



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Pneumatic Products U.S.

A complete range of pneumatic system components

Catalog PDN1000-3US



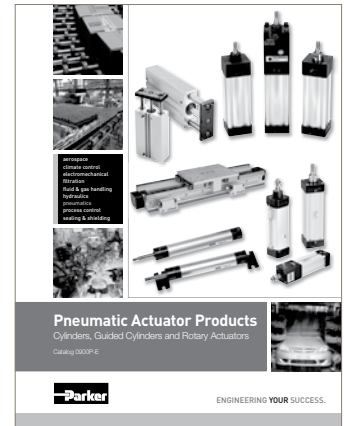
ENGINEERING YOUR SUCCESS.



0600P-E



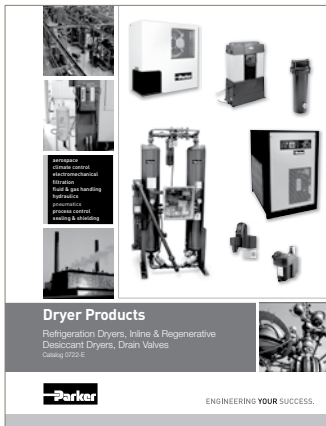
0700P-E



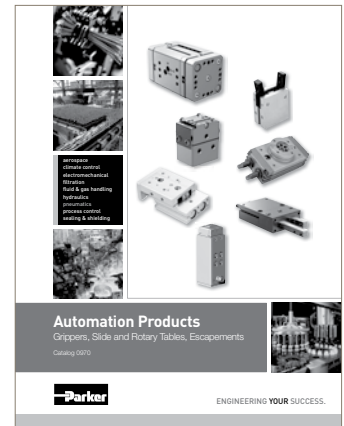
0900P-E



0802-E



0722P-E



0970-E


For additional technical data, view the above catalogs at www.parker.com/pneu/literature
 For information on Parker's On-line Training, visit www.parker.com/training

The Parker 5-Year Extended Warranty



Parker Hannifin Corporation will extend its warranty on all pneumatic components to sixty (60) months providing they are correctly installed and protected by Parker pneumatic filters which are properly maintained. Components covered by this warranty include all cylinders, valves and pneumatic automation components manufactured by Parker in any of our global facilities. This warranty covers our components anywhere in the world you may ship your equipment.

Parker's obligation under this warranty is limited to the replacement or repair of any failed components. The buyer understands that the seller will not be liable for any other costs or damages.

The buyers of quality Parker components and filters benefit by having ONE source for all pneumatic needs - Parker.



Yoon "Michael" Chung
 President
 Automation Group



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At Parker, we have the largest global distribution network in motion and control, with over 7,500 distributors serving more than 422,000 customers. To find the distributor nearest you, please visit our DISTRIBUTOR LOCATOR at <http://www.parker.com/pneu/distributor>



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⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated on the separate page of this document entitled "Offer of Sale".

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A

Tie Rod Cylinders

3MA Series - Economy NFPA Cylinder



B6

- Bore sizes 1-1/2 through 5 inch
- 18 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

4MA / 4ML Series - Flexible NFPA Cylinder



B16

- Bore sizes 1-1/2 through 8 inch
- 20 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -50°F to 250°F
- Aluminum body construction

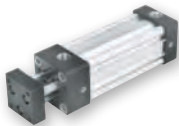
3MAJ / 4MAJ - Rodlock Cylinder



B40

- Bore sizes 1-1/2 through 8 inch
- 17 standard mounting styles
- Pressures up to 100 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

4MNR Series - Non-Rotating Cylinder



B58

- Bore sizes 1-1/8 through 4 inch
- 14 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

P1D Series - ISO 15552 / ISO 6431



B65

- 5 available for maximum flexibility
- Bore sizes 32mm through 200mm
- 10 standard mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

Round Body Cylinders

SR / SRM / SRD / SRDM Series - Non-Repairable



B83

- Bore sizes 5/16 through 3 inch
- 28 mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Stainless steel body construction

SRX Series - Position Feedback



B109

- Bore sizes 1-1/16 through 3 inch
- Continuous position feedback
- Pressures up to 150 PSIG
- Temperatures 40°F to 165°F
- Stainless steel body construction

P1L Series - Repairable



B117

- Bore sizes 20mm through 100mm
- 9 mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

P1A Series - ISO Non-Repairable



B132

- Bore sizes 10mm through 25mm
- 5 mounting styles
- Pressures up to 145 PSIG
- Temperatures -40°F to 302°F
- Stainless steel body construction

P Series - Repairable



B136

- Bore sizes 1-1/8 through 4 inch
- 4 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

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Compact Cylinders

P1Q Series - Economy Compact Cylinder



B143

- Bore sizes 12mm through 100mm
- 4 flexible mounting options
- Pressures up to 10 PSIG
- Temperatures 23°F to 158°F
- Aluminum body construction

P1M Series - Compact Cylinder



B151

- Bore sizes 12mm through 100mm
- 6 mounting options
- Pressures up to 145 PSIG
- Temperatures -4°F to 250°F
- Aluminum body construction

LP / LPM Series - Compact Cylinder



B163

- Bore sizes 9/16 through 4 inch
- 6 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 200°F
- Aluminum body construction

Guided Cylinders

P5T Series - Compact Guided



B169

- Bore sizes 16mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Flexible porting: top, rear, side

P5L Series - Guided



B176

- Bore sizes 20mm through 100mm
- Direct mounting
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Extruded aluminum body construction

HB Series - Heavy Duty Guided



B202

- Bore sizes 1-1/2 through 2-1/2 inch
- Thrust, reach and compact versions available
- Air service pressure up to 250 PSIG, hydraulic service up to 750 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Rod lock version available

P5E Series - P1D ISO Guided



B210

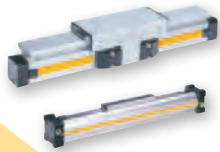
- Bore sizes 32mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 14°F to 165°F
- Aluminum body construction
- Rod lock version available

A

Pictorial Index

Rodless Cylinders

OSP-P Series - Band Type Rodless



B216

- Bore sizes 10mm through 80mm
- Pressures to max. 8 bar
- Temperatures -10°F to 80°F
- Aluminum body construction

Rotary Actuators

PV Series - Vane Rotary



B263

- 8 model sizes
- Single or double vane models
- Pressures to 150 PSIG
- Temperatures 30°F to 250°F
- 7 to 1800 lb-in output torque

Actuator Products

P1X Series - Band Type Rodless



B234

- 7 bore sizes 16mm through 63mm
- Integral sensor mounting rail
- Pressures 7 to 100 PSIG
- Temperatures 40°F to 140°F
- Aluminum body construction

PRN(A) Series - Vane Rotary



B267

- 5 miniature and 4 standard models
- Temperatures -23°F to 176°F
- 1.33 to 2355 in-lb torque at 100 PSIG

Vacuum Products

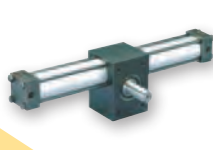
P1Z Series - Magnetically Coupled Rodless



B246

- 3 bore sizes 16mm, 20mm & 32mm
- Pressures 29 to 100 PSIG
- Temperatures 15°F to 140°F
- Stainless steel body construction

PTR Series - Rack & Pinion Rotary



B272

- Bore sizes 1 through 3-1/4 inch
- Pressures to 250 PSIG
- Temperatures 0°F to 250°F
- 39 to 2281 lb-in output torque

Valve Products

GDL Series - Rails & Cassettes



B258

- 6 sizes available
- Speed up to 10m/s (33 ft/s)
- Temperatures -10°C to 80°C
- Aluminum alloy rail
- Aluminum body construction

HP Series - Large Rack & Pinion Rotary



B275

- 2 large bore models
- 3 standard rotations
- Pressures to 100 PSIG
- Temperatures 0°F to 250°F
- 4500 and 10,000 lb-in output at 100 PSIG

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P1V-S Series - Air Motors



B278

- Power from 20 through 1200 watts
- Speeds 5 to 24,000 RPM
- Pressures to max. 7 bar
- Temperatures -30°C to 100°C

Automation Products

Grippers



- Grip forces to 44,000N
- Parallel or Angular
- 2 or 3 jaw
- Pneumatic or electric
- Temperature to 300°F
- Magnetic piston standard
- Clean room

B281

Slide Tables



- 6 bore sizes: 6mm to 25mm
- Strokes to 150mm
- Integration of linear rail and dual bore cylinder
- Available with adjustable stroke and shock absorbers
- Magnetic piston standard

B314

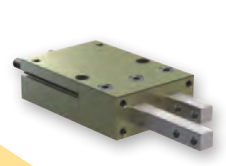
Rotary Tables



- 4 bore sizes: 16mm to 32mm
- Dual rack and pinion with integrated bearing
- Adjustable rotation standard 0 to 190 degrees
- Available with optional shock absorbers

B326

Escapements

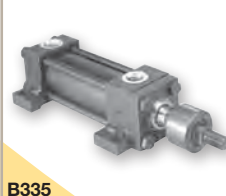


- 3 bore sizes: 14mm to 27mm
- Locking key ensures part separation and eliminates jams
- Adjustable retract stops
- Sealed design repels contaminants
- Dowel holes in body for precision applications

B328

Actuator Accessories

Linear Alignment Couplers



- 12 standard thread sizes
- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available

B335

4TK Series - Air Oil Tanks



- 6 standard bore sizes
- Lightweight aluminum / fiberglass design
- 2 fluid flow baffles reduce agitation and aeration
- 8 standard mounting styles

B336

PRL Series - Stand Alone Rodlock



- 5 different sizes
- Large holding forces
- 2 different mounting styles
- Case-hardened rod material available

B337

Electronic Sensors

Sensors



- Solid state
- Reed
- NAMUR
- Proximity

B339

Shock Absorbers

Shock Absorbers



- Miniature - self-compensating
- Heavyweight - soft contact and self-compensating
- Miniature - soft contact and self-compensating
- Magnum series - adjustable
- Heavy - self-compensating
- Heavy - adjustable

B361

A

Vacuum Cups

PFG Flat Cups



- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Low profile design makes flat pads ideal for fast response
- Cup Sizes: 1.5mm to 200mm

C4

PBG Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and flexible products
- Cup sizes: 10mm to 150mm

C17

P5V-CFS Flat Cups



- Precision molded double lip flat cup for slightly curved surfaces
- Double lip for additional security. If outside lip bends and loses its seal, the inner lip remains sealed.
- Outer ribs prevent the cup lip from being cut
- Cup Sizes: 50mm to 150mm

C29

PJG Short Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and slightly flexible products
- Shorter stroke provides fast response
- Cup sizes: 6mm to 80mm

C30

PCG Multiple Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, or curved surfaces
- 2-1/2 bellows design minimizes contact pressure applied to products
- Cup sizes: 5mm to 90mm

C42

PUGB Flat Swivel Cups



- 30° swivel single lip flat cup for smooth surfaces, slightly curved surfaces, and flexible products
- Rigid stem or level compensator provides good stability for horizontal lift
- Cup Sizes: 60mm to 100mm

C50

Vacuum Generators

MCA, CV, CV-CK Inline Generators



- MCA: Light weight vacuum generator
- CV: Basic aluminum body vacuum generator
- CV-CK: Basic aluminum body vacuum generator with mechanical switch for part present confirmation

C54

CHF Inline Generators



- CHF- High Flow Series is a multistage vacuum generator
- Intended for high flow vacuum applications
- Ideal for porous applications
- Standard with flow thru exhaust mufflers to reduce clogging in dirty environments

C56

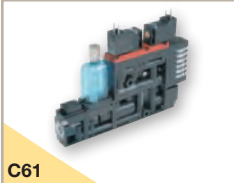
MC22 Integrated Generators



- Compact vacuum generator includes vacuum and blow-off solenoids and vacuum filters
- Optional check valve and MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 8 stations

C58

MC72 Integrated Generators



- Light weight vacuum generator includes vacuum and blow-off solenoids.
- Includes check valve, vacuum filter and optional MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 5 stations

C61

CEK Integrated Generators



- Air-economizing functions with emergency stop logic that maintains degree of vacuum with loss of output power
- Includes vacuum and blow-off solenoids, check valve, vacuum filter and optional MPS-23 pressure sensor
- Inline versions can be mounted in manifolds up to 5 stations

C64

CVXCEK Integrated Generators



- Basic 2 station CEK generator manifold with additional electrical capabilities
- Integrates MPS-23 sensor for on board air-economizing programming
- M12 electrical wiring package with optional 18-pin single connection

C67

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Vacuum Generator Sensors


MPS-23 Integrated Generator Sensors



- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C69

MVS-201 Integrated Generator Sensors




- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C71

Pressure Sensors / Cables


MPS-33 Pressure Sensors



- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C73


MPS-34 Pressure Sensors



- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C75


SCP01 Pressure Sensor



- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

C77

SCPSD Pressure Sensors




- CV-CK is a Venturi Generator with adjustable open contact mechanical switch for vacuum confirmation.
- Great for low cost vacuum confirmation

C78

Cables – continued

Cables




- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: swivel straight or angled
- IP67 swivel connector

C80

Vacuum Generator Accessories


FSV Metered Flow Sensing Valve



- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter

C81


CH01 One Way Check Valve



- Poppet design
- Low leakage
- Low cracking pressure

C82


VF & VFL Vacuum Filters



- Filters the vacuum system to protect the components from damaging particles absorbed from the environment
- Elements easily replaced

C83


VFP Vacuum Filters



- Provides easy monitoring, economy and safety
- 10 micron porous plastic element prolongs element life
- Shatterproof and airtight
- Replaceable filter element

C84

Vacuum Silencers



- Pressure up to 128 PSIG
- Temperature 41°F to 132°F (5°C to 55.5°C)
- Silencing effect 20 dB

C85

A	Pictorial Index
	Actuator Products
	Vacuum Products
	Valve Products
	Air Preparation Products
	Dryer Products
	Accessories
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A

Direct Acting Valves

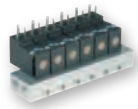
XM Series - Direct Acting



D4

- Inline or stacking
- 1/8 inch ports
- Pressures 0 to 125 PSIG
- Temperatures 32°F to 125°F
- Flow - .15 Cv

15mm Series - Direct Acting



D8

- Subbase or manifold
- 1/8 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 140°F
- Flow - .033 to .05 Cv

Inline Valves

Viking Lite Series - Inline



D11

- Inline or bar manifold
- 1/8 through 3/8 inch ports
- Pressures 22 to 145 PSIG
- Temperatures 14°F to 122°F
- Flow - .6 to 2.5 Cv

Viking Xtreme Series - Inline



D19

- Inline or bar manifold
- 1/8 through 1/2 inch ports
- Pressures VAC to 232 PSIG
- Temperatures -40°F to 140°F
- Flow - .7 to 2.7 Cv

B Series - Inline



D43

- Inline, subbase or bar manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .75 to 7.0 Cv

ADEX Series - Inline



D68

- Inline, subbase or bar manifold
- M3, M5, 1/8 inch ports
- Pressures VAC to 100 PSIG
- Temperatures 32°F to 122°F
- Flow - .1 to .47 Cv

Inline – continued

N Series - Inline Poppet



D78

- Inline mounted
- 3/8 through 1-1/2 inch ports
- Pressures 30 to 250 PSIG
- Temperatures 0°F to 200°F
- Flow - 3.6 to 29.9 Cv

Subbase & Manifold Valves

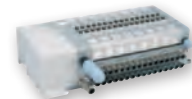
Moduflex Series Valves



D89

- Inline or stacking
- 4mm tube, 1/4, 3/8 inch ports
- Pressures VAC to 120 PSIG
- Temperatures 5°F to 140°F
- Flow - .18 to .80 Cv

Isys Micro Series



D113

- Subbase or manifold
- 4mm through 1/4 tube
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .35 Cv

Isys ISO Series



D124

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .55 to 6.0 Cv

Fieldbus Systems



D166

- Fieldbus interface for Isys and Moduflex valves
- Up to 256 inputs
- Up to 256 outputs
- Digital or analog

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Subbase & Manifold – continued


DX ISOMAX Series



- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 14°F to 140°F
- Flow - .55 to 4.15 Cv

D185

Valvair II Series




- Subbase or manifold
- 3/8 through 1-1/2 inch ports
- Pressures VAC to 225 PSIG
- Temperatures 0°F to 200°F
- Flow - 1.9 to 12.0 Cv

D198

Manual / Mechanical Valves


Directair 2 & 4



- Manual / mechanical
- 1/8 and 1/4 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 32°F to 175°F
- Flow - .20 to .84 Cv

D208


Viking Xtreme



- Manual / mechanical
- 1/8, 1/4 and 3/8 inch ports
- Pressures:
 Type A & B - VAC to 232 PSIG
 Type C & D - VAC to 174 Psig
- Temperatures -40°F to 140°F
- Flow - .5 to 2.7 Cv

D218

42 Series




- Manual / mechanical
- 1/4 and 3/8 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 0°F to 140°F
- Flow - 1.3 to 2.9 Cv

D225

Manual / Mechanical – continued


M0 Series



- Air Pilot, Manual / mechanical
- 1/4 and 1 inch ports
- Pressures VAC to 225 PSIG
- Temperatures -15°F to 200°F
- Flow - .5 to 1.25 Cv

D227

LV / EZ Lockout Valves



- Port sizes 3/8 through 1-1/4 inch
- Max. supply pressure 300 PSIG
- Max. operating temperature 175°F
- Cv from 3.7 to 14

D231

Brass Poppet, Sliding Seal




- 4-way, 3-position rotary disc, direct air operated valves
- Pressures 0 to 150 PSIG
- Temperatures 18°F to 200°F
- Flow - 2.5 to 6.2 Cv

D233

Valve Accessories


Control Panel Products



- A wide variety of push buttons and selector switches
- Visual indicators
- Foot pedal switches
- Modular pneumatic / electric push buttons

D236

Sensing / Limit Switches



- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleen or blocking for detection

D240



A

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A

Air Preparation Products

Pictorial Index

Global FRL's



- Port size: 1/4 through 3/4 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -13°F through 150°F
- Filters, regulators, filter / regulators, lubricators and accessories

E3

General Industrial FRL's



- Port size: 1/8 through 3 inch
- Maximum supply pressure: 250 PSIG
- Operating temperature: 32°F through 150°F
- Filters, regulators, filter / regulators, lubricators and accessories

E79

Actuator Products

Prep-Air II FRL's



- Compact & standard
- Port size: 1/4 through 3/4 inch
- Filters, regulators, filter / regulators, lubricators and accessories
- Operating temperature: 32°F through 175°F
- Point of use applications
- Modular construction

E40

Vacuum Products

Stainless Steel FRL's



- Port sizes: 1/4 and 1/2 inch
- Stainless steel construction handles most corrosive environments
- Operating temperature -40°F through 180°F
- Meets NACE specifications MR-01-75/ISO 15156
- Filters, regulators, filter / regulators, and lubricators

E100

Valve Products

Miniature FRL's



- Port size: 1/8 through 3/8 inch
- Filters, regulators, filter / regulators, lubricators and accessories
- Operating temperature: -4°F through 125°F
- Non-modular construction
- Ideal for point of use applications

E59

Air Preparation Products

Precision / Proportional Regulators



- Port sizes: 1/4 through 2 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -40°F through 200°F
- High precision
- Electronic proportional

E107

Dryer Products

P3N FRL's



- Port size: 3/4 through 1-1/2 inch
- Filters, regulators, filter / regulators, lubricators and accessories
- Operating temperature: 32°F through 175°F
- High flow

E70

Accessories

Liquid Separators



- Port sizes 1/4 through 6 inch flange
- High liquid removal efficiencies at all flow conditions
- Low maintenance
- Suitable for variable flow compressors


E118

Application Engineering Data

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Dryers

Dryer Products




- Refrigeration (10-2400 SCFM)
- Inline desiccant (15-60 SCFM)
- Regenerative desiccant (3-800 SCFM)
- Heatless desiccant dryers
- Zero loss & timer drains
- Auto electrical drain valves

F3

Accessories – continued

Quick Connect Couplers




- Senso Control® (Product Highlight Only)
- Industrial interchange nipples –1/4" to 3/4" body size
- Sleevematic couplers –1/4" to 1/2" body size
- Safromatic couplers –1/4" to 3/4" body size
- Economatic quick connect couplings –1/4" body size

G14

Accessories


Ball Valves / Plug Valves



- Forged brass, general purpose, industrial ball valves
- Stainless steel, general purpose, industrial ball valves
- One piece extruded brass body plug valves

G3

Tubing & Fittings



- Push-to-connect, Prestolok composite fittings
- Push-to-connect, Prestolok metal fittings
- Pipe fittings
- E: instrument grade tubing, N: flexible tubing, FRPE: flame resistant tubing, NR: semi-rigid high strength tubing, U: polyether base tubing

G18

Application Engineering Data

- Fluid Power Graphic Symbols
- Valve Product Selection Data
- Technical Data
- Application Engineering Data

H1

Hose & Fittings



- 801 General purpose hose
- Push-on hose barb fittings

G4

Part Number to Page Number, Safety Guides, Offer of Sale

- Part Number to Page Number Index
- Safety Guide – Actuator Products
- Safety Guide – Control Products
- Offer of Sale

J1

Integrated Fittings



- Flow control regulators
- Inline check valves
- Blocking valves
- Threshold sensors

G5

Miscellaneous Accessories

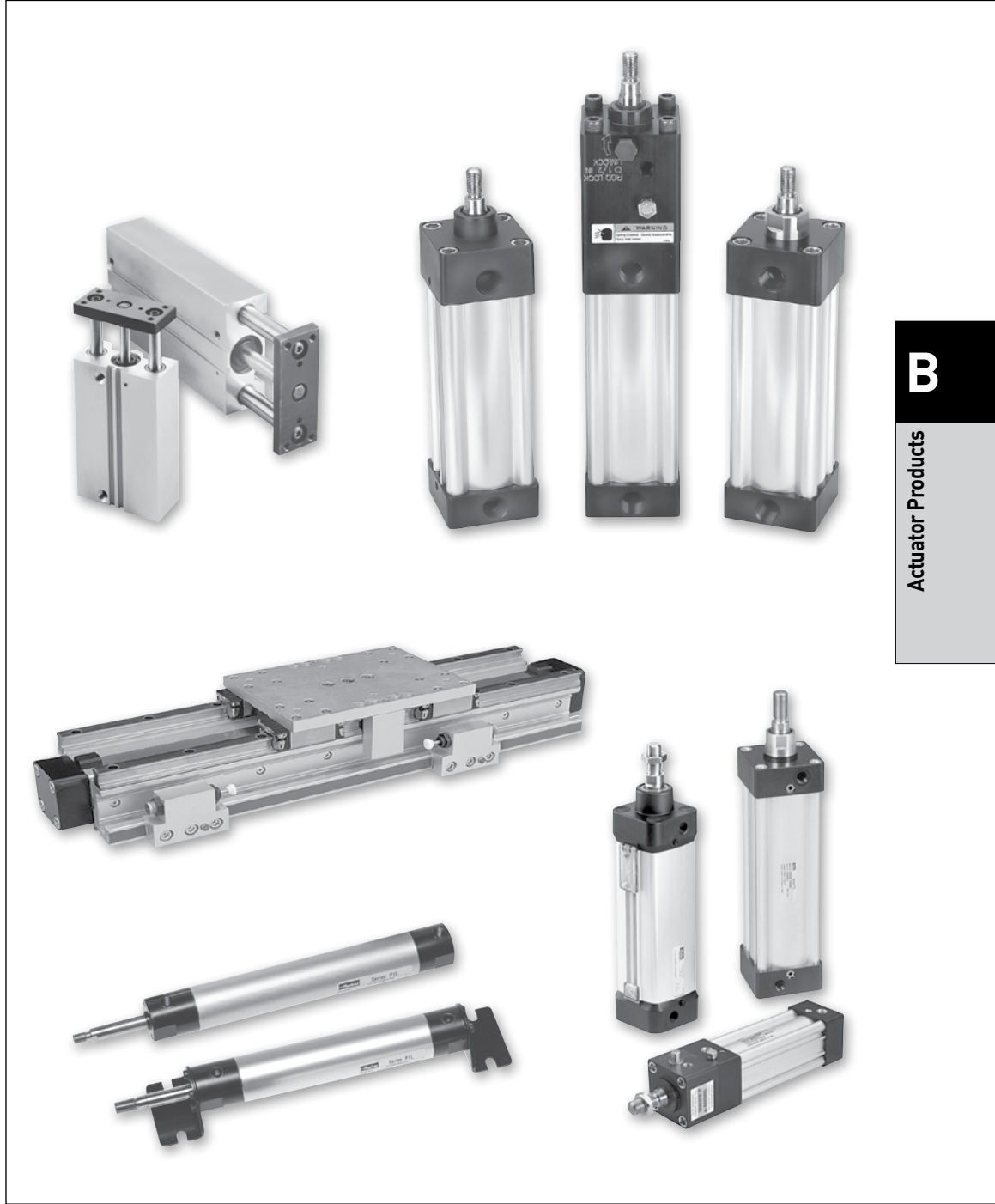
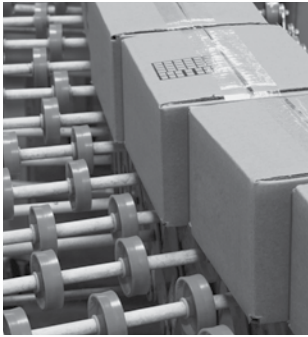


- Tank valves & air chucks
- Mufflers & silencers
- Relief valves
- Quick exhaust / shuttle valves
- Pressure switches
- Blow guns
- Ports from M5 through 3/4 inch

G10

A

Notes




B
Actuator Products

Actuator Products

Tie Rod Cylinders

3MA Series - Economy NFPA Cylinder



- Bore sizes 1-1/2 through 5 inch
- 18 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

B6

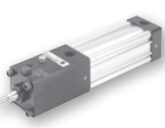
4MA / 4ML Series - Flexible NFPA Cylinder



- Bore sizes 1-1/2 through 8 inch
- 20 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -50°F to 250°F
- Aluminum body construction

B16

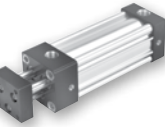
3MAJ / 4MAJ - Rodlock Cylinder



- Bore sizes 1-1/2 through 8 inch
- 17 standard mounting styles
- Pressures up to 100 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

B40

4MNR Series - Non-Rotating Cylinder



- Bore sizes 1-1/8 through 4 inch
- 14 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

B58

P1D Series - ISO 15552 / ISO 6431



- 6 available for maximum flexibility
- Bore sizes 32mm through 200mm
- 10 standard mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

B65

Round Body Cylinders


SR / SRM / SRD / SRDM Series - Non-Repairable



- Bore sizes 5/16 through 3 inch
- 28 mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Stainless steel body construction

B83


SRX Series - Position Feedback



- Bore sizes 1-1/16 through 3 inch
- Continuous position feedback
- Pressures up to 150 PSIG
- Temperatures 40°F to 165°F
- Stainless steel body construction

B109

P1L Series - Repairable



- Bore sizes 20mm through 100mm
- 9 mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

B117


P1A Series - ISO Non-Repairable



- Bore sizes 10mm through 25mm
- 5 mounting styles
- Pressures up to 145 PSIG
- Temperatures -40°F to 302°F
- Stainless steel body construction

B132

P Series - Repairable




- Bore sizes 1-1/8 through 4 inch
- 4 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

B136

Compact Cylinders


P1Q Series - Economy Compact Cylinder



- Bore sizes 12mm through 100mm
- 4 flexible mounting options
- Pressures up to 10 PSIG
- Temperatures 23°F to 158°F
- Aluminum body construction

B143

P1M Series - Compact Cylinder



- Bore sizes 12mm through 100mm
- 6 mounting options
- Pressures up to 145 PSIG
- Temperatures -4°F to 250°F
- Aluminum body construction

B151

LP / LPM Series - Compact Cylinder




- Bore sizes 9/16 through 4 inch
- 6 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 200°F
- Aluminum body construction

B163

Guided Cylinders


P5T Series - Compact Guided



- Bore sizes 16mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Flexible porting: top, rear, side

B169

P5L Series - Guided



- Bore sizes 20mm through 100mm
- Direct mounting
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Extruded aluminum body construction

B176


HB Series - Heavy Duty Guided



- Bore sizes 1-1/2 through 2-1/2 inch
- Thrust, reach and compact versions available
- Air service pressure up to 250 PSIG, hydraulic service up to 750 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Rod lock version available

B202

P5E Series - P1D ISO Guided



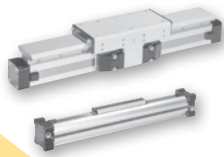
- Bore sizes 32mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 14°F to 165°F
- Aluminum body construction
- Rod lock version available

B210

B
 Pictorial Index
 Actuator Products

Rodless Cylinders

OSP-P Series - Band Type Rodless



- Bore sizes 10mm through 80mm
- Pressures to max. 8 bar
- Temperatures -10°F to 80°F
- Aluminum body construction

B216

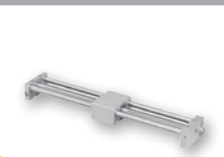
P1X Series - Band Type Rodless



- 7 bore sizes 16mm through 63mm
- Integral sensor mounting rail
- Pressures 7 to 100 PSIG
- Temperatures 40°F to 140°F
- Aluminum body construction

B234

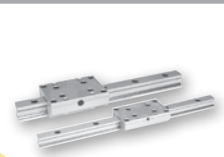
P1Z Series - Magnetically Coupled Rodless



- 3 bore sizes 16mm, 20mm & 32mm
- Pressures 29 to 100 PSIG
- Temperatures 15°F to 140°F
- Stainless steel body construction

B246

GDL Series - Rails & Cassettes



- 6 sizes available
- Speed up to 10m/s (33 ft/s)
- Temperatures -10°C to 80°C
- Aluminum alloy rail
- Aluminum body construction

B258

Rotary Actuators

PV Series - Vane Rotary



- 8 model sizes
- Single or double vane models
- Pressures to 150 PSIG
- Temperatures 30°F to 250°F
- 7 to 1800 lb-in output torque

B263

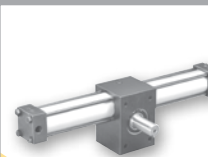
PRN(A) Series - Vane Rotary



- 5 miniature and 4 standard models
- Temperatures -23°F to 176°F
- 1.33 to 2355 in-lb torque at 100 PSIG

B267

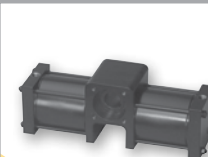
PTR Series - Rack & Pinion Rotary



- Bore sizes 1 through 3-1/4 inch
- Pressures to 250 PSIG
- Temperatures 0°F to 250°F
- 39 to 2281 lb-in output torque

B272

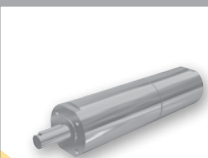
HP Series - Large Rack & Pinion Rotary



- 2 large bore models
- 3 standard rotations
- Pressures to 100 PSIG
- Temperatures 0°F to 250°F
- 4500 and 10,000 lb-in output at 100 PSIG

B275

P1V-S Series - Air Motors



- Power from 20 through 1200 watts
- Speeds 5 to 24,000 RPM
- Pressures to max. 7 bar
- Temperatures -30°C to 100°C

B278

Automation Products

Grippers



B281

- Grip forces to 44,000N
- Parallel or Angular
- 2 or 3 jaw
- Pneumatic or electric
- Temperature to 300°F
- Magnetic piston standard
- Clean room

Slide Tables



B314

- 6 bore sizes: 6mm to 25mm
- Strokes to 150mm
- Integration of linear rail and dual bore cylinder
- Available with adjustable stroke and shock absorbers
- Magnetic piston standard

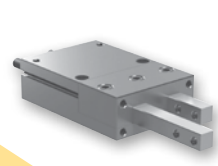
Rotary Tables



B326

- 4 bore sizes: 16mm to 32mm
- Dual rack and pinion with integrated bearing
- Adjustable rotation standard 0 to 190 degrees
- Available with optional shock absorbers

Escapements

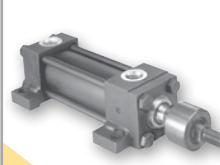


B328

- 3 bore sizes: 14mm to 27mm
- Locking key ensures part separation and eliminates jams
- Adjustable retract stops
- Sealed design repels contaminants
- Dowel holes in body for precision applications

Actuator Accessories

Linear Alignment Couplers



B335

- 12 standard thread sizes
- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available

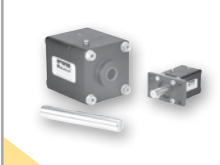
4TK Series - Air Oil Tanks



B336

- 6 standard bore sizes
- Lightweight aluminum / fiberglass design
- 2 fluid flow baffles reduce agitation and aeration
- 8 standard mounting styles

PRL Series - Stand Alone Rodlock



B337

- 5 different sizes
- Large holding forces
- 2 different mounting styles
- Case-hardened rod material available

Electronic Sensors

Sensors



B339

- Solid state
- Reed
- NAMUR
- Proximity

Shock Absorbers

Shock Absorbers

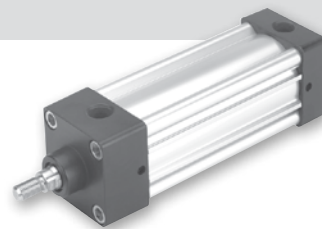


B361

- Miniature - self-compensating
- Heavyweight - soft contact and self-compensating
- Miniature - soft contact and self-compensating
- Magnum series - adjustable
- Heavy - self-compensating
- Heavy - adjustable

3MA Series

- NFPA interchangeable economy series
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4" and 5"
- Available in any practical stroke length
- 18 standard modular mounting styles available
- Extruded-profile aluminum body with integrated switch grooves
- Single rod end or double rod end options available
- Cushions – standard and adjustable at both ends, optional non-cushioned
- NPT porting standard
- RoHS compliant



Operating information

Operating pressure:	250 PSIG (17 bar)
Temperature range:	-10°F to 165°F (-23°C to 74°C)
Filtration requirements:	40 micron, dry filtered air

Ordering information

2.00	C	J	3MA	U	1	4	A	C	6.000
Bore size 1.50 2.00 2.50 3.25 4.00 5.00	Double rod cylinder ⁵ Specify "K" only if double rod cylinder is required.	Mounting style Specify mounting style code (see table on following page).	Series 3MA	Ports Standard (NPTF)	Piston rod number Standard (rod code number 1) ³			Stroke length Specify stroke length required in inches.	
Cushion head end C Standard (cushioned head end) Blank Non-cushioned head end				Seals Blank Standard (nitrile seals) E Fluorocarbon rod wiper and rod seal only ²			Cushion cap end C Standard (cushioned cap end) Blank Non-cushioned cap end		
Cylinder construction Blank* Standard (extruded body, standard round lobe orientation) A* Extruded body, round lobe orientation rotated 90 degrees from standard N* Extruded body, round lobe orientation rotated 180 degrees from standard Z* Extruded body, round lobe orientation rotated 270 degrees from standard T Aluminum round tube and carbon steel tie rods and nuts				Special modification Specify "S" only for special modification other than rod end, and then describe modification in item notes.			Piston rod thread type A Standard (UNF unified thread) W BSF British fine M* Metric		
Piston type Blank Standard (lipseals and magnetic ring) ⁵ 1 Lipseals, no magnetic ring ⁵ 2 Lipseals, no magnetic ring (aluminum piston) 3 Lipseals and magnetic ring (aluminum piston) 4 Bumper seals, no magnetic ring 6 Bumper seals and magnetic ring B Lipseals, 1/4" thick bumpers both ends ¹ H Lipseals, 1/4" thick bumper head end ¹ C Lipseals, 1/4" thick bumper cap end ¹ D Lipseals and magnetic ring, 1/4" thick bumpers both ends ¹ F Lipseals and magnetic ring, 1/4" thick bumper head end ¹ R Lipseals and magnetic ring, 1/4" thick bumper cap end ¹				Piston rod thread style 4 Small male 8 Intermediate male 9 Short female 55 For use with split coupler ⁴ 3 Special (and specify all dimensions required)			Rod material code Blank Standard Y 17-4 PH stainless steel J 303 stainless steel S 316 stainless steel		

* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore size.

¹ Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".

² Used for external chemical compatibility applications, not high temperature.

³ Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter. (Note: 3MA has only one rod diameter per bore size, so proper piston rod diameter from chart result may lead to bore size change). For oversize rod within the same bore size, please see 4MA section.

⁴ For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material Code is required with this option, please place an "S" for special in Special Modification field and specify rod material in the item notes.

⁵ Double rod cylinders not available with composite piston type.

For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.

3MA Mounting Styles for 1-1/2" to 5" Bore

Mounting style	NFPA mounting	Description	Bore size
TEF	MX5/MS4	Sleeve Nut with Side Tap (standard mount)	1-1/2 - 5
T	MX0	No Mount (same construction as TEF)	1-1/2 - 5
TE	MX5	Sleeve Nut (same construction as TEF)	1-1/2 - 5
F	MS4	Side Tap (same construction as TEF)	1-1/2 - 5
J	MF1	Head Rectangular Flange	1-1/2 - 5
H	MF2	Cap Rectangular Flange	1-1/2 - 5
TB	MX3	Tie Rods Extended Head End	1-1/2 - 5
TC	MX2	Tie Rods Extended Cap End	1-1/2 - 5
TD	MX1	Tie Rods Extended Both Ends	1-1/2 - 5

Mounting style	NFPA mounting	Description	Bore size
C	MS2	Side Lug	1-1/2 - 5
CB	MS1	Side End Angle	1-1/2 - 5
G	MS7	Side End Lug	1-1/2 - 4
NB	N/A	Base Bar	1-1/2 - 4
BB	MP1	Cap Fixed Clevis	1-1/2 - 5
BC	MP2	Cap Detachable Clevis	1-1/2 - 5
BE	MP4	Cap Detachable Eye	1-1/2 - 4
DD	MT4	Intermediate Trunnion	1-1/2 - 5
KTEF*	MDX5/ MDS4	Double Rod End, TEF Mount	1-1/2 - 5

* Double rod end cylinders can be ordered with head mountings, i.e. KJ.

B

Tie Rod Cylinders
 Actuator Products

3MA
 Series

4MA/4ML
 Series

3MAJ/4MAJ
 Series

4MNR
 Series

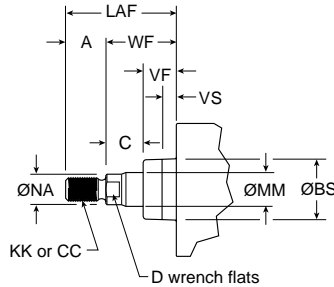
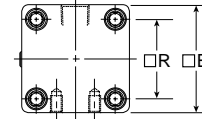
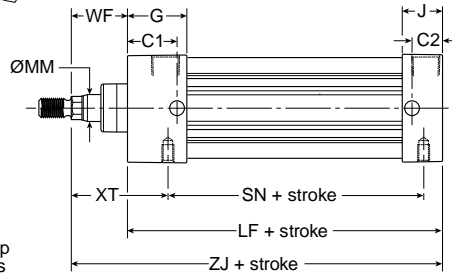
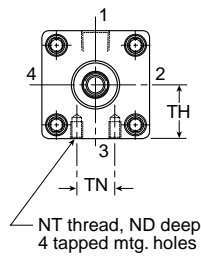
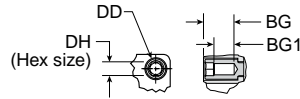
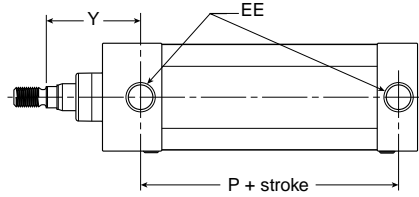
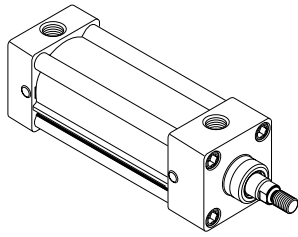
P1D
 Series

Sensors

For sensors see page B339.



3MA Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)



For dimensions of all standard rod end styles, please see next page.
 BS = pilot diameter
 VS = length of pilot diameter

Styles TEF, T, TE and F

Bore size	Rod no.	Rod dia. MM	Thread		+0.000 -0.004														EE (NPTF)	G
			Style 8 CC	Style 4 & 9 KK	A	AA	BG	BG1	BS	C	C1	C2	D	DD	DH	E				
1-1/2	1	5/8	1/2-20	7/16-20	0.750	2.020	0.562	0.374	1.124	0.385	1.000	0.500	1/2	1/4-28	1/4	2.000	3/8	1.438		
2	1	5/8	1/2-20	7/16-20	0.750	2.600	0.562	0.362	1.124	0.385	1.148	0.711	1/2	5/16-24	5/16	2.500	3/8	1.375		
2-1/2	1	5/8	1/2-20	7/16-20	0.750	3.100	0.562	0.362	1.124	0.385	1.117	0.711	1/2	5/16-24	5/16	3.000	3/8	1.344		
3-1/4	1	1	7/8-14	3/4-16	1.125	3.900	0.700	0.500	1.499	0.510	1.350	0.881	7/8	3/8-24	3/8	3.750	1/2	1.594		
4	1	1	7/8-14	3/4-16	1.125	4.700	0.700	0.500	1.499	0.510	1.350	0.881	7/8	3/8-24	3/8	4.500	1/2	1.594		
5	1	1	7/8-14	3/4-16	1.125	5.800	0.781	0.531	1.499	0.510	1.350	0.975	7/8	1/2-20	1/2	5.500	1/2	1.594		

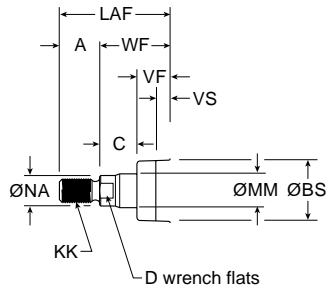
Bore size	Rod no.	Rod dia. MM	+0.005 -0.005														Add stroke			
			J	LAF	NA	ND	NT	R	TH	TN	VF	VS	WF	XT	Y	LF	P	SN	ZJ	
1-1/2	1	5/8	0.938	1.750	0.563	0.375	1/4-20	1.430	0.993	0.625	0.615	-	1.000	1.938	1.875	3.625	2.313	2.250	4.625	
2	1	5/8	0.938	1.750	0.563	0.438	5/16-18	1.840	1.243	0.875	0.615	0.250	1.000	1.938	1.875	3.625	2.313	2.250	4.625	
2-1/2	1	5/8	0.938	1.750	0.563	0.625	3/8-16	2.190	1.493	1.250	0.615	0.250	1.000	1.938	1.938	3.750	2.375	2.375	4.750	
3-1/4	1	1	1.125	2.500	0.938	0.750	1/2-13	2.760	1.868	1.500	0.865	0.250	1.375	2.438	2.438	4.250	2.625	2.625	5.625	
4	1	1	1.125	2.500	0.938	0.750	1/2-13	3.320	2.243	2.063	0.865	0.250	1.375	2.438	2.438	4.250	2.625	2.625	5.625	
5	1	1	1.219	2.500	0.938	0.938	5/8-11	4.100	2.743	2.688	0.865	0.250	1.375	2.438	2.438	4.500	2.875	2.875	5.875	

B
 Tie Rod Cylinders
 Actuator Products
 3MA Series
 4MA/4ML Series
 3MAJ/4MAJ Series
 4MNR Series
 P1D Series

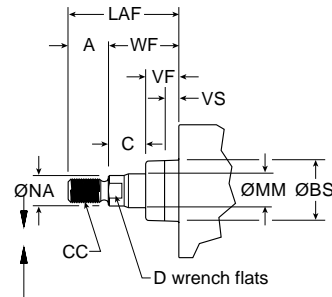


3MA Rod End Dimensions

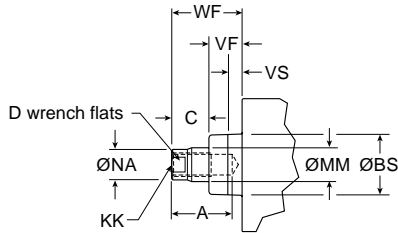
Thread Style 4
 (NFPA Style SM)
 Small Male



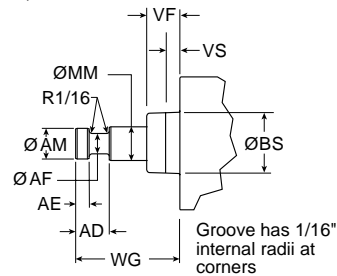
Thread Style 8
 (NFPA Style IM)
 Intermediate Male



Thread Style 9
 (NFPA Style SF)
 Short Female



Thread Style 55
 For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - “Special Thread”

Special threads, rod extensions, rod eyes, blanks, etc. are also available.
 To order, specify “Style 3” and give desired dimensions for KK or CC, A and W or WF.
 If otherwise special, please supply dimensioned sketch.

Applies to all rod ends:
 BS = pilot diameter
 VS = length of pilot diameter

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread		+0.000 -0.004														
			Style 8 CC	Style 4 & 9 KK	A	AD	AE	AF	AM	BS	C	D	LAF	NA	VF	VS	WF	WG	
1-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1.750	0.563	0.615	-	1.000	1.750	
2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1.750	0.563	0.615	0.250	1.000	1.750	
2-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1.750	0.563	0.615	0.250	1.000	1.750	
3-1/4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	2.500	0.938	0.865	0.250	1.375	2.375	
4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	2.500	0.938	0.865	0.250	1.375	2.375	
5	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	2.500	0.938	0.865	0.250	1.375	2.375	

B

Tie Rod Cylinders
Actuator Products

3MA Series

4MA/4ML Series

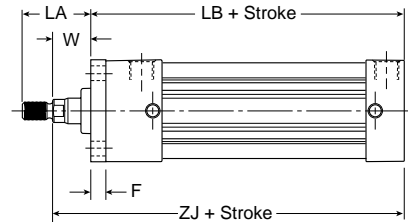
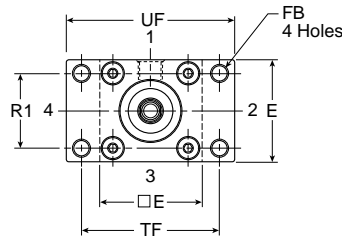
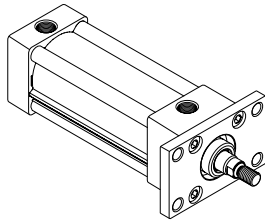
3MAJ/4MAJ Series

4MNR Series

P1D Series

Head Rectangular Flange

Style J
 (NFPA MF1)

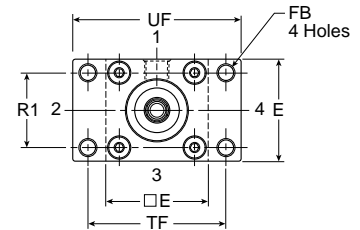
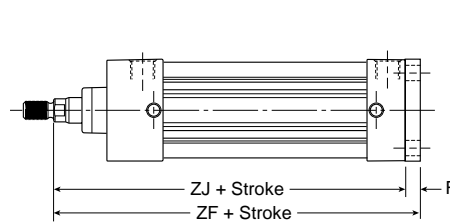
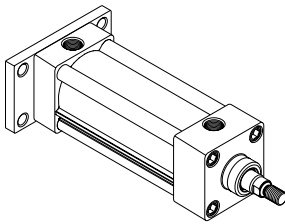


Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.

For reference, $WF = W + F$ and $LA = W + A$.

Cap Rectangular Flange

Style H
 (NFPA MF2)



Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke		
												LB	ZF	ZJ
1-1/2	1	5/8	0.750	2.000	0.375	0.313	1.375	1.430	2.750	3.375	0.625	4.000	5.000	4.625
2	1	5/8	0.750	2.500	0.375	0.375	1.375	1.840	3.375	4.125	0.625	4.000	5.000	4.625
2-1/2	1	5/8	0.750	3.000	0.375	0.375	1.375	2.190	3.875	4.625	0.625	4.125	5.125	4.750
3-1/4	1	1	1.125	3.750	0.625	0.438	1.875	2.760	4.688	5.500	0.750	4.875	6.250	5.625
4	1	1	1.125	4.500	0.625	0.438	1.875	3.320	5.438	6.250	0.750	4.875	6.250	5.625
5	1	1	1.125	5.500	0.625	0.563	1.875	4.100	6.625	7.625	0.750	5.125	6.500	5.875

B
 Tie Rod Cylinders
 Actuator Products

3MA Series

4MA/4ML Series

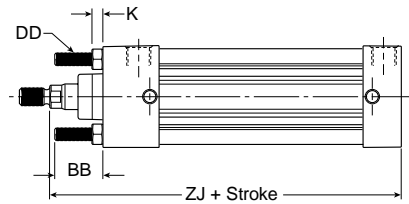
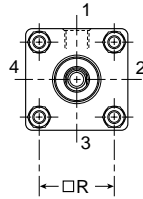
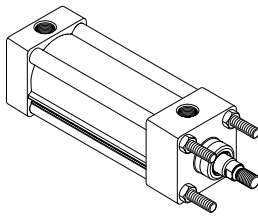
3MAJ/4MAJ Series

4MNR Series

P1D Series

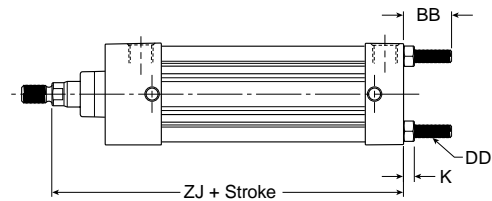
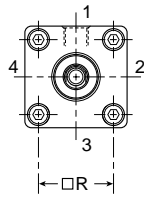
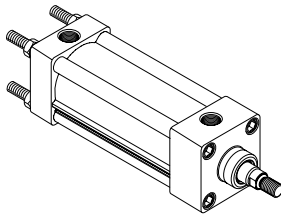
Tie Rods Ext. Head End

Style TB
 (NFPA MX3)



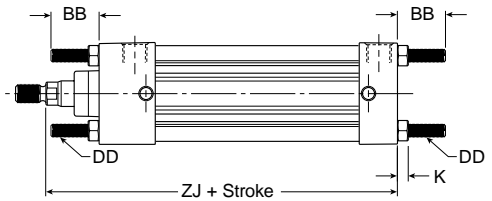
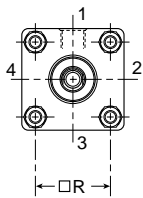
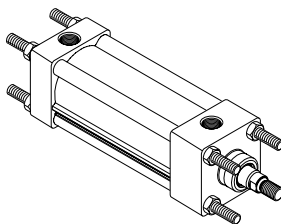
Tie Rods Ext. Cap End

Style TC
 (NFPA MX2)



Tie Rods Ext. Both Ends

Style TD
 (NFPA MX1)



Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	BB	DD	E	K	R	Add stroke	
								ZJ	
1-1/2	1	5/8	1.000	1/4-28	2.000	0.250	1.430	4.625	
2	1	5/8	1.125	5/16-24	2.500	0.313	1.840	4.625	
2-1/2	1	5/8	1.125	5/16-24	3.000	0.313	2.190	4.750	
3-1/4	1	1	1.375	3/8-24	3.750	0.375	2.760	5.625	
4	1	1	1.375	3/8-24	4.500	0.375	3.320	5.625	
5	1	1	1.813	1/2-20	5.500	0.438	4.100	5.875	

B

Tie Rod Cylinders
 Actuator Products

3MA Series

4MA/4ML Series

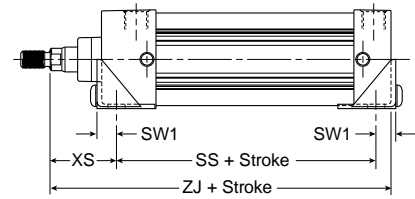
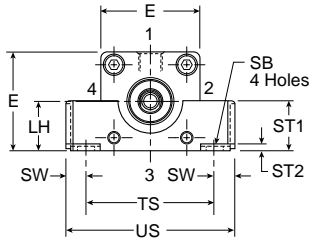
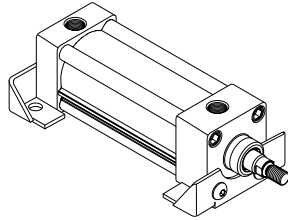
3MAJ/4MAJ Series

4MNR Series

P1D Series

Side Lug

Style C
 (NFPA MS2)

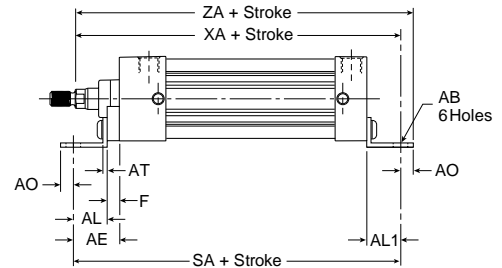
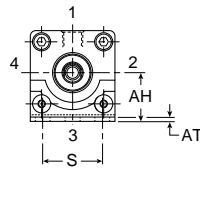
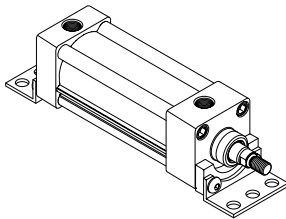


Style C

Bore size	Rod no.	Rod dia. MM	E	LH	SB	ST	ST1	ST2	SW	SW1	TS	US	XS	Add stroke	
														SS	ZJ
1-1/2	1	5/8	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.375	2.875	4.625
2	1	5/8	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.375	2.875	4.625
2-1/2	1	5/8	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.375	3.000	4.750
3-1/4	1	1	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	1.875	3.250	5.625
4	1	1	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	1.875	3.250	5.625
5	1	1	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.063	3.125	5.875

Side End Angle*

Style CB
 (NFPA MS1)



Note: Dimension "S" is for the holes in the mount (not the screw to screw dimension)

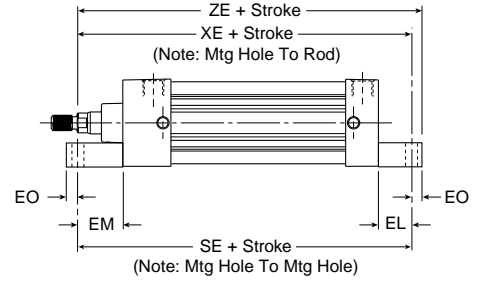
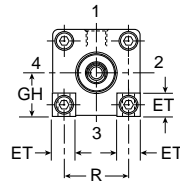
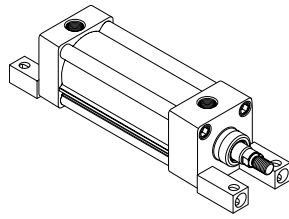
*Maximum recommended pressure for this mount is 150 PSIG

Style CB

Bore size	Rod no.	Rod dia. MM	AB	AE	AH	AL	AL1	AO	AT	E	F	S	Add stroke		
													SA	XA	ZA
1-1/2	1	5/8	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	5.625	6.000
2	1	5/8	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	5.625	6.000
2-1/2	1	5/8	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	5.750	6.125
3-1/4	1	1	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	6.875	7.375
4	1	1	0.563	–	2.250	1.875	1.250	0.500	0.125	4.500	–	3.500	7.375	6.875	7.375
5	1	1	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.250	7.875

Side End Lug

Style G
 (NFPA MS7)

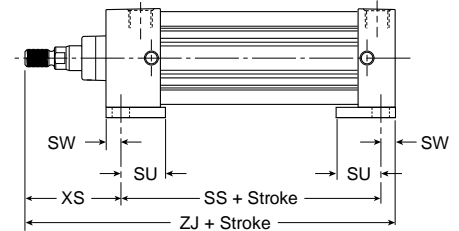
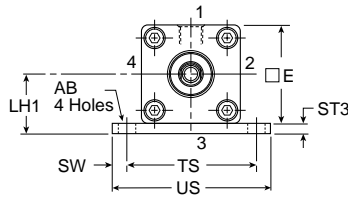
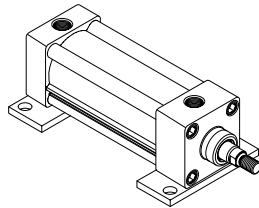


Style G

Bore Size	Rod no.	Rod Dia. MM	E	EB	EL	EM	EO	ET	GH	R	Add stroke		
											SE	XE	ZE
1-1/2	1	5/8	2.000	0.281	0.750	1.125	0.250	0.563	0.993	1.430	5.500	5.375	5.625
2	1	5/8	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.563	5.875
2-1/2	1	5/8	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	5.813	6.125
3-1/4	1	1	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.500	6.875
4	1	1	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.625	7.000

Base Bar Mount

Style NB



Note: Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.

Style NB

Bore size	Rod no.	Rod dia. MM	AB	E	LH1	ST3	SU	SW	TS	US	XS	Add stroke	
												SS	ZJ
1-1/2	1	5/8	0.438	2.000	1.243	0.250	1.125	0.375	2.750	3.500	1.375	2.875	4.625
2	1	5/8	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.375	2.875	4.625
2-1/2	1	5/8	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.375	3.000	4.750
3-1/4	1	1	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	1.875	3.250	5.625
4	1	1	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	1.875	3.250	5.625

B
 Tie Rod Cylinders
 Actuator Products

3MA
 Series

4MA/4ML
 Series

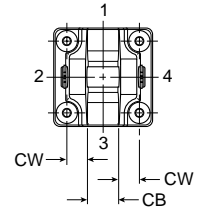
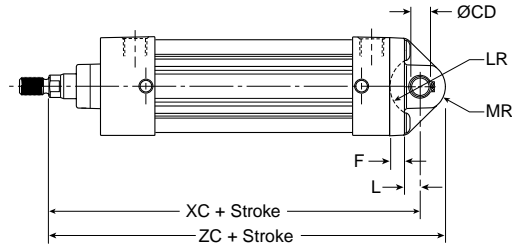
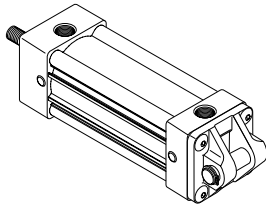
3MAJ/4MAJ
 Series

4MNR
 Series

P1D
 Series

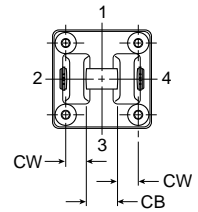
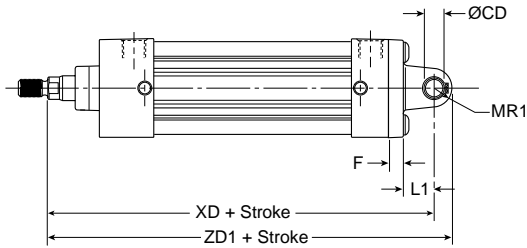
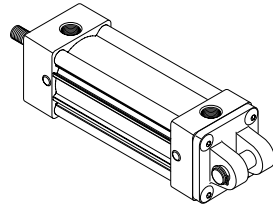
Cap Fixed Clevis

Style BB
 (NFPA MP1)



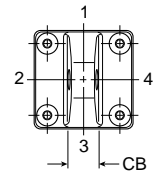
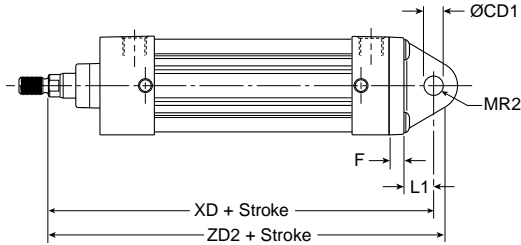
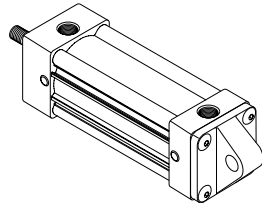
Cap Detachable Clevis

Style BC
 (NFPA MP2)



Cap Detachable Eye*

Style BE
 (NFPA MP4)



Note: 5 inch bore not available on BE mount, see 4MA series.

Note: For maximum swivel angle of BB mount with rear mounting plate, please reference Catalog 0900P-E, cylinder accessories on page B108.

Styles BB, BC and BE

Bore size	Rod no.	Rod dia. MM	CB	+0.00 CD	+0.002 -0.004 CD1	CW	E	F	L	LR	L1	MR	MR1	MR2	Add stroke				
															XC	XD	ZC	ZD1	ZD2
1-1/2	1	5/8	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
2	1	5/8	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
2-1/2	1	5/8	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.500	5.875	6.125	6.375	6.563
3-1/4	1	1	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
4	1	1	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
5*	1	1	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625

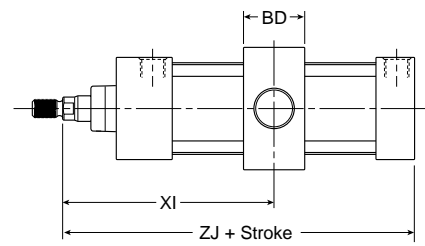
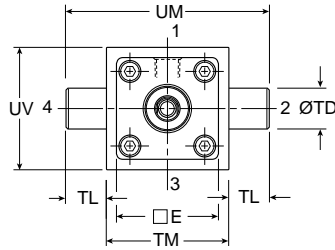
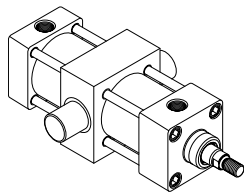
* 5 inch bore not available on BE mount, see 4MA series

B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 Series
 4MA/4ML
 Series
 3MAJ/4MAJ
 Series
 4MNR
 Series
 P1D
 Series

Intermediate Trunnion

Style DD
(NFPA MT4)

Note: Tie rod nuts for Style DD have a slot instead of internal hex.



Style DD

Bore size	Rod no.	Rod dia. MM	E	BD	+0.000 -0.001 TD	TL	TM	UM	UT	UV	XG	Min. XI	Add stroke	
													XJ	ZJ
1-1/2	1	5/8	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	1.750	3.036	4.125	4.625
2	1	5/8	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	1.750	3.125	4.125	4.625
2-1/2	1	5/8	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	1.750	3.094	4.250	4.750
3-1/4	1	1	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.250	3.969	5.000	5.625
4	1	1	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.250	3.969	5.000	5.625
5	1	1	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.250	3.969	5.250	5.875

Mounting Kits and Accessories

Refer to page B37 for 3MA mounting kits and cylinder accessories.

1-1/2" - 5" Bore 3MA Piston Seal Kits & Complete Cylinder Kits

Bore size	Rod no.	Rod dia. MM	PK - Piston Seal Kit, Standard Lipseals Includes piston & end seals	SK - Complete Cylinder Kit. Includes wiper, rod seal, rod bearing, cylinder seals, and needle valve inserts	Torque units endcap fastener or tie rod	
			Nitrile seal kit number	Nitrile seal kit number	USA inch-lbs	Metric N-m
1-1/2	1	5/8	PK1503MA01	SK15003MA1	32 - 36	3.6 - 4.1
2	1	5/8	PK2003MA01	SK20003MA1	72 - 82	8 - 9
2-1/2	1	5/8	PK2503MA01	SK25003MA1	72 - 82	8 - 9
3-1/4	1	1	PK3253MA01	SK32003MA1	216 - 228	24 - 25.3
4	1	1	PK4003MA01	SK40003MA1	216 - 228	24 - 25.3
5	1	1	PK5003MA01	SK50003MA1	360 - 372	41 - 42

B

Tie Rod Cylinders
Actuator Products

3MA Series

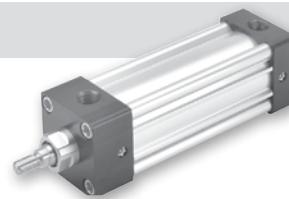
4MA/4ML Series

3MAJ/4MAJ Series

4MNR Series

P1D Series

4MA/4ML Series – 1-1/2" thru 5" Bore Size



- Industry leading aluminum NFPA interchangeable cylinder with flexible construction
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4" and 5"
- Removable bronze alloy gland/bearing for easy maintenance
- Available in any practical stroke length
- 20 standard mounting styles available
- Extruded-profile aluminum body with integrated switch grooves
- Single rod end or double rod ends
- Cushions – standard and adjustable at both ends, optional non-cushioned
- RoHS compliant

Operating information

	4MA	4ML
Operating pressure:	250 PSIG (17 bar) maximum air service	400 PSIG (27 bar) maximum hydraulic service
Temperature range –		
Standard seals	-10°F to 165°F (-23°C to 74°C)	
Fluorocarbon seals	-10°F to 250°F (-23°C to 121°C)	
Low temperature seals	-50°F to 150°F (-46°C to 66°C)	
Filtration requirements:	40 micron, dry filtered air	Filtered hydraulic oil

Ordering information

2.00	J	4MA	U	1	4	A	6.000
Bore size 1.50 ¹ 2.00 2.50 3.25 4.00 5.00	Double rod cylinder ¹² Specify "K" only if double rod cylinder is required.	Series 4MA Air service 4ML Hydraulic service ²	Ports U NPTF R BSPP B BSPT T SAE	Piston rod number Specify rod code number for required diameter. ^{8, 2}	Special modification Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MA with Linear Position Sensor Option) ⁷	Cushion cap end Blank Non-cushioned cap end C Cushioned cap end (not available for 4ML)	Stroke length Specify stroke length required in inches. ¹¹
Mounting style Specify mounting style code (see table on following page).	Cushion head end Blank Non-cushioned head end C Cushioned head end (not available for 1.50" bore with 1" rod or 4ML)	Cylinder construction Blank* Standard (extruded body, standard round lobe orientation) A* Extruded body, round lobe orientation rotated 90 degrees from standard N* Extruded body, round lobe orientation rotated 180 degrees from standard Z* Extruded body, round lobe orientation rotated 270 degrees from standard T Aluminum round tube and carbon steel tie rods & nuts	Seals Blank Standard (nitrile seals) V Fluorocarbon seals ⁴ E Fluorocarbon rod wiper and rod seal only ⁵ 4 Low temperature seals ⁴ M Metallic rod wiper, nitrile seals ⁶	Piston rod thread style 4 Small male 8 Intermediate male 9 Short female 55 For use with split coupler ⁹ 3 Special (and specify all dimensions required)	Piston rod thread type A Standard (UNF unified thread) W BSF British fine M* Metric	Rod material and gland code Blank Standard rod and gland H Standard rod and HI LOAD gland Y 17-4 PH stainless steel rod and standard gland Z 17-4 PH stainless steel rod and HI LOAD gland J 303 stainless steel rod and standard gland ¹⁰ K 303 stainless steel rod and HI LOAD gland ¹⁰ S 316 stainless steel rod and standard gland ¹⁰ T 316 stainless steel rod and HI LOAD gland ¹⁰	
Piston type ² Blank Standard (lipseals and magnetic ring) ¹² 1 Lipseals, no magnetic ring ¹² 2 Lipseals, no magnetic ring (aluminum piston) 3 Lipseals and magnetic ring (aluminum piston) (standard for 4ML) 4 Bumper seals, no magnetic ring 6 Bumper seals and magnetic ring B Lipseals, 1/4" thick bumpers both ends ³ H Lipseals, 1/4" thick bumper head end ³ C Lipseals, 1/4" thick bumper cap end ³ D Lipseals and magnetic ring, 1/4" thick bumpers both ends ³ F Lipseals and magnetic ring, 1/4" thick bumper head end ³ R Lipseals and magnetic ring, 1/4" thick bumper cap end ³	<p>* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore size.</p> <p>¹ Not available with Linear Position Sensor Option (LPSO).</p> <p>² Piston Types (blank), 1, 4 and 6 not available for 4ML. Piston Types (blank) and 1 not available for oversize rod numbers 2 and 3. Seals option V only available with Piston Types 2 and 4. Seals option 4 only available with Piston Types 2 and 3.</p> <p>³ Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".</p> <p>⁴ Reed and solid-state sensors only available with standard seals or options E and M. See footnote 2.</p> <p>⁵ Used for external chemical compatibility applications, not high temperature.</p> <p>⁶ If fluorocarbon seals are required with this option, please place an "S" for special in the Special Modification field and specify the "fluorocarbon seals and metallic rod wiper" in the item notes.</p> <p>⁷ For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes: a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)</p> <p>⁸ Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter.</p> <p>⁹ For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.</p> <p>¹⁰ Not available for 4ML.</p> <p>¹¹ If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes. Not available with Piston Types (blank) and 1.</p> <p>¹² Double rod cylinders not available with composite piston type.</p>						

For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.



B
 Tie Rod Cylinders
 Actuator Products
 3MA Series
 4MA/4ML Series
 3MAJ/4MAJ Series
 4MNR Series
 P1D Series

4MA/4ML Mounting Styles for 1-1/2" to 5" Bore

Mounting style	NFPA mounting	Description	Bore size	Mounting style	NFPA mounting	Description	Bore size
TEF 	MX5/MS4	Sleeve Nut with Side Tap (standard mount)	1-1/2 - 5*	CB 	MS1	Side End Angle	1-1/2 - 5
T 	MX0	No Mount (same construction as TEF)	1-1/2 - 5	G 	MS7	Side End Lug	1-1/2 - 4*
TE 	MX5	Sleeve Nut (same construction as TEF)	1-1/2 - 5	NB 	N/A	Base Bar	1-1/2 - 4*
F 	MS4	Side Tap (same construction as TEF)	1-1/2 - 5*	BB 	MP1	Cap Fixed Clevis	1-1/2 - 5
J 	MF1	Head Rectangular Flange	1-1/2 - 5	BC 	MP2	Cap Detachable Clevis	1-1/2 - 5
H 	MF2	Cap Rectangular Flange	1-1/2 - 5	BE 	MP4	Cap Detachable Eye	1-1/2 - 5
TB 	MX3	Tie Rods Extended Head End	1-1/2 - 5	D 	MT1	Head Trunnion	1-1/2 - 5*
TC 	MX2	Tie Rods Extended Cap End	1-1/2 - 5	DB 	MT2	Cap Trunnion	1-1/2 - 5
TD 	MX1	Tie Rods Extended Both Ends	1-1/2 - 5	DD 	MT4	Intermediate Trunnion	1-1/2 - 5
C 	MS2	Side Lug	1-1/2 - 5	KTEF † 	MDX5/MDS4	Double Rod End, TEF Mount	1-1/2 - 5

* Not available for 1-1/2" bore with 1" rod.

† Double rod end cylinders can be ordered with head mountings, i.e. KJ.

B

**Tie Rod Cylinders
Actuator Products**

**3MA
Series**

**4MA/4ML
Series**

**3MAJ/4MAJ
Series**

**4MNR
Series**

**P1D
Series**

Sensors

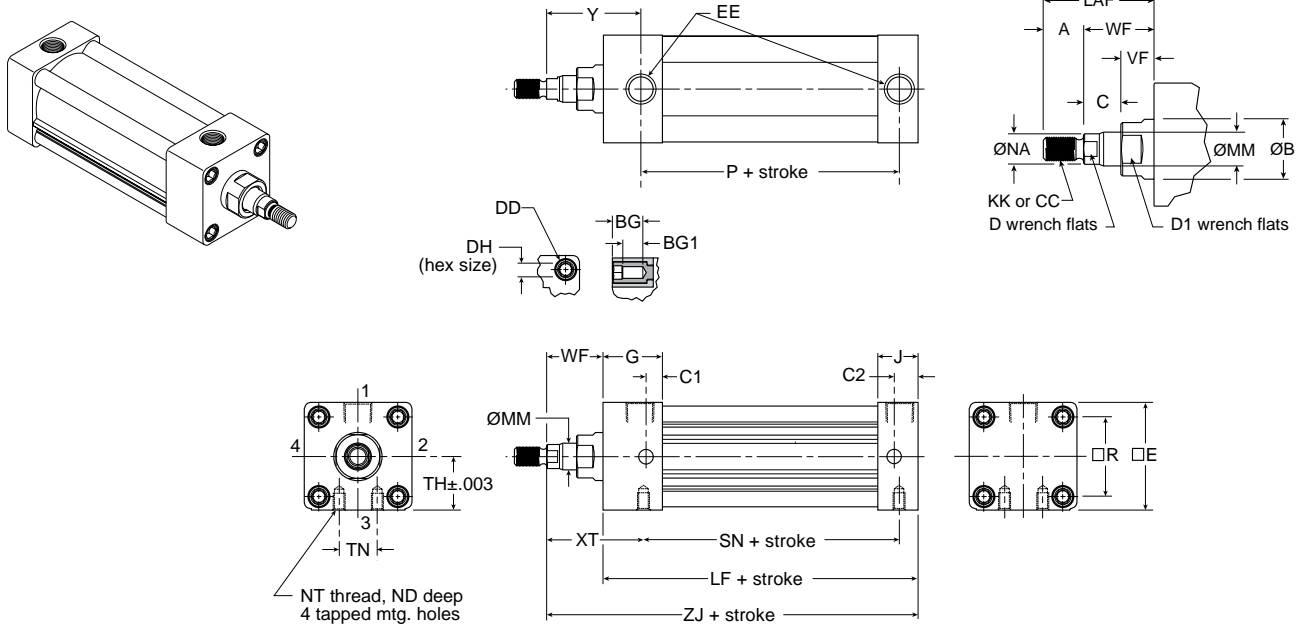
For sensors see page B339.



Kits & Accessories

See page B37.

Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)



Styles TEF, T, TE and F

Bore size	Rod no.	Rod dia. MM	Thread		Style 8		Style 4 & 9		+0.000		-0.002		EE (NPTF)		G																			
			CC	KK	A	AA	B	BG	BG1	C	C1	C2	D	D1	DD	DH	E																	
1-1/2	1*	5/8	1/2-20	7/16-20	0.750	2.020	1.124	0.562	0.374	0.385	1.000	0.500	1/2	1	1/4-28	1/4	2.000	3/8	1.438															
	2	1	7/8-14	3/4-16	1.125	2.020	1.499	0.562	0.374	0.510	-	0.500	7/8	1-3/8	1/4-28	1/4	2.000	3/8	1.438															
2	1	5/8	1/2-20	7/16-20	0.750	2.600	1.124	0.562	0.362	0.385	1.000	0.562	1/2	1	5/16-24	5/16	2.500	3/8	1.375															
	3	1	7/8-14	3/4-16	1.125	2.600	1.499	0.562	0.362	0.510	1.000	0.562	7/8	1-3/8	5/16-24	5/16	2.500	3/8	1.375															
2-1/2	1	5/8	1/2-20	7/16-20	0.750	3.100	1.124	0.562	0.362	0.385	1.000	0.594	1/2	1	5/16-24	5/16	3.000	3/8	1.344															
	3	1	7/8-14	3/4-16	1.125	3.100	1.499	0.562	0.362	0.510	1.000	0.594	7/8	1-3/8	5/16-24	5/16	3.000	3/8	1.344															
3-1/4	1	1	7/8-14	3/4-16	1.125	3.900	1.499	0.700	0.500	0.510	1.188	0.719	7/8	1-3/8	3/8-24	3/8	3.750	1/2	1.594															
	3	1-3/8	1-1/4-12	1-14	1.625	3.900	1.999	0.700	0.500	0.635	1.188	0.719	1-1/8	1-7/8	3/8-24	3/8	3.750	1/2	1.594															
4	1	1	7/8-14	3/4-16	1.125	4.700	1.499	0.700	0.500	0.510	1.188	0.719	7/8	1-3/8	3/8-24	3/8	4.500	1/2	1.594															
	3	1-3/8	1-1/4-12	1-14	1.625	4.700	1.999	0.700	0.500	0.635	1.188	0.719	1-1/8	1-7/8	3/8-24	3/8	4.500	1/2	1.594															
5	1	1	7/8-14	3/4-16	1.125	5.800	1.499	0.781	0.531	0.510	1.188	0.813	7/8	1-3/8	1/2-20	1/2	5.500	1/2	1.594															
	3	1-3/8	1-1/4-12	1-14	1.625	5.800	1.999	0.781	0.531	0.635	1.188	0.813	1-1/8	1-7/8	1/2-20	1/2	5.500	1/2	1.594															
Bore size	Rod no.	Rod dia. MM	J		LAF		NA		ND		NT		R		TH		TN		VF		WF		XT		Y		LF		P		SN		ZJ	
			J	LAF	NA	ND	NT	R	TH	TN	VF	WF	XT	Y	LF	P	SN	ZJ																
1-1/2	1*	5/8	0.938	1.750	0.563	0.375	1/4-20	1.430	0.993	0.625	0.615	1.000	1.938	1.875	3.625	2.313	2.250	4.625																
	2	1	0.938	2.500	0.938	-	-	1.430	0.993	-	0.865	1.375	-	2.250	3.625	2.313	-	5.000																
2	1	5/8	0.937	1.750	0.563	0.438	5/16-18	1.840	1.243	0.875	0.615	1.000	1.938	1.875	3.625	2.313	2.250	4.625																
	3	1	0.937	2.500	0.938	0.375	5/16-18	1.840	1.243	0.875	0.865	1.375	2.313	2.250	3.625	2.313	2.250	5.000																
2-1/2	1	5/8	0.938	1.750	0.563	0.625	3/8-16	2.190	1.493	1.250	0.615	1.000	1.938	1.938	3.750	2.375	2.375	4.750																
	3	1	0.938	2.500	0.938	0.625	3/8-16	2.190	1.493	1.250	0.865	1.375	2.313	2.313	3.750	2.375	2.375	5.125																
3-1/4	1	1	1.125	2.500	0.938	0.750	1/2-13	2.760	1.868	1.500	0.865	1.375	2.438	2.438	4.250	2.625	2.625	5.625																
	3	1-3/8	1.125	3.250	1.313	0.750	1/2-13	2.760	1.868	1.500	0.990	1.625	2.688	2.688	4.250	2.625	2.625	5.875																
4	1	1	1.125	2.500	0.938	0.750	1/2-13	3.320	2.243	2.063	0.865	1.375	2.438	2.438	4.250	2.625	2.625	5.625																
	3	1-3/8	1.125	3.250	1.313	0.750	1/2-13	3.320	2.243	2.063	0.990	1.625	2.688	2.688	4.250	2.625	2.625	5.875																
5	1	1	1.219	2.500	0.938	0.938	5/8-11	4.100	2.743	2.688	0.865	1.375	2.438	2.438	4.500	2.875	2.875	5.875																
	3	1-3/8	1.219	3.250	1.313	0.938	5/8-11	4.100	2.743	2.688	0.990	1.625	2.688	2.688	4.500	2.875	2.875	6.125																

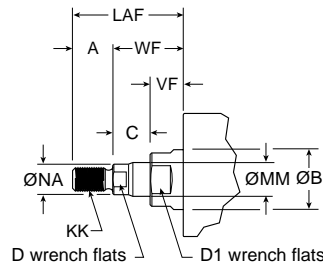
* NOTE - 1-1/2" bore with 1" rod is TE mount, F mount not available.
 1-1/2" bore with 1" rod cannot have a cushion at head end.



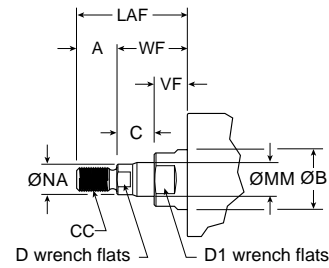
B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 4MA/4ML
 3MAJ/4MAJ
 4MNR
 P1D

4MA Rod End Dimensions

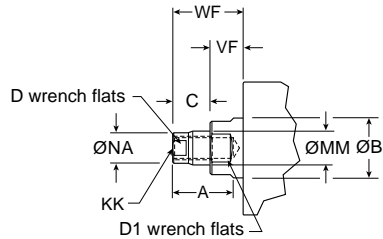
Thread Style 4
 (NFPA Style SM)
 Small Male



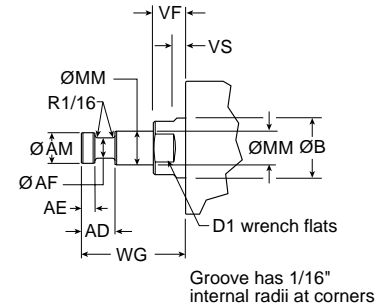
Thread Style 8
 (NFPA Style IM)
 Intermediate Male



Thread Style 9
 (NFPA Style SF)
 Short Female



Thread Style 55
 For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"

Special threads, rod extensions, rod eyes, blanks, etc. are also available. To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF. If otherwise special, please supply dimensioned sketch.

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread		+0.000 -0.002													
			Style 8 CC	Style 4 & 9 KK	A	AD	AE	AF	AM	B	C	D	D1	LAF	NA	VF	WF	WG
1-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1	1.750	0.563	0.615	1.000	1.750
	2	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1	1.750	0.563	0.615	1.000	1.750
	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
2-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1	1.750	0.563	0.615	1.000	1.750
	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
3-1/4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
5	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750

B

Tie Rod Cylinders
 Actuator Products

3MA
 Series

4MA/4ML
 Series

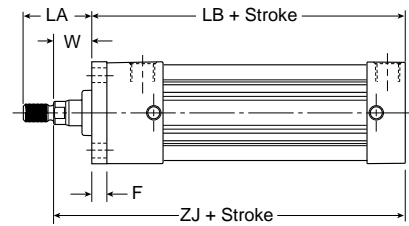
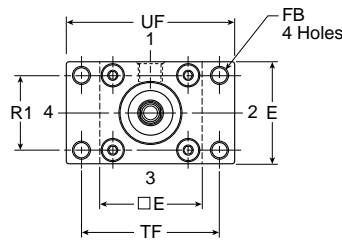
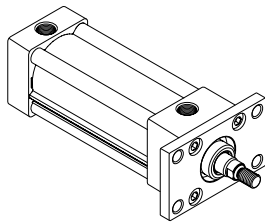
3MAJ/4MAJ
 Series

4MNR
 Series

P1D
 Series

Head Rectangular Flange

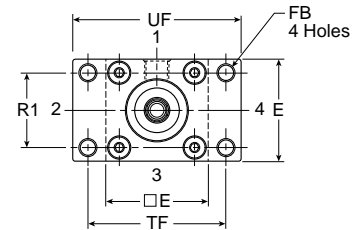
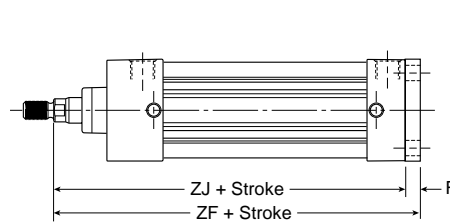
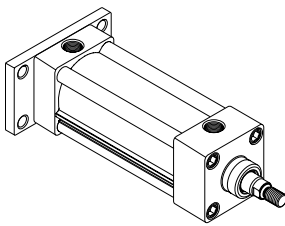
Style J
 (NFPA MF1)



Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.
 For reference, $WF = W + F$ and $LA = W + A$.

Cap Rectangular Flange

Style H
 (NFPA MF2)



Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke		
												LB	ZF	ZJ
1-1/2	1	5/8	0.750	2.000	0.375	0.313	1.375	1.430	2.750	3.375	0.625	4.000	5.000	4.625
	2	1	1.125	2.000	0.375	0.313	2.125	1.430	2.750	3.375	1.000	4.000	5.375	5.000
2	1	5/8	0.750	2.500	0.375	0.375	1.375	1.840	3.375	4.125	0.625	4.000	5.000	4.625
	3	1	1.125	2.500	0.375	0.375	2.125	1.840	3.375	4.125	1.000	4.000	5.375	5.000
2-1/2	1	5/8	0.750	3.000	0.375	0.375	1.375	2.190	3.875	4.625	0.625	4.125	5.125	4.750
	3	1	1.125	3.000	0.375	0.375	2.125	2.190	3.875	4.625	1.000	4.125	5.500	5.125
3-1/4	1	1	1.125	3.750	0.625	0.438	1.875	2.760	4.688	5.500	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	3.750	0.625	0.438	2.625	2.760	4.688	5.500	1.000	4.875	6.500	5.875
4	1	1	1.125	4.500	0.625	0.438	1.875	3.320	5.438	6.250	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	4.500	0.625	0.438	2.625	3.320	5.438	6.250	1.000	4.875	6.500	5.875
5	1	1	1.125	5.500	0.625	0.563	1.875	4.100	6.625	7.625	0.750	5.125	6.500	5.875
	3	1-3/8	1.625	5.500	0.625	0.563	2.625	4.100	6.625	7.625	1.000	5.125	6.750	6.125

B
 Tie Rod Cylinders
 Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

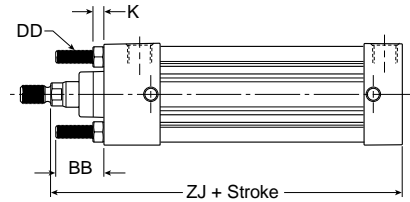
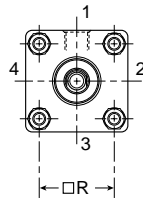
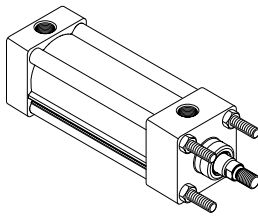
4MNR Series

P1D Series



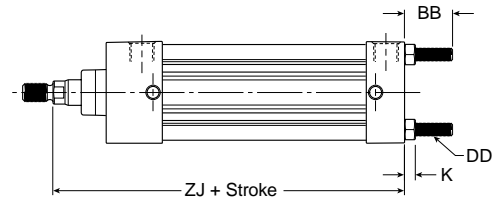
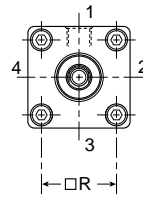
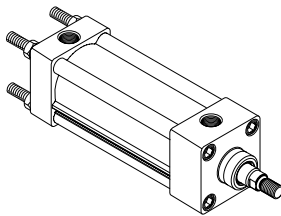
Tie Rods Ext. Head End

Style TB
 (NFPA MX3)



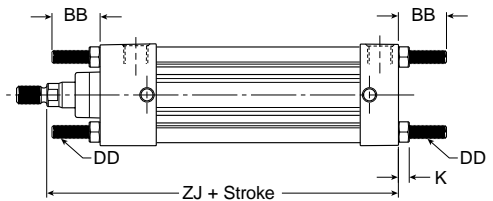
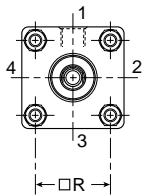
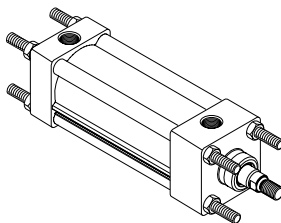
Tie Rods Ext. Cap End

Style TC
 (NFPA MX2)



Tie Rods Ext. Both Ends

Style TD
 (NFPA MX1)



Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	BB	DD	E	K	R	Add stroke	
								ZJ	
1-1/2	1	5/8	1.000	1/4-28	2.000	0.250	1.430	4.625	
	2	1	1.000	1/4-28	2.000	0.250	1.430	5.000	
2	1	5/8	1.125	5/16-24	2.500	0.313	1.840	4.625	
	3	1	1.125	5/16-24	2.500	0.313	1.840	5.000	
2-1/2	1	5/8	1.125	5/16-24	3.000	0.313	2.190	4.750	
	3	1	1.125	5/16-24	3.000	0.313	2.190	5.125	
3-1/4	1	1	1.375	3/8-24	3.750	0.375	2.760	5.625	
	3	1-3/8	1.375	3/8-24	3.750	0.375	2.760	5.875	
4	1	1	1.375	3/8-24	4.500	0.375	3.320	5.625	
	3	1-3/8	1.375	3/8-24	4.500	0.375	3.320	5.875	
5	1	1	1.813	1/2-20	5.500	0.438	4.100	5.875	
	3	1-3/8	1.813	1/2-20	5.500	0.438	4.100	6.125	

B

Tie Rod Cylinders
 Actuator Products

3MA
 Series

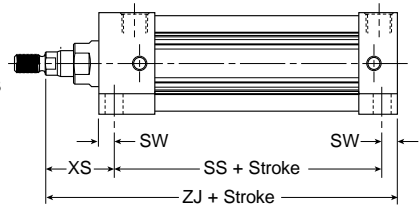
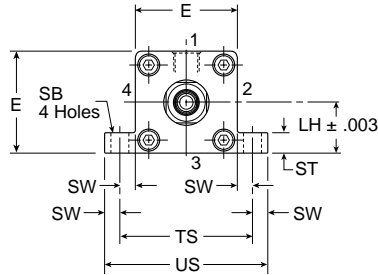
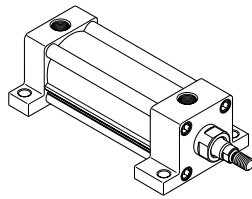
4MA/4ML
 Series

3MAJ/4MAJ
 Series

4MNR
 Series

P1D
 Series

Side Lug
 Style C for
 (NFPA MS2)

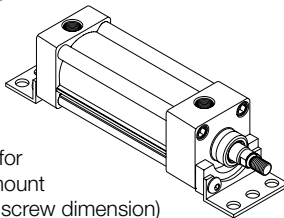


Styles C

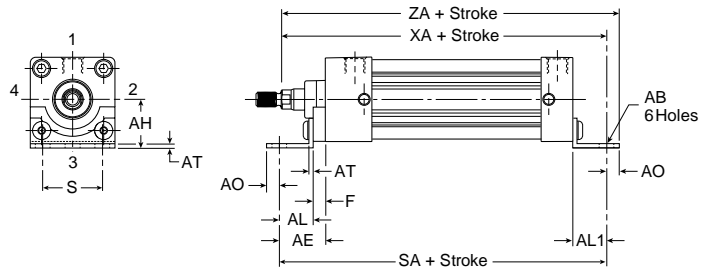
Bore size	Rod no.	Rod dia. MM	E	LH	SB	ST	ST1	ST2	SW	SW1	TS	US	XS	Add stroke	
														SS	ZJ
1-1/2	1	5/8	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.375	2.875	4.625
	2	1	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.750	2.875	5.000
2	1	5/8	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.375	2.875	4.625
	3	1	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.375	3.000	4.750
	3	1	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	2.125	3.250	5.875
4	1	1	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	2.125	3.250	5.875
5	1	1	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.063	3.125	5.875
	3	1-3/8	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.313	3.125	6.125

Side End Angle*

Style CB
 (NFPA MS1)



Note:
 Dimension "S" is for the holes in the mount (not the screw to screw dimension)



*Maximum recommended pressure for this mount is 150 PSIG

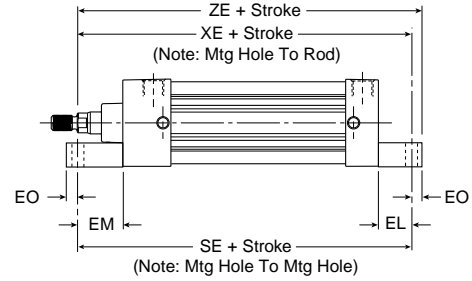
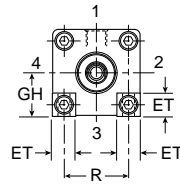
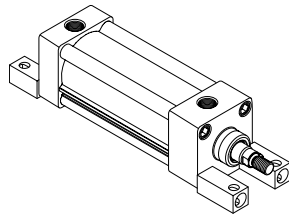
Style CB

Bore size	Rod no.	Rod dia. MM	AB	AE	AH	AL	AL1	AO	AT	E	F	S	Add stroke		
													SA	XA	ZA
1-1/2	1	5/8	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	5.625	6.000
	2	1	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	6.000	6.375
2	1	5/8	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	5.625	6.000
	3	1	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	6.000	6.375
2-1/2	1	5/8	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	5.750	6.125
	3	1	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	6.125	6.500
3-1/4	1	1	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	6.875	7.375
	3	1-3/8	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	7.125	7.625
4	1	1	0.563	-	2.250	1.875	1.250	0.500	0.125	4.500	-	3.500	7.375	6.875	7.375
	3	1-3/8	0.563	-	2.250	1.875	1.250	0.500	0.125	4.500	-	3.500	7.375	7.125	7.625
5	1	1	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.250	7.875
	3	1-3/8	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.500	8.125



Side End Lug

Style G
 (NFPA MS7)



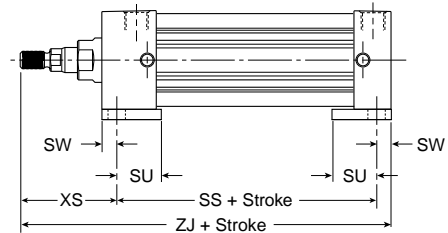
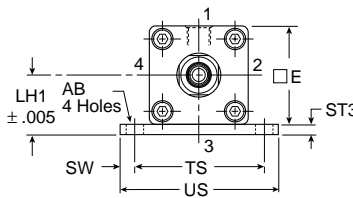
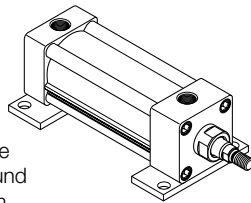
Style G

Bore size	Rod no.	Rod dia. MM	E	EB	EL	EM	EO	ET	GH	R	Add Stroke		
											SE	XE	ZE
1-1/2	1	5/8	2.000	0.281	0.750	1.125	0.250	0.563	0.993	1.430	5.500	5.375	5.625
	2	1	-	-	-	-	-	-	-	-	-	-	-
2	1	5/8	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.563	5.875
	3	1	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.938	6.250
2-1/2	1	5/8	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	5.813	6.125
	3	1	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	6.188	6.500
3-1/4	1	1	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.500	6.875
	3	1-3/8	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.750	7.125
4	1	1	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.625	7.000
	3	1-3/8	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.875	7.250

Base Bar Mount

Style NB for 4MA

Note: Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.



Style NB

Bore size	Rod no.	Rod dia. MM	AB	E	LH1	ST3	SU	SW	TS	US	XS	Add stroke	
												SS	ZJ
1-1/2	1	5/8	0.438	2.000	1.243	0.250	1.125	0.375	2.750	3.500	1.375	2.875	4.625
	2	1	-	-	-	-	-	-	-	-	-	-	-
2	1	5/8	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.375	2.875	4.625
	3	1	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.375	3.000	4.750
	3	1	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	2.125	3.250	5.875
4	1	1	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	2.125	3.250	5.875

B

Tie Rod Cylinders
Actuator Products

3MA
Series

4MA/4ML
Series

3MAJ/4MAJ
Series

4MNR
Series

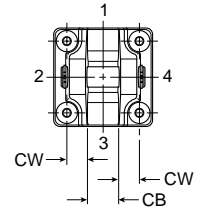
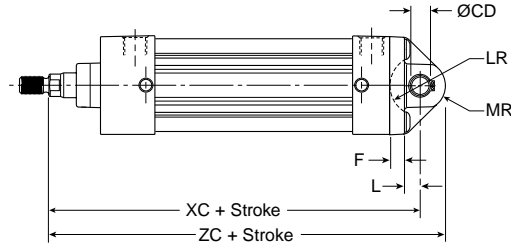
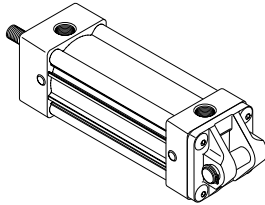
P1D
Series



Cap Fixed Clevis

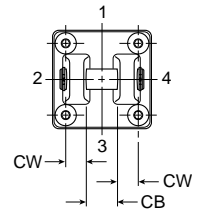
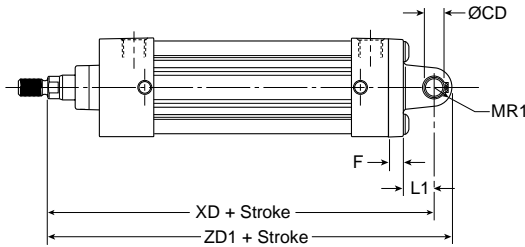
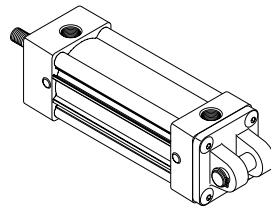
Style BB
(NFPA MP1)

Note: For maximum swivel angle of BB mount with rear mounting plate, see cylinder accessories



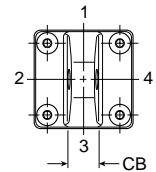
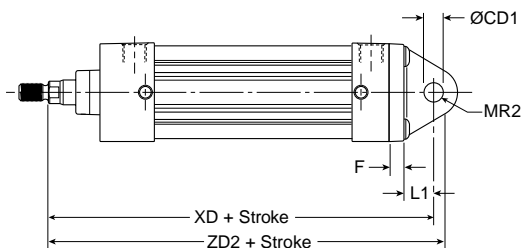
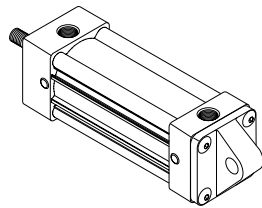
Cap Detachable Clevis

Style BC
(NFPA MP2)



Cap Detachable Eye

Style BE
(NFPA MP4)



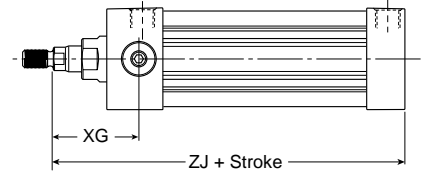
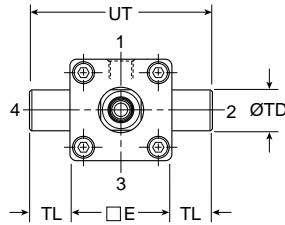
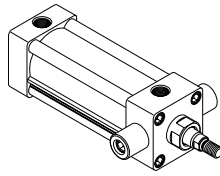
Styles BB, BC and BE

Bore size	Rod no.	Rod dia. MM	CB	Rod dia.		CW	E	F	L	LR	L1	MR	MR1	MR2	Add stroke				
				+0.000 -0.002	+0.002 +0.004										XC	XD	ZC	ZD1	ZD2
1-1/2	1	5/8	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	2	1	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2	1	5/8	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	3	1	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2-1/2	1	5/8	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.500	5.875	6.125	6.375	6.563
	3	1	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.875	6.250	6.500	6.750	6.313
3-1/4	1	1	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
4	1	1	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
5	1	1	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
	3	1-3/8	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.375	8.000	8.313	8.750	8.875

Head Trunnion*

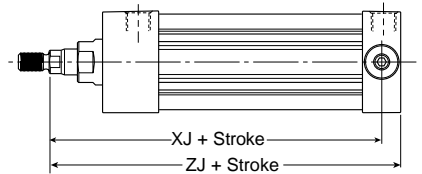
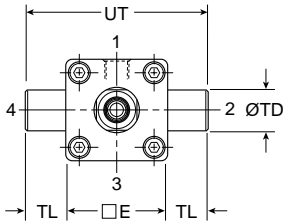
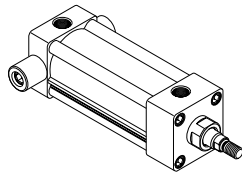
Style D
(NFPA MT1)

Note: not available for 1-1/2" bore with 1" rod.



Cap Trunnion

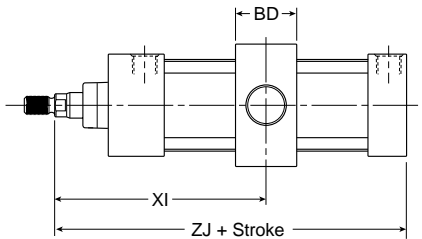
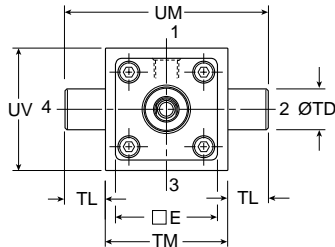
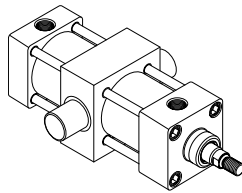
Style DB
(NFPA MT2)



Intermediate Trunnion

Style DD
(NFPA MT4)

Note: Tie rod nuts for Style DD have a slot instead of internal hex.



Styles D, DB and DD

Bore size	Rod no.	Rod dia. MM	E	BD	+0.000 -0.001 TD	TL	TM	UM	UT	UV	XG	Min. XI	Add stroke	
													XJ	ZJ
1-1/2	1 *	5/8	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	1.750	3.036	4.125	4.625
	2	1	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	-	3.437	4.250	5.000
2	1	5/8	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	1.750	3.125	4.125	4.625
	3	1	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	2.125	3.500	4.500	5.000
2-1/2	1	5/8	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	1.750	3.094	4.250	4.750
	3	1	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	2.125	3.469	4.625	5.125
3-1/4	1	1	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.250	3.969	5.000	5.625
	3	1-3/8	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.500	4.219	5.250	5.875
4	1	1	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.250	3.969	5.000	5.625
	3	1-3/8	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.500	4.219	5.250	5.875
5	1	1	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.250	3.969	5.250	5.875
	3	1-3/8	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.500	4.219	5.500	6.125

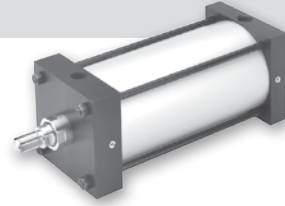
* Head trunnion style D not available for 1-1/2" bore with 1" rod

Kits & Accessories

See page B37.



4MA/4ML Series – 6" thru 8" Bore Size



- Industry leading NFPA interchangeable cylinder with flexible construction
- Bore sizes – 6" and 8"
- Removable bronze alloy gland/bearing for easy maintenance
- Available in any practical stroke length
- Tube and tie rod construction for heavy duty use
- Single rod end or double rod ends
- Cushions – optional and adjustable at either end or both ends (N/A for 4ML hydraulic version)
- 20 standard mounting styles available
- RoHS compliant

Operating information

	4MA	4ML
Operating pressure:	250 PSIG (17 bar) maximum air service	400 PSIG (27 bar) maximum hydraulic service
Temperature range –		
Standard seals	-10°F to 165°F (-23°C to 74°C)	
Fluorocarbon seals	-10°F to 250°F (-23°C to 121°C)	
Low temperature seals	-50°F to 150°F (-46°C to 66°C)	
Filtration requirements:	40 micron, dry filtered air Filtered hydraulic oil	

Ordering information

6.00	□	□	J	4MA	□	U	□	□	1	4	□	A	□	12.000
Bore size 6.00 8.00		Double rod cylinder Specify "K" only if double rod cylinder is required.		Series 4MA Air service 4ML Hydraulic service		Ports U NPTF R BSPP B BSPT T SAE			Piston rod number Specify rod code number for required diameter. 8, 2					Stroke length Specify stroke length required in inches. 8
			Mounting style Specify mounting style code (see table on following page).						Special modification Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MA with Linear Position Sensor Option) 7			Cushion cap end Blank Non-cushioned cap end C Cushioned cap end (not available for 4ML)		
		Cushion head end Blank Non-cushioned head end C Cushioned head end (not available for 4ML)										Piston rod thread type A Standard (UNF unified thread) W BSF British fine M* Metric		
			Piston type Blank Standard (lipseals and magnetic ring) 3 Lipseals and magnetic ring			Seals Blank Standard (nitrile seals) V Fluorocarbon seals 1 E Fluorocarbon rod wiper and rod seal only 2 4 Low temperature seals 1 M Metallic rod wiper, nitrile seals 3							Rod material and gland code Blank Standard rod and gland H Standard rod and HI LOAD gland Y 17-4 PH stainless steel rod and standard gland Z 17-4 PH stainless steel rod and HI LOAD gland J 303 stainless steel rod and standard gland 7 K 303 stainless steel rod and HI LOAD gland 7 S 316 stainless steel rod and standard gland 7 T 316 stainless steel rod and HI LOAD gland 7	
									Piston rod thread style 4 Small male 8 Intermediate male 9 Short female 55 For use with split coupler 6 3 Special (and specify all dimensions required)					

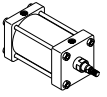
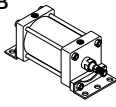
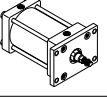
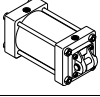
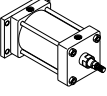
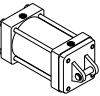
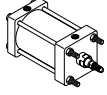
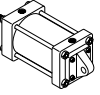
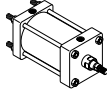
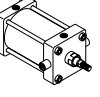
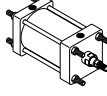
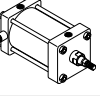
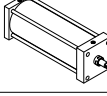
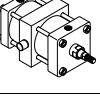
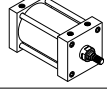
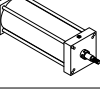
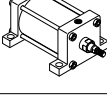
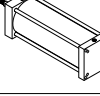
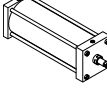
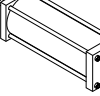
* Please reference catalog 0900P-E, page B106.

Sensors
For sensors see page B339.

1 Reed and solid-state sensors only available with standard seals or options E and M.
 2 Used for external chemical compatibility applications, not high temperature.
 3 If fluorocarbon seals are required with this option, please place an "S" for special in the Special Modification field and specify the "fluorocarbon seals and metallic rod wiper" in the item notes.
 4 For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes:
 a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)
 b. Sensor position
 c. Port position (if other than position 1)
 d. Length of stop tubing, gross stroke and net stroke (if required)
 Also, Piston Type 3 is required.
 5 Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter.
 6 For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.
 7 Not available for 4ML.
 8 If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes.

For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.

4MA/4ML Mounting Styles for 6" to 8" Bore

Mounting style	NFPA mounting	Description	Bore size	Mounting style	NFPA mounting	Description	Bore size
T 	MX0	No Mount	6 - 8	CB 	MS1	Side End Angle	6 - 8
J 	MF1	Head Rectangular Flange	6	BB 	MP1	Cap Fixed Clevis	6 - 8
H 	MF2	Cap Rectangular Flange	6	BC 	MP2	Cap Detachable Clevis	6 - 8
TB 	MX3	Tie Rods Extended Head End	6 - 8	BE 	MP4	Cap Detachable Eye	6
TC 	MX2	Tie Rods Extended Cap End	6 - 8	D 	MT1	Head Trunnion	6 - 8
TD 	MX1	Tie Rods Extended Both Ends	6 - 8	DB 	MT2	Cap Trunnion	6 - 8
TE 	MX5	Sleeve Nut	6 - 8	DD 	MT4	Intermediate Trunnion	6 - 8
TEF 	MX5/MS4	Sleeve Nut with Side Tap	6 - 8	JB 	ME3	Head Square	8
C 	MS2	Side Lug	6 - 8	HB 	ME4	Cap Square	8
F 	MS4	Side Tap	6 - 8	KT † 	MDX0	Double Rod End, No Mount	6 - 8

† Double rod end cylinders can be ordered with head mountings, i.e. KJ.

B

**Tie Rod Cylinders
Actuator Products**

**3MA
Series**

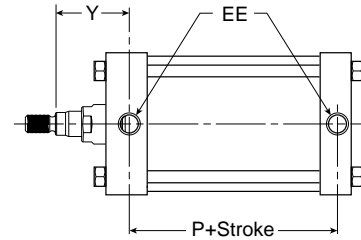
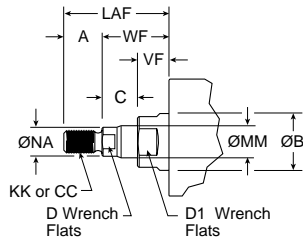
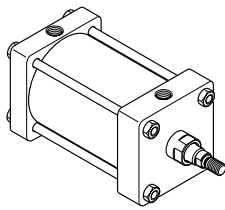
**4MA/4ML
Series**

**3MAJ/4MAJ
Series**

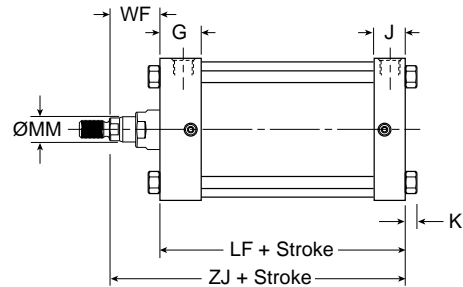
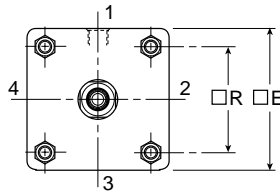
**4MNR
Series**

**P1D
Series**

Single Rod Dimensioned Drawings – (Style T)



For dimensions of all standard rod end styles, please see next page.



Style T

Bore size	Rod no.	Rod dia. MM	Thread		A	AA	R	VF	WF	D	D1	E	EE (NPTF)	G
			Style 8 CC	Style 4 & 9 KK										
6	1	1-3/8	1-1/4-12	1-14	1.625	6.900	1.999	0.635	1-1/8	1-7/8	6.500	3/4	1.910	
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	6.900	2.374	0.760	1-1/2	2-3/16	6.500	3/4	1.910	
8	1	1-3/8	1-1/4-12	1-14	1.625	9.100	1.999	0.635	1-1/8	1-7/8	8.500	3/4	1.810	
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	9.100	2.374	0.760	1-1/2	2-3/16	8.500	3/4	1.810	

Bore size	Rod no.	Rod dia. MM	Add stroke										
			J	K	LAF	NA	R	VF	WF	Y	LF	P	ZJ
6	1	1-3/8	1.410	0.438	3.250	1.313	4.880	0.990	1.625	2.813	5.000	3.125	6.625
	3	1-3/4	1.410	0.438	3.875	1.688	4.880	1.115	1.875	3.063	5.000	3.125	6.875
8	1	1-3/8	1.440	0.563	3.250	1.313	6.440	0.990	1.625	2.750	5.125	3.250	6.750
	3	1-3/4	1.440	0.563	3.875	1.688	6.440	1.115	1.875	3.000	5.125	3.250	7.000

B
 Tie Rod Cylinders
 Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

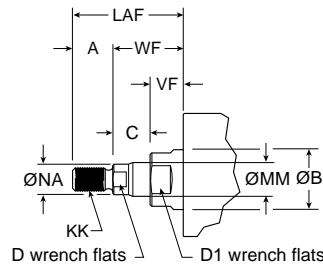
4MNR Series

P1D Series

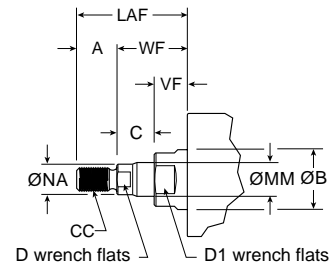


4MA Rod End Dimensions

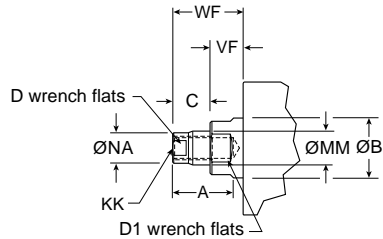
Thread Style 4
 (NFPA Style SM)
 Small Male



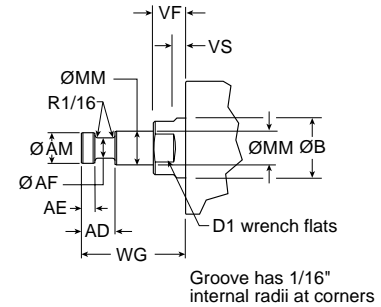
Thread Style 8
 (NFPA Style IM)
 Intermediate Male



Thread Style 9
 (NFPA Style SF)
 Short Female



Thread Style 55
 For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"

Special threads, rod extensions, rod eyes, blanks, etc. are also available. To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF. If otherwise special, please supply dimensioned sketch.

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread		+0.000 -0.002													
			Style 8 CC	Style 4 & 9 KK	A	AD	AE	AF	AM	B	C	D	D1	LAF	NA	VF	WF	WG
6	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	0.760	1-1/2	2-3/16	3.875	1.688	1.115	1.875	3.125
8	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	0.760	1-1/2	2-3/16	3.875	1.688	1.115	1.875	3.125

B

Tie Rod Cylinders
 Actuator Products

3MA
 Series

4MA/4ML
 Series

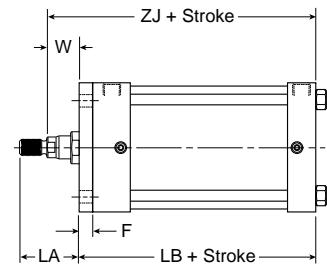
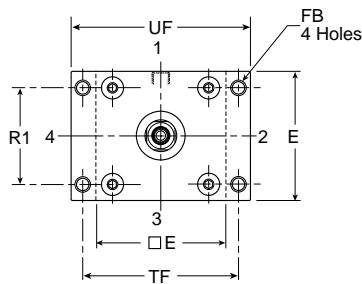
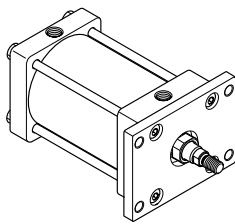
3MAJ/4MAJ
 Series

4MNR
 Series

P1D
 Series

Head Rectangular Flange

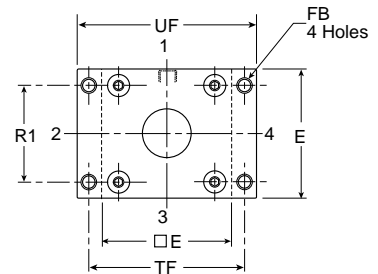
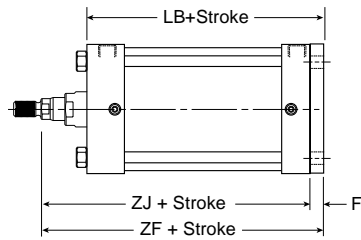
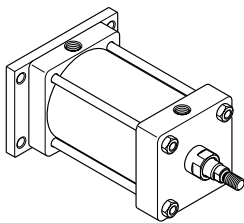
Style J
 (NFPA MF1)
 (only 6" Bore)



Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J. For reference, $WF = W + F$ and $LA = W + A$.

Cap Rectangular Flange

Style H
 (NFPA MF2)
 (only 6" Bore)



Styles J and H

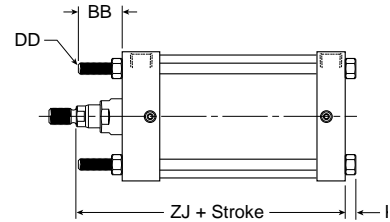
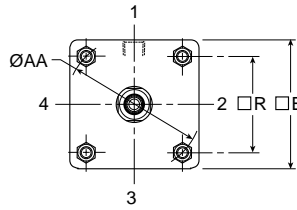
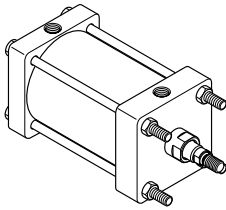
Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke		
												LB	ZF	ZJ
6	1	1-3/8	1.625	6.500	0.750	0.563	2.500	4.880	7.625	8.625	0.875	5.750	7.375	6.625
	3	1-3/4	2.000	6.500	0.750	0.563	3.125	4.880	7.625	8.625	1.125	5.750	7.625	6.875

B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 Series
 4MA/4ML
 Series
 3MAJ/4MAJ
 Series
 4MNR
 Series
 P1D
 Series



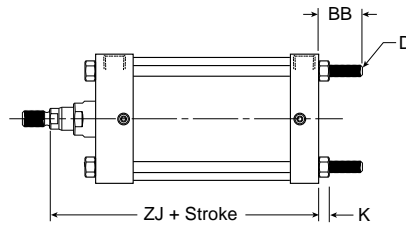
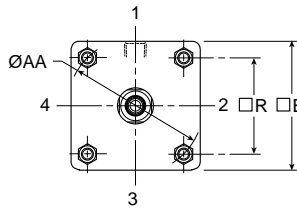
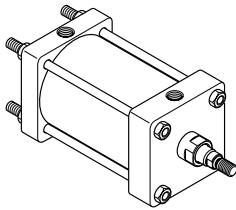
Tie Rods Ext. Head End

Style TB
 (NFPA MX3)



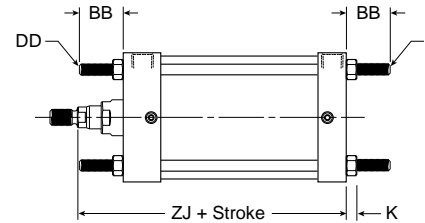
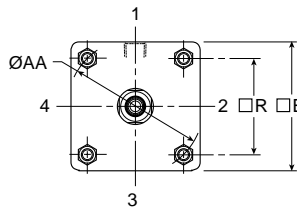
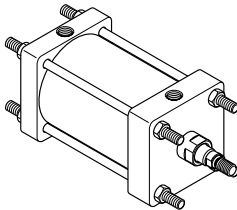
Tie Rods Ext. Cap End

Style TC
 (NFPA MX2)



Tie Rods Ext. Both Ends

Style TD
 (NFPA MX1)



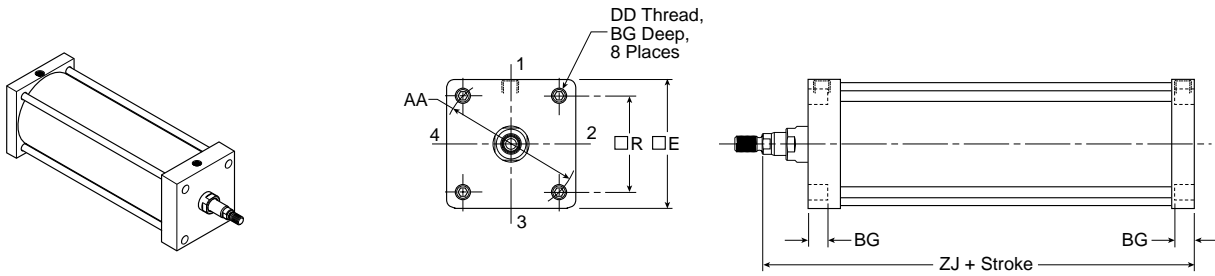
Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	AA	BB	DD	E	K	R	Add stroke	
									ZJ	
6	1	1-3/8	6.900	1.813	1/2-20	6.500	0.438	4.880	6.625	
	3	1-3/4	6.900	1.813	1/2-20	6.500	0.438	4.880	6.875	
8	1	1-3/8	9.100	2.313	5/8-18	8.500	0.563	6.440	6.750	
	3	1-3/4	9.100	2.313	5/8-18	8.500	0.563	6.440	7.000	

B	Tie Rod Cylinders Actuator Products
	3MA Series
	4MA/4ML Series
	3MAJ/4MAJ Series
4MNR Series	
P1D Series	

Sleeve Nut

Style TE
 (NFPA MX5)



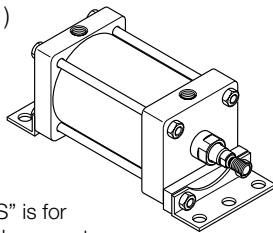
Style TE

Bore size	Rod no.	Rod dia. MM	AA	BG	DD	E	R	Add stroke	
								ZJ	
6	1	1-3/8	6.900	0.500	1/2-20	6.500	4.880	6.625	
	3	1-3/4	6.900	0.500	1/2-20	6.500	4.880	6.875	
8	1	1-3/8	9.100	0.620	5/8-18	8.500	6.440	6.750	
	3	1-3/4	9.100	0.620	5/8-18	8.500	6.440	7.000	

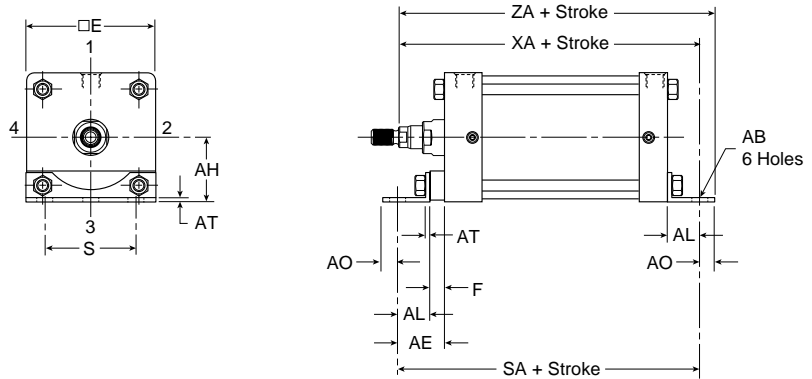
B
 Tie Rod Cylinders
 Actuator Products
 3MA Series
 4MA/4ML Series
 3MAJ/4MAJ Series
 4MNR Series
 P1D Series

Side End Angle*

Style CB
 (NFPA MS1)



Note:
 Dimension "S" is for the holes in the mount (not the screw to screw dimension)



*Maximum recommended pressure for this mount is 150 PSIG

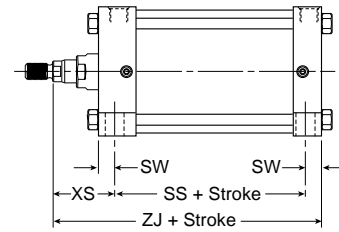
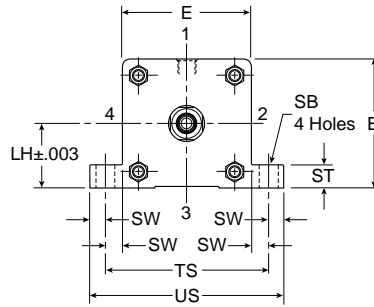
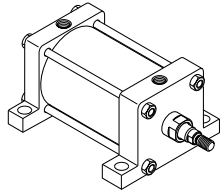
Style CB

Bore size	Rod no.	Rod dia. MM	AB	AE	AH	AL	AO	AT	E	F	S	Add stroke		
												SA	XA	ZA
6	1	1-3/8	0.813	2.125	3.250	1.375	0.625	0.188	6.500	0.750	5.250	8.500	8.000	6.625
	3	1-3/4	0.813	2.125	3.250	1.375	0.625	0.188	6.500	0.750	5.250	8.500	8.250	6.875
8	1	1-3/8	0.813	1.813	4.250	1.813	0.688	0.250	8.500	-	7.125	8.750	8.563	9.250
	3	1-3/4	0.813	1.813	4.250	1.813	0.688	0.250	8.500	-	7.125	8.750	8.813	9.500



Side Lug

Style C
 (NFPA MS2)

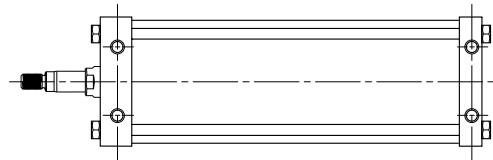
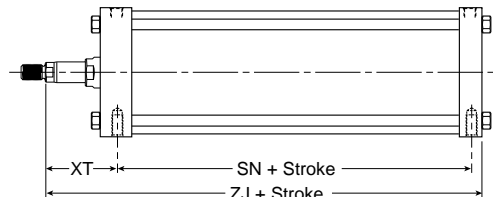
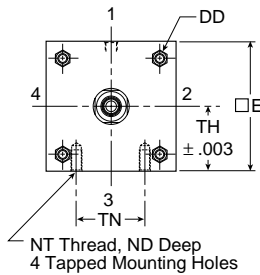
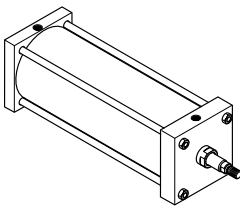


Style C

Bore size	Rod no.	Rod dia. MM	E	+/- .003 LH	SB	ST	SW	TS	US	XS	Add stroke	
											SS	ZJ
6	1	1-3/8	6.500	3.243	0.813	1.000	0.688	7.875	9.250	2.313	3.625	6.625
	3	1-3/4	6.500	3.243	0.813	1.000	0.688	7.875	9.250	2.563	3.625	6.875
8	1	1-3/8	8.500	4.243	0.813	1.000	0.688	9.875	11.250	2.313	3.750	6.750
	3	1-3/4	8.500	4.243	0.813	1.000	0.688	9.875	11.250	2.563	3.750	7.000

Side Tap

Style F
 (NFPA MS4)



Style F

Bore size	Rod no.	Rod dia. MM	E	ND	NT	+/- .003 TH	TN	XT	Add stroke	
									SN	ZJ
6	1	1-3/8	6.500	1.125	3/4-10	3.243	3.250	2.813	3.125	6.625
	3	1-3/4	6.500	1.125	3/4-10	3.243	3.250	3.063	3.125	6.875
8	1	1-3/8	8.500	1.125	3/4-10	4.243	4.500	2.813	3.250	6.750
	3	1-3/4	8.500	1.125	3/4-10	4.243	4.500	3.063	3.250	7.000

B

Tie Rod Cylinders
 Actuator Products

3MA
 Series

4MA/4ML
 Series

3MAJ/4MAJ
 Series

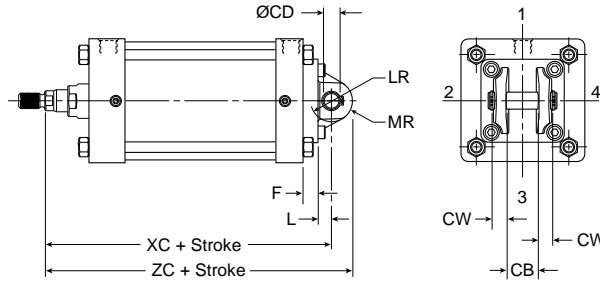
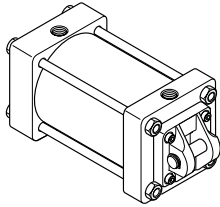
4MNR
 Series

P1D
 Series

Cap Fixed Clevis

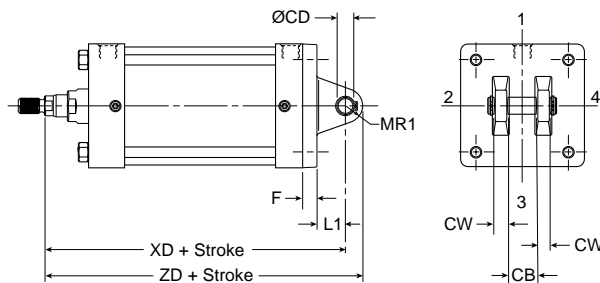
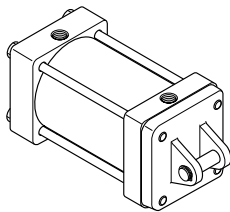
Style BB
 (NFPA MP1)

Note: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.



Cap Detachable Clevis

Style BC
 (NFPA MP2)

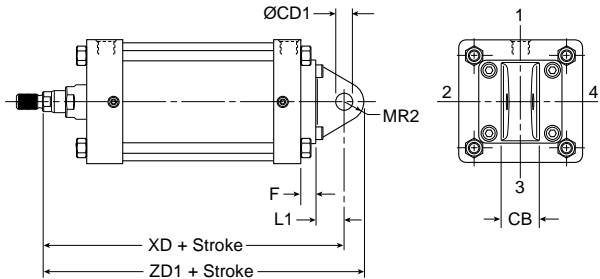
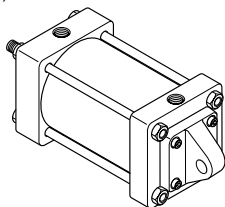


Styles BB and BC

Bore size	Rod no.	Rod dia. MM	CB	+0.000 -0.002 CD	CW	E	F	L	LR	L1	MR	MR1	Add stroke			
													XC	XD	ZC	ZD
6	1	1-3/8	1.500	1.001	0.750	6.500	0.750	0.750	1.250	1.500	1.125	1.000	8.125	8.875	9.250	9.875
	3	1-3/4	1.500	1.001	0.750	6.500	0.750	0.750	1.250	1.500	1.125	1.000	8.375	9.125	9.500	10.125
8	1	1-3/8	1.500	1.001	0.750	8.500	0.750	0.750	1.250	1.500	1.125	1.000	8.250	9.000	9.375	10.000
	3	1-3/4	1.500	1.001	0.750	8.500	0.750	0.750	1.250	1.500	1.125	1.000	8.500	9.250	9.625	10.250

Cap Detachable Eye

Style BE
 (NFPA MP4)
 (only 6" Bore)



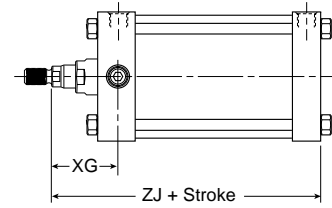
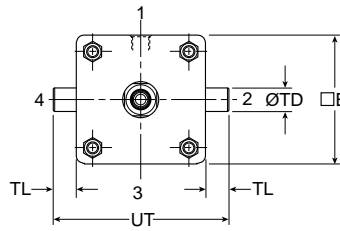
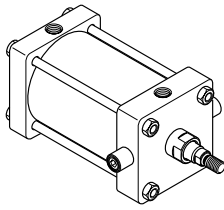
Style BE

Bore size	Rod no.	Rod dia. MM	CB	+0.002 +0.004 CD1	E	F	L1	MR2	Add stroke	
									XD	ZD1
6	1	1-3/8	1.500	1.000	6.500	0.750	1.500	1.125	8.875	10.000
	3	1-3/4	1.500	1.000	6.500	0.750	1.500	1.125	9.125	10.250

B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 Series
 4MA/4ML
 Series
 3MAJ/4MAJ
 Series
 4MNR
 Series
 P1D
 Series

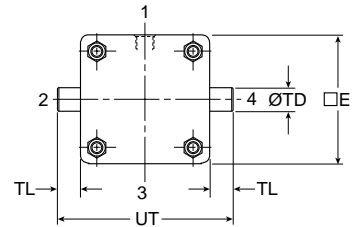
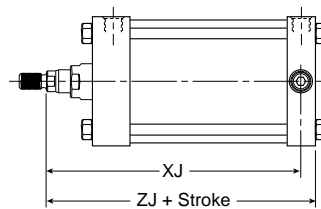
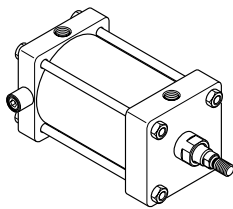
Head Trunnion

Style D
 (NFPA MT1)



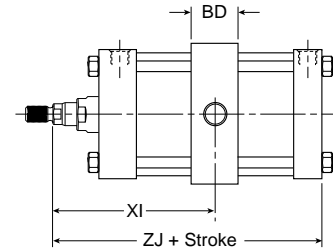
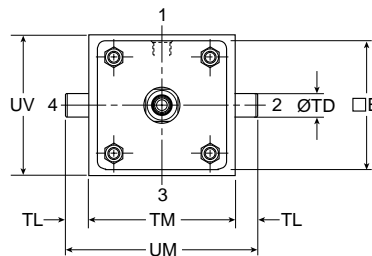
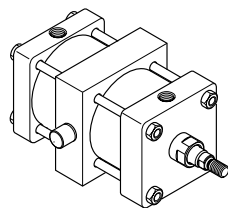
Cap Trunnion

Style DB
 (NFPA MT2)



Intermediate Trunnion

Style DD
 (NFPA MT4)



Styles D, DB and DD

Bore size	Rod no.	Rod dia. MM	E	BD	+0.000 -0.001 TD	TL	TM	UM	UT	UV	XG	Min. XI	Add stroke	
													XJ	ZJ
6	1	1-3/8	6.500	2.500	1.375	1.375	7.625	10.375	9.250	7.000	2.625	4.813	5.875	6.625
	3	1-3/4	6.500	2.500	1.375	1.375	7.625	10.375	9.250	7.000	2.875	5.063	6.125	6.875
8	1	1-3/8	8.500	2.500	1.375	1.375	9.750	12.500	11.250	9.500	2.625	4.750	6.000	6.750
	3	1-3/4	8.500	2.500	1.375	1.375	9.750	12.500	11.250	9.500	2.875	5.000	6.250	7.000

B

Tie Rod Cylinders
 Actuator Products

3MA
 Series

4MA/4ML
 Series

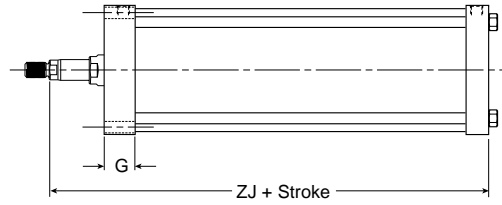
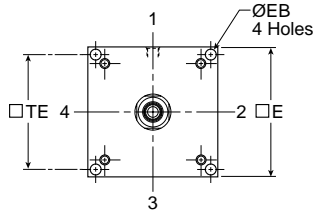
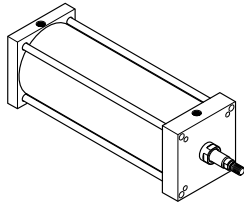
3MAJ/4MAJ
 Series

4MNR
 Series

P1D
 Series

Head Square

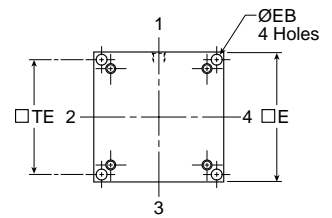
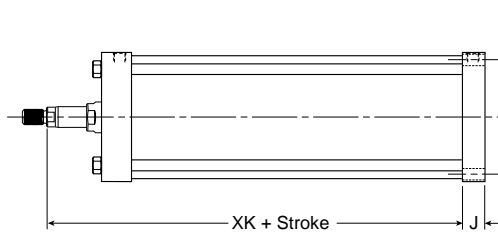
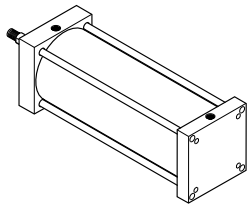
Style JB
 (NFPA ME3)



B
 Tie Rod Cylinders
 Actuator Products
 3MA Series
 4MA/4ML Series
 3MAJ/4MAJ Series
 4MNR Series
 P1D Series

Cap Square

Style HB
 (NFPA ME4)



Styles JB and HB

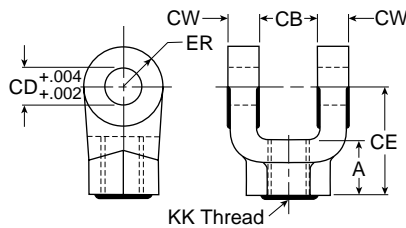
Bore size	Rod no.	Rod dia. MM	E	EB	G	J	TE	Add stroke	
								XK	ZJ
8	1	1-3/8	8.500	0.688	1.810	1.440	7.570	5.313	6.750
	3	1-3/4	8.500	0.688	1.810	1.440	7.570	5.563	7.000

Mounting Kits and Accessories

Bore size	J (MF1)	H (MF2)	BB (MP1)	BC (MP2)	BE (MP4)	CB (MS1)	C (MS2)	G (MS7)	Kit fastener torque units	
	Head rectangular flange	Cap rectangular flange	Cap fixed clevis	Cap detachable clevis	Cap detachable eye	Side end angles	Side lug (3MA only)	Side end lug	inch-lbs	N-m
	Kit number	Kit number	Kit number	Kit number	Kit number	Kit number	Kit number	Kit number		
1-1/2	L079700150	L079700150	L079710150	L079730150	L079720150	L079740150	L079830150	L079750150	32-36	3.6-4.1
2	L079700200	L079700200	L079710200	L079730200	L079720200	L079740200	L079830200	L079750200	72-82	8-9
2-1/2	L079700250	L079700250	L079710250	L079730250	L079720250	L079740250	L079830250	L079750250	72-82	8-9
3-1/4	L079700325	L079700325	L079710325	L079730325	L079720325	L079740325	L079830325	L079750325	216-228	24-25.3
4	L079700400	L079700400	L079710400	L079730400	L079720400	L079740400	L079830400	L079750400	216-228	24-25.3
5	L079700500	L079700500	L079710500	L079730500	N/A	L079740500	L079830500	N/A	360-372	41-42

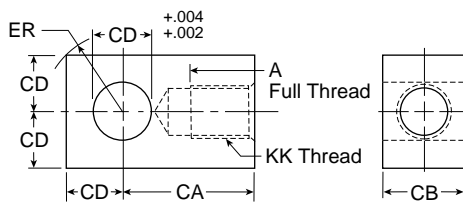
** Spacer plate not used for 4" bore or double rod cylinders

Female Rod Clevis



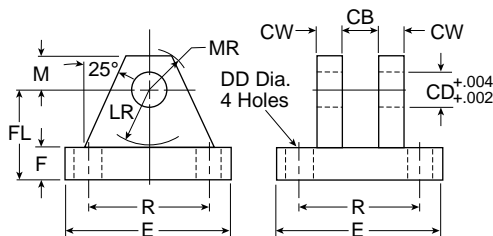
Symbol	1458030044	1458030050	1458030075	1458030088	1458030100	1458030125	1458030150
A	3/4	3/4	1-1/8	1-5/8	1-5/8	2	2-1/4
CB	3/4	3/4	1-1/4	1-1/2	1-1/2	2	2-1/2
CD	1/2	1/2	3/4	1	1	1-3/8	1-3/4
C E	1-1/2	1-1/2	2-1/8	2-15/16	2-15/16	3-3/4	4-1/2
CW	1/2	1/2	5/8	3/4	3/4	1	1-1/4
ER	1/2	1/2	3/4	1	1	1-3/8	1-3/4
KK	7/16-20	1/2-20	3/4-16	7/8-14	1-14	1-1/4-12	1-1/2-12
Load capacity (lbs)	4250	4900	11200	18800	19500	33500	45600

Rod Eye Knuckle



Symbol	1458040044	1458040050	1458040075	1458040088	1458040100	1458040125	1458040150
A	3/4	3/4	1-1/8	1-1/8	1-5/8	2	2-1/4
CA	1-1/2	1-1/2	2-1/16	2-3/8	2-13/16	3-7/16	4
CB	3/4	3/4	1-1/4	1-1/2	1-1/2	2	2-1/2
CD	1/2	1/2	3/4	1	1	1-3/8	1-3/4
ER	23/32	23/32	1-1/16	1-7/16	1-7/16	1-31/32	2-1/2
KK	7/16-20	1/2-20	3/4-16	7/8-14	1-14	1-1/4-12	1-1/2-12
Load capacity (lbs)	5000	5700	12100	13000	21700	33500	45000

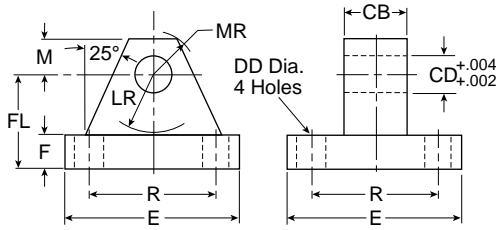
Clevis Bracket



Symbol	1458050044	1458050050	1458050075	1458050100	1458050138	1458050175
CB	15/32	3/4	1-1/4	1-1/2	2	2-1/2
CD	7/16	1/2	3/4	1	1-3/8	1-3/4
CW	3/8	1/2	5/8	3/4	1	1-1/4
DD	17/64	13/32	17/32	21/32	21/32	29/32
E	2-1/4	3-1/2	5	6-1/2	7-1/2	9-1/2
F	3/8	1/2	5/8	3/4	7/8	7/8
FL	1	1-1/2	1-7/8	2-1/4	3	3-5/8
LR	5/8	3/4	1-3/16	1-1/2	2	2-3/4
M	3/8	1/2	3/4	1	1-3/8	1-3/4
MR	1/2	5/8	29/32	1-1/4	1-21/32	2-7/32
R	1.75	2.55	3.82	4.95	5.73	7.50
Load capacity (lbs)	3600	7300	14000	19200	36900	34000



Mounting Plate & Eye Bracket



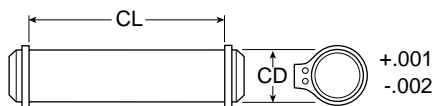
Symbol	1458060031	1458060050	1458060075	1458060100	1458060138	1458060175
CB	15/16	3/4	1-1/4	1-1/2	2	2-1/2
CD	15/16	1/2	3/4	1	1-3/8	1-3/4
DD	17/64	13/32	17/32	21/32	21/32	29/32
E	2-1/4	2-1/2	3-1/2	4-1/2	5	6-1/2
F	3/8	3/8	5/8	7/8	7/8	1-1/8
FL	1	1-1/8	17/8	2-3/8	3	3-3/8
LR	5/8	3/4	1-1/4	1-1/2	2-1/8	2-1/4
M	3/8	1/2	3/4	1	1-3/8	1-3/4
MR	1/2	9/16	7/8	1-1/4	1-5/8	2-1/8
R	1.75	1.63	2.55	3.25	3.82	4.95
Load Capacity (lbs)	1700	4100	10500	20400	21200	49480

1-1/2" to 8" Bore Cylinder Accessories

Rod end accessories can be selected by cylinder rod end thread size from Table A & B below. Mating parts for rod end accessories are listed just to the right of the knuckle or clevis selected. Mounting plates for style MP1 & MP4 cylinder mounts are selected by bore size from Table C.

Rod end thread size	Table A Mating parts			Table B Mating parts			Table C Mounting plates		
	Female rod clevis	Eye bracket	Pivot pin	Knuckle	Clevis bracket	Pivot pin	Bore size	For mtg. style MP1 cylinder	For mtg. style MP4 cylinder
7/16-20	1458030044	1458060050	0856640050	1458040044	1458050050	0856640050	1-1/2	1458060050	1458050050
1/2-20	1458030050	1458060050	0856640050	1458040050	1458050050	0856640050	2	1458060050	1458050050
3/4-16	1458030075	1458060075	0856640075	1458040075	1458050075	0856640075	2-1/2	1458060050	1458050050
7/8-14	1458030088	1458060100	0856640100	1458040088	1458050100	0856640100	3-1/4	1458060075	1458050075
1-14	1458030100	1458060100	0856640100	1458040100	1458050100	0856640100	4	1458060075	1458050075
1-1/4-12	1458030125	1458060138	0856640138	1458040125	1458050138	0856640138	5	1458060075	—
1-1/2-12	1458030150	1458060175	0856640175	1458040150	1458050175	0856640175	6	1458060100	—
							8	1458060100	—

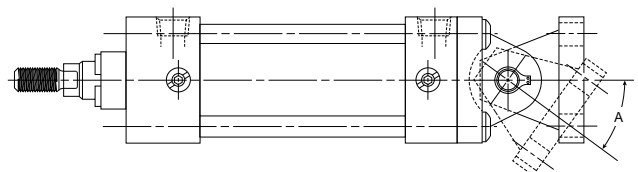
Pivot Pin



Symbol	0856640044	0856640050	0856640075	0856640100	0856640138	0856640175
CD	7/16	1/2	3/4	1	1-3/8	1-3/4
CL	1-5/16	1-7/8	2-5/8	3-1/8	4-1/8	5-3/16
Shear cap. (lbs)	6600	8600	19300	34300	65000	105200

Note: Pivot Pin must be ordered separately for single lug pivot mounting.

Maximum pivot angle for rear clevis mounts (BB mounts) and accessories



Bore	1-1/2	2	2-1/2	3-1/4	4	5	6	8
Angle A	52	43	29	50	49	45	42	42

Service Kits

Bore size	Rod dia.	Rod no.	RG - Rod gland cartridge kit. Includes gland and wiper, rod, and o-ring seals		Gland to head torque units		PK - Piston seal kit, standard lipseals. Includes piston and o-ring seals		SK - complete cylinder kit. Includes rod gland kit, piston seal kit, and cushion kits		Torque units endcap fastener or tie rod	
			Nitrile seal kit number	Fluorocarbon seals kit number	Ft-lbs	Nm	Nitrile seal kit number	Fluorocarbon seal kit number	Nitrile seal kit number	Fluorocarbon seal kit number	inch-lbs	Nm
1-1/2	5/8	1	RG04MA0061	RG04MA0065	40-45	54-61	PK1504MA01	PK1504MA05	SK15104MA1	SK15104MA5	32-36	3.6-4.1
	1	2	RG04MA0101	RG04MA0105	45-50	61-68			SK15304MA1	SK15304MA5		
2	5/8	1	RG04MA0061	RG04MA0065	40-45	54-61	PK2004MA01	PK2004MA05	SK20104MA1	SK20104MA5	72-82	8-9
	1	3	RG04MA0101	RG04MA0105	45-50	61-68			SK20304MA1	SK20304MA5		
2-1/2	5/8	1	RG04MA0061	RG04MA0065	40-45	54-61	PK2504MA01	PK2504MA05	SK25104MA1	SK25104MA5	72-82	8-9
	1	3	RG04MA0101	RG04MA0105	45-50	61-68			SK25304MA1	SK25304MA5		
3-1/4	1	1	RG04MA0101	RG04MA0105	45-50	61-68	PK3254MA01	PK3254MA05	SK32104MA1	SK32104MA5	216-228	24-25.3
	1-3/8	3	RG04MA0131	RG04MA0135	75-80	102-108			SK32304MA1	SK32304MA5		
4	1	1	RG04MA0101	RG04MA0105	45-50	61-68	PK4004MA01	PK4004MA05	SK40104MA1	SK40104MA5	216-228	24-25.3
	1-3/8	3	RG04MA0131	RG04MA0135	75-80	102-108			SK40304MA1	SK40304MA5		
5	1	1	RG04MA0101	RG04MA0105	45-50	61-68	PK5004MA01	PK5004MA05	SK50104MA1	SK50104MA5	360-372	41-42
	1-3/8	3	RG04MA0131	RG04MA0135	75-80	102-108			SK50304MA1	SK50304MA5		
6	1-3/8	1	RG04MA0131	RG04MA0135	75-80	102-108	PK6004MA01	PK6004MA05	SK60104MA1	SK60104MA5	420-432	48-49
	1-3/4	3	RG04MA0171	RG04MA0175	90-95	122-129			SK60304MA1	SK60304MA5		
8	1-3/8	1	RG04MA0131	RG04MA0135	75-80	102-108	PK8004MA01	PK8004MA05	SK80104MA1	SK80104MA5	960-972	109-115
	1-3/4	3	RG04MA0171	RG04MA0175	90-95	122-129			SK80304MA1	SK80304MA5		

B

**Tie Rod Cylinders
Actuator Products**

**3MA
Series**

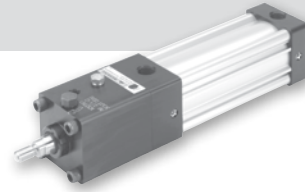
**4MA/4ML
Series**

**3MAJ/4MAJ
Series**

**4MNR
Series**

**P1D
Series**

3MAJ/4MAJ Series



- Industry leading NFPA interchangeable rod lock cylinder with flexible construction
- Rod lock holding force equivalent to cylinder output force at 100 PSIG
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4", 5", 6" and 8"
- 17 standard styles mounting styles available
- Available in any practical stroke length
- Rod diameters – 5/8", 1", 1-3/8" and 1-3/4"
- Single rod end or double rod ends
- Adjustable cushions are standard at both ends
- Manual override feature standard on all configurations

Operating information

Operating pressure: 100 PSIG (7 bar) maximum air pressure, except 2" bore with 1" rod rated at 80 PSIG)
 60 PSIG (4.1 bar) minimum air pressure to release rod lock

Temperature range –
 Standard seals -10°F to 165°F (-23°C to 74°C)
 Fluorocarbon seals -10°F to 250°F (-23°C to 121°C)

Filtration requirements: 40 micron, dry filtered air

Ordering information

2.00	C	J	4MAJ	U	1	4	A	C	6.000
Bore size	Double Rod Cylinder¹²	Series	Ports⁴	Piston rod number	Special modification	Cushion cap end	Piston rod thread type	Stroke length	
1.50 ¹	Specify "K" only if double rod cylinder is required.	4MAJ 4MA rod lock cylinder 3MAJ 3MA rod lock cylinder	U NPTF R BSPP B BSPT T SAE	Specify rod code number for required diameter. ⁸	Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MAJ with Linear Position Sensor Option) ⁷	C Cushioned cap end "C" is required	A Standard (UNF unified thread) W BSF British fine M* Metric	Specify stroke length required in inches. ⁸	
2.00	Mounting style								
2.50	Specify mounting style code (see table on following page).								
3.25									
4.00									
5.00									
6.00 ^{2, 11}									
8.00 ^{2, 11}									
Cushion head end									
C Cushioned head end "C" is required									
Cylinder construction									
Blank* Standard (extruded body, standard round lobe orientation)									
A* Extruded body, round lobe orientation rotated 90 degrees from standard									
N* Extruded body, round lobe orientation rotated 180 degrees from standard									
Z* Extruded body, round lobe orientation rotated 270 degrees from standard									
T Aluminum round tube and carbon steel tie rods & nuts									
* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore.									
Piston type¹¹									
Blank Standard (lipseals and magnetic ring) ¹²									
1 Lipseals, no magnetic ring ¹²									
2 Lipseals, no magnetic ring (aluminum piston)									
3 Lipseals and magnetic ring (aluminum piston)									
4 Bumper seals, no magnetic ring									
6 Bumper seals and magnetic ring									
B Lipseals, 1/4" thick bumpers both ends ³									
H Lipseals, 1/4" thick bumper head end ³									
C Lipseals, 1/4" thick bumper cap end ³									
D Lipseals and magnetic ring, 1/4" thick bumpers both ends ³									
F Lipseals and magnetic ring, 1/4" thick bumper head end ³									
R Lipseals and magnetic ring, 1/4" thick bumper cap end ³									
Seals									
Blank Standard (nitrile seals)									
V Fluorocarbon seals ^{2, 5}									
E Fluorocarbon rod wiper and rod seal only ⁶									
Piston rod thread style									
4 Small male									
8 Intermediate male									
9 Short female									
55 For use with split coupler ⁹									
3 Special (and specify all dimensions required)									
Rod material and gland code									
Blank Standard rod and gland									
H Standard rod and HI LOAD gland									
Y 17-4 PH stainless steel rod and standard gland									
Z 17-4 PH stainless steel rod and HI LOAD gland									

1 Not available with 1" rod diameter (rod number 2) for 1-1/2" bore. Not available with Linear Position Sensor Option (LPSO).
 2 Not available for 3MAJ, please specify 4MAJ.
 3 Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".
 4 Port thread styles only for base cylinder. Rod lock port is always NPTF. If a different rod lock port thread style is required, place an "S" for special in the Special Modification field and indicate the desired rod lock port thread style in the item notes. NPTF cylinder ports are must be ordered for 3MAJ.
 5 Fluorocarbon seals for 4MAJ are only for external chemical compatibility applications, not high temperature.
 6 Used for external chemical compatibility applications, not high temperature.
 7 For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes:
 a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)
 b. Sensor position
 c. Port position (if other than position 1)
 d. Length of stop tubing, gross stroke and net stroke (if required)
 LPSO not available for 3MAJ, please specify 4MAJ. Cylinder dimensions will

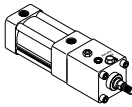
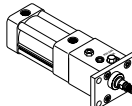
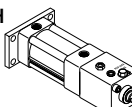
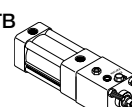
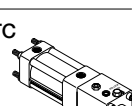
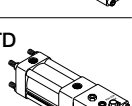
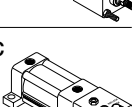
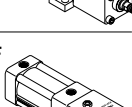
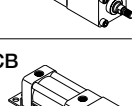
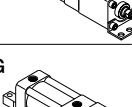
approximate dimensions for 4MAJ. Piston Type option (blank), 3, 6, D, F or R is required. Please consult the Actuator Division for additional information.
 8 Review Piston Rod Selection Chart, please reference catalog 0900P-E, on page A14 to determine proper piston rod diameter.
 9 For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.
 10 If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes. Not available with Piston Types (blank) and 1 for 1-1/2" - 5" bore cylinders. Stop tube not available for 3MAJ, please specify 4MAJ.
 11 6"-8" bore 4MAJ can accept only Piston Types (blank) and 3. The (blank) piston for 6"-8" bores is aluminum, lipseals, no magnetic ring. Composite pistons not available with oversize rod number 3.
 12 Double rod cylinders not available with composite piston type.

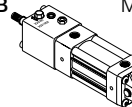
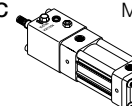
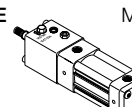
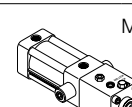
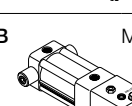
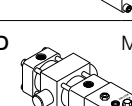
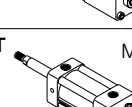
For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.



B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 4MA/4ML
 3MAJ/4MAJ
 4MNR
 P1D

3MAJ*/4MAJ Mounting Styles for 6" to 8" Bore

Mounting style	NFPA mounting	Description	Bore size
T 	MX0	No Mount	1-1/2 - 8
J 	MF1	Head Rectangular Flange	1-1/2 - 6
H 	MF2	Cap Rectangular Flange	1-1/2 - 6
TB 	MX3	Tie Rods Extended Head End	1-1/2 - 8
TC 	MX2	Tie Rods Extended Cap End	1-1/2 - 8
TD 	MX1	Tie Rods Extended Both Ends	1-1/2 - 8
C 	MS2	Side Lug	1-1/2 - 8
F 	MS4	Side Tap	1-1/2 - 8
CB 	MS1	Side End Angle	1-1/2 - 8
G 	MS7	Side End Lug	1-1/2 - 4

Mounting style	NFPA mounting	Description	Bore size
BB 	MP1	Cap Fixed Clevis	1-1/2 - 8
BC 	MP2	Cap Detachable Clevis	1-1/2 - 8
BE 	MP4	Cap Detachable Eye	1-1/2 - 6
D 	MT1	Head Trunnion	1-1/2 - 8
DB 	MT2	Cap Trunnion	1-1/2 - 8
DD 	MT4	Intermediate Trunnion	1-1/2 - 8
KT 	MDX0	Double Rod End, No Mount	1-1/2 - 8

* 3MAJ utilizes base 3MA cylinder and is available in 1-1/2" to 5" bore sizes. Mounting style codes C, D and DB not available for 3MAJ

B

**Tie Rod Cylinders
 Actuator Products**

**3MA
 Series**

**4MA/4ML
 Series**

**3MAJ/4MAJ
 Series**

**4MNR
 Series**

**P1D
 Series**

Sensors

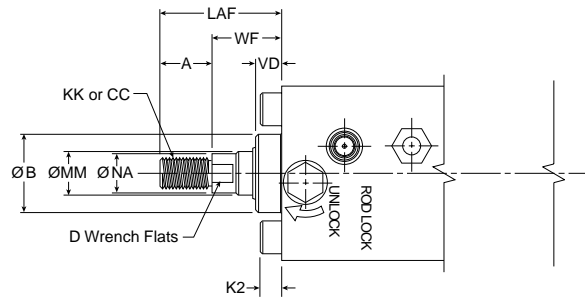
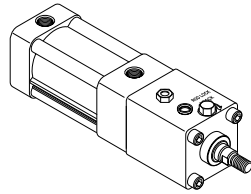
For sensors see page B339.



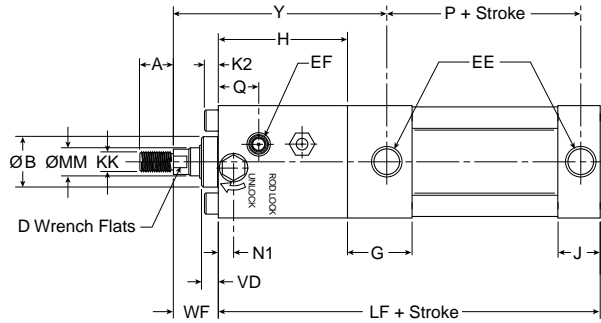
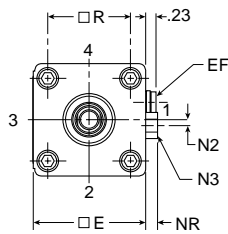
3MAJ/4MAJ Series Single Rod Dimensions

No Mount Basic

Style T
 (NFPA MX0)



For dimensions of all standard rod end styles, see next page.



Style T

Bore size	Rod no.	Rod dia. MM	Thread		A	AA	+0.000 -0.002 B	D	E	EE (NPTF)	EF (NPTF)	G	H	J
			Style 8 CC	Style 4 & 9 KK										
1-1/2	1	5/8	1/2-20	7/16-20	0.750	2.020	1.124	1/2	2.000	3/8	1/8	1.438	2.625	0.938
	2	5/8	1/2-20	7/16-20	0.750	2.600	1.124	1/2	2.500	3/8	1/8	1.375	2.875	0.937
	3	1	7/8-14	3/4-16	1.125	2.600	1.499	7/8	2.500	3/8	1/8	1.375	3.875	0.937
2-1/2	1	5/8	1/2-20	7/16-20	0.750	3.100	1.124	1/2	3.000	3/8	1/8	1.344	2.875	0.938
	3	1	7/8-14	3/4-16	1.125	3.100	1.499	7/8	3.000	3/8	1/8	1.344	4.000	0.938
3-1/4	1	1	7/8-14	3/4-16	1.125	3.900	1.499	7/8	3.750	1/2	1/4	1.594	4.500	1.125
	3	1-3/8	1-1/4-12	1-14	1.625	3.900	1.999	1-1/8	3.750	1/2	1/4	1.594	4.875	1.125
4	1	1	7/8-14	3/4-16	1.125	4.700	1.499	7/8	4.500	1/2	1/4	1.594	4.875	1.125
	3	1-3/8	1-1/4-12	1-14	1.625	4.700	1.999	1-1/8	4.500	1/2	1/4	1.594	5.125	1.125
5	1	1	7/8-14	3/4-16	1.125	5.800	1.499	7/8	5.500	1/2	1/4	1.594	5.375	1.219
	3	1-3/8	1-1/4-12	1-14	1.625	5.800	1.999	1-1/8	5.500	1/2	1/4	1.594	5.750	1.219

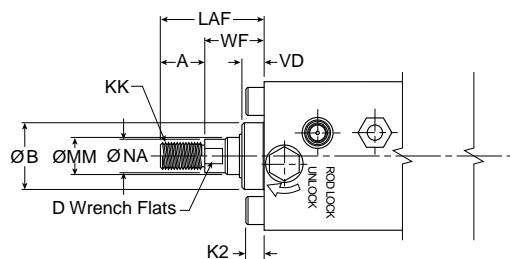
Bore size	Rod no.	Rod dia. MM	K2	LAF	N1	N2	Hex N3	NA	NR	Q	R	VD	WF	Y	Add stroke	
															LF	P
1-1/2	1	5/8	0.250	1.750	0.220	0.140	5/16	0.563	0.190	0.715	1.430	0.375	1.000	4.500	6.250	2.313
	2	5/8	0.313	1.750	0.340	0.130	1/2	0.563	0.265	0.895	1.840	0.375	1.000	4.750	6.500	2.313
	3	1	0.313	2.500	0.338	0.146	1/2	0.938	0.275	1.065	1.840	0.500	1.375	6.125	7.500	2.313
2-1/2	1	5/8	0.313	1.750	0.346	0.150	1/2	0.563	0.265	0.755	2.190	0.500	1.000	4.813	6.625	2.375
	3	1	0.313	2.500	0.346	0.148	1/2	0.938	0.265	1.120	2.190	0.500	1.375	6.313	7.750	2.375
3-1/4	1	1	0.375	2.500	0.631	0.180	5/8	0.938	0.340	1.510	2.760	0.500	1.375	6.938	8.750	2.625
	3	1-3/8	0.375	3.250	0.813	0.247	5/8	1.313	0.350	1.645	2.760	0.625	1.625	7.563	9.125	2.625
4	1	1	0.375	2.500	0.625	0.240	7/8	0.938	0.500	1.725	3.320	0.500	1.375	7.313	9.125	2.625
	3	1-3/8	0.375	3.250	0.771	0.276	7/8	1.313	0.490	1.679	3.320	0.750	1.625	7.813	9.375	2.625
5	1	1	0.500	2.500	0.720	0.220	7/8	0.938	0.500	1.995	4.100	0.500	1.375	7.813	9.875	2.875
	3	1-3/8	0.500	3.250	0.720	0.220	7/8	1.313	0.490	2.330	4.100	0.750	1.625	8.438	10.250	2.875



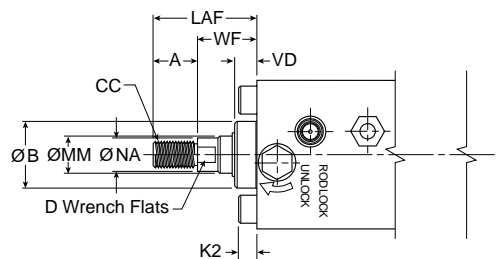
B
 Tie Rod Cylinders
 Actuator Products
 3MA Series
 4MA/4ML Series
 3MAJ/4MAJ Series
 4MNR Series
 P1D Series

Rod End Dimensions

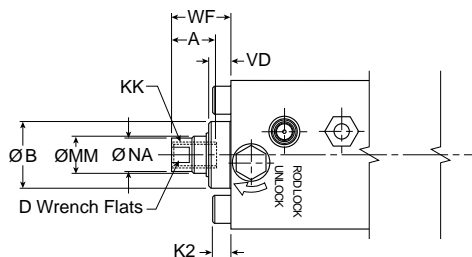
Thread Style 4
 (NFPA Style SM)
 Small Male



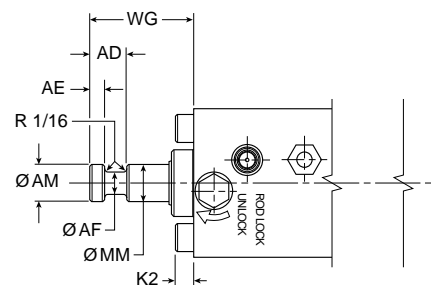
Thread Style 8
 (NFPA Style IM)
 Intermediate Male



Thread Style 9
 (NFPA Style SF)
 Short Female



Thread Style 55
 For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"

Special threads, rod extensions, rod eyes, blanks, etc. are also available. To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF. If otherwise special, please supply dimensioned sketch.

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread		A	AD	AE	AF	AM	+0.000 -0.002		K2	LAF	NA	VD	WF	WG
			Style 8 CC	Style 4 & 9 KK						B	D						
1-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	1/2	0.250	1.750	0.563	0.375	1.000	1.750
	2	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.313	2.500	0.938	0.500	1.375	2.375
	3	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	1/2	0.313	1.750	0.563	0.375	1.000
2-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	1/2	0.313	1.750	0.563	0.500	1.000	1.750
	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.313	2.500	0.938	0.500	1.375	2.375
3-1/4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.375	2.500	0.938	0.500	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.375	3.250	1.313	0.625	1.625	2.750
4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.375	2.500	0.938	0.500	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.375	3.250	1.313	0.750	1.625	2.750
5	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.500	2.500	0.938	0.500	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.500	3.250	1.313	0.750	1.625	2.750

B

Tie Rod Cylinders
Actuator Products

3MA Series

4MA/4ML Series

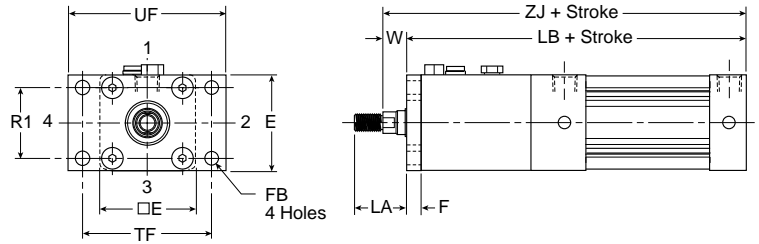
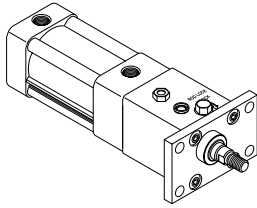
3MAJ/4MAJ Series

4MNR Series

P1D Series

Head Rectangular Flange

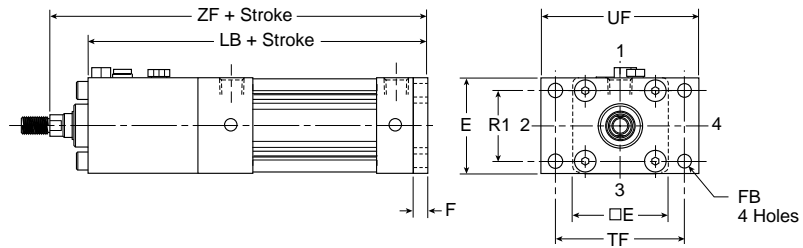
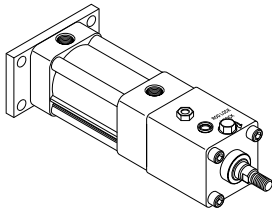
Style J
 (NFPA MF1)



Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J. For reference, $WF = W + F$ and $LA = W + A$.

Cap Rectangular Flange

Style H
 (NFPA MF2)



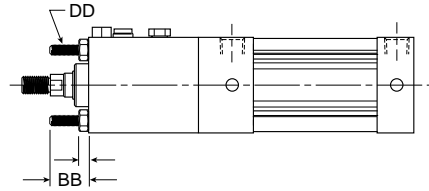
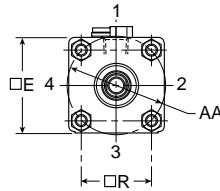
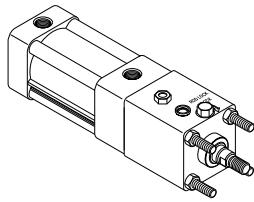
Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke		
												LB	ZF	ZJ
1-1/2	1	5/8	0.750	2.000	0.375	0.313	1.375	1.430	2.750	3.375	0.625	6.625	7.625	7.250
	1	5/8	0.750	2.500	0.375	0.375	1.375	1.840	3.375	4.125	0.625	6.875	7.875	7.500
	3	1	1.125	2.500	0.375	0.375	2.125	1.840	3.375	4.125	1.000	7.875	9.250	8.875
2-1/2	1	5/8	0.750	3.000	0.375	0.375	1.375	2.190	3.875	4.625	0.625	7.000	8.000	7.625
	3	1	1.125	3.000	0.375	0.375	2.125	2.190	3.875	4.625	1.000	8.125	9.500	9.125
3-1/4	1	1	1.125	3.750	0.625	0.438	1.875	2.760	4.688	5.500	0.750	9.375	10.750	10.125
	3	1-3/8	1.625	3.750	0.625	0.438	2.625	2.760	4.688	5.500	1.000	9.750	11.375	10.750
4	1	1	1.125	4.500	0.625	0.438	1.875	3.320	5.438	6.250	0.750	9.750	11.125	10.500
	3	1-3/8	1.625	4.500	0.625	0.438	2.625	3.320	5.438	6.250	1.000	10.000	11.625	11.000
5	1	1	1.125	5.500	0.625	0.563	1.875	4.100	6.625	7.625	0.750	10.500	11.875	11.250
	3	1-3/8	1.625	5.500	0.625	0.563	2.625	4.100	6.625	7.625	1.000	10.875	12.500	11.875

B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 Series
 4MA/4ML
 Series
 3MAJ/4MAJ
 Series
 4MNR
 Series
 P1D
 Series

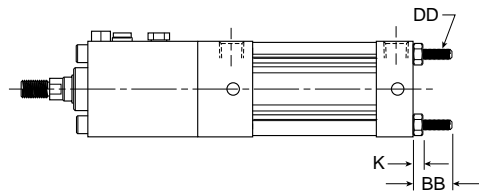
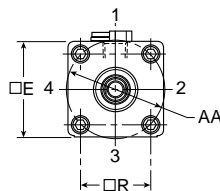
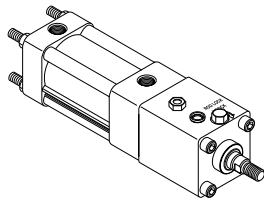
Tie Rods Extended Head End Mount

Style TB
 (NFPA MX3)



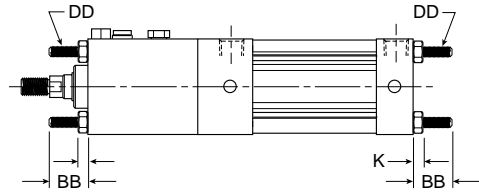
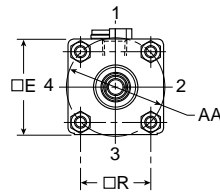
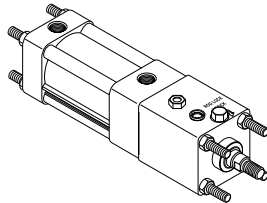
Tie Rods Extended Cap End Mount

Style TC
 (NFPA MX2)



Tie Rods Extended Both Ends Mount

Style TD
 (NFPA MX1)



Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	AA	BB	DD	E	K	R
1-1/2	1	5/8	2.020	1.000	1/4-28	2.000	0.250	1.430
2	1	5/8	2.600	1.125	5/16-24	2.500	0.313	1.840
	3	1	2.600	1.125	5/16-24	2.500	0.313	1.840
2-1/2	1	5/8	3.100	1.125	5/16-24	3.000	0.313	2.190
	3	1	3.100	1.125	5/16-24	3.000	0.313	2.190
3-1/4	1	1	3.900	1.375	3/8-24	3.750	0.375	2.760
	3	1-3/8	3.900	1.375	3/8-24	3.750	0.375	2.760
4	1	1	4.700	1.375	3/8-24	4.500	0.375	3.320
	3	1-3/8	4.700	1.375	3/8-24	4.500	0.375	3.320
5	1	1	5.800	1.813	1/2-20	5.500	0.438	4.100
	3	1-3/8	5.800	1.813	1/2-20	5.500	0.438	4.100

B

Tie Rod Cylinders
Actuator Products

3MA Series

4MA/4ML Series

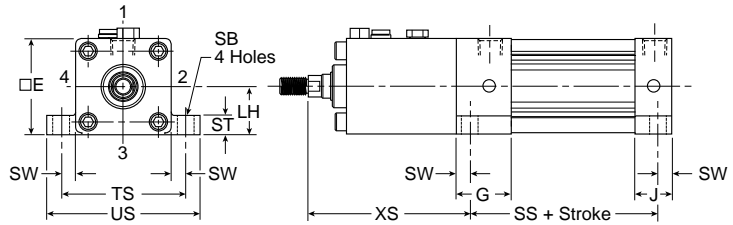
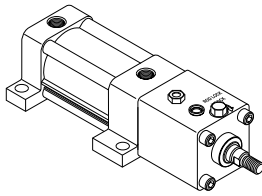
3MAJ/4MAJ Series

4MNR Series

P1D Series

Side Lug Mount

Style C (only 4MAJ)
 (NFPA MS2)

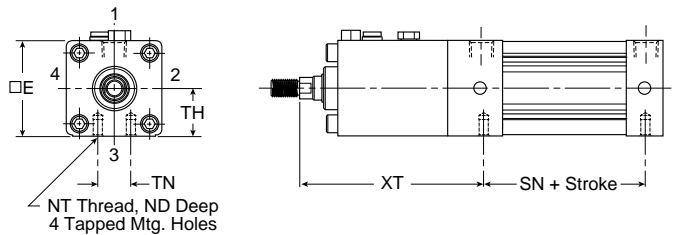
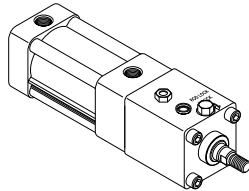


Style C

Bore size	Rod no.	Rod dia. MM	E	G	J	+/- .003 LH	SB	ST	SW	TS	US	XS	Add stroke SS
1-1/2	1	5/8	2.000	1.438	0.938	0.993	0.438	0.500	0.375	2.750	3.500	4.000	2.875
	2	5/8	2.500	1.375	0.937	1.243	0.438	0.500	0.375	3.250	4.000	4.250	2.875
2	3	1	2.500	1.375	0.937	1.243	0.438	0.500	0.375	3.250	4.000	5.625	2.875
	1	5/8	3.000	1.344	0.938	1.493	0.438	0.500	0.375	3.750	4.500	4.250	3.000
2-1/2	3	1	3.000	1.344	0.938	1.493	0.438	0.500	0.375	3.750	4.500	5.750	3.000
	1	5/8	3.750	1.594	1.125	1.868	0.563	0.750	0.500	4.750	5.750	6.375	3.250
3-1/4	3	1-3/8	3.750	1.594	1.125	1.868	0.563	0.750	0.500	4.750	5.750	7.000	3.250
	1	1	4.500	1.594	1.125	2.243	0.563	0.750	0.500	5.500	6.500	6.750	3.250
4	3	1-3/8	4.500	1.594	1.125	2.243	0.563	0.750	0.500	5.500	6.500	7.250	3.250
	1	1	5.500	1.594	1.219	2.743	0.813	1.000	0.688	6.875	8.250	7.438	3.125
5	3	1-3/8	5.500	1.594	1.219	2.743	0.813	1.000	0.688	6.875	8.250	8.063	3.125

Side Tap Mount

Style F
 (NFPA MS4)

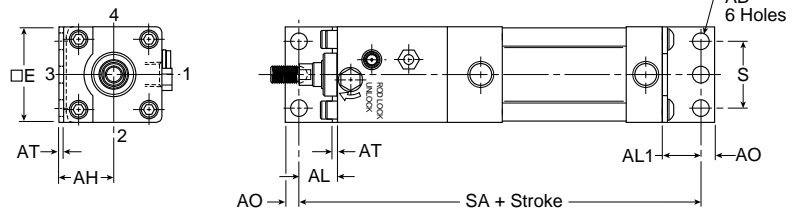
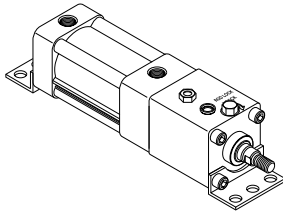


Style F

Bore size	Rod no.	Rod dia. MM	E	ND	NT	+/- .003 TH	TN	XT	Add stroke SN
1-1/2	1	5/8	2.000	0.375	1/4-20	0.993	0.625	4.563	2.250
	2	5/8	2.500	0.438	5/16-18	1.243	0.875	4.813	2.250
2	3	1	2.500	0.375	5/16-18	1.243	0.875	6.188	2.250
	1	5/8	3.000	0.625	3/8-16	1.493	1.250	4.813	2.375
2-1/2	3	1	3.000	0.625	3/8-16	1.493	1.250	6.313	2.375
	1	5/8	3.750	0.750	1/2-13	1.868	1.500	6.938	2.625
3-1/4	3	1-3/8	3.750	0.750	1/2-13	1.868	1.500	7.563	2.625
	1	1	4.500	0.750	1/2-13	2.243	2.063	7.313	2.625
4	3	1-3/8	4.500	0.750	1/2-13	2.243	2.063	7.813	2.625
	1	1	5.500	0.938	5/8-11	2.743	2.688	7.813	2.875
5	3	1-3/8	5.500	0.938	5/8-11	2.743	2.688	8.438	2.875

Side End Angle Mount

Style CB
 (NFPA MS1)

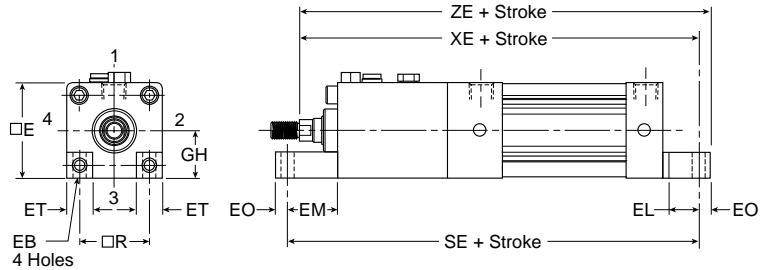
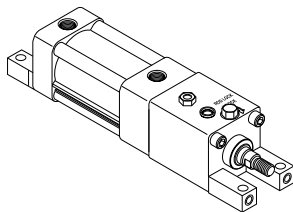


Style CB

Bore size	Rod no.	Rod dia. MM	AB	AH	AL	AL1	AO	AT	E	S	Add stroke
											SA
1-1/2	1	5/8	0.438	1.188	1.000	1.000	0.375	0.125	2.000	1.250	8.250
	3	1	0.438	1.438	1.000	1.000	0.375	0.125	2.500	1.750	8.500
2	1	5/8	0.438	1.438	1.000	1.000	0.375	0.125	2.500	1.750	9.500
	3	1	0.438	1.438	1.000	1.000	0.375	0.125	2.500	1.750	9.500
2-1/2	1	5/8	0.438	1.625	1.000	1.000	0.375	0.125	3.000	2.250	8.625
	3	1	0.438	1.625	1.000	1.000	0.375	0.125	3.000	2.250	9.750
3-1/4	1	1	0.563	1.938	1.250	1.250	0.500	0.125	3.750	2.750	11.250
	3	1-3/8	0.563	1.938	1.250	1.250	0.500	0.125	3.750	2.750	11.625
4	1	1	0.563	2.250	1.875	1.250	0.500	0.125	4.500	3.500	12.250
	3	1-3/8	0.563	2.250	1.875	1.250	0.500	0.125	4.500	3.500	12.500
5	1	1	0.688	2.750	1.375	1.375	0.625	0.188	5.500	4.250	12.625
	3	1-3/8	0.688	2.750	1.375	1.375	0.625	0.188	5.500	4.250	13.000

Side End Lug Mount

Style G
 (NFPA MS7)



Style G

Bore size	Rod no.	Rod dia. MM	E	EB	EL	EM	EO	ET	+/- .003 GH	R	Add stroke		
											SE	XE	ZE
1-1/2	1	5/8	2.000	0.281	0.750	1.125	0.250	0.563	0.993	1.430	8.125	8.000	8.250
	3	1	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	8.750	8.438	8.750
2	1	5/8	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	9.750	9.813	10.125
	3	1	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	9.750	9.813	10.125
2-1/2	1	5/8	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	9.125	8.688	9.000
	3	1	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	10.250	10.188	10.500
3-1/4	1	1	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	11.125	11.000	11.375
	3	1-3/8	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	11.500	11.625	12.000
4	1	1	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	11.750	11.500	11.875
	3	1-3/8	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	12.000	12.000	12.375

B

Tie Rod Cylinders
 Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

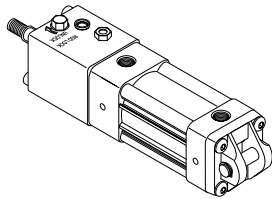
4MNR Series

P1D Series

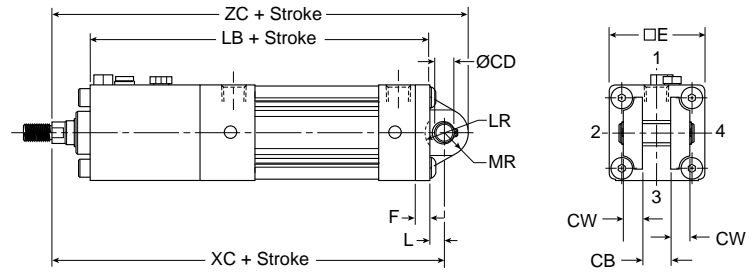


Cap Fixed Clevis Mount

Style BB
 (NFPA MP1)

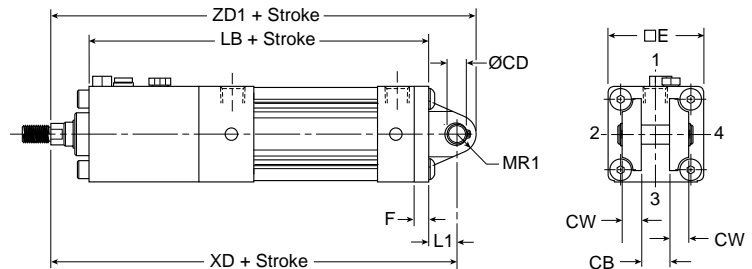
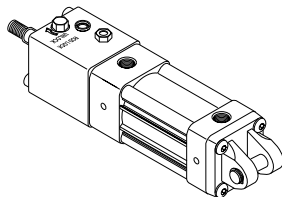


NOTE: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.



Cap Detachable Clevis Mount

Style BC
 (NFPA MP2)



Styles BB and BC

Bore size	Rod no.	Rod dia. MM	CB	+0.002 -0.002 CD	CW	E	F	L	L1	LR	MR	MR1	Add stroke				
													LB	XC	XD	ZC	ZD1
1-1/2	1	5/8	0.750	0.501	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	6.625	8.000	8.375	8.625	8.875
	2	1	0.750	0.501	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	6.875	8.250	8.625	8.875	9.125
2	3	1	0.750	0.501	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	7.875	9.625	10.000	10.250	10.500
	1	5/8	0.750	0.501	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	7.000	8.375	8.750	9.000	9.250
2-1/2	3	1	0.750	0.501	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	8.125	9.875	10.250	10.500	10.750
	1	1	1.250	0.751	0.625	3.750	0.625	0.625	1.250	1.000	0.938	0.750	9.375	11.375	12.000	12.313	12.750
3-1/4	3	1-3/8	1.250	0.751	0.625	3.750	0.625	0.625	1.250	1.000	0.938	0.750	9.750	12.000	12.625	12.938	13.375
	1	1	1.250	0.751	0.625	4.500	0.625	0.625	1.250	1.000	0.938	0.750	9.750	11.750	12.375	12.688	13.125
4	3	1-3/8	1.250	0.751	0.625	4.500	0.625	0.625	1.250	1.000	0.938	0.750	10.000	12.250	12.875	13.188	13.625
	1	1	1.250	0.751	0.625	5.500	0.625	0.625	1.250	1.000	0.938	0.750	10.500	12.500	13.125	13.438	13.875
5	3	1-3/8	1.250	0.751	0.625	5.500	0.625	0.625	1.250	1.000	0.938	0.750	10.875	13.125	13.750	14.063	14.500

B
 Tie Rod Cylinders
 Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

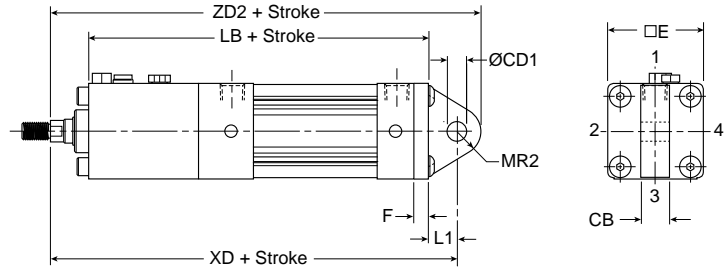
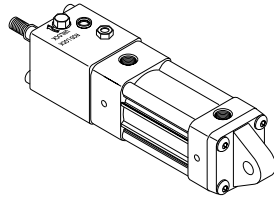
4MNR Series

P1D Series

Cap Detachable Eye Mount*

Style BE
 (NFPA MP4)

* Not available for
 5" bore 3MAJ,
 please specify 4MAJ.



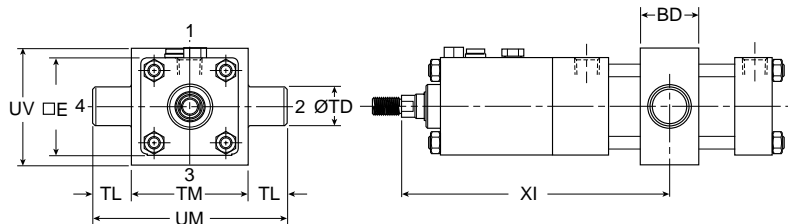
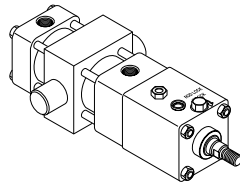
Style BE

Bore size	Rod no.	Rod dia. MM	CB	+0.02 +0.04 CD1	E	F	L1	MR2	Add Stroke		
									LB	XD	ZD2
1-1/2	1	5/8	0.750	0.500	2.000	0.375	0.750	0.625	6.625	8.375	9.000
	3	1	0.750	0.500	2.500	0.375	0.750	0.625	7.875	10.000	10.625
2	1	5/8	0.750	0.500	2.500	0.375	0.750	0.625	6.875	8.625	9.250
	3	1	0.750	0.500	2.500	0.375	0.750	0.625	7.875	10.000	10.625
2-1/2	1	5/8	0.750	0.500	3.000	0.375	0.750	0.688	7.000	8.750	9.438
	3	1	0.750	0.500	3.000	0.375	0.750	0.688	8.125	10.250	10.938
3-1/4	1	1	1.250	0.750	3.750	0.625	1.250	0.875	9.375	12.000	12.875
	3	1-3/8	1.250	0.750	3.750	0.625	1.250	0.875	9.750	12.625	13.500
4	1	1	1.250	0.750	4.500	0.625	1.250	0.875	9.750	12.375	13.250
	3	1-3/8	1.250	0.750	4.500	0.625	1.250	0.875	10.000	12.875	13.750
5*	1	1	1.250	0.750	5.500	0.625	1.250	0.875	10.500	13.125	14.000
	3	1-3/8	1.250	0.750	5.500	0.625	1.250	0.875	10.875	13.750	14.625

Intermediate Trunnion Mount

Style DD
 (NFPA MT4)

Note: Tie rod nuts for Style DD have a slot instead of external hex.



Note: Style DD requires minimum stroke per table.

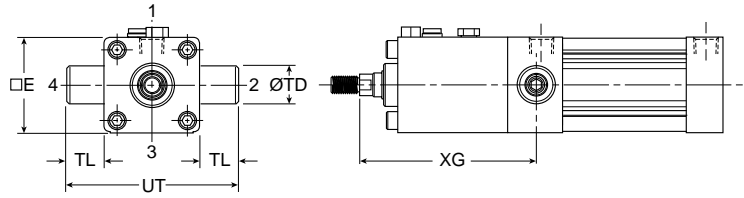
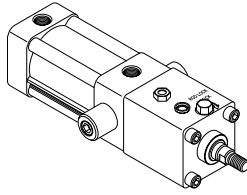
Style DD

Bore size	Rod no.	Rod dia. MM	E	BD	+0.00 -0.01 TD	TL	TM	UM	UV	Min. XI	Min. stroke
2	1	5/8	2.500	1.500	1.000	1.000	3.000	5.000	3.000	6.00	4.000
	3	1	2.500	1.500	1.000	1.000	3.000	5.000	3.000	7.38	4.000
2-1/2	1	5/8	3.000	1.500	1.000	1.000	3.500	5.500	3.500	5.97	3.875
	3	1	3.000	1.500	1.000	1.000	3.500	5.500	3.500	7.47	3.875
3-1/4	1	1	3.750	2.000	1.000	1.000	4.500	6.500	4.250	13.72	4.375
	3	1-3/8	3.750	2.000	1.000	1.000	4.500	6.500	4.250	14.34	4.375
4	1	1	4.500	2.000	1.000	1.000	5.250	7.250	5.000	14.09	4.875
	3	1-3/8	4.500	2.000	1.000	1.000	5.250	7.250	5.000	14.59	4.875
5	1	1	5.500	2.000	1.000	1.000	6.250	8.250	6.000	16.34	5.125
	3	1-3/8	5.500	2.000	1.000	1.000	6.250	8.250	6.000	16.97	5.125



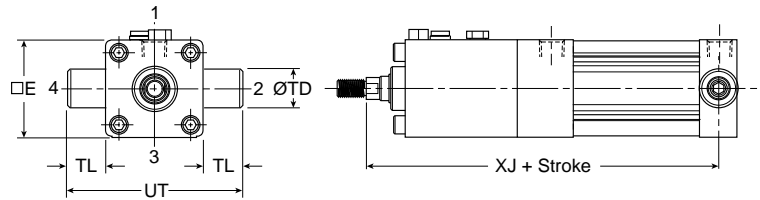
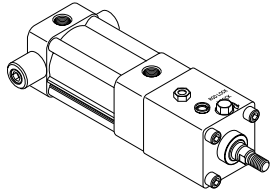
Head Trunnion Mount

Style D (only 4MAJ)
 (NFPA MT1)



Cap Trunnion Mount

Style DB (only 4MAJ)
 (NFPA MT2)



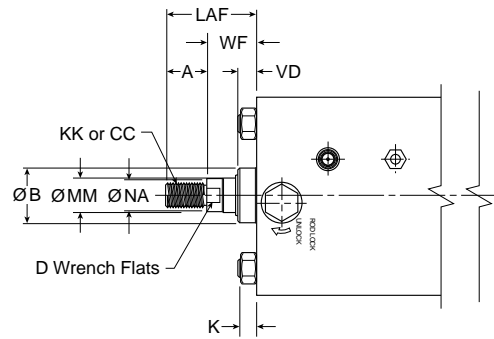
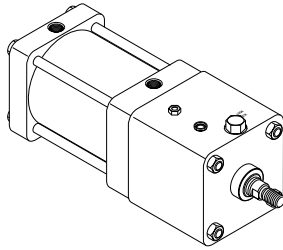
Styles D and DB

Bore size	Rod no.	Rod dia. MM	E	+0.000 -0.001 TD	TL	UT	XG	XJ
1-1/2	1	5/8	2.000	1.000	1.000	4.000	4.375	6.750
	3	1	2.500	1.000	1.000	4.500	4.625	7.000
2	1	5/8	2.500	1.000	1.000	4.500	6.000	8.375
	3	1	2.500	1.000	1.000	4.500	6.000	8.375
2-1/2	1	5/8	3.000	1.000	1.000	5.000	4.625	7.125
	3	1	3.000	1.000	1.000	5.000	6.125	8.625
3-1/4	1	1	3.750	1.000	1.000	5.750	6.750	9.500
	3	1-3/8	3.750	1.000	1.000	5.750	7.375	10.125
4	1	1	4.500	1.000	1.000	6.500	7.125	9.875
	3	1-3/8	4.500	1.000	1.000	6.500	7.625	10.375
5	1	1	5.500	1.000	1.000	7.500	7.625	10.625
	3	1-3/8	5.500	1.000	1.000	7.500	8.250	11.250

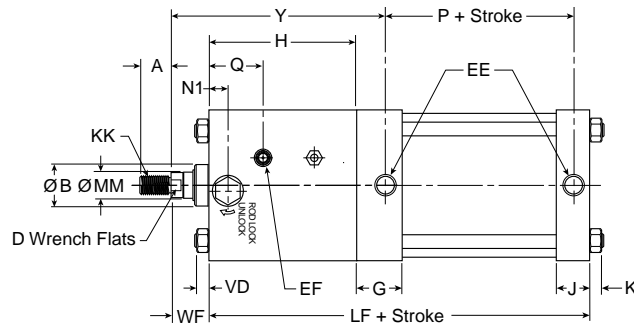
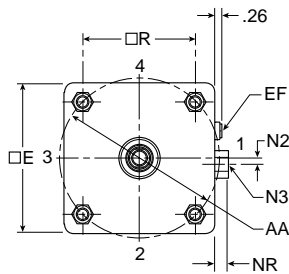
B
Tie Rod Cylinders
Actuator Products

Series
3MA
Series
4MA/4ML
Series
3MAJ/4MAJ
Series
4MNR
Series
P1D

No Mount
 Style T
 (NFPA MX0)



For dimensions of all standard rod end styles, see next page.



Style T

Bore size	Rod no.	Rod dia. MM	Thread		A	AA	B	D	E	EE (NPTF)	EF (NPTF)	G	H	J
			Style 8 CC	Style 4 & 9 KK										
6	1	1-3/8	1-1/4 - 12	1-14	1.625	6.900	1.999	1-1/8	6.500	3/4	1/4	1.910	6.375	1.410
	3	1-3/4	1-1/2 - 12	1-1/4 - 12	2.000	6.900	2.374	1-1/2	6.500	3/4	1/4	1.910	6.875	1.410
8	1	1-3/8	1-1/4 - 12	1-14	1.625	9.100	1.999	1-1/8	8.500	3/4	1/4	1.810	6.625	1.440
	3	1-3/4	1-1/2 - 12	1-1/4 - 12	2.000	9.100	2.374	1-1/2	8.500	3/4	1/4	1.810	7.125	1.440

Bore size	Rod no.	Rod dia. MM	K	LAF	N1	N2	Hex N3	NA	NR	Q	R	VD	WF	Y	Add stroke	
															LF	P
6	1	1-3/8	0.438	3.250	1.165	0.177	1-5/16	1.313	0.750	2.705	4.880	0.755	1.625	9.188	11.375	3.125
	3	1-3/4	0.438	3.875	1.495	0.177	1-5/16	1.688	0.740	3.055	4.880	0.875	1.875	9.938	11.875	3.125
8	1	1-3/8	0.563	3.250	1.305	0.177	1-5/16	1.313	0.740	2.885	6.440	0.755	1.625	9.375	11.750	3.250
	3	1-3/4	0.563	3.875	1.570	0.177	1-5/16	1.688	0.740	3.145	6.440	0.875	1.875	10.125	12.250	3.250

B

Tie Rod Cylinders
Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

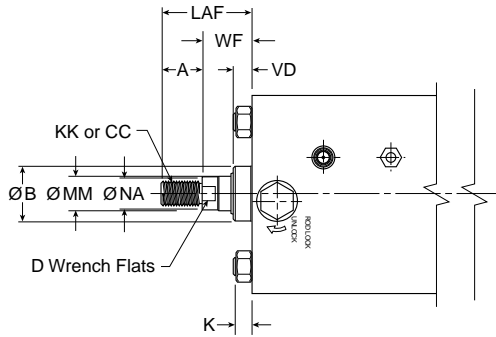
4MNR Series

P1D Series

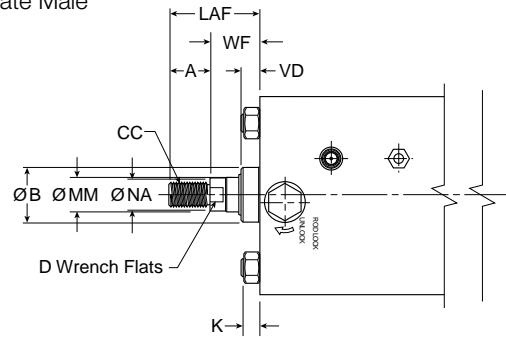


Rod End Dimensions – 6" to 8" Bore Sizes

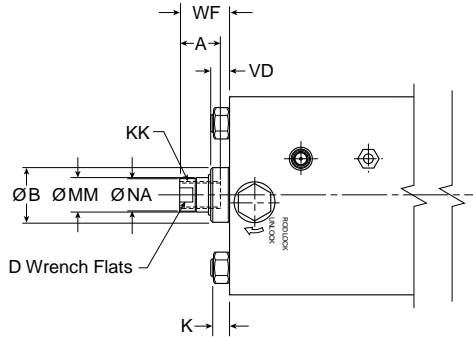
Thread Style 4
 (NFPA Style SM)
 Small Male



Thread Style 8
 (NFPA Style IM)
 Intermediate Male

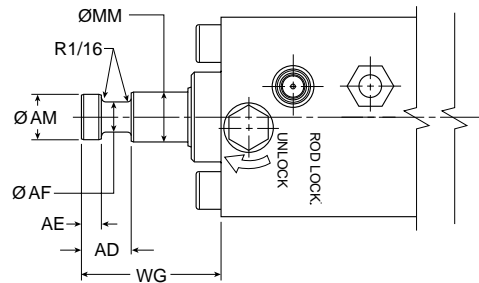


Thread Style 9
 (NFPA Style SF)
 Short Female



Thread Style 55

For use with Split Coupler
 (please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"

Special threads, rod extensions, rod eyes, blanks, etc. are also available.
 To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.
 If otherwise special, please supply dimensioned sketch.

Rod End Dimensions

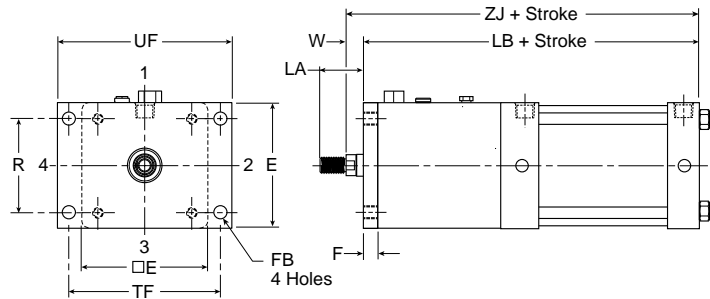
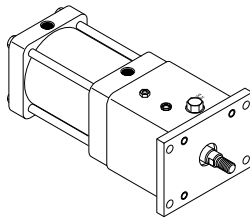
Bore size	Rod no.	Rod dia. MM	Thread		A	AD	AE	AF	AM	B	D	K	LAF	NA	VD	WF	WG
			Style 8 CC	Style 4 & 9 KK													
6	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.438	3.250	1.313	0.755	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	1-1/2	0.438	3.875	1.688	0.875	1.875	3.125
8	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.563	3.250	1.313	0.755	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	1-1/2	0.563	3.875	1.688	0.875	1.875	3.125

B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 Series
 4MA/4ML
 Series
 3MAJ/4MAJ
 Series
 4MNR
 Series
 P1D
 Series



Head Rectangular Flange Mount

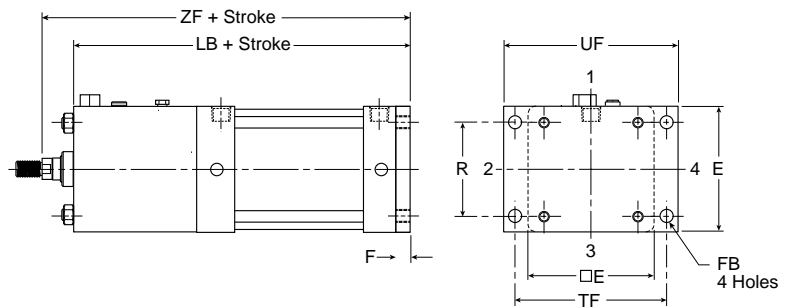
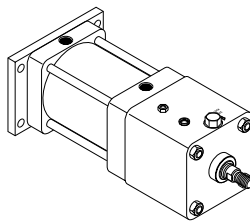
Style J
 (NFPA MF1)
 (only 6" Bore)



Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.
 For reference, $WF = W + F$ and $LA = W + A$.

Cap Rectangular Flange Mount

Style H
 (NFPA MF2)
 (only 6" Bore)



Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R	TF	UF	W	Add stroke		
												LB	ZF	ZJ
6	1	1-3/8	1.625	6.500	0.750	0.563	2.500	4.880	7.625	8.625	0.875	12.125	13.750	13.000
	3	1-3/4	2.000	6.500	0.750	0.563	3.125	4.880	7.625	8.625	1.125	12.625	14.500	13.750

B

Tie Rod Cylinders
 Actuator Products

3MA Series

4MA/4ML Series

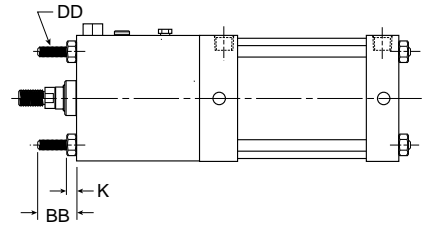
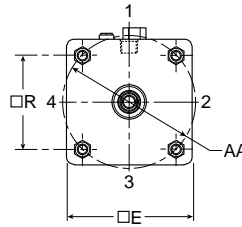
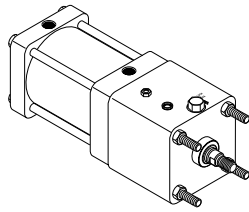
3MAJ/4MAJ Series

4MNR Series

P1D Series

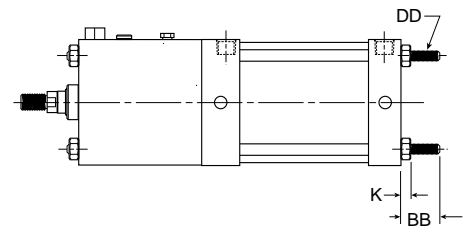
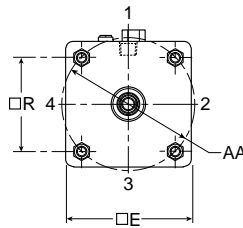
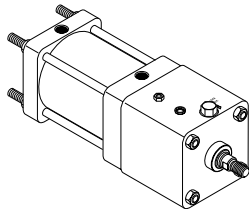
Tie Rods Extended Head End Mount

Style TB
 (NFPA MX3)



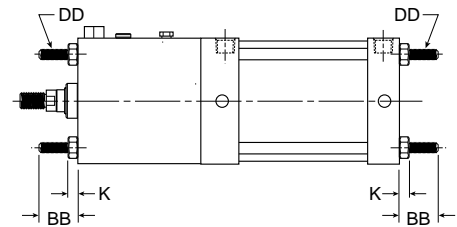
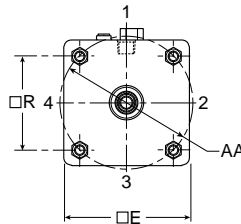
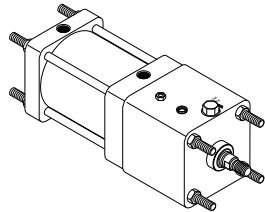
Tie Rods Extended Cap End Mount

Style TC
 (NFPA MX2)



Tie Rods Extended Both Ends Mount

Style TD
 (NFPA MX1)



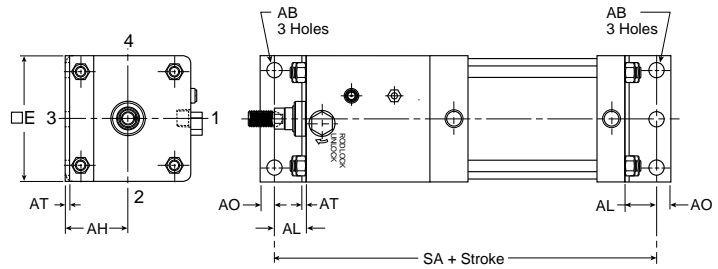
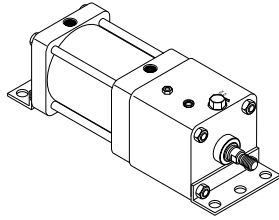
Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	AA	BB	DD	E	K	R
6	1	1-3/8	6.900	1.813	1/2-20	6.500	0.438	4.880
	3	1-3/4	6.900	1.813	1/2-20	6.500	0.438	4.880
8	1	1-3/8	9.100	2.313	5/8-18	8.500	0.563	6.440
	3	1-3/4	9.100	2.313	5/8-18	8.500	0.563	6.440

B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 Series
 4MA/4ML
 Series
 3MAJ/4MAJ
 Series
 4MNR
 Series
 P1D
 Series

Side End Angle Mount

Style CB
 (NFPA MS1)

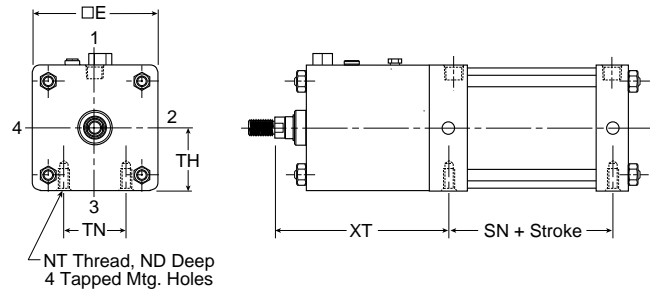
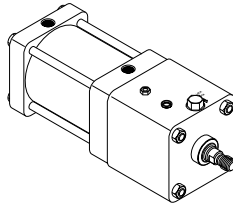


Style CB

Bore size	Rod no.	Rod dia. MM	AB	AH	AL	AO	AT	E	S	Add stroke SA
6	1	1-3/8	0.813	3.250	1.375	0.625	0.188	6.500	5.250	14.125
	3	1-3/4	0.813	3.250	1.375	0.625	0.188	6.500	5.250	14.625
8	1	1-3/8	0.813	4.250	1.813	0.688	0.250	8.500	7.125	15.375
	3	1-3/4	0.813	4.250	1.813	0.688	0.250	8.500	7.125	15.875

Side Tap Mount

Style F
 (NFPA MS4)

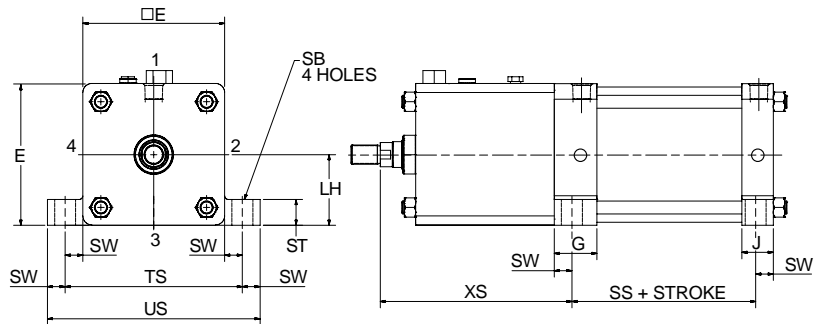
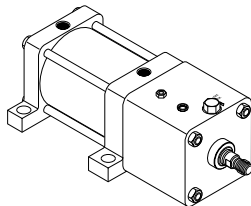


Style F

Bore size	Rod no.	Rod dia. MM	E	ND	NT	+/- .003 TH	TN	XT	Add stroke SN
6	1	1-3/8	6.500	1.125	3/4-10	3.243	3.250	9.188	3.125
	3	1-3/4	6.500	1.125	3/4-10	3.243	3.250	9.938	3.125
8	1	1-3/8	8.500	1.125	3/4-10	4.243	4.500	9.438	3.250
	3	1-3/4	8.500	1.125	3/4-10	4.243	4.500	10.188	3.250

Side Lug Mount

Style C
 (NFPA MS2)



Style C

Bore size	Rod no.	Rod dia. MM	E	G	J	+/- .003 LH	SB	ST	SW	TS	US	XS	Add stroke SS
6	1	1-3/8	6.500	1.910	1.410	3.243	0.813	1.000	0.688	7.875	9.250	8.688	3.625
	3	1-3/4	6.500	1.910	1.410	3.243	0.813	1.000	0.688	7.875	9.250	9.438	3.625
8	1	1-3/8	8.500	1.810	1.440	4.243	0.813	1.000	0.688	9.875	11.250	8.938	3.750
	3	1-3/4	8.500	1.810	1.440	4.243	0.813	1.000	0.688	9.875	11.250	9.688	3.750

B

Tie Rod Cylinders
 Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

4MNR Series

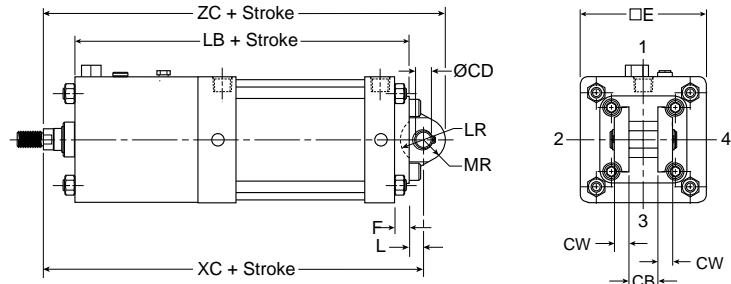
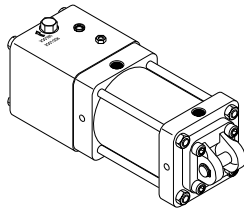
P1D Series



Cap Fixed Clevis

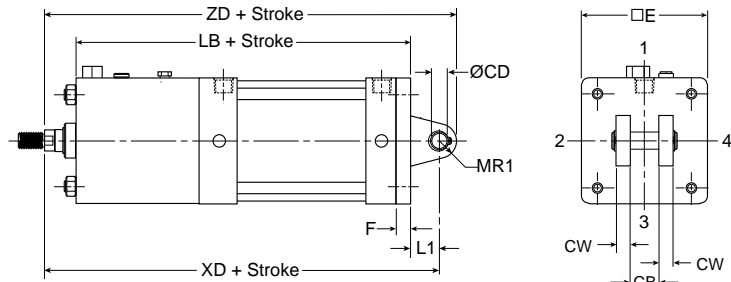
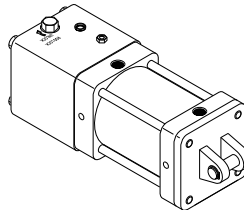
Style BB
 (NFPA MP1)

NOTE: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.



Cap Detachable Clevis

Style BC
 (NFPA MP2)

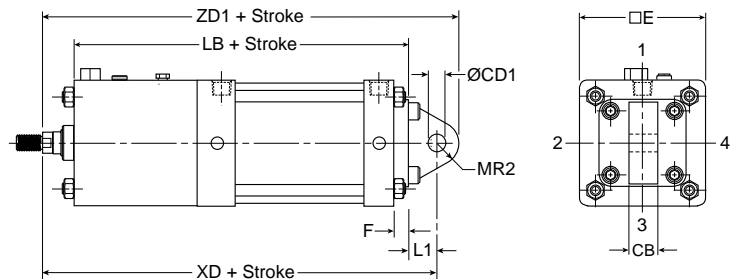
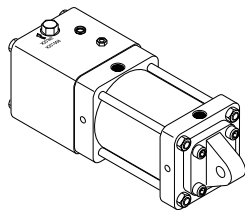


Styles BB and BC

Bore size	Rod no.	Rod dia. MM	CB	Rod dia.		CW	E	F	L	L1	LR	MR	MR1	Add stroke			
				+0.001	-0.002									LB	XC	XD	ZC
6	1	1-3/8	1.500	1.001	0.750	6.500	0.750	0.750	1.500	1.250	1.125	1.000	12.125	14.500	15.250	15.625	16.250
	3	1-3/4	1.500	1.001	0.750	6.500	0.750	0.750	1.500	1.250	1.125	1.000	12.625	15.250	16.000	16.375	17.000
8	1	1-3/8	1.500	1.001	0.750	8.500	0.750	0.750	1.500	1.250	1.125	1.000	12.500	14.875	15.625	16.000	16.625
	3	1-3/4	1.500	1.001	0.750	8.500	0.750	0.750	1.500	1.250	1.125	1.000	13.000	15.625	16.375	16.750	17.375

Cap Detachable Eye Mount

Style BE
 (NFPA MP4)
 (only 6" Bore)

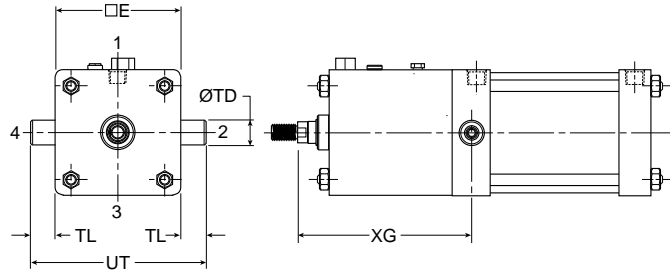
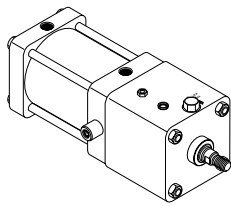


Style BE

Bore size	Rod no.	Rod dia. MM	CB	Rod dia.		E	F	L1	MR2	Add stroke		
				+0.002	+0.004					LB	XD	ZD1
6	1	1-3/8	1.500	1.000	0.750	6.500	0.750	1.500	1.125	12.125	15.250	16.375
	3	1-3/4	1.500	1.000	0.750	6.500	0.750	1.500	1.125	12.625	16.000	17.125

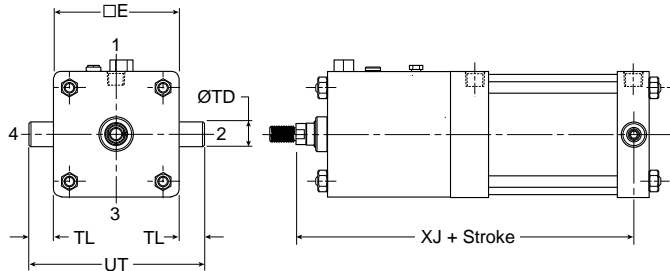
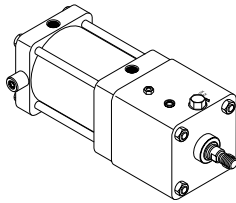
Head Trunnion Mount

Style D
 (NFPA MT1)



Cap Trunnion Mount

Style DB
 (NFPA MT2)

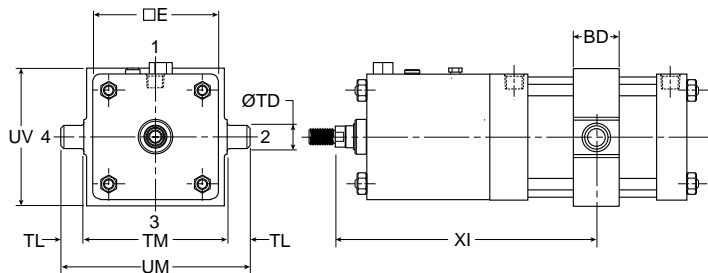
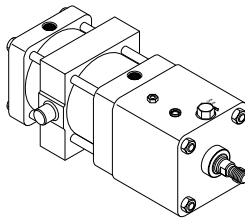


Styles D and DB

Bore size	Rod no.	Rod dia. MM	E	+0.000 -0.001 TD	TL	UT	XG	XJ
6	1	1-3/8	6.500	1.375	1.375	9.250	9.000	12.250
	3	1-3/4	6.500	1.375	1.375	9.250	9.750	13.000
8	1	1-3/8	8.500	1.375	1.375	11.250	9.250	12.625
	3	1-3/4	8.500	1.375	1.375	11.250	10.000	13.375

Intermediate Trunnion Mount

Style DD
 (NFPA MT4)



Note: Style DD requires minimum stroke per table.

Style DD

Bore size	Rod no.	Rod dia. MM	E	BD	+0.000 -0.001 TD	TL	TM	UM	UV	Min. XI	Min. stroke
6	1	1-3/8	6.500	2.500	1.375	1.375	7.625	10.375	7.000	20.16	6.125
	3	1-3/4	6.500	2.500	1.375	1.375	7.625	10.375	7.000	20.19	6.125
8	1	1-3/8	8.500	2.500	1.375	1.375	9.750	12.500	9.500	26.31	6.500
	3	1-3/4	8.500	2.500	1.375	1.375	9.750	12.500	9.500	27.06	6.500

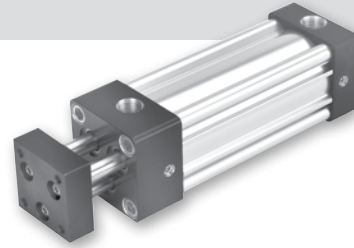
Kits & Accessories

See page B37.



4MNR Series

- Bore sizes – 1-1/8", 1-1/2", 2", 2-1/2", 3-1/4", and 4"
- Non-rotating cylinder, multiple piston rods
- Strokes available in any practical stroke length
- Steel tooling plate standard, specials available
- Single rod end or double rod ends
- Optional adjustable cushions available
- Mounting styles – 14 standard styles
- RoHS compliant



Operating information


Operating pressure:	250 PSIG (17 bar)
Temperature range –	
Standard seals	-10°F to 165°F (-23°C to 74°C)
Fluorocarbon seals	-10°F to 250°F (-23°C to 121°C)
Filtration requirements:	40 micron, dry filtered air

Ordering information

2.00		J		4MNR	2	U		T	9		A		6.000
Bore size 1.12 ¹ 1.50 ¹ 2.00 2.50 3.25 4.00	Double rod cylinder Specify "K" only if double rod cylinder is required.	Mounting style Specify mounting style code (see table on following page).	Series 4MNR	Ports U NPTF R BSPP	Seals Blank Standard (nitrile seals) V Fluorocarbon seals ³ E Fluorocarbon rod wiper and rod seal only ⁴	Tooling plate T Standard plate M Special plate (please specify details)	Special modification Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MNR with Linear Position Sensor Option) ⁵	Cushion head end Blank Non-cushioned head end C Cushioned head end	Cushion cap end Blank Non-cushioned cap end C Cushioned cap end	Piston rod thread type A Standard (UNF unified thread)	Stroke length Specify stroke length required in inches.	Rod material and gland code Blank Standard rod and gland H Standard rod and HI LOAD gland Y 17-4 PH stainless steel rod and standard gland	Piston type² 2 Lipseals, no magnetic ring (aluminum piston) 3 Lipseals and magnetic ring (aluminum piston)
Cylinder construction Blank* Standard (extruded body, standard round lobe orientation) A* Extruded body, round lobe orientation rotated 90 degrees from standard N* Extruded body, round lobe orientation rotated 180 degrees from standard Z* Extruded body, round lobe orientation rotated 270 degrees from standard T Aluminum round tube and carbon steel tie rods & nuts	Piston rod thread style 9 Standard 3 Special (and specify all dimensions required)	* Please reference table in catalog 0900P-E, page B10											

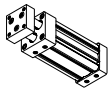
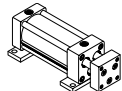
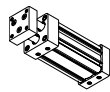
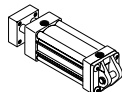
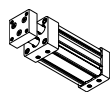
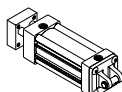
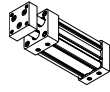
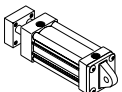
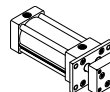
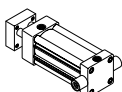
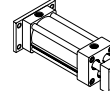
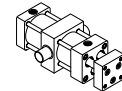
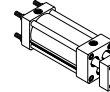
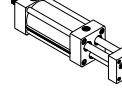
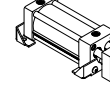
Kits & Accessories
See page B37.

Sensors
For sensors see page B339.



For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.

4MNR Mounting Styles

Mounting style	NFPA mounting	Description	Bore size	Mounting style	NFPA mounting	Description	Bore size
TEF 	MX5/MS4	Sleeve Nut with Side Tap (standard mount)	1-1/2 - 4	NB 	N/A	Base Bar	1-1/8 - 4
T 	MX0	No Mount (same construction as TEF)	1-1/8 - 4	BB 	MP1	Cap Fixed Clevis	1-1/2 - 4
TE 	MX5	Sleeve Nut (same construction as TEF)	1-1/2 - 4	BC 	MP2	Cap Detachable Clevis	1-1/8 - 4
F 	MS4	Side Tap (same construction as TEF)	1-1/8 - 4	BE 	MP4	Cap Detachable Eye	1-1/8 - 4
J 	MF1	Head Rectangular Flange	1-1/8 - 4	DB 	MT2	Cap Trunnion	1-1/2 - 4
H 	MF2	Cap Rectangular Flange	1-1/2 - 4	DD 	MT4	Intermediate Trunnion	1-1/2 - 4
TC 	MX2	Tie Rods Extended Cap End	1-1/2 - 5	KTEF / KT / KTE / KF * 	MDX0 / MDX5 / MDS4	Double Rod End	1-1/2 - 4
C 	MS2	Side Lug	1-1/2 - 4				

* Double rod end cylinders can be ordered with head mountings i.e. KJ.

B

**Tie Rod Cylinders
Actuator Products**

**3MA
Series**

**4MA/4ML
Series**

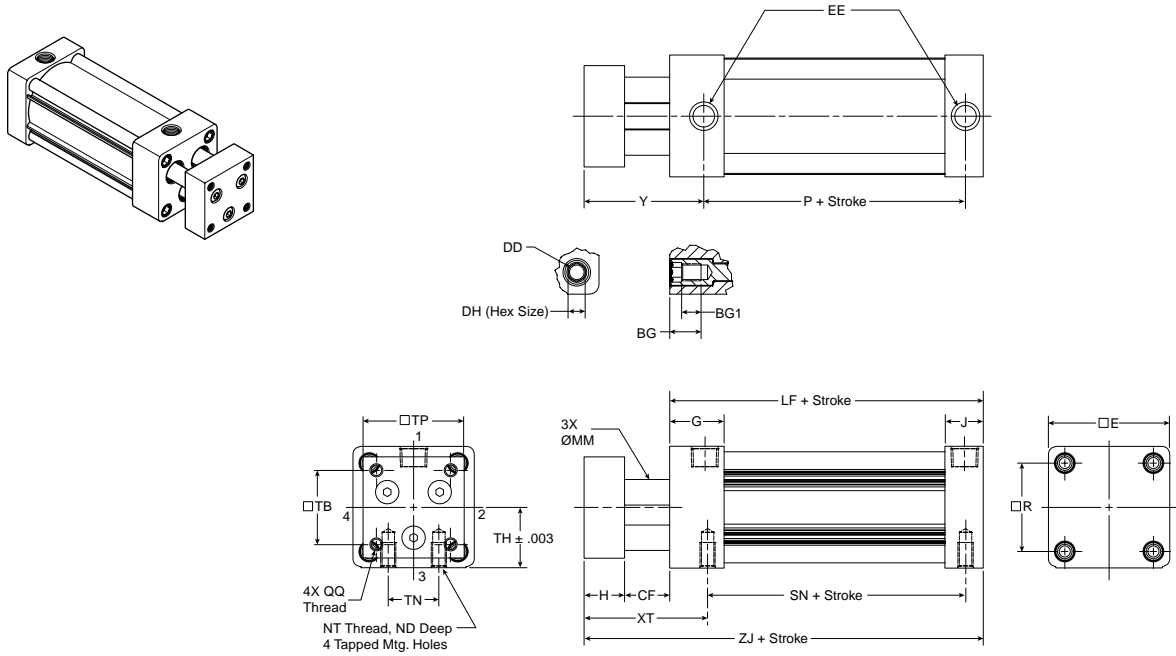
**3MAJ/4MAJ
Series**

**4MNR
Series**

**P1D
Series**

4MNR Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)

(NFPA MX0, MX5, MS4)



Thread Style 3 - "Special Thread"

Special threads, rod extensions, rod eyes, blanks, etc. are also available. To order, specify "Style 3" and give desired dimensions for KK (thread size), A (thread length) and W or WF. If otherwise special, please supply dimensioned sketch.

Styles TEF, T, TE and F

Bore size	Rod dia. MM	BG	BG1	CF	DD	DH	E	EE (NPTF)	G	H	J	ND	NT
1-1/8 *	5/16	-	-	0.875	10-32	-	1.500	1/8	1.000	0.625	0.625	0.250	10-32
1-1/2	8mm	0.056	0.375	1.125	1/4-28	1/4	2.000	3/8	1.438	0.750	0.938	0.375	1/4-20
2	12mm	0.056	0.362	1.125	5/16-24	5/16	2.500	3/8	1.375	0.750	0.938	0.438	5/16-18
2-1/2	16mm	0.056	0.362	1.125	5/16-24	5/16	3.000	3/8	1.344	1.000	0.938	0.625	3/8-16
3-1/4	16mm	0.700	0.500	1.375	3/8-24	3/8	3.750	1/2	1.594	1.000	1.125	0.750	1/2-13
4	16mm	0.700	0.500	1.375	3/8-24	3/8	4.500	1/2	1.594	1.000	1.125	0.750	1/2-13

Bore size	Rod dia. MM	QQ	R	TB	TH	TP	TN	XT	Y	Add stroke			
										LF	P	SN	ZJ
1-1/8 *	5/16	6-32	1.125	0.750	0.750	1.250	0.500	2.000	2.031	2.500	1.468	1.500	3.750
1-1/2	8mm	10-32	1.430	1.120	0.993	1.500	0.625	2.812	2.750	3.625	2.313	2.250	5.375
2	12mm	1/4-28	1.840	1.430	1.243	2.000	0.875	2.812	2.750	3.625	2.313	2.250	5.375
2-1/2	16mm	5/16-24	2.190	1.840	1.493	2.500	1.250	3.062	3.062	3.750	2.375	2.375	5.875
3-1/4	16mm	3/8-24	2.760	2.190	1.680	3.250	1.500	3.437	3.437	4.250	2.625	2.625	6.500
4	16mm	3/8-24	3.320	2.760	2.243	4.000	2.063	3.437	3.437	4.250	2.625	2.625	6.500

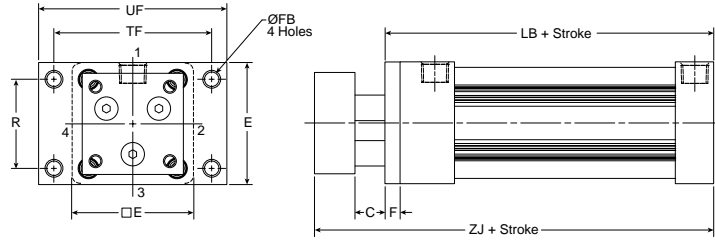
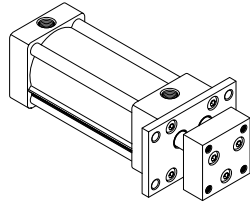
* Twin rod with flange construction (not shown)

B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 4MA/4ML
 3MAJ/4MAJ
 4MNR
 P1D



Head Rectangular Flange

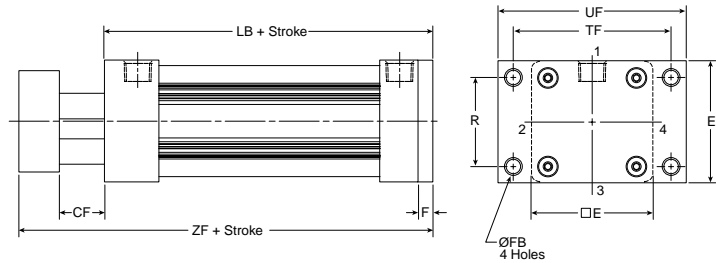
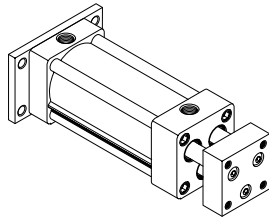
Style J
(NFPA MF1)



Note: Style J has a “C” dimension instead of “CF” because of the flange installation. For reference, CF = C + F

Cap Rectangular Flange

Style H
(NFPA MF2)



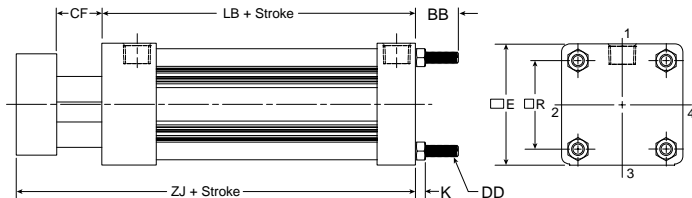
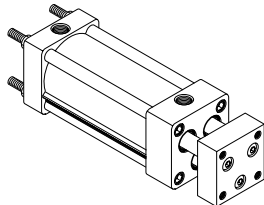
Styles J and H

Bore size	Rod dia. MM	C	CF	E	F	FB	H	R	TF	UF	Add stroke		
											LB	ZF	ZJ
1-1/8 *	5/16	0.625	0.875	1.500	0.250	0.219	0.625	1.000	2.000	2.500	2.750	4.250	4.000
1-1/2	8mm	0.750	1.125	2.000	0.375	0.313	0.750	1.430	2.750	3.375	4.000	5.875	5.500
2	12mm	0.750	1.125	2.500	0.375	0.375	0.750	1.840	3.375	4.125	4.000	5.875	5.500
2-1/2	16mm	0.750	1.125	3.000	0.375	0.375	1.000	2.190	3.875	4.625	4.125	6.250	5.875
3-1/4	16mm	0.750	1.375	3.750	0.625	0.438	1.000	2.760	4.688	5.500	4.875	7.250	6.625
4	16mm	0.750	1.375	4.500	0.625	0.438	1.000	3.320	5.438	6.250	4.875	7.250	6.625

* Twin rod with flange construction (not shown)

Tie Rods Ext. Cap End

Style TC
(NFPA MX2)



Style TC

Bore size	Rod dia. MM	BB	DD	CF	E	K	R	Add stroke	
								LB	ZJ
1-1/2	8mm	1.000	1/4-28	1.125	2.000	0.250	1.430	4.000	5.500
2	12mm	1.125	5/16-24	1.125	2.500	0.313	1.840	4.000	5.500
2-1/2	16mm	1.125	5/16-24	1.125	3.000	0.313	2.190	4.125	5.875
3-1/4	16mm	1.375	3/8-24	1.375	3.750	0.375	2.760	4.875	6.625
4	16mm	1.375	3/8-24	1.375	4.500	0.375	3.320	4.875	6.625

B

Tie Rod Cylinders
Actuator Products

3MA Series

4MA/4ML Series

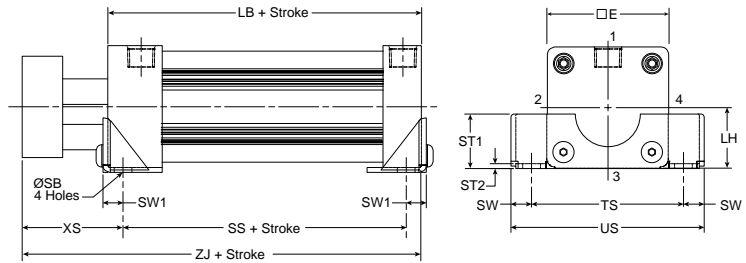
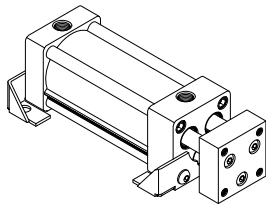
3MAJ/4MAJ Series

4MNR Series

P1D Series

Side Lug

Style C
 (NFPA MS2)

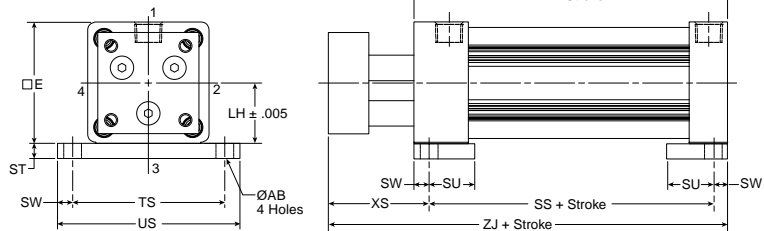
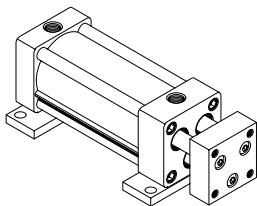


Style C

Bore size	Rod dia. MM	E	LH	SB	ST1	ST2	SW	SW1	TS	US	XS	Add stroke		
												LB	SS	ZJ
1-1/2	8mm	2.000	0.993	0.438	1.000	0.120	0.375	0.495	2.750	3.500	2.250	4.000	2.875	5.500
2	12mm	2.500	1.243	0.438	1.250	0.120	0.375	0.495	3.250	4.000	2.250	4.000	2.875	5.500
2-1/2	16mm	3.000	1.493	0.438	1.343	0.120	0.375	0.495	3.750	4.500	2.500	4.125	3.000	5.875
3-1/4	16mm	3.750	1.868	0.563	1.500	0.188	0.500	0.688	4.750	5.750	2.875	4.875	3.250	6.625
4	16mm	4.500	2.243	0.563	1.500	0.188	0.500	0.688	5.500	6.500	2.875	4.875	3.250	6.625

Base Bar Mount

Style NB



Note: Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.

Style NB

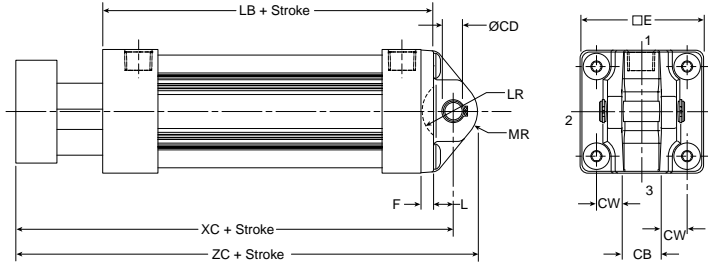
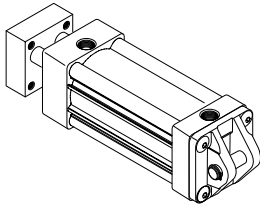
Bore size	Rod dia. MM	AB	E	LH	ST	SU	SW	TS	US	XS	Add stroke		
											LB	SS	ZJ
1-1/8 *	5/16	0.203	1.500	1.000	0.250	0.750	0.250	1.875	2.375	1.750	2.750	1.750	3.750
1-1/2	8mm	0.438	2.000	1.243	0.250	1.125	0.375	2.750	3.500	2.250	4.000	2.875	5.500
2	12mm	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	2.250	4.000	2.875	5.500
2-1/2	16mm	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	2.500	4.125	3.000	5.875
3-1/4	16mm	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	2.875	4.875	3.250	6.625
4	16mm	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	2.875	4.875	3.250	6.625

* Twin rod with flange construction (not shown)

Cap Fixed Clevis

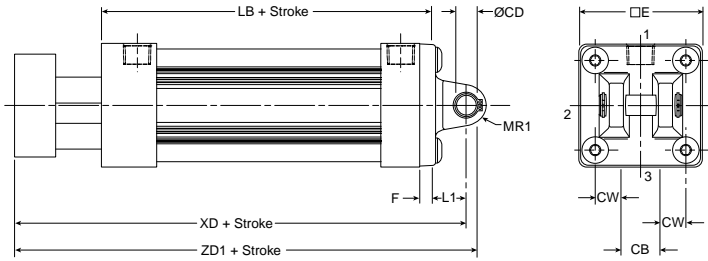
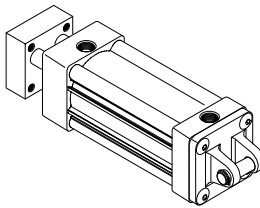
Style BB (NFPA MP1)

Note: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, accessories page B141.



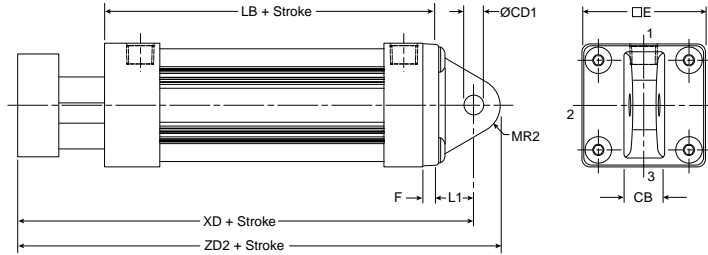
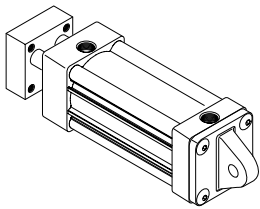
Cap Detachable Clevis

Style BC (NFPA MP2)



Cap Detachable Eye

Style BE (NFPA MP4)



Styles BB, BC and BE

Bore size	Rod dia. MM	CB	CD	CD1	CW	E	F	L	LR	L1
1-1/2	8mm	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750
2	12mm	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750
2-1/2	16mm	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750
3-1/4	16mm	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250
4	16mm	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250

Bore size	Rod dia. MM	MR	MR1	MR2	Add stroke					
					LB	XC	XD	ZC	ZD1	ZD2
1-1/2	8mm	0.625	0.500	0.625	4.000	6.250	6.625	6.875	7.125	7.250
2	12mm	0.625	0.500	0.625	4.000	6.250	6.625	6.875	7.125	7.250
2-1/2	16mm	0.625	0.500	0.688	4.125	6.625	7.000	7.250	7.500	7.688
3-1/4	16mm	0.938	0.750	0.875	4.875	7.875	8.500	8.813	9.250	9.375
4	16mm	0.938	0.750	0.875	4.875	7.875	8.500	8.813	9.250	9.375

B

Tie Rod Cylinders
Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

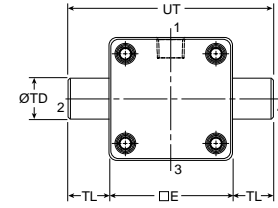
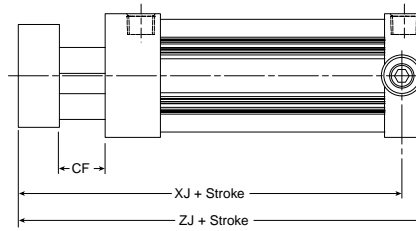
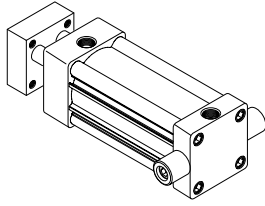
4MNR Series

P1D Series



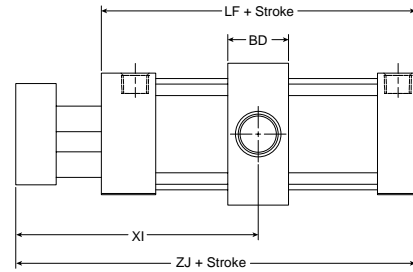
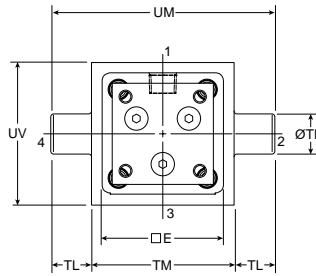
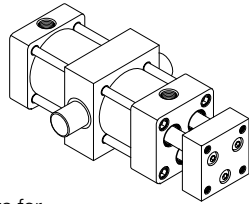
Cap Trunnion

Style DB
 (NFPA MT2)



Intermediate Trunnion

Style DD
 (NFPA MT4)



Note: Tie rod nuts for Style DD have a slot instead of internal hex.

B
Tie Rod Cylinders
Actuator Products
Series
3MA
Series
4MA/4ML
Series
3MAJ/4MAJ
Series
4MNR
Series
P1D
Series

Styles DD and DD

Bore size	Rod dia. MM	E	BD	CF	TD	TL	TM	UM	UT	UV	Min. XI	Add stroke		
												LF	XJ	ZJ
1-1/2	8mm	2.000	1.250	1.125	1.000	1.000	2.500	4.500	4.000	2.500	4.000	4.000	5.000	5.875
2	12mm	2.500	1.500	1.125	1.000	1.000	3.000	5.000	4.500	3.000	4.125	4.000	5.000	5.875
2-1/2	16mm	3.000	1.500	1.125	1.000	1.000	3.500	5.500	5.000	3.500	4.375	4.125	5.375	6.250
3-1/4	16mm	3.750	2.000	1.375	1.000	1.000	4.500	6.500	5.750	4.250	5.125	4.875	6.000	7.250
4	16mm	4.500	2.000	1.375	1.000	1.000	5.250	7.250	6.500	5.000	5.125	4.875	6.000	7.250

P1D Series

The innovative P1D is a long lasting ISO/VDMA cylinder. The cylinders are double acting, with a new design of air cushioning.

The P1D complies with the current ISO 6431, ISO 15552, VDMA 24562 and AFNOR installation dimension standards

- Available in 32 to 200mm bores
- PUR seals for long service life
- Drop-in sensors
- Corrosion resistant design
- Magnetic piston as standard
- Lubricated with food grade grease



Operating information

Operating pressure:	145 PSIG (10 bar) maximum
Temperature range:	Standard: -4°F to 176°F (-20°C to 80°C) High temperature: 14°F to 250°F (-10°C to 121°C)
Cylinders for low pressure hydraulic operation:	Ø32 - 125mm
ATEX approval:	CE Ex IIGD c T4 248°F (120°C)
Filtration requirements:	40 micron, dry filtered air

P1D Standard - Double acting

Ø32mm - (G¹/₈)

Stroke (mm)	Order Code
25	P1D-S032MC-0025NNNNN
40	P1D-S032MC-0040NNNNN
50	P1D-S032MC-0050NNNNN
80	P1D-S032MC-0080NNNNN
100	P1D-S032MC-0100NNNNN
125	P1D-S032MC-0125NNNNN
160	P1D-S032MC-0160NNNNN
200	P1D-S032MC-0200NNNNN
250	P1D-S032MC-0250NNNNN
320	P1D-S032MC-0320NNNNN
400	P1D-S032MC-0400NNNNN
500	P1D-S032MC-0500NNNNN

Ø40mm - (G¹/₄)

25	P1D-S040MC-0025NNNNN
40	P1D-S040MC-0040NNNNN
50	P1D-S040MC-0050NNNNN
80	P1D-S040MC-0080NNNNN
100	P1D-S040MC-0100NNNNN
125	P1D-S040MC-0125NNNNN
160	P1D-S040MC-0160NNNNN
200	P1D-S040MC-0200NNNNN
250	P1D-S040MC-0250NNNNN
320	P1D-S040MC-0320NNNNN
400	P1D-S040MC-0400NNNNN
500	P1D-S040MC-0500NNNNN

Ø50mm - (G¹/₄)

25	P1D-S050MC-0025NNNNN
40	P1D-S050MC-0040NNNNN
50	P1D-S050MC-0050NNNNN
80	P1D-S050MC-0080NNNNN
100	P1D-S050MC-0100NNNNN
125	P1D-S050MC-0125NNNNN
160	P1D-S050MC-0160NNNNN
200	P1D-S050MC-0200NNNNN
250	P1D-S050MC-0250NNNNN
320	P1D-S050MC-0320NNNNN
400	P1D-S050MC-0400NNNNN
500	P1D-S050MC-0500NNNNN

Ø63mm - (G³/₈)

Stroke (mm)	Order Code
25	P1D-S063MC-0025NNNNN
40	P1D-S063MC-0040NNNNN
50	P1D-S063MC-0050NNNNN
80	P1D-S063MC-0080NNNNN
100	P1D-S063MC-0100NNNNN
125	P1D-S063MC-0125NNNNN
160	P1D-S063MC-0160NNNNN
200	P1D-S063MC-0200NNNNN
250	P1D-S063MC-0250NNNNN
320	P1D-S063MC-0320NNNNN
400	P1D-S063MC-0400NNNNN
500	P1D-S063MC-0500NNNNN

Ø80mm - (G³/₈)

25	P1D-S080MC-0025NNNNN
40	P1D-S080MC-0040NNNNN
50	P1D-S080MC-0050NNNNN
80	P1D-S080MC-0080NNNNN
100	P1D-S080MC-0100NNNNN
125	P1D-S080MC-0125NNNNN
160	P1D-S080MC-0160NNNNN
200	P1D-S080MC-0200NNNNN
250	P1D-S080MC-0250NNNNN
320	P1D-S080MC-0320NNNNN
400	P1D-S080MC-0400NNNNN
500	P1D-S080MC-0500NNNNN

Ø100mm - (G¹/₂)

Stroke (mm)	Order Code
25	P1D-S100MC-0025NNNNN
40	P1D-S100MC-0040NNNNN
50	P1D-S100MC-0050NNNNN
80	P1D-S100MC-0080NNNNN
100	P1D-S100MC-0100NNNNN
125	P1D-S100MC-0125NNNNN
160	P1D-S100MC-0160NNNNN
200	P1D-S100MC-0200NNNNN
250	P1D-S100MC-0250NNNNN
320	P1D-S100MC-0320NNNNN
400	P1D-S100MC-0400NNNNN
500	P1D-S100MC-0500NNNNN

Ø125mm - (G¹/₂)

25	P1D-S125MC-0025NNNNN
40	P1D-S125MC-0040NNNNN
50	P1D-S125MC-0050NNNNN
80	P1D-S125MC-0080NNNNN
100	P1D-S125MC-0100NNNNN
125	P1D-S125MC-0125NNNNN
160	P1D-S125MC-0160NNNNN
200	P1D-S125MC-0200NNNNN
250	P1D-S125MC-0250NNNNN
320	P1D-S125MC-0320NNNNN
400	P1D-S125MC-0400NNNNN
500	P1D-S125MC-0500NNNNN

The cylinders are supplied complete with a zinc plated steel piston rod nut.

Sensors

For sensors see page B339.



Most popular.

Design Versions

P1D Basic Version

The P1D Basic Version cylinders meet the specifications in the ISO 15552 standard. This means full interchangeability to any ISO 15552 cylinder anywhere around the globe. P1D Basic Version will be available throughout the extensive worldwide Parker Hannifin organization.



P1D Standard Version

P1D Standard Version cylinders are available in 32-125mm bores and utilize internal composite technology to save weight, while assuring the high performance and functionality expected of ISO cylinders. Cushions and bumpers at both ends and a magnetic piston are included as standard. The Standard Version serves all markets where performance at an affordable price is desired.



P1D Removable Gland Version

P1D Removable Gland Version cylinders are available in 32-200mm bores and utilize bar stock endcaps and a removable high-strength bronze bearing for traditional and custom applications. The bronze bearing assembly is externally removable for quick and easy maintenance. No other ISO cylinder manufacturer in the world produces a Removable Gland Version and meets these demands. This version covers all applications which require performance and customization at all bore sizes.



P1D Rod Lock Cylinder

The P1D Rod Lock Cylinder incorporates a powerful piston rod locking device, which clamps the piston rod and locks it in position. The locking device is a spring lock with an air pressure release and is integrated into the front (head) cover of the cylinder.



P1D Clean Version

The P1D Clean Version is completely designed for the food industry. The stringent requirements for hygiene regarding choice of material and corrosion resistance have guided the development of this cylinder version. Available with BSPP ports (ISO 1179-1 with ISO 228-1 threads).



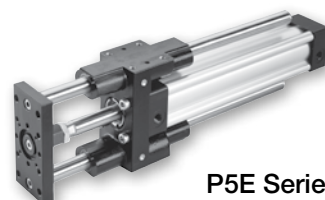
P1D Tie-Rod Version

The P1D Tie-Rod Version cylinders are based on the same high level technology as the Standard Version. They accept either Standard Version or Removable Gland Version heads and caps. This cylinder is the perfect choice wherever a true tie-rod cylinder is needed.



Guided Cylinders

For guided versions of the P1D, see the P5E Series and HB Series.



P5E Series

B	Tie Rod Cylinders Actuator Products
	3MA Series
	4MA/4ML Series
	3MAJ/4MAJ Series
	4MNR Series
P1D Series	

Ordering information

P1D	-	S	032	M	C	-	0500	N	N	N	N	N
------------	----------	----------	------------	----------	----------	----------	-------------	----------	----------	----------	----------	----------

Piston Style		Bore size		Stroke ¹⁴		Rod end	
Cushions	Piston material	032	32mm	Specify whole mm using 4 digits, i.e. 0500		N	Metric male
None	Composite ¹ Aluminum ²	040	40mm			6	Metric female
Cush B/E	M Y	050	50mm			3	Special*
Cush head	- 3, 20 4	063	63mm			* Please provide desired dimensions for KK, AM and WH or W. If otherwise, please provide dimensioned sketch.	
Cush cap	J 5	080	80mm				
	K 6	100	100mm				
		125	125mm				
		160	160mm ⁸				
		200	200mm ⁸				

Version			
	Cylinder body profile	Rod lock	
		None	Fitted w/ standard rod lock ⁷
Die cast end caps ⁴	Basic	B	N/A
	Standard	S	L
	Tie Rod ¹³	T	M
	Clean	C	D
Machined end caps rod lock not available with removable gland. ⁵	Standard	G ⁵	R
	Tie Rod ¹³	E ⁵	7 ⁴
Special ⁶	Any Special		/

Function				
Fastener type	Rod wiper style	Double acting	Double rod	Tandem ¹³
Standard end cover screws	Std scraper	M ²⁰	F	C
Stainless steel end cover screws ⁹	Metal scraper	Q	R	J
	Std scraper	A	G	N/A
	Metal scraper	S	T	N/A

Piston rod & seal material			
Piston rod material	Seal material		
	Standard	Fluorocarbon ¹⁰	Hydraulic ¹¹
Chrome plated carbon steel ²	C ²⁰	G	J
Chrome plated stainless steel ^{2, 19}	R ²⁰	D	Z
303 Stainless steel ¹³	S	N/A	N/A
Acid-resistant stainless steel	M	N ²	N/A

Cylinder ports front & rear		
-	BSPP Ports (G Threads)**	
E	NPTF Ports*	
Q	BSPT Ports (Rc Threads)*†	

* Not available on clean version.
† Not available on die cast version.
** ISO 1179-1 with ISO 228-1 threads.

Rod mountings & plugs ¹⁵		
Rod mounting	No plugs ^{16, 20}	With plugs ¹
Swivel rod eye	S	A
Swivel rod eye SS	T	1
Swivel rod eye with clevis bracket GA ¹⁹	V	E
Swivel rod eye SS with clevis bracket GA	W	2
Clevis	C	B
Clevis SS	D	3
Flexco coupling	F	G
One additional piston rod nut	X	P
Stainless steel piston rod nut	Y	4
Acid-resistant nut	Z	5
None (piston rod nut only)	N	R

Sensors ¹⁷			
Prepared for factory-fitted sensors	Cable location		
	Front or left	Rear or right	Front & rear
P1D clean version	6	7	8
P1D all versions (except Clean) prepared for sensors or clean version without sensor capability ^{18, 20}	N		

Mounting style		
	Standard ²⁰	Rotated 90°
Flange MF1 at head (front) end	1	3
Flange MF2 at cap (rear) end	B	4
Flanges MF1 and MF2 at both ends	2	K
Foot brackets MS1	F	R
Clevis bracket GA aluminum	C	U
Rear eye MP4 aluminum	E	V
Rear swivel eye MP6 aluminum	S	W
Clevis bracket MP2 aluminum	T	Y
Rear eye + clevis (MP4 + MP2) aluminum	L	Z
Clevis bracket MP2 + pivot hinge aluminum	X	5
Clevis bracket GA aluminum + steel swivel hinge	Q	0
Rear swivel eye + clevis bracket GA aluminum	M	A
Intermediate trunnion MT4 (requires XV dimension)	G	7
Trunnion flange at head (front) end ⁴	H	P
Trunnion flange at cap (rear) end ⁴	J	8
None (MX0)	N	9

Notes:

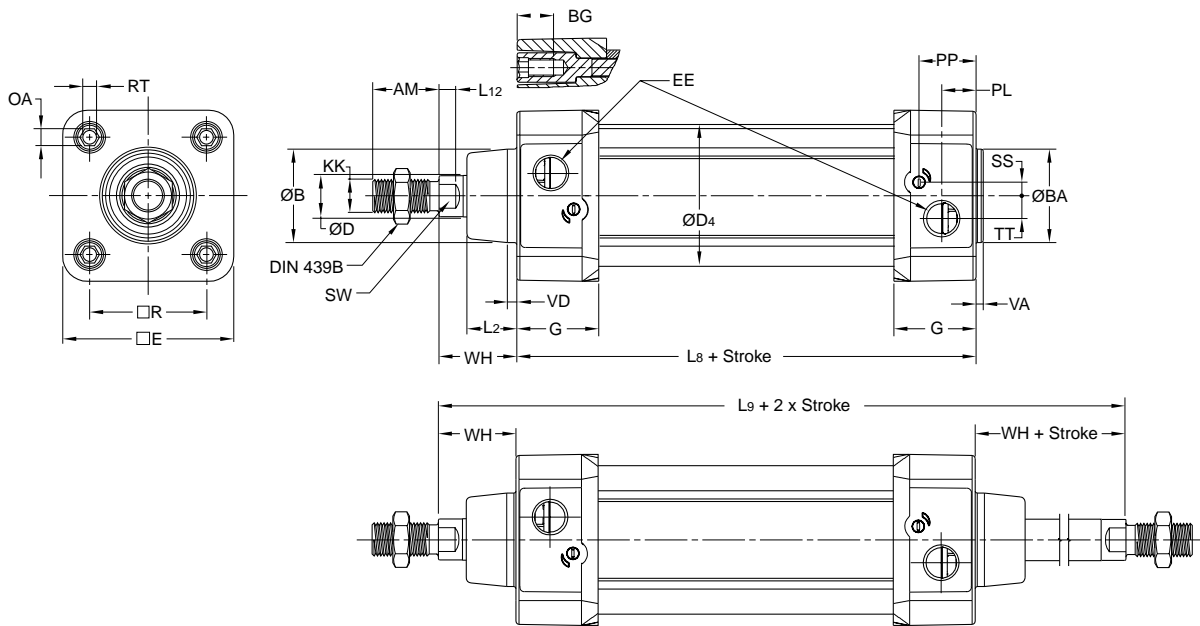
- Not available for 160-200mm bores.
- Not available on Clean Version.
- Must be placed in model code.
- Not available for 160-200mm bores or with fluorocarbon seals.
- When Removable Gland Version is fitted with rod lock, gland cannot be replaced without disassembling cylinder.
- If special cylinder is ordered (other than rod end), End Cap Style, Cylinder Body Profile and Rod Lock option must be given in addition to the special request.
- Cylinders fitted with rod locks must be cushioned on both ends.
- Tie Rod Version E must be specified for these bores.
- Applies only to end cover screws for 32-125mm bores. For stainless steel tie rods and nuts (all bore sizes), change Version to special and request stainless steel tie rods and nuts.
- If used for temperature above 80°C (176°F), aluminum piston required. Not available with die cast end caps.
- Hydraulic seal option valid for Removable Gland Version only. Adjustable cushion options and Rod Lock Versions not available.
- Only available on Clean Version.
- Tie Rod Version is required for Tandem Function.
- When specifying a stop tube, place a "/" in the version field. Then specify the version, amount of stop tube and amount of net stroke. The stroke used in the model code should be gross stroke (net stroke plus stop tube).
- Please review Piston Rod Selection Chart in the Engineering Section to check for a rod buckling condition.
- Clean Version comes standard with plugs. Use this column when ordering Clean Version.
- For sensor part numbers and specifications, please refer to Electronic Sensors section.
- P1D Clean Version ordered without sensors cannot be retrofitted with sensor capability.
- Consult factory for this option.
- Only option for Basic Version.

Double Rod Cylinders
Double rod option is available with Mounting Styles MX0, MS1, MF1, MF2 and MT4.
For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of '3' and be sure to clearly state which rod end is to be assembled at which end.

For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.



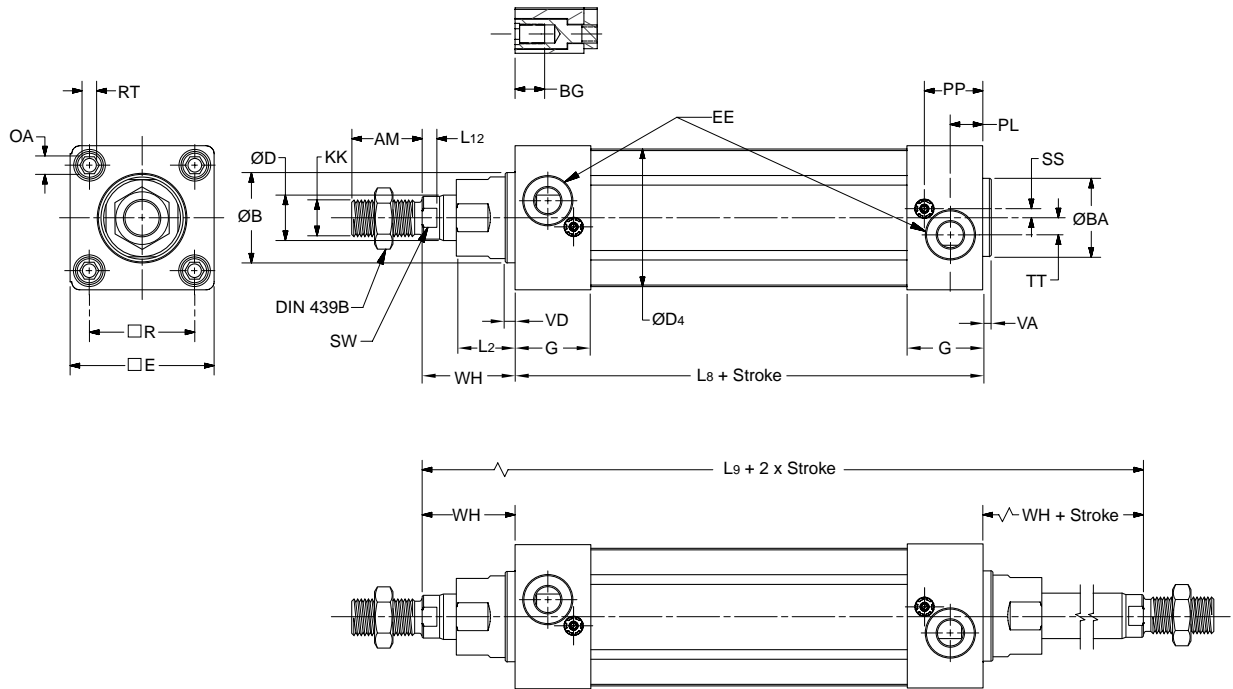
P1D Basic & Standard Version



Series	EE															
	Bore size	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E	BSPP*	NPTF/BSPT	G mm	KK	L2 mm	L8 mm	L9 mm	L12 mm
3MA Series	32	22	30	30	16	12	45.0	50.0	G1/8	1/8	28.5	M10x1.25	16.0	94	146	6.0
	40	24	35	35	16	16	52.0	57.4	G1/4	1/4	33.0	M12x1.25	19.0	105	165	6.5
4MA/4ML Series	50	32	40	40	16	20	60.7	69.4	G1/4	1/4	33.5	M16x1.5	24.0	106	180	8.0
	63	32	45	45	16	20	71.5	82.4	G3/8	3/8	39.5	M16x1.5	24.0	121	195	8.0
	80	40	45	45	17	25	86.7	99.4	G3/8	3/8	39.5	M20x1.5	30.0	128	220	10.0
3MAJ/4MAJ Series	100	40	55	55	17	25	106.7	116.0	G1/2	1/2	44.5	M20x1.5	32.4	138	240	10.0
	125	54	60	60	20	32	134.0	139.0	G1/2	1/2	51.0	M27x2	45.0	160	290	13.0
Series	Bore size	OA mm	PL mm	PP mm	R mm	RT	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm				
	4MNR Series	32	6	13	21.8	32.5	M6	4.0	10	4.5	3.5	4.5	26			
P1D Series	40	6	14	21.9	38.0	M6	8.0	13	5.5	3.5	4.5	30				
	50	8	14	25.9	46.5	M8	4.0	17	7.5	3.5	4.5	37				
P1D Series	63	8	16	27.4	56.5	M8	6.5	17	11.0	3.5	4.5	37				
	80	6	16	30.5	72.0	M10	0	22	15.0	3.5	4.5	46				
	100	6	18	35.8	89.0	M10	0	22	20.0	3.5	4.5	51				
P1D Series	125	8	23	40.5	110.0	M12	0	27	17.5	3.5	6.5	65				

* ISO 1179-1 with ISO 228-1 threads

P1D Removable Gland Version



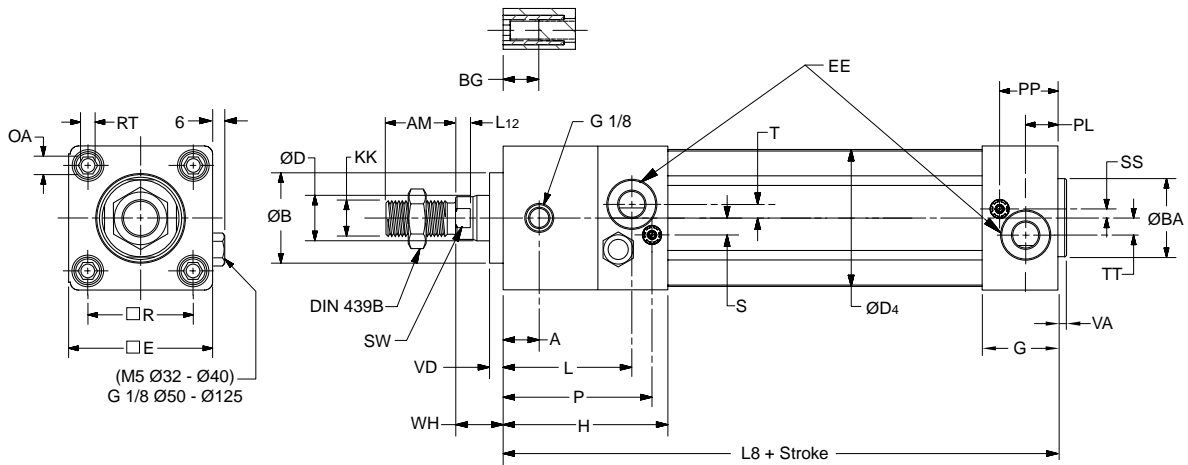
Bore size	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E mm	EE		G mm	KK	L2 mm	L8 mm	L9 mm	L12 mm
								BSPP *	NPTF/BSPT						
32	22	30	30	16	12	45.0	46.5	G1/8	1/8	28.5	M10x1.25	18	94	146	6.0
40	24	35	35	16	16	52.0	52.0	G1/4	1/4	33.0	M12x1.25	20	105	165	6.5
50	32	40	40	16	20	60.7	63.5	G1/4	1/4	33.5	M16x1.5	26	106	180	6.5
63	32	45	45	16	20	71.5	76.0	G3/8	3/8	39.5	M16x1.5	26	121	195	6.5
80	40	45	45	17	25	86.7	95.5	G3/8	3/8	39.5	M20x1.5	33	128	220	10.0
100	40	55	55	17	25	106.7	114.5	G1/2	1/2	44.5	M20x1.5	33	138	240	10.0
125	54	60	60	20	32	134.0	140.0	G1/2	1/2	51.0	M27x2	41	160	290	13.0

Bore size	OA mm	PL mm	PP mm	R mm	RT	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm
32	6	13	21.8	32.5	M6	6.5	10	4.5	3.5	4.5	26
40	6	14	21.9	38.0	M6	8.0	13	5.5	3.5	4.5	30
50	8	14	25.9	46.5	M8	4.0	17	7.5	3.5	4.5	37
63	8	16	27.4	56.5	M8	6.5	17	11.0	3.5	4.5	37
80	6	16	30.5	72.0	M10	0	22	15.0	3.5	4.5	46
100	6	18	35.8	89.0	M10	0	22	20.0	3.5	4.5	51
125	8	23	40.5	110.0	M12	0	27	17.5	5.5	6.5	65

* ISO 1179-1 with ISO 228-1 threads

B
Tie Rod Cylinders
Actuator Products
3MA Series
4MA/4ML Series
3MAJ/4MAJ Series
4MNR Series
P1D Series

P1D Rod Lock Version (Version R or L)



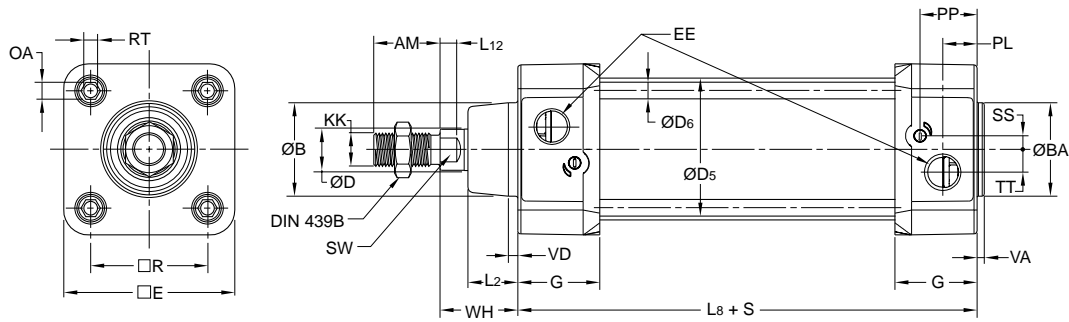
Bore size	A mm	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E mm	EE *	G mm	H mm	KK	L mm	L8 mm	L12 mm
32	16	22	30	30	16	12	45.0	46.5	G1/8	28.5	71.5	M10x1.25	56.0	137	6.0
40	16	24	35	35	16	16	52.0	52.0	G1/4	33.0	77.0	M12x1.25	56.0	149	6.5
50	18	32	40	40	16	20	60.7	63.5	G1/4	33.5	80.5	M16x1.5	62.5	153	6.5
63	26	32	45	45	16	20	71.5	76.0	G3/8	39.5	96.5	M16x1.5	74.5	178	6.5
80	35	40	45	45	17	25	86.7	95.5	G3/8	39.5	110.5	M20x1.5	87.0	199	10.0
100	50	40	55	55	17	25	106.7	114.5	G1/2	44.5	132.5	M20x1.5	106.0	226	10.0
125	60	54	60	60	20	32	134.0	140.0	G1/2	51.0	145.0	M27x2	117.0	254	13.0

Bore size	OA mm	P mm	PL mm	PP mm	R mm	RT mm	S mm	SS mm	SW mm	T mm	TT mm	VA mm	VD mm	WH mm
32	6	64.8	13	21.8	32.5	M6	7	6.5	10	2.5	4.5	3.5	4.5	15
40	6	68.0	14	21.9	38.0	M6	9	8.0	13	2.0	5.5	3.5	4.5	16
50	8	73.5	14	25.9	46.5	M8	8	4.0	17	4.0	7.5	3.5	5.0	17
63	8	89.5	16	27.4	56.5	M8	8	6.5	17	2.0	11.0	3.5	5.0	17
80	6	101.5	16	30.5	72.0	M10	9	0	22	5.0	15.0	3.5	4.0	20
100	6	123.5	18	35.8	89.0	M10	12	0	22	6.0	20.0	3.5	4.0	20
125	8	136.0	23	40.5	110.0	M12	12	0	27	6.0	17.5	5.5	6.0	27

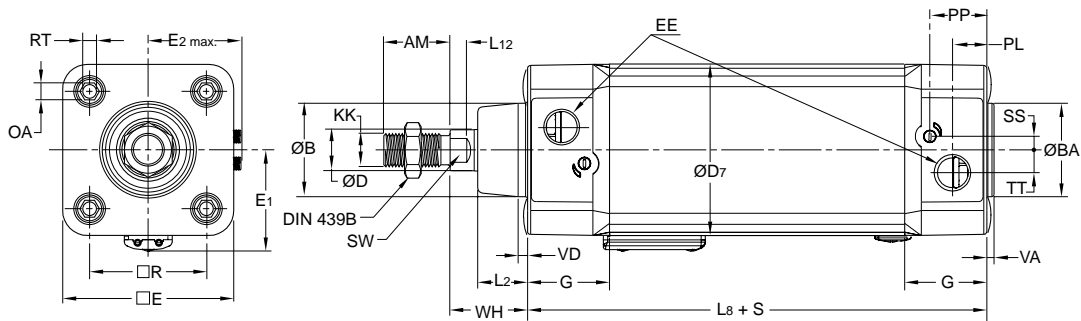
* ISO 1179-1 with ISO 228-1 threads

B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 4MA/4ML
 3MAJ/4MAJ
 4MNR
 P1D

P1D Tie-Rod Version (32-125mm)



P1D Clean Version



Bore size	D5 mm	D6 mm	D7 mm	E1 mm	E2 max mm
32	36	5.3	49.6	32	5
40	45	5.3	57.3	36	6
50	55	7.1	69.3	42	6
63	68	7.1	82.3	49	5
80	85	8.9	99.3	57	5
100	105	8.9	117.6	68	6
125	132	10.7	142.8	81	6

Other dimensions, see P1D removable gland version.

B

**Tie Rod Cylinders
 Actuator Products**

**3MA
 Series**

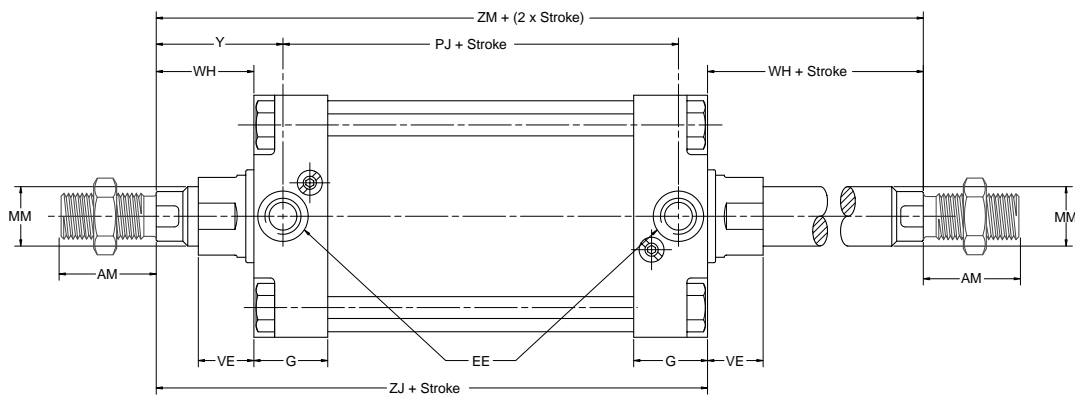
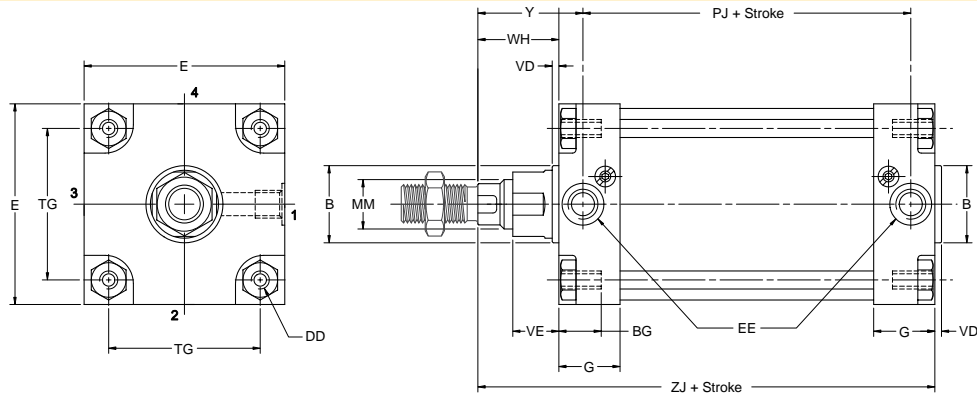
**4MA/4ML
 Series**

**3MAJ/4MAJ
 Series**

**4MNR
 Series**

**P1D
 Series**

P1D Tie-Rod Version (160-200mm)



Rod End #1

Rod End #2

Bore size	AM mm	B d11 mm	BG mm	DD	E mm	EE		G mm	MM mm	TG mm	VD mm	VE mm	WH mm	Y mm	PJ1 mm	ZJ1 mm	ZM2 mm
						BSPP ³	NPTF/BSPT										
160	72	65	24	M16	177	G3/4	3/4	54	40	140	6	56	80	105	130	260	340
200	72	75	24	M16	214	G3/4	3/4	54	40	175	6	56	95	120	130	275	370

1 Add stroke
 2 Add 2x stroke
 3 ISO 1179-1 with ISO 228-1 threads

Double Rod Cylinders

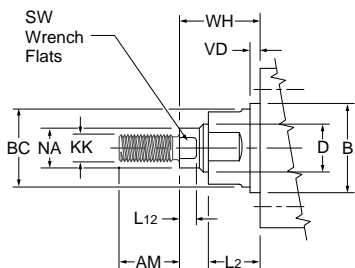
Double rod option is available on Mounting Styles MX0, MS1, MF1, MF2 and MT4.

For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of '3' and be sure to clearly state which rod end is to be assembled at which end.

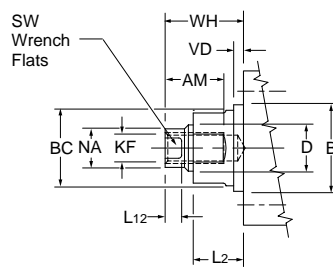
B
 Tie Rod Cylinders
 Actuator Products
 Series
 3MA
 Series
 4MA/4ML
 Series
 3MAJ/4MAJ
 Series
 4MNR
 Series
 P1D

All Mountings Except MF1

Thread Style N



Thread Style 6



**Thread Style 3 -
 “Special Thread”**

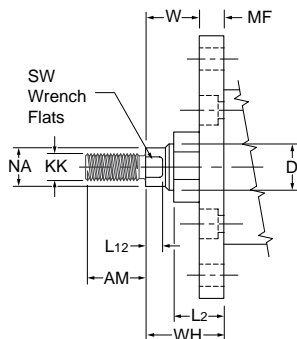
Special thread, extension, rod eye, blank, etc are also available. To order, specify “Style 3” and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

Bore size	D	KK	KF	AM	B d11	BC	SW across flats	L12	NA	VD	L2	WH*
32	12	M10x1.25	M8x1	22	30	27	10	6	11	4.5	18	26
40	16	M12x1.25	M10x1.25	24	35	32	13	6.5	15	4.5	20	30
50	20	M16x1.5	M14x1.5	32	40	36	17	6.5	19	4.5	26	37
63	20	M16x1.5	M14x1.5	32	45	36	17	6.5	19	4.5	26	37
80	25	M20x1.5	M18x1.5	40	45	41	22	10	24	4.5	33	46
100	25	M20x1.5	M18x1.5	40	55	41	22	10	24	4.5	33	51
125	32	M27x2	M24x2	54	60	50	27	13	31	6.5	41	65
160	40	M36x2	M30x2	72	65	60	36	16	39	6	56	80
200	40	M36x2	M30x2	72	75	60	36	16	39	6	56	95

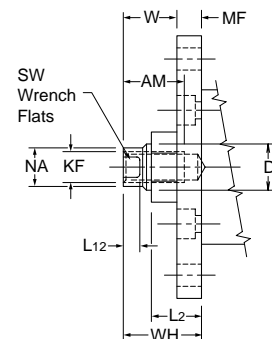
*NOTE: Dimensions do not apply to Rod Lock Versions.

With MF1 Mounting

Thread Style N



Thread Style 6



**“Special Thread”
 Style 3**

Special thread, extension, rod eye, blank, etc are also available. To order, specify “Style 3” and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

Bore size	D	KK	KF	AM	SW across flats	L12	MF	NA	L2	W†	WH†
32	12	M10x1.25	M8x1	22	10	6	10	11	18	16	26
40	16	M12x1.25	M10x1.25	24	13	6.5	10	15	20	20	30
50	20	M16x1.5	M14x1.5	32	17	6.5	12	19	26	25	37
63	20	M16x1.5	M14x1.5	32	17	6.5	12	19	26	25	37
80	25	M20x1.5	M18x1.5	40	22	10	16	24	33	30	46
100	25	M20x1.5	M18x1.5	40	22	10	16	24	33	35	51
125	32	M27x2	M24x2	54	27	13	20	31	41	45	65
160	40	M36x2	M30x2	72	36	16	20	39	56	60	80
200	40	M36x2	M30x2	72	36	16	25	39	56	70	95

†NOTE: Dimensions do not apply to Rod Lock Versions.



B

Tie Rod Cylinders
Actuator Products

3MA
Series

4MA/4ML
Series

3MAJ/4MAJ
Series

4MNR
Series

P1D
Series

Flange – MF1, MF2

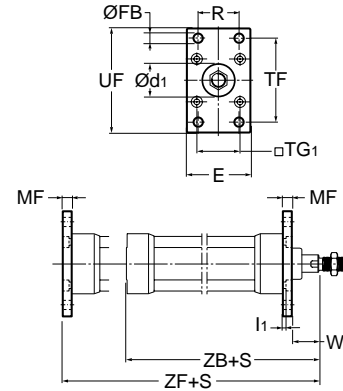


Intended for fixed mounting of cylinder. Flange can be fitted to front or rear end cover of cylinder.

Materials:

32-100mm bore flange: Surface-treated aluminum, black
 125-200mm bore flange: Steel, black
 Mounting screws acc. to DIN 6912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



According to ISO MF1/MF2, VDMA 24 562, AFNOR

Bore size mm	d1 H11 mm	FB H13 mm	TG1 mm	E mm	R JS14 mm	MF JS14 mm	TF JS14 mm	UF	I1 -0.5 mm	W mm	ZF mm	ZB mm	Weight kg	Part number
32	30	7	32.5	45	32	10	64	80	5.0	16	130	123.5	0.23	P1C-4KMBA
40	35	9	38.0	52	36	10	72	90	5.0	20	145	138.5	0.28	P1C-4LMBA
50	40	9	46.5	65	45	12	90	110	6.5	25	155	146.5	0.53	P1C-4MMBA
63	45	9	56.5	75	50	12	100	120	6.5	25	170	161.5	0.71	P1C-4NMBA
80	45	12	72.0	95	63	16	126	150	8.0	30	190	177.5	1.59	P1C-4PMBA
100	55	14	89.0	112	75	16	150	185	8.0	35	205	192.5	2.19	P1C-4QMBA
125	60	16	110.0	140	90	20	188	220	10.5	45	245	230.5	3.78	P1C-4RMB
160	65	18	140.0	180	115	20	230	260	9.5	60	280	266	C.F.	L075370160
200	75	22	175.0	220	135	25	270	300	12.5	70	300	281	C.F.	L075370200

S = Stroke length C.F. = Consult Factory

Foot Bracket – MS1

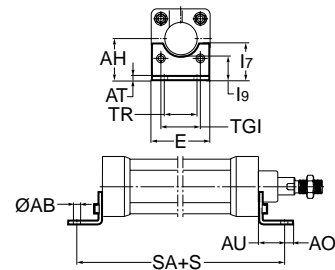


Intended for fixed mounting of cylinder. Foot bracket can be fitted to front and rear end covers of cylinder.

Materials:

Foot bracket: Surface-treated steel, black
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied in pairs with mounting screws for attachment to cylinder.



According to ISO MS1, VDMA 24 562, AFNOR

Bore size mm	AB H14 mm	TG1 mm	E mm	TR JS14 mm	AO mm	AU mm	AH JS15 mm	I7 mm	AT mm	I9 JS14 mm	SA mm	Weight* kg	Part number
32	7	32.5	45	32	10	24	32	30	4.5	17.0	142	0.06	P1C-4KMF
40	9	38.0	52	36	8	28	36	30	4.5	18.5	161	0.08	P1C-4LMF
50	9	46.5	65	45	13	32	45	36	5.5	25.0	170	0.16	P1C-4MMF
63	9	56.5	75	50	13	32	50	35	5.5	27.5	185	0.25	P1C-4NMF
80	12	72.0	95	63	14	41	63	49	6.5	40.5	210	0.50	P1C-4PMF
100	14	89.0	115	75	15	41	71	54	6.5	43.5	220	0.85	P1C-4QMF
125	16	110.0	140	90	22	45	90	71	8.0	60.0	250	1.48	P1C-4RMF
160	18	140.0	180	115	15	60	115	100	9.0	63.5	300	C.F.	L075380160
200	22	175.0	220	135	30	70	135	100	12.0	65.0	320	C.F.	L075380200

S = Stroke length C.F. = Consult Factory

*Weight per item

B
 Tie Rod Cylinders
 Actuator Products
 3MA Series
 4MA/4ML Series
 3MAJ/4MAJ Series
 4MNR Series
 P1D Series



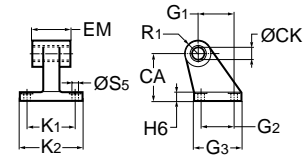
Pivot Bracket with Rigid Bearing



Intended for flexible mounting of cylinder. The pivot bracket can be combined with clevis bracket MP2.

Materials:

Pivot bracket: Surface-treated aluminium, black
 Bearing: Sintered oil-bronze bushing



According to CETOP RP 107 P, VDMA 24 562, AFNOR

Bore size mm	CK H9 mm	S5 H13 mm	K1 JS14 mm	K2	G1 JS14 mm	G2 JS14 mm	EM mm	G3 mm	CA JS15 mm	H6 mm	R1 mm	Weight kg	Part number
32	10	6.6	38	51	21	18	25.5	31	32	8	10.0	0.06	P1C-4KMD
40	12	6.6	41	54	24	22	27.0	35	36	10	11.0	0.08	P1C-4LMD
50	12	9.0	50	65	33	30	31.0	45	45	12	13.0	0.15	P1C-4MMD
63	16	9.0	52	67	37	35	39.0	50	50	12	15.0	0.20	P1C-4NMD
80	16	11.0	66	86	47	40	49.0	60	63	14	15.0	0.33	P1C-4PMD
100	20	11.0	76	96	55	50	59.0	70	71	15	19.0	0.49	P1C-4QMD
125	25	14.0	94	124	70	60	69.0	90	90	20	22.5	1.02	P1C-4RMD
160	30	14.0	118	156	97	89	88.5	126	115	25	31.0	C.F.	L075480160
200	30	16.0	122	162	105	89	88.5	130	135	30	31.0	C.F.	L075480200

C.F. = Consult Factory

Swivel Eye Bracket – MP6

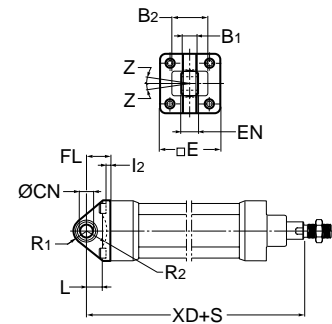


Intended for use together with clevis bracket GA

Materials:

Bracket: Surface-treated aluminium, black
 (Cast iron for 160-200mm bores)
 Swivel bearing acc. to DIN 648K: Hardened steel

Supplied complete with mounting screws for attachment to cylinder.



According to VDMA 24 562, AFNOR

Bore size mm	E mm	B1 mm	B2 mm	EN mm	R1 mm	R2 mm	FL mm	I2 mm	L mm	CN H7 mm	XD mm	Z	Weight kg	Part number
32	45	10.5	–	14	16	–	22	5.5	12	10	142	4°	0.08	P1C-4KMSA
40	52	12.0	–	16	18	–	25	5.5	15	12	160	4°	0.11	P1C-4LMSA
50	65	15.0	51	21	21	19	27	6.5	15	16	170	4°	0.20	P1C-4MMSA
63	75	15.0	–	21	23	–	32	6.5	20	16	190	4°	0.27	P1C-4NMSA
80	95	18.0	–	25	29	–	36	10.0	20	20	210	4°	0.52	P1C-4PMSA
100	115	18.0	–	25	31	–	41	10.0	25	20	230	4°	0.72	P1C-4QMSA
125	140	25.0	–	37	40	–	50	10.0	30	30	275	4°	1.53	P1C-4RMSA
160	177	30.0	–	43	44	41	55	4.0	41	35	315	16°	C.F.	L075420160
200	214	30.0	–	43	48	42	60	8.0	42	35	335	16°	C.F.	L075420200

S = Stroke length C.F. = Consult Factory

B

Tie Rod Cylinders
Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

4MNR Series

P1D Series



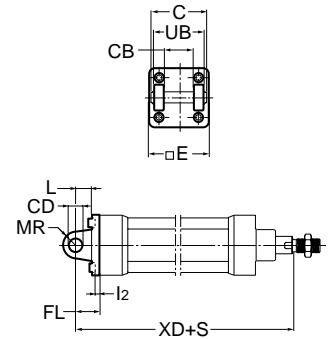
Clevis Bracket – MP2



Intended for flexible mounting of cylinder. Clevis bracket MP2 can be combined with clevis bracket MP4.

Materials:

Clevis bracket: Surface-treated aluminium, black for 32-160mm bores; Cast iron for 200mm bore
 Pin: Surface hardened steel
 Circlips according to DIN 471: Spring steel
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
 Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP2, VDMA 24 562, AFNOR

Bore size mm	C mm	E mm	UB h14 mm	CB H14 mm	FL ±0.2 mm	L mm	l2 mm	CD H9 mm	MR mm	XD mm	Weight kg	Part number
32	53	45	45	26	22	13	5.5	10	10	142	0.08	P1C-4KMT
40	60	52	52	28	25	16	5.5	12	12	160	0.11	P1C-4LMT
50	68	65	60	32	27	16	6.5	12	12	170	0.14	P1C-4MMT
63	78	75	70	40	32	21	6.5	16	16	190	0.29	P1C-4NMT
80	98	95	90	50	36	22	10.0	16	16	210	0.36	P1C-4PMT
100	118	115	110	60	41	27	10.0	20	20	230	0.64	P1C-4QMT
125	139	140	130	70	50	30	10.0	25	25	275	1.17	P1C-4RMT
160	178	180	170	90	55	35	10.0	30	25	315	C.F.	L075390160
200	178	200	170	90	60	35	14.0	30	25	335	C.F.	L075390200

S = Stroke length C.F. = Consult Factory

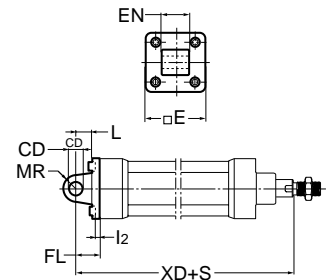
Clevis Bracket – MP4



Intended for flexible mounting of cylinder. Clevis bracket MP4 can be combined with clevis bracket MP2.

Materials:

Clevis bracket: Surface-treated aluminium, black for 32-125mm bores; Cast iron for 160-200mm bores
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
 Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP4, VDMA 24 562, AFNOR

Bore size mm	E mm	EW mm	FL mm	L ±0.2 mm	l2 mm	CD mm	MR H9 mm	XD mm	Weight kg	Part number
32	45	26	22	13	5.5	10	10	142	0.09	P1C-4KME
40	52	28	25	16	5.5	12	12	160	0.13	P1C-4LME
50	65	32	27	16	6.5	12	12	170	0.17	P1C-4MME
63	75	40	32	21	6.5	16	16	190	0.36	P1C-4NME
80	95	50	36	22	10.0	16	16	210	0.46	P1C-4PME
100	115	60	41	27	10.0	20	20	230	0.83	P1C-4QME
125	140	70	50	30	10.0	25	25	275	1.53	P1C-4RME
160	180	90	55	35	10.0	30	25	315	C.F.	L075410160
200	220	90	60	35	14.0	30	25	335	C.F.	L075410200

S = Stroke length C.F. = Consult Factory

B
 Tie Rod Cylinders
 Actuator Products
 3MA Series
 4MA/4ML Series
 3MAJ/4MAJ Series
 4MNR Series
 P1D Series



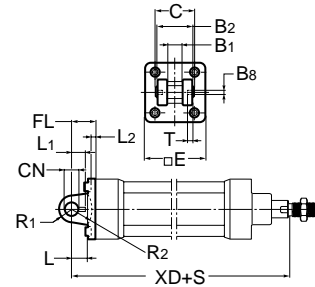
Clevis Bracket – GA



Intended for flexible mounting of cylinder. Clevis bracket GA can be combined with pivot bracket with swivel bearing, swivel eye bracket and swivel rod eye.

Materials:

- Clevis bracket: Surface-treated aluminium
 - Pin: Surface hardened steel
 - Locking pin: Spring steel
 - Circlips according to DIN 471: Spring steel
 - Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
- Supplied complete with mounting screws for attachment to cylinder.

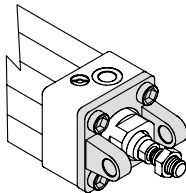


According to VDMA 24 562, AFNOR

Bore size mm	C mm	E mm	B2 d12 mm	B1 H14 mm	T mm	B3 mm	R2 mm	L1 mm	FL ±0.2 mm	I2 mm	L mm	CN F7 mm	R1 mm	XD mm	Weight kg	Part number
32	41	45	34	14	3	3.3	17	11.5	22	5.5	12	10	11	142	0.09	P1C-4KMCA
40	48	52	40	16	4	4.3	20	12.0	25	5.5	15	12	13	160	0.13	P1C-4LMCA
50	54	65	45	21	4	4.3	22	14.0	27	6.5	17	16	18	170	0.17	P1C-4MMCA
63	60	75	51	21	4	4.3	25	14.0	32	6.5	20	16	18	190	0.36	P1C-4NMCA
80	75	95	65	25	4	4.3	30	16.0	36	10.0	20	20	22	210	0.58	P1C-4PMCA
100	85	115	75	25	4	4.3	32	16.0	41	10.0	25	20	22	230	0.89	P1C-4QMCA
125	110	140	97	37	6	6.3	42	24.0	50	10.0	30	30	30	275	1.75	P1C-4RMCA
160	140	178	122	43	6	6.3	46	26.5	55	10.0	37	35 h9	36	C.F.	C.F.	L075510160
200	175	218	122	43	6	6.3	49	26.5	60	11.5	40	35 h9	38	C.F.	C.F.	L075510200

S = Stroke length C.F. = Consult Factory

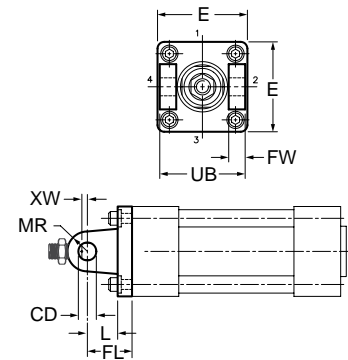
Head Detachable Clevis – MP7



Intended for flexible mounting of cylinder

Materials:

- Clevis bracket: Cast iron for 32-63mm bores;
 - Surface treated aluminum, black for 80-200mm bores
 - Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
- Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP7, VDMA 24 562, AFNOR

Bore size mm	CD mm	E mm	FL mm	FW mm	L mm	MR mm	UB mm	XW mm	Part number
32	10	46.5	22	8	12	10	45	4	L075400032
40	12	52	25	9	15	12	52	5	L075400040
50	12	63.5	27	10	15	13	60	10	L075400050
63	16	76	32	15	20	16	70	5	L075400063
80	16	95.5	36	20	20	17	90	10	L075400080
100	20	114.5	41	25	25	21	110	10	L075400100
125	25	140	50	30	35	25	130	15	L075400125
160	30	177	55	40	36	30	170	25	L075400160
200	30	214	60	40	41	30	170	35	L075400200

B

Tie Rod Cylinders
Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

4MNR Series

P1D Series

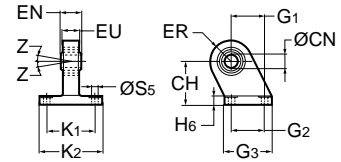


Pivot Bracket with Swivel Bearing



Intended for use together with clevis bracket GA.

Materials:
 Pivot bracket: Surface-treated steel, black
 Swivel bearing acc. to DIN 648K: Hardened steel



According to VDMA 24 562, AFNOR

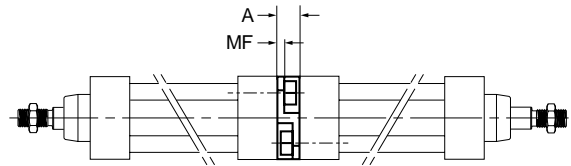
Bore size mm	CN H7 mm	S5 H13 mm	K1 JS14 mm	K2 mm	EU mm	G1 JS14 mm	G2 JS14 mm	EN mm	G3 mm	CH JS15 mm	H6 mm	ER mm	Z	Weight kg	Part number
32	10	6.6	38	51	10.5	21	18	14	31	32	10	16	4°	0.18	P1C-4KMA
40	12	6.6	41	54	12.0	24	22	16	35	36	10	18	4°	0.25	P1C-4LMA
50	16	9.0	50	65	15.0	33	30	21	45	45	12	21	4°	0.47	P1C-4MMA
63	16	9.0	52	67	15.0	37	35	21	50	50	12	23	4°	0.57	P1C-4NMA
80	20	11.0	66	86	18.0	47	40	25	60	63	14	28	4°	1.05	P1C-4PMA
100	20	11.0	76	96	18.0	55	50	25	70	71	15	30	4°	1.42	P1C-4QMA
125	30	14.0	94	124	25.0	70	60	37	90	90	20	40	4°	3.10	P1C-4RMA

Mounting Kit

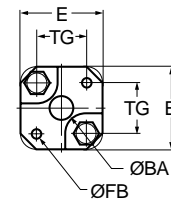


Mounting kit for back to back mounted cylinders, 3 and 4 position duplex cylinders.

Materials:
 Mounting: Aluminium
 Mounting screws: Zinc-plated steel 8.8



Bore size mm	E mm	TG mm	ØFB mm	MF mm	A mm	ØBA mm	Weight kg	Part number
32	50	32.5	6.5	5	16	30	0.060	P1E-6KB0
40	60	38.0	6.5	5	16	35	0.078	P1E-6LB0
50	66	46.5	8.5	6	20	40	0.162	P1E-6MB0
63	80	56.5	8.5	6	20	45	0.194	P1E-6NB0
80	100	72.0	10.5	8	25	45	0.450	P1E-6PB0
100	118	89.0	10.5	8	25	55	0.672	P1E-6QB0

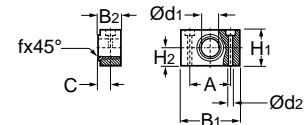


Pivot Bracket – MT4



Intended for use together with central trunnion MT4.

Materials:
 Pivot bracket: Surface-treated aluminium
 Bearing acc. to DIN 1850 C: Sintered oil-bronze bushing
 Supplied in pairs.



According to ISO, VDMA 24 562, AFNOR

Bore size mm	B1 mm	B2 mm	A mm	C mm	d1 mm	d2 H13 mm	H1 mm	H2 mm	fx45° min mm	Weight* kg	Part number
32	46	18.0	32	10.5	12	6.6	30	15	1.0	0.04	9301054261
40	55	21.0	36	12.0	16	9.0	36	18	1.6	0.07	9301054262
50	55	21.0	36	12.0	16	9.0	36	18	1.6	0.07	9301054262
63	65	23.0	42	13.0	20	11.0	40	20	1.6	0.12	9301054264
80	65	23.0	42	13.0	20	11.0	40	20	1.6	0.12	9301054264
100	75	28.5	50	16.0	25	14.0	50	25	2.0	0.21	9301054266
125	75	28.5	50	16.0	25	14.0	50	25	2.0	0.21	9301054266

* Weight per item

Intermediate Trunnion – MT4



Standard*



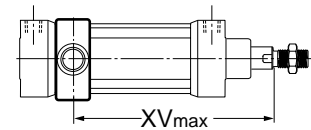
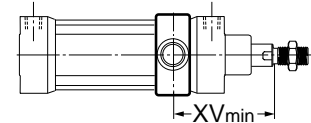
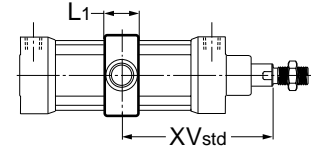
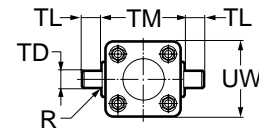
Tie Rod Version

Intended for articulated mounting of cylinder. The trunnion is factory-fitted at an optional location. Order by specifying Mounting Style G or 7 and providing the desired XV dimension (3-digit measure in mm). See page B67 for ordering information. Combined with pivot bracket for MT4 for 32-125mm bores.

Materials:

Trunnion: Zinc plated steel
 (Cast iron for 160-200mm bores)

* Standard mounting is for the Standard cylinder body and is permanently affixed by the factory.



According to ISO MT4, VDMA 24 562, AFNOR

Bore size mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	X1 mm	XVmin mm	X2 mm	Weight kg
32	50	12	12	1.0	46	15	73.0	62.0	84.0	0.13
40	63	16	16	1.6	59	20	82.5	73.0	92.0	0.31
50	75	16	16	1.6	69	20	90.0	80.5	99.5	0.37
63	90	20	20	1.6	84	25	97.5	89.5	106.0	0.69
80	110	20	20	1.6	102	25	110.0	98.0	122.0	0.89
100	132	25	25	2.0	125	30	120.0	110.5	129.5	1.58
125	160	25	25	2.0	155	32	145.0	132.0	158.0	2.60
160	200	32	32	2.5	190	70	C.F.	169	C.F.	C.F.
200	250	32	32	2.5	242	70	C.F.	184	C.F.	C.F.

$XV_{std} = X1 + \text{Stroke length}/2$

$XV_{max} = X2 + \text{Stroke length}$

C.F. = Consult Factory

Flange Mounted Trunnion

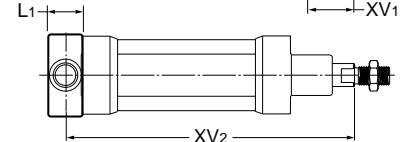
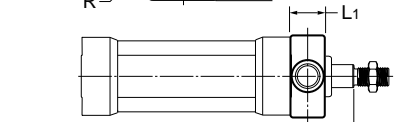
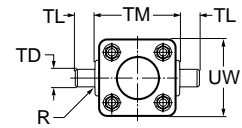


Intended for articulated mounting of cylinder. This trunnion can be flange mounted on the front or rear end cover of all P1D cylinders. If you choose, you can order a complete cylinder with factory-fitted flange mounted trunnion – see the ordering information on page B67 Individual trunnions have part numbers as shown below.

Materials:

Trunnion: zinc plated steel
 Screws: zinc plated steel, 8.8

Delivered complete with mounting screws for attachment to the cylinder



According to ISO MT4, VDMA 24 562, AFNOR

Bore size mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	XV1 mm	X mm	Weight kg	Part number
32	50	12	12	1.0	46	14	19.0	127.0	0.17	P1D-4KMYF
40	63	16	16	1.6	59	19	20.5	144.5	0.43	P1D-4LMYF
50	75	16	16	1.6	69	19	27.5	152.5	0.55	P1D-4MMYF
63	90	20	20	1.6	84	24	25.0	170.0	1.10	P1D-4NMYF
80	110	20	20	1.6	102	24	34.0	186.0	1.66	P1D-4PMYF
100	132	25	25	2.0	155	29	36.5	203.5	3.00	P1D-4QMYF

$XV2 = X + \text{Stroke length}$

B	Tie Rod Cylinders
	Actuator Products
3MA Series	
4MA/4ML Series	
3MAJ/4MAJ Series	
4MNR Series	
P1D Series	



Swivel Rod Eye



Stainless Steel
 Swivel Rod Eye

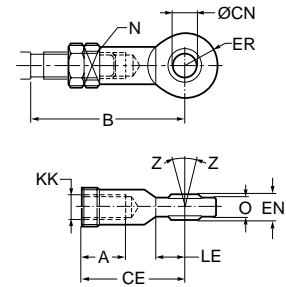
Swivel rod eye for articulated mounting of cylinder.
 Swivel rod eye can be combined with clevis bracket GA.
 Maintenance-free.

Materials:

Swivel rod eye: Zinc-plated steel
 Swivel bearing according to DIN 648K: Hardened steel

Swivel rod eye: Stainless steel
 Swivel bearing according to DIN 648K: Stainless steel

Use stainless steel nut (see next page) with stainless steel swivel rod eye.



According to ISO 8139

Bore size mm	A mm	B min mm	B max mm	CE mm	CN H9 mm	EN h12 mm	ER mm	KK	LE min mm	N mm	O mm	Z	Weight kg	Part number	Stainless steel part number
32	20	48.0	55	3	10	14	14	M10x1.25	15	17	10.5	12°	0.08	P1C-4KRS	P1S-4JRT
40	22	56.0	62	50	12	16	16	M12x1.25	17	19	12.0	12°	0.12	P1C-4LRS	P1S-4LRT
50	28	72.0	80	64	16	21	21	M16x1.5	22	22	15.0	15°	0.25	P1C-4MRS	P1S-4MRT
63	28	72.0	80	64	16	21	21	M16x1.5	22	22	15.0	15°	0.25	P1C-4PRS	P1S-4PRT
80	33	87.0	97	77	20	25	25	M20x1.5	26	32	18.0	15°	0.46	P1C-4RRS	P1S-4RRT
100	33	87.0	97	77	20	25	25	M20x1.5	26	32	18.0	15°	0.46	P1C-4RRS	P1S-4RRT
125	51	123.5	137	110	30	37	35	M27x2	36	41	25.0	15°	1.28	P1C-4RRS	P1S-4RRT
160/200	56	C.F.	C.F.	125	35*	43	40	M36x2	40	50	28.0	15°	C.F.	L075470036	C.F.

*H7 C.F. = Consult Factory

Clevis



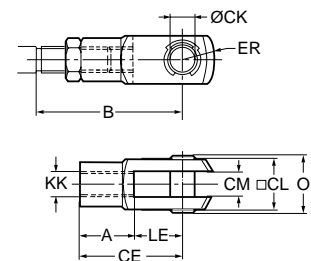
Stainless Steel
 Clevis

Clevis for articulated mounting of cylinder.

Materials:

Clevis, clip: Galvanized steel
 Pin: Hardened steel

Clevis: Stainless steel
 Pin: Stainless steel
 Circlips according to DIN 471: Stainless steel



According to ISO 8140

Bore size mm	A mm	B min mm	B max mm	CE mm	CK h11/E9 mm	CL mm	CM mm	ER mm	KK	LE mm	O mm	Weight kg	Part number	Stainless steel part number
32	20	45.0	52	40	10	20	10	16	M10x1.25	20	28.0	0.09	P1C-4KRC	P1S-4JRD
40	24	54.0	60	48	12	24	12	19	M12x1.25	24	32.0	0.15	P1C-4LRC	P1S-4LRD
50	32	72.0	80	64	16	32	16	25	M16x1.5	32	41.5	0.35	P1C-4MRC	P1S-4MRD
63	32	72.0	80	64	16	32	16	25	M16x1.5	32	41.5	0.35	P1C-4MRC	P1S-4MRD
80	40	90.0	100	80	20	40	20	32	M20x1.5	40	50.0	0.75	P1C-4PRC	P1S-4PRD
100	40	90.0	100	80	20	40	20	32	M20x1.5	40	50.0	0.75	P1C-4PRC	P1S-4PRD
125	56	123.5	137	110	30	55	30	45	M27x2	54	72.0	2.10	P1C-4RRC	P1S-4RRD
160/200	71	C.F.	C.F.	144	35	70	35	57	M36x2	72	95	C.F.	L075490036	C.F.

C.F. = Consult Factory



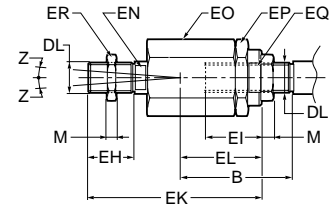
Flexo Coupling



Flexo coupling for articulated mounting of piston rod. Flexo fitting is intended to take up axial angle errors within a range of $\pm 4^\circ$.

Materials:

Flexo coupling, nut: Zinc-plated steel
 Socket: Hardened steel
 Supplied complete with galvanized adjustment nut.



Bore size mm	B min mm	B max mm	DL	EH mm	EI mm	EK mm	EL mm	EN mm	EO mm	EP mm	EQ mm	ER mm	M mm	Z	Weight kg	Part number
32	36.0	43	M10x1.25	20	23	70	31	12	30	30	19	30	5.0	4°	0.21	P1C-4KRF
40	37.0	43	M12x1.25	23	23	67	31	12	30	30	19	30	6.0	4°	0.22	P1C-4LRF
50	53.0	61	M16x1.5	40	32	112	45	19	41	41	30	41	8.0	4°	0.67	P1C-4MRF
63	53.0	61	M16x1.5	40	32	112	45	19	41	41	30	41	8.0	4°	0.67	P1C-4PRF
80	57.0	67	M20x1.5	39	42	122	56	19	41	41	30	41	10.0	4°	0.72	P1C-4PRF
100	57.0	67	M20x1.5	39	42	122	56	19	41	41	30	41	10.0	4°	0.72	P1C-4RRF
125	75.5	89	M27x2	48	48	145	60	24	55	55	32	55	13.5	4°	1.80	P1C-4RRF
160/200	C.F.	C.F.	M36x2	72	78	251	C.F.	36	75	75	50	55	18.0	4°	C.F.	L075530036

C.F. = Consult Factory

Nuts



Intended for fixed mounting of accessories to the piston rod.

Material: Zinc-plated steel

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.

Stainless Steel Nut

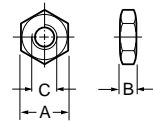
Material: Stainless steel A2

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.

Acid-proof nut

Material: Acid-proof steel A4

Cylinders with acid-proof piston rod are supplied with nut of acid-proof steel.



According to DIN 439 B

Bore size mm	A mm	B mm	C	Weight kg	Part numbers		
					Steel	Stainless steel	Acid-proof
32	17	5.0	M10x1.25	0.007	9128985601	9126725404	0261109919
40	19	6.0	M12x1.25	0.010	0261109910	9126725405	0261109920
50	24	8.0	M16x1.5	0.021	9128985603	9126725406	0261109917
63	24	8.0	M16x1.5	0.021			
80	30	10.0	M20x1.5	0.040	0261109911	0261109921	0261109916
100	30	10.0	M20x1.5	0.040			
125	41	13.5	M27x2	0.100	0261109912	0261109922	0261109918
160/200	55	18.0	M36x2	C.F.	L075540036	C.F.	C.F.

C.F. = Consult Factory

B

Tie Rod Cylinders
Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

4MNR Series

P1D Series



**Service Kits: P1D-S, P1D-T, P1D-C,
and P1D-F Versions**

Cylinder bore mm	P1D cylinder version
	Consisting of: piston, rod and o-ring seals
32	SK032P1D01
40	SK040P1D01
50	SK050P1D01
63	SK063P1D01
80	SK080P1D01
100	SK100P1D01
125	SK125P1D01

Gland Service Kits: P1D-G and P1D-E Versions

Bore size mm	Rod dia. mm	Rod no.	RG-rod gland cartridge kit Consisting of: rod gland, seals, and wiper		RK-rod seal kit Consisting of: gland seals, and wiper	
			Nitrile seals part number	Fluorocarbon seals part number	Nitrile seals part number	Fluorocarbon seals Part number
32	12	1	RG0P1D0121	RG0P1D0125	RK0P1D0121	RK0P1D0125
40	16	1	RG0P1D0161	RG0P1D0165	RK0P1D0161	RK0P1D0165
50 & 63	20	1	RG0P1D0201	RG0P1D0205	RK0P1D0201	RK0P1D0205
80 & 100	25	1	RG0P1D0251	RG0P1D0255	RK0P1D0251	RK0P1D0255
125	32	1	RG0P1D0321	RG0P1D0325	RK0P1D0321	RK0P1D0325

Piston and End Seal Service Kits: P1D-G and P1D-E Versions

Bore size mm	PK – piston seal kit Consisting of: piston seals, wear ring, and magnetic strip (nitrile only)		CB – cylinder body end seal kit Consisting of: end seal o-rings	
	Nitrile seals part number	Fluorocarbon seals part number	Nitrile seals part number	Fluorocarbon seals part number
32	PK032P1D01	PK032P1D05	CB032P1D01	CB032P1D05
40	PK040P1D01	PK040P1D05	CB040P1D01	CB040P1D05
50	PK050P1D01	PK050P1D05	CB050P1D01	CB050P1D05
63	PK063P1D01	PK063P1D05	CB063P1D01	CB063P1D05
80	PK080P1D01	PK080P1D05	CB080P1D01	CB080P1D05
100	PK100P1D01	PK100P1D05	CB100P1D01	CB100P1D05
125	PK125P1D01	PK125P1D05	CB125P1D01	CB125P1D05

B
Tie Rod Cylinders
Actuator Products
Series
3MA
4MA/4ML
3MAJ/4MAJ
Series
4MNR
Series
P1D
Series

SR Series

- 304 stainless steel cylinder body, non repairable construction
- Aluminum heads and caps, Delrin heads and caps are optional
- 12 bore sizes — 5/16" through 3"
 (see dimensional tables for SRM and SRD/SRDM exclusions).
- Stainless steel piston rods are standard up to 1.50" bore
- 28 standard mounting styles (not all available on SRM and SRD/SRDM – see table on following page)
- Single and double acting
- Adjustable cushions optional on both ends




Operating information

Operating pressure: 250 PSIG (17 bar) for SR and SRM
 100 PSIG (7 bar) for SRD/SRDM

Temperature range: -10°F to 165°F (-23°C to 74°C) for SR
 14°F to 140°F (-10°C to 60°C) for SRM
 32°F to 160°F (0°C to 71°C) for SRD/SRDM

Filtration requirements: 40 micron, dry filtered air

Ordering information

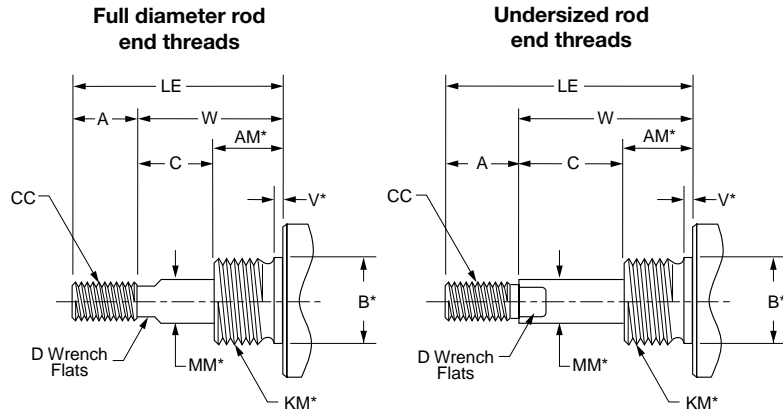
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¹ Bore sizes and mounting styles are limited by series. See table on next page for availability.
² Cushions not available on SRD/SRDM series or KDX mounts.
³ Bumpers may increase cylinder length. Please reference catalog 0900P-E, page D37 for adders.
⁴ Fluorocarbon seals not available on SRM or SRDM series.
⁵ TRD mount not available with cushions.

For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.

Non-Standard Rods

For non-standard rod dimensions, or undersized rod end threads, put a “3” in model number and describe the rod using the letters shown in the drawing. Specify CC, LE and A dimensions. LE is measured in retracted position.

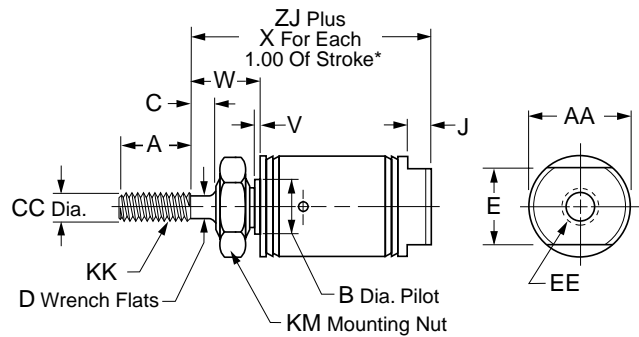


* Requires an S designation in model number.

Mounting Style N

Nose mount, spring return

Bore size	SR	SRM	Std. strokes (in)	Max. stroke (in)	SS rod std
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✓
7/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6	✓
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
3/4"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
7/8"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
1-1/4"	•	•	1/2, 1, 2, 3, 4	6	✓
1-1/2"	•	•	1/2, 1, 2, 3, 4	6	✓
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6	
2"	•	•	-	4	



Bore size																ZJ	
	A	AA	B	C	CC	D	E	EE	J	KK	KM	V	W	X	SR	SRM	
5/16"	0.38	0.36	-	-	0.125	-	0.36	#10-32	-	#5-40 UNC	1/4-28	0	0.25	0.75**	1.12	-	
7/16"	0.50	0.50	0.374	-	0.188	-	0.38	#10-32	0.19	#10-32 UNF	3/8-24	0.05	0.31	0.94**	1.31	-	
9/16"	0.50	0.62	0.437	-	0.188	-	0.50	#10-32	0.19	#10-32 UNF	7/16-20	0.06	0.38	1.62	1.53	1.76	
3/4"	0.50	0.81	0.499	-	0.250	-	0.62	1/8 NPTF	0.19	1/4-28 UNF	1/2-20	0.09	0.44	1.69	1.50	1.75	
7/8"	0.50	0.93	0.624	-	0.250	-	0.62	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	0.09	0.50	1.56	1.84	-	
1-1/16"	0.50	1.12	0.624	0.12	0.312	0.25	0.88	1/8 NPTF	0.19	5/16-24 UNF	5/8-18	0.09	0.69	1.56	2.06	2.31	
1-1/4"	0.75	1.34	0.749	0.25	0.437	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	0.88	1.81	2.66	2.78	
1-1/2"	0.75	1.56	0.749	0.25	0.437	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	0.88	1.69	2.44	2.69	
1-3/4"	0.88	1.84	1.031	0.38	0.500	7/16	1.25	1/4 NPTF	0.25	1/2-20 UNF	1-14	0.09	0.75	2.0	2.97	3.09	
2"	0.88	2.08	1.374	0.38	0.625	0.50	1.25	1/4 NPTF	0.31	1/2-20 UNF	1-1/4-120.12	1.19	-		▲	▲	

▲ SR: 5.41" for 1" stroke, 7.41" for 2" stroke, 8.66" for 3" stroke, 11.59" for 4" stroke.
 SRM: 5.66" for 1" stroke, 7.66" for 2" stroke, 8.91" for 3" stroke, 11.84" for 4" stroke.

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract a half inch.

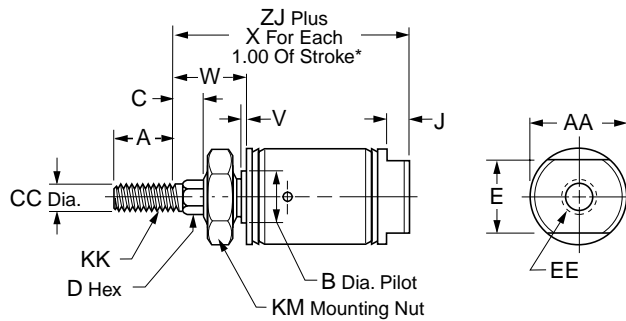
** For each 0.50" of stroke

B
 Round Body Cylinders
 Actuator Products
SR/SM/SRD/SRDM
 Series
SRX
 Series
P1L
 Series
P1A
 Series
P
 Series



Mounting Style NR

Nose mount, spring return, hex rod



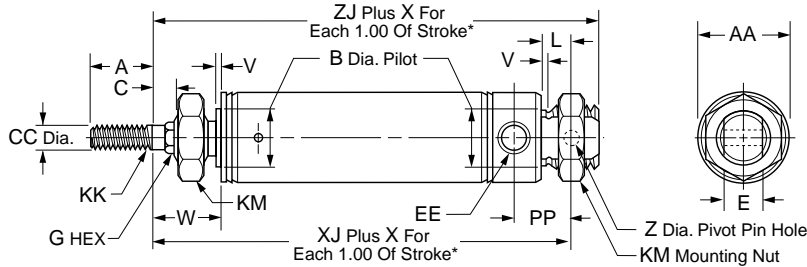
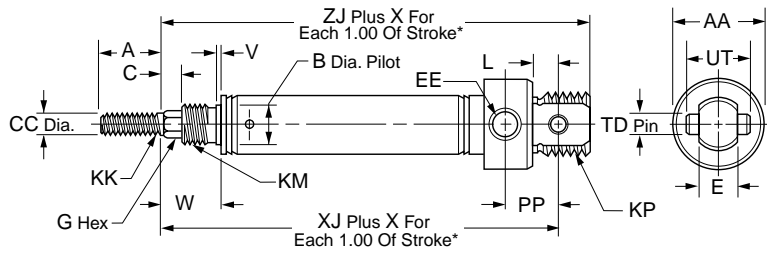
Bore size	SR	SRM	Std. stroke (in)	Max.. stroke (in)	SS rod std
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
3/4"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
7/8"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓
1-1/4"	•	•	1, 2, 3, 4	6	✓
1-1/2"	•	•	1/2, 1, 2, 3, 4	6	✓
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6	

Bore size	A	AA	B	C	CC	D	E	EE	J	KK	KM	V	W	X	ZJ	
															SR	SRM
7/16"	0.50	-	0.374	0.25	0.188	3/16	-	#10-32	0.19	#10-32 UNF	3/8-24	0.05	0.56	0.94	1.56	-
9/16"	0.50	-	0.437	0.25	0.188	3/16	-	#10-32	0.19	#10-32 UNF	7/16-20	0.06	0.62	1.62	1.78	2.03
3/4"	0.50	-	0.499	0.25	0.250	1/4	-	1/8 NPTF	0.19	1/4-28 UNF	1/2-20	0.09	0.69	1.69	1.75	2.00
7/8"	0.50	-	0.624	0.25	0.250	1/4	-	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	0.09	0.75	1.56	2.09	-
1-1/16"	0.50	1.12	0.624	0.25	0.312	3/8	0.88	1/8 NPTF	0.19	5/16-24 UNF	5/8-18	0.09	0.75	1.56	2.19	2.44
1-1/4"	0.88	1.34	0.749	0.25	0.437	7/16	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	0.88	1.81	2.66	2.78
1-1/2"	0.88	1.56	0.749	0.38	0.437	7/16	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	1.00	1.69	2.56	2.81
1-3/4"	0.88	1.84	1.031	0.38	0.500	1/2	1.25	1/4 NPTF	0.25	1/2-20 UNF	1-14	0.09	1.12	2.0	3.03	3.15

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

Mounting Style NRP

Pivot & nose mount, spring return, hex rod



Bore sizes

7/16" *
3/4"

* No mounting nuts

Bore sizes

9/16" *
7/8" *
1-1/16" *
1-1/4"
1-1/2" *
1-3/4"

* No mounting nuts

B
 Round Body Cylinders
 Actuator Products

SR/SW/SRD/SRDM
 Series

SRX
 Series

P1L
 Series

P1A
 Series

P
 Series

Bore size	Std. stroke (in)		Max. stroke (in)	SS rod std	A	AA	B	C	CC	E	EE	
	SR	SRM										
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.74	0.374	0.25	0.188	0.31	#10-32
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.62	0.437	0.25	0.188	0.31	#10-32
3/4"	•	•	1, 2, 3, 4	6	✓	0.50	0.86	0.499	0.25	0.250	0.38	1/8 NPTF
7/8"	•		1, 2, 3, 4	6	✓	0.50	0.93	0.624	0.25	0.250	0.38	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.50	1.12	0.624	0.25	0.312	0.38	1/8 NPTF
1-1/4"	•	•	1, 2, 3, 4	6	✓	0.88	1.34	0.749	0.25	0.437	0.50	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✓	0.88	1.56	0.749	0.38	0.437	0.62	1/8 NPTF
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6		0.88	1.84	1.031	0.38	0.500	0.62	1/4 NPTF

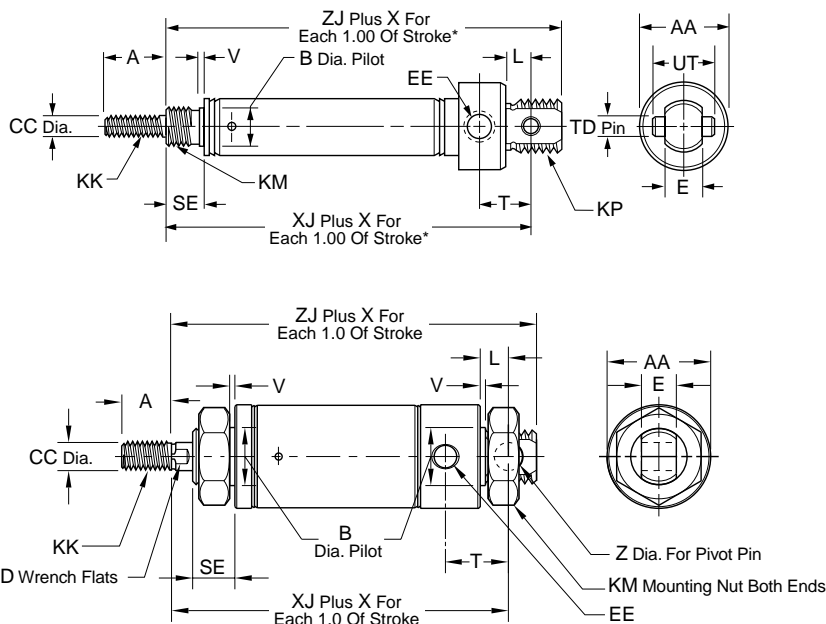
Bore size	XJ												ZJ			
	G HEX	KK	KM	KP	L	PP	TD	UT	V	W	X	SR	SRM	Z	SR	SRM
7/16"	3/16	#10-32 UNF	3/8-24	7/16-20 UNF	0.25	0.44	0.156	0.50	0.05	0.56	0.94	2.00	-	-	2.25	-
9/16"	3/16	#10-32 UNF	7/16-20	7/16-20 UNF	0.25	0.38	-	-	0.06	0.62	1.62	2.06	2.31	0.157	2.25	2.50
3/4"	1/4	1/4-28 UNF	1/2-20	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.69	1.69	2.53	2.78	-	2.81	3.06
7/8"	1/4	1/4-28 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.75	1.56	2.72	-	-	3.00	-
1-1/16"	3/8	5/16-24 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.75	1.56	2.78	3.03	-	3.06	3.31
1-1/4"	7/16	7/16-20 UNF	3/4-16	-	0.41	0.78	0.251	-	0.09	0.88	1.81	3.38	3.50	0.251	3.78	3.91
1-1/2"	7/16	7/16-20 UNF	3/4-16	-	0.50	0.81	0.375	1.00	0.09	1.00	1.69	3.25	3.50	-	3.62	3.87
1-3/4"	1/2	1/2-20 UNF	1-14	-	0.50	1.12	0.376	0.62	0.09	1.12	2.0	4.09	4.21	0.376	4.59	4.71

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.



Mounting Style P

Pivot mount, spring return



Bore sizes
5/16" *
7/16"
3/4"

* No mounting nuts

Bore sizes
9/16" *
7/8" *
1-1/16" *
1-1/4"
1-1/2" *
1-3/4"
2" *

* No mounting nuts

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE
5/16"	•		1/2, 1, 1-1/2, 2, 3, 4	4	✓	0.38	0.39	-	0.125	-	0.25	#10-32
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.74	0.374	0.188	-	0.31	#10-32
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.62	0.437	0.188	-	0.31	#10-32
3/4"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.86	0.499	0.250	-	0.38	1/8 NPTF
7/8"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.93	0.624	0.250	-	0.38	1/8 NPTF
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	1.12	0.624	0.312	0.25	0.38	1/8 NPTF
1-1/4"	•	•	1, 2, 3, 4	6	✓	0.75	1.34	0.749	0.437	0.38	0.50	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✓	0.75	1.56	0.749	0.437	0.38	0.62	1/8 NPTF
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6		0.88	1.84	1.031	0.500	7/16	0.62	1/4 NPTF
2"	•	•	-	4		0.88	2.08	1.374	0.625	0.50	0.75	1/4 NPTF

Bore size	KK	KM	KP	L	SE	T	TD	UT	V	X	XJ		ZJ		
											SR	SRM	Z	SR	SRM
5/16"	#5-40 UNC	3/8-24	-	0.34	0.25	0.34	-	-	-	0.75	1.52	-	0.125	1.68	-
7/16"	#10-32 UNF	3/8-24	7/16-20 UNF	0.25	0.31	0.44	0.156	0.50	0.05	0.94	1.75	-	-	2.00	-
9/16"	#10-32 UNF	7/16-20	7/16-20 UNF	0.25	0.38	0.38	-	-	0.06	1.62	1.81	2.06	0.157	2.00	2.25
3/4"	1/4-28 UNF	1/2-20	5/8-18 UNF	0.34	0.44	0.62	0.250	0.75	0.09	1.69	2.28	2.53	-	2.56	2.81
7/8"	1/4-28 UNF	5/8-18	5/8-18 UNF	0.34	0.50	0.62	0.250	0.75	0.09	1.56	2.47	-	-	2.75	-
1-1/16"	5/16-24 UNF	5/8-18	5/8-18 UNF	0.34	0.50	0.62	0.250	0.75	0.09	1.56	2.66	2.91	-	2.94	3.19
1-1/4"	7/16-20 UNF	3/4-16	-	0.41	0.63	0.78	-	-	0.09	1.81	3.38	3.91	0.251	3.78	3.50
1-1/2"	7/16-20 UNF	3/4-16	-	0.50	0.63	0.81	0.375	1.00	0.09	1.81	3.12	3.37	-	3.50	3.75
1-3/4"	1/2-20 UNF	1-14	-	0.50	0.75	1.12	-	-	0.09	2.0	4.03	4.15	0.376	4.53	4.65
2"	1/2-20 UNF	1-1/4-12	-	0.56	0.81	1.03	-	-	0.12	-	■	*	-	▲	◆

■ 6.34" for 1" stroke, 8.34" for 2" stroke, 9.59" for 3" stroke, 12.53" for 4" stroke*
 ▲ 6.78" for 1" stroke, 8.78" for 2" stroke, 10.03" for 3" stroke, 12.97" for 4" stroke*
 * To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract a half inch.

B

Round Body Cylinders
Actuator Products

SR/SM/SRD/SRDM
Series

SRX
Series

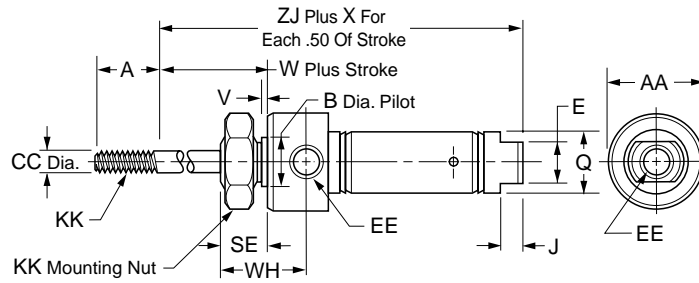
P1L
Series

P1A
Series

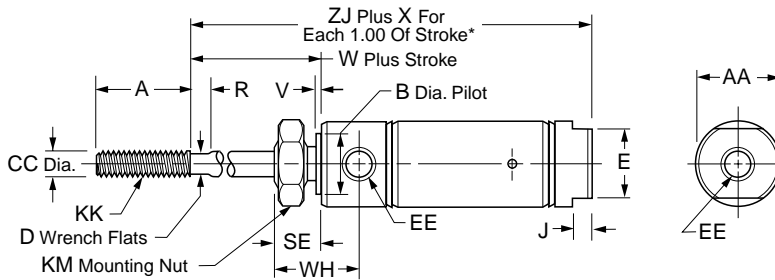
P
Series

Mounting Style R

Nose mount, spring extended



Bore sizes
5/16"
7/16"
3/4"



Bore sizes
9/16"
7/8"
1-1/16"
1-1/4"
1-1/2"
1-3/4"
2" *

* No mounting nuts

Bore size	Series		Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E
	SR	SRM									
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3	4	✓	0.38	0.50 SQ.	-	0.125	-	-
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.74	0.437	0.188	-	0.38
9/16"	•	•	1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.62	0.437	0.188	-	0.50
3/4"	•	•	1/2, 1, 2, 3, 4	6	✓	0.50	0.86	0.624	0.250	-	-
7/8"	•		1/2, 1, 2, 3, 4	6	✓	0.50	0.93	0.624	0.250	-	-
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	1.12	0.624	0.312	0.25	-
1-1/4"	•	•	1, 2, 3, 4	6	✓	0.75	1.34	0.749	0.437	0.38	-
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	0.437	0.38	0.88
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6		0.88	1.84	1.031	0.500	7/16	-
2"	•	•	-	4		0.88	2.08	1.374	0.625	0.50	-

Bore size	Series											ZJ	
	EE	J	KK	KM	Q	R	SE	V	W	WH	X	SR	SM
5/16"	#10-32	-	#5-40 UNC	3/8-24	0.36	-	0.31	-	0.31	0.47	1.25	1.49	-
7/16"	#10-32	0.19	#10-32 UNF	7/16-20	0.50	-	0.38	0.05	0.38	0.72	1.44	1.94	-
9/16"	#10-32	0.19	#10-32 UNF	7/16-20	0.62	-	0.38	0.05	0.38	0.78	2.62	2.00	2.25
3/4"	1/8 NPTF	-	1/4-28 UNF	5/8-18	0.81	-	0.50	0.09	0.50	0.97	2.69**	2.31	2.56
7/8"	1/8 NPTF	-	1/4-28 UNF	5/8-18	-	-	0.50	0.09	0.50	0.97	2.56	2.31	-
1-1/16"	1/8 NPTF	-	5/16-24 UNF	5/8-18	-	0.12	0.50	0.09	0.62	1.06	2.81	2.62	2.87
1-1/4"	1/8 NPTF	-	7/16-20 UNF	3/4-16	-	0.25	0.62	0.09	0.88	1.38	2.81	3.47	3.60
1-1/2"	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	-	0.25	0.62	0.09	0.88	1.25	3.00	3.19	3.44
1-3/4"	1/4 NPTF	-	1/2-20 UNF	1-14	-	-	0.75	0.09	1.06	1.63	3.0	4.03	4.15
2"	1/4 NPTF	-	1/2-20 UNF	1-1/4-12	-	0.38	0.81	0.12	1.19	1.47	-	▲	◆

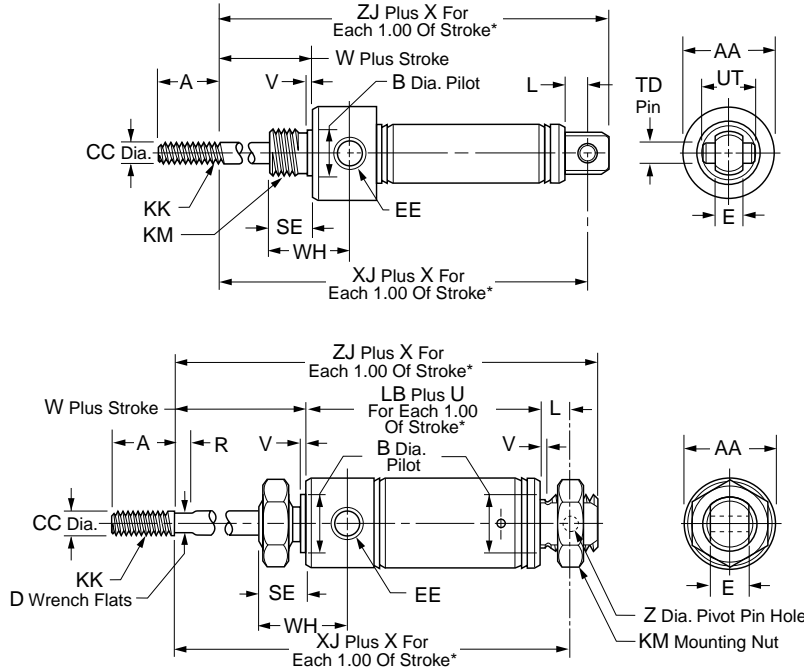
▲ 7.11" for 1" stroke, 10.11" for 2" stroke, 12.34" for 3" stroke, 16.34" for 4" stroke.*

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

** For each 1.00" of stroke.

Mounting Style RP

Pivot and nose mount, spring extended



Bore sizes
5/16" *
7/16"
3/4"

* No mounting nuts

Bore sizes
9/16" *
7/8" *
1-1/16" *
1-1/4"
1-1/2" *
1-3/4"
2" *

* No mounting nuts

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE	KK
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3	4	✓	0.38	0.50 SQ.	–	0.125	–	0.25	#10-32	#5-40 UNC
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.74	0.437	0.188	–	0.31	#10-32	#10-32 UNF
9/16"	•	•	1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.62	0.437	0.188	–	0.31	#10-32	#10-32 UNF
3/4"	•	•	1/2, 1, 2, 3, 4	6	✓	0.50	0.86	0.624	0.250	–	0.38	1/8 NPTF	1/4-28 UNF
7/8"	•		1/2, 1, 2, 3, 4	6	✓	0.50	0.93	0.624	0.250	–	0.38	1/8 NPTF	1/4-28 UNF
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	1.12	0.624	0.312	0.25	0.38	1/8 NPTF	5/16-24 UNF
1-1/4"	•	•	1, 2, 3, 4	6	✓	0.75	1.34	0.749	0.437	0.38	0.50	1/8 NPTF	7/16-20 UNF
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	0.437	0.38	0.62	1/8 NPTF	7/16-20 UNF
2"	•	•	–	4		.88	2.08	1.374	0.625	0.50	0.75	1/4 NPTF	1/2-20 UNF

Bore size	KM	L	LB	R	SE	TD	U	UT	V	W	WH	X	XJ			ZJ	
													SR	SRM	Z	SR	SRM
5/16"	3/8-24	0.19	–	–	0.31	–	–	–	–	0.31	0.47	1.25	1.88	–	–	2.04	–
7/16"	7/16-20	0.25	–	–	0.38	0.156	–	0.50	0.05	0.38	0.72	1.44	2.38	–	–	2.62	–
9/16"	7/16-20	0.25	–	–	0.38	–	–	–	0.06	0.38	0.78	2.62	2.28	2.53	0.157	2.47	2.72
3/4"	5/8-18	0.34	–	–	0.50	0.250	–	0.75	0.09	0.50	0.97	2.69	2.44	2.69	–	2.72	2.97
7/8"	5/8-18	0.34	–	–	0.50	0.250	–	0.75	0.09	0.50	0.97	2.56	2.63	–	–	2.91	–
1-1/16"	5/8-18	0.34	–	0.12	0.50	0.250	–	0.75	0.09	0.62	1.06	2.81	2.78	3.03	–	3.06	3.31
1-1/4"	3/4-16	0.41	2.47	0.25	0.62	–	1.81	–	0.09	0.88	1.38	2.81	3.78	3.91	0.251	4.16	4.28
1-1/2"	3/4-16	0.50	–	0.25	0.62	0.375	–	1.00	0.09	0.88	1.25	3.00	3.88	4.13	–	4.25	4.50
2"	1-1/4 -12	0.56	–	0.38	0.81	–	–	–	0.12	1.19	1.47	–	■	★	0.376	▲	◆

■ 8.05" for 1" stroke, 11.05" for 2" stroke, 13.28" for 3" stroke, 17.28" for 4" stroke*

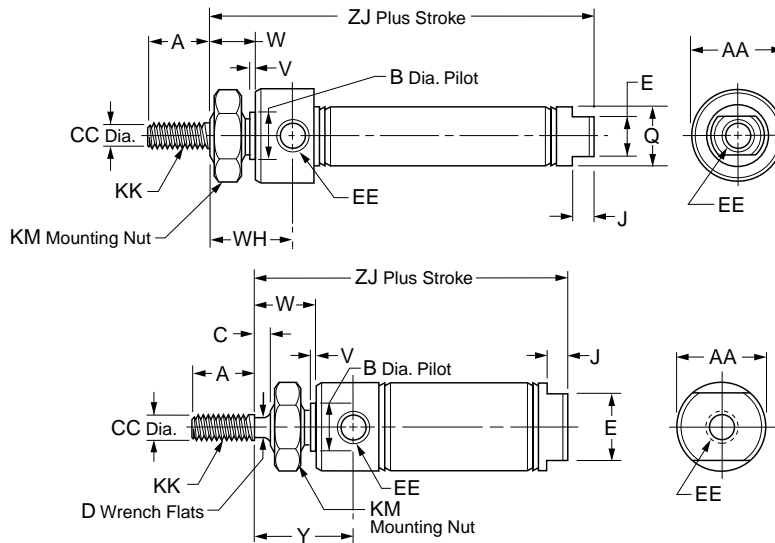
▲ 8.50" for 1" stroke, 11.50" for 2" stroke, 13.72" for 3" stroke, 17.72" for 4" stroke*

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.



Mounting Style D

Nose mount, double acting



Bore sizes
5/16"
7/16"
3/4"

Bore sizes
9/16"
7/8"
1-1/16"
1-1/4"
1-1/2"
1-3/4"
2" *
2-1/2" *
3" *

* No mounting nuts

Bore size	Series			Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC
	SR	SRM	SRD SRDM								
5/16"	•			1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✓	0.38	0.50 SQ.	–	–	0.125
7/16"	•			1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.74	0.437	–	0.188
9/16"	•	•	•	1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.62	0.437	–	0.188
3/4"	•	•	•	1/2, 1, 2, 2-1/2, 3, 4, 5, 6, 8, 10	12	✓	0.50	0.86	0.624	–	0.250
7/8"	•			1/2, 1, 2, 3, 4, 5, 6	12	✓	0.50	0.93	0.624	–	0.250
1-1/16"	•	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	12	✓	0.50	1.12	0.624	0.12	0.312
1-1/4"	•	•		1, 2, 3, 4, 5, 6	12	✓	0.75	1.34	0.749	0.25	0.437
1-1/2"	•	•	•	1/2, 1, 2, 3, 4, 5, 6, 8, 10, 12	12	✓	0.75	1.56	0.749	0.25	0.437
1-3/4"	•	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6	12		0.88	1.84	1.031	0.31	0.500
2"	•	•	•	–	12		0.88	2.08	1.374	0.38	0.625
2-1/2"	•	•		–	12		0.88	2.62	1.500	0.38	0.625
3"	•			–	12		1.25	3.16	1.630	0.38	0.750

Bore size	Series											ZJ	
	D	E	EE	J	KK	KM	Q	V	W	WH	Y	SR	SRM
5/16"	–	–	#10-32	–	#5-40 UNC	3/8-24	0.36	–	0.31	0.47	–	1.64	–
7/16"	–	0.38	#10-32	0.19	#10-32 UNF	7/16-20	0.50	0.05	0.38	0.72	–	2.12	–
9/16"	–	0.50	#10-32	0.19	#10-32 UNF	7/16-20	–	0.06	0.38	0.78	–	2.28	2.53
3/4"	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	0.81	0.09	0.50	0.97	–	2.97	2.97
7/8"	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	–	0.09	0.50	0.97	–	2.94	–
1-1/16"	0.25	0.88	1/8 NPTF	0.19	5/16-24 UNF	5/8-18	–	0.09	0.62	–	1.19	3.25	3.41
1-1/4"	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	–	0.09	0.88	–	1.62	4.00	4.03
1-1/2"	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	–	0.09	0.88	–	1.50	3.69	3.94
1-3/4"	7/16	1.25	1/4 NPTF	0.25	1/2-20 UNF	1-14	–	0.09	1.06	1.63	–	4.69	4.69
2"	0.50	1.25	1/4 NPTF	0.31	1/2-20 UNF	1-1/4-12	–	0.12	1.19	–	1.84	4.69	4.97
2-1/2"	1/2	1.75	1/4 NPTF	0.31	1/2-20 UNF	1-3/8-12	–	0.13	1.19	–	1.84	4.69	4.69
3"	5/8	2.00	3/8 NPTF	0.31	5/8-18 UNF	1-1/2-12	–	0.19	1.38	–	2.09	5.25	–



B
 Round Body Cylinders
 Actuator Products

SR/SW/SRD/SRDM
 Series

SRX
 Series

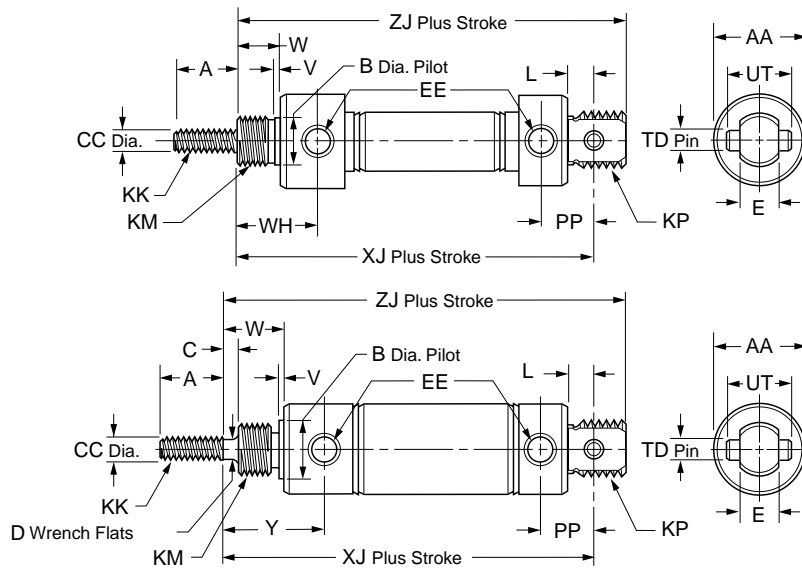
P1L
 Series

P1A
 Series

P
 Series

Mounting Style DP

Pivot and nose mount, double acting, pivot pin



Bore sizes
5/16"
7/16"
3/4"

Bore sizes
1-1/16"
1-1/2"

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod	A	AA	B	CC	D	E
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.74	0.437	0.188	-	0.31
3/4"	•	•	1/2, 1, 2, 2-1/2, 3, 4, 5, 6, 8, 10	12	✓	0.50	0.86	0.624	0.250	-	0.38
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	12	✓	0.50	1.12	0.624	0.312	0.25	0.38
1-1/2"	•	•	1, 2, 3, 4, 5, 6, 8, 10, 12	12	✓	0.75	1.56	0.749	0.437	0.38	0.62

Bore size	EE	KK	KM	KP	L	PP	TD	UT	V	W	WH	XJ		ZJ		
												SR	SRM	Y	SR	SRM
7/16"	#10-32	#10-32 UNF	7/16-20	7/16-20 UNF	0.25	0.44	0.156	0.50	0.05	0.38	0.72	2.56	-	-	2.81	-
3/4"	1/8 NPTF	1/4-28 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.50	0.97	3.75	3.75	-	4.03	4.03
1-1/16"	1/8 NPTF	5/16-24 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.62	-	3.84	4.00	1.19	4.12	4.28
1-1/2"	1/8 NPTF	7/16-20 UNF	3/4-16	-	0.50	0.81	0.375	1.00	0.09	0.87	-	4.38	4.63	1.50	4.75	5.00

B
 Round Body Cylinders
 Actuator Products

SR/SM/SRD/SRDM
 Series

SRX
 Series

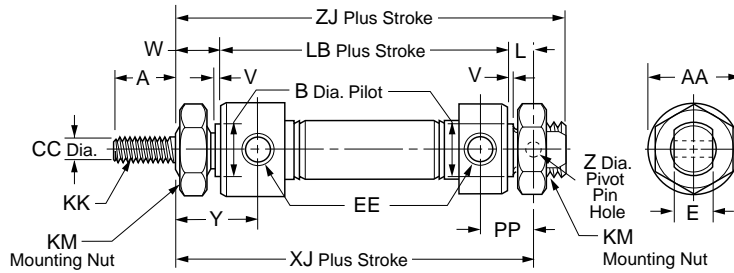
P1L
 Series

P1A
 Series

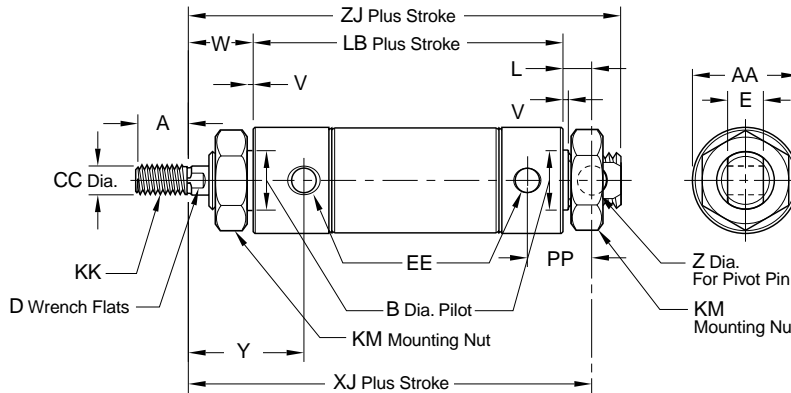
P
 Series

Mounting Style DXP

Pivot & nose mount, double acting, no pivot pin



Bore sizes
5/16"
7/16"
3/4"



Bore sizes
9/16" *
7/8"
1-1/16"
1-1/4"
1-1/2"
1-3/4"
2" *
2-1/2" *
3" *

* No mounting nuts

B
 Round Body Cylinders
 Actuator Products

SR/SW/SRD/SRDM
 Series

SRX
 Series

P1L
 Series

P1A
 Series

P
 Series

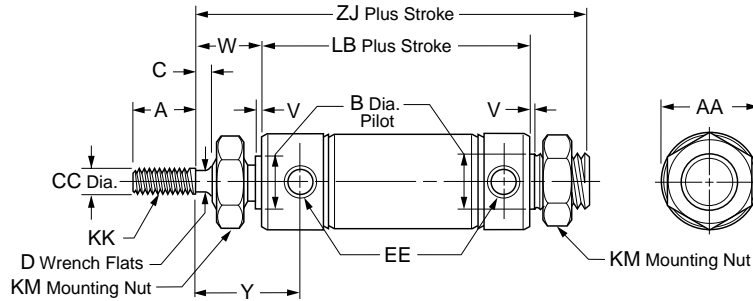
Bore size	SR	SRM	SRD	SRDM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E
5/16"	•				1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✓	0.38	0.50 SQ.	-	0.125	-	0.25
7/16"	•				1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.74	0.437	0.188	-	0.31
9/16"	•	•	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.62	0.437	0.188	-	0.31
3/4"	•	•	•		1, 2, 3, 4, 5, 6, 8, 10	32	✓	0.50	0.86	0.624	0.250	-	0.38
7/8"	•				1, 2, 3, 4, 5, 6, 8, 10	32	✓	0.50	0.93	0.624	0.250	-	0.38
1-1/16"	•	•	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	32	✓	0.50	1.12	0.624	0.312	0.25	0.38
1-1/4"	•	•			1, 2, 3, 4, 5, 6, 7, 8, 10, 12	32	✓	0.75	1.34	0.749	0.437	0.38	0.50
1-1/2"	•	•	•		-	32	✓	0.75	1.56	0.749	0.437	0.38	0.62
1-3/4"	•	•			1, 2, 3, 4, 5, 6, 8, 10, 12	32		0.88	1.84	1.031	0.500	7/16	0.62
2"	•	•	•		-	32		0.88	2.08	1.374	0.625	0.50	0.75
2-1/2"	•	•			-	32		0.88	2.62	1.500	0.625	1/2	0.75
3"	•				-	32		1.25	3.16	1.630	0.750	5/8	0.88

Bore size	XJ								ZJ					
	EE	KK	KM	L	LB	PP	V	W	SR	SRM	Y	Z	SR	SRM
5/16"	#10-32	#5-40 UNC	3/8-24	0.19	-	0.34	-	0.31	2.03	-	-	0.125	2.19	-
7/16"	#10-32	#10-32 UNF	7/16-20	0.25	1.94	0.44	0.05	0.38	2.56	-	0.72	0.157	2.81	-
9/16"	#10-32	#10-32 UNF	7/16-20	0.25	-	0.38	0.06	0.38	2.56	2.81	0.78	0.157	2.75	3.00
3/4"	1/8 NPTF	1/4-28 UNF	5/8-18	0.34	2.91	0.62	0.09	0.50	3.75	3.75	0.97	0.251	4.03	4.03
7/8"	1/8 NPTF	1/4-28 UNF	5/8-18	0.34	-	0.62	0.09	0.50	3.56	-	0.97	0.251	3.84	-
1-1/16"	1/8 NPTF	5/16-24 UNF	5/8-18	0.34	-	0.62	0.09	0.62	3.84	-	1.19	0.251	4.12	4.28
1-1/4"	1/8 NPTF	7/16-20 UNF	3/4-16	0.41	-	0.78	0.09	0.88	4.72	4.75	1.62	0.251	5.12	5.16
1-1/2"	1/8 NPTF	7/16-20 UNF	3/4-16	0.50	-	0.81	0.09	0.88	4.38	4.63	1.50	0.376	4.75	5.00
1-3/4"	1/4 NPTF	1/2-20 UNF	1-14	0.50	4.19	1.12	0.09	1.06	5.75	5.75	1.94	0.376	6.25	6.25
2"	1/4 NPTF	1/2-20 UNF	1-1/4-12	0.56	-	1.03	0.12	1.19	5.62	5.91	-	0.376	6.06	6.34
2-1/2"	1/4 NPTF	1/2-20 UNF	1-3/8-12	0.56	-	1.03	0.13	1.19	5.62	5.62	1.84	0.376	6.06	6.06
3"	3/8 NPTF	5/8-18 UNF	1-1/2-12	0.81	-	1.34	0.19	1.38	6.50	-	2.09	0.500	7.12	-



Mounting Style DX

Threaded both ends, double acting



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std
7/16" *	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓
9/16" *	•	•	1/2, 1, 1-1/2, 2, 3, 4	12	✓
3/4" *	•	•	1, 2, 3, 4, 5, 6, 8, 10	32	✓
7/8" *	•	•	1, 2, 3, 4, 5, 6, 8, 10	32	✓
1-1/16" *	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	32	✓
1-1/4" *	•	•	1, 2, 3, 4, 5, 6, 7, 8, 10, 12	32	✓
1-1/2"	•	•	1, 2, 3, 4, 5, 6, 8, 10, 12	32	✓
2" *	•	•	–	32	

Bore size	A	AA	B	C	CC	D	EE	KK	KM	LB			ZJ		
										SR	SRM	V	W	Y	SR
7/16" *	0.50	0.74	0.437	–	0.188	–	#10-32	#10-32 UNF	7/16-20	1.94		0.05	0.38	0.72	2.81
9/16" *	0.50	0.62	0.437	–	0.188	–	#10-32	#10-32 UNF	7/16-20	–		0.06	0.38	0.78	2.75
3/4" *	0.50	0.86	0.624	–	0.250	–	1/8 NPTF	1/4-28 UNF	5/8-18	2.91		0.09	0.50	0.97	4.03
7/8" *	0.50	0.93	0.624	–	0.250	–	1/8 NPTF	1/4-28 UNF	5/8-18	–		0.09	0.50	0.97	3.84
1-1/16" *	0.50	1.12	0.624	0.12	0.312	0.25	1/8 NPTF	5/16-24 UNF	5/8-18	–		0.09	0.62	1.19	4.12
1-1/4" *	0.75	0.34	0.749	0.25	0.437	0.38	1/8 NPTF	7/16-20 UNF	3/4-16	–		0.09	0.88	1.62	5.12
1-1/2"	0.75	1.56	0.749	0.25	0.437	0.38	1/8 NPTF	7/16-20 UNF	3/4-16	3.00		0.09	0.88	1.50	4.50
2" *	0.88	2.08	1.374	0.38	0.625	0.50	1/4 NPTF	1/2-20 UNF	1-1/4-12	–		0.12	1.19	–	6.06

* Available upon request. Please consult factory.

B

Round Body Cylinders
 Actuator Products

SR/SM/SRD/SRDM
 Series

SRX
 Series

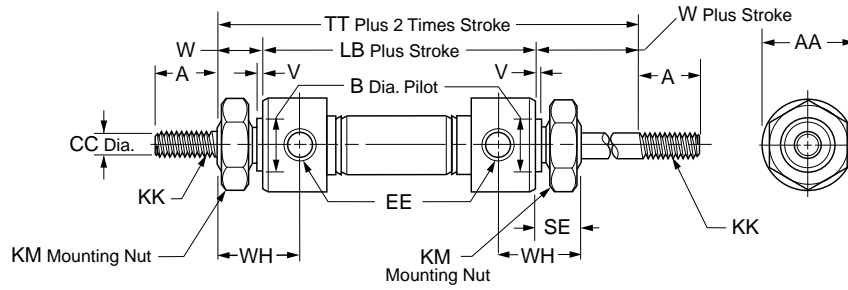
P1L
 Series

P1A
 Series

P
 Series

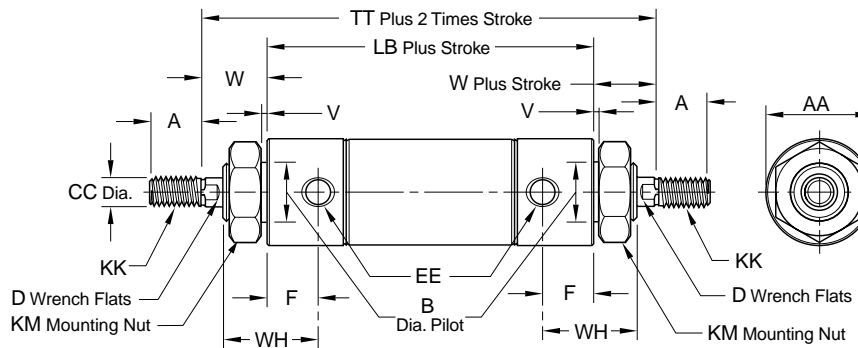
Mounting Style KDX

Threaded both ends, double acting, double rod



Bore sizes

- 7/16"
- 3/4"



Bore sizes

- 9/16" *
- 7/8"
- 1-1/16"
- 1-1/4"
- 1-1/2"
- 1-3/4"
- 2" *
- 2-1/2" *
- 3" *

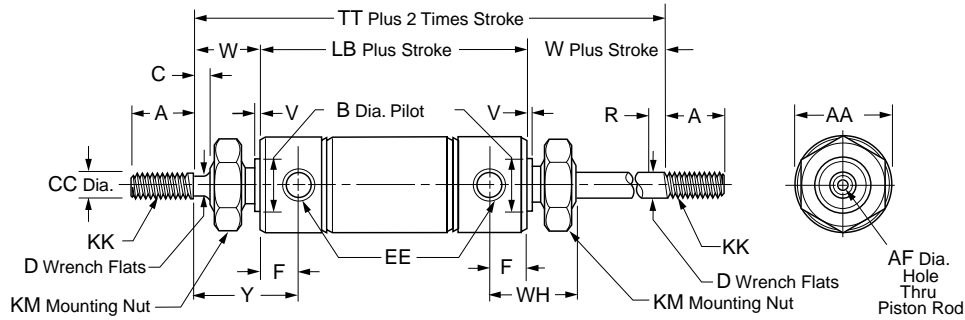
* No mounting nuts

Bore size	SR	SRM	SRD SRDM	Std. stroke (in)	Max. stroke (in)	SS rod	A	AA	B	CC
7/16"	•			1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.74	0.437	0.188
9/16"	•	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✓	0.50	0.62	0.437	0.188
3/4"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.50	0.86	0.624	0.250
7/8"	•			1, 2, 3, 4, 6	12	✓	0.50	0.93	0.624	0.250
1-1/16"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.50	1.12	0.624	0.312
1-1/4"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	1.34	0.749	0.437
1-1/2"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	1.56	0.749	0.437
1-3/4"	•	•	•	1, 2, 3, 4, 5, 6	12	✓	0.88	1.84	1.031	0.500
2"	•	•	•	–	12	✓	0.88	2.08	1.374	0.625
2-1/2"	•	•	•	–	18	✓	0.88	2.62	1.500	0.625
3"	•	•	•	–	12	✓	1.25	3.16	1.630	0.750

Bore size	D	EE	F	KK	KM	LB			TT			V	W	WH
						SR	SRM	SE	SR	SRM	SE			
7/16"	–	#10-32	0.34	#10-32 UNF	7/16-20	2.06	–	0.38	2.81	–	0.05	0.38	0.72	
9/16"	–	#10-32	0.40	#10-32 UNF	7/16-20	2.19	2.44	0.38	2.94	3.19	0.06	0.38	0.78	
3/4"	–	1/8 NPTF	0.47	1/4-28 UNF	5/8-18	3.00	3.00	0.50	4.00	4.00	0.09	0.50	0.97	
7/8"	–	1/8 NPTF	0.47	1/4-28 UNF	5/8-18	2.91	–	0.50	3.91	–	0.09	0.50	0.97	
1-1/16"	0.25	1/8 NPTF	0.56	5/16-24 UNF	5/8-18	2.75	3.28	0.50	4.00	4.53	0.09	0.62	1.19	
1-1/4"	0.38	1/8 NPTF	0.75	7/16-20 UNF	3/4-16	3.81	3.84	0.63	5.56	5.59	0.09	0.88	1.62	
1-1/2"	0.38	1/8 NPTF	0.62	7/16-20 UNF	3/4-16	3.38	3.63	0.63	5.12	5.38	0.09	0.88	1.50	
1-3/4"	7/16	1/4 NPTF	0.88	1/2-20 UNF	1-14	4.44	4.44	0.75	6.56	6.56	0.09	1.06	1.63	
2"	0.50	1/4 NPTF	0.65	1/2-20 UNF	1-1/4-12	4.19	4.47	–	6.56	6.84	0.12	1.19	1.84	
2-1/2"	1/2	1/4 NPTF	0.65	1/2-20 UNF	1-3/8-12	4.19	4.19	–	6.56	6.56	0.13	1.19	1.84	
3"	5/8	3/8 NPTF	0.71	5/8-18 UNF	1-1/2-12	4.56	–	–	7.31	–	0.19	1.38	1.72	

Mounting Style KDXH

Threaded both ends, double rod, hollow rod

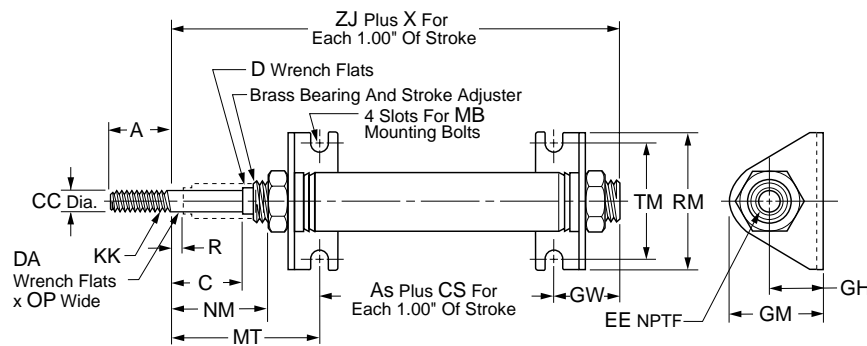


Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod	A	AA	AF	B	C	CC
1-1/16"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.50	1.12	0.187	0.624	0.12	0.312
1-1/4"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.75	1.34	0.250	0.749	0.25	0.437
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.75	1.56	0.250	0.749	0.25	0.437
1-3/4"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.88	1.84	0.328	1.031	0.38	0.500

Bore size	D	EE	F	KK	KM	LB		R	TT		V	W	WH	Y
						SR	SRM		SR	SRM				
1-1/16"	0.25	1/8 NPTF	0.56	5/16-24 UNF	5/8-18	2.75	3.28	0.12	4.00	4.53	0.09	0.62	1.06	1.19
1-1/4"	0.38	1/8 NPTF	0.75	7/16-20 UNF	3/4-16	3.81	3.84	0.25	5.56	5.59	0.09	0.88	1.38	1.62
1-1/2"	0.38	1/8 NPTF	0.62	7/16-20 UNF	3/4-16	3.38	3.63	0.25	5.12	5.38	0.09	0.88	1.25	1.50
1-3/4"	7/16	1/4 NPTF	0.88	1/2-20 UNF	1-14	4.44	4.44	–	6.56	6.56	0.09	1.06	1.63	1.63

Mounting Style A

Nose mount, spring return, head adjustable stroke



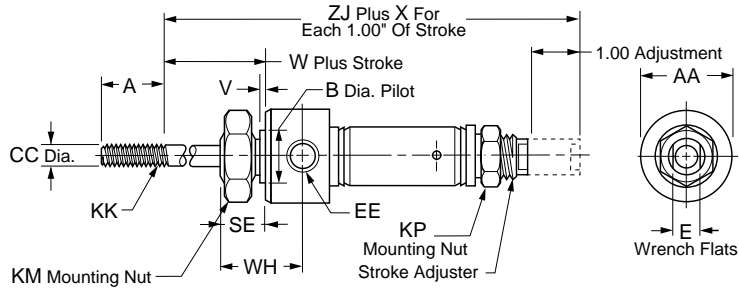
Bore size	SR	SRM	Std. stroke	Max. stroke (in)	SS rod std	A	AS	C	CC	CS	D
3/4"	•		Stroke adjustment in 1" increments to 3": 1" stroke adjusts 0-1"	6	✓	0.50	–	1.19	0.250	1.69	–
1-1/16"	•		2" stroke adjusts 1-2"	6	✓	0.50	0.32	1.25	0.312	1.56	0.25
1-1/2"	•		3" stroke adjusts 2-3"	6	✓	0.75	0.19	1.25	0.437	2.00	0.62

Bore size	EE	GH	GM	GW	KK	MB	MT	NM	OP	R	RM	TM	X	ZJ
3/4"	1/8 NPTF	0.81	1.38	0.88	1/4-28 UNF	0.250	2.38	1.44	–	0.19	1.88	1.50	1.69	3.12
1-1/16"	1/8 NPTF	0.81	1.38	0.93	5/16-24 UNF	0.250	2.38	1.44	0.12	0.25	1.88	1.50	1.56	3.63
1-1/2"	1/8 NPTF	1.00	1.78	1.25	7/16-20 UNF	0.250	2.56	1.50	–	0.25	2.50	1.88	2.00	4.00

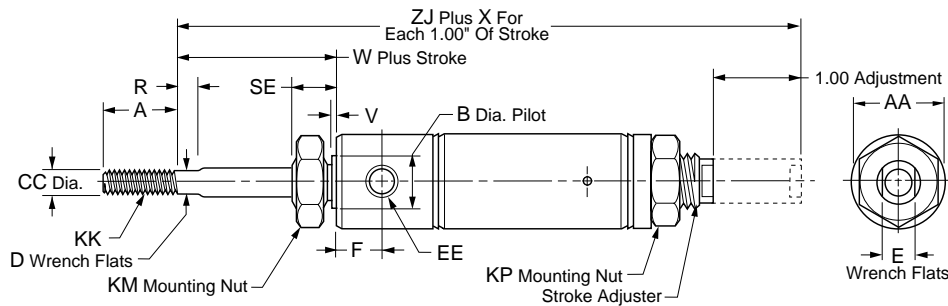


Mounting Style RA

Nose mount, spring return, cap adjustable stroke



Bore sizes
 3/4"



Bore sizes
 1-1/16"
 1-1/2"

B
 Round Body Cylinders
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 P
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Bore size	SR	SRM	Std. stroke	Max. stroke (in)	SS rod std
3/4"	•		Stroke adjustment in 1" increments to 3"	6	✓
1-1/16"	•		1" stroke adjusts 0-1"	6	✓
1-1/2"	•		2" stroke adjusts 1-2" 3" stroke adjusts 2-3"	6	✓

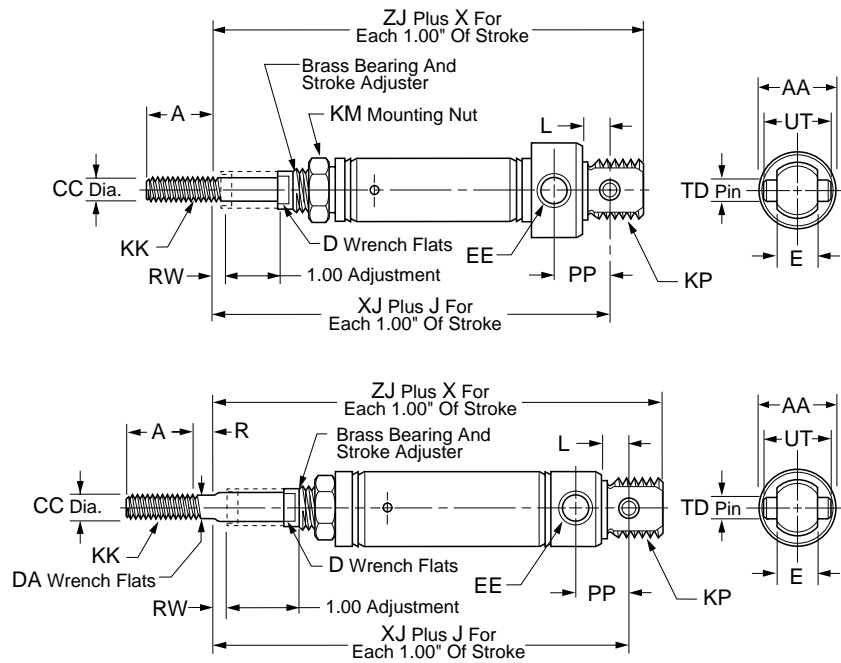
Bore size	A	AS	AA	B	CC	D	E	EE	F
3/4"	0.50	1.69	0.86	0.624	0.250	-	0.34	1/8 NPTF	-
1-1/16"	0.50	0.32	1.12	0.624	0.312	0.25	0.50	1/8 NPTF	0.56
1-1/2"	1.25	0.19	1.56	0.749	0.437	0.38	0.62	1/8 NPTF	0.62

Bore size	KK	KM	SE	R	V	W	WH	X	ZJ
3/4"	1/4-28 UNF	5/8-18	0.50	-	0.09	0.53	0.97	2.69	3.78
1-1/16"	5/16-24 UNF	5/8-18	0.50	0.12	0.09	0.50	-	2.56	4.03
1-1/2"	7/16-20 UNF	3/4-16	0.62	0.25	0.09	0.88	-	2.00	5.81



Mounting Style AP

Pivot mount, spring return, head adjustable stroke



Bore sizes
 3/4"

Bore sizes
 1-1/16"
 1-1/2"

Bore size	SR	SRM	Std. stroke	Max. stroke (in)	SS rod std
3/4"	•		Stroke adjustment in 1" increments to 3":	6	✓
1-1/16"	•		1" stroke adjusts 0-1" 2" stroke adjusts 1-2"	6	✓
1-1/2"	•		3" stroke adjusts 2-3"	6	✓

Bore size	A	AA	CC	D	DA	E	EE	J	KK
3/4"	0.50	0.86	0.250	0.34	–	0.38	1/8 NPTF	1.69	1/4-28 UNF
1-1/16"	0.50	1.12	0.312	0.50	0.25	0.38	1/8 NPTF	1.56	5/16-24 UNF
1-1/2"	0.75	1.56	0.437	0.62	0.38	0.62	1/8 NPTF	2.00	7/16-20 UNF

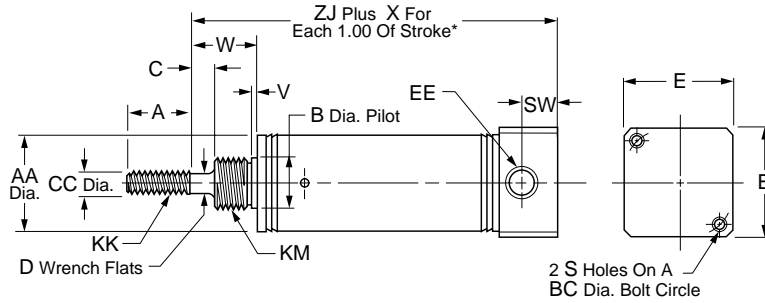
Bore size	KM	KP	L	OP	PP	R	RW	TD	UT	X	XJ	ZJ
3/4"	7/16-20	5/8-18 UNF	0.34	–	0.62	0.19	0.19	0.250	0.75	1.69	3.65	3.93
1-1/16"	–	5/8-18 UNF	0.34	0.25	0.62	0.12	0.25	0.250	0.75	1.56	3.97	4.25
1-1/2"	3/4-16	–	0.50	–	0.81	0.25	0.25	0.375	1.00	2.00	4.31	4.69

B
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 Series



Mounting Style BRN

Rear block mount, single acting, spring return



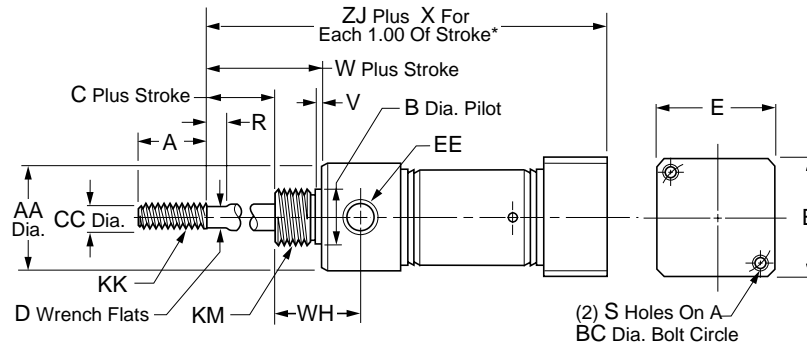
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D
7/16"	•		1/2, 1, 2, 3, 4	6	✓	0.50	0.5	0.374	–	0.188	–
3/4"	•	•	1, 2, 3, 4	6	✓	0.75	0.81	0.499	0.25	0.250	0.22
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.624	0.38	0.312	0.25
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	0.25	0.437	0.38

Bore size	E	EE	KK	KM	SW	V	W	X	ZJ	
									SR	SRM
7/16"	0.75	#10-32	#10-32 UNF	3/8-24	0.38	0.05	0.31	0.94	1.62	–
3/4"	1.00	1/8 NPTF	1/4-28 UNF	1/2-20	0.44	0.09	0.62	1.69	2.31	2.56
1-1/16"	1.25	1/8 NPTF	5/16-24 UNF	5/8-18	0.44	0.09	0.88	1.81	2.81	3.06
1-1/2"	1.75	1/4 NPTF	7/16-20 UNF	3/4-16	0.62	0.09	0.88	2.00	3.06	3.31

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

Mounting Style BRR

Rear block mount, single acting, spring extend



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	BC	C	CC	D
3/4"	•	•	1, 2, 3, 4	6	✓	0.75	0.86	0.624	1.00	0.25	0.250	0.22
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.624	1.25	0.38	0.312	0.25
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	1.75	0.25	0.437	0.38

Bore size	E	EE	KK	KM	R	S	V	W	WH	X	ZJ	
											SR	SRM
3/4"	1.00	1/8 NPTF	1/4-28 UNF	5/8-18	0.25	#10-32 UNF	0.09	0.75	0.97	2.69	3.22	3.47
1-1/16"	1.25	1/8 NPTF	5/16-24 UNF	5/8-18	0.25	#10-32 UNF	0.09	0.88	1.06	2.81	3.53	3.78
1-1/2"	1.75	1/4 NPTF	7/16-20 UNF	3/4-16	0.25	1/4-20 UNC	0.09	0.88	1.25	3.00	3.88	4.13

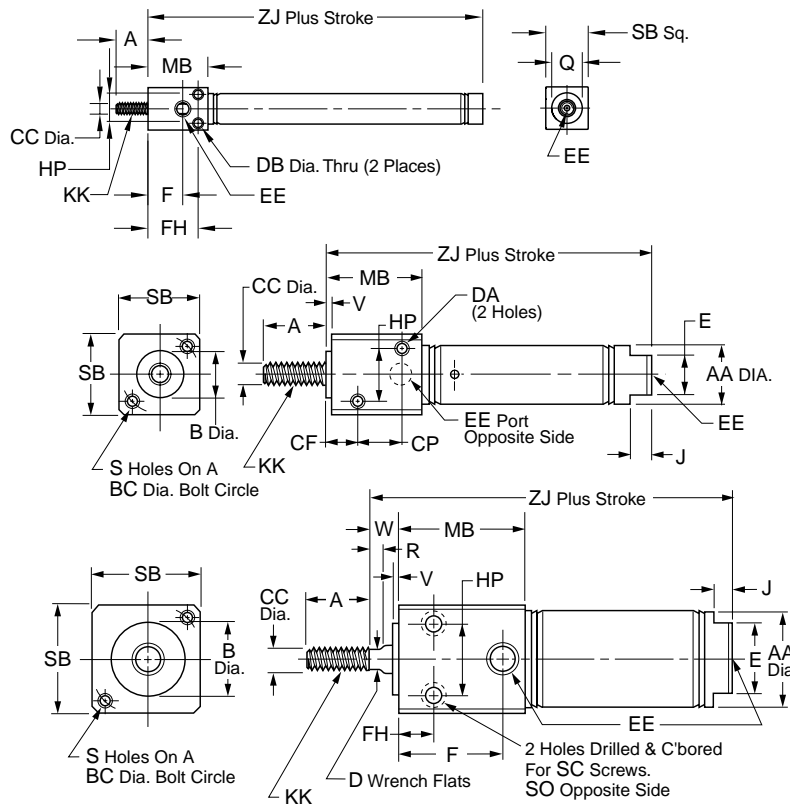
* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

B
 Round Body Cylinders
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 P
 Series



Mounting Style BFD

Front block mount, double acting



Bore sizes
 5/16"

Bore sizes
 7/16"

Bore sizes
 3/4"
 1-1/16"
 1-1/2"

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	BC	CC
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✓	0.38	-	-	-	0.125
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.50	0.437	0.75	0.188
3/4"	•	•	1/2, 1, 2, 3, 4, 5, 6	12	✓	0.75	0.81	0.624	1.00	0.250
1-1/16"	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	1.12	0.750	1.25	0.312
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✓	1.25	1.56	1.00	1.75	0.437

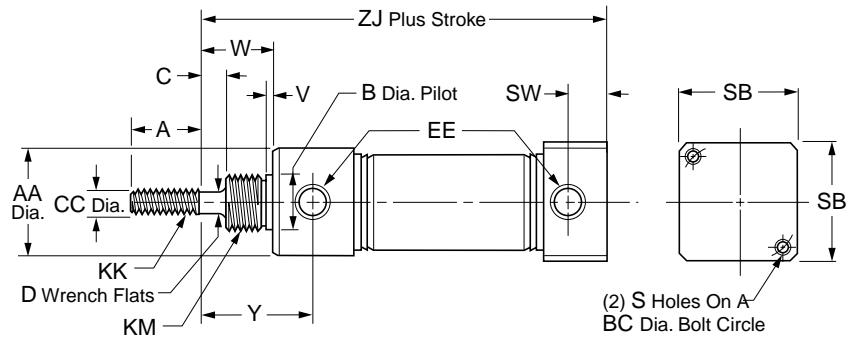
Bore size	CF	CP	D	DA	DB	E	EE	F	FH	HP	J
5/16"	-	-	-	-	0.11	-	#10-32	0.41	0.59	0.34	-
7/16"	0.31	0.44	-	#8-32	-	0.38	#10-32	-	0.31	0.44	0.19
3/4"	-	-	0.22	-	-	0.62	1/8 NPTF	0.88	0.38	0.62	0.19
1-1/16"	-	-	0.25	-	-	0.88	1/8 NPTF	1.16	0.62	0.81	0.19
1-1/2"	-	-	0.38	-	-	0.88	1/4 NPTF	1.53	0.88	1.12	0.25

Bore size	ZJ											
	KK	MB	Q	R	S	SB	SC	SO	V	W	SR	SRM
5/16"	#5-40 UNC	0.71	0.36	-	-	0.50 SQ	-	-	-	-	1.72	-
7/16"	#10-32 UNF	0.88	-	-	#8-32 UNC	0.75	-	-	0.062	-	2.12	-
3/4"	1/4-28 UNF	1.12	-	-	#10-32 UNF	1.00	#10-32	1/4-20 UNC	0.093	0.34	3.22	3.22
1-1/16"	5/16-24 UNF	1.41	-	0.25	#10-32 UNF	1.25	#10-32	1/4-20 UNC	0.093	0.47	3.75	3.91
1-1/2"	7/16-20 UNF	1.88	-	-	1/4-20 UNC	1.75	1/4-20	5/16-18 UNC	0.125	0.38	4.19	4.44



Mounting Style BRD

Rear block mount, double acting



B
 Round Body Cylinders
 Actuator Products
 SR/SW/SRD/SRDM
 Series
 SRX
 Series
 P1L
 Series
 P1A
 Series
 P
 Series

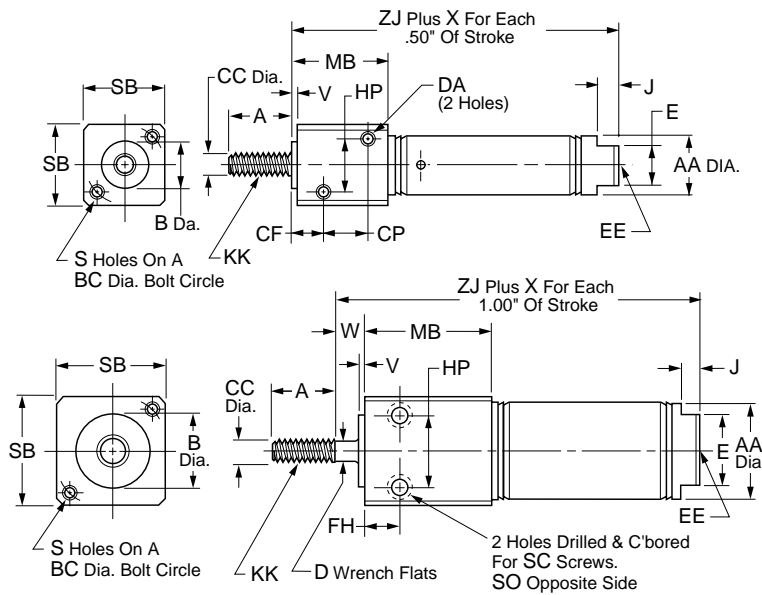
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std
7/16"	•		1/2, 1, 2, 3, 4	12	✓
3/4"	•	•	1, 2, 3, 4, 5, 6	12	✓
1-1/16"	•	•	1, 2, 3, 4	12	✓
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✓

Bore size	A	AA	B	BC	C	CC	D	EE	KK
7/16"	0.50	0.74	0.437	0.75	–	0.188	–	#10-32	#10-32 UNF
3/4"	0.75	0.86	0.624	1.00	0.25	0.250	0.22	1/8 NPTF	1/4-28 UNF
1-1/16"	0.75	1.12	0.624	1.25	0.38	0.312	0.25	1/8 NPTF	5/16-24 UNF
1-1/2"	1.25	1.56	0.749	1.75	0.25	0.437	0.38	1/4 NPTF	7/16-20 UNF

Bore size	KM	S	SB	SW	V	W	Y	ZJ	
								SR	SRM
7/16"	7/16-20 UNF	#8-32 UNC	0.75	0.38	0.05	0.43	0.72	2.44	–
3/4"	5/8-18 UNF	#10-32 UNF	1.00	0.44	0.09	0.75	1.22	3.78	3.78
1-1/16"	5/8-18 UNF	#10-32 UNF	1.25	0.44	0.09	0.88	1.44	4.00	4.16
1-1/2"	3/4-16 UNF	1/4-20 UNC	1.75	0.62	0.09	0.88	1.47	4.38	4.63

Mounting Style BFN

Front block mount, single acting, spring return



Bore sizes
7/16"

Bore sizes
3/4"
1-1/16"
1-1/2"

Bore size	SR	SRM	Std. stroke (in)	Max stroke (in)	SS rod std
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✓
3/4"	•	•	1/2, 1, 2, 3, 4	6	✓
1-1/16"	•	•	1, 2, 3, 4	6	✓
1-1/2"	•	•	1, 2, 3, 4	6	✓

Bore size	A	AA	B	BC	CC	CF	CP	D	DA	E	EE	FH
7/16"	0.50	0.50	0.437	0.75	0.188	0.31	0.44	-	#8-32 UNC	0.38	#10-32	0.31
3/4"	0.75	0.81	0.624	1.00	0.250	-	-	0.22	-	0.62	1/8 NPTF	0.38
1-1/16"	0.75	1.12	0.750	1.25	0.312	-	-	0.25	-	0.88	1/8 NPTF	0.62
1-1/2"	1.25	1.56	1.00	1.75	0.437	-	-	0.38	-	0.88	1/4 NPTF	0.88

Bore size	HP	J	KK	MB	S	SB	SC	SO	V	W	X	ZJ	
												SR	SRM
7/16"	0.44	0.19	#10-32 UNF	0.88	#8-32 UNC	0.75	-	-	0.062	-	0.94	1.94	-
3/4"	0.62	0.19	1/4-28 UNF	1.12	#10-32 UNF	1.00	#10-32	1/4-20 UNC	0.093	0.34	1.69	2.66	2.91
1-1/16"	0.81	0.19	5/16-24 UNF	1.41	#10-32 UNF	1.25	#10-32	1/4-20 UNC	0.093	0.47	1.81	3.38	3.63
1-1/2"	1.12	0.25	7/16-20 UNF	1.88	1/4 UNC	1.75	1/4-20	5/16-18 UNC	0.125	0.38	2.00	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

B
 Round Body Cylinders
 Actuator Products

SR/SM/SRD/SRDM
 Series

SRX
 Series

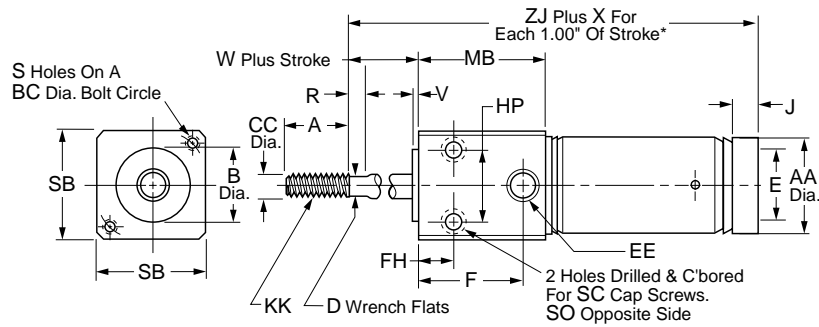
P1L
 Series

P1A
 Series

P
 Series

Mounting Style BFR

Front block mount, single acting, spring extend



Bore size	SR	SRM	Std. stroke (in)	Max stroke (in)	SS rod std
3/4"	•	•	1, 2, 3, 4	6	✓
1-1/16"	•	•	1, 2, 3, 4	6	✓
1-1/2"	•	•	1, 2, 3, 4	6	✓

Bore size	A	AA	B	BC	CC	D	E	EE	F	FH	HP	J
3/4"	0.75	0.81	0.624	1.00	0.250	0.22	-	1/8 NPTF	0.88	0.38	0.62	0.19
1-1/16"	0.75	1.12	0.750	1.25	0.312	0.25	-	1/8 NPTF	1.16	0.62	0.81	-
1-1/2"	1.25	1.56	1.00	1.75	0.437	0.38	0.88	1/4 NPTF	1.53	0.88	1.12	0.25

Bore size	KK	MB	R	S	SB	SC	SO	V	W	X	ZJ	
											SR	SRM
3/4"	1/4-28 UNF	1.12	0.25	#10-32 UNF	1.00	#10-32	1/4-20 UNC	0.093	0.34	2.69	2.56	2.81
1-1/16"	5/16-24 UNF	1.41	0.25	#10-32 UNF	1.25	#10-32	1/4-20 UNC	0.093	0.47	2.81	3.12	3.37
1-1/2"	7/16-20 UNF	1.88	0.25	1/4-20 UNC	1.75	1/4-20	5/16-18 UNC	0.125	0.38	3.00	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

B
 Round Body Cylinders
 Actuator Products

SR/SW/SRD/SRDM
 Series

SRX
 Series

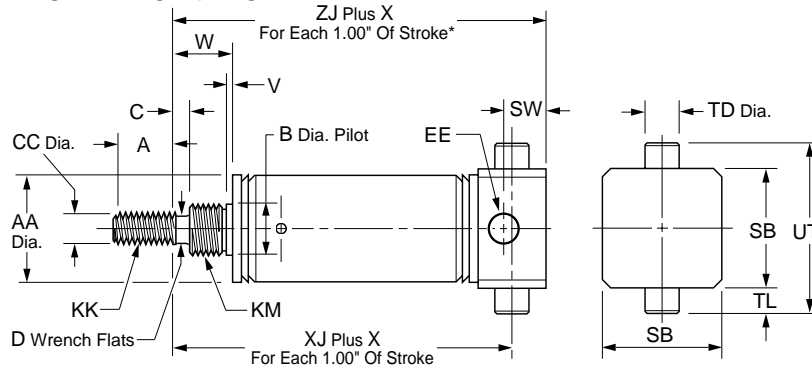
P1L
 Series

P1A
 Series

P
 Series

Mounting Style TRN

Rear trunnion mount, single acting, spring return



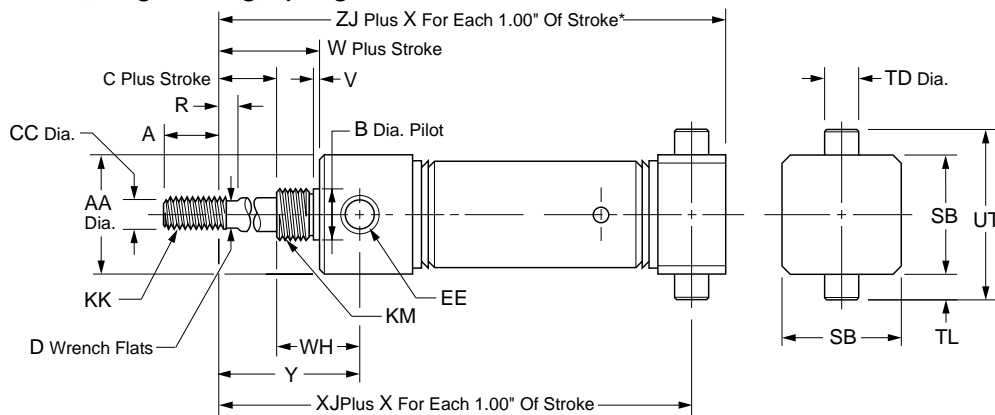
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	EE
						7/16"	•		1/2, 1, 2, 3, 4	6	✓	0.50
3/4"	•	•	1, 2, 3, 4	6	✓	0.75	0.81	0.499	0.25	0.250	0.22	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.624	0.38	0.312	0.25	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	0.749	0.25	0.437	0.38	1/4 NPTF

Bore size	KK	KM	SB	SW	TD	TL	UT	V	W	X	XJ		ZJ	
											SR	SRM	SR	SRM
7/16"	#10-32 UNF	3/8-24 UNF	0.75	0.38	0.374	0.50	1.25	0.05	0.32	0.94**	1.38	–	1.62	–
3/4"	1/4-28 UNF	1/2-20 UNF	1.00	0.44	0.500	0.38	1.75	0.09	0.62	1.69	1.94	2.19	2.31	2.56
1-1/16"	5/16-24 UNF	5/8-18 UNF	1.25	0.44	0.500	0.38	2.00	0.09	0.88	1.81	2.44	2.69	2.81	3.06
1-1/2"	7/16-20 UNF	3/4-16 UNF	1.75	0.62	0.500	0.38	2.50	0.09	0.88	2.00	2.56	2.81	3.06	3.31

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.
 ** For each 0.50" of stroke.

Mounting Style TRR

Rear trunnion mount, single acting, spring extend



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	EE
						3/4"			1, 2, 3, 4	6	3	0.75
1-1/16"			1, 2, 3, 4	6	3	0.75	1.12	0.624	0.38	0.312	0.25	1/8 NPTF
1-1/2"			1, 2, 3, 4	6	3	1.25	1.56	0.749	0.25	0.437	0.38	1/4 NPTF

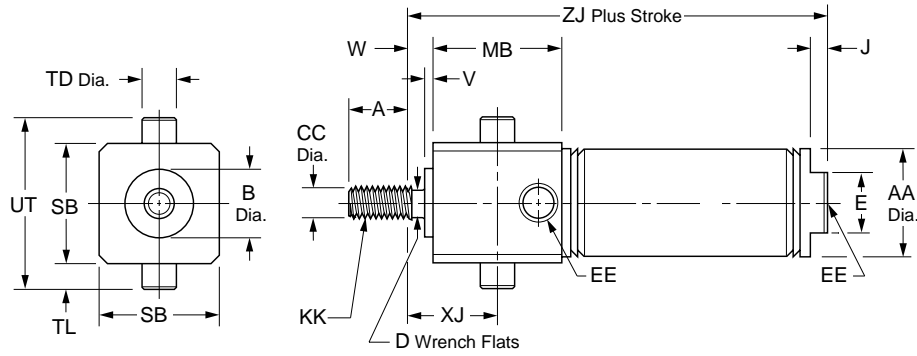
Bore size	KK	KM	R	SB	TD	TL	UT	V	W	WH	X	XJ		ZJ	
												SR	SRM	SR	SRM
3/4"	1/4-28 UNF	1/2-20 UNF	0.25	1.00	0.500	0.38	1.75	0.09	0.75	0.72	2.69	2.85	3.10	3.22	3.47
1-1/16"	5/16-24 UNF	5/8-18 UNF	0.25	1.25	0.500	0.38	2.00	0.09	0.88	0.68	2.81	3.15	3.40	3.53	3.78
1-1/2"	7/16-20 UNF	3/4-16 UNF	0.25	1.75	0.500	0.38	2.50	0.09	0.88	1.25	3.00	3.38	3.63	3.88	4.13

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.



Mounting Style TFD

Front trunnion mount, double acting

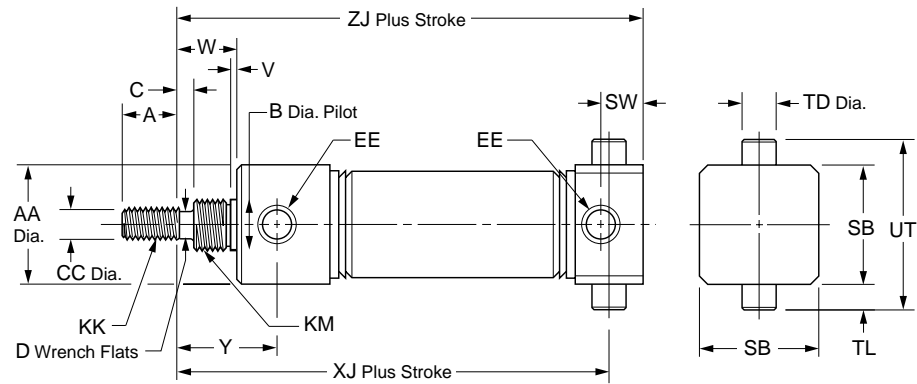


Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.50	0.437	0.188	–	0.38	#10-32
3/4"	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	0.81	0.624	0.250	0.22	0.62	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	1.12	0.750	0.312	0.25	0.88	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✓	1.25	1.56	1.000	0.437	0.38	0.88	1/4 NPTF

Bore size	J	KK	MB	SB	TD	TL	UT	V	W	XJ	ZJ SR	ZJ SRM
7/16"	0.19	#10-32 UNF	0.88	0.75	0.374	0.250	1.25	0.062	–	0.31	2.12	–
3/4"	0.19	5/16-24 UNF	1.12	1.00	0.500	0.38	1.75	0.093	0.34	0.69	3.22	3.22
1-1/16"	0.25	7/16-20 UNF	1.41	1.25	0.500	0.38	2.00	0.093	0.47	1.09	3.75	3.91
1-1/2"			1.88	1.75	0.500	0.38	2.50	0.125	0.38	1.31	4.19	4.44

Mounting Style TRD

Rear trunnion mount, double acting



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✓	0.50	0.74	0.437	–	0.188	–	#10-32
3/4"	•	•	1, 2, 3, 4, 5, 6	12	✓	0.75	0.86	0.624	0.25	0.250	0.22	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	12	✓	0.75	1.12	0.624	0.38	0.312	0.25	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✓	1.25	1.56	0.749	0.25	0.437	0.38	1/4 NPTF

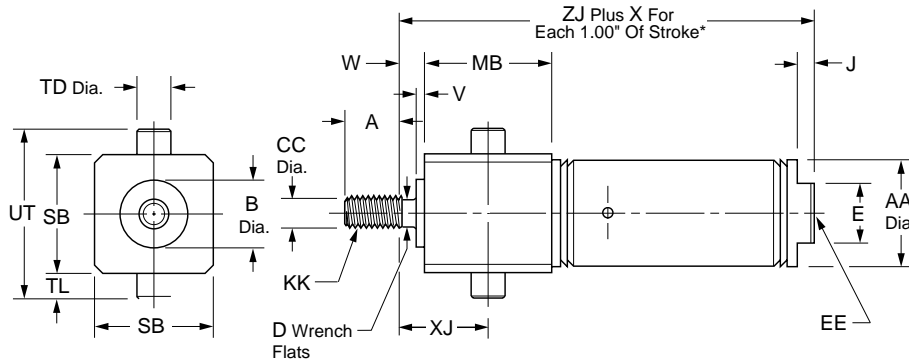
Bore size	KK	KM	SB	SW	TD	TL	UT	V	W	XJ SR	XJ SRM	Y	ZJ SR	ZJ SRM
7/16"	#10-32 UNF	7/16-20 UNF	0.75	0.38	0.374	0.25	1.25	0.05	0.38	2.19	–	0.72	2.44	–
3/4"	5/16-24 UNF	5/8-18 UNF	1.00	0.44	0.500	0.38	1.75	0.09	0.75	3.41	3.41	1.22	3.78	3.78
1-1/16"	7/16-20 UNF	3/4-16 UNF	1.25	0.44	0.500	0.38	2.00	0.09	0.88	3.62	3.62	1.44	4.00	4.16
1-1/2"			1.75	0.62	0.500	0.38	2.50	0.09	0.88	3.88	4.13	1.47	4.38	4.63

B
 Round Body Cylinders
 Actuator Products
 SR/SW/SRD/SRDM
 Series
 SRX
 Series
 P1L
 Series
 P1A
 Series
 P
 Series



Mounting Style TFN

Front trunnion mount, single acting, spring return



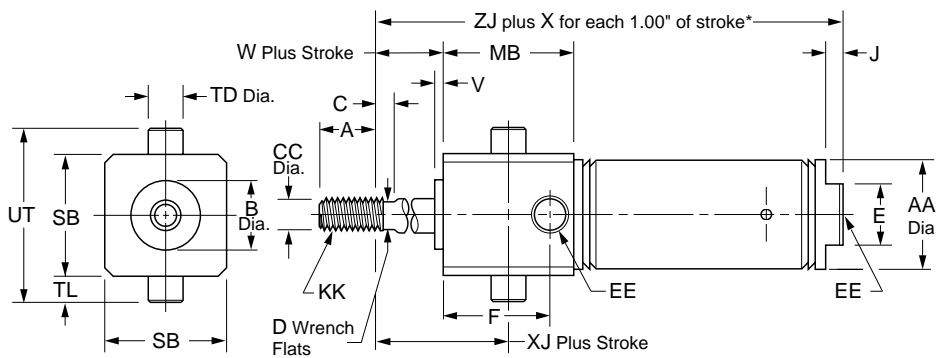
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✓	0.50	0.50	0.437	0.188	–	0.38	#10-32
3/4"	•	•	1/2, 1, 2, 3, 4	6	✓	0.75	0.81	0.624	0.250	0.22	0.62	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.750	0.312	0.25	0.88	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	1.000	0.437	0.38	0.88	1/4 NPTF

Bore size	J	KK	MB	SB	TD	TL	UT	V	W	X	XJ	ZJ SR	ZJ SRM
7/16"	0.19	#10-32 UNF	0.88	0.75	0.374	0.25	1.25	0.062	0	0.94**	0.31	1.94	–
3/4"	0.19	5/16-24 UNF	1.12	1.00	0.500	0.38	1.75	0.093	0.34	1.69	0.69	2.66	2.91
1-1/16"	0.25	7/16-20 UNF	1.41	1.25	0.500	0.38	2.00	0.093	0.47	1.81	1.09	3.38	3.63
1-1/2"			1.88	1.75	0.500	0.38	2.50	0.125	0.38	2.00	1.31	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.
 ** For each 0.50" of stroke

Mounting Style TFR

Front trunnion mount, single acting, spring extend



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	E
3/4"	•	•	1, 2, 3, 4	6	✓	0.75	0.81	0.624	0.25	0.250	0.22	0
1-1/16"	•	•	1, 2, 3, 4	6	✓	0.75	1.12	0.750	0.25	0.312	0.25	0
1-1/2"	•	•	1, 2, 3, 4	6	✓	1.25	1.56	1.000	0.25	0.437	0.38	0.88

Bore size	F	EE	J	KK	MB	SB	TD	TL	UT	V	W	X	XJ	ZJ SR	ZJ SRM
3/4"	0.88	1/8 NPTF	–	1/4-28 UNF	1.12	1.00	0.500	0.38	1.75	0.093	0.34	2.69	0.69	2.56	2.81
1-1/16"	1.16	1/8 NPTF	–	5/16-24 UNF	1.41	1.25	0.500	0.38	2.00	0.093	0.47	2.81	1.09	3.12	3.37
1-1/2"	–	1/4 NPTF	0.25	7/16-20 UNF	1.88	1.75	0.500	0.38	2.50	0.125	0.38	3.00	1.31	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.



Air Reservoirs

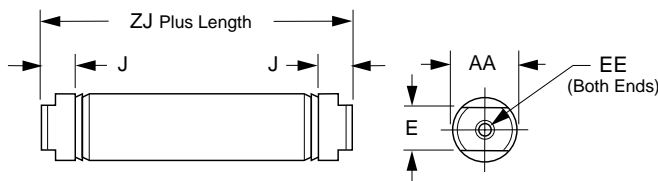
Air Reservoirs installed can significantly reduce the pulsation of a system. In addition air reservoirs can be used as a means to store energy. Caution should always be used when storing energy. Air reservoirs if installed in the correct location and sized correctly can temporarily increase the flow of an actuator or cylinder.

As always never exceed the rated pressure of the cylinder.

Ordering information

.75	AR	SR	2.00																				
<table border="1"> <tr><th colspan="2">Bore Size*</th></tr> <tr><td>.75</td><td>3/4"</td></tr> <tr><td>1.06</td><td>1-1/16"</td></tr> <tr><td>1.50</td><td>1-1/2"</td></tr> <tr><td>2.00</td><td>2"</td></tr> <tr><td>2.50</td><td>2-1/2"</td></tr> <tr><td>3.00</td><td>3"</td></tr> </table>	Bore Size*		.75	3/4"	1.06	1-1/16"	1.50	1-1/2"	2.00	2"	2.50	2-1/2"	3.00	3"	<table border="1"> <tr><th colspan="2">Mounting</th></tr> <tr><td>AR</td><td>Air Reservoir</td></tr> </table>	Mounting		AR	Air Reservoir		<table border="1"> <tr><th>Length</th></tr> <tr><td>Specify in inches. See table below.</td></tr> </table>	Length	Specify in inches. See table below.
Bore Size*																							
.75	3/4"																						
1.06	1-1/16"																						
1.50	1-1/2"																						
2.00	2"																						
2.50	2-1/2"																						
3.00	3"																						
Mounting																							
AR	Air Reservoir																						
Length																							
Specify in inches. See table below.																							

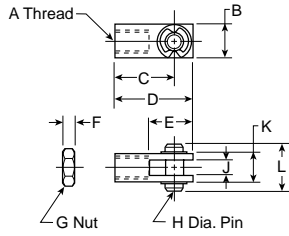
Bore size	Standard lengths	Max. length	Volume (in3)
3/4"	1" increments to 4"	32"	0.39 plus 0.44 per inch length
1-1/16"	1" increments to 8"	32"	0.99 plus 0.89 per inch length
1-1/2"	1" increments to 16"	32"	1.91 plus 1.77 per inch length
2"	1" increments to 16"	32"	4.22 plus 3.14 per inch length
2-1/2"	1" increments to 16"	32"	7.04 plus 4.91 per inch length
3"	1" increments to 16"	32"	9.90 plus 7.07 per inch length



Bore size	AA	E	EE	J	ZJ
3/4"	0.813	0.625	1/8" NPTF	0.19	1.938
1-1/16"	1.125	0.88	1/8" NPTF	0.19	2.375
1-1/2"	1.56	0.88	1/8" NPTF	0.250	2.250
2"	2.08	1.25	1/4" NPTF	0.562	2.875
2-1/2"	2.62	1.75	1/4" NPTF	0.562	2.875
3"	3.16	2.00	3/8" NPTF	0.562	3.190

Piston Rod Clevis

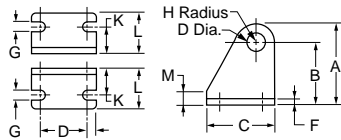
Assembly includes pin and (2) retainer rings and (1) jam nut.



Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
5/16	#5-40	.31	.44	.56	.38	.11	#5-40	.12	.13	.31	.50	L071300025
7/16, 9/16	#10-32	.38	.75	.94	.56	.12	#10-32	.19	.19	.38	.56	L071300100 L077130100*
3/4, 7/8	1/4-28	.50	.94	1.19	.68	.16	1/4-28	.25	.25	.50	.69	L071300200 L077130200*
1-1/16	5/16-24	.50	.94	1.19	.68	.19	5/16-24	.25	.25	.50	.69	L071300300 L077130300*
1-1/4, 1-1/2	7/16-20	.75	1.31	1.69	.94	.25	7/16-20	.38	.38	.75	1.03	L071300400 L077130400*
1-3/4, 2, 2-1/2	1/2-20	.75	1.31	1.69	.94	.31	1/2-20	.38	.38	.75	1.03	L071300500 L077130500*
3	5/8-18	1.00	2.25	2.75	1.50	.38	5/8-18	.50	.50	1.00	1.38	L071300600

* Stainless Steel for use with SRD/SRDM cylinders.

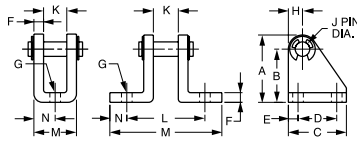
Pivot Brackets



Bore size	A	B	C	D	E	F	G	H	J	K	L	M	Part number
7/16	.76	.56	.75	.50	.12	.06	.19	.20	.160	.28	.50	.12	L071310100
3/4, 7/8, 1-1/16	1.19	.88	1.12	.75	.19	.12	.27	.31	.255	.44	.81	.25	L071310200
1-1/2	1.75	1.38	1.50	1.00	.25	.12	.27	.38	.380	.62	1.00	.25	L071310300

Pivot Bracket Assembly

Assembly includes pin and (2) retainer rings.



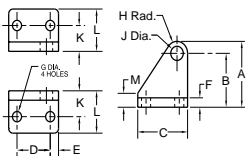
5/16" bore only

Bore size	A	B	C	D	E	F	G	H	J	K	L	M	N	Part number
5/16	.53	.40	.62	.38	.12	.04	.16	.12	.12	.26	-	.36	.18	L071320025
7/16, 9/16	.76	.56	.75	.50	.12	.06	.19	.19	.156	.34	.91	1.34	.22	L071320100 L077150100*
3/4, 7/8, 1-1/16	1.18	.88	1.12	.75	.19	.12	.27	.30	.250	.38	1.25	2.00	.38	L071320200 L077150200*
1-1/4	1.18	.88	1.12	.75	.19	.12	.27	.30	.250	.50	1.38	2.14	.38	L071320300
1-1/2, 1-3/4	1.75	1.38	1.50	1.00	.25	.25	.27	.37	.375	.62	2.00	2.88	.44	L071320400 L077150400*
2, 2-1/2	1.75	1.38	1.50	1.00	.25	.25	.27	.37	.375	.75	2.12	3.00	.44	L071320500 L077150500*
3	2.25	1.75	1.75	1.25	.25	.25	.27	.50	.50	.88	2.62	3.88	.62	L071320600

* Stainless steel for use with SRD/SRDM cylinders.

SR Series Trunnion Brackets

Select brackets for SR series trunnion mount cylinders from the table below. (Note: trunnion brackets are ordered as a separate item from the cylinder.)

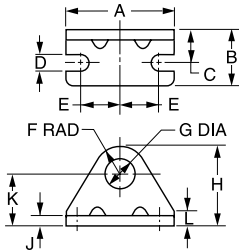


Bore size	A	B	C	D	E	F	G	H	J	K	L	M	Part number
7/16	1.75	1.38	1.50	1	.25	.25	.27	.38	.375	.69	1.12	.37	L076600100
3/4, 1-1/16, 1-1/2	1.75	1.38	1.50	1	.25	.25	.27	.38	.500	.69	1.12	.37	L076600200

Most popular.



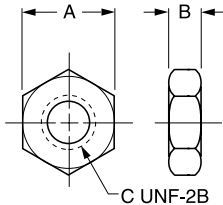
Foot Brackets



Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
5/16	1.00	.37	.25	.13	.37	.31	.25	.75	.06	.44	.12	L073790016
5/16	1.00	.37	.25	.13	.37	.31	.38	.75	.06	.44	.12	L073790023
7/16	1.38	.62	.31	.19	.50	.31	.38	.88	.07	.56	.12	L073790024
7/16, 9/16	1.38	.62	.38	.19	.50	.38	.44	.94	.09	.56	.12	L073790028 L077160028*
3/4	1.62	.75	.44	.19	.62	.41	.50	1.09	.10	.69	.19	L073790032
3/4, 7/8, 1-1/16	1.88	1.00	.56	.27	.75	.56	.63	1.38	.12	.81	.25	L073790040 L077160040*
1-1/4, 1-1/2	2.50	1.50	.75	.27	.94	.75	.75	1.75	.12	1.00	.38	L073790048 L077160048*
1-3/4	3.00	1.50	.87	.35	1.12	.91	1.03	2.16	.19	1.25	.50	L073790102
2	3.12	1.62	1.00	.34	1.12	1.00	1.38	2.50	.25	1.50	.62	L073790124 L077160124*
2-1/2	3.75	1.62	1.00	.35	1.44	1.25	1.51	3.00	.25	1.75	.75	L073790132
3	4.37	1.62	1.00	.35	1.75	1.25	1.64	3.14	.25	1.89	.89	L073790140

* Stainless Steel for use with SRD/SRDM cylinders.

Mounting Nut



Bore size	A	B	C	Part number
5/16	.44	.16	1/4-28	L073800200
5/16, 7/16	.56	.22	3/8-24	L073800400
7/16, 9/16	.69	.25	7/16-20	L073800500 L077170500*
3/4	.75	.31	1/2-20	L073800600
3/4, 7/8, 1-1/16	.94	.38	5/8-18	L073800800 L077170800*
1-1/4, 1-1/2	1.12	.42	3/4-16	L073800900
1-1/4, 1-1/2	1.12	.72	3/4-16	L077170900*
1-3/4	1.50	.55	1-14	L073801100
2	1.88	.50	1-1/4-12	L073801200 L077171200*
2-1/2	2.06	.78	1-3/8-12	L073801400
3	2.25	.84	1-1/2-12	L073801500

* Stainless Steel for use with SRD/SRDM cylinders.

Most popular.



B
 Round Body Cylinders
 Actuator Products

SR/SW/SRD/SRDM
 Series

SRX
 Series

P1L
 Series

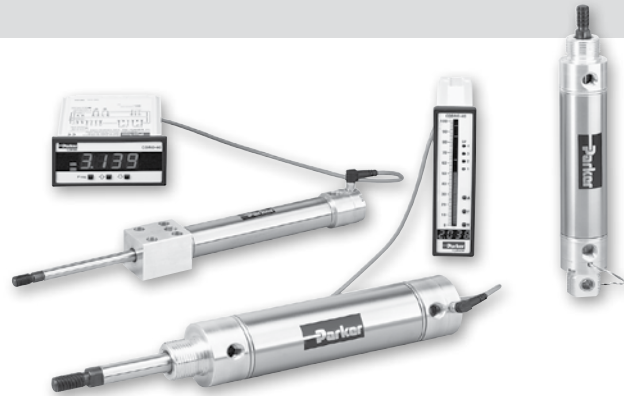
P1A
 Series

P
 Series

SRX Series

- Continuous position feedback
- Bore sizes: 1-1/16" to 3"
- Signal input: 5 to 24 VDC
- Signal output (w/o controls): DC ratiometric voltage*
- Signal output (w/controls): 0 to 10 VDC or 4 to 20 mA
- Strokes: Available in any practical stroke length up to 24"

* Mega Ohm impedance interface device suggested for limiting sensor current if controller is not used.




Operating information

Operating pressure:	150 PSIG (10.3 bar)
Temperature range:	40°F to 160°F (4.4°C to 71°C)
Filtration requirements:	40 micron, dry filtered air

Ordering information

1.50"	DXP	P	SRX	B	F	S	3	6.00"
Bore size		Connector style		Piston		Special		Stroke
1.06"		P Plug		B Bumper*		S Special		Stroke in inches
1.50"		F Flying leads		Leave blank if not required.		Leave blank if special modification is not required.		
2.00"								
2.50"								
3.00"								
	Mounting style				Seals		Non-standard rod dimension	
	D Nose mount				F Low friction		3 Non-standard dimension	
	DXP Nose and pivot mount				Leave blank if not required.		Leave blank if special rod end dimension is not required.	
	BFD Front block mount							

* Incorporating bumpers adds 1/4" of overall length to the cylinder.

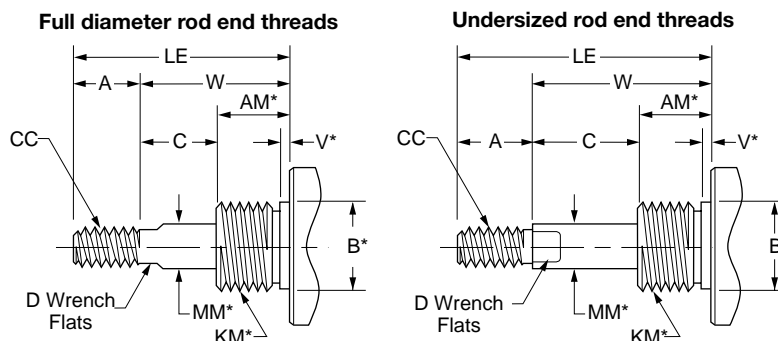
Sensors
 For sensors see page B339. 

NOTE: For non-standard / special rod ends, see below.

For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.

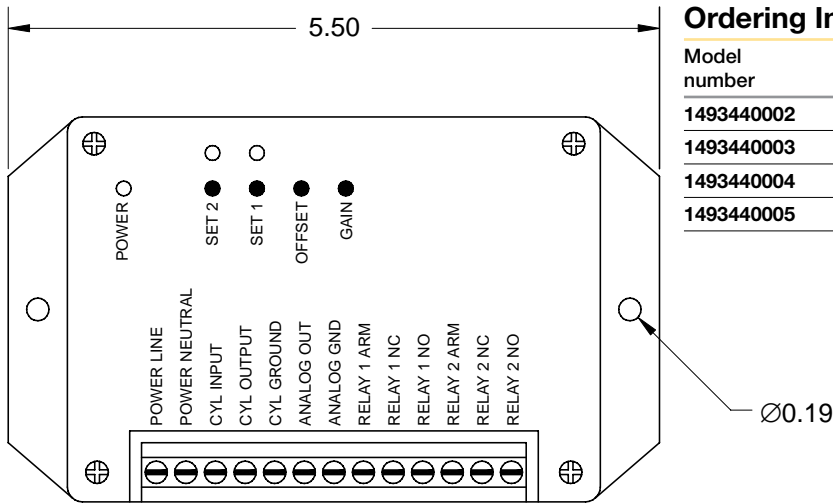
Non-standard rods

For non-standard rod dimensions, or undersized rod end threads, put a "3" in model number and describe the rod using the letters shown in the drawing. It is necessary to specify only those dimensions that are non-standard. LE is measured in retracted position.



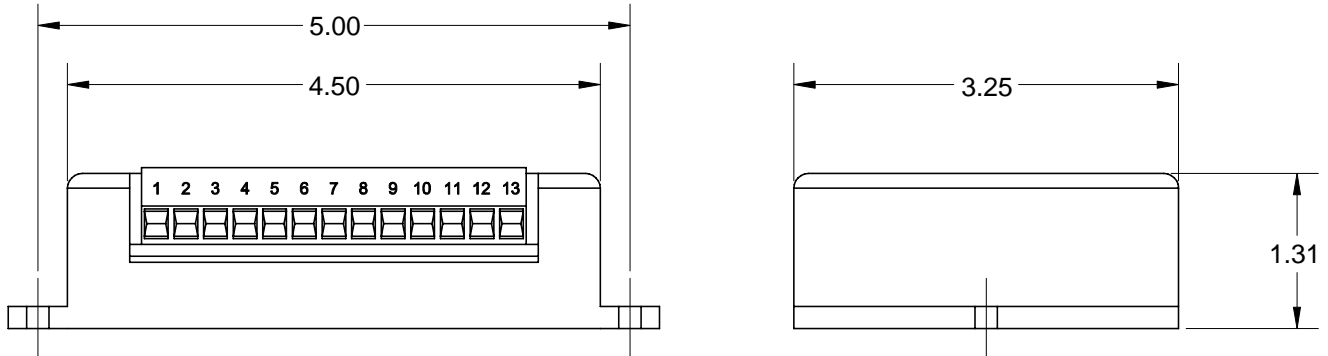
* Requires an "S" designation in model number.

Dual Set Point Controller, Part #149344000



Ordering Information

Model number	Input specifications	Output specifications
1493440002	120 VAC	0-10 V
1493440003	120 VAC	4-20 mA
1493440004	12-24 VDC	0-10 V
1493440005	12-24 VDC	4-20 mA



Dual Set Point Controller Specifications, Part #149344000

- Power Input Requirements..... 12 to 24 VDC, 0.1 amps, or 120 VAC, 60 Hz, 0.1 amps
- Output specifications – Set PointRelay (2) 2 amps @ 24 VDC or 120 VAC
- Output Specifications – Scaleable0 to 10 V, 1 mA max. output current (10K ohm impedance min.) 4 to 20mA, into 500-ohm max. impedance
- Maximum Zero Offset.....50% of cylinder stroke
- Minimum Span Range.....50% of cylinder stroke
- Enclosure Dimensions..... 1.31" h x 5.50" w x 3.25" d
- Electronics Temperature Operating Range +40°F to +160°F

Please reference Parker Bulletin #0971-G-B2 for information regarding programming and operation of this controller.

B
 Round Body Cylinders
 Actuator Products

SR/SW/SRD/SRDM
 Series

SRX
 Series

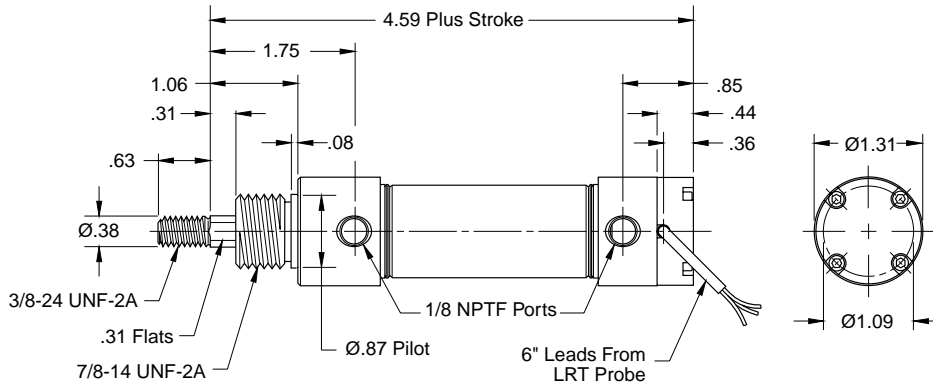
P1L
 Series

P1A
 Series

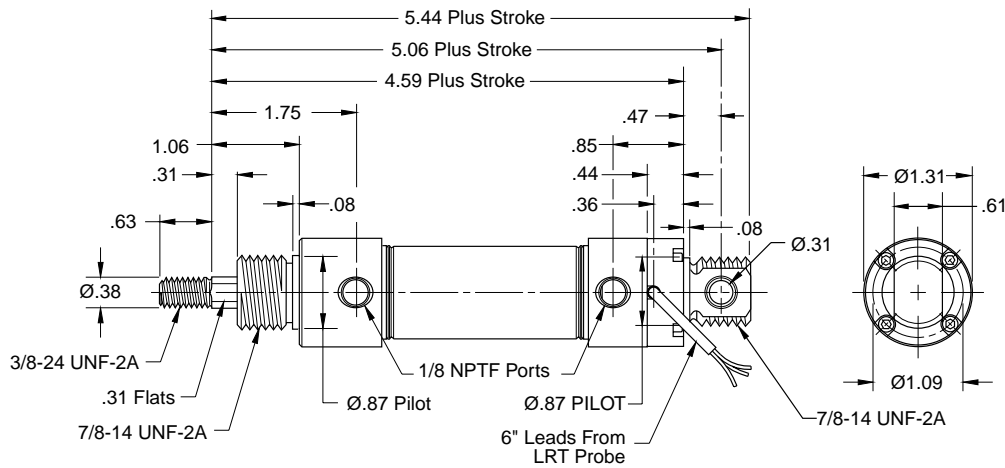
P
 Series

1-1/16" Bore Cylinders

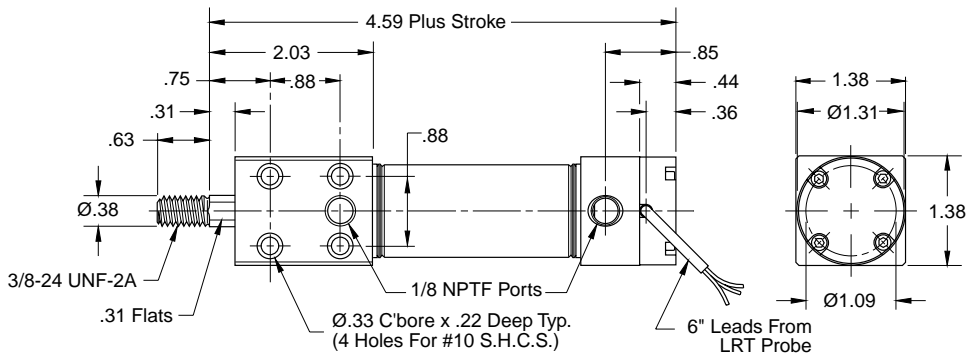
Style D



Style DXP



Style BFD



B

Round Body Cylinders
 Actuator Products

SR/SM/SRD/SRDM
 Series

SRX
 Series

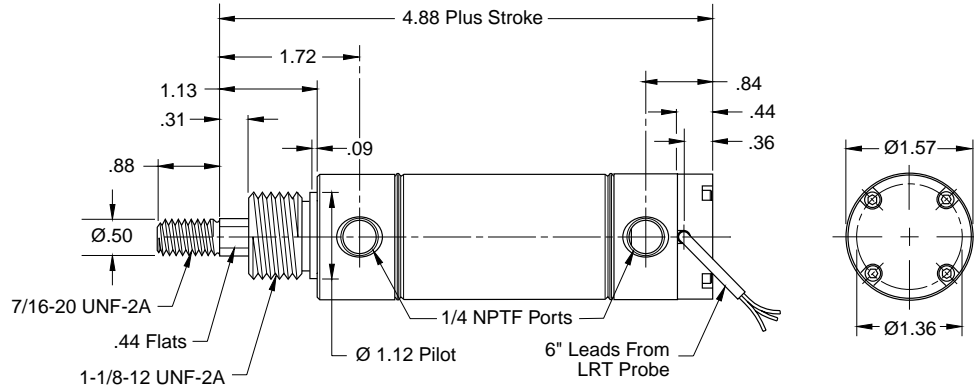
P1L
 Series

P1A
 Series

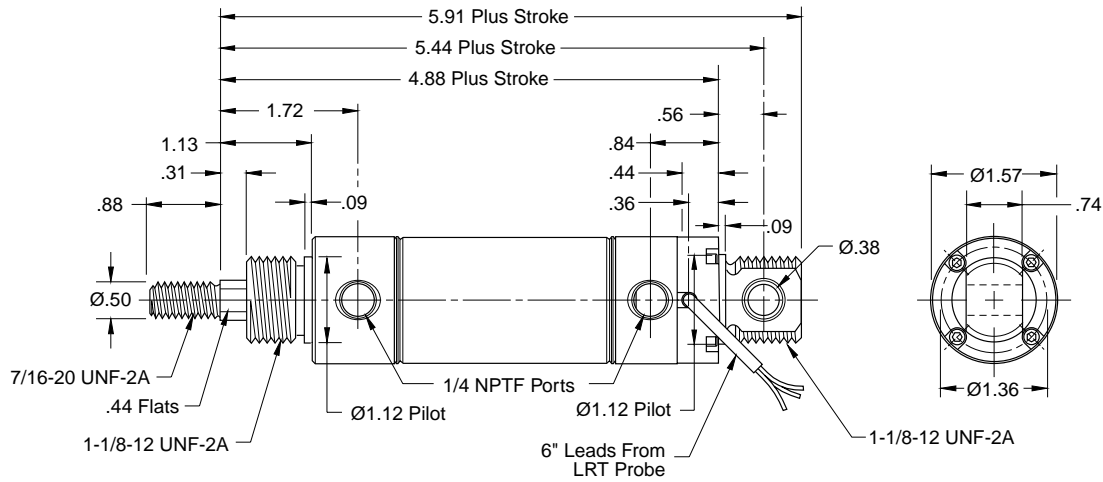
P
 Series

1-1/2" Bore Cylinders

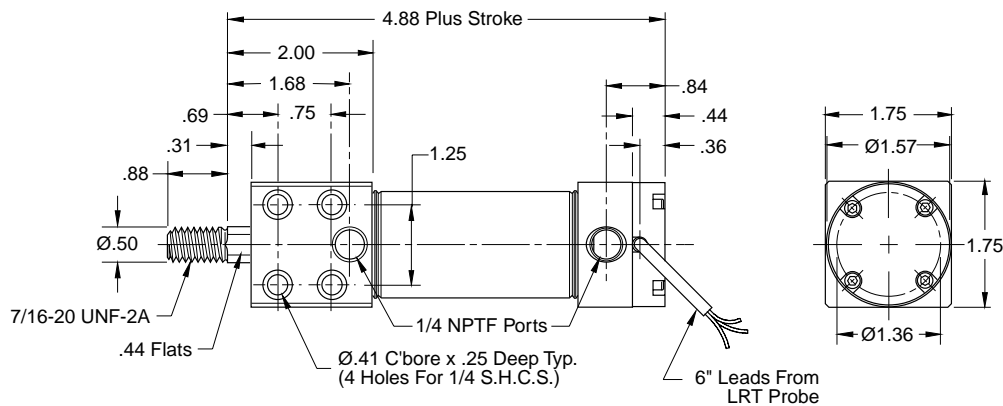
Style D



Style DXP



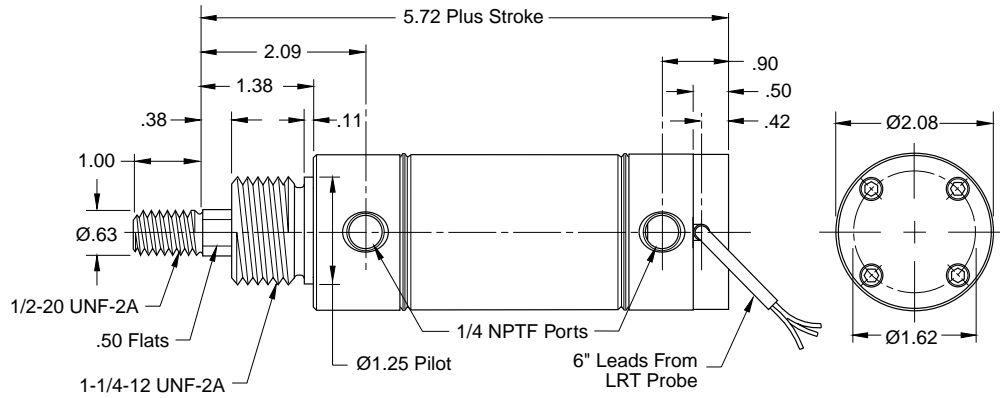
Style BFD



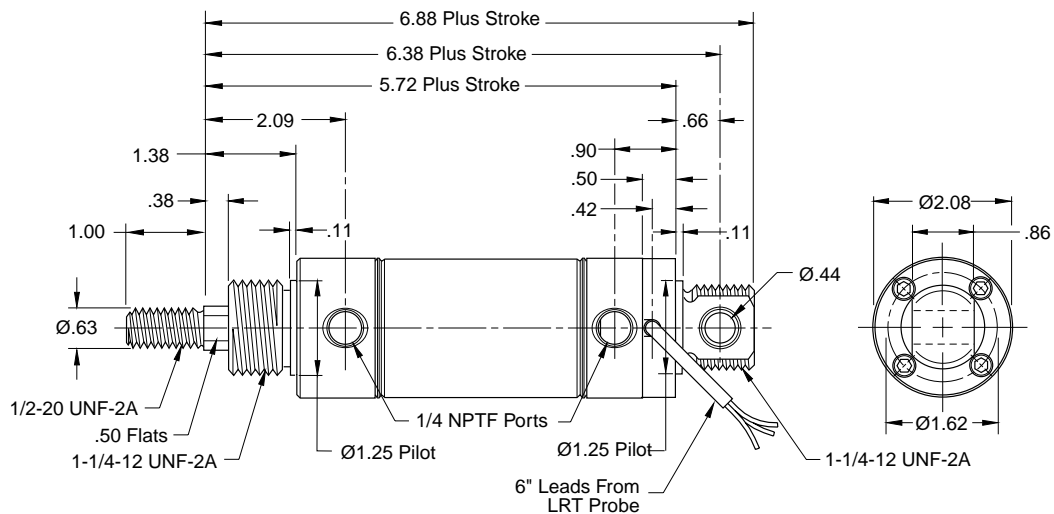
B	Round Body Cylinders
	Actuator Products
SR/SM/SRD/SRD/SRD	Series
	Series
SRX	Series
	Series
P1L	Series
	Series
P1A	Series
	Series
P	Series
	Series

2" Bore Cylinders

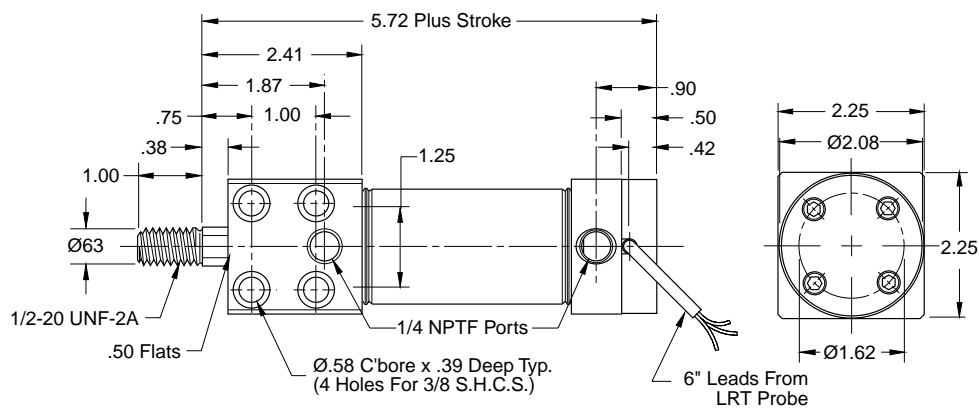
Style D



Style DXP



Style BFD



B

Round Body Cylinders
 Actuator Products

SR/SM/SRD/SRDM
 Series

SRX
 Series

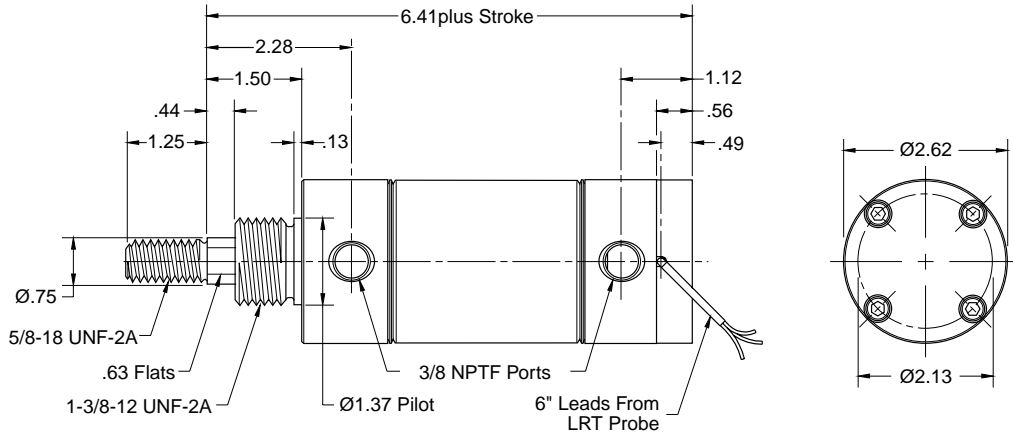
P1L
 Series

P1A
 Series

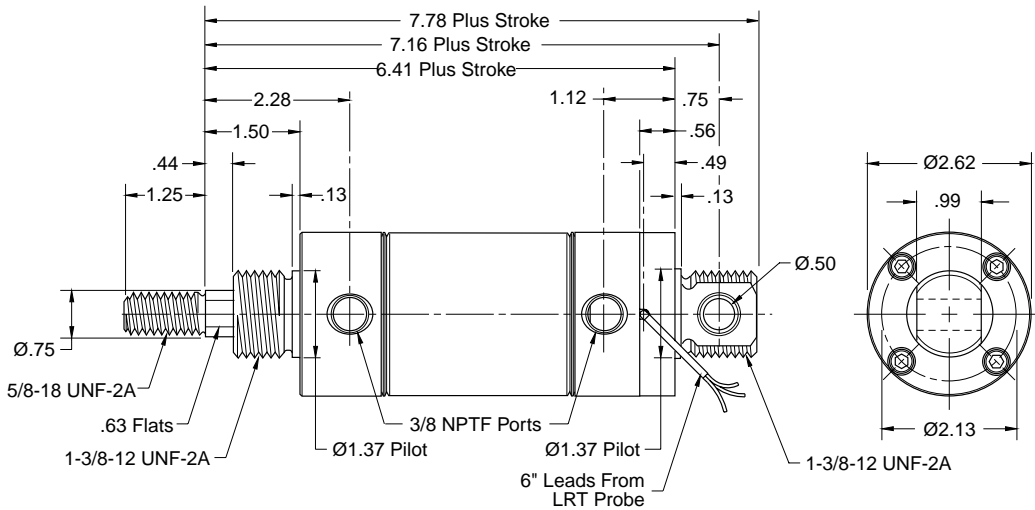
P
 Series

2-1/2" Bore Cylinders

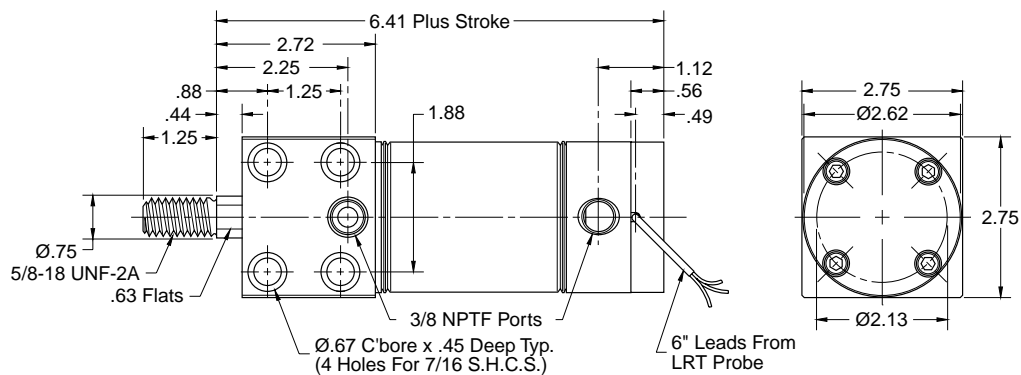
Style D



Style DXP



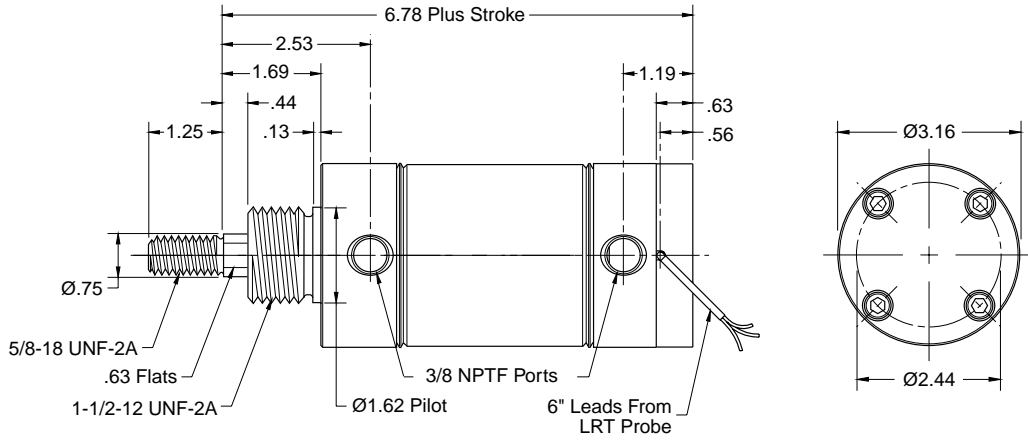
Style BFD



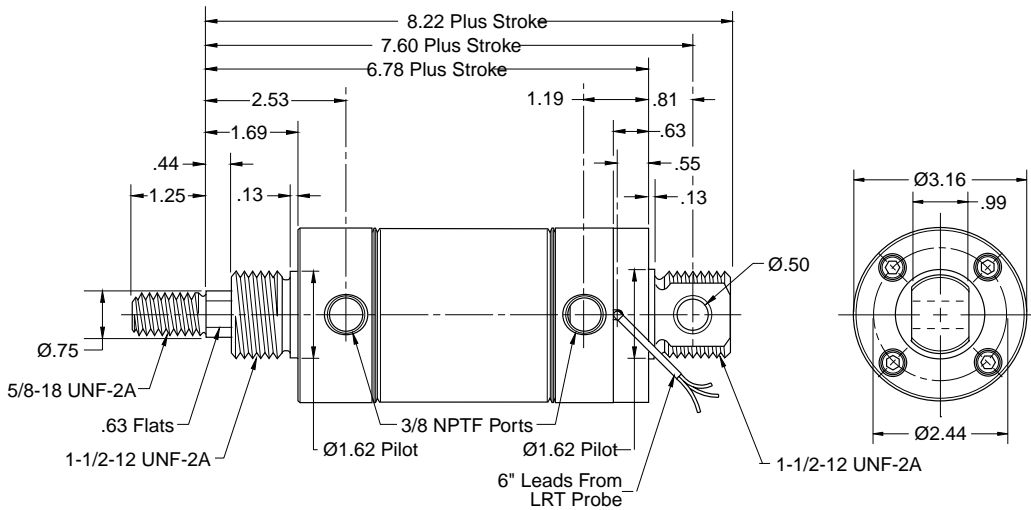
B	Round Body Cylinders
	Actuator Products
SR/SM/SRD/SRDM	Series
	SRX
P1L	Series
	P1A
P	Series
	P

3" Bore Cylinders

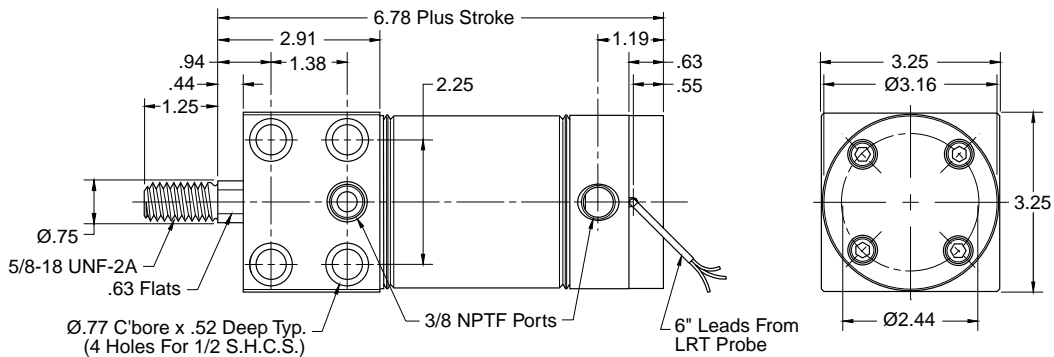
Style D



Style DXP

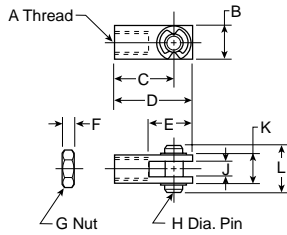


Style BFD



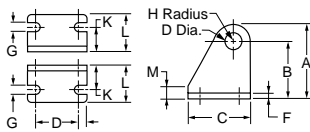
B	Round Body Cylinders Actuator Products
	SR/SM/SRD/SRDM Series
	SRX Series
	P1L Series
	P1A Series
	P Series

Piston Rod Clevis



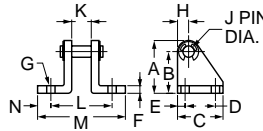
Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
1-1/16	3/8-24	.63	1.38	1.69	.94	.22	3/8-24	.31	.32	.63	.88	L071300350
1-1/2	7/16-20	.75	1.31	1.69	.94	.25	7/16-20	.38	.38	.75	1.03	L071300400
2	1/2-20	.88	1.88	2.31	1.31	.31	1/2-20	.44	.45	.88	1.14	L071300550
2-1/2, 3	5/8-18	1.00	2.25	2.75	1.50	.38	5/8-18	.50	.51	1.00	1.38	L071300600

Pivot Brackets



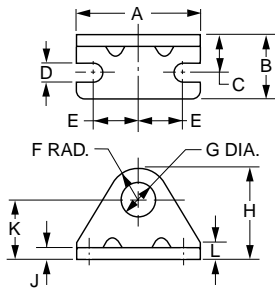
Bore size	A	B	C	D	E	F	G	H	J	K	L	M	Part number
1-1/16	1.31	1.00	1.31	.81	.25	.16	.28	.31	.315	.56	.88	.28	L071310400
1-1/2	1.63	1.25	1.63	1.00	.31	.19	.34	.38	.378	.69	1.13	.31	L071310500
2	1.81	1.38	1.81	1.19	.31	.25	.34	.44	.440	.75	1.19	.38	L071310600
2-1/2, 3	2.13	1.63	2.13	1.38	.38	.25	.41	.50	.503	.88	1.38	.38	L071310700

Pivot Brackets



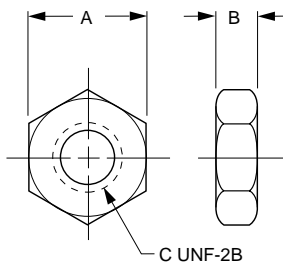
Bore size	A	B	C	D	E	F	G	H	J	K	L	M	N	Part number
1-1/16	1.31	1.00	1.31	.81	.25	.16	.28	.31	.312	.62	1.75	2.38	.31	L071320250
1-1/2	1.63	1.25	1.63	1.00	.31	.19	.34	.38	.375	.75	2.13	3.00	.44	L071320350
2	1.81	1.38	1.81	1.19	.31	.25	.34	.44	.437	.88	2.38	3.25	.44	L071320450
2-1/2, 3	2.13	1.63	2.13	1.38	.38	.25	.41	.50	.500	1.00	2.75	3.75	.50	L071320550

Foot Brackets



Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
1-1/16	2.13	1.16	.66	.28	.75	.75	.88	1.75	.16	1.00	.38	L073790056
1-1/2	2.75	1.44	.81	.35	1.00	.94	1.13	2.19	.19	1.25	.38	L073790108
2	3.00	1.59	.91	.35	1.19	1.06	1.26	2.44	.22	1.38	.44	L073790116
2-1/2	3.75	1.88	1.06	.41	1.50	1.19	1.38	2.81	.25	1.63	.50	L073790125
3	4.38	1.62	1.00	.35	1.75	1.25	1.64	3.14	.25	1.89	.89	L073790140

Mounting Nut



Bore size	A	B	C	Part number
1-1/16	1.31	.48	7/8-14	L073801000
1-1/2	1.69	.61	1-1/8-12	L073801300
2	1.88	.50	1-1/4-12	L073801200
2-1/2	2.06	.78	1-3/8-12	L073801400
3	2.25	.84	1-1/2-12	L073801500

Most popular.

B
 Round Body Cylinders
 Actuator Products
 SR/SM/SRD/SRD/SDM
 Series
 SRX
 Series
 P1L
 Series
 P1A
 Series
 P
 Series



P1L Series

- Repairable aluminum cylinder, anodized body and end caps
- 8 bore sizes: 20mm to 100mm (3/4" to 4")
- 4 Standard rod ends: inch, metric, male, female
- Bumpers standard on both ends
- Adjustable cushions optional at both ends
- Mounting styles: 9 standard
- Strokes available in any practical length
- Available in metric or inch mounting threads



Operating information

Operating pressure:	10 bar (145 PSIG)
Temperature range:	
Standard	-23°C to 74°C (-10°F to 250°F)
High temperature version*	-23°C to 121°C (-10°F to 250°F)
* Option intended for limited exposure to temperatures over 80°C or 176°F. This option is primarily for applications which subject the cylinder to fluids that have an adverse effect on external seals.	
Filtration requirements:	40 micron, dry filtered air

Ordering information

P1L N 032 D M N 0200 W B N N N

Construction 1	
N	Inch mounting threads
M	Metric mounting threads

Bores (mm)			
020	032	050	080
025	040	063	100

Function	
D	Double acting, single rod
K	Double acting, double rod

Cushions/magnetic piston	
N	No cushion, no magnetic piston
M	No cushion, magnetic piston 2
F	Cushioned both ends, no magnetic piston
Y	Cushioned both ends, magnetic piston 2

Stroke	
Specify in mm	

Version 3	
B	Basic
W	With options
/	Special

Seal material	
N	Standard seals
T	Fluorocarbon

Mounting style	
N	No mountings fitted (std.)
J	Front flange
H	Rear flange
B	Single rear clevis
A	Double rear clevis
F	Foot, front & rear
G	Nose mount
E	Front trunnion
D	Rear trunnion

Rod material	
N	Carbon steel (std on 32-100mm bores)
S	Stainless (std on 20-25mm bores)

Rod end style 1	
N	Inch male 4
6	Metric female
5	Metric male 5
9	Inch female
3	Special

Port type 1	
N	NPT threads 4
B	BSPT threads 5

Stroke length for standard cylinders		
Bore	Min. stroke (mm)	Max. stroke (mm) 6
20	2	1000
25	2	1000
32	2	1000
40	4	1000
50	5	1000
63	7	1000
80	4	1000
100	4	1000

Sensors
 For sensors see page B339.

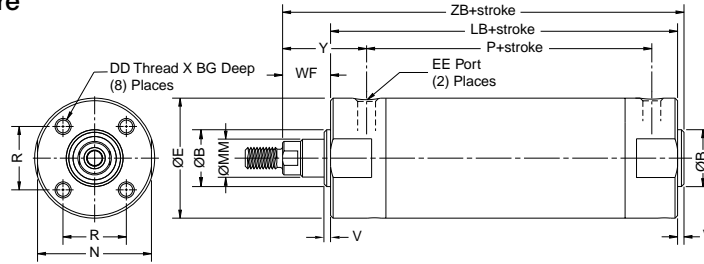
Notes:

- 1 When selecting inch or metric construction, be advised that the piston rod end and porting thread will coincide with the mounting thread selected as the standard for the basic cylinder. For example, selecting "M" in the construction field will automatically provide a metric male piston rod end and BSPT ports as standard.
- 2 Not available with fluorocarbon seal option.
- 3 If cylinder contains no options, then use "B" as the last digit in the model code. The last 4 boxes are used only when "W" or "/" appears in this field.
- 4 Standard with Inch Construction
- 5 Standard with Metric Construction
- 6 Please consult factory for availability of stroke lengths longer than those listed.

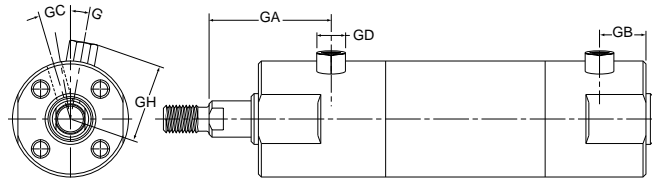
For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.

Style N - Basic No Mount

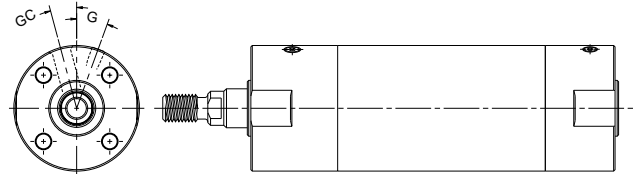
Typical 20 to 100 mm Bore
 without air cushion



With adjustable air cushion - 20 to 25 mm bores



With adjustable air cushion - 32 to 100 mm bores
 (feature a flush-fit cushion adjustment screw)



Style N, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02 (+0 -0.001)	DD (UNF)	BG depth	ØE	EE (NPTF)	Ø MM rod dia.	N	NA	R	V	WF	Y
20	12 (0.472)	M4x0.7 (8-32)	7 (0.28)	27 (1.06)	1/8* (1/8 †)	8 (0.315)	24 (0.94)	-	14 (0.55)	2 (0.08)	13 (0.50)	28 (1.10)
25	14 (0.551)	M5x0.8 (10-32)	7.6 (0.30)	32 (1.26)	1/8* (1/8 †)	10 (0.394)	29 (1.14)	-	16.5 (0.65)	2 (0.08)	16 (0.62)	30 (1.18)
32	18 (0.709)	M5x0.8 (10-32)	7.6 (0.30)	39 (1.53)	1/8 (1/8)	12 (0.472)	36 (1.42)	11 (0.43)	20 (0.79)	2 (0.08)	22 (0.88)	40 (1.57)
40	25 (0.984)	M6x1 (1/4-28)	12 (0.47)	48.5 (1.91)	1/8 (1/8)	16 (0.630)	44 (1.73)	14 (0.55)	26 (1.02)	2 (0.08)	22 (0.88)	42 (1.65)
50	30 (1.181)	M8x1.25 (5/16-24)	16 (0.63)	59 (2.32)	1/4 (1/4)	20 (0.787)	55 (2.17)	18 (0.71)	32 (1.26)	2 (0.08)	30 (1.19)	53 (2.09)
63	32 (1.260)	M10x1.5 (3/8-24)	16 (0.63)	72 (2.83)	1/4 (1/4)	20 (0.787)	69 (2.72)	18 (0.71)	38 (1.50)	2 (0.08)	30 (1.19)	53 (2.09)
80	40 (1.575)	M10x1.5 (3/8-24)	22 (0.88)	90 (3.54)	3/8 (3/8)	25 (0.984)	86 (3.39)	23 (0.91)	50 (1.97)	3 (0.12)	31 (1.22)	59 (2.32)
100	50 (1.968)	M12x1.75 (1/2-20)	22 (0.88)	110 (4.33)	1/2 (1/2)	32 (1.260)	106 (4.17)	30 (1.18)	60 (2.36)	3 (0.12)	31 (1.22)	57 (2.24)

Add stroke

Bore size	LB	P	ZB
20	69 (2.70)	45 (1.77)	83 (3.28)
25	69 (2.70)	46 (1.81)	86 (3.40)
32	71 (2.78)	43 (1.69)	95 (3.74)
40	78 (3.06)	49 (1.93)	102 (4.02)
50	90 (3.53)	53 (2.09)	122 (4.80)
63	90 (3.53)	52 (2.05)	122 (4.80)
80	108 (4.25)	64 (2.52)	142 (5.59)
100	108 (4.25)	66 (2.60)	142 (5.59)

Adjustable air cushion

Bore size	GA	GB	GD Hex	GC°	G°	GH	EE	Cushion length
20	33 (1.30)	14 (0.55)	8 (0.31)	13-1/2	25-1/2	20.5 (0.81)	M5 x 0.8 (10-32 UNF)	9 (0.35)
25	35 (1.38)	14 (0.55)	8 (0.31)	15-1/2	20-1/2	23 (0.91)	M5 x 0.8 (10-32 UNF)	9 (0.35)
32	-	-	-	10-1/2	30-1/2	-	1/8 (1/8 NPTF)	10 (0.39)
40	-	-	-	10-1/2	22-1/2	-	1/8 (1/8 NPTF)	12 (0.47)
50	-	-	-	10-1/2	23-1/2	-	1/4 (1/4 NPTF)	15 (0.59)
63	-	-	-	15-1/2	20-1/2	-	1/4 (1/4 NPTF)	15 (0.59)
80	-	-	-	15-1/2	25-1/2	-	3/8 (3/8 NPTF)	15 (0.59)
100	-	-	-	15-1/2	25-1/2	-	1/2 (1/2 NPTF)	15 (0.59)

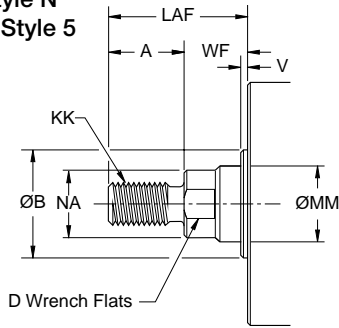
* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch



Rod End Details

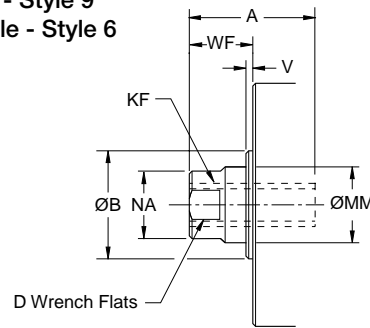
Male threads

Inch male - Style N
 Metric male - Style 5



Female threads

Inch female - Style 9
 Metric female - Style 6



Special rod end threads

Thread Style 3

Special Metric or Inch threads, extension, blank, etc., are also available.

To order, specify "Style 3" and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters).
 If otherwise special, supply a dimensioned sketch.

Rod ends – mm (inch)

Bore size	Thread									
	A	ØB +0 -0.02 (+0 -0.001)	D	KK Style 5 (Style N)	KF Style 6 (Style 9)	LAF	Ø MM rod dia.	NA	V	WF
20	13 (0.50)	12 (0.472)	6 (0.24)	M8 x 1.25 (1/4-28)	M5 x 0.80 (#10-32)	26 (1.00)	8 (0.315)	-	2 (0.08)	13 (0.50)
25	13 (0.50)	14 (0.551)	8 (0.31)	M10 x 1.25 (5/16-24)	M6 x 1.00 (1/4-28)	29 (1.12)	10 (0.394)	-	2 (0.08)	16 (0.62)
32	19 (0.75)	18 (0.709)	10 (0.39)	M10 x 1.25 (7/16-20)	M8 x 1.25 (5/16-24)	41 (1.63)	12 (0.472)	11 (0.43)	2 (0.08)	22 (0.88)
40	19 (0.75)	25 (0.984)	12 (0.47)	M14 x 1.5 (7/16-20)	M8 x 1.25 (3/8-24)	41 (1.63)	16 (0.630)	14 (0.55)	2 (0.08)	22 (0.88)
50	22 (0.88)	30 (1.181)	16 (0.63)	M18 x 1.5 (1/2-20)	M10 x 1.25 (1/2-20)	52 (2.07)	20 (0.787)	18 (0.71)	2 (0.08)	30 (1.19)
63	22 (0.88)	32 (1.260)	16 (0.63)	M18 x 1.5 (1/2-20)	M10 x 1.25 (1/2-20)	52 (2.07)	20 (0.787)	18 (0.71)	2 (0.08)	30 (1.19)
80	38 (1.50)	40 (1.575)	20 (0.79)	M22 x 1.5 (3/4-16)	M16 x 1.5 (5/8-18)	69 (2.72)	25 (0.984)	23 (0.91)	3 (0.12)	31 (1.22)
100	48 (1.88)	50 (1.968)	26 (1.02)	M26 x 1.5 (1-14)	M20 x 1.5 (3/4-16)	79 (3.11)	32 (1.260)	30 (1.18)	3 (0.12)	31 (1.22)

B

Round Body Cylinders
 Actuator Products

SR/SM/SRD/SRDM
 Series

SRX
 Series

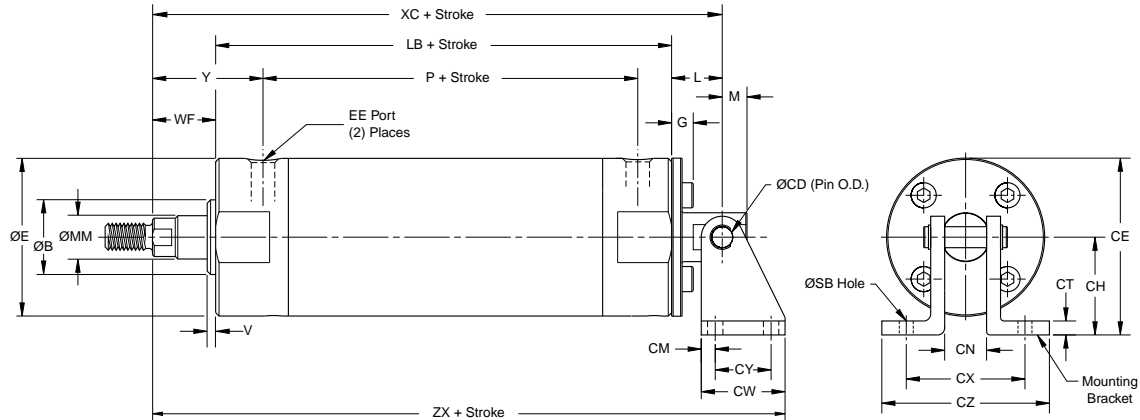
P1L
 Series

P1A
 Series

P
 Series

Style B - Single Rear Clevis

Typical 20 to 100 mm Bore



Note: Mating Mounting Bracket and Pin must be ordered as separate items

Style B, envelope and mounting dimensions – mm (inch)

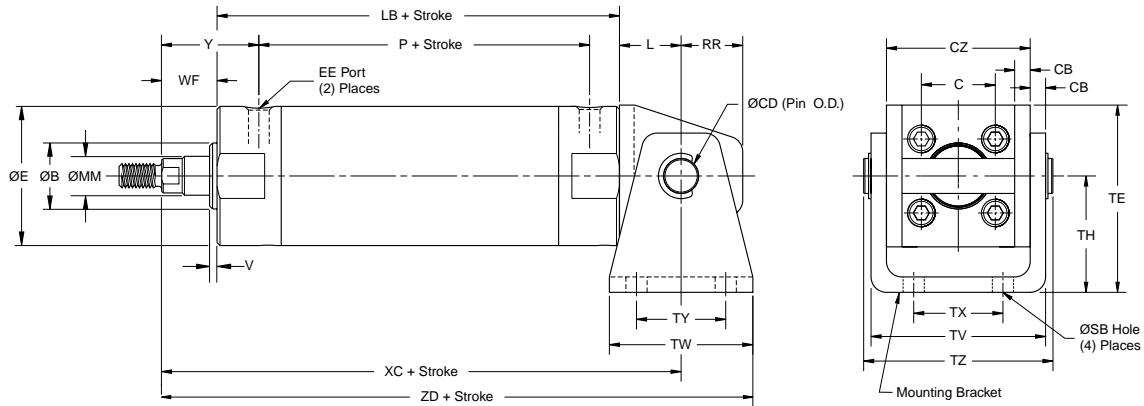
Bore size	ØB	ØCD	ØE	EE	G	L	M	ØMM	V	WF	Y
	+0 - 0.02 (+0 - 0.001)	h9 (+0 - 0.002)		BSPT (NTPF)				rod dia.			
20	12 (0.472)	6.35 (0.250)	27 (1.06)	1/8* (1/8 †)	7 (0.26)	18 (0.70)	7 (0.28)	8 (0.315)	2 (0.08)	13 (0.50)	28 (1.10)
25	14 (0.551)	6.35 (0.250)	32 (1.26)	1/8* (1/8 †)	8 (0.27)	17 (0.68)	7 (0.28)	10 (0.394)	2 (0.08)	16 (0.62)	30 (1.18)
32	18 (0.709)	6.35 (0.250)	39 (1.53)	1/8 (1/8)	15.5 (0.57)	27 (1.07)	10 (0.39)	12 (0.472)	2 (0.08)	22 (0.88)	40 (1.57)
40	25 (0.984)	9.52 (0.375)	48.5 (1.91)	1/8 (1/8)	10 (0.36)	22 (0.88)	10 (0.39)	16 (0.630)	2 (0.08)	22 (0.88)	42 (1.65)
50	30 (1.181)	9.52 (0.375)	59 (2.32)	1/4 (1/4)	12 (0.43)	23 (0.91)	11 (0.44)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)
63	32 (1.260)	9.52 (0.375)	72 (2.83)	1/4 (1/4)	13 (0.46)	23 (0.91)	11 (0.44)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)
80	40 (1.575)	19.07 (0.751)	90 (3.54)	3/8 (3/8)	15 (0.54)	35 (1.38)	19 (0.75)	25 (0.984)	3 (0.12)	31 (1.22)	59 (2.32)
100	50 (1.968)	19.07 (0.751)	110 (4.33)	1/2 (1/2)	17 (0.64)	43 (1.69)	19 (0.75)	32 (1.260)	3 (0.12)	31 (1.22)	57 (2.24)

Bore size											Add stroke			
	CE	CH	CM	CN	CT	CW	CX	CY	CZ	ØSB	LB	P	XC	ZX
20	35.5 (1.39)	22 (0.87)	5 (0.19)	10 (0.38)	3 (0.12)	29 (1.13)	32 (1.25)	19 (0.75)	51 (2.00)	7 (0.27)	69 (2.70)	45 (1.77)	99 (3.91)	120 (4.74)
25	38 (1.49)	22 (0.87)	5 (0.19)	10 (0.38)	3 (0.12)	29 (1.13)	32 (1.25)	19 (0.75)	51 (2.00)	7 (0.27)	69 (2.70)	46 (1.81)	102 (4.00)	123 (4.83)
32	41.5 (1.63)	22 (0.87)	5 (0.19)	13 (0.50)	3 (0.12)	29 (1.13)	35 (1.38)	19 (0.75)	54 (2.12)	7 (0.27)	71 (2.78)	43 (1.69)	120 (4.72)	141 (5.55)
40	59 (2.31)	35 (1.38)	6 (0.25)	16 (0.62)	3 (0.12)	38 (1.50)	47 (1.86)	25 (1.00)	67 (2.62)	7 (0.27)	78 (3.06)	49 (1.93)	122 (4.81)	151 (5.94)
50	64.5 (2.52)	35 (1.38)	6 (0.25)	19 (0.75)	6 (0.25)	38 (1.50)	54 (2.12)	25 (1.00)	76 (3.00)	7 (0.27)	90 (3.53)	53 (2.09)	143 (5.63)	172 (6.76)
63	80 (3.17)	44 (1.75)	6 (0.25)	19 (0.75)	6 (0.25)	38 (1.50)	54 (2.12)	25 (1.00)	76 (3.00)	7 (0.27)	90 (3.53)	52 (2.05)	143 (5.63)	172 (6.76)
80	96 (3.77)	51 (2.00)	13 (0.50)	28 (1.09)	6 (0.25)	64 (2.50)	72 (2.84)	38 (1.50)	104 (4.09)	11 (0.42)	108 (4.25)	64 (2.52)	173 (6.82)	218 (8.57)
100	115 (4.54)	60 (2.37)	13 (0.50)	32 (1.25)	6 (0.25)	70 (2.75)	76 (3.00)	44 (1.75)	108 (4.25)	14 (0.55)	108 (4.25)	66 (2.60)	189 (7.44)	240 (9.44)

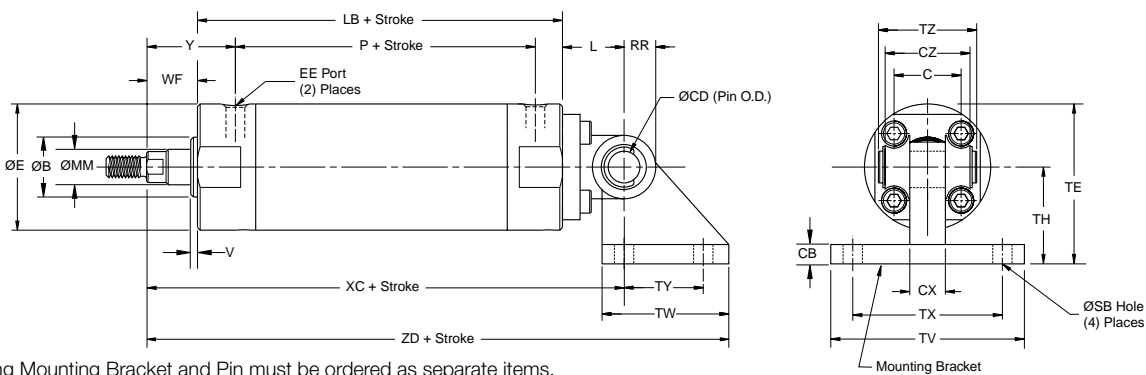
* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

Style A - Double Rear Clevis

Typical 20 to 63 mm bore



Typical 80 to 100 mm bore



Note: Mating Mounting Bracket and Pin must be ordered as separate items.

Style A, envelope and mounting dimensions – mm (inch)

Bore size	ØB	C	CB	ØCD	CZ	CX	ØE	EE	L	ØMM	RR	V	WF
	+0 -0.02 (+0 -0.001)			d 9 (-0.001 -0.003)				BSPT (NPTF)		rod dia.			
20	12 (0.472)	14 (0.55)	3 (0.12)	8 (0.315)	29 (1.14)	–	27 (1.06)	1/8* (1/8†)	14 (0.55)	8 (0.315)	11 (0.43)	2 (0.08)	13 (0.50)
25	14 (0.551)	16.5 (0.65)	3 (0.12)	10 (0.394)	33 (1.30)	–	32 (1.26)	1/8* (1/8†)	16 (0.63)	10 (0.394)	13 (0.51)	2 (0.08)	16 (0.62)
32	18 (0.709)	20 (0.79)	4.5 (0.18)	12 (0.472)	40 (1.57)	–	39 (1.53)	1/8 (1/8)	20 (0.79)	12 (0.472)	15 (0.59)	2 (0.08)	22 (0.88)
40	25 (0.984)	26 (1.02)	4.5 (0.18)	14 (0.551)	49 (1.93)	–	48.5 (1.91)	1/8 (1/8)	22 (0.87)	16 (0.630)	18 (0.71)	2 (0.08)	22 (0.88)
50	30 (1.181)	32 (1.26)	6 (0.25)	16 (0.630)	60 (2.36)	–	59 (2.32)	1/4 (1/4)	25 (0.98)	20 (0.787)	20 (0.79)	2 (0.08)	30 (1.19)
63	32 (1.260)	38 (1.50)	8 (0.31)	18 (0.709)	74 (2.91)	–	72 (2.83)	1/4 (1/4)	30 (1.18)	20 (0.787)	22 (0.87)	2 (0.08)	30 (1.19)
80	40 (1.575)	50 (1.97)	11 (0.43)	18 (0.709)	56 (2.20)	28 (1.10)	90 (3.54)	3/8 (3/8)	35 (1.38)	25 (0.984)	18 (0.71)	3 (0.12)	31 (1.22)
100	50 (1.968)	60 (2.36)	12 (0.47)	22 (0.866)	64 (2.52)	32 (1.26)	110 (4.33)	1/2 (1/2)	43 (1.69)	32 (1.260)	22 (0.87)	3 (0.12)	31 (1.22)

Bore size	ØSB	TY	TV	TE	TH	TX	TW	TZ	Y	Add Stroke			
										LB	P	XC	ZD
20	5.5 (0.22)	28 (1.10)	35 (1.39)	38 (1.50)	25 (0.98)	16 (0.63)	42 (1.66)	43.4 (1.71)	28 (1.10)	69 (2.70)	45 (1.77)	95 (3.75)	116 (4.58)
25	5.5 (0.22)	28 (1.10)	39 (1.55)	45.5 (1.79)	30 (1.18)	20 (0.79)	42 (1.66)	48 (1.89)	30 (1.18)	69 (2.70)	46 (1.81)	100 (3.95)	121 (4.78)
32	7 (0.28)	28 (1.10)	49 (1.93)	54 (2.13)	35 (1.38)	22 (0.87)	48 (1.88)	59.4 (2.34)	40 (1.57)	71 (2.78)	43 (1.69)	113 (4.45)	137 (5.39)
40	7 (0.28)	30 (1.18)	58 (2.28)	63.5 (2.50)	40 (1.57)	30 (1.18)	56 (2.20)	71.4 (2.81)	42 (1.65)	78 (3.06)	49 (1.93)	122 (4.81)	150 (5.91)
50	9 (0.35)	36 (1.42)	72 (2.83)	79 (3.11)	50 (1.97)	36 (1.42)	64 (2.52)	86 (3.38)	53 (2.09)	90 (3.53)	53 (2.09)	145 (5.70)	177 (6.96)
63	11 (0.43)	46 (1.81)	90 (3.54)	96 (3.78)	60 (2.36)	46 (1.81)	74 (2.91)	105.4 (4.15)	53 (2.09)	90 (3.53)	52 (2.05)	150 (5.90)	187 (7.36)
80	11 (0.43)	45 (1.77)	110 (4.33)	100 (3.94)	55 (2.17)	85 (3.35)	72 (2.83)	64 (2.52)	59 (2.32)	108 (4.25)	64 (2.52)	174 (6.85)	232.5 (9.15)
100	13.5 (0.53)	60 (2.36)	130 (5.12)	120 (4.72)	65 (2.56)	100 (3.94)	93 (3.66)	72 (2.83)	57 (2.24)	108 (4.25)	66 (2.60)	182 (7.17)	258.5 (10.18)

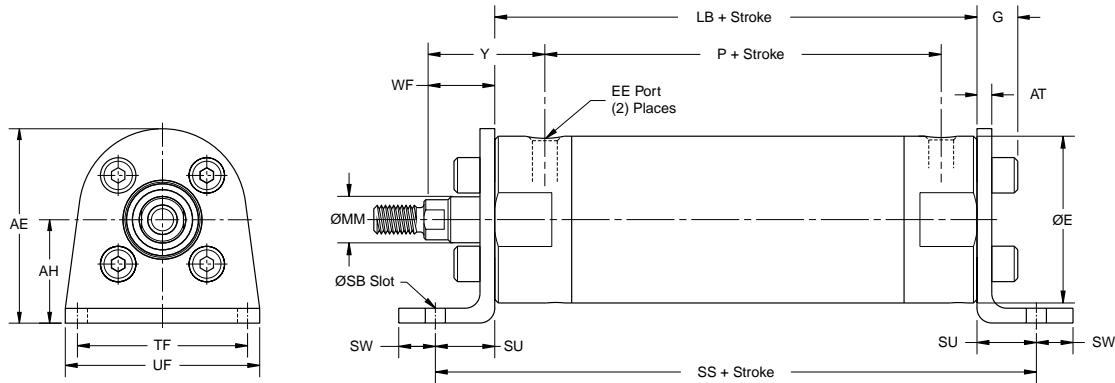
* Ports are M5 for cushioned versions, metric

† Ports are 10-32 for cushioned versions, inch



Style F - Foot Mount

Typical 20 to 100 mm bore



Style F, envelope and mounting dimensions – mm (inch)

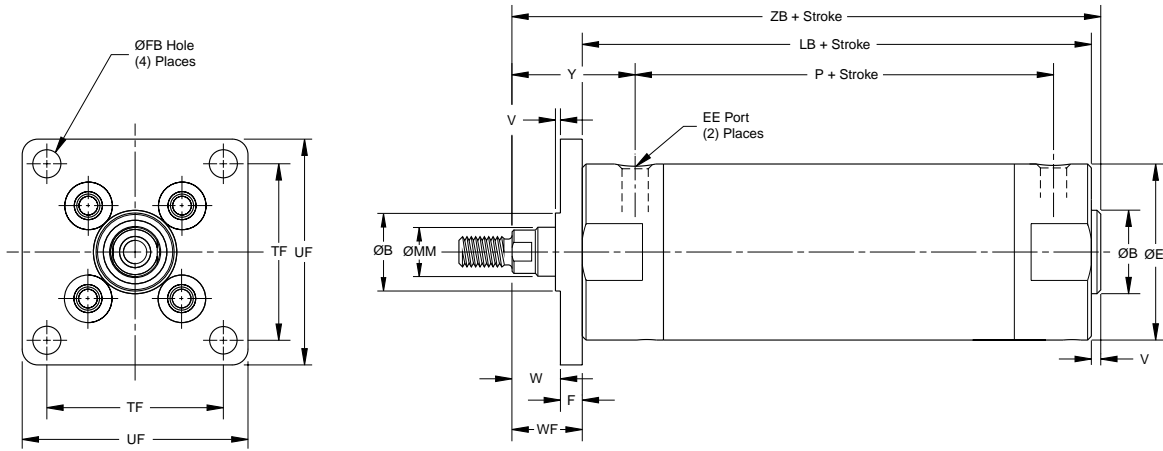
Bore size	AE	AH	AT	ØE	EE (BSPT)	G	ØMM rod dia.	ØSB
20	36.5 (1.44)	20.6 (0.81)	3 (0.12)	27 (1.06)	1/8* (1/8†)	6 (0.20)	8 (0.315)	7 (0.27)
25	38.5 (1.52)	20.6 (0.81)	3 (0.12)	32 (1.26)	1/8* (1/8†)	6.5 (0.22)	10 (0.394)	7 (0.27)
32	46.5 (1.83)	25.4 (1.00)	3 (0.12)	39 (1.53)	1/8 (1/8)	6.5 (0.22)	12 (0.472)	7 (0.28)
40	51 (2.02)	25.4 (1.00)	3 (0.12)	48.5 (1.91)	1/8 (1/8)	7 (0.25)	16 (0.630)	7 (0.28)
50	72 (2.84)	38.1 (1.50)	6 (0.25)	59 (2.32)	1/4 (1/4)	11 (0.41)	20 (0.787)	9 (0.34)
63	83.5 (3.29)	44.5 (1.75)	6 (0.25)	72 (2.83)	1/4 (1/4)	12 (0.44)	20 (0.787)	9 (0.34)
80	101 (3.98)	55 (2.17)	6 (0.25)	90 (3.54)	3/8 (3/8)	12 (0.44)	25 (0.984)	11 (0.43)
100	121 (4.76)	65 (2.56)	6 (0.25)	110 (4.33)	1/2 (1/2)	13 (0.50)	32 (1.260)	14 (0.55)

Bore size	SU	SW	TF	UF	WF	Y	Add stroke		
							LB	P	SS
20	14 (0.56)	11 (0.44)	38 (1.50)	48 (1.88)	13 (0.50)	28 (1.10)	69 (2.70)	45 (1.77)	97 (3.82)
25	14 (0.56)	11 (0.44)	38 (1.50)	48 (1.88)	16 (0.62)	30 (1.18)	69 (2.70)	46 (1.81)	97 (3.82)
32	19 (0.75)	19 (0.75)	48 (1.88)	63.5 (2.50)	22 (0.88)	40 (1.57)	71 (2.78)	43 (1.69)	109 (4.28)
40	18 (0.72)	20 (0.78)	48 (1.88)	63.5 (2.50)	22 (0.88)	42 (1.65)	78 (3.06)	49 (1.93)	114 (4.50)
50	25 (1.00)	16 (0.62)	57 (2.24)	79 (3.12)	30 (1.19)	53 (2.09)	90 (3.53)	53 (2.09)	140 (5.53)
63	25 (1.00)	16 (0.62)	73 (2.88)	95 (3.75)	30 (1.19)	53 (2.09)	90 (3.53)	52 (2.05)	140 (5.53)
80	28.5 (1.12)	14 (0.55)	100 (3.94)	125 (4.92)	31 (1.22)	59 (2.32)	108 (4.25)	64 (2.52)	165 (6.49)
100	30 (1.18)	16 (0.63)	120 (4.72)	150 (5.91)	31 (1.22)	57 (2.24)	108 (4.25)	66 (2.60)	168 (6.61)

* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

Style J - Front Flange

Typical 20 to 100 mm bore



Style J, envelope and mounting dimensions – mm (inch)

Bore size	ØB		EE (BSPT)	F	ØFB	ØMM rod dia.	TF	UF	V	WF	W	Y
	+0	-0.02										
20	12 (0.472)	27 (1.06)	1/8* (1/8†)	6 (0.24)	5.5 (0.22)	8 (0.315)	28 (1.10)	40 (1.57)	2 (0.08)	13 (0.50)	7 (0.26)	28 (1.10)
25	14 (0.551)	32 (1.26)	1/8* (1/8†)	7 (0.28)	5.5 (0.22)	10 (0.394)	32 (1.26)	44 (1.73)	2 (0.08)	16 (0.62)	9 (0.34)	30 (1.18)
32	18 (0.709)	39 (1.53)	1/8 (1/8)	7 (0.28)	7 (0.28)	12 (0.472)	38 (1.50)	53 (2.09)	2 (0.08)	22 (0.88)	15 (0.60)	40 (1.57)
40	25 (0.984)	48.5 (1.91)	1/8 (1/8)	8 (0.31)	7 (0.28)	16 (0.630)	46 (1.81)	61 (2.40)	2 (0.08)	22 (0.88)	14 (0.57)	42 (1.65)
50	30 (1.181)	59 (2.32)	1/4 (1/4)	9 (0.35)	9 (0.35)	20 (0.787)	58 (2.28)	76 (3.00)	2 (0.08)	30 (1.19)	21 (0.84)	53 (2.09)
63	32 (1.260)	72 (2.83)	1/4 (1/4)	9 (0.35)	11 (0.43)	20 (0.787)	70 (2.76)	92 (3.62)	2 (0.08)	30 (1.19)	21 (0.84)	53 (2.09)
80	40 (1.575)	90 (3.54)	3/8 (3/8)	11 (0.43)	11 (0.43)	25 (0.984)	82 (3.23)	104 (4.09)	3 (0.12)	31 (1.22)	20 (0.79)	59 (2.32)
100	50 (1.968)	110 (4.33)	1/2 (1/2)	14 (0.55)	14 (0.55)	32 (1.260)	100 (3.94)	128 (5.04)	3 (0.12)	31 (1.22)	17 (0.67)	57 (2.24)

Bore size	Add stroke		
	LB	P	ZB
20	69 (2.70)	45 (1.77)	83 (3.28)
25	69 (2.70)	46 (1.81)	86 (3.40)
32	71 (2.78)	43 (1.69)	95 (3.74)
40	78 (3.06)	49 (1.93)	102 (4.02)
50	90 (3.53)	53 (2.09)	122 (4.80)
63	90 (3.53)	52 (2.05)	122 (4.80)
80	108 (4.25)	64 (2.52)	142 (5.59)
100	108 (4.25)	66 (2.60)	142 (5.59)

* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

B

Round Body Cylinders
Actuator Products

SR/SM/SRD/SRDM
Series

SRX
Series

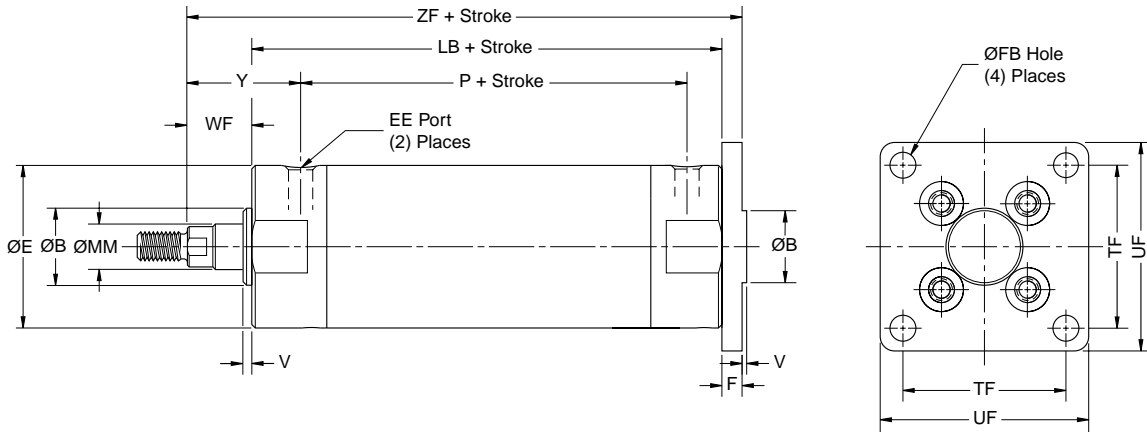
P1L
Series

P1A
Series

P
Series

Style H - Rear Flange

Typical 20 to 100 mm bore



Style H, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02	ØE	EE (BSPT)	F	ØFB	ØMM rod dia.	TF	UF	V	WF	Y
20	12 (0.472)	27 (1.06)	1/8* (1/8†)	6 (0.24)	5.5 (0.22)	8 (0.315)	28 (1.10)	40 (1.57)	2 (0.08)	13 (0.50)	28 (1.10)
25	14 (0.551)	32 (1.26)	1/8* (1/8†)	7 (0.28)	5.5 (0.22)	10 (0.394)	32 (1.26)	44 (1.73)	2 (0.08)	16 (0.62)	30 (1.18)
32	18 (0.709)	39 (1.53)	1/8 (1/8)	7 (0.28)	7 (0.28)	12 (0.472)	38 (1.50)	53 (2.09)	2 (0.08)	22 (0.88)	40 (1.57)
40	25 (0.984)	48.5 (1.91)	1/8 (1/8)	8 (0.31)	7 (0.28)	16 (0.630)	46 (1.81)	61 (2.40)	2 (0.08)	22 (0.88)	42 (1.65)
50	30 (1.181)	59 (2.32)	1/4 (1/4)	9 (0.35)	9 (0.35)	20 (0.787)	58 (2.28)	76 (3.00)	2 (0.08)	30 (1.19)	53 (2.09)
63	32 (1.260)	72 (2.83)	1/4 (1/4)	9 (0.35)	11 (0.43)	20 (0.787)	70 (2.76)	92 (3.62)	2 (0.08)	30 (1.19)	53 (2.09)
80	40 (1.575)	90 (3.54)	3/8 (3/8)	11 (0.43)	11 (0.43)	25 (0.984)	82 (3.23)	104 (4.09)	3 (0.12)	31 (1.22)	59 (2.32)
100	50 (1.968)	110 (4.33)	1/2 (1/2)	14 (0.55)	14 (0.55)	32 (1.260)	100 (3.94)	128 (5.04)	3 (0.12)	31 (1.22)	57 (2.24)

Bore size	Add stroke		
	LB	P	ZF
20	69 (2.70)	45 (1.77)	87 (3.44)
25	69 (2.70)	46 (1.81)	91 (3.60)
32	71 (2.78)	43 (1.69)	100 (3.94)
40	78 (3.06)	49 (1.93)	108 (4.25)
50	90 (3.53)	53 (2.09)	129 (5.07)
63	90 (3.53)	52 (2.05)	129 (5.07)
80	108 (4.25)	64 (2.52)	150 (5.91)
100	108 (4.25)	66 (2.60)	153 (6.02)

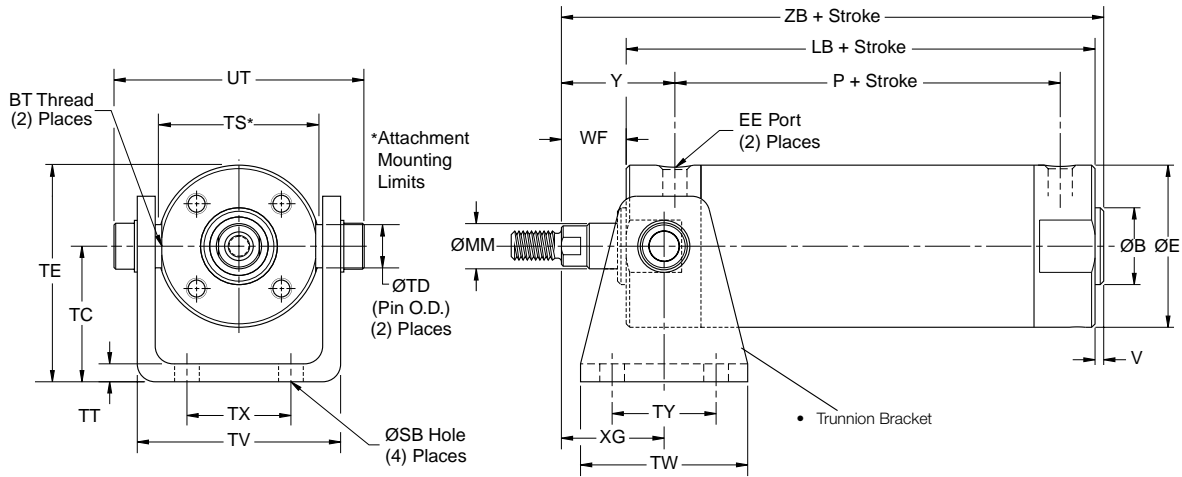
* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

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Style E - Front Trunnion

Typical 20 to 63 mm bore



Note: Trunnion Bracket must be ordered as separate item

Style E, envelope and mounting dimensions – mm (inch)

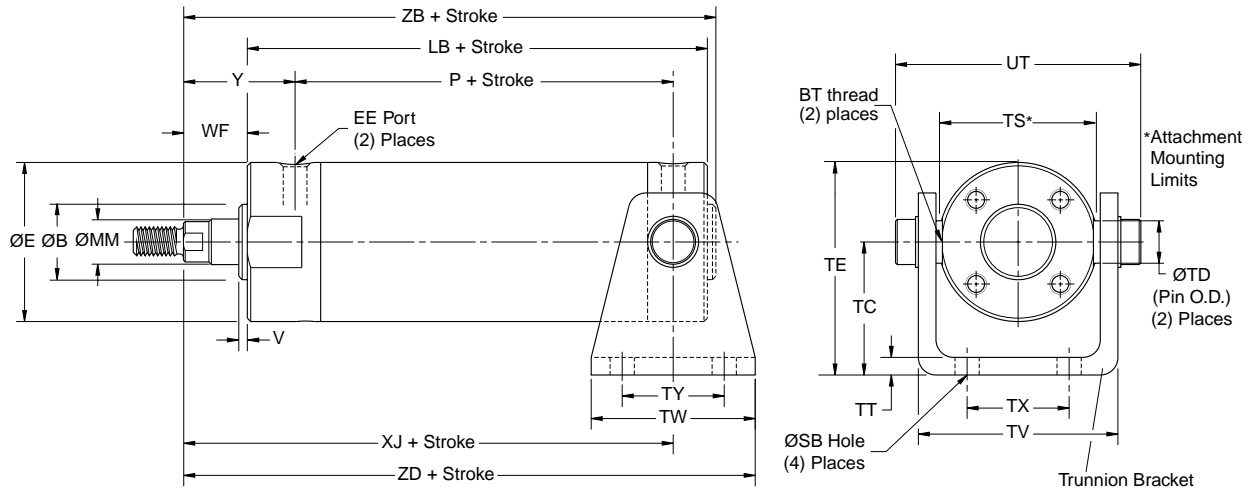
Bore size	ØB		BT	D	ØE	EE (BSPT)	ØMM rod dia.	V	WF	XG	Y	ØSB	TC
	+0	-0.02											
20	12	(0.472)	M5x0.80	6	(0.24)	1/8*	8	2	13	24	28	5.5	25
						(1/8†)	(0.315)	(0.08)	(0.50)	(0.93)	(1.10)	(0.22)	(0.98)
25	14	(0.551)	M6x0.75	8	(0.31)	1/8*	10	2	16	27	30	5.5	30
						(1/8†)	(0.394)	(0.08)	(0.62)	(1.05)	(1.18)	(0.22)	(1.18)
32	18	(0.709)	M8x1.00	10	(0.39)	1/8	12	2	22	33	40	7	35
						(1/8)	(0.472)	(0.08)	(0.88)	(1.31)	(1.57)	(0.28)	(1.38)
40	25	(0.984)	M10x1.25	12	(0.47)	1/8	16	2	22	34	42	7	40
						(1/8)	(0.630)	(0.08)	(0.88)	(1.35)	(1.65)	(0.28)	(1.57)
50	30	(1.181)	M12x1.25	16	(0.63)	1/4	20	2	30	43	53	9	50
						(1/4)	(0.787)	(0.08)	(1.19)	(1.70)	(2.09)	(0.35)	(1.97)
63	32	(1.260)	M14x1.50	16	(0.63)	1/4	20	2	30	43	53	11	60
						(1/4)	(0.787)	(0.08)	(1.19)	(1.70)	(2.09)	(0.43)	(2.36)

Bore size	ØTD e8	TE	TS	TT	TV	TW	TX	TY	UT	Add stroke		
										LB	P	ZB
20	8	38.5	28	3	35	42	16	28	47.5	69	45	83
		(1.51)	(1.10)	(0.12)	(1.39)	(1.66)	(0.63)	(1.10)	(1.87)	(2.70)	(1.77)	(3.28)
25	10	46	33	3	39	42	20	28	53	69	46	86
		(1.81)	(1.30)	(0.12)	(1.55)	(1.66)	(0.79)	(1.10)	(2.09)	(2.70)	(1.81)	(3.40)
32	12	54.5	40	4.5	49	48	22	28	68	71	43	95
		(2.15)	(1.58)	(0.18)	(1.93)	(1.88)	(0.87)	(1.10)	(2.67)	(2.78)	(1.69)	(3.74)
40	14	64	49	4.5	58	56	30	30	79	78	49	102
		(2.53)	(1.93)	(0.18)	(2.28)	(2.20)	(1.18)	(1.18)	(3.10)	(3.06)	(1.93)	(4.02)
50	16	79.5	60	6	72	64	36	36	99	90	53	122
		(3.13)	(2.36)	(0.25)	(2.83)	(2.52)	(1.42)	(1.42)	(3.88)	(3.53)	(2.09)	(4.80)
63	18	96	74	8	90	74	46	46	119	90	52	122
		(3.78)	(2.91)	(0.31)	(3.54)	(2.91)	(1.81)	(1.81)	(4.69)	(3.53)	(2.05)	(4.80)

* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

Style D - Rear Trunnion

Typical 20 to 63 mm bore



Note: Trunnion Bracket must be ordered as separate item

Style D, envelope and mounting dimensions – mm (inch)

Bore size	ØB	BT	ØE	EE (BSPT)	ØMM rod dia.	V	WF	Y	ØSB	TC	ØTD e8	TE
	+0 -0.02											
20	12 (0.472)	M5x0.80	27 (1.06)	1/8* (1/8†)	8 (0.315)	2 (0.08)	13 (0.50)	28 (1.10)	5.5 (0.22)	25 (0.98)	8 (0.315)	38.5 (1.51)
25	14 (0.551)	M6x0.75	32 (1.26)	1/8* (1/8†)	10 (0.394)	2 (0.08)	16 (0.62)	30 (1.18)	5.5 (0.22)	30 (1.18)	10 (0.394)	46 (1.81)
32	18 (0.709)	M8x1.00	39 (1.53)	1/8 (1/8)	12 (0.472)	2 (0.08)	22 (0.88)	40 (1.57)	7 (0.28)	35 (1.38)	12 (0.472)	54.5 (2.15)
40	25 (0.984)	M10x1.25	48.5 (1.91)	1/8 (1/8)	16 (0.630)	2 (0.08)	22 (0.88)	42 (1.65)	7 (0.28)	40 (1.57)	14 (0.551)	64 (2.53)
50	30 (1.181)	M12x1.25	59 (2.32)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)	9 (0.35)	50 (1.97)	16 (0.630)	79.5 (3.13)
63	32 (1.260)	M14x1.50	72 (2.83)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)	11 (0.43)	60 (2.36)	18 (0.709)	96 (3.78)

Bore size	Add stroke											
	TS	TT	TV	TW	TX	TY	UT	LB	P	XJ	ZB	ZD
20	28 (1.10)	3 (0.12)	35 (1.39)	42 (1.66)	16 (0.63)	28 (1.10)	47.5 (1.87)	69 (2.70)	45 (1.77)	70 (2.77)	83 (3.28)	91 (3.60)
25	33 (1.30)	3 (0.12)	39 (1.55)	42 (1.66)	20 (0.79)	28 (1.10)	53 (2.09)	69 (2.70)	46 (1.81)	73 (2.89)	86 (3.40)	94 (3.72)
32	40 (1.58)	4.5 (0.18)	49 (1.93)	48 (1.88)	22 (0.87)	28 (1.10)	68 (2.67)	71 (2.78)	43 (1.69)	83 (3.27)	95 (3.74)	107 (4.21)
40	49 (1.93)	4.5 (0.18)	58 (2.28)	56 (2.20)	30 (1.18)	30 (1.18)	79 (3.10)	78 (3.06)	49 (1.93)	90 (3.54)	102 (4.02)	118 (4.64)
50	60 (2.36)	6 (0.25)	72 (2.83)	64 (2.52)	36 (1.42)	36 (1.42)	99 (3.88)	90 (3.53)	53 (2.09)	108 (4.25)	122 (4.80)	140 (5.51)
63	74 (2.91)	8 (0.31)	90 (3.54)	74 (2.91)	46 (1.81)	46 (1.81)	119 (4.69)	90 (3.53)	52 (2.05)	108 (4.25)	122 (4.80)	145 (5.71)

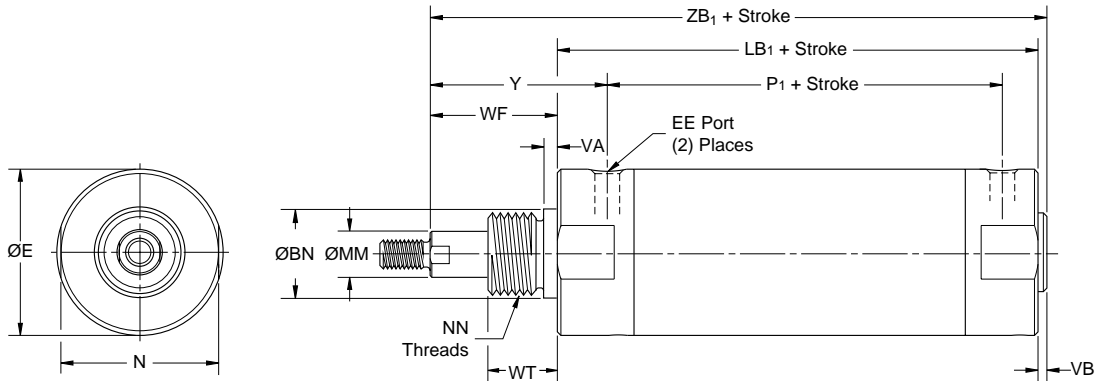
* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch

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Style G - Nose Mount

Typical 20 to 25 mm bore



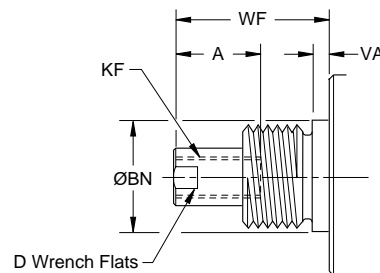
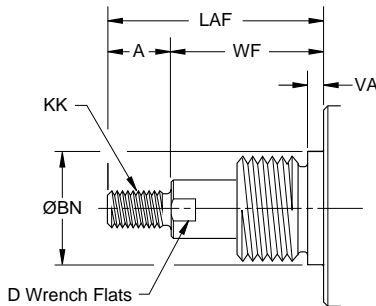
Rod end details – 20 and 25 mm bore

Male threads

Inch male - Style N
 Metric male - Style 5

Female threads

Inch female - Style 9
 Metric female - Style 6



Special rod end threads

Thread style 3

Special metric or inch threads, extension, blank, etc., are also available. To order, specify "Style 3" and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters). If otherwise special, supply a dimensioned sketch.

Style G, envelope and mounting dimensions – mm (inch)

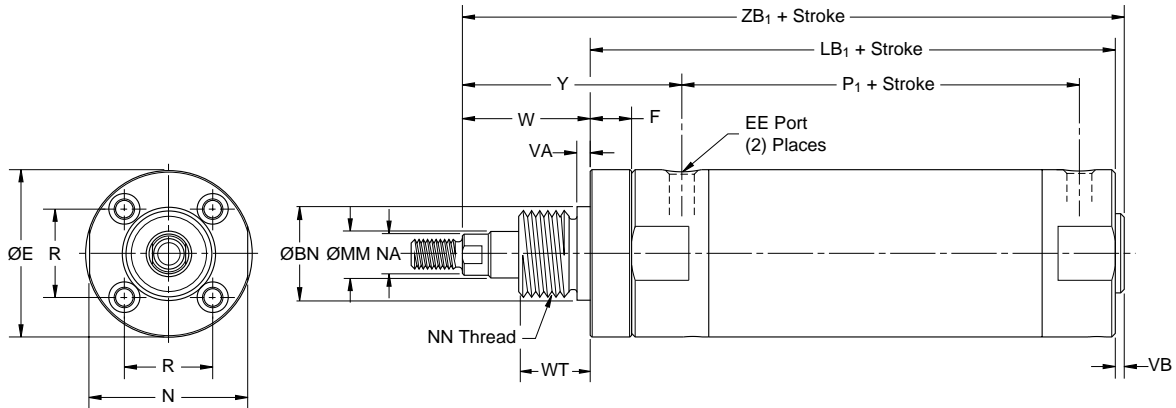
Bore size	A	BN +0 -0.08	D	ØE	EE (BSPT)	Thread KK Style 5	Thread KF Style 6	ØMM rod dia.	LAF	NN	N	VA	VB	WF	WT	Y	Add stroke		
																	LB ¹	P ¹	ZB ¹
20	13 (0.50)	19.02 (0.749)	6 (0.24)	27 (1.06)	1/8* (1/8†)	M8x1.25 (1/4-28)	M5x0.80 (#10-32)	35 (1.38)	8 (0.315)	3/4-16 (3/4-16)	24 (0.94)	3 (0.12)	2 (0.08)	22 (0.88)	16 (0.63)	32 (1.25)	66 (2.60)	47 (1.85)	90 (3.56)
25	13 (0.50)	19.02 (0.749)	8 (0.31)	32 (1.26)	1/8* (1/8†)	M10x1.25 (5/16-24)	M6x1.00 (1/4-28)	35 (1.38)	10 (0.394)	3/4-16 (3/4-16)	29 (1.14)	3 (0.12)	2 (0.08)	22 (0.88)	16 (0.63)	32 (1.25)	66 (2.60)	47 (1.85)	90 (3.56)

* Ports are M5 for cushioned versions, metric

† Ports are 10-32 for cushioned versions, inch

Style G - Nose Mount

Typical 32 to 63mm bore



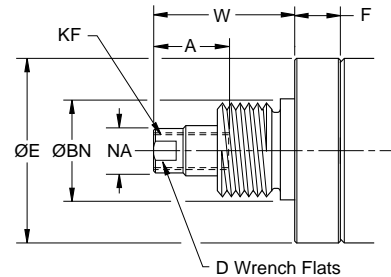
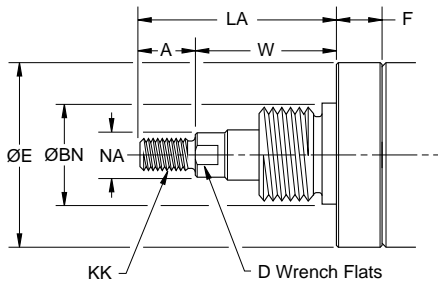
Rod end details – 32 to 63mm bore

Male threads

Inch male - Style N
 Metric male - Style 5

Female threads

Inch female - Style 9
 Metric female - Style 6



Special rod end threads

Thread style 3

Special metric or inch threads, extension, blank, etc., are also available. To order, specify "Style 3" and give desired dimensions for KK or KF, A and LAF or WF (Note: LAF = LA+F and WF = W+F), (length dimensions in millimeters). If otherwise special, supply a dimensioned sketch.

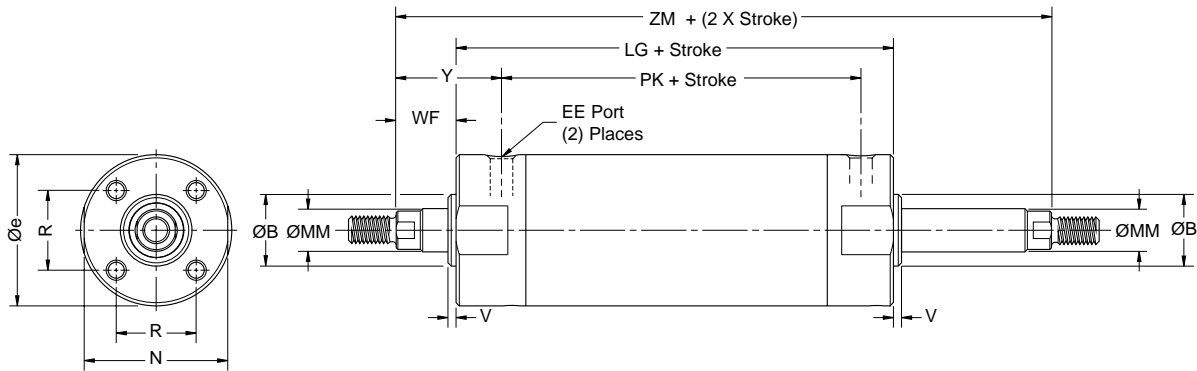
Style G, envelope and mounting dimensions – mm (inch)

Bore size	A	BN +0 -0.8	D	ØE	EE* (BSPT)	F	Thread KK Style 5	Thread KF Style 6	LA	ØMM rod dia.	NN	N	NA	R	VA	VB	W	WT	Y	Add stroke		
																				LB ¹	P ¹	ZB ¹
32	19 (0.75)	19.02 (0.749)	10 (0.39)	39 (1.53)	1/8 (1/8)	9 (0.37)	M10x1.25 (7/16-20)	M8x1.25 (5/16-24)	41 (1.63)	12 (0.472)	3/4-16 (3/4-16)	36 (1.42)	11 (0.43)	20 (0.79)	3 (0.12)	2 (0.08)	22 (0.88)	16 (0.63)	49 (1.93)	80 (3.15)	43 (1.69)	104 (4.11)
40	19 (0.75)	26.87 (1.058)	12 (0.47)	48.5 (1.91)	1/8 (1/8)	14 (0.56)	M14x1.5 (7/16-20)	M8x1.25 (3/8-24)	51 (2.00)	16 (0.630)	1-14 (1-14)	44 (1.73)	14 (0.55)	26 (1.02)	5 (0.19)	2 (0.08)	32 (1.25)	22 (0.88)	66 (2.60)	92 (3.62)	49 (1.93)	126 (4.95)
50	22 (0.88)	34.90 (1.374)	16 (0.63)	59 (2.32)	1/4 (1/4)	15 (0.59)	M18x1.5 (1/2-20)	M10x1.25 (1/2-20)	52 (2.07)	20 (0.787)	1-1/4-12 (1-1/4-12)	55 (2.17)	18 (0.71)	32 (1.26)	3 (0.12)	2 (0.08)	30 (1.19)	20.5 (0.81)	68 (2.68)	105 (4.12)	53 (2.09)	137 (5.39)
63	22 (0.88)	38.10 (1.500)	16 (0.63)	72 (2.83)	1/4 (1/4)	16 (0.63)	M18x1.5 (1/2-20)	M10x1.25 (1/2-20)	52 (2.07)	20 (0.787)	1-3/8-12 (1-3/8-12)	69 (2.72)	18 (0.71)	38 (1.50)	3 (0.12)	2 (0.08)	30 (1.19)	20.5 (0.81)	70 (2.76)	106 (4.19)	52 (2.05)	139 (5.46)

* See Metric Dimensions for BSPT Port Size.
 See Inch Dimensions for NPTF Port Size.

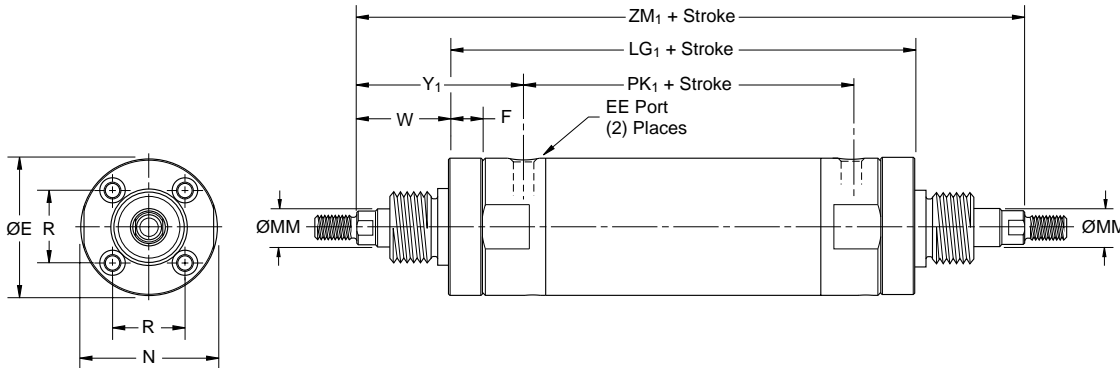
Double-Rod

Typical 20 to 100mm bore



Double-Rod

Nose Mount (32 to 63mm bore)



For detailed dimensions for the nose mount from 20 to 63 mm bore, please reference previous pages.

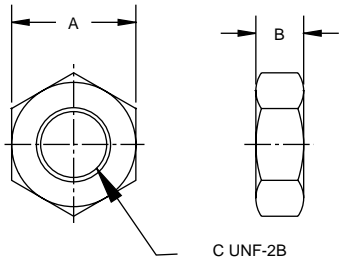
Double rod, envelope and mounting dimensions – mm (inch)

Bore size	ØB		F	EE (BSPT)	ØMM rod dia.		Add stroke											
	+0	-0.02			ØE	N	R	V	W	WF	Y	Y1	LG	LG1	PK	PK1	ZM	ZM1
20	12	27	-	1/8* (1/8†)	8	24	14	2	-	13	28	32	75	70	45	50	101	95
	(0.472)	(1.06)			(0.315)	(0.94)	(0.55)	(0.08)		(0.50)	(1.10)	(1.25)	(2.97)	(2.74)	(1.77)	(1.97)	(3.97)	(3.74)
25	14	32	-	1/8* (1/8†)	10	29	16.5	2	-	16	30	32	75	70	47	50	107	101
	(0.551)	(1.26)			(0.394)	(1.14)	(0.65)	(0.08)		(0.62)	(1.18)	(1.25)	(2.97)	(2.74)	(1.85)	(1.97)	(4.21)	(3.98)
32	18	39	9	1/8	12	36	20	2	22	22	40	49	78	97	42	42	122	141
	(0.709)	(1.53)	(0.37)	(1/8)	(0.472)	(1.42)	(0.79)	(0.08)	(0.88)	(0.88)	(1.57)	(1.93)	(3.06)	(3.80)	(1.65)	(1.65)	(4.82)	(5.56)
40	25	48.5	14	1/8	16	44	26	2	32	22	42	66	87	115	47	47	131	179
	(0.984)	(1.91)	(0.56)	(1/8)	(0.630)	(1.73)	(1.02)	(0.08)	(1.25)	(0.88)	(1.65)	(2.60)	(3.41)	(4.53)	(1.85)	(1.85)	(5.17)	(7.03)
50	30	59	15	1/4	20	55	32	2	30	30	53	68	100	130	54	54	160	190
	(1.181)	(2.32)	(0.59)	(1/4)	(0.787)	(2.17)	(1.26)	(0.08)	(1.19)	(1.19)	(2.09)	(2.68)	(3.93)	(5.11)	(2.13)	(2.13)	(6.31)	(7.49)
63	32	72	17	1/4	20	69	38	2	30	30	53	70	100	133	54	54	160	194
	(1.260)	(2.83)	(0.66)	(1/4)	(0.787)	(2.72)	(1.50)	(0.08)	(1.19)	(1.19)	(2.09)	(2.76)	(3.93)	(5.25)	(2.13)	(2.13)	(6.31)	(7.63)
80	40	90	-	3/8	25	86	50	3	-	31	59	-	119	-	61	-	181	-
	(1.575)	(3.54)		(3/8)	(0.984)	(3.39)	(1.97)	(0.12)		(1.22)	(2.32)		(4.70)		(2.40)		(7.14)	
100	50	110	-	1/2	32	106	60	3	-	31	57	-	119	-	65	-	181	-
	(1.968)	(4.33)		(1/2)	(1.260)	(4.17)	(2.36)	(0.12)		(1.22)	(2.24)		(4.70)		(2.56)		(7.14)	

* Ports are M5 for cushioned versions, metric
 † Ports are 10-32 for cushioned versions, inch



Rod Jam Nut



Rod jam nut should be ordered separately on all mounting styles.

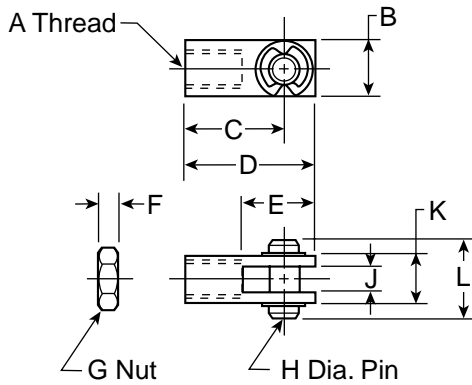
Rod Jam Nut Dimensions – mm

Bore size	A	B	C	Part number
20	13	4	M8 x 1.25	L075540008
25-32	17	5	M10 x 1.25	L075540010
40	22	7	M14 x 1.5	L075540014
50-63	27	8	M18 x 1.5	L075540018
80	32	11	M22 x 1.5	L075540022
100	41	16	M26 x 1.5	L075540026

Rod Jam Nut Dimensions – inch

Bore size	A	B	C	Part number
20	0.44	0.16	1/4-28	L077970025
25	0.50	0.19	5/16-24	L077970031
32-40	0.69	0.25	7/16-20	L077970044
50-63	0.75	0.31	1/2-20	L077970050
80	1.12	0.42	3/4 -16	L077970075
100	1.50	0.55	1-14	L077970100

Piston Rod Clevis



Piston Rod Clevis Dimensions – mm

Bore size	A	B	C	D	E	F	H h9	J	K	L	Part number
20	M8x1.25	13	24	30	18	4	6.35	6.5	13	17.5	L077590020
25	M10x1.25	19	24	30	18	5	6.35	6.5	19	24.5	L077590025
32	M10x1.25	19	34	43	24	5	9.52	10	19	26	L077590032
40	M14x1.5	19	34	43	24	7	9.52	10	19	26	L077590040
50	M18x1.5	28	34	43	24	8	9.52	10	28	36	L077590050
63	M18x1.5	28	34	43	24	8	9.52	10	28	36	L077590050
80	M22x1.5	38	50	71	48	11	18	28	56	64	PIM-4PRC
100	M26x1.5	44	55	79	55	16	22	32	63.5	72	L077590100

Piston Rod Clevis Dimensions – inch

Bore size	A	B	C	D	E	F	H	J	K +0 -0.02	L	Part number
20	1/4-28	0.50	0.94	1.19	0.69	0.16	0.250	0.26	0.50	0.69	L077960025
25	5/16-24	0.50	0.94	1.19	0.69	0.19	0.250	0.26	0.50	0.69	L077960031
32	7/16-20	0.75	1.32	1.69	0.94	0.25	0.375	0.38	0.75	1.03	L077960044
40	7/16-20	0.75	1.32	1.69	0.94	0.25	0.375	0.38	0.75	1.03	L077960044
50	1/2-20	0.75	1.32	1.69	0.94	0.31	0.375	0.38	0.75	1.03	L077960050
63	1/2-20	0.75	1.32	1.69	0.94	0.31	0.375	0.38	0.75	1.03	L077960050
80	3/4-16	1.25	1.81	2.38	1.31	0.42	0.437	0.52	1.25	1.66	L077960075
100	1-14	1.50	2.63	3.38	1.81	0.55	0.500	0.64	1.50	1.91	L077960100

B
Round Body Cylinders
Actuator Products
SRX
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SR/SM/SRD/SRDM
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P1L
Series
P1A
Series
P
Series



Mounting Kits & Accessories

How to order P1L mounting kits as a separate item

Bore size	Foot mounting		Flange		Trunnion / double clevis bracket	Single clevis bracket
	Inch	Metric	Inch	Metric		
20	L077440075	L077550020	L077450075	L077560020	L077510020	L077520075
25	L077440100	L077550025	L077450100	L077560025	L077510025	L077520075
32	L077440125	L077550032	L077450125	L077560032	L077510032	L077520125
40	L077440150	L077550040	L077450150	L077560040	L077510040	L077520150
50	L077440200	L077550050	L077450200	L077560050	L077510050	L077520200
63	L077440250	L077550063	L077450250	L077560063	L077510063	L077520250
80	L077440312	L077550080	L077450312	L077560080	L077510080	L077520312
100	L077440400	L077550100	L077450400	L077560100	L077510100	L077520400

Bore size	Single clevis		Double clevis		Single clevis pin	Double clevis pin
	Inch	Metric	Inch	Metric		
20	L077470075	L077570020	L077480075	L077580020	L077490075	L077500020
25	L077470100	L077570025	L077480100	L077580025	L077490075	L077500025
32	L077470125	L077570032	L077480125	L077580032	L077490125	L077500032
40	L077470150	L077570040	L077480150	L077580040	L077490150	L077500040
50	L077470200	L077570050	L077480200	L077580050	L077490200	L077500050
63	L077470250	L077570063	L077480250	L077580063	L077490200	L077500063
80	L077470312	L077570080	L077480312	L077580080	L077490312	L077500080
100	L077470400	L077570100	L077480400	L077580100	L077490400	L077500100

Notes:

- “Inch” mounting kits include inch threaded bolts, while “Metric” mounting kits include metric threaded bolts. Please verify that the kit style matches the cylinder Construction type (code “N” or “M”) for which it is intended.
- Clevis pins may be used for either Inch or Metric mounting kits.

Service kits

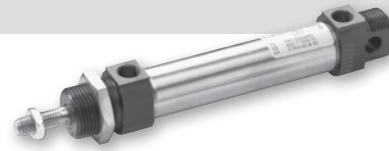
Bore size	Single rod cylinder repair kits Consisting of: 1 ea. Symbol #5, 7, 12, & 2 ea. Symbol #1, 8 11, 14		Double rod cylinder repair kits Consisting of: 1 ea. Symbol #5, 7, & 2 ea. Symbol #1, 8 11, 12, 14	
	Class 1 seals, std. service	Class 5 seals, high temp.	Class 1 seals, std. service	Class 5 seals, high temp.
mm	Part number	Part number	Part number	Part number
20	P1L020D001	P1L020D005	P1L020K001	P1L020K005
25	P1L025D001	P1L025D005	P1L025K001	P1L025K005
32	P1L032D001	P1L032D005	P1L032K001	P1L032K005
40	P1L040D001	P1L040D005	P1L040K001	P1L040K005
50	P1L050D001	P1L050D005	P1L050K001	P1L050K005
63	P1L063D001	P1L063D005	P1L063K001	P1L063K005
80	P1L080D001	P1L080D005	P1L080K001	P1L080K005
100	P1L100D001	P1L100D005	P1L100K001	P1L100K005

B
 Round Body Cylinders
 Actuator Products
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 Series
 SRX
 Series
 P1L
 Series
 P1A
 Series
 P
 Series



P1A Series

- Conforms to ISO 6432 and CETOP RP52P standards
- 5 bore sizes, 10mm to 25mm
- Stainless steel body with black anodized aluminum end caps
- Stainless steel piston rod
- Magnetic piston and bumpers standard

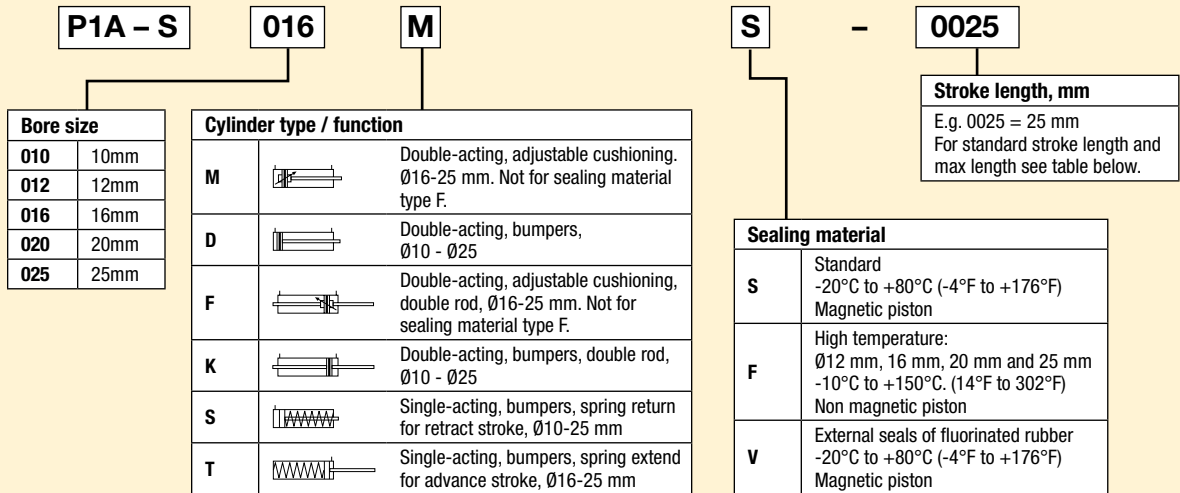


Operating information

Operating pressure:	10 bar (145 PSIG)
Temperature range:	
Working	-20°C to 80°C (-4°F to 176°F)
High temperature version	
20mm, 25mm	-10°C to 150°C (14°F to 302°F)
10mm, 12mm, 16mm	-10°C to 120°C (14°F to 248°F)
Low temperature version	-40°C to 60°C (-40°F to 140°F)
Filtration requirements:	40 micron, dry filtered air



Ordering information



Stroke Lengths		Stroke Length (* = standard, ° = non-standard, blank = N/A)																
Cylinder model	Bore size	10	15	20	25*	30	40	50*	80*	100*	125*	160*	200*	250*	320*	400*	500*	
		Double acting with fixed end-cushioning:																
P1A-S 010 D	10	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 012 D	12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 016 D	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 020 D	20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 025 D	25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Double acting with adjustable end-cushioning:																		
P1A-S 016 M	16			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 020 M	20			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
P1A-S 025 M	25			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Single acting:																		
P1A-S 010 SS	10	•	•	•	•	•	•	•	•									
P1A-S 012 SS	12	•	•	•	•	•	•	•	•									
P1A-S 016 SS(TS)	16	•	•	•	•	•	•	•	•**									
P1A-S 020 SS(TS)	20	•	•	•	•	•	•	•	•									
P1A-S 025 SS(TS)	25	•	•	•	•	•	•	•	•									

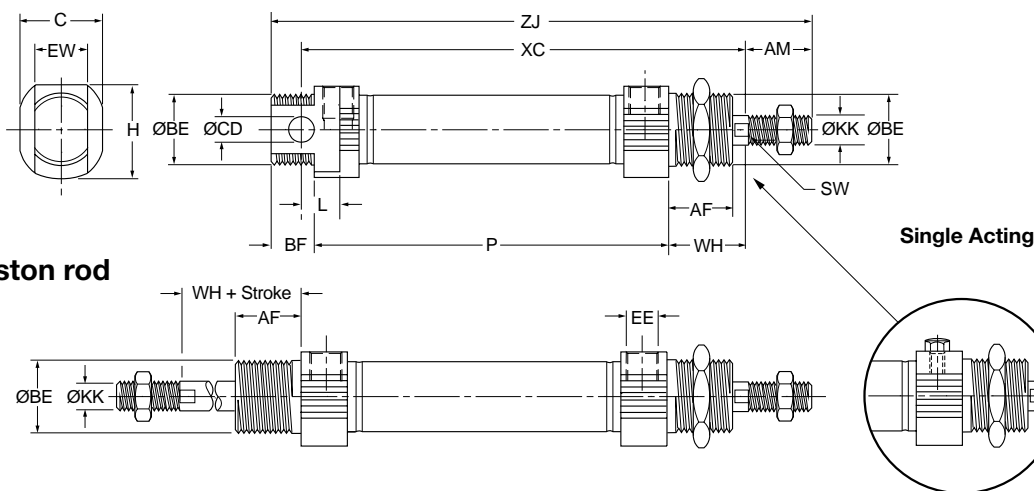
* Standard stroke lengths in mm according to ISO 4393
 ** Not for the TS version

Sensors

For sensors see page B339.



Double acting cylinders



Double piston rod

Bore size mm	AM ^{0/-2} mm	BE	AF mm	BF mm	C mm	CD ^{h9} mm	EE	EW mm	H mm	KK	L mm	SW mm	WH±1.2 mm
10	12	M12x1.25	12	10	14.0	4	M5	8	16.7	M4	6	–	16
12	16	M16x1.5	18	13	18.0	6	M5	12	19.1	M6	9	5	22
16 ¹⁾	16	M16x1.5	18	13	18.0	6	M5	12	19.1	M6	9	5	22
16 ²⁾	16	M16x1.5	18	13	25.0	6	M5	12	24.0	M6	9	5	22
20	20	M22x1.5	20	14	24.0	8	G1/8	16	27.0	M8	12	7	24
25	22	M22x1.5	22	14	27.5	8	G1/8	16	29.0	M10x1.25	12	9	28

1) P1A-S016DS/SS/TS 2) P1A-S016MS

Double acting cylinders

Bore size mm	XC mm	ZJ mm	P mm
10	64 + stroke	84 + stroke	46 + stroke
12	75 + stroke	99 + stroke	48 + stroke
16	82 + stroke	104 + stroke	53 + stroke
20	95 + stroke	125 + stroke	67 + stroke
25	104 + stroke	132 + stroke	68 + stroke

Single-acting, spring return, type SS

Bore size mm	XC (mm) at various strokes						ZJ (mm) at various strokes						P (mm) at various strokes					
	10	15	25	40	50	80	10	15	25	40	50	80	10	15	25	40	50	80
10	74	79	89	126	136	174	94	99	109	146	156	194	56	61	71	108	118	156
12	85	90	100	132	142	185	109	114	124	156	166	209	58	63	73	105	115	158
16	92	97	107	122	132	184	114	119	129	144	154	206	63	68	78	93	103	155
20	105	110	120	135	145	191	135	140	150	165	175	221	77	82	92	107	117	163
25	114	119	129	144	154	201	142	147	157	172	182	229	78	83	93	108	118	165

Single-acting, spring-extended, type TS

Bore size mm	ZC ³⁾ (mm) at various strokes					ZJ ³⁾ (mm) at various strokes					P (mm) at various strokes							
	10	15	25	40	80	10	15	25	40	80	10	15	25	40	80			
16	107	112	122	137	147	–	134	139	149	164	174	–	78	83	93	108	118	–
20	120	125	135	150	160	195	156	161	171	186	196	231	92	97	107	122	132	167
25	129	134	144	159	169	205	165	170	180	195	205	241	93	98	108	123	133	169

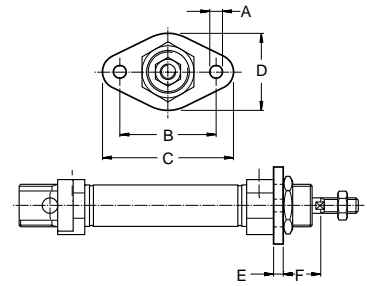
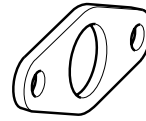
3) With piston rod retracted, as shown in the dimension drawing
 Length tolerances ±1 mm Stroke length tolerance +1.5/0 mm

B
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 Series
 SRX
 Series
 P1L
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 P1A
 Series
 P
 Series



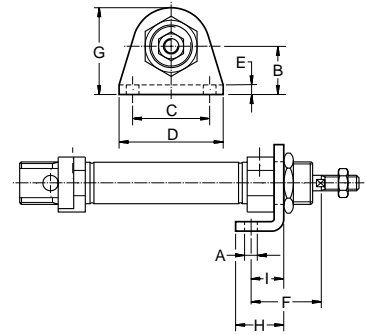
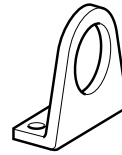
Flange - MF8

Cylinder Ø mm	A	B	C	D	E	F	Weight lbs	Part number
10	4.5	30	40	22	3	13	0.025	P1A-4CMB
12-16	5.5	40	52	30	4	18	0.055	P1A-4DMB
20	6.6	50	66	40	5	19	0.100	P1A-4HMB
25	6.6	50	66	40	5	23	0.100	



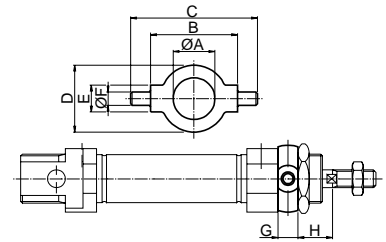
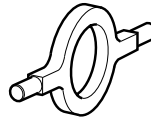
Foot - MS3

Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	Weight lbs	Part number
10	4.5	16	25	35	3	24	26.0	16	11	0.045	P1A-4CMF
12-16	5.5	20	32	42	4	32	32.5	20	14	0.08	P1A-4DMF
20	6.5	25	40	54	5	36	45.0	25	17	0.18	P1A-4HMF
25	6.5	25	40	54	5	40	45.0	25	17	0.18	



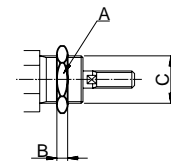
Cover Trunnion

Cylinder Ø mm	A mm	B h14 mm	C mm	D mm	E e9 mm	F mm	G mm	H mm	Weight lbs	Part number
10	12.5	26	38	20	8	4	6	10	0.03	P1A-4CMJ
12-16	16.5	38	58	25	10	6	8	14	0.07	P1A-4DMJ
20	22.5	46	66	30	10	6	8	16	0.08	P1A-4HMJ
25	22.5	46	66	30	10	6	8	20	0.08	



Mounting Nut

Cylinder Ø mm	A mm	B mm	C mm	Weight lbs	Part number
10	19	6	M12x1.25	0.02	9127385101
12-16	24	8	M16x1.50	0.04	9127385102
20-25	32	11	M22x1.50	0.09	9127385103

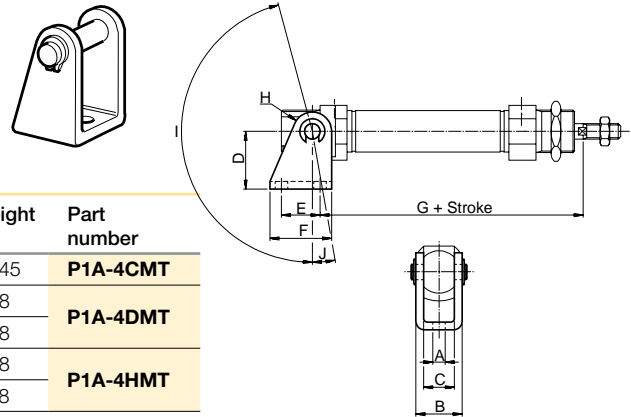


Most popular.



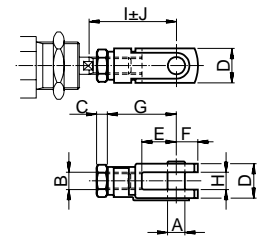
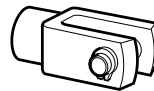
B
 Round Body Cylinders
 Actuator Products
 SR/SM/SRD/SRDM
 Series
 SRX
 Series
 P1L
 Series
 P1A
 Series
 P
 Series

Clevis Bracket



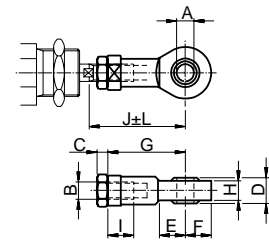
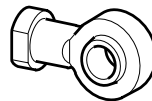
Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I °	J °	Weight lbs	Part number
10	4.5	13	8	24	12.5	20	65.3	5	160	17	0.045	P1A-4CMT
12	5.5	18	12	27	15.0	25	73.0	7	170	15	0.08	P1A-4DMT
16	5.5	18	12	27	15.0	25	80.0	7	170	15	0.08	P1A-4DMT
20	6.5	24	16	30	20.0	32	91.0	10	165	10	0.18	P1A-4HMT
25	6.5	24	16	30	20.0	32	100.0	10	165	10	0.18	P1A-4HMT

Rod clevis



Cylinder Ø mm	A mm	B	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	Weight lbs	Part number
10	4	M4	2.2	8	8	5	16	4	22.0	2.0	0.015	P1A-4CRC
12-16	6	M6	3.2	12	12	7	24	6	31.0	3.0	0.05	P1A-4DRC
20	8	M8	4.0	16	16	10	32	8	40.5	3.5	0.10	P1A-4HRC
25	10	M10 x 1.25	5.0	20	20	12	40	10	49.0	3.0	0.21	P1A-4JRC

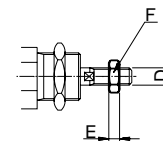
Swivel Rod Eye



Cylinder Ø mm	A mm	B	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	Weight lbs	Part number
10	5	M4	2.2	8	10	9	27	6.0	8	33.0	9	2.0	0.04	P1A-4CRS
12-16	6	M6	3.2	9	10	10	30	6.8	9	38.5	11	1.5	0.06	P1A-4DRS
20	8	M8	4.0	12	12	12	36	9.0	12	46.0	14	2.0	0.10	P1A-4HRS
25	10	M10 x 1.25	5.0	14	14	14	43	10.5	15	52.5	17	2.5	0.19	P1A-4JRS

Rod Nut

Cylinder Ø mm	D mm	F mm	E mm	Weight lbs	Part number
10	M4	7	2.2	0.002	0261110600
12-16	M6	10	3.2	0.004	0261210800
20	M8	13	4.0	0.010	0261211000
25	M10x1.25	17	5.0	0.015	9128985601



Most popular.



P Series

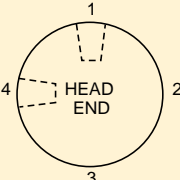

- Repairable design, aluminum construction
- 6 bore sizes: 1-1/8" to 4"
- Double-acting, spring-return and spring-extend models
- Cushions optional at either or both ends
- Universal nose and tang mounts
- Standard stroke lengths to 20 inches in one inch increments, plus 1-1/2", 2-1/2" and 3-1/2" strokes. Fraction strokes and strokes over 20 inches are available upon request.



Operating information

Operating pressure:	150 PSIG (8 bar)
Temperature range:	-10°F to 165°F (-23°C to 74°C)
Standard seals	-10°F to 250°F (-23°C to 121°C)
Fluorocarbon seals	-10°F to 250°F (-23°C to 121°C)
Filtration requirements:	40 micron, dry filtered air

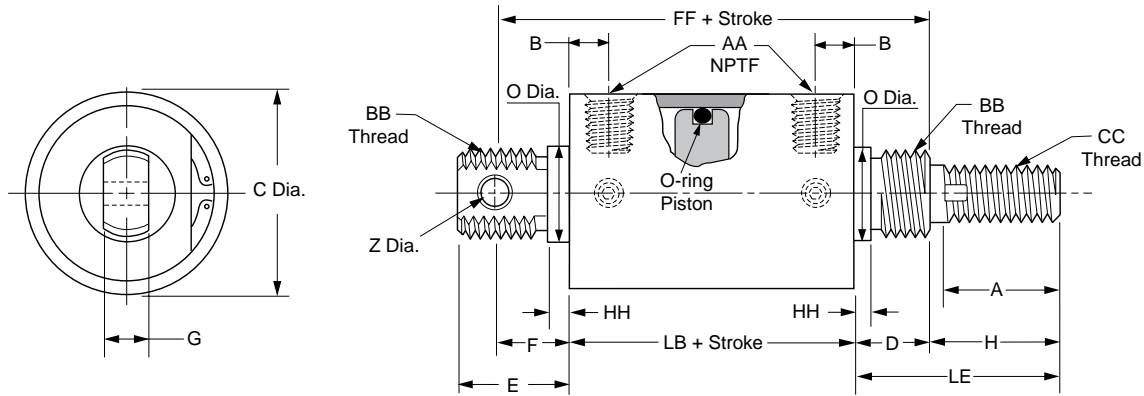
Ordering information

2-1/2"	C	K	P	L	U				1	6		C	X6"
Bore size 1-1/8" 1-1/2" 2" 2-1/2" 3" 4"			Series	Piston Blank O-ring piston L Lipseal piston Sensors available on lipseal pistons only.									Stroke Specify in inches. Show times symbol "X" just ahead of stroke length.
Cushion head end Blank No cushion C Cushion head end				Ports U N.P.T.F.								Cushion cap end Blank No cushion C Cushion cap end	
Double rod Blank Single rod K Double rod				Seals / options Blank Buna-N V Fluorocarbon M Magnet with Buna-N seals ¹								Rod material Blank Standard rod D 416 Stainless steel ²	
Mounting style Blank Standard N No tang A Dual tang				Spring E Spring extend R Spring return								Rod thread 6 Standard 3 Special (For special rod end specify "CC" thread Dia. A and LE or LE1 or Dim. or submit sketch.)	
Safety Cushion Adjustment Location 				Special number Use "S" symbol only if special feature is required (specify). NOTE: Do not use symbol "S" for rod end modification.								Rod diameter style 1 Standard For double rod cylinders specify rod code twice.	
With port in position 1, cushion location will be position 4.				Notes: ¹ Must specify lipseal piston with magnet option. ² Standard on 1-1/8" bore. {D} not required.								Sensors For sensors see page B339. 	

For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.

Model P

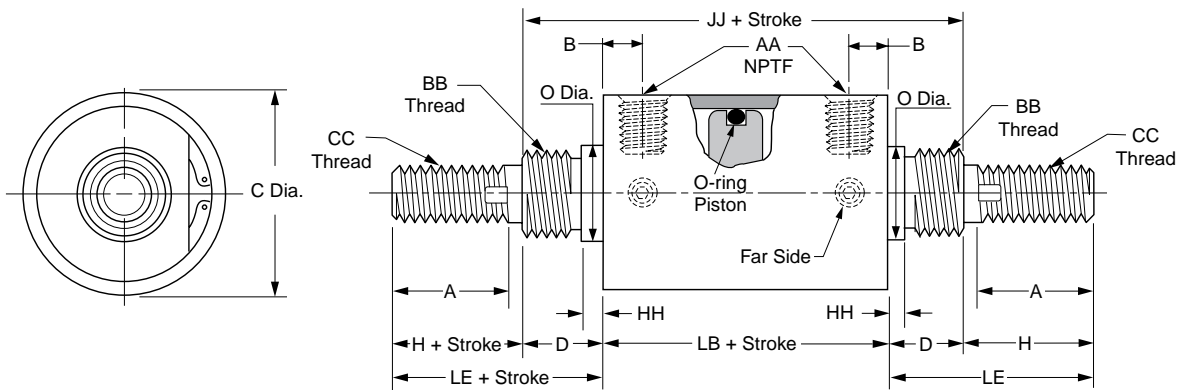
O-ring piston – single rod



Model P cylinders are available without tang covered by dimension E minus HH at no extra charge. To order specify Model NP.

Model KP

O-ring piston – double rod



Mounting nuts not supplied with cylinder.

Model P and KP single and double rod cylinders

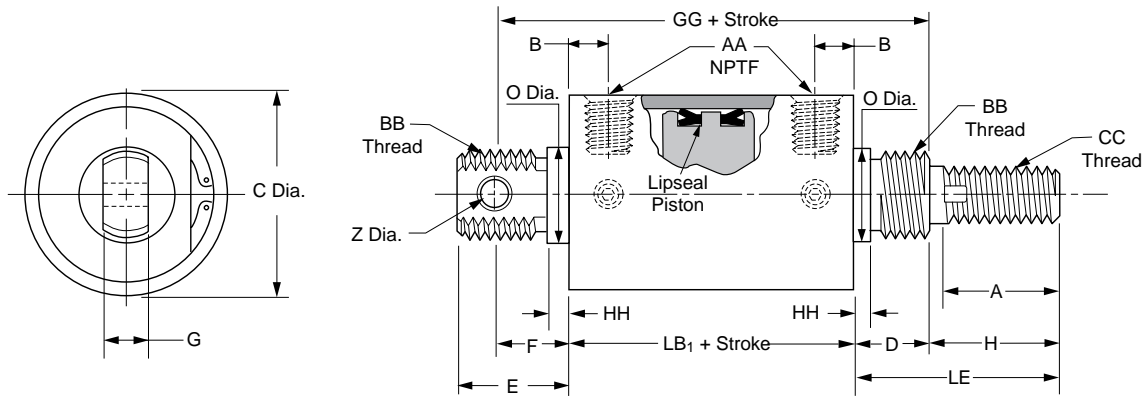
Bore Size	Rod Dia.	LB	B	C	D	E	F	G	H	A	O	Z	AA	BB	CC	FF	HH	JJ	LE
1-1/8	3/8	2-1/16	13/32	1-3/8	5/8	1	11/16	3/8	1	7/8	3/4	1/4	1/8	3/4-16	3/8-16	3-3/8	3/32	3-5/16	1-5/8
1-1/2	1/2	2-5/8	1/2	1-3/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	1/2-13	4-3/8	1/8	4-3/8	2-5/16
2	5/8	2-5/8	1/2	2-1/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	5/8-11	4-3/8	1/8	4-3/8	2-5/16
2-1/2	3/4	3	5/8	2-3/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	5-3/8	3/16	5	2-11/16
3	3/4	3	5/8	3-1/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	5-3/8	3/16	5	2-11/16

Note: 4" bore size offered only with Lipseal Piston.
 FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PV or KP.



Model PL

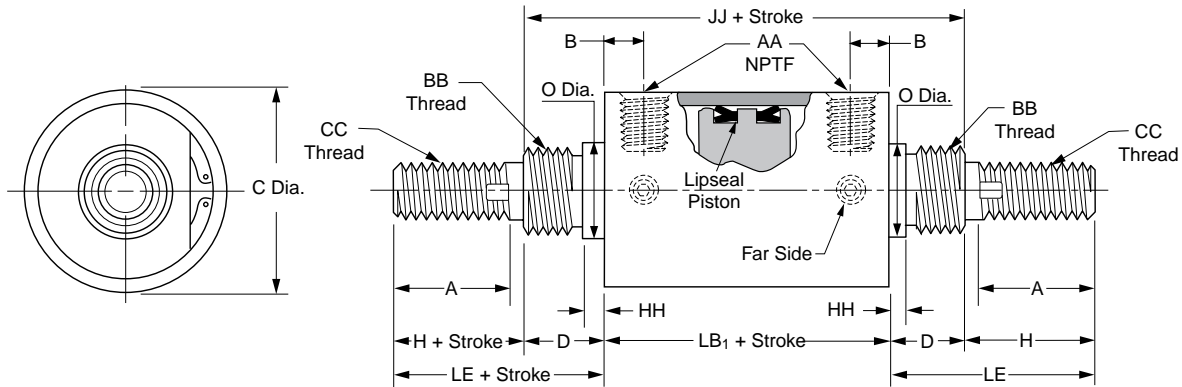
Lipseal piston – single rod



Model PL cylinders are available without tang covered by dimension E minus HH at no extra charge. To order specify Model NPL.

Model KPL

Lipseal piston – double rod



Mounting nuts not supplied with cylinder.

Model PL and KPL single and double rod cylinders

Bore Size	Rod Dia.	LB ₁	B	C	D	E	F	G	H	A	O	Z	AA	BB	CC	GG	HH	KK	LE
1-1/8	3/8	3-1/16	13/32	1-3/8	5/8	1	11/16	3/8	1	7/8	3/4	1/4	1/8	3/4-16	3/8-16	4-3/8	3/32	4-5/16	1-5/8
1-1/2	1/2	3-5/8	1/2	1-3/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	1/2-13	5-3/8	1/8	5-3/8	2-5/16
2	5/8	3-5/8	1/2	2-1/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	5/8-11	5-3/8	1/8	4-3/8	2-5/16
2-1/2	3/4	4	5/8	2-3/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	6-3/8	3/16	6	2-11/16
3	3/4	4	5/8	3-1/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	6-3/8	3/16	6	2-11/16
4	1	5-1/2	15/16	4-3/8	1-1/8	2-3/16	1-7/16	3/4	2-1/4	1-7/8	1-3/4	1/2	1/2	1-3/4-12	1-14	8-1/16	3/16	7-1/4	3-3/8

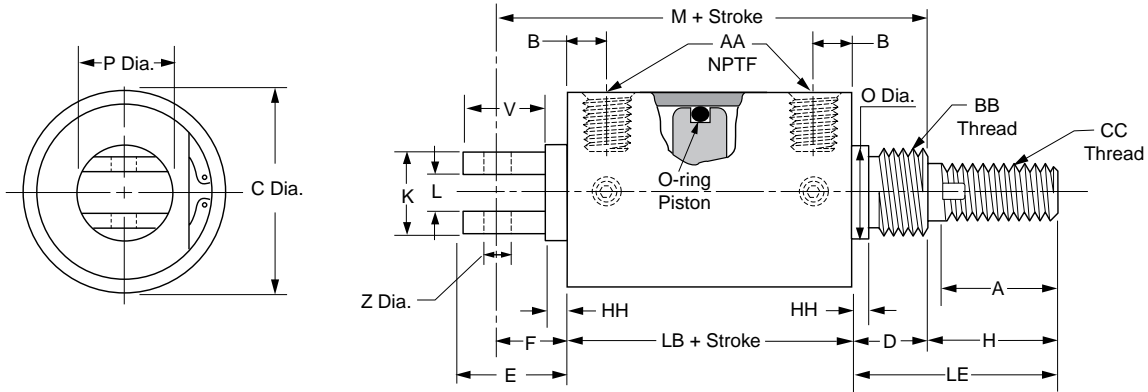
FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PLV or KPLV.

B
 Round Body Cylinders
 Actuator Products
 SR/SM/SRD/SRDM
 Series
 SRX
 Series
 P1L
 Series
 P1A
 Series
 P
 Series



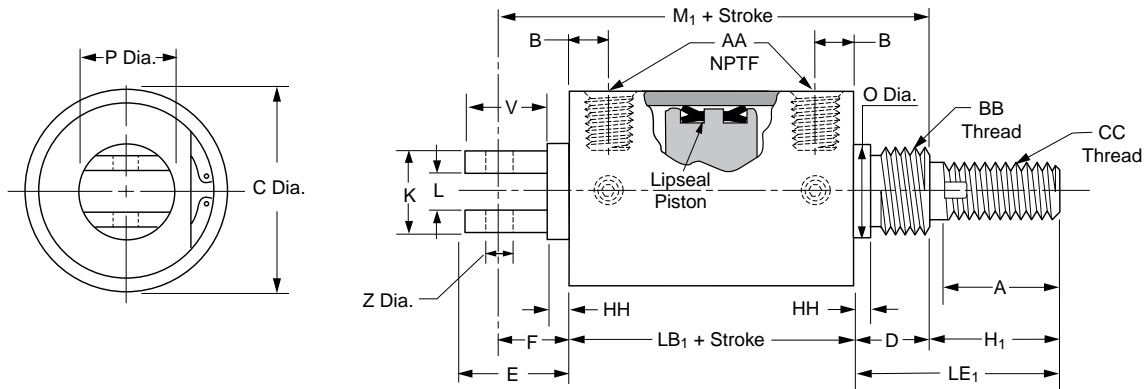
Model AP

O-ring piston – single rod
 1-1/8" bore thru 3" bore



Model APL

Lipseal piston – single rod
 1-1/8" bore thru 4" bore



Mounting nuts not supplied with cylinder.

Models AP and APL only

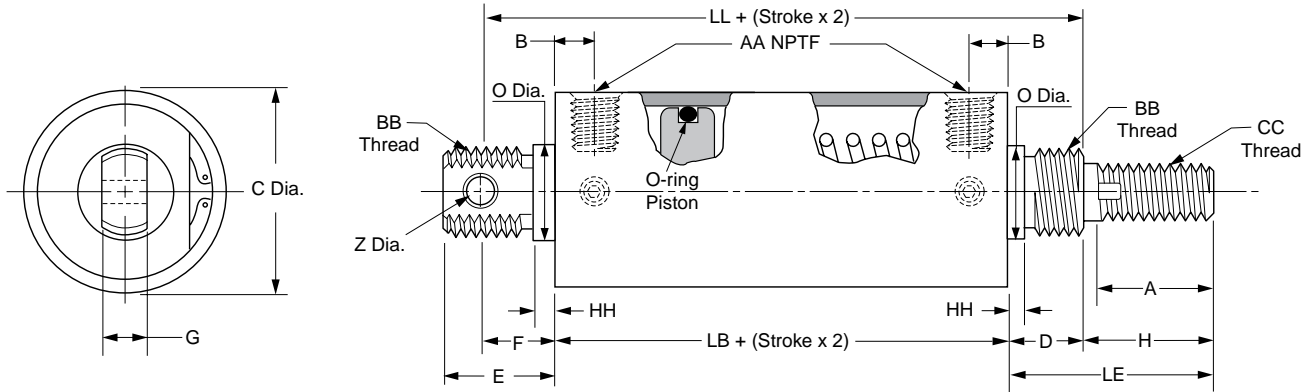
Bore Size	Rod Dia.	LB	LB ₁	B	C	D	E	F	H	H ₁	A	K	L	M	M ₁	O	P	V	Z	AA	BB	CC	HH	LE	LE ₁	
1-1/8	3/8	2-1/16	3-1/16	13/32	1-3/8	5/8	1	11/16	1	1	7/8	15/16	3/8	4-3/8	5-3/8	3/4	15/16	7/8	3/8	1/8	3/4-16	3/8-16	3/32	1-5/8	1-5/8	
1-1/2	1/2	2-5/8	3-5/8	1/2	1-3/4	7/8	1-5/8	15/16	2-7/16	1-7/16	1-1/4	1-1/4	1/2	6-7/8	6-7/8	1-1/16	1-1/4	1-1/2	3/8	1/4	1-14	1/2-13	1/8	3-5/16	2-5/16	
2	5/8	2-5/8	3-5/8	1/2	2-1/4	7/8	2-1/4	1-9/16	2-7/16	1-7/16	1-1/4	1-1/2	1/2	7-1/2	7-1/2	1-1/16	1-11/16	1-3/4	1/2	1/4	1-14	5/8-11	1/8	3-5/16	2-5/16	
2-1/2	3/4	3	4	5/8	2-3/4	1	2-1/4	1-13/16	1-1/8	3-11/16	2-11/16	1-1/2	1-1/2	1/2	8-13/16	8-13/16	1-3/8	2-1/4	1-11/16	1/2	3/8	1-3/8-12	3/4-10	3/16	4-11/16	3-11/16
3	3/4	3	4	5/8	3-1/4	1	2-5/8	1-5/8	3-11/16	2-11/16	1-1/2	1-1/2	1/2	9-5/16	9-5/16	1-3/8	2-1/4	1-3/4	1/2	3/8	1-3/8-12	3/4-10	3/16	4-11/16	3-11/16	
4	1	-	5-1/2	15/16	4-3/8	1-1/8	2-7/8	1-7/8	-	2-1/4	1-7/8	2-1/4	3/4	-	10-3/4	1-3/4	3	2-1/2	3/4	1/2	1-3/4-12	1-14	3/16	-	3-3/8	

FLUOROCARBON Seals for operation to 250°F are available at extra cost. Specify model ASPV or ASPLV.



Model PR – Spring return
Model PE – Spring extend

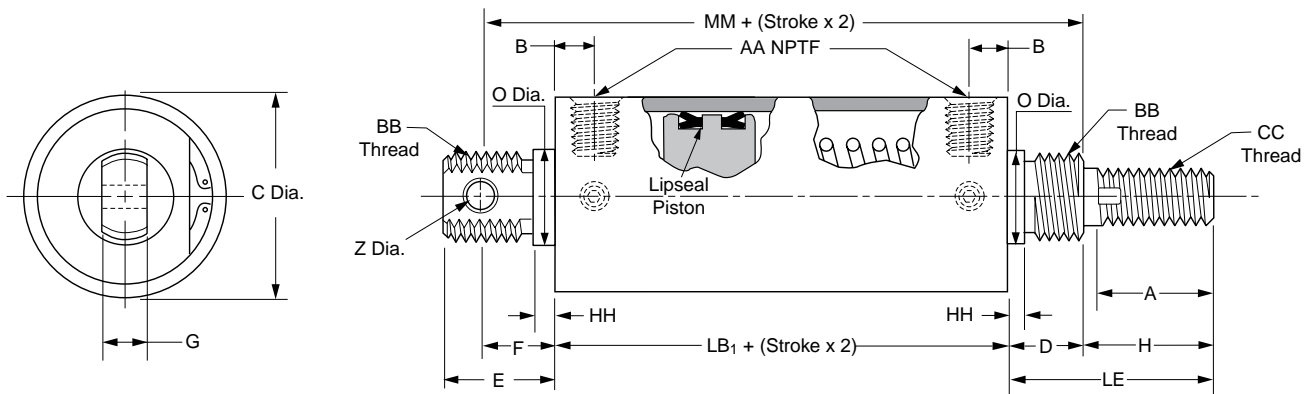
O-ring piston



Spring return cylinders are available without tail section covered by dimension E minus HH at no extra charge. To order, add letter "N" to model number.

Model PLR – Spring return
Model PLE – Spring extend

Lipseal piston



Mounting nuts not supplied with cylinder.

For single rod spring return cylinders up to 6" stroke (no load spring)

Bore Size	Rod Dia.	LB	LB ₁	B	C	D	E	F	G	H	A	O	Z	AA	BB	CC	HH	LL	MM	LE	Spring force	
																					Pre-load (lbs.)	Max. load (lbs.)
1-1/8	3/8	2-1/16	3-1/16	13/32	1-3/8	5/8	1	11/16	3/8	1	7/8	3/4	1/4	1/8	3/4-16	3/8-16	3/32	3-3/8	4-3/8	1-5/8	12	36
1-1/2	1/2	2-5/8	3-5/8	1/2	1-3/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	1/2-13	1/8	4-3/8	5-3/8	2-5/16	14	45
2	5/8	2-5/8	3-5/8	1/2	2-1/4	7-8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	5/8-11	1/8	4-3/8	5-3/8	2-5/16	18	48
2-1/2	3/4	3	4	5/8	2-3/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	3/16	5-3/8	6-3/8	2-11/16	30	64
3	3/4	3	4	5/8	3-1/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	3/16	5-3/8	6-3/8	2-11/16	30	64
4	1	▲	5-1/2	15/16	4-3/8	1-1/8	2-3/16	1-7/16	3/4	2-1/4	1-7/8	1-3/4	1/2	1/2	1-3/4-12	1-14	3/16	▲	8-1/16	3-3/8	50	148

▲ 4" bore spring return cylinders, available only with lipseal type piston.

** Net stroke plus stop tube = gross stroke.

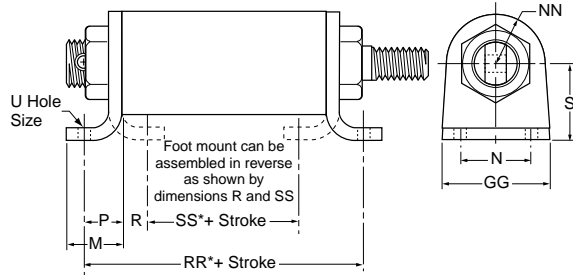
FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PVR, PVE, PLVR or PLVE.

* Dimensions shown are for cylinder with no load spring. For heavier springs or double rod spring return cylinders, consult factory.

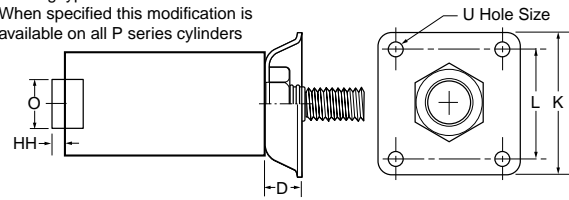
B
 Round Body Cylinders
 Actuator Products
 SR/SM/SRD/SRDM
 Series
 SRX
 Series
 P1L
 Series
 P1A
 Series
 P
 Series



Foot and Flange Mounts



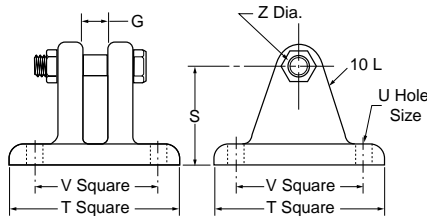
No tang type shown.
 When specified this modification is available on all P series cylinders



Bore size	D	K	L	M	N	O	P	R	S	U	GG	HH	NN	RR	SS	Foot mount*	Flange mount**
1-1/8	5/8	2-1/2	2	1-3/8	1-11/16	3/4	7/8	5/8	1-9/32	9/32	2-11/16	3/32	11/16	3-13/16	13/16	L069190000	L069230000
1-1/2	7/8	3-1/4	2-1/2	1-9/32	1-5/8	1-1/16	7/8	9/16	1-3/4	9/32	2-7/16	1/8	1-1/8	4-3/8	1-1/2	L069200000	L069240000
2	7/8	3-1/4	2-1/2	1-9/32	1-5/8	1-1/16	7/8	9/16	1-3/4	9/32	2-7/16	1/8	1-1/8	4-3/8	1-1/2	L069200000	L069240000
2-1/2	1	4-1/2	3-3/8	1-29/32	2-1/4	1-3/8	1-1/4	7/8	2-3/8	13/32	3-9/16	3/16	1-5/8	5-1/2	1-1/4	L069210000	L069250000
3	1	4-1/2	3-3/8	1-29/32	2-1/4	1-3/8	1-1/4	7/8	2-3/8	13/32	3-9/16	3/16	1-5/8	5-1/2	1-1/4	L069210000	L069250000
4	1-1/8	5-1/4	4	2-17/32	3-1/4	1-3/4	1-3/4	1-5/16	3-3/16	15/32	4-13/16	3/16	2-3/16	9▲	2-7/8▲	L069220000	L069260000

▲ Dimension shown is for lipseal piston type.
 * Part number includes one foot mounting and one mounting nut.
 ** Includes mounting nut.

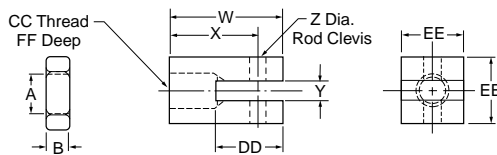
Clevis Bracket



Bore size	G	S	T	U	V	Z	Part number
1-1/8	3/8	1-9/32	2-1/4	9/32	1-3/4	1/4	L067300000
1-1/2	1/2	1-3/4	3	9/32	2-1/4	5/16	L067310000
2	1/2	1-3/4	3	9/32	2-1/4	5/16	L067310000
2-1/2	5/8	2-3/8	4	13/32	3	7/16	L067320000
3	5/8	2-3/8	4	13/32	3	7/16	L067320000
4	3/4	3-3/16	5	15/32	3-3/4	1/2	L067330000

Connecting pin and locknut furnished with clevis bracket.

Rod Clevis

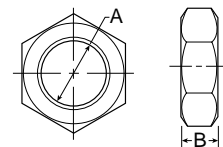


Cyl. bore	Rod dia.	A	B	CC	DD	EE	FF	W	X	Y	Z	Part number
1-1/8	3/8	3/8-16	7/32	3/8-16	1-1/8	3/4	5/8	1-3/4	1-3/8	5/16	1/4	L067340000
1-1/2	1/2	1/2-13	5/16	1/2-13	1-5/16	1	15/16	2-1/4	1-3/4	3/8	5/16	L067350000
2	5/8	5/8-11	3/8	5/8-11	1-5/16	1	15/16	2-1/4	1-3/4	3/8	5/16	L067360000
2-1/2	3/4	3/4-10	27/64	3/4-10	1-5/16	1-1/4	1-1/16	2-3/8	1-13/16	1/2	7/16	L067370000
3	3/4	3/4-10	27/64	3/4-10	1-5/16	1-1/4	1-1/16	2-3/8	1-13/16	1/2	7/16	L067370000
4	1	1-14	35/64	1-14	1-13/16	1-1/2	1-9/16	3-3/8	2-5/8	5/8	1/2	L067380000

Note: Rod end jam nut furnished with rod clevis.

Most popular.

Mounting Nut for Cylinders**



Bore size	A	B	Part number
1-1/8	3/4-16	27/64	0833010048
1-1/2 & 2	1-14	35/64	0833010100
2-1/2 & 3	1-3/8-12	25/32	0833010124
4	1-3/4-12	15/16	0831830000

Sensors

For sensors see page B339.



Table A

Seal kit for series “P” cylinders with o-ring piston

Contains: 2 each symbol #15 & 1 each symbol #16, 24 & 25

Bore size	Standard seal kit part number	Hi-temp seal kit part number
1-1/8"	L067680000	L067730000
1-1/2"	L067690000	L067740000
2"	L067700000	L067750000
2-1/2"	L067710000	L067760000
3"	L067720000	L067770000

Table B

Seal kit for series “P” cylinders with lipseal piston

Contains: 2 each symbol #15 & 23 & 1 each symbol #24 & 25

Bore size	Standard seal kit part number	Hi-temp seal kit part number
1-1/8"	L067780000	L067840000
1-1/2"	L067790000	L067850000
2"	L067800000	L067860000
2-1/2"	L067810000	L067870000
3"	L067820000	L067880000
4"	L067830000	L067890000

Table C

Cushion seal kit for series “P” cylinders

Contains: 2 each symbol #19 & 21 (Symbol #21 not required or supplied for 1-1/8" & 1-1/2" bore size cylinders)

Bore size	Standard seal kit part number	Hi-temp seal kit part number
1-1/8"	L067900000	L067950000
1-1/2"	L067910000	L067960000
2"	L067920000	L067970000
2-1/2"	L067930000	L067980000
3"	L067930000	L067980000
4"	L067940000	L067990000

B
 Round Body Cylinders
 Actuator Products
 SR/SW/SRD/SRDM
 Series
 SRX
 Series
 P1L
 Series
 P1A
 Series
 P
 Series

P1Q Series

- Economical square body compact cylinder
- 10 bore sizes available 12mm - 100mm
- 4 flexible mounting options
- Female and male rod ends available
- Bumpers standard on all models
- Magnetic and non-magnetic construction available



Operating information

Operating pressure:	10 bar (145 PSIG) maximum
Temperature range:	-5°C to 60°C (23°F to 140°F)
Filtration requirements:	40 micron, dry filtered air

Metric Double Acting / Magnetic - Female Threaded Piston Rod

12mm

Stroke (mm)	Order Code
5	P1QS012DC7G0005
10	P1QS012DC7G0010
15	P1QS012DC7G0015
25	P1QS012DC7G0025
30	P1QS012DC7G0030

16mm

5	P1QS016DC7G0005
10	P1QS016DC7G0010
15	P1QS016DC7G0015
25	P1QS016DC7G0025
30	P1QS016DC7G0030

20mm

10	P1QS020DC7G0010
15	P1QS020DC7G0015
25	P1QS020DC7G0025
30	P1QS020DC7G0030
40	P1QS020DC7G0040
50	P1QS020DC7G0050

25mm

10	P1QS025DC7G0010
15	P1QS025DC7G0015
25	P1QS025DC7G0025
30	P1QS025DC7G0030
40	P1QS025DC7G0040
50	P1QS025DC7G0050

32mm

10	P1QS032DC7N0010
15	P1QS032DC7N0015
25	P1QS032DC7N0025
30	P1QS032DC7N0030
40	P1QS032DC7N0040
50	P1QS032DC7N0050
75	P1QS032DC7N0075
100	P1QS032DC7N0100

40mm

15	P1QS040DC7N0015
25	P1QS040DC7N0025
30	P1QS040DC7N0030
40	P1QS040DC7N0040
50	P1QS040DC7N0050
75	P1QS040DC7N0075
100	P1QS040DC7N0100

50mm

15	P1QS050DC7N0015
25	P1QS050DC7N0025
30	P1QS050DC7N0030
40	P1QS050DC7N0040
50	P1QS050DC7N0050
75	P1QS050DC7N0075
100	P1QS050DC7N0100

63mm

15	P1QS063DC7N0015
25	P1QS063DC7N0025
30	P1QS063DC7N0030
40	P1QS063DC7N0040
50	P1QS063DC7N0050
75	P1QS063DC7N0075

80mm

15	P1QS080DC7N0015
25	P1QS080DC7N0025
30	P1QS080DC7N0030
40	P1QS080DC7N0040
50	P1QS080DC7N0050
75	P1QS080DC7N0075

100mm

15	P1QS100DC7N0015
25	P1QS100DC7N0025
30	P1QS100DC7N0030
40	P1QS100DC7N0040
50	P1QS100DC7N0050
75	P1QS100DC7N0075

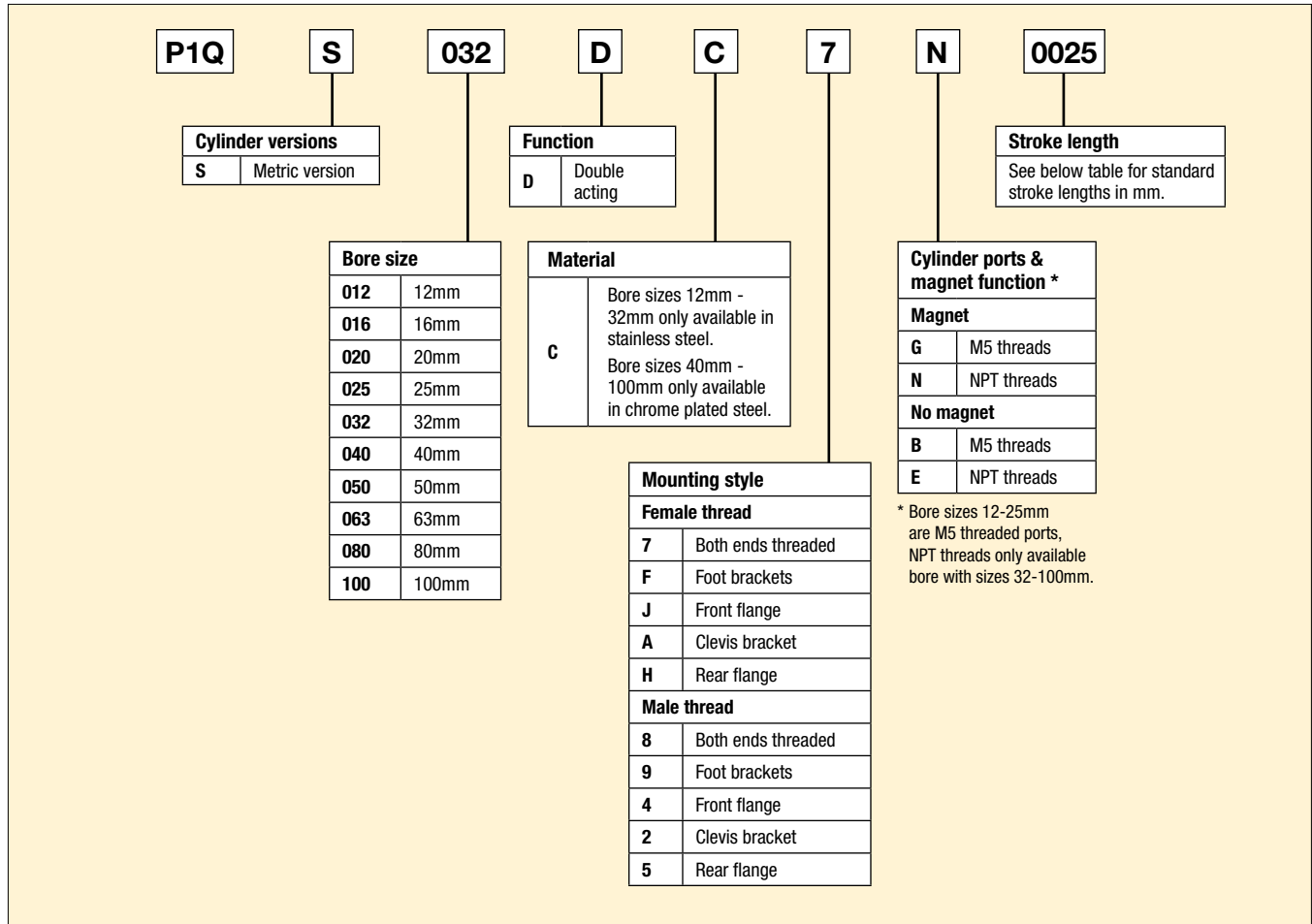
Most popular.

Sensors

For sensors see page B339.



Ordering information



B
 Compact Cylinders
 Actuator Products
 P1Q Series
 P1M Series
 LP/LPM Series

Standard strokes

Bore size	5	10	15	25	30	40	50	75	100
12 - 16	•	•	•	•	•				
20 - 25		•	•	•	•	•	•		
32		•	•	•	•	•	•	•	•
40 - 50			•	•	•	•	•	•	•
63 - 100			•	•	•	•	•	•	•

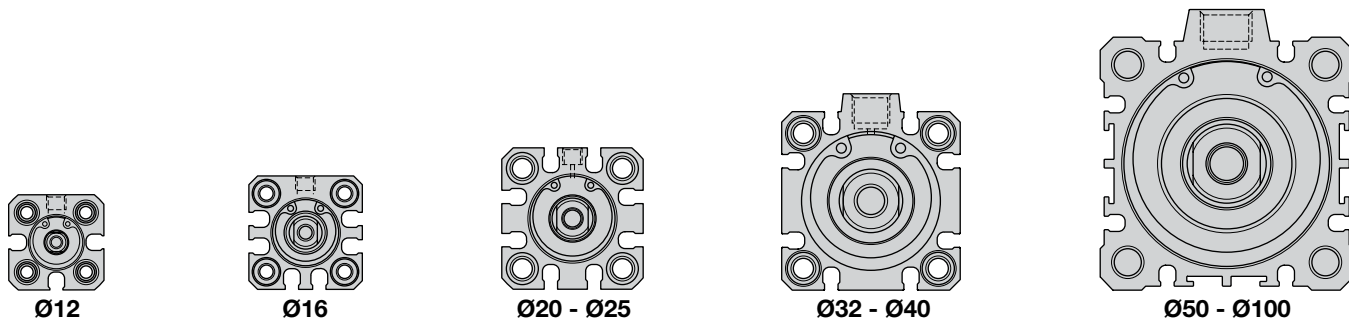
Cylinder forces, double acting variants

Cyl. bore/ pist. rod mm	Stroke piston area	cm ²	Max theoretical force in N (bar)								
			1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
12/6	+	1.1	11	23	34	45	57	68	79	90	102
	-	0.8	8	17	25	34	42	51	59	68	76
16/8	+	2.0	20	40	60	80	101	121	141	161	181
	-	1.5	15	30	45	60	75	90	106	121	136
20/10	+	3.1	31	63	94	126	157	188	220	251	283
	-	2.4	24	47	71	94	118	141	165	188	212
25/12	+	4.9	49	98	147	196	245	295	344	393	442
	-	3.8	38	76	113	151	189	227	264	302	340
32/16	+	8.0	80	161	241	322	402	483	563	643	724
	-	6.0	60	121	181	241	302	362	422	483	543
40/16	+	12.6	126	251	377	503	628	754	880	1005	1131
	-	10.6	106	211	317	422	528	633	739	844	950
50/20	+	19.6	196	393	589	785	982	1178	1374	1571	1767
	-	16.5	165	330	495	660	825	990	1155	1319	1484
63/20	+	31.2	312	623	935	1247	1559	1870	2182	2494	2806
	-	28.0	280	561	841	1121	1402	1682	1962	2242	2523
80/25	+	50.3	503	1005	1508	2011	2513	3016	3519	4021	4524
	-	45.4	454	907	1361	1814	2268	2721	3175	3629	4082
100/32	+	78.5	785	1571	2356	3142	3927	4712	5498	6283	7069
	-	70.5	705	1410	2115	2820	3525	4230	4936	5640	6345

+ = Outward stroke
 - = Return stroke

Note:
 Select a theoretical force 50-100% larger than the force required

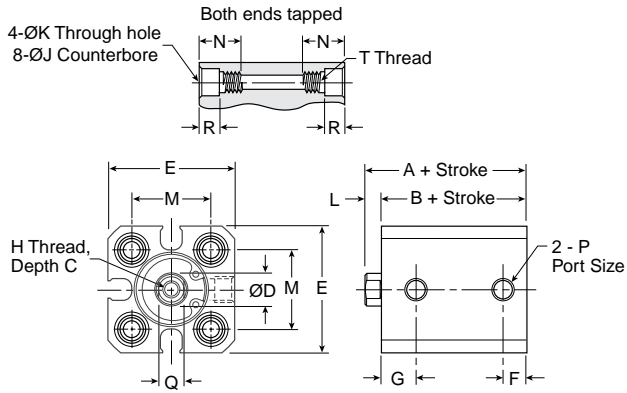
Front profiles by bore size



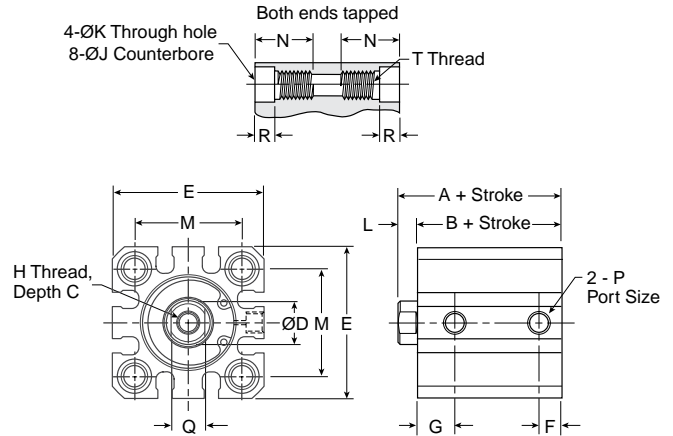
B
 Compact Cylinders
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 LP/LPM Series

Magnet Dimensions

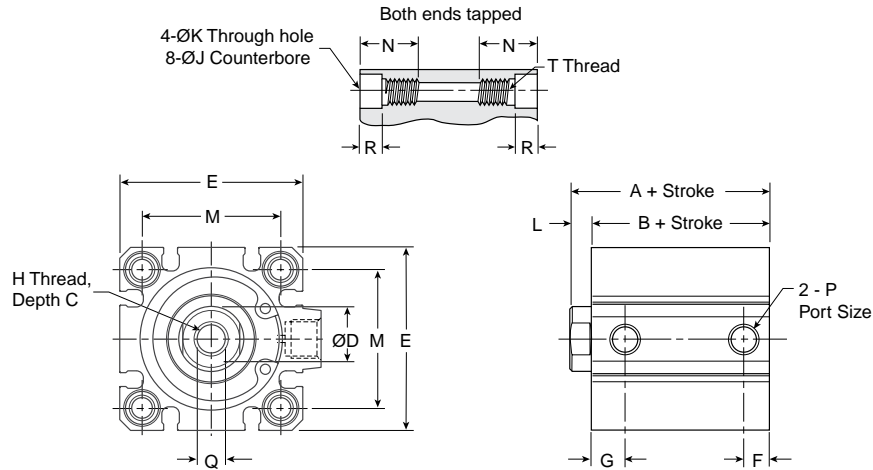
Ø12 - Ø16



Ø20 - Ø25



Ø32 - Ø100



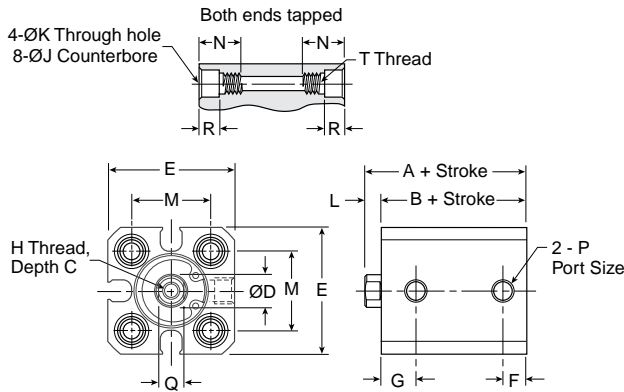
Bore size	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H	J mm	K mm	L mm	M mm	N mm	P	Q mm	R mm	T
12	25.5	22	6	6	25	5	7.5	M3x0.5	6.5	3.5	3.5	15.5	11	M5x0.8	5	4	M4x0.7
16	25.5	22	8	8	29	5	7.5	M4x0.7	6.5	3.5	3.5	20	11	M5x0.8	6	4	M4x0.7
20	34	29.5	7	10	36	5.5	9	M5x0.8	9	5.4	4.5	25.5	17	M5x0.8	8	7	M6x1.0
25	37.5	32.5	12	12	40	5.5	11	M6x1.0	9	5.4	5	28	17	M5x0.8	10	7	M6x1.0
32	40	33	13	16	45	7.5	10.5	M8x1.25	9	5.5	7	34	17	1/8"	14	7	M6x1.0
40	46.5	39.5	13	16	52	8	11	M8x1.25	9	5.5	7	40	17	1/8"	14	7	M6x1.0
50	48.5	40.5	15	20	64	10.5	10.5	M10x1.5	11	6.6	8	50	22	1/4"	17	8	M8x1.25
63	54	46	15	20	77	10.5	15	M10x1.5	14	9	8	60	28.5	1/4"	17	10.5	M10x1.5
80	63.5	53.5	21	25	98	12.5	16	M16x2.0	17.5	11	10	77	35.5	3/8"	22	13.5	M12x1.75
100	75	63	27	30	117	13	23	M20x2.5	17.5	11	12	94	35.5	3/8"	27	13.5	M12x1.75

B
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 LP/LPM Series

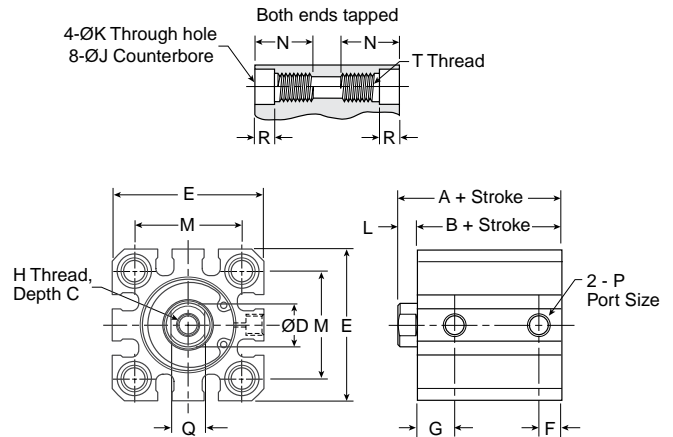


Non-magnet Dimensions

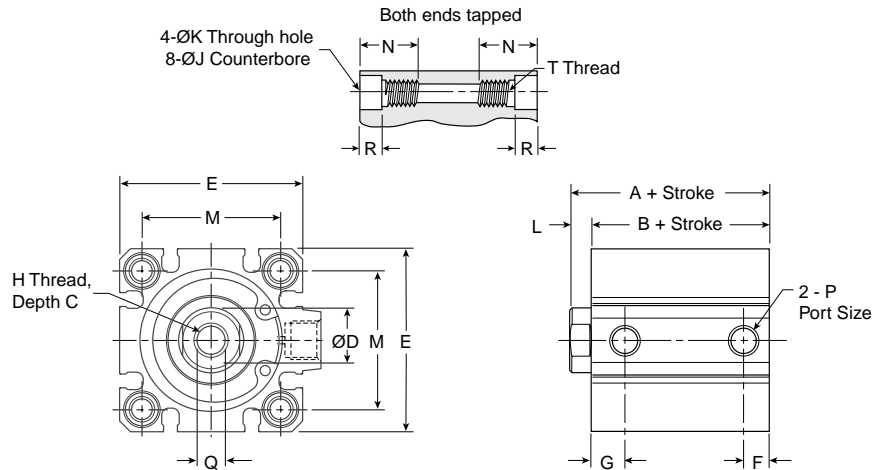
Ø12 - Ø16



Ø20 - Ø25



Ø32 - Ø100



Bore size	A		B		C mm	D mm	E mm	F mm	G mm	H	J mm	K mm	L mm	M mm	N mm	P	Q mm	R mm	T
	5 to 50mm	75 to 100mm	5 to 50mm	75 to 100mm															
12	20.5	-	17	-	6	6	25	5	7.5	M3x0.5	6.5	3.5	3.5	15.5	11	M5x0.8	5	4	M4x0.7
16	20.5	-	17	-	8	8	29	5	7.5	M4x0.7	6.5	3.5	3.5	20	11	M5x0.8	6	4	M4x0.7
20	24	-	19.5	-	7	10	36	5.5	9	M5x0.8	9	5.4	4.5	25.5	17	M5x0.8	8	7	M6x1.0
25	27.5	-	22.5	-	12	12	40	5.5	11	M6x1.0	9	5.4	5	28	17	M5x0.8	10	7	M6x1.0
32	30	40	23	33	13	16	45	7.5	10.5	M8x1.25	9	5.5	7	34	17	1/8"	14	7	M6x1.0
40	36.5	46.5	29.5	39.5	13	16	52	8	11	M8x1.25	9	5.5	7	40	17	1/8"	14	7	M6x1.0
50	38.5	48.5	30.5	40.5	15	20	64	10.5	10.5	M10x1.5	11	6.6	8	50	22	1/4"	17	8	M8x1.25
63	44	54	36	46	15	20	77	10.5	15	M10x1.5	14	9	8	60	28.5	1/4"	17	10.5	M10x1.5
80	53.5	63.5	43.5	53.5	21	25	98	12.5	16	M16x2.0	17.5	11	10	77	35.5	3/8"	22	13.5	M12x1.75
100	65	75	53	63	27	30	117	13	23	M20x2.5	17.5	11	12	94	35.5	3/8"	27	13.5	M12x1.75

B
 Compact Cylinders
 Actuator Products
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 P1M Series
 LP/LPM Series

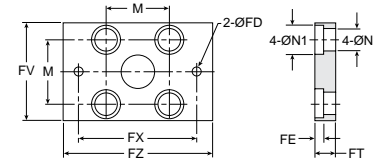
Flange Mounting – Style J, H, 4, 5



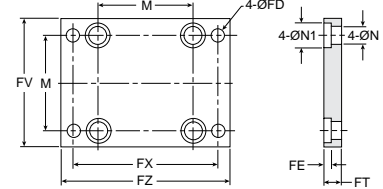
Intended for fixed mounting of cylinder. Flange can be fitted to front or rear of cylinder.

Material
 Flange: surface treated steel, black
 Supplied complete with mounting screws for attachment to cylinder.

Ø12 - Ø25



Ø32 - Ø100



Bore size	FD mm	FT mm	FV mm	FX mm	FZ mm	M mm	N mm	N1 mm	Mass kg	Part number
12	4.5	5.5	25	45	55	15.5	4.5	7.5	0.08	P1Q-4DMB
16	4.5	5.5	30	45	55	20	4.5	7.5	0.10	P1Q-4FMB
20	6.5	8	39	48	60	25.5	6.5	10.5	0.16	P1Q-4HMB
25	6.5	8	42	52	64	28	6.5	10.5	0.20	P1Q-4JMB
32	5.5	8	48	56	65	34	6.5	10.5	0.23	P1Q-4KMB
40	5.5	8	54	62	72	40	6.5	10.5	0.28	P1Q-4LMB
50	6.5	9	67	76	89	50	8.5	13.5	0.53	P1Q-4MMB
63	9	9	80	92	108	60	10.5	16.5	0.71	P1Q-4NMB
80	11	11	99	116	134	77	12.5	18.5	1.59	P1Q-4PMB
100	11	11	117	136	154	94	12.5	18.5	2.19	P1Q-4QMB

Foot Mounting – Style F, 9

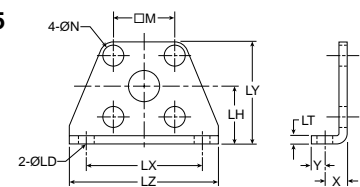


Intended for fixed mounting of cylinder. Angle bracket can be fitted to front and rear of cylinder.

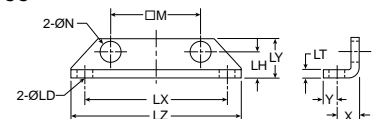
Material
 Angle bracket: surface treated steel, black
 Supplied in pairs with mounting screws for attachment to cylinder.

* Weight per item

Ø12 - Ø25



Ø32 - Ø100



Bore size	LD mm	LH mm	LT mm	LX mm	LY mm	LZ mm	X mm	Y mm	M mm	N mm	Mass kg	Part number
12	4.5	17	2	34	29.5	44	8	4.5	15.5	4.5	0.02*	P1Q-4DMF
16	4.5	19	2	38	33.5	48	8	5	20	4.5	0.02*	P1Q-4FMF
20	6.5	24	3.2	48	42	62	9.2	5.8	25.5	6.5	0.04*	P1Q-4HMF
25	6.5	26	3.2	52	46	66	10.7	5.8	28	6.5	0.05*	P1Q-4JMF
32	6.5	13	3.2	57	20	71	11.2	5.8	34	6.5	0.06*	P1Q-4KMF
40	6.5	13	3.2	64	20	78	11.2	7	40	6.5	0.08*	P1Q-4LMF
50	8.5	14	3.2	79	22	95	12.2	8	50	8.5	0.16*	P1Q-4MMF
63	10.5	16	3.2	95	26	113	13.7	9	60	10.5	0.25*	P1Q-4NMF
80	13	20.5	4.5	118	32	140	16.5	11	77	13	0.50*	P1Q-4PMF
100	13	24	6	137	36	162	23	11.5	94	13	0.85*	P1Q-4QMF

B
 Compact Cylinders
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 P1M Series
 LP/LPM Series

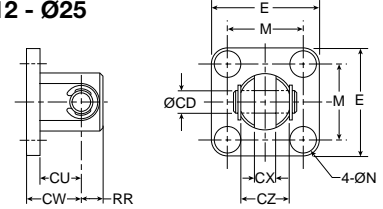
Clevis Mounting – Style A, 2



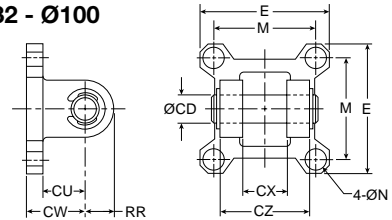
Intended for flexible mounting of cylinder. Clevis bracket can be fitted to the rear of cylinder.

Material
 Clevis bracket: surface treated steel, black
 Supplied complete with mounting screws for attachment to cylinder.

Ø12 - Ø25



Ø32 - Ø100



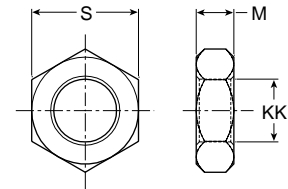
Bore size	CD mm	CU mm	CW mm	CX mm	CZ mm	N mm	RR mm	M mm	E mm	Mass kg	Part number
12	5	9.5	14	5.3	9.8	4.5	6	15.5	25	0.02	P1Q-4DMT
16	5	10.5	15	6.8	11.8	4.5	6	20	29	0.03	P1Q-4FMT
20	8	12.5	18	8.3	15.8	6.5	9	25.5	36	0.05	P1Q-4HMT
25	10	14.5	20	10.3	19.8	6.5	10	28	40	0.06	P1Q-4JMT
32	10	14.5	20	18.3	35.8	6.5	10	34	45.5	0.08	P1Q-4KMT
40	10	15	22	18.3	35.8	6.5	10	40	53.5	0.11	P1Q-4LMT
50	14	20	28	22.3	43.8	8.5	14	50	64.5	0.14	P1Q-4MMT
63	14	21	30	22.3	43.8	10.5	14	60	77.5	0.29	P1Q-4NMT
80	18	28	38	28.3	55.8	12.5	18	77	98.5	0.36	P1Q-4PMT
100	22	32	45	32.3	63.8	12.5	22	94	117.5	0.64	P1Q-4QMT

Jam Nut



Intended for fixed mounting of accessories to the piston rod.

Materials
 Galvanized steel
 Cylinders supplied with galvanized nut.



Bore size	KK	M	S	Mass kg	Part number
12	M5x0.8	2.7	18	0.002	L075540005
16	M6x1.0	3.2	10	0.002	L075540006
20	M8x1.25	4	13	0.005	L075540008
25	M10x1.25	5	17	0.007	L075540010
32	M14x1.5	7	22	0.010	L075540014
40	M14x1.5	7	22	0.010	L075540014
50	M18x1.5	8	27	0.021	L075540018
63	M18x1.5	8	27	0.021	L075540018
80	M22x1.5	11	32	0.040	L075540022
100	M26x1.5	16	41	0.040	L075540026

B

Compact Cylinders
 Actuator Products

P1Q
 Series

P1M
 Series

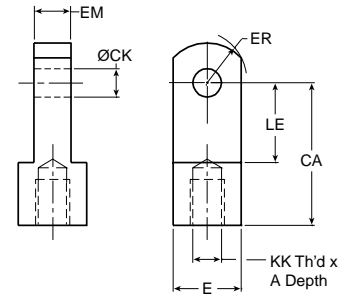
LP/LPM
 Series

Rod Eye



Rod eye for articulated mounting of cylinder.
 Rod eye can be combined with clevis bracket.
 Maintenance-free.

Material
 Rod eye, nut: galvanized steel



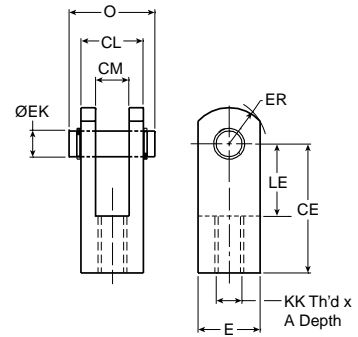
Bore size	A	E	CA	KK	ER	LE	CK	EM	Mass kg	Part number
12	7	9.5 Sq.	16	M5x0.8	6.5	7	5	5	0.03	P1M-4DRE
16	8	11 Sq.	25	M6x1.0	8	14	5	6.5	0.03	P1M-4FRE
20	8.5	16 Sq.	25	M8x1.25	10.5	11.5	8	8	0.05	P1M-4HRE
25	10.5	19 Sq.	30	M10x1.25	13	14	10	10	0.07	P1M-4JRE
32	14	22 Dia.	30	M14x1.5	12	14	10	18	0.08	P1M-4LRE
40	14	22 Dia.	30	M14x1.5	12	14	10	18	0.12	P1M-4LRE
50	18.5	28 Dia.	40	M18x1.5	16	20	14	22	0.25	P1M-4MRE
63	18.5	28 Dia.	40	M18x1.5	16	20	14	22	0.25	P1M-4MRE
80	22	38 Dia.	50	M22x1.5	21	27	18	28	0.25	P1M-4PRE

Rod Clevis



Clevis for articulated mounting of cylinder.

Material
 Clevis, clip, nut: galvanized steel
 Pin: hardened steel

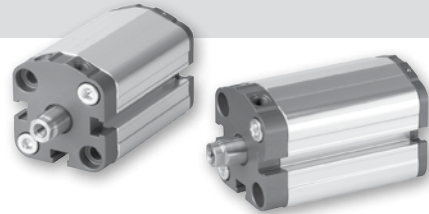


Bore size	A	E	CE	KK	ER	LE	EK (h9)	CM	CL	O	Mass kg	Part number
12	7	9.5	16	M5x0.8	6.5	7	5	5	9.5	14.5	0.02	P1M-4DRC
16	11	11	21	M6x1.0	8	10	5	6.5	11	16.5	0.02	P1M-4FRC
20	8.5	16	25	M8x1.25	10.5	11.5	8	8	16	21	0.05	P1M-4HRC
25	10.5	19	30	M10x1.25	13	14	10	10	19	25.5	0.09	P1M-4JRC
32	16	22 Dia.	30	M14x1.25	12	14	10	18	36	41.5	0.09	P1M-4LRC
40	16	22 Dia.	30	M14x1.25	12	14	10	18	36	41.5	0.15	P1M-4LRC
50	20	28 Dia.	40	M18x1.5	16	20	14	22	44	50.5	0.35	P1M-4MRC
63	20	28 Dia.	40	M18x1.5	16	20	14	22	44	50.5	0.35	P1M-4MRC
80	23	38 Dia.	50	M22x1.5	21	27	18	28	56	64	0.75	P1M-4PRC

B
 Compact Cylinders
 Actuator Products
 P1Q Series
 P1M Series
 LP/LPM Series

P1M Series

- Versatile range of square body style compact cylinder
- Available in Low Profile Version or Long Bearing Version for enhanced rod bearing support
- 10 bore sizes: 12mm through 100mm
- Single and double acting versions available
- Four flexible port configurations available
- Recessed, flush position piston sensing available



Operating information

Operating pressure:	145 PSIG (10 bar) maximum air
Temperature range:	Standard: -4°F to 176°F (-20°C to 80°C) High: 14°F to 250°F (-10°C to 121°C)
Filtration requirements:	40 micron, dry filtered air

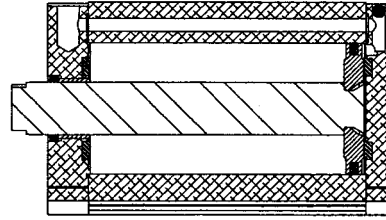
Ordering information

P1M	032	C	/	D	C	P	6	G	012																																																																													
	Bore size <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>012</td><td>12mm</td></tr> <tr><td>016</td><td>16mm</td></tr> <tr><td>020</td><td>20mm</td></tr> <tr><td>025</td><td>25mm</td></tr> <tr><td>032</td><td>32mm</td></tr> <tr><td>040</td><td>40mm</td></tr> <tr><td>050</td><td>50mm</td></tr> <tr><td>063</td><td>63mm</td></tr> <tr><td>080</td><td>80mm</td></tr> <tr><td>100</td><td>100mm</td></tr> </table>	012	12mm	016	16mm	020	20mm	025	25mm	032	32mm	040	40mm	050	50mm	063	63mm	080	80mm	100	100mm		Insert "/" to denote special	Function <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>D</td><td>Double acting</td></tr> <tr><td>K</td><td>Double rod</td></tr> <tr><td>R</td><td>Single acting spring return ⁶</td></tr> <tr><td>E</td><td>Single acting spring extend ⁴</td></tr> </table>	D	Double acting	K	Double rod	R	Single acting spring return ⁶	E	Single acting spring extend ⁴		Piston rod & bearings Extra low profile rod bearing <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>P</td><td>Chrome plated steel rod not available on 12-25mm bores</td></tr> <tr><td>Y</td><td>Stainless steel rod standard on 12-25mm bores and spring extend models</td></tr> </table> Long rod bearing ² <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>C</td><td>Chrome plated steel rod not available on 12-25mm bores</td></tr> <tr><td>A</td><td>Stainless steel rod standard on 12-25mm bores and spring extend models</td></tr> </table>	P	Chrome plated steel rod not available on 12-25mm bores	Y	Stainless steel rod standard on 12-25mm bores and spring extend models	C	Chrome plated steel rod not available on 12-25mm bores	A	Stainless steel rod standard on 12-25mm bores and spring extend models		Stroke length Specify stroke length required in mm.																																										
012	12mm																																																																																					
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	Cylinder style <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>C</td><td>Basic no mtgs.</td></tr> <tr><td>A</td><td>Double rear clevis ^{1,3}</td></tr> <tr><td>B</td><td>Single rear clevis ^{1,3}</td></tr> <tr><td>F</td><td>Foot mount ^{1,4}</td></tr> <tr><td>J</td><td>Front flange ¹</td></tr> <tr><td>H</td><td>Rear flange ^{1,3}</td></tr> </table>	C	Basic no mtgs.	A	Double rear clevis ^{1,3}	B	Single rear clevis ^{1,3}	F	Foot mount ^{1,4}	J	Front flange ¹	H	Rear flange ^{1,3}			Piston/seal material Without magnet ² <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>C</td><td>No bumpers class 1 std. temp. seals</td></tr> <tr><td>G</td><td>No bumpers class 5 fluorocarbon seals</td></tr> <tr><td>B</td><td>With bumpers class 1 std. temp. seals ⁷</td></tr> </table> With magnet ⁵ (Not available on spring extend models) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>N</td><td>No bumpers class 1 std. temp. seals</td></tr> <tr><td>M</td><td>With bumpers class 1 std. temp. seals ⁷</td></tr> </table>	C	No bumpers class 1 std. temp. seals	G	No bumpers class 5 fluorocarbon seals	B	With bumpers class 1 std. temp. seals ⁷	N	No bumpers class 1 std. temp. seals	M	With bumpers class 1 std. temp. seals ⁷		Ports Bspp <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>G</td><td>Ported each end</td></tr> <tr><td>H</td><td>Both ports head</td></tr> <tr><td>J</td><td>Both ports cap</td></tr> <tr><td>K</td><td>Both ports cap face ³</td></tr> </table> NPTF (Not available on 12-25mm bores) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>N</td><td>Ported each end</td></tr> <tr><td>M</td><td>Both ports head</td></tr> <tr><td>L</td><td>Both ports cap</td></tr> <tr><td>P</td><td>Both ports cap face ³</td></tr> </table>	G	Ported each end	H	Both ports head	J	Both ports cap	K	Both ports cap face ³	N	Ported each end	M	Both ports head	L	Both ports cap	P	Both ports cap face ³																																										
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<p>NOTES:</p> <ol style="list-style-type: none"> ¹ Fitted with Mounting Accessory ² Magnetic Piston Option must be specified along with Long Rod Bearing option to achieve Long Bearing Version ³ Porting Options 'K' and 'P' (Both ports cap face) not available with rear mountings ⁴ Single Acting Spring Extend available with stainless steel rod only. ⁵ For information regarding sensors, please refer to Electronic Sensors section. ⁶ Spring return is short bearing version only. ⁷ Bumper only available on head end for spring extend. Bumper only available on cap end for spring return. 																																																																																						
<p>Sensors For sensors see page B339. </p>																																																																																						

For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.

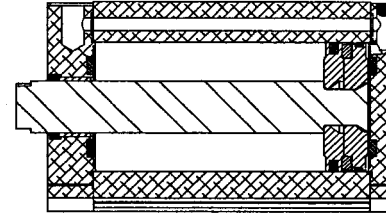
Extra Low Profile Version

The Extra Low Profile Bearing Version provides the most compact cylinder possible. This bearing version is recommended for applications that require shorter stroke lengths or that are light duty. It is available in stroke lengths up to 50mm in the smaller bore sizes and 150 mm in the larger bore sizes.

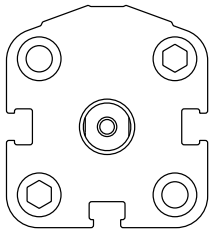


Long Bearing Version

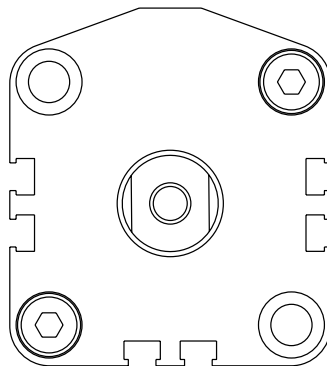
The Long Bearing Version provides additional rod bearing and piston bearing support and also includes a magnetic piston with bearing strip for greater piston bearing support. This Long Bearing version is required for stroke lengths beyond the Extra Low Profile maximum stroke length and is recommended for higher duty applications.



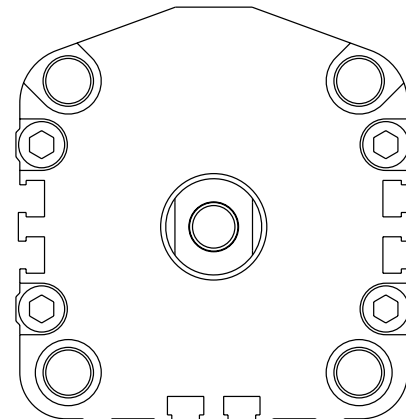
Front profiles by bore size



Bores 12-25mm



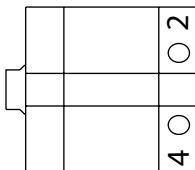
Bores 32-50mm



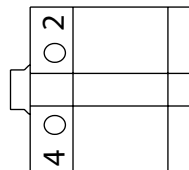
Bores 63-100mm

Porting configurations

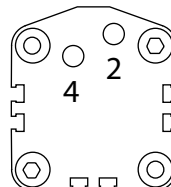
Both Ports Cap



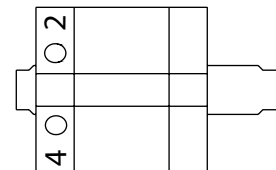
Both Ports Head*



Both Ports Cap Face



Double Rod Both Ports One End



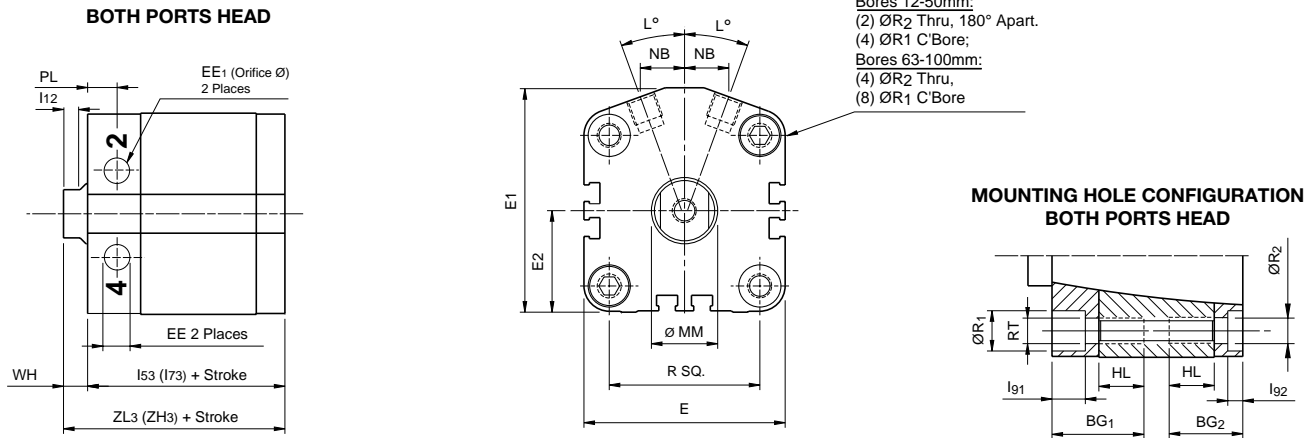
To retract cylinder apply air to port #2
 To extend cylinder apply air to port #4

For a double rod cylinder, pressurize port #2 to retract the piston rod into the head containing the ports.

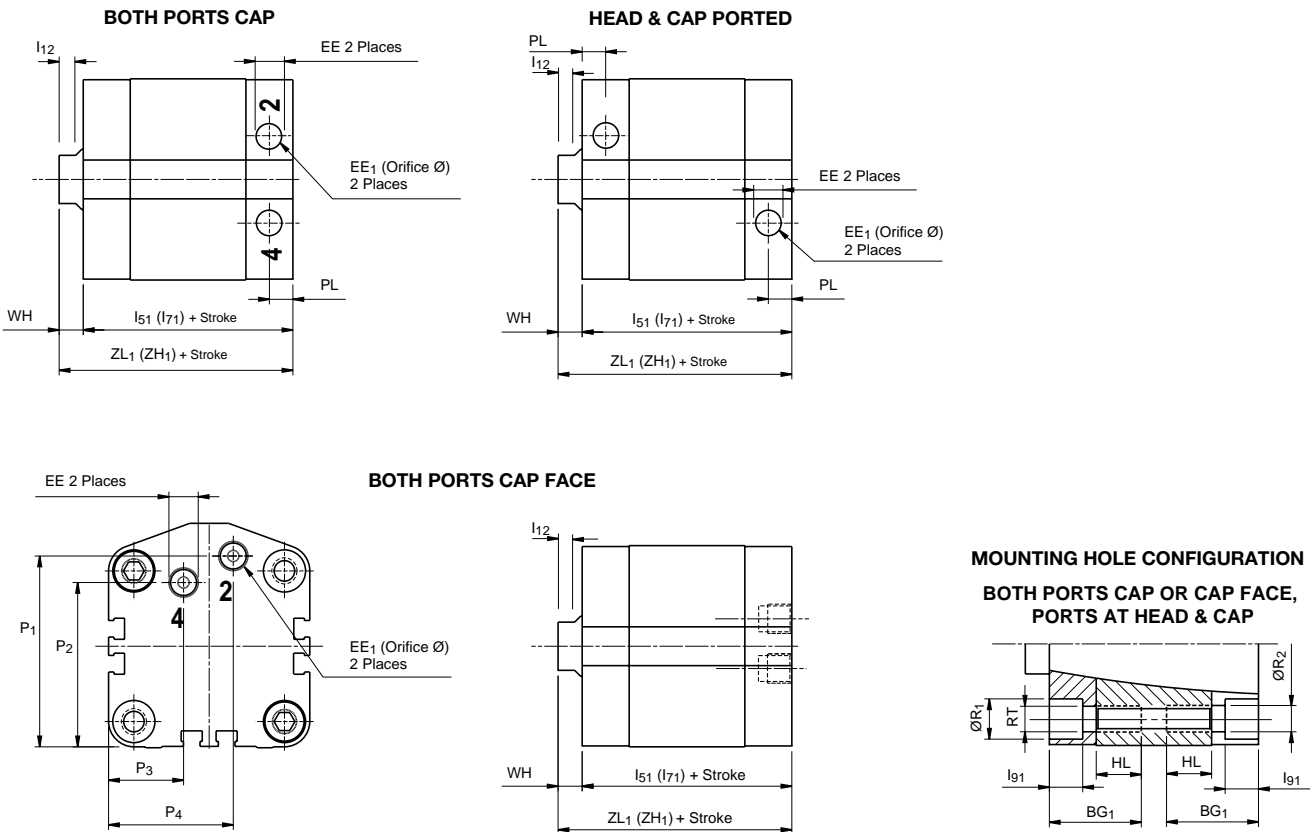
* For 12mm to 16mm bores, although the location of ports #2 and #4 are reversed, porting functions shown above apply.

B
 Compact Cylinders
 Actuator Products
 P1Q Series
 P1M Series
 LP/LPM Series

All porting configurations



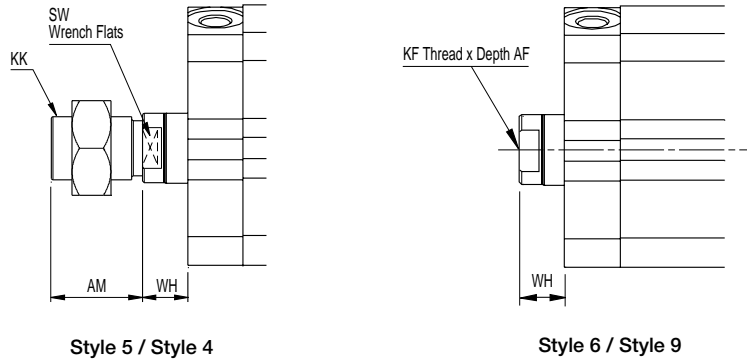
Optional porting configurations



Note: Magnetic Dimensions in Parentheses

For special rod ends, specify “3” in model number and give desired WH, AM or AF and KK or KF (length dimensions in millimeters).

Jam nut is supplied when cylinder is ordered with Style 4 or Style 5 rod end.



B
 Compact Cylinders
 Actuator Products
 P1Q Series
 P1M Series
 LP/LPM Series

Bore size	Rod	AF		AM		KF		KK		WH		I ₁₂	SW
		Style 6	Style 9	Style 5	Style 4	Style 6	Style 9	Style 5	Style 4	Style 4, 9 & 6	Style 5		
12	6	6	5.4	9	8	M3x0.5	#8-32	M5x0.8	#8-32	3.5	5	3	5
16	8	8	5.4	10	8	M4x0.7	#8-32	M6x1.0	#8-32	3.5	5.5	3	7
20	10	7	7	12	8	M5x0.8	#10-32	M8x1.25	#10-32	4.5	6.5	4	9
25	10	12	10	15	9.5	M6x1.0	1/4-28	M10x1.25	1/4-28	5	7.5	4	9
32	12	13	13.3	20.5	12.7	M8x1.25	5/16-24	M12x1.25	5/16-24	7	8	5	10
40	16	13	18.3	20.5	16	M8x1.25	3/8-24	M14x1.5	3/8-24	7	8	5.5	13
50	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
63	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
80	25	21	24.3	32.5	25.5	M16x2.0	5/8-18	M22x1.5	5/8-18	10	11	6	21
100	25	27	27	32.5	28.5	M20x2.5	3/4-16	M22x1.5	3/4-16	12	11	6	21

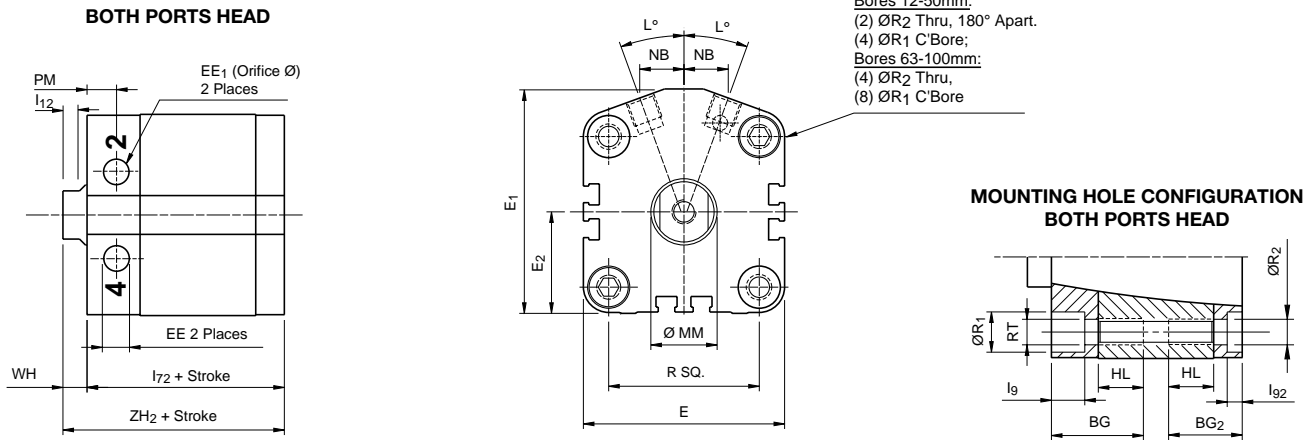
Bore size	BG ₁	BG ₂	E	E ₁	E ₂	EE		HL	I ₉₁	I ₉₂	L	NB	P ₁	P ₂	
						BSPP	NPTF								
12	16.5	11.5	27	31	14	M5	-	1	8	3.5	3.5	26	5.5	25	9.5
16	17	12	31.5	35	16	M5	-	1.2	8	4	4	20	7	29.5	9.5
20	19	14.5	38.5	42.5	19.5	M5	-	1.3	10	4.5	4.5	20	8	35	13.5
25	21	15	41.5	45.5	21	M5	-	1.8	10	5	5	20	8.5	38.5	14
32	25	17	48	56	24	G1/8	1/8	2.7	10	4	4	25	9.5	45.5	16.5
40	25.5	17.5	56	62.5	28	G1/8	1/8	3.4	10	4	4	20	11.5	51	12
50	29.5	23.5	67	74.5	33.5	G1/8	1/8	4	14	5	5	20	14.5	63	54.5
63	34	28	82	86	40.5	G1/8	1/8	5	18	6.5	8	20	17.5	73.5	64
80	43	34	98	106.5	48.5	G1/4	1/4	5.5	22	8.5	10	20	25.5	92	79.5
100	44	35.5	119	126.5	59.5	G1/4	1/4	6	22	8.5	10	20	31.5	111.5	97.5

Bore size	P ₃	P ₄	PL	PM	R	R ₁	R ₂ *	RT	Non-magnetic				Magnetic				ELP Max stroke
									I ₅₁	I ₅₃	ZL ₁	ZL ₃	I ₇₁	I ₇₃	ZH ₁	ZH ₃	
12	13.5	13.5	5	8.5	15.5	5.8	3.5	M4	22	17	25.5	20.5	33	28	36.5	31.5	50
16	15.5	18	5	9	20	7.4	3.5	M4	23.5	18.5	27	22	34.5	29.5	38	33	50
20	24.5	21.5	5	9	25.5	9	5.5	M6	24	19.5	28.5	24	34	29.5	38.5	34	50
25	27.5	24.5	7	9	28	9	5.5	M6	28.5	22.5	33.5	27.5	38.5	32.5	43.5	37.5	50
32	31.5	28.5	8	10.5	34	10.5	5.5	M6	36.5	28.5	43.5	35.5	46	37.5	53	44.5	100
40	23	33	7.5	9.5	40	10.5	5.5	M6	38.5	29.5	44.5	36.5	47.5	39.5	54.5	46.5	100
50	25	41.5	8	10	50	13.5	7.5	M8	38.5	32.5	46.5	40.5	47.5	41.5	55.5	49.5	100
63	30	53	8	11	60	13.5	9.5	M10	39.5	34	47.5	42	51.5	46	59.5	54	100
80	33	69.5	11.5	11.5	77	16.5	11	M12	52	43	62	53	62.5	53.5	72.5	63.5	150
100	36.5	87.5	12	12	94	17	11	M12	57	48.5	69	60.5	71.5	63	83.5	75	150

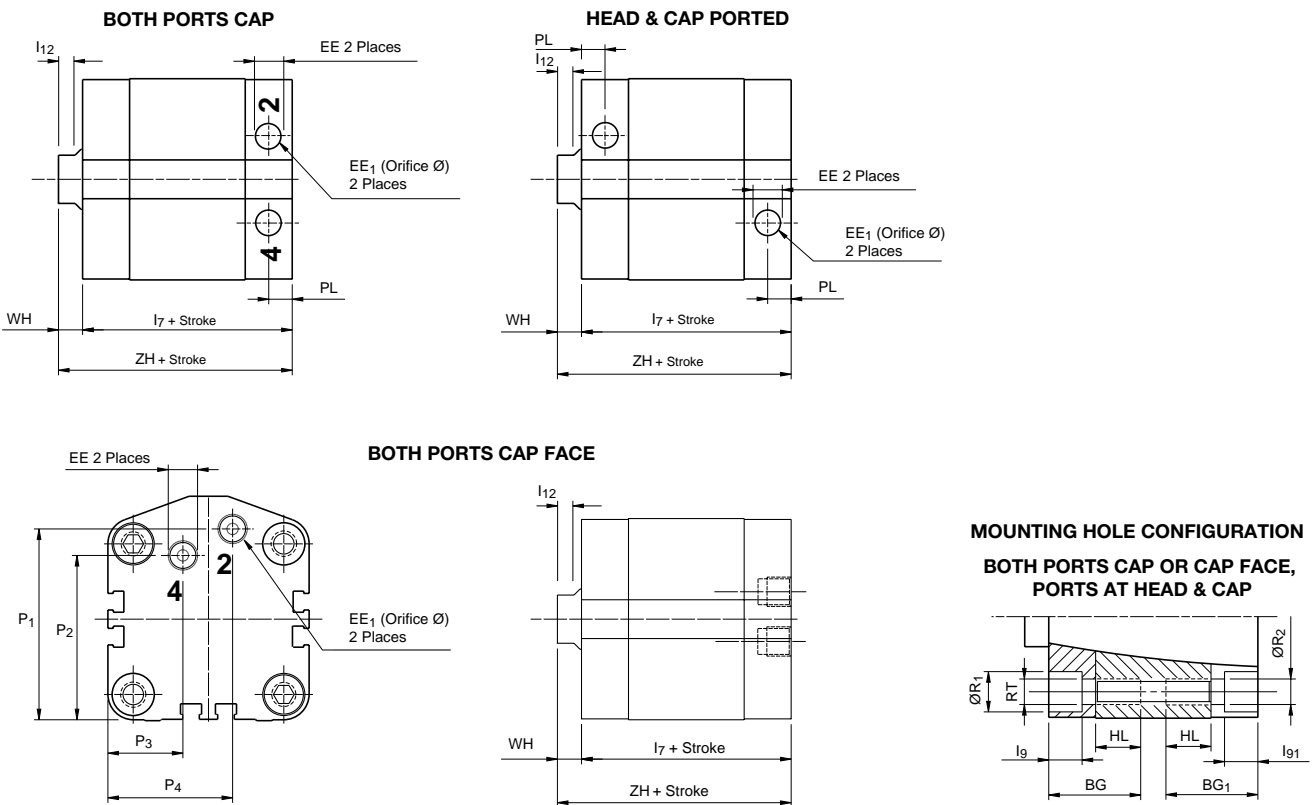
**R2 thru” not available on 12mm and 16mm bores.



All porting configurations



Optional porting configurations

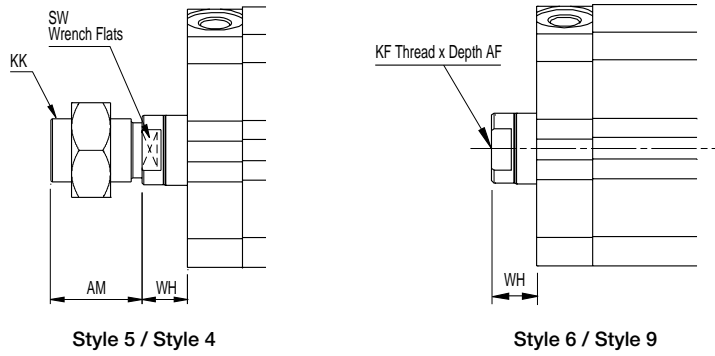


Note: Magnetic Dimensions in Parentheses

For special rod ends, specify “3” in model number and give desired WH, AM or AF and KK or KF (length dimensions in millimeters).

Jam nut is supplied when Style 4 or Style 5 rod end is specified.

Note: Magnetic piston and longer rod bearing are standard with Long Bearing Version.



B
 Compact Cylinders
 Actuator Products
 P1Q Series
 P1M Series
 LP/LPM Series

Bore size	Rod MM	AF		AM		KF		KK		WH		I12	SW
		Style 6	Style 9	Style 5	Style 4	Style 6	Style 9	Style 5	Style 4	Style 4, 9 & 6	Style 5		
12	6	6	5.4	9	8	M3x0.5	#8-32	M5x0.8	#8-32	3.5	5	3	5
16	8	8	5.4	10	8	M4x0.7	#8-32	M6x1.0	#8-32	3.5	5.5	3	7
20	10	7	7	12	8	M5x0.8	#10-32	M8x1.25	#10-32	4.5	6.5	4	9
25	10	12	10	15	9.5	M6x1.0	1/4-28	M10x1.25	1/4-28	5	7.5	4	9
32	12	13	13.3	20.5	12.7	M8x1.25	5/16-24	M12x1.25	5/16-24	7	8	5	10
40	16	13	18.3	20.5	16	M8x1.25	3/8-24	M14x1.5	3/8-24	7	8	5.5	13
50	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
63	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
80	25	21	24.3	32.5	25.5	M16x2.0	5/8-18	M22x1.5	5/8-18	10	11	6	21
100	25	27	27	32.5	28.5	M20x2.5	3/4-16	M22x1.5	3/4-16	12	11	6	21

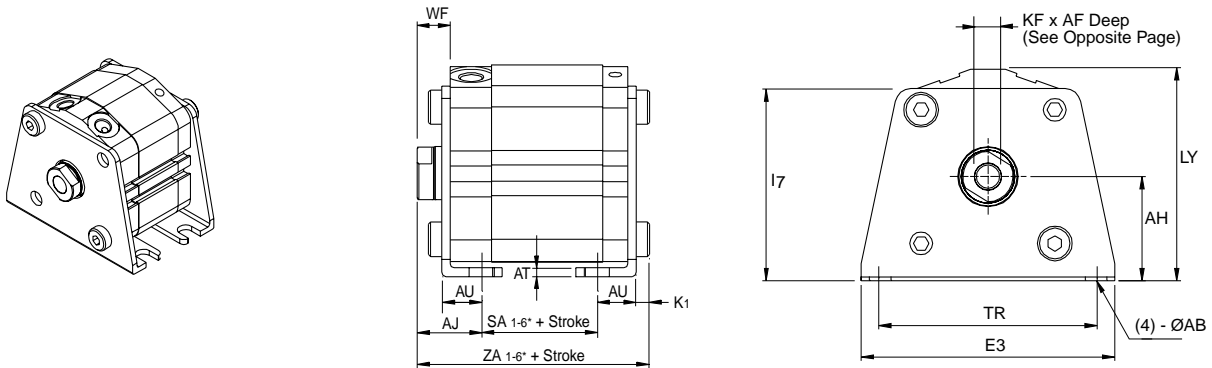
Bore size	EE															
	BG	BG1	BG2	E	E1	E2	BSPP	NPTF	EE1	HL	l7	l72	l9	l91	l92	L
12	21.5	16.5	11.5	27	31	14	M5	–	1	8	38.5	33.5	3.5	3.5	3.5	26
16	22	17	12	31.5	35	16	M5	–	1.2	8	40.5	35.5	5.5	4	4	20
20	24.5	19	14.5	38.5	42.5	19.5	M5	–	1.3	10	40	35.5	10.5	4.5	4.5	20
25	24.5	21	15	41.5	45.5	21	M5	–	1.8	10	42.5	36.5	10.5	5	5	20
32	27.5	25	17	48	56	24	G1/8	1/8	2.7	10	48	40	14	4	4	25
40	27.5	25.5	17.5	56	62.5	28	G1/8	1/8	3.4	10	49.5	41.5	14	4	4	20
50	31.5	29.5	23.5	67	74.5	33.5	G1/8	1/8	4	14	49.5	43.5	13	5	5	20
63	37	34	28	82	86	40.5	G1/8	1/8	5	18	54.5	49	6.5	6.5	8	20
80	43	43	34	98	106.5	48.5	G1/4	1/4	5.5	22	62.5	53.5	9.5	8.5	10	20
100	44	44	35.5	119	126.5	59.5	G1/4	1/4	6	22	71.5	63	9.5	8.5	10	20

Bore size													Min stroke	Max stroke
	NB	P1	P2	P3	P4	PM	R	R1	R2*	RT	ZH	ZH2		
12	5.5	25	9.5	13.5	13.5	8.5	15.5	5.8	3.5	M4	42	37	4	200
16	7	29.5	9.5	15.5	18	9	20	7.4	3.5	M4	44	39	4	200
20	8	35	13.5	24.5	21.5	9	25.5	9	5.5	M6	44.5	40	8	200
25	8.5	38.5	14	27.5	24.5	9	28	9	5.5	M6	47.5	41.5	8	200
32	9.5	45.5	16.5	31.5	28.5	10.5	34	10.5	5.5	M6	55	47	9	320
40	11.5	51	12	23	33	9.5	40	10.5	5.5	M6	56.5	48.5	7	320
50	14.5	63	54.5	25	41.5	10	50	13.5	7.5	M8	57.5	51.5	13	320
63	17.5	73.5	64	30	53	11	60	13.5	9.5	M10	62.5	57	18	500
80	25.5	92	79.5	33	69.5	11.5	77	16.5	11	M12	72.5	62.5	23	500
100	31.5	111.5	97.5	36.5	87.5	12	94	17	11	M12	83.5	75	18	500

* “R2 thru” not available on 12mm and 16mm bores.



Foot Mounting – Style F



Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	AB	AH	AJ	AT	AU	E3	l7	K1	LY	TR	Part number
12	4.5	17	19.5	2	8	44	29.5	2.8	34	35	P1M-4DMF
16	4.5	19	19.5	2	8	48	33.5	2.8	38	39	P1M-4FMF
20	6.5	24	20.5	3.2	9.2	62	42	4	47	50	P1M-4HMF
25	6.5	26	22.5	3.2	10.7	66	46	4	50.5	52	P1M-4JMF
32	6.5	30	25	3.2	11.2	71	54	4	62	60	P1M-4KMF
40	6.5	33	25	3.2	11.2	78	61	4	67.5	67	P1M-4LMF
50	9	39	29.5	3.2	14.7	95	72.5	5	80	82	P1M-4MMF
63	11	46	31	3.2	16.2	113	32	5	91.5	100	P1M-4NMF
80	13	59	35	4.5	19.5	140	42	7	117	118	P1M-4PMF
100	13	71	39	6	23	162	53	7	138	139	P1M-4QMF

Bore size	ELP version non-magnetic					ELP version magnetic					Long bearing version					
	Both ports head		Optional porting		Min. ** stroke	Both ports head		Optional porting		Min.** stroke	Both ports head		Optional porting		Min.** stroke	Style 5 end length adjustment
	SA1	ZA1*	SA2*	ZA2*		SA3	ZA3*	SA4	ZA4*		SA5	ZA5*	SA6	ZA6*		
12	5	35.3	10	40.3	15	16	46.3	21	51.3	4	21.5	51.8	26.5	56.8	4	1.5
16	6.5	36.8	11.5	41.8	14	17.5	47.8	22.5	52.8	4	23.5	53.8	28.5	58.8	4	2
20	7.5	41.2	12	45.7	18	17.5	51.2	22	55.7	8	23.5	57.2	28	61.9	8	2
25	7.5	44.7	13.5	50.7	18	17.5	54.7	23.5	60.7	8	21.5	58.7	27.5	64.7	8	2.5
32	12.5	52.5	20.5	60.7	18	21.5	61.7	29.5	69.9	9	24	64	32	72.2	9	1
40	13.5	53.7	21.5	61.9	17	23.5	63.7	31.5	71.9	7	25.5	65.7	33.5	73.9	7	1
50	9.5	58.7	15.5	64.9	22	18.5	67.7	24.5	73.9	13	20.5	69.7	26.5	75.9	13	-0.5
63	8	60.2	13.5	65.7	30	20	72.2	25.5	77.7	18	23	75.2	28.5	80.7	18	-0.5
80	13	74.5	22	83.5	33	23.5	85	32.5	94	23	23.5	85	32.5	94	23	1
100	14.5	83.5	23	92	33	29	98	37.5	106.5	18	29	98	37.5	106.5	18	-1

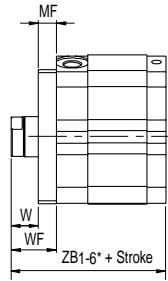
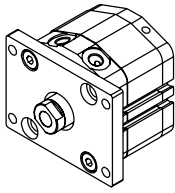
* For strokes less than 'min. stroke', only one bracket will be supplied at rod end.

** Dimensions shown apply only for rod end styles 4, 6 and 9. For rod end style 5, please include the above length adjustment.

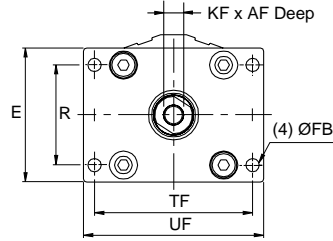
Note: Foot bracket mounting is not available with cap face porting

B
 Compact Cylinders
 Actuator Products
 P1Q Series
 P1M Series
 LP/LPM Series

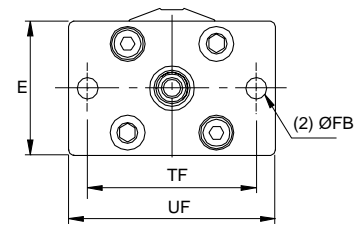
Front Flange Mounting – Style J



Bores 32-100mm



Bores 12-25mm



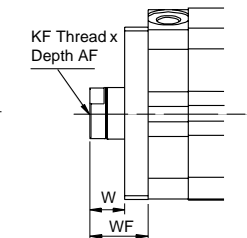
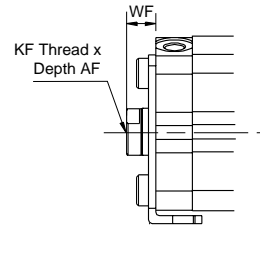
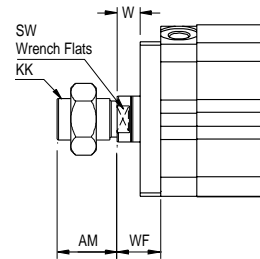
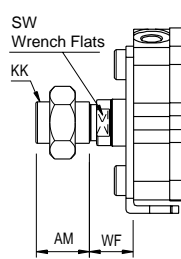
Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	ELP version Non-magnetic							ELP version Magnetic				Long bearing Version		Style 5 rod end length adjustment	Part number
	E	FB	MF	R	TF	UF	ZB1*	Optional Porting	ZB2*	Both ports head	Optional porting	ZB3*	ZB4*		
12	25	4.5	5.5	-	45	55	30.5	35.5	41.5	46.5	47	52	1.5	P1M-4DMB	
16	30	4.5	5.5	-	45	55	32	37	43	48	49	54	2	P1M-4FMB	
20	39	6.5	8	-	50.5	62	34	38.5	44	48.5	50	54.5	2	P1M-4HMB	
25	42	6.5	8	-	53	65	37.5	43.5	47.5	53.5	51.5	57.5	2.5	P1M-4JMB	
32	48	5.5	8	34	58	68	45.5	53.5	54.5	62.5	57	65	1	P1M-4KMB	
40	54	5.5	8	40	66	76	46.5	54.5	56.5	64.5	58.5	66.5	1	P1M-4LMB	
50	67	6.5	9	50	79	90	50.5	56.5	59.5	65.5	61.5	67.5	-0.5	P1M-4MMB	
63	80	9	9	60	97	112	52	57.5	64	69.5	67	72.5	-0.5	P1M-4NMB	
80	99	11	11	77	116	134	63	72	73.5	82.5	73.5	82.5	1	P1M-4PMB	
100	117	11	11	94	137	154	70.5	79	85	93.5	85	93.5	-1	P1M-4QMB	

* Dimensions shown apply only for Rod End Styles 4, 6 and 9. For Rod End Style 5, please include the above length adjustment.

Rod End Front Mounts F & J

For special rod threads, specify "3" in model number and give desired AM or AF, WF and KK or KF.



Foot Mounting - Style F

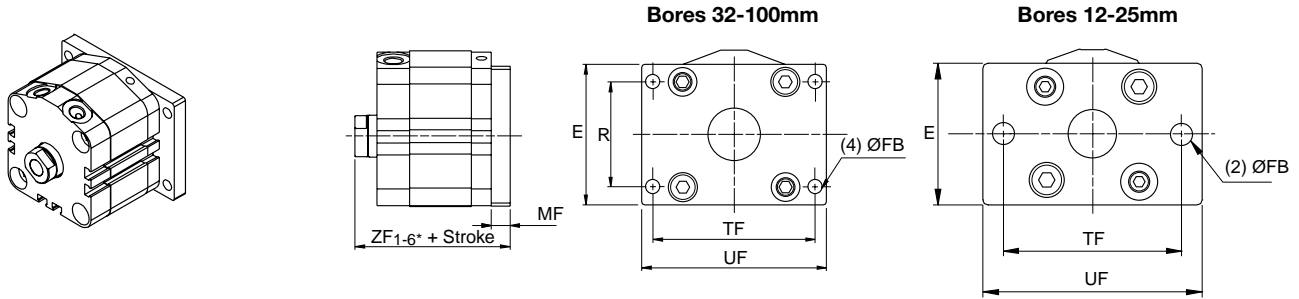
Foot Flange Mounting - Style J

Foot Mounting - Style F

Foot Flange Mounting - Style J

Bore size	AF		AM		KF		KK		W		WF		SW
	Style 9	Style 6	Style 4	Style 5	Style 9	Style 6	Style 4	Style 5	Styles 9, 6, 4	Style 5	Styles 9, 6, 4	Style 5	
12	5.4	6	8	9	#8-32	M3X0.5	#8-32	M5X0.8	8	9.5	13.5	15	5
16	5.4	8	8	10	#8-32	M4x0.7	#8-32	M6x1.0	8	10	13.5	15.5	7
20	7	7	8	12	#10-32	M5x0.8	#10-32	M8x1.25	6.5	8.5	14.5	16.5	9
25	10	12	9.5	15	1/4-28	M6x1.0	1/4-28	M10x1.25	7	9.5	15	17.5	9
32	13.3	13	12.7	20.5	5/16-24	M8x1.25	5/16-24	M12x1.25	9	10	17	18	10
40	18.3	13	16	20.5	3/8-24	M8x1.25	3/8-24	M14x1.5	9	10	17	18	13
50	17.6	15	19.5	26	1/2-20	M10x1.5	1/2-20	M18x1.5	9	8.5	18	17.5	16
63	17.6	15	19.5	26	1/2-20	M10x1.5	1/2-20	M18x1.5	9	8.5	18	17.5	16
80	24.3	21	25.5	32.5	5/8-18	M16x2.0	5/8-18	M22x1.5	9	10	20	21	21
100	27	27	28.5	32.5	3/4-16	M20x2.5	3/4-16	M22x1.5	11	10	22	21	21

Rear Flange Mounting – Style H



Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	E	FB	MF	R	TF	UF	Part number
12	25	4.5	5.5	–	45	55	P1M-4DMB
16	30	4.5	5.5	–	45	55	P1M-4FMB
20	39	6.5	8	–	50.5	62	P1M-4HMB
25	42	6.5	8	–	53	65	P1M-4JMB
32	48	5.5	8	34	58	68	P1M-4KMB
40	54	5.5	8	40	66	76	P1M-4LMB
50	67	6.5	9	50	79	90	P1M-4MMB
63	80	9	9	60	97	112	P1M-4NMB
80	99	11	11	77	116	134	P1M-4PMB
100	117	11	11	94	137	154	P1M-4QMB

Bore size	ELP version non-magnetic		ELP version magnetic		Long bearing version		Style 5 rod end length adjustment
	Both ports head ZF1*	Optional porting ZF2*	Both ports head ZF3*	Optional porting ZF4*	Both ports head ZF5*	Optional porting ZF6*	
12	26	31	37	42	42.5	47.5	1.5
16	27.5	32.5	38.5	43.5	44.5	49.5	2
20	32	36.5	42	46.5	48	52.5	2
25	35.5	41.5	45.5	51.5	49.5	55.5	2.5
32	43.5	51.5	52.5	60.5	55	63	1
40	44.5	52.5	54.5	62.5	56.5	64.5	1
50	49.5	55.5	58.5	64.5	60.5	66.5	-0.5
63	51	57.5	63	68.5	66	71.5	-0.5
80	64	73	74.5	83.5	74.5	83.5	1
100	71.5	80	86	94.5	86	94.5	-1

Note: Rear Flange mounting is not available with cap face porting.

* Dimensions shown apply only for Rod End Styles 4, 6 and 9.

For Rod End Style 5, please include the above length adjustment.

B

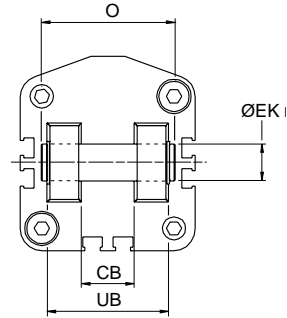
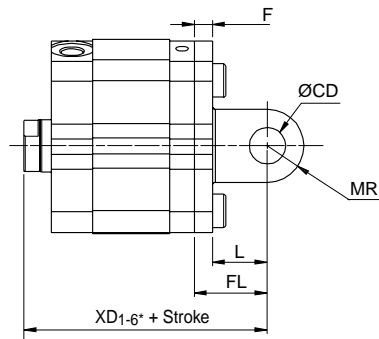
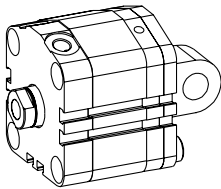
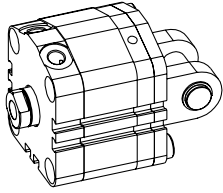
Compact Cylinders
Actuator Products

P1Q Series

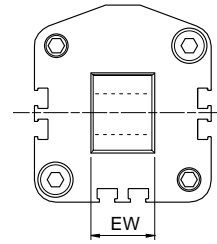
P1M Series

LP/LPM Series

Rear Clevis Mounts – Styles A & B



Style A



Style B

Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	CB	CD/EK	EW	F	FL	L	MR	O	UB	Double clevis kit part number	Single clevis kit part number**
12	5	5	5	4	14	10	6.5	14.5	10	P1M-4DMT	P1M-4DME
16	6.5	5	6.5	4	15	11	6.5	16.5	12	P1M-4FMT	P1M-4FME
20	8	8	8	5	18	13	10	21	16	P1M-4HMT	P1M-4HME
25	10	10	10	5	20	15	11	25.5	20	P1M-4JMT	P1M-4JME
32	18	10	18	5	20	15	10	41.5	36	P1M-4KMT	P1M-4KME
40	18	10	18	6	22	16	10	41.5	36	P1M-4LMT	P1M-4LME
50	22	14	22	7	28	21	14	50.5	44	P1M-4MMT	P1M-4MME
63	22	14	22	8	30	22	14	50.5	44	P1M-4NMT	P1M-4NME
80	28	18	28	10	38	28	18	64	56	P1M-4PMT	P1M-4PME
100	32	22	32	13	45	32	22	72	64	P1M-4QMT	P1M-4QME

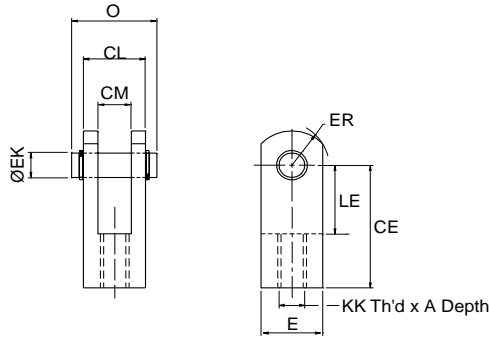
Bore size	ELP version non-magnetic		ELP version magnetic		Long bearing version		Style 5 rod end length adjustment
	Both ports head XD1*	Optional porting XD2*	Both ports head XD3*	Optional porting XD4*	Both ports head XD5*	Optional porting XD6*	
12	34.5	39.5	45.5	50.5	51	56	1.5
16	37	42	48	53	54	59	2
20	42	46.5	52	56.5	58	62.5	2
25	47.5	53.5	57.5	63.5	61.5	67.5	2.5
32	55.5	63.5	64.5	72.5	67	75	1
40	59.5	66.5	68.5	76.5	70.5	78.5	1
50	68.5	74.5	77.5	83.5	79.5	85.5	-0.5
63	72	78.5	84	89.5	87	92.5	-0.5
80	91	100	101.5	110.5	101.5	110.5	1
100	105.5	114	120	128.5	120	128.5	-1

* Dimensions shown apply only for Rod End Styles 4, 6 and 9. For Rod End Style 5, please include the above length adjustment.

** Single Clevis Kit can be used as mounting bracket for double clevis cylinders. Double Clevis Kit can be used as mounting kit for single clevis cylinders.

Note: Rear Clevis mounts are not available with cap face port.

Rod Clevis



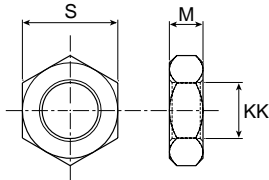
Metric

Bore size	A	E	CE	KK	ER	LE	EK (h9)	CM	CL	O	Part number
12	7	9.5	16	M5x0.8	6.5	7	5	5	9.5	14.5	P1M-4DRC
16	11	11	21	M6x1.0	8	10	5	6.5	11	16.5	P1M-4FRC
20	8.5	16	25	M8x1.25	10.5	11.5	8	8	16	21	P1M-4HRC
25	10.5	19	30	M10x1.25	13	14	10	10	19	25.5	P1M-4JRC
32	16	22 Dia.	30	M12x1.25	12	14	10	18	36	41.5	P1M-4KRC
40	16	22 Dia.	30	M14x1.5	12	14	10	18	36	41.5	P1M-4LRC
50/63	20	28 Dia.	40	M18x1.5	16	20	14	22	44	50.5	P1M-4MRC
80	23	38 Dia.	50	M22x1.5	21	27	18	28	56	64	P1M-4PRC
100	24	44 Dia.	55	M22x1.5	24	31	22	32	64	72	P1M-4QRC

Inch

Bore size	A	E	CE	KK	ER	LE	EK (inch) +0, -0.002	CM	CL (inch)	O (inch)	Part number
12	6	9.5	16	#8-32	6.5	7	3/16	5	0.375	0.563	P1M-4DRC-T
16	6	11	21	#8-32	8	10	3/16	6.5	0.437	0.625	P1M-4FRC-T
20	6	16	25	#10-32	10.5	11.5	5/16	8	0.625	0.875	P1M-4HRC-T
25	8	19	30	1/4-28	13	14	3/8	10	0.750	1.031	P1M-4JRC-T
32	16	22 Dia.	30	5/16-24	12	14	3/8	18	1.437	1.687	P1M-4KRC-T
40	16	22 Dia.	30	3/8-24	12	14	3/8	18	1.437	1.687	P1M-4LRC-T
50/63	20	28 Dia.	40	1/2-20	16	20	1/2	22	1.750	2.125	P1M-4MRC-T
80	23	38 Dia.	50	5/8-18	21	27	3/4	28	2.250	2.625	P1M-4PRC-T
100	24	44 Dia.	55	3/4-16	24	31	7/8	32	2.500	2.875	P1M-4QRC-T

Jam Nuts



Style 4

Bore size	KK	M	S	Part number
12	#8-32	1/8	11/32	L073800080
16	#8-32	1/8	11/32	L073800080
20	#10-32	1/8	3/8	L073800100
25	1/4-28	5/32	7/16	L073800200
32	5/16-24	3/16	1/2	L073800300
40	3/8-24	7/32	9/16	L073800400
50	1/2-20	5/16	3/4	L073800600
63	1/2-20	5/16	3/4	L073800600
80	5/8-18	3/8	15/16	L073800800
100	3/4-16	27/64	1-1/8	L073800900

Dimensions in inches

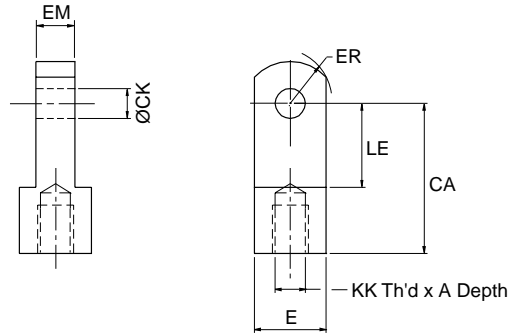
Style 5

Bore size	KK	M	S	Part number
12	M5x0.8	2.7	18	L075540005
16	M6x1.0	3.2	10	L075540006
20	M8x1.25	4	13	L075540008
25	M10x1.25	5	17	L075540010
32	M12x1.25	6	19	L075540012
40	M14x1.5	7	22	L075540014
50	M18x1.5	8	27	L075540018
63	M18x1.5	8	27	L075540018
80	M22x1.5	11	32	L075540022
100	M22x1.5	11	32	L075540022

Dimensions in mm



Rod Eye



Metric

Bore size	A	E	CA	KK	ER	LE	CK	EM	Part number
12	7	9.5 Sq.	16	M5x0.8	6.5	7	5	5	P1M-4DRE
16	8	11 Sq.	25	M6x1.0	8	14	5	6.5	P1M-4FRE
20	8.5	16 Sq.	25	M8x1.25	10.5	11.5	8	8	P1M-4HRE
25	10.5	19 Sq.	30	M10x1.25	13	14	10	10	P1M-4JRE
32	15	22 Dia.	30	M12x1.25	12	14	10	18	P1M-4KRE
40	14	22 Dia.	30	M14x1.5	12	14	10	18	P1M-4LRE
50/63	18.5	28 Dia.	40	M18x1.5	16	20	14	22	P1M-4MRE
80	22	38 Dia.	50	M22x1.5	21	27	18	28	P1M-4PRE
100	22	44 Dia.	55	M22x1.5	24	31	22	32	P1M-4QRE

Inch

Bore size	A	E	CA	KK	ER	LE	CK (inch)	EM	Part number
12	6	9.5 Sq.	16	#8-32	6.5	7	3/16	5	P1M-4DRE-T
16	6	11 Sq.	25	#8-32	8	14	3/16	6.5	P1M-4FRE-T
20	6	16 Sq.	25	#10-32	10.5	11.5	5/16	8	P1M-4HRE-T
25	8	19 Sq.	30	1/4-28	13	14	3/8	10	P1M-4JRE-T
32	12	22 Dia.	30	5/16-24	12	14	3/8	18	P1M-4KRE-T
40	11	22 Dia.	30	3/8-24	12	14	3/8	18	P1M-4LRE-T
50/63	18	28 Dia.	40	1/2-20	16	20	1/2	22	P1M-4MRE-T
80	21	38 Dia.	50	5/8-18	21	27	3/4	28	P1M-4PRE-T
100	21	44 Dia.	55	3/4-16	24	31	7/8	32	P1M-4QRE-T

B
 Compact Cylinders
 Actuator Products
 P1Q Series
 P1M Series
 LP/LPM Series

LP/LPM Series

- Low profile design
- Flexible construction with special modification capability
- High density iron rod bearing provides maximum support for longer life
- Single and double acting versions available
- 6 mounting styles
- 8 bore sizes from 9/16" to 4"
- Strokes from 1/8" to 6"
- Permanent lubrication
- Non-lube service



Operating information


Operating pressure:	200 PSIG (17 bar)	
Temperature range:	LP	-10°F to 200°F (-23°C to 93°C)
	LPM	-10°F to 140°F (-23°C to 60°C)
Filtration requirements:	40 micron, dry filtered air	

Ordering information

1.50	K	N	LP	L	V	B	E	S	9	1.25"
Bore size			Series				Spring			Stroke length
0.56 9/16"			LP Standard				Blank None			Specify stroke length required in inches.
0.75 3/4"			LPM Magnetic Piston ⁵				E Spring extended			
1.12 1-1/8"				Piston seal			R Spring return			
1.50 1-1/2"				Blank Standard seal				Rod end thread style		
2.00 2"				L Lipseal piston seal ³				9 Standard female rod end		
2.50 2-1/2"					Seals			4 Optional male rod end		
3.00 3"					Blank Standard			3 Special rod end (specify dimensions or sketch)		
4.00 4"					V Class 5 seals					
Double rod cylinder						Bumpers*		Special features		
Blank Single rod						Blank No bumpers		Blank No special feature		
K Double rod						B Bumpers both ends		S Special feature		
	Mounting style					H Head end only				
	N Basic (Std.)					C Cap end only ⁴				
	Single rod styles									
	4F Head bolt									
	4R Cap bolt									
	2F Head trunnion ¹									
	2R Cap trunnion ¹									
	1 Cap pivot eye									
	Double rod styles									
	N Basic									
	4R Cap bolt									
	2F Head trunnion									
	Hollow rod styles ^{1,2,5}									
	NH Basic									
	4RH Cap bolt									
	2FH Head trunnion									

¹ Not available on 9/16" bore.
² Hollow rods are used on double rod cylinders. All hollow rod options require the double rod prefix "K".
³ Lipseal piston is not available on LPM Series.
⁴ Not available on spring extend.
⁵ LPM Series with hollow rod option are not available on the 9/16", 3/4" and 1-1/8" bore sizes.

Note: For sensor specifications and part numbers, please refer to the Electronic Sensors section.

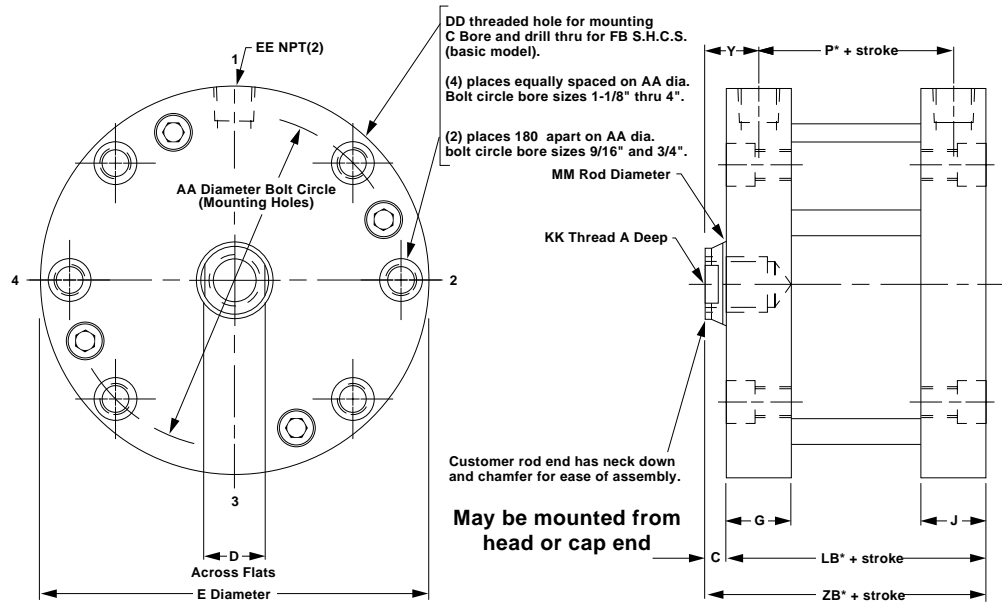
Sensors
 For sensors see page B339. 

For ordering purposes, when special options or common modifications are requested, the factory will assign a sequential part number in place of the model number.

Mounting Style N

Cylinder Dimensions
 Double Acting
 Single Rod End,
 Female Rod Style No. 9

Temperature: -10°F to 200°F (optional Fluorocarbon seals).
 All air cylinders are permanently lubricated.
 LPM Series maximum temperature 140°F.



Bore size	A	C	D	E	G	J	P*	Y	AA	DD	EE	FB	KK	LB*	MM	ZB*
9/16	0.40	1/8	7/32	1-1/8	23/64	23/64	11/32	17/64	0.875	#8-32	#10-32	#4	#8-32	5/8	1/4	3/4
3/4	0.44	1/8	1/4	1-1/2	23/64	23/64	3/8	17/64	1.219	#10-32	#10-32	#6	#10-32	21/32	5/16	25/32
1-1/8	0.62	1/8	7/16	2	1/2	1/2	27/64	3/8	1.687	#10-32	1/8	#6	5/16-24	59/64	1/2	1-3/64
1-1/2	0.62	1/8	1/2	2-5/8	1/2	1/2	1/2	3/8	2.187	1/4-28	1/8	#10	3/8-24	1	5/8	1-1/8
2	0.70†	1/8	5/8	3-1/8	1/2	1/2	9/16	3/8	2.687	1/4-28	1/8	#10	1/2-20	1-1/16	3/4	1-3/16
2-1/2	0.70†	1/8	5/8	3-3/4	5/8	5/8	5/8	7/16	3.250	5/16-24	1/4	1/4	1/2-20	1-1/4	3/4	1-3/8
3	0.75†	1/8	3/4	4-1/4	43/64	43/64	21/32	7/16	3.781	5/16-24	1/4	1/4	5/8-18	1-9/32	7/8	1-13/32
4	0.75†	1/8	7/8	5-1/2	27/32	27/32	49/64	17/32	4.937	3/8-24	3/8	5/16	3/4-16	1-5/8	1	1-3/4

* These dimensions are for the LP Series with standard piston.
 † For strokes less than 0.25", A dimension = 0.66".

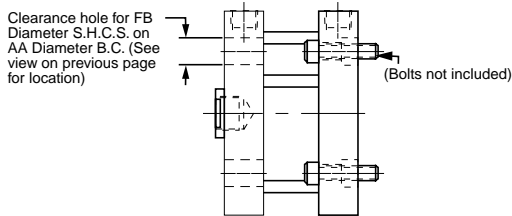
Added length table for LPM or lipseal piston options

Bore size	LPM option*						LP with lipseal piston option				
	P	LB	XD	XJ	ZB	Stroke	P	LB	XD	XJ	ZB
9/16†	15/16	1-7/32	2	-	1-11/32	1/2	5/8	29/32	1-11/16	-	1-1/32
3/4†	31/32	1-1/4	2-1/32	1-3/16	1-3/8	1/2	21/32	15/16	1-23/32	7/8	1-1/16
1-1/8†	63/64	1-31/64	2-3/8	1-23/64	1-39/64	9/16	43/64	1-11/64	2-1/16	1-3/64	1-19/64
1-1/2	1-1/8	1-5/8	2-13/16	1-1/2	1-3/4	7/16	13/16	1-5/16	2-1/2	1-3/16	1-7/16
2	1-9/32	1-25/32	3-1/32	1-21/32	1-29/32	7/16	61/64	1-29/64	2-45/64	1-21/64	1-37/64
2-1/2	1-21/64	1-61/64	3-21/64	1-3/4	2-5/64	1/2	1	1-5/8	3	1-27/64	1-3/4
3	1-27/64	2-3/64	3-53/64	1-53/64	2-11/64	1/2	1-3/32	1-23/32	3-1/2	1-1/2	1-27/32
4	1-1/2	2-23/64	4-11/64	2	2-31/64	1/2	1-11/64	2-1/32	3-27/32	1-43/64	2-5/32

Note minimum strokes for LPM option.
 † These bore sizes not available for the LPM option with the hollow rod option.
 * The LPM option is only available with the standard quad seal.

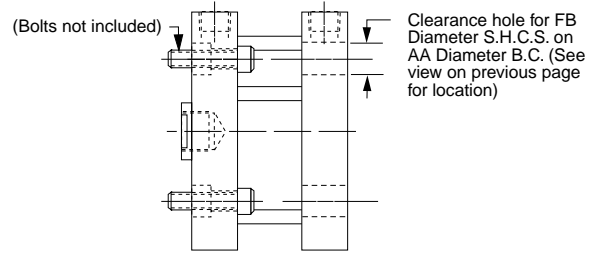
Head Bolt Clearance Holes

Mounting Style 4F
 Available Head End



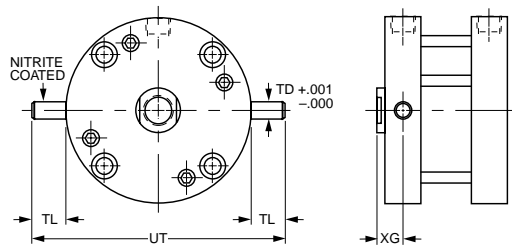
Cap Bolt Clearance Holes

Mounting Style 4R
 Available Cap End



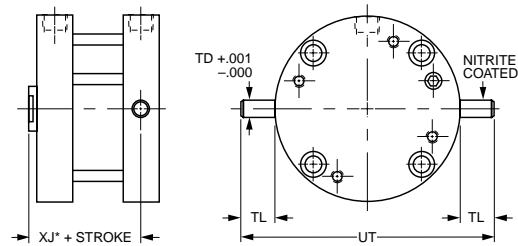
Head Trunnion

Mounting Style 2F (9/16" bore not available)



Cap Trunnion

Mounting Style 2R (9/16" bore not available)

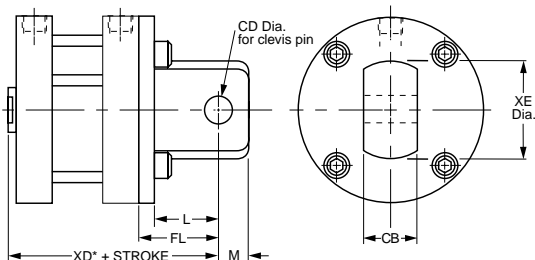


Bore size	TD	TL	UT	XG	XJ*
3/4	0.125	5/16	2-1/8	5/16	19/32
1-1/8	0.250	1/2	3	3/8	51/64
1-1/2	0.250	1/2	3-5/8	3/8	7/8
2	0.250	1/2	4-1/8	3/8	15/16
2-1/2	0.312	5/8	5	29/64	1-3/64
3	0.312	5/8	5-1/2	15/32	1-1/16
4	0.375	3/4	7	35/64	1-17/64

* These dimensions are for the LP Series with standard piston.

Cap Pivot Eye

Mounting Style 1



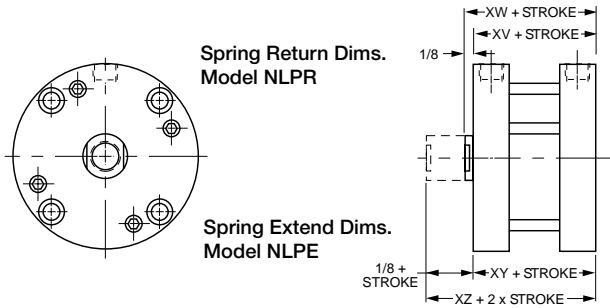
Bore size	L	M	CB	CD	FL	XD*	XE
9/16	1/2	1/4	3/8	3/16	21/32	1-13/32	19/32
3/4	1/2	1/4	3/8	3/16	21/32	1-7/16	3/4
1-1/8	1/2	1/4	3/8	3/16	49/64	1-13/16	3/4
1-1/2	13/16	7/16	3/4	3/8	1-1/16	2-3/16	1-3/8
2	13/16	7/16	3/4	3/8	1-1/8	2-5/16	1-3/8
2-1/2	13/16	7/16	3/4	3/8	1-1/4	2-5/8	1-3/8
3	1-9/32	9/16	1	5/8	1-21/32	3-1/16	1-7/8
4	1-9/32	9/16	1	5/8	1-11/16	3-7/16	1-7/8

Order clevis pin from accessories when required.

* These dimensions are for the LP Series with standard piston. See table on the previous page for dimensions for the lipseal piston or LPM options.

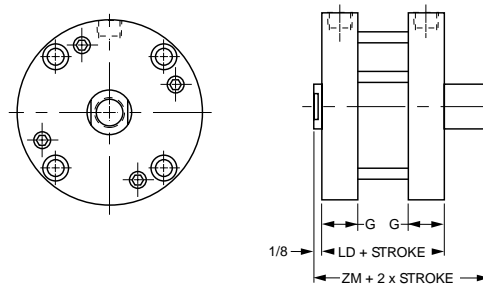
Spring Extend & Spring Return Cylinders

(Available through 2" stroke)



Double Rod Spring Extend & Spring Return Cylinders

(Available through 2" stroke)



B
Compact Cylinders
Actuator Products
P1Q
Series
P1M
Series
LP/LPM
Series

Bore size	1/8" to 1" stroke				Over 1" to 2" stroke				Add this length to XV, XW, XY, XZ for Lipseal Piston
	XV	XW	XY	XZ	XV	XW	XY	XZ	
9/16	1	1-1/8	57/64	1-1/64	1-11/16	1-13/16	1-37/64	1-45/64	9/32
3/4	1-1/64	1-9/64	59/64	1-3/64	1-45/64	1-53/64	1-39/64	1-47/64	9/32
1-1/8	1-23/64	1-31/64	1-9/32	1-13/32	1-63/64	2-7/64	1-29/32	2-1/32	1/4
1-1/2	1-25/64	1-33/64	1-11/32	1-15/32	2-1/64	2-9/64	1-31/32	2-3/32	5/16
2	1-11/64	1-19/64	1-13/32	1-17/32	1-51/64	1-59/64	2-1/32	2-5/32	25/64
2-1/2	1-3/8	1-1/2	1-23/32	1-27/32	2	2-1/8	2-11/32	2-15/64	3/8
3	1-1/2	1-5/8	1-55/64	1-63/64	2-1/8	2-1/4	2-31/64	2-39/64	7/16
4	1-27/32	1-31/32	2-13/64	2-21/64	2-15/32	2-19/32	2-53/64	2-61/64	13/32

Bore size	Spring return/extend – LP						Spring return/extend – LPM					
	≥ 1/8", ≤ 1"			<1", ≤ 2"			≥ 1/8", >1"			>1", ≤ 2"		
	G	LD	ZM	Min.* stroke	LD	ZM	LD	ZM	Min.* stroke	LD	ZM	
9/16	23/64	1-1/8	1-3/8	5/16	1-13/16	2-1/16	1-23/32	1-27/32	3/16	2-13/32	2-17/32	
3/4	23/64	1-11/64	1-27/64	1/8	1-55/64	2-7/64	1-49/64	1-57/64	3/16	2-29/64	2-37/64	
1-1/8	1/2	1-1/2	1-3/4	1/8	2-1/8	2-3/8	2-1/16	2-3/16	1/8	2-11/16	2-13/16	
1-1/2	1/2	1-11/16	1-15/16	1/8	2-5/16	2-9/16	2-5/16	2-7/16	1/4	2-15/16	3-1/16	
2	1/2	1-31/64	1-47/64	1/8	2-7/64	2-23/64	2-13/64	2-21/64	1/4	2-53/64	2-61/64	
2-1/2	5/8	1-3/4	2	1/8	2-3/8	2-5/8	2-29/64	2-37/64	3/16	3-5/64	3-13/64	
3	43/64	1-29/32	2-5/32	1/8	2-17/32	2-25/32	2-43/64	2-51/64	1/8	3-19/64	3-27/64	
4	27/32	2-1/4	2-1/2	1/8	2-7/8	3-1/8	2-63/64	3-7/64	1/8	3-39/64	3-47/64	

* Note minimum strokes for LPM option.

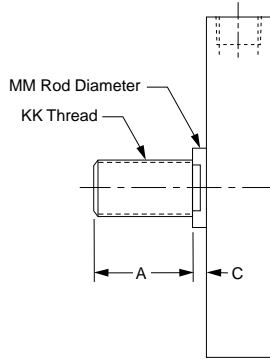
Spring force data

1/8" to 1" stroke			Over 1" to 2" stroke		
Bore size	Max. Spring force (lbs)	Spring rate (lb/in)	Bore dia.	Max. Spring force (lbs)	Spring rate (lb/in)
9/16	5.7	4.25	9/16	5.7	1.75
3/4	9	6	3/4	9	2.5
1-1/8	10	6	1-1/8	10	2.5
1-1/2	13	5.5	1-1/2	12	2.25
2	13	5.5	2	12	2.25
2-1/2	17.5	6	2-1/2	16	2.5
3 & 4	24	6.5	3 & 4	23	2.75



Optional Male Rod End

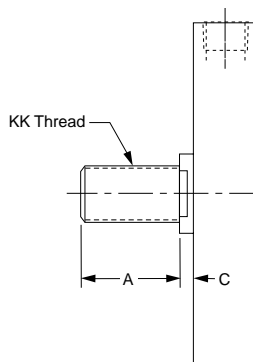
Specify #4



Bore size	A	C	KK	MM
9/16	0.38	1/8	#8-32	1/4
3/4	0.50	1/8	#10-32	5/16
1-1/8	0.50	1/8	5/16-24	1/2
1-1/2	0.50	1/8	3/8-24	5/8
2	0.62	1/8	1/2-20	3/4
2-1/2	0.62	1/8	1/2-20	3/4
3	0.75	1/8	5/8-18	7/8
4	0.75	1/8	3/4-16	1

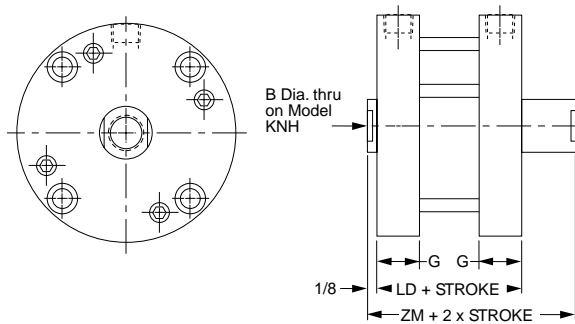
Non-standard Rods

For non-standard rod ends, please specify rod thread style 3 and provide the KK, A, and C dimensions as needed.



Double or Hollow Rod Cylinders

Note: Cylinders with hollow rod option should not be bottomed out during stroke.



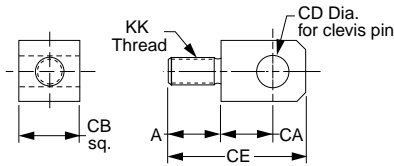
LP double or hollow rod option, LPM, lipseal piston

Bore size			Standard double rod end or with hollow rod		LPM option		LP with lipseal piston option	
	B	G	LD	ZM	LD	ZM	LD	ZM
9/16	*	23/64	3/4	1	1-11/32	1-15/32	1-1/32	1-9/32
3/4	9/64	23/64	13/16	1-1/16	1-13/32	1-17/32	1-3/32	1-11/32
1-1/8	7/32	1/2	1-3/16	1-7/16	1-3/4	1-7/8	1-7/16	1-11/16
1-1/2	9/32	1/2	1-19/64	1-35/64	1-59/64	2-3/64	1-39/64	1-55/64
2	3/8	1/2	1-3/8	1-5/8	2-3/32	2-7/32	1-49/64	2-1/64
2-1/2	3/8	5/8	1-5/8	1-7/8	2-21/64	2-29/64	2	2-1/4
3	7/16	43/64	1-11/16	1-15/16	2-29/64	2-37/64	2-1/8	2-3/8
4	1/2	27/32	2-1/32	2-9/32	2-49/64	2-57/64	2-7/16	2-11/16

*Hollow rod not available on 9/16" bore.



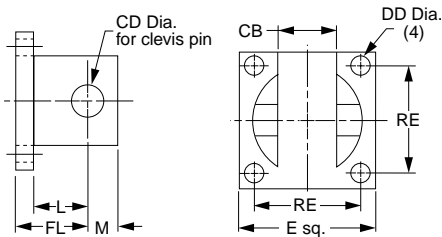
Rod Eye



Bore size	A	CA	CB	CD	CE	KK	Part number
9/16	3/8	15/32	3/8	3/16	1-3/32	#8-32	L073810008
3/4	3/8	15/32	3/8	3/16	1-3/32	#10-32	L073810010
1-1/8	9/16	15/32	3/8	3/16	1-9/32	5/16-24	L073810020
1-1/2	5/8	23/32	3/4	3/8	1-25/32	3/8-24	L073810024
2-2-1/2	21/32	23/32	3/4	3/8	1-27/32	1/2-20	L073810032
3	21/32	1	1	5/8	2-3/8	5/8-18	L073810040
4	21/32	1	1	5/8	2-3/8	3/4-16	L073810048

Clevis Bracket

(Supplied with Pin)

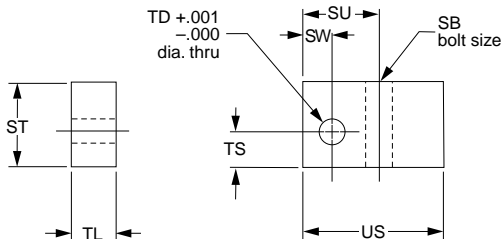


E	L	M	CB	CD	DD	FL	RE	Part number
1	13/32	7/32	25/64	3/16	9/64	9/16	3/4	L073820012
1-3/4	25/32	13/32	49/64	3/8	11/64	15/16	1-3/8	L073820024
2-1/2	1	9/16	1-1/64	5/8	17/64	1-1/4	2	L073820040

Use L073820012 on 9/16", 3/4" and 1-1/8" bore.
 Use L073820024 on 1-1/2", 2" and 2-1/2" bore.
 Use L073820040 on 3" and 4" bore.

Note: The Clevis Bracket is an accessory for the rod eye or the cap pivot eye and cannot be mounted directly to the cylinder.

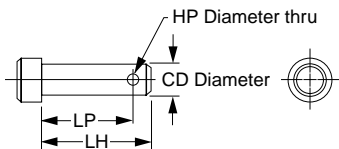
Trunnion Bracket



SB	ST	SU	SW	TD	TL	TS	US	Part number
1/4	7/8	13/16	5/16	.252	1/2	3/8	1-1/2	L073840016
5/16	1	15/16	3/8	.314	5/8	29/64	1-5/8	L073840020
3/8	1-1/4	1-1/16	7/16	.377	3/4	35/64	1-7/8	L073840024

Use L073840016 on 1-1/8", 1-1/2" and 2" bore.
 Use L073840020 on 2-1/2" and 3" bore.
 Use L073840024 on 4" bore.

Clevis Pin



CD	HP	LH	LP	Part number
3/16	3/32	1	29/32	L073830012
3/8	5/32	1-5/8	1-15/32	L073830024
5/8	5/32	2	1-27/32	L073830040

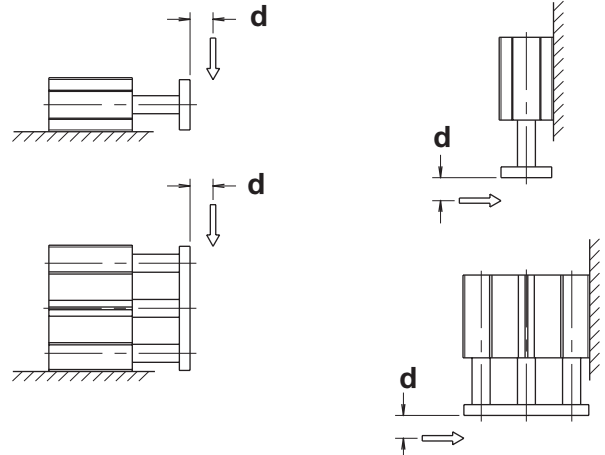
Service Kits

Bore size	Rod dia.	Standard piston, single rod cylinders		Lipseal piston, single rod cylinders	
		Class 1 seals part number	Class 5 seals part number	Class 1 seals part number	Class 5 seals part number
9/16	1/4"	SKS05LP251	SKS05LP255	KS05LPL251	KS05LPL255
3/4	5/16"	SKS07LP311	SKS07LP315	KS07LPL311	KS07LPL315
1-1/8	1/2"	SKS12LP501	SKS12LP505	KS12LPL501	KS12LPL505
1-1/2	5/8"	SKS15LP621	SKS15LP625	KS15LPL621	KS15LPL625
2	3/4"	SKS20LP751	SKS20LP755	KS20LPL751	KS20LPL755
2-1/2	3/4"	SKS25LP751	SKS25LP755	KS25LPL751	KS25LPL755
3	7/8"	SKS30LP871	SKS30LP875	KS30LPL871	KS30LPL875
4	1"	SKS40LP101	SKS40LP105	KS40LPL101	KS40LPL105

Horizontal Load Capacity
Standard Unit

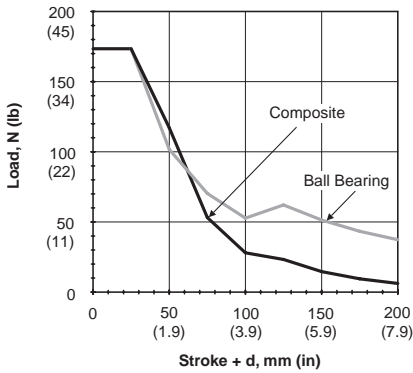
P5T Series units will have the same load capacity regardless of orientation. The graphs below show maximum load capacity based on a unit life of 10 million cycles.

EXAMPLE: A P5T-16 with “stroke + d” of 75mm and composite bushings would have a load capacity of 50N.

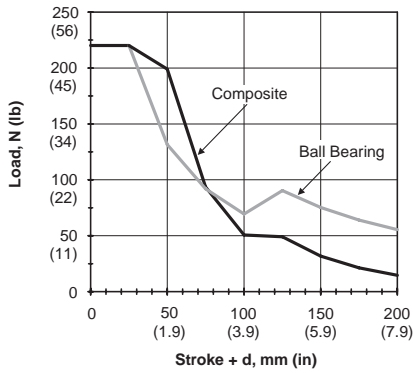


B	Guided Cylinders
	Actuator Products
P5T	Series
P5L	Series
HB	Series
P5E	Series

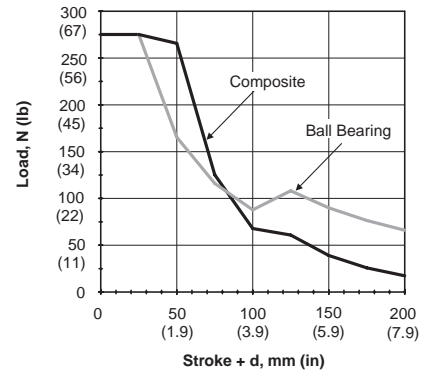
16mm Bore Size



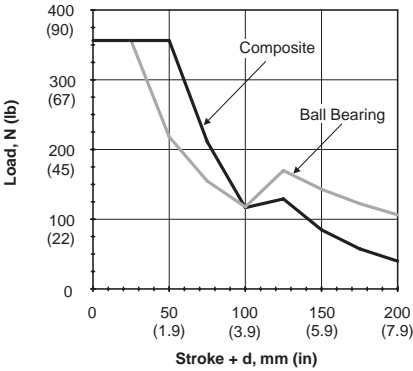
20mm Bore Size



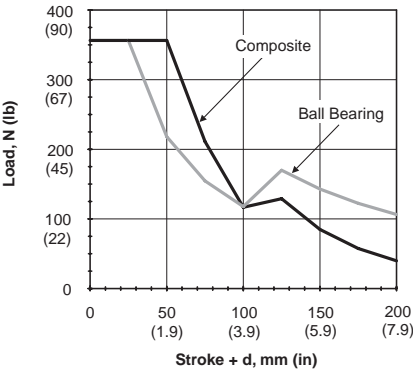
25mm Bore Size



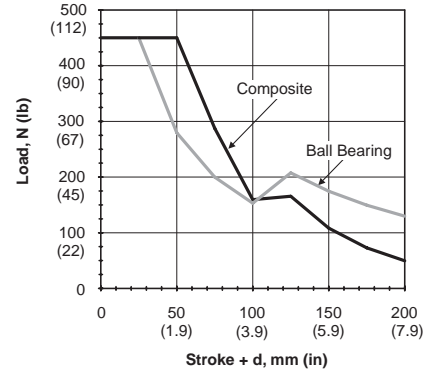
32mm Bore Size



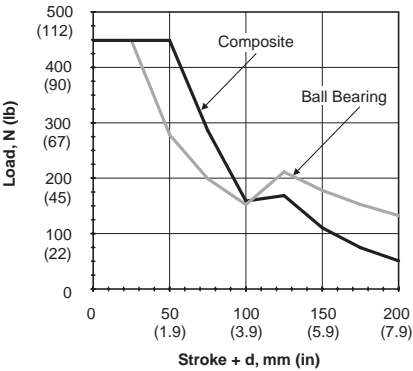
40mm Bore Size



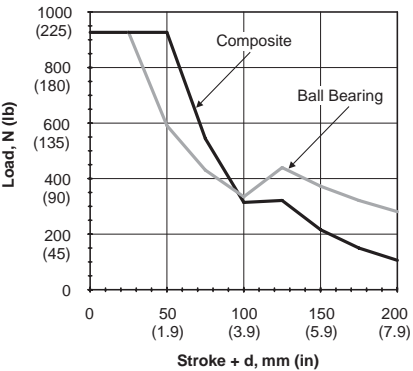
50mm Bore Size



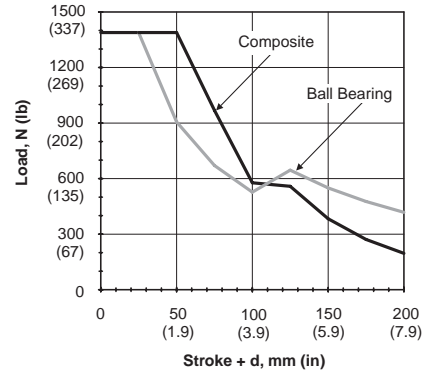
63mm Bore Size



80mm Bore Size



100mm Bore Size



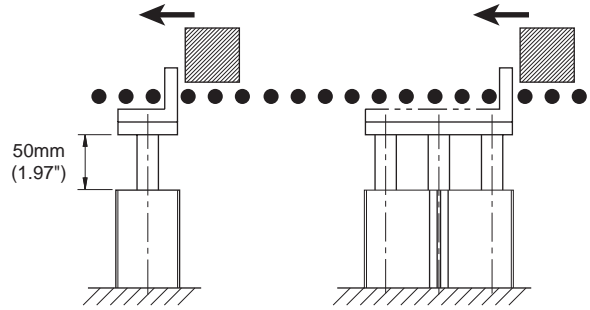
Load Stopping Capacity Standard Unit

P5T Series actuators are ideal for conveyor stopping applications. Units can be mounted horizontally or vertically.

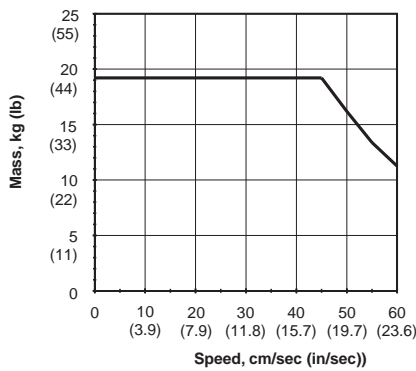
Composite bushings are strongly recommended for this type of application.

EXAMPLE: A P5T-50 unit with a stroke up to 50mm will stop an object moving at 40 cm/second (15.75 in/s) that weighs up to 50 kg (110 lb).

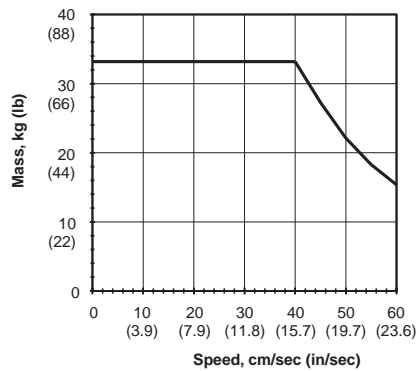
Note: The following graphs are based on 50mm of stroke.



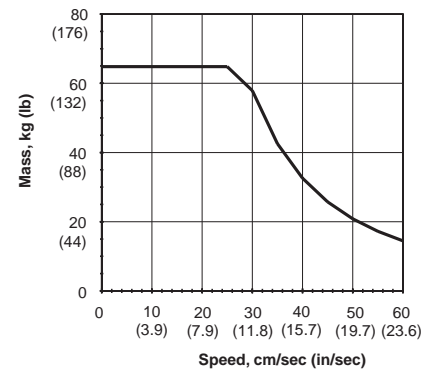
16mm Bore Size



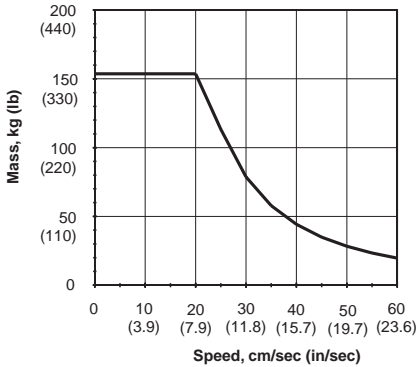
20mm Bore Size



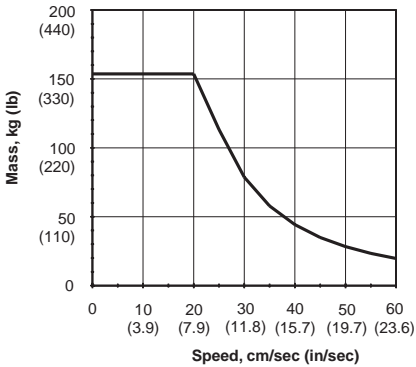
25mm Bore Size



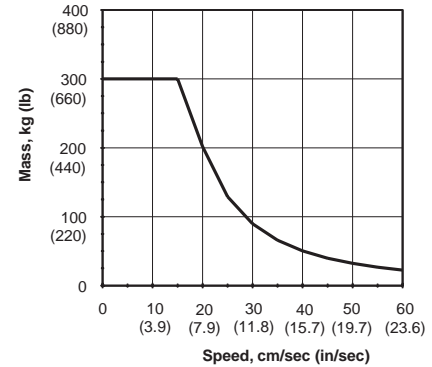
32mm Bore Size



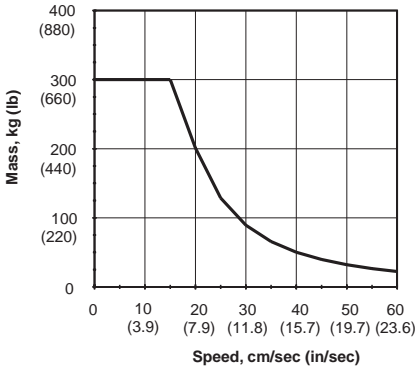
40mm Bore Size



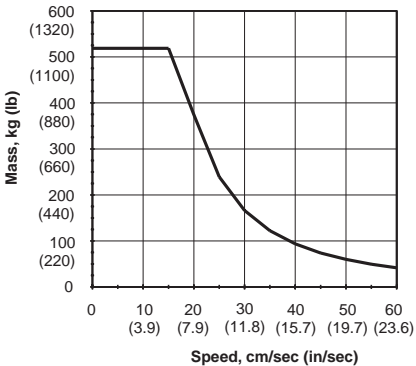
50mm Bore Size



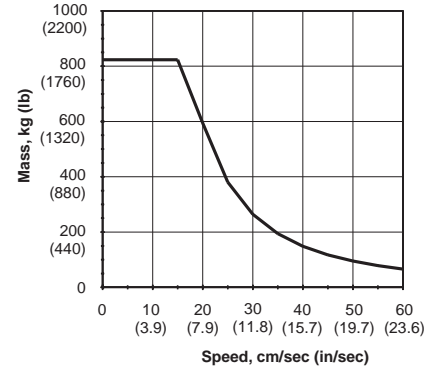
63mm Bore Size



80mm Bore Size



100mm Bore Size



B

Guided Cylinders
 Actuator Products

P5T
 Series

P5L
 Series

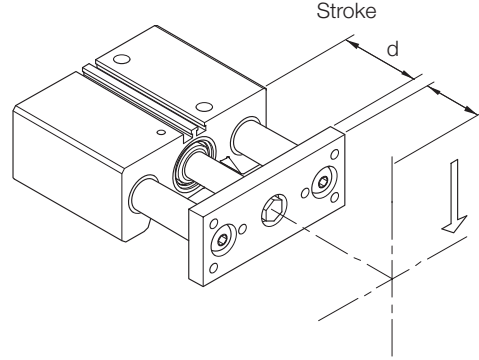
HB
 Series

P5E
 Series

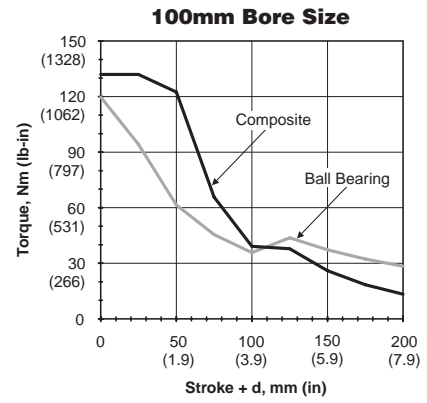
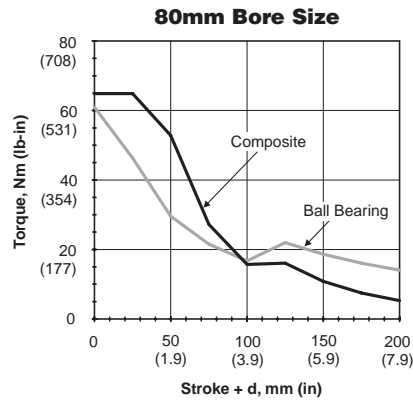
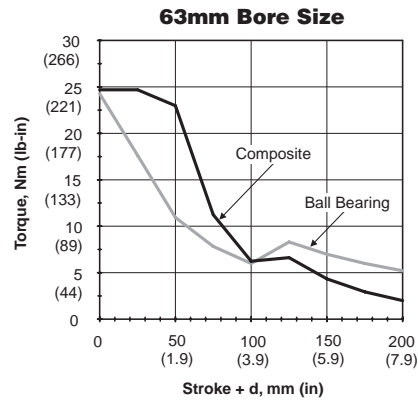
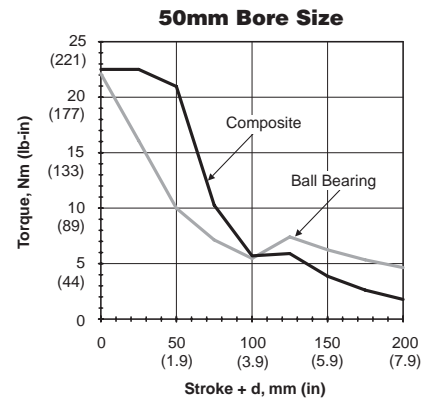
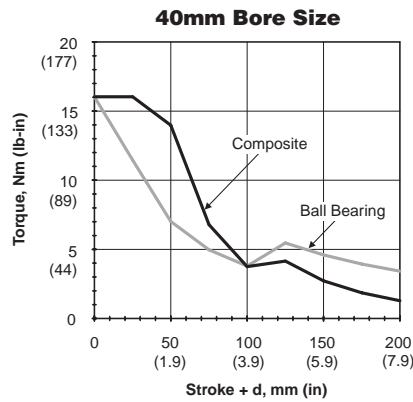
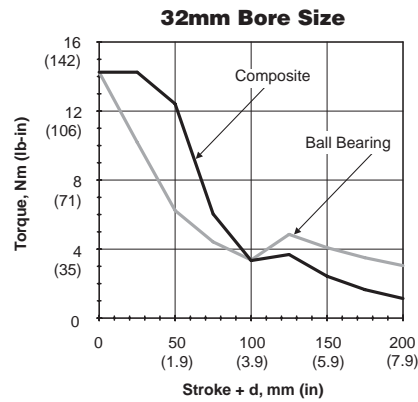
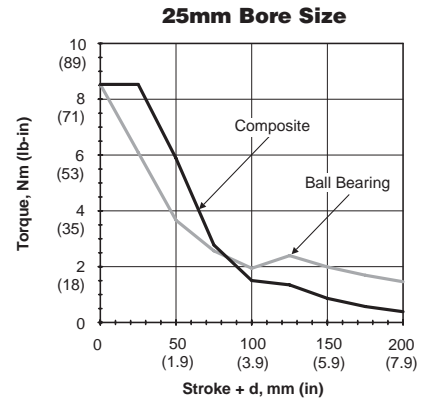
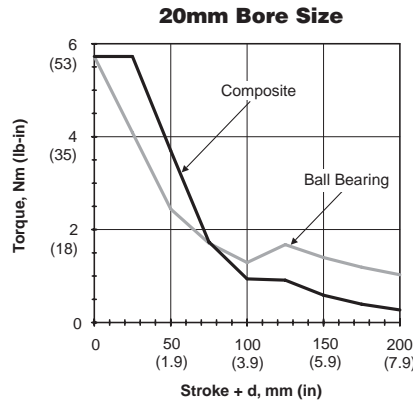
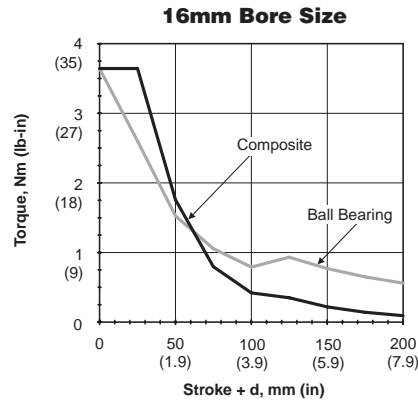
Asymmetrical Torque Capacity Standard Unit

Asymmetrical loading occurs when the load is applied to one side of the unit. P5T Series units can resist torsional loads that are asymmetrical.

EXAMPLE: A mechanism exerts an asymmetrical load of 15Nm on a P5T-50 with 50mm “stroke+d”. The P5T-50 with composite bushings will have adequate torsional capacity.



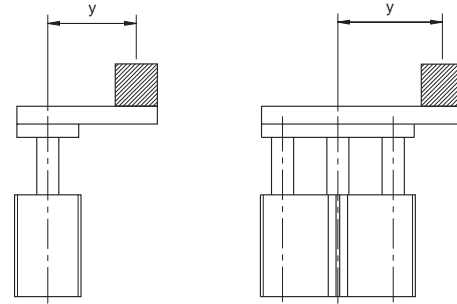
B	Guided Cylinders
	Actuator Products
Series	P5T
Series	P5L
Series	HB
Series	P5E



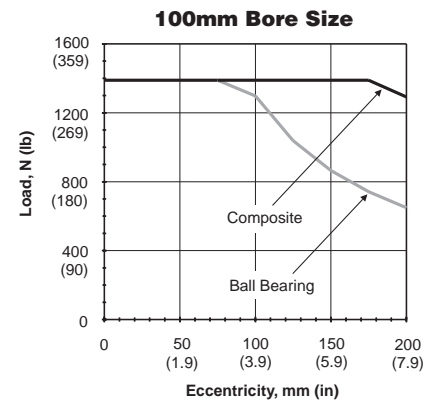
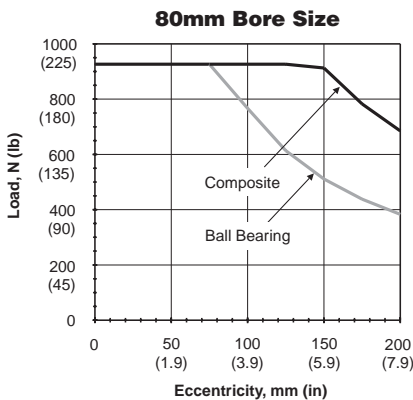
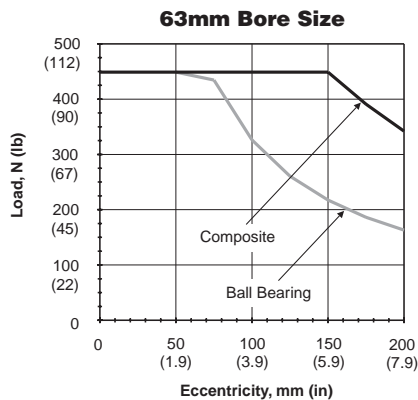
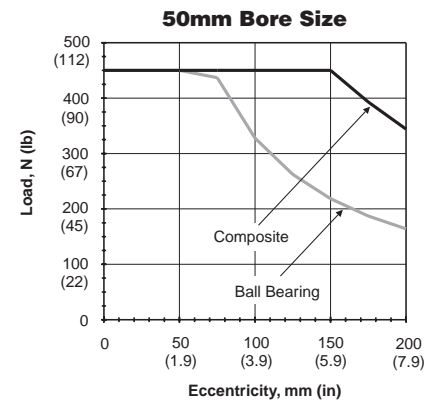
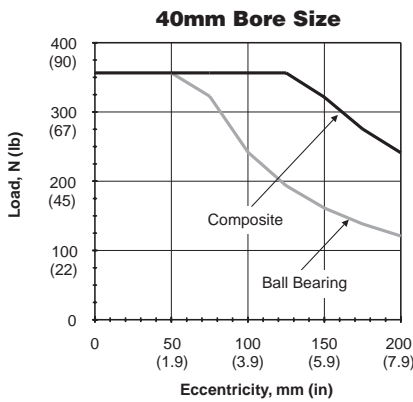
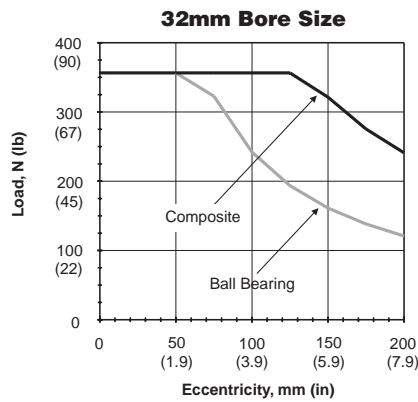
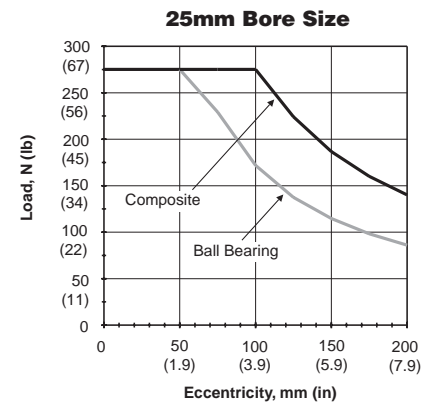
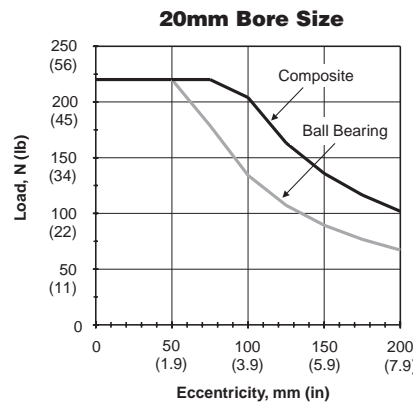
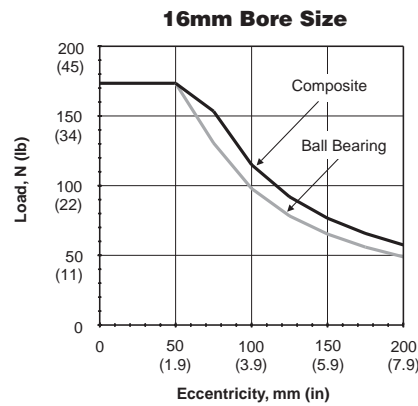
Vertical Eccentric Load Capacity Standard Unit

P5T Series units mounted vertically will have the same eccentric load capacity regardless of orientation. The graphs provide maximum load capacity for an eccentric mounted load. The load is assumed to be mounted at the face of the tooling plate.

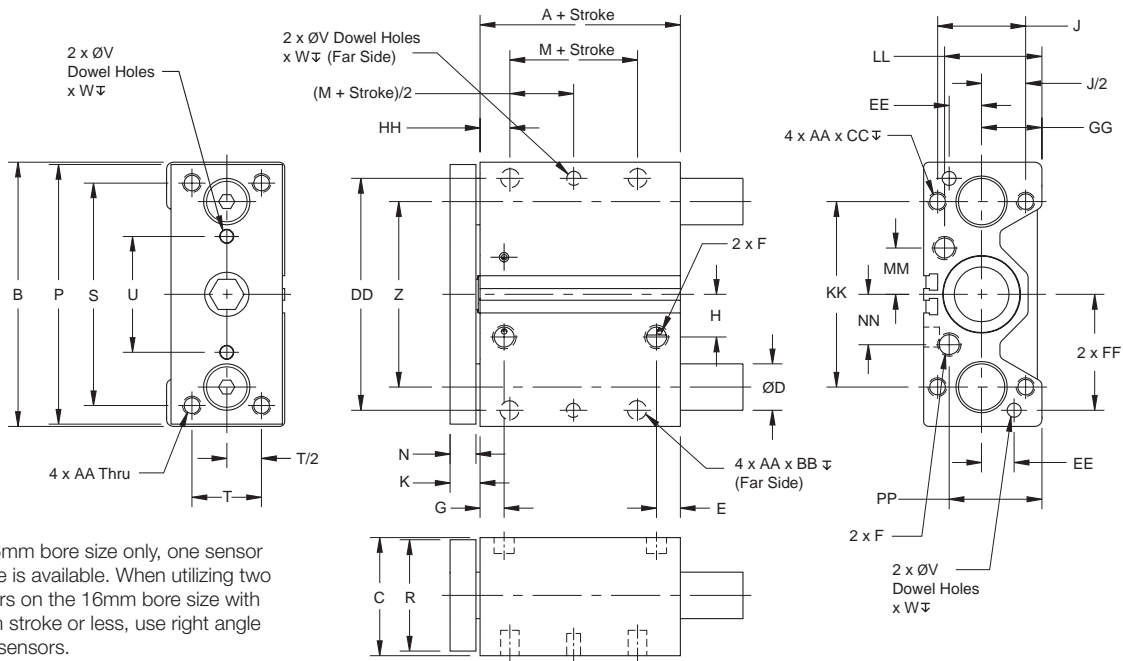
These load curves illustrate load ratings based on the bearing system of the product. Load rating is a key selection criterion but is not the only one to consider in the selection of a product.



y = eccentricity distance



B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	



Note: On 16mm bore size only, one sensor groove is available. When utilizing two sensors on the 16mm bore size with 25mm stroke or less, use right angle short sensors.

Dimensions in mm (inch)

Note: Dimensions for special stroke length actuators will be the same as those of the next longest stroke actuator.

Model	A**	B	C	D	D ²	E**	F	G	H	J	K
16	37.75 (1.49)	64 (2.52)	31 (1.22)	8 (0.315)	10 (0.394)	10.1 (0.40)	M5/10-32	10.1 (0.40)	6.95 (0.27)	22 (0.866)	9.94 (0.39)
20	36 (1.42)	74 (2.91)	36 (1.42)	10 (0.394)	12 (0.472)	19 (0.75)	1/8 NPTF or BSPP	10 (0.39)	15.8 (0.62)	26 (1.024)	9.94 (0.39)
25	38 (1.50)	88 (3.46)	42 (1.65)	12 (0.472)	16 (0.630)	21 (0.83)	1/8 NPTF or BSPP	11.4 (0.45)	15.5 (0.61)	32 (1.260)	9.94 (0.39)
32	36 (1.42)	114 (4.49)	51 (2.00)	16 (0.630)	20 (0.787)	10.26 (0.40)	1/8 NPTF or BSPP	10.35 (0.41)	18.42 (0.73)	38 (1.496)	13.1 (0.52)
40	44 (1.73)	124 (4.88)	52 (2.05)	16 (0.630)	20 (0.787)	12.10 (0.48)	1/8 NPTF or BSPP	14.9 (0.59)	22.53 (0.89)	38 (1.496)	13.1 (0.52)
50	44.9 (1.77)	140 (5.51)	62 (2.44)	20 (0.787)	25 (0.984)	14.5 (0.57)	1/4 NPTF or BSPP	16.1 (0.63)	27 (1.06)	44 (1.732)	14.7 (0.58)
63	50.05 (1.97)	150 (5.91)	75 (2.95)	20 (0.787)	25 (0.984)	16.4 (0.65)	1/4 NPTF or BSPP	14.5 (0.57)	33 (1.30)	44 (1.732)	14.7 (0.58)
80	60.3 (2.37)	188 (7.40)	95 (3.74)	25 (0.984)	30 (1.181)	17.5 (0.610)	3/8 NPTF or BSPP	19 (0.75)	37 (1.46)	56 (2.205)	18 (0.71)
100**	67.5 (2.60)	224 (8.82)	115 (4.53)	30 (1.181)	35 (1.38)	21.9 (0.862)	3/8 NPTF or BSPP	23 (0.91)	40 (1.57)	62 (2.441)	18 (0.71)

Model	M	N	P	R	S	T	U	V	W	Z	AA	BB
16	7 (0.276)	7.94 (0.31)	62 (2.44)	25.4 (1.00)	52 (2.047)	16 (.630)	20 (0.787)	3 (0.118)	6 (0.236)	42 (1.654)	M5x0.8	7.5 (0.30)
20	10 (0.394)	7.94 (0.31)	72 (2.83)	31.8 (1.25)	60 (2.362)	18 (.709)	30 (1.181)	4 (0.157)	6 (0.236)	52 (2.047)	M5x0.8	7.5 (0.30)
25	10 (0.394)	7.94 (0.31)	86 (3.39)	38 (1.50)	70 (2.756)	26 (1.024)	34 (1.339)	4 (0.157)	6 (0.236)	62 (2.441)	M6x1.0	9 (0.35)
32	5 (0.197)	11.1 (0.44)	112 (4.41)	44.5 (1.75)	96 (3.780)	30 (1.181)	50 (1.969)	6 (0.236)	6 (0.236)	80 (3.150)	M8x1.25	11 (0.43)
40	10 (0.394)	11.1 (0.44)	122 (4.80)	44.5 (1.75)	106 (4.173)	30 (1.181)	60 (2.362)	6 (0.236)	6 (0.236)	90 (3.543)	M8x1.25	11 (0.43)
50	10 (0.394)	12.7 (0.50)	138 (5.43)	57.2 (2.25)	120 (4.724)	40 (1.575)	60 (2.362)	8 (0.315)	8 (0.315)	100 (3.937)	M10x1.5	12 (0.47)
63	10 (0.394)	12.7 (0.50)	148 (5.83)	69.9 (2.75)	130 (5.118)	50 (1.969)	72 (2.835)	8 (0.315)	8 (0.315)	110 (4.331)	M10x1.5	15 (0.59)
80	15 (0.591)	16 (0.63)	185 (7.28)	89 (3.50)	160 (6.299)	60 (2.362)	92 (3.622)	10 (0.394)	10 (0.394)	140 (5.512)	M12x1.75	18 (0.71)
100	15 (0.591)	16 (0.63)	221 (8.70)	108 (4.25)	190 (7.480)	80 (3.150)	114 (4.488)	10 (0.394)	10 (0.394)	170 (6.693)	M14x2.0	21 (0.83)

Model	CC	DD	EE	FF	GG	HH	KK	LL	MM	NN	PP	Piston Rod
16	10 (0.39)	54 (2.126)	8 (0.315)	27 (1.063)	15 (0.591)	13.06 (0.514)	42 (1.654)	22.5 (0.88)	11.25 (0.44)	9.7 (0.38)	23.0 (0.91)	8 (0.315)
20	10 (0.39)	64 (2.520)	10 (0.394)	32 (1.260)	17 (0.669)	13.06 (0.514)	52 (2.126)	26.0 (1.02)	15.4 (0.61)	15.4 (0.61)	26.0 (1.0)	10 (0.394)
25	12 (0.47)	76 (2.992)	11 (0.433)	38 (1.496)	21 (0.827)	14.06 (0.553)	62 (2.441)	33.4 (1.31)	17 (0.67)	17 (0.67)	33.4 (1.31)	10 (0.394)
32	16 (0.63)	100 (3.937)	14 (0.551)	50 (1.969)	26 (1.024)	12.9 (0.508)	80 (3.150)	42 (1.65)	20 (0.79)	21.7 (0.85)	38 (1.50)	16 (0.630)
40	16 (0.63)	110 (4.33)	14 (0.551)	55 (2.165)	26 (1.024)	13.9 (0.547)	90 (3.543)	41 (1.61)	24 (0.95)	26.4 (1.04)	37.9 (1.49)	16 (0.630)
50	20 (0.79)	124 (4.882)	16 (0.630)	62 (2.441)	30 (1.181)	14.3 (0.563)	100 (3.937)	51 (2.01)	29 (1.14)	33 (1.30)	44 (1.73)	20 (0.787)
63	20 (0.79)	132 (5.197)	18 (0.709)	66 (2.598)	36.5 (1.437)	16.3 (0.642)	110 (4.331)	62 (2.44)	36 (1.42)	37.75 (1.49)	57.75 (2.27)	20 (0.787)
80	24 (0.94)	166 (6.535)	22 (0.866)	83 (3.268)	46.5 (1.831)	21 (0.83)	140 (5.512)	78 (3.07)	45 (1.77)	48 (1.89)	75.5 (2.97)	25 (0.984)
100	28 (1.10)	200 (7.874)	24 (0.945)	100 (3.937)	56.5 (2.224)	25 (0.98)	170 (6.693)	91.5 (3.60)	53 (2.09)	51 (2.01)	95.5 (3.76)	25 (0.984)

D1 With linear ball bearing

D2 With composite bushing

** For Model 100 with 25mm stroke, A = 100.3 (3.95") and E = 28 (1.10")



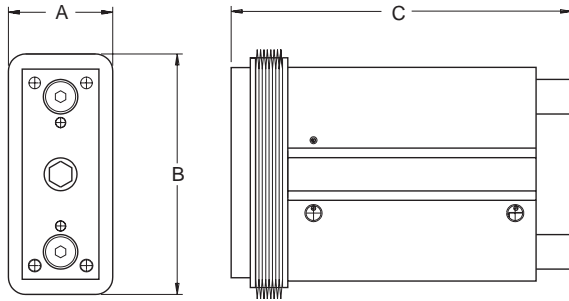
Contaminant & Weld Flash Covers

A contaminant cover protects the guide rods and bearings from particles and fluid that could cause premature failure.

A weld flash cover protects guide rods and bearings from weld spatter.

Cover option can be ordered on models having the bearings both ends option.

Consult factory to order.



Weld Flash Cover Specifications

Coating material (exposed side)	PVC (Black)
Base material	Nomex
Coating material (other side)	PVC (Black)
Material thickness range	.012" - .016" (.3-.4mm)
Temperature resistance (nomex)	
Briefly	642°F (450°C)
Continuously	-22° to 572°F (-30° to 300°C)
Temperature resistance (coating)	
Briefly	392°F (200°C)
Continuously	-22° to 302°F (-30° to 150°C)
Resistant to	Chemicals, coolants, solvents, oil
Characteristics	self-extinguishing, abrasion resistant
Material weight	400 grams/square meter

Dimensions in mm (inch)

Model	A	B	Standard stroke									
			10	25	40	50	75	100	125	150	175	200
16	42 (1.65)	86 (3.39)	61.2 (2.41)	100.2 (3.94)	135.2 (5.32)	135.2 (5.32)	160.2 (6.31)	200.2 (7.88)	-	-	-	-
20	45 (1.77)	98 (3.86)	-	106.9 (4.21)	141.9 (5.59)	141.9 (5.59)	166.9 (6.57)	216.9 (8.54)	241.9 (9.52)	-	-	-
25	49 (1.93)	112 (4.41)	-	119.9 (4.72)	-	144.9 (5.70)	169.9 (6.69)	194.9 (7.67)	241.9 (9.52)	266.9 (10.51)	-	-
32	62 (2.44)	142 (5.59)	-	127.9 (5.04)	-	152.9 (6.02)	177.9 (7.00)	202.9 (7.99)	266 (10.47)	291 (11.46)	316 (12.44)	341 (13.43)
40	62 (2.44)	152 (5.98)	-	127.9 (5.04)	-	152.9 (6.02)	177.9 (7.00)	202.9 (7.99)	266 (10.47)	291 (11.46)	316 (12.44)	341 (13.43)
50	66 (2.60)	167 (6.57)	-	134 (5.28)	-	159 (6.26)	184 (7.24)	209 (8.23)	274.1 (10.79)	299.1 (11.78)	324.1 (12.76)	349.1 (13.74)
63	77 (3.03)	187 (7.36)	-	134 (5.28)	-	159 (6.26)	184 (7.24)	209 (8.23)	274.1 (10.79)	299.1 (11.78)	324.1 (12.76)	349.1 (13.74)
80	104 (4.09)	244 (9.61)	-	151.8 (5.98)	-	176.8 (6.96)	201.8 (7.94)	226.8 (8.93)	290 (11.42)	315 (12.40)	340 (13.39)	365 (14.37)
100	109 (4.29)	279 (10.98)	-	170.3 (6.70)	-	195.3 (7.69)	220.3 (8.67)	245.3 (9.66)	308.4 (12.14)	333.4 (13.13)	358.4 (14.11)	383.4 (15.09)

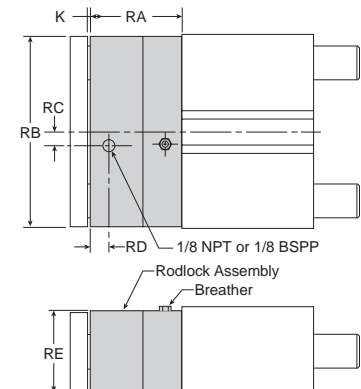
Seal Kits

Bore size	Seal kit part number	
	Nitrile seals	Fluorocarbon seals
16	PSK-P5T16	PSK-P5T16-F
20	PSK-P5T20	PSK-P5T20-F
25	PSK-P5T25	PSK-P5T25-F
32	PSK-P5T32	PSK-P5T32-F
40	PSK-P5T40	PSK-P5T40-F
50	PSK-P5T50	PSK-P5T50-F
63	PSK-P5T63	PSK-P5T63-F
80	PSK-P5T80	PSK-P5T80-F
100	PSK-P5T100	PSK-P5T100-F

P5T Rodlock Dimensions

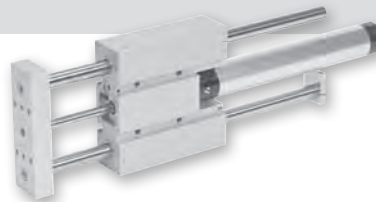
Bore	RA	RB	RC	RD	RE	K
32	58 (2.28)	112 (4.41)	6 (0.24)	10 (0.39)	49.50 (1.95)	2 (0.08)
40	58 (2.28)	122 (4.80)	6 (0.24)	10 (0.39)	49.50 (1.95)	2 (0.08)
50	66 (2.60)	138 (5.43)	10 (0.39)	13 (0.51)	59.30 (2.33)	2 (0.08)
63	83 (3.27)	148 (5.83)	7 (0.28)	18 (0.71)	69.90 (2.75)	2 (0.08)
80	100 (3.94)	185 (7.28)	10 (0.39)	26 (1.02)	90.70 (3.57)	2 (0.08)
100	116 (4.57)	221 (8.70)	10 (0.39)	43 (1.69)	108.00 (4.25)	2 (0.08)

Dimensions in mm (inch)



P5L Series

- 3 body styles (Thrust, Reach, Base)
- 8 bore sizes 20mm to 100mm
- Maximum strokes 400 to 1000mm depending on model
- 3 Bearing options: composite, ball bearing, self-aligning ball bearing
- Dowel holes standard on body and tool plate
- Available with adjustable stroke and shock absorbers
- Direct mount of thrust and reach to same size base
- Powered by P1L cylinder



Operating information

Operating pressure:	10 bar (145 PSIG)
Temperature range:	
Standard seals	-17°C to 74°C (0°F to 165°F)
Fluorocarbon seals*	-17°C to 121°C (0°F to 250°F) *
	See fluorocarbon seal option for high temperature applications.
Operating characteristics:	Double acting
Filtration requirements:	40 micron, dry filtered air

Ordering information

P5L - R L 100 J1 A A N F N - 0900 - A

Series	T Thrust slide R Reach slide B Base slide
Bore size	020 20mm 025 25mm 032 32mm 040 40mm 050 50mm 063 63mm 080 80mm 100 100mm
Cylinder type	L P1L cylinder
Cylinder seals	N Nitrile (standard) V Fluorocarbon (high temperature)
Stroke length	Order in 1mm increments.
T-slots	- Standard (Extruded T-slots on sizes 20-40, no T-slots on sizes 50-100) A** Machined T-slots (Sizes 50-100)
** Not available on sizes 20-40	
Proximity sensor options	N No Sensor P PNP, lead type R NPN, lead type S PNP, plug in type T NPN, plug in type W Prox ready, 8mm (no sensor supplied) Z Prox ready, 12mm (no sensor supplied)
Note: Piston magnet is standard on all cylinders. Inductive proximity sensors are included with Options P, R, S & T.	
Cylinder port style	G BSPT ports H NPTF ports P BSPT ports w/ Presto-lok flow controls (mm) F NPTF ports w/ Presto-lok flow controls (inch) B BSPT ports w/ flow controls N NPTF ports w/ flow controls
Extend options	N None A Shock/stroke adjusters B Bumpers (base slides only) C Cushions both ends E Micro-adjusters and cushions (both ends only) H Cushions and bumpers (includes options C & K) K Bumpers and adjustable stop collars L Shock absorbers and bumpers (N/A on base slides)
Retract options	N None A Shock/stroke adjusters B Bumpers only C Cushions both ends E Micro-adjusters and cushions (both ends only) H Cushions and bumpers (includes options C & K) K Bumpers and adjustable stop collars L Shock absorbers and bumpers (N/A on base slides)
Bushings	J1 Composite bushing, chrome plated shafts J2 Composite bushing, oversized chrome plated shafts J3 Composite bushing, stainless steel shafts J4 Composite bushing, oversized stainless steel shafts G1 Composite bushing, chrome plated shafts, contaminant tolerant seals G3 Composite bushing, stainless steel shafts, contaminant tolerant seals H3 Linear ball bearings, stainless steel shafts H5 Linear ball bearings, carbon steel shafts S3* Self aligning linear ball bearings, stainless steel shafts S5* Self aligning linear ball bearings, carbon steel shafts
* Not available 20mm bore models	

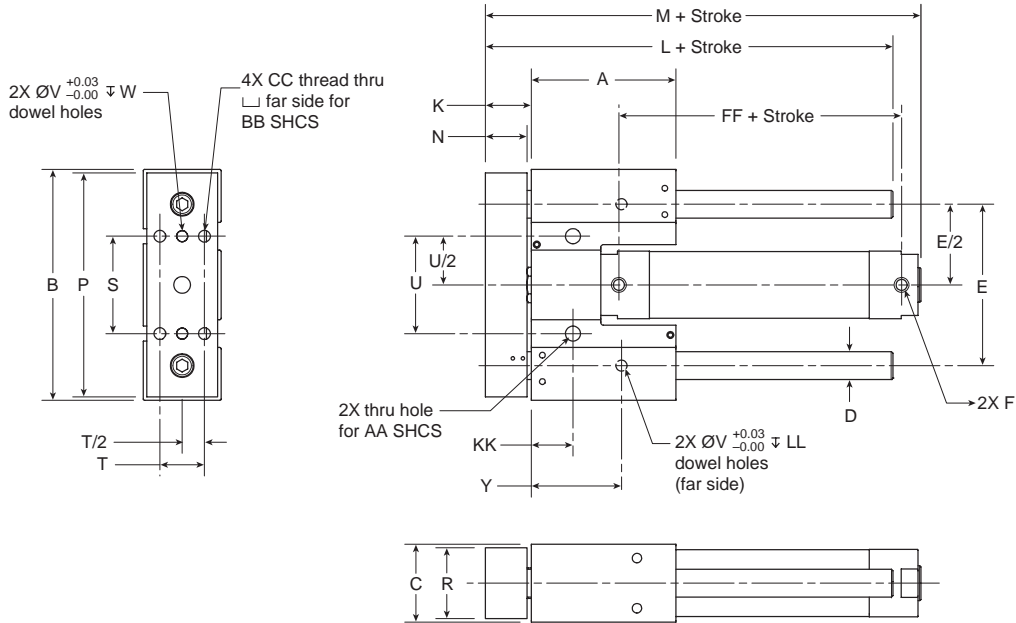
B
 Guided Cylinders
 Actuator Products
 P5T Series
 P5L Series
 HB Series
 P5E Series

Sensors

For sensors see page B339.



Thrust Slides



Dimensions in mm (inch)

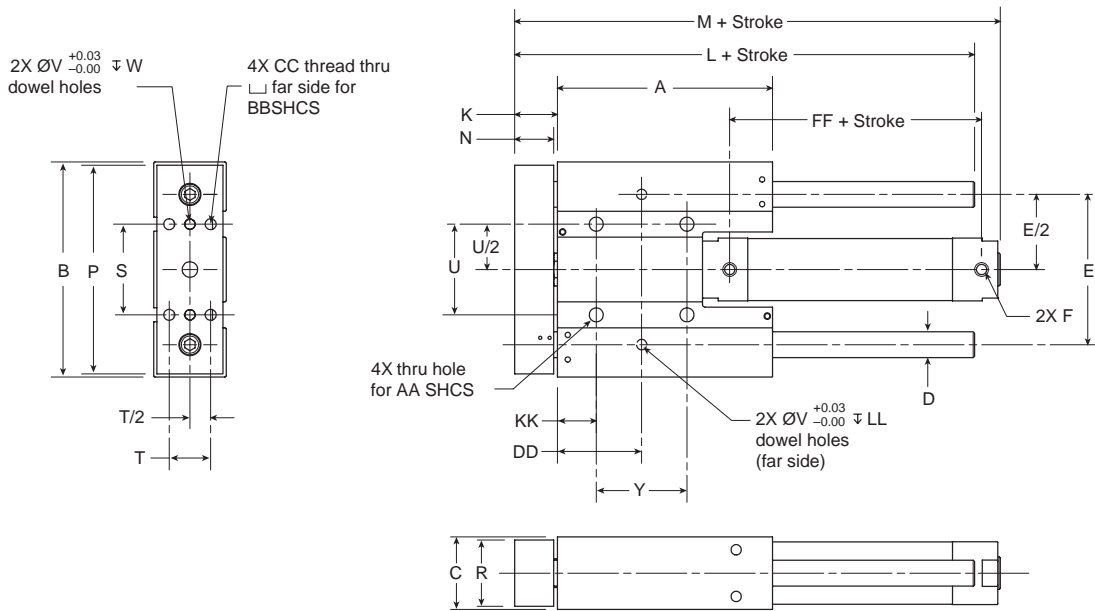
Bore size	A	B	C	Ds*	Do*	E	F**	K	L	M	N	P	R
20	60 (2.4)	98 (3.9)	30 (1.2)	10 (0.4)	12 (0.5)	68 (2.7)	1/8†	20 (0.8)	86 (3.4)	114 (4.5)	17 (0.7)	96 (3.8)	26 (1.0)
25	76 (3.0)	122 (4.8)	38 (1.5)	12 (0.5)	16 (0.6)	84 (3.3)	1/8†	25 (1.0)	107 (4.2)	126 (5.0)	22 (0.9)	119 (4.7)	33 (1.3)
32	84 (3.3)	140 (5.5)	44 (1.7)	16 (0.6)	20 (0.8)	92 (3.6)	1/8	27 (1.1)	117 (4.6)	140 (5.5)	24 (0.9)	137 (5.4)	39 (1.5)
40	104 (4.1)	166 (6.5)	56 (2.2)	20 (0.8)	25 (1.0)	116 (4.6)	1/8	33 (1.3)	143 (5.6)	163 (6.4)	30 (1.2)	161 (6.3)	51 (2.0)
50	130 (5.1)	216 (8.5)	70 (2.8)	25 (1.0)	30 (1.2)	148 (5.8)	1/4	39 (1.5)	175 (6.9)	195 (7.7)	36 (1.4)	211 (8.3)	63 (2.5)
63	152 (6.0)	260 (10.2)	84 (3.3)	30 (1.2)	40 (1.6)	176 (6.9)	1/4	43 (1.7)	203 (8.0)	219 (8.6)	40 (1.6)	255 (10.0)	77 (3.0)
80	180 (7.1)	320 (12.6)	102 (4.0)	40 (1.6)	50 (2.0)	220 (8.7)	3/8	49 (1.9)	237 (9.3)	249 (9.8)	46 (1.8)	315 (12.4)	95 (3.7)
100	222 (8.7)	390 (15.4)	120 (4.7)	50 (2.0)	60 (2.4)	260 (10.2)	1/2	59 (2.3)	289 (11.4)	306 (12.0)	56 (2.2)	383 (15.1)	111 (4.4)

Bore size	S	T	U	V	W	Y	AA	BB	CC	FF	KK	LL
20	40 (1.6)	16 (0.6)	40 (1.6)	4.03 (0.2)	4 (0.2)	36 (1.4)	M5	M4	M5x0.8	45 (1.8)	16 (0.6)	4 (0.2)
25	48 (1.9)	20 (0.8)	48 (1.9)	5.03 (0.2)	5 (0.2)	46 (1.8)	M6	M5	M6x1.0	46 (1.8)	22 (0.9)	5 (0.2)
32	50 (2.0)	24 (0.9)	50 (2.0)	6.03 (0.2)	6 (0.2)	53 (2.1)	M8	M6	M8x1.25	43 (1.7)	28 (1.1)	6 (0.2)
40	70 (2.8)	32 (1.3)	70 (2.8)	8.03 (0.3)	8 (0.3)	65 (2.6)	M10	M8	M10x1.5	49 (1.9)	30 (1.2)	8 (0.3)
50	80 (3.1)	42 (1.7)	80 (3.1)	8.03 (0.3)	8 (0.3)	83 (3.3)	M10	M8	M10x1.5	53 (2.1)	43 (1.7)	8 (0.3)
63	100 (3.9)	52 (2.0)	100 (3.9)	10.03 (0.4)	10 (0.4)	101 (4.0)	M12	M10	M12x1.75	52 (2.0)	51 (2.0)	10 (0.4)
80	124 (4.9)	62 (2.4)	124 (4.9)	12.03 (0.5)	12 (0.5)	127 (5.0)	M16	M14	M16x1.5	64 (2.5)	65 (2.6)	12 (0.5)
100	148 (5.8)	72 (2.8)	148 (5.8)	12.03 (0.5)	12 (0.5)	154 (6.1)	M20	M16	M20x2.5	66 (2.6)	80 (3.1)	12 (0.5)

* s = standard, o = oversized ** NPTF or BSPT † w/cushions M5/10-32



Reach Slides



Dimensions in mm (inch)

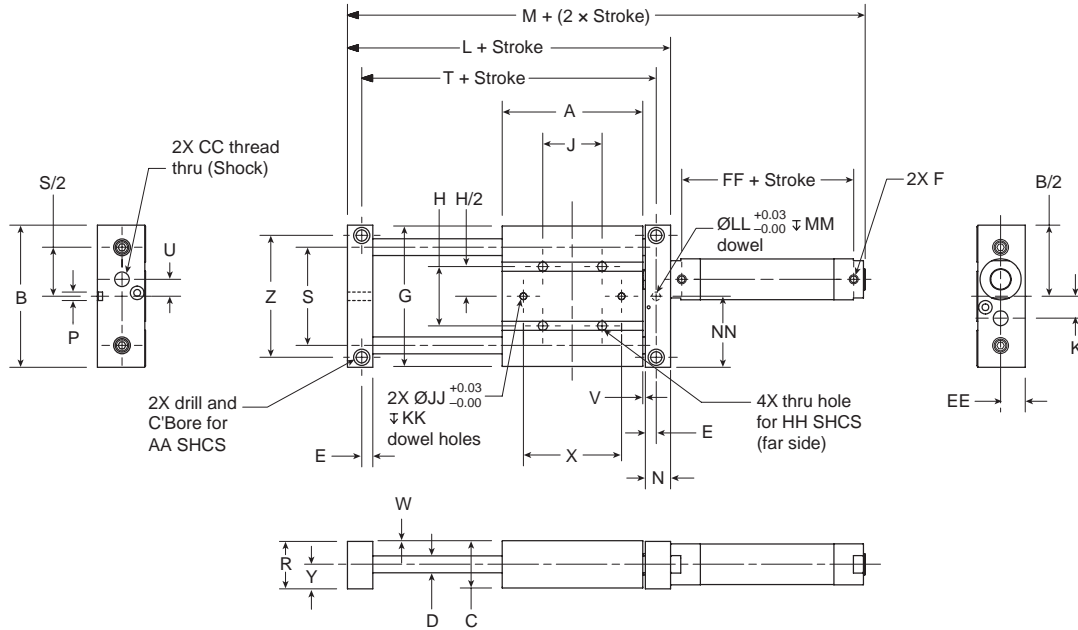
Bore size	A	B	C	Ds*	Do*	E	F**	K	L	M	N	P	R
20	98 (3.9)	98 (3.9)	30 (1.2)	10 (0.4)	12 (0.5)	68 (2.7)	1/8†	20 (0.8)	124 (4.9)	152 (6.0)	17 (0.7)	96 (3.8)	26 (1.0)
25	122 (4.8)	122 (4.8)	38 (1.5)	12 (0.5)	16 (0.6)	84 (3.3)	1/8†	25 (1.0)	153 (6.0)	172 (6.8)	22 (0.9)	119 (4.7)	33 (1.3)
32	140 (5.5)	140 (5.5)	44 (1.7)	16 (0.6)	20 (0.8)	92 (3.6)	1/8	27 (1.1)	173 (6.8)	196 (7.7)	24 (0.9)	137 (5.4)	39 (1.5)
40	166 (6.5)	166 (6.5)	56 (2.2)	20 (0.8)	25 (1.0)	116 (4.6)	1/8	33 (1.3)	205 (8.1)	225 (8.9)	30 (1.2)	161 (6.3)	51 (2.0)
50	216 (8.5)	216 (8.5)	70 (2.8)	25 (1.0)	30 (1.2)	148 (5.8)	1/4	39 (1.5)	261 (10.3)	281 (11.1)	36 (1.4)	211 (8.3)	63 (2.5)
63	260 (10.2)	260 (10.2)	84 (3.3)	30 (1.2)	40 (1.6)	176 (6.9)	1/4	43 (1.7)	311 (12.2)	327 (12.9)	40 (1.6)	255 (10.0)	77 (3.0)
80	320 (12.6)	320 (12.6)	102 (4.0)	40 (1.6)	50 (2.0)	220 (8.7)	3/8	49 (1.9)	377 (14.8)	389 (15.3)	46 (1.8)	315 (12.4)	9 (3.7)
100	390 (15.4)	390 (15.4)	120 (4.7)	50 (2.0)	60 (2.4)	260 (10.2)	1/2	59 (2.3)	457 (18.0)	474 (18.7)	56 (2.2)	383 (15.1)	111 (4.4)

Bore size	S	T	U	V	W	Y	AA	BB	CC	DD	FF	KK	LL
20	40 (1.6)	16 (0.6)	40 (1.6)	4.03 (0.2)	4 (0.2)	40 (1.6)	M5	M4	M5X0.8	36 (1.4)	45 (1.8)	16 (0.6)	4 (0.2)
25	48 (1.9)	20 (0.8)	48 (1.9)	5.03 (0.2)	5 (0.2)	48 (1.9)	M6	M5	M6X1.0	46 (1.8)	46 (1.8)	22 (0.9)	5 (0.2)
32	50 (2.0)	24 (0.9)	50 (2.0)	6.03 (0.2)	6 (0.2)	50 (2.0)	M8	M6	M8X1.25	53 (2.1)	43 (1.7)	28 (1.1)	6 (0.2)
40	70 (2.8)	32 (1.3)	70 (2.8)	8.03 (0.3)	8 (0.3)	70 (2.8)	M10	M8	M10X1.5	65 (2.6)	49 (1.9)	30 (1.2)	8 (0.3)
50	80 (3.1)	42 (1.7)	80 (3.1)	8.03 (0.3)	8 (0.3)	80 (3.1)	M10	M8	M10X1.5	83 (3.3)	53 (2.1)	43 (1.7)	8 (0.3)
63	100 (3.9)	52 (2.0)	100 (3.9)	10.03 (0.4)	10 (0.4)	100 (3.9)	M12	M10	M12X1.75	101 (4.0)	52 (2.0)	51 (2.0)	10 (0.4)
80	124 (4.9)	62 (2.4)	124 (4.9)	12.03 (0.5)	12 (0.5)	124 (4.9)	M16	M14	M16X1.5	127 (5.0)	64 (2.5)	65 (2.6)	12 (0.5)
100	148 (5.8)	72 (2.8)	148 (5.8)	12.03 (0.5)	12 (0.5)	148 (5.8)	M20	M16	M20X2.5	154 (6.1)	66 (2.6)	80 (3.1)	12 (0.5)

* s = standard, o = oversized ** NPTF or BSPT † w/cushions M5/10-32



Base Slides



Dimensions in mm (inch)

Bore size	A	B	C	Ds*	Do*	E	F**	G	H	J	K	L	M	N	P+.03	R	S
20	98 (3.9)	100 (3.9)	30 (1.2)	10 (0.4)	12 (0.5)	8 (0.3)	1/8†	98 (3.9)	40 (1.6)	40 (1.6)	18 (0.7)	140 (5.5)	211 (8.3)	18 (0.7)	5.03 (0.2)	30 (1.2)	68 (2.7)
25	122 (4.8)	124 (4.9)	38 (1.5)	12 (0.5)	16 (0.6)	14 (0.6)	1/8†	122 (4.8)	48 (1.9)	48 (1.9)	22 (0.9)	176 (6.9)	247 (9.7)	24 (0.9)	6.03 (0.2)	38 (1.5)	84 (3.3)
32	140 (5.5)	142 (5.6)	44 (1.7)	16 (0.6)	20 (0.8)	12 (0.5)	1/8	140 (5.5)	50 (2.0)	50 (2.0)	22 (0.9)	198 (7.8)	271 (10.7)	26 (1.0)	6.03 (0.2)	44 (1.7)	92 (3.6)
40	166 (6.5)	168 (6.6)	56 (2.2)	20 (0.8)	25 (1.0)	13 (0.5)	1/8	166 (6.5)	70 (2.8)	70 (2.8)	26 (1.0)	232 (9.1)	312 (12.3)	30 (1.2)	10.03 (0.4)	56 (2.2)	116 (4.6)
50	216 (8.5)	218 (8.6)	70 (2.8)	25 (1.0)	30 (1.2)	16 (0.6)	1/4	216 (8.5)	80 (3.1)	80 (3.1)	28 (1.1)	292 (11.5)	384 (15.1)	35 (1.4)	10.03 (0.4)	70 (2.8)	148 (5.8)
63	260 (10.2)	262 (10.3)	84 (3.3)	30 (1.2)	40 (1.6)	19 (0.7)	1/4	260 (10.2)	100 (3.9)	100 (3.9)	42 (1.7)	350 (13.8)	442 (17.4)	42 (1.7)	12.03 (0.5)	84 (3.3)	176 (6.9)
80	320 (12.6)	322 (12.7)	102 (4.0)	40 (1.6)	50 (2.0)	24 (0.9)	3/8	320 (12.6)	124 (4.9)	124 (4.9)	42 (1.7)	434 (17.1)	545 (21.5)	54 (2.1)	16.03 (0.6)	102 (4.0)	220 (8.7)
100	390 (15.4)	392 (15.4)	120 (4.7)	50 (2.0)	60 (2.4)	28 (1.1)	1/2	390 (15.4)	148 (5.8)	148 (5.8)	62 (2.4)	528 (20.8)	639 (25.2)	66 (2.6)	16.03 (0.6)	120 (4.7)	260 (10.2)

Bore size	T	U	V***	W	X	Y	Z	AA	CC	EE	FF	HH	JJ	KK	LL	MM	NN
20	120 (4.7)	11 (0.4)	3 (0.1)	1 (0.0)	68 (2.7)	14 (0.6)	86 (3.4)	M6	M12	16 (0.6)	45 (1.8)	M5	4.03 (0.2)	4 (0.2)	5.03 (0.2)	5 (0.2)	50 (2.0)
25	156 (6.1)	12 (0.5)	3 (0.1)	1 (0.0)	84 (3.3)	18 (0.7)	104 (4.1)	M8	M14	20 (0.8)	46 (1.8)	M6	5.03 (0.2)	5 (0.2)	6.03 (0.2)	6 (0.2)	62 (2.4)
32	170 (6.7)	11 (0.4)	3 (0.1)	1 (0.0)	92 (3.6)	21 (0.8)	120 (4.7)	M10	M14	23 (0.9)	43 (1.7)	M8	6.03 (0.2)	6 (0.2)	6.03 (0.2)	6 (0.2)	71 (2.8)
40	198 (7.8)	20 (0.8)	3 (0.1)	1 (0.0)	116 (4.6)	27 (1.1)	144 (5.7)	M12	M20	29 (1.1)	49 (1.9)	M10	8.03 (0.3)	8 (0.3)	10.03 (0.4)	10 (0.4)	84 (3.3)
50	254 (10.0)	22 (0.9)	3 (0.1)	1 (0.0)	148 (5.8)	34 (1.3)	188 (7.4)	M16	M25	36 (1.4)	53 (2.1)	M10	8.03 (0.3)	8 (0.3)	10.03 (0.4)	10 (0.4)	109 (4.3)
63	304 (12.0)	30 (1.2)	3 (0.1)	1 (0.0)	176 (6.9)	41 (1.6)	224 (8.8)	M20	M25	43 (1.7)	52 (2.0)	M12	10.03 (0.4)	10 (0.4)	12.03 (0.5)	12 (0.5)	131 (5.2)
80	374 (14.7)	36 (1.4)	3 (0.1)	1 (0.0)	220 (8.7)	50 (2.0)	276 (10.9)	M24	M33	52 (2.0)	64 (2.5)	M16	12.03 (0.5)	12 (0.5)	16.03 (0.6)	16 (0.6)	161 (6.3)
100	452 (17.8)	36 (1.4)	3 (0.1)	1 (0.0)	260 (10.2)	59 (2.3)	336 (13.2)	M30	M36	61 (2.4)	66 (2.6)	M20	12.03 (0.5)	12 (0.5)	16.03 (0.6)	16 (0.6)	196 (7.7)

* s = standard, o = oversized ** NPTF or BSPT † w/cushions M5/10-32
 *** Space between housing and end plate in both extend and retract positions.



B
 Guided Cylinders
 Actuator Products
 P5T Series
 P5L Series
 HB Series
 P5E Series

Horizontal Load Capacity & Deflection with Standard Shafting

- Standard Composite w/ Chrome Plated or Stainless Steel Rods
- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

See the P5L options section of this catalog for more bearing selection information.

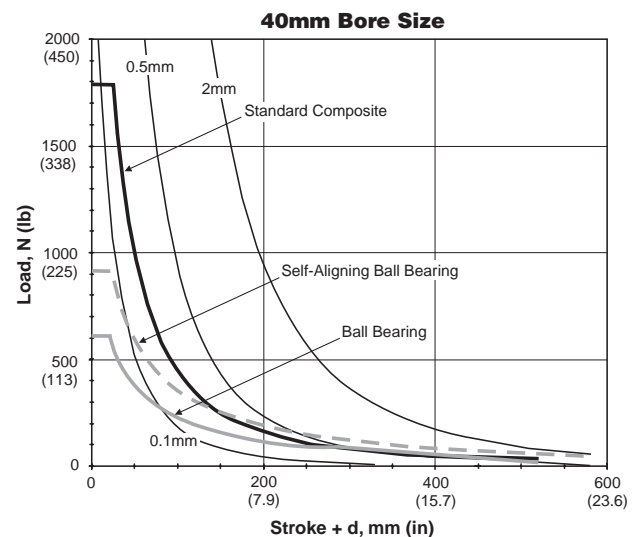
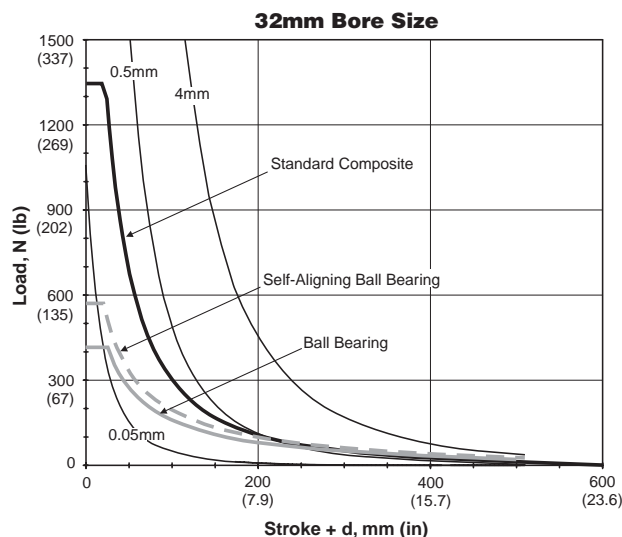
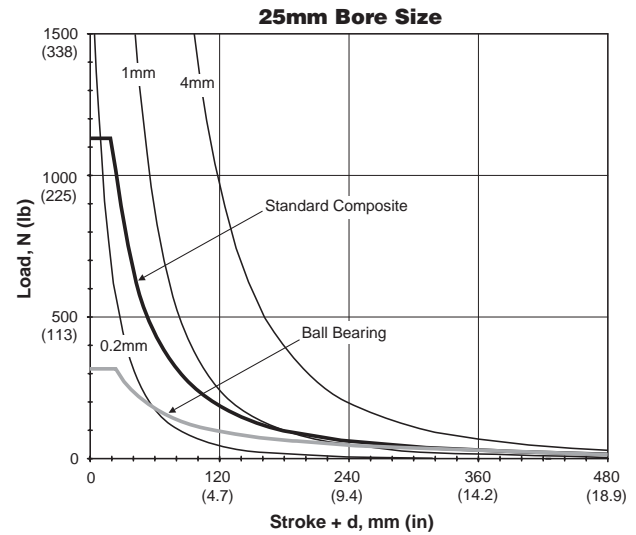
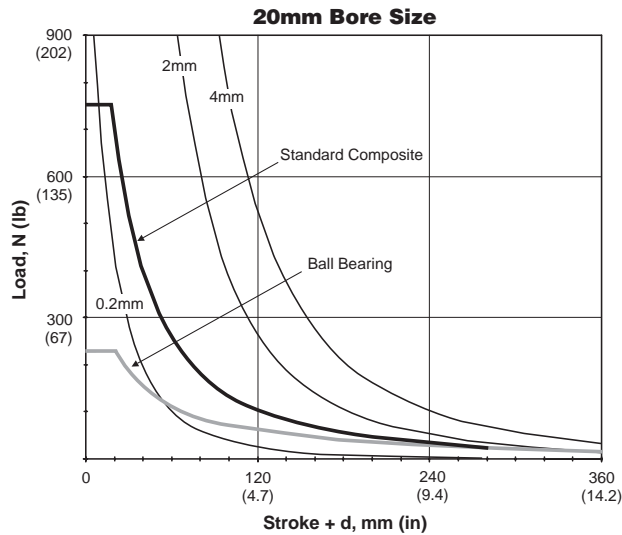
Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

Note: The following variables commonly affect the bearing life of a guided cylinder:

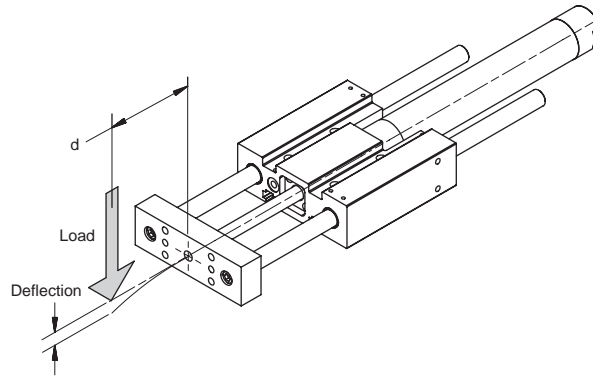
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

B
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 Series P5L
 Series HB
 Series P5E

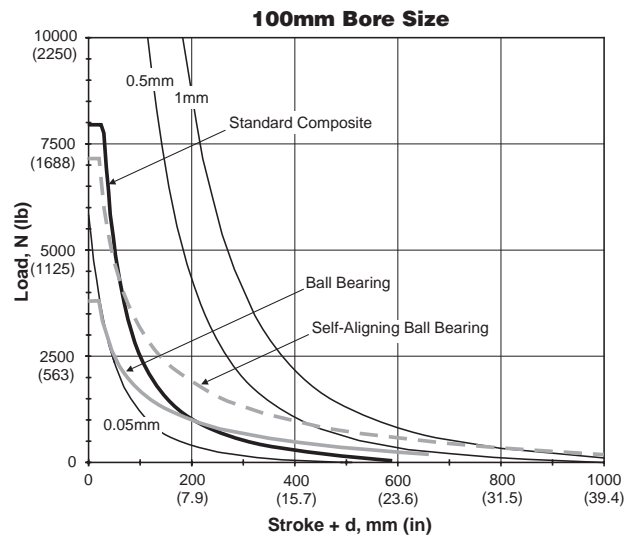
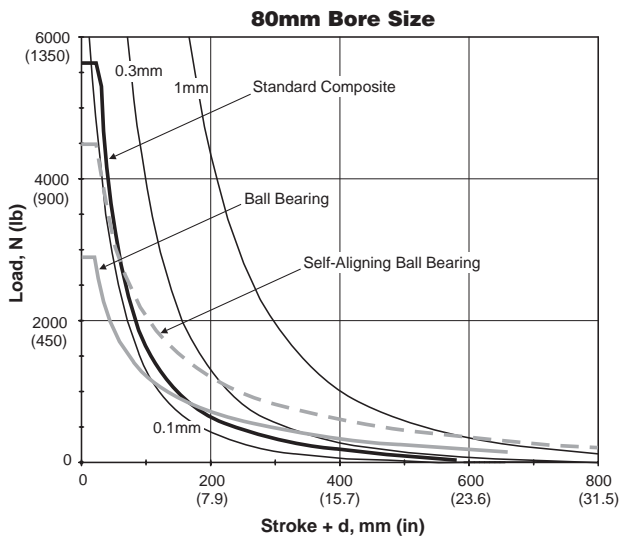
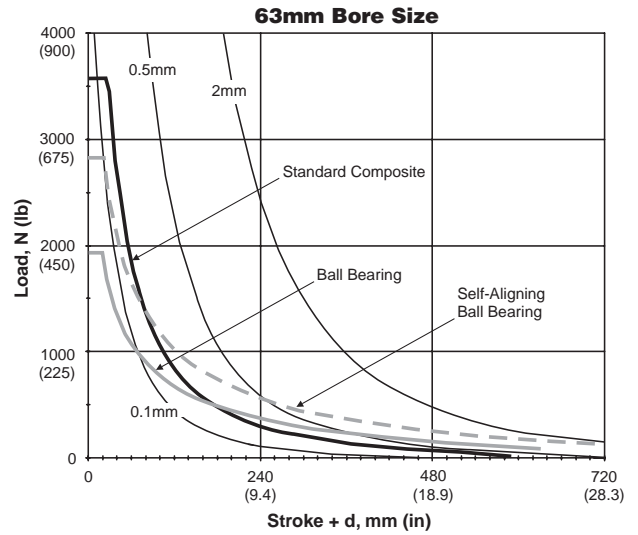
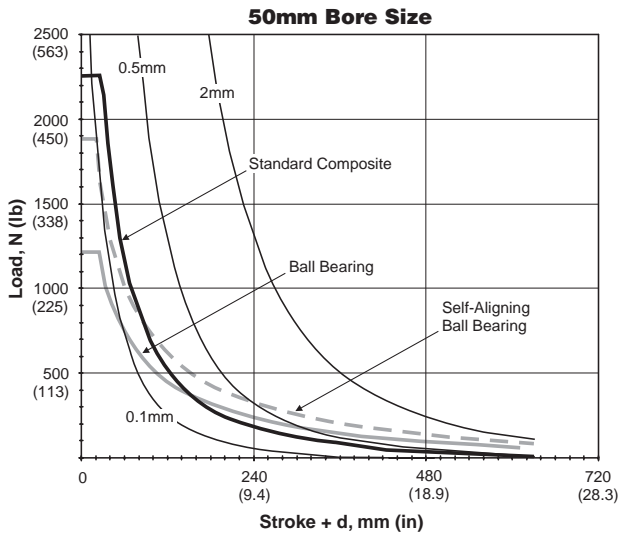
P5L Thrust Slides



Horizontal Load Capacity & Deflection with Standard Shafting



P5L Thrust Slides



B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	

Horizontal Load Capacity & Deflection with Oversized Shafting

- Oversized Composite w/ Chrome Plated or Stainless Steel Rods

The graphs on the following two s illustrate the maximum suggested side load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

See the P5L options section of this catalog for more bearing selection information.

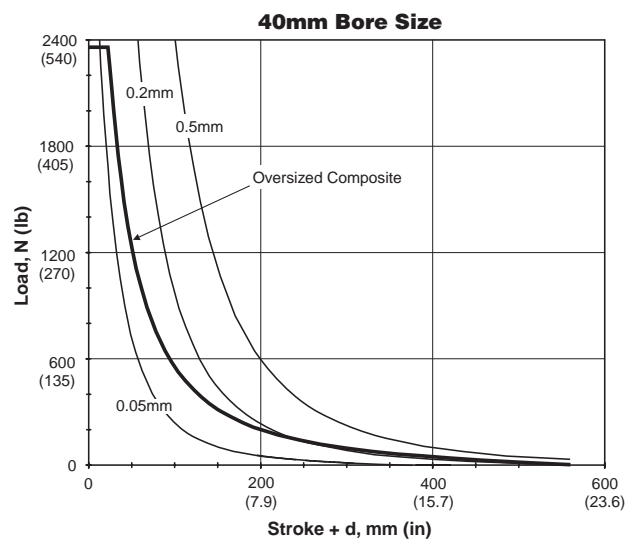
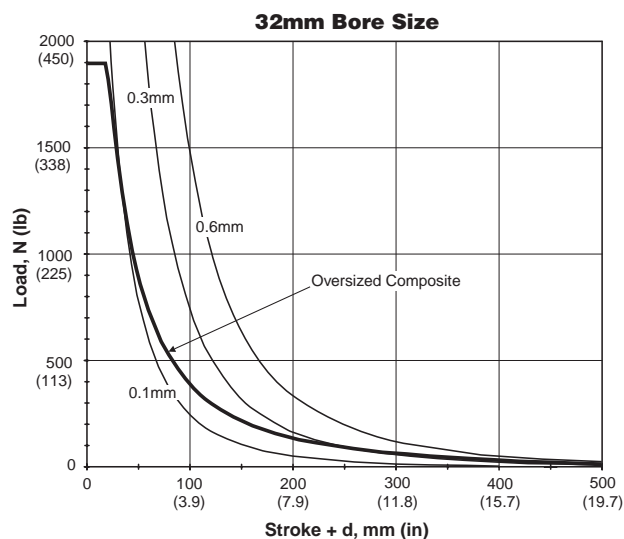
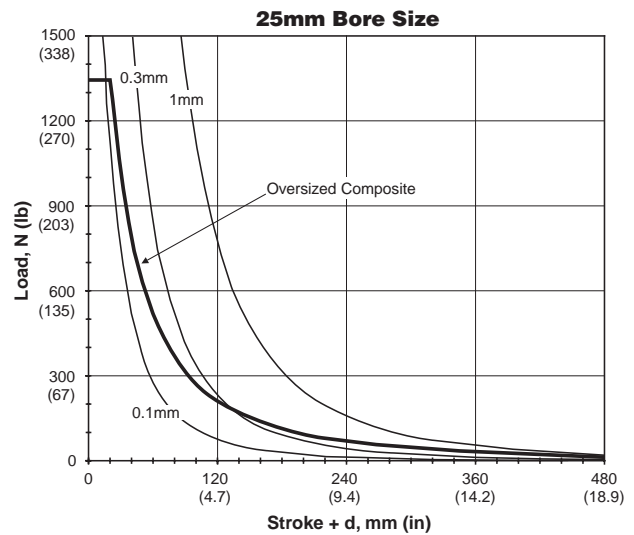
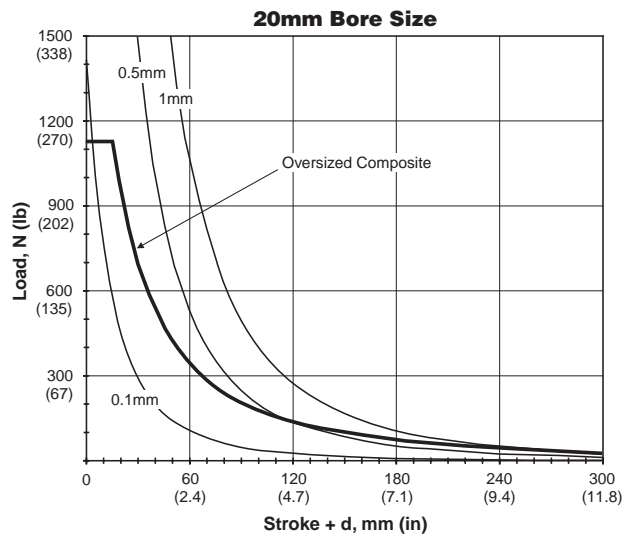
Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

Note: The following variables commonly affect the bearing life of a guided cylinder:

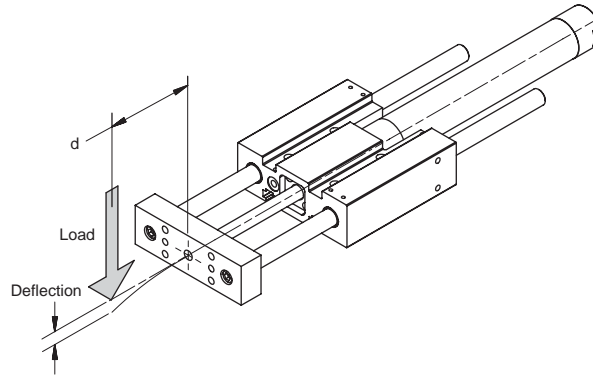
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

B
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 Series P5L
 Series HB
 Series P5E

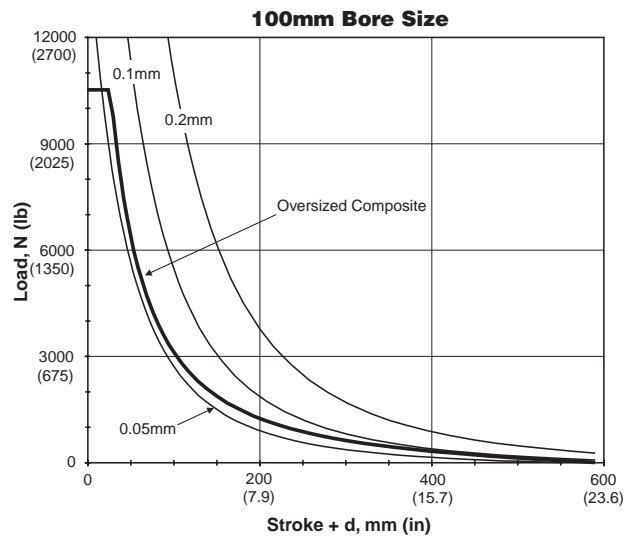
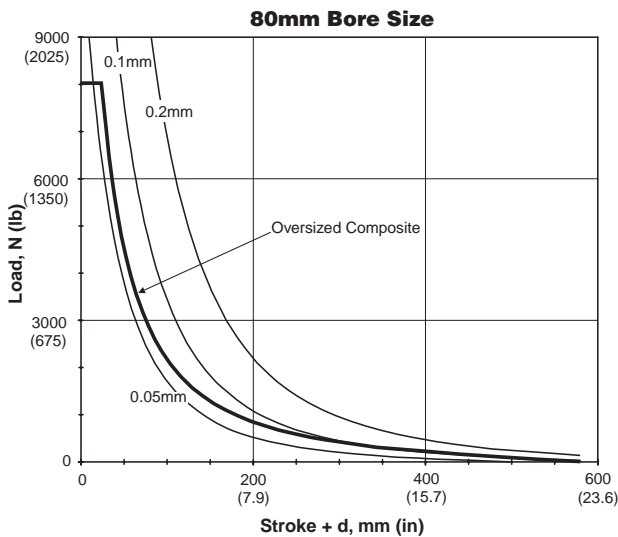
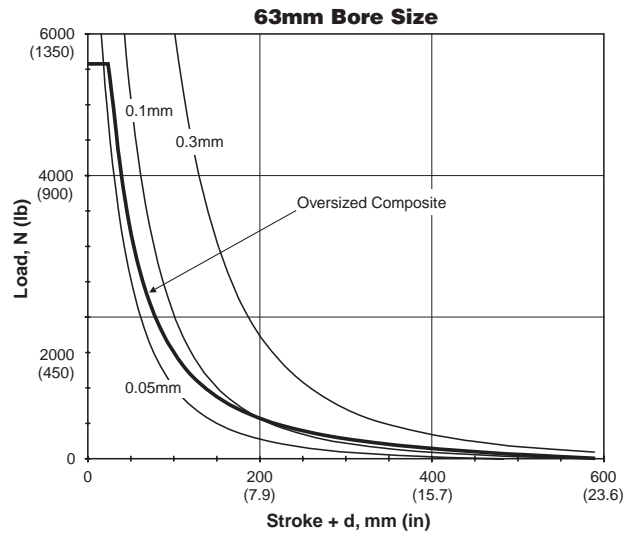
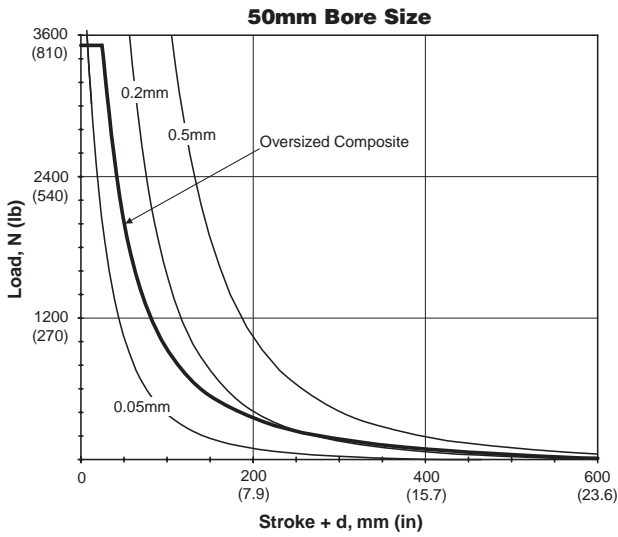
P5L Thrust Slides



Horizontal Load Capacity & Deflection with Oversized Shafting



P5L Thrust Slides



B	Guided Cylinders Actuator Products
	P5T Series
	P5L Series
	HB Series
P5E Series	

Horizontal Load Capacity & Deflection with Standard Shafting

- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

See the P5L options section of this catalog for more bearing selection information.

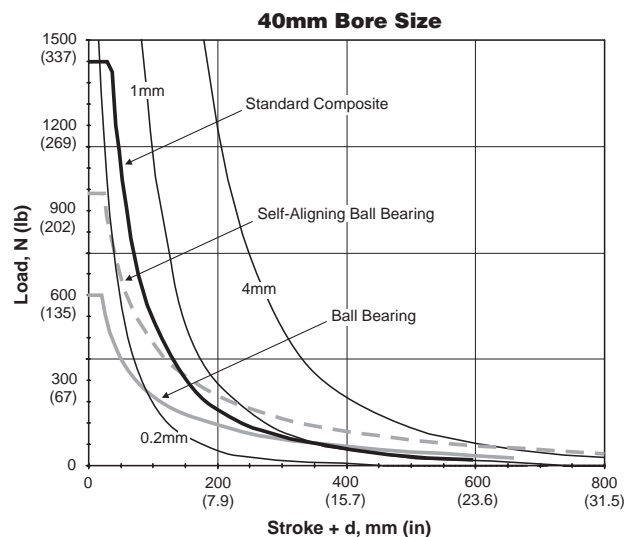
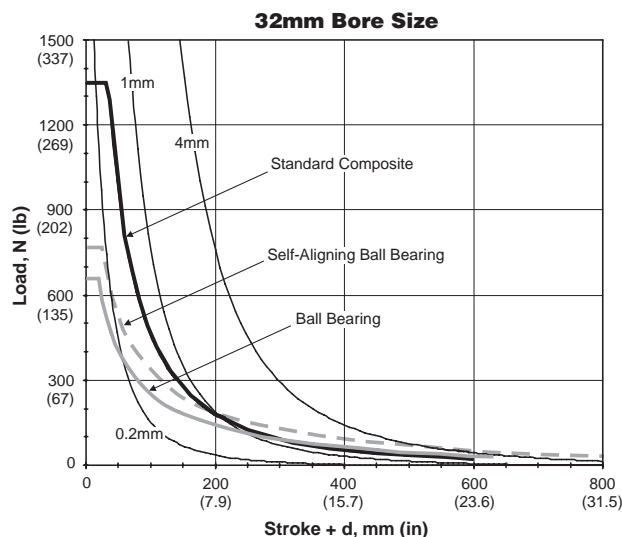
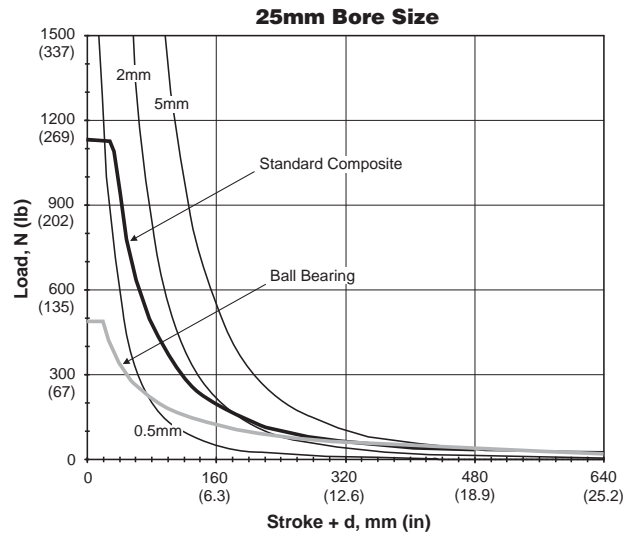
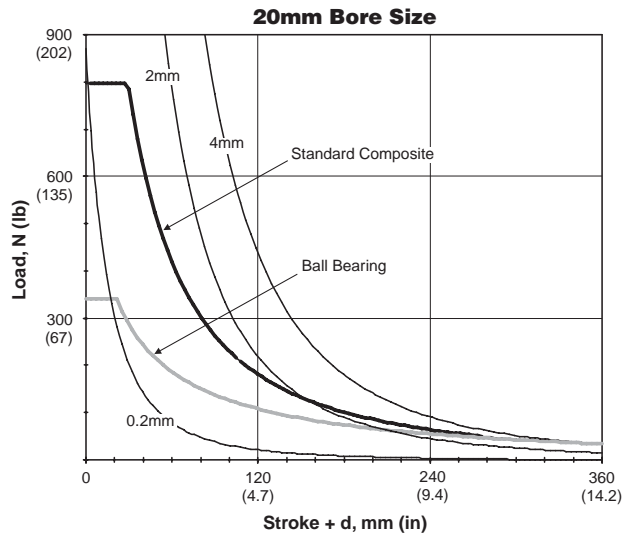
Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

Note: The following variables commonly affect the bearing life of a guided cylinder:

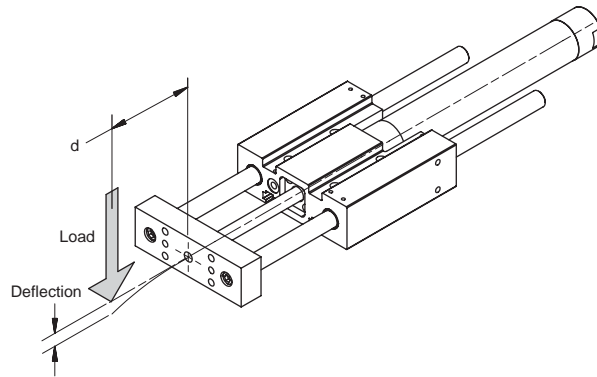
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

B
 Guided Cylinders
 Actuator Products
 Series P5T
 Series P5L
 Series HB
 Series P5E

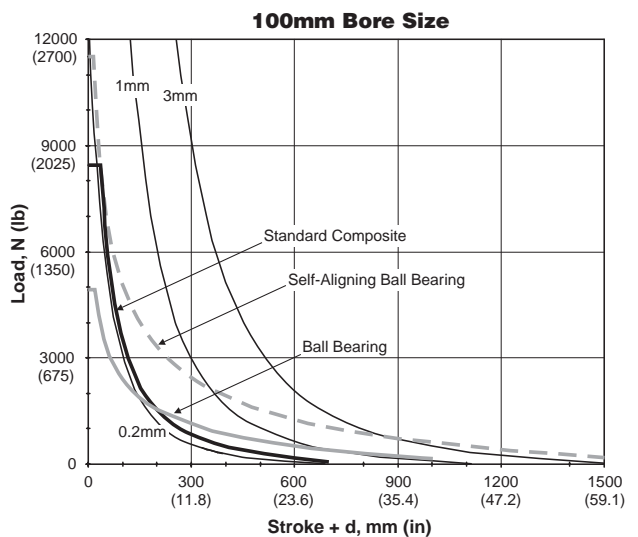
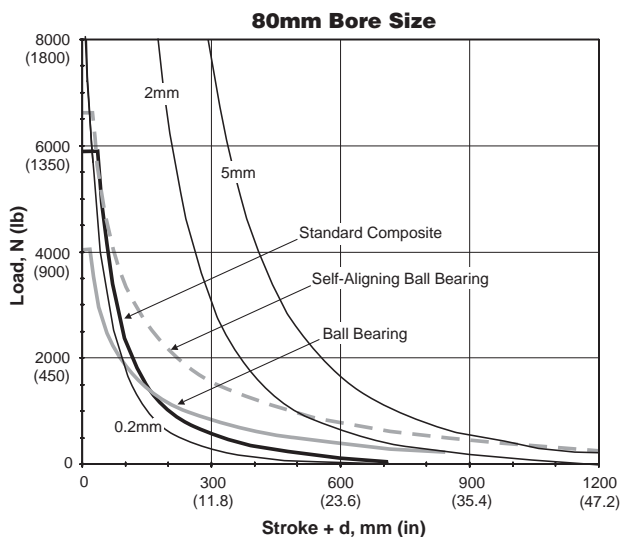
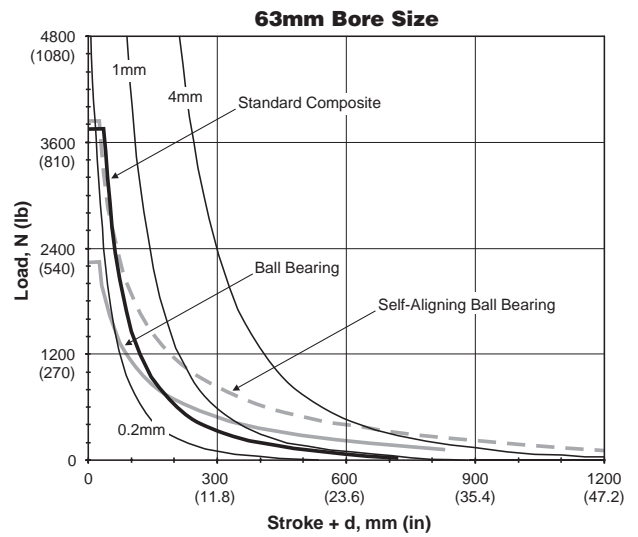
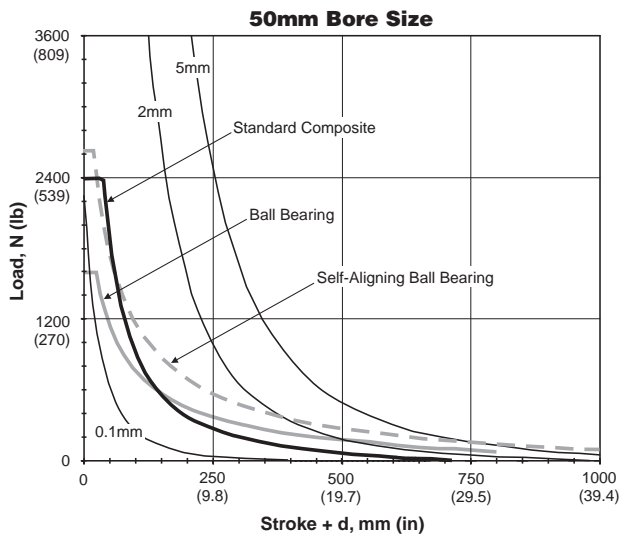
P5L Reach Slides



Horizontal Load Capacity & Deflection with Standard Shafting



P5L Reach Slides



B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	

Horizontal Load Capacity & Deflection with Oversized Shafting

- Oversized Composite w/ Chrome Plated or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

See the P5L options section of this catalog for more bearing selection information.

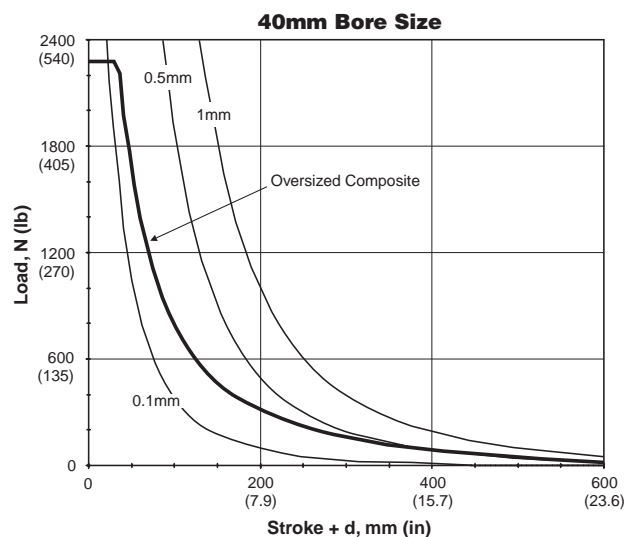
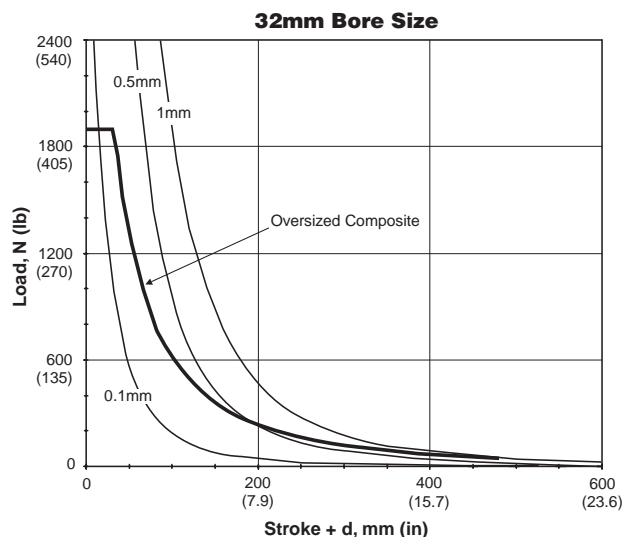
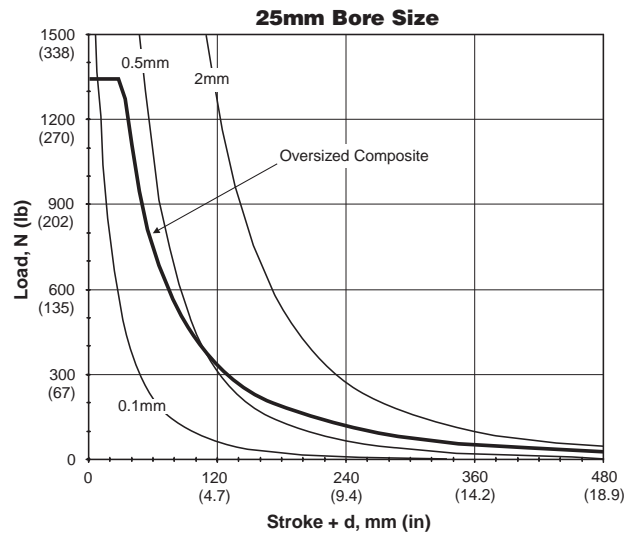
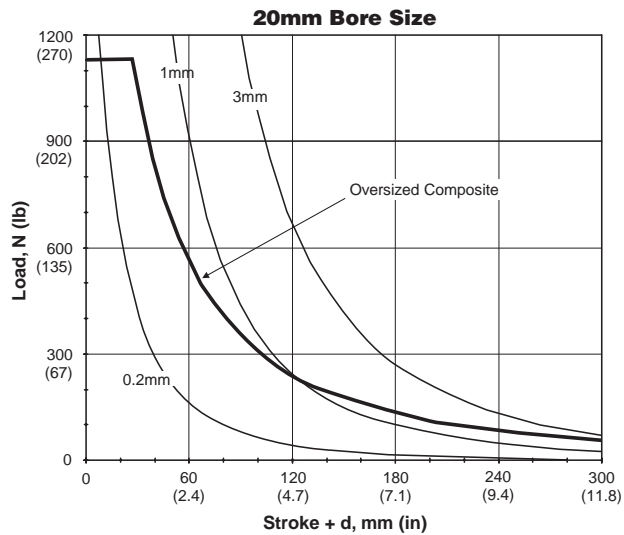
Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

Note: The following variables commonly affect the bearing life of a guided cylinder:

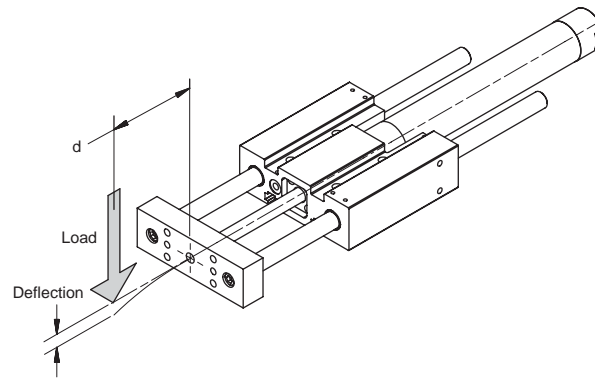
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

B
 Guided Cylinders
 Actuator Products
 Series P5T
 Series P5L
 Series HB
 Series P5E

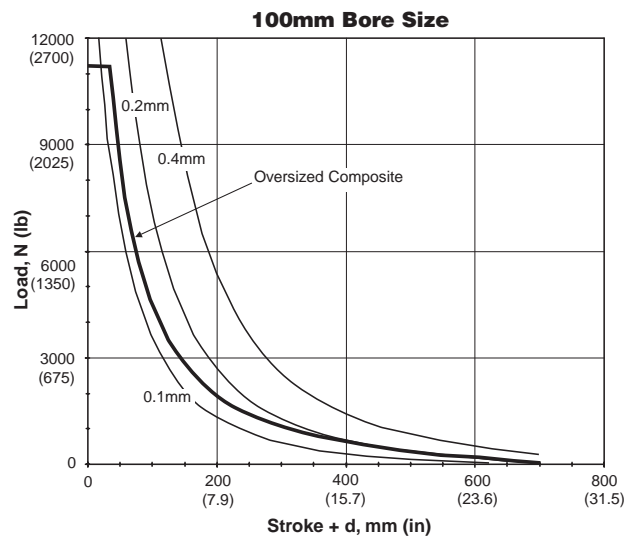
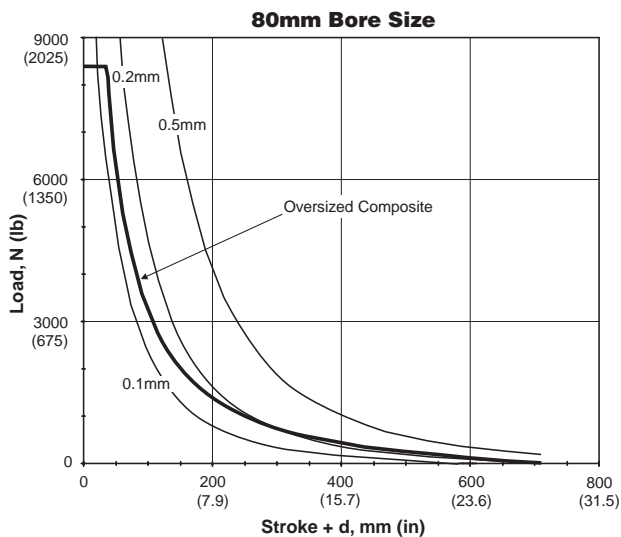
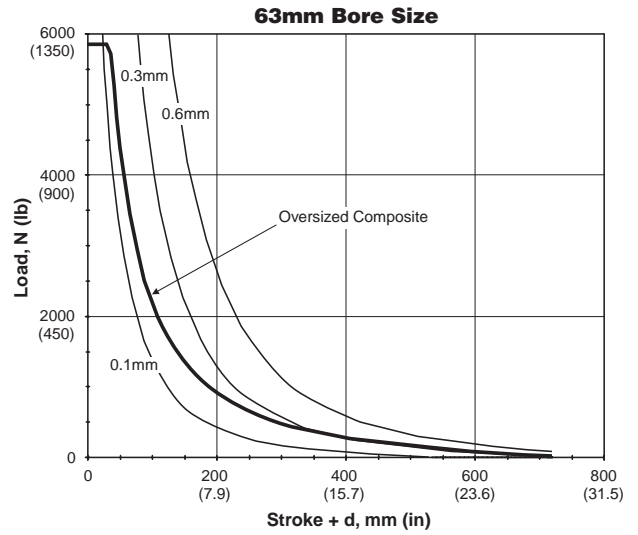
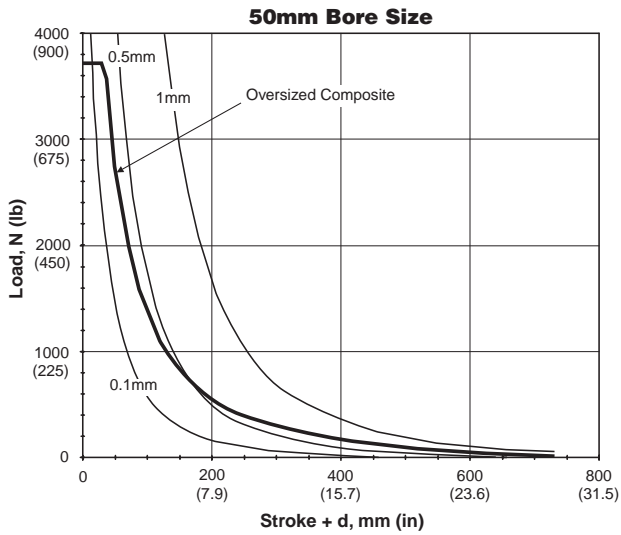
P5L Reach Slides



Horizontal Load Capacity & Deflection with Oversized Shafting



P5L Reach Slides



B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	

Asymmetrical Torque Capacity

- Standard Composite w/ Chrome Plated or Stainless Steel Rods
- Oversized Composite w/ Chrome Plated or Stainless Steel Rods
- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

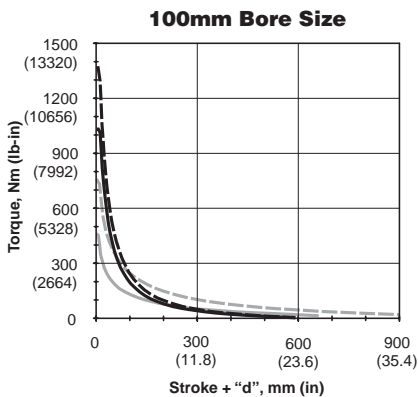
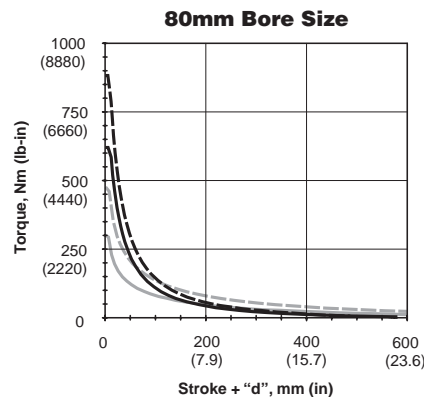
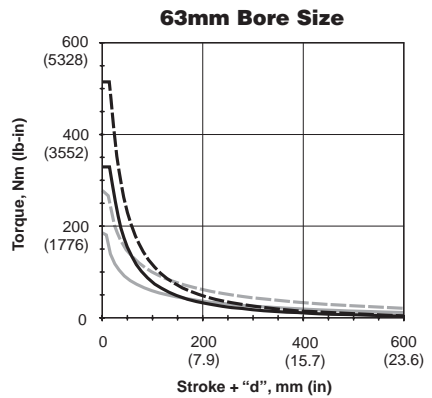
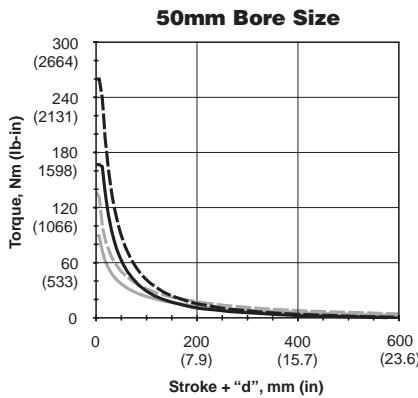
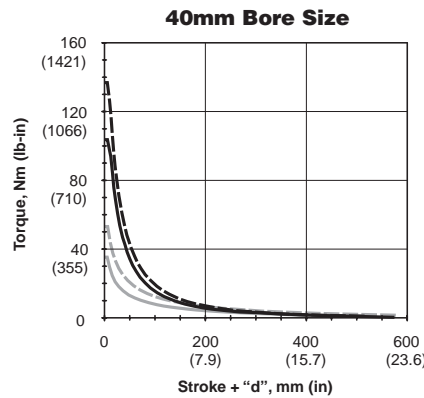
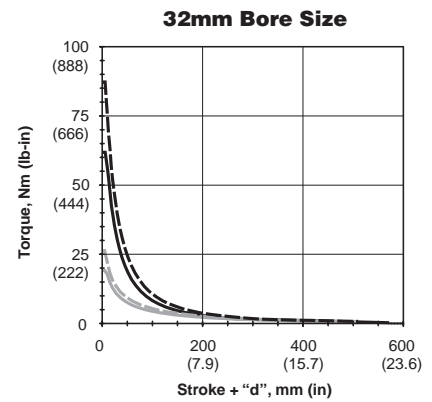
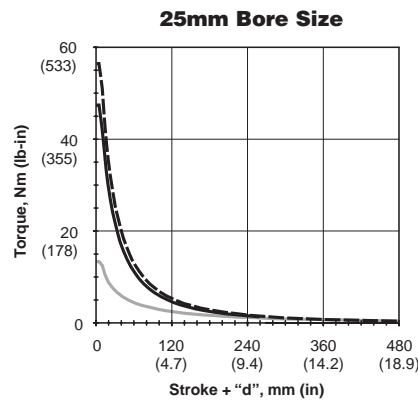
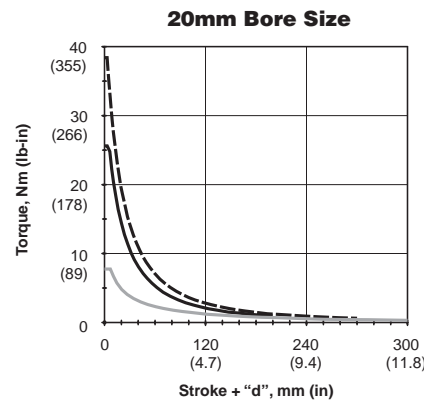
The graphs on the following two pages illustrate the maximum suggested asymmetrical load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs

include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application. An asymmetrical load is defined as a perpendicular load applied at some horizontal distance, “m” from the center of the tooling plate.

P5L Thrust Slides

B Guided Cylinders Actuator Products	P5T Series
	P5L Series
HB Series	
P5E Series	



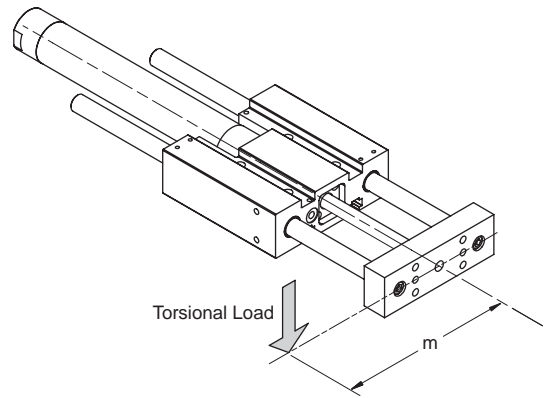
LEGEND

	Standard Composite
	Oversized Composite
	Recirculating Ball Bearing
	Self Aligning Ball Bearing

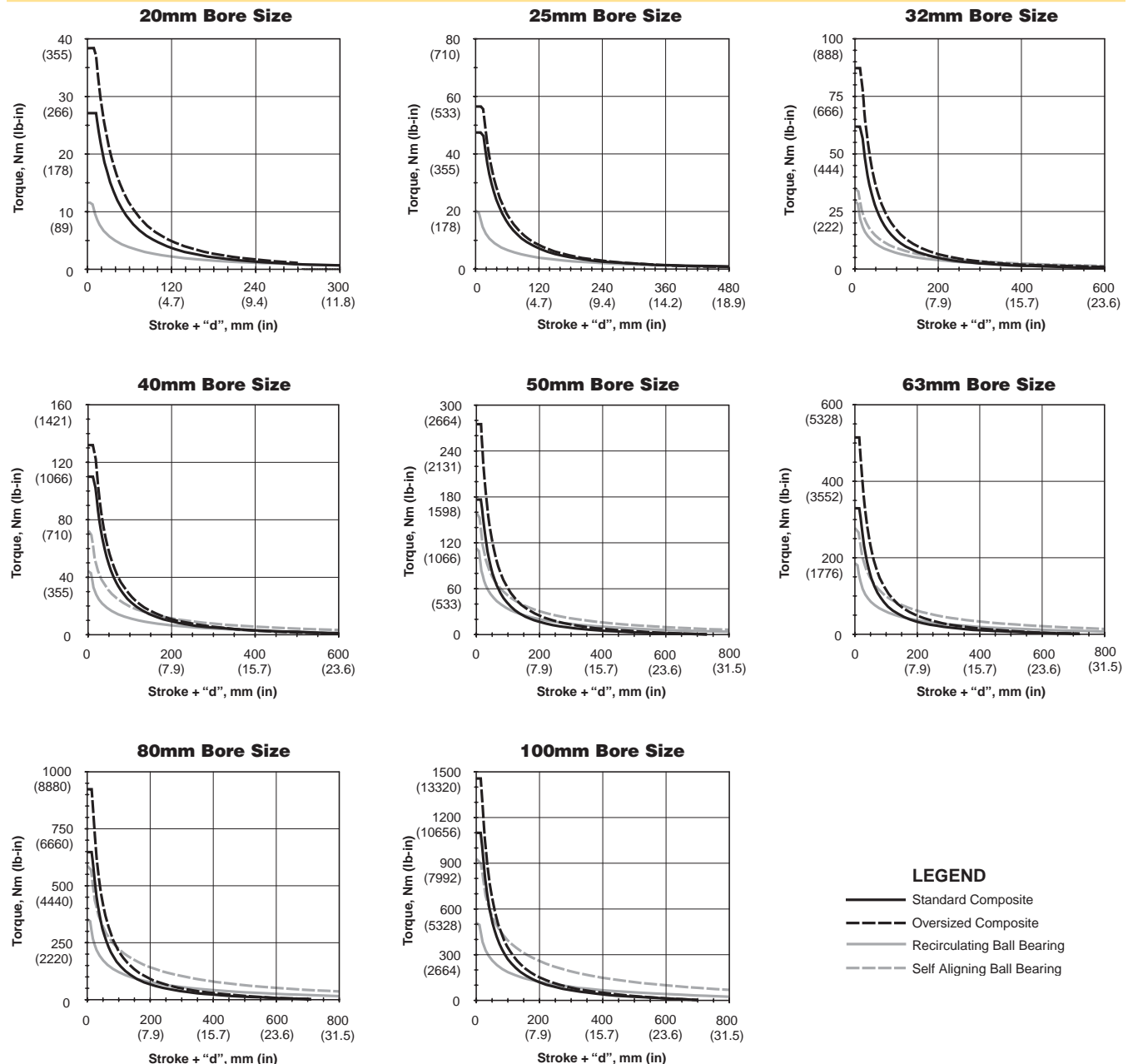
Asymmetrical Torque Capacity

Note: The following variables commonly affect the bearing life of a guided cylinder:

- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)



P5L Reach Slides



B	Guided Cylinders
	Actuator Products
P5T Series	
P5L Series	
HB Series	
P5E Series	

Vertical Eccentric Load Capacity

- Standard Composite w/ Chrome Plated or Stainless Steel Rods
- Oversized Composite w/ Chrome Plated or Stainless Steel Rods
- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested eccentric load based on a stroke of 100mm (4 inches).

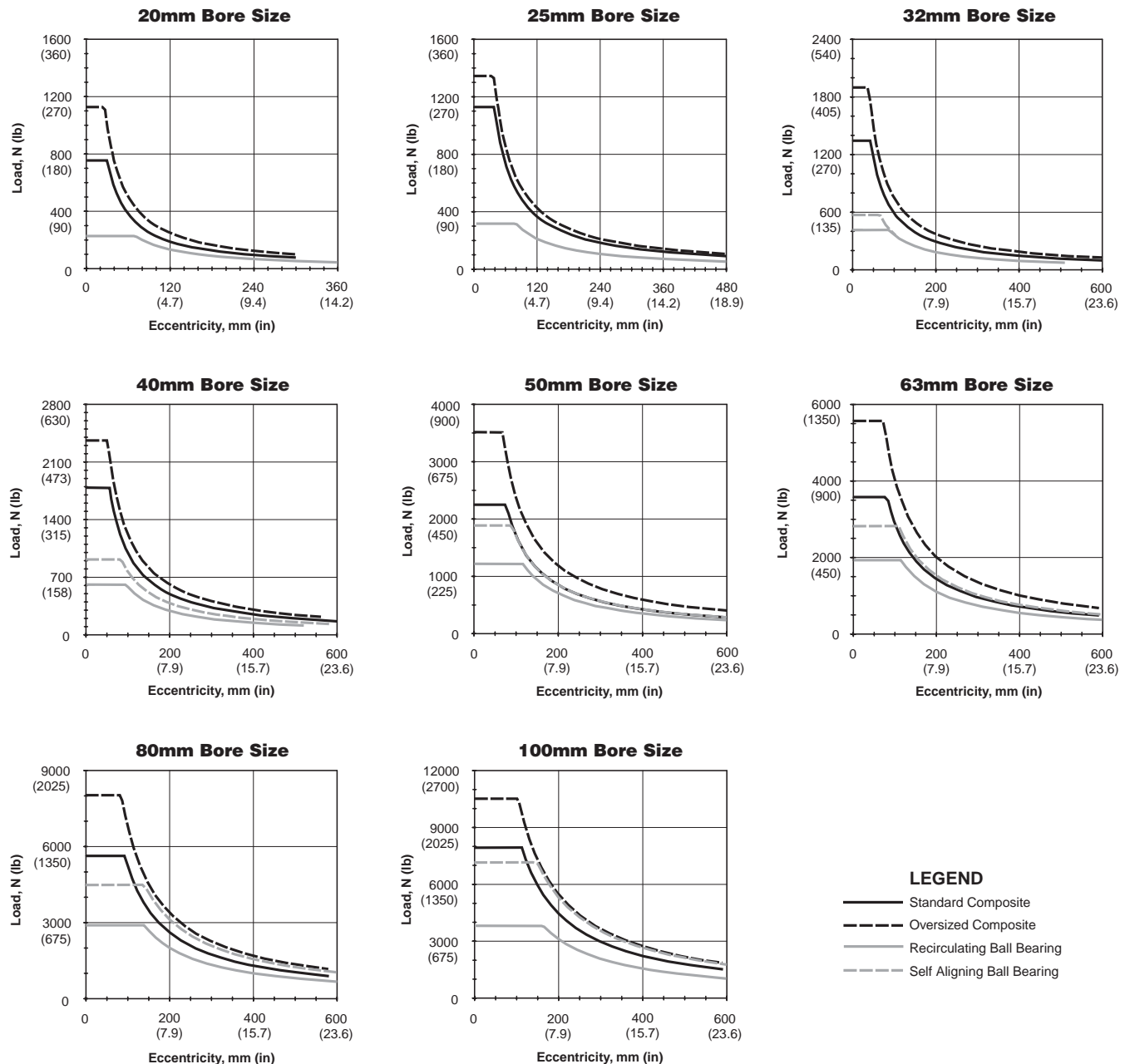
An eccentric load is defined as a load applied in the same direction as the motion of the cylinder however, acting at some distance (eccentricity "h") from the center of the tooling plate. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

Note: The following variables commonly affect the bearing life of a guided cylinder:

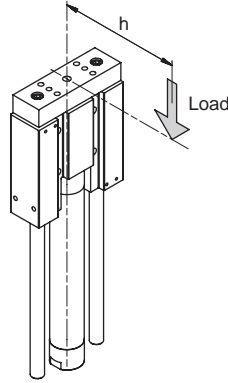
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

P5L Thrust Slides

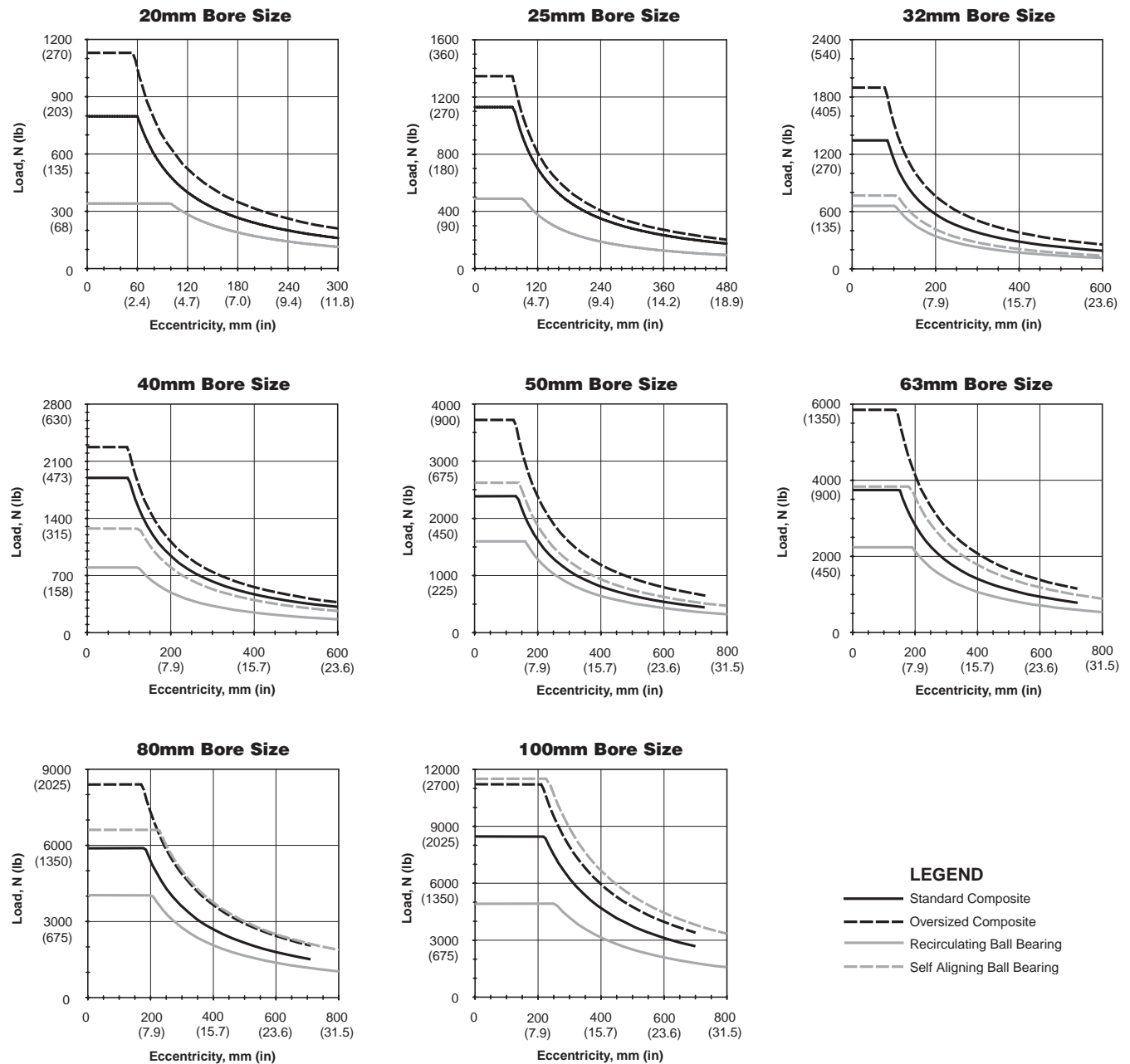
B	Guided Cylinders
	Actuator Products
Series	P5T
Series	P5L
Series	HB
Series	P5E



Vertical Eccentric Load Capacity



P5L Reach Slides



B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	

Horizontal Load Capacity & Deflection with Standard Shafting

- Standard Composite w/ Chrome Plated or Stainless Steel Rods
- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

See the P5L options section of this catalog for more bearing selection information.

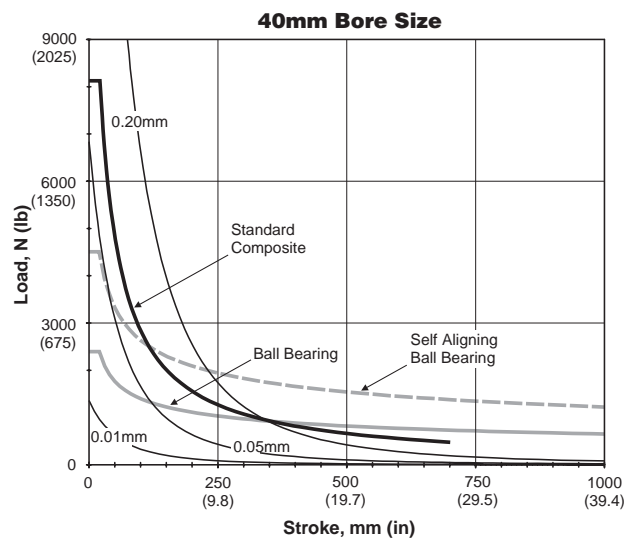
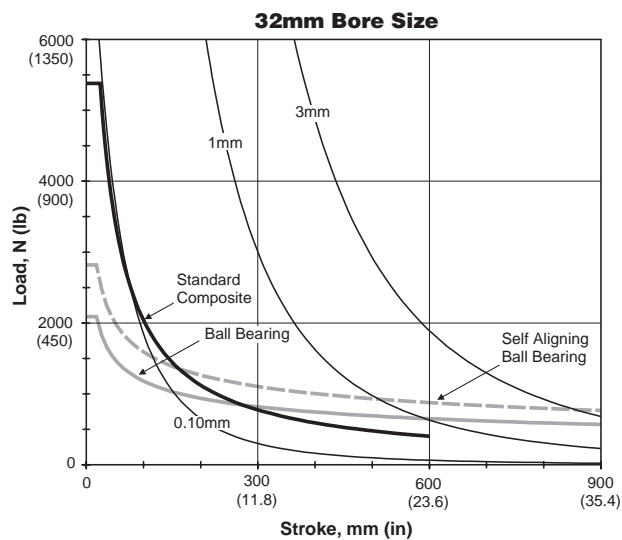
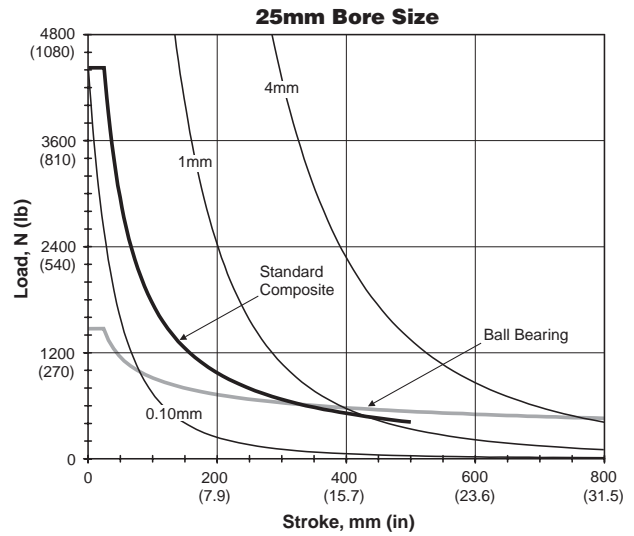
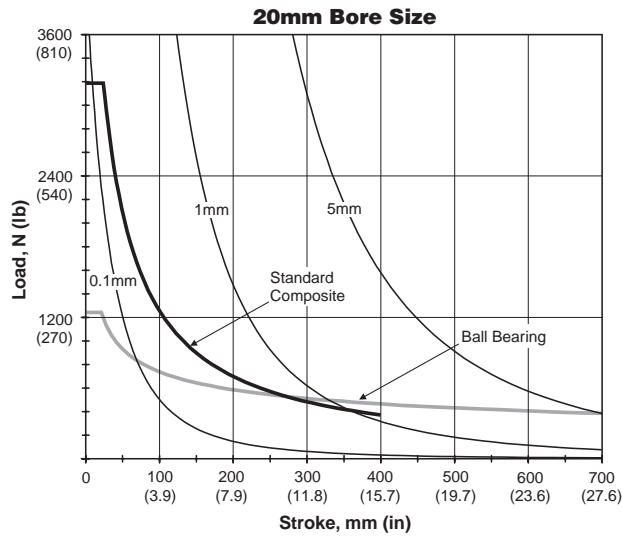
Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

Note: The following variables commonly affect the bearing life of a guided cylinder:

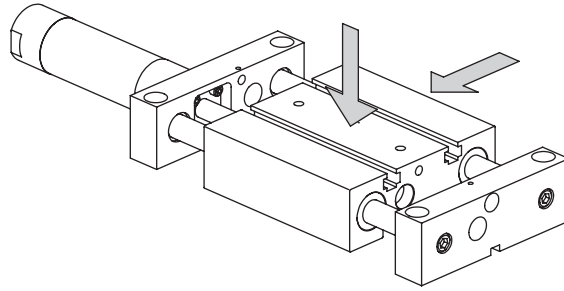
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

B
 Guided Cylinders
 Actuator Products
 Series P5T
 Series P5L
 Series HB
 Series P5E

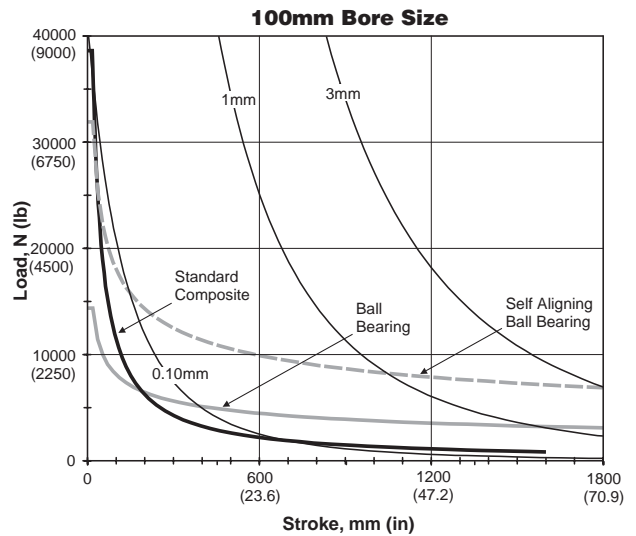
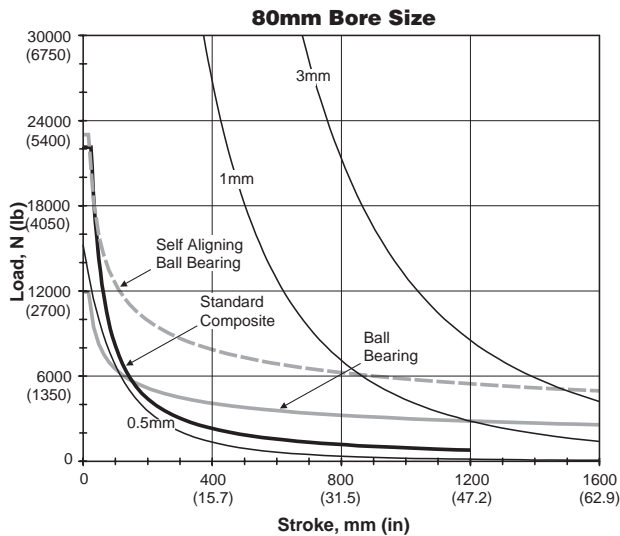
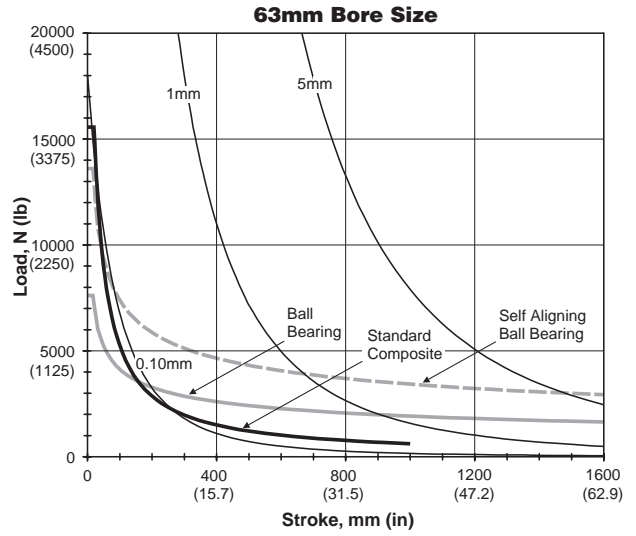
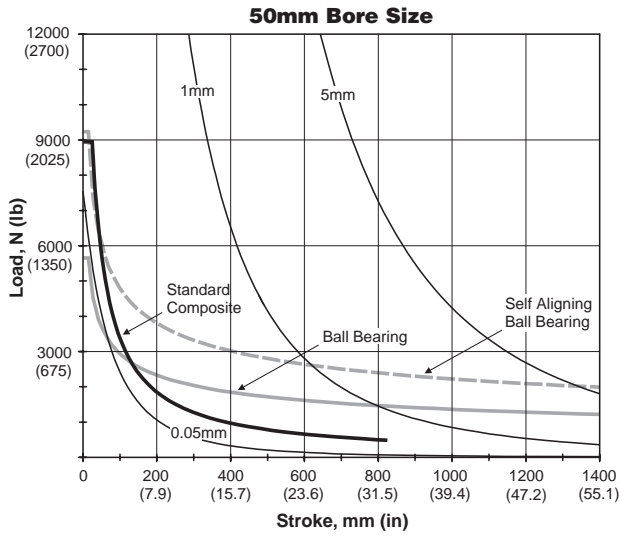
P5L Base Slides



Horizontal Load Capacity & Deflection with Standard Shafting



P5L Base Slides



B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	

Horizontal Load Capacity & Deflection with Oversized Shafting

- Oversized Composite w/ Chrome Plated or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

See the P5L options section of this catalog for more bearing selection information.

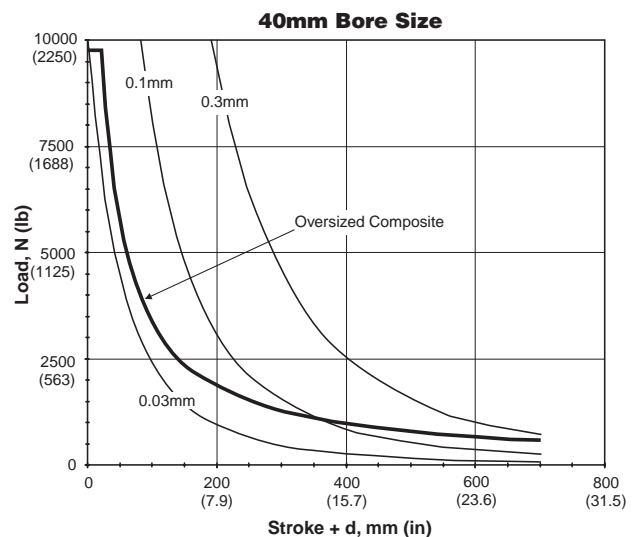
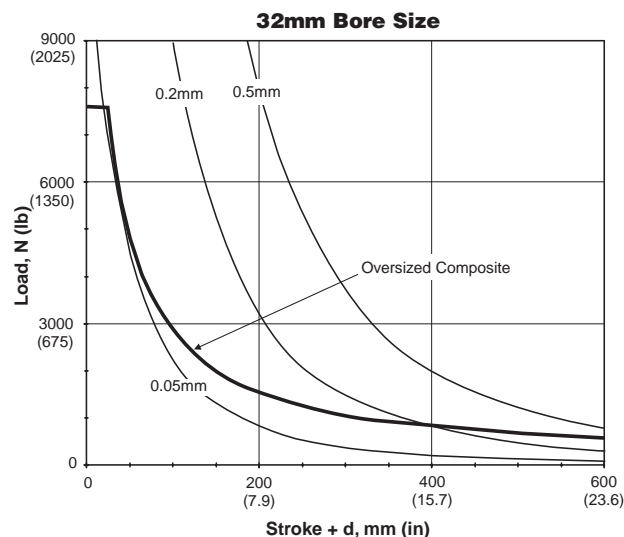
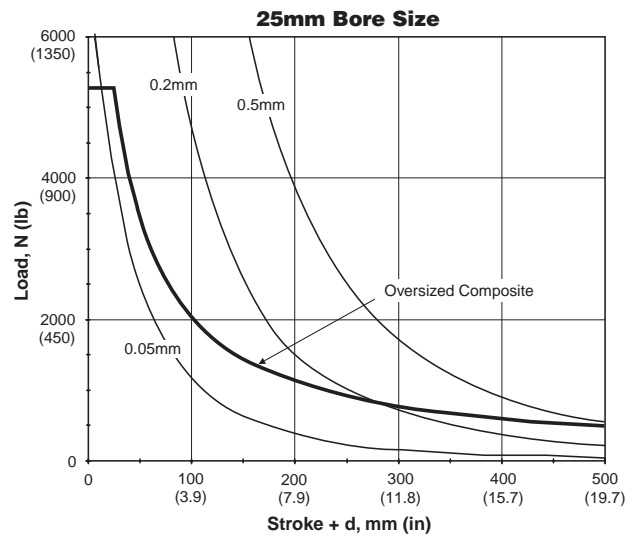
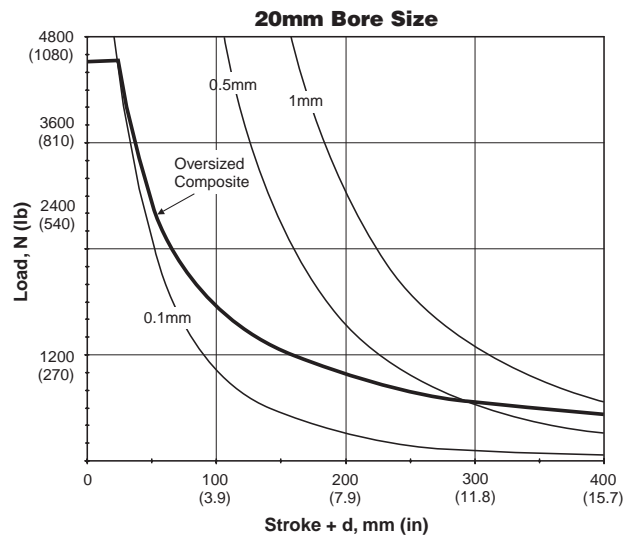
Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

Note: The following variables commonly affect the bearing life of a guided cylinder:

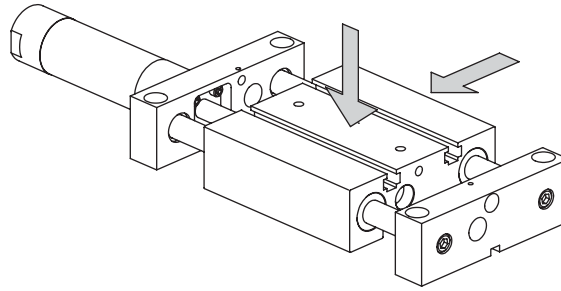
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

B	Guided Cylinders
	Actuator Products
Series	P5T
Series	P5L
Series	HB
Series	P5E

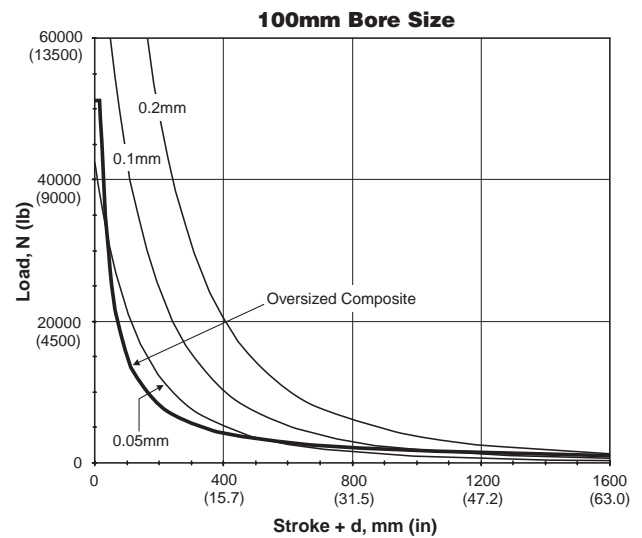
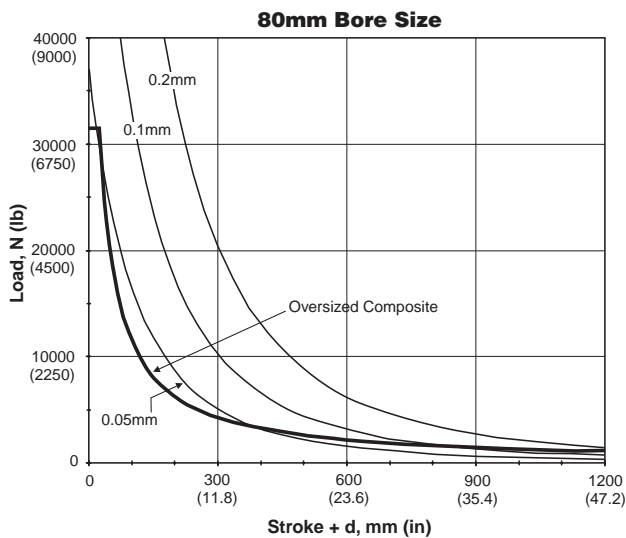
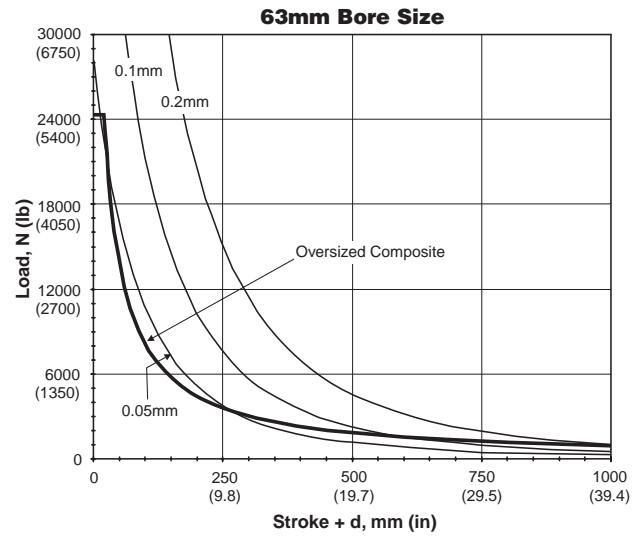
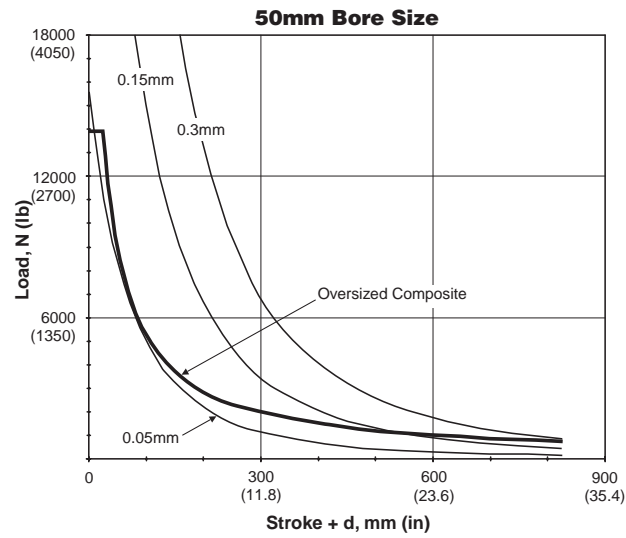
P5L Base Slides



Horizontal Load Capacity & Deflection with Oversized Shafting



P5L Base Slides



B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	

Symmetrical Roll Torsional Loading

The graphs on the following two pages illustrate the maximum suggested roll load at a given actuator stroke. It is assumed that the moment loading is acting about the centerline of the carriage. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application. For an equivalent static load capacity multiply the information in these graphs by 1.5.

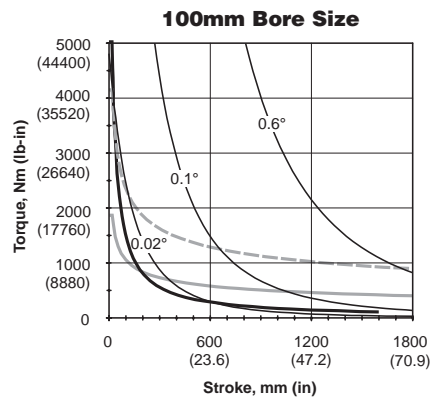
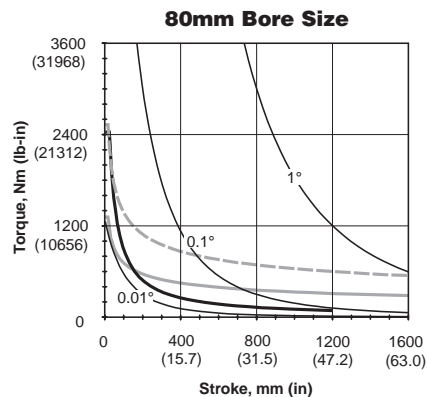
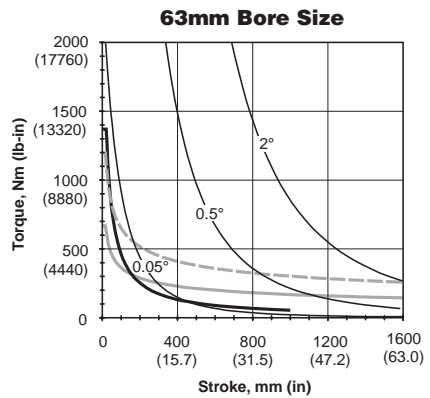
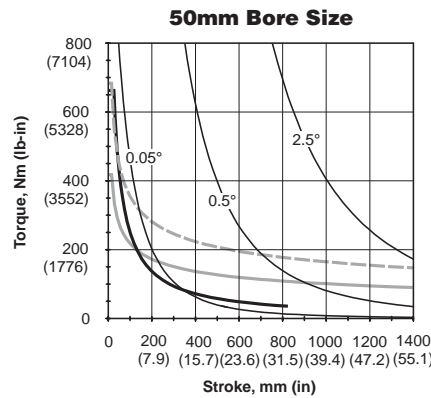
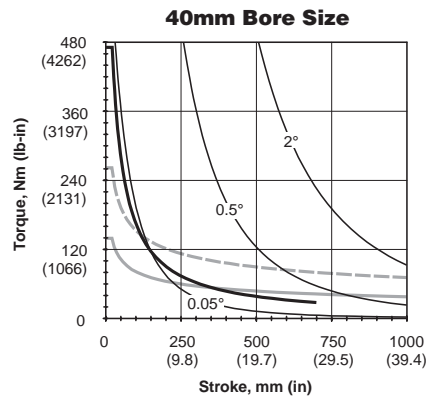
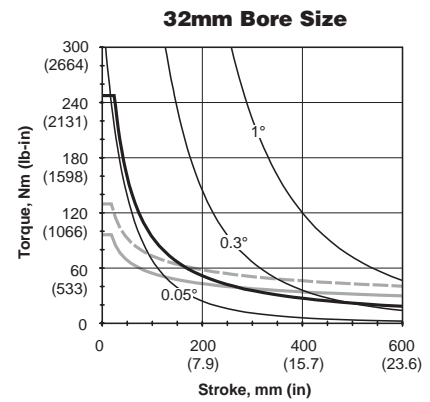
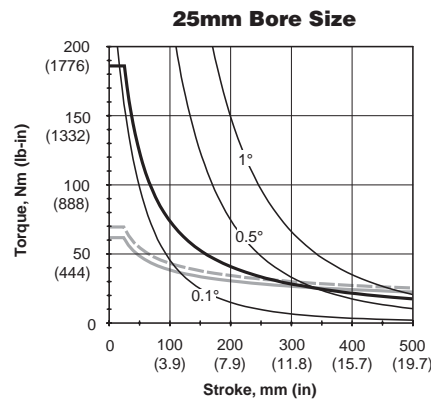
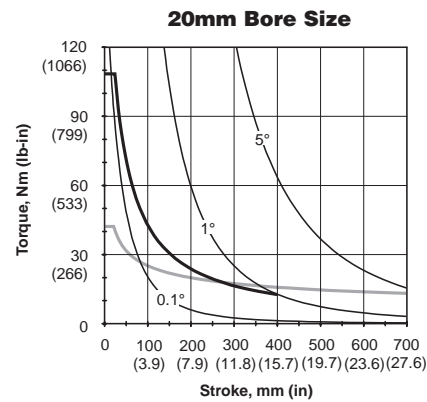
Heavy lines show loading; lighter lines show various degrees of deflection.

Note: The following variables commonly affect the bearing life of a guided cylinder:

- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

Standard Shafting

B	Guided Cylinders
	Actuator Products
Series	P5T
Series	P5L
Series	HB
Series	P5E

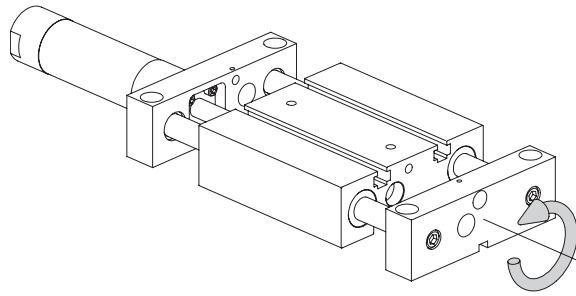


LEGEND

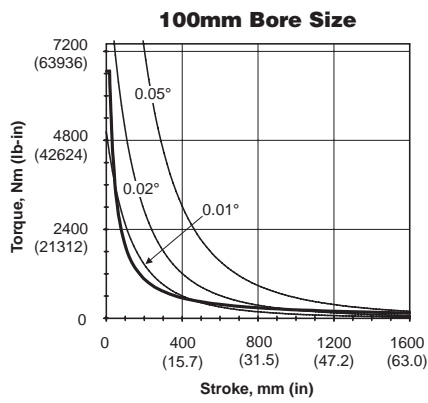
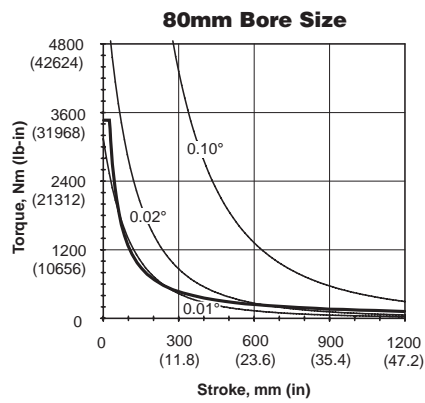
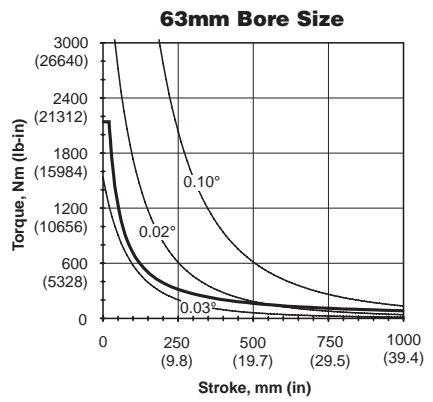
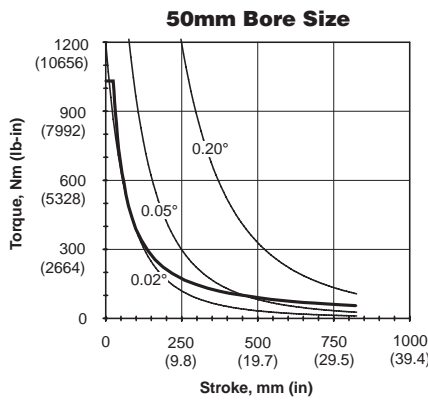
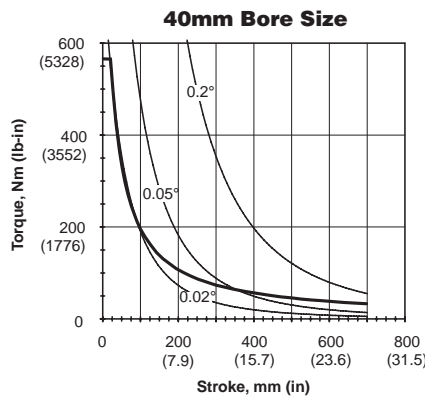
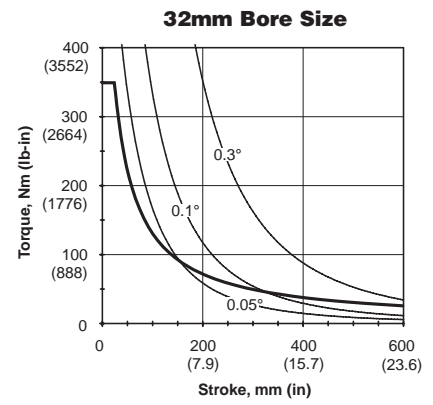
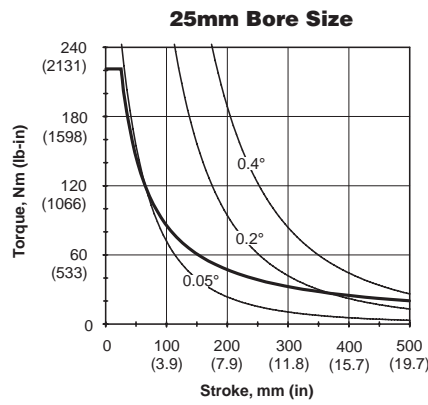
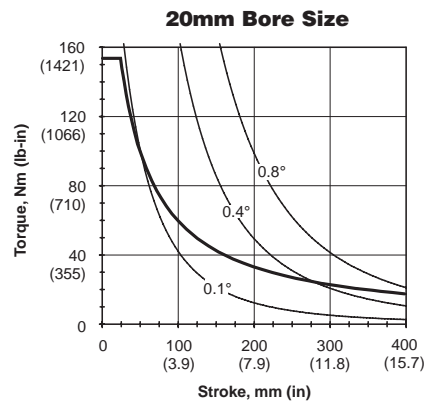
- Standard Composite
- Recirculating Ball Bearing
- - - Self Aligning Ball Bearing



Symmetrical Roll Torsional Loading



Oversized Shafting



B	Guided Cylinders
	Actuator Products
P5T Series	
P5L Series	
HB Series	
P5E Series	



Symmetrical Pitch Torsional Loading

The graphs on the following two pages illustrate the maximum suggested pitch load at a given actuator stroke. It is assumed that the moment loading is acting about the centerline of the carriage. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application. For an equivalent static load capacity multiply the information in these graphs by 1.5.

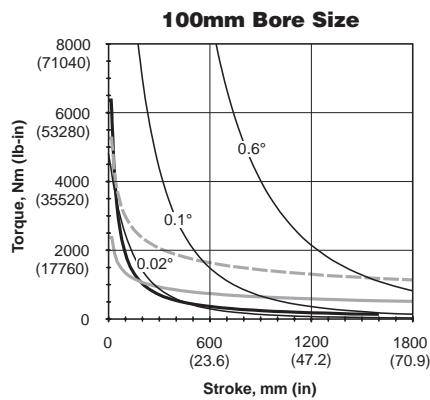
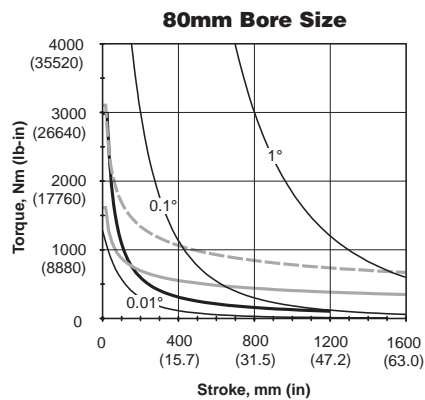
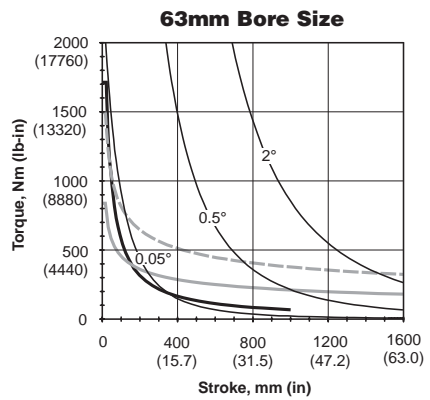
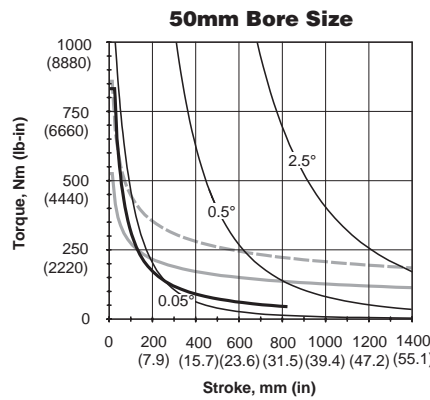
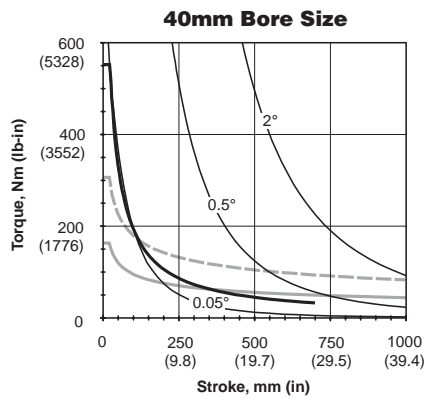
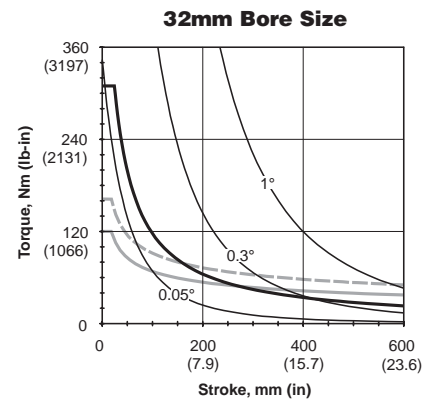
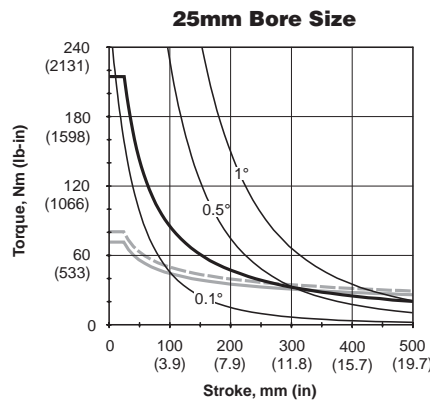
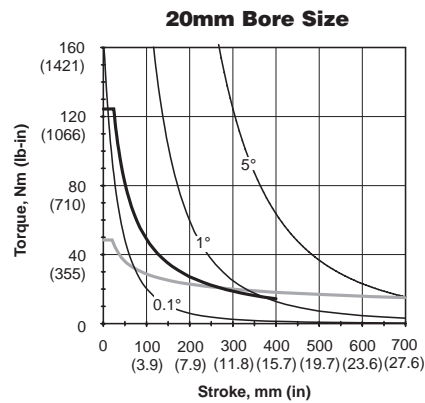
Heavy lines show loading; lighter lines show various degrees of deflection.

Note: The following variables commonly affect the bearing life of a guided cylinder:

- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

Standard Shafting

B	Guided Cylinders
	Actuator Products
Series	P5T
Series	P5L
Series	HB
Series	P5E

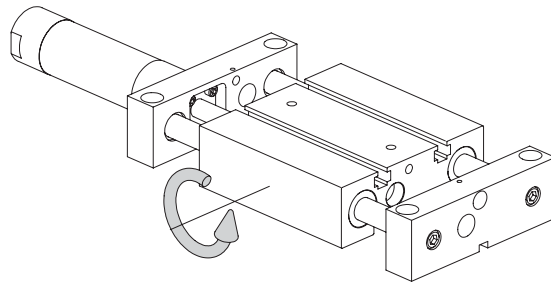


LEGEND

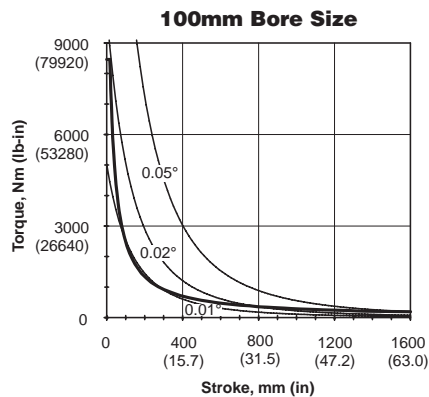
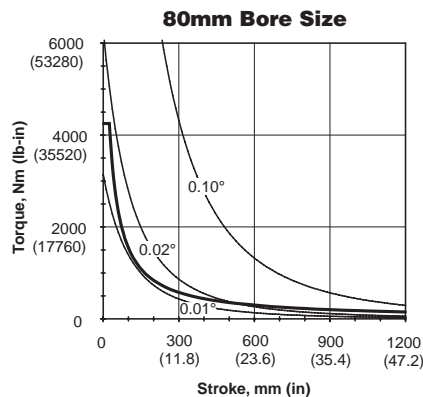
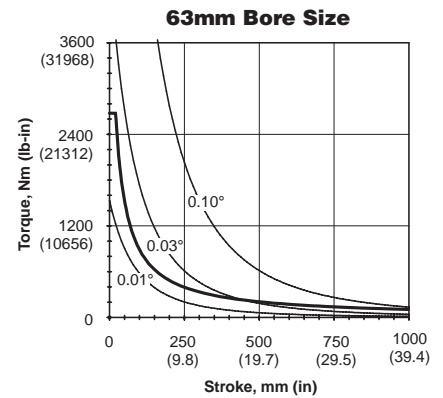
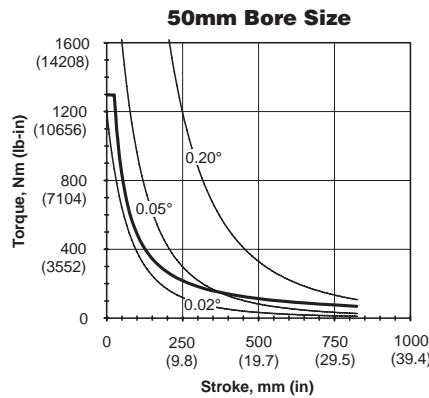
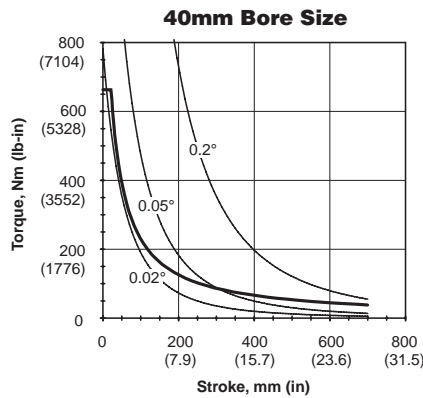
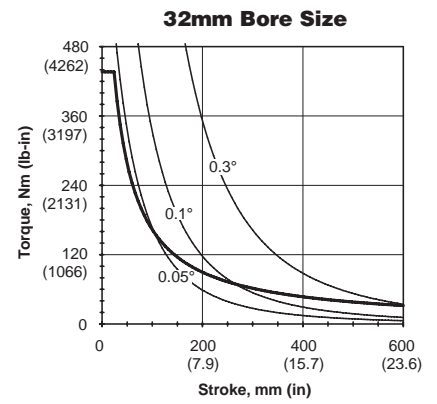
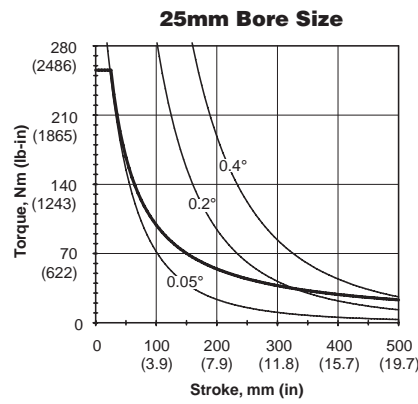
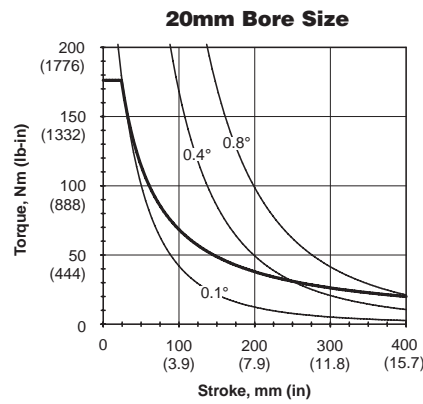
	Standard Composite
	Recirculating Ball Bearing
	Self Aligning Ball Bearing



Symmetrical Pitch Torsional Loading



Oversized Shafting



B	Guided Cylinders
	Actuator Products
P5T Series	
P5L Series	
HB Series	
P5E Series	

Symmetrical Yaw Torsional Loading

The graphs on the following two pages illustrate the maximum suggested yaw load at a given actuator stroke. It is assumed that the moment loading is acting about the centerline of the carriage. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application. For an equivalent static load capacity multiply the information in these graphs by 1.5.

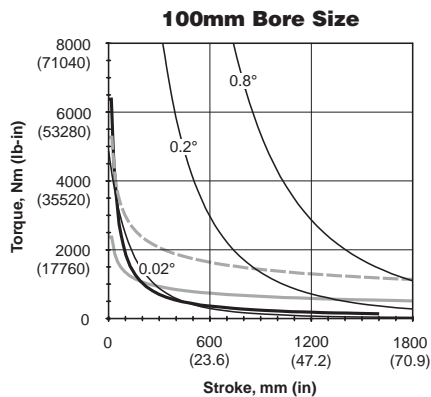
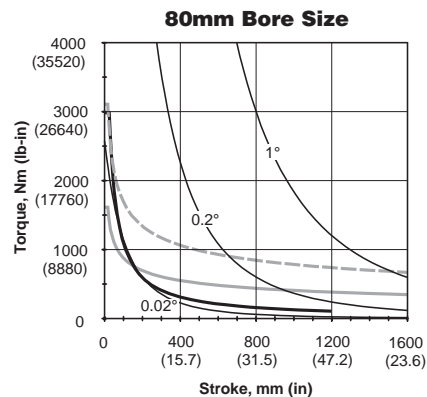
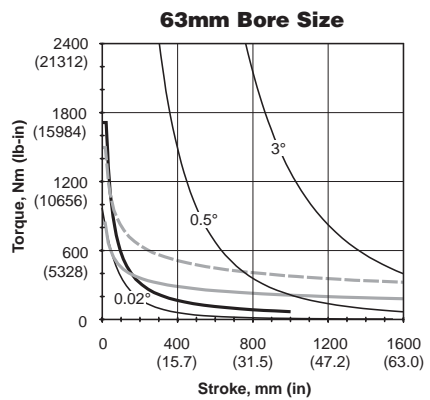
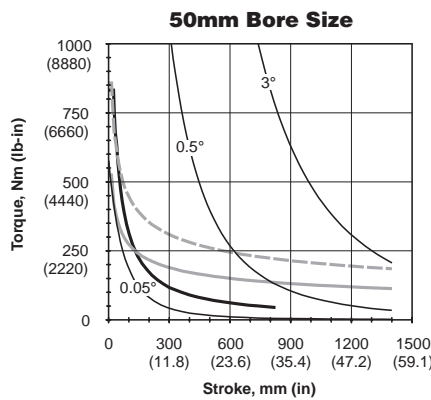
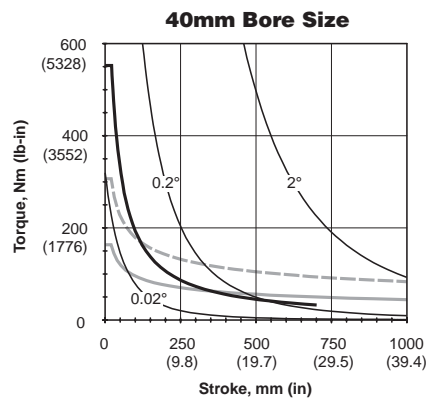
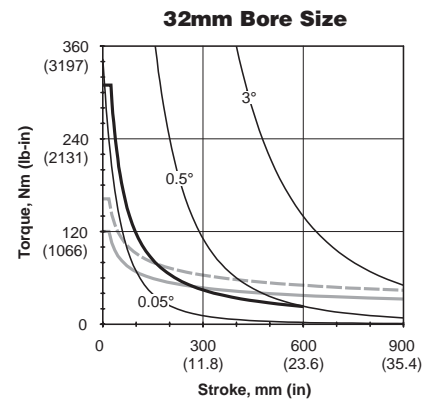
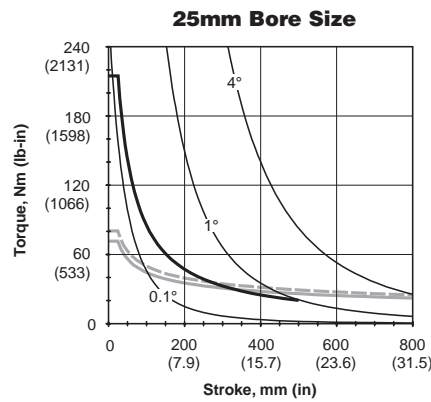
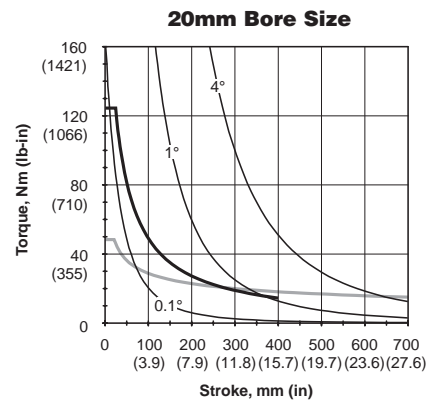
Heavy lines show loading; lighter lines show various degrees of deflection.

Note: The following variables commonly affect the bearing life of a guided cylinder:

- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

Standard Shafting

B	Guided Cylinders
	Actuator Products
Series	P5T
Series	P5L
Series	HB
Series	P5E

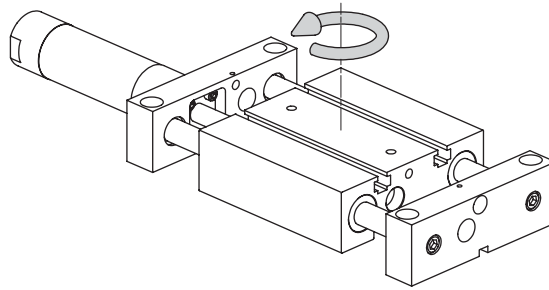


LEGEND

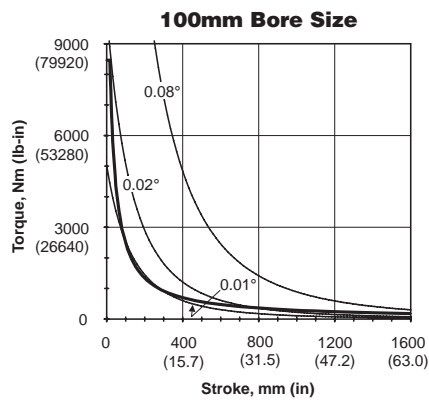
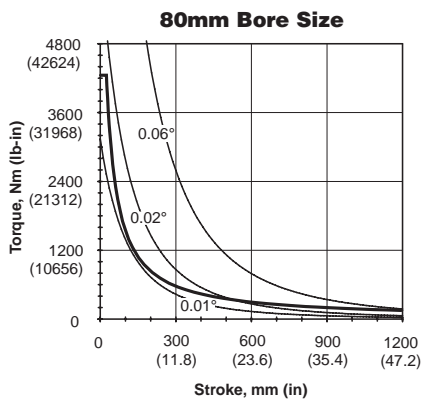
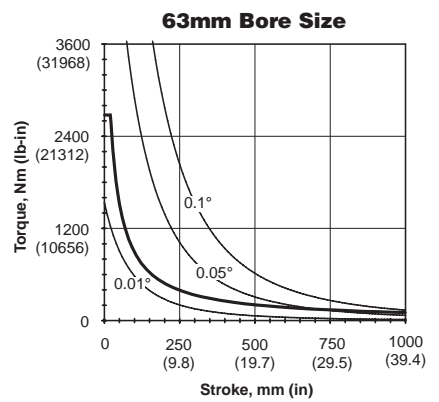
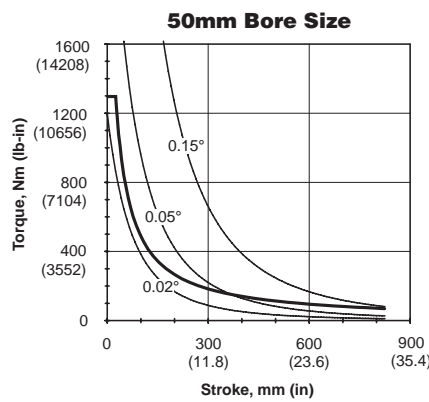
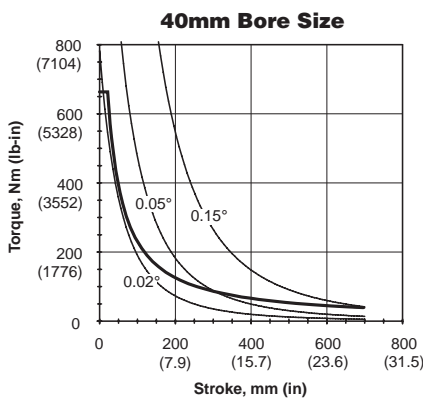
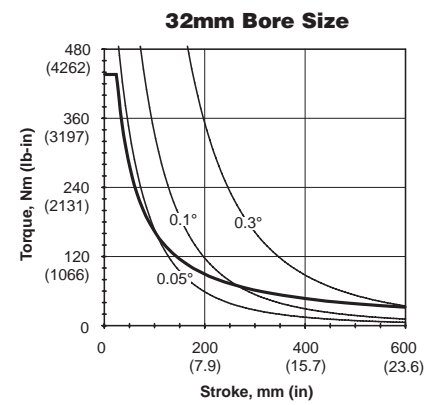
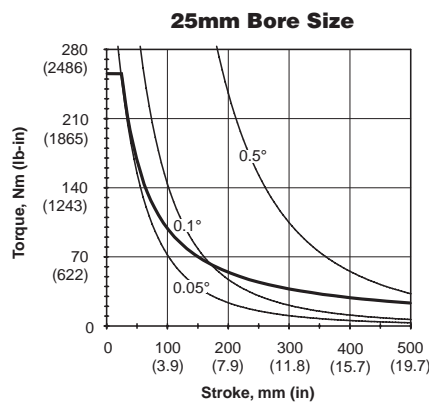
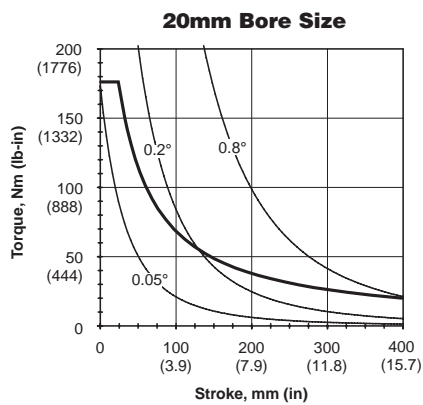
- Standard Composite
- Recirculating Ball Bearing
- - - Self Aligning Ball Bearing



Symmetrical Yaw Torsional Loading



Oversized Shafting

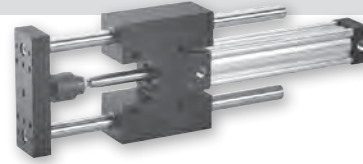


B	Guided Cylinders
	Actuator Products
P5T Series	
P5L Series	
HB Series	
P5E Series	



HB Series


- Medium duty to extremely heavy duty linear motion
- Powered by the 3MA or 4MA NFPA cylinder, with ISO options available
- Bore sizes 1-1/2", 2", and 2-1/2"
- Thrust, reach, and compact versions available
- Shock absorber, bumpers/stop collars, and proximity sensor options available



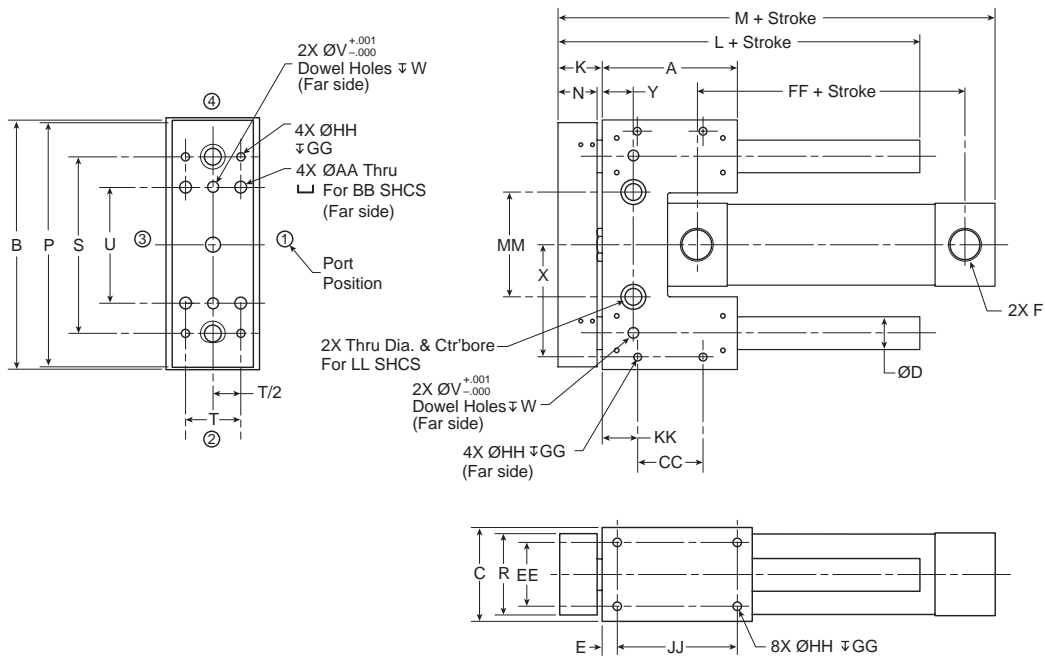
Operating information

Operating pressure:	Maximum	100 PSIG (7 bar), air – 4MAJ cylinder 150 PSIG (10 bar), air – P1D cylinder 250 PSIG (17 bar), air – 3MA, 4MA and 2A cylinders 400 PSIG (28 bar), oil – 4ML cylinder only 750 PSIG (52 bar), oil – 3L cylinder only
Temperature range:	Cylinder	Standard seals 0°F to 165°F (-18°C to 74°C) Fluorocarbon seals* 0°F to 250°F (-18°C to 121°C) * See fluorocarbon seal option for high temperature applications. Not available for 3MA or rod lock cylinders.
Filtration requirements:		40 micron, dry filtered air

Ordering information for HBC, HBT and HBR

	HBT	25	-	08	A	P1	T	F	4A	-	B																																	
Series	<table border="1" style="width: 100%;"> <tr><td>HBC</td><td>Compact slide</td></tr> <tr><td>HBT</td><td>Thrust slide</td></tr> <tr><td>HBR</td><td>Reach slide</td></tr> </table>		HBC	Compact slide	HBT	Thrust slide	HBR	Reach slide		Stroke length	<table border="1" style="width: 100%;"> <tr><td colspan="2">Order in 1" increments. ⁴</td></tr> <tr><td colspan="2">For 3-position units, specify intermediate and total stroke separated by a "/", i.e. 02/06.</td></tr> <tr><td colspan="2">Consult factory for strokes over 36".</td></tr> </table>		Order in 1" increments. ⁴		For 3-position units, specify intermediate and total stroke separated by a "/", i.e. 02/06.		Consult factory for strokes over 36".		Bushings			Design Series																						
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										<table border="1" style="width: 100%;"> <tr><td>3A</td><td>3MA NFPA air cylinder, NPTF ports ²</td></tr> <tr><td>4A</td><td>4MA NFPA air cylinder, NPTF ports</td></tr> <tr><td>4J</td><td>4MAJ NFPA air cylinder with manual override rodlock, NPTF ports, 100 PSIG max.</td></tr> <tr><td>D</td><td>P1D ISO cylinder w/ removable gland, BSPP ports</td></tr> <tr><td>D1</td><td>P1D ISO cylinder w/ removable gland, Standard Rodlock, BSPP ports</td></tr> <tr><td>D2</td><td>P1D ISO cylinder w/ removable gland, manual override rodlock, BSPP ports</td></tr> <tr><td>E</td><td>P1D ISO cylinder w/ removable gland, NPTF ports</td></tr> <tr><td>E1</td><td>P1D ISO cylinder w/ removable gland, standard rodlock, NPTF ports</td></tr> <tr><td>E2</td><td>P1D ISO cylinder w/ removable gland, manual override rodlock, NPTF ports</td></tr> <tr><td>4L</td><td>4ML NFPA hydraulic cylinder, NPTF ports, 400 PSIG max. ²</td></tr> <tr><td>S</td><td>2A NFPA steel air cylinder, 250 PSIG max.</td></tr> <tr><td>S1</td><td>3L NFPA steel hydraulic cylinder, 750 PSIG max. (Stop collars, bumpers, and flow controls not available with this option.)</td></tr> <tr><td>Q</td><td>No cylinder, NFPA cylinder mounting</td></tr> <tr><td>Q1</td><td>No cylinder, ISO cylinder mounting</td></tr> <tr><td>X</td><td>Special cylinder type (please specify)</td></tr> </table>		3A	3MA NFPA air cylinder, NPTF ports ²	4A	4MA NFPA air cylinder, NPTF ports	4J	4MAJ NFPA air cylinder with manual override rodlock, NPTF ports, 100 PSIG max.	D	P1D ISO cylinder w/ removable gland, BSPP ports	D1	P1D ISO cylinder w/ removable gland, Standard Rodlock, BSPP ports	D2	P1D ISO cylinder w/ removable gland, manual override rodlock, BSPP ports	E	P1D ISO cylinder w/ removable gland, NPTF ports	E1	P1D ISO cylinder w/ removable gland, standard rodlock, NPTF ports	E2	P1D ISO cylinder w/ removable gland, manual override rodlock, NPTF ports	4L	4ML NFPA hydraulic cylinder, NPTF ports, 400 PSIG max. ²	S	2A NFPA steel air cylinder, 250 PSIG max.	S1	3L NFPA steel hydraulic cylinder, 750 PSIG max. (Stop collars, bumpers, and flow controls not available with this option.)	Q	No cylinder, NFPA cylinder mounting	Q1	No cylinder, ISO cylinder mounting	X	Special cylinder type (please specify)			
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J	8mm sensor mounting bracket, no sensor supplied																																											
J1	12mm sensor mounting bracket, no sensor supplied																																											
										Other Options																																		
										<table border="1" style="width: 100%;"> <tr><td colspan="2">(More than one selection is possible)</td></tr> <tr><td>Blank</td><td>None</td></tr> <tr><td>F</td><td>Flow controls (presto-lok)</td></tr> <tr><td>G</td><td>Flow controls (NPT)</td></tr> <tr><td>K</td><td>Stainless steel support shafting</td></tr> </table>		(More than one selection is possible)		Blank	None	F	Flow controls (presto-lok)	G	Flow controls (NPT)	K	Stainless steel support shafting																							
(More than one selection is possible)																																												
Blank	None																																											
F	Flow controls (presto-lok)																																											
G	Flow controls (NPT)																																											
K	Stainless steel support shafting																																											
										NOTES																																		
										<ol style="list-style-type: none"> Option B includes options B1 and B2. Cushions are not available with 4ML cylinders or 3MA cylinders on HB products. Fluorocarbon seals not available with 3MA or rodlock cylinders. P1D cylinders have strokes only in whole mm. The HB inch stroke will be changed (rounded up) to reflect this. 																																		
										Sensors																																		
										For sensors see page B339. 																																		

HBC Series



Model number	A	B	C	Ds*	Do**	E	F NPTF	F BSPP	K	L	M	N	P	R	S	T	U
15 ¹	3.25	6.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4 ¹	1/4	1.06	5.19	6.26	0.94	5.88	1.94	4.250	1.375	2.750
20	4.00	7.25	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	1/4	1.31	6.39	7.00	1.19	7.13	2.44	5.000	1.750	3.250
25	5.00	9.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	3/8	1.56	7.82	8.38	1.44	8.88	2.88	6.500	2.000	3.750

Model number	V	W	X	Y	AA	BB	CC	EE	FF	GG	HH	JJ	KK	LL	MM
15 ¹	0.251	0.27	2.750	0.750	0.28	1/4	1.750	1.500	2.31	0.50	1/4-20	2.50	0.75	3/8	2.500
20	0.313	0.33	3.250	0.750	0.34	5/16	2.250	1.750	2.31	0.63	5/16-18	3.00	0.88	3/8	3.000
25	0.376	0.39	4.000	1.532	0.41	3/8	3.000	2.250	2.38	0.75	3/8-16	4.00	1.00	1/2	4.000

* Standard shafting
 ** Oversized shafting
 1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.

B

Guided Cylinders
Actuator Products

P5T Series

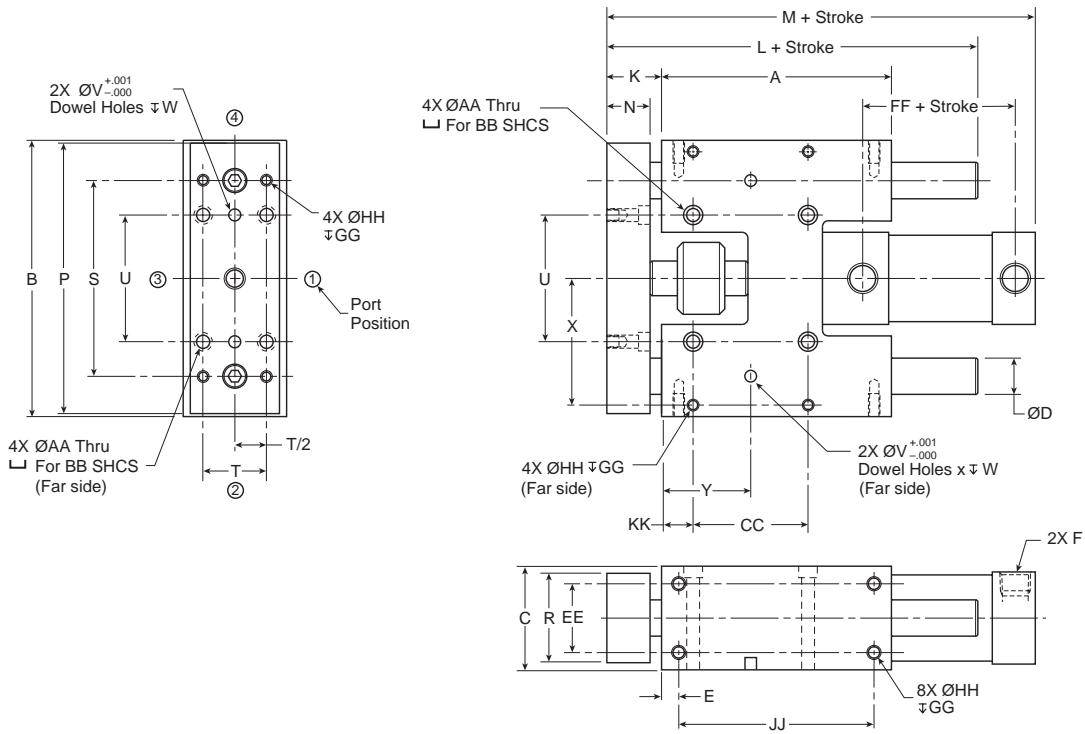
P5L Series

HB Series

P5E Series

HBT Series

B
Guided Cylinders
Actuator Products
P5T
Series
P5L
Series
HB
Series
P5E
Series



Model number	A	B	C	Ds*	Do**	E	F NPTF	F BSPP	K	L	M	N	P	R	S	T
15	5.0	6.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4 1	1/4	1.06	6.94	8.19	0.94	5.88	1.94	4.250	1.375
20	5.5	7.25	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	1/4	1.31	7.88	8.94	1.19	7.13	2.44	5.000	1.750
25	6.5	9.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	3/8	1.56	9.31	10.31	1.44	8.88	2.88	6.500	2.000

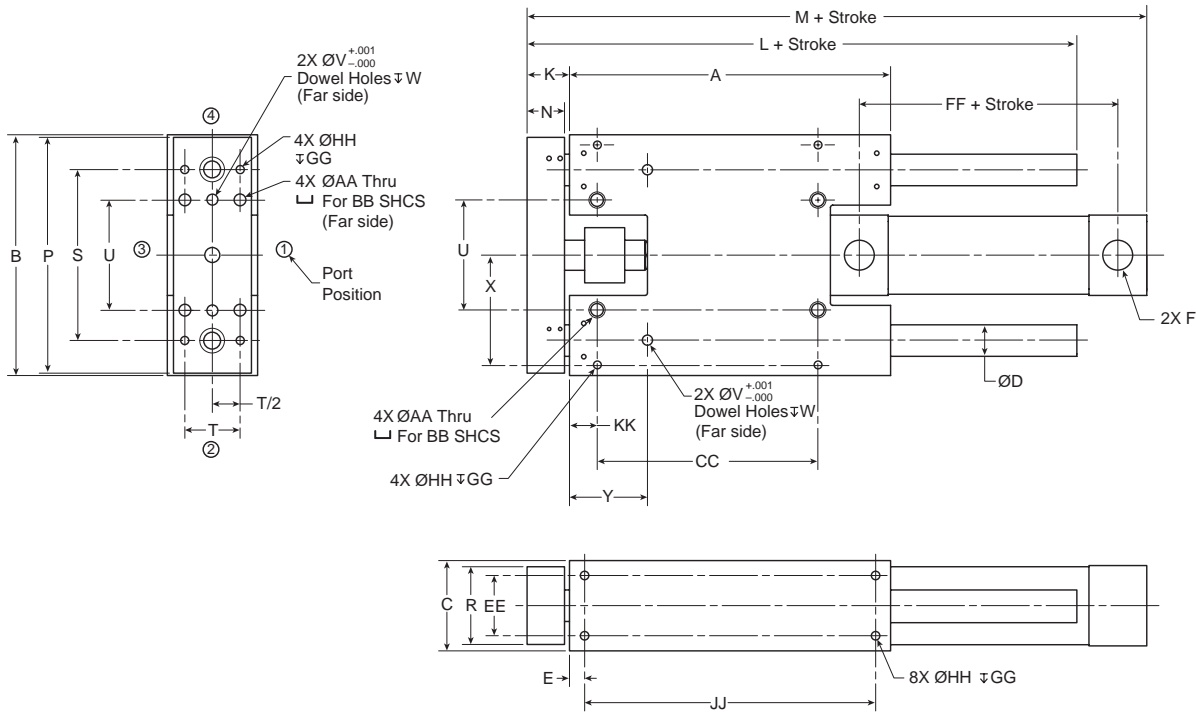
Model number	U	V	W	X	Y	AA	BB	CC	EE	FF	GG	HH	JJ	KK
15	2.750	0.251	0.27	2.750	1.938	0.28	1/4	2.500	1.500	2.31	0.50	1/4-20	4.25	0.69
20	3.250	0.313	0.33	3.250	2.250	0.34	5/16	2.750	1.750	2.31	0.63	5/16-18	4.50	0.88
25	3.750	0.376	0.39	4.000	2.750	0.41	3/8	3.500	2.250	2.38	0.75	3/8-16	5.50	1.00

* Standard shafting
 ** Oversized shafting
 1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.



HBR Series



Model number	A	B	C	Ds*	Do**	E	F NPTF	F BSPP	K	L	M	N	P	R	S	T
15	8.00	6.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4 1	1/4	1.06	9.94	11.19	0.94	5.88	1.94	4.250	1.375
20	10.00	7.25	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	1/4	1.31	12.39	13.44	1.19	7.13	2.44	5.000	1.750
25	12.00	9.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	3/8	1.56	14.82	15.82	1.44	8.88	2.88	6.500	2.000

Model number	U	V	W	X	Y	AA	BB	CC	EE	FF	GG	HH	JJ	KK
15	2.750	0.251	0.27	2.750	1.938	0.28	1/4	5.500	1.500	2.31	0.50	1/4-20	7.25	0.69
20	3.250	0.313	0.33	3.250	2.250	0.34	5/16	7.250	1.750	2.31	0.63	5/16-18	9.00	0.88
25	3.750	0.376	0.39	4.000	2.760	0.41	3/8	9.000	2.250	2.38	0.75	3/8-16	11.00	1.00

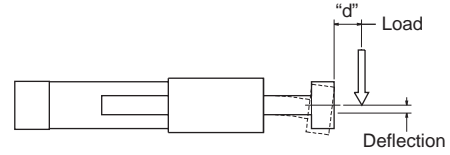
* Standard shafting
** Oversized shafting
1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.

B
Guided Cylinders
Actuator Products
P5T Series
P5L Series
HB Series
P5E Series

Horizontal Load Capacity & Deflection with Standard Shafting

The graphs illustrate the side load vs. actuator stroke for the three HB slide sizes. Applied loads will cause a slight deflection of the support rods. The graphs include the weight of the support rods and tooling plate and are based on a bearing life equivalent to 10 million cycles for dynamic conditions. Higher dynamic loads will reduce cycle life. For static loads, multiply the information in the graph by 1.5.



Note: Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation

EXAMPLE:
 An HBT15 with ball bearings and a "stroke+d" of 12" would have a load capacity of 20 lbs.

B

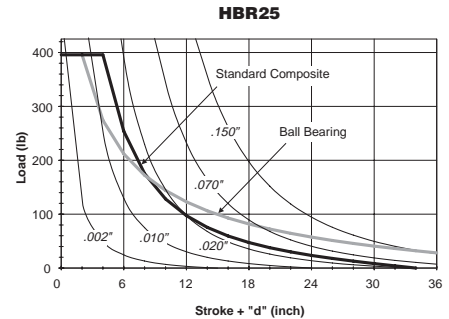
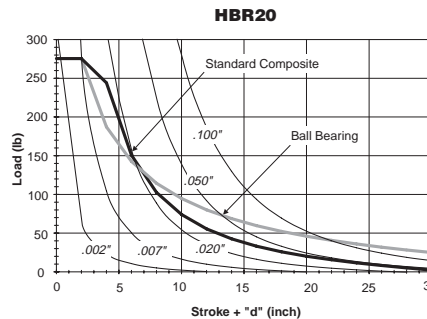
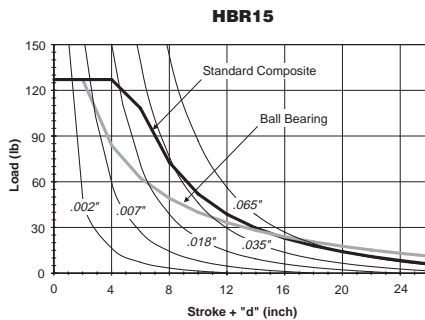
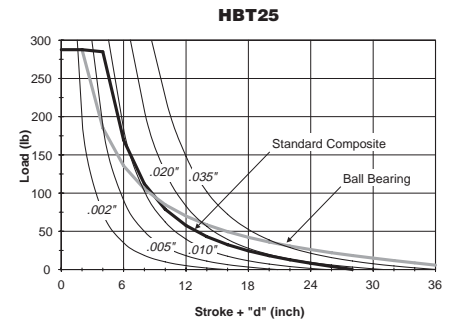
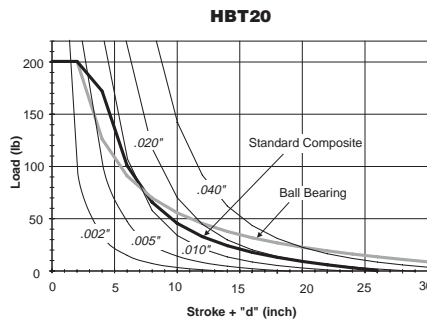
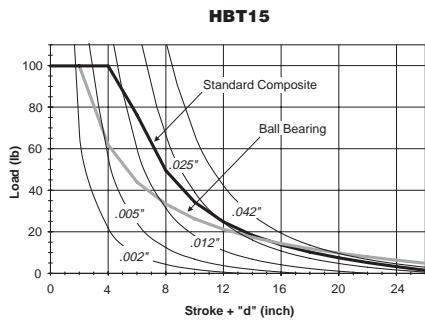
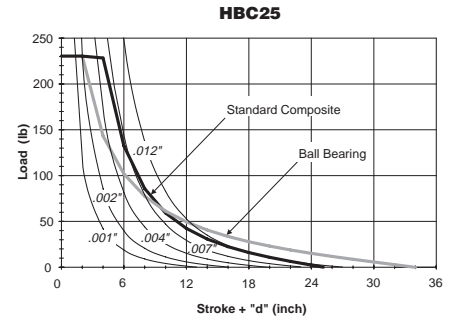
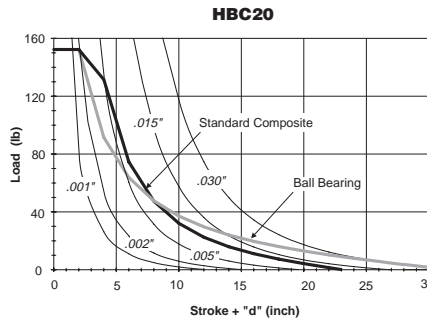
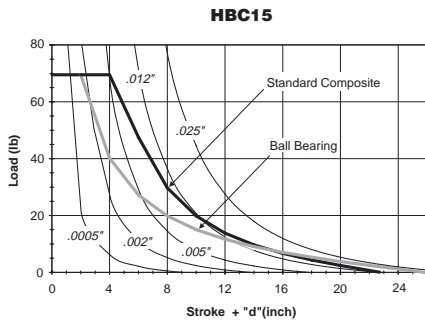
Guided Cylinders
Actuator Products

Series P5T

Series P5L

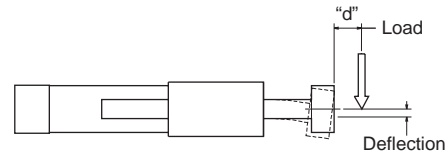
Series HB

Series P5E



Horizontal Load Capacity & Deflection with Oversized Shafting

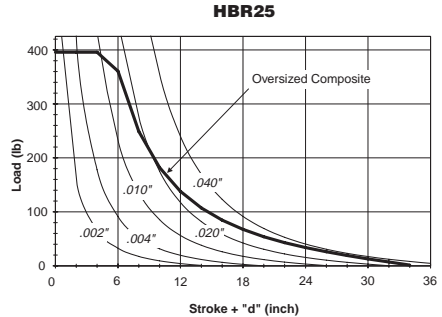
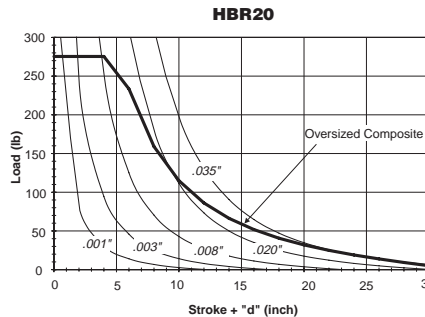
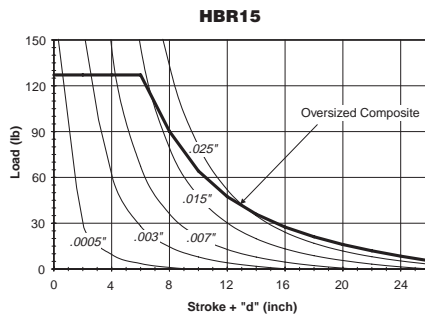
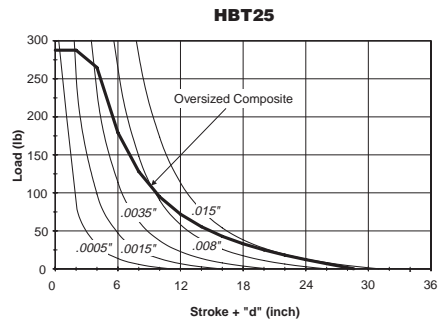
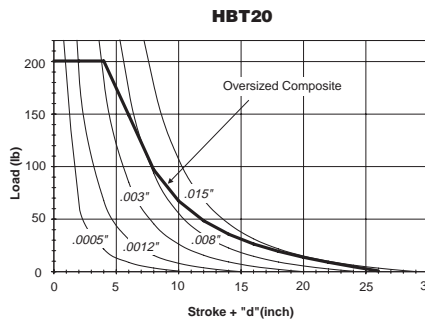
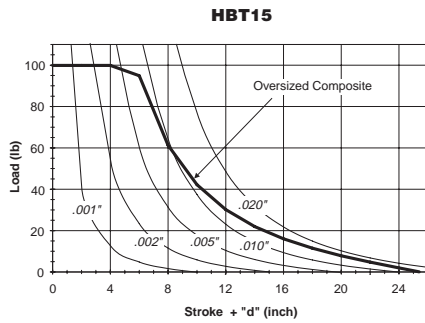
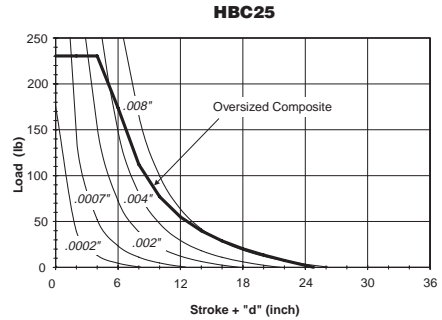
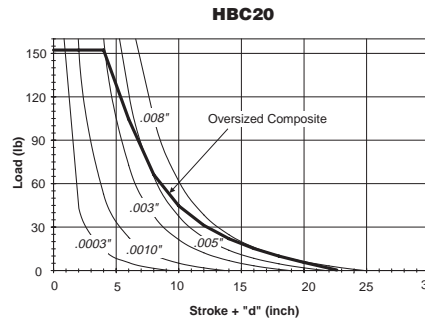
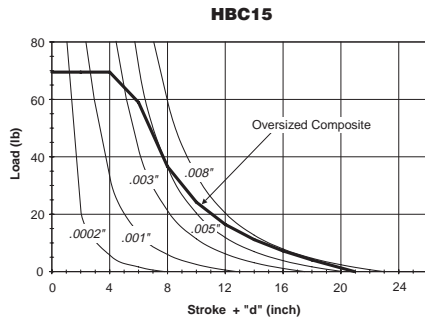
The graphs illustrate the side load vs. actuator stroke for the three HB slide sizes. Applied loads will cause a slight deflection of the support rods. Deflection distance is also shown. The graphs include the weight of the support rods and tooling plate and are based on a bearing life equivalent to 10 million cycles for dynamic conditions. Higher dynamic loads will reduce cycle life. For static loads, multiply the information in the graph by 1.5.



Note: Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation

EXAMPLE:
 An HBT15 with oversized composite bushings and a “stroke+d” of 8” would have a load capacity of 60 lbs.

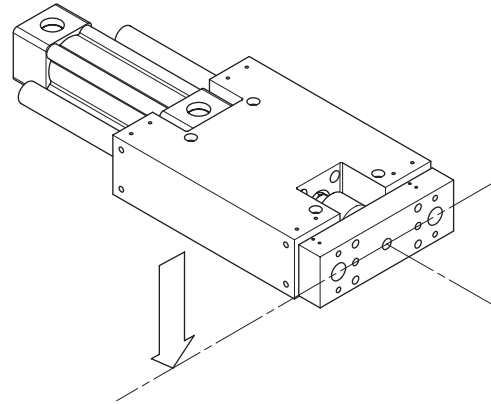


B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	

Asymmetrical Torque Capacity

Asymmetrical loading occurs when the load is applied to one side of the unit. HB Series units can resist torsional loads that are asymmetrical. The graphs show torsional load capacity for both standard and oversized shafting under dynamic conditions. For static applications, multiply the information in the graphs by 1.5. The vertical load for HBN does not include the weight of the tool plate and support rods.

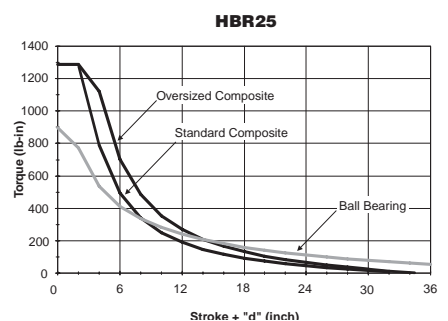
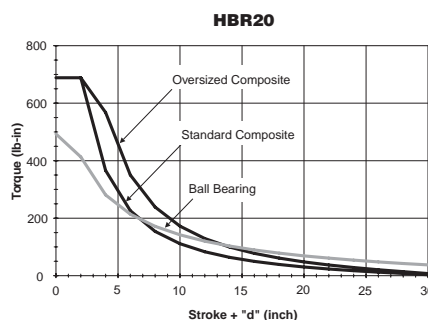
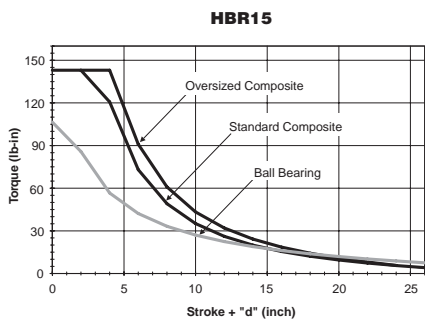
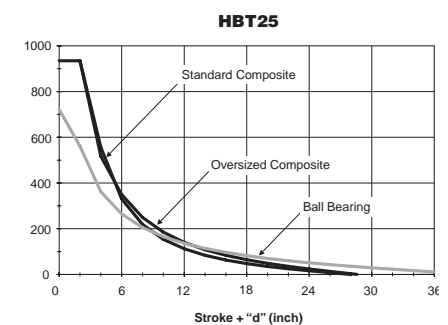
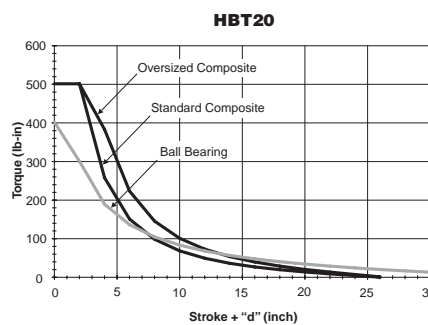
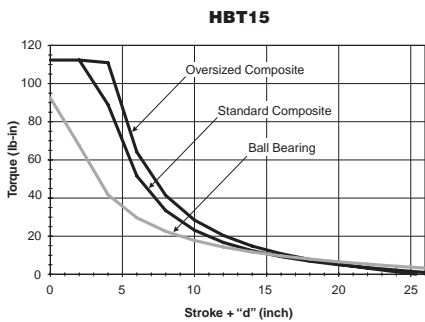
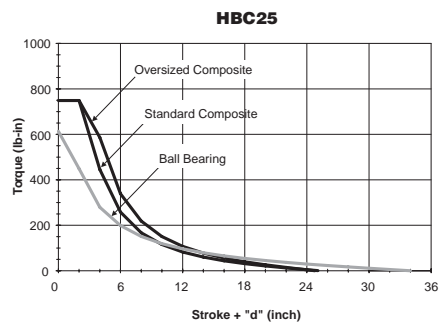
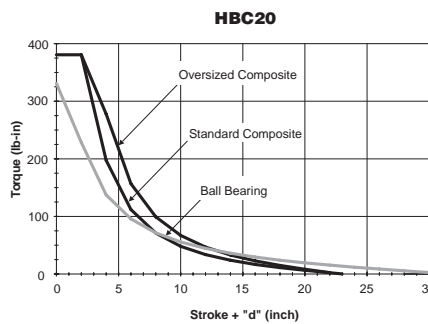
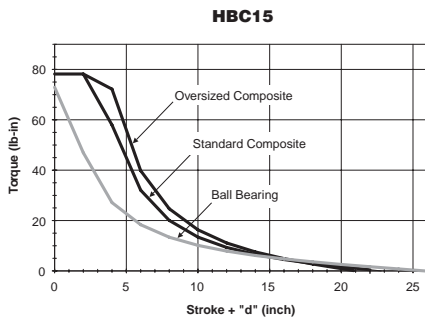
Torsional Load



Note: Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation

B	Guided Cylinders
	Actuator Products
PST	Series
P5L	Series
HB	Series
P5E	Series

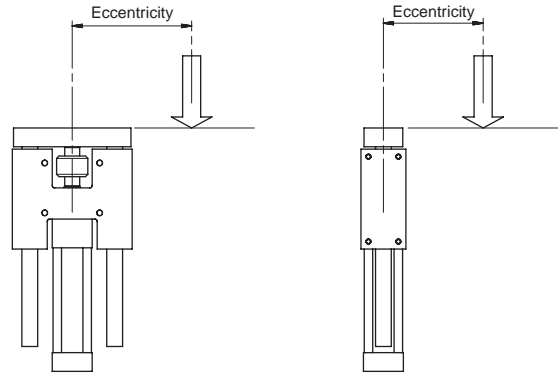


Vertical Eccentric Load Capacity

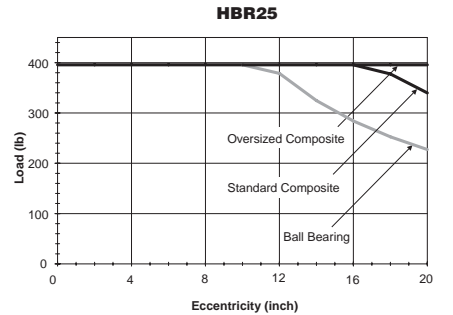
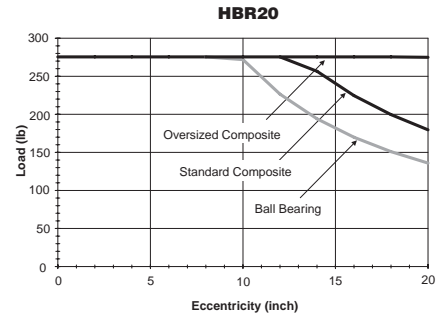
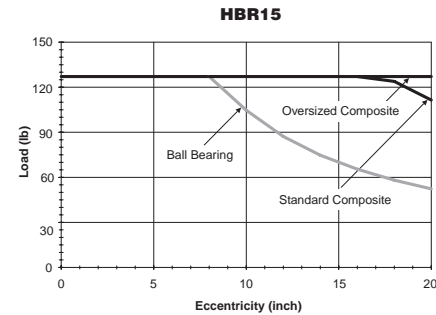
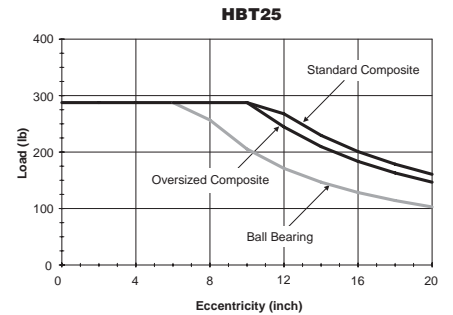
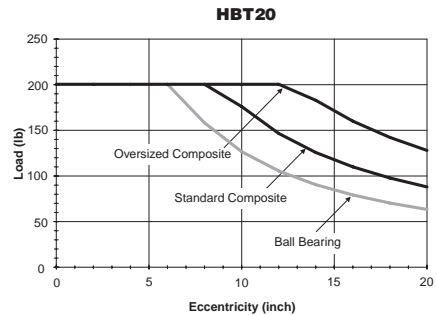
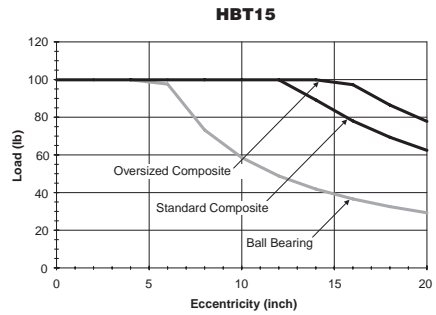
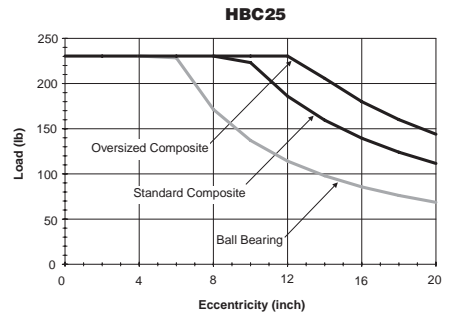
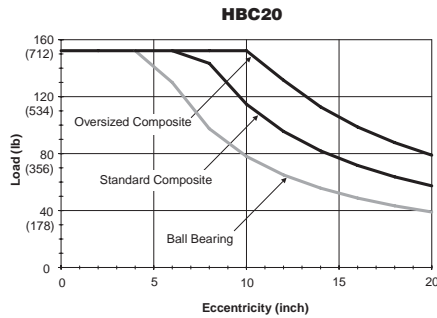
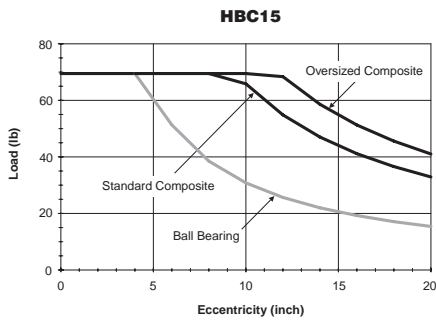
HB Series units mounted vertically will have the same eccentric load capacity regardless of orientation. The graphs provide maximum load capacity for an eccentric mounted load on a 4" stroke cylinder. The load is assumed to be mounted at the face of the tooling plate.

Note: Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration



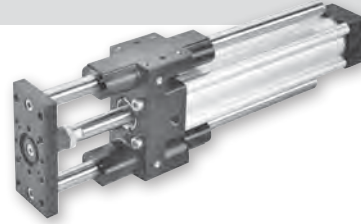
EXAMPLE:
 An HBT15 with ball bearings carrying an eccentric load with an eccentricity distance of 15" would have a load capacity of 40 lbs.



B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	

P5E Series

- Low profile guided assembly
- Powered by the P1D cylinder
- Bore sizes 32, 40, 50, 63, 80 and 100mm
- Strokes to any practical length
- Rod lock options available
- Composite and ball bearing options available



Operating information

Operating pressure:	145 PSIG (10 bar) maximum
Temperature range:	14°F to 165°F (-10°C to 74°C)
Filtration requirements:	40 micron, dry filtered air

Ordering information

P5E - J 032 F G N 0250

Shaft / bearing type	
J	Composite bearing, chrome plated standard shaft
M	Composite bearing, chrome plated oversize shaft ¹
C	Composite bearing, stainless steel shaft
H	Ball bearing, stainless steel shaft

Bore size	
032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm

Stroke length	
Specify whole millimeters, i.e. 0250 = 250mm stroke	

Bumpers / Adjustable Stop Collars	
N	None
B	Bumpers, retract only ²
E	Bumpers and adjustable stop collars, extend only
T	Bumpers both ends, adjustable stop collars on extend ²
R	Bumpers and adjustable stop collars on retract ²
S	Bumpers and adjustable stop collars both ends ²

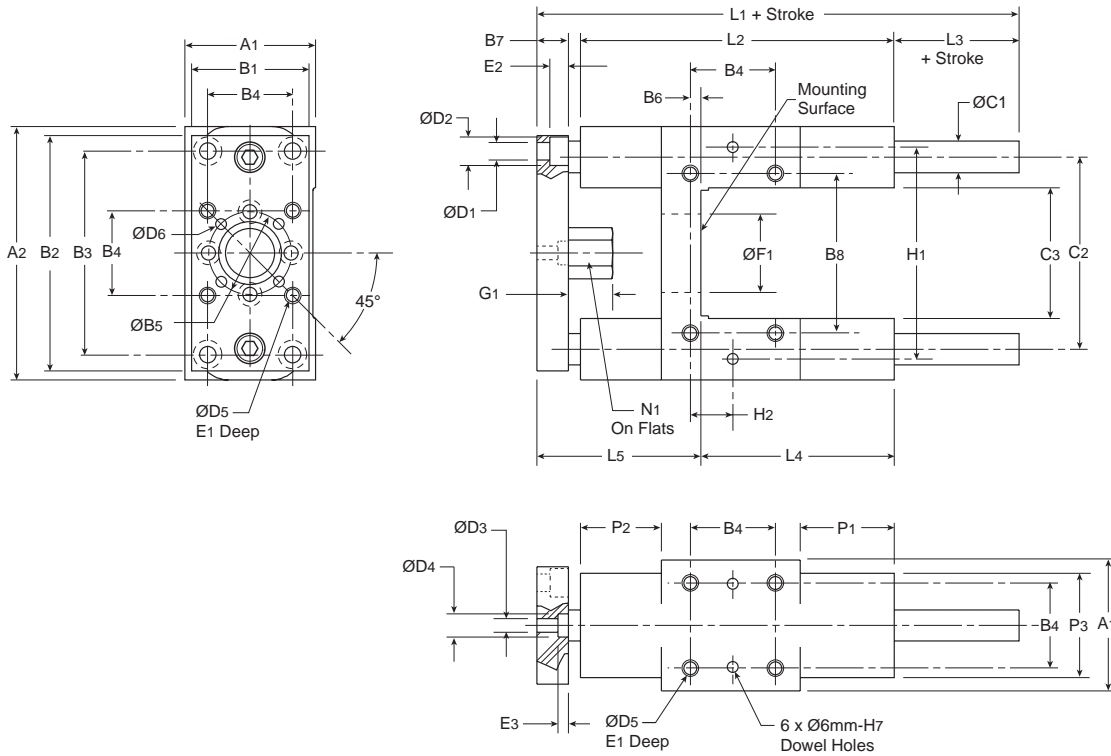
Cylinder type ³	
F	P1D removable gland cylinder
G	P1D removable gland cylinder with cushions
K	P1D rod lock cylinder with cushions
S	P1D manual override rod lock cylinder with cushions
Q	No cylinder
X	Special – please specify

Port Style	
H	NPTF (std)
G	BSPP
N	NPTF with flow controls (std. female ports)
B	BSPP with flow controls (ISO female ports)
F	Flow controls, NPTF port, prestolok tube (inch)
P	Flow controls, BSPP port, prestolok tube (mm)

Sensors
 For sensors see page B339.

¹ Bumpers and adjustable stop collars are not available with oversize shaft option.
² These options will increase the cylinder length. To achieve a specific usable stroke length with these options, add the corresponding value(s) in the adder table, please reference catalog 0900P-E, page F156 to the desired stroke length. See Bumper Options for explanation.
 Adders are not used when P1D Rod Lock (K) or P1D Manual Override Rod Lock (S) are specified with bumpers.
³ Tie Rod Version or composite piston option must be specified as Special (X).

B
 Guided Cylinders
 Actuator Products
 P5T Series
 P5L Series
 HB Series
 P5E Series



Metric (inch)

Bore size											ØC1	ØC1										
	A1	A2	B1	B2	B3	B4	ØB5	B6	B7	B8	std.	O.S.	C2	C3	ØD1	ØD2	ØD3	ØD4	ØD5	ØD6		
32	50 (1.97)	97 (3.82)	45 (1.77)	92 (3.62)	78 (3.07)	32.5 (1.28)	31.5 (1.24)	4 (0.16)	12.7 (0.50)	61 (2.40)	12 (0.47)	16 (0.63)	73.5 (2.89)	50 (1.97)	6.6 (0.26)	11 (0.43)	5.2 (0.20)	9 (0.35)	M6 x 1.00	4 (0.16)		
40	58 (2.28)	115 (4.53)	50.8 (2.00)	110 (4.33)	84 (3.31)	38 (1.50)	31.5 (1.24)	11 (0.43)	12.7 (0.50)	69 (2.72)	16 (0.63)	20 (0.79)	86.5 (3.41)	58 (2.28)	6.6 (0.26)	11 (0.43)	5.2 (0.20)	9 (0.35)	M6 x 1.00	4 (0.16)		
50	70 (2.76)	137 (5.39)	63 (2.48)	132 (5.20)	100 (3.94)	46.5 (1.83)	50 (1.97)	19 (0.75)	16 (0.63)	85 (3.35)	20 (0.79)	25 (0.98)	103.5 (4.07)	70 (2.76)	9 (0.35)	14 (0.55)	6.4 (0.25)	11 (0.43)	M8 x 1.25	4 (0.16)		
63	85 (3.35)	152 (5.98)	82.5 (3.25)	145 (5.71)	105 (4.13)	56.5 (2.24)	50 (1.97)	15 (0.59)	16 (0.63)	100 (3.94)	20 (0.79)	25 (0.98)	118.5 (4.67)	85 (3.35)	9 (0.35)	14 (0.55)	6.4 (0.25)	11 (0.43)	M8 x 1.25	4 (0.16)		
80	105 (4.13)	189 (7.44)	100 (3.94)	180 (7.09)	130 (5.12)	72 (2.83)	76 (2.99)	21 (0.83)	19 (0.75)	130 (5.12)	25 (0.98)	30 (1.18)	147 (5.79)	105 (4.13)	11 (0.43)	17 (0.67)	8.4 (0.33)	14 (0.55)	M10 x 1.50	6 (0.24)		
100	130 (5.12)	213 (8.39)	120 (4.72)	200 (7.87)	150 (5.91)	89 (3.50)	76 (2.99)	24.5 (0.97)	19 (0.75)	150 (5.91)	25 (0.98)	30 (1.18)	171.5 (6.75)	130 (5.12)	11 (0.43)	17 (0.67)	8.4 (0.33)	14 (0.55)	M10 x 1.50	6 (0.24)		

Bore size																		Port size	Piston rod thread
	E1	E2	E3	ØF1	G1	H1	H2	L1	L2	L3	L4	L5	N1	P1	P2	P3			
32	12 (0.47)	7 (0.28)	4 (0.16)	30 (1.18)	17 (0.67)	81 (3.19)	16 (0.63)	153 (6.02)	120 (4.72)	17 (0.67)	71 (2.80)	64.7 (2.55)	17 (0.67)	36 (1.42)	31 (1.22)	40 (1.57)	1/8	M10 x 1.25	
40	12 (0.47)	7 (0.28)	4 (0.16)	35 (1.38)	24 (0.94)	99 (3.90)	19 (0.75)	166 (6.54)	130 (5.12)	20 (0.79)	71 (2.80)	74.7 (2.94)	17 (0.67)	36 (1.42)	36 (1.42)	44 (1.73)	1/4	M12 x 1.25	
50	16 (0.63)	9 (0.35)	9 (0.35)	40 (1.57)	27 (1.06)	119 (4.69)	23 (0.91)	194 (7.64)	150 (5.90)	25 (0.98)	79 (3.11)	90 (3.54)	24 (0.94)	42 (1.65)	44 (1.73)	50 (1.97)	1/4	M16 x 1.5	
63	16 (0.63)	9 (0.35)	9 (0.35)	45 (1.77)	27 (1.06)	132 (5.20)	28 (1.10)	224 (8.82)	180 (7.09)	25 (0.98)	109 (4.29)	90 (3.54)	24 (0.94)	58 (2.28)	44 (1.73)	60 (2.36)	3/8	M16 x 1.5	
80	20 (0.79)	11 (0.43)	5 (0.19)	45 (1.77)	32 (1.26)	166 (6.54)	36 (1.42)	252 (9.92)	200 (7.87)	30 (1.18)	113 (4.45)	109 (4.29)	30 (1.18)	50 (1.97)	52 (2.05)	70 (2.76)	3/8	M20 x 1.5	
100	20 (0.79)	11 (0.43)	5 (0.20)	55 (2.17)	32 (1.26)	190 (7.48)	45 (1.77)	272 (10.71)	220 (8.66)	30 (1.18)	128 (5.04)	114 (4.49)	30 (1.18)	49 (1.93)	51 (2.01)	70 (2.76)	1/2	M20 x 1.5	

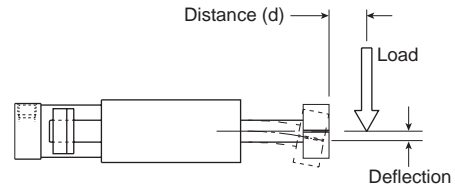
B
 Guided Cylinders
 Actuator Products
 P5T Series
 P5L Series
 HB Series
 P5E Series



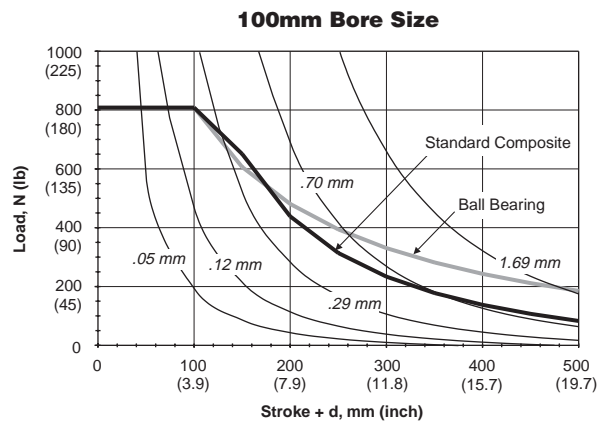
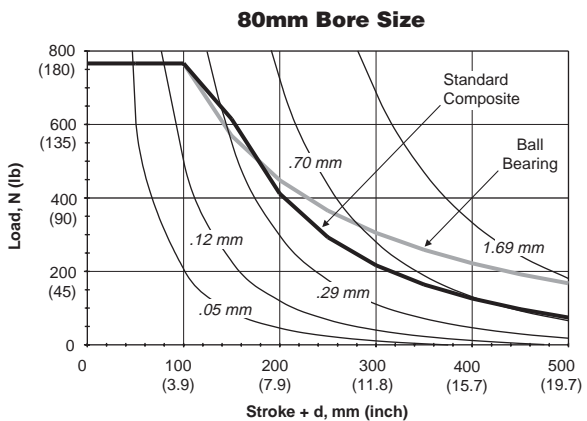
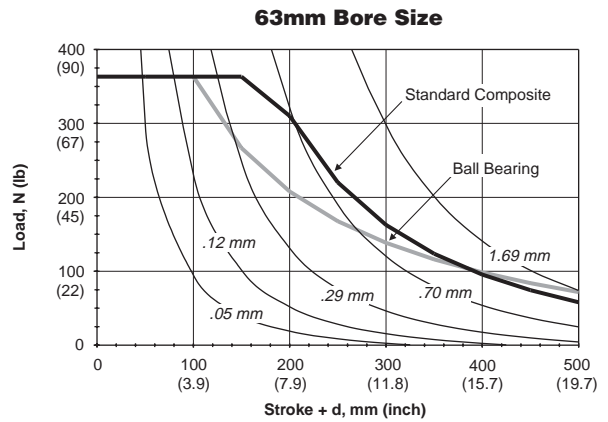
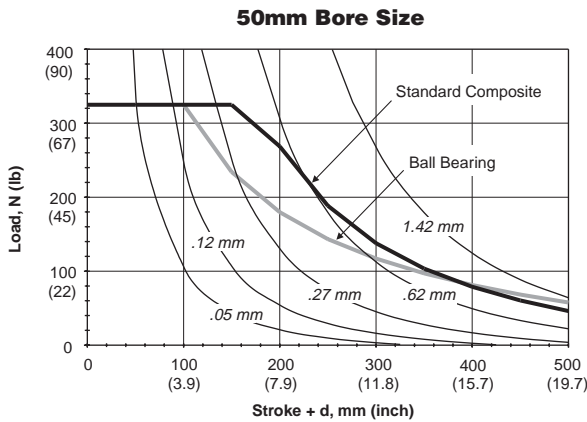
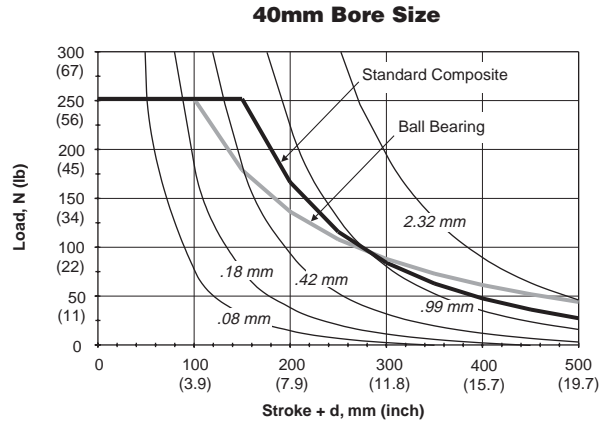
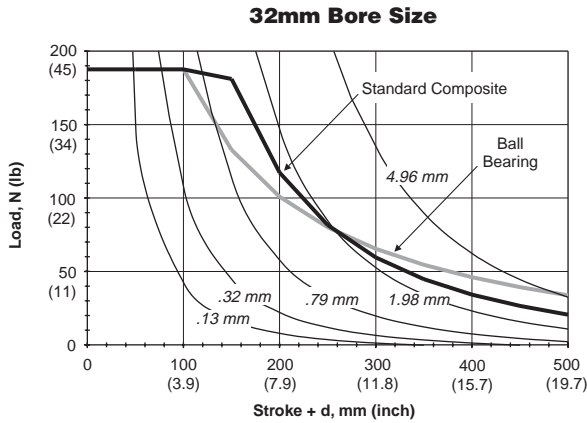
Maximum Load Capacity with Standard Shaft

The following curves are based on 10 million cycles at a speed of 0.20 m/s (40 fpm). Higher dynamic loads will reduce cycle life. For static conditions, multiply the information in the graphs by 1.5.

EXAMPLE: A P5E with 40mm bore, composite bushings and a “stroke+d” of 400mm will have a load capacity of 48N.



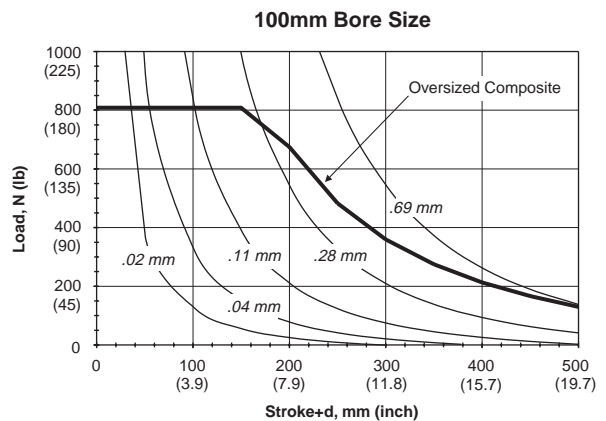
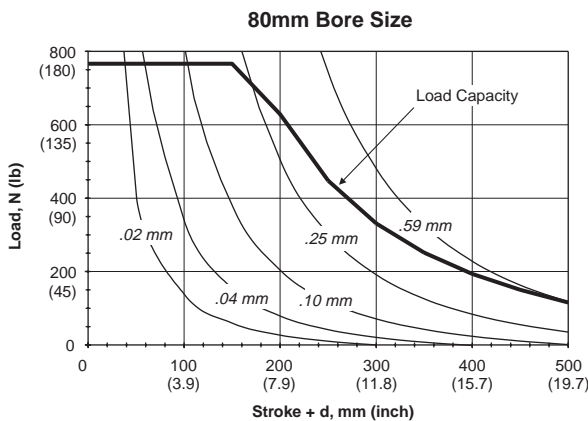
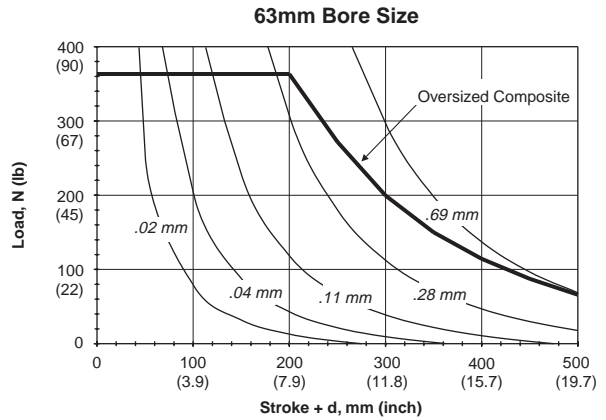
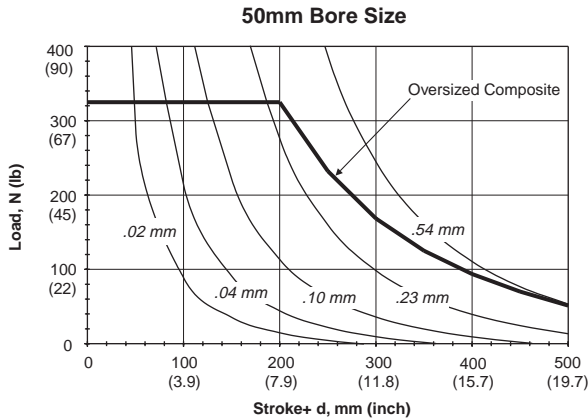
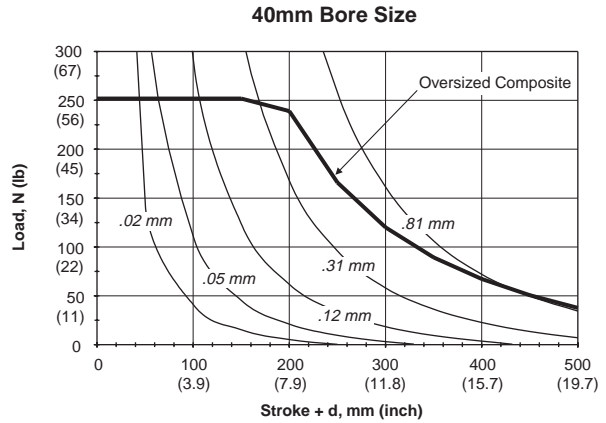
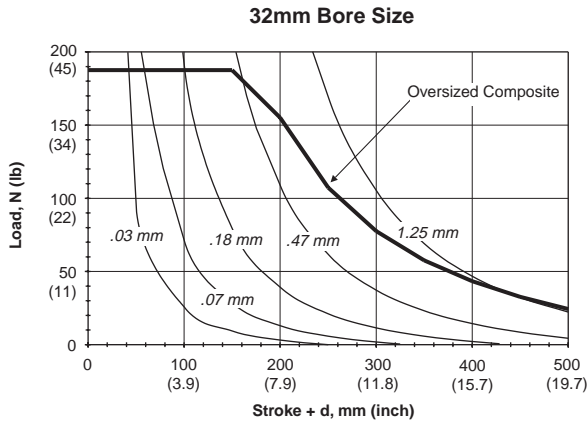
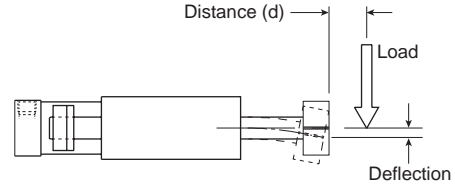
B	Guided Cylinders
	Actuator Products
Series	P5T
Series	P5L
Series	HB
Series	P5E



Maximum Load Capacity with Oversized Shaft

The following curves are based on 10 million cycles at a speed of 0.20 m/s (40 fpm). Higher dynamic loads will reduce cycle life. For static conditions, multiply the information in the graphs by 1.5.

EXAMPLE: A P5E with 63mm bore, oversized support shafts and a “stroke+d” of 300mm would have a load capacity of 200N.

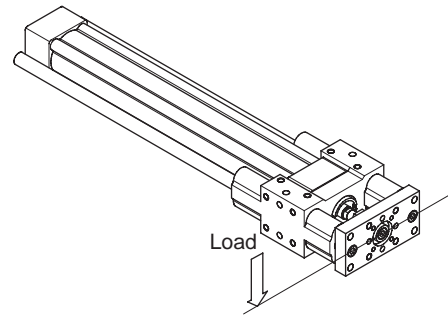


B	Guided Cylinders
	Actuator Products
P5T	Series
P5L	Series
HB	Series
P5E	Series

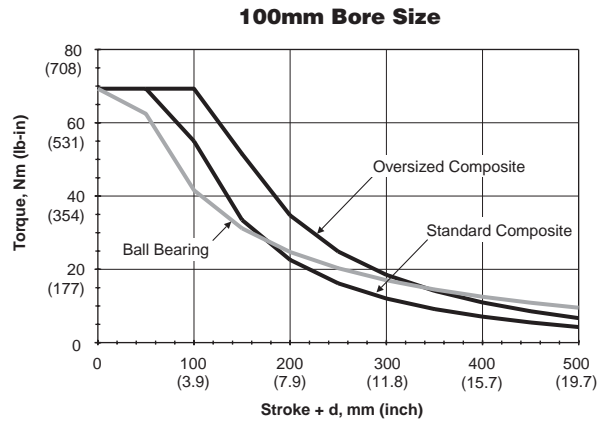
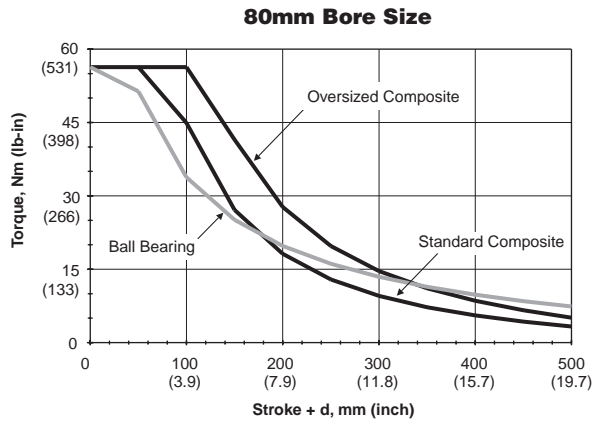
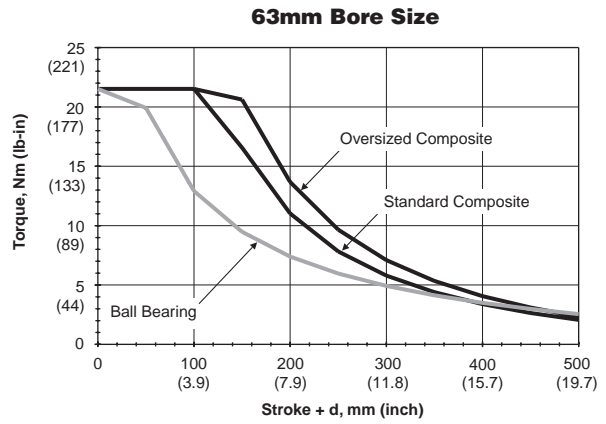
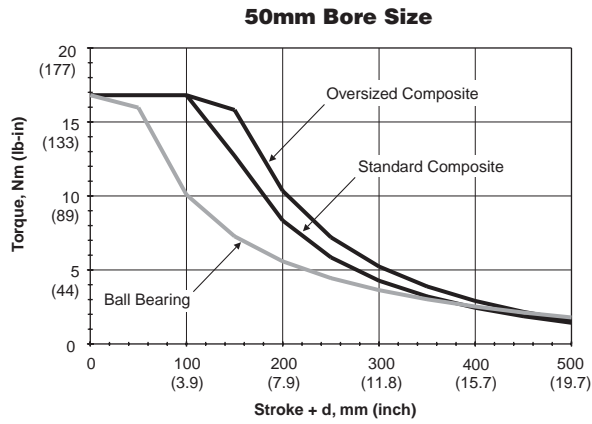
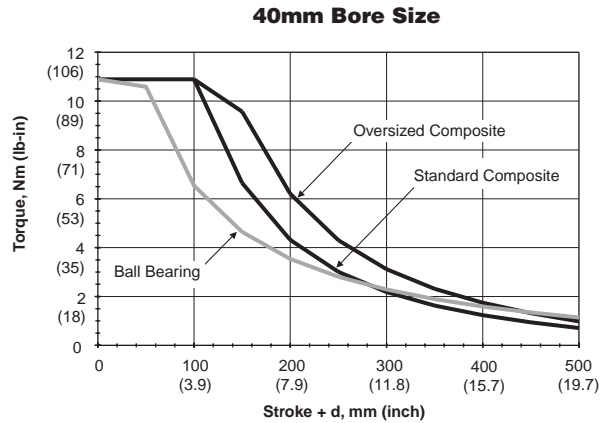
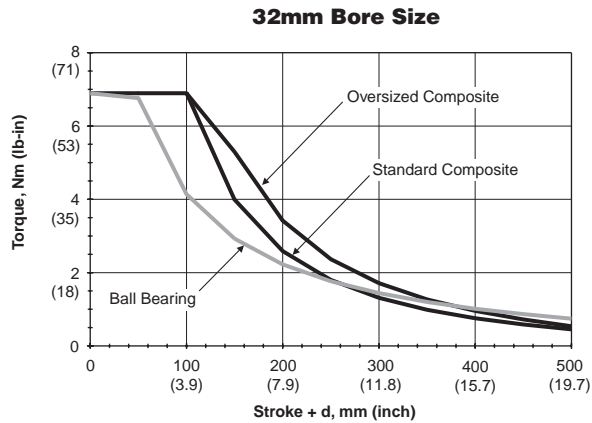
Asymmetrical Torque Capacity

Asymmetrical loading occurs when an off-center load is applied to the unit. P5E Series units can resist torsional loads that are asymmetrical.

EXAMPLE: A P5E with 63mm bore, ball bearings and a “stroke + d” of 300mm would have an asymmetrical torque capacity of 5 Nm.



B	Guided Cylinders
	Actuator Products
Series	P5T
Series	P5L
Series	HB
Series	P5E



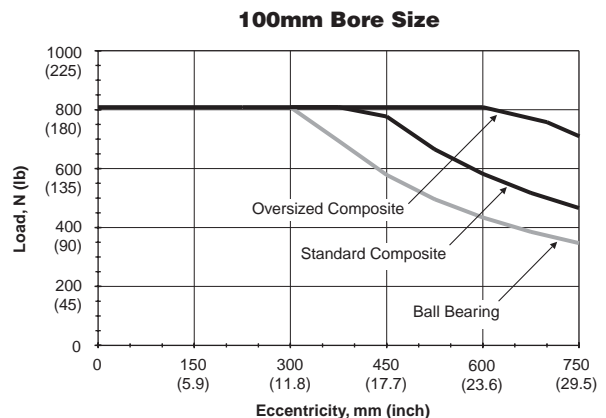
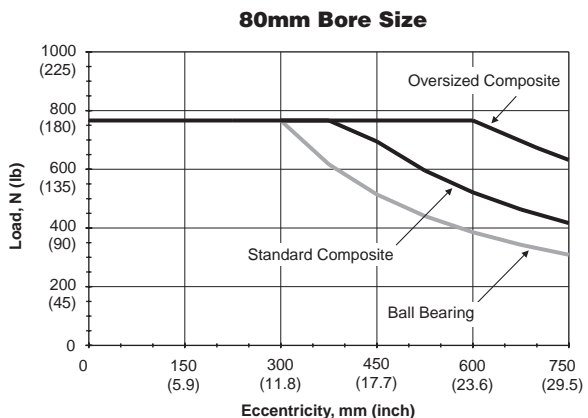
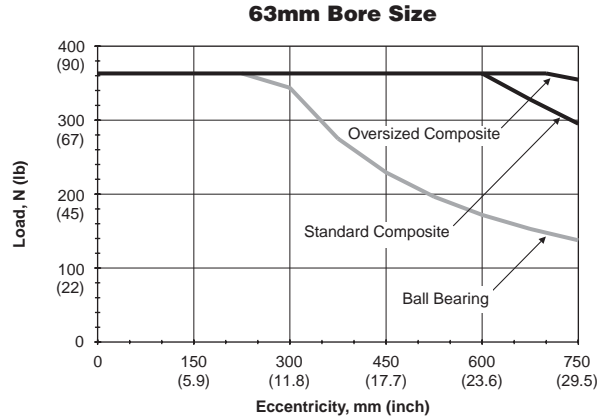
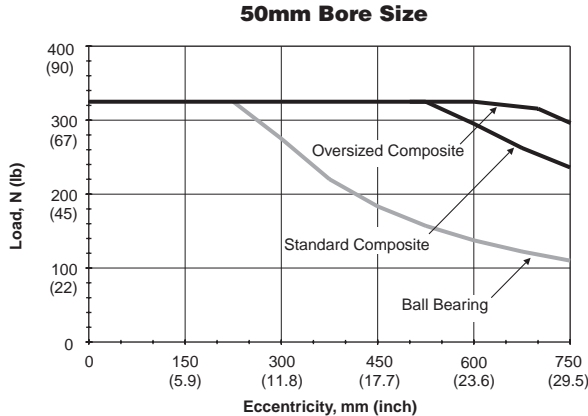
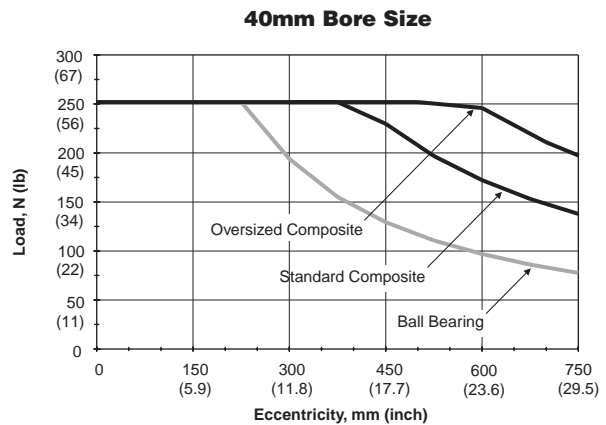
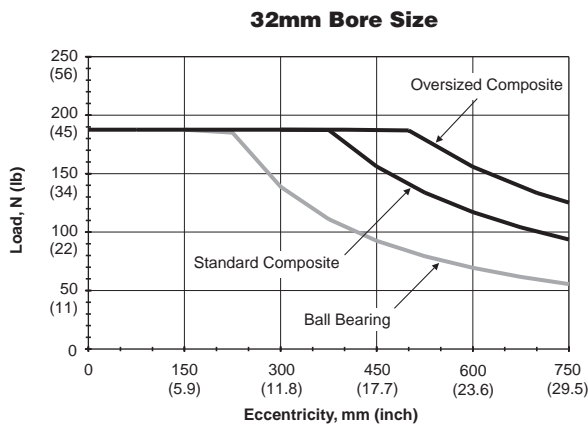
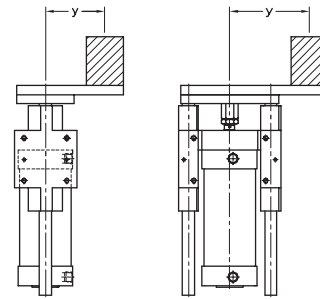
Vertical Eccentric Load Capacity

P5E Series units mounted vertically will have the same eccentric load capacity regardless of orientation. The graphs provide maximum load capacity for an eccentric mounted load. The load is assumed to be mounted at the face of the tooling plate.

These load curves illustrate load ratings based on the bearing system of the product. Load rating is a key selection criterion but is not the only one to consider in the selection of a product.

Note: Charts are based on 100mm of stroke.

EXAMPLE: A P5E with a 40mm bore carrying an eccentric load located 300mm from the centerline has a capacity of approximately 200N (45 lbs).



B	Guided Cylinders Actuator Products
	P5T Series
P5L Series	
HB Series	
P5E Series	

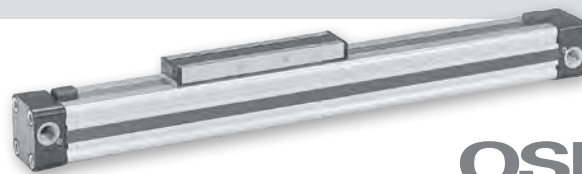
OSP-P Series

Standard Features:

- Double-acting with adjustable cushions
- With magnetic piston for position sensing
- Standard stroke lengths to 6000mm. Long stroke versions available upon request
- End cap can be rotated 4 x 90° to position ports as desired

Optional Features:

- Clean room cylinders
- Stainless steel screws
- Slow speed lubrication
- Fluorocarbon seals
- Single end porting
- Integrated valves
- Integrated bearing options



OSP
 ORIGA
 SYSTEM
 PLUS

Operating information

Operating pressure:	117 PSIG (8 bar)
Temperature range:	-10°F to 80°F (14°C to 176°C)
Filtration requirements:	Filtered, nonlubricated compressed air

Material specifications

Cylinder profile	Anodized aluminum
Carrier (piston)	Anodized aluminum
End caps	Aluminum, lacquered / plastic (P10)
Sealing bands	Corrosion resistant steel
Seals	NBR (Option: Fluorocarbon)
Screws	Galvanized steel Option: stainless steel
Dust covers, wipers	Composite

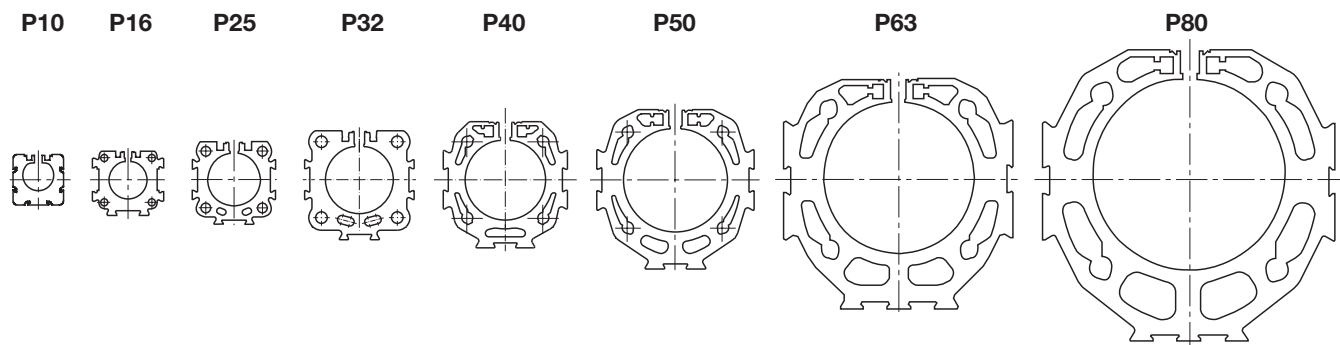
Weight (mass) kg

Cylinder series (Basic cylinder)	Weight (Mass) kg	
	At 0 mm stroke	per 100 mm stroke
OSP-P10	0.087	0.052
OSP-P16	0.22	0.1
OSP-P25	0.65	0.197
OSP-P32	1.44	0.354
OSP-P40	1.95	0.415
OSP-P50	3.53	0.566
OSP-P63	6.41	0.925
OSP-P80	12.46	1.262

Features

Characteristics	Description
Type	Rodless cylinder
Series	OSP-P
Stroke length	5.5m (216 inches)
System	Double-acting, with cushions and magnetic piston
Mounting	See drawings
Air connection	Threaded
Weight (mass)	See table below
Installation	In any position
Lubrication	Prelubricated at the factory (additional oil mist lubrication not required) Option: special slow speed grease

Size Comparison



ORIGA SYSTEM PLUS – innovation from a proven design

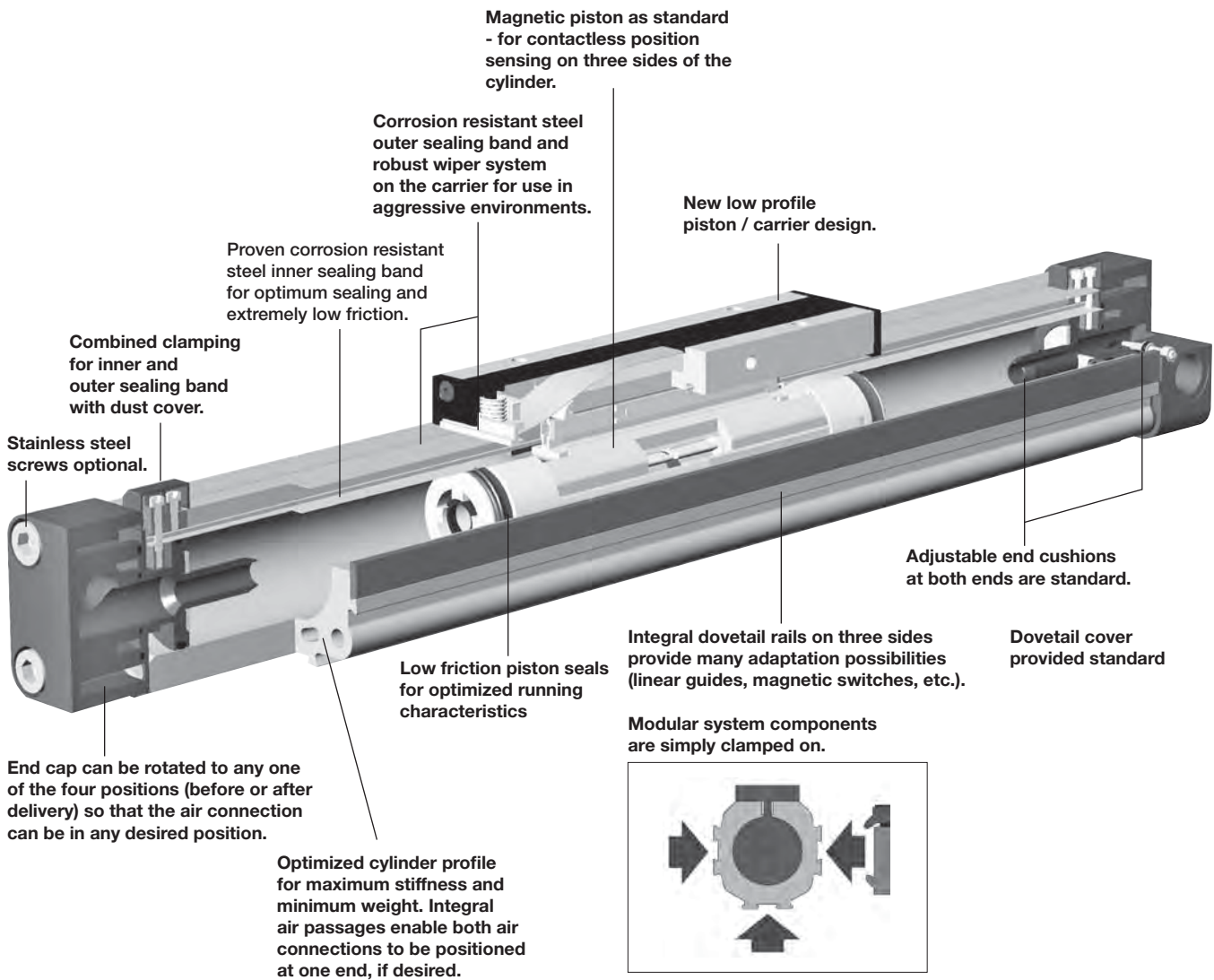
A new generation of linear drives which can be simply and neatly integrated into any machine layout.

A new modular linear drive system

With this second generation linear drive the OSP-P series offers design engineers complete flexibility. The well known ORIGA cylinder has been further developed into a combined linear actuator, guidance and control package. It forms the basis for the the OSP-P linear drive system. All additional functions are designed into modular system components which replace the previous series of cylinders.

Mounting rails on 3 sides

Mounting rails on 3 sides of the cylinder enable modular components such as linear guides, brakes, valves, magnetic switches etc. to be fitted to the cylinder itself. This solves many installation problems, especially where space is limited. The modular system concept forms an ideal basis for additional customer-specific functions.



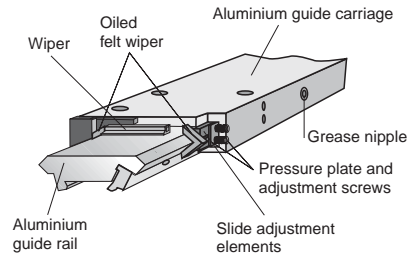
B	Rodless Cylinders Actuator Products
	OSP-P Series
P1X Series	
P1Z Series	
GDL Series	

Plain Bearing Guide SLIDELINE

- Available on 16 to 80mm bore

Features:

- Adjustable composite slide elements – optional integral brake
- Integrated sealing system with wiper elements to remove dirt and lubricate the slideways
- Any length of stroke up to 5500 mm

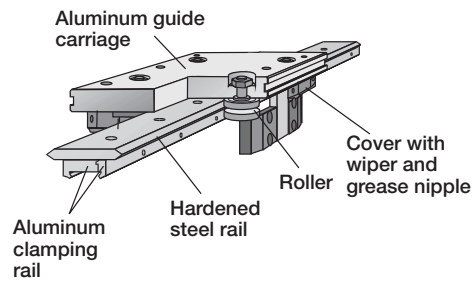


Roller Guide POWERSLIDE

- Available on 16 to 50mm bore

Features:

- Anodized aluminum guide carriage with vee rollers
- Hardened steel guide rail
- Multiple guide sizes can be used on the same drive
- Max. Speed $v = 3$ m/s
- Integrated wiper and grease nipple
- Any length of stroke up to 3500 mm



B	Rodless Cylinders Actuator Products
	OSP-P Series
P1X Series	
P1Z Series	
GDL Series	

Loads, forces and moments

When sizing an OSP cylinder, consideration must be given to:

- Loads, forces and moments
- Performance of the pneumatic end cushions. The main factors are the mass to be cushioned and the piston speed (unless external cushioning is used, e. g. hydraulic shock absorbers)

To determine the maximum values for light, shock-free operation, which must not be exceeded even in dynamic operation.

Load and moment data are based on speeds $v \leq 0.5$ m/s.

When working out the action force required, it is essential to take into account the friction forces generated by the specific application or load.

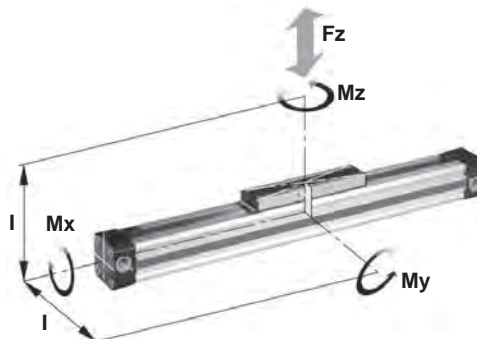
The sum total of each of these types of moments, divided by each of the maximum values, determines a Load-Moment Factor (LMF) should be equal to or less than 1.0. On horizontal mountings, the total load (L) should also be divided by the maximum load allowable and factored into the equation.

Horizontal Mountings:

$$\frac{L}{[L]} + \frac{M}{[M]} + \frac{M_s}{[M_s]} + \frac{M_v}{[M_v]} = LMF \leq 1.0$$

Vertical Mountings:

$$\frac{M}{[M]} + \frac{M_s}{[M_s]} + \frac{M_v}{[M_v]} = LMF \leq 1.0$$



$$M = F \cdot l$$

Bending moments are calculated from the center of the linear actuator

B
 Rodless Cylinders
 Actuator Products

OSP-P
 Series

P1X
 Series

P1Z
 Series

GDL
 Series

Cylinder series (mm Ø)	Theoretical output force at 6 bar N (lb)	Actual output force F_A at 6 bar N (lb)	Max. moments			Max. load F N (lb)	Cushion length (mm)
			M_x Nm (in lb)	M_y Nm (in lb)	M_z Nm (in lb)		
OSP-P10	47 (10.6)	32 (7.2)	0.2 (1.8)	1 (8.9)	0.3 (2.7)	20 (4.5)	2.5 * (.09)
OSP-P16	120 (26.9)	78 (17.5)	0.45 (3.9)	4 (35.4)	0.5 (4.4)	120 (26.9)	11 (.43)
OSP-P25	295 (66.3)	250 (56.2)	1.5 (13.3)	15 (132.8)	3 (26.6)	300 (67.4)	17 (.67)
OSP-P32	483 (108.6)	420 (94.4)	3 (26.6)	30 (265.5)	5 (44.3)	450 (101.2)	20 (.79)
OSP-P40	754 (169.5)	640 (143.9)	6 (53.1)	60 (531)	8 (70.8)	750 (168.6)	27 (1.06)
OSP-P50	1178 (264.8)	1000 (224.8)	10 (88.5)	115 (1017.8)	15 (132.8)	1200 (269.8)	30 (1.18)
OSP-P63	1870 (420.4)	1550 (348.5)	12 (106.2)	200 (1771)	24 (212.4)	1650 (370.9)	32 (1.26)
OSP-P80	3016 (678)	2600 (584.5)	24 (212.4)	360 (3186)	48 (424.8)	2400 (539.5)	39 (1.54)

* A rubber element (non-adjustable) is used for end cushioning.
 To deform the rubber element enough to reach the absolute end position would require a Dp of 4 bar!

Cushioning diagram

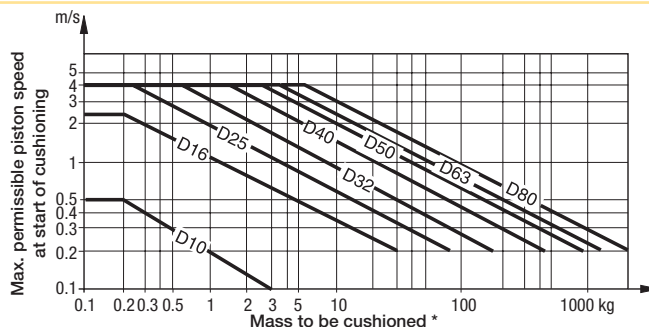
Determine the moving mass and follow the chart below to determine the maximum cylinder velocity.

Alternatively, take your desired velocity and moving mass to determine the required cylinder diameter.

If these maximum permissible values are exceeded, additional shock absorbers must be used.

For sizing a basic cylinder, use the adjacent chart. To size a cylinder with guide bearing, use the charts on the following page.

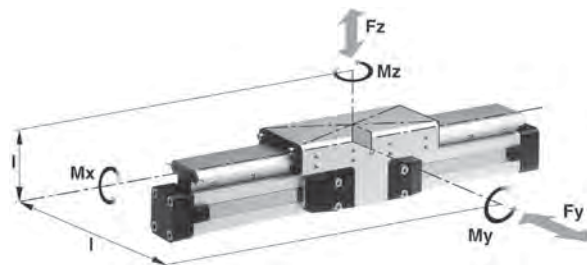
The peak piston velocity can be determined by assuming it is 50% greater than the average velocity. The peak velocity should be used in sizing the cylinder cushions.



* For cylinders with linear guides or brakes, please be sure to take the mass of the carriage or the brake housing into account.

SLIDELINE loads, forces and moments

Stroke up to 5500 mm (longer strokes on request)



Technical data

The table shows the maximum permissible values for smooth operation, which should not be exceeded even under dynamic conditions.

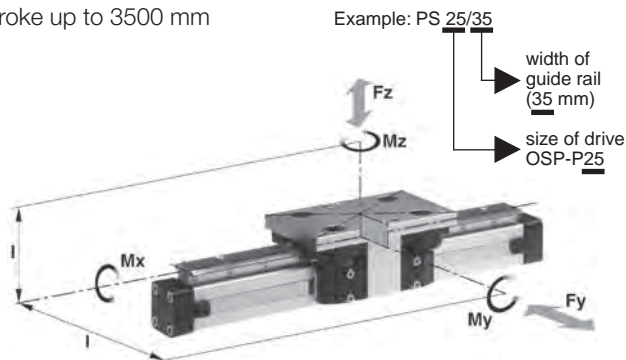
The load and moment figures apply to speeds $v < 0.2$ m/s.

Series	For linear drive	Max. moments (Nm)			Max. loads (N) Fy, Fz	Mass of linear drive with guide (kg)		Mass * of guide carriage (kg)
		Mx	My	Mz		With 0mm stroke	Increase per 100mm stroke	
SL16	OSP-P16	6	11	11	325	0.57	0.22	0.23
SL25	OSP-P25	14	34	34	675	1.55	0.39	0.61
SL32	OSP-P32	29	60	60	925	2.98	0.65	0.95
SL40	OSP-P40	50	110	110	1500	4.05	0.78	1.22
SL50	OSP-P50	77	180	180	2000	6.72	0.97	2.06
SL63	OSP-P63	120	260	260	2500	11.66	1.47	3.32
SL80	OSP-P80	120	260	260	2500	15.71	1.81	3.32

* Add the mass of the guide carriage to the mass to be cushioned.

POWERSLIDE loads, forces and moments

Stroke up to 3500 mm



Technical data

The table shows the maximum permissible values for smooth operation, which should not be exceeded even under dynamic conditions.

For further information and technical data see linear drives OSP-P.

*** Please note:**

In the cushioning diagram, add the mass of the guide carriage to the mass to be cushioned.

Series	For linear drive	Max. moments (Nm)			Max. load (N) Fy, Fz	Mass of linear drive with guide (kg)		Mass * of guide carriage (kg)
		Mx	My	Mz		With 0 mm stroke	Increase per 100mm stroke	
PS 16/25	OSP-P16	14	45	45	1400	0.93	0.24	0.7
PS 25/25	OSP-P25	14	63	63	1400	1.5	0.4	0.7
PS 25/35	OSP-P25	20	70	70	1400	1.7	0.4	0.8
PS 25/44	OSP-P25	65	175	175	3000	2.6	0.5	1.5
PS 32/35	OSP-P32	20	70	70	1400	2.6	0.6	0.8
PS 32/44	OSP-P32	65	175	175	3000	3.4	0.7	1.5
PS 40/44	OSP-P40	65	175	175	3000	4.6	1.1	1.5
PS 40/60	OSP-P40	90	250	250	3000	6	1.3	2.2
PS 50/60	OSP-P50	90	250	250	3000	7.6	1.4	2.3
PS 50/76	OSP-P50	140	350	350	4000	11.5	1.8	4.9

* Add the mass of the guide carriage to the mass to be cushioned.

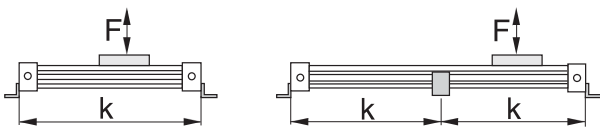
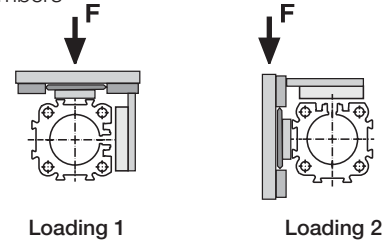
Intermediate supports

To avoid excessive bending and oscillation of the cylinder, intermediate supports may be required. The diagrams below show the maximum permissible support spacing based upon load.

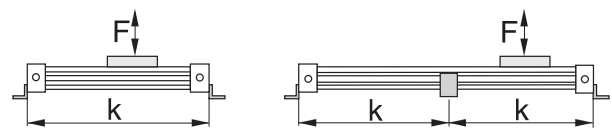
Bending up to 0.5 mm is permissible between supports. The intermediate supports are clamped to the dovetail profile and support the cylinder tube axially.

For cylinders with guide bearings, distinguish between loading scenario 1 and loading scenario 2.

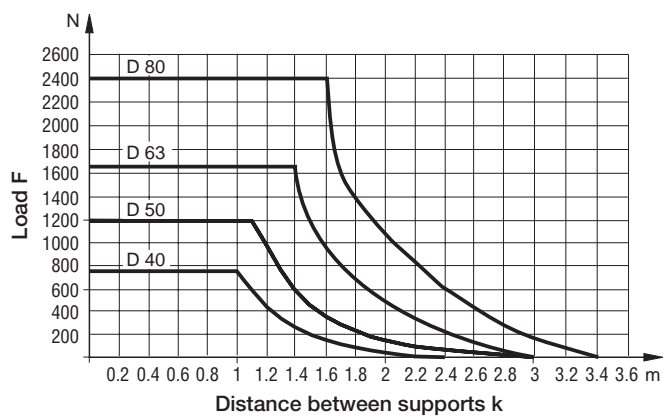
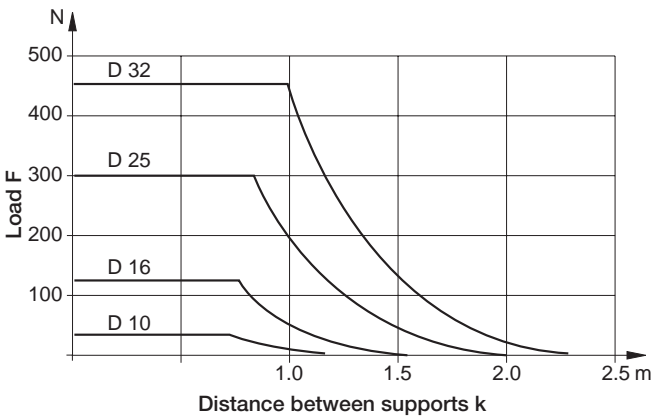
See accessories section for intermediate support dimensions and part numbers



Basic cylinder 10 to 32mm bore intermediate supports

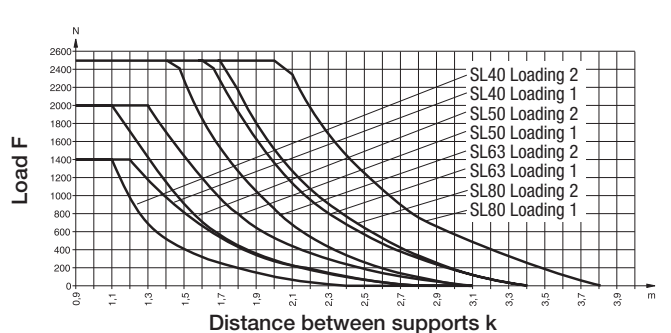
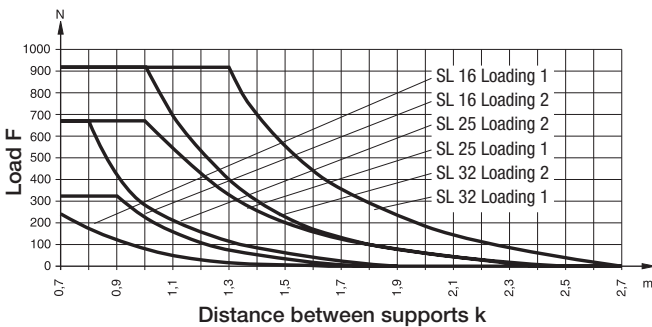


Basic cylinder 40 to 80mm bore intermediate supports

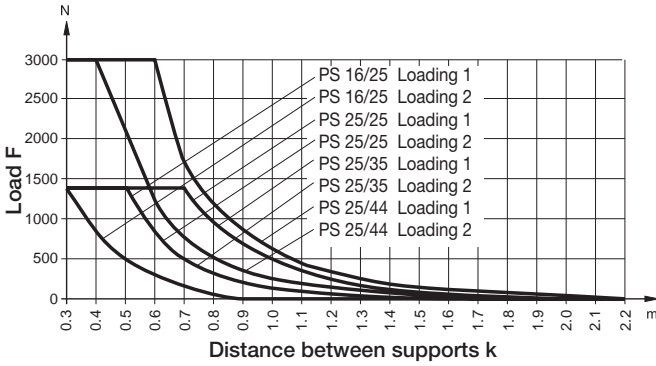


SLIDELINE 16 to 32mm bore intermediate supports

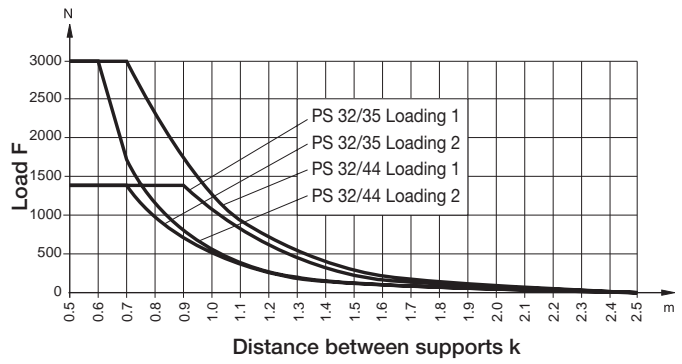
SLIDELINE 40 to 80mm bore intermediate supports



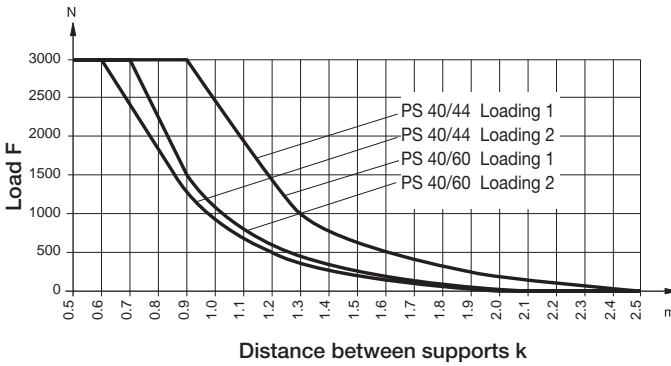
POWERSLIDE 16/25, 25/25, 25/35, 25/44mm bore intermediate supports



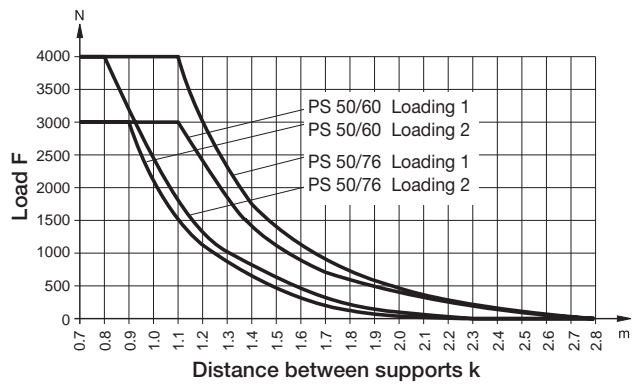
POWERSLIDE 2/35, 32/44mm bore intermediate supports



POWERSLIDE 40/44, 40/60mm bore intermediate supports



POWERSLIDE 50/60, 50/76mm bore intermediate supports



B

Rodless Cylinders
 Actuator Products

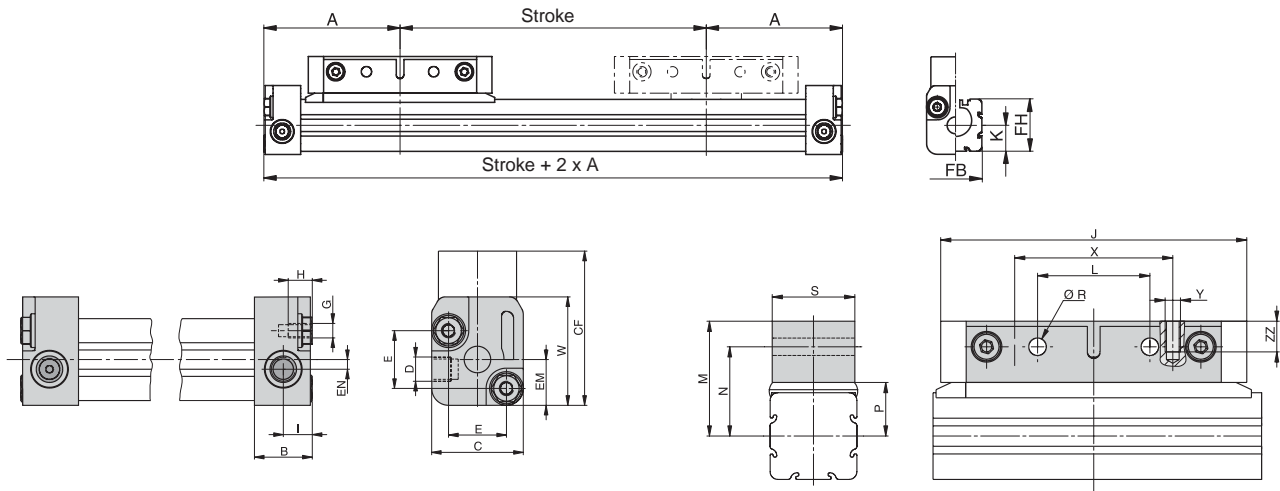
OSP-P
 Series

P1X
 Series

P1Z
 Series

GDL
 Series

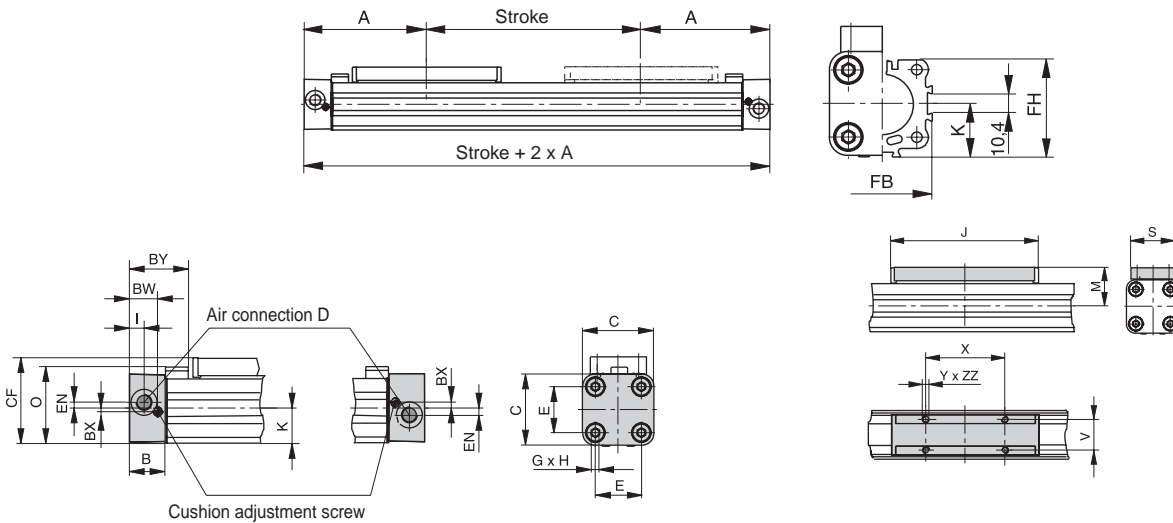
Basic cylinder dimensions – 10mm bore



Dimensions (mm)

Series	A	B	C	D	E	G	H	I	J	K	L	M	N	P	R	S	W	X	Y	Z _{min}	CF	EM	EN	FB	FH	ZZ
OSP-P10	44.5	12	19	M5	12	M3	5	6	60	8.5	22	22.5	17.5	10.5	3.4	16	22.5	31	M3	64	32	9.5	2	17	17	6

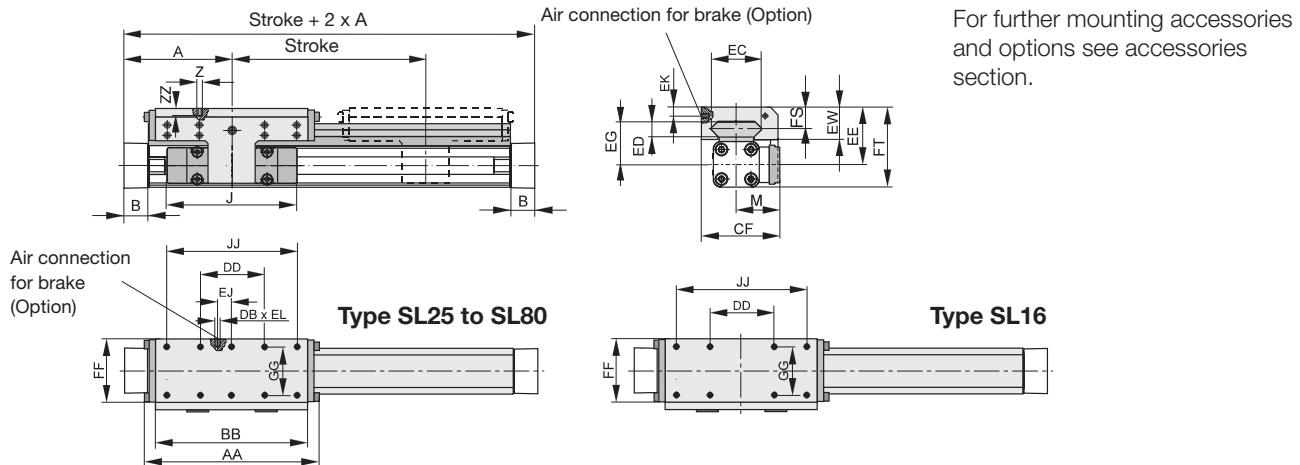
Basic cylinder dimensions – 16 to 80mm bore



Dimensions (mm)

Series	A	B	C	D	E	G	H	I	J	K	M	O	S	V	X	Y	Z	BW	BX	BY	CF	EN	FB	FH	ZZ
OSP-P16	65	14	30	M5	18	M3	9	5.5	69	15	23	33.2	22	16.5	36	M4	81	10.8	1.8	28.4	38	3	30	27.2	7
OSP-P25	100	22	41	G1/827	M5	15	9	117	21.5	31	47	33	25	65	M5	128	17.5	2.2	40	52.5	3.6	40	39.5	8	
OSP-P32	125	25.5	52	G1/436	M6	15	11.5	152	28.5	38	59	36	27	90	M6	170	20.5	2.5	44	66.5	5.5	52	51.7	1	
OSP-P40	150	28	69	G1/454	M6	15	12	152	34	44	72	36	27	90	M6	212	21	3	54	78.5	7.5	62	63	10	
OSP-P50	175	33	87	G1/470	M6	15	14.5	200	43	49	86	36	27	110	M6	251	27	-	59	92.5	11	76	77	10	
OSP-P63	215	38	106	G3/878	M8	21	14.5	256	54	63	107	50	34	140	M8	313	30	-	64	117	12	96	96	16	
OSP-P80	260	47	132	G1/296	M10	25	22	348	67	80	133	52	36	190	M10	384	37.5	-	73	147	16.5	122	122	20	

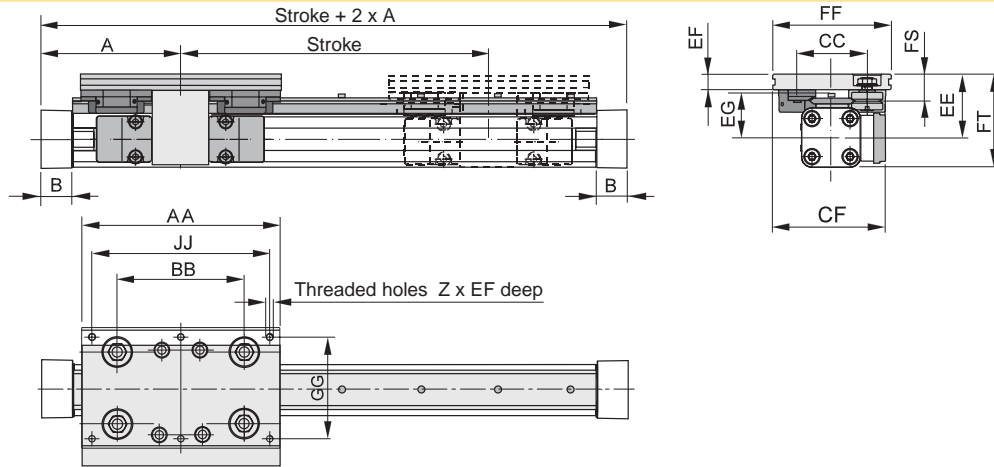
SLIDELINE Dimensions



Dimensions (mm)

Series	A	B	J	M	Z	AA	BB	DB	DD	CF	EC	ED	EE	EG	EJ	EK	EL	EW	FF	FT	FS	GG	JJ	ZZ
SL 16	65	14	69	31	M4	106	88	-	30	55	36	8	40	30	-	-	-	22	48	55	14	36	70	8
SL 25	100	22	117	40.5	M6	162	142	M5	60	72.5	47	12	53	39	22	6	6	30	64	73.5	20	50	120	12
SL 32	125	25.5	152	49	M6	205	185	M5	80	91	67	14	62	48	32	6	6	33	84	88	21	64	160	12
SL 40	150	28	152	55	M6	240	220	M5	100	102	77	14	64	50	58	6	6	34	94	98.5	21.5	78	200	12
SL 50	175	33	200	62	M6	284	264	M5	120	117	94	14	75	56	81	6	6	39	110	118.5	26	90	240	16
SL 63	215	38	256	79	M8	312	292	-	130	152	116	18	86	66	-	-	-	46	152	139	29	120	260	14
SL 80	260	47	348	96	M8	312	292	-	130	169	116	18	99	79	-	-	-	46	152	165	29	120	260	14

POWERSLIDE Dimensions



Dimensions (mm)

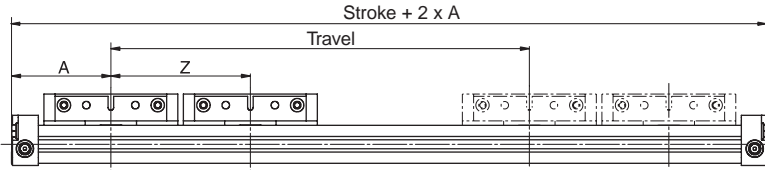
Series	A	B	Z	AA	BB	CC	CF	EE	EF	EG	FF	FS	FT	GG	JJ
PS 16/25	65	14	4xM6	120	65	47	80	49	12	35	80	21	64	64	100
PS 25/25	100	22	6xM6	145	90	47	79.5	53	11	39	80	20	73.5	64	125
PS 25/35	100	22	6xM6	156	100	57	89.5	52.5	12.5	37.5	95	21.5	73	80	140
PS 25/44	100	22	6xM8	190	118	73	100	58	15	39	116	26	78.5	96	164
PS 32/35	125	25.5	6xM6	156	100	57	95.5	58.5	12.5	43.5	95	21.5	84.5	80	140
PS 32/44	125	25.5	6xM8	190	118	73	107	64	15	45	116	26	90	96	164
PS 40/44	150	28	6xM8	190	118	73	112.5	75	15	56	116	26	109.5	96	164
PS 40/60	150	28	6xM8	240	167	89	122.5	74	17	54	135	28.5	108.5	115	216
PS 50/60	175	33	6xM8	240	167	89	130.5	81	17	61	135	28.5	123.5	115	216
PS 50/76	175	33	6xM10	280	178	119	155.5	93	20	64	185	39	135.5	160	250

Piston Options

Tandem pistons can be ordered to provide a larger mounting footprint. This option reduces the travel of the piston. When specifying the stroke of the cylinder, include the desired travel + Z dimension.

Please note Zmin dimension.

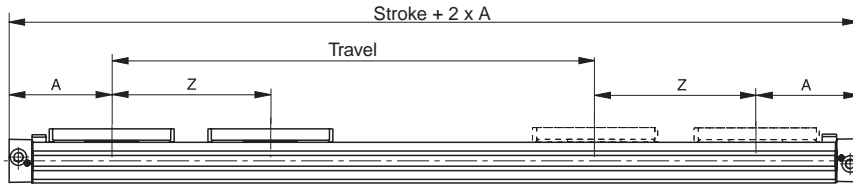
10mm bore



Dimensions (mm)

Series	A	Zmin
OSP-P10	44.5	64

16 to 80mm bore



Dimensions (mm)

Series	A	Z min
OSP-P16	65	81
OSP-P25	100	128
OSP-P32	125	170
OSP-P40	150	212
OSP-P50	175	251
OSP-P63	215	313
OSP-P80	260	384

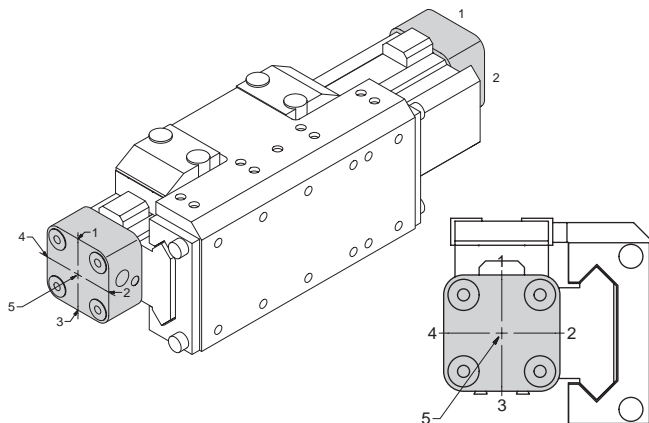
Port orientation

When determining port orientation, the piston carriage is always at position 1. When a bearing system is order, the piston carriage is at position 1 and the bearing carriage is at position 2.

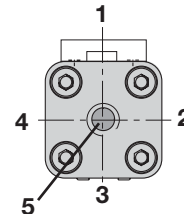
End caps can be field rotated to move port locations, excluding single ended port configurations

Note: Single end ports and port position 5 not available on 10 to 40mm bore.

Cylinder with guide end cap positioning



Basic cylinder end cap positioning



B
 Rodless Cylinders
 Actuator Products
 OSP-P Series
 P1X Series
 P1Z Series
 GDL Series

Joint Clamp Connection \varnothing 25-50 mm

The joint clamp connection combines two OSP-P cylinders of the same size into a compact unit with high performance.

Features

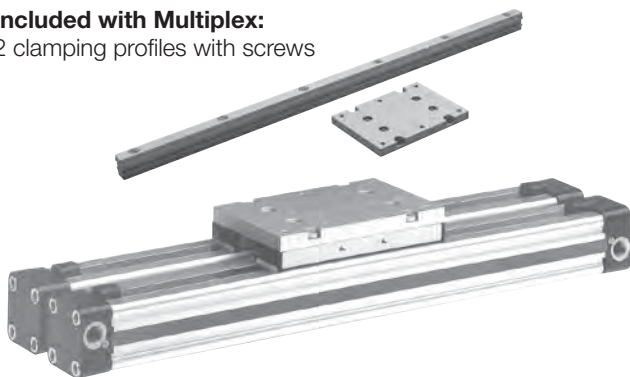
Increased load and torque capacity
 Higher driving forces

Included with Joint Clamp:

2 clamping profiles with screws
 1 mounting plate

Included with Multiplex:

2 clamping profiles with screws



Series	Order number	
	Joint clamp	Multiplex
OSP-P25	20153-sssss	20035-sssss
OSP-P32	20290-sssss	20167-sssss
OSP-P40	20156-sssss	20036-sssss
OSP-P50	20292-sssss	20168-sssss

Note: sssss = stroke of cylinder

Clevis Mounting, \varnothing 16-80 mm

When external guides are used, parallelism deviations can lead to mechanical strain on the piston. This can be avoided by the use of a clevis mounting.

In the drive direction, the mounting has very little play.

Freedom of movement is provided as follows:

- Tilting in direction of movement
- Vertical compensation
- Tilting sideways
- Horizontal compensation

Series	Order number	
	Standard	Stainless
OSP-P16	20462	20463
OSP-P25	20005	20092
OSP-P32	20096	20094
OSP-P40	20024	20093
OSP-P50	20097	20095
OSP-P63	20466	20467
OSP-P80	20477	20478



Inversion Mounting, \varnothing 16-80 mm

In dirty environments, or where there are special space restrictions, inversion of the cylinder is recommended.

The inversion bracket transfers the driving force to the opposite side of the cylinder. The size and position of the mounting holes are the same as on the standard cylinder.

Please note:

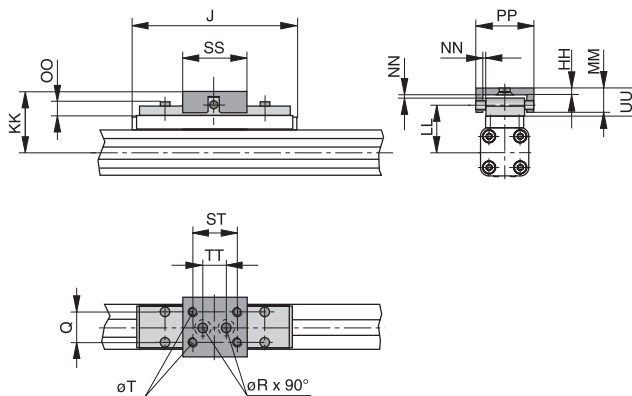
Other components of the OSP system such as **mid-section supports**, **magnetic switches** and the **external air passage for the 16mm bore**, can still be mounted on the free side of the cylinder.

When combining single end porting with inversion mountings, RS magnetic switches can only be mounted directly opposite to the external air-supply profile.



Series	Order number
OSP-P16	20446
OSP-P25	20037
OSP-P32	20161
OSP-P40	20039
OSP-P50	20166
OSP-P63	20459
OSP-P80	20490

Series OSP-P16 to 32



Dimensions (mm)

Series	J	Q	T	\varnothing R	HH	KK	LL	MM	NN*	OO	PP	SS	ST	TT	UU
OSP-P16	69	10	M4	4.5	3	34	26.6	10	1	8.5	26	28	20	10	11
OSP-P25	117	16	M5	5.5	3.5	52	39	19	2	9	38	40	30	16	21
OSP-P32	152	25	M6	6.6	6	68	50	28	2	13	62	60	46	40	30
OSP-P40	152	25	M6	-	6	74	56	28	2	13	62	60	46	-	30
OSP-P50	200	25	M6	-	6	79	61	28	2	13	62	60	46	-	30
OSP-P63	256	37	M8	-	8	100	76	34	3	17	80	80	65	-	37
OSP-P80	348	38	M10	-	8	122	96	42	3	16	88	90	70	-	42

* Dimension NN gives the possible plus and minus play in horizontal and vertical movement, which also makes tilting sideways possible.

Active Brake (Basic Cylinder)



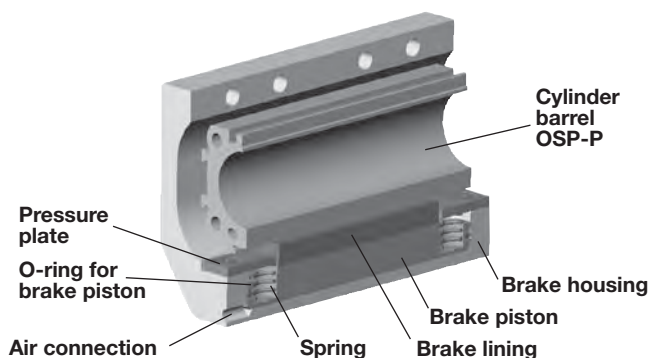
Series AB25 to 80 for basic cylinder

Features

- Actuated by pressurization
- Released by spring actuation
- Holds position, even under changing load conditions

Note:

Cannot be used in combination with intermediate supports or position sensors.



Forces and Weights (SLIDELINE Guide Required)

Series	Max. braking force (N) ⁽¹⁾	Brake pad way (mm)	Mass (kg)			Active brake order number
			Linear drive with brake			
			0 mm stroke	Increase per 100mm stroke	Brake*	
AB 25	350	2.5	1.0	0.197	0.35	20806
AB 32	590	2.5	2.02	0.354	0.58	20807
AB 40	900	2.5	2.83	0.415	0.88	20808
AB 50	1400	2.5	5.03	0.566	1.50	20809
AB 63	2170	3.0	9.45	0.925	3.04	20810
AB 80	4000	3.0	18.28	1.262	5.82	20811

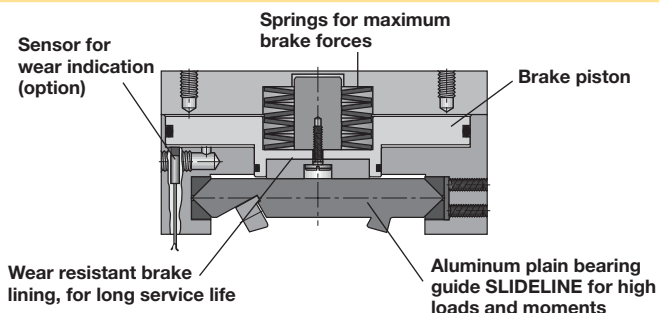
⁽¹⁾ – at 6 bar
 both chambers pressurized with 6 bar
 – oil on the braking surface will reduce braking effectiveness

*** Please Note:**
 The mass of the brake should be added to the total moving mass when using the cushioning diagram.

Multi-Brake

The Multi-Brake is a passive device. When the air pressure is removed the brake is actuated and movement of the cylinder is blocked. The brake is released by pressurization.

The high friction, wear resistant brake linings allow the Multi-Brake to be used as a dynamic brake to stop cylinder movement in the shortest possible time. The powerful springs also allow the Multi-Brake to be used in applications where non-precision positioning is required



Series	Max. brake force N (lb) ⁽¹⁾	Mass of linear drive with guide kg (lb)		Mass* guide carriage kg (lb)
		With 0 mm stroke	Increase per 100 mm stroke	
MB-SL 25	470 (105.7)	2.04 (5.5)	0.39 (1.0)	1.10 (2.9)
MB-SL 32	790 (177.6)	3.82 (10.2)	0.65 (1.7)	1.79 (4.8)
MB-SL 40	1200 (269.8)	5.16 (13.8)	0.78 (2.1)	2.34 (6.3)
MB-SL 50	1870 (420.4)	8.29 (22.2)	0.97 (2.6)	3.63 (9.7)
MB-SL 63	2900 (651.9)	13.31 (35.7)	1.47 (3.9)	4.97 (13.3)
MB-SL 80	2900 (651.9)	17.36 (46.5)	1.81 (4.8)	4.97 (13.3)

⁽¹⁾ Braking surface dry – oil on the braking surface will reduce the braking force

* In the cushioning diagram, the mass of the guide carriage has to be added to the total moving mass.

B
 Rodless Cylinders
 Actuator Products
 Series
 OSP-P
 Series
 P1X
 Series
 P1Z
 Series
 GDL



End cap mountings, \varnothing 10-80 mm

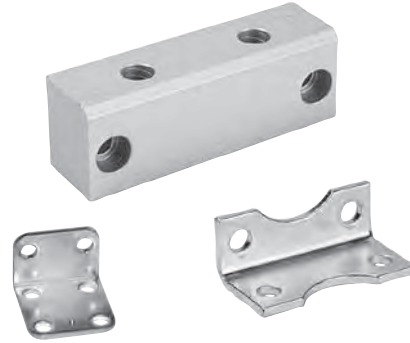
On the face of each end cap there are four threaded holes for mounting the actuator. The hole layout is square, so that the mounting can be fitted to the bottom, top or either side, regardless of the position chosen for the air connection.

Material:

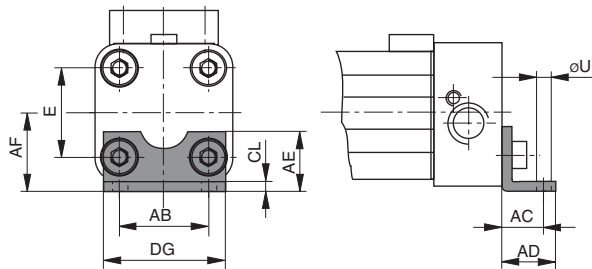
Series OSP-P10 – P32: Galvanized steel.

Series OSP-P40 – P80: Anodized aluminum.

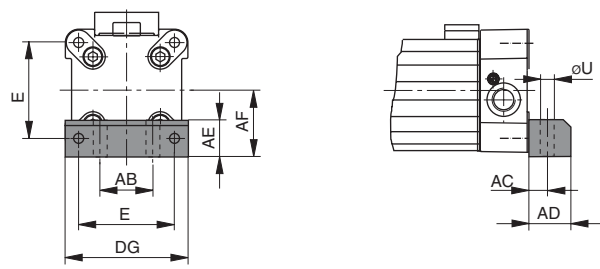
The mountings are supplied in pairs.



Series OSP-P16 to 32: Type A1



Series OSP-P40 to 80: Type C1



Dimensions (mm)

Series	E	ØU	AB	AC	AD	AE	AF	CL	DG
OSP-P10	—	3.6	12	10	14	20.2	11	1.6	18.4
OSP-P16	18	3.6	18	10	14	12.5	15	1.6	26
OSP-P25	27	5.8	27	16	22	18	22	2.5	39
OSP-P32	36	6.6	36	18	26	20	30	3	50
OSP-P40	54	9	30	12.5	24	24	38	—	68
OSP-P50	70	9	40	12.5	24	30	48	—	86
OSP-P63	78	11	48	15	30	40	57	—	104
OSP-P80	96	14	60	17.5	35	50	72	—	130

(* = Pair)

Mounting type

Series	A1	B1	C1	D1	E1
OSP-P10	0240	—	—	—	—
OSP-P16	20408FIL	—	—	20434FIL	20435FIL
OSP-P25	2010	20311FIL	—	20008FIL	20009FIL
OSP-P32	3010	20313FIL	—	20157FIL	20158FIL
OSP-P50	—	—	5010FIL	20162FIL	20163FIL
OSP-P63	—	—	6010FIL	20451FIL	20452FIL
OSP-P80	—	—	8010FIL	20480FIL	20482FIL

Mounting kits can be ordered via the above part numbers.

Note: Mounting kits are provided in pairs.

B

Rodless Cylinders
 Actuator Products

OSP-P
 Series

P1X
 Series

P1Z
 Series

GDL
 Series

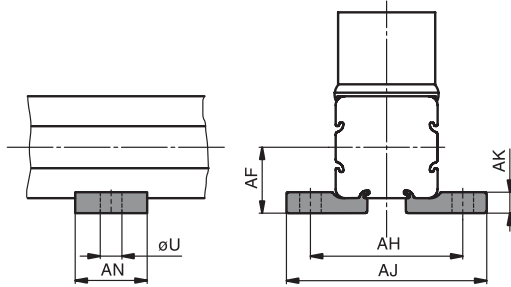
Intermediate supports, ø 10-80 mm

Note on types E1 and D1 (P16 – P80):

The intermediate supports can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.



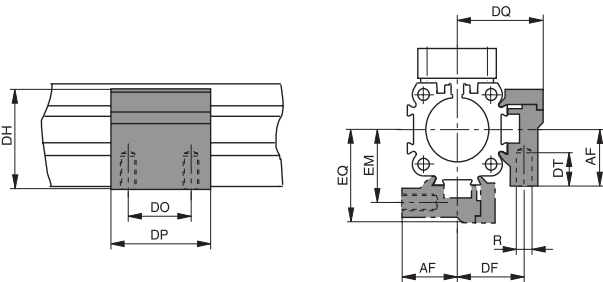
Series OSP-10, Type E1



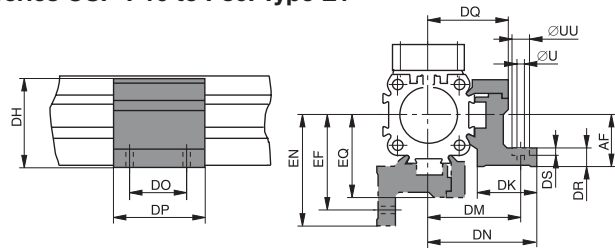
Dimensions (mm) Series OSP-P10

Series	U	AF	AH	AJ	AK	AN
OSP-P10	3.6	11	25.4	33.4	3.5	12

Series OSP-16 to 80, Type D1



Series OSP-P16 to P80: Type E1



Dimension Table (mm) – Series OSP-P16 to P80


Series	R	U	UU	AF	DF	DH	DK	DM	DN	DO	DP	DQ	DR	DS	DT	EF	EM	EN	EQ
OSP-P16	M3	3.4	6	15	20	29.2	24	32	36.4	18	30	27	6	3.4	6.5	32	20	36.4	27
OSP-P25	M5	5.5	10	22	27	38	26	40	47.5	36	50	34.5	8	5.7	10	41.5	28.5	49	36
OSP-P32	M5	5.5	10	30	33	46	27	46	54.5	36	50	40.5	10	5.7	10	48.5	35.5	57	43
OSP-P40	M6	7	-	38	35	61	34	53	60	45	60	45	10	-	11	56	38	63	48
OSP-P50	M6	7	-	48	40	71	34	59	67	45	60	52	10	-	11	64	45	72	57
OSP-P63	M8	9	-	57	47.5	91	44	73	83	45	65	63	12	-	16	79	53.5	89	69
OSP-P80	M10	11	-	72	60	111.5	63	97	112	55	80	81	15	-	25	103	66	118	87

B
 Rodless Cylinders
 Actuator Products
 Series
 OSP-P
 Series
 P1X
 Series
 P1Z
 Series
 GDL

Adaptor profile, ø 16-50 mm

Adaptor profile OSP


A universal attachment for mounting of valves etc.
 Solid material

	Series	Order number	
		Standard	Stainless
	OSP-P16	20432FIL	20438FIL
	OSP-P25	20006FIL	20186FIL
	OSP-P32	20006FIL	20186FIL
	OSP-P40	20025FIL	20267FIL
	OSP-P50	20025FIL	20267FIL

T-Slot Profile ø 16-50 mm

T-slot profile OSP

A universal attachment for mounting with standard T-Nuts

	Series	Order number	
		Standard	Stainless
	OSP-P16	20433FIL	20439FIL
	OSP-P25	20007FIL	20187FIL
	OSP-P32	20007FIL	20187FIL
	OSP-P40	20026FIL	20268FIL
	OSP-P50	20026FIL	20268FIL

Note: Can be used in conjunction with IPS T-nut (20-058).




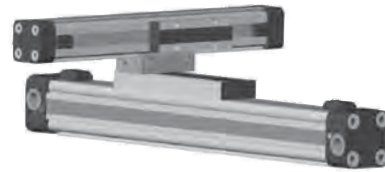
Combination of Series OSP-P with system profiles

Connection profile, ø 16-50 mm

For combining

Series OSP-P with system profiles
 Series OSP-P with Series OSP-P

	Series	Order number
	OSP-P16	20849FIL
	OSP-P25	20850FIL
	OSP-P32	20850FIL
	OSP-P40	20851FIL
	OSP-P50	20851FIL



Combination of Series OSP-P with Series OSP-P

B

Rodless Cylinders
 Actuator Products

OSP-P
 Series

P1X
 Series

P1Z
 Series

GDL
 Series

Other Options



PROLINE
 The compact aluminum roller guide for high loads and velocities and utilizes the GDL Guide Bearing



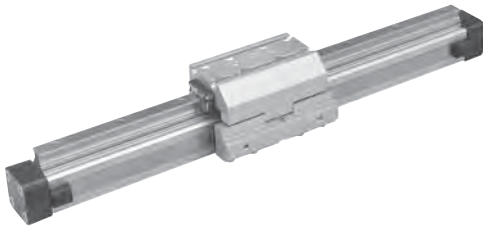
Integrated VOE Valves



STARLINE
 Recirculating ball bearing guide for very high loads and precision



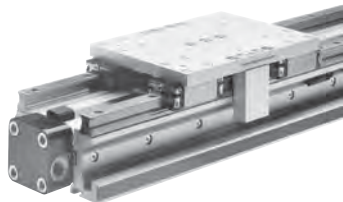
SENSOFLEX SFI-plus
 Incremental measuring system with 0.1 (1.0) mm resolution



KF Guide
 Recirculating ball bearing guide – the mounting dimensions correspond to FESTO Type: DGPL-KF



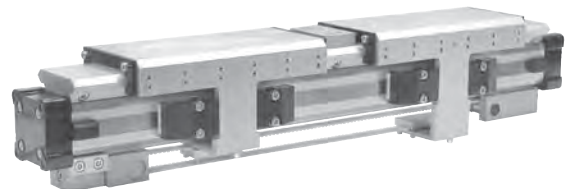
Variable Stop VS
 The variable stop provides simple stroke limitation
 Available on STARLINE only



Heavy Duty Guide HD
 for heavy duty applications



Clean Room Version
 Certified to DIN EN ISO 14644-1



Rodless Cylinder
 For synchronized bi-parting movements
 Available on SLIDELINE Guide Bearing only

B	Actuator Products
	Rodless Cylinders
OSP-P Series	
P1X Series	
P1Z Series	
GDL Series	

Service packs

	Bore sizes						
	16mm	25mm	32mm	40mm	50mm	63mm	80mm
BUNA service pack single piston	11111xsssss	11112xsssss	11113xsssss	11114xsssss	11115xsssss	11116xsssss	11118xsssss
Fluorocarbon service pack single piston	11121xsssss	11122xsssss	11123xsssss	11124xsssss	11125xsssss	11126xsssss	11128xsssss
BUNA service pack single piston - slow speed grease	11131xsssss	11132xsssss	11133xsssss	11134xsssss	11135xsssss	11136xsssss	11138xsssss
Fluorocarbon service pack single piston - slow speed grease	11141xsssss	11142xsssss	11143xsssss	11144xsssss	11145xsssss	11146xsssss	11148xsssss

Note: sssss = stroke of cylinder

Service Pack Information

Service Packs contain all the components necessary to completely rebuild a Parker rodless cylinder, are available. Each pack contains a complete seal kit, inner and outer bands, Parker grease tube, cleaning tool and repair instructions. It's all packaged in an easy-to-ship, easy-to-store box clearly labeled to indicate the cylinder type, bore and stroke for which it is intended. Contact your local Parker distributor for more information.

Seal kits

	Bore sizes						
	16mm	25mm	32mm	40mm	50mm	63mm	80mm
BUNA seal kit - standard cylinder	11052	11053	11054	11055	11056	11057	11058
Fluorocarbon seal kit - standard cylinder	11059	11060	11061	11062	11063	11064	11065
Seal kit - sideline carriage	11066	11067	11068	11069	11070	—	—
Seal kit active brake - standard cylinder	—	11822FIL	11823FIL	11824FIL	11825FIL	11826FIL	11827FIL
Seal kit - multibrake	—	11089FIL	11090FIL	11091FIL	11092FIL	11093FIL	—

Seal Kit Information

Seal Kits include all seals, a tube of grease, bearing shoe, scraper and cleaning tool.

B

Rodless Cylinders
 Actuator Products

OSP-P
 Series

P1X
 Series

P1Z
 Series

GDL
 Series

P1X Series

- 7 bore sizes – 16mm through 63mm
- Two port locations standard
- Large carriage for stability
- Integral sensor mounting rail
- Optional adjustable stroke and shock absorbers



Operating information

Maximum pressure:	100 PSIG (7 bar)	
Minimum pressure:	Ø16, Ø20 bores	29 PSI (2 bar)
	Ø25, Ø32, Ø40 bores	14.5 PSI (1 bar)
	Ø50, Ø63 bores	7 PSI (0.5 bar)
Proof pressure:	152 PSI (10.5 bar)	
Temperature range:	40°F to 140°F (5°C to 60°C)	
Filtration requirements:	Filtered, nonlubricated compressed air	

Ordering Information

P1X	N	032	D	A	N	0500	W	D	N	N	N	-B
Series	Construction	Bore size	Carriage	Piston / Shock style	Seal material	Stroke length*	Basic or options	Porting options	Carriage mounting style	Mounting options	Fastener Type	
P1X Global Rodless	N Inch M Metric	016 16mm 020 20mm 025 25mm 032 32mm 040 40mm 050 50mm 063 63mm	D Double acting	A Cushions both ends (standard) R Cushion right end only* L Cushion left end only* N No cushions or shock absorbers H Shock absorber both ends** B Shock absorber right end only** C Shock absorber left end only**	N Standard	0500	B† Standard W† With options / Special (for factory use only)	N NPTF (Std) G BSPP Q BSPT*	D Basic mount J Inverted basic mount A Swivel mount G Inverted swivel mount	No Foot mount End mount foot bracket Bottom mount foot bracket Intermediate supports	N Standard - zinc-plated S Stainless steel	

* As viewed from port side of cylinder
 ** Cannot be combined with inverted carriage

* Stroke is ALWAYS in mm.
 † When "B" is specified, the remaining digits in the part number are not necessary. If "W" is used, the remaining digits in the part number must be filled out.
 †† Not available on 40, 50 and 63mm bore sizes.

Essential Information
 Optional Features

Sensors
 For sensors see page B339.

B
 Rodless Cylinders
 Actuator Products
 OSP-P Series
 P1X Series
 P1Z Series
 GDL Series

Specifications

Model	P1X (Standard w/switch)			
Bore size mm (inch nominal)	16 (5/8)	20 (3/4), 25 (1)	32 (1-1/4), 40 (1-1/2)	50 (2), 63 (2 1/2)
Port size – N series	M5 (10-32)	1/8 NPT	1/4 NPT	3/8 NPT
Port size – M series	M5 (10-32)	1/8 Rc	1/4 Rc	3/8 Rc
Stroke tolerance in.	±0.080 to 39"	±0.100 to 118"	±0.120 to 196"	
Piston speed, *in./sec.	2-80 IPS with side ports on each end (Ø16 & Ø20 bores 2-40 IPS with single end porting with 39" stroke) (Ø25, Ø32, Ø40, Ø50 & Ø63 bores 2-40 IPS with single end porting with 78" stroke)			
Cushion	Air cushion standard			
Lubrication	Not required (if you choose to lubricate your system, continuing lubrication will be required.)			

*Actual piston speed with one end port will vary depending on stroke length.

Weight & theoretical force characteristics

Bore	Area in ²	Weights												
		Weight at zero stroke						Weight per 1" (25.4mm) stroke		Theoretical force (lbs) At pressure (PSI)				
		M00		MLB		MLB1		lbs	kg	30	40	60	80	100
16	0.31	0.70	0.3	0.73	0.3	0.77	0.4	0.07	0.03	9	12	19	25	31
20	0.49	1.15	0.5	1.19	0.5	1.28	0.6	0.10	0.04	15	20	29	39	49
25	0.84	2.21	1.0	2.43	1.1	2.43	1.1	0.15	0.07	23	30	46	61	76
32	1.26	3.31	1.5	3.53	1.6	3.75	1.7	0.20	0.09	38	50	69	100	125
40	1.96	5.29	2.4	5.51	2.5	—	—	0.27	0.12	59	78	117	156	195
50	3.08	7.94	3.6	8.16	3.7	—	—	0.40	0.18	91	122	182	243	304
63	4.86	13.67	6.2	14.33	6.5	—	—	0.63	0.28	145	193	290	386	483

Moments

Figure 1 shows the maximum allowable moments for each of the three types of loading: pitch, roll and yaw.

The sum total of each of these types of moments, divided by each of the maximum values, determines a Load-Moment Factor (LMF) should be equal to or less than 1.0. On horizontal mountings, the total load (L) should also be divided by the maximum load allowable (Figure 2) and factored into the equation.

Horizontal mountings:

$$\frac{L}{[L]} + \frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

Vertical mountings:

$$\frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

Figure 1

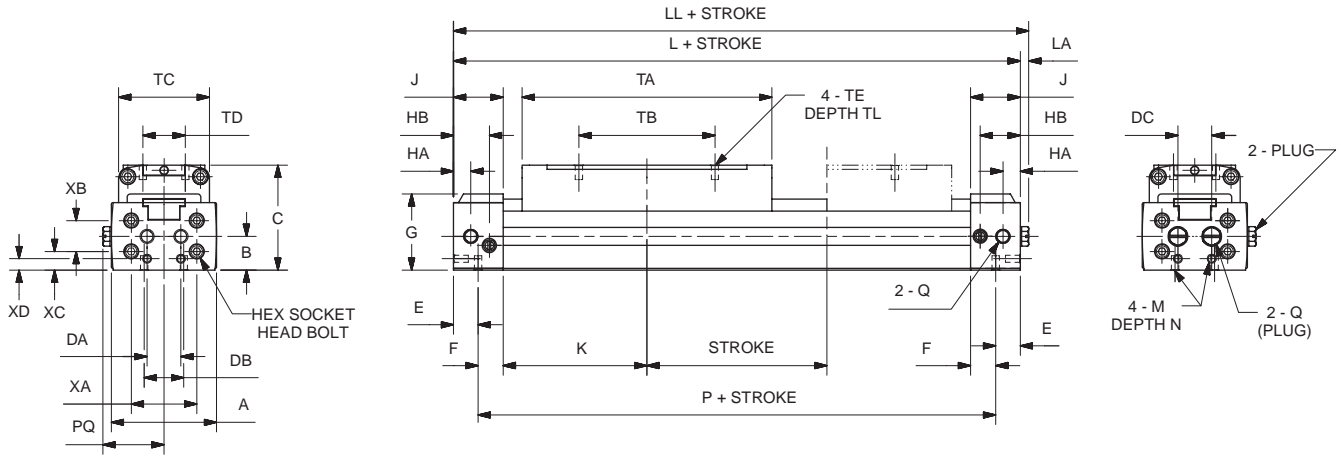
Maximum allowable moments n-m (lb-in)

Bore size	[M]		[Ms]		[Mv]	
	Pitch moment		Roll moment		Yaw moment	
	Std.	Inverted	Std.	Inverted	Std.	Inverted
16	5 (44)	3.5 (31)	1 (9)	0.5 (4)	1 (9)	1 (9)
20	10 (89)	7 (62)	1.5 (13)	0.7 (6)	3 (27)	3 (27)
25	17 (150)	12 (106)	5 (44)	2.5 (22)	10 (89)	10 (89)
32	36 (319)	25 (221)	10 (89)	5 (44)	21 (186)	21 (186)
40	77 (682)	54 (478)	23 (204)	11.5 (102)	26 (230)	26 (230)
50	154 (1363)	108 (956)	32 (283)	16 (142)	42 (372)	42 (372)
63	275 (2434)	193 (1708)	52 (460)	26 (230)	76 (673)	76 (673)

Figure 2

Bore size	Max. allowable load [L] N (lbs)		Max. unsupported length mm (in) at max. load
	Std.	Inverted	
16	141 (32)	70 (16)	450 (17.7)
20	198 (45)	101 (23)	551 (21.7)
25	356 (81)	180 (41)	899 (35.4)
32	616 (140)	308 (70)	749 (29.5)
40	959 (218)	480 (109)	1000 (39.4)
50	1456 (331)	726 (165)	1300 (51.2)
63	2297 (522)	1148 (261)	1600 (63.0)

Basic cylinder



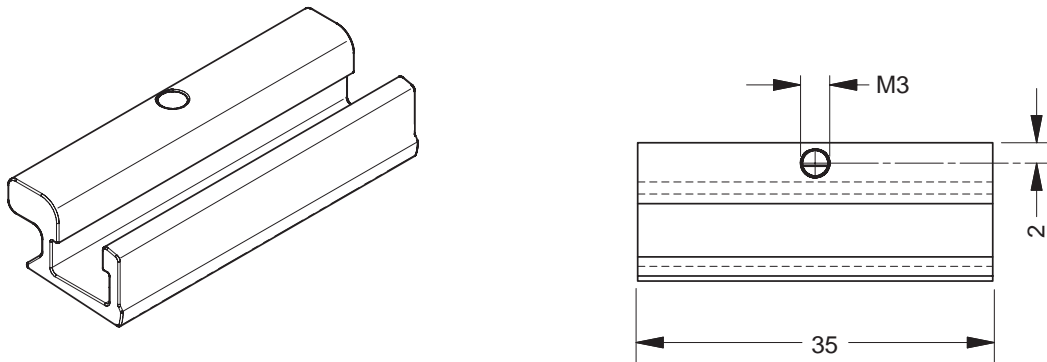
Bore (mm)	A	B	C	DA	DB	DC	E	F	G	HA	HB	J	K	L	LL	LA	M	N
16	1.46 (37)	0.47 (12)	1.46 (37)	0.47 (12)	0.55 (14)	0.47 (12)	0.34 (8.5)	0.35 (9)	1.06 (27)	0.24 (6)	0.55 (14)	0.69 (17.5)	2.24 (57)	5.87 (149)	5.98 (152)	0.12 (3)	5-40 (M3)	0.20 (5)
20	1.73 (44)	0.55 (14)	1.65 (42)	0.55 (14)	0.63 (16)	0.63 (16)	0.41 (10.5)	0.45 (11.5)	1.22 (31)	0.34 (8.5)	0.73 (18.5)	0.87 (22)	2.46 (62.5)	6.65 (169)	6.75 (171.5)	0.10 (2.5)	8-32 (M4)	0.26 (6.5)

Bore (mm)	P	PQ	Q	TA	TB	TC	TD	TE	TL	XA	XB	XC	XD
16	5.20 (132)	0.83 (21)	10-32 NPT (M5)	3.47 (88)	1.89 (48)	1.26 (32)	0.59 (15)	5-40 (M3)	0.20 (5)	0.91 (23)	0.43 (11)	0.26 (6.5)	0.16 (4)
20	5.83 (148)	0.97 (24.5)	1/8 NPT (1/8 Rc)	3.94 (100)	2.36 (60)	1.50 (38)	0.71 (18)	8-32 (M4)	0.24 (6)	1.10 (28)	0.63 (16)	0.24 (6)	0.20 (5)

inches (mm)

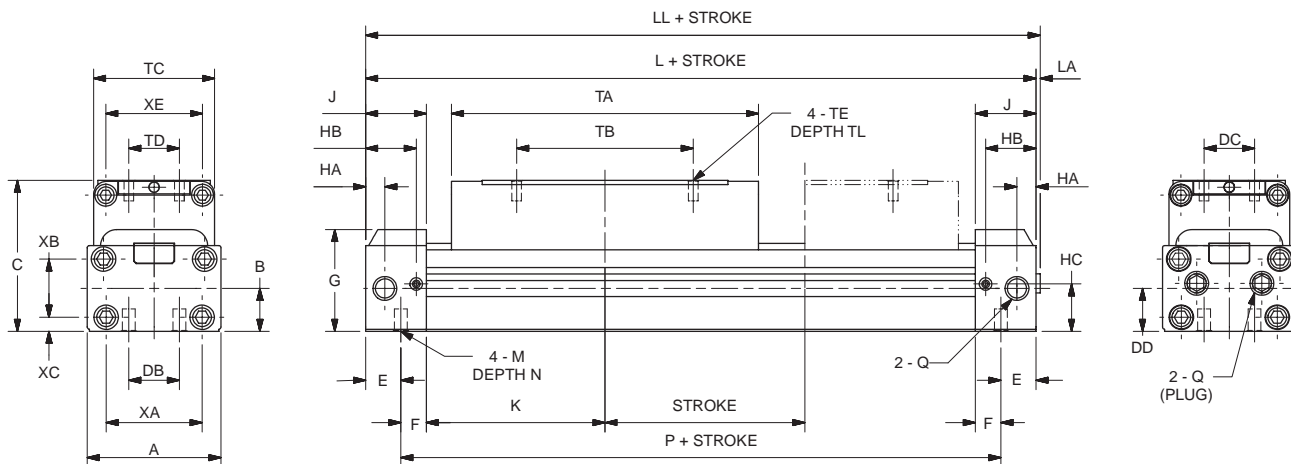
Sensor adapter bracket

Part number P8S-TMA0Y
 (Shown larger than actual size)



NOTE: Must be ordered separately when ordering sensors.

Basic cylinder



Bore (mm)	A	B	C	DB	DC	DD	E	F	G	HA	HB	HC	J	K	L	LL	LA	M	N
25	2.09 (53)	0.67 (17)	2.09 (53)	0.79 (20)	1.02 (26)	0.75 (19)	0.55 (14)	0.39 (10)	1.59 (40.5)	0.30 (7.5)	0.79 (20)	0.74 (18.9)	0.95 (24)	2.80 (71)	7.48 (190)	7.56 (192)	0.08 (2)	1/4-20 (M6)	0.35 (9)
32	2.60 (66)	0.73 (18.5)	2.24 (57)	1.26 (32)	1.06 (27)	0.83 (21)	0.59 (15)	0.51 (13)	1.71 (43.5)	0.39 (10)	0.93 (23.5)	0.85 (21.5)	1.10 (28)	3.35 (85)	8.90 (226)	9.00 (228.5)	0.10 (2.5)	1/4-20 (M6)	0.35 (9)
40	3.15 (80)	0.87 (22)	2.64 (67)	1.42 (36)	1.38 (35)	1.10 (28)	0.67 (17)	0.55 (14)	2.03 (51.5)	0.51 (13)	1.02 (26)	1.06 (27)	1.22 (31)	3.58 (91)	9.61 (244)	9.71 (246.5)	0.10 (2.5)	5/16-18 (M8)	0.47 (12)
50	3.78 (96)	1.10 (28)	3.23 (82)	1.77 (45)	1.38 (35)	1.38 (35)	0.91 (23)	0.63 (16)	2.40 (61)	0.59 (15)	1.30 (33)	1.39 (35.3)	1.54 (39)	3.54 (90)	10.16 (258)	10.26 (260.5)	0.10 (2.5)	5/16-18 (M8)	0.47 (12)
63	4.65 (118)	1.38 (35)	3.74 (95)	1.97 (50)	1.54 (39)	1.65 (42)	0.75 (19)	0.79 (20)	2.91 (74)	0.59 (15)	1.26 (32)	1.69 (43)	1.54 (39)	4.29 (109)	11.65 (296)	11.75 (298.5)	0.10 (2.5)	3/8-16 (M10)	0.59 (15)

Bore (mm)	P	Q	TA	TB	TC	TD	TE	TL	XA	XB	XC	XE
25	6.38 (162)	1/8 NPT (1/8 Rc)	4.80 (122)	2.76 (70)	1.89 (48)	0.79 (20)	10-24 (M5)	0.32 (8)	1.50 (38)	0.91 (23)	0.22 (5.5)	1.58 (40)
32	7.72 (196)	1/4 NPT (1/4 Rc)	5.28 (134)	3.15 (80)	2.21 (56)	0.79 (20)	1/4-20 (M6)	0.35 (9)	1.89 (48)	0.98 (25)	0.24 (6)	1.85 (47)
40	8.27 (210)	1/4 NPT (1/4 Rc)	5.83 (148)	3.54 (90)	2.68 (68)	1.18 (30)	1/4-20 (M6)	0.43 (11)	2.36 (60)	1.18 (30)	0.28 (7)	2.28 (58)
50	8.35 (212)	3/8 NPT (3/8 Rc)	5.98 (152)	3.94 (100)	3.15 (80)	1.18 (30)	5/16-18 (M8)	0.51 (13)	2.91 (74)	1.42 (36)	0.39 (10)	2.76 (70)
63	10.16 (258)	3/8 NPT (3/8 Rc)	6.61 (168)	4.33 (110)	4.02 (102)	1.58 (40)	5/16-18 (M8)	0.51 (13)	3.78 (96)	1.65 (42)	0.55 (14)	3.54 (90)

inches (mm)

B

Rodless Cylinders
Actuator Products

OSP-P Series

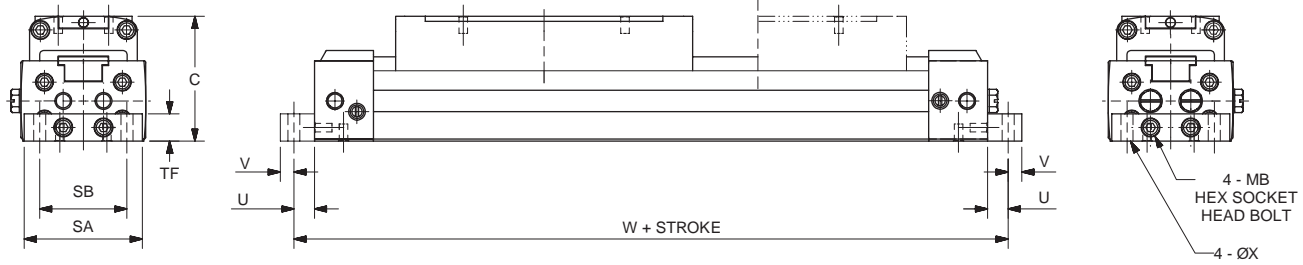
P1X Series

P1Z Series

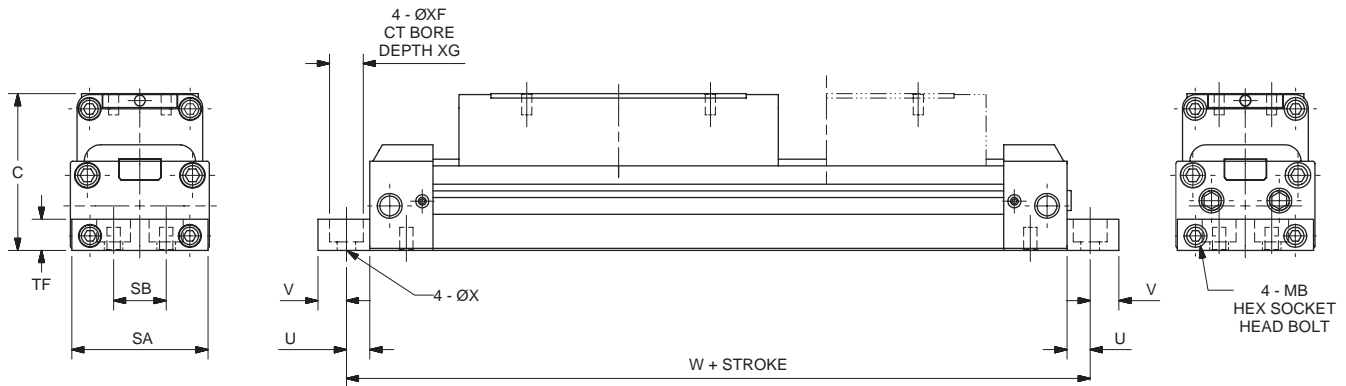
GDL Series



16 to 32 mm bore sizes



40 to 63 mm bore sizes



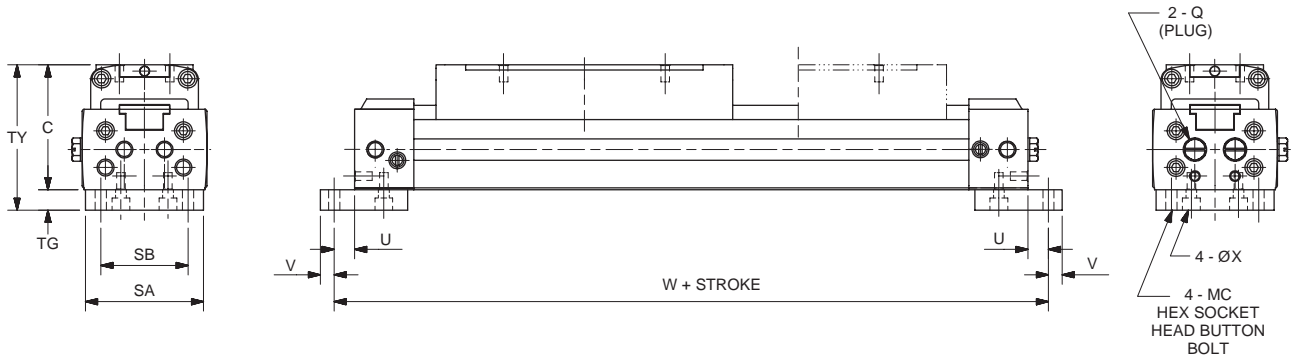
Bore (mm)	C	SA	SB	TF	U	V	W	X	XF	XG	MB
16	1.46 (37)	1.38 (35)	1.02 (26)	0.32 (8)	0.24 (6)	0.16 (4)	6.34 (161)	0.14 (3.6)	—	—	M3x10
20	1.65 (42)	1.69 (43)	1.30 (33)	0.39 (10)	0.24 (6)	0.24 (6)	7.13 (181)	0.19 (4.7)	—	—	M4x12
25	2.09 (53)	2.05 (52)	0.79 (20)	0.47 (12)	0.35 (9)	0.43 (11)	8.19 (208)	0.28 (7)	—	—	M5x50
32	2.24 (57)	2.52 (64)	1.26 (32)	0.47 (12)	0.35 (9)	0.43 (11)	9.61 (244)	0.28 (7)	—	—	M5x50
40	2.64 (67)	3.15 (80)	1.18 (30)	0.59 (15)	0.49 (12.5)	0.45 (11.5)	10.60 (269)	0.35 (9)	0.51 (13)	0.34 (8.7)	M6x55
50	3.23 (82)	3.70 (94)	1.57 (40)	0.79 (20)	0.49 (12.5)	0.45 (11.5)	11.10 (283)	0.35 (9)	0.51 (13)	0.34 (8.7)	M8x65
63	3.74 (95)	4.57 (116)	1.89 (48)	0.98 (25)	0.59 (15)	0.59 (15)	12.80 (326)	0.43 (11)	0.61 (15.5)	0.41 (10.5)	M8x70

inches (mm)

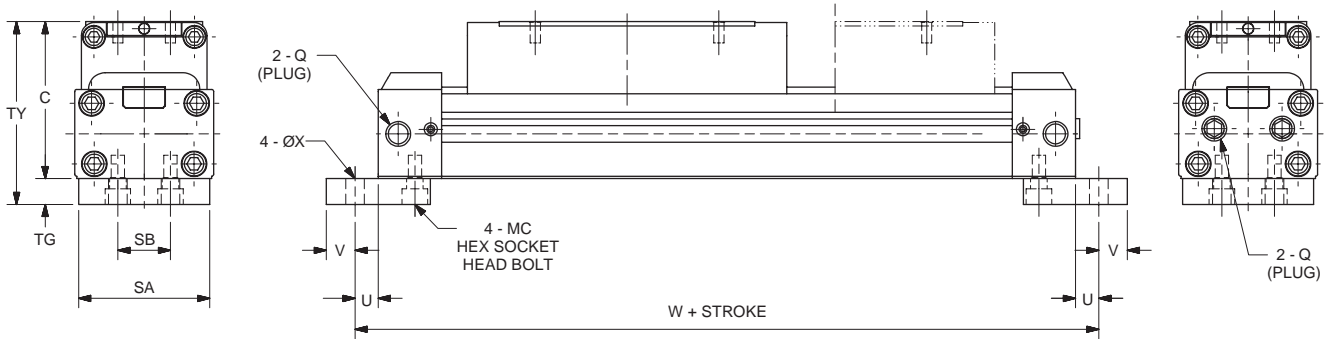
B
 Rodless Cylinders
 Actuator Products
 Series OSP-P
 Series P1X
 Series P1Z
 Series GDL



16 to 20 mm bore sizes



25 to 32 mm bore sizes



Bore (mm)	C	Q	SA	SB	TG	TY	U	V	W	X	MC
16	1.46 (37)	10-32 (M5)	1.38 (35)	1.02 (26)	0.24 (6)	1.69 (43)	0.24 (6)	0.16 (4)	6.34 (161)	0.13 (3.4)	5-40, 1/4 LG
20	1.65 (42)	1/8 NPT (1/8 Rc)	1.69 (43)	1.30 (33)	0.32 (8)	1.97 (50)	0.24 (6)	0.24 (6)	7.13 (181)	0.18 (4.5)	8-32, 3/8 LG
25	2.09 (53)	1/8 NPT (1/8 Rc)	1.97 (50)	0.79 (20)	0.39 (10)	2.48 (63)	0.35 (9)	0.43 (11)	8.19 (208)	0.28 (7)	1/4-20 x 1/2 LG
32	2.24 (57)	1/4 NPT (1/4 Rc)	2.52 (64)	1.26 (32)	0.39 (10)	2.64 (67)	0.35 (9)	0.43 (11)	9.61 (244)	0.28 (7)	1/4-20 x 1/2 LG
40	2.64 (67)	1/4 NPT (1/4 Rc)	—	—	—	—	—	—	—	—	—
50	3.23 (82)	3/8 NPT (3/8 Rc)	—	—	—	—	—	—	—	—	—
63	3.74 (95)	3/8 NPT (3/8 Rc)	—	—	—	—	—	—	—	—	—

inches (mm)

B

Rodless Cylinders
 Actuator Products

OSP-P
 Series

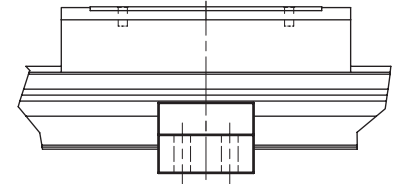
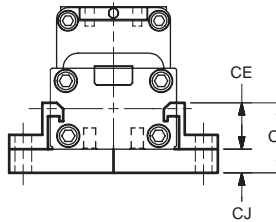
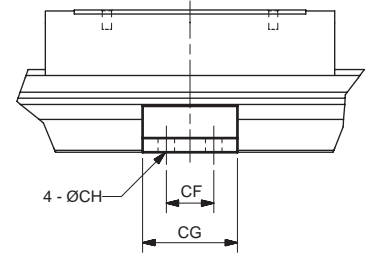
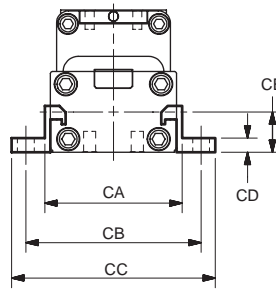
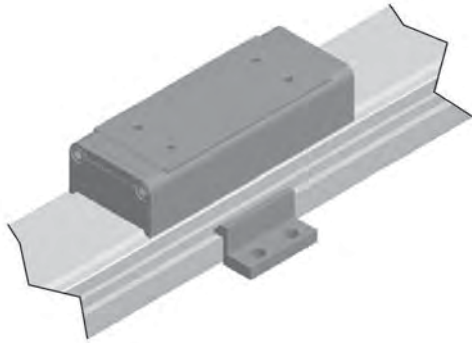
P1X
 Series

P1Z
 Series

GDL
 Series

Intermediate support brackets

End mount



Intermediate support brackets (2 per kit)

Bore (mm)	CA	CB	CC	CD	CE	CF	CG	CH
16	1.654 (42)	2.205 (56)	2.52 (64)	0.118 (3)	0.472 (12)	0.787 (20)	1.378 (35)	0.157 (4)
20	1.929 (49)	2.52 (64)	2.953 (75)	0.157 (4)	0.551 (14)	0.787 (20)	1.496 (38)	0.197 (5)
25	2.362 (60)	2.992 (76)	3.465 (88)	0.236 (6)	0.768 (19.5)	0.787 (20)	1.575 (40)	0.276 (7)
32	2.913 (74)	3.465 (88)	3.937 (100)	0.236 (6)	0.846 (21.5)	0.787 (20)	1.575 (40)	0.276 (7)
40	3.543 (90)	4.252 (108)	4.882 (124)	0.236 (6)	0.965 (24.5)	1.181 (30)	2.362 (60)	0.354 (9)
50	4.173 (106)	4.882 (124)	5.512 (140)	0.315 (8)	1.201 (30.5)	1.181 (30)	2.362 (60)	0.354 (9)
63	5.118 (130)	5.984 (152)	6.772 (172)	0.394 (10)	1.516 (38.5)	1.969 (50)	3.543 (90)	0.433 (11)

Bore (mm)	CJ	CK	Kit part number	
			End mount or no mount	Bottom mount
16	0.236 (6)	0.709 (18)	L080180016	L080190016
20	0.315 (8)	0.866 (22)	L080180020	L080190020
25	0.394 (10)	1.161 (29.5)	L080180025	L080190025
32	0.394 (10)	1.24 (31.5)	L080180032	L080190032
40	—	—	L080180040	
50	—	—	L080180050	
63	—	—	L080180063	

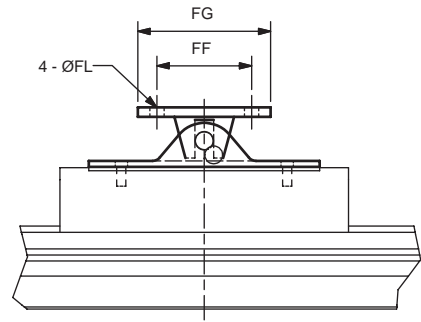
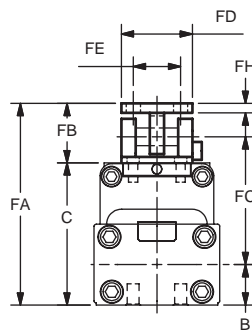
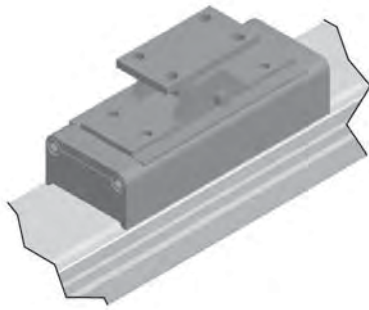
inches (mm)

B
 Rodless Cylinders
 Actuator Products
 OSP-P Series
 P1X Series
 P1Z Series
 GDL Series



Swivel mount

Absorbs misalignment between cylinder and load



FJ dimension is the maximum horizontal float

FK dimension is the maximum vertical float

Swivel mounts

Bore (mm)	FA	FB	FC	FD	FE	FF	FG	FH
16	2.238 (58)	0.827 (21)	1.339 (34)	0.945 (24)	0.673 (16)	1.181 (30)	1.575 (40)	0.118 (3)
20	2.638 (67)	0.984 (25)	1.535 (39)	1.181 (30)	0.787 (20)	1.575 (40)	2.205 (56)	0.157 (4)
25	3.071 (78)	0.984 (25)	1.85 (47)	1.181 (30)	0.787 (20)	1.575 (40)	2.205 (56)	0.157 (4)
32	3.74 (95)	1.496 (38)	2.185 (55.5)	1.772 (45)	1.181 (30)	1.969 (50)	2.756 (70)	0.236 (6)
40	4.134 (105)	1.496 (38)	2.441 (62)	1.772 (45)	1.181 (30)	1.969 (50)	2.756 (70)	0.236 (6)
50	4.961 (126)	1.732 (44)	2.874 (73)	2.362 (60)	1.575 (40)	2.756 (70)	3.543 (90)	0.315 (8)
63	5.472 (139)	1.732 (44)	3.11 (79)	2.362 (60)	1.575 (40)	2.756 (70)	3.543 (90)	0.315 (8)

inches (mm)

Bore (mm)		FJ	FK	FL	B	C	Part number
16	inches	0.118	0.118	0.134	0.472	1.457	L078930016
	mm	3	3	3.4	12	37	
20	inches	0.118	0.118	0.177	0.551	1.654	L080160020
	mm	3	3	4.5	14	42	
25	inches	0.118	0.118	0.236	0.669	2.087	L080160025
	mm	3	3	6	17	53	
32	inches	0.197	0.197	0.276	0.728	2.244	L080160032
	mm	5	5	7	18.5	57	
40	inches	0.197	0.197	0.276	0.866	2.638	L080160040
	mm	5	5	7	22	67	
50	inches	0.197	0.197	0.354	1.102	3.228	L080160050
	mm	5	5	9	28	82	
63	inches	0.197	0.197	0.354	1.378	3.74	L080160063
	mm	5	5	9	35	95	

B

Rodless Cylinders
 Actuator Products

OSP-P
 Series

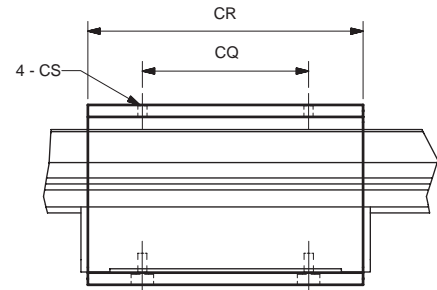
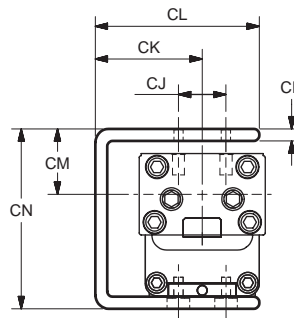
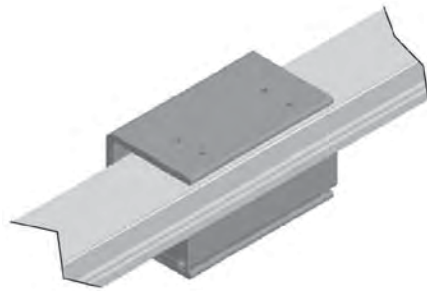
P1X
 Series

P1Z
 Series

GDL
 Series

Inverted mount

Provides mounting surface 180° from carriage



Inverted mounts*

Bore (mm)		CJ	CK	CL	CM	CN	CP	CQ	CR	CS	Part number**
16	inches	0.591	1.398	1.969	1.142	2.362	0.236	1.89	3.465	5-40	L080170016
	mm	15	35.5	50	29	60	6	48	88		L08017M016
20	inches	0.709	1.28	1.969	1.024	2.362	0.236	2.362	3.937	8-32	L080170020
	mm	18	32.5	50	26	60	6	60	100		L08017M020
25	inches	0.787	1.772	2.717	1.181	2.795	0.197	2.756	4.567	10-24	L080170025
	mm	20	45	69	30.0	71	5	70	116		L08017M025
32	inches	0.787	2.126	3.209	1.358	3.15	0.276	3.15	5.039	1/4-20	L080170032
	mm	20	54	81.5	34.5	80	7	80	128		L08017M032
40	inches	1.181	2.48	3.76	1.516	3.602	0.315	3.543	5.433	1/4-20	L080170040
	mm	30	63	95.5	38.5	91.5	8	90	138		L08017M040
50	inches	1.181	2.913	4.449	1.909	4.429	0.394	3.937	5.591	5/16-18	L080170050
	mm	30	74	113	48.5	112.5	10	100	142		L08017M050
63	inches	1.575	3.465	5.433	2.283	5.157	0.512	4.331	6.22	5/16-18	L080170063
	mm	40	88	138	58	131	13	110	158		L08017M063

*Inverted mounts not available with adjustable stroke, shock absorber or tube center support bracket.

**Use this part number when ordering as a separate part. When ordering with cylinder, use "C" option as part of cylinder part number.

End port piping

Refer to Figure 3 to determine when end port piping can be used with various types of mountings relative to fitting clearance.

On all bore sizes with foot mounting, the end port pipe fittings will obstruct the mounting holes. To avoid this problem, mount the cylinder first and tighten the mounting bolts and then attach the pipe fittings to the cylinder ports.

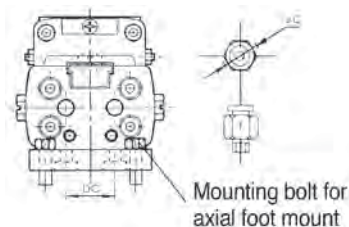


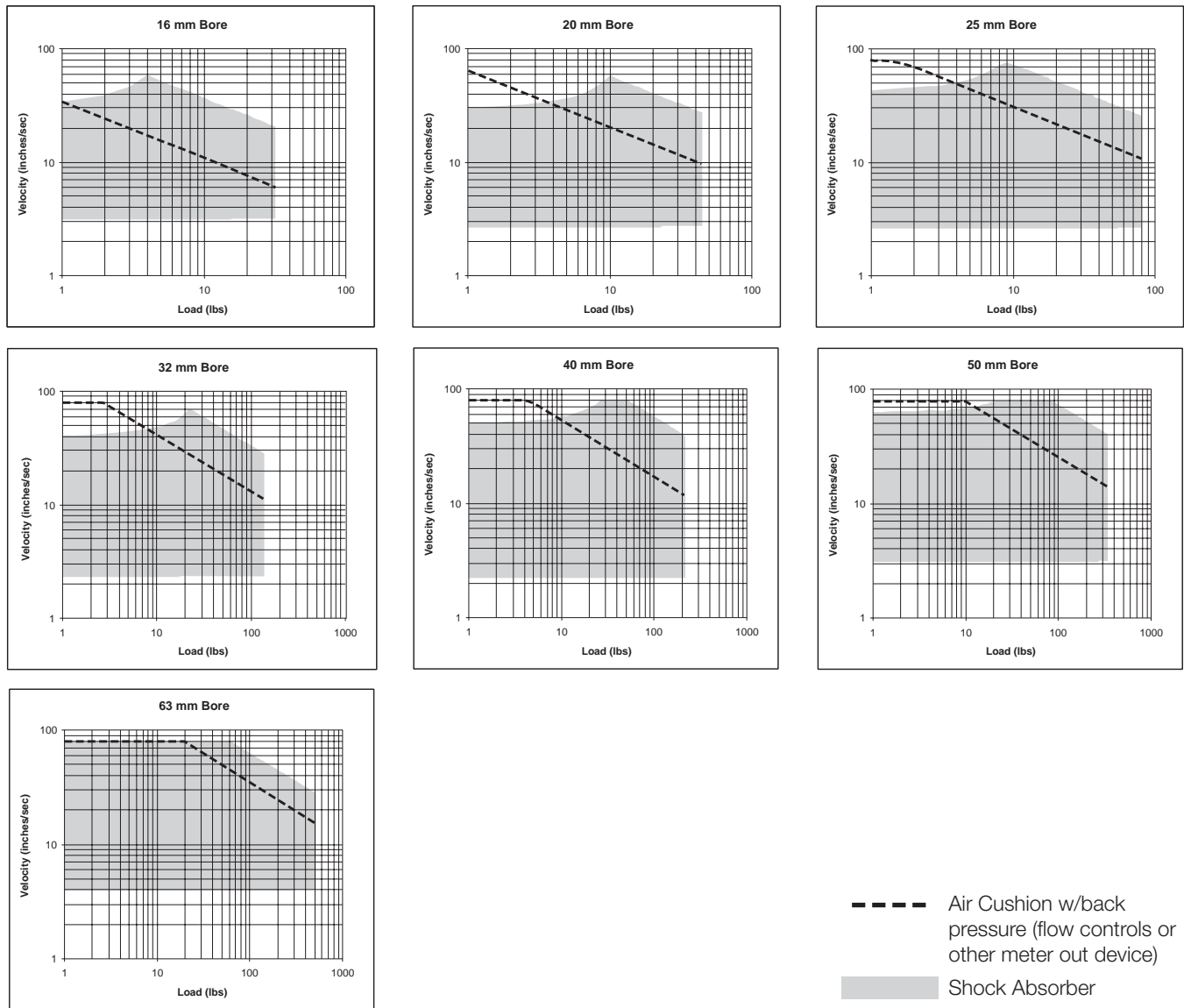
Figure 3

Bore (mm)	øC [O.D. of fittings - mm (in.)]		
	No mount	End mount	Bottom mount
16	12 (0.472)		12 (0.472)
20	16 (0.630)	End Port Piping	16 (0.630)
25	26 (1.024)	Not Available	26 (1.024)
32	27 (1.065)		27 (1.063)
40	35 (1.378)	26 (1.024)	
50	35 (1.378)	30 (1.181)	
63	39 (1.535)	34 (1.339)	

Shock absorber specifications

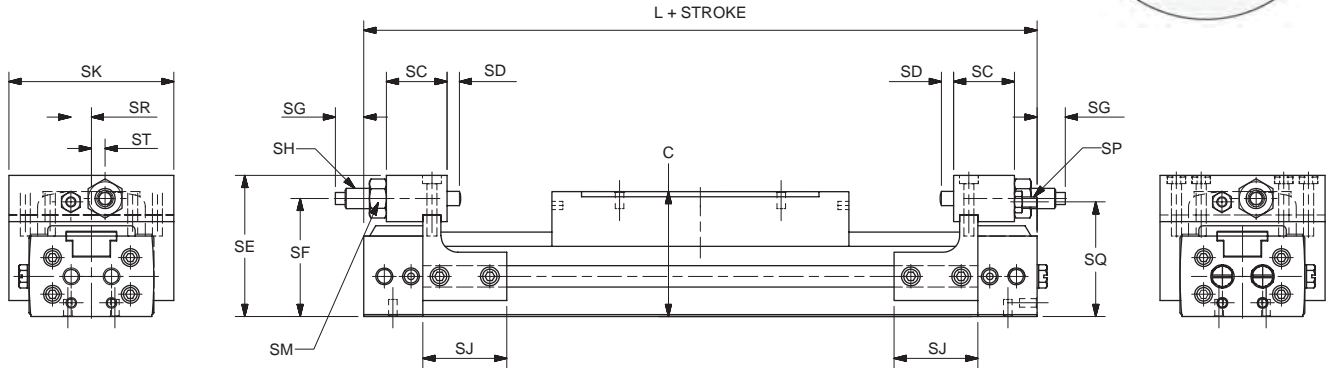
Cylinder	16mm	20mm	25mm	32mm	40mm	50, 63mm
Shock absorber number	0887790016	0887790020	0887790025	0887790032	0887790040	0887790050
Max. energy absorption - in.-lbs (kgf-m)	26.0 (0.3)	60.8 (0.7)	104.2 (1.2)	226 (2.6)	608 (7.0)	1042 (12)
Stroke - inches	0.236	0.315	0.394	0.590	0.787	0.984
Energy absorption / hour - in.-lbs / hour	54,700	109,380	187,510	338,560	729,200	750,000
Max. impact velocity - in. / sec.	59	59	78.7	78.7	98.4	118.1
Max. cycle rate per hour	2100	1800	1800	1500	1200	720
Ambient temperature - °F (°C)	41-140 (5-60)					
Spring return force - lb. Extended	0.65	0.45	0.65	1.33	2.20	3.60
Compressed	1.01	0.97	1.33	2.65	4.86	7.49
Return time - Sec.	0.3	0.3	0.3	0.3	0.4	0.4

Performance data (16 to 32mm bores)



- Notes:**
1. If the cylinder is vertical in orientation, double the total load for bottom shock absorber.
 2. Use the total load that is being moved by shock absorber. If a weight transfer application, this would include La.
 3. If final velocity cannot be easily determined, use two times the stroke divided by the stroke time.

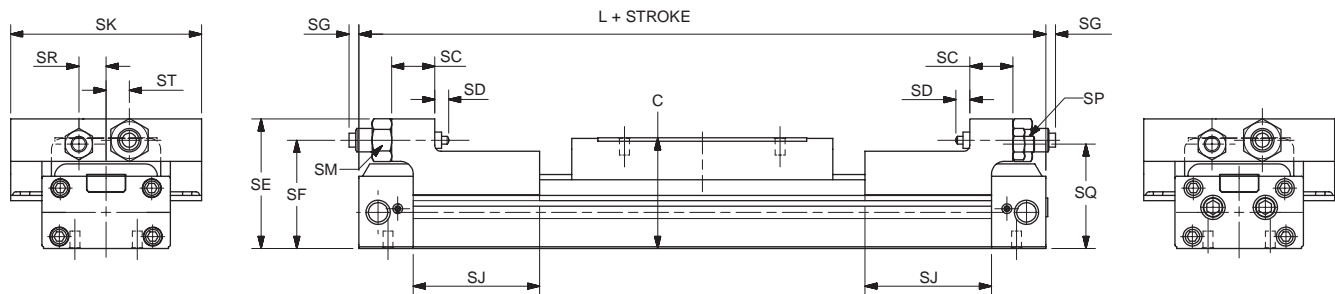
16 to 25 mm bore sizes



Bore (mm)	SC	SD	SE	SF	SG		SH in-lbs	SJ	SK	SP	SQ	SR	ST	C	L
					Max	Min									
16	0.71 (18)	0.16 (4)	1.65 (42)	1.38 (35)	0.57 (14.5)	0.18 (4.5)	26	0.98 (25)	1.93 (49)	M3	1.34 (34)	0.24 (6)	0.16 (4)	1.46 (37)	5.87 (149)
20	0.89 (22.5)	0.14 (3.5)	1.89 (48)	1.57 (40)	0.57 (14.5)	0.18 (4.5)	61	1.54 (39)	2.24 (57)	M4	1.50 (38)	0.32 (8)	0.20 (5)	1.65 (42)	6.65 (169)
25	0.79 (20)	0.10 (2.5)	2.46 (62.5)	2.03 (51.5)	0.57 (14.5)	0.18 (4.5)	104	1.97 (50)	3.03 (77)	M6	1.97 (50)	0.47 (12)	0.39 (10)	2.09 (53)	7.48 (190)

inches (mm)
 SH = max. energy absorption

32 to 63 mm bore sizes



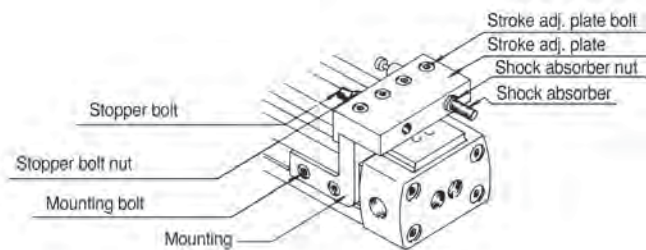
Bore (mm)	SC	SD	SE	SF	SG		SH in-lbs	SJ	SK	SP	SQ	SR	ST	C	L
					Max	Min									
32	0.87 (22)	0.28 (7)	2.62 (66.5)	2.19 (55.5)	1.06 (27)	0.67 (17)	226	2.56 (65)	3.86 (98)	M8	2.11 (53.5)	0.55 (14)	0.47 (12)	2.24 (57)	8.90 (226)
40	1.26 (32)	0.28 (7)	3.09 (78.5)	2.58 (65.5)	1.34 (34)	0.94 (24)	608	2.56 (65)	4.41 (112)	M10	2.50 (63.5)	0.67 (17)	0.47 (12)	2.64 (67)	9.61 (244)
50	1.50 (38)	0.32 (8)	3.90 (99)	3.15 (80)	2.17 (55)	1.77 (45)	1042	2.76 (70)	5.35 (136)	M12	3.05 (77.5)	0.87 (22)	0.67 (17)	3.23 (82)	10.16 (258)
63	1.50 (38)	0.32 (8)	4.41 (112)	3.68 (93.5)	1.73 (44)	1.34 (34)	1042	2.76 (70)	6.22 (158)	M16	3.50 (89)	0.98 (25)	0.79 (20)	3.74 (95)	11.65 (296)

inches (mm)
 SH = max. energy absorption



B
 Rodless Cylinders
 Actuator Products
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 P1X Series
 P1Z Series
 GDL Series

Positioning of stroke adjustment unit



ø16-ø25

- (1) Moving the stroke adjustment unit.
 The stroke adjustment unit can be moved by loosening the mounting bolts.
- (2) Locking of stroke adjustment unit.
 After moving the stroke adjustment unit to the appropriate position, lock it there by tightening the mounting bolts to the torque values shown in Figure 4. Insufficient torque may cause the stroke adjustment unit to slip out of position.

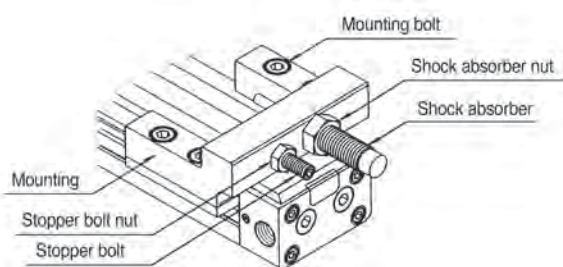
Figure 4
Torque values for tightening stroke adjustment unit.

Bore size	Tightening torque	
	Mounting bolt (lb-in)	Stroke adj. plate bolt (lb-in)
16mm	9-11	4-6
20mm	22-24	
25mm	46-50	22-24
32mm	195-213	-
40mm	390-415	-
50, 63mm	682-735	-

- (3) Stroke adjustment using the stopper bolt.
 Adjust the stroke by loosening the stopper bolt nut and turning the stopper bolt. After adjusting the stroke, tighten the stopper bolt nut to the torque values shown in Figure 5. When adjusting the 16-25 mm cylinders, due to the small amount of clearance between the table and the stroke adjustment plate, adjust the stroke by moving the complete stroke adjustment unit.

Figure 5
Torque values for tightening stopper bolt nut and shock absorber nut.

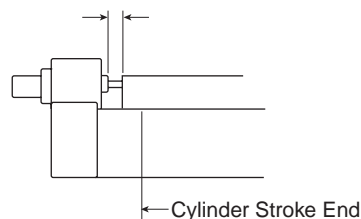
Bore size	Tightening torque	
	Stopper bolt nut (lb-in)	Shock absorber nut (lb-in)
16mm	10-11	12-16
20mm	22-24	26-35
25mm	73-84	40-53
32mm	195-213	66-89
40mm	390-425	195-266
50mm	682-735	487-620
63mm	1772-1914	487-620



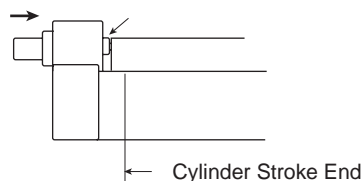
ø32-ø63

- (4) Adjustment of shock absorber.
 Adjust the absorption energy of the shock absorber by changing the operating stroke of the shock absorber. This is done by loosening the shock absorber nut and turning the unit. When adjustment is complete, tighten the shock absorber nut to the torque values shown in Figure 12a.
- (5) Notes on usage.
 The shock absorber absorbs rated energy with rated stroke. The factory setting allows a small amount of shock absorber stroke before it bottoms out. Readjust the location of the shock absorber so that the complete stroke of the absorber is utilized.

Absorption energy as set at factory:
 Small margin with stroke of shock absorber.



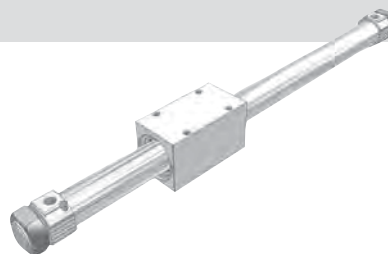
Adjust the position of the shock absorber until the plunger of the shock absorber is fully depressed.



B	Rodless Cylinders Actuator Products
	OSP-P Series
P1X Series	
P1Z Series	
GDL Series	

P1Z Series

- Available in 3 bores with stroke lengths up to 2000 mm
- Adjustable air cushioning is available on all cylinderS
- The load is fixed onto the mobile carriage by 4 tapped holes
- The cylinder is attached by the ends with jam nuts, flanges or foot mounts



Technical data

Bore size		Weights			
		Weight at zero stroke		Weight per 25mm of stroke	
mm	inch	kg	lbs	kg	lbs
16	5/8	0.28	0.62	0.01	0.02
20	3/4	0.46	1.01	0.02	0.05
32	1-1/4	1.35	2.98	0.04	0.08

Operating information

Maximum pressure:	100 PSIG (7 bar)
Minimum pressure:	29 PSI (2 bar)
Temperature range:	14°F to 140°F (-10°C to 60°C)
Filtration requirements:	Dry, filtered compressed air to ISO 8573-1 class 3. 4. 3. or better

If external lubrication is added, this must always be continued.

Specifications for P1Z series magnetically coupled rodless

Bore size mm (inch nominal)	16 (5/8)	20 (3/4)	32 (1 1/4)
Port size	M5 BSPP, 10-32 NPT	1/8 BSPP, 1/8 NPT	1/8 BSPP, 1/8 NPT
Maximum stroke mm (inch)	1000 (39.4)	1500 (59.1)	2000 (78.7)
Stroke tolerance mm	+1.5/-0	<=1000 +1.5/-0; >1000 +2/-0	
Piston speed m/s (inch/sec)	0.1 to 0.4 (4 to 15.75)		
Max. coupling force N (lbs)	157 (35)	236 (53)	703 (158)
Cushion	Air cushion standard		
Lubrication	Not required (If you choose to lubricate your system, continuing lubrication will be required.)		

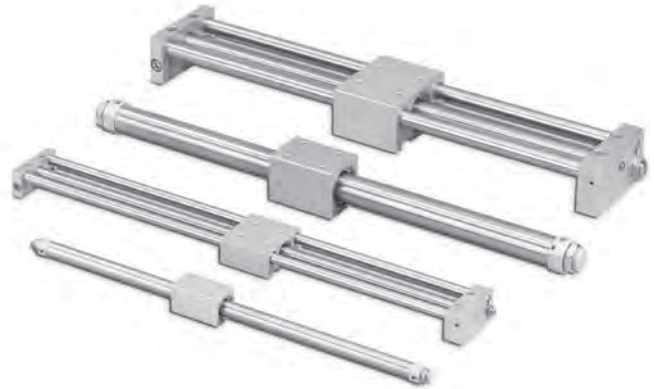
Ordering information

Standard cylinder (15 positions)										Options (16 positions)																																																				
P	1	Z	M	0	1	6	S	N	N	0	5	0	0	B	F	M	N																																													
			<table border="1"> <tr><th colspan="2">Bore</th></tr> <tr><td>016</td><td>Ø 16 mm</td></tr> <tr><td>020</td><td>Ø 20 mm</td></tr> <tr><td>032</td><td>Ø 32 mm</td></tr> </table>			Bore		016	Ø 16 mm	020	Ø 20 mm	032	Ø 32 mm	<table border="1"> <tr><th colspan="2">Cushioning</th></tr> <tr><td>N</td><td>None (Ø 16 only)</td></tr> <tr><td>A</td><td>Adjustable Cushions</td></tr> </table>			Cushioning		N	None (Ø 16 only)	A	Adjustable Cushions	<table border="1"> <tr><th colspan="2">Strokes</th></tr> <tr><td>0200</td><td>200 mm</td></tr> <tr><td>1000</td><td>1000 mm</td></tr> </table>			Strokes		0200	200 mm	1000	1000 mm	<table border="1"> <tr><th colspan="2">Mounting kit*</th></tr> <tr><td>F</td><td>Footmount</td></tr> <tr><td>L</td><td>Flanges</td></tr> <tr><td>N</td><td>None (std.)</td></tr> </table>			Mounting kit*		F	Footmount	L	Flanges	N	None (std.)	<table border="1"> <tr><th colspan="2">Options *</th></tr> <tr><td>B†</td><td>None</td></tr> <tr><td>W</td><td>With options</td></tr> </table>			Options *		B†	None	W	With options	<table border="1"> <tr><th colspan="2">Cylinder port type</th></tr> <tr><td>M†</td><td>Metric (Ø 16 only)</td></tr> <tr><td>B†</td><td>BSPP (Ø 20 & 32)</td></tr> <tr><td>N</td><td>NPTF (Ø 20 & 32)</td></tr> </table>			Cylinder port type		M†	Metric (Ø 16 only)	B†	BSPP (Ø 20 & 32)	N	NPTF (Ø 20 & 32)
Bore																																																														
016	Ø 16 mm																																																													
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Cushioning																																																														
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* Cylinders are supplied with mounting nuts fitted on each endplate.																																																														
Ø		Stroke (mm)		Stroke (in)																																																										
16		0 to 1000		0 to 39.4																																																										
20		0 to 1500		0 to 59.1																																																										
32		0 to 2000		0 to 78.7																																																										
Order code examples:																																																														
- P1ZM016SNN0100B Ø 16 mm bore 100 mm stroke cylinder supplied with mounting nut on each endplate																																																														
- P1ZM020SAN1000WFBN Ø 20 mm bore 1 m stroke cylinder with foot mount on each endplate																																																														

Basic Version

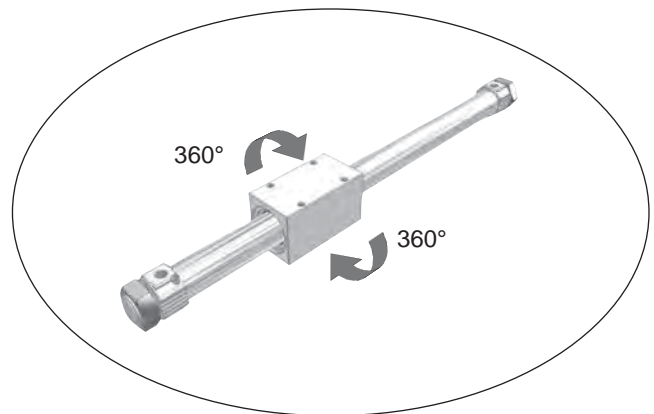
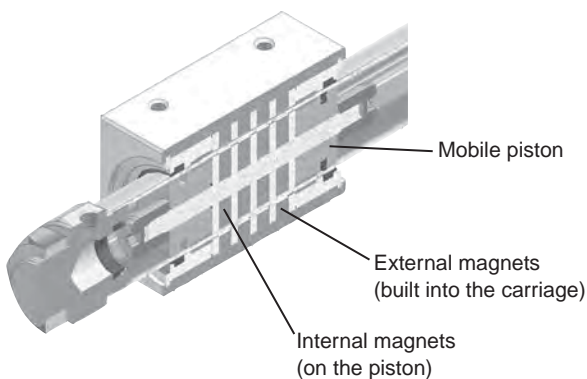
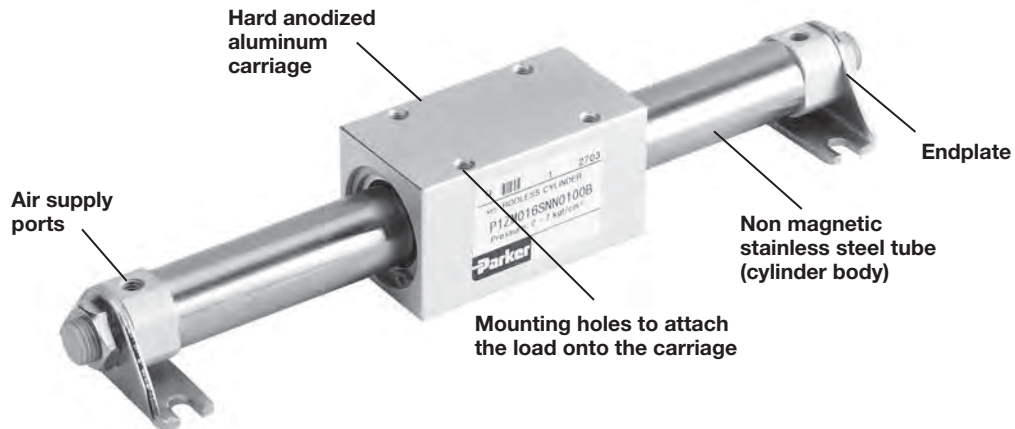
The magnetic rodless cylinder is a pneumatic cylinder featuring a mobile piston fitted with annular magnets. The mobile carriage is also equipped with magnets to provide magnetic coupling between the piston and carriage. It incorporates the following features:

- end of stroke cushioning/bumpers
- mounting:
 - threaded endcaps
 - optional foot mount
 - optional flange mount



Sensors

For sensors see page B339.



Cushioning

Ø 16 mm: non-adjustable bumper or adjustable pneumatic cushioning

Ø 20 and 32 mm: adjustable pneumatic cushioning

Mounting

The mobile carriage is free to rotate 360° around the cylinder axis. This feature facilitates the adaptation of the cylinder to various mounting arrangements.

The load must be guided by an external device.

B

Rodless Cylinders
 Actuator Products

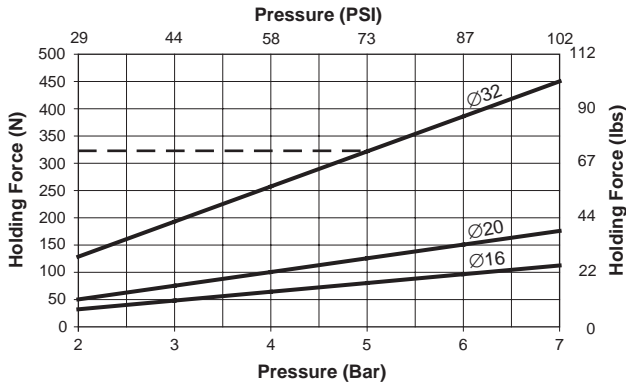
OSP-P
 Series

P1X
 Series

P1Z
 Series

GDL
 Series

Technical data



Example:

Pressure: 5 bar

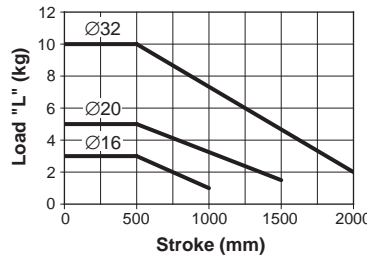
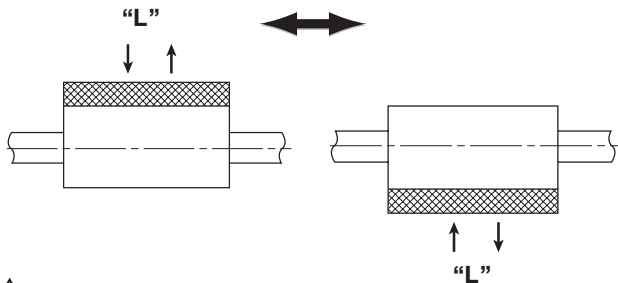
$F_{max} = 322 \text{ N}$ for Ø 32 mm cylinder

⚠ Calculate the kinetic energy due to the load moved

Acceleration or deceleration should not exceed the magnetic coupling force of cylinder

Load diagrams

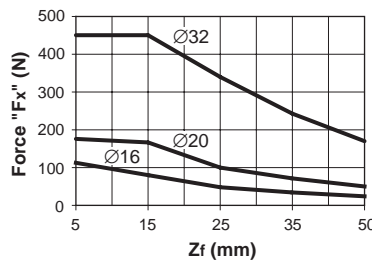
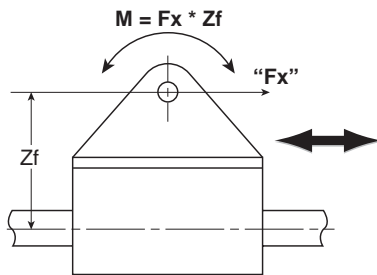
Permissible radial loads, horizontal mounting



Ø	L Max.	
	(kg)	(lbs.)
16	3	6.6
20	5	11.0
32	10	22.0

⚠ The load must be guided by a device from outside the cylinder

Permissible axial loads, horizontal mounting

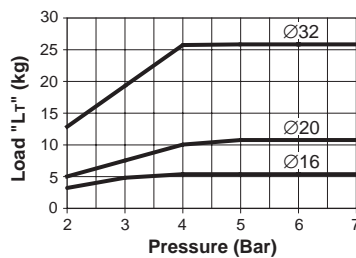
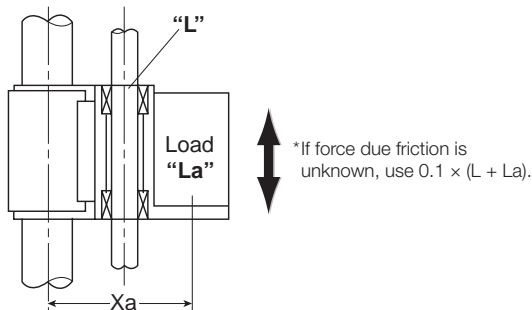


Ø	Max. Moment M		Max. Fx*	
	(Nm)	(in-lbs.)	(N)	(lbs.)
16	1.2	11	112	25
20	2.5	22	175	39
32	8.5	75	450	101

* at 7 bar

⚠ The load must be guided by a device from outside the cylinder

Permissible axial loads, vertical mounting



Ø	Max. load T		Max. XA	
	(kg)	(lbs.)	(mm)	(in.)
16	5	11	122	4.8
20	10	22	142	5.6
32	24	53	174	6.8

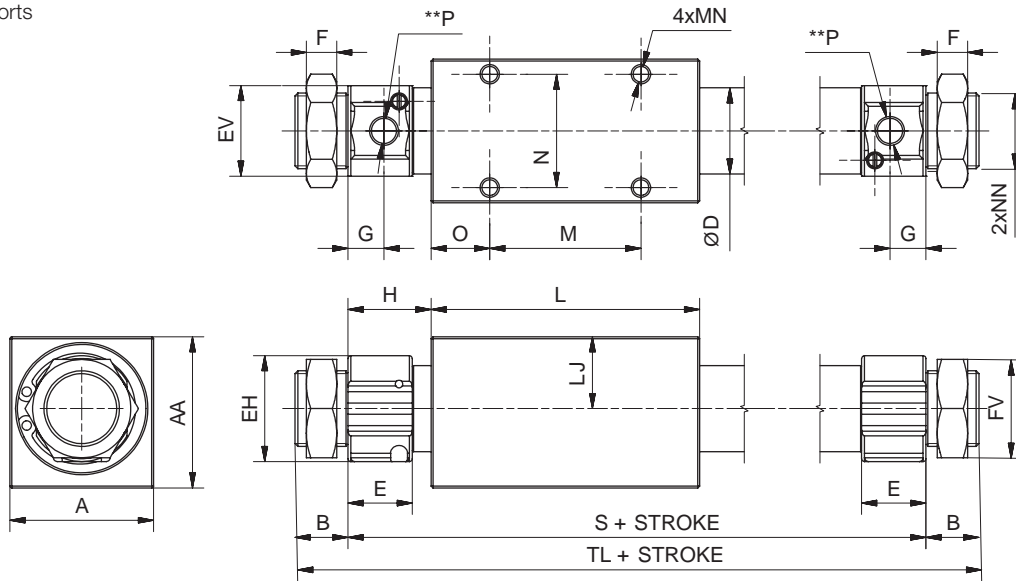
* at 6.5 bar

L = Load guided by external device
La = Direct mounting onto the cylinder
Ff = Force due to friction*

LT = Load weight + guiding device weight + force due to friction

Dimensions

** = Air supply Ports



Ø	A	AA	B	ØD	E	ØEH	ØEV	F	FV	G	H	L	LJ	M	N	O
16	32 (1.26)	34 (1.34)	10 (0.39)	18 (0.71)	11 (0.43)	18 (0.71)	18 (0.71)	4 (0.16)	14 (0.55)	5.5 (0.22)	15.5 (0.61)	61 (2.40)	16 (0.63)	34 (1.34)	25 (0.98)	13.5 (0.53)
20	38 (1.50)	40 (1.57)	14 (0.55)	22.8 (0.90)	17 (0.67)	28 (1.10)	24 (0.94)	8 (0.31)	26 (1.02)	9.5 (0.37)	22 (0.87)	71 (2.80)	19 (0.75)	40 (1.57)	30 (1.18)	15.5 (0.61)
32	60 (2.36)	60 (2.36)	16 (0.63)	35 (1.38)	17 (0.67)	40 (1.57)	36 (1.42)	8 (0.31)	32 (1.26)	9.5 (0.37)	23 (0.91)	87 (3.43)	30 (1.18)	50 (1.97)	40 (1.57)	18.5 (0.73)

Ø	P	MN	NN	S	TL
16	M5 x 0.8 (10-32)	M4 x 0.7 x 6	M10 x 1 x 6	92 (3.62)	112 (4.41)
20	G 1/8 (1/8)	M5 x 0.8 x 8	M20 x 1.5 x 7	115 (4.53)	143 (5.63)
32	G 1/8 (1/8)	M6 x 1 x 10	M26 x 1.5 x 7	133 (5.24)	165 (6.50)

B

Rodless Cylinders
 Actuator Products

OSP-P
 Series

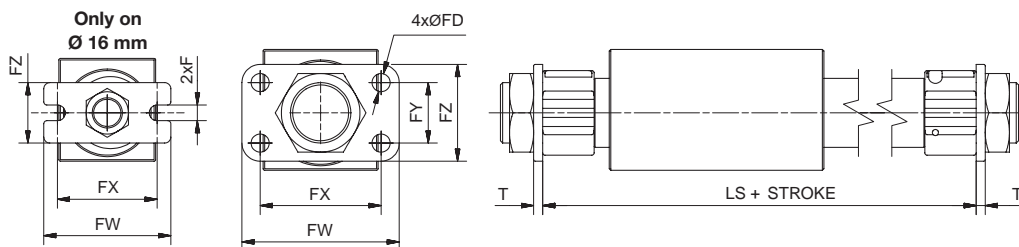
P1X
 Series

P1Z
 Series

GDL
 Series

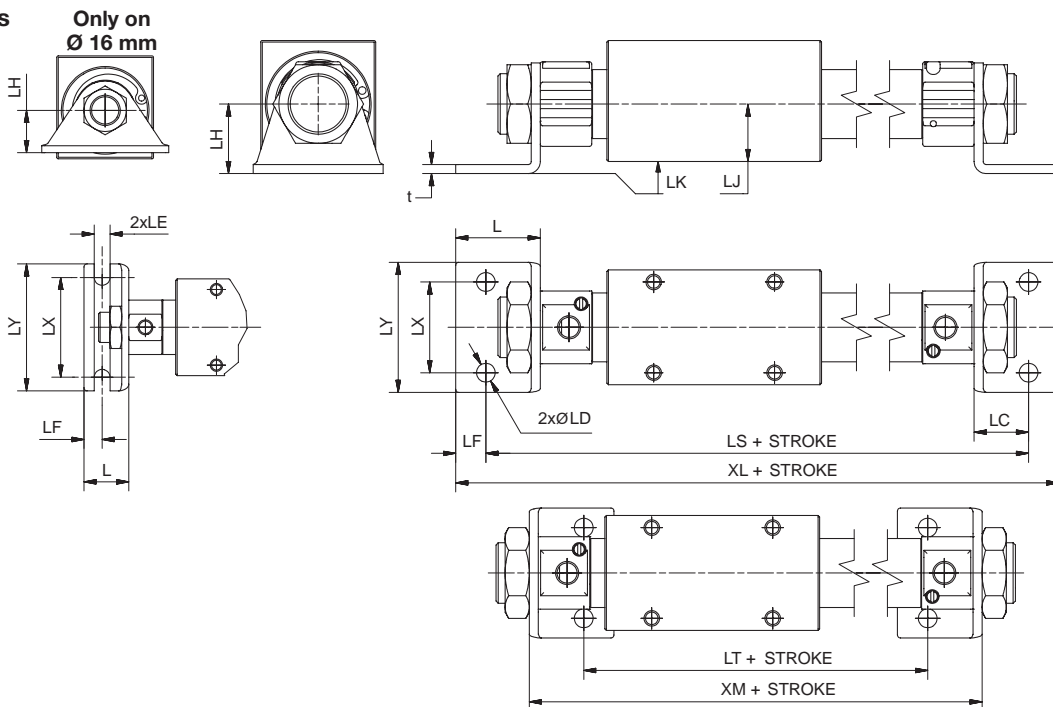
Mountings

Flanges



Ø	F	ØFD	FW	FX	FY	FZ	T	LS	Order code
16	5.2 (0.20)	-	42 (1.65)	33 (1.30)	-	20 (0.79)	2.3 (0.09)	92 (3.62)	PDC15-FH
20	-	6 (0.24)	52 (2.05)	40 (1.57)	20 (0.78)	32 (1.26)	3 (0.12)	115 (4.53)	PK1A20-FH
32	-	7 (0.28)	80 (3.15)	64 (2.52)	28 (1.10)	44 (1.73)	5 (0.20)	133 (5.24)	PK1A25-FH

Brackets



Ø	t	L	LC	ØLD	LE	LF	LH	LJ	LK	LX	LY	LS	LT	XL	XM	Order code
16	2.3 (0.09)	14.8 (0.58)	8.8 (0.35)	-	5.2 (0.20)	6 (0.24)	14 (0.55)	16 (0.63)	-2 (-0.08)	33 (1.30)	42 (1.65)	109.6 (4.32)	79 (3.11)	121.6 (4.79)	96.6 (3.80)	PDC15-LB*
20	3 (0.12)	28 (1.10)	18 (0.71)	6.2 (0.24)	-	10 (0.39)	23 (0.91)	19 (0.75)	4 (0.16)	30 (1.18)	43 (1.69)	151 (5.94)	85 (3.35)	171 (6.73)	121 (4.76)	PK1A20-LB*
32	3 (0.12)	35 (1.38)	23 (0.91)	7 (0.28)	-	12 (0.47)	30 (1.18)	30 (1.18)	0 (0)	46 (1.81)	62 (2.44)	179 (7.05)	**	203 (7.99)	**	PK1A25-LB*

* Set of 2 pcs
 ** Impossible mounting

B
 Rodless Cylinders
 Actuator Products
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 P1X Series
 P1Z Series
 GDL Series

P1Z Series - Guided Version

The magnetic rodless cylinder is a pneumatic cylinder featuring a mobile piston with annular magnets.

The mobile carriage is also equipped with magnets to give magnetic coupling between the piston and carriage. The carriage slides along the main tube and is guided by two guide rods.

It incorporates the following features:

- Built-in guide rods
- Adjustable end-of-stroke bumpers
- Optional magnetic piston sensing
- Optional transfer porting

Guidance

The guided version consists of a carriage fitted with 4 plain bearings, guided on 2 rods.

This design provides high rigidity, accurate guidance and smooth movement of the carriage.

End of stroke

Each endplate can be fitted with an adjustable bumper or self-compensating shock absorbers.

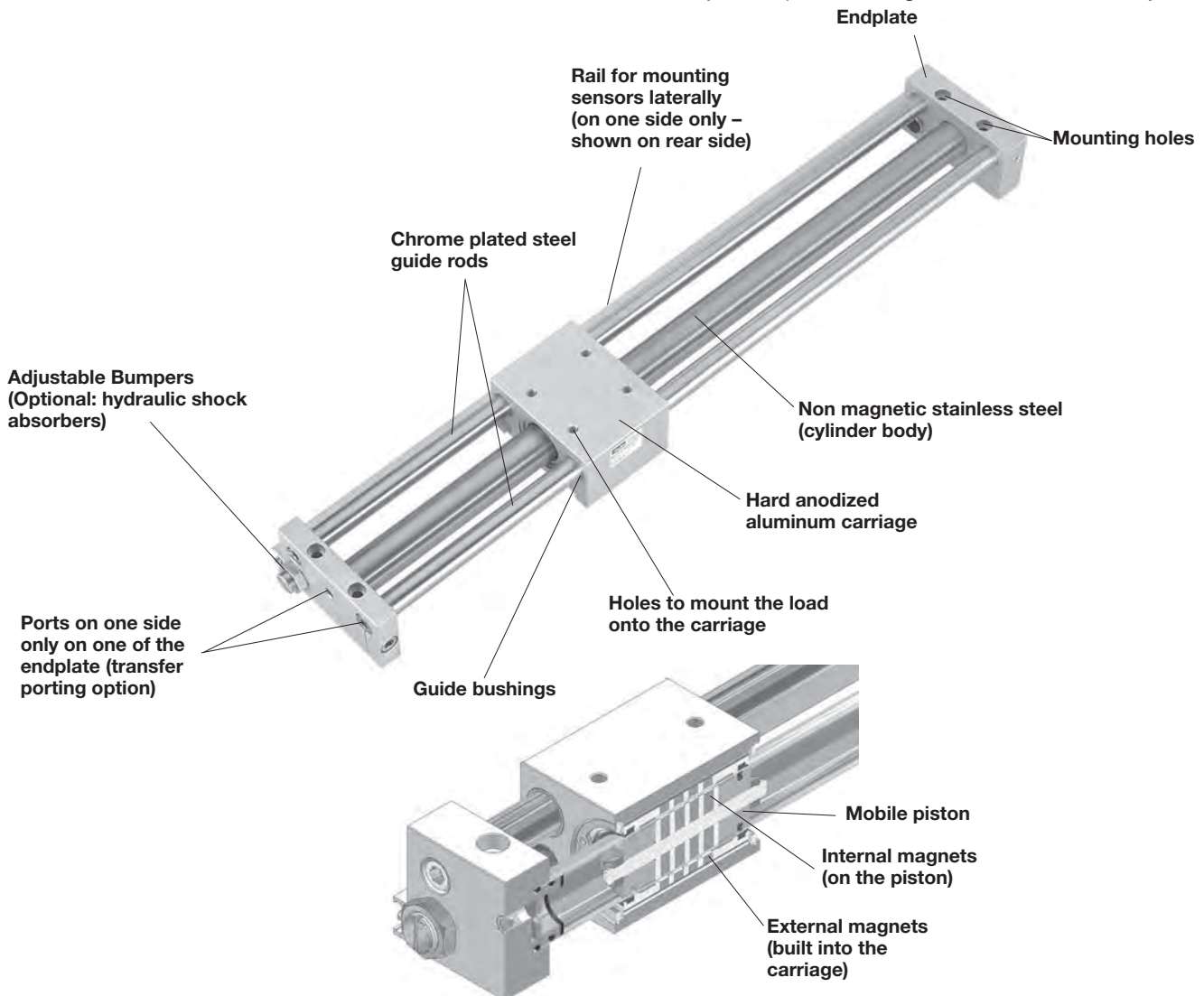
Optional transfer porting

Cylinder air supply is located on one end only to facilitate cylinder installation and avoid long tube lengths for longer strokes.

Options

The following options are available to enhance the Magnetic Rodless cylinder functions:

- External bumpers: when low operating pressure, light loads and short strokes.
- External hydraulic shock absorbers: recommended for arduous applications.
- Reed and solid state sensors: provide sensing at an adjustable position along the entire stroke of the cylinder.



B

**Rodless Cylinders
 Actuator Products**

**OSP-P
 Series**

**P1X
 Series**

**P1Z
 Series**

**GDL
 Series**

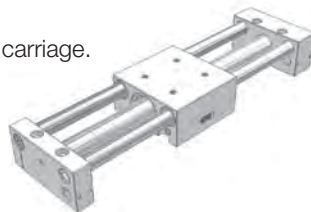
Ordering information

Standard cylinder (15 positions)	Options (16 positions)																												
P 1 Z M 0 1 6 T C N	0 5 0 0 B N M L																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Bore</th></tr> <tr><td>016</td><td>Ø 16 mm</td></tr> <tr><td>020</td><td>Ø 20 mm</td></tr> <tr><td>032</td><td>Ø 32 mm</td></tr> </table>	Bore		016	Ø 16 mm	020	Ø 20 mm	032	Ø 32 mm	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Strokes</th></tr> <tr><td>0200</td><td>200 mm</td></tr> <tr><td>1000</td><td>1000 mm</td></tr> </table>	Strokes		0200	200 mm	1000	1000 mm														
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016	Ø 16 mm																												
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Cushioning</th></tr> <tr><td>C</td><td>Adjustable stop</td></tr> <tr><td>H</td><td>Hydraulic shock absorber</td></tr> </table>	Cushioning		C	Adjustable stop	H	Hydraulic shock absorber	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Options</th></tr> <tr><td>B†</td><td>None</td></tr> <tr><td>W</td><td>With options</td></tr> </table>	Options		B†	None	W	With options																
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Function</th></tr> <tr><td>G</td><td>Guided</td></tr> <tr><td>T</td><td>Guided with transfer porting</td></tr> </table>	Function		G	Guided	T	Guided with transfer porting	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Cylinder port type</th></tr> <tr><td>M†</td><td>Metric (Ø 16 only)</td></tr> <tr><td>B†</td><td>BSPP (Ø 20 & 32)</td></tr> <tr><td>N</td><td>NPTF (Ø 20 & 32)</td></tr> </table> <p><small>† Standard when "B" option is used.</small></p>	Cylinder port type		M†	Metric (Ø 16 only)	B†	BSPP (Ø 20 & 32)	N	NPTF (Ø 20 & 32)														
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Ø</th><th>Stroke (mm)</th><th>(in)</th></tr> <tr><td>16</td><td>0 to 750</td><td>0 to 29.5</td></tr> <tr><td>20</td><td>0 to 1000</td><td>0 to 39.4</td></tr> <tr><td>32</td><td>0 to 1000</td><td>0 to 59.1</td></tr> </table>	Ø	Stroke (mm)	(in)	16	0 to 750	0 to 29.5	20	0 to 1000	0 to 39.4	32	0 to 1000	0 to 59.1	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="4">End of stroke sensing</th></tr> <tr><th>NPN</th><th>PNP</th><th>Reed</th><th>Sensors type (Qty: 2)</th></tr> <tr><td>L</td><td></td><td></td><td>With rail, no sensor</td></tr> <tr><td>N† (std.)</td><td></td><td></td><td>No sensor rail</td></tr> </table> <p>Note: Order Sensors separately.</p>	End of stroke sensing				NPN	PNP	Reed	Sensors type (Qty: 2)	L			With rail, no sensor	N† (std.)			No sensor rail
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NPN	PNP	Reed	Sensors type (Qty: 2)																										
L			With rail, no sensor																										
N† (std.)			No sensor rail																										
<p>Order code examples:</p> <ul style="list-style-type: none"> - P1ZM016GCN0100B Ø 16 mm bore 100 mm stroke cylinder supplied with adjustable stop - P1ZM020GHN1000WNBL Ø 20 mm bore 1 m stroke cylinder with hydraulic shock absorbers and rail for sensors 																													

B
 Rodless Cylinders
 Actuator Products
 OSP-P Series
 P1X Series
 P1Z Series
 GDL Series

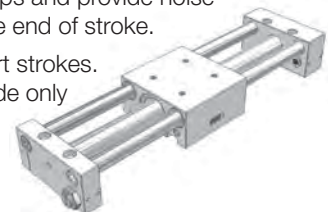
Range

Magnetic rodless cylinder, guided version
 Available in 3 diameters with possible strokes up to 1500 mm (59 in).
 4 tapped mounting holes on the carriage.
 Endcap mounting provided by 4 tapped and counterbored holes.



Options

External adjustable bumpers
 Can be fitted on cylinder endcaps and provide noise reduction and adjustment at the end of stroke.
 Used when light loads and short strokes.
 Pneumatic air supply on one side only (transfer porting option).



External hydraulic shock absorbers
 Self-compensating hydraulic shock absorbers can be used instead of bumpers for a greater cushioning effect at the end of stroke.
 They are recommended for arduous applications.

Reed or solid state sensors:
 A rail fitted on one side only of the cylinder provides mounting and position adjustment of sensors.
 The rail is located on same side as the end of stroke stops.



General features

Specifications for P1Z series magnetically coupled rodless

Operating medium	Compressed Air		
Maximum pressure	100 PSIG (7 bar)		
Minimum pressure bar (IPS)	29 PSIG (2 bar)		
Bore size mm (inch nominal)	16 (5/8)	20 (3/4)	32 (1 1/4)
Port size	M5 BSPP, 10-32 NPT	1/8 BSPP, 1/8 NPT	1/8 BSPP, 1/8 NPT
Ambient temperature	14°F to 140°F (-10°C to 60°C)		
Maximum stroke mm (inch)	750 (29.5)	1000 (39.4)	1500 (59.1)
Stroke tolerance mm	+1.5/-0	<=1000 +1.5/-0; >1000 +2/-0	
Piston speed m/s (inch/sec)	0.1 to 0.4 (4 to 15.75)		
Max. coupling force N (Lbs)	157 (35)	236 (53)	703 (158)
Cushion	Air cushion standard		
Lubrication	Not required (If you choose to lubricate your system, continuing lubrication will be required.)		

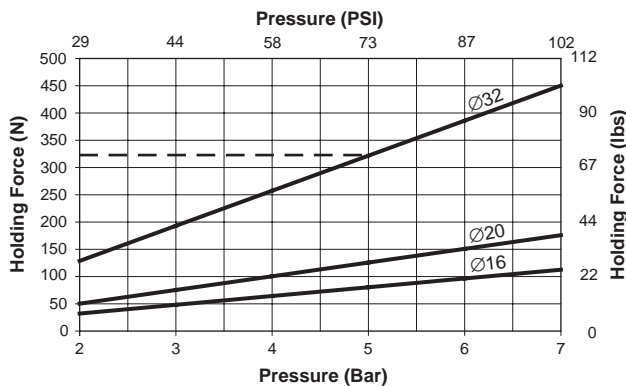
Weights

Bore size		Weight at zero stroke		Weight per 25mm of stroke	
mm	inch	kg	lbs	kg	lbs
16	5/8	0.9	1.98	0.05	0.11
20	3/4	1.52	3.35	0.08	0.17
32	1-1/4	3.63	8.00	0.13	0.29

Options

Function	Description
Detection	Sensors mounting in T-slot Reed or solid state sensors (PNP or NPN)
External rubber bumpers	Supplied pre-fitted in endplates if chosen
Hydraulic shock absorbers	Self-compensating shock absorbers supplied pre-fitted in endplates if chosen

Pressure in the cylinder / pneumatic holding force



Example:

Pressure: 5 bar (73 PSI)

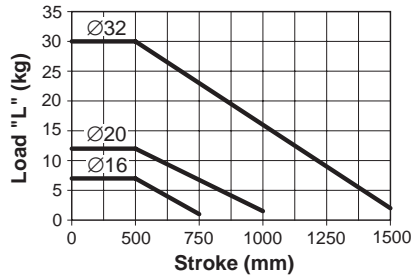
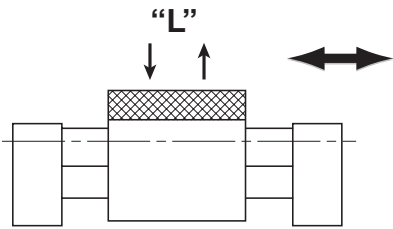
$F_{max} = 322 \text{ N (72 lbs.)}$ for Ø 32 mm cylinder

⚠ Calculate the kinetic energy due to the load moved.

Acceleration or deceleration should not exceed the magnetic coupling force of cylinder.

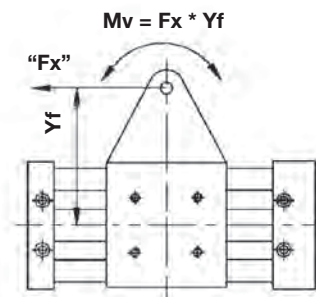
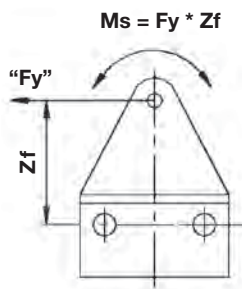
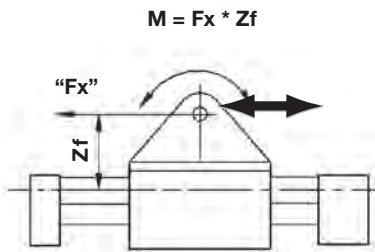
Load diagrams

Permissible radial loads, horizontal mounting



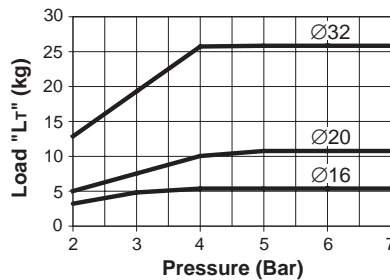
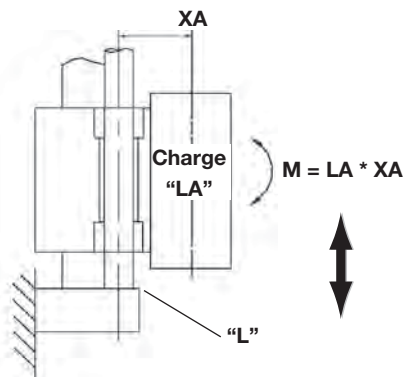
Ø	L Max.	
	(kg)	(lbs.)
16	7	15
20	12	26
32	30	66

Permissible axial loads, horizontal mounting



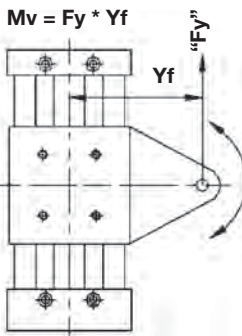
Ø	Max. moment M		Max. moment Ms		Max. moment Mv	
	(Nm)	(in-lbs.)	(Nm)	(in-lbs.)	(Nm)	(in-lbs.)
16	2.4	21	0.5	4.4	2.4	21
20	5	44	1	8.9	5	44
32	15	133	3	26.6	15	133

Permissible axial loads, vertical mounting



Ø	Max. load LT*	Max. XA
	(kg)	(mm)
16	5	122
20	10	142
32	24	174

* at 6.5 bar



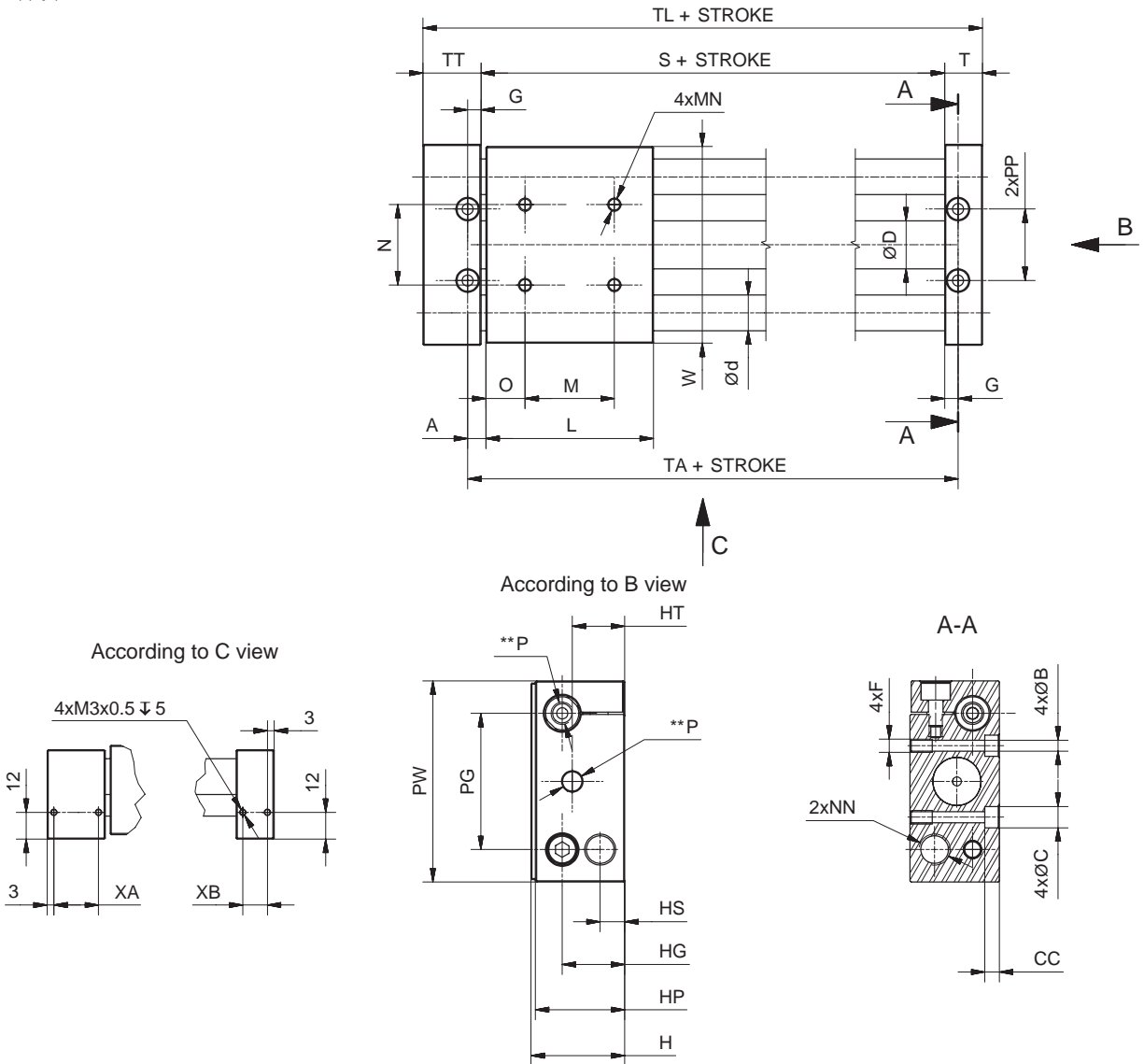
- L** = Load guided by external device
- LA** = Mounting direct onto cylinder
- LT** = Load weight + guiding device weight + force due to friction
- Ff*** = Force due to friction

*If force due to friction is unknown, use $0.1 * (L + LA)$

B Rodless Cylinders Actuator Products
 OSP-P Series
 P1X Series
 P1Z Series
 GDL Series

Dimensions

** = Air supply ports



Ø	A	ØB	ØC	CC	ØD	Ød	F	G	H	HP	HG	HS	HT	L	M	N	MN
16	8 (.31)	4.3 (.17)	8 (.31)	4.5 (.18)	17.4 (.69)	12 (.47)	M5x0.8 x 10	6 (.24)	34 (1.34)	33.5 (1.32)	25 (0.98)	12 (.47)	21.5 (0.85)	65 (2.56)	34 (1.34)	30 (1.18)	M5 x 0.8 x 8
20	8 (.31)	5.5 (.22)	9.5 (.37)	6.5 (.26)	21.4 (.84)	16 (.63)	M6x1 x 10	6 (.24)	42 (1.65)	40 (1.57)	28 (1.10)	12 (.47)	23.5 (.93)	75 (2.95)	40 (1.57)	36 (1.42)	M6 x 1 x 10
32	13.5 (.53)	8.7 (.34)	14 (.55)	8 (.31)	33.6 (1.32)	20 (.79)	M10x1.5 x 15	10 (.39)	66 (2.60)	64 (2.52)	46 (1.81)	20 (.79)	41 (1.61)	91 (3.58)	60 (2.36)	50 (1.97)	M8 x 1.25 x 12

Ø	NN	O	P	PG	PW	PP	T	TT	S	TA	TL	W	XA	XB
16	M10 x 1 x 6	15.5 (0.61)	M5 x 0.8	50 (1.97)	70 (2.76)	27 (1.06)	14 (0.55)	23 (0.91)	69 (2.76)	81 (3.19)	106 (4.17)	68 (2.68)	17 (0.67)	8 (0.31)
20	M14 x 1.5 x 7	17.5 (0.69)	G1/8	61 (2.40)	90 (3.54)	32 (1.26)	17 (0.67)	26 (1.02)	79 (3.11)	91 (3.58)	122 (4.80)	88 (3.46)	20 (0.79)	11 (0.43)
32	M20 x 1.5 x 7	15.5 (0.61)	G1/8	86 (3.39)	122 (4.80)	50 (1.97)	20 (0.79)	28 (1.10)	97 (3.82)	117 (4.61)	145 (5.71)	118 (4.65)	22 (0.87)	14 (0.55)

B

Rodless Cylinders
 Actuator Products

OSP-P
 Series

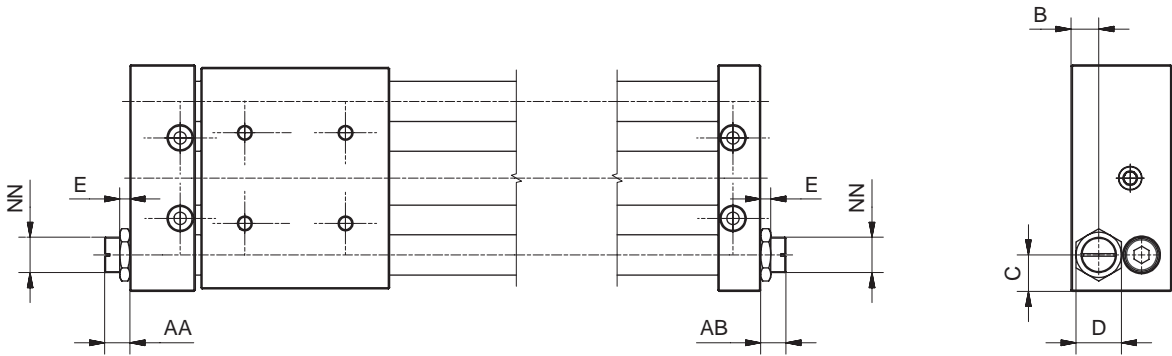
P1X
 Series

P1Z
 Series

GDL
 Series

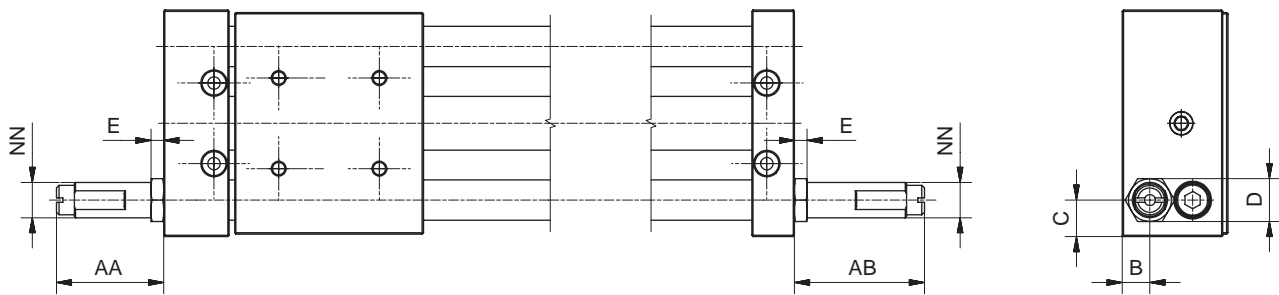


Optional external adjustable bumpers



Ø	AA	AB	B	C	D	E	NN
16	7.5 (0.30)	6.5 (0.26)	12 (0.47)	10 (0.39)	14 (0.55)	4 (0.16)	M10 x 1
20	10 (0.39)	10 (0.39)	11 (0.43)	14.5 (0.57)	18 (0.71)	4 (0.16)	M14 x 1.5
32	11 (0.43)	12 (0.47)	20 (0.79)	18 (0.71)	26 (1.02)	8 (0.31)	M20 x 1.5

External hydraulic shock absorbers



Ø	AA	AB	B	C	D	E	NN
16	18 (0.71)	27 (1.06)	12 (0.47)	10 (0.39)	13 (0.51)	3 (0.12)	M10 x 1
20	50 (1.97)	59 (2.32)	11 (0.43)	14.5 (0.57)	17 (0.67)	5 (0.20)	M14 x 1.5
32	56 (2.20)	66 (2.60)	20 (0.79)	18 (0.71)	24 (0.94)	6 (0.24)	M20 x 1.5

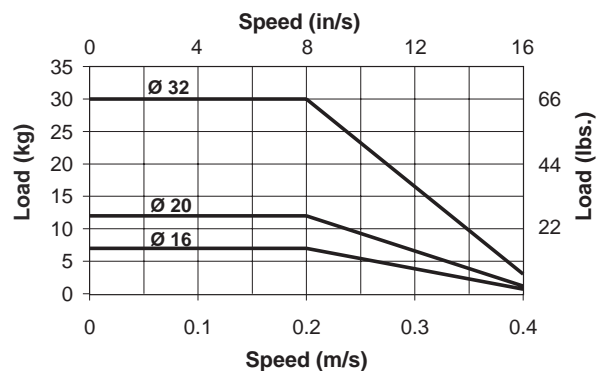
Loads / speeds diagram

The diagram to the right exhibits the P1Z cylinders maximum capacities with an adjustable bumper.

If the intersection exhibits between speed and load is above the curves, it is imperative to use hydraulic shock absorbers to prevent cylinder damage.

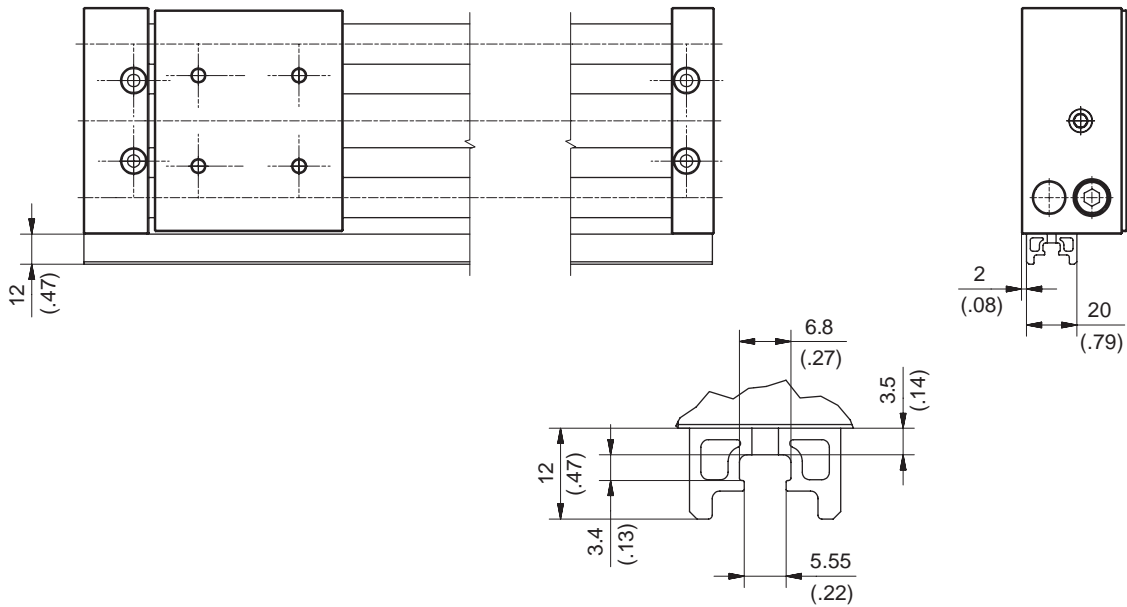
Example:

- Ø 32 mm cylinder with a 0.3 m/s speed and 25 kg load
 Choose the hydraulic shock absorber option
- Ø 20mm cylinder with 0.2 m/s speed and 10 kg load
 Choose the adjustable bumpers option



B
 Rodless Cylinders
 Actuator Products
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 P1X Series
 P1Z Series
 GDL Series

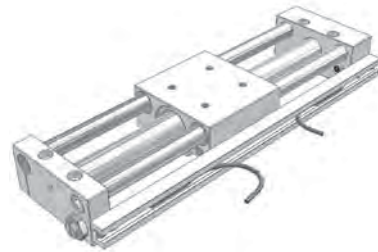
Optional sensor rail



Detection

Reed or solid state sensor mounting is possible on one cylinder side only.

External aluminum profile integrates 1 T-slot for sensor mounting.



Repair kits

Ø	Basic version	Guided version
16 (Cushioned)	P1ZM016SAN-R	–
16 (Non-cushioned)	P1ZM016SNN-R	P1ZM016GNN-R
20	P1ZM020SAN-R	P1ZM020GNN-R
32	P1ZM032SAN-R	P1ZM032GNN-R

B

Rodless Cylinders
 Actuator Products

OSP-P
 Series

P1X
 Series

P1Z
 Series

GDL
 Series

GDL Series

High Performance Series:

(Sizes FDC12HP-... thru FDC45HP-...)

The High Performance series is the basis for GDL's development, which is used in the majority of applications. High Performance guides consist of 8 axial needle roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and shielded, while offering the highest load and moment rating capacities within the GDL product line.



Standard Performance Series:

(Sizes FDC12SP-... thru FDC45SP-...)

The Standard Performance series is intended for minor loads and moments for particularly economical guidance solutions. Standard Performance guides consist of 8 radial ball roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and sealed, while offering the lowest load and moment ratings available within the GDL product line, with the exception of the Grease-Free and the Anti-Friction / Corrosion Resistant series. Standard Performance series is the second most commonly used GDL guides for various applications and also provides excellent running behavior.

Material specifications

Rail	Aluminum alloy
Guideways	Hardened high alloy spring steel
Cassettes / rollershoes / top plates	Aluminum alloy
Rollers	Bearing steel / Stainless steel bearing steel

Specifications

Characteristic	Unit	Description
Full profile wipers		Rollershoes and cassette are provided with snap-on full profile wipers. The snap-on full profile wipers are easily replaceable with available wipers kits.
Acceleration and deceleration	m/s ² (ft/sec ²)	40 m/s ² maximum (131 ft/s ² maximum)
Guide installation		Possible in any position. Cassettes can be adjusted at the factory or by the customer.
Drag adjustment set screw		Rollershoes can be set-up by the customer to incorporate the drag adjustment set screw feature. The drag adjustment set screw components are supplied with each pair of rollershoes.
Standard lubrication		Lifetime lubrication with standard grease-packed roller bearings.
Speed	m/s (ft/s)	Up to 10 m/s (or up to 33 ft/s)
Bearing types		Steel axial needle, Specials on request (ex: anti-magnetic, grease free, high dynamics) - consult factory
Operating temperature	C (F)	-10°C to 80°C (14°F to 176°F) temperature range Custom length cassettes and rollershoes for 100 piece lots minimum. Keyed butt-jointed rail sections up to 4000mm. Solid continuous length rails between 4000. Offset or non-standard "L11" dimensions on opposite ends of cut rails. Integrated metal scraper with standard full profile wiper currently available. Rail underside blind mounting holes.
Specials available		

B

Rodless Cylinders
 Actuator Products

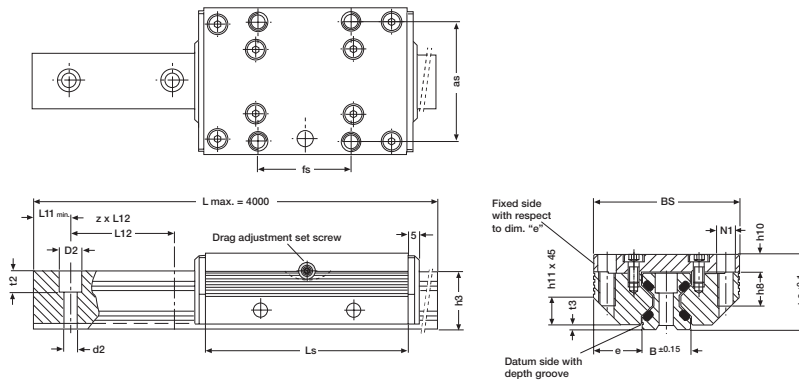
OSP-P
 Series

P1X
 Series

P1Z
 Series

GDL
 Series

Cassette with double sided rail



Dimensions for both standard FDC version guides

Size	Length		BS	h3	h9	as	d2	D2	e	fs	h8	h10	h11	L11 min.	L12	t2	t3	N1
	Ls	B																
12	64	12.0	37	14.7	19	30	3.4	6	12.50	25	8	4.0	6	10	40	5.5	1.4	M4
15	78	15.5	47	18.7	24	38	4.5	8	15.75	30	10	5.0	8	10	60	6.0	2.0	M5
20	92	21.0	63	22.6	30	53	5.5	10	21.00	40	12	7.0	11	10	60	7.0	2.0	M6
25	98	23.0	70	27.0	36	57	6.6	11	23.50	45	16	8.5	13	10	60	10.0	2.5	M8
35	135	32.0	100	37.0	48	82	9.0	15	34.00	62	20	10.5	20	12	80	11.5	3.5	M10
45	165	45.0	120	46.0	60	100	11.0	18	37.50	80	24	13.5	22	16	105	14.5	4.0	M12

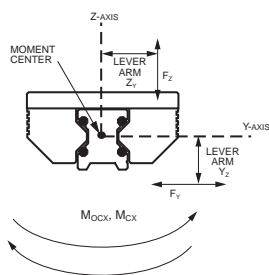
Dimensions (mm)

Dimensions for both underside mounting hole FDC version guides (Ref. ordering instructions)

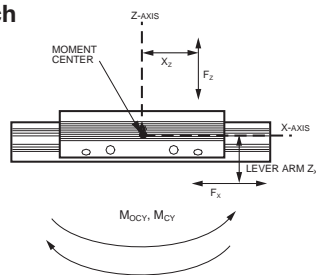
Size	Length		BS	h3	h9	as	d2	D2	e	fs	h8	h10	h11	L11 min.	L12	t2	t3	N1
	Ls	B																
12	64	12.0	37	14.7	19	30	3.4	6	12.50	29	8	4.0	6	10	40	5.5	1.4	M4
15	78	15.5	47	18.7	24	38	4.5	8	15.75	34	10	5.0	8	10	60	6.0	2.0	M5
20	92	21.0	63	22.6	30	53	5.5	10	21.00	40	12	7.0	11	10	60	7.0	2.0	M6
25	98	23.0	70	27.0	36	57	6.6	11	23.50	45	16	8.5	13	10	60	10.0	2.5	M8
35	135	32.0	100	37.0	48	82	9.0	15	34.00	62	20	10.5	20	12	80	11.5	3.5	M10
45	165	45.0	120	46.0	60	100	11.0	18	37.50	90	24	13.5	22	16	105	14.5	4.0	M12

Dimensions (mm)

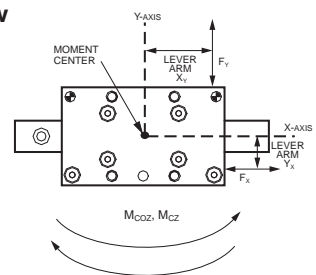
Roll



Pitch



Yaw



Load & moment rating capacities (for cassettes on double sided rail)

Dynamic load rating C (N)	Static load rating Co (N)	Static moment rating capacities:			Dynamic moment rating capacities:			Cassette weight (kg)	Rail weight (kg)	Cassette series
		Roll Mocz (Nm)	Pitch Mocy (Nm)	Yaw Mocz (Nm)	Roll Mcx (Nm)	Pitch Mcy (Nm)	Yaw Mcz (Nm)			
2800	3000	27	43	43	25	40	40	0.1	0.4	FDC12HP-...
4200	3400	37	58	58	45	72	72	0.3	0.8	FDC15HP-...
5400	5400	76	111	111	76	111	111	0.4	0.9	FDC20HP-...
9000	10100	158	222	222	142	198	198	0.6	1.8	FDC25HP-...
12500	18000	423	559	559	294	388	388	1.5	3.2	FDC35HP-...
21200	25900	827	983	983	678	806	806	2.9	5.5	FDC45HP-...

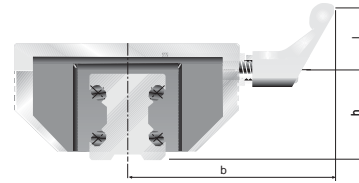
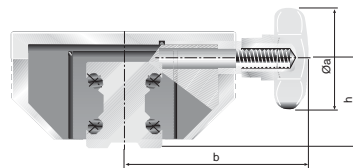


GDL Aluminum roller guides

High performance cassettes with lock device



Special cassette types



The locking cassette with star grip handle can be stopped at any desired location on the rail. The clamping device does not exert forces on the rail guideways.

The clamping device is used in fixtures which are movable manually, clamping and stop ledgers, feeding of tools and work pieces. Also available with L-ratchet handle.

Star grip handle dimensions

Size	Øa	b	h	Clamp force	Part numbers star grip knob
12	N/A				
15	25	41	19.0	200	FDC15HP-00020000
20	25	49	23.0	250	FDC20HP-00020000
25	32	56	28.0	250	FDC25HP-00020000
35	50	83	38.5	350	FDC35HP-00020000
45	63	101	48.0	750	FDC45HP-00020000

Dimensions (mm), Force (N) with normal manual tightening.

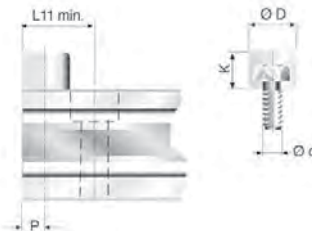
L-ratchet handle dimensions

Size	l	b	h	Clamp force	Part numbers L-ratchet handle
12	N/A				
15	45	59.5	19.0	200	FDC15HP-00010000
20	45	67.5	23.0	250	FDC20HP-00010000
25	45	71	28.0	250	FDC25HP-00010000
35	63	96	38.5	350	FDC35HP-00010000
45	78	116	48.0	750	FDC45HP-00010000

Size	Ød	ØD	K	L11 min.	P	Order number
12	M5	12	8	15.0	6.0	63504A
15	M5	12	8	16.0	6.0	63504A
20	M5	12	8	17.0	6.0	63504A
25	M6	15	10	20.5	7.5	63505A
35	M8	19	13	26.5	9.5	63506A
45	M10	24	16	33.0	12.0	63507A

Dimensions (mm)

End of stroke stop screws



The stop screws are screwed into threads (option) on the guide rails. The end of stroke stopping energy is reduced by a rubber cap. With guide rails where the L11 is less than the standard minimum, we offset the mounting hole by half of its diameter.

Note: Customer must drill and tap the holes for the stop screws.

GDL accessories

Rail mounting screw covers



Material: Wear resistant plastic, resistant to oil and aging.

Mounting: Put a plastic plate on top and pound in uniformly. Remove residual burrs with a soft brush or fingernail.

Note: Use respective order numbers for ordering separately or include in rail part number.

Size	Cylindrical screw DIN912	Ø D	Order number
12	M3	6	87752A
15	M4	8	87753A
20	M5	10	87754A
25	M6	11	87755A
35	M8	15	87756A
45	M10	18	87757A

Dimensions (mm)

B
 Rodless Cylinders
 Actuator Products
 OSP-P Series
 P1X Series
 P1Z Series
 GDL Series

GDL Aluminum roller guides

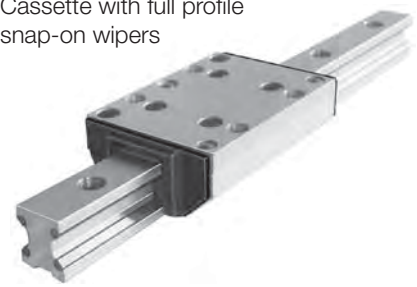
Version with wipers

Integrated into an additional cover, a felt wiper is saturated with oil. Although dependent on the degree of contaminants, these wipers last for

some 6000km, after which the felt wipers can either be washed or replaced.

For optimal cassette rolling performance, all holes in the guide rails should be filled with the plastic rail mounting screw covers.

Cassette with full profile snap-on wipers



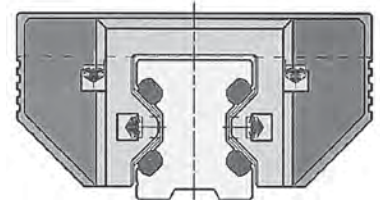
Order numbers for replacement wiper kits

FDC series and size	Respective order number
12	84457B
15	84480B
20	84481B
25	84482B
35	84483B
45	84484B

*wiper kits are sold in pairs

NOTE: Use respective order numbers for ordering separately as replacements, or specify in cassette part number.

Full profile snap-on wiper



GDL's keyed butt-jointed rail option

GUIDELINE rails can be precisely fastened together using a factory offered keyed butt-joint option for continuous rail lengths, as shown in Figures 1 & 2.

Two rail sections are clamped together with mating round bar stock pieces that seat tangent to both rail section guideways on each side of the rail. While the rail sections are clamped together, a keyway slot is machined in the top and bottom sides of the rail, across the butt-joint. Screw holes are then drilled through the rail inside the keyway slot, so the opposing keyways can be drawn together tightly with screws. The round bar stock clamp is then removed, providing a rigid and well aligned keyed butt-joint.

The keyed butt-joint option provides optimum alignment of all guideways from one rail section to the next. This allows for optimum “smooth” guidance of the cassette bearings, while crossing rail butt-joints.

The keyed butt-jointed rail option is currently available in the FDR version 25, 35, & 45 mm rail sizes. For a keyed butt-joint on rail sizes 25, 35 or 45 mm, specify P/N:# GDL-BJK

Consult factory for other size possibilities.

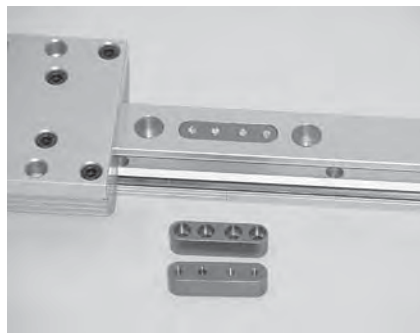


Figure 1

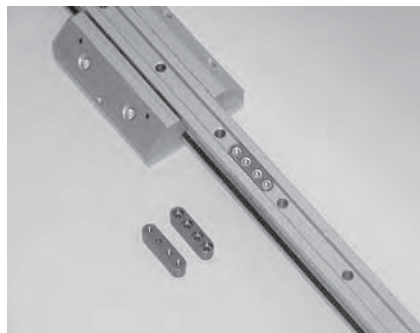


Figure 2

GDL coupled with structural aluminum extrusion material and OSP-E actuator

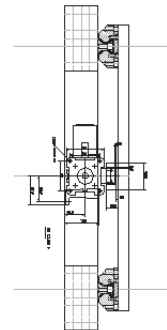


Figure 3

GDL linear guides couple well with various structural aluminum extrusions and Parker-Origa OSP-P and OSP-E actuators. Mounting can be easily accomplished using standard fasteners and mounting brackets. See Figure 3 above.

B

Rodless Cylinders
 Actuator Products

OSP-P
 Series

P1X
 Series

P1Z
 Series

GDL
 Series

Ordering Information / Part Numbering System for GDL Rails

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
F	D	R	1	2	H	0	0	0	0	0	0	-	0	0	0	0	0	
Series FD Double sided rail guide* (standard)		Rail Size 1 2* 1 5* 2 0* 2 5* 3 5* 4 5*		Guideway Material H High performance alloy steel* (standard) S Stainless steel		Coatings 0 Anodized aluminum* (standard) Z Custom (consult factory)		"L11" Dimension 00 Equal on both sides* (standard) ?? Actual dimension (mm)**		Mounting Holes 0 Topside thru hole* (standard) 1 Underside blind thread Z Custom (consult factory)		Long Rail Joining Option 0 None* (standard) 1 Keyed butt joint (size 25-45 only) 2 Unkeyed butt joint		Length (mm) - 0 0 0 0 0 Note: Maximum length is 4 meters on Size 12.				
Rail R Standard										Screw Covers 0 None* (standard) 1 Yes*								

** As measured from left side while viewing the depth groove line.

Note: Quantity supplied to cover all rail holes.

*Stocked Item

B
 Rodless Cylinders
 Actuator Products
 OSP-P Series
 P1X Series
 P1Z Series
 GDL Series

Ordering Information / Part Numbering System for GDL Cassettes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
F	D	C	1	2	H	P	-	0	0	0	0	0	0	0	0		
Series FD Double sided rail cassette* (standard)		Rail Size 1 2* 1 5* 2 0* 2 5* 3 5* 4 5*		Bearing Options HP Axial needle - high performance alloy steel* (standard) SP Single row radial ball - standard performance - alloy steel* (standard) ZZ Factory** (consult factory)		Grease 0 High performance* (standard) Z Custom (consult factory)		Lubrication Options 0 None* (standard) Z Custom (consult factory)**		Coatings 0 Anodized and standard hardware* (standard) 1 Anodized and stainless steel hardware* Z Custom (consult factory)		Mounting Holes 0 Topside threaded thru* (standard) 1 Underside hole thru (unthreaded) 2 Underside hole thru (threaded)		Adjustment 0 None* (standard) 1 Adjusted to specific rail*		Cassette Length 0 Normal length* (standard) Z Custom (consult factory)**	
Cassette C Standard																	

*Stocked Item
 **Minimum Order Quantity Required

* Locking mechanism only available on FD Series size 15 thru 45 with Axial Needle Bearing - High Performance - Alloy Steel.



PV Series

- Single or double vane rotary actuator
- 8 model sizes
- Output torque @ 100 PSIG: 8 to 1800 lb-in
- Standard rotations:
 - Single vane units: $280^\circ \pm 1^\circ$
(except size 10 & 11: $275^\circ \pm 2.5^\circ$)
 - Double vane units: $100^\circ \pm 1^\circ$
(except size 10 & 11: $95^\circ \pm 2.5^\circ$)
- Available with stroke adjusters and internal stops to provide 90° and 180° rotation
- Stainless steel shaft
- Optional radial ball bushing shaft bearing



Operating information

Operating pressure:	150 PSIG (10.3 bar)
Temperature range: †	
Nitrile seals	30°F to 180°F (-1°C to 82°C)
Fluorocarbon seals*	30°F to 250°F (-1°C to 121°C)
	* See fluorocarbon seal option for high temperature applications.
	† Low temperature version, please consult factory.
Filtration requirements:	40 micron, dry filtered air

Ordering information

PV 22 D - 090BS - B B 2 V - B

Model			
10	22	33	42
11		36	44
			46

Vanes / maximum rotation	
Omit	Single Vane, 280° Rotation (275° on PV10, PV11)
D	Double Vane, 100° Rotation (95° on PV10, PV11)

Rotation Options (may order more than one)	
Omit	Standard Units (no stroke adjusters, bumpers or switches)
090A	Stroke Adjusters adjustable from 60° to maximum unit rotation (preadjusted to 90°)
180A	Stroke Adjusters (single vane only) adjustable from 60° to 190° (preadjusted to 180°)
090B	Internal bumpers, 90° rotation ⁴
180B	Internal bumpers, 180° rotation (single vane only)
090S	Magnets ¹ added, 90° setting
180S	Magnets ¹ added, 180° setting (single vane only)

1. Switches can be used with stroke adjusters or bumpers (example: PV22D-090BS-BB2-B).
 2. Not available with switches or stroke adjusters.
 3. No tapped mounting holes in face opposite the flange.
 4. 90° bumpers (090B) not available on PV10/11 sizes.

Note:
 Order Hall effect sensors and reed switches separately from the Electronic Sensors section.

Special options	
Omit	Standard
Two digit code assigned by factory when any "X" appears in the model number or when special options or features are required.	

Design series	
B	Current design series

Options	
Omit	None
L	Radial ball bushings
V	Fluorocarbon seals

Ports	
2	NPTF Top (Std) (10-32 on PV10 & PV11)
7	NPTF Rear ² (10-32 on PV10 & PV11)

Shaft	
B	Single male keyed (Std)
C	Double end male keyed ²

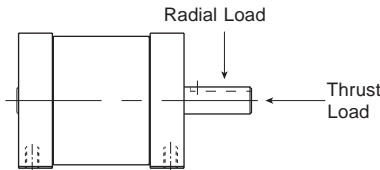
Mounting	
B	Base / Front (Std)
R	Rear Flange ^{2,3}
F	Front Flange
S	Base / Rear Face ²

Sensors	
For sensors see page B339.	

B
 Rotary Actuators
 Actuator Products
 PV Series
 PRN(A) Series
 PTR Series
 HP Series
 P1V-S Series

Quick reference data

Model number	Maximum rotation (Degrees)	Actual output torque (lb-in) at specified input pressure (PSI)			Displacement (in³)	Maximum breakaway pressure (PSI)	Maximum bypass leakage @100 psi (CFM)	Unit weight (lb)
		50	75	100				
10	275°	4	6	8	0.52	25	0.15	0.38
10D	95°	8	12	16	0.37	20	0.20	0.38
11	275°	8	12	16	1.04	20	0.15	0.50
11D	95°	17	25	33	0.74	15	0.20	0.50
22	280°	32	48	64	3.67	15	0.20	0.50
22D	100°	68	101	135	2.62	10	0.25	1.75
33	280°	75	112	150	8.70	15	0.20	3.44
33D	100°	155	235	315	6.20	10	0.25	3.56
36	280°	150	220	300	17.40	15	0.20	5.19
36D	100°	315	470	630	12.40	10	0.25	5.50
42	280°	140	210	285	17.80	15	0.20	7.13
42D	100°	300	450	600	14.58	10	0.25	7.50
44	280°	285	425	570	35.61	15	0.20	8.81
44D	100°	600	900	1200	29.17	10	0.25	9.38
46	280°	425	640	850	53.41	15	0.20	10.50
46D	100°	900	1350	1800	43.75	10	0.25	10.75



Kinetic energy ratings and bearing load capacities

Model number	Composite bushing load capacities (lb)*		Radial ball bushing load capacities (lb)*		Distance between centerline bearings	Maximum kinetic energy rating for models based on configuration (in-lb)		
	Radial	Thrust	Radial	Thrust		Standard	Stroke adjusters	Bumpers
10	15	7	50	15	0.88	0.03	0.12	0.05
11	15	7	50	15	1.50	0.06	0.12	0.09
22	50	25	Consult factory		2.38	0.25	0.50	0.38
33	100	50	Consult factory		3.50	0.75	1.50	1.13
36	100	50	Consult factory		6.50	1.00	1.50	1.50
42	200	75	Consult factory		2.75	2.00	4.00	3.00
44	200	75	Consult factory		4.75	2.50	4.00	3.75
46	200	75	Consult factory		6.75	3.00	4.00	4.75

* Bearing capacities only. Check Kinetic Energy ratings to determine if actuator will stop load.

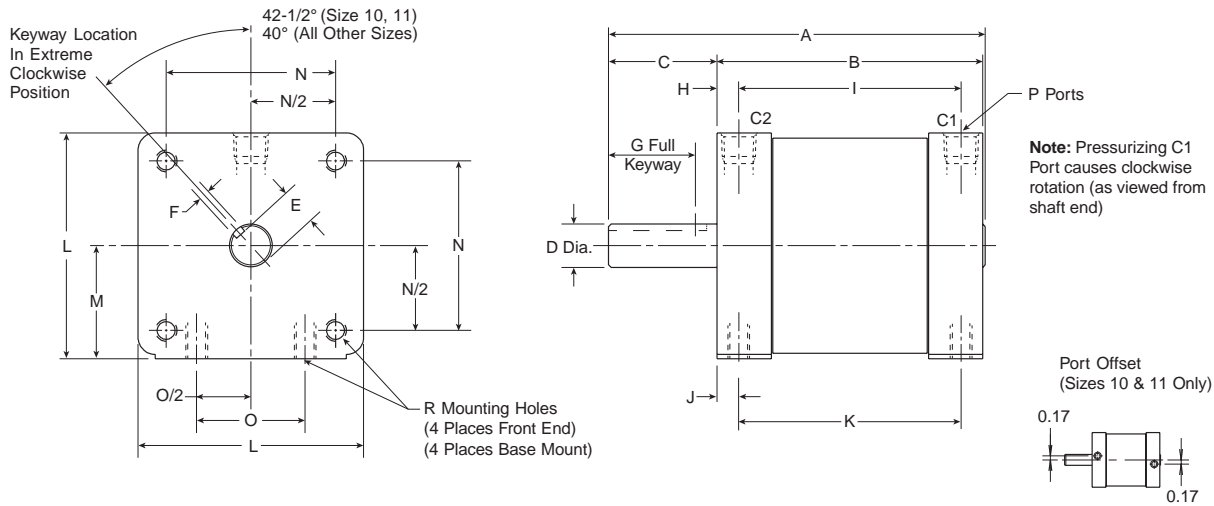
Seal kit ordering information

PSK	PV22D	V
Series	Model number	Material
PSK Parker seal kit	PV22D Model number	Omit Nitrile
		V Fluorocarbon

Seal kit installation tool

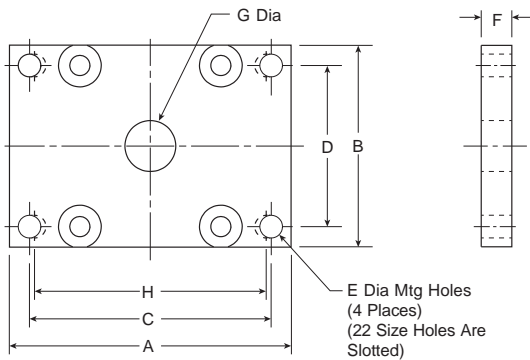
Model (S)	Items	Seal guide kit number
PV10 & 11 (D)	21, 22	ATS-PV1
PV22 (D)	21, 22	ATS-PV2
PV33 & 36 (D)	21, 22	ATS-PV3

Standard Face/Base Mount (B) and Male Keyed Shaft (B)



Model number	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R
10	2.280	1.38	0.88	0.312 0.311	0.258 0.253	0.094 0.095	0.63	0.19	1.00	0.19	1.000	1.62	0.810	1.220	0.750	10-32	8-32 x 0.25 DP
11	2.905	2.00	0.88	0.312 0.311	0.258 0.253	0.094 0.095	0.63	0.19	1.63	0.19	1.625	1.62	0.810	1.220	0.750	10-32	8-32 x 0.25 DP
22	4.340	3.06	1.25	0.500 0.499	0.423 0.418	0.125 0.126	0.94	0.25	2.56	0.25	2.560	2.50	1.250	2.000	1.250	1/8 NPTF	1/4-20NC x 0.38 DP
33	6.180	4.40	1.75	0.749 0.748	0.644 0.639	0.188 0.189	1.38	0.35	3.70	0.26	3.875	3.00	1.500	2.436	1.500	1/4 NPTF	5/16-18NC x 0.47 DP
36	9.180	7.40	1.75	0.749 0.748	0.644 0.639	0.188 0.189	1.38	0.35	6.70	0.26	6.875	3.00	1.500	2.436	1.500	1/4 NPTF	5/16-18NC x 0.47 DP
42	6.280	4.00	2.25	0.999 0.998	0.859 0.854	0.250 0.251	2.00	0.50	3.00	0.50	3.000	4.50	2.250	3.500	2.375	1/4 NPTF	3/8-16NC x 0.75 DP
44	8.280	6.00	2.25	0.999 0.998	0.859 0.854	0.250 0.251	2.00	0.50	5.00	0.50	5.000	4.50	2.250	3.500	2.375	1/4 NPTF	3/8-16NC x 0.75 DP
46	10.280	8.00	2.25	0.999 0.998	0.859 0.854	0.250 0.251	2.00	0.50	7.00	0.50	7.000	4.50	2.250	3.500	2.375	1/4 NPTF	3/8-16NC x 0.75 DP

Flange Mount (F, R)*

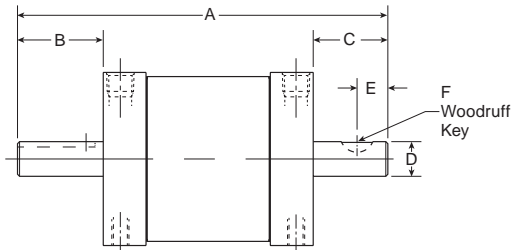


Model number	A	B	C	D	E	F	G	H
10	2.50	1.62	2.000	1.250	0.203	0.19	0.41	N/A
11	2.50	1.62	2.000	1.250	0.203	0.19	0.41	N/A
22	3.50	2.50	3.000	2.000	0.281	0.25	0.66	2.875
33	4.50	3.00	3.750	2.000	0.344	0.38	0.84	N/A
36	4.50	3.00	3.750	2.000	0.344	0.38	0.84	N/A
42	7.32	4.51	5.905	2.953	0.551	0.63	1.61	N/A
44	7.32	4.51	5.905	2.953	0.551	0.63	1.61	N/A
46	7.32	4.51	5.905	2.953	0.551	0.63	1.61	N/A

Note: The face opposite the flange mount does not contain tapped mounting holes. Consult factory if needed.



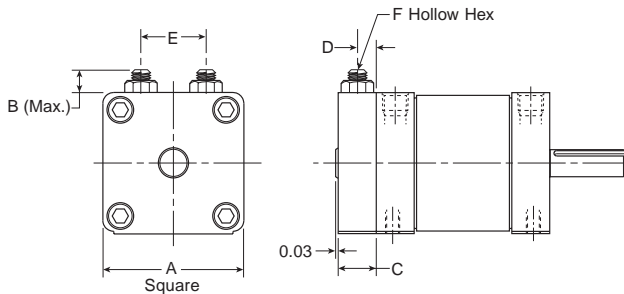
Double End Male Keyed Shaft (C)



Model number	A	B	C	D	E	F
10	2.75	0.88	0.50	0.312 0.311	0.28	#302.5
11	3.38	0.88	0.50	0.312 0.311	0.28	#302.5
22	5.06	1.25	0.75	0.500 0.499	0.44	#404
33	7.15	1.75	1.00	0.749 0.748	0.56	#606
36	10.15	1.75	1.00	0.749 0.748	0.56	#606
42	7.53	2.25	1.28	0.999 0.998	0.72	#808
44	9.53	2.25	1.28	0.999 0.998	0.72	#808
46	11.53	2.25	1.28	0.999 0.998	0.72	#808

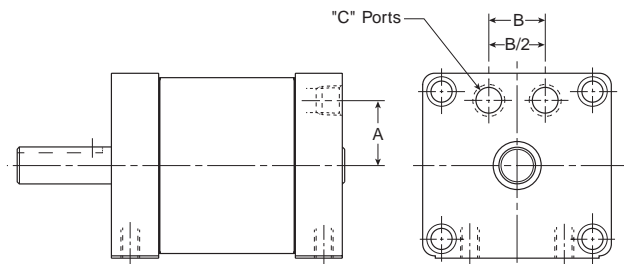
Note: Not available with switches or stroke adjustment. Consult factory for rear port option.

Adjustable Rotation Stop (090A, 180A)



Model number	A	B	C	D	E	F
10	1.62	0.63	0.47	0.24	0.75	3/32
11	1.62	0.63	0.47	0.24	0.75	3/32
22	2.50	1.00	0.72	0.36	1.25	5/32
33	3.00	1.16	0.97	0.48	1.56	3/16
36	3.00	1.16	0.97	0.48	1.56	3/16
42	4.50	1.38	1.25	0.56	2.25	7/32
44	4.50	1.38	1.25	0.56	2.25	7/32
46	4.50	1.38	1.25	0.56	2.25	7/32

Rear Port (7)



Model number	A	B	C
10	0.54	0.50	10-32
11	0.54	0.50	10-32
22	0.88	0.75	1/8 NPTF
33	1.09	0.90	1/8 NPTF
36	1.09	0.90	1/8 NPTF
42	1.68	1.00	1/4 NPTF
44	1.68	1.00	1/4 NPTF
46	1.68	1.00	1/4 NPTF

B
 Rotary Actuators
 Actuator Products
 PV
 Series
 PRN(A)
 Series
 PTR
 Series
 HP
 Series
 P1V-S
 Series

PRN Series

- Single or double vane rotary actuator
- 3 standard rotations: 90°, 180°, or 270°
- Output torque @ 0.7 MPa:
 16 to 1120 N•cm (1.4 to 99 in-lb)
- Internal bumpers are standard
- Shock absorbers are available for high inertia loads



Operating information

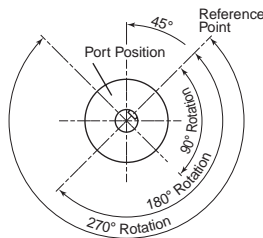
Operating pressure:	100 PSIG (6.9 bar)
Temperature range:	-5°C to 80°C (-23°F to 176°F)
Filtration requirements:	40 micron, dry filtered air

Ordering information

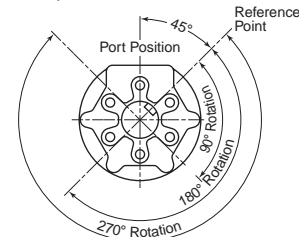
PRNA	20	S - 90 - 90 S																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Type</th></tr> <tr><td>PRNA</td><td>Sizes 1-20</td></tr> <tr><td>PRN</td><td>Sizes 30-800</td></tr> </table>	Type		PRNA	Sizes 1-20	PRN	Sizes 30-800	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Size</th></tr> <tr><td>1</td></tr> <tr><td>3</td></tr> <tr><td>10</td></tr> <tr><td>20</td></tr> <tr><td>30</td></tr> <tr><td>50</td></tr> <tr><td>150</td></tr> <tr><td>300</td></tr> <tr><td>800</td></tr> </table>	Size		1	3	10	20	30	50	150	300	800	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Type</th></tr> <tr><td>S</td><td>Single vane</td></tr> <tr><td>D</td><td>Double vane</td></tr> </table>	Type		S	Single vane	D	Double vane	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Porting</th></tr> <tr><td>Omit</td><td>Standard porting</td></tr> <tr><td>S</td><td>Rear porting (sizes 3-20 only)</td></tr> </table>	Porting		Omit	Standard porting	S	Rear porting (sizes 3-20 only)
Type																																
PRNA	Sizes 1-20																															
PRN	Sizes 30-800																															
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Porting																																
Omit	Standard porting																															
S	Rear porting (sizes 3-20 only)																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Rotation angle</th></tr> <tr><td>90</td><td>90° (all sizes, single and double vane)</td></tr> <tr><td>100</td><td>100° (sizes 50 through 800, double vane only)</td></tr> <tr><td>180</td><td>180° (all sizes, single vane only)</td></tr> <tr><td>270</td><td>270° (single vane only, not available on size 1)</td></tr> <tr><td>280</td><td>280° (sizes 50 through 800, single vane only)</td></tr> </table>		Rotation angle		90	90° (all sizes, single and double vane)	100	100° (sizes 50 through 800, double vane only)	180	180° (all sizes, single vane only)	270	270° (single vane only, not available on size 1)	280	280° (sizes 50 through 800, single vane only)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Oscillating reference point*</th></tr> <tr><td>40</td><td>40°</td></tr> <tr><td>45</td><td>45°</td></tr> <tr><td>90</td><td>90°</td></tr> </table> <p>* See specification tables for availability of rotation angle /reference point combinations for the selected model.</p>		Oscillating reference point*		40	40°	45	45°	90	90°									
Rotation angle																																
90	90° (all sizes, single and double vane)																															
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Oscillating reference point*																																
40	40°																															
45	45°																															
90	90°																															
<p>Sensors For sensors see page B339. </p>																																

Reference point and rotation orientations

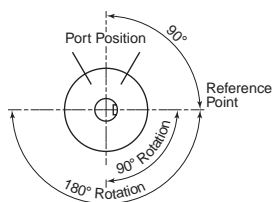
PRNA1S/D, PRNA3S/D, PRNA10S/D, PRNA20S/D, PRN30S/D
 Reference point at 45°



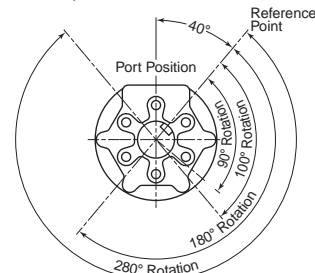
PRN50, 150, 300, 800
 Reference point at 45°



PRN1AS, PRNA3S, PRNA10S, PRNA20S
 Reference point at 90°



PRN50, 150, 300, 800
 Reference point at 40°



Quick reference data – PRNA miniature

Type	Model number	Theoretical output torque								Maximum breakaway pressure		Unit weight	
		0.3 MPa (45 PSI)		0.5 MPa (75 PSI)		0.7 MPa (100 PSI)		1.0 MPa (145 PSI)		MPa	PSI	kg	lb
		Ncm	(in-lb)	Ncm	(in-lb)	Ncm	(in-lb)	Ncm	(in-lb)				
Single vane	PRNA1S	8	(0.7)	13	(1.2)	19	(1.6)	—	—	0.08	(12)	0.04	(0.08)
	PRNA3S	17	(1.5)	31	(3)	45	(4.0)	—	—	0.10	(15)	0.07	(0.15)
	PRNA10S	46	(4.1)	86	(7.6)	127	(11)	—	—	0.10	(15)	0.14	(0.31)
	PRNA20S	80	(7.1)	159	(14)	240	(21)	350	(31)	0.10	(15)	0.25	(0.55)
Double vane	PRNA1D	17	(1.5)	28	(2.5)	41	(3.6)	—	—	0.10	(15)	0.04	(0.09)
	PRNA3D	32	(2.9)	54	(4.8)	76	(6.7)	—	—	0.07	(10)	0.07	(0.16)
	PRNA10D	101	(8.9)	168	(15)	235	(21)	—	—	0.07	(10)	0.15	(0.33)
	PRNA20D	165	(15)	330	(29)	530	(47)	800	(71)	0.06	(9)	0.26	(0.57)

Quick reference data – PRN

Type	Model number	Theoretical output torque								Maximum breakaway pressure		Unit weight	
		0.3 MPa (45 PSI)		0.5 MPa (75 PSI)		0.7 MPa (100 PSI)		1.0 MPa (145 PSI)		MPa	PSI	kg	(lb)
		Ncm	(in-lb)	Ncm	(in-lb)	Ncm	(in-lb)	Ncm	(in-lb)				
Single vane	PRN30S	180	(16)	319	(28)	480	(42)	720	(64)	0.10	(15)	0.47	(1.04)
	PRN50S	259	(23)	479	(42)	700	(62.0)	1060	(94)	0.10	(15)	0.8	(1.8)
	PRN150S	850	(75)	1500	(133)	2100	(186)	3050	(270)	0.08	(12)	2.0	(4.4)
	PRN300S	1650	(146)	2850	(252)	4050	(358)	5750	(509)	0.08	(12)	3.7	(8.2)
	PRN800S	5910	(523)	10200	(903)	14400	(1274)	20500	(1814)	0.05	(7)	13	(28)
Double vane	PRN30D	440	(39)	770	(68)	1120	(99)	1660	(147)	0.08	(12)	0.48	(1.06)
	PRN50D	579	(51)	1040	(92.0)	1510	(134)	2250	(199)	0.08	(12)	0.8	(1.8)
	PRN150D	1900	(168)	3500	(310)	4800	(425)	6900	(611)	0.06	(9)	2.0	(4.4)
	PRN300D	3900	(345)	6800	(602)	9700	(858)	1370	(121)	0.06	(9)	4.3	(9.5)
	PRN800D	12000	(1062)	20600	(1823)	28800	(2549)	41100	(3637)	0.05	(7)	13	(28)

Kinetic energy ratings and bearing load capacities – sizes 1 to 30

Model number	Bearing load capacities				Distance between centerline bearings		Maximum kinetic energy rating	
	Thrust load		Radial load		mm	in	mJ	in-lb
	N	lb	N	lb				
PRNA1S	1	0.2	10	2	15	0.6	0.8	0.01
PRNA3S	4	0.9	40	9	20	0.8	4	0.03
PRNA10S	4	0.9	50	11	30	1.2	8	0.07
PRNA20S	25	5.6	300	67	42	1.7	40	0.35
PRN30S	30	6.7	400	90	48	1.9	67	0.60

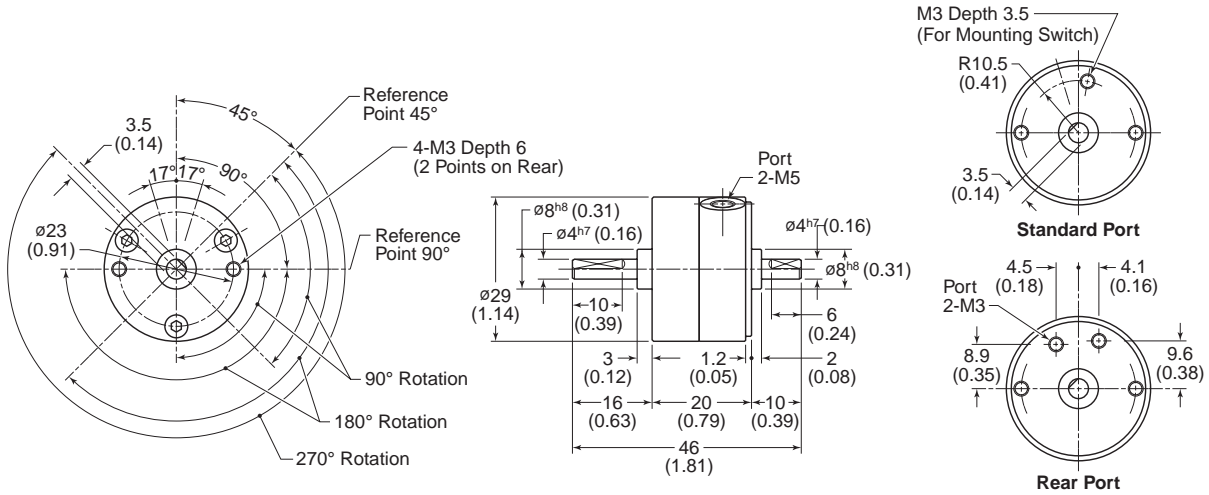
Kinetic energy ratings and bearing load capacities – sizes 50 to 800

Model	Bearing load capacities						Maximum kinetic energy rating					
	Thrust load		Radial load		Distance between centerline bearings		Standard unit		Shock absorber (per cycle)		Shock absorber (per cycle)	
	N	lb	N	lb	mm	in	J	in-lb	J	in-lb	J/hr	in-lb/hr
PRN50S/D	44.1	9.9	588	132	66	2.6	0.13	1.2	7.8	69	3100	27000
PRN150S/D	88.2	19.8	1176	264	79.5	3.1	0.6	5.3	10	231	11300	100000
PRN300S/D	147	33.0	1960	441	97.5	3.8	8.0	70	20	462	22000	194000
PRN800S/D	490	110.2	4900	1102	138.5	5.5	10.5	92	156	1387	56500	500000

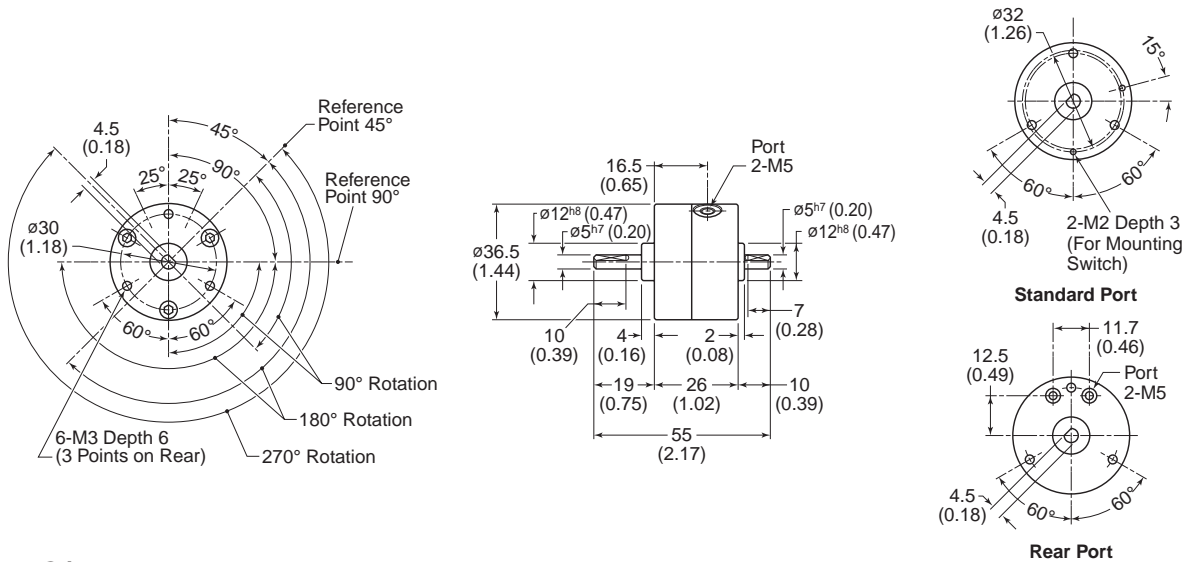


B
 Rotary Actuators
 Actuator Products
 Series
 PV
 Series
 PRN(A)
 Series
 PTR
 Series
 HP
 Series
 P1V-S
 Series

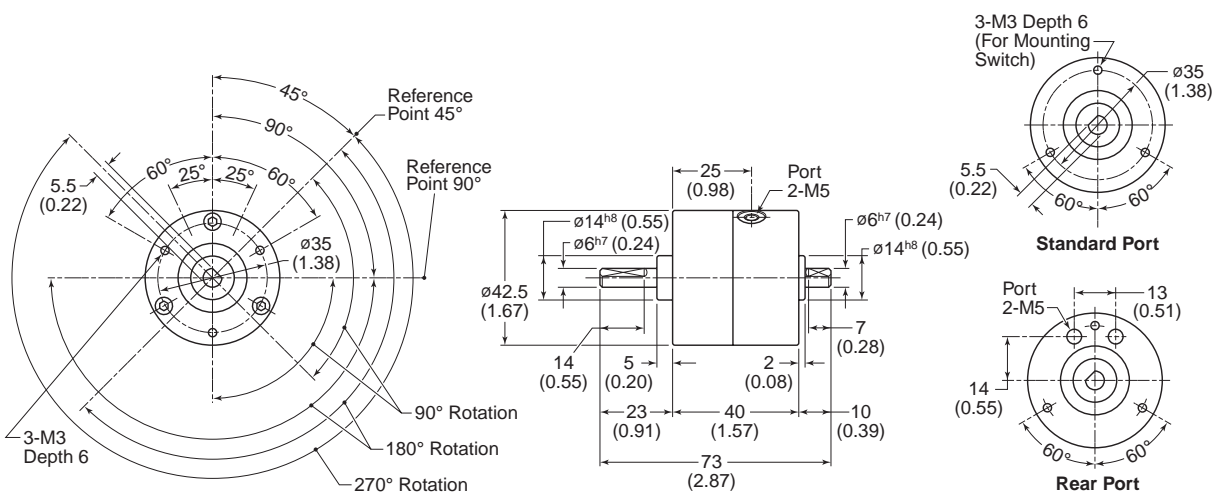
PRNA1S



PRNA3S/D



PRNA10S/D

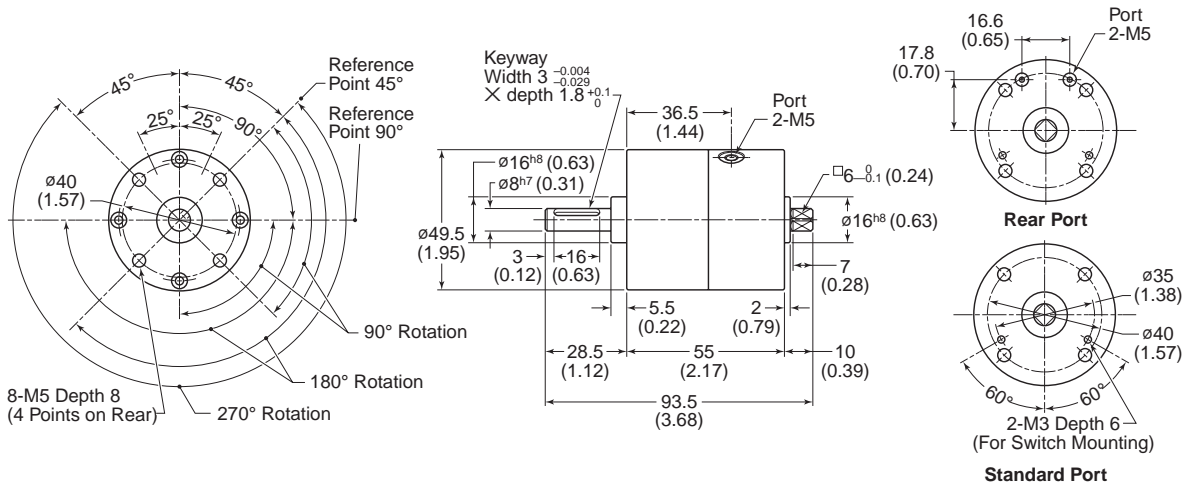


Dimensions in mm (inch)

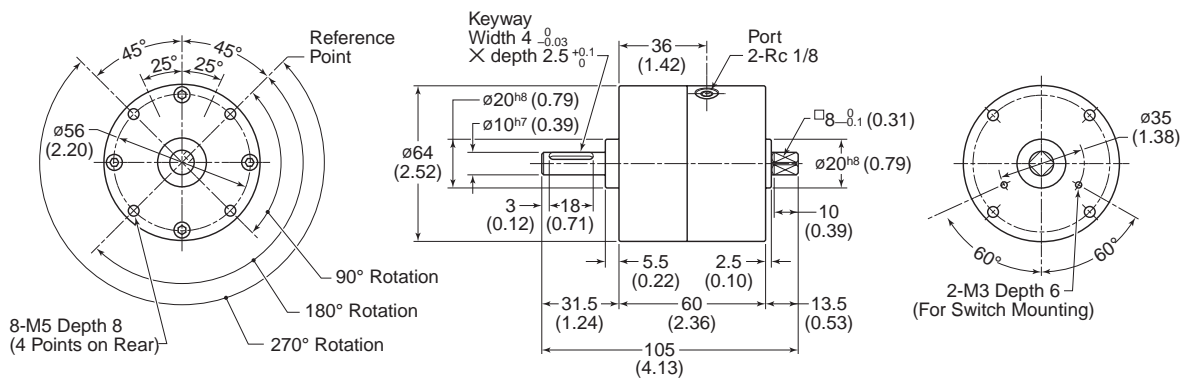
B	Rotary Actuators Actuator Products
	PV Series
	PRN(A) Series
	PTR Series
	HP Series
	PIV-S Series



PRNA20S/D



PRN30S/D

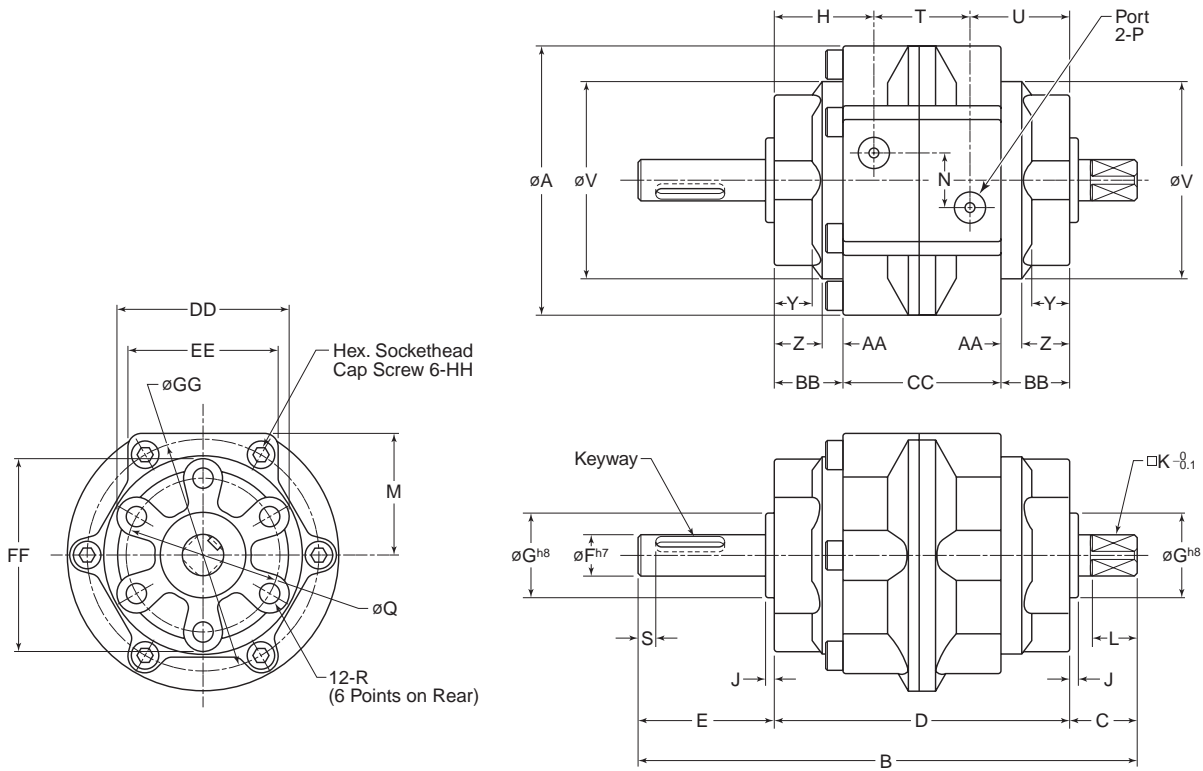


Dimensions in mm (inch)



B	Rotary Actuators
	Actuator Products
PV Series	
PRN(A) Series	
PTR Series	
HP Series	
P1V-S Series	

PRN Sizes 50 to 800



Dimensions in mm (inch)

Model number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
PRN50	79 (3.11)	145 (5.71)	19.5 (0.77)	86 (3.39)	39.5 (1.56)	12 (0.47)	25 (0.98)	29 (1.14)	2.5 (0.10)	10 (0.39)	13 (0.51)	36 (1.42)	16 (0.63)	Rc1/8	45 (1.77)	M6 x 1, Depth 9	5 (0.20)
PRN150	110 (4.33)	180 (7.09)	23.5 (0.93)	103 (4.06)	53.5 (2.11)	17 (0.67)	30 (1.18)	34.5 (1.36)	3 (0.12)	13 (0.51)	16 (0.63)	51 (2.01)	24 (0.94)	Rc1/4	70 (2.76)	M8 x 1.25, Depth 12	5 (0.20)
PRN300	141.5 (5.57)	220 (8.66)	30 (1.18)	125 (4.92)	65 (2.56)	25 (0.98)	45 (1.77)	41.5 (1.63)	3.5 (0.14)	19 (0.75)	22 (0.87)	66 (2.60)	32 (1.26)	Rc3/8	80 (3.15)	M10 x 1.5, Depth 15	5 (0.20)
PRN800	196 (7.72)	285 (11.22)	44.5 (1.75)	171 (6.73)	69.5 (2.74)	40 (1.57)	70 (2.76)	53.5 (2.11)	4.5 (0.18)	32 (1.26)	35 (1.38)	90 (3.54)	44 (1.73)	Rc1/2	120 (4.72)	M12 x 1.75, Depth 18	10 (0.39)

Model number	T	U	V	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	Keyway width x depth x length
PRN50	28 (1.10)	29 (1.14)	58 (2.28)	11 (0.43)	14 (0.55)	6 (0.24)	20 (0.79)	46 (1.81)	51 (2.01)	44 (1.73)	57 (2.24)	68 (2.68)	M5 x 30	4 ⁰ _{-0.03} x 2.5 ^{+0.1} ₀ x 20
PRN150	34 (1.34)	34.5 (1.36)	85.2 (3.35)	10.5 (0.41)	15.5 (0.61)	8 (0.31)	23.5 (0.93)	56 (2.20)	75 (2.95)	61 (2.40)	85 (3.35)	97 (3.82)	M6 x 35	5 ⁰ _{-0.03} x 3 ^{+0.1} ₀ x 36
PRN300	42 (1.65)	41.5 (1.63)	110 (4.33)	13 (0.51)	17.5 (0.69)	10 (0.39)	27.5 (1.08)	70 (2.76)	88.5 (3.48)	78 (3.07)	98.5 (3.88)	125 (4.92)	M8 x 45	7 ⁰ _{-0.03} x 4 ^{+0.1} ₀ x 40
PRN800	64 (2.52)	53.5 (2.11)	152 (5.98)	14.5 (0.57)	21.1 (0.83)	11.4 (0.45)	32.5 (1.28)	106 (4.17)	130 (5.12)	110 (4.33)	145 (5.71)	173 (6.81)	M12 x 70	12 ⁰ _{-0.043} x 5 ^{+0.2} ₀ x 40

B

Rotary Actuators
 Actuator Products

PV Series

PRN(A) Series

PTR Series

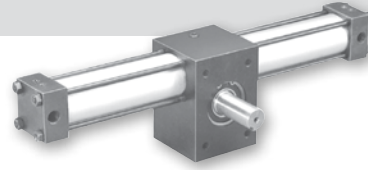
HP Series

P1V-S Series



PTR Series

- Rack and pinion rotary actuator
- 5 bore sizes from 1" to 3-1/4"
- Output torque @ 100 PSIG: 39 lb-in to 2281 lb-in
- Standard rotations: 90°, 180°, 270°, 360°
- Available as single or double rack, 3 position, air/oil, antitbacklash
- Optional bumpers, cushions, stroke adjusters, shock absorbers



Operating information

Operating pressure:	250 PSIG (17 bar)
Temperature range:	
Nitrile seals	0°F to 180°F (-18° to 82°C)
Fluorocarbon seals	0°F to 250°F (-18° to 121°C)
Filtration requirements:	40 micron, dry filtered air

Sensors

For sensors see page B339.



Ordering information

PTR 25 1 - 090 3 F P - A B 2 1 M V - C

Model 1	
10	1" Bore
15	1-1/2" Bore
20	2" Bore
25	2-1/2" Bore
32	3-1/4" Bore

Rotation 2	
090	90°
180	180°
270	270°
360	360°
Or specify any other rotation.	

Configuration	
1	Single Rack
2	Double Rack
3	Three Position Actuator
6	Air/Oil Operation
7	Antitbacklash

Mounting	
A	Face/base (standard)
F	Front flange
G	Foot flange
P	Pilot ring
R	Rear flange
X	Special

Design Series	
C	Current

Special Options	
Omit	Standard
(Two-digit code assigned by factory and applies when any "X" or "9" appears in the model number or when special options or features are required.)	

Seals	
Omit	Nitrile
V	Fluorocarbon
X	Special

Standard options	
Omit	None
M	Magnetic piston ring
S	Shaft seal cover
Q	Prepped for external air/oil tank
L	Air/oil cushion & flow control adj. at location 1 (opposite standard)

Port flow controls	
Omit	None
P	Flow control both rotations
R	Flow control CW rotation 3
S	Flow control CCW rotation 3

Shaft	
A	Female keyed
B	Single male keyed (standard)
C	Double male keyed
R	Preload keyway
X	Special

Port location	
1	Position 1 (standard)
2	Position 2
3	Position 3
4	Position 4 8
5	Position 5 6
9	Special

Port type	
1	SAE straight thread
2	NPTF
4	BSPP (ISO 1179-1 with ISO 228-1 threads)
9	Special

Other options	
Detail in clear text:	
• Proximity Sensors	
• Feedback Potentiometer	

Notes:

- 1 Cylinder bore size. See appropriate tables for torque output.
- 2 For 3-position units, specify middle and total rotation separated by a "/", ie 090/180. To obtain equal rotation both sides of midstroke (theoretical 12:00), order unit with 5° longer rotation than standard with stroke adjusters.
- 3 Viewed from shaft end.
- 4 Double rack models only.
- 5 Reduces to 10° with cushions.
- 6 Not available with cushions or stroke adjusters.
- 7 Refer to Catalog 0900-E page H45 for option configuration compatibility.
- 8 Not available on double rack models

Cushion / Bumpers	
Omit	None
1	Cushioned CW rotation 3
2	Cushioned CCW rotation 3
3	Cushioned both rotations
4	Four cushions 4
5	Bumper CW rotation 3
6	Bumper CCW rotation 3
7	Bumper both rotations
9	Special

Stroke adjusters	
Omit	None
D	0-30° CW rotation 3, 5
E	0-30° CCW rotation 3, 5
F	0-30° both rotations 5
H	Shock/stroke adj. CW rotation 3, 7
K	Shock/stroke adj. CCW rotation 3, 7
L	Shock/stroke adj. both rotations 7
X	Special

B

Rotary Actuators
Actuator Products

PV
Series

PRN(A)
Series

PTR
Series

HP
Series

P1V-S
Series

Quick reference data

Model		Typ. actual output torque @ 100 PSI (lb-in)	Theoretical output torque* (lb-in) versus input pressure (PSI)				Displacement per degree rotation (in ³ /°)	Maximum angular backlash (minutes)	Tolerance (degrees)
Single rack	Double rack		50	75	100	250			
101		35	19	29	39	98	0.007	60	-0, +5
	102	70	39	59	79	197	0.014	60	-0, +5
151		100	59	88	118	294	0.021	45	-0, +4
	152	200	118	177	236	590	0.042	45	-0, +4
201		250	141	212	282	705	0.049	35	-0, +3
251		375	215	322	430	1074	0.075	35	-0, +3
	202	500	282	423	565	1410	0.099	35	-0, +3
	252	750	430	644	859	2148	0.150	35	-0, +3
321		1000	570	856	1141	2852	0.199	25	-0, +2
	322	2000	1141	1711	2281	5703	0.398	25	-0, +2

* Allow 10% for friction loss. Allow 20% on air/oil units. Use the single rack torque values for all air/oil, three position, and anti-backlash actuators.

Bearing load capacities and kinetic energy ratings

Model	Bearing load capacities* (lb)		Distance between bearings	Maximum kinetic energy absorption rating for models based on configuration (lb-in)			
	Radial	Thrust		Standard or stroke adjusters	Bumper	Cushion**	Shock absorbers (per cycle / per hour)
10	100	50	1.40	0.5	0.75	5.00	15/150,000
15	250	125	2.15	1.50	2.25	15.00	35/200,000
20	500	250	2.15	3.00	4.50	35.00	140/350,000
25	750	375	2.50	5.50	8.25	55.00	140/300,000
32	1000	500	3.75	12.00	18.00	155.00	N/A

* Bearing capacities only. Check Kinetic Energy ratings to determine if actuator will stop load.

** Assuming positive back pressure provided by meter-out flow control.

Seal kit ordering information

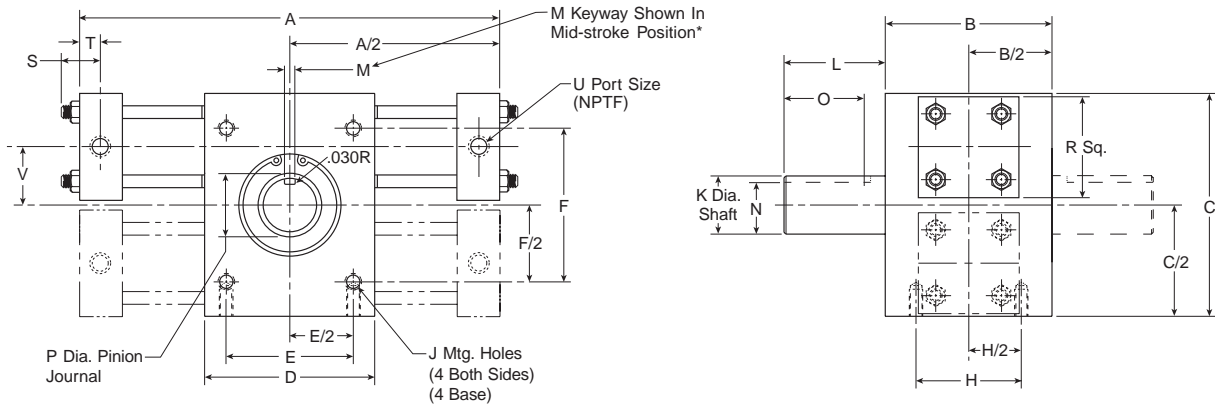
- Standard units are equipped with Nitrile seals.
- Optional seal compounds are available.
- Seal kit part numbers as shown:

PSK Parker seal kit	—	PTR322 Base model	V	
			Omit	Standard
			V	Fluorocarbon
			Q	Quad ring piston seals
			W	Corboxilated nitrile piston seals

B
 Rotary Actuators
 Actuator Products
 PV Series
 PRN(A) Series
 PTR Series
 HP Series
 PIV-S Series

Standard Face Base Mount (A) and Male Keyed Shaft (B)

Double Male Keyed Shaft (C) shown in phantom



Model number	Rotation (Degrees)	A	B	C	D	E	F	H	J	K	L	M	N
10	90°	6-11/16											
	180°	8-1/4	2	3	2	1.500	2.000	1.500	1/4-20 x 3/8 DP	0.500 0.499	7/8	0.125 0.127	0.430 0.425
	360°	11-7/16											
15	90°	9-1/8											
	180°	11-3/16	3	4-1/4	3	2.000	3.000	2.000	5/16-18 x 1/2 DP	0.875 0.874	1-7/8	0.188 0.190	0.771 0.761
	360°	15-3/8											
20	90°	11-3/16											
	180°	14-1/16	3	5	4	2.500	3.500	2.000	3/8-16 x 1/2 DP	1.125 1.124	1-7/8	0.250 0.252	0.986
	360°	19-11/16											
25	90°	12-9/16											
	180°	15-1/2	3-1/2	6	4	2.500	4.500	2.000	1/2-13 x 3/4 DP	1.375 1.374	2-1/4	0.313 0.315	1.201 1.191
	360°	20-5/8											
32	90°	16-5/8											
	180°	21-1/8	5	8	5	3.000	5.000	2.500	3/4-10 x 1 DP	1.750 1.749	3-1/2	0.375 0.377	1.542 1.532
	360°	29-3/8											

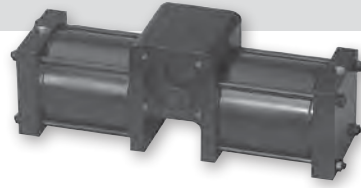
Model number	O	P	R	S	T	U	V
10	5/8	0.59	1-1/2	1/4	0.31	1/8	3/4
15	1-1/2	0.98	2	5/16	0.41	1/4	1-1/16
20	1-1/2	1.18	2-1/2	3/8	0.41	1/4	1-1/4
25	1-3/4	1.38	3	3/8	0.41	1/4	1-1/2
32	3	1.77	3-3/4	7/16	0.56	3/8	1-15/16

* To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.

B
 Rotary Actuators
 Actuator Products
 Series
 PV
 Series
 PRN(A)
 Series
 PTR
 Series
 HP
 Series
 P1V-S
 Series

HP Series

- Rack and pinion rotary actuator
- 2 large bore models
- 3 standard rotations: 90°, 180°, 360°
- Standard output torque at 100 PSIG: 4,500 and 10,000 lb-in
- Large female pinion
- Available with adjustable cushions and stroke adjusters



Operating information

Operating pressure:	100 PSIG (6.9 bar)
Temperature range:	
Nitrile seals	0°F to 180°F (-18° to 82°C)
Fluorocarbon seals	0°F to 250°F (-18° to 121°C)
Filtration requirements:	40 micron, dry filtered air

Ordering information

HP 10 - 090 3 C - A A 2 V -

Model	
4.5	4,500 lb-in output torque
10	10,000 lb-in output torque

Rotation 1	
090	90°
180	180°
360	360°

Specify other rotations.

Cushions	
Omit	None
1	CW rotation ²
2	CCW rotation ²
3	Both rotation
9	Special

Stroke adjusters	
Omit	None
A	0-5° CW rotation ²
B	0-5° CCW rotation ²
C	0-5° both rotation
D	0-30° CW rotation ^{2,3}
E	0-30° CCW rotation ^{2,3}
F	0-30° both rotation ³
X	Special

Special options	
Omit	Standard
Two digit code assigned by factory when any "X" or "9" appears in the model number or when special options or features are required.	

Seals	
Omit	Nitrile (standard)
V	Fluorocarbon
X	Special


Port type	
2	NPTF (standard)
9	Special

Shaft configuration	
A	Female keyed shaft
B	Male keyed shaft
D	Female SAE 10B spline
E	Male SAE 10B spline
X	Special

Mounting style	
A	Face (standard)
X	Special

Notes:

- ¹ To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.
- ² Viewed from shaft end.
- ³ Cannot combine with cushions.

Sensors
 For sensors see page B339. 

B

Rotary Actuators
 Actuator Products

PV
 Series

PRN(A)
 Series

PTR
 Series

HP
 Series

P1V-S
 Series

Quick reference data

Model	Rotation* (Degrees)	Displacement (Cubic inches)	Weight (lb)	Bore size	Actual torque output at 100 psi (lb-in)	Maximum rotational tolerance (degrees)	Maximum angular backlash (minutes)
4.5	90°	79.93	63	6"	4,500	-0, +2	15
	180°	159.86	75				
	360°	319.72	95				
10	90°	177.64	125	8"	10,000	-0, +2	15
	180°	355.28	147				
	360°	710.56	190				

* To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.

Bearing load capacities and kinetic energy ratings

Model	Radial load (lb) per bearing		Thrust load (lb)		Distance between bearings (in.)	Maximum kinetic energy rating for models based on configuration (in-lb)		
	Dynamic	Static	Dynamic	Static		Standard	Stroke adjusters	Cushion
4.5	2,000	3,000	300	450	2.77	45	45	650
10	2,000	3,000	500	750	3.63	100	100	1450

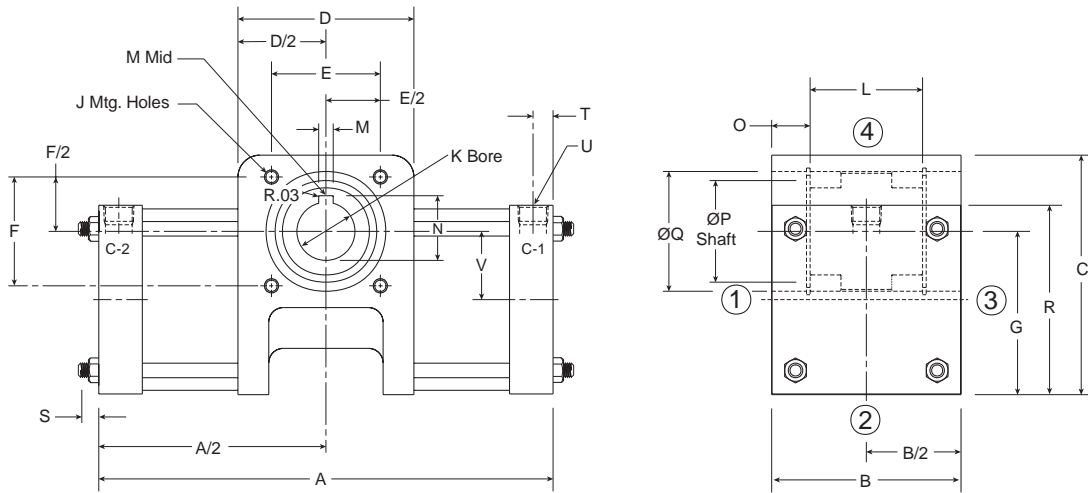
Seal kit ordering information

- Standard units are equipped with Nitrile seals.
- Optional seal compounds are available.
- Seal kit part numbers as shown:

PSK	—	HP4.5	V	
Parker seal kit		Base model	Omit	Standard
			V	Fluorocarbon
			N	Non-Lube

B
 Rotary Actuators
 Actuator Products
 PV Series
 PRN(A) Series
 PTR Series
 HP Series
 P1V-S Series

Standard face mount (A) and female keyed shaft (A) shown



Notes: Pressure on C-1 port gives clockwise rotation.
 Pressure on C-2 port gives counterclockwise rotation.

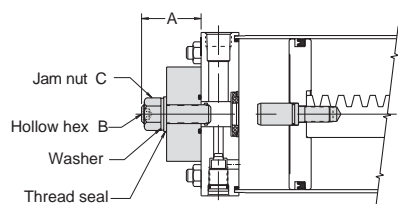
Numbers above represent possible mounting and port positions.

Model number	Rotation (Degrees)	A	B	C	D	E	F	G	J	K
4.5	90°	15-5/8								
	180°	22-1/4	6.525	8-1/4	6.063	3.750	3.750	5.615	7/16-14 x 21/32 DP	2.000 2.003
	360°	33								
10	90°	18								
	180°	26-3/4	8.525	10-1/2	7.813	5.000	5.000	7.265	5/8-11 x 15/16 DP	2.250 2.253
	360°	39-5/8								

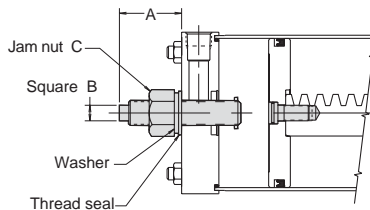
Model number	L	M	N	O	P	Q	R	S	T	U	V
4.5	3-7/8	0.500	2.223	1-5/16	3-1/2	4-1/8	6-1/2	5/8	0.69	3/4 NPTF	2.35
		0.502	2.233								
10	5	0.625	2.525	1-3/4	4-1/2	5-1/4	8-1/2	3/4	0.69	3/4 NPTF	3.00
		0.628	2.535								

Stroke Adjusters (A - F)

5° stroke adjust option with cushion option

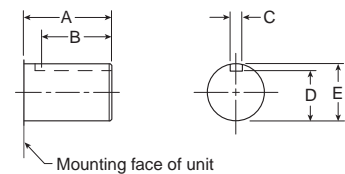


5° or 30° stroke adjust option without cushion option



Cushioned end cap				Non-cushioned end cap				
Model number	(1) Turn Adjust	A		(1) Turn Adjust	A		B	C
		A	B		5°	30°		
4.5	2.5°	2.50	5/8	2.0°	2.00	2.81	3/8	3/4-16
		1.00-14			2.56	3.50		
10	2.0°	2.50	15/16	1.5°	2.56	3.50	15/16	1-1/2-12
		1.50-12						

Male Shaft (B)



Model number	A	B
4.5	2.61	2.38
10	4.38	3.38

Model number	C	D	E
4.5	0.561	1.928	2.249
	0.562	1.933	2.250
10	0.625	1.888	2.249
	0.627	1.893	2.250





P1V-S Series

- Stainless steel air motor
- Approved for use in food grade applications
- Seven different sizes
- Powers ranging from 20 to 1,200 watts
- Speeds from 5 to 24,000 rpm
- Fluor rubber seals



Operating information

Operating pressure:	Max. 7 bar (Max. 6 bar in explosive atmospheres) 
Temperature range:	-30°C to 100°C (-22°F to 212°F)
Ambient temperature:	-20°C to 40°C (-4°F to 104°F) in explosive atmospheres 
Filtration requirements:	40 µm filtered, oil mist or dry unlubricated compressed air

Ordering Information

P 1 V - S	0 2 0	A	0	E 5 0
Air Motor Range	Motor Size	Function	Optional Functions	Free Speed per min
P1V-S Stainless Vane Motor	002 20 W 008 80 W 012 120 W 020 200 W 030 300 W 060 600 W 120 1200 W	A Keyed Shaft, Reversible D Threaded Shaft, Reversible	0 Standard C* Continuous Lubrication - Free Operation Z* Spring Loaded Vanes M* Multi: Combination of C+Z D** Standard with Brake E** Option C with Brake F** Option Z with Brake G** Option M with Brake	0005 5 001 10 999 9990 A00 10000 E00 14000 E50 14500 N00 22000 Q00 24000

* Not for P1V-S002 and P1V-S008
 ** Only for P1V-S020 and P1V-S030

B

Rotary Actuators
 Actuator Products

PV Series

PRN(A) Series

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P1V-S Series

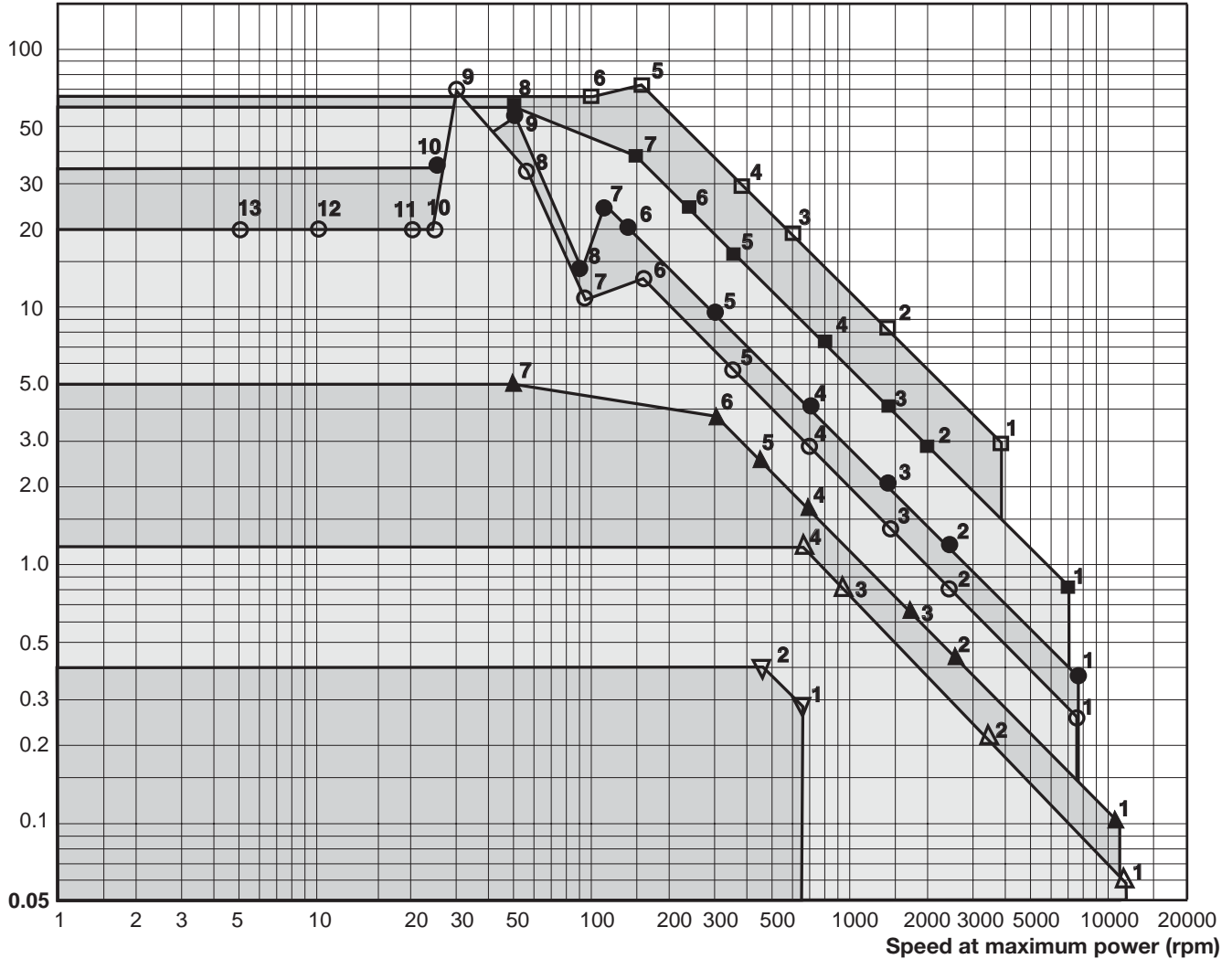
Series	Watts	Air motors in diagram on previous page	
P1V-S002A	20	▽1	P1V-S002A0130
		▽2	P1V-S002A0095
P1V-S008A	80	△1	P1V-S008A0Q00
		△2	P1V-S008A0700
		△3	P1V-S008A0190
		△4	P1V-S008A0130
P1V-S012A	120	▲1	P1V-S012A0N00, P1V-S012D0N00
P1V-S012D		▲2	P1V-S012A0550, P1V-S012D0550
		▲3	P1V-S012A0360, P1V-S012D0360
		▲4	P1V-S012A0140, P1V-S012D1400
		▲5	P1V-S012A0090, P1V-S012D0090
		▲6	P1V-S012A0060, P1V-S012D0060
		▲7	P1V-S012A0010, P1V-S012D0010
P1V-S020A	200	○1	P1V-S020A0E50, P1V-S020D0E50
P1V-S020D		○2	P1V-S020A0460, P1V-S020D0460
		○3	P1V-S020A0240, P1V-S020D0240
		○4	P1V-S020A0140, P1V-S020D0140
		○5	P1V-S020A0070, P1V-S020D0070
		○6	P1V-S020A0035, P1V-S020D0035
		○7	P1V-S020A0018, P1V-S020D0018
		○8	P1V-S020A0011
		○9	P1V-S020A0006
		○10	P1V-S020A0005, P1V-S020D0005
		○11	P1V-S020A0002
		○12	P1V-S020A0001
		○13	P1V-S020A00005
P1V-S030A	300	●1	P1V-S030A0E50, P1V-S030D0E50
P1V-S030D		●2	P1V-S030A0460, P1V-S030D0460
		●3	P1V-S030A0240, P1V-S030D0240
		●4	P1V-S030A0140, P1V-S030D0140
		●5	P1V-S030A0060, P1V-S030D0060
		●6	P1V-S030A0028, P1V-S030D0028
		●7	P1V-S030A0023
		●8	P1V-S030A0018, P1V-S030D0018
		●9	P1V-S030A0010
		●10	P1V-S030A0005, P1V-S030D0005
P1V-S060A	600	■1	P1V-S060A0E00
		■2	P1V-S060A0400
		■3	P1V-S060A0270
		■4	P1V-S060A0170
		■5	P1V-S060A0072
		■6	P1V-S060A0048
		■7	P1V-S060A0030
		■8	P1V-S060A0010
P1V-S120A	1200	□1	P1V-S120A0800
		□2	P1V-S120A0270
		□3	P1V-S120A0110
		□4	P1V-S120A0078
		□5	P1V-S120A0032
		□6	P1V-S120A0012

Most popular.

B
 Rotary Actuators
 Actuator Products
 PV Series
 PRN(A) Series
 PTR Series
 HP Series
 P1V-S Series

Choice of Air Motor

Torque at Maximum Power [Nm]




B	Rotary Actuators Actuator Products
PV	Series
PRN(A)	Series
PTR	Series
HP	Series
P1V-S	Series

The motor to be used should be selected by starting with the torque needed at a specific shaft speed. Since maximum power is reached at half the motor's free speed, the motor should be chosen so that the operating point is as close as possible to the maximum power of the motor.

Use the above graph to choose the correct motor size. The graph contains the points for the maximum torque of each motor at maximum output. Add your operating point to the graph, then select a marked point above and to the right of your point.

Then use the correct working diagram of the chosen motor to get more detailed technical data. Always select a motor whose requisite technical data are in the shaded area. Also use the correction diagram to find out what operation with different supply pressures would mean for the motor.

Tip: Select a motor which is slightly too fast and powerful, then regulate its speed and torque with a pressure regulator and/or throttle to achieve the optimum working point.



Important!
 Before carrying out service activities, make sure the air motor is vented. Before disassembling the motor, disconnect the primary air hose to ensure that the air supply is interrupted.



NOTE!
 All technical data in the catalog are typical values. The air quality is a major factor in the service life of the motor, see ISO 8573-1.

Grippers

	Series	Type	Grip force max.	mm or degrees of stroke	Spring open	Spring close	Clean room	Page number
	P5GA	Angular	13N to 194N	-10° to 30°	No	No	No	B282
	P5GB	Parallel	16N to 130N	6mm to 16mm	No	No	No	B284
	P5GV	Parallel	36N	3.2mm to 6.3mm	No	No	Yes	B286
	P5GR	Parallel	120N to 458N	6.4mm to 38.1mm	No	Yes	Yes	B288
	P5GU	Parallel	116N to 160N	6.5mm to 25.4mm	No	No	Yes	B291
	P5GN	Parallel	62N to 445N	1.6mm to 9.5mm	No	No	Yes	B294
	P5GM	Parallel	62N to 445N	4.8mm to 25.4mm	No	No	Yes	B297
	P5GS	Parallel	222N to 800N	19.1mm to 73.5mm	No	No	No	B300
	P5GT	Parallel	178N to 2669N	6.4mm to 50.8mm	No	No	No	B303
	P5GP	Electric	111N	0mm to 25mm	No	No	No	B306
	P5GQ	Electric	445N to 1334N	10mm to 20mm	No	No	No	B308
	P5GW	3-Jaw	682N to 44354N	4.0mm to 35mm	No	Yes	Yes	B310

B

Automation Products
 Actuator Products

Grippers

Slide Tables

Rotary Tables

Escapements

Sensors

Fittings

P5GA Angular Gripper Series - Economy

- Angular gripper, 2-finger - economy
- Comprehensive range of bore sizes, 12mm to 32mm
- Magnetic piston standard




Operating information

Operating pressure:	1.5 to 7 bar (21.8 to 102 PSIG)
Temperature range:	-5° to 60° C (23° to 140° F)
Maximum frequency:	180 cycles/min

Ordering Information: P5GA Angular Gripper Series - Economy

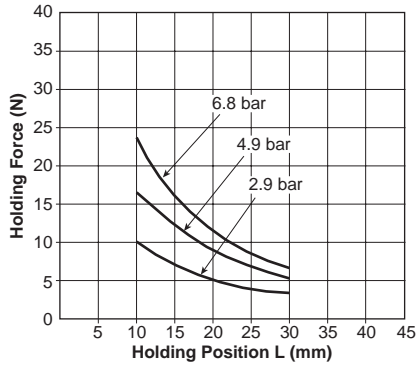
Function	Bore size (mm)	Ports (BSP)	Rotation	Weight (g)	Part number
Double acting magnetic	12	M3	-10 to 30 degrees	53	P5GA-012MSG030B
Double acting magnetic	16	M5	-10 to 30 degrees	103	P5GA-016MSG030B
Double acting magnetic	20	M5	-10 to 30 degrees	193	P5GA-020MSG030B
Double acting magnetic	25	M5	-10 to 30 degrees	327	P5GA-025MSG030B
Double acting magnetic	32	M5	-10 to 30 degrees	525	P5GA-032MSG030B

Sensor part numbers: Page 330.

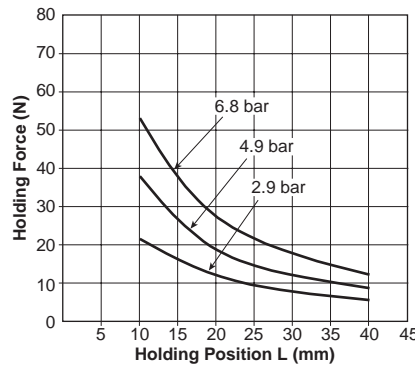
 Most popular.

B	Automation Products
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	Grippers
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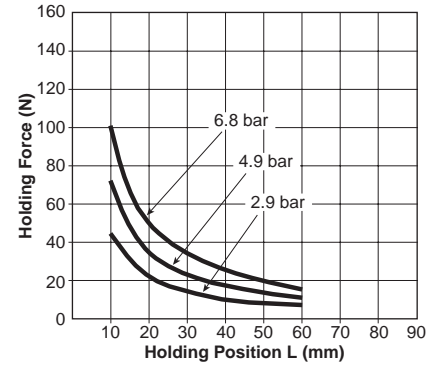
Clamp Force - P5GA-012



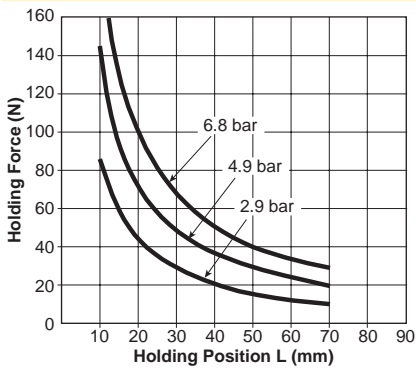
Clamp Force - P5GA-016



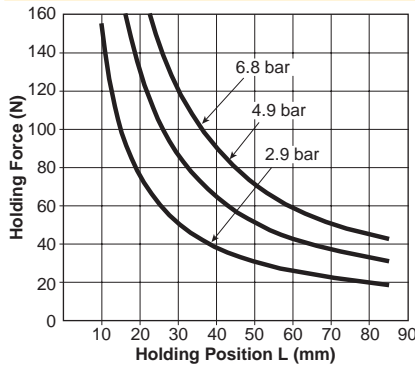
Clamp Force - P5GA-020



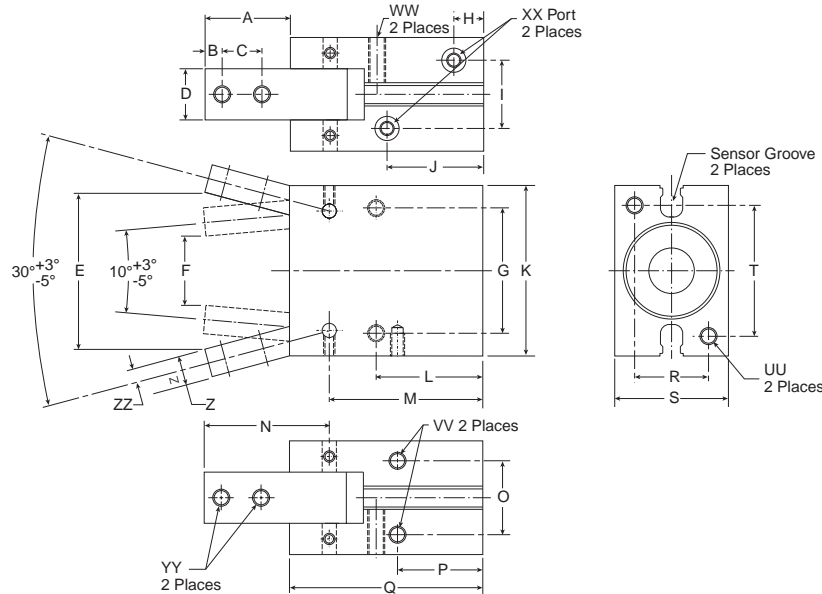
Clamp Force - P5GA-025



Clamp Force - P5GA-032



Dimensions: P5GA Angular Gripper Series - Economy



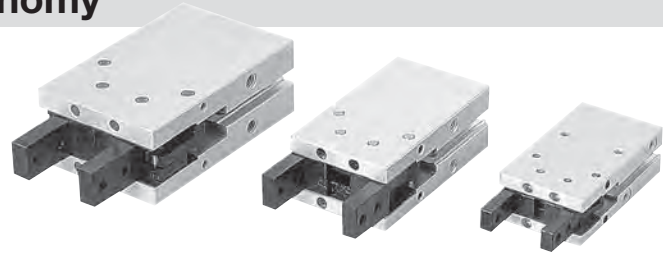
Tube I.D.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	UU	VV	WW	XX	YY	Z	ZZ
12	15.4	3	6	7	26.3	9	20	7.5	10.2	23.5	28	20	32.9	21.5	10.2	16	39	10	16	22	M3	M3	M3	M3	M3	5	2.5
16	17.5	3	8	9	31.1	14	24	7.5	12	22	34	22.5	35	25	14	18	42.5	14	22	26	M4	M4	M4	M5	M3	6	3
20	22	4	10	12	40.1	18	30	8	13	25	45	25	39.5	32.5	16	19	50	16	26	35	M5	M5	M5	M5	M4	7	3.5
25	26	5	12	14	47.9	21	36	8.5	18	28	52	28.5	45.5	38.5	20	21.5	58	20	32	40	M6	M6	M6	M5	M5	9	4
32	30	6	14	18	55.1	24	44	10.5	24	34	60	37.5	54	44	26	30	68	26	40	46	M6	M6	M6	M5	M6	10	5

Dimensions in millimeters



P5GB Parallel Gripper Series - Economy

- Parallel gripper, 2-finger - economy
- Comprehensive range of bore sizes, 12mm to 32mm
- Magnetic piston standard



Operating information

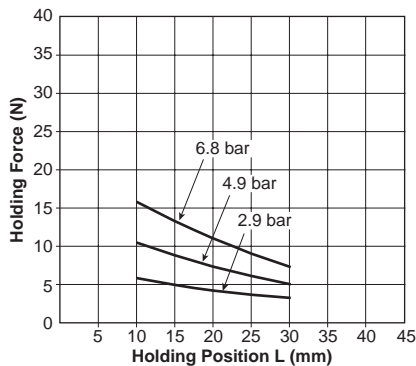
Operating pressure:	1.5 to 7 bar (21.8 to 102 PSIG)
Temperature range:	-5° to 60° C (23° to 140° F)
Maximum frequency:	180 cycles/min

Ordering Information: P5GB Parallel Gripper Series - Economy

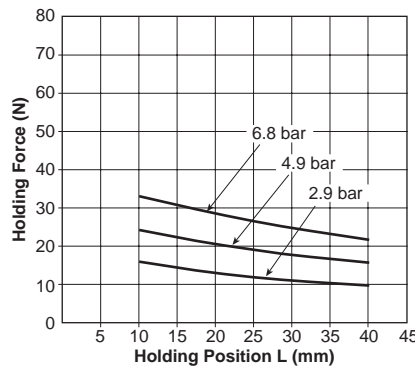
Function	Bore size (mm)	Ports (BSPP)	Stroke (mm)	Weight (g)	Part number
Double acting magnetic	12	M3	6	66	P5GB-012MSG006B
Double acting magnetic	16	M5	8	144	P5GB-016MSG008B
Double acting magnetic	20	M5	12	255	P5GB-020MSG012B
Double acting magnetic	25	M5	14	419	P5GB-025MSG014B
Double acting magnetic	32	M5	16	719	P5GB-032MSG016B

Sensor part numbers: Page 330.

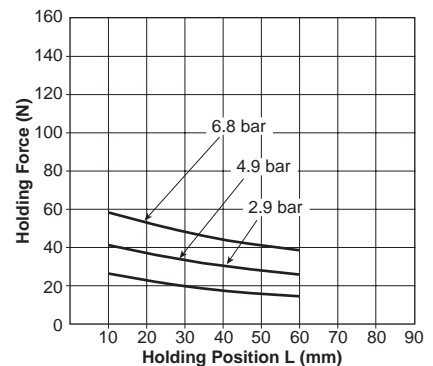
Clamp Force - P5GB-012



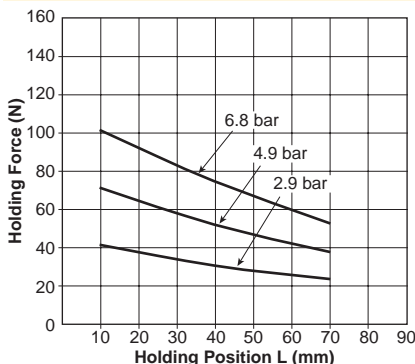
Clamp Force - P5GB-016



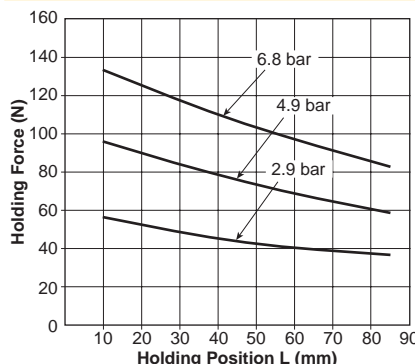
Clamp Force - P5GB-020



Clamp Force - P5GB-025

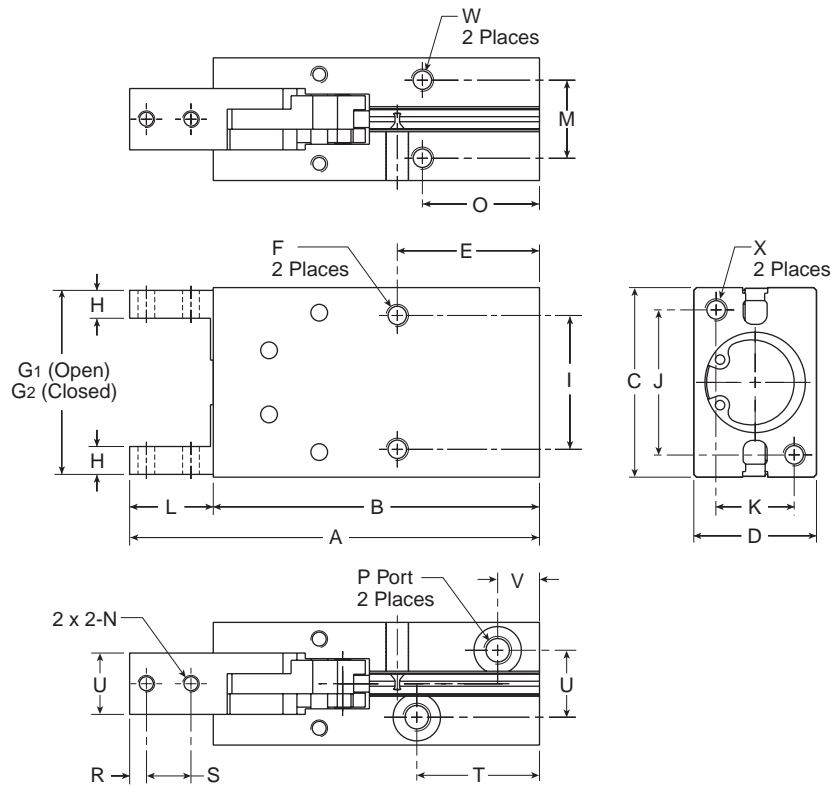


Clamp Force - P5GB-032



 Most popular.

Dimensions: P5GB Parallel Gripper Series - Economy



Tube I.D.	A	B	C	D	E	F	G1	G2	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
12	63.5	50.5	28	16	20	M3 x 0.5 x 5 Dp	27	21	4	18	17	10	13	10	M3 x 0.5	16	M3	7	3	6	23	10.2
16	73.5	58.5	34	22	25.5	M4 x 0.7 x 11 Dp33	25	5	24	26	14	15	14	M3 x 0.5	21	M5	11	3	8	22	12	
20	88.5	69.5	45	26	25	M5 x 0.8 x 8 Dp	44	32	6	30	35	16	19	16	M3 x 0.7	19	M5	12	4	10	26	13
25	102.5	78.5	52	32	28	M6 x 1.0 x 10 Dp51	37	8	36	40	20	24	20	M3 x 0.8	22	M5	14	5	12	29	18	
32	120.5	90.5	60	40	34	M6 x 1.0 x 10 Dp59	43	10	44	46	24	30	26	M3 x 1.0	26	M5	20	7	15	35	24	

Tube I.D.	V	W	X
12	7.5	M3 x 0.5 x 5 Dp	M3 x 0.5 x 5 Dp
16	7.5	M4 x 0.7 x 7 Dp	M4 x 0.7 x 7 Dp
20	8	M5 x 0.8 x 8 Dp	M5 x 0.8 x 8 Dp
25	8.5	M6 x 1.0 x 10 Dp	M6 x 1.0 x 10 Dp
32	10.5	M6 x 1.0 x 10 Dp	M6 x 1.0 x 10 Dp

Dimensions in millimeters

B

Automation Products
 Actuator Products

Grippers

Slide Tables

Rotary Tables

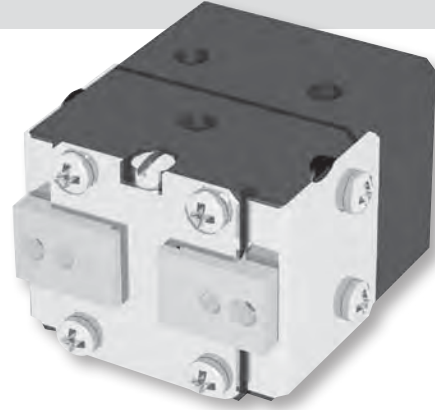
Escapements

Sensors

Fittings

P5GV Miniature Clean Room Series

- One piece lightweight aluminum body
- Stationary and non-contacting stainless steel cover eliminates the possibility of particle generation
- Bearings are preloaded for maximum support and zero side play
- The body has hard-coat anodize 60 RC with PTFE impregnation
- Units are lubricated with a clean-room grade grease
- Purge / scavenge port for extreme environments from dirty and gritty to clean-room class 10 or better
- Adjustable preload screw allows for adjustment of preload on roller bearings
- External components are made from corrosion resistant materials for resistance to de-ionized water or for use in FDA and medical parts handling applications
- Slip fit dowel pin holes located in body and jaws



Operating information


Operating pressure:	3 to 7 bar (44 to 102 PSIG)
Temperature range:	
Nitrile seals (standard)	-35° to 80° C (-30° to 180° F)
Fluorocarbon seals (optional)	-30° to 120° C (-20° to 250° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)

*Addition of lubrication will greatly increase service life

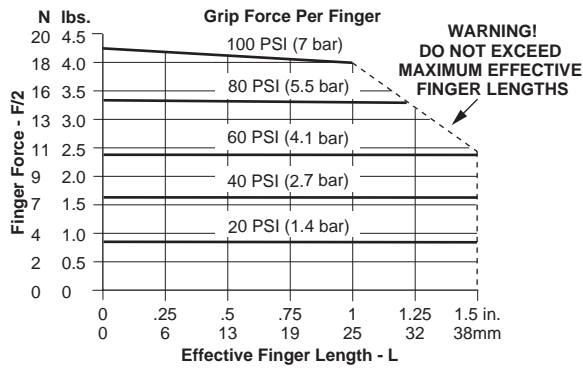
Ordering Information: P5GV Miniature Clean Room Series

Function	Bore size (mm)	Ports (BSPP)	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number
Double acting, Nitrile	10	M3	3.2	36	0.05	0.03	0.024	P5GV-010MSG003B
Double acting, Fluorocarbon	10	M3	3.2	36	0.05	0.03	0.024	P5GV-010MFG003B
Double acting, Nitrile	10	M3	4.8	36	0.05	0.03	0.026	P5GV-010MSG005B
Double acting, Fluorocarbon	10	M3	4.8	36	0.05	0.03	0.026	P5GV-010MFG005B
Double acting, Nitrile	10	M3	6.3	36	0.05	0.03	0.034	P5GV-010MSG006B
Double acting, Fluorocarbon	10	M3	6.3	36	0.05	0.03	0.034	P5GV-010MFG006B

Not available with sensors.

 Most popular.

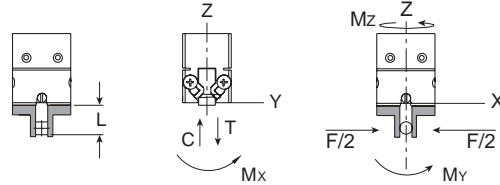
Loading information - P5GV



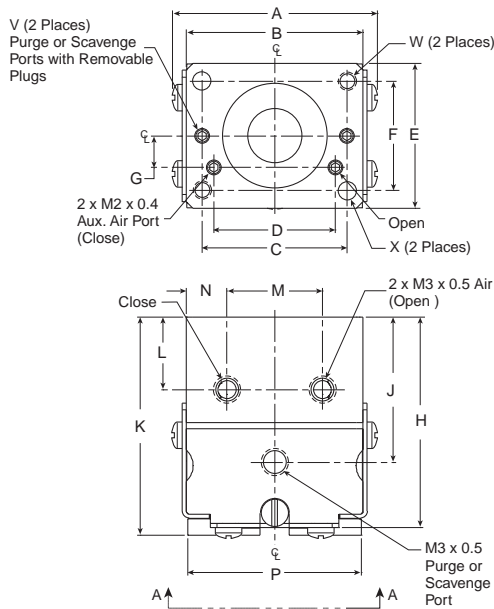
Loading capacity† - P5GV

	Static (metric)	Dynamic (metric)
Maximum tensile T	89 N	31 N
Maximum compressive C	89 N	31 N
Maximum moment Mx	1 Nm	0.5 Nm
Maximum moment My	2 Nm	0.6 Nm
Maximum moment Mz	1 Nm	0.5 Nm

† Capacities are per set of jaws and are not simultaneous

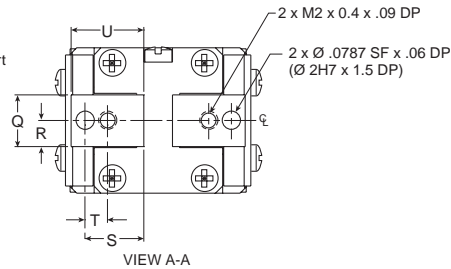


Dimensions: P5GV Miniature Clean Room Series



Unless otherwise noted all tolerances are as shown below

Dimensions are symmetrical about centerline
 Third Angle Projection
Metric (mm)
 (0.) = (±.25)
 (0.0) = (±.13)
 (0.00) = (±.013)



Part number	A	B	C	D	E	F	G	H	J	K	L	M
P5GV-010MS(F)G003B	23	19.5	16.0	13.4	16.0	12.00	3.5	23	16	24.0	8	10.5
P5GV-010MS(F)G005B	24	21.0	16.0	13.4	16.0	12.00	3.5	25	17	25.5	9	10.5
P5GV-010MS(F)G006B	30	26.5	20.0	13.4	16.0	11.00	3.5	25	18	25.5	10	10.5

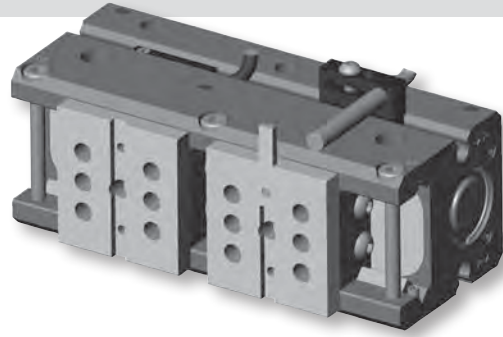
Part number	N	P	Q	R	S	T	U	V	W	X
P5GV-010MS(F)G003B	4.5	Open 19.2 Closed 16	.569 ±0.03	2.8	6.50	2.5	8	M2 x 0.4	M2 x .18 4.5 Dp	Ø 2H7 x 3.3 Dp
P5GV-010MS(F)G005B	5.2	Open 20.8 Closed 16	.569 ±0.03	2.8	6.50	2.5	8	M2 x 0.4	M2 x 0.4 .18 Dp	Ø 2H7 x 3.3 Dp
P5GV-010MS(F)G006B	8.0	Open 126.4 Closed 20	.569 ±0.03	2.8	7.50	2.5	10	M2 x 0.5	M3 x 0.5 .20 Dp	Ø 3H7 x 5.0 Dp

Dimensions in millimeters



P5GR High Precision Series

- Excellent parallelism and accuracy between gripper mounting surface and jaw surfaces
- H7 dowel pin holes in body and jaws. Jaws also have key slot for better finger alignment.
- Hardened plated jaws for wear resistance and longer life
- Top manifold air ports eliminates the need for airlines
- “Dual-V” roller bearings provide low friction motion and are preloaded for maximum support and zero side play
- One piece, aircraft quality aluminum body, has hard-coat anodized 60 RC with PTFE impregnation
- Standard purge / scavenge port used with vacuum for clean room environments or positive pressure for harsh environments and jaw surfaces
- Adjustable pre-load screws allows for adjustment of preload on roller bearings
- 4 standard air port locations; front, top and both sides
- Shielded design repels contamination from penetrating the “Dual-V” roller bearings
- Magnetic piston standard




Operating information

Pressure range (without springs):	0.3 to 7 bar (4 to 102 PSIG)
Pressure range (with springs):	
P5GR-010MSG006B & P5GR-010MSG013B	1.4 to 7 bar (20 to 102 PSIG)
P5GR-014MSG016B & P5GR-014MSG025B	3.4 to 7 bar (49 to 102 PSIG)
P5GR-021MSG025B	2.8 to 7 bar (41 to 102 PSIG)
P5GR-021MSG038B	2.1 to 7 bar (30 to 102 PSIG)
Temperature range:	
Nitrile seals (standard)	-35° to 80° C (-30° to 180° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)
*Addition of lubrication will greatly increase service life	

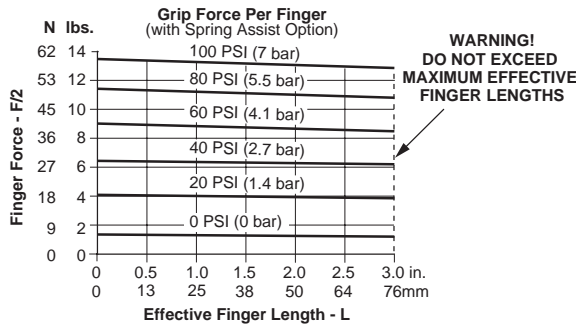
Ordering Information: P5GR High Precision Series

Function	Bore size (mm)	Ports (BSPP)	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number
Double acting magnetic	10	M3	6.4	120	0.001	0.00005	0.16	P5GR-010MSG006B
Spring closing, magnetic	10	M3	6.4	120	0.001	0.00005	0.16	P5GR-010DSG006B
Double acting magnetic	10	M3	12.7	120	0.001	0.00005	0.20	P5GR-010MSG013B
Spring closing, magnetic	10	M3	12.7	120	0.001	0.00005	0.20	P5GR-010DSG013B
Double acting magnetic	14	M3	15.9	227	0.001	0.00005	0.48	P5GR-014MSG016B
Spring closing, magnetic	14	M3	15.9	227	0.001	0.00005	0.48	P5GR-014DSG016B
Double acting magnetic	14	M3	25.4	214	0.001	0.00005	0.57	P5GR-014MSG025B
Spring closing, magnetic	14	M3	25.4	214	0.001	0.00005	0.57	P5GR-014DSG025B
Double acting magnetic	21	M5	25.4	458	0.001	0.00005	1.02	P5GR-021MSG025B
Spring closing, magnetic	21	M5	25.4	458	0.001	0.00005	1.02	P5GR-021DSG025B
Double acting magnetic	21	M5	38.1	449	0.001	0.00005	1.41	P5GR-021MSG038B
Spring closing, magnetic	21	M5	38.1	449	0.001	0.00005	1.41	P5GR-021DSG038B

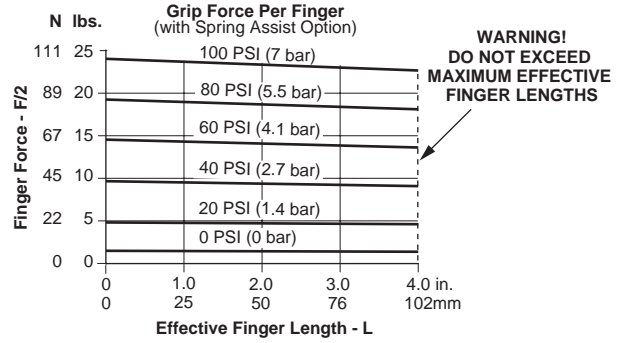
Sensor part numbers: Page 330.

 Most popular.

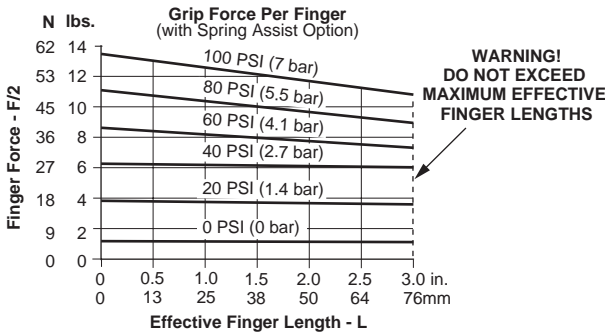
Loading information - P5GR-010*006**



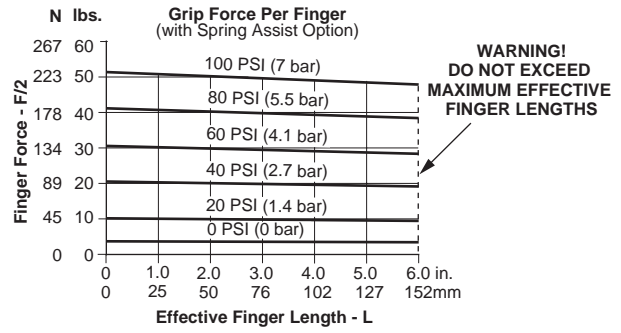
Loading information - P5GR-014*025**



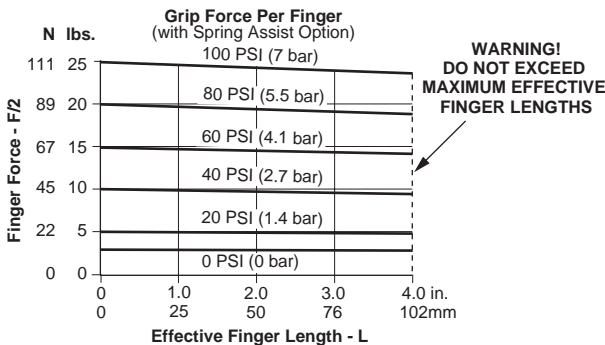
Loading information - P5GR-010*013**



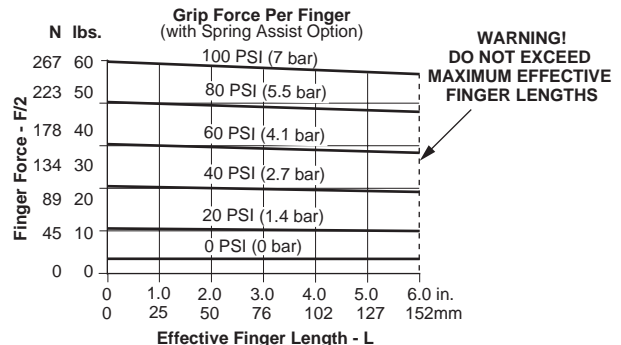
Loading information - P5GR-021*025**



Loading information - P5GR-014...016



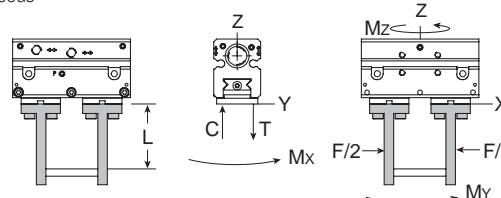
Loading information - P5GR-021*038**



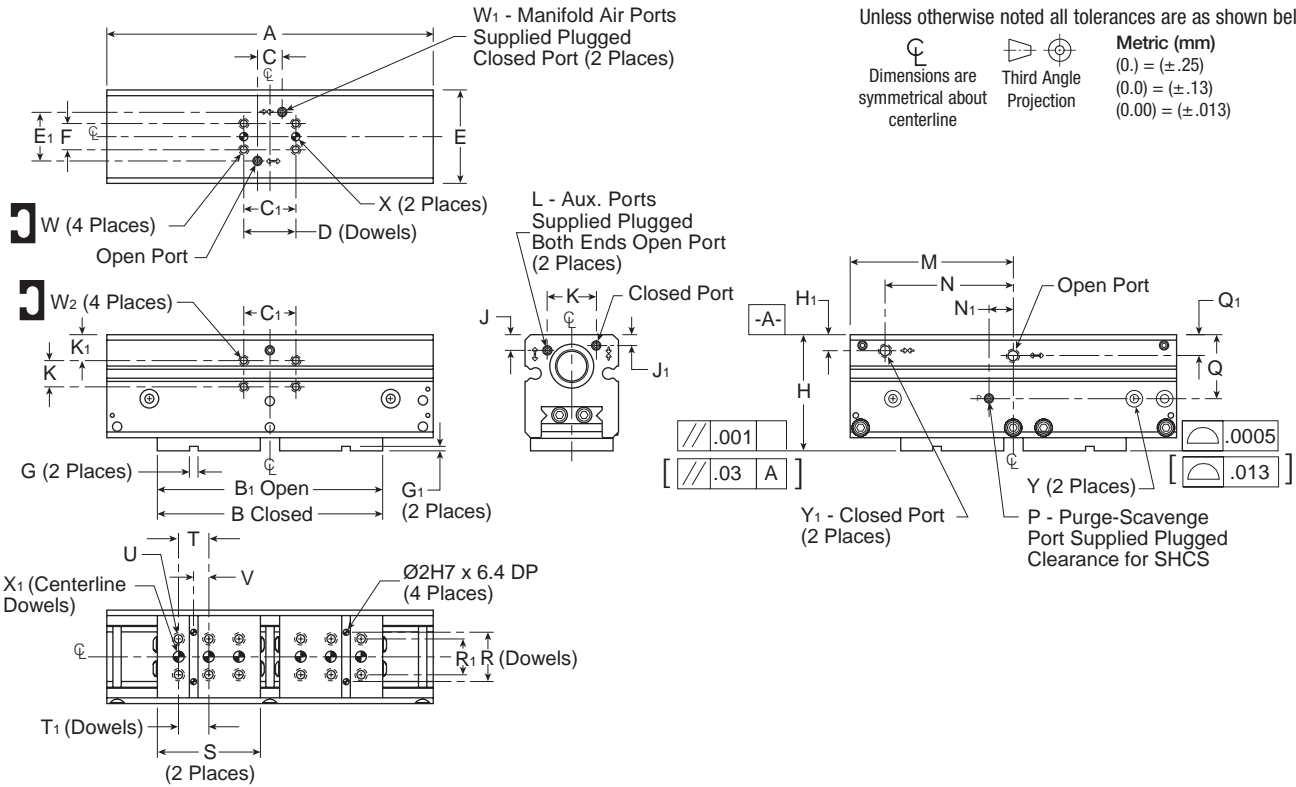
Loading capacity† - P5GR High Precision Series

	P5GR-010***006		P5GR-010***013		P5GR-014***016		P5GR-014***025		P5GR-021***025		P5GR-021***038	
	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)
Maximum tensile T	267 N	89 N	311 N	102 N	556 N	187 N	734 N	245 N	667 N	222 N	890 N	245 N
Maximum compressive C	267 N	89 N	311 N	102 N	556 N	187 N	734 N	245 N	667 N	222 N	890 N	245 N
Maximum moment Mx	4.0 Nm	1.4 Nm	5.6 Nm	1.9 Nm	9.0 Nm	3.1 Nm	11 Nm	3.7 Nm	34 Nm	11 Nm	45 Nm	15 Nm
Maximum moment My	5.6 Nm	1.9 Nm	7.3 Nm	4.0 Nm	12 Nm	4.0 Nm	14 Nm	4.7 Nm	40 Nm	4.7 Nm	51 Nm	17 Nm
Maximum moment Mz	4.0 Nm	1.4 Nm	5.6 Nm	1.9 Nm	9.0 Nm	3.1 Nm	11 Nm	3.7 Nm	34 Nm	11 Nm	45 Nm	15 Nm

† Capacities are per set of jaws and are not simultaneous



Dimensions: P5GR High Precision Series



Part number	A	B	B1	C	C1	D	E	E1	F	G	G1	H	H1	J	J1	K	K1	L	M	N	N1	P
P5GR-010***006	62.9	47	53	8.9	19.1	19.05	25.0	15.2	9.5	3.15 $^{+0.02}$	1.52 $^{+0.02}$	34.67 $^{+0.02}$	5.8	4.4	3.8	9.5	8.5	M3 x 3 Dp	31.4	18.7	5.1	M3 x 3 Dp
P5GR-010***013	73.7	49	62	8.9	19.1	19.05	25.0	15.2	9.5	3.15 $^{+0.02}$	1.52 $^{+0.02}$	34.67 $^{+0.02}$	5.8	4.4	3.8	9.5	8.5	M3 x 3 Dp	36.8	24.1	5.1	M3 x 3 Dp
P5GR-014***016	90.2	63	79	8.9	19.1	19.05	34.0	17.8	9.5	3.15 $^{+0.02}$	1.52 $^{+0.02}$	42.21 $^{+0.02}$	5.8	5.7	3.9	9.5	9.5	M3 x 3 Dp	45.1	32.4	8.9	M3 x 3 Dp
P5GR-014***025	118.7	82	107	8.9	19.1	19.05	34.0	17.8	9.5	3.15 $^{+0.02}$	1.52 $^{+0.02}$	42.21 $^{+0.02}$	5.8	5.7	3.9	9.5	9.5	M3 x 3 Dp	59.4	46.7	8.9	M3 x 3 Dp
P5GR-021***025	129	89	115	12.7	38.1	38.10	46.0	28.7	19.1	3.15 $^{+0.02}$	1.52 $^{+0.02}$	55.63 $^{+0.02}$	5.8	7.0	5.8	19.1	9.5	M5 x 5 Dp	64.5	45.5	14.0	M5 x 5 Dp
P5GR-021***038	175.5	123	161	12.7	38.1	38.10	46.0	28.7	19.1	3.15 $^{+0.02}$	1.52 $^{+0.02}$	55.63 $^{+0.02}$	5.8	7.0	5.8	19.1	9.5	M5 x 5 Dp	87.8	68.7	14.0	M5 x 5 Dp

Part number	Q	Q1	R	R1	S	T	T1	U	V	W	W1	W2	X	X1	Y	Y1
P5GR-010***006	18.5	7.4	9.19	9.0	21	12	11.99	M3 x 5 Dp	6.0	M3 x 4 Dp	M3 x 3 Dp	M3 x 4 Dp	Ø3H7 x 2.5 Dp	Ø2H7 x 3.6 Dp	Ø6.35 x 3 Dp	M5 x 4 Dp
P5GR-010***013	18.5	7.4	9.20	9.0	21	12	11.99	M3 x 5 Dp	6.0	M3 x 4 Dp	M3 x 3 Dp	M3 x 4 Dp	Ø3H7 x 2.5 Dp	Ø2H7 x 3.6 Dp	Ø6.35 x 3 Dp	M5 x 4 Dp
P5GR-014***016	23.2	8.0	17.98	13.0	28	16	16.00	M4 x 7 Dp	8.0	M3 x 4 Dp	M3 x 3 Dp	M3 x 5 Dp	Ø3H7 x 2.5 Dp	Ø4H7 x 3.6 Dp	Ø6.35 x 3 Dp	M5 x 5 Dp
P5GR-014***025	23.2	8.0	17.98	13.0	37.5	11	11.00	M4 x 7 Dp	5.5	M3 x 4 Dp	M3 x 3 Dp	M3 x 5 Dp	Ø3H7 x 2.5 Dp	Ø4H7 x 3.6 Dp	Ø6.35 x 3 Dp	M5 x 5 Dp
P5GR-021***025	31.1	11.2	25.78	17.0	40.0	12.5	12.50	M5 x 10 Dp	6.2	M5 x 5 Dp	M5 x 5 Dp	M5 x 5 Dp	Ø5H7 x 3.0 Dp	Ø5H7 x 5.3 Dp	Ø6.35 x 3 Dp	M5 x 5 Dp
P5GR-021***038	31.1	11.2	25.78	17.0	58.0	16.0	16.00	M5 x 10 Dp	8.0	M5 x 5 Dp	M5 x 5 Dp	M5 x 5 Dp	Ø5H7 x 3.0 Dp	Ø5H7 x 5.3 Dp	Ø6.35 x 3 Dp	M5 x 5 Dp

Dimensions in millimeters

B
Automation Products

Grippers

Slide Tables

Rotary Tables

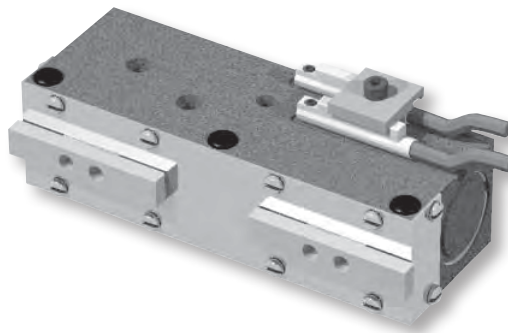
Escapements

Sensors

Fittings

P5GU Clean Room Harsh Environment Series

- Internal components are made from hardened bearing and tool steels. External components are made from corrosion resistant materials for resistance to de-ionized water or for use in FDA and medical parts handling applications.
- Stationary and non-contacting stainless steel shields eliminate the possibility of particle generation
- Adjustable preload screws allow for adjustment of preload on roller bearings
- The body has hard-coat anodized 60 RC with PTFE impregnation
- Dual “V” roller bearings provide low friction rolling motion. Roller bearings are preloaded for maximum support and zero side play.
- Units are lubricated with a clean room grade grease
- Slip fit dowel pin holes in body
- Purge / scavenge port for extreme environments from dirty and gritty to clean room Class 10 or better
- Stainless steel screws provide protection against corrosion
- Magnetic piston standard




Operating information

Operating pressure:	0.3 to 7 bar (4 to 102 PSIG)
Temperature range:	
Standard seals	-35° to 80° C (-30° to 180° F)
Fluorocarbon seals	-30° to 120° C (-20° to 248° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)
*Addition of lubrication will greatly increase service life	

Ordering Information: Clean Room Harsh Environment Series

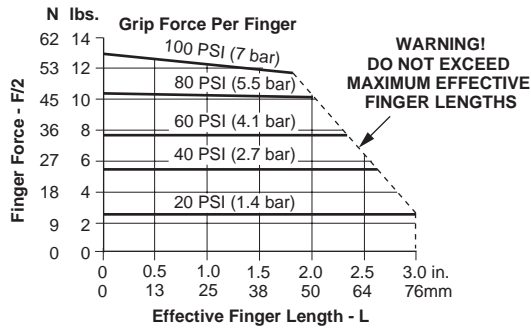
Function	Bore size (mm)	Ports (BSP)	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number
Double acting magnetic	11	M5	6.4	116	0.05	0.03	0.07	P5GU-011MSG006B
Double acting magnetic	11	M5	6.4	116	0.05	0.03	0.07	P5GU-011MFG006B
Double acting magnetic	11	M5	12.7	116	0.05	0.03	0.09	P5GU-011MSG013B
Double acting magnetic	11	M5	12.7	116	0.05	0.03	0.09	P5GU-011MFG013B
Double acting magnetic	13	M5	19.1	160	0.05	0.03	0.15	P5GU-013MSG019B
Double acting magnetic	13	M5	19.1	160	0.05	0.03	0.15	P5GU-013MFG019B
Double acting magnetic	13	M5	25.4	160	0.05	0.03	0.17	P5GU-013MSG025B
Double acting magnetic	13	M5	25.4	160	0.05	0.03	0.17	P5GU-013MFG025B

Sensor part numbers: Page 330.

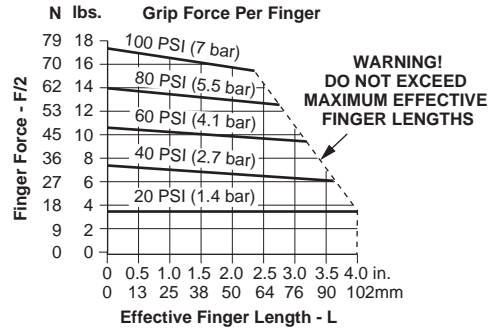
 Most popular.



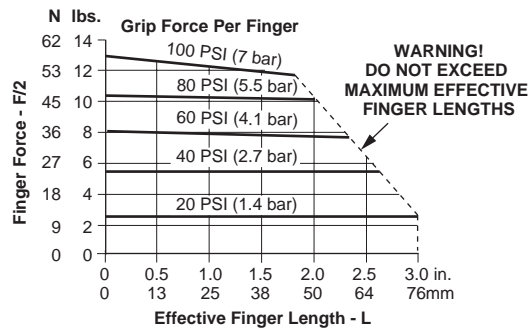
Loading information - P5GU-011*006**



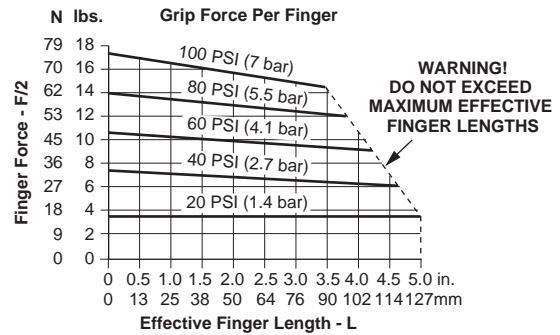
Loading information - P5GU-013*019**



Loading information - P5GU-011*013**



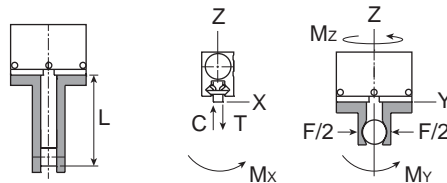
Loading information - P5GU-013*025**



Loading capacity† - P5GU Clean Room Harsh Environment Series

	P5G-011***006		P5GU-011***013		P5GU-013***019		P5GU-013***025	
	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)
Maximum tensile T	222 N	67 N	289 N	89 N	400 N	133 N	534 N	178 N
Maximum compressive C	222 N	67 N	289 N	89 N	400 N	133 N	534 N	178 N
Maximum moment Mx	3.4 Nm	1.1 Nm	5.1 Nm	1.7 Nm	6.8 Nm	2.3 Nm	8.5 Nm	2.8 Nm
Maximum moment My	4.5 Nm	1.4 Nm	6.8 Nm	2.3 Nm	9.0 Nm	2.8 Nm	11.3 Nm	4.0 Nm
Maximum moment Mz	3.4 Nm	1.1 Nm	5.1 Nm	1.7 Nm	6.8 Nm	2.3 Nm	8.5 Nm	2.8 Nm

† Capacities are per set of jaws and are not simultaneous



B
 Automation Products
 Actuator Products

Grippers

Slide Tables

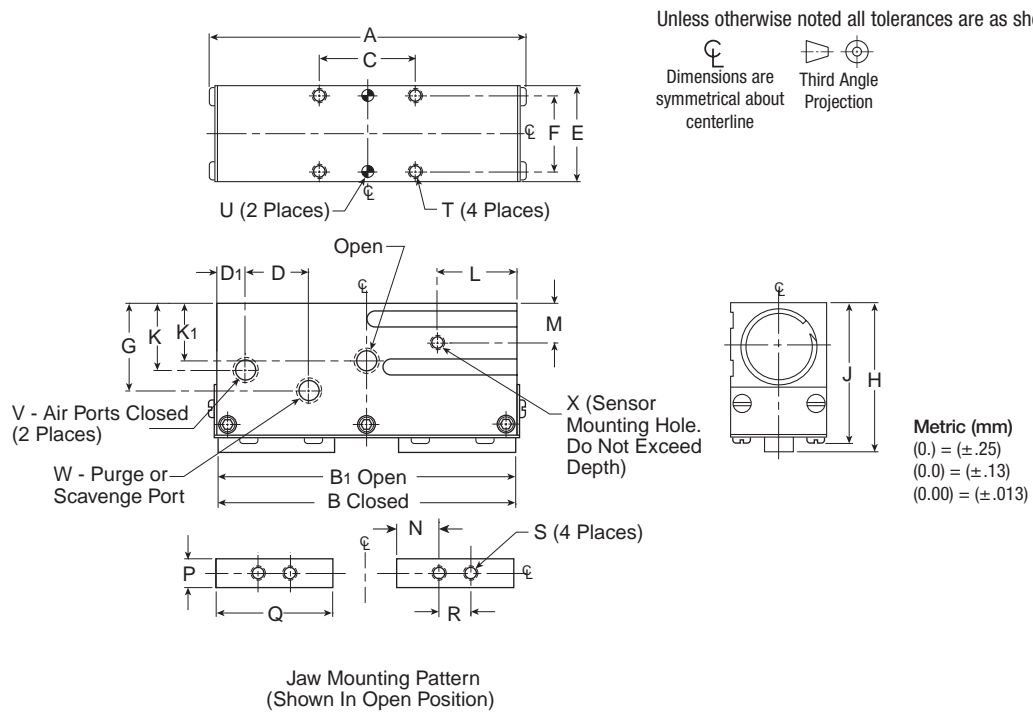
Rotary Tables

Escapements

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Fittings

Dimensions: P5GU Clean Room Harsh Environment Series



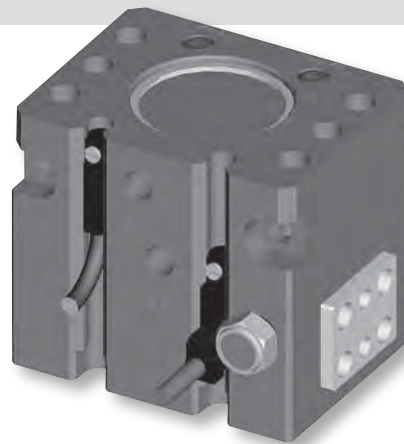
Part number	A	B	B1	C	D	D1	E	F	G	H	J	K	K1	L	M	N	P	Q	R
P5GU-011(006)	48.3	38	44	19.1	8	6	19.1	15.09	17	29.5	27.8	13	11	11	8	6.4	5.69 ^{+0.003} _{-0.003}	19.1	6.4
P5GU-011(013)	62.9	46	59	19.1	13	6	19.0	15.09	17	29.5	27.8	13	11	16	8	8.3	5.69 ^{+0.003} _{-0.003}	23.2	6.4
P5GU-013(019)	83.4	63	83	25.4	14	15	22.2	16.66	18	32.6	30.3	13	11	19	8	12.7	5.69 ^{+0.003} _{-0.003}	31.8	6.4
P5GU-013(025)	101.8	76	101	25.4	14	24	22.2	16.66	18	32.6	30.3	13	11	25	8	15.9	5.69 ^{+0.003} _{-0.003}	38.1	6.4

Part number	S	T	U	V	W	X
P5GU-011(006)	M3 x 4 Dp	M3 x 4 Dp	Ø 3 SF x 4 Dp	M5	M5	M3 x 3 Dp
P5GU-011(013)	M3 x 4 Dp	M3 x 4 Dp	Ø 3 SF x 4 Dp	M5	M5	M3 x 4 Dp
P5GU-013(019)	M3 x 4 Dp	M3 x 8 Dp	Ø 3 SF x 6 Dp	M5	M5	M3 x 4 Dp
P5GU-013(025)	M3 x 4 Dp	M3 x 8 Dp	Ø 3 SF x 6 Dp	M5	M5	M3 x 4 Dp

Dimensions in millimeters

P5GN Compact Series

- One piece lightweight aircraft quality aluminum body
- The body and bottom plate have hard-coat anodize 60 RC with PTFE impregnation
- 3 standard air port locations (front, back, and top)
- Back and top air ports can be o-ring manifold sealed to eliminate air lines
- Standard mounting slots for magneto resistive (sensors sold separately)
- Slip fit dowel pin holes in body and jaws
- Jaws are supported throughout the length of the body
- Purge / scavenge port used with vacuum for clean room environments or positive pressure with harsh environments
- Jaw components made from hardened and precision ground steel for minimum jaw play with hard plating for wear resistance and long life
- Front-to-back thru counterbores for socket head cap screw mounting
- Magnetic piston standard



Operating information

Operating pressure:	1.5 to 7 bar (22 to 102 PSIG)
Temperature range:	
Nitrile seals (standard)	-35° to 80° C (-30° to 180° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)

*Addition of lubrication will greatly increase service life

Ordering Information: P5GN Compact Series

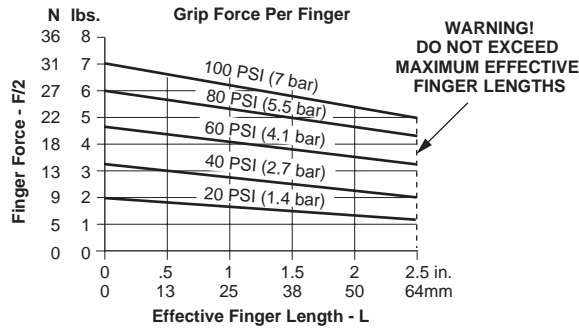
Function	Bore size (mm)	Ports (BSPP)	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number
Double acting magnetic	12	M3	1.6	62	0.05	0.03	0.04	P5GN-012MSG001B
Double acting magnetic	12	M3	2.4	62	0.05	0.03	0.04	P5GN-012MSG002B
Double acting magnetic	12	M3	3.2	62	0.05	0.03	0.04	P5GN-012MSG003B
Double acting magnetic	14	M3	2.4	98	0.05	0.03	0.07	P5GN-014MSG002B
Double acting magnetic	14	M3	3.2	98	0.05	0.03	0.07	P5GN-014MSG003B
Double acting magnetic	14	M3	4.8	98	0.05	0.03	0.07	P5GN-014MSG005B
Double acting magnetic	22	M5	3.2	222	0.05	0.03	0.23	P5GN-022MSG003B
Double acting magnetic	22	M5	4.8	222	0.05	0.03	0.23	P5GN-022MSG005B
Double acting magnetic	22	M5	6.4	222	0.05	0.03	0.23	P5GN-022MSG006B
Double acting magnetic	32	M5	4.8	445	0.08	0.03	0.46	P5GN-032MSG005B
Double acting magnetic	32	M5	6.4	445	0.08	0.03	0.46	P5GN-032MSG006B
Double acting magnetic	32	M5	9.5	445	0.08	0.03	0.46	P5GN-032MSG010B

Sensor part numbers: Page 330.

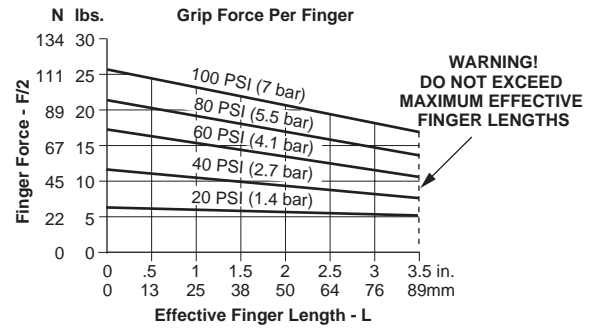
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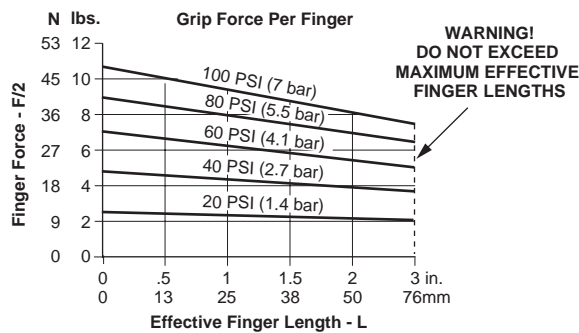
Loading information - P5GN-012



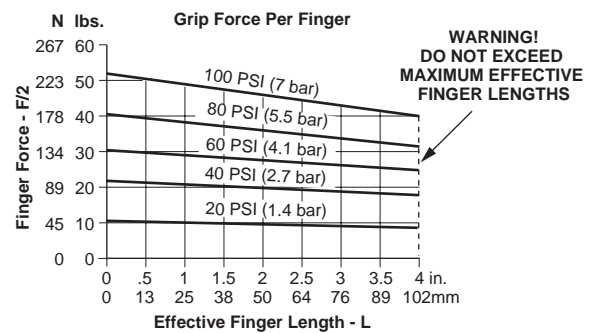
Loading information - P5GN-022



Loading information - P5GN-014



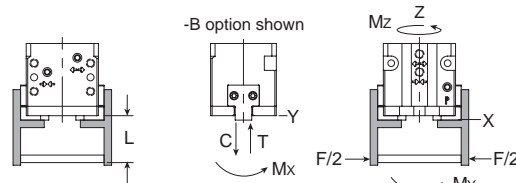
Loading information - P5GN-032



Loading capacity† - P5GN Compact Series

	P5GN-012		P5GN-014		P5GN-022		P5GN-032	
	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)
Maximum tensile T	134 N	27 N	267 N	45 N	614 N	111 N	2225 N	289 N
Maximum compressive C	223 N	45 N	401 N	67 N	1224 N	111 N	4228 N	289 N
Maximum moment Mx	2 Nm	0.6 Nm	5 Nm	8 Nm	14 Nm	2 Nm	48 Nm	8 Nm
Maximum moment My	2 Nm	0.6 Nm	5 Nm	8 Nm	14 Nm	2 Nm	48 Nm	8 Nm
Maximum moment Mz	2 Nm	0.6 Nm	5 Nm	8 Nm	14 Nm	2 Nm	48 Nm	8 Nm

† Capacities are per set of jaws and are not simultaneous



B

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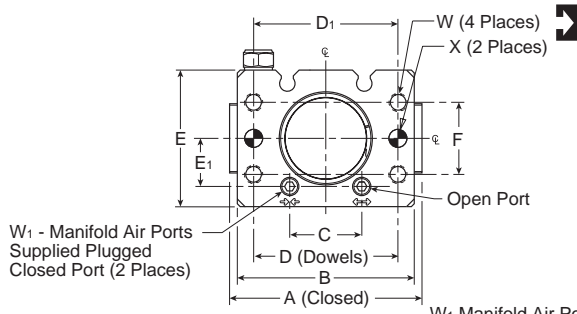
Rotary Tables

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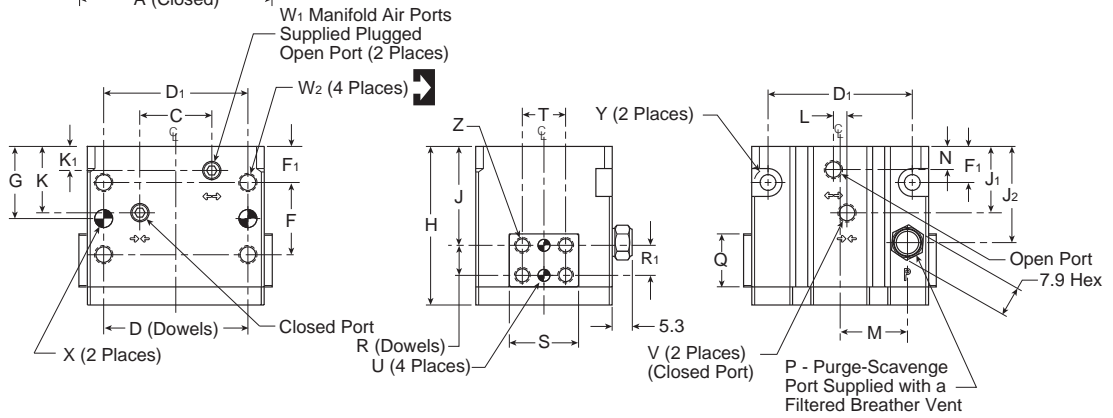
Dimensions: P5GN Compact Series



Unless otherwise noted all tolerances are as shown below

Dimensions are symmetrical about centerline Third Angle Projection

Metric (mm)
 (0.) = (± .25)
 (0.0) = (± .13)
 (0.00) = (± .013)



Part number	A	B	C	D	D1	E	E1	F	F1	G	H	J	J1	J2	K	K1	L	M	N	P
P5GN-012	28	24.4	10.2	19.05	19.1	22.2	7.9	9.5	6.7	11.4	24.4	17.6	9.7	14.7	9.7	3.6	-	9.4	3.6	M3 x 3 Dp
P5GN-014	35	31.2	10.2	19.05	19.1	24.1	8.6	9.5	8.0	12.7	27.4	19.9	11.2	17.0	11.2	3.6	-	11.7	3.6	M3 x 3 Dp
P5GN-022	51	46.7	19.1	38.10	38.1	36.1	12.7	19.1	9.5	19.1	41.9	26.1	17.5	25.4	17.5	6.1	3.6	17.8	6.1	M5 x 4 Dp
P5GN-032	64	59.7	22.9	38.10	38.1	43.2	16.5	19.1	12.7	22.2	51.2	31.3	19.8	30.5	19.8	6.4	4.1	22.4	6.4	M5 x 4 Dp

Part number	Q	R	R1	S	T	U	V	W	W1	W2	X	Y	Z
P5GN-012	7.11 ^{+0.003} _{-0.003}	3.81	-	10.67 ^{+0.003} _{-0.003}	6.4	∅ 2.0 H7 x 3 Dp	M3 x 3 Dp	M3 x 4 Dp	M3 x 3 Dp	M3 x 4 Dp	∅ 3 H7 x 3 Dp	∅ 5 x 4 Dp C'bore (for M2.5 SHCS)	M3 x 4 Dp (4 Places)
P5GN-014	8.64 ^{+0.003} _{-0.003}	4.76	-	12.19 ^{+0.003} _{-0.003}	7.1	∅ 2.5 H7 x 3 Dp	M3 x 3 Dp	M3 x 4 Dp	M3 x 3 Dp	M3 x 4 Dp	∅ 3 H7 x 3 Dp	∅ 5 x 3 Dp C'bore (for M2.5 SHCS)	M4 x 5 Dp (4 Places)
P5GN-022	13.97 ^{+0.003} _{-0.003}	7.94	8.0	18.29 ^{+0.003} _{-0.003}	11.4	∅ 3 H7 x 5 Dp	M5 x 4 Dp	M5 x 8 Dp	M5 x 5 Dp	M5 x 6 Dp	∅ 5 H7 x 5 Dp	∅ 7 x 4 Dp C'bore (for M4 SHCS)	M4 x 6 Dp (8 Places)
P5GN-032	19.05 ^{+0.003} _{-0.003}	11.11	11.1	25.40 ^{+0.003} _{-0.003}	15.9	∅ 4 H7 x 6 Dp	M5 x 4 Dp	M5 x 8 Dp	M5 x 5 Dp	M5 x 6 Dp	∅ 5 H7 x 6 Dp	∅ 7 x 4 Dp C'bore (for M4 SHCS)	M5 x 8 Dp (8 Places)

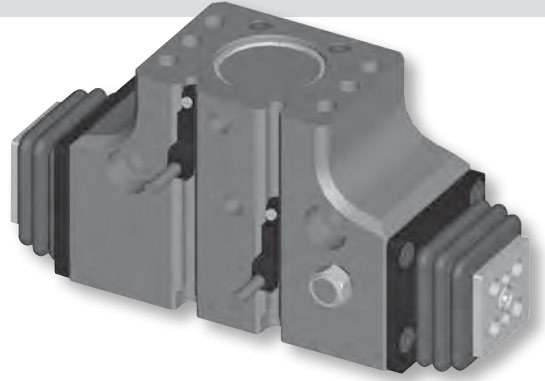
Dimensions in millimeters

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P5GM Parallel Series

- One piece lightweight aircraft quality aluminum body
- The body and bottom plate have hard-coat anodize 60 RC with PTFE impregnation
- 3 standard air port locations (front, back, and top)
- Back and top air ports can be o-ring manifold sealed to eliminate air lines
- Standard mounting slots for magneto resistive (sensors sold separately)
- Slip fit dowel pin holes in body and jaws
- Jaws are supported throughout the length of the body
- Purge / scavenge port used with vacuum for clean room environments or positive pressure with harsh environments
- Jaw components made from hardened and precision ground steel for minimum jaw play with hard plating for wear resistance and long life
- Front-to-back thru counterbores for socket head cap screw mounting
- Magnetic piston standard



Operating information


Operating pressure:	1.5 to 7 bar (22 to 102 PSIG)
Temperature range:	
Nitrile seals (standard)	-35° to 80° C (-30° to 180° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)

*Addition of lubrication will greatly increase service life

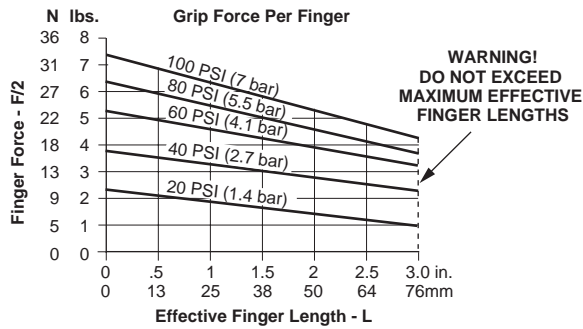
Ordering Information: P5GM Parallel Series

Function	Bore size (mm)	Ports (BSPP)	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number
Double acting magnetic	10	M3	4.8	62	0.05	0.03	0.04	P5GM-010MSG005B
Double acting magnetic	10	M3	6.4	62	0.05	0.03	0.04	P5GM-010MSG006B
Double acting magnetic	10	M3	9.5	62	0.05	0.03	0.04	P5GM-010MSG010B
Double acting magnetic	14	M3	6.4	98	0.05	0.03	0.14	P5GM-014MSG006B
Double acting magnetic	14	M3	9.5	98	0.05	0.03	0.14	P5GM-014MSG010B
Double acting magnetic	14	M3	12.7	98	0.05	0.03	0.14	P5GM-014MSG013B
Double acting magnetic	22	M5	9.5	222	0.05	0.03	0.43	P5GM-022MSG010B
Double acting magnetic	22	M5	12.7	222	0.05	0.03	0.43	P5GM-022MSG013B
Double acting magnetic	22	M5	19.1	222	0.05	0.03	0.43	P5GM-022MSG019B
Double acting magnetic	32	M5	12.7	445	0.08	0.03	0.90	P5GM-032MSG013B
Double acting magnetic	32	M5	19.1	445	0.08	0.03	0.90	P5GM-032MSG019B
Double acting magnetic	32	M5	25.4	445	0.08	0.03	0.90	P5GM-032MSG032B

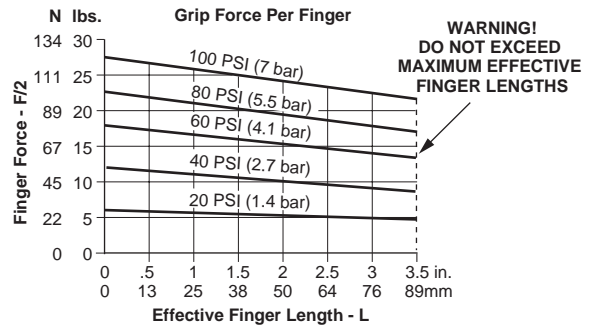
Sensor part numbers: Page 330.

 Most popular.

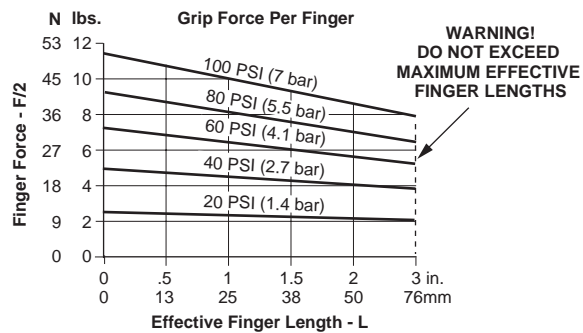
Loading information - P5GM-010



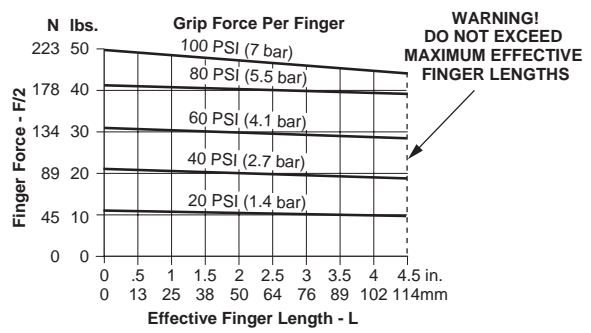
Loading information - P5GM-022



Loading information - P5GM-014



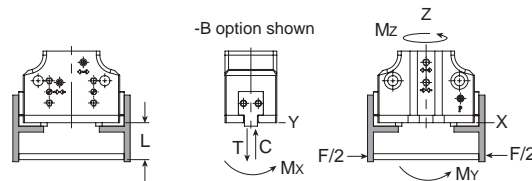
Loading information - P5GM-032



Loading capacity† - P5GM Parallel Series

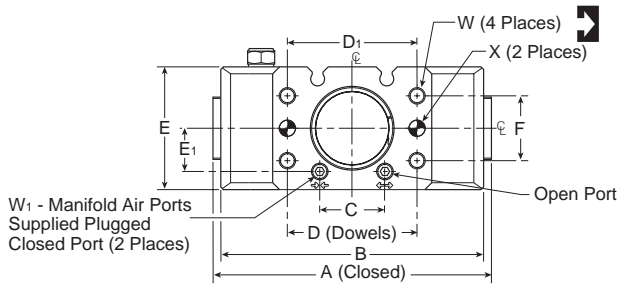
	P5GM-010		P5GM-014		P5GM-022		P5GM-032	
	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)
Maximum tensile T	445 N	67 N	556 N	111 N	1558 N	178 N	3004 N	401 N
Maximum compressive C	668 N	111 N	1113 N	111 N	2893 N	178 N	5785 N	401 N
Maximum moment Mx	10 Nm	2 Nm	13 Nm	2 Nm	28 Nm	5 Nm	73 Nm	12 Nm
Maximum moment My	10 Nm	2 Nm	13 Nm	2 Nm	28 Nm	5 Nm	73 Nm	12 Nm
Maximum moment Mz	10 Nm	2 Nm	13 Nm	2 Nm	28 Nm	5 Nm	73 Nm	12 Nm

† Capacities are per set of jaws and are not simultaneous



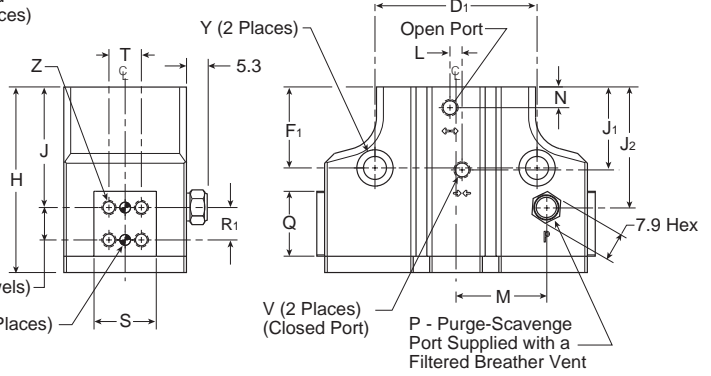
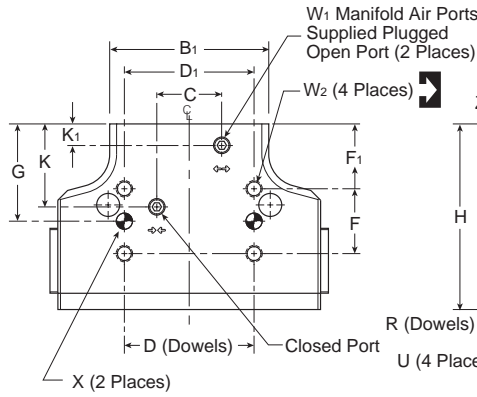
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Dimensions: P5GM Parallel Series



Unless otherwise noted all tolerances are as shown below

Dimensions are symmetrical about centerline
 Third Angle Projection
Metric (mm)
 (0.) = (±.25)
 (0.0) = (±.13)
 (0.00) = (±.013)



Part number	A	B	B ₁	C	D	D ₁	E	E ₁	F	F ₁	G	H	J	J ₁	J ₂	K	K ₁	L	M	N	P
P5GM-010	45	41.4	24.4	10.2	19.05	19.1	22.2	7.9	9.5	12.7	17.5	30.7	22.4	13.5	20.3	13.5	3.6	-	14.7	3.6	M3 x 3 Dp
P5GM-014	56	52.6	31.2	10.2	19.05	19.1	24.1	8.6	9.5	15.8	20.6	36.2	26.6	15.7	23.4	15.7	3.6	-	17.3	3.6	M3 x 3 Dp
P5GM-022	82	77.2	46.7	19.1	38.10	38.1	36.1	12.7	19.1	19.1	28.6	54.5	35.4	24.4	35.6	24.4	6.1	3.6	26.7	6.1	M5 x 4 Dp
P5GM-032	103	98.8	59.7	22.9	38.10	38.1	43.2	16.5	19.1	28.6	38.1	67.0	41.6	29.2	43.2	29.2	6.4	4.1	35.1	6.4	M5 x 4 Dp

Part number	Q	R	R ₁	S	T	U	V	W	W ₁	W ₂	X	Y	Z
P5GM-010	10.67 ^{+0.000} _{-0.003}	4.76	-	10.67 ^{+0.000} _{-0.003}	6.4	∅ 2.0 H7 x 3 Dp	M3 x 3 Dp	M3 x 4 Dp	M3 x 3 Dp	M3 x 4 Dp	∅ 3 H7 x 3 Dp	∅ 7 x 4 Dp C'bore (for M4 SHCS)	M3 x 4 Dp (4 Places)
P5GM-014	12.70 ^{+0.000} _{-0.003}	4.76	-	12.19 ^{+0.000} _{-0.003}	7.1	∅ 2.5 H7 x 3 Dp	M3 x 3 Dp	M3 x 4 Dp	M3 x 3 Dp	M3 x 4 Dp	∅ 3 H7 x 3 Dp	∅ 7 x 4 Dp C'bore (for M4 SHCS)	M4 x 5 Dp (4 Places)
P5GM-022	19.05 ^{+0.000} _{-0.003}	9.53	9.5	18.29 ^{+0.000} _{-0.003}	9.5	∅ 3 H7 x 5 Dp	M5 x 3Dp	M5 x 8 Dp	M5 x 5 Dp	M5 x 6 Dp	∅ 5 H7 x 5 Dp	∅ 11 x 7 Dp C'bore (for M6 SHCS)	M4 x 6 Dp (8 Places)
P5GM-032	25.40 ^{+0.000} _{-0.003}	15.88	15.9	25.40 ^{+0.000} _{-0.003}	15.9	∅ 4 H7 x 6 Dp	M5 x 4 Dp	M5 x 8 Dp	M5 x 5 Dp	M5 x 6 Dp	∅ 5 H7 x 5 Dp	∅ 11 x 7 Dp C'bore (for M6 SHCS)	M5 x 8 Dp (8 Places)

Dimensions in millimeters

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 Actuator Products

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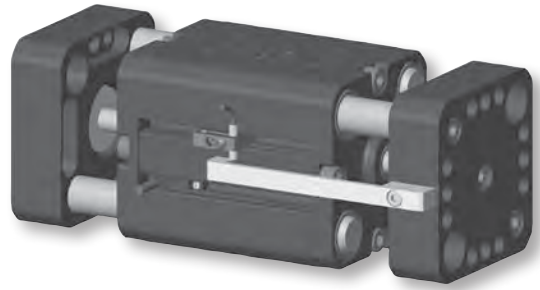
Escapements

Sensors

Fittings

P5GS Wide Body Series

- C-bores on inside of jaws for thru mounting to increase range of applications
- Standard sensor mounting slots for magneto resistive and inductive sensors (sensors sold separately)
- End of stroke cushions reduce shock of fully open and close strokes
- Each jaw is supported by 2 shafts that extend the entire length of the body and are guided by 2 oil impregnated bronze bushings per shaft
- Hardened precision stainless steel shafting for wear resistance and long life
- Magneto resistive sensors are an alternative option to inductive sensors (magnets supplied standard)
- Top air ports can be o-ring manifold sealed to eliminate air lines
- 2 standard air port locations (front and top)
- Slip fit dowel pin holes in body and jaws
- Large jaw configuration allows for simplified finger mounting




Operating information

Operating pressure:	3 to 7 bar (44 to 102 PSIG)
Temperature range:	
Nitrile seals (Standard)	-35° to 80° C (-30° to 180° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)
*Addition of lubrication will greatly increase service life	

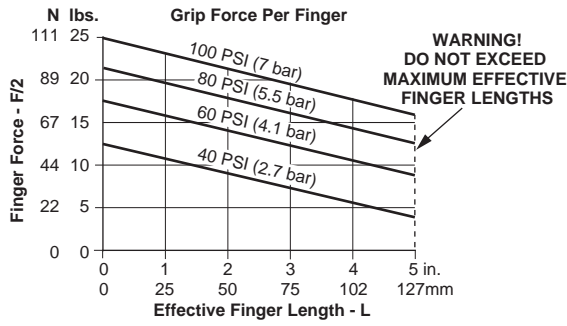
Ordering Information: P5GS Wide Body Series

Function	Bore size (mm)	Ports (BSPP)	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number
Double acting magnetic	16	M3	19.1	222	0.08	0.03	0.30	P5GS-016MSG019B
Double acting magnetic	16	M3	31.8	222	0.08	0.03	0.39	P5GS-016MSG032B
Double acting magnetic	24	M5	25.4	445	0.08	0.03	0.81	P5GS-024MSG025B
Double acting magnetic	24	M5	50.8	445	0.08	0.03	1.20	P5GS-024MSG051B
Double acting magnetic	32	M5	38.1	800	0.08	0.03	1.48	P5GS-032MSG038B
Double acting magnetic	32	M5	73.5	800	0.08	0.03	2.0	P5GS-032MSG074B

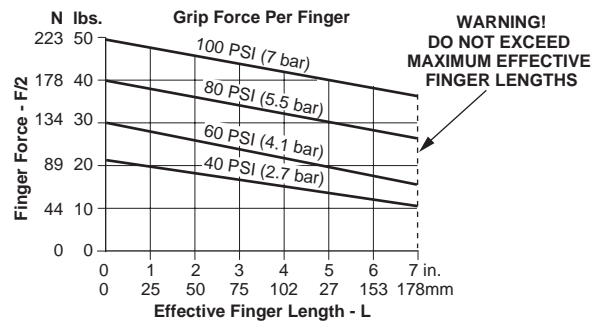
Sensor part numbers: Page 330.

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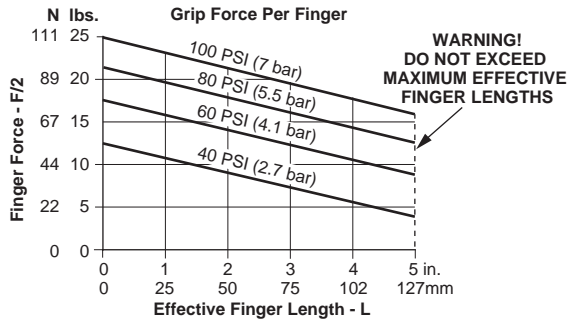
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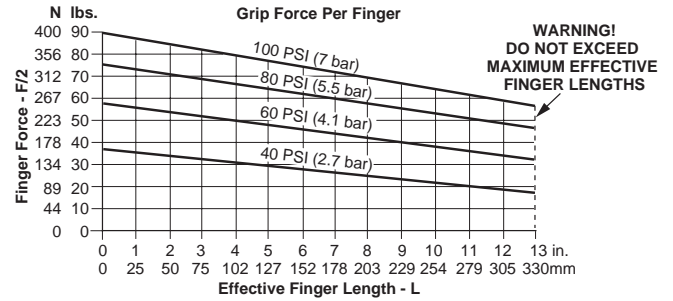
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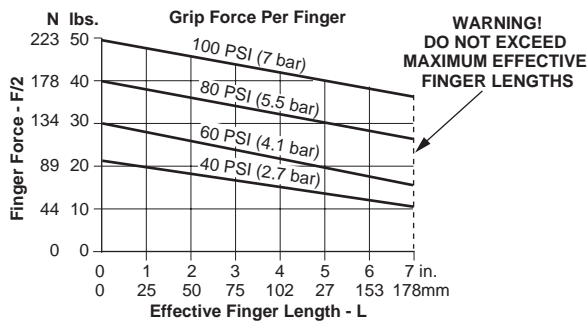
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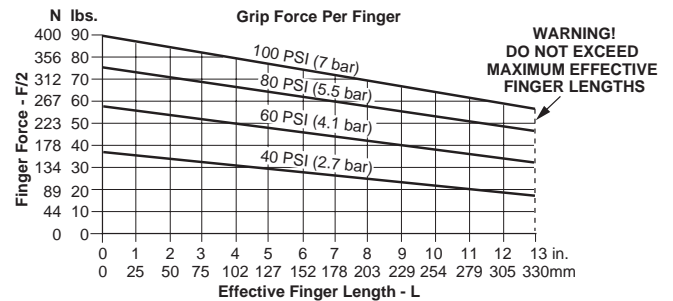
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Loading information - P5GS-024MSG025B



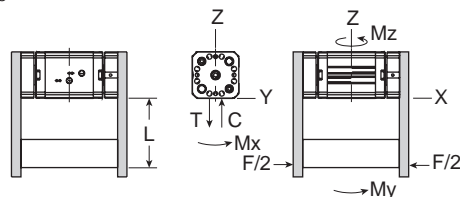
Loading information - P5GS-032MSG074B



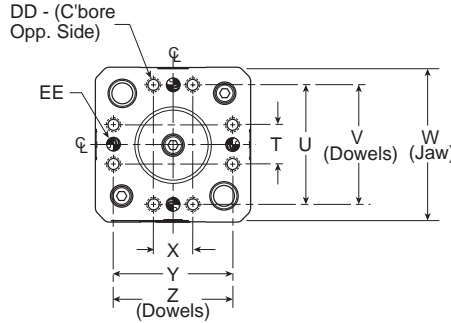
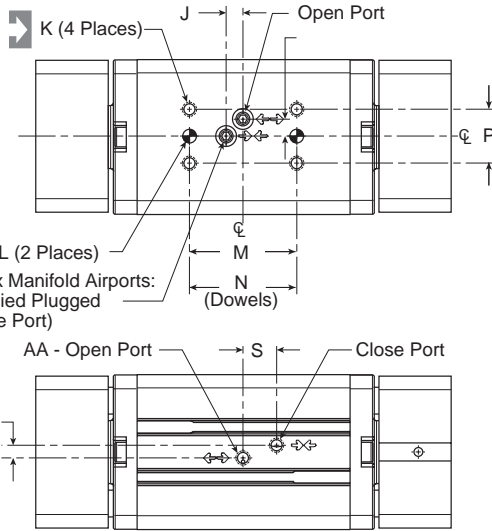
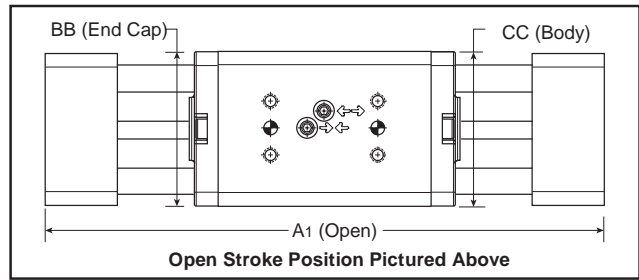
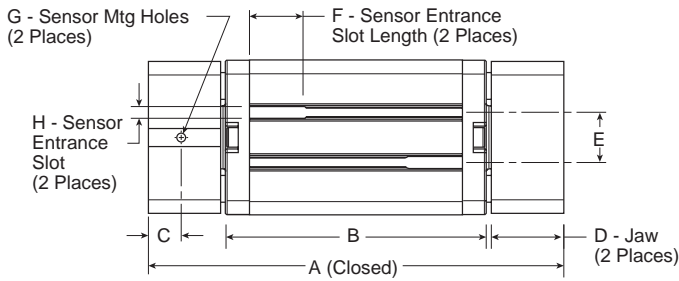
Loading capacity† - P5GS Wide Body Series

	P5GS-016M***19B		P5GS-016M***32B		P5GS-024M***25B		P5GS-024M***51B		P5GS-032M***38B		P5GS-032M***74B	
	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)
Maximum tensile T	267 N	53 N	267 N	53 N	534 N	107 N	534 N	107 N	2668 N	267 N	2668 N	267 N
Maximum compressive C	267 N	53 N	267 N	53 N	534 N	107 N	534 N	107 N	2668 N	267 N	2668 N	267 N
Maximum moment Mx	14 Nm	3 Nm	14 Nm	3 Nm	24 Nm	5 Nm	24 Nm	5 Nm	68 Nm	7 Nm	68 Nm	7 Nm
Maximum moment My	20 Nm	4 Nm	20 Nm	4 Nm	34 Nm	7 Nm	34 Nm	7 Nm	102 Nm	10 Nm	102 Nm	10 Nm
Maximum moment Mz	14 Nm	3 Nm	14 Nm	3 Nm	24 Nm	5 Nm	24 Nm	5 Nm	68 Nm	7 Nm	68 Nm	7 Nm

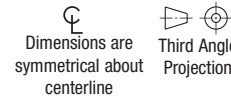
† Capacities are per set of jaws and are not simultaneous



Dimensions: P5GS Wide Body Series



Unless otherwise noted all tolerances are as shown below



Metric (mm)

(0.) = (±.25)

(0.0) = (±.13)

(0.00) = (±.013)

Part number	A	A ₁	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
P5GS-016MSG019B	79	98	54.4	5.8	10.5	7.9	19.1	M3 x 3 Dp	4.2	4	M3 x 5 Dp	∅ 3h7 x 5 Dp	19.0	19.05	9.5	M3 x 5 Dp
P5GS-016MSG032B	104	136	67.1	7.3	16.9	7.9	19.1	M3 x 3 Dp	4.2	4	M3 x 5 Dp	∅ 3h7 x 5 Dp	19.1	19.05	9.5	M3 x 5 Dp
P5GS-024MSG025B	97	122	67.1	6.7	13.0	17.8	19.1	M3 x 4 Dp	4.2	6	M3 x 7 Dp	∅ 5h7 x 5 Dp	38.1	38.10	19.1	M5 x 7 Dp
P5GS-024MSG051B	147	198	92.5	11.7	25.7	17.8	19.1	M3 x 4 Dp	4.2	6	M3 x 7 Dp	∅ 5h7 x 5 Dp	38.1	38.10	19.1	M5 x 7 Dp
P5GS-032MSG038B	125	164	82.8	12.1	19.2	18.8	19.1	M3 x 4 Dp	4.2	6	M3 x 8 Dp	∅ 5h7 x 5 Dp	38.1	38.10	19.1	M5 x 5 Dp
P5GS-032MSG074B	177	240	108.2	14.9	39.1	18.8	19.1	M3 x 4 Dp	4.2	6	M3 x 8 Dp	∅ 5h7 x 5 Dp	38.1	38.10	19.1	M5 x 7 Dp

Part number	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE
P5GS-016MSG019B	6	10	10.0	30.0	30.00	37.6	10.0	30.0	30.00	M5 x 5 Dp	37.6	38.0	M4 x 8 Dp	∅ 4h7 x 5 Dp
P5GS-016MSG032B	6	12	10.0	30.0	30.00	37.6	10.0	30.0	30.00	M5 x 5 Dp	37.6	38.0	M4 x 8 Dp	∅ 4h7 x 5 Dp
P5GS-024MSG025B	5	11	14.0	42.5	42.50	54.0	14.0	42.5	42.50	M5 x 6 Dp	54.7	55.0	M5 x 10 Dp	∅ 5h7 x 5 Dp
P5GS-024MSG051B	5	12	14.0	42.5	42.50	54.0	14.0	42.5	42.50	M5 x 6 Dp	54.7	55.0	M5 x 10 Dp	∅ 5h7 x 5 Dp
P5GS-032MSG038B	5	15	18.0	51.0	51.00	63.0	18.0	51.0	51.00	M5 x 6 Dp	63.7	64.0	M6 x 13 Dp	∅ 6h7 x 8 Dp
P5GS-032MSG074B	5	15	18.0	51.0	51.00	63.0	18.0	51.0	51.00	M5 x 6 Dp	63.7	64.0	M6 x 13 Dp	∅ 6h7 x 8 Dp

Dimensions in millimeters

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P5GT Double Wedge Series

- Extremely compact and robust package
- One piece 7075 -T6 aircraft quality aluminum body
- Dynamic components are hardened for wear resistance and long life
- Accessory mounting holes mount sensors to unit
- Slip fit dowel pin holes in body and jaws
- Jaws are supported throughout the length of the body and are precision ground for minimal jaw play
- A double acting piston is connected by a shaft to a double sided wedge
- The wedge slides in a slot located in each of the jaws converting vertical motion of the wedge into horizontal synchronous motion of the jaws
- The large surface area of the wedge minimizes frictional wear
- Magnetic piston standard



Operating information

Operating pressure:	3 to 7 bar (44 to 102 PSIG)
Temperature range:	
Nitrile seals (standard)	-35° to 80° C (-30° to 180° F)
Fluorocarbon seals (optional)	-30° to 150° C (-20° to 300° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)

*Addition of lubrication will greatly increase service life

Ordering Information: P5GT Double Wedge Series

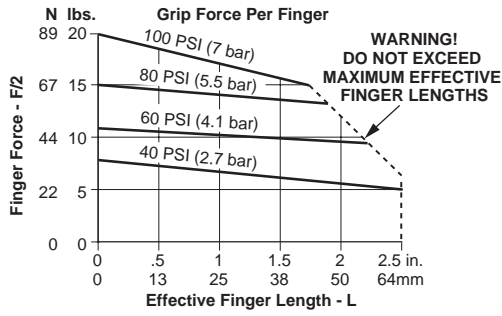
Function	Bore size (mm)	Ports (BSPP)	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number
Double acting magnetic, Nitrile	25	M5	6.4	178	0.05	0.03	0.12	P5GT-025MSG006B
Double acting magnetic, Fluorocarbon	25	M5	6.4	178	0.05	0.03	0.12	P5GT-025MFG006B
Double acting magnetic, Nitrile	25	M5	9.5	178	0.05	0.03	0.25	P5GT-025MSG010B
Double acting magnetic, Fluorocarbon	25	M5	9.5	178	0.05	0.03	0.25	P5GT-025MFG010B
Double acting magnetic, Nitrile	32	M5	12.7	311	0.05	0.03	0.57	P5GT-032MSG013B
Double acting magnetic, Fluorocarbon	32	M5	12.7	311	0.05	0.03	0.57	P5GT-032MFG013B
Double acting magnetic, Nitrile	46	1/8	19.1	979	0.08	0.03	1.0	P5GT-046MSG019B
Double acting magnetic, Fluorocarbon	46	1/8	19.1	979	0.08	0.03	1.0	P5GT-046MFG019B
Double acting magnetic, Nitrile	64	1/8	31.8	1779	0.08	0.03	3.5	P5GT-064MSG032B
Double acting magnetic, Fluorocarbon	64	1/8	31.8	1779	0.08	0.03	3.5	P5GT-064MFG032B
Double acting magnetic, Nitrile	89	1/4	50.8	2669	0.08	0.03	9.5	P5GT-089MSG051B
Double acting magnetic, Fluorocarbon	89	1/4	50.8	2669	0.08	0.03	9.5	P5GT-089MFG051B

Sensor part numbers: Page 330.

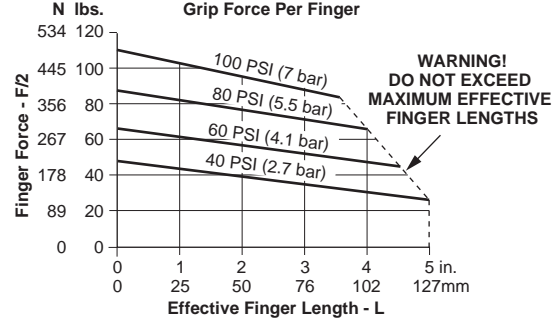
 Most popular.



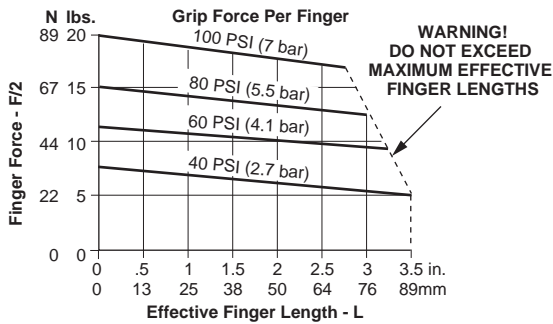
Loading information - P5GT-025/006



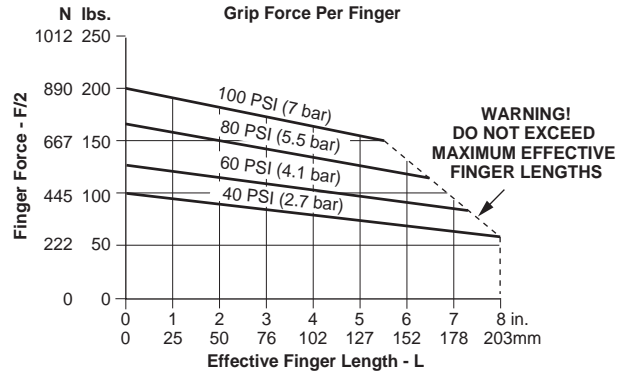
Loading information - P5GT-046



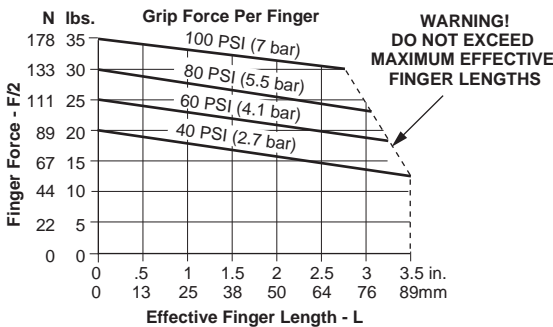
Loading information - P5GT-025/010



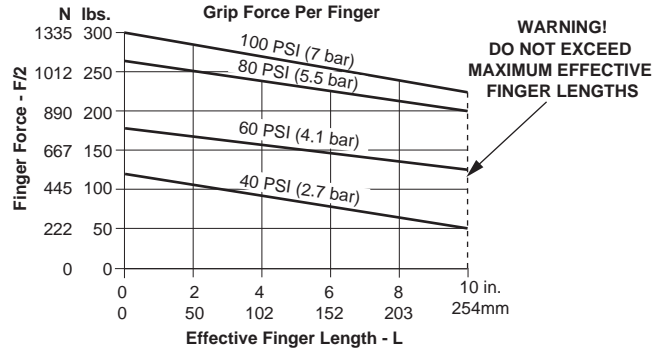
Loading information - P5GT-064



Loading information - P5GT-032



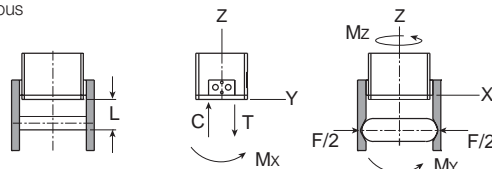
Loading information - P5GT-089



Loading capacity† - P5GT Double Wedge Series

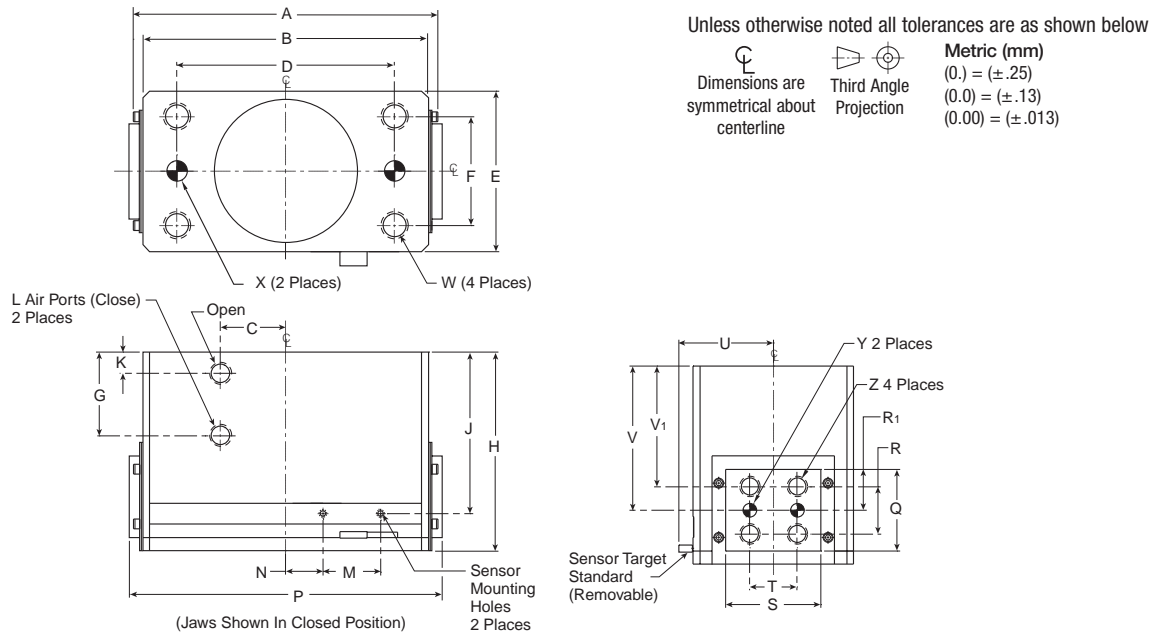
	P5GT-025(006)		P5GT-025(010)		P5GT-032		P5GT-046		P5GT-064		P5GT-089	
	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)
Maximum tensile T	445 N	111 N	890 N	111 N	1779 N	222 N	3336 N	445 N	6672 N	1112 N	13345 N	1334 N
Maximum compressive C	890 N	111 N	1779 N	111 N	3336 N	222 N	6672 N	445 N	13345 N	1112 N	26689 N	1334 N
Maximum moment Mx	11 Nm	2 Nm	17 Nm	3 Nm	34 Nm	6 Nm	85 Nm	14 Nm	170 Nm	28 Nm	565 Nm	56 Nm
Maximum moment My	11 Nm	2 Nm	17 Nm	3 Nm	34 Nm	6 Nm	85 Nm	14 Nm	170 Nm	28 Nm	565 Nm	56 Nm
Maximum moment Mz	11 Nm	2 Nm	17 Nm	3 Nm	34 Nm	6 Nm	85 Nm	14 Nm	170 Nm	28 Nm	565 Nm	56 Nm

† Capacities are per set of jaws and are not simultaneous



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Dimensions: P5GT Double Wedge Series



Part number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
P5GT-025(006)	–	38.1	20	31.75	31.8	12.70	17	28.6	9	5	M5	25	–	Open 48 Closed 41	9.55 ^{+0.00} _{-.003}
P5GT-025(010)	–	50.8	23	38.10	38.1	25.40	12	35.6	14	9	M5	14	6	Open 63 Closed 54	12.34 ^{+0.00} _{-.003}
P5GT-032	70.4	63.50	30	50.80	41.3	19.05	14.4	47.3	18	7	M5	17	3	Open 81 Closed 68	18.69 ^{+0.00} _{-.003}
P5GT-046	89.6	82.55	25	63.50	54.0	25.40	25	61.9	46	8	G1/8	27	5	Open 108 Closed 85	25.43 ^{+0.00} _{-.003}
P5GT-064	142.2	133.35	–	101.60	74.9	50.8	39	92.8	75	10	G1/8	27	17	Open 177 Closed 146	38.10 ^{+0.00} _{-.003}
P5GT-089	214.7	203.20	–	152.40	100.3	69.9	47	118.2	98	11	G1/4	56	25	Open 266 Closed 216	47.63 ^{+0.00} _{-.003}

Part number	R	S	T	U	V	W	X	Y	Z	Z1
P5GT-025(006)	6.35	15.88 ^{+0.00} _{-.003}	7.9	22.2	21.5	M4 x 9 Dp	Ø 3H7 x 6 Dp	Ø 2H7 x 4 Dp	M4 x 4.7 Dp	M3 x 4 Dp
P5GT-025(010)	7.95	18.67 ^{+0.00} _{-.003}	12.7	25.4	26.3	M6 x 12 Dp	Ø 5H7 x 6 Dp	Ø 2.5H7 x 4 Dp	M4 x 7 Dp	M3 x 4 Dp
P5GT-032	9.53	25.01 ^{+0.00} _{-.003}	17.5	27.0	28.5	M6 x 12 Dp	Ø 5H7 x 6 Dp	Ø 4H7 x 4 Dp	M5 x 9 Dp	M3 x 4 Dp
P5GT-046	12.70	31.78 ^{+0.00} _{-.003}	19.1	33.3	38.1	M10 x 19 Dp	Ø 6H7 x 12 Dp	Ø 5H7 x 9 Dp	M6 x 12 Dp	M3 x 6 Dp
P5GT-064	22.2	44.48 ^{+0.00} _{-.003}	22.23	44.2	67.4	M12 x 25 Dp	Ø 10H8 x 12 Dp	Ø 8H7 x 12 Dp	M10 x 19 Dp	M3 x 9 Dp
P5GT-089	28.57	57.10 ^{+0.00} _{-.003}	34.9	56.9	70.7	M20 x 38 Dp	Ø 12H8 x 19 Dp	Ø 6H7 x 12 Dp	M12 x 28 Dp	M3 x 9 Dp

Dimensions in millimeters

P5GP Electric Gripper Series

- One piece, lightweight aircraft quality aluminum body ensures product accuracy
- The body and jaws are hard-coat anodized to 60 RC with PTFE impregnation
- Ridged design and full body support of the jaws allows for long finger lengths
- Versatile mounting on top, side front and back of body.
- IP54 rating for tough application environments
- Slip fit dowel pin holes located in body and jaws for precision mounting
- Precision rack and pinion drive components for smooth actuation. Zero backlash while gripping ensures excellent repeatability and accuracy.
- Built in electronics, no external control board needed
- Magnetic piston standard



Operating information

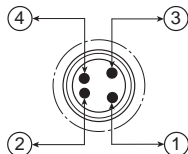
Voltage:	24VDC
Power Req. @ 100% Duty Cycle:	4.2 Watts
Current - Peak:	1.5 Amps Max.
Current - Continuous:	0.175 Amps
Temperature range:	5° to 60° C (41° to 140° F)

Ordering Information: P5GP Electric Gripper Series

Function	Stroke (mm)	Grip force (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number
Electric	25	111	0.051	0.025	0.53	P5GP-000ESX025B

Sensor part numbers: Page 330.

Electrical Interface



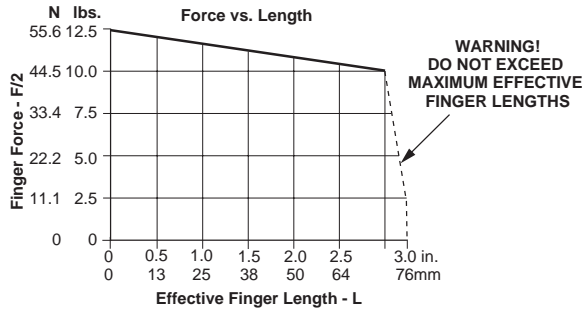
Pin Out (Looking Into Header Connector On Gripper)

- 1 Brown (+ 24 VDC)
- 2 White (Open Gripper) +24 VDC = Active
- 3 Blue (Ground)
- 4 Black (Close Gripper) +24 VDC = Active

4-Wire Power & Signal Cable: P8S-CABL-046

Most popular.

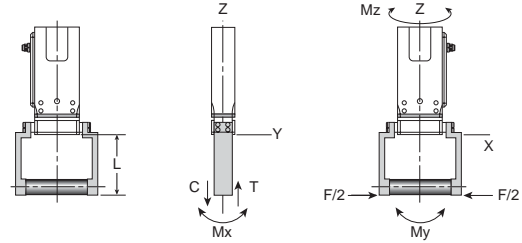
Loading information - P5GP-000



Loading capacity† - P5GP Electric Gripper

	Static (metric)
Maximum tensile T	10 N
Maximum compressive C	10 N
Maximum moment Mx	14 Nm
Maximum moment My	17 Nm
Maximum moment Mz	14 Nm

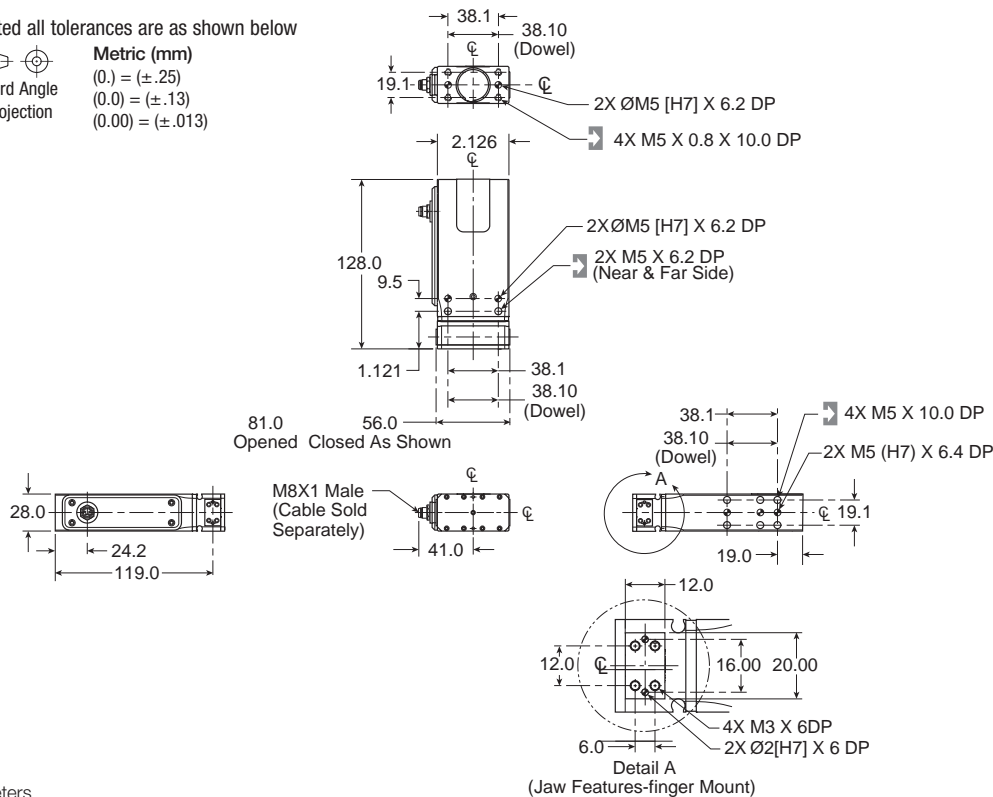
† Capacities are per set of jaws and are not simultaneous



Dimensions: P5GP Electric Gripper Series

Unless otherwise noted all tolerances are as shown below

- ⌀ Dimensions are symmetrical about centerline
- Third Angle Projection
- Metric (mm)
 - (0.) = (±.25)
 - (0.0) = (±.13)
 - (0.00) = (±.013)



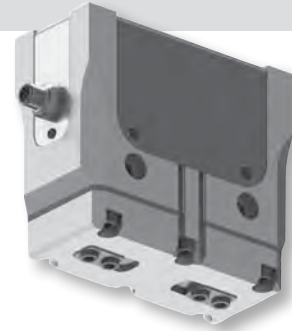
Dimensions in millimeters

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P5GQ Electric Gripper Series - High Force

- Gripper is available in two stroke lengths, standard and extended stroke
- Ridged design and full body support of the jaws allows for long finger lengths
- Finger locating sleeves for precise finger mounting (standard)
- Slip fit dowel pin located in body and jaws for precision mounting
- Jaw components hardened and precision ground steel for minimum jaw play with hard plating for wear resistance and long life
- IP50
- Grip force can be changed on the fly using 0-5V analog input
- No external controller needed, 8-pin cable sold separately
- Magnetic piston standard



Operating information

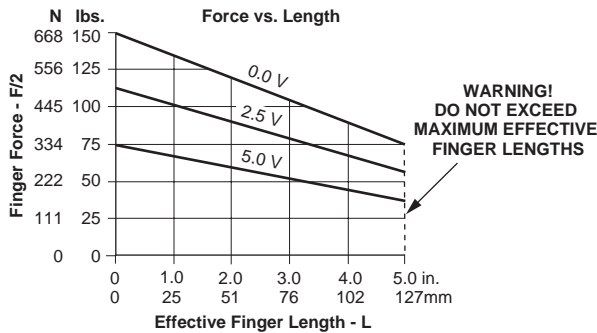
Voltage:	24VDC
Power Req. @ 100% Duty Cycle:	10 Watts
Current - Peak:	2 Amps Max.
Current - Continuous:	0.4 Amps
Temperature range:	0° to 55° C (32° to 131° F)

Ordering Information: P5GQ Electric Gripper Series - High Force

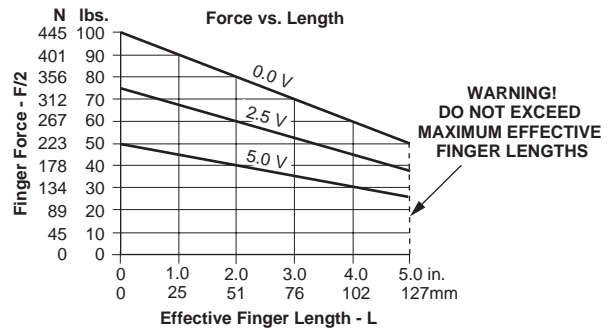
Function	Gripping mode	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number
Electric	ID	10.0	667-1334	0.05	0.025	2.52	P5GQ-000RSX010B
Electric	ID	20.0	445-890	0.05	0.025	2.52	P5GQ-000RSX020B
Electric	OD	10.0	667-1334	0.05	0.025	2.52	P5GQ-000QSX010B
Electric	OD	20.0	445-890	0.05	0.025	2.52	P5GQ-000QSX020B

Sensor part numbers: Page 330.

Loading information - P5GQ-000*010



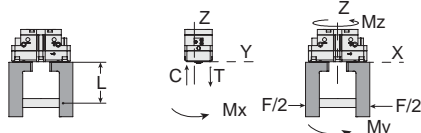
Loading information - P5GQ-000*020



Loading capacity† - P5GQ-000*010

	Static (metric)	Dynamic (Metric)
Maximum tensile T	1564 N	259 N
Maximum compressive C	2070 N	259 N
Maximum moment Mx	76 Nm	10 Nm
Maximum moment My	106 Nm	14 Nm
Maximum moment Mz	70 Nm	14 Nm

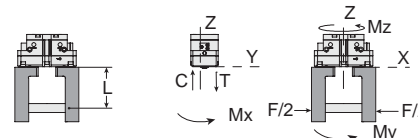
† Capacities are per set of jaws and are not simultaneous



Loading capacity† - P5GQ-000*020

	Static (metric)	Dynamic (Metric)
Maximum tensile T	1394 N	168 N
Maximum compressive C	1845 N	168 N
Maximum moment Mx	68 Nm	6 Nm
Maximum moment My	84 Nm	8 Nm
Maximum moment Mz	56 Nm	8 Nm

† Capacities are per set of jaws and are not simultaneous

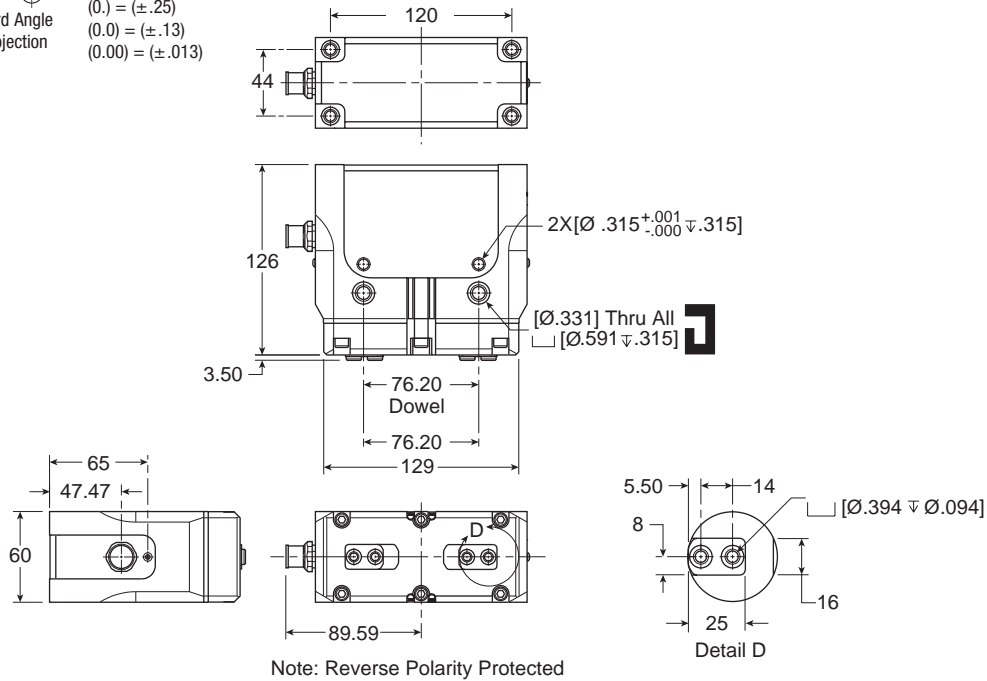


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Dimensions: P5GQ Electric Gripper Series - High Force

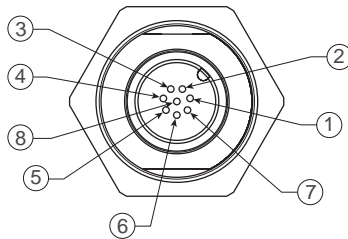
Unless otherwise noted all tolerances are as shown below

Dimensions are symmetrical about centerline
 Third Angle Projection
Metric (mm)
 (0.) = (±.25)
 (0.0) = (±.13)
 (0.00) = (±.013)



P8S-CABL-052: 8 Wire power and signal cable, 5m long, straight M12 connector

P8S-CABL-053: 8 Wire power and signal cable, 5m long, 90 degree M12 connector



Electrical interface: Pin out (Looking into the head of the connector on gripper)

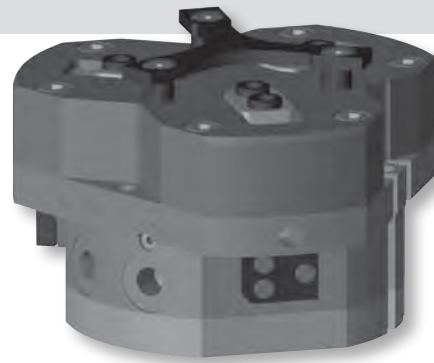
Pin #	Color	Signal	Description	Current
1	White	Force	0-5 VDC (Analog)	5mA
2	Brown	+24V	Motor power	2A (max), 0.4 A (avg)
3	Green	Open	24 VDC active (Inputs)	10mA
4	Yellow	Open sense	NPN / PNP (Outputs)	300mA (max)
5	Gray	Close	24 VDC active (Inputs)	10mA
6	Pink	Close sense	NPN / PNP (Outputs)	300mA (max)
7	Blue	Ground	Motor ground	2A (max)
8	Red	I/O power	24 VDC (PNP outputs only)	300mA (max)

Dimensions in millimeters



P5GW 3-Jaw Centering Series

- Multiple side or top air ports (top ports require o-ring)
- Optional spring assist retains the component should the air supply fail, to assist the gripper for internal (-O) or external (-C) gripping, or in single acting or spring assist mode
- Finger locating sleeves for precise finger mounting
- Jaw components hardened and precision ground steel for minimum jaw play with hard plating for wear resistance and long life
- Standard purge / scavenge port used with vacuum for clean room environments or positive pressure for harsh environments
- Gripper can be mounted from the top or bottom
- Gripper body is shielded to repel chips and other particulate from internal drive mechanism
- Magnetic piston standard



Operating information

Operating pressure:	0.3 to 7 bar (4 to 102 PSIG)
Temperature range:	
Nitrile seals (Standard)	-35° to 80° C (-30° to 180° F)
Fluorocarbon seals (Optional)	-30° to 150° C (-20° to 300° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)

*Addition of lubrication will greatly increase service life

Ordering Information: P5GW 3-Jaw Centering Series

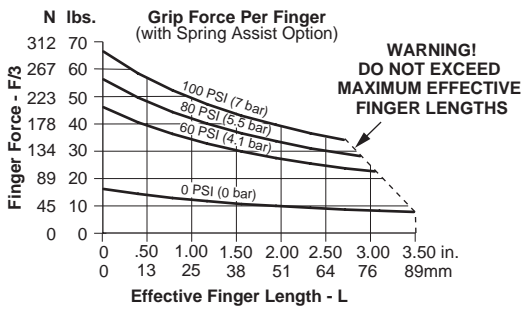
Function	Bore size (mm)	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number Fluorocarbon	Part number Nitrile
Double acting magnetic	32	4.0	682	0.04	0.02	0.25	P5GW-032MFG004B	P5GW-032MSG004B
Double acting magnetic	43	6.0	1238	0.04	0.02	0.53	P5GW-043MFG006B	P5GW-043MSG006B
Double acting magnetic	55	8.0	2078	0.04	0.02	1.08	P5GW-055MFG008B	P5GW-055MSG008B
Double acting magnetic	72	10.0	3644	0.06	0.03	1.95	P5GW-072MFG010B	P5GW-072MSG010B
Double acting magnetic	95	13.0	6353	0.06	0.03	3.9	P5GW-095MFG013B	P5GW-095MSG013B
Double acting magnetic	120	16.0	10202	0.08	0.04	7.89	P5GW-120MFG016B	P5GW-120MSG016B
Double acting magnetic	156	25.0	17165	0.10	0.05	15.7	P5GW-156MFG025B	P5GW-156MSG025B
Double acting magnetic	225	35.0	35288	0.10	0.05	43.9	P5GW-225MFG035B	P5GW-225MSG035B

Function	Bore size (mm)	Stroke (mm)	Grip force @ 7 bar (N)	Accuracy +/- mm	Repeatability +/-mm	Weight (kg)	Part number Spring close
Spring closing magnetic	32	4.0	889	0.04	0.02	0.25	P5GW-032DSG004B
Spring closing magnetic	43	6.0	1490	0.04	0.02	0.53	P5GW-043DSG006B
Spring closing magnetic	55	8.0	2627	0.04	0.02	1.08	P5GW-055DSG008B
Spring closing magnetic	72	10.0	4562	0.06	0.03	1.95	P5GW-072DSG010B
Spring closing magnetic	95	13.0	7877	0.06	0.03	3.9	P5GW-095DSG013B
Spring closing magnetic	120	16.0	13786	0.08	0.04	7.89	P5GW-120DSG016B
Spring closing magnetic	156	25.0	22093	0.10	0.05	15.7	P5GW-156DSG025B
Spring closing magnetic	225	35.0	44354	0.10	0.05	43.9	P5GW-225DSG035B

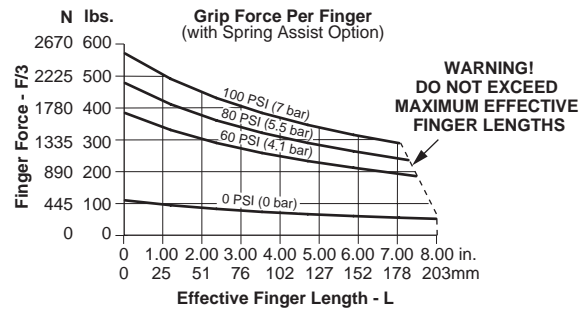
Sensor part numbers: Page 330.

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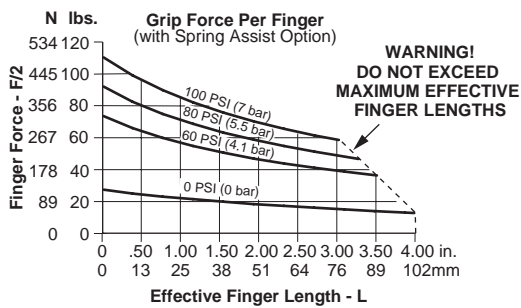
Loading information - P5GW-032



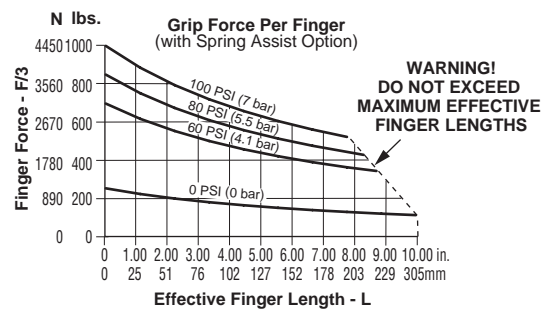
Loading information - P5GW-095



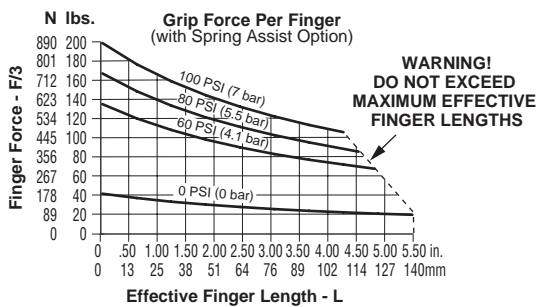
Loading information - P5GW-043



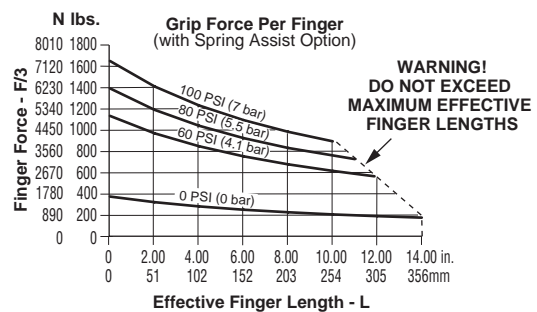
Loading information - P5GW-120



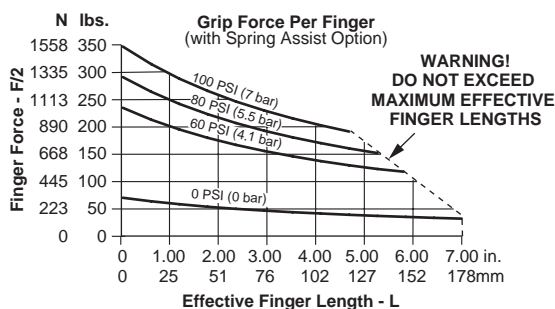
Loading information - P5GW-055



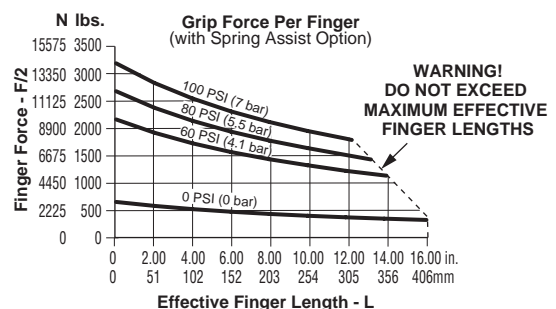
Loading information - P5GW-156



Loading information - P5GW-072



Loading information - P5GW-225

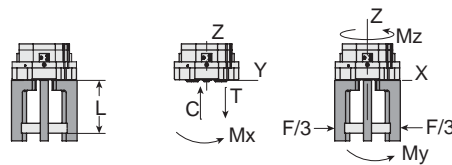


Loading capacity† - P5GW 3-Jaw Centering Series

	P5GW-32		P5GW-43		P5GW-55		P5GW-72	
	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)
Maximum tensile T	810 N	89 N	1200 N	129 N	1680 N	302 N	2110 N	425 N
Maximum compressive C	1060 N	89 N	1560 N	129 N	2180 N	302 N	2790 N	425 N
Maximum moment Mx	22 Nm	2 Nm	45 Nm	4 Nm	72 Nm	11 Nm	92 Nm	16 Nm
Maximum moment My	28 Nm	3 Nm	64 Nm	6 Nm	102 Nm	16 Nm	182 Nm	22 Nm
Maximum moment Mz	18 Nm	3 Nm	41 Nm	6 Nm	66 Nm	16 Nm	84 Nm	22 Nm

	P5GW-95		P5GW-120		P5GW-156		P5GW-225	
	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)
Maximum tensile T	2990 N	674 N	4320 N	1315 N	5400 N	1763 N	8230 N	2733 N
Maximum compressive C	3980 N	674 N	5810 N	1315 N	7120 N	1763 N	10700 N	2733 N
Maximum moment Mx	127 Nm	25 Nm	172 Nm	45 Nm	215 Nm	60 Nm	455 Nm	131 Nm
Maximum moment My	179 Nm	35 Nm	250 Nm	65 Nm	305 Nm	86 Nm	578 Nm	167 Nm
Maximum moment Mz	117 Nm	35 Nm	164 Nm	65 Nm	208 Nm	86 Nm	362 Nm	167 Nm

† Capacities are per set of jaws and are not simultaneous



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P5SS Slide Tables

- Combination of dual bore cylinder and linear rail
- Magnetic piston standard
- Rubber bumper standard
- Available with stroke adjusters
- Available with shock absorbers



Operating information

Operating pressure: 1.5 to 7 bar (21.8 to 102 PSIG)
 Temperature range: -5° to 60° C (23° to 140° F)
 Filtration requirements:
 Air filtration: 40 micron or better
 Air lubrication: Not necessary*
 Air humidity: Low moisture content (dry)
 *Addition of lubrication will greatly increase service life

Ordering Information: P5SS Slide Tables

P5	S	S	-	***	D	S	G	***	B	N	A	N	N	N														
Family	Series	Spare		Function	Temperature / Finish	Ports	Stroke	Options	Fitting	Spare	Spare	Spare																
S Slide	S Slide table	-		D Double acting magnetic	S Standard	G BSPP	010 10mm 020 20mm 030 30mm 040 40mm 050 50mm 075 75mm 100 100mm 125 125mm 150 150mm	B No options W With specified options pos 16-20	N None	N None	N None	N None																
<table border="1"> <thead> <tr> <th colspan="2">Bore size</th> </tr> </thead> <tbody> <tr> <td>006</td> <td>6mm bore: 10, 20, 30, 40, 50mm stroke</td> </tr> <tr> <td>008</td> <td>8mm bore: 10, 20, 30, 40, 50, 75mm stroke</td> </tr> <tr> <td>012</td> <td>12mm bore: 10, 20, 30, 40, 50, 75, 100mm stroke</td> </tr> <tr> <td>016</td> <td>16mm bore: 10, 20, 30, 40, 50, 75, 100, 125mm stroke</td> </tr> <tr> <td>020</td> <td>20mm bore: 10, 20, 30, 40, 50, 75, 100, 125, 150mm stroke</td> </tr> <tr> <td>025</td> <td>25mm bore: 10, 20, 30, 40, 50, 75, 100, 125, 150mm stroke</td> </tr> </tbody> </table>															Bore size		006	6mm bore: 10, 20, 30, 40, 50mm stroke	008	8mm bore: 10, 20, 30, 40, 50, 75mm stroke	012	12mm bore: 10, 20, 30, 40, 50, 75, 100mm stroke	016	16mm bore: 10, 20, 30, 40, 50, 75, 100, 125mm stroke	020	20mm bore: 10, 20, 30, 40, 50, 75, 100, 125, 150mm stroke	025	25mm bore: 10, 20, 30, 40, 50, 75, 100, 125, 150mm stroke
Bore size																												
006	6mm bore: 10, 20, 30, 40, 50mm stroke																											
008	8mm bore: 10, 20, 30, 40, 50, 75mm stroke																											
012	12mm bore: 10, 20, 30, 40, 50, 75, 100mm stroke																											
016	16mm bore: 10, 20, 30, 40, 50, 75, 100, 125mm stroke																											
020	20mm bore: 10, 20, 30, 40, 50, 75, 100, 125, 150mm stroke																											
025	25mm bore: 10, 20, 30, 40, 50, 75, 100, 125, 150mm stroke																											

Theoretical force



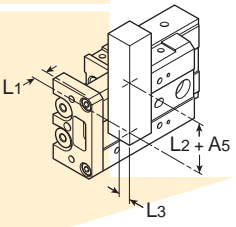
Tube I.D. (mm)	Piston rod (mm)	Operating direction	Piston area (mm ²)	Operating pressure MPa						
				0.2	0.3	0.4	0.5	0.6	0.7	
6	3	OUT	57	11	17	23	29	34	40	
		IN	42	8	13	17	21	25	29	
8	4	OUT	101	20	30	40	51	61	71	
		IN	75	15	23	30	38	45	53	
12	6	OUT	226	45	68	90	113	136	158	
		IN	170	34	51	68	85	102	119	
16	8	OUT	402	80	121	161	201	241	281	
		IN	302	60	91	121	151	181	211	
20	10	OUT	628	126	188	251	314	377	400	
		IN	471	94	141	188	236	283	330	
25	12	OUT	982	196	295	393	491	589	687	
		IN	756	151	227	302	378	454	529	

* Option K, L & M shock absorber is not available on 6mm bore
 † Option G & H 25mm adjuster is not available on 6mm bore

Sensor part numbers: Page 330.

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Selection Flow Chart

Operating conditions	Formula and charts	Selection example
List out the operating conditions according to mounting position and shape of the workpiece	Model used Cushion style Workpiece install position Mounting position Average speed Va (mm/s) Allowable load W (kg) (Figure 1) Overhang Ln (mm) (Figure 2)	Cylinder: P5SS-6-10 Cushion: Cushion pad Workpiece table mounting Mounting: Lateral mounting Average speed: Va = 150mm/s Load: W = 0.3kg L1 = 4mm L2 = 4mm L3 = 4mm
		
Kinetic energy		
Calculate kinetic energy E(J) of work	$E = 1/2 \cdot W (V/1000)^2$	$E = 1/2 \cdot 0.3 (210/1000)^2 = 0.0066$
Calculate allowable kinetic energy Ea(J)	Collision speed $V = 1.4 \cdot Va$ $Ea = K \cdot Emax$ Workpiece mounting coefficient K: Figure 3	Collision speed $V = 1.4 \cdot 150 = 210$ $Ea = 1 \cdot 0.015 = 0.015$ Possible to use by $E = 0.0066 \leq Ea = 0.015$
Make sure that kinetic energy of work is less / lower than allowable kinetic energy.	Max. allowable kinetic energy Emax: Table 1 Kinetic energy (E) ≤ Allowable kinetic energy (Ea)	
Load rate		
Load rate of work		
Calculate static work Wa(kg)	$Wa = K \cdot \beta \cdot Wmax$ Workpiece mounting coefficient K: Figure 3 Allowable load coefficient β: Figure 4 Maximum allowable moment Wmax: Table 2	$Wa = 1 \times 1 \times 0. = 0.66$ K = 1 β = 1 Wmax = 0.6
Calculate load rate α1 of static work	$\alpha_1 = W/Wa$	$\alpha_1 = 0.3/0.6 = 0.5$
Load rate of static moment		Yawing Rolling
Calculate static moment M(Nm).	$M = W \times 9.8 (Ln + An)/1000$ Correction value for moment center distance An: Table 3	Calculate My Calculate Mr $My = W \times 9.8 (L1 + A3)/1000 = 0.3 \times 9.8 (4 + 13)/1000 = 0.05$ $Mr = W \times 9.8 (L3 + A2)/1000 = 0.3 \times 9.8 (5 + 6)/1000 = 0.033$
Calculate allowable static moment Ma(Nm).	$Ma = K \cdot \gamma \cdot Mmax$ Workpiece mounting coefficient K: Figure 3 Allowable moment coefficient γ: Figure 5 Max. allowable moment Mmax: Table 4	$A3 = 13$ $A2 = 6$ $May = 1 \times 1 \times 0.7 = 0.7$ $Mar = 0.7$ (Same value as Ma) Mymax = 0.7
Calculate load rate α2 of static moment	$\alpha_2 = M/Ma$	$\alpha_2 = 0.05/0.7 = 0.072$ $\alpha_2' = 0.033/0.7 = 0.047$
Load rate of kinetic moment		Pitching Yawing
Calculate kinetic moment Me(Nm).	$Me = 1/3 \cdot We \cdot 9.8 (Ln + An)/1000$ Collision equivalence load $We = \delta \cdot W \cdot V$ δ: Cushion coefficient with cushion pad (Standard) = 4/100 with shock absorber = 1/100	Calculate Mep Calculate Mey $Mep = 1/3 \times 2.52 \times 9.8 \times (5 + 6)/1000 = 0.09$ $Mey = 1/3 \times 2.52 \times 9.8 \times (4 + 16)/1000 = 0.165$ $We = 4/100 \times 0.3 \times 210 = 2.52$ $We = 2.52$
Calculate allowable kinetic moment Mea(Nm).	Correction value for moment center distance An: Table 3 $Mea = K \gamma Mmax$ Workpiece mounting coefficient t K: Figure 3 Allowable moment coefficient γ: Figure 5 Max. allowable moment Mmax: Table 4	$A2 = 6$ $A4 = 16$ $Meap = 1 \times 0.97 \times 0.7 = 0.679$ $Meay = 0.679$ (Same value as Meap) K = 1 γ = 0.97
Calculate load rate α3 of kinetic moment.	$\alpha_3 = Me/Mea$	$Mpmax = 0.$ $\alpha_3 = 0.09/0.679 = 0.13$ $\alpha_3' = 0.165/0.679 = 0.243$
Sum of load rate		
When sum of load rate does not exceed 1, it is possible to use.	$\sum \alpha_n = \alpha_1 + \alpha_2 + \alpha_3 \leq 1$	$\sum \alpha_n = \alpha_1 + \alpha_2 + \alpha_2' + \alpha_3 + \alpha_3' \leq 1$ $= 0.5 + 0.072 + 0.047 + 0.133 + 0.243 = 0.995 \leq 1$ And it is possible to use.

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Table 1: Maximum allowable kinetic energy: E_{max} (J)

Allowable kinetic energy		
Cushion pad	Shock absorber	Model
0.015	—	P5SS-006
0.023	0.041	P5SS-008
0.05	0.105	P5SS-012
0.104	0.214	P5SS-016
0.153	0.313	P5SS-020
0.232	0.472	P5SS-025

Table 2: Maximum allowable static load: W_{max} (kg)

Max. allowable kinetic energy	Model
0.6	P5SS-006
0.8	P5SS-008
2	P5SS-012
3.7	P5SS-016
6	P5SS-020
8.5	P5SS-025

Table 3: Correction value for moment center distance: A_n (mm) (Refer to Figure 2)

A_1	A_2	A_3	A_4	A_5	Model
11	6	13	16	16	P5SS-006
11	8	13	20	20	P5SS-008
24	9.5	26	25	25	P5SS-012
27	10.5	30	31	31	P5SS-016
34	15.5	36	38	38	P5SS-020
42	20.5	44	46	46	P5SS-025

Figure 3: Workpiece mounting coefficient: K

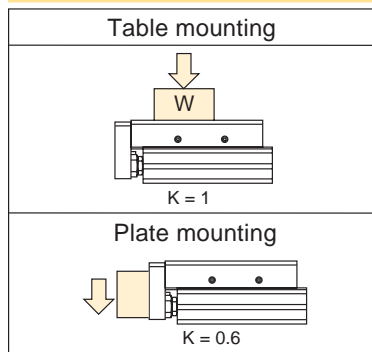


Table 4: Maximum allowable moment: M_{max} (Nm)

Stroke (mm)									
10	20	30	40	50	75	100	125	150	Model
0.7	1.0	1.1	1.1	1.1	—	—	—	—	P5SS-006
2.0	2.0	2.6	3.5	3.9	3.9	—	—	—	P5SS-008
3.9	3.9	3.9	5.5	6.8	9.6	9.6	—	—	P5SS-012
9.8	9.8	9.8	9.8	12.0	21.0	30.0	30.0	—	P5SS-016
16.4	16.4	16.4	16.4	24.2	31.4	45.5	45.5	45.5	P5SS-020
26.5	26.5	26.5	26.5	37.8	49.8	62.2	62.2	62.2	P5SS-025

Figure 1: Allowable load: W (kg)

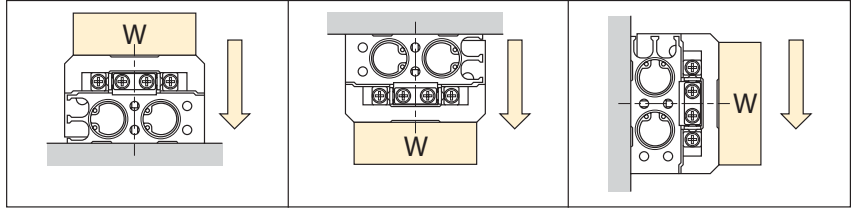
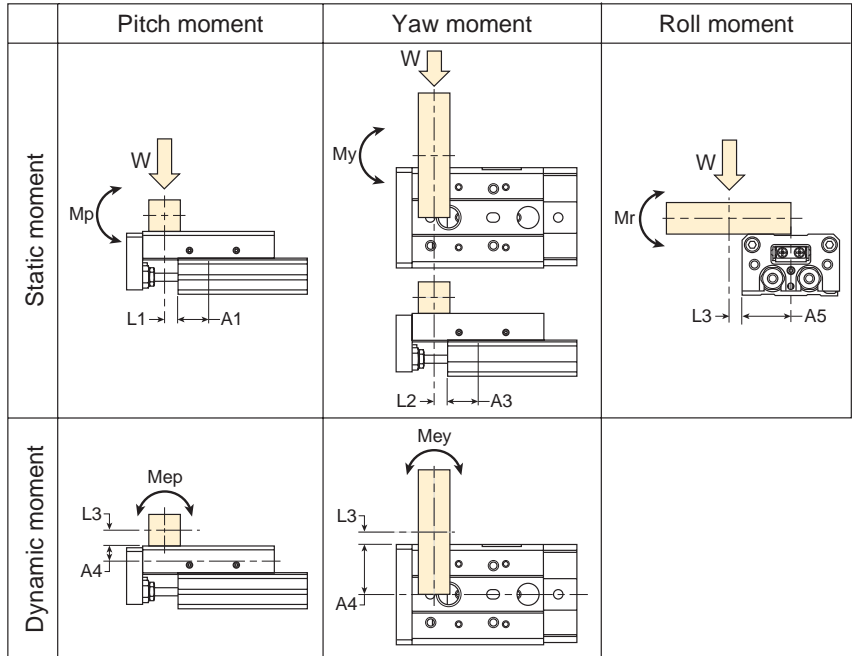


Figure 2: Overhang: L_n (mm) Correction value for moment center distance: A_n (mm)



Note: Static moment: Moment by gravity.
 Kinetic moment: Moment by stopper collision.

Figure 4: Allowable static load coefficient: β

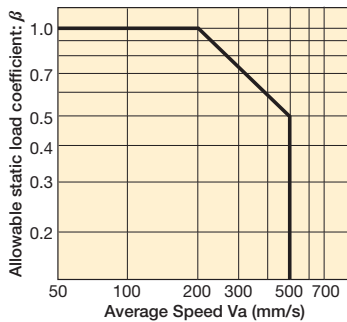
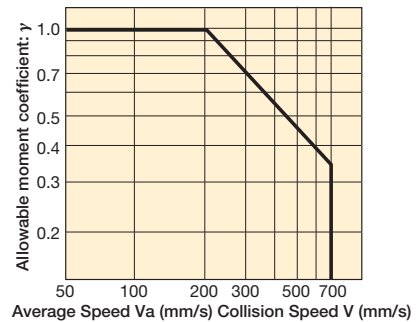


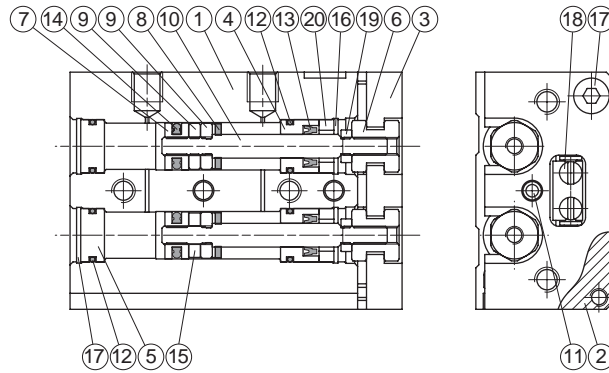
Figure 5: Allowable moment coefficient: γ



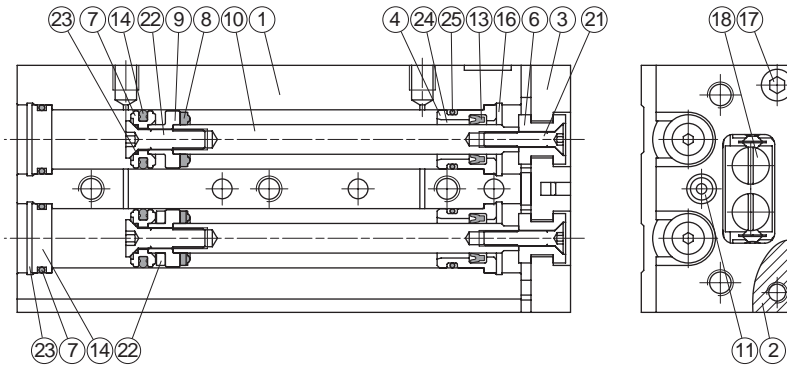
Note: Average speed for static moment.
 Collision speed for kinetic moment.

Material

Ø 6, Ø 8



Ø 12 thru Ø 25



No.	Part name	6	8	12 to 25
1	Body		Aluminum alloy	
2	Table		Aluminum alloy	
3	Plate		Aluminum alloy	
4	Rod cover		Aluminum alloy	
5	Head cover		Aluminum alloy	
6	Floating connector		Stainless steel	
7	Piston		Stainless steel	Aluminum alloy
8	Cushion pad		NBR	
9	Spacer ring	Aluminum alloy	Stainless steel	Aluminum alloy
10	Piston rod		Stainless steel	
11	End cushion		PU	
12	Cover ring		NBR	
13	Rod packing		NBR	

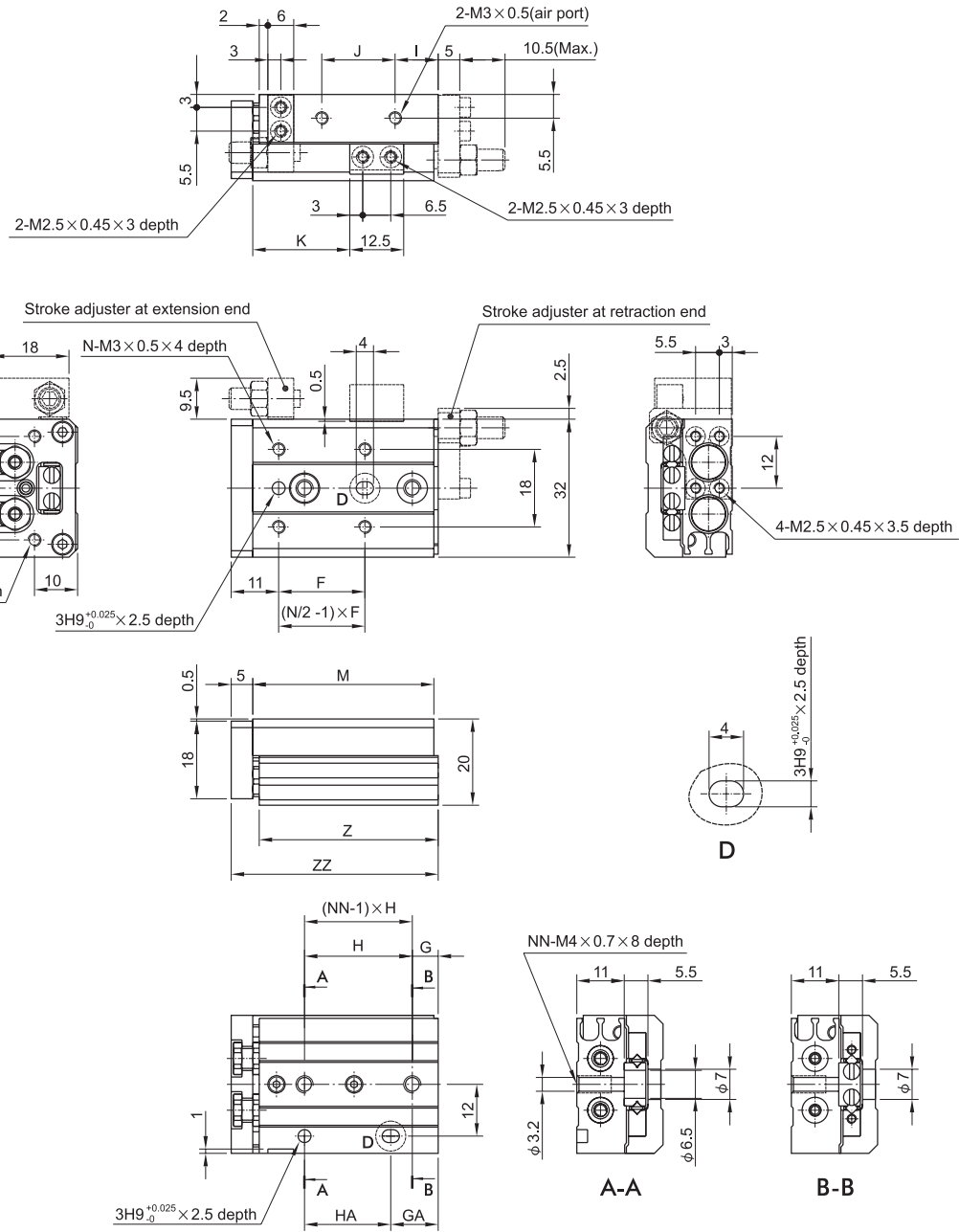
No.	Part name	6	8	12 to 25
14	Piston packing		NBR	
15	Magnet ring		Magnet material	
16	Snap ring	Spring steel	Stainless steel	
17	Bolt		Stainless steel	
18	Slide way		Bearing steel	
19	Nut	Copper	-	
20	Rod cover washer	Stainless steel	-	
21	Floating connector bolt	Stainless steel	-	
22	Piston screw		-	Stainless steel
23	Piston gasket		-	NBR
24	Rod bush		Copper	
25	Cover ring		NBR	

Weight (g)

Stroke (mm)	Tube I.D.					
	Ø6	Ø8	Ø12	Ø16	Ø20	Ø25
10	78	137	335	536	1001	1573
20	98	148	339	546	1012	1587
30	111	171	343	552	1020	1605
40	147	216	393	630	1098	1735
50	172	255	482	723	1254	1930
75	-	367	684	1030	1690	2553
100	-	-	910	1341	2214	3180
125	-	-	-	1646	2729	4082
150	-	-	-	-	3310	4420



Dimensions: P5SS Slide Table - Ø 6



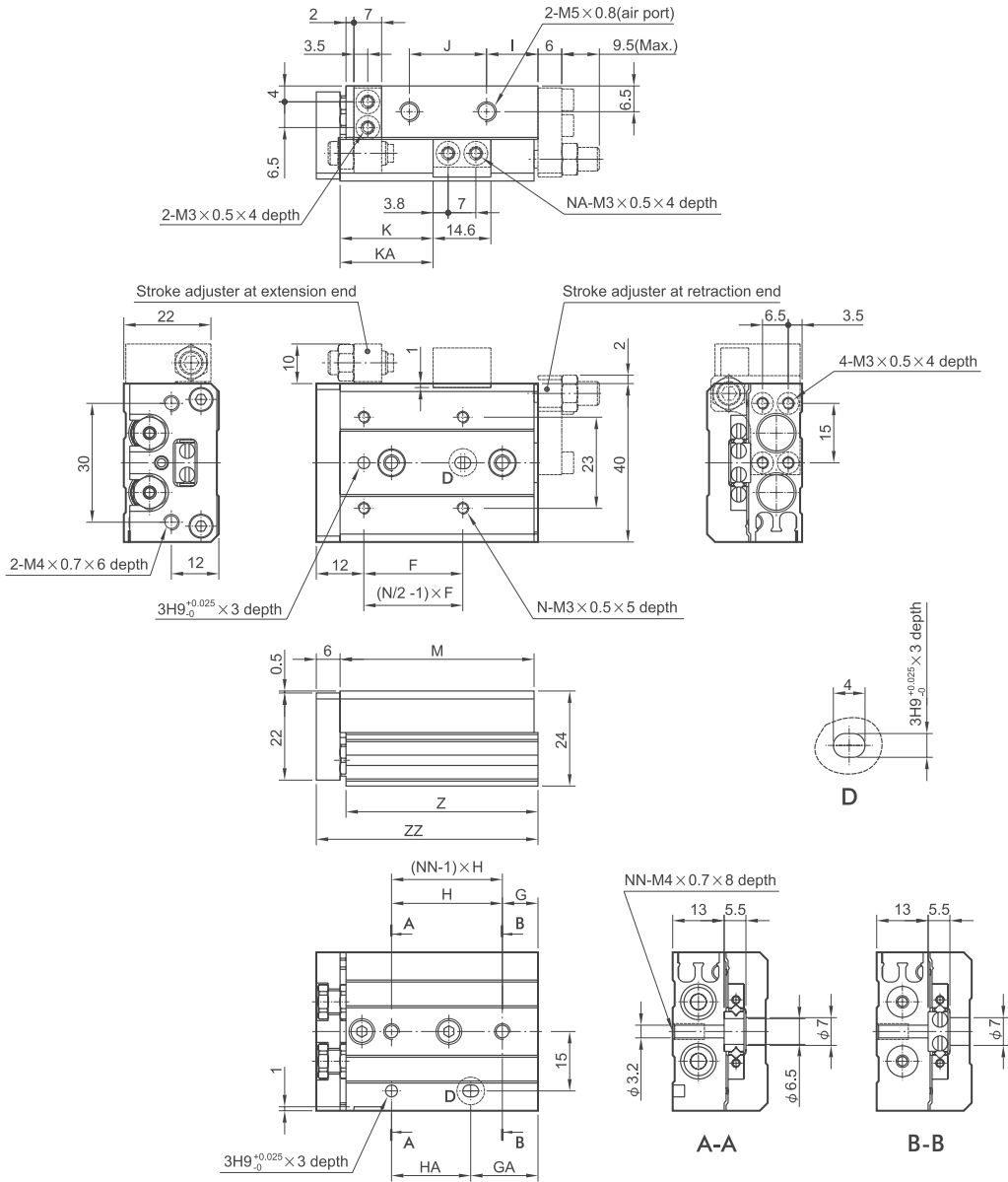
Stroke (mm)	F	G	GA	H	HA	I	J	K	M	N	NN	Z	ZZ
10	20	6	11	25	20	10	17	22.5	42	4	2	41.5	48
20	30	6	21	35	20	10	27	32.5	52	4	2	51.5	58
30	20	11	31	20	20	7	40	42.5	62	6	3	61.5	68
40	28	13	43	30	30	19	50	52.5	84	6	3	83.5	90
50	38	17	41	24	48	25	60	62.5	100	6	4	99.5	106

Dimensions in millimeters

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Dimensions: P5SS Slide Table - Ø 8

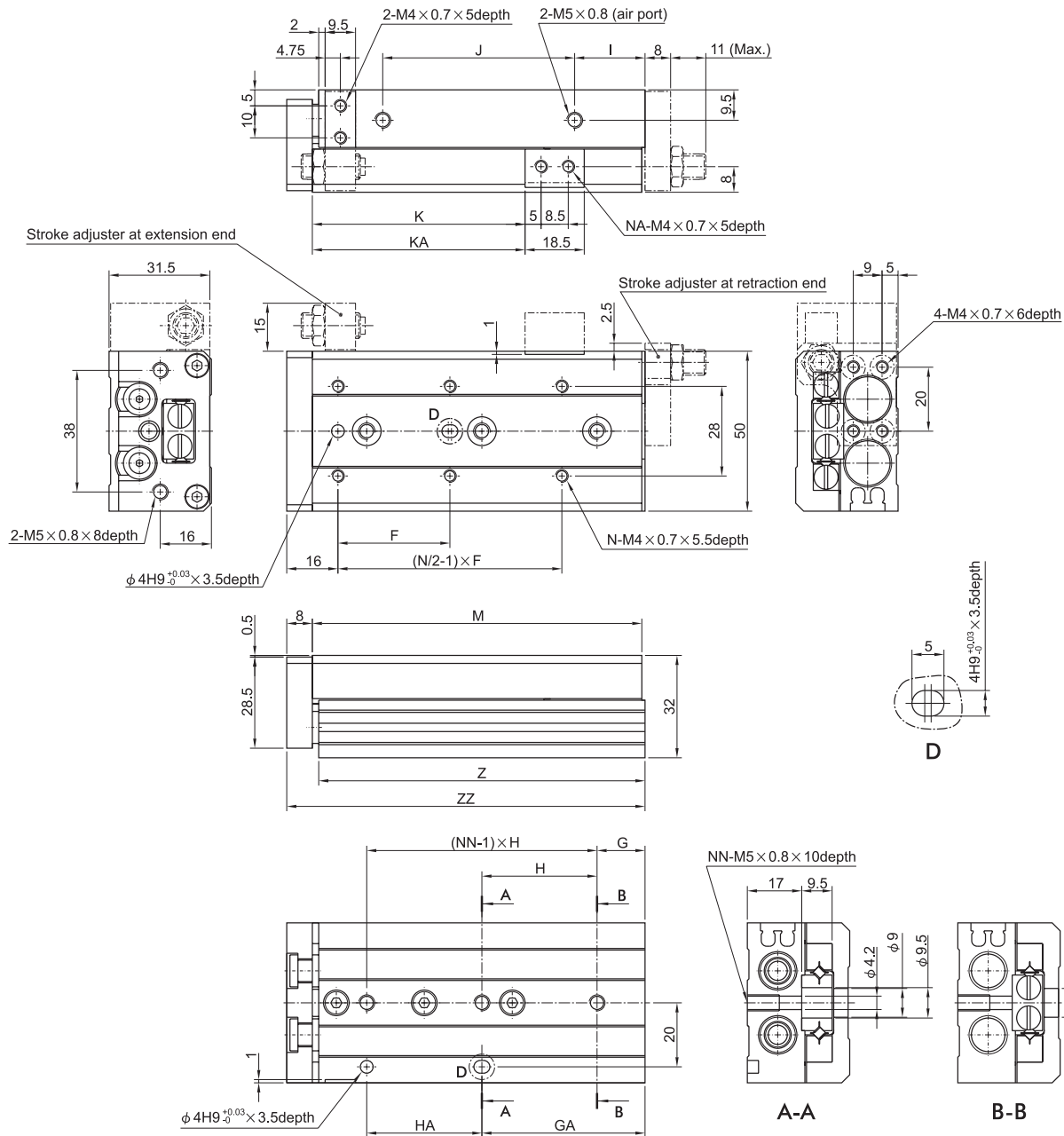


Stroke (mm)	F	G	GA	H	HA	I	J	K	KA	M	N	NA	NN	Z	ZZ
10	25	9	17	28	20	13	19.5	23.5	—	49	4	2	2	48.5	56
20	25	12	12	30	30	8.5	29	33.5	—	54	4	2	2	53.5	61
30	40	13	33	20	20	9.5	39	43.5	—	65	4	2	3	64.5	72
40	50	15	43	28	28	10.5	56	53.5	—	83	4	2	3	82.5	90
50	38	20	43	23	46	24.5	60	63.5	82.5	101	6	4	4	100.5	108
75	50	27	83	28	56	38.5	96	88.5	132.5	151	6	4	5	150.5	158

Dimensions in millimeters



Dimensions: P5SS Slide Table - Ø 12



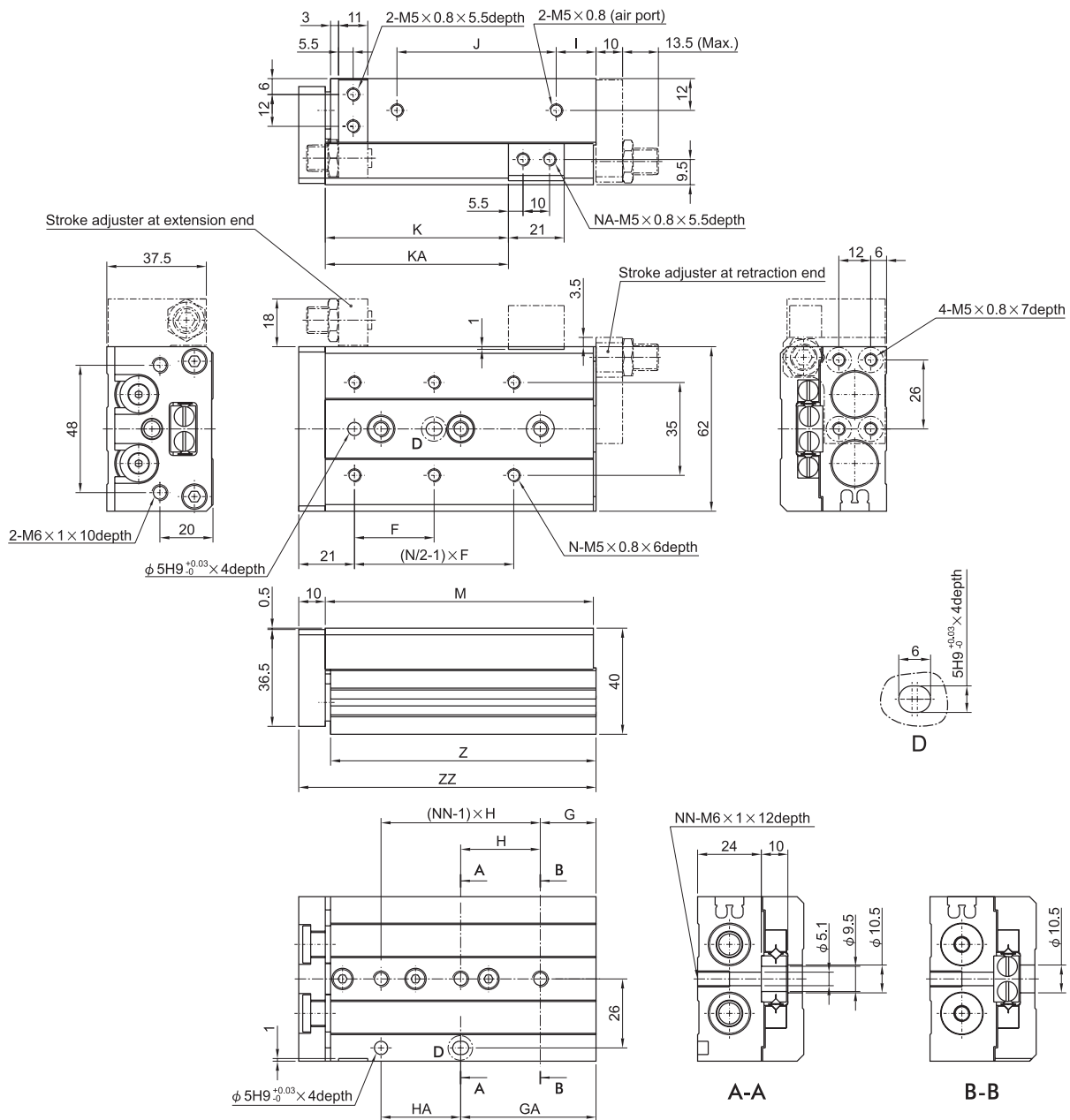
Stroke (mm)	F	G	GA	H	HA	I	J	K	KA	M	N	NA	NN	Z	ZZ
10	35	15	15	40	40	10	40	26.5	—	71	4	2	2	70	80
20	35	15	15	40	40	10	40	36.5	—	71	4	2	2	70	80
30	35	15	15	40	40	10	40	46.5	—	71	4	2	2	70	80
40	50	17	42	25	25	10	52	56.5	—	83	4	2	3	82	92
50	35	15	51	36	36	22	60	66.5	—	103	6	2	3	102	108
75	55	25	61	36	72	43	85	91.5	125.5	149	6	4	4	148	158
100	65	35	111	38	76	52	130	116.5	179.5	203	6	4	5	202	212

Dimensions in millimeters

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Dimensions: P5SS Slide Table - Ø 16

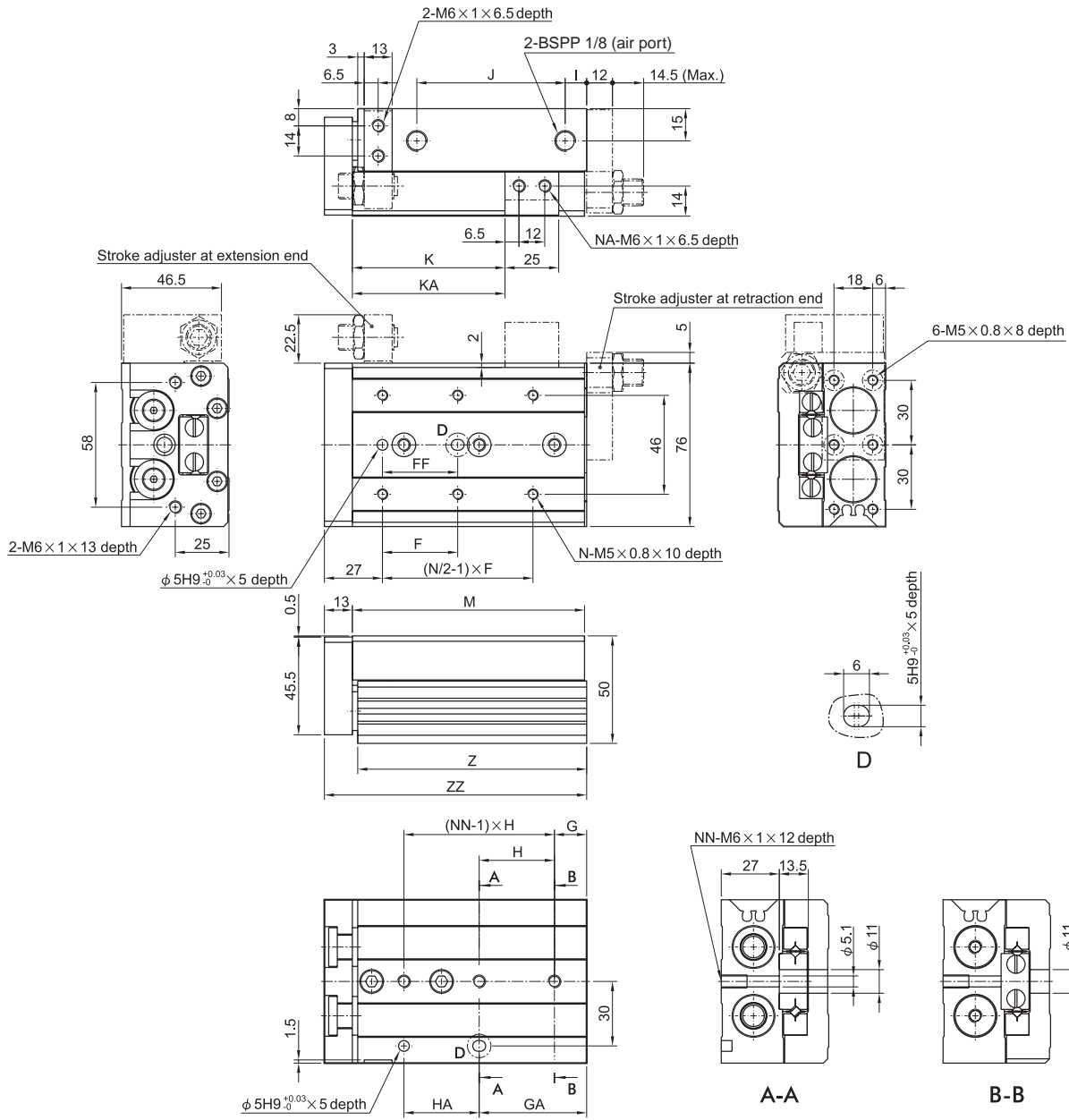


Stroke (mm)	F	G	GA	H	HA	I	J	K	KA	M	N	NA	NN	Z	ZZ
10	35	16	16	40	40	10	40	29	—	76	4	2	2	75	87
20	35	16	16	40	40	10	40	39	—	76	4	2	2	75	87
30	35	16	16	40	40	10	40	49	—	76	4	2	2	75	87
40	40	16	16	50	50	10	50	59	—	86	4	2	2	85	97
50	30	21	51	30	30	15	60	69	—	101	6	2	3	100	112
75	55	26	61	35	70	40	85	94	125	151	6	4	4	150	162
100	65	39	109	35	70	55	118	119	173	199	6	4	5	198	210
125	70	19	159	35	70	68	155	144	223	249	8	4	7	248	260

Dimensions in millimeters



Dimensions: P5SS Slide Table - Ø 20



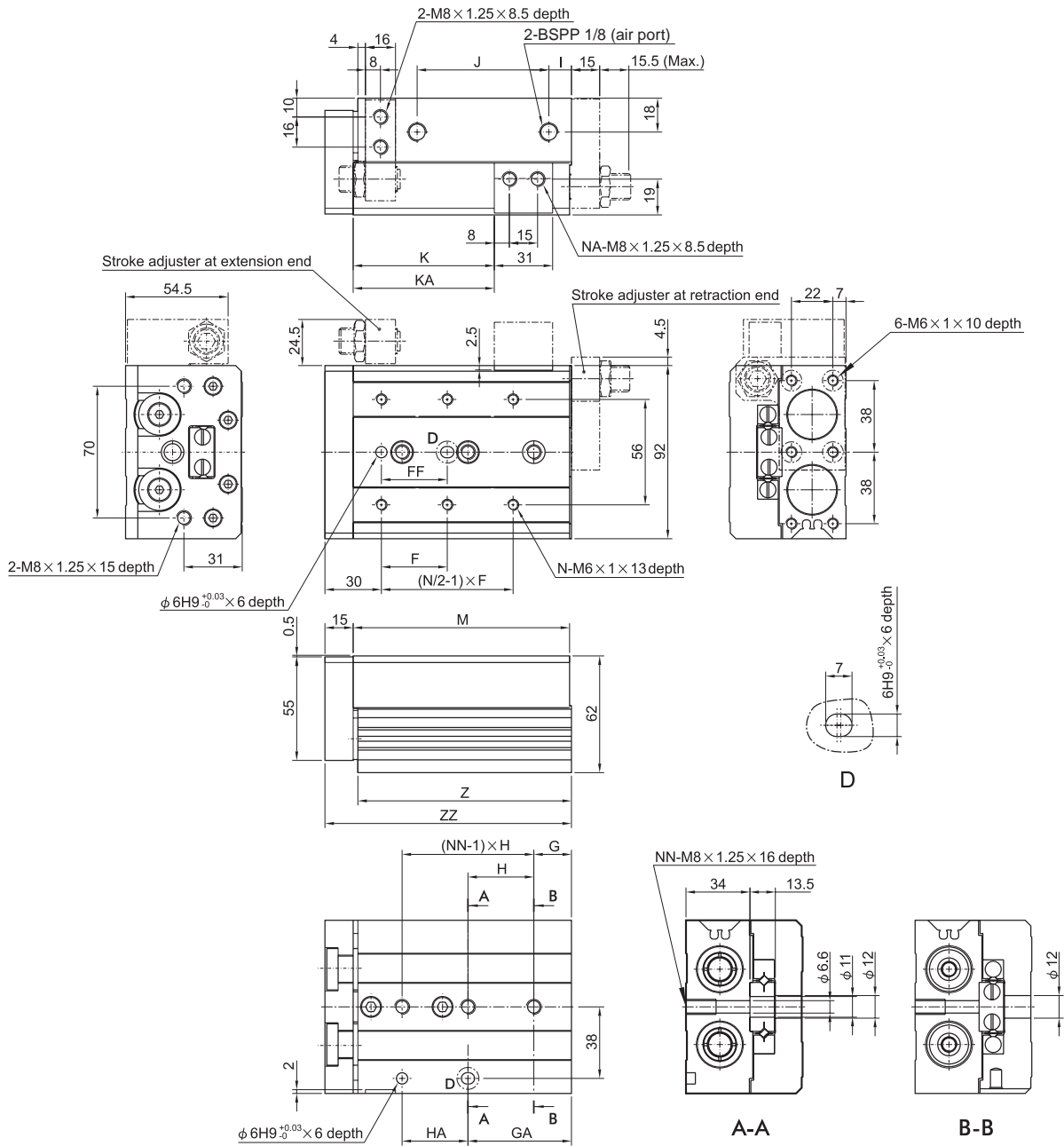
Stroke (mm)	F	FF	G	GA	H	HA	I	J	K	KA	M	N	NA	NN	Z	ZZ
10	50	40	15	25	45	35	10	44	31	—	83	4	2	2	81.5	97
20	50	40	15	25	45	35	10	44	41	—	83	4	2	2	81.5	97
30	50	40	15	25	45	35	10	44	51	—	83	4	2	2	81.5	97
40	60	50	15	35	55	35	10	54	61	—	93	4	2	2	91.5	107
50	35	35	15	50	35	36	10	69	71	—	108	6	2	3	106.5	122
75	60	60	19	54	35	70	10	108	96	—	147	6	2	4	145.5	161
100	70	70	37	107	35	70	58	113	121	169	200	6	4	5	198.5	214
125	70	70	41	155	38	76	70	155	146	223	254	8	4	6	252.5	268
150	80	80	19	195	44	88	87	190	171	275	306	8	4	7	304.5	320

Dimensions in millimeters



B
 Automation Products
 Actuator Products
 Grippers
 Slide Tables
 Rotary Tables
 Escapements
 Sensors
 Fittings

Dimensions: P5SS Slide Table - Ø 25



Stroke (mm)	F	FF	G	GA	H	HA	I	J	K	KA	M	N	NA	NN	Z	ZZ
10	50	40	22	22	45	45	12	47	35	—	92	4	2	2	90.5	108
20	50	40	22	22	45	45	12	47	45	—	92	4	2	2	90.5	108
30	50	40	22	22	45	45	12	47	55	—	92	4	2	2	90.5	108
40	60	50	22	22	55	55	12	57	65	—	102	4	2	2	100.5	118
50	35	35	20	55	35	35	12	70	75	—	115	6	2	3	113.5	131
75	60	60	26	61	35	70	33	90	100	—	156	6	2	4	154.5	172
100	70	70	32	102	35	70	50	114	125	162	197	6	4	5	195.5	213
125	75	75	40	154	38	76	67	155	150	218	255	8	4	6	253.5	271
150	80	80	30	190	40	80	82	180	175	258	295	8	4	7	293.5	311

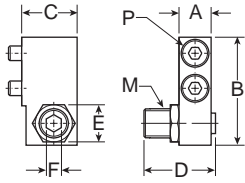
Dimensions in millimeters



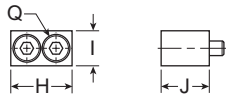
Stroke Adjusters

Stroke Adjuster at Extension End

Mounted to Body



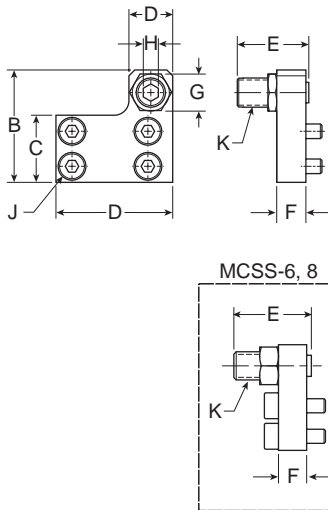
Mounted to Table



Tube I.D.	Part number	Adjustable stroke range (mm)	Mounted to body								Mounted to table							
			A	B	C	D	E	F	M	P*	H	I	J	Q*				
6	P5SS-006-EA-05	5				16.5												
	P5SS-006-EA-15	15	6	17.8	10.5	26.5	7	2.5	M5 x .08	M2.5 x 10	12.5	6	8.5	M2.5 x .08				
8	P5SS-008-EA-05	5				16.5												
	P5SS-008-EA-15	15	7	21.5	11	26.5	8	3	M6 x 1	M3 x 10	14.6	7	10	M3 x 10				
	P5SS-008-EA-25	25				36.5												
12	P5SS-012-EA-05	5				20												
	P5SS-012-EA-15	15	9.5	31	16	30	11	4	M8 x 1	M4 x 16	18.5	10	13	M4 x 12				
16	P5SS-016-EA-05	5				24.5												
	P5SS-016-EA-10	15	11	37	19	34.5	14	5	M10 x 1	M5 x 16	21	12	16.5	M5 x 16				
20	P5SS-020-EA-05	5				27.5												
	P5SS-020-EA-15	15	13	45.5	24	37.5	17	6	M12 x 1.25	M6 x 20	25	13	21	M6 x 20				
25	P5SS-025-EA-05	5				32.5												
	P5SS-025-EA-15	15	16	53.5	26.5	42.5	19	6	M14 x 1.5	M8 x 25	31	17	25.5	M8 x 25				
	P5SS-025-EA-25	25				52.5												

*Size of hexagon socket head cap screws

Stroke Adjuster at Retraction End



Tube I.D.	Part number	Adjustable stroke range (mm)	Mounted to table										
			A	B	C	D	E	F	G	H	J*	K	
6	P5SS-006-RA-05	5	21	19	10.5	8	16.5	5	7	2.5	M2.5 x 8	M5 x .08	
	P5SS-006-RA-15	15				26.5							
8	P5SS-008-RA-05	5				16.5							
	P5SS-008-RA-15	15	25	22.5	12.5	9	26.5	6	8	3	M3 x 10	M6 x 1	
	P5SS-008-RA-25	25				36.5							
12	P5SS-012-RA-05	5				20							
	P5SS-012-RA-15	15	32	31	18.5	13	30	8	12	4	M4 x 8	M8 x 1	
16	P5SS-016-RA-05	5				24.5							
	P5SS-016-RA-15	15	40	38.5	12	15	34.5	10	14	5	M5 x 10	M10 x 1	
20	P5SS-020-RA-05	5				27.5							
	P5SS-020-RA-15	15	50	48	29	21	37.5	12	17	6	M5 x 12	M12 x 1.25	
25	P5SS-025-RA-05	5				32.5							
	P5SS-025-RA-15	15	60	58	35	23	42.5	15	19	6	M6 x 16	M14 x 1.5	
	P5SS-025-RA-25	25				52.5							

*Size of hexagon socket head cap screws

B
 Automation Products
 Actuator Products

Grippers

Slide Tables

Rotary Tables

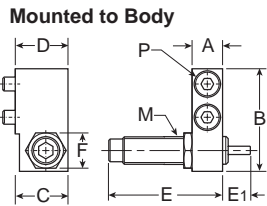
Escapements

Sensors

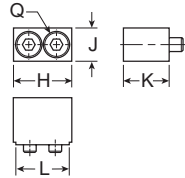
Fittings

Shock Absorbers

Shock Absorber at Extension End



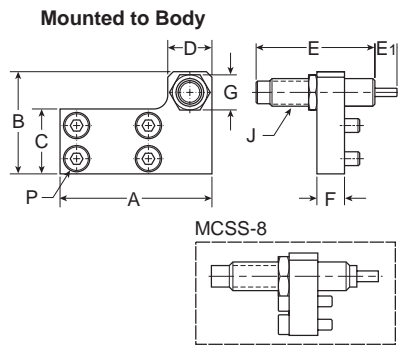
Mounted to Table



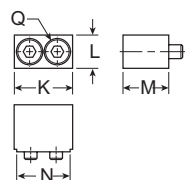
Tube		Mounted to body										Mounted to table				
I.D.	Part number	A	B	C	D	E	E1	F	M	P*	H	J	K	L	Q*	
8	P5SS-008-ESK	7	23	14	15.5	40.8	8	11	M8 x 1	M3 x 16	16.6	7	15.5	14.6	M3 x 16	
12	P5SS-012-ESK	9.5	31	14.5	16	40.8	8	11	M8 x 1	M4 x 16	20.5	10	15	18.5	M4 x 12	
16	P5SS-016-ESK	11	37	17.5	19	43.2	6.6	12.7	M10 x 1	M5 x 16	23	12	18.5	21	M5 x 16	
20	P5SS-020-ESK	13	45.5	23.5	26	86.6	12.7	19	M14 x 1.5	M6 x 25	25.5	13	25.5	25	M6 x 25	
25	P5SS-025-ESK	16	53.5	23.5	26.5	86.6	12.7	19	M14 x 1.5	M8 x 25	25.5	17	25.5	31	M8 x 25	

*Size of hexagon socket head cap screws

Shock Absorber at Retraction End



Mounted to Table



Tube		Mounted to body										Mounted to table				
I.D.	Part number	A	B	C	D	E	E1	F	G	M	P*	K	L	M	N	Q*
8	P5SS-008-RSK	38	23	12.5	14	40.8	8	8	12	M8 x 1	M3 x 12	16.6	7	15.5	14.6	M3 x 16
12	P5SS-012-RSK	45	31	18	14	40.8	8	8	11	M8 x 1	M4 x 8	20.5	10	15	18.5	M4 x 12
16	P5SS-016-RSK	55	37	23.5	16	43.2	6.6	10	12.7	M10 x 1	M5 x 10	23	12	18.5	21	M5 x 16
20	P5SS-020-RSK	70	47	29	23	86.6	12.7	12	19	M14 x 1.5	M5 x 12	25.5	13	25.5	25	M6 x 25
25	P5SS-025-RSK	80	54	35	23	86.6	12.7	15	19	M14 x 1.5	M6 x 16	25.5	17	25.5	31	M8 x 25

*Size of hexagon socket head cap screws

B

Automation Products
 Actuator Products

Grippers

Slide Tables

Rotary Tables

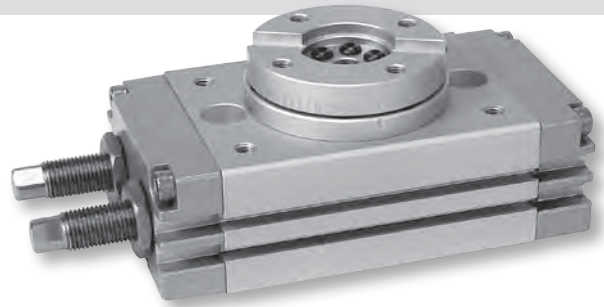
Escapements

Sensors

Fittings

P5RS Rotary Tables

- Twin rack and pinion
- Adjustable between 0° and 190°
- Magnetic piston standard
- Stroke adjusters standard
- Available with shock absorbers



Operating information

Operating pressure:	1 to 9 bar (14.5 to 130.5 PSIG)
Temperature range:	-5° to 60° C (23° to 140° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)

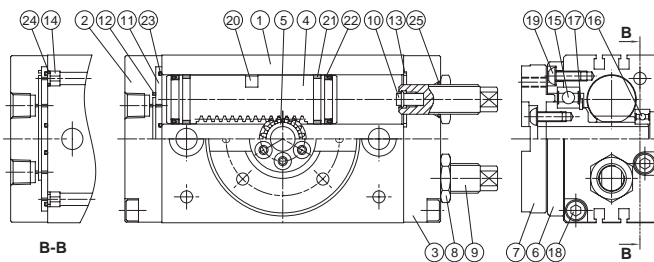
*Addition of lubrication will greatly increase service life

Ordering Information: P5RS Rotary Tables

Description	Ports (BSPP)	Rotation	Torque (N-m at 7 bar)	Weight (kg)	Part number
Rotary table, stroke adjusters	1/8	190 degrees	1.69	0.7	P5RS-016DSG190B
Rotary table, stroke adjusters	1/8	190 degrees	3.52	1.16	P5RS-020DSG190B
Rotary table, stroke adjusters	1/8	190 degrees	6.87	1.57	P5RS-025DSG190B
Rotary table, stroke adjusters	1/8	190 degrees	13.52	3.07	P5RS-032DSG190B
Rotary table, shock absorber	1/8	190 degrees	1.69	0.7	N/A
Rotary table, shock absorber	1/8	190 degrees	3.52	1.16	N/A
Rotary table, shock absorber	1/8	190 degrees	6.87	1.57	P5RS-025DSG190WNSNNN
Rotary table, shock absorber	1/8	190 degrees	13.52	3.07	P5RS-032DSG190WNSNNN

Sensor part numbers: Page 330.

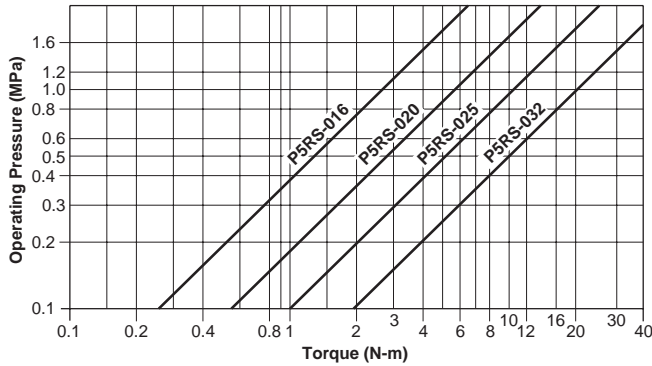
Material



No.	Part name	Material	No.	Part name	Material
1	Body	Aluminum alloy	14	Fixed	Copper
2	Cover	Aluminum alloy	15	Ball bearing	Bearing steel
3	End cover	Aluminum alloy	16	Ball bearing	Bearing steel
4	Piston	Stainless steel	17	Snap ring	Spring steel
5	Pinion	SCM	18	Screw	SCM
6	Bearing retainer	Aluminum alloy	19	Screw	SCM
7	Table	Aluminum alloy	20	Magnet	Magnet material
8	Seal nut	Stainless steel	21	Wearing	PTFE
9	Shock absorber	Stainless steel	22	Piston packing	NBR
10	Cushion pad	NBR	23	O-ring	NBR
11	Plate	Aluminum alloy	24	O-ring	NBR
12	Packing	NBR	25	O-ring	NBR
13	Gasket	NBR			

Most popular.

Load capacity - P5RS Rotary Table

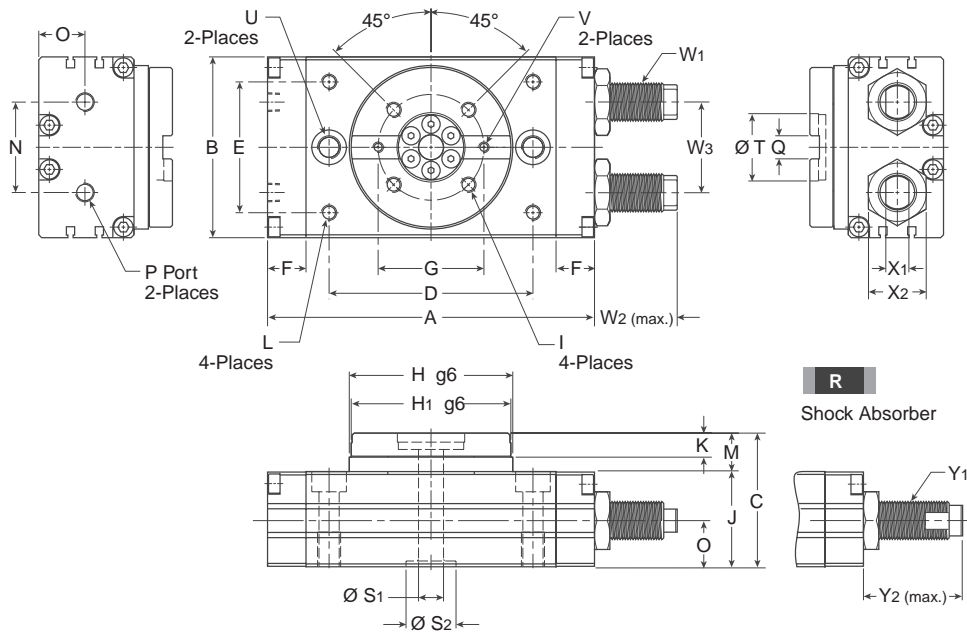


Allowable load

Set the load and moment to be applied to the table within the allowable values shown in the table below. (Values outside of limitations will cause excessive play, deteriorate accuracy, and shorten service life)

Bore	Allowable radial load (N)	Allowable thrust load (N)		Allowable moment (Nm)
		(a)	(b)	
16	78	74	78	2.4
20	147	137	137	4.0
25	196	197	363	5.3
32	314	296	451	9.7

Dimensions: P5RS Rotary Tables



Tube I.D.	A	B	C	D	E	F	G	H	H ₁	I	J	K	L	M	N	O	P	Q
16	108	58	47	62	38	15	38	50	48	M5 x 7 Dp, P.C.D38	33	8	M5 x 8 Dp	14	26	15.5	BSPP 1/8	8 ^{+0.03} ₀ (wide) x 3.3 Dp
20	128	68	55	78	47	15	46	62.5	60	M6 x 7 Dp, P.C.D46	38	10	M6 x 8 Dp	17	27	18.5	BSPP 1/8	10 ^{+0.03} ₀ (wide) x 3.5 Dp
25	135.5	77	58.5	84	55	15.5	48	67	65	M6 x 9 Dp, P.C.D48	41.5	10	M6 x 8 Dp	17	37	20	BSPP 1/8	12 ^{+0.03} ₀ (wide) x 4 Dp
32	170	94	69.5	106	68	20	55	85	83	M8 x 10 Dp, P.C.D55	49.5	12.5	M8 x 8.5 Dp	20	47	24	BSPP 1/8	12 ^{+0.03} ₀ (wide) x 5 Dp

Tube I.D.	S ₁	S ₂	T	U	V	W ₁	W ₂	W ₃	X ₁	X ₂	Y ₁	Y ₂
16	6	17 (H7) x 2.5 Dp	24 (H7) x 3 Dp	2-Ø 6.8 thru, Ø 11 x 6.5 Dp, M8 x 12 Dp (Sink)	M3 x 4 Dp	M10 x 1.0	27	26	7	17	N/A	31
20	10	22 (H7) x 2.5 Dp	32 (H7) x 3 Dp	2-Ø 8.6 thru, Ø 14 x 8.5 Dp, M10 x 15 Dp (Sink)	M4 x 6 Dp	M12 x 1.0	23	32	8	19	N/A	36
25	13	22 (H7) x 3 Dp	32 (H7) x 3.7 Dp	2-Ø 8.6 thru, Ø 14 x 8.5 Dp, M10 x 15 Dp (Sink)	M4 x 8 Dp	M14 x 1.5	36	37	8	22	MC150M-NB	52
32	13	26 (H7) x 3 Dp	35 (H7) x 4.7 Dp	2-Ø 10.5 thru, Ø 18 x 10.5 Dp, M12 x 18 Dp (Sink)	M5 x 8.5 Dp	M20 x 1.5	43	47	12	30	MC225M-NB	62

Dimensions in millimeters



P5MD Feed Escapements

- Most effective mechanism for separating parts fed from a track or conveyor
- 7075-T6 aircraft quality aluminum body hard-coat anodized 60 RC with PTFE impregnation
- Adjustable retract stops
- Built-in sensor mounting slots
- Built-in sensor magnet for use with Hall Effect sensors
- Sealed design repels contaminants
- Slip fit dowel holes in body for precision applications
- Dynamic components are precision ground and hardened for wear resistance and long life
- Locking key ensures part separation and eliminates jams



Operating information

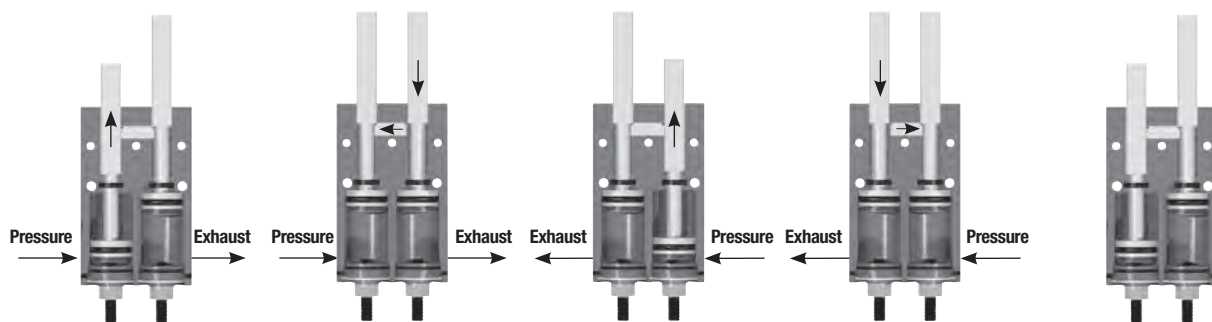
Operating pressure:	3 to 7 bar (44 to 102 PSIG)
Temperature range:	
Nitrile seals (Standard)	-35° to 80° C (-30° to 180° F)
Filtration requirements:	
Air filtration	40 micron or better
Air lubrication	Not necessary*
Air humidity	Low moisture content (dry)

*Addition of lubrication will greatly increase service life

Ordering Information: P5MD Feed Escapements

Stroke (mm)	Thrust force @ 7 Bar (N)	Parts escaped per minute	Weight (kg)	Side finger mount	Top finger mount
				P5MD-014SSG016B	P5MD-014TSG016B
15.9	111	150	0.15	P5MD-020SSG025B	P5MD-020TSG025B
25.4	222	100	0.39	P5MD-027SSG032B	P5MD-027TSG032B
31.8	400	85	0.83		

Sensor part numbers: Page 330.

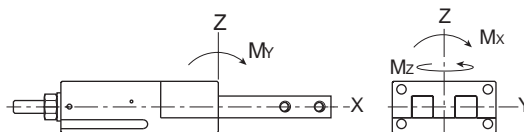


- Dual double acting pistons slide in opposite directions within the body through the use of internal porting.
- When pressure is applied, one piston extends and passes a port in its cylinder wall which is linked to the retract side of the other piston's cylinder.
- The second piston then begins to retract and pushes the locking key aside into the cavity on the side of the first finger.
- Locking Key ensures only 1 finger can be retracted at a time.
- Finger must be allowed to fully extend for proper operation.

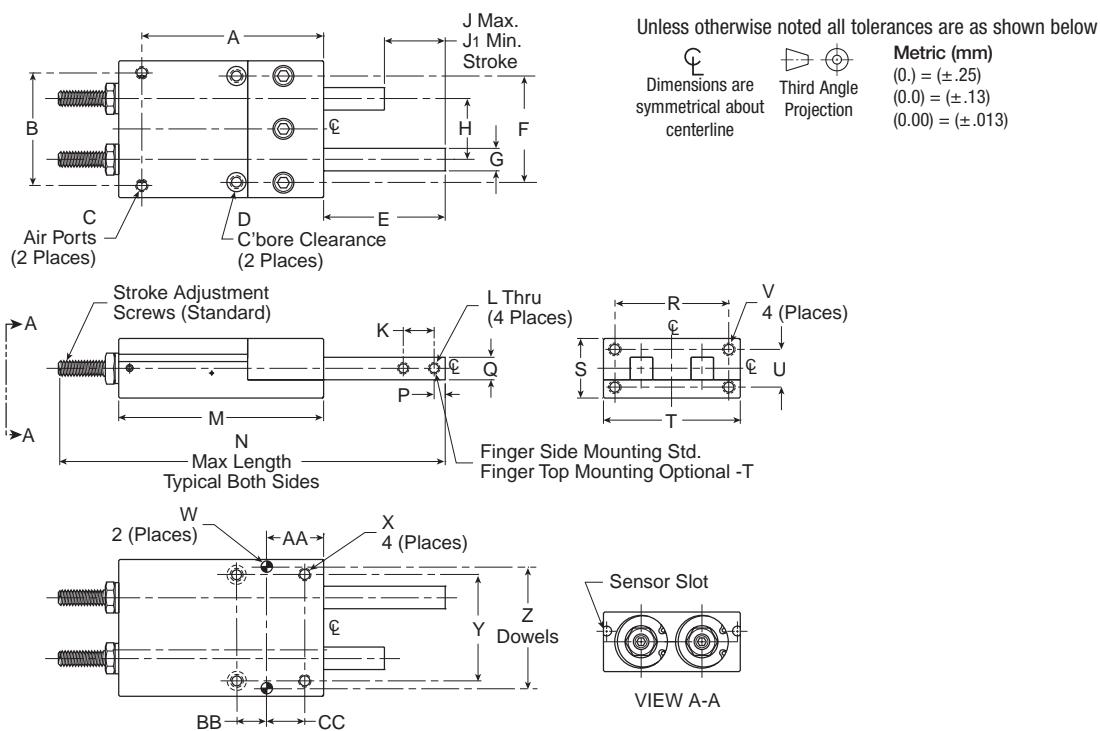
Most popular.

Loading capacity - P5MD Feed Escapements

	P5MD-014		P5MD-020		P5MD-027	
	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)	Static (metric)	Dynamic (metric)
Maximum moment M_x	6 Nm	0.57 Nm	17 Nm	1.70 Nm	28 Nm	2.83 Nm
Maximum moment M_y	6 Nm	0.57 Nm	17 Nm	1.70 Nm	28 Nm	2.83 Nm
Maximum moment M_z	6 Nm	0.57 Nm	17 Nm	1.70 Nm	28 Nm	2.83 Nm



Dimensions: P5MD Feed Escapements



B
 Automation Products
 Actuator Products
 Grippers
 Slide Tables
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Sensors

Magnetic

Series	PNP with quick disconnect M8	NPN with quick disconnect M8	PNP with quick disconnect (90 degrees) M8	NPN with quick Disconnect (90 Degrees) M8	Page
P5GM	P8S-HHSP-017	P8S-HHSN-017	P8S-HHSP-011	P8S-HISN-011	B332
P5GN	P8S-HHSP-017	P8S-HHSN-017	P8S-HHSP-011	P8S-HISN-011	B332
P5GP	P8S-HHSP-017	P8S-HHSN-017	NA	NA	B332
P5GQ	P8S-HHSP-017	P8S-HHSN-017	NA	NA	B332
P5GR	P8S-HHSP-017	P8S-HHSN-017	P8S-HHSP-011	P8S-HISN-011	B332
P5GS	P8S-HHSP-017	P8S-HHSN-017	P8S-HHSP-011	P8S-HISN-011	B332
P5GT	NA	NA	NA	NA	
P5GU	P8S-HHSP-017	P8S-HHSN-017	NA	NA	B332
P5GV	NA	NA	NA	NA	B332
P5GW	P8S-HHSP-017	P8S-HHSN-017	P8S-HHSP-011	P8S-HISN-011	B332
P5MD	P8S-HHSP-017	P8S-HHSN-017	NA	NA	B332

Inductive

Series	PNP M8 disconnent	NPN M8 disconnect	PNP M12 disconnent	NPN M12 disconnect	Inductive sensor mounting kit	Page
P5GR-010	P8S-HISP-014	P8S-HISN-014	NA	NA	P8S-HSMK-119	B333
P5GR-014					P8S-HSMK-119	
P5GR-021					P8S-HSMK-120	
P5GS-016	P8S-HISP-019	P8S-HISN-019	NA	NA	P8S-HSMK-116	
P5GS-024					P8S-HSMK-117	
P5GS-032					P8S-HSMK-118	
P5GT-025	P8S-HISP-019	P8S-HISN-019	NA	NA	P8S-HSMK-003	
P5GT-025					P8S-HSMK-003	
P5GT-032					P8S-HSMK-003	
P5GT-046	P8S-HISP-011	P8S-HISN-011	NA	NA	P8S-HSMK-072	B332
P5GT-064					P8S-HSMK-072	
P5GT-089					P8S-HSMK-073	
P5GW-072	P8S-HISP-011	P8S-HISN-011	NA	NA	NA	B332
P5GW-95					NA	
P5GW-120					NA	
P5GW-156	NA	NA	P8S-HISN-017	P8S-HISP-017	NA	B333
P5GW-220					NA	

Sensors for Economy Grippers, Slide Tables, Rotary Tables

Series	Reed switch 5-120 V AC/DC	Reed switch 5-120 V AC/DC M8	NPN 5-30 VDC	NPN 5-30 VDC M8	PNP 5-30 VDC	PNP 5-30 VDC M8	Page
P5SS	P8S-ERFXS	P8S-ERSUS	P8S-ENFXS	P8S-ENSUS	P8S-EPFXS	P8S-EPSUS	B331
P5GA	P8S-ERFXS	P8S-ERSUS	P8S-ENFXS	P8S-ENSUS	P8S-EPFXS	P8S-EPSUS	B331
P5GB	P8S-ERFXS	P8S-ERSUS	P8S-ENFXS	P8S-ENSUS	P8S-EPFXS	P8S-EPSUS	B331
P5RS	P8S-FRFXS	P8S-FRSUS	P8S-FNFXS	P8S-FNSUS	P8S-FPFXS	P8S-FPSUS	B331

Cables

2 meter cable M8	5 meter cable M8	2 meter cable M12	5 meter cable M12
P8S-CABL-010	P8S-CABL-013	P8S-CABL-014	P8S-CABL-018



B Automation Products
Actuator Products
Grippers
Slide Tables
Rotary Tables
Escapements
Sensors
Fittings

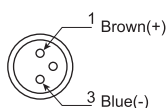
Model	P8S-FRFXS P8S-FRSUS (M8)	P8S-FNFXS	P8S-FPFXS
Wiring method	2 wire	3 wire	
Switching logic	SPST normally open	Solid state output, normally open	
Switch type	Reed switch	NPN current sinking	PNP current sourcing
Operating voltage	5 to 120 V DC/AC	5 to 30 VDC	
Switching voltage	100 mA max.	200 mA max.	
Contact rating	10 W max.	6 W max.	
Current consumption	—	8 mA @ 24 V max. (Switch active)	
Voltage drop	3.5 V max.	1 V @ 200 mA max.	
Leakage current	—	0.01 mA max.	
Indicator	Red LED	Red LED	Green LED
Cable	2.8 Ø, 2C	2.8 Ø, 3C	
Magnet frequency (1)	60 Gauss	40 Gauss	
Temperature range	-10°C to 70°C (14°F to 158°F)		
Shock (2)	30 G	50 G	
Vibration (3)	9 G		
Enclosure classification	IEC 529, IP67		
Protection circuit	None	Power source reverse polarity; surge suppression	
Connect diagram			

- (1) Measuring standard target: Ø 15.5 x Ø 8 x 5t (Anisotropy rubber magnet).
 (2) Sine wave / X.Y.Z 3 directions / 3 times each direction / 11ms each time.
 (3) Double amplitude 1.5 mm / 10 Hz -55 Hz-10 Hz (Sweep 1min / X.Y.Z. 3 directions / 1 hour each time.

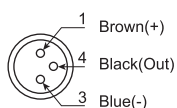
Model	P8S-ERFXS P8S-ERSUS (M8)	P8S-ENFXS P8S-ENSUS (M8)	P8S-EPFXS P8S-EPSUS (M8)
Switch type	Reed switch	NPN current sinking	PNP current sourcing
Contacts	Normal open		
Voltage range	5 to 120 V DC/AC	5 to 30 VDC	
Current range	100 mA max.	50 mA max.	
Contact rating	6 W max.	1.5 W max.	
Shock resistance	30 G	50 G	
Voltage drop	0.5 V max.		1.5V max.
Response time	Max. 1 ms		
Temperature range	-10°C to 70°C (14°F to 158°F)		
Lead wire	2.8 Ø, 3C		3.0 Ø, 3C, PU
Lead wire length	2 m		
Indicator lamp	LED lights up when ON		
Enclosure classification	IP67 (NEMA 6)		IEC 529, IP67
Indicator	Red LED		Green LED
Connect diagram			

Wiring of the QD

2 wire QD wiring



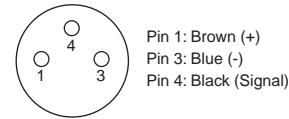
3 wire QD wiring



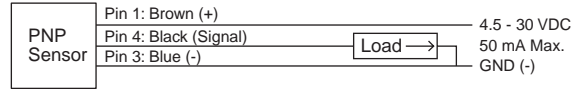
P8S-HHSP-011 and P8S-HISN-011 Sensors

P8S-HHSP-011 ↔ P8S-HISN-011

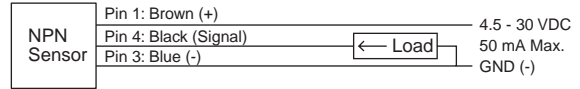
Description: Solid state magnetoresistive (MR) sensor
Function: PNP (N.O.) or NPN (N.O.)
Voltage supply range: 4.5 - 30 VDC
Current consumption: Max. 9 mA @ 24 V
Voltage drop: Max. 1.2 V
Max. switching current: 50 mA
Reverse polarity protection: Yes
Short circuit (transient) protection: Yes
Temperature range: -10°C to 70°C (14°F to 158°F)
Protection class: IP67
Response frequency: 1 kHz



P8S-HHSP-011



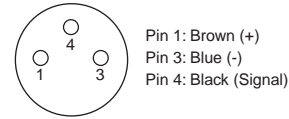
P8S-HISN-011



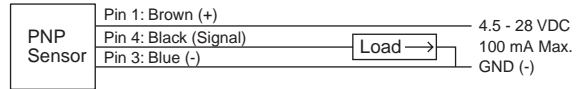
P8S-HHSP-017 and P8S-HHSN-017 Sensors

P8S-HHSP-017 ↔ P8S-HHSN-017

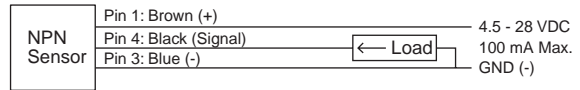
Description: Magnetoresistive 4mm Dovetail
Function: PNP (N.O.) or NPN (N.O.)
Voltage supply range: 4.5 - 28 VDC
Current consumption: Max. 10 mA @ 24 V
Voltage drop: Max. 0.5 V
Max. switching current: 100 mA
Reverse polarity protection: Yes
Short circuit (transient) protection: Yes
Temperature range: -10°C to 70°C (14°F to 158°F)
Protection class: IP67
Response frequency: 1 kHz
Hysteresis: <0.2 mm
Repeatability: <0.1 mm
Insulation resistance: Min 100 M OHM (Lead to case @ 500 VDC)
Withstand voltage: (Lead to case) 1000 VAC RMS for 1 min or 1500 VAC RMS for 2 sec



P8S-HHSP-017



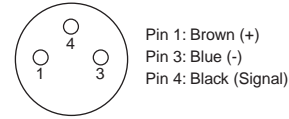
P8S-HHSN-017



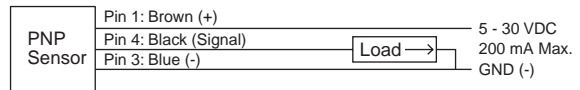
P8S-HISP-011 and P8S-HISN-011 Sensors

P8S-HISP-011 ↔ P8S-HISN-011

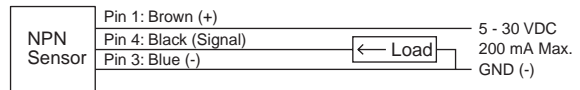
Description: Inductive 8mm proximity sensor
Connection: 3-pole quick disconnect
Function: PNP (N.O.) or NPN (N.O.)
Indicator: LED
Load current: 200 mA max.
Internal voltage drop: < 1 V
Current consumption: 15 mA max.
Operating voltage: 5 - 30 VDC
Reverse polarity protection: Yes
Response frequency: 800 - 1000 Hz
Relative humidity: 35 - 95%
Shielded design: Yes
Sensing range: 1.5 mm
Temperature range: -25°C to 7°C (-13°F to 45°F)
NEMA rating: 6
IEC rating: IP67
Ratings: CE, ISO 9001



P8S-HISP-011



P8S-HISN-011



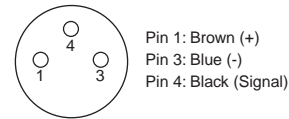
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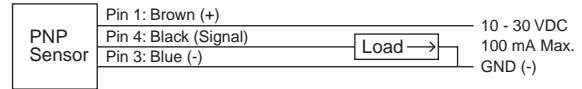
P8S-HISP-014 and P8S-HISN-014 Sensors

P8S-HISP-014 ↔ P8S-HISN-014

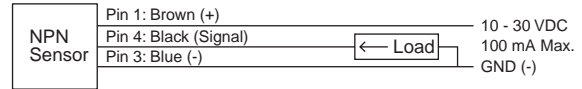
Description: Inductive 4mm proximity sensor
Connection: 3-pole quick disconnect
Function: PNP (N.O.) or NPN (N.O.)
Indicator: LED
Load current: 100 mA max.
Internal voltage drop: < 2.5 V
Current consumption: 18 mA
Operating voltage: 10 - 30 VDC
Reverse polarity protection: Yes
Response frequency: 5 kHz
Relative humidity: 35 - 95%
Shielded design: Yes
Sensing range: 1.0 mm
Temperature range: -25°C to 75°C (-13°F to 167°F)
NEMA rating: 6
IEC rating: IP67
Ratings: CE, ISO 9001



P8S-HISP-014



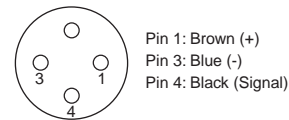
P8S-HISN-014



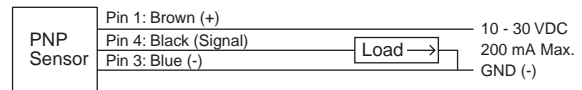
P8S-HISP-017 and P8S-HISN-017 Sensors

P8S-HISP-017 ↔ P8S-HISN-017

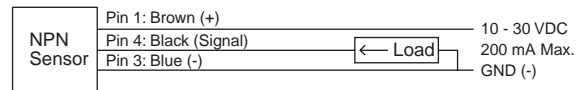
Description: Inductive 12mm proximity sensor
Connection: 4-pole quick disconnect
Function: PNP (N.O.) or NPN (N.O.)
Indicator: 360° LED
Load current: 200 mA max.
Internal voltage drop: < 2.0 V
Current consumption: 10 mA max.
Operating voltage: 10 - 30 VDC
Reverse polarity protection: Yes
Response frequency: 2 kHz
Shielded design: Yes
Sensing range: 4 mm
Temperature range: -25°C to 75°C (-13°F to 167°F)
NEMA rating: 6
IEC rating: IP67
Ratings: UL, CSA, CE



P8S-HISP-017



P8S-HISN-017



B

Automation Products
 Actuator Products

Grippers

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Escapements


Sensors

Fittings

Fittings

Male Connector	Thread (BSPP) / Tube	3mm	4mm (5/32 in)	6mm	8mm (5/16 in)	10mm	12mm
	M3	68LF-3M-M3					
	M5	68LF-3M-M5	68LF-4M-M5	68LF-6M-M5			
	1/8		68LF-4M-2G	68LF-6M-2G	68LF-8M-2G		
	1/4		68LF-4M-4G	68LF-6M-4G	68LF-8M-4G	68LF-10M-4G	68LF-12M-4G
	3/8			68LF-6M-6G	68LF-8M-6G	68LF-10M-6G	68LF-12M-6G
	1/2			68LF-6M-8G	68LF-8M-8G	68LF-10M-8G	68LF-12M-8G

Male Elbow 90° Swivel	Thread (BSPP) / Tube	3mm	4mm (5/32 in)	6mm	8mm (5/16 in)	10mm	12mm
	M3	369PLP-3M-M3	369PLP-4M-M3				
	M5	369PLP-3M-M5	369PLP-4M-M5	369PLP-6M-M5			
	1/8		369PLP-4M-2G	369PLP-6M-2G	369PLP-8M-2G		
	1/4		369PLP-4M-4G	369PLP-6M-4G	369PLP-8M-4G	369PLP-10M-4G	369PLP-12M-4G
	3/8			369PLP-6M-6G	369PLP-8M-6G	369PLP-10M-6G	369PLP-12M-6G
	1/2			369PLP-6M-8G	369PLP-8M-8G	369PLP-10M-8G	369PLP-12M-8G

Flow Control Right Angle	Thread (BSPP) / Tube	3mm	4mm (5/32 in)	6mm	8mm (5/16 in)	10mm	12mm
	M3	FCM731-3M-M3	FCM731-4M-M3				
	M5	FCM731-3M-M5	FCM731-4M-M5	FCM731-6M-M5			
	1/8		FCM731-4M-2G	FCM731-6M-2G	FCM731-8M-2G		
	1/4			FCC731-6M-4G	FCC731-8M-4G	FCC731-10M-4G	
	3/8				FCC731-8M-6G	FCC731-10M-6G	FCC731-12M-6G
	1/2						FCC731-12M-8G

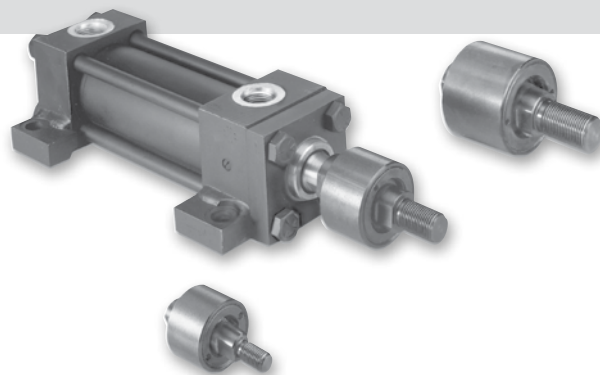
B
Automation Products
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Linear Alignment Couplers

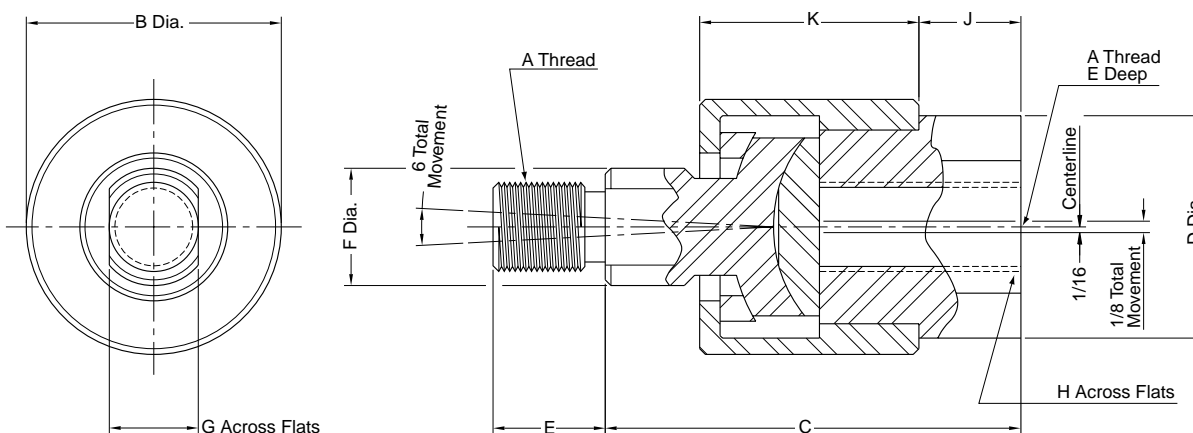
Linear Alignment Couplers are available in 12 standard thread sizes...

Cost Saving Features and Benefits Include...

- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available. Please consult factory.
- Simplifying cylinder installation and reducing assembly costs
- Increase rod bearing and rod seal life for lower maintenance costs



Alignment coupler



See table 1 for part numbers and dimensions

Table 1 – Part numbers and dimensions

A	B	C	D	E	F	G	H	J	K	Max. pull load (lbs.)	Approx. weight (Lbs.)	Part number
5/16 -24	1-1/8	1-3/4	15/16	1/2	1/2	3/8	3/4	3/8	15/16	1200	0.35	1347570031
3/8 -24	1-1/8	1-3/4	15/16	1/2	1/2	3/8	3/4	3/8	15/16	2425	0.35	1347570038
7/16 -20	1-3/8	2	1-1/8	3/4	5/8	1/2	7/8	3/8	1-3/32	3250	0.55	1347570044
1/2 -20	1-3/8	2	1-1/8	3/4	5/8	1/2	7/8	3/8	1-3/32	4450	0.55	1347570050
5/8 -18	1-3/8	2	1-1/8	3/4	5/8	1/2	7/8	3/8	1-3/32	6800	0.55	1347570063
3/4 -16	2	2-5/16	1-5/8	1-1/8	1-5/16	3/4	1-5/16	7/16	1-9/32	9050	1.4	1347570075
7/8 -14	2	2-5/16	1-5/8	1-1/8	1-5/16	3/4	1-5/16	7/16	1-9/32	14450	1.4	1347570088
1-14	3-1/8	3	2-3/8	1-5/8	1-7/16	1-1/4	1-7/8	3/4	1-25/32	19425	4.8	1347570100
1-1/4 -12	3-1/8	3	2-3/8	1-5/8	1-7/16	1-1/4	1-7/8	3/4	1-25/32	30500	4.8	1347570125
1-1/4 -12	3-1/2	4	2	2	1-1/2	1-1/4	1-11/16	3/4	2-1/2	30500	6.9	1337390125
1-1/2 -12	4	4-3/8	2-1/4	2-1/4	1-3/4	1-1/2	1-15/16	7/8	2-3/4	45750	9.8	1337390150
1-3/4 -12	4	4-3/8	2-1/4	2-1/4	1-3/4	1-1/2	1-15/16	7/8	2-3/4	58350	9.8	1337390175
1-7/8 -12	5	5-5/8	3	3	2-1/4	1-15/16	2-5/8	1-3/8	3-3/8	67550	19.8	1337390188

How to order linear alignment couplers

When ordering a cylinder with a threaded male rod end, specify the coupler of equal thread size by part number as listed in Table 1, i.e.; Piston Rod “KK” or “CC” dimension is 3/4” - 16”, specify coupler part number 1347570075.



B
 Actuator Accessories
 Actuator Products
 Linear Alignment
 4TK Series
 PRL Series

PRL Series

The PRL Series rod lock is used in applications where the locking of linear travel is required. It is commonly used in workholding applications and for locking tools and fixtures in the event of air pressure or electrical control failure.

Application

- **Clamping:** Without an appropriate air signal to the rod lock pressure port, the rod lock clamps to the precision metric rod and prevents rod movement in the axial direction.
- **Delatching:** When 4 Bar (58 PSIG) of air pressure is applied to the port, the rod lock releases and allows free movement of the rod. This will be required for installation.
- **Locking Direction:** The rod lock is designed specifically to prevent rod movement in the axial direction only. It is not recommended for locking rotary rod motion.
- **Rod Material:** The Series PRL rod lock is a precision locking device, therefore strict rod tolerances and rod material specifications are required to ensure safe and proper operation. Minimum requirements for the rod material include a chrome plated surface finish of 10 microinches or less and a surface hardness of 52 Rc. Rod material may be ordered separately in custom lengths. See next page for how to order.
- **Environment:** The rod lock is recommended for use in dry, clean conditions. Please take precautions to prevent moisture from entering the pressure port or the exhaust port of the locking device.

There should be no relative motion between the rod and the Rod Lock Device when the locking device is activated. The locking device is not intended to brake a movement in repeated sequences.

Considerations for Rod Sizing

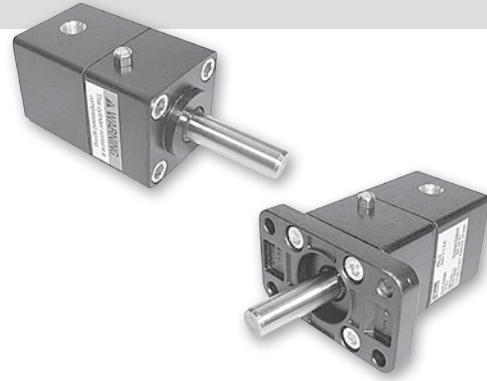
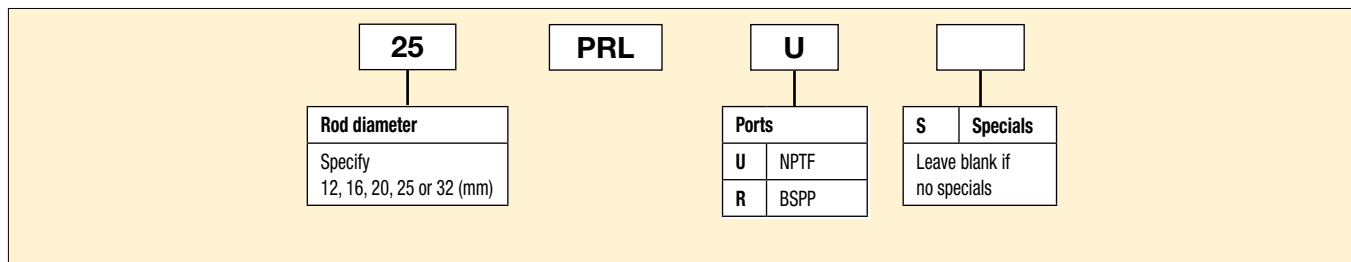
When applying a rod lock device, it is important to consider the loading forces which will be imposed on the rod in the axial direction.

For applications where the rod lock and its associated load impose a compressive force on the rod, please consider the axial compression force and rod length to select the appropriate rod diameter for preventing rod buckling.

In situations where the rod lock and its associated load place the rod in tension, please take care to securely fasten the rod ends to the machine member.

Ordering information

Example: 25PRLU



Operating information

Working pressure	Max. 10 bar (145 PSIG)
Working temperature	-20° to 80°C (-4°F to 176°F)
Locking pressure	4 bar (58 PSIG) ±10%
Filtration requirements	40 micron, dry filtered air

Holding Forces

Model number	Holding force	
	Pounds (lbs.)	Newtons (N)
12PRL*	123	550
16PRL*	193	860
20PRL*	481	2140
25PRL*	1211	5390
32PRL*	1894	8425

* Character reserved for port style

B

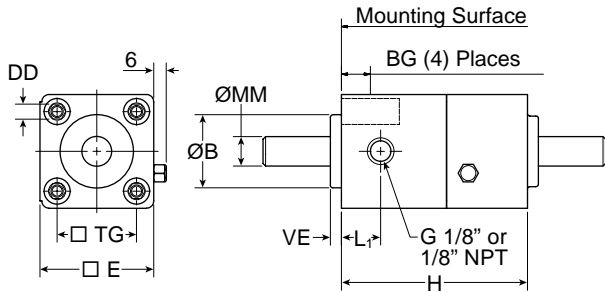
Actuator Accessories
 Actuator Products

Linear
 Alignment

4TK
 Series

PRL
 Series

Basic rod lock



Rod lock with flange mount

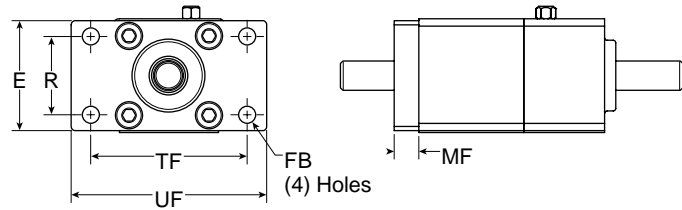


Table 1 – Mounting dimensions

Part	Rod dia. MM	B D11	BG	DD	E	FB	H	L1	MF	R	TF	TG	UF	VE
12PRL*	12.00 (-.04)	30	16	M6	46.5	7	76	16	10	32	64	32.5	80	4.5
16PRL*	16.00 (-.04)	35	16	M6	51	9	81.1	16	10	36	72	38	92	4.5
20PRL*	20.00 (-.04)	45	16	M8	76	9	100.8	26	12	50	100	56.5	129	5
25PRL*	25.00 (-.04)	55	16	M10	114.5	14	146	50	16	75	150	89	186	4
32PRL*	32.00 (-.04)	60	20	M12	140	16	165.2	60	20	90	180	110	220	6

* Character reserved for port style

Flange mounting kit

Mounting kits are available separately from the rod lock device. Please use the following part numbers to order. Mounting fasteners are included with the kits.

Model number	Flange mount
12PRL*	L075370032
16PRL*	L075370040
20PRL*	L075370063
25PRL*	L075370100
32PRL*	L075370125

* Character reserved for port style

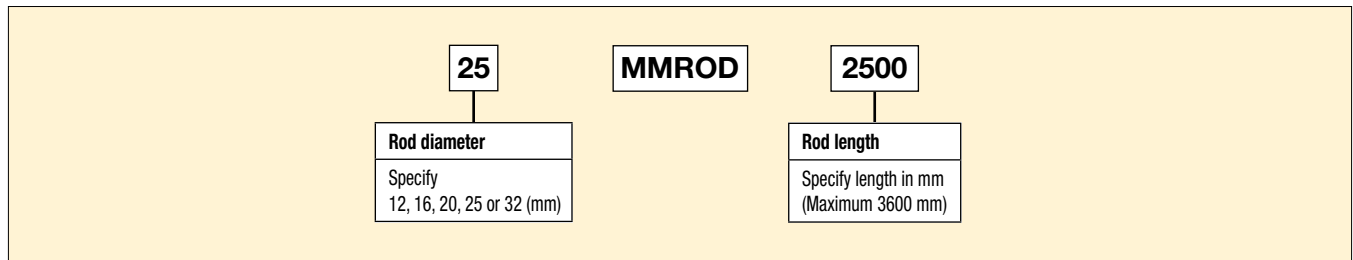
Metric rod material

Rods will be supplied in the specified length with chamfered ends. Please note, the rod material is case hardened and requires annealing prior to machining. Parker is pleased to quote custom machined rods per customer supplied drawings.

⚠ Caution: Using piston rod material which does not meet the tolerance and finished conditions as listed on the previous page may prevent the locking device from properly holding the intended load.

How to order

Example: 25MMROD2500



PNP Solid State Sensor Selection Guide

Series	Bore size or type	3M flying leads	10m flying leads	8mm quick connect*	8mm quick connect w/ 1 m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #	
Compact cylinders	P1Q	12mm - 100mm	P8S-EPFXS ¹	N/A	P8S-EPSUS	N/A	N/A	N/A	N/A	
	P1M standard sensor	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	
	P1M right angle sensor	All	N/A	P8S-SPETXD	P8S-SPTHXD	N/A	N/A	N/A	B346	
	LPM	9/16"	L076990000 ²	N/A	L07699000C	N/A	N/A	N/A	B350	N/A
		3/4" - 1-1/8"	L077000000 ²	N/A	L07700000C	N/A	N/A	N/A	B350	N/A
1-1/2" - 2"		L077010000 ²	N/A	L07701000C	N/A	N/A	N/A	B350	N/A	
	2-1/2" - 4"	L077020000 ²	N/A	L07702000C	N/A	N/A	N/A	B350	N/A	
Round body cylinders	P1L	20 - 25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B343	B345
		32 - 63mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B343	B345
		80 - 100mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B343	B345
	SRM/SRDM	9/16" - 3/4"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B343	B345
		1-1/16" - 2-1/2"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B343	B345
	P	1-1/8" - 2-1/2"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B343	B345
	3" - 4"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B343	B345	
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
	3MA/4MA	6" - 8"						P8S-TMA0X	B343	N/A
Iso cylinders	P1A standard sensor	10-25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B343	B345
		10mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2CCC	B349	B349
	P1A right angle sensors	12mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2DCC	B349	B349
		16mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2FCC	B349	B349
		20mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2HCC	B349	B349
		25mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2JCC	B349	B349
P1D standard & clean profiles	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A	
P1D tie rod version	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMA0X	B343	N/A	
Rodless cylinders	P1X	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMA0Y	B343	N/A
	P1Z	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
	OSP-P	All	KL3308 ¹	KL3309 ⁴	KL3312	N/A	N/A	Included w/ sensor	B348	N/A
Guided cylinders	P5T	Flush mount	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
		Right angle	N/A	P8S-SPETXD	P8S-SPTHXD	N/A	N/A	N/A	B346	N/A
	P5E	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
	HB	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
		20 - 25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B343	B345
P5L	32 - 63mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B343	B345	
	80 - 100mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B343	B345	
Rotary actuators	PV WR XR	Normally open	SMH-1P ²	N/A	SMH-1PC	N/A	N/A	N/A	B352	N/A
		Normally closed	SMC-1P ²	N/A	SMC-1PC	N/A	N/A	N/A	B352	N/A
	PRN(A)	All	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PTR	10, 15	SWH-1P ³	N/A	SWH-1PC	N/A	N/A	Included w/ sensor	B353	N/A	
	20, 25, 32	SWH-2P ³	N/A	SWH-2PC	N/A	N/A	Included w/ sensor	B353	N/A	

1. Flying leads are 2 meters in length
 2. Flying Leads are 1.5 meters in length

3. Flying leads are 1 meter in length
 4. Flying leads are 5 meter in length

Note: See page B354 for Weld Immune Sensors.
 * See page B355 for cord sets.

B
 Electronic Sensors
 Actuator Products
 Selection Guide
 Drop-in Sensors
 Solid State / Reed Sensors
 Weld Immune Sensors
 Cordset / Connect Block
 Proximity Sensors

NPN Solid State Sensor Selection Guide

Series	Bore size or type	3m flying leads	10m flying leads	8mm quick connect*	8mm quick connect w/ 1m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #		
Compact cylinders	P1Q	12mm - 100mm	P8S-ENFXS ¹	N/A	P8S-ENSUS	N/A	N/A	N/A	N/A		
	P1M standard sensor	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
	P1M right angle sensor	All	N/A	P8S-SNETX	P8S-SNTHX	N/A	N/A	N/A	B346	N/A	
	LPM	9/16"	L076950000 ²	N/A	L07695000C	N/A	N/A	N/A	B350	N/A	
		3/4" - 1-1/8"	L076960000 ²	N/A	L07696000C	N/A	N/A	N/A	B350	N/A	
1-1/2" - 2"		L076970000 ²	N/A	L07697000C	N/A	N/A	N/A	B350	N/A		
2-1/2" - 4"		L076980000 ²	N/A	L07698000C	N/A	N/A	N/A	B350	N/A		
Round body cylinders	P1L	20 - 25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B343	B345	
		32 - 63mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B343	B345	
		80 - 100mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B343	B345	
	SRM/SRDM	9/16" - 3/4"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B343	B345	
		1-1/16" - 2-1/2"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B343	B345	
	P	1-1/8" - 2-1/2"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B343	B345	
		3" - 4"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B343	B345	
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GNFLX	P8S-GPNFTX	P8S-GNSHX	P8S-GPNSCX	P8S-GNMHX	N/A	B343	N/A	
	3MA/4MA	6" - 8"						P8S-TMA0X	B343	N/A	
ISO cylinders	P1A standard sensor	10-25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B343	B345	
		10mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2CCC	B349	B349
	P1A right angle sensors	12mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2DCC	B349	B349
		16mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2FCC	B349	B349
		20mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2HCC	B349	B349
		25mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2JCC	B349	B349
	P1D standard & clean profiles	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
P1D tie rod version	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMA0X	B343	N/A		
Rodless Cylinders	P1X	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMA0Y	B343	N/A	
	P1Z	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
	OSP-P	All	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Guided cylinders	P5T	Flush mount	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
		Right angle	N/A	P8S-SNETX	P8S-SNTHX	N/A	N/A	N/A	B346	N/A	
	P5E	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
	HB	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
		20 - 25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B343	B345	
32 - 63mm		P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B343	B345		
P5L	80 - 100mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B343	B345		
Rotary actuators	PV WR XR	Normally open	SMH-1N ²	N/A	SMC-1NC	N/A	N/A	N/A	B352	N/A	
		Normally closed	SMC-1N ²	N/A	SMC-1NC	N/A	N/A	N/A	B352	N/A	
	PRN(A)	All	See page B308								
	PTR	10, 15	SWH-1N ³	N/A	SWH-1NC	N/A	N/A	Included w/ sensor	B351	N/A	
20, 25, 32		SWH-2N ³	N/A	SWH-2NC	N/A	N/A	Included w/ sensor	B351	N/A		

1 Flying leads are 2 meters in length
 2 Flying Leads are 1.5 meters in length
 3 Flying leads are 1 meter in length

Note: See page B354 for Weld Immune Sensors.
 * See page B355 for cord sets.

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 Electronic Sensors
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 Cordset / Connect Block
 Proximity Sensors



Reed Sensor Selection Guide

Series	Bore size or type	3m flying leads	10m flying leads	8mm quick connect*	8 mm quick connect w/ 1 m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #		
Compact cylinders	P1Q	12mm - 100mm	P8S-ERFXS ¹	N/A	P8S-ERSUS	N/A	N/A	N/A	N/A		
	P1M standard sensor	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A	
	P1M right angle sensor	All	N/A	P8S-SRETX	P8S-SRTHX	N/A	N/A	N/A	B346	N/A	
	LPM	9/16"	L077030000 ¹	N/A	L07703000C	N/A	N/A	N/A	B348	N/A	
		3/4" - 1-1/8"	L077040000 ¹	N/A	L07704000C	N/A	N/A	N/A	B348	N/A	
1-1/2" - 2"		L077050000 ¹	N/A	L07705000C	N/A	N/A	N/A	B348	N/A		
	2-1/2" - 4"	L077060000 ¹	N/A	L07706000C	N/A	N/A	N/A	B348	N/A		
Round body cylinders	P1L	20 - 25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B344	B345	
		32 - 63mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B344	B345	
		80 - 100mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B344	B345	
	SRM/SRDM	9/16" - 3/4"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B344	B345	
		1-1/16" - 2-1/2"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B344	B345	
	P	1-1/8" - 2-1/2"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B344	B345	
		3" - 4"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B344	B345	
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A	
	3MA/4MA	6" - 8"						P8S-TMA0X	B342	N/A	
ISO cylinders	P1A standard sensor	10-25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B342	B345	
		10mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2CCB	B349	B349	
	P1A alternate sensors	12mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2DCB	B349	B349	
		16mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2FCB	B349	B349	
		20mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2HCB	B349	B349	
	25mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2JCB	B349	B349		
Drop-in Sensors	P1D standard & clean profiles	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A	
		All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMA0X	B344	N/A	
Solid State / Reed Sensors	Rodless cylinders	P1X	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMA0Y	B344	N/A
		P1Z	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A
	OSP-P	All	KL3302 ³	KL3300 ⁴	KL3302	N/A	N/A	Included w/ sensor	B344	N/A	
Weld Immune Sensors	Guided cylinders	Flush mount	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A	
		Right angle	N/A	P8S-SRETX	P8S-SRTHX	N/A	N/A	N/A	B344	N/A	
	P5E	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A	
	HB	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A	
		20 - 25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B344	B344	
P5L	32 - 63mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B344	B344		
	80 - 100mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B344	B344		
Cordset / Connect Block	Rotary actuators	PV WR XR	N.O. high amp	SMR-1 ¹	N/A	SMR-1C	N/A	N/A	B352	N/A	
			N.O. low amp	SMR-1L ¹	N/A	SMR-1LC	N/A	N/A	N/A	B352	N/A
		N.C.	SMD-1L ¹	N/A	SMD-1LC	N/A	N/A	N/A	N/A	B352	N/A
	PRN	50 - 800	See model code					B351	N/A		
Proximity Sensors	PTR	10, 15	SWR-1 ²	N/A	SWR-1C	N/A	N/A	Included w/ sensor	B353	N/A	
		20, 25, 32	SWR-2 ²	N/A	SWR-2C	N/A	N/A	Included w/ sensor	B353	N/A	

1. Flying leads are 1.5 meters in length
 2. Flying Leads are 1 meters in length

3. Flying leads are 2 meter in length
 4. Flying leads are 5 meter in length

Note: See page B354 for Weld Immune Sensors.
 * See page B355 for cord sets.

P8S Global Drop-In Solid State Sensors



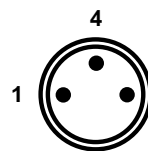
Wiring	PNP sensor	NPN sensor	PNP sensor ATEX certified
3m flying leads	P8S-GPFLX	P8S-GNFLX	P8S-GPFLX/EX
10m flying leads	P8S-GPFTX	P8S-GNFTX	
0.3m lead with 8mm connector	P8S-GPSHX	P8S-GNSHX	N/A
0.3m lead with 12mm connector	P8S-GPMHX	P8S-GNMHX	
1m lead with 8mm connector	P8S-GPSCX	P8S-GNSCX	

Specifications

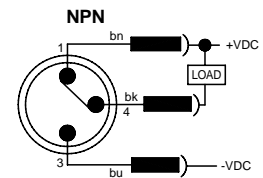
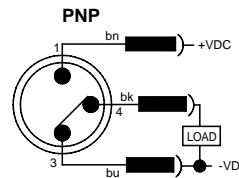
Switch classification	Standard PNP or NPN	ATEX certified PNP
Type	Electronic	
Output function	Normally open	
Sensor output	PNP/NPN	PNP
Operating voltage	10 - 30VDC	180 - 30VDC
Continuous current	100 mA max.	70 mA max.
Response sensitivity	28 Gauss min.	
Switching frequency	1 KHz	
Power consumption	10 mA max.	
Voltage drop	2.5 VDC max.	
Ripple	10% of operating voltage	
Hysteresis	1.5 mm max.	
Repeatability	0.1 mm max.	
EMC	EN 60 947-5-2	
Short-circuit protection	Yes	
Power-up pulse suppression	Yes	
Reverse polarity protection	Yes	
Enclosure rating	IP 68	
Shock and vibration stress	30g, 11 ms, 10 to 55 Hz, 1 mm	
Operating temperature range	-25°C to +75°C (-13°F to 167°F)	-20°C to +45°C (-4°F to 113°F)
Housing material	PA 12, black	
Connector cable	PVC	
Connector	PUR	—
Approval for ATEX	—	3D/3G

Wiring connection

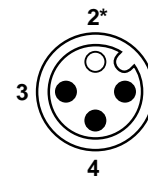
Flying lead or 8 mm connector (shown)



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Black	Output signal (N.O.)
3	Blue	-VDC

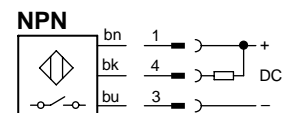
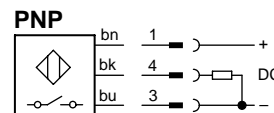


12 mm connector

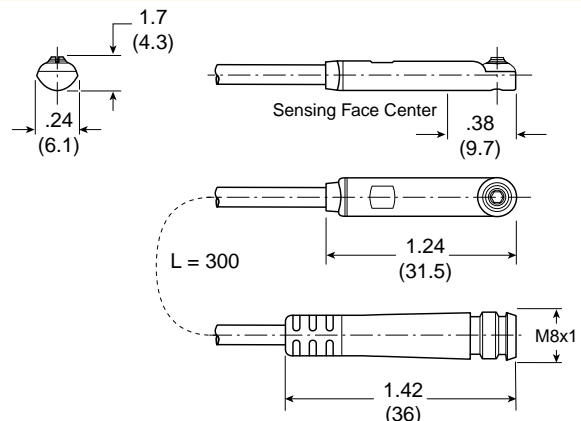


Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Black	Output signal (N.O.)
2*	White	Not used
3	Blue	-VDC

* Pin 2 not present.



Dimensions



P8S Global Drop-In Reed Sensors



Wiring	Reed sensor
3m flying leads	P8S-GRFLX
10m flying leads	P8S-GRFTX
0.3m lead with 8mm connector	P8S-GRSHX
0.3m lead with 12mm connector	P8S-GRMHX
1m lead with 8mm connector	P8S-GRSCX

Specifications

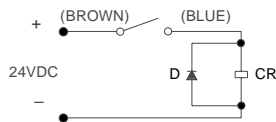
Type	2-Wire Reed
Output function	Normally open
Operating voltage	10 - 120 VAC*, 10 - 30 VDC
Switching power	6 W/VA
Continuous current	100 mA max.
Response sensitivity	30 Gauss min.
Switching frequency	400 Hz
Voltage drop	2.5 V max.
Ripple	10% of operating voltage
Hysteresis	1.5 mm max.
Repeatability	0.2 mm max.
Emc	EN 60 947-5-2
Reverse polarity protection	Yes
Enclosure rating	IP 68
Shock and vibration stress	30g, 11 ms, 10 to 55 Hz, 1 mm
Operating temperature range	-25°C to +75°C (-13°F to 167°F)
Housing material	PA 12, Black
Connector cable	PVC
Connector	PUR cable with 8 or 12 mm connector

* 8mm connector rated for 50 vac max.

Circuit for switching contact protection (for inductive loads, e.g. solenoids, relays)

(Required for proper operation 24VDC)

Put diode parallel to load (CR) following polarity as shown.

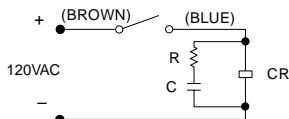


D: Diode: select a diode with the breakdown voltage and current rating according to the load.

Typical Example – 100 volt, 1 amp diode
 CR: Relay coil (under 0.5W coil rating)

(Recommended for longer life 120 VAC)

Put a resistor and capacitor in parallel with the load (CR). Select the resistor and capacitor according to the load.

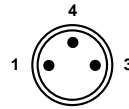


Typical Example:

CR: Relay coil (under 2W coil rating)
 R: Resistor 1 KΩ - 5 KΩ, 1/4 W
 C: Capacitor 0.1 μF, 600 V

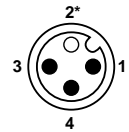
Wiring connection

Flying Lead or 8 mm Connector



Pin	Wire	Function
1	Brown	Operating voltage (+V)
4	Black	Not used
3	Blue	Output signal (-V or ground)

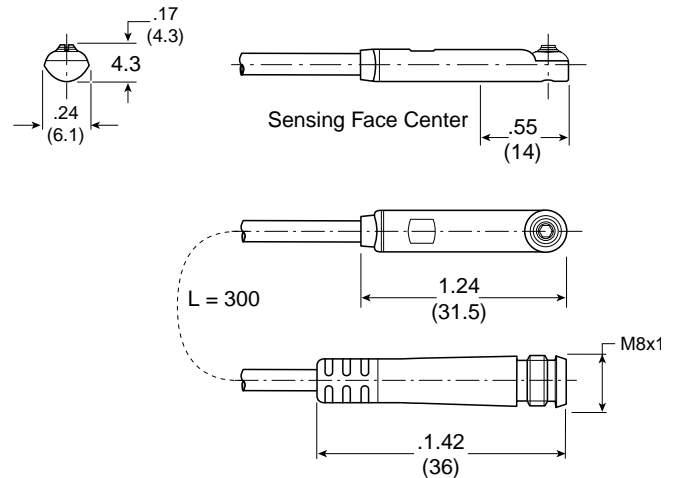
12 mm Connector



Pin	Wire	Function
1	Brown	Operating voltage (+V)
2*	White	Not used
3	Blue	Output signal (-V or ground)
4	Black	Not used

* Pin 2 not present.

Dimensions



⚠ Caution

- Use an ammeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- **NOTE:** When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that $R \text{ (ohms)} > E/0.3$.

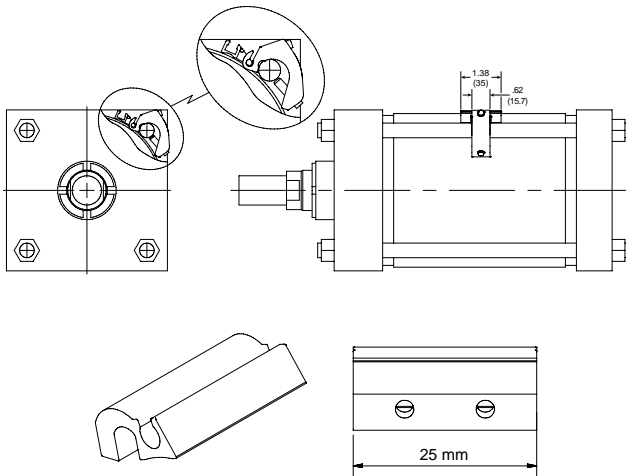
B
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Tie Rod Bracket Assembly Part Number and Dimensions

Tie Rod Bracket Assembly is necessary for Global and Mini-Global Sensor installation on all tie rod construction cylinders. This includes all Intermediate Trunnion mounts (Style DD or MT4); some 1-1/8" bore 3MA Series mounts; and all 6"-8" bore Sensors and bracket assemblies must be ordered separately.

Part number P8S-TMA0X fits 1-1/2" to 8" bores and 32-200mm bores for Global Sensors
 Part number P8S-TMA0Z fits 1-1/8" bore for Mini-Global Sensors

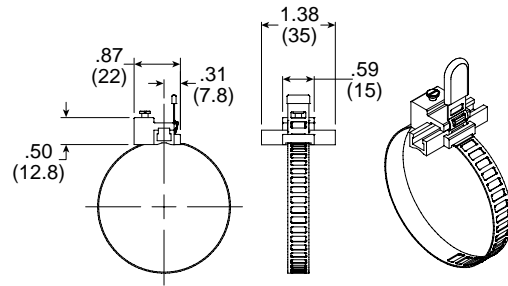
P8S-TMA0X



Round body bracket assembly part numbers Sensors and brackets must be ordered separately

Bore size	Round body bracket
9/16" - 1-1/16"	P8S-TMC01
20 - 25mm	P8S-TMC01
1-1/8" - 2-1/2"	P8S-TMC02
32 - 63mm	P8S-TMC02
3" - 4"	P8S-TMC03
80 - 100mm	P8S-TMC03

P8S-TMA0Z



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P8S Right Angle Solid State Sensors

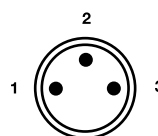


Specifications

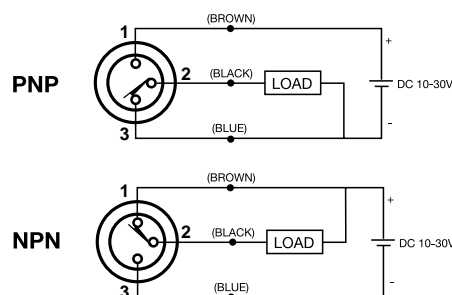
Type	Electronic
Output function	Normally open
Switching output	PNP/NPN
Operating voltage	10 - 30VDC
Continuous current	≤ 150 mA
Response sensitivity	30 Gauss min.
Switching frequency	5kHz
Power consumption	15 mA
Voltage drop	≤ 2 VDC
Ripple	≤ 10% of operating voltage
Delay time (24v)	Approx. 20 ms
Time delay before availability	≤ 2 ms
Hysteresis	≤ 1.5 mm
Repeatability	≤ 0.2 mm
EMC	EN 60 947-5-2
Short-circuit protection	Yes
Power-up pulse suppression	Yes
Reverse polarity protection	Yes
Enclosure rating	IP 67 DIN 40050
Shock and vibration stress	30g, 11ms, 10 to 55 Hz, 1 mm
Ambient temperature range	-25°C to +75°C (-13°F to 167°F)
Housing material	PA 12, black
Connector cable	PVC
Connector	PUR cable w/8 mm connector

Wiring	PNP sensors	NPN sensors
0.2m lead with 8mm connector	P8S-SPTHXD	P8S-SNTHX
10m flying leads	P8S-SPETXD	P8S-SNETX

Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
2	Black	Output signal (N.O.)
3	Blue	-VDC



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P8S Right Angle Reed Sensors

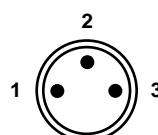


Specifications

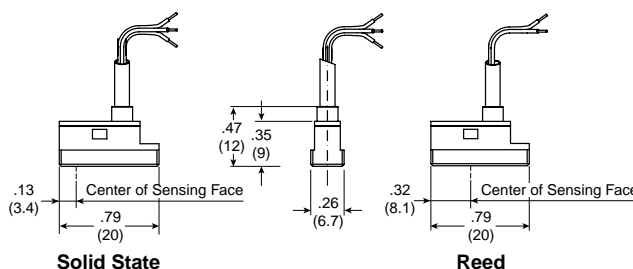
Type	2-wire reed
Output function	Normally open
Output voltage	10 - 110* VAC, 10 - 30 VDC
Continuous current	≤ 100 mA
Response sensitivity	30 Gauss min.
Switching frequency	400 Hz
Voltage drop	≤ 3 V
Ripple	≤ 10% of operating voltage
Time delay (24v)	Approx. 20 ms
Hysteresis	≤ 1.0 mm
Repeatability	≤ 0.2 mm
EMC	EN 60 947-5-2
Reverse polarity protection	Yes
Enclosure rating	IP 67
Shock and vibration stress	30g, 11ms, 10 to 55 Hz, 1 mm
Ambient temperature range	-25°C to +75°C (-13°F to 167°F)
Housing material	PA 12, black
Connector cable	PVC
Connector	PUR cable w/8 mm connector

Wiring	Reed sensors
0.2m lead with 8mm connector	P8S-SRTHX
10m flying leads	P8S-SRETX

Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+V)
3	Black	Not used
2	Blue	Output signal (-V or Ground)



* 8Mm connector rated for 50 vac max.



OSP-P Magnetic Switches

OSP-P Magnetic Switches for T-Slot – Series RST & EST

Magnetic switches are used for electrical sensing of the position of the piston, e.g. at its end positions. They can also be used for sensing of intermediate positions.

Sensing is contactless, based on magnets which are built-in as standard. A yellow LED indicates operating status.

The universal magnetic switches are suitable for all OSP-P Actuators.

1) For the magnetic switch temperature range, please take into account the surface temperature and the self-heating properties of the linear drive.



Characteristics

Electrical characteristics	Unit	Type RST	Type EST
Switching output		Reed	PNP
Operating voltage	V	10-30 AC/DC	10-30 DC
Ripple		—	≤ 10%
Voltage drop	V	≤ 3	≤ 2
Electrical configuration		Two wire	Three wire
Output function		normally open normally closed	normally open
Permanent current	mA	≤ 100	≤ 100
Breaking capacity	W	≤ 6 peak	—
Power consumption at UB = 24V, switched on, without load	mA	—	≤ 10
Function indicator		LED, yellow (not for normally closed)	
Response time	ms	≤ 2	≤ 0.5
Sensitivity	mT	2 – 4	2 – 4
Time delay before availability	ms	—	≤ 2
Reverse polarity protection		Yes	Yes
Short-circuit protection		No	Yes (pulsed)
Switchable capacity load	μF	0.1 at 100 W, 24 VDC	
Switching frequency	Hz	≤ 400	≤ 5k
Repeatability	mm	≤ 0.2	≤ 0.2
Hysteresis	mm	≤ 1.5	≤ 1.5
EMC	EN	60947-5-2	
Lifetime		≥ 35 Mio. cycles with PLC load	Unlimited
Power-up pulse suppression		—	Yes
Protection for inductive load		—	Yes
Mechanical characteristics	Unit	Type RST	Type EST
Housing		Plastic / PA66 + PA6I red	
Cable cross section	mm ²	2 x 0.14	3 x 0.14
Cable type*		PUR, black	PUR, black
Bending radius	mm	≥ 36	≥ 30
Weight (Mass)	kg	ca. 0.030 RST-K ca. 0.010 RST-S	ca. 0.030 EST-K ca. 0.010 EST-S
Degree of protection	IP	67 to DIN EN 60529	
Ambient temperature range**	°C	-25°C to +80°C	-25°C to +75°C at UB=10 – 30 V -25°C to +80°C at UB=10 – 28 V
– with adapter	°C	-25°C to +60°C	
Adapter tightening torque	Nm	0.15 (tightening torque of screwing adapter onto magnetic switch)	
Shock resistance			
Vibration to EN 60068-2-6	G	15, 11 ms, 10 to 55 Hz, 1 mm	
Shock to EN 60068-2-27	G	50, 11 ms	
Bump to EN 60068-2-29	G	30, 11 ms, 1000 bumps each axis	

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Ordering Information

Version	Voltage	Type	Order number
Magnetic switch, reed contact, normally open, LED indicator, cable 2 m	10-30 V AC / DC	RST-K	KL3302
Magnetic switch, reed contact, normally open, LED indicator, cable 5 m	10-30 V AC / DC	RST-K	KL3300
Magnetic switch, reed contact, normally open, snap connector M8, LED indicator, cable 0.24 m	10-30 V AC / DC	RST-S	KL3302
Magnetic switch, reed contact, normally open, screw connector M8, LED indicator, cable 0.24 m	10-30 V AC / DC	RST-S	KL3303
Magnetic switch, reed contact, normally closed, cable 5 m	10-30 V AC / DC	RST-K	KL3305
Magnetic switch, electronic, PNP LED indicator, cable 2 m	10-30 V DC	EST-K	KL3308
Magnetic switch, electronic, PNP LED indicator, cable 5 m	10-30 V DC	EST-K	KL3309
Magnetic switch, electronic, PNP snap connector M8, LED indicator	10-30 V DC	EST-S	KL3312
Magnetic switch, electronic, PNP screw connector M8, LED indicator	10-30 V DC	EST-S	KL3306

Included in delivery: 1 magnetic switch
 1 adapter for dovetail groove mounting

Accessories

Description	Type	Order number
Cable M8, 2.5 m without lock nut	KS 25	KY3240
Cable M8, 5.0 m without lock nut	KS 50	KY3241
Cable M8, 10.0 m without lock nut	KS 100	KY3140
Cable M8, 2.5 m with lock nut	KSG 25	KC3102
Cable M8, 5.0 m with lock nut	KSG 50	KC3104
Adapter for dovetail groove (pack of 10)		KL3333

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Solid State / Reed Sensors

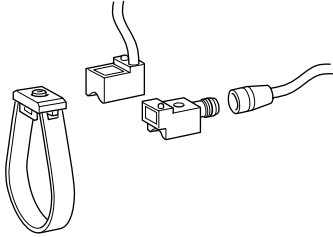
Weld Immune Sensors

Cordset / Connect Block

Proximity Sensors

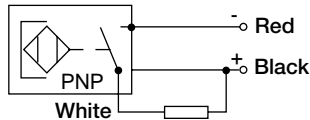
P1A Series Solid State Sensors

These sensors are of solid-state type, with no moving parts. Short-circuit and transient protection is incorporated as standard. The integral electronics make these sensors suitable for applications with very high switching frequencies.

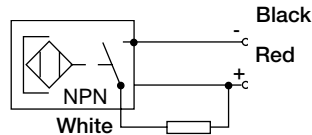


Wiring connection

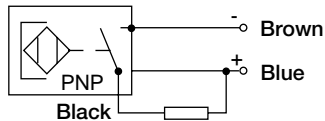
P1A-2XMK



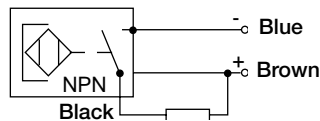
P1A-2XLK



P1A-2XHK, P1A-2XJH

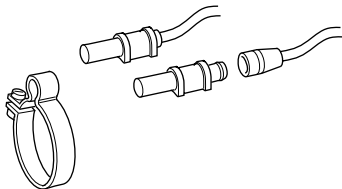


P1A-2XEK, P1A-2XFH

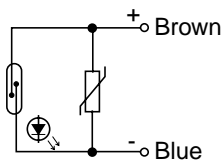


P1A Series Reed Sensors

The reed sensors incorporate a well-proven, universal-voltage, compact reed switch element; making them suitable for a wide range of applications. They can work with electronic control systems or conventional relay systems.



Wiring connection



Electronic Sensors

Output	Cable length	Weight (lb)	Part number
PNP, N.O.	2 m	0.09	P1A-2XMK, Rt. angle
NPN, N.O.	2 m	0.09	P1A-2XLK, Rt. angle
PNP, N.O.	2 m	0.022	P1A-2XHK
NPN, N.O.	2 m	0.022	P1A-2XEK
PNP, N.O.	*	0.033	P1A-2XJH
NPN, N.O.	*	0.033	P1A-2XFH

Mounting Brackets

Fits cylinder bore size	Weight (lb)	Part number
10mm	0.01	P1A-2CCC
12mm	0.01	P1A-2DCC
16mm	0.0176	P1A-2FCC
20mm	0.0176	P1A-2HCC
25mm	0.022	P1A-2JCC

Cable for Sensors

Cable length	Weight (lb)	Part number
3 m	0.12	9126344341**
10 m	0.4	9126344342**

* Cable ordered separately

** Cable includes female part connector for sensor

Electronic Sensors

Output	Cable length	Weight (lb)	Part number
Making (N.O.)	3m	0.12	P1A-2XRL
Making (N.O.)	*	0.004	P1A-2XSH

Mounting Brackets

Fits cylinder bore size	Weight (lb)	Part number
10mm	0.004	P1A-2CCB
12mm	0.005	P1A-2DCB
16mm	0.006	P1A-2FCB
20mm	0.009	P1A-2HCB
25mm	0.010	P1A-2JCB

Cable for Sensors

Cable length	Weight (lb)	Part number
3 m	0.12	9126344341**
10 m	0.4	9126344342**

* Cable ordered separately

** Cable includes female part connector for sensor

LP/LPM Series Sensors

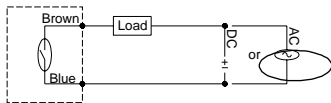
Bore size	Reed (Low AMP)	NPN sinking	PNP sourcing
9/16"	L077030000	L076950000	L076990000
3/4", 1-1/8"	L077040000	L076960000	L077000000
1-1/2", 2"	L077050000	L076970000	L077010000
2-1/2", 3", 4"	L077060000	L076980000	L077020000

Note: For sensors with an 8mm connector, replace the last digit with a 'C'. For example: L07696000C.

Circuits

Reed Sensor

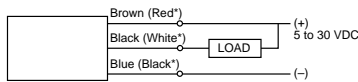
NOTE: Polarity must be observed for DC operation only.



*Number in parentheses pertains to inductive loads.

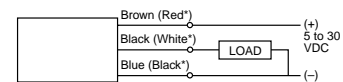
NPN Sensor – Sinking Output

Color of Cable Black
 "On" State Voltage Drop 1.5V Maximum



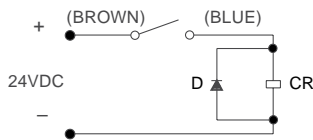
PNP Sensor – Sourcing Output

Color of Cable Black
 "On" State Voltage Drop 1.5V Maximum

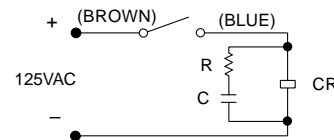


Circuit for Switching Contact Protection (Inductive Loads) – for Reed Sensor Only (Required for proper operation 24V DC)

Put Diode parallel to load (CR) following polarity as shown below.



Put a resistor and capacitor in parallel with the load (CR). Select the resistor and capacitor according to the load.



D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

Typical Example – 100 Volt, 1 Amp Diode
 CR: Relay coil (under 0.5W coil rating)
 (Recommended for longer life 125 VAC)

Typical Example:
 CR: Relay coil (under 2W coil rating)
 R: Resistor 1 KΩ – 5 KΩ, 1/4 W
 C: Capacitor 0.1 μF, 600 V

*Wire colors in parentheses pertain to sensors manufactured before 10/15/93.

⚠ Caution

- Use an ampmeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- NOTE: When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.

- Current capabilities are relative to operational temperatures.
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that $R \text{ (ohms)} > E/0.3$.

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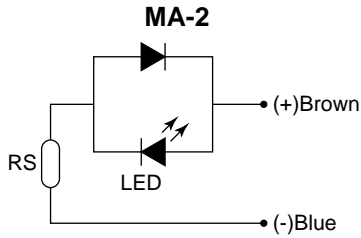
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PRNA Sizes 3 to 30 Sensors

Fixed position sensor



Variable position sensor

Size	Part number
1	FR-1PRN
3	FR-3PRN
10	FR-10PRN
20	FR-20PRN
30	FR-30PRN

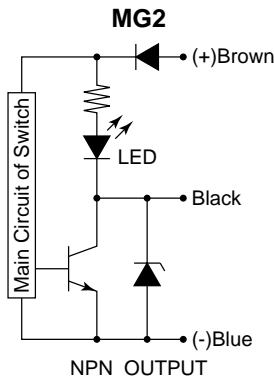
Model code and ordering information

Example: SR20 - 180 - 90

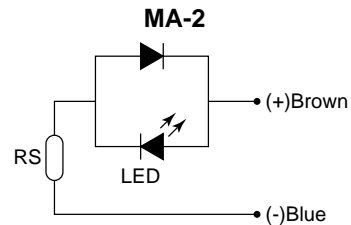
SR	20	-	180	-	90
	Size		Rotation		Reference point
	3		090 90°		45 45°
	10		100 100°		90 90°
	20		180 180°		
	30		270 270°		

PRN Sizes 50 to 800 Sensors

Solid state sensors



Reed sensors



Model code and ordering information

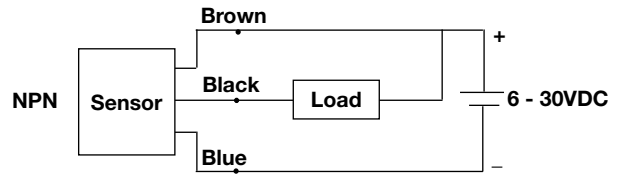
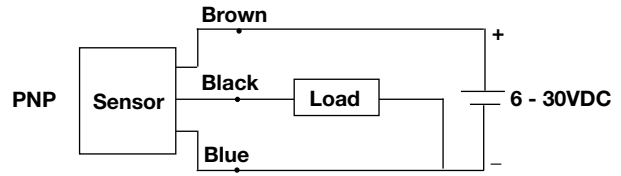
Example: FM50 - 90 - 45 - MA2

FM	50	-	90	-	45	-	MA	-	2
	Size		Rotation		Reference point		Sensor type		Number sensors
	50		090 90°		45 45°		MA Reed		2 Standard
	150		180 180°		90 90°		MG Solid State		
	300		270 270°						
	800								

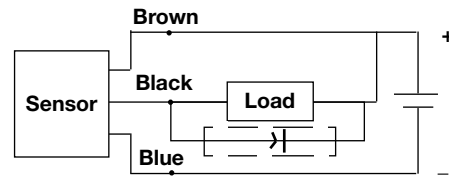
PV, WR & WR Series Solid State (Hall Effect) Sensors

Type	LED color	Logic	Cable/Connector	Part number
N.O.	Green	PNP	1.5m black with leads	SMH-1P
N.O.	Red	NPN		SMH-1N
N.C.	Yellow	PNP		SMC-1P
N.C.	White/Red	NPN	0.15m black with connector	SMC-1N
N.O.	Green	PNP		SMH-1PC
N.O.	Red	NPN		SMH-1NC
N.C.	Yellow	PNP	SMC-1PC	
N.C.	White/Red	NPN	SMC-1NC	

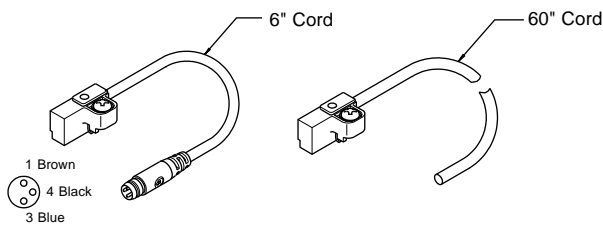
Wiring connection



Protection circuit*



* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)



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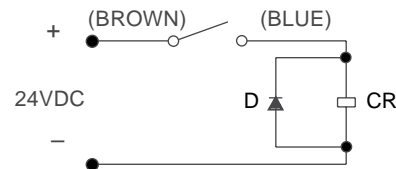
PV, WR & WR Series Reed Sensors

Reed sensors are available in a normally open or normally closed configuration. The low amp sensor is suitable for connection to PLCs or other low current devices. The high amp sensor can be used to drive sequencers, relays, coils, or other devices directly.

Type	LED color	Rating	Cable/Connector	Part number
N.O.	Green	High Amp	1.5m Gray with Leads	SMR-1
N.O.	Red	Low Amp		SMR-1L
N.C.	Yellow	Low Amp	0.15m Gray with Connector	SMD-1L
N.O.	Green	High Amp		SMR-1C
N.O.	Red	Low Amp	SMR-1LC	
N.C.	Yellow	Low Amp	SMD-1LD	

Integral circuit for switching contact protection

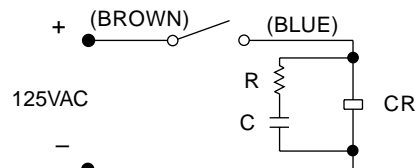
(Required for proper operation 24V DC)
 Put Diode parallel to load (CR) with polarity as shown below.



D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

CR: Relay coil (under 0.5 W coil rating)

(Recommended for longer sensor life 125V AC)
 Put resistor and capacitor parallel to load (CR).



CR: Relay coil (under 2 W coil ratings)

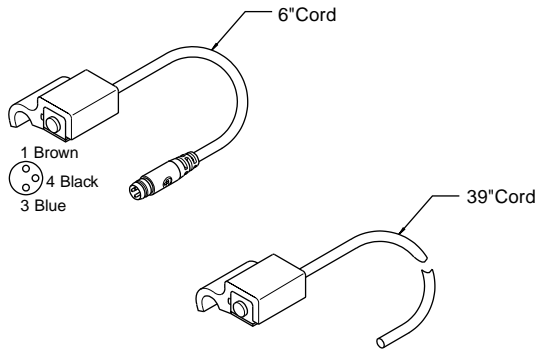
R: Resistor under 1 K ohm

C: Capacitor 0.1 μF

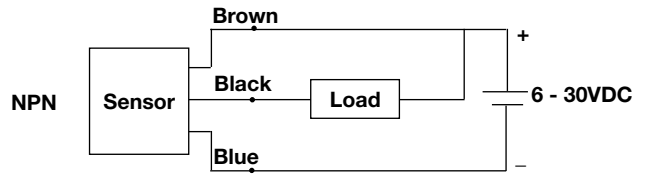
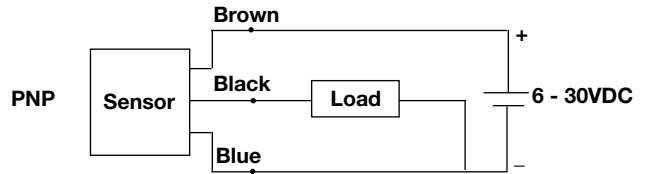
PTR Series Solid State (Hall Effect) Sensors

PTR model	PNP		NPN	
	With 6" male quick connect	With 39" potted-in leads	With 6" male quick connect	With 39" potted-in leads
10	SWH-1PC	SWH-1P	SWH-1NC	SWH-1N
15	SWH-1PC	SWH-1P	SWH-1NC	SWH-1N
20	SWH-2PC	SWH-2P	SWH-2NC	SWH-2N
25	SWH-2PC	SWH-2P	SWH-2NC	SWH-2N
32	SWH-2PC	SWH-2P	SWH-2NC	SWH-2N

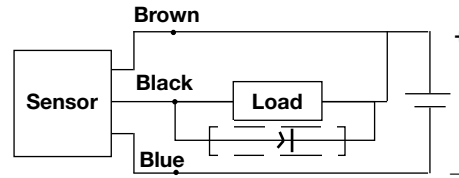
Note: Sensors with male quick connect option require female cordsets to be ordered separately. Please reference catalog 0900P-E, page M22.



Wiring connection



Protection circuit*



* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)

PTR Series Reed Sensors

PTR model	With 6" male quick connect	With 39" potted-in leads
10	SWR-1C	SWR-1
15	SWR-1C	SWR-1
20	SWR-2C	SWR-2
25	SWR-2C	SWR-2
32	SWR-2C	SWR-2

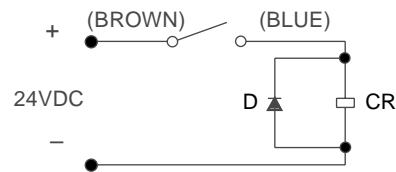
Sensors with male quick connect option require female cordsets to be ordered separately.

Note: Please reference catalog 0900P-E, page M22

Protection circuit (Inductive loads)

(Required for proper operation 24VDC)

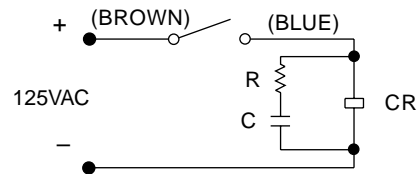
Select a diode with a breakdown voltage and current rating according to the load (CR). Place a diode in parallel to the load with the polarity as indicated:



CR: Relay coil (under 0.5W coil rating)

(Recommended for longer sensor life 125VAC)

Select a resistor and capacitor according to the load (CR). Place a resistor and capacitor in parallel to the load:



CR: Relay coil (under 2W coil rating)

R: Resistor under 1 K ohm

C: Capacitor 0.1 μF

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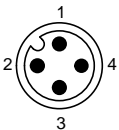
Cordset/
 Connect Block

Proximity
 Sensors

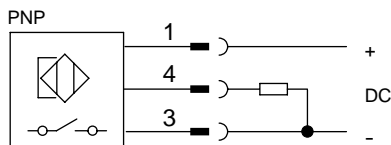
Weld Immune Sensor



- Weld immune in all welding applications (AC, DC and medium frequency welding).
- Sensor locks the output during the welding process; when welding process stops, the sensor updates the output accordingly.
- NOTE: Tie rod construction of the P1D Series can be ordered directly in the model code.

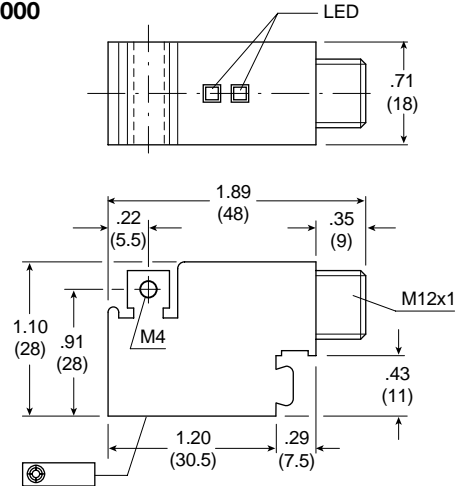


Pin	Function
1	Operating voltage (+VDC)
4	Output signal (N.O.)
3	-VDC
2	Not used

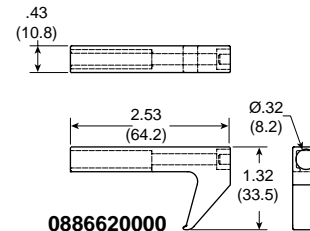


Description	Part number
Weld immune sensor	088660000
Tie rod bracket kit	088662000

088660000



088662000



Air Piloted Switch

Features

Converts a magnetic field to an air pilot signal	
Band clamp allows for mounting to tie rod cylinders	
Fits 32 to 100mm bore (1.5 to 4 inch bore)	
Type	3/2 valve - NC, 2-position / spring return 3-way

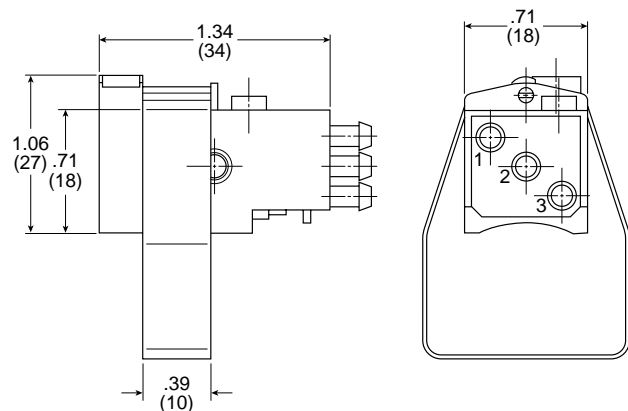
Construction materials

Body	Macrolon, glass fiber
Mounting bracket	Aluminum, anodized
Connection	3 - 3mm OD barbs

Characteristics

Operating temperature	14°F to 140°F (-10°C to +60°C)
Operating pressure	30 PSI to 90 PSI (2 bar to 6 bar)
Normal operating pressure	90 PSI (6 bar)
Flow	0.04 Cv (40 l/min)
Cycle rate	40 hz
Switching accuracy	± 0.008" (0.2 mm) w/o air
Filtration	40 micron
Media	Filtered and regulated compressed air
Installation	In any position
Weight	Sensor 0.49 ozs (0.014 Kg) Sensor & bracket 0.99 Ozs (0.028 Kg)

Description	Part number
Sensor – Air type	KZ 2364
Mounting bracket	KZ 8255



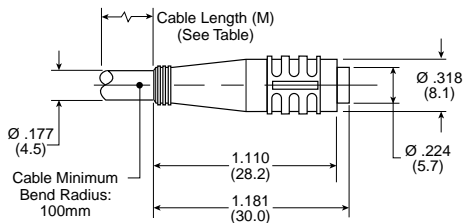
Quick Connect Cordset

8mm Cordset with Female Quick Connect

A female connector is available for all sensors with the male 8mm quick connect option. The male plug will accept a snap-on or threaded connector. Cordset part numbers are listed below:

Cable length	Threaded connector	Snap on connector
5 meters	086620T005	086620S005
2 meters	086620T002	086620S002

Snap-On Straight Connector



12mm Cordset with Female Quick Connect

M12 Straight connector

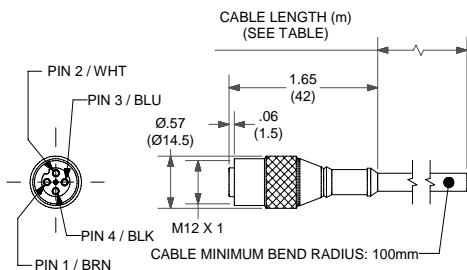
Cable length	Part number
5 meters	9126487205
2 meters	9126487202

M12 Right angle Connector

Cable length	Part number
5 meters	9126487205
2 meters	9126487202

A female connector is available for all sensors with the male 12mm quick connect option. The cordsets are available with a right angle or straight connector. Cordset part numbers are listed above.

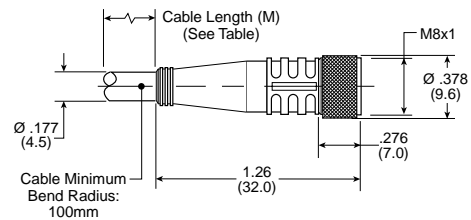
Straight Connector



Cordset Specifications

Connector Oil resistant polyurethane body material, PA 6 (Nylon) contact carrier, spacings to VDE 0110 Group C, (150 AC/DC)
 Contacts Gold plated beryllium copper, machined from solid stock
 Coupling Method..... Snap-Lock or chrome plated brass nut
 Cord Construction Oil resistant black PUR jacket, non-wicking, non-hygroscopic, 300V.
 Cable end is stripped and tinned.
 ConductorsExtra high flex stranding, PVC insulation
 Temperature -40 to 194°F (-40 to 90°C)
 Protection..... NEMA 1, 3, 4, 6P and IEC IP67
 Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

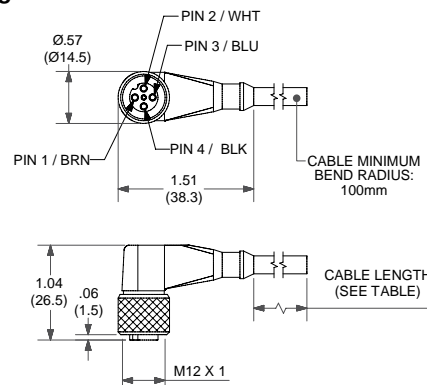
Threaded Straight Connector



Cordset Specifications

Connector Polyvinylchloride (PVC) body material, PVC contact carrier, spacing to VDE 0110 Group C, (250VAC / 300VDC)
 Contacts Gold Plated Copper Tin (CuSn), stamped from stock.
 Coupling Method..... Threaded nut: Chrome plated brass.
 Cord Construction PVC non-wicking, non-hygroscopic, 250VAC / 300VDC. Cable end is stripped.
 Conductors Extra high flex stranding with PVC insulation
 Temperature -13°F to 158°F (-25°C to 70°C)
 Protection..... NEMA 1, 3, 4, 6P and IEC IP67
 Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

Right Angle Connector



EPS-5, 6 & 7 / CLS-1 & 4

End-of-Stroke Proximity Sensors

Ordering information

Sensor type	Inductive proximity			Non-contacting magnetically actuated	
Style	EPS-7	EPS-5	EPS-6	CLS-1	CLS-4
Sensor part number	148897****	146617****	148896****	148275****	149109****
6' Cable	0853550006	0853550006	0859170006	0853550006	—
12' Cable	0853550012	0853550012	0859170012	0853550012	—
6' Cable, right angle	0875470006	0875470006	—	0875470006	—

**** Part number suffix: **** 4-digit suffix indicates probe length: 0125=1.25", 0206=2.06", 0288=2.875", 0456=4.562"

Specifications

Style	EPS-7	EPS-5	EPS-6	CLS-1	CLS-4
Code designator	H	R	D	F	B
Sensor type	Inductive proximity	Inductive proximity	Inductive Proximity	Non-contacting magnetically actuated	Non-contacting magnetically actuated
Description	Economical, General Purpose, 2 wire device, primarily for AC applications, not suitable for 24 VDC applications. Use EPS-5 only for automotive industry customers who specify them.		Economical, General Purpose, 3 wire, DC sensor, dual output: sinking and sourcing	Functional replacement for AB (Mechanical) Limit Switches in many applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style.	Functional replacement for AB (Mechanical) Limit Switches in many High Temperature applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style.
Supply voltage	20 to 250 VAC/DC	20 to 230 VAC/DC	10 to 30 VDC	24 to 240 VAC/DC	24 to 240 VAC/DC
Load current, min	8 mA	5 mA	NA	NA	NA
Load current, max	300 mA	500 mA	200 mA	4 AMPS @ 120 VAC 3 AMPS @ 24 VDC	4 AMPS @ 120 VAC 3 AMPS @ 24 VDC
Leakage current:	1.7 mA, max.	1.7 mA, max.	10 micro amps max.	—	—
Voltage drop	7 V, max.	10 V, max	2 VDC max.	NA	NA
Operating temperature	-14° to 158° F	-4° to 158° F	-14° to 158° F	-40°F to 221° F	-40° F to 400° F
Connection	3-pin mini	3-pin mini	5-pin mini	3-pin mini	144" PTFE coated flying leads with 1/2" conduit hub
Enclosure rating	IEC IP67	NEMA 4, 6, 12, 13	IEC IP67	NEMA 1, 2, 3, 4, 4x, 5, 6, 6P, 11, 12, 12K, 13	NEMA 1, 2, 3, 4, 4x, 5
Led indication	Yes	Yes	Yes	No	No
Short circuit protection	Yes	Yes	Yes	No	No
Weld field immunity	Yes	Yes	Yes	Yes	Yes
Output	2 wire, Normally Open with leakage current	2 wire, Normally Open with leakage current	Dual output: DC Sinking and DC Sourcing, user selectable via wiring	SPDT (Single pole double throw), Normally Open/ Normally Closed, Form C	SPDT (Single pole double throw), Normally Open/ Normally Closed, Form C
Approvals / marks	CE, UL, CSA	UL	CE, UL, CSA	UL or CSA	UL or CSA
Make / break location	0.125" from end of stroke, typical. Tolerance is 0/-0.125"				
Wiring instructions	Pin 1: AC ground (Green)	Pin 1: AC ground (Green)	Pin 1: +10 to 30 VDC (White)	Pin 1: Common (Green)	Common: (Black)
	Pin 2: Output (Black)	Pin 2: Output (Black)	Pin 2: Sourcing output (Red)	Pin 2: Normally Closed (Black)	Normally Open: (Blue)
	Pin 3: AC line (White)	Pin 3: AC line (White)	Pin 3: Grounded (not connected or required)	Pin 3: Normally Open (White)	Normally Closed: (Red)
			Pin 4: Sinking output (Orange)		
			Pin 5: DC common (Black)		

Series and parallel wiring

When Parker EPS-5, 6 or 7 proximity sensors are used as inputs to programmable controllers, the preferred practice is to connect each sensor to a separate input channel of the PC. Series or parallel operations may then be accomplished by the internal PC programming.

Parker EPS-5, 6 or 7 sensors may be hard wired for series operation, but the voltage drop through the sensors (see specifications) must not reduce the available voltage below what is needed to actuate the load.

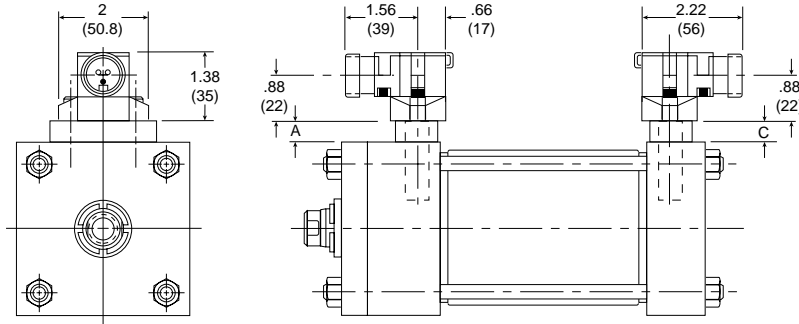
Parker EPS-5, 6 or 7 sensors may also be hard wired for parallel operation. However, the leakage current of each sensor will pass through the load. The total of all leakage currents must not exceed the current required to actuate the load. In most cases, the use of two or more EPS-5, 6 or 7 sensors in parallel will require the use of a bypass (shunt) resistor.

EPS-5
Automotive applications

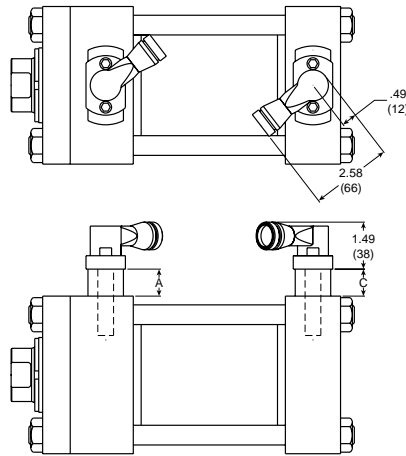
(Meets some Automotive Manufacturer's Specifications)

Series	A max.	C max.
2A, 4MA, 4MAJ	1.55"	1.30"

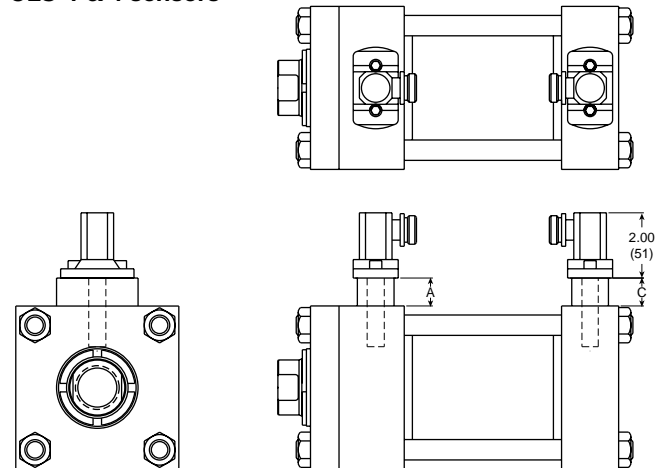
For exact dimensions, see Bulletin 0840-G-E1



EPS-7 & EPS-6 sensors

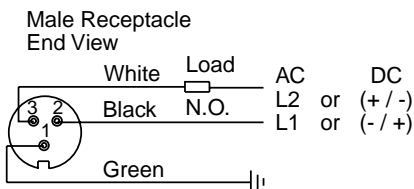


CLS-1 & 4 sensors

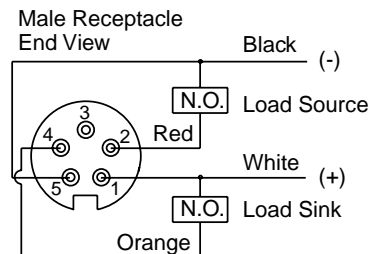


Connector pin numbering

3-pin mini



5-pin mini



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How to specify EPS sensors

Parker EPS proximity sensors may be ordered on 2A, 2AN, 4MA and 4MAJ Series cylinders as follows:

- 1) Complete the basic cylinder model number.
- 2) Place an "S" in the model number to denote sensors and/or special features.
- 3) Mounting styles D, DB, JB, or HB should be used with caution because of possible mounting interferences. Consult bulletin 0840-G-E1 for additional information.
- 4) Special modifications to cylinders other than sensors must have a written description.

- 5) Specify letter prefix "H" for EPS-7, "D" for EPS-6, "R" for EPS-5, "F" for CLS-1, or "B" for CLS-4, then fill in the four fields specifying port location, sensor orientation and actuation point for both head and cap. If only one sensor is used, place "XXXX" in the unused fields.

Example = H13CGG-XXXX denotes a sensor on the head end only, EPS-7

Example = BXXXX-42BGG denotes a sensor on the cap end only, CLS-4

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Head end

R	1	3	A	GG
Specify:	Port Location	Sensor Location	Sensor Orientation	Actuation Point
R = EPS-5	See Figure 1.	See Figure 1.	See Figure 2 for EPS-7 and EPS-6 only.	GG = End of Stroke
H = EPS-7				See Bulletin 0840-G-E1 for stroke remaining.
D = EPS-6				
F = CLS-1				
B = CLS-4				
N = Prep for sensors only				

Cap end

4	2	B	GG
Port Location	Sensor Location	Sensor Orientation	Actuation Point
See Figure 1.	See Figure 1.	See Figure 2 for EPS-7 and EPS-6 only.	GG = End of Stroke
			See Bulletin 0840-G-E1 for stroke remaining.

Note: All specified sensor and port locations are as seen from rod end of cylinder.
 *EPS-5 sensors will be oriented so that the connectors face each other.
 **Consult the Wadsworth, Ohio facility for this option with 4MA and 4MAJ Series cylinders.

Figure 1

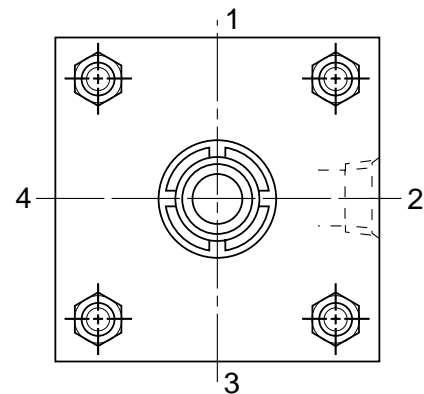
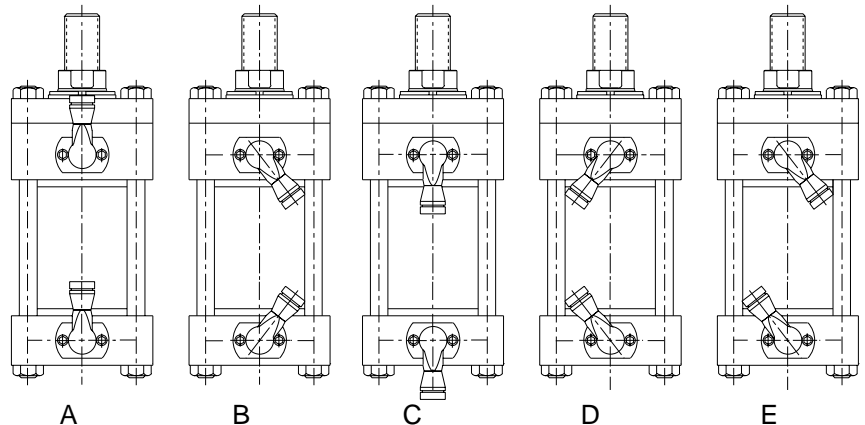


Figure 2



Example:
 4.00 CJ4MAUS14AC 12.000
 S = H13CGG-13CGG

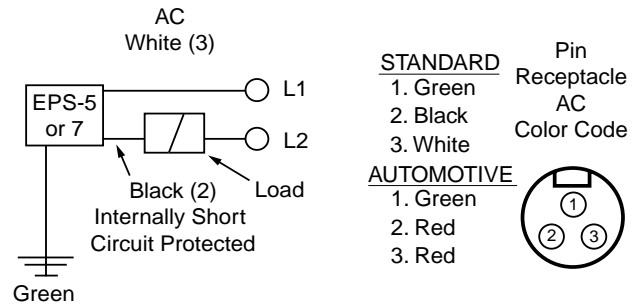
EPS-5 & EPS-7

Connectors

The male quick disconnect on the Parker EPS-5 or 7 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

Cable length	Part number	
	Automotive	Standard
3'	085356003	0853550003
6'	085356006	0853550006
9'	085356009	—
12'	085356012	0853550012



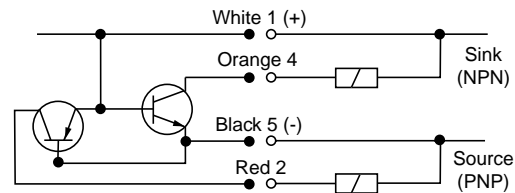
EPS-6

Connectors

The male quick disconnect on the Parker EPS-6 is a Brad Harrison 41310 connector.

Plug pin and cable identification

- 1) +10 to 30 VDC (White)
- 2) Source (Red)
- 3) Grounded not connected nor required
- 4) Sink (Orange)
- 5) Common (Black)



LED Function	“Ready”	“Target”
Power Applied (No Target)	ON	OFF
Target Present	OFF	ON
Short Circuit Condition	FLASH	FLASH

Cable length	Part number
3	0859170003
6	0859170006
12	0859170012

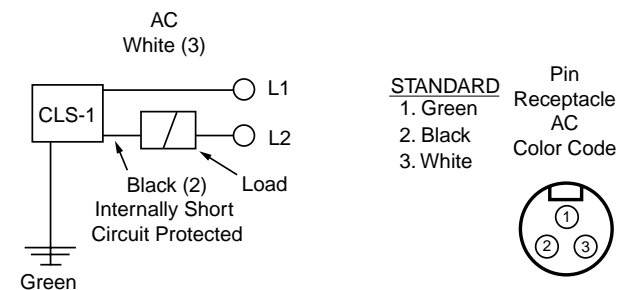
CLS

Connectors

The male quick disconnect on the Parker CLS-1 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

Cable length	Part number
3'	0853550003
6'	0853550006
9'	—
12'	0853550012



The connection for the CLS-4 are 144" PTFE insulated flying leads with 1/2" conduit hub. 3-wire: Common (black), Normally open (blue), and Normally closed (red).

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End-of-Stroke Proximity Sensors

PTR and HP Series Proximity Sensors

The inductive type proximity sensor provides end of rotation indication. The non-contact probe senses the presence of the ferrous cushion spear and has no springs, plungers, cams or dynamic seals that can wear out or go out of adjustment. The sensor is solid state and meets NEMA 3, 4, & 13 specifications. For ease of wiring, the connector housing is rotatable through 360°. To rotate, lift the cover latch, position, and release.

A standard proximity sensor controls 20-230 VAC/DC loads from 5 to 500 mA. The low 1.7 mA off-state leakage current can allow use for direct PLC input. The standard short circuit protection (SCP) protects the sensor from a short in the load or line upon sensing such a condition (5 amp or greater current) by assuming a non-conductive mode. The fault condition must be corrected and the power removed to reset the sensor preventing automatic restarts.

The low voltage DC sensor is also available for use with 10-30 VDC. This sensor is in a non-rotatable housing, but does incorporate the short circuit protection.

Both sensors are equipped with two LEDs, "Ready" and "Target". The "Ready" LED is lit when power is applied and the cushion spear is not present. The "Target" LED will light and the "Ready" LED will go out when the sensor is closed, indicating the presence of the cushion spear. Both LEDs flashing indicates a short circuit condition.

Notes:

1. Available with or without cushions.
2. Not available with stroke adjusters.
3. Pressure rating: 3000 PSIG
4. Operating temperature: -4°F to 150°F
5. Specify sensor type, orientation and voltage when ordering.
6. The low voltage DC sensor is available in non-rotatable style only, consult representative for further information.

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Inductive Proximity Sensors – 8mm Barrel Type

Proximity sensors are normally ordered with the unit as part of the model number. Use these part numbers for replacement parts only.

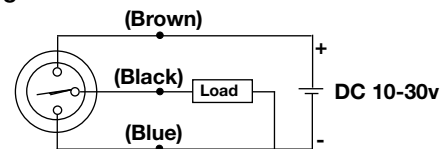
Ordering information

Series	PNP		NPN	
	Quick* connect	Flying leads	Quick ** connect	Flying leads
HB	B8830-P	913090000	B8830-N	913090100
P5L	B8830-P	913090000	B8830-N	913090100
WR	B8830-P	913090000	B8830-N	913090100

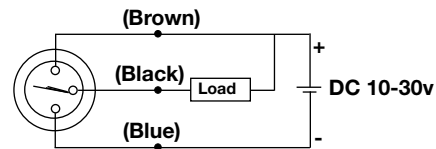
* Order cordset B8757-P separately.

** Order cordset B8757-N separately.

PNP wiring connection



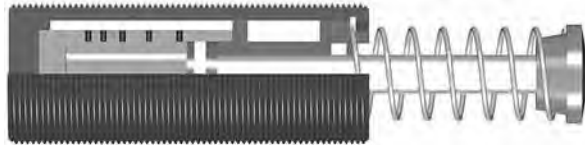
NPN wiring connection



Shock Absorbers

The use of one piece / closed end bodies and inner pressure chambers provides extremely strong construction, which can withstand much higher internal pressures and overload forces without mechanical damage.

The closed end / one piece bodies and inner pressure chambers, reduces the chance of sudden failure, or machine damage in the event of an overload.



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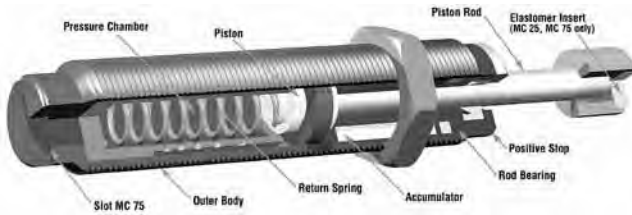
Shock
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Specifications

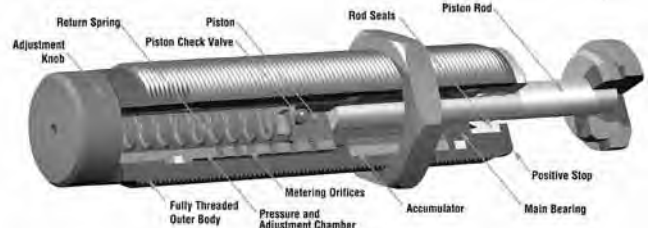
	Oil type	Materials	Mechanical stop	Lock nut
MC 9 - MC 75	Silicone	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.		Included
MC 150 - MC 600	Silicone	Steel body: Black oxide finish. Piston rod: Hardened stainless steel. Rolling seal: EPDM*	Must be provided 0.02 to 0.04 inch (0.5 to 1 mm) before end of stroke.	Included
SC 190 - SC 925	#5	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.	Integral mechanical stop built into front of units.	Included
SC 300 - SC 650	#5	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.	Integral mechanical stop built into front of units.	Included
MA 35 - MA 900	MA 35: #5 MA 150: Silicone MA 225, 600, 900: ATF	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.	Adjustment screw for optimum deceleration.	Included
MC 33 - MC 64 Self-Compensating	ATF	Steel body: Black oxide finish. Piston rod: Hardened, high tensile steel, chrome plated.		Included
MC 33 - MC 64 Adjustable	ATF	Rod end button: Hardened steel with black oxide finish. Return spring: Zinc plated	Turn front stop collar or rear adjuster against the scale marked 0 to 9 for optimum deceleration	Included
1-1/2" Bore Series	American 46	Steel body: Black oxide finish. Piston rod: Hardened, high tensile steel, chrome plated. Return spring: Zinc plated	Must be provided .09 inch (2.3 mm) before end of stroke.	
CA 2 - CA 4 Self-Compensating	ATF	Steel body: Black oxide finish. Piston rod: Hardened, high tensile steel, chrome plated.	Must be provided .09 inch (2.3 mm) before end of stroke.	
A 2 - A 3 Adjustable	ATF	Return spring: Zinc plated	Must be provided .09 inch (2.3 mm) before end of stroke.	

* Seal not compatible with petroleum based fluids) If unit to be used in contact with such fluids specify neoprene rolling seal. Consider the SC2 Series as an alternative.

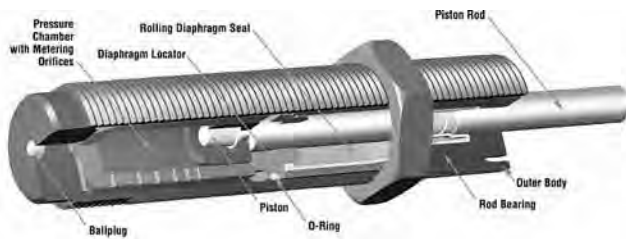
**Miniature shock absorbers
 MC 9 to MC 75
 Self-compensating**



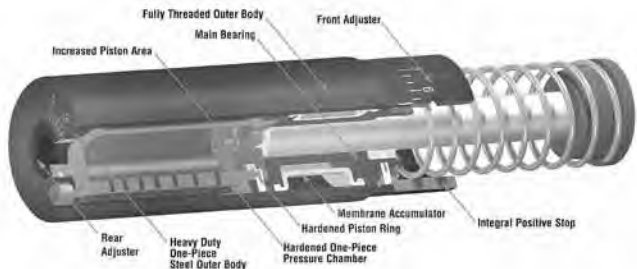
**MA series 225-900 shock absorbers
 (Miniature adjustable)
 Adjustable**



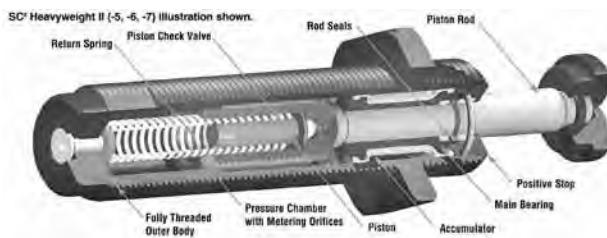
**Miniature shock absorbers
 MC 150, MC 225 and MC 600
 Self-Compensating**



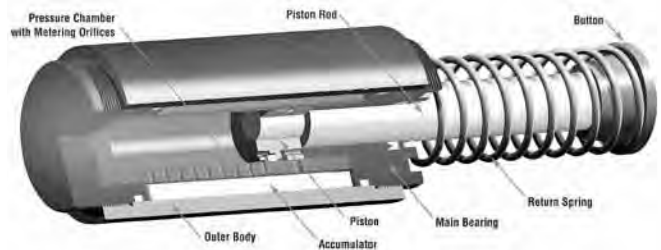
**Magnum series MA and ML 33 to 64
 Adjustable**



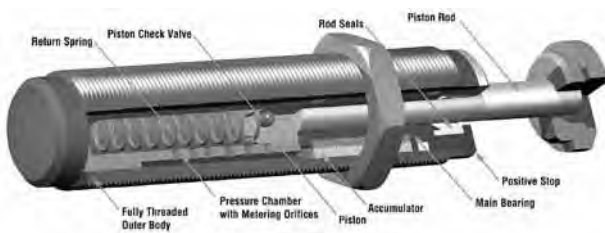
**Heavyweight shock absorbers
 SC 300 and SC 650
 Soft Contact and Self-Compensating**



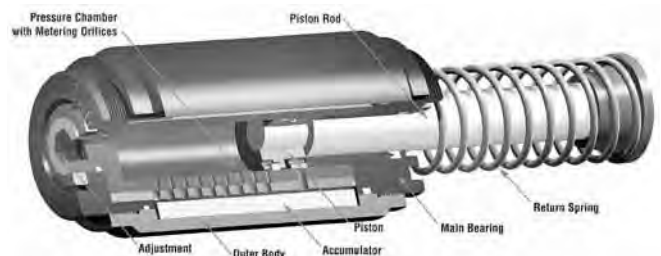
**Heavy industrial shock absorbers
 CA to CA 4
 Self-Compensating**



**Miniature shock absorbers
 SC 190 to SC 925
 Soft Contact and Self-Compensating**



**Heavy industrial shock absorbers
 A2 to A3
 Adjustable**



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Miniature Shock Absorbers MC 9 to MC 75 - Self-Compensating

Miniature Shock Absorbers are self-contained hydraulic units. The MC 9 to MC 75 model range has a very short overall length and low return force. Its small size allows for high energy absorption in confined spaces, while the wide effective weight ranges accommodate a variety of load conditions. With threaded outer bodies and multiple accessories, MC models can be mounted in numerous configurations.



Operating information

Impact velocity range:

MC 9:	0.5 to 6 ft/sec (0.15 to 1.8 m/sec)
MC 10:	0.5 to 5 ft/sec (0.15 to 1.5 m/sec)
MC 25:	0.5 to 8 ft/sec (0.15 to 2.4 m/sec)
MC 75:	0.5 to 12 ft/sec (0.15 to 3.66 m/sec)

Operating temperature:

MC 9 and MC 10:	14°F to 158°F (-10°C to 70°C)
MC 25:	32°F to 150°F (0°C to 66°C)
MC 75:	32°F to 150°F (0°C to 66°C)

Ordering information – Miniature MC series, self compensating

MC	75		-1	
MC series	Model number	Mounting thread	Effective weight	Button options
	9	MC9	MC9	MC9 & MC10
	10	M M6 x 1.0 metric	-1 Light	Standard, no button
	25	MC10	-2 Medium	-B Delrin button
	75	M M8 x 1.0 metric	MC10	MC25 & MC75
		E M8 x 0.75 metric	L Light range	Standard, with button
		MC25 Standard (UNEF)	H Heavy range	-NB *No button, short rod
		M Metric	MC25	-880 No button, standard rod
		MC75 Standard (UNEF)	L Light range	
		M Metric	Standard range	
			H Heavy range	
			MC75	
			-1 Light	
			-2 Medium	
			-3 Heavy	

* Consult factory for dimensional details.

Stroke inches 1 inch = 25.4 mm	E3 max. energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max. energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
0.20	9	1.35-7.0	18,000	N/A	N/A	MC 9-1
0.20	9	1.75-9.0	18,000			MC 9-2
0.20	4	0.75-6.0	35,000	N/A	N/A	MC 10L
0.20	7	1.5-11	35,000			MC 10H
0.25	20	1.5-5	120,000			MC 25L
0.25	20	4-12	120,000	N/A	N/A	MC 25
0.25	20	10-30	120,000			MC 25H
0.40	75	0.5-2.5	250,000			MC 75-1
0.40	75	2-14	250,000	N/A	N/A	MC 75-2
0.40	75	6-80	250,000			MC 75-3

Miniature Shock Absorbers MC 150 to MC 600 - Self-Compensating

Miniature Shock Absorbers

MC 150 to MC 600 model range, feature a hermetically sealed rolling diaphragm seal system that provides the highest possible cycle lifetime and an extremely low rod return force. These models can be directly mounted into the end cover of pneumatic cylinders to provide superior damping compared to normal cylinder cushions. Use of the optional stop collar is recommended to provide a positive mechanical stop. By adding the optional side load adapter (metric threaded models only), it is possible to accept side loads up to 25° from the axis.



Operating information

Impact velocity range: 0.26 to 19.7 ft/sec (0.08 to 6 m/sec)
 Operating temperature: 32°F to 150°F (0°C to 66°C)

Note: MC 150 to MC 600 models may be mounted into pressure chambers of pneumatic actuators.

Ordering information – Miniature MC series, self compensating

MC	225	□	-1	□	
MC series	Model number	Mounting thread		Effective weight	
	150	-	MC150, MC255, MC600		
	255	M	Standard range		
	600	ME*	H	Heavy range	
		ML**	H2	Extra heavy range	
				Button options	
				Standard, no button	
				-B	Delrin button
				-BS	Steel button

*MC 150 only **MC 600 only

Stroke inches 1 inch = 25.4 mm	E3 max. energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max. energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
0.50	150	2-22	300,000			MC 150
0.50	150	20-200	300,000	N/A	N/A	MC 150H
0.50	150	150-450	300,000			MC 150H2
0.50	225	5-55	400,000			MC 225
0.50	225	50-500	400,000	N/A	N/A	MC 225H
0.50	225	400-2,000	400,000			MC 225H2
1.00	600	20-300	600,000			MC 600
1.00	600	250-2,500	600,000	N/A	N/A	MC 600H
1.00	600	880-5,000	600,000			MC 600H2

SC² Series SC 190 to SC 925 - *Soft Contact & Self-Compensating*

SC² Series Miniature Shock Absorbers provide dual performance benefits. They offer **soft contact deceleration** where initial impact reaction forces are very low, with the advantages of **self-compensation** to react to changing energy conditions, without adjustment. They have long stroke lengths, **SC² 925 with 1.58 inch (40 mm) superstroke**, to provide smooth deceleration and low reaction forces.



Operating information

Impact velocity range: 0.5 to 12 ft/sec (0.15 to 3.66 m/sec)
 Operating temperature: 32°F to 150°F (0°C to 66°C)

Note: Integral mechanical stop built into front of units.

Ordering information – Miniature SC² series, soft contact and self compensating

SC	300	□	-1	□
SC ² series Soft Contact Self Compensating	Model number 190 300 650 925	Mounting thread – Standard (UNF) M Metric	Effective weight -1 Ultra light -2 Light -3 Medium -4 Heavy	Button options Standard with button -NB No button, short rod -BS No button, standard rod

Stroke inches 1 inch = 25.4 mm	E3 max. energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max. energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
0.63	225	3-15	300,000			SC 190-1
0.63	225	8-40	300,000	N/A	N/A	SC 190-2
0.63	225	20-100	300,000			SC 190-3
0.63	225	50-225	300,000			SC 190-4
0.75	300	3-18	400,000			SC 300-1
0.75	300	10-60	400,000	N/A	N/A	SC 300-2
0.75	300	30-180	400,000			SC 300-3
0.75	300	70-450	400,000			SC 300-4
1.00	650	17-100	600,000			SC 650-1
1.00	650	50-300	600,000	N/A	N/A	SC 650-2
1.00	650	150-900	600,000			SC 650-3
1.00	650	450-2,600	600,000			SC 650-4
1.58	975	30-200	800,000			SC 925-1
1.58	975	90-600	800,000	N/A	N/A	SC 925-2
1.58	975	250-1,600	800,000			SC 925-3
1.58	975	750-4,600	800,000			SC 925-4

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SC² Heavyweight Series SC 300 to SC 650 - Soft Contact & Self-Compensating

SC² 300 and SC² 650 Heavyweight Series Shock Absorbers deliver up to 950% of the effective weight capacity and 280% of the energy absorption capability of standard models. These durable units are ideal for decelerating heavy weights moving at low velocities. The Heavyweight Series design combines the piston and the inner tube into a single component, the piston tube. It acts as both the pressure creating and pressure controlling device.



Operating information

Impact velocity range: 0.3 to 12 ft/sec (0.9 to 3.66 m/sec)
 Operating temperature: 32°F to 150°F (0°C to 66°C)

Note: Integral mechanical stop built into front of units.

Ordering information – SC² series, soft contact and self compensating

SC	300	□	-1	□
SC ² series Soft Contact Self Compensating	Model number 300 650	Mounting thread – Standard (UNF) M Metric	Effective weight -5 Heavy -6 Heavy plus -7 Heavy duty -8 Extra heavy -9 Ultra heavy	Button options Standard with button -NB No button, short rod -880 No button, standard rod

Stroke inches 1 inch = 25.4 mm	E3 max. energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max. energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
0.59	650	25-100	400,000			SC 300-5
0.59	650	75-300	400,000			SC 300-6
0.59	650	200-400	400,000	N/A	N/A	SC 300-7
0.59	620	300-1,500	400,000			SC 300-8
0.59	620	700-4,300	400,000			SC 300-9
0.91	1,860	50-250	600,000			SC 650-5
0.91	1,860	200-800	600,000			SC 650-6
0.91	1,860	700-2,400	600,000	N/A	N/A	SC 650-7
0.91	1,860	1,700-5,800	600,000			SC 650-8
0.91	1,860	4,000-14,000	600,000			SC 650-9

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Miniature Shock Absorbers MA 35 to MA 900 - Adjustable

MA Series miniature shock absorbers offer a compact design with true linear deceleration, and are adjustable over a wide range of conditions. If your preference is a fully adjustable shock absorber rather than a self-compensating model on your application, then the MA Series provides a directly interchangeable alternative.



Operating information

Impact velocity range:
 MA35 3.3 ft/sec (1.0 m/sec)
 MA150, 225, 600, 900 0.5 to 12 ft/sec (0.15 to 3.66 m/sec)
 Operating temperature: 32°F to 150°F (0°C to 66°C)

Ordering information – MA series, adjustable

MA	225	-	□
MA series MA – Miniature Adjustable	Model number 35 150 225 600 900	Mounting thread - Standard (UNF) M Metric ME Fine metric (MA 150 Only)	Button options MA35 Standard with button -NB No button, short rod MA150 Standard, no button -B Nylon button -BS Steel button MA 225-900 Standard steel button -NB No button, short rod -880 No button, standard rod

Stroke inches 1 inch = 25.4 mm	E3 max energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
0.40	35	13-125	53,000			MA 35
0.50	150	2-200	300,000			MA 150
0.75	225	5-500	400,000	N/A	N/A	MA 225
1.00	600	20-3,000	600,000			MA 600
1.58	900	30-4,500	800,000	1,100,000 1,200,000	1,500,000 1,600,000	MA 900

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Shock Absorbers
 Actuator Products

Shock Absorbers

Magnum Series MC 33 to MC 64 - Self-Compensating

The **Magnum Series** offer you the capability to mount shock absorbers that contain the highest energy capacity ratings in the industry. **Up to 150% of the energy per cycle** of previous models in the same package size, means increased safety factors in a wider range of applications.

Up to 390% of the effective weight capacity of previous models, may allow a smaller, lower priced shock absorber to be mounted, to meet your application requirements.



Operating information

Impact velocity range:
 MC Models: 0.5 to 16.5 ft/sec (0.15 to 5 m/sec)
 Operating temperature: 10°F to 150°F (-12°C to 66°C)

Ordering information – MC series, self compensating

MC		3325			-		1		C	
Return method and accumulator style		Model number			Mounting thread		Effective weight		Mounting options	
MC	Self-contained spring return, internal accumulator	3325	4525	6450	-	Standard (UNF)	-1	Light range		Standard mount
MCA	Air return, external accumulator	3350	4550	64100	M	Metric	-2	Medium range		Flanged stop collar
MCS	Spring return, external accumulator	3625	4575	64150			-3	Heavy range		Rectangular flange*
MCN	Self return (clevis), internal accumulator	3650					-4	Heavier range		Square flange*
									-C	Clevis mount**
									-S	Side-foot mount**
									-P	Side port
									-Z	Within air cylinder

* Welded versions available upon request.
 ** Not available on MC 3625 and 3650 models.

Self-Compensating Models

Stroke inches 1 inch = 25.4 mm	E3 max. energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max. energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
0.91	1,350	20-80 68-272 230-920 780-3,120	670,000	1,100,000	1,500,000	MC 3325-1 MC 3325-2 MC 3325-3 MC 3325-4
1.91	2,700	40-160 136-544 460-1,840 1,560-6,240	760,000	1,200,000	1,600,000	MC 3350-1 MC 3350-2 MC 3350-3 MC 3350-4
0.91	1,350	20-80 68-272 230-920 780-3,120	670,000	1,100,000	1,500,000	MC 3625-1 MC 3625-2 MC 3625-3 MC 3625-4
1.91	2,700	40-160 136-544 460-1,840 1,560-6,240	760,000	1,200,000	1,600,000	MC 3650-1 MC 3650-2 MC 3650-3 MC 3650-4
0.91	3,000	50-200 170-680 575-2,300 1,950-7,800	950,000	1,400,000	1,700,000	MC 4525-1 MC 4525-2 MC 4525-3 MC 4525-4
1.91	6,000	100-400 340-1,360 1,150-4,600 3,900-15,600	1,000,000	1,700,000	2,200,000	MC 4550-1 MC 4550-2 MC 4550-3 MC 4550-4
2.91 1.91	9,000	150-600 510-2,040 1,730-6,920 5,850-23,400	1,300,000	2,000,000	2,500,000	MC 4575-1 MC 4575-2 MC 4575-3 MC 4575-4
	15,000	300-1,200 1,020-4,080 3,460-13,840 11,700-46,800	1,300,000	2,600,000	3,400,000	MC 6450-1 MC 6450-2 MC 6450-3 MC 6450-4
3.91	30,000	600-2,400 2,040-8,160 6,920-27,680 23,400-93,600	1,700,000	3,400,000	4,400,000	MC 64100-1 MC 64100-2 MC 64100-3 MC 64100-4
5.91	45,000	900-3,600 3,060-12,240 10,380-41,520 35,100-140,400	2,200,000	4,400,000	5,700,000	MC 64150-1 MC 64150-2 MC 64150-3 MC 64150-4

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Magnum Series MA & ML 33 to 64 - Adjustable

Magnum Series adjustable shock absorbers feature the latest seal technology, a hardened piston ring, pressure chamber and outer body for increased operating life. Additionally, these rugged units offer the unique feature of front or rear adjustment along with a fully threaded outer body for ease of installation.

Along with the self-compensating models, the adjustable range offers unprecedented increases in energy and effective weight capacity.



Operating information

Impact velocity range:

MA Models 0.5 to 16.5 ft/sec (0.15 to 5 m/sec)

ML Models 0.06 to 1.5 ft/sec (0.02 to 0.46 m/sec)

Operating temperature: 10°F to 150°F (-12°C to 66°C)

Ordering information – MA & ML (low velocity) series, adjustable

MA	3325	□	C																																																									
<table border="1"> <thead> <tr> <th colspan="2">Return method and accumulator style</th> </tr> </thead> <tbody> <tr> <td>MA</td> <td>Self-contained spring return, internal accumulator</td> </tr> <tr> <td>MAA</td> <td>Air return, external accumulator</td> </tr> <tr> <td>MAS</td> <td>Spring return, external accumulator</td> </tr> <tr> <td>MAN</td> <td>Self return (clevis), internal accumulator</td> </tr> <tr> <td>ML</td> <td>Self-contained spring return, internal accumulator*</td> </tr> <tr> <td>MLA</td> <td>Air return, external accumulator*</td> </tr> <tr> <td>MLS</td> <td>Spring return, external accumulator*</td> </tr> <tr> <td>MLN</td> <td>Self return (clevis), internal accumulator*</td> </tr> </tbody> </table>	Return method and accumulator style		MA	Self-contained spring return, internal accumulator	MAA	Air return, external accumulator	MAS	Spring return, external accumulator	MAN	Self return (clevis), internal accumulator	ML	Self-contained spring return, internal accumulator*	MLA	Air return, external accumulator*	MLS	Spring return, external accumulator*	MLN	Self return (clevis), internal accumulator*	<table border="1"> <thead> <tr> <th colspan="3">Model number</th> </tr> </thead> <tbody> <tr> <td>3325</td> <td>4525</td> <td>6450</td> </tr> <tr> <td>3350</td> <td>4550</td> <td>64100</td> </tr> <tr> <td>3625</td> <td>4575</td> <td>64150</td> </tr> <tr> <td>3650</td> <td></td> <td></td> </tr> </tbody> </table>	Model number			3325	4525	6450	3350	4550	64100	3625	4575	64150	3650			<table border="1"> <thead> <tr> <th colspan="2">Mounting thread</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>Standard (UNF)</td> </tr> <tr> <td>M</td> <td>Metric</td> </tr> </tbody> </table>	Mounting thread		-	Standard (UNF)	M	Metric	<table border="1"> <thead> <tr> <th colspan="2">Mounting options</th> </tr> </thead> <tbody> <tr> <td></td> <td>Standard mount</td> </tr> <tr> <td></td> <td>Flanged stop collar</td> </tr> <tr> <td></td> <td>Rectangular flange*</td> </tr> <tr> <td></td> <td>Square flange*</td> </tr> <tr> <td>-C</td> <td>Clevis mount**</td> </tr> <tr> <td>-S</td> <td>Side-foot mount**</td> </tr> <tr> <td>-P</td> <td>Side port</td> </tr> <tr> <td>-Z</td> <td>Within air cylinder</td> </tr> </tbody> </table>	Mounting options			Standard mount		Flanged stop collar		Rectangular flange*		Square flange*	-C	Clevis mount**	-S	Side-foot mount**	-P	Side port	-Z	Within air cylinder
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Stroke inches 1 inch = 25.4 mm	E3 max energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
0.91 1.91	1,500 3,000	20-3,800 28-5,400	670,000 760,000	1,100,000 1,200,000	1,500,000 1,600,000	MA 3325 MA 3350
0.91 1.91	1,500 3,000	20-3,800 28-5,400	670,000 760,000	1,100,000 1,200,000	1,500,000 1,600,000	MA 3625 MA 3650
0.91 1.91 2.91	3,450 6,900 10,350	95-22,000 150-32,000 155-33,000	950,000 1,000,000 1,300,000	1,400,000 1,700,000 2,000,000	1,700,000 2,200,000 2,500,000	MA 4525 MA 4550 MA 4575
1.91 3.91 5.91	18,000 36,000 54,000	480-110,000 600-115,000 730-175,000	1,300,000 1,700,000 2,200,000	2,600,000 3,400,000 4,400,000	3,400,000 4,400,000 5,700,000	MA 6450 MA 64100 MA 64150
0.91 1.91	1,500 3,000	.05-1.5 .05-1.5	670,000 760,000	1,100,000 1,200,000	1,500,000 1,600,000	ML 3325 ML 3350
0.91 1.91	1,500 3,000	.05-1.5 .05-1.5	670,000 760,000	1,100,000 1,200,000	1,500,000 1,600,000	ML 3625 ML 3650
0.91 1.91	3,450 6,900	.05-1.5 .05-1.5	950,000 1,000,000	1,400,000 1,700,000	1,700,000 2,200,000	ML 4525 ML 4550
0.91 1.91	9,000 18,000	.05-1.5 .05-1.5	1,100,000 1,300,000	2,200,000 2,600,000	2,900,000 3,400,000	ML 6425 ML 6450

1-1/2" Bore Series - Adjustable

1-1/2" bore series shock absorbers are designed for the toughest environments. These durable adjustable models provide outstanding deceleration over a wide range of effective weight conditions. Large energy capacities stop heavy loads set into motion by high propelling forces, without damage.



Operating information

Impact velocity range: 0.5 to 15 ft/sec (0.15 to 4.5 m/sec)
 Operating temperature: 10°F to 150°F (-12°C to 66°C)

Ordering information – 1-1/2" bore series, adjustable

A	1-1/2	6-1/2	F
Return method and accumulator style	Bore size	Stroke length	Mounting style
A Spring return, internal accumulator	1-1/2	2	-F Front flange
AA Air return, external accumulator		3-1/2	-R Rear flange
SA Spring return, external accumulator		5	-RF Front rectangular flange
NA Self return (clevis), internal accumulator		6-1/2	-RR Rear rectangular flange
			-S Side foot mount
			-C Clevis mount

Stroke inches 1 inch = 25.4 mm	E3 max energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
2.00	16,000	430-70,000	3,200,000	4,000,000	5,200,000	1-1/2x2
3.50	28,000	480-80,000	5,600,000	7,000,000	9,100,000	1-1/2x3-1/2
5.00	40,000	500-90,000	8,000,000	10,000,000	13,000,000	1-1/2x5
6.50	52,000	680-100,000	10,400,000	13,000,000	17,000,000	1-1/2x6-1/2

B
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Heavy Industrial Shock Absorbers CA 2 to CA 3 - Self-Compensating

CA 2" & CA 3" Bore Series of self-compensating shock absorbers are designed for extremely heavy duty applications and provide smooth deceleration under changing conditions. High energy capacities combined with wide effective weight ranges qualify these units to perform in the most demanding environments.



Operating information

Impact velocity range: 1 to 16.5 ft/sec (0.30 to 5 m/sec)
 Operating temperature: 10°F to 150°F (-12°C to 66°C)

Ordering information – CA 2 & CA 3 series, self-compensating

CA	2	x	8	R	-	3																																													
<table border="1"> <thead> <tr> <th colspan="2">Return method and accumulator style</th> </tr> </thead> <tbody> <tr> <td>CA</td> <td>Spring return, internal accumulator</td> </tr> <tr> <td>CAA</td> <td>Air return, external accumulator</td> </tr> <tr> <td>CSA</td> <td>Spring return, external accumulator</td> </tr> <tr> <td>CNA</td> <td>Self return (clevis), internal accumulator</td> </tr> </tbody> </table>		Return method and accumulator style		CA	Spring return, internal accumulator	CAA	Air return, external accumulator	CSA	Spring return, external accumulator	CNA	Self return (clevis), internal accumulator	<table border="1"> <thead> <tr> <th>Bore size</th> </tr> </thead> <tbody> <tr> <td>2</td> </tr> <tr> <td>3</td> </tr> </tbody> </table>	Bore size	2	3	<table border="1"> <thead> <tr> <th>Stroke length</th> </tr> </thead> <tbody> <tr> <td>2</td> </tr> <tr> <td>4</td> </tr> <tr> <td>5</td> </tr> <tr> <td>6</td> </tr> <tr> <td>8</td> </tr> <tr> <td>10</td> </tr> <tr> <td>12</td> </tr> </tbody> </table>	Stroke length	2	4	5	6	8	10	12	<table border="1"> <thead> <tr> <th colspan="2">Mounting style</th> </tr> </thead> <tbody> <tr> <td>-F</td> <td>Front flange</td> </tr> <tr> <td>-R</td> <td>Rear flange</td> </tr> <tr> <td>-RF</td> <td>Front rectangular flange</td> </tr> <tr> <td>-RR</td> <td>Rear rectangular flange</td> </tr> <tr> <td>-S</td> <td>Side foot mount</td> </tr> <tr> <td>-C</td> <td>Clevis mount</td> </tr> </tbody> </table>		Mounting style		-F	Front flange	-R	Rear flange	-RF	Front rectangular flange	-RR	Rear rectangular flange	-S	Side foot mount	-C	Clevis mount	<table border="1"> <thead> <tr> <th colspan="2">Effective weight</th> </tr> </thead> <tbody> <tr> <td>-1</td> <td>Light</td> </tr> <tr> <td>-2</td> <td>Medium light</td> </tr> <tr> <td>-3</td> <td>Medium heavy</td> </tr> <tr> <td>-4</td> <td>Heavy</td> </tr> </tbody> </table>	Effective weight		-1	Light	-2	Medium light	-3	Medium heavy	-4	Heavy
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Stroke inches 1 inch = 25.4 mm	E3 max energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
2.00	32,000	1,600-4,800 4,000-12,000 10,000-30,000 25,000-75,000	9,600,000	12,000,000	15,600,000	CA 2x2-1 CA 2x2-2 CA 2x2-3 CA 2x2-4
4.00	64,000	3,200-9,600 8,000-24,000 20,000-60,000 50,000-150,000	12,000,000	15,000,000	19,500,000	CA 2x4-1 CA 2x4-2 CA 2x4-3 CA 2x4-4
6.00	96,000	4,800-14,400 12,000-36,000 30,000-90,000 75,000-225,000	14,400,000	18,000,000	23,500,000	CA 2x6-1 CA 2x6-2 CA 2x6-3 CA 2x6-4
8.00	128,000	6,400-19,200 16,000-48,000 40,000-120,000 100,000-300,000	16,800,000	21,000,000	27,000,000	CA 2x8-1 CA 2x8-2 CA 2x8-3 CA 2x8-4
10.00	160,000	8,000-24,000 20,000-60,000 50,000-150,000 125,000-375,000	19,200,000	24,000,000	31,000,000	CA 2x10-1 CA 2x10-2 CA 2x10-3 CA 2x10-4
5.00	125,000	6,400-19,200 16,000-48,000 40,000-120,000 100,000-300,000	20,000,000	25,000,000	32,500,000	CA 3x5-1 CA 3x5-2 CA 3x5-3 CA 3x5-4
8.00	200,000	10,240-30,720 25,600-76,800 64,000-192,000 160,000-480,000	32,000,000	40,000,000	52,000,000	CA 3x8-1 CA 3x8-2 CA 3x8-3 CA 3x8-4
12.00	300,000	15,360-46,080 38,400-115,200 96,000-288,000 240,000-720,000	48,000,000	60,000,000	78,000,000	CA 3x12-1 CA 3x12-2 CA 3x12-3 CA 3x12-4

Heavy Industrial Shock Absorbers CA 4 - Self-Compensating

CA 4" Bore Series of self-compensating shock absorbers are designed for extremely heavy duty applications and provide smooth deceleration under changing conditions. High energy capacities combined with wide effective weight ranges qualify these units to perform in the most demanding environments.



Operating information

Impact velocity range: 1 to 16.5 ft/sec (0.30 to 5 m/sec)
 Operating temperature: 10°F to 150°F (-12°C to 66°C)

Ordering information – CA 4 series, self-compensating

CA	4	x	8	R	-	5
Return method and accumulator style	Bore size		Stroke length	Mounting style		Effective weight
CA Spring return, internal accumulator	4		6	-F Front flange		-3 Light
CAA Air return, external accumulator			8	-R Rear flange		-5 Medium
CSA Spring return, external accumulator			16	-RP Rear standard		-7 Heavy
CNA Self return (clevis), internal accumulator				-FP Front standard		
				-FRP Front and rear standard		
				-S Side foot mount		
				-C Clevis mount		

Stroke inches 1 inch = 25.4 mm	E3 max energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
6.00	420,000	8,000-19,000	27,000,000	45,000,000	58,000,000	CA 4x6-3
6.00	420,000	19,000-41,000	27,000,000	45,000,000	58,000,000	CA 4x6-5
6.00	420,000	41,000-94,000	27,000,000	45,000,000	58,000,000	CA 4x6-7
8.00	560,000	11,000-25,000	30,000,000	50,000,000	65,000,000	CA 4x8-3
8.00	560,000	25,000-55,000	30,000,000	50,000,000	65,000,000	CA 4x8-5
8.00	560,000	55,000-125,000	30,000,000	50,000,000	65,000,000	CA 4x8-7
16.00	1,120,000	22,000-50,000	50,000,000	85,000,000	110,000,000	CA 4x16-3
16.00	1,120,000	50,000-110,000	50,000,000	85,000,000	110,000,000	CA 4x16-5
16.00	1,120,000	110,000-250,000	50,000,000	85,000,000	110,000,000	CA 4x16-7

B
 Shock Absorbers
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Heavy Industrial Shock Absorbers A 2 and A 3 - Adjustable

A 2 and A 3 Series adjustable shock absorbers are capable of decelerating heavy duty loads. These reliable units replace the former 2" and 3" large bore adjustable shock absorbers.

Features include a considerably reduced outer diameter, internal accumulator and threaded mounting brackets, easily adaptable to the front or rear of the outer body.



Operating information

Impact velocity range: 0.33 to 16.5 ft/sec (0.1 to 5 m/sec)
 Operating temperature: 10°F to 150°F (-12°C to 66°C)

Ordering information – A 2 & A 3 series, adjustable

A	2	x	8	-	R
Return method and accumulator style		Bore size	Stroke length	Mounting style	
A	Spring return, internal accumulator	2	2	-F	Front flange
AA	Air return, external accumulator	3	4	-R	Rear flange
SA	Spring return, external accumulator		5	-RF	Front rectangular flange
NA	Self return (clevis), internal accumulator		6	-RR	Rear rectangular flange
				-S	Side foot mount
				-C	Clevis mount

Note: A no button option is available on the 3" Bore only as a special.

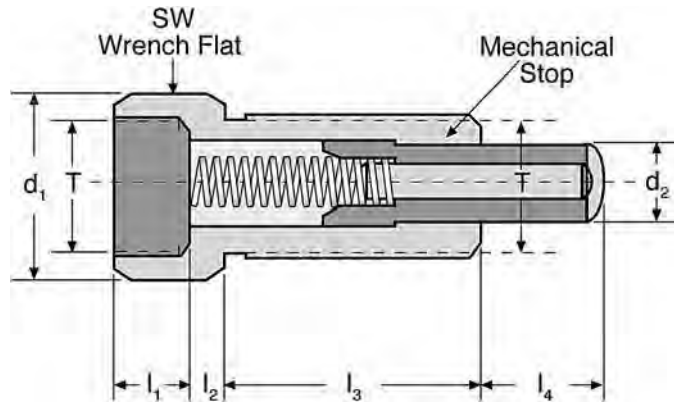
Stroke inches 1 inch = 25.4 mm	E3 max energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour			Model number
			Self-contained	A/O tank	A/O Re-circulating	
2.00	32,000	560-170,000	9,600,000	12,000,000	15,600,000	A 2x2
4.00	80,000	510-160,000	12,000,000	15,000,000	19,500,000	A 2x4
6.00	120,000	570-190,000	14,400,000	18,000,000	23,500,000	A 2x6
8.00	170,000	580-200,000	16,800,000	21,000,000	27,000,000	A 2x8
10.00	210,000	720-250,000	19,200,000	24,000,000	31,000,000	A 2x10
5.00	140,000	1,050-340,000	20,000,000	25,000,000	32,500,000	A 3x5
8.00	250,000	1,200-400,000	32,000,000	40,000,000	52,000,000	A 3x8
12.00	390,000	1,350-450,000	48,000,000	60,000,000	78,000,000	A 3x12

B

Shock Absorbers
 Actuator Products

Shock
 Absorbers

Miniature Shock Absorber Side Load Adapters



Dimensions Inches (Millimeters)

MC, MVC Series model	SC Series model	MA Series model	Side load adapter	T	d1	d2	l1	l2	l3	l4	SW	Maximum side load (α)
MC 150M	N/A	MA 150M	250-0558	M14 x 1.5	0.70 (18)	0.35 (9)	0.31 (8)	0.15 (4)	0.78 (20)	0.49 (12.5)	0.62 (16)	25°
MC 225M	N/A	N/A	250-0559	M20 x 1.5	0.94 (24)	0.47 (12)	0.39 (10)	0.15 (4)	0.78 (20)	0.49 (12.5)	0.86 (22)	25°
MC 600M	N/A	N/A	250-0560	M25 x 1.5	1.18 (30)	0.62 (16)	0.39 (10)	0.23 (6)	1.50 (38)	0.98 (25)	1.06 (27)	25°
N/A	SC190M-880*	N/A	250-0080	M14 x 1.5	0.70 (18)	0.35 (9)	0.39 (10)	0.15 (4)	1.02 (26)	0.62 (16)	0.62 (16)	25°
MVC 225M-880*	SC 300M-880*	MA 225M-880*	250-0081	M20 x 1.5	0.94 (24)	0.47 (12)	0.39 (10)	0.15 (4)	1.25 (32)	0.75 (19)	0.86 (22)	25°
MVC 600M-880*	SC 650M-880*	MA 600M-880*	250-0082	M25 x 1.5	1.18 (30)	0.62 (16)	0.39 (10)	0.23 (6)	1.50 (38)	0.98 (25)	1.06 (27)	25°

Note: Side load not to exceed 5". Maximum side load depends on application, shock absorber model, and stroke length.

Note: The side load adapter can only be installed on select metric shock absorbers without rod end button.

Magnum Series Group Accessories

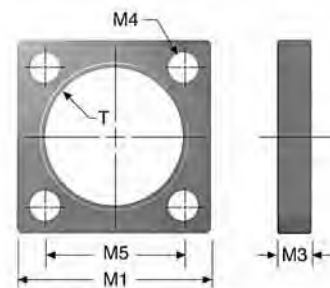
Square and Rectangular Flanges Inches (Millimeters)

Used with	Square flange	Rect flange	T	M1	M2	M3	M4	M5	M6
MA 33 ML 33 MC 33		250-0016	1-1/4-12 UNF	1.50 (38.1)	2.00 (50.8)	0.38 (9.5)	.219 (5.6)	1.12 (28.4)	1.62 (41.2)
MA 33M ML 33M MC 33M	N/A	250-0293	M33x1.5	1.62 (41.1)	2.12 (53.8)	0.38 (9.5)	.278 (7.1)	1.10 (28.0)	1.65 (42.0)
MA 36 ML 36 MC 36		250-0633	1-3/8-12 UNF	1.75 (44.4)	2.00 (50.8)	0.38 (9.5)	.219 (5.6)	1.12 (28.4)	1.62 (41.2)
MA 36M ML 36M MC 36M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MA 45 ML 45 MC 45	250-0023	250-0024	1-3/4-12 UN	2.25 (57.2)	3.00 (76.2)	0.50 (12.7)	0.34 (8.7)	1.62 (41.2)	2.38 (60.5)
MA 45M ML 45M MC 45M	250-0298	250-0299	M45x1.5	2.25 (57.2)	3.00 (76.2)	0.50 (12.7)	0.35 (8.8)	1.62 (41.2)	2.38 (60.5)
MA 64 ML 64 MC 64	250-0028	N/A	2-1/2-12 UN	3.50 (88.9)	N/A	0.62 (15.9)	0.41 (10.4)	2.75 (69.6)	N/A
MA 64M ML 64M MC 64M	250-0302	N/A	M64x2	3.50 (88.9)	N/A	0.62 (15.9)	0.41 (10.4)	2.75 (69.6)	N/A

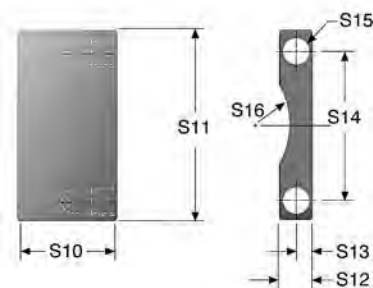
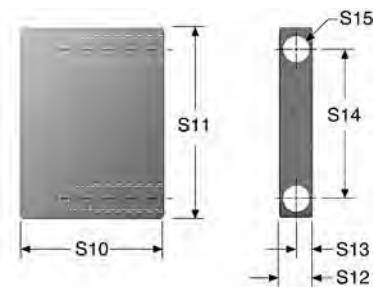
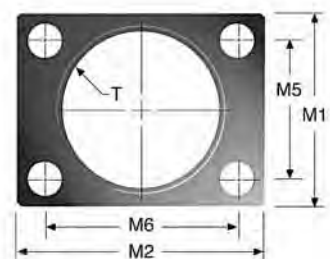
Stop Bars Inches (Millimeters)

Used with	Part #	S10	S11	S12	S13	S14	S15	S16
MA 33 ML 33 MC 33	250-0426	1.28 (32.5)	1.50 (38.1)	0.38 (9.7)	0.19 (4.8)	1.12 (28.4)	10-32 UNF	N/A
MA 33M ML 33M MC 33M	250-0427	1.28 (32.5)	1.50 (38.1)	0.38 (9.7)	0.19 (4.8)	1.12 (28.4)	M5x0.8	N/A
MA 36 ML 36 MC 36	250-0426	1.28 (32.5)	1.50 (38.1)	0.38 (9.7)	0.19 (4.8)	1.12 (28.4)	10-32 UNF	N/A
MA 36M ML 36M MC 36M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MA 45 ML 45 MC 45	250-0428	1.03 (26.2)	2.25 (57.2)	0.63 (16.0)	0.31 (7.9)	1.62 (41.3)	5/16-24 UNF	N/A
MA 45M ML 45M MC 45M	250-0639	1.03 (26.2)	2.25 (57.2)	0.63 (16.0)	0.31 (7.9)	1.62 (41.3)	M8x1.25	N/A
MA 6450 MA 64100 ML 6425 ML 6450 MC 6450 MC 64100	250-0430	1.44 (36.5)	3.50 (88.9)	0.50 (12.7)	0.25 (6.4)	2.75 (69.8)	3/8-24 UNF	1.37 (34.8)
MA 6450M MA 64100M ML 6425M ML 6450M MC 6450M MC 64100M	250-0640	1.44 (36.5)	3.50 (88.9)	0.50 (12.7)	0.25 (6.4)	2.75 (69.8)	M10x1.5	1.37 (34.8)
MA 64150 MC 64150	250-0432	2.31 (57.7)	3.50 (88.9)	0.50 (12.7)	0.25 (6.4)	2.75 (69.8)	3/8-24 UNF	1.37 (34.8)
MA 64150M MC 64150M	250-0641	2.31 (57.7)	3.50 (88.9)	0.50 (12.7)	0.25 (6.4)	2.75 (69.8)	M10x1.5	1.37 (34.8)
MAA 64150 MCA 64150	250-0435	2.18 (55.4)	3.50 (88.9)	0.50 (12.7)	0.25 (6.4)	2.75 (69.8)	3/8-24 UNF	1.37 (34.8)
MAA 64150M MCA 64150M	250-0649	2.18 (55.4)	3.50 (88.9)	0.50 (12.7)	0.25 (6.4)	2.75 (69.8)	M10x1.5	1.37 (34.8)

Square Flange



Rectangular Flange



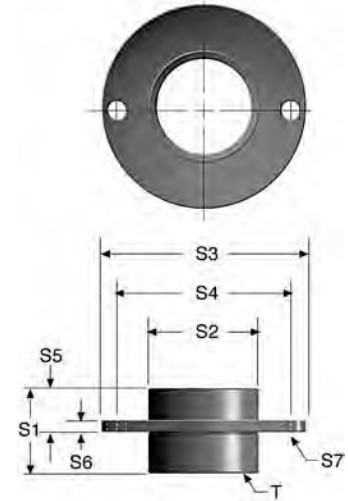
Hard metric stop bars available upon request.

Stop bars come in pairs, two bars per package.

Magnum Series Group Accessories

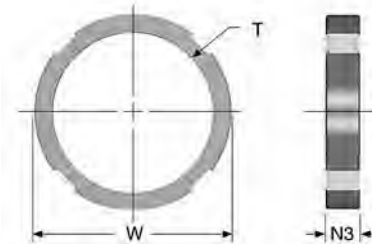
Flanged Stop Collars In Inches (Millimeters)

Used With	Part #	T	S1	S2	S3	S4	S5	S6	S7
MA 33 ML 33 MC 33	250-0070	1-1/4-12 UNF	2.00 (50.8)	1.50 (38.1)	2.50 (63.5)	2.00 (50.8)	0.88 (22.4)	0.25 (6.4)	0.282 (7.16)
MA 33M ML 33M MC 33M	250-0071	M33x1.5	2.00 (50.8)	1.50 (38.1)	2.50 (63.5)	2.00 (50.8)	0.88 (22.4)	0.25 (6.4)	0.282 (7.16)
MA 36 ML 36 MC 36 MA 36M ML 36M MC 36M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MA 45 ML 45 MC 45	250-0072	1-3/4-12 UN	1.85 (47.0)	2.25 (57.2)	3.25 (82.6)	2.75 (69.6)	0.88 (22.4)	0.25 (6.4)	0.282 (7.16)
MA 45M ML 45M MC 45M	250-0073	M45x1.5	1.85 (47.0)	2.25 (57.2)	3.25 (82.6)	2.75 (69.9)	0.88 (22.4)	0.25 (6.4)	0.282 (7.16)
MA 6450 ML 64100 MC 6450 MC 64100	250-0074	2-1/2-12 UN	2.25 (57.2)	3.00 (76.2)	4.25 (108.0)	3.50 (88.9)	1.00 (25.4)	0.38 (9.7)	0.282 (7.16)
MA 6450M ML 64100M MC 6450M MC 64100M	250-0075	M64x2	2.25 (57.2)	3.00 (76.2)	4.25 (108.0)	3.50 (88.9)	1.00 (25.4)	0.38 (9.7)	0.282 (7.16)
MA 64150 MC 64150	250-0076	2-1/2-12 UN	3.13 (79.4)	3.00 (76.2)	4.25 (108.0)	3.50 (88.9)	1.00 (25.4)	0.38 (9.7)	0.282 (7.16)
MA 64150M MC 64150M	250-0077	M64x2	3.13 (79.4)	3.00 (76.2)	4.25 (108.0)	3.50 (88.9)	1.00 (25.4)	0.38 (9.7)	0.282 (7.16)

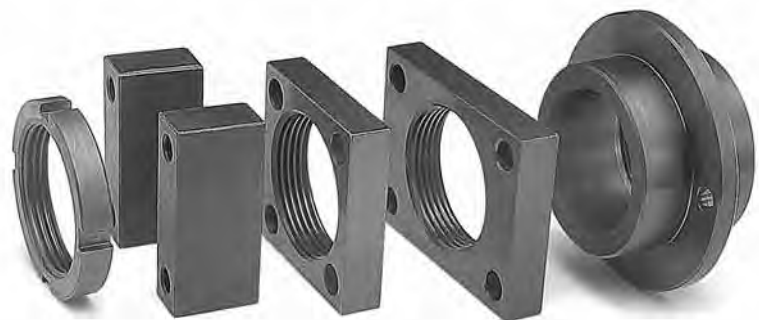


Lock Nuts Inches (Millimeters)

Used With	Part #	T	W	N3
MA 33 ML 33 MC 33	250-0038	1-1/4-12 UN	1.50 (38.1)	0.25 (6.4)
MA 33M ML 33M MC 33M	250-0292	M33x1.5	1.56 (39.6)	0.25 (6.4)
MA 36 ML 36 MC 36	250-0631	1-3/8-12 UNF	1.75 (44.5)	0.25 (6.4)
MA 36M ML 36M MC 36M	250-0537	M36x1.5	1.75 (44.5)	0.25 (6.4)
MA 45 ML 45 MC 45	250-0041	1-3/4-12 UN	2.25 (57.2)	0.37 (9.4)
MA 45M ML 45M MC 45M	250-0297	M45x1.5	2.25 (57.2)	0.37 (9.4)
MA 64 ML 64 MC 64	250-0042	2-1/2-12 UN	3.00 (76.2)	0.37 (9.4)
MA 64M ML 64M MC 64M	250-0302	M64x2	3.00 (76.2)	0.37 (9.4)



One lock nut included with each shock absorber where appropriate.



B Shock Absorbers Actuator Products Shock Absorbers

Side-Foot Mount Assembly



Side-Foot Mount Assembly

Used With	Part #	Used With	Part #
MA 33 ML 33 MC 33	250-0015	MA 6450 MA 64100 ML 6425	250-0300
MA 33M ML 33M MC 33M	250-0294	ML 6450 MC 6450 MC 64100	
MA 36 ML 36 MC 36	N/A	MA 6450M MA 64100M ML 6425M	250-0306
MA 36M ML 36M MC 36M	N/A	ML 6450M MC 6450M MC 64100M	
MA 45 ML 45 MC 45	250-0025	MA 64150 MC 64150	250-0030
MA 45M ML 45M MC 45M	250-0300	MA 64150M MC 64150M	250-0306

Clevis Mount Assembly



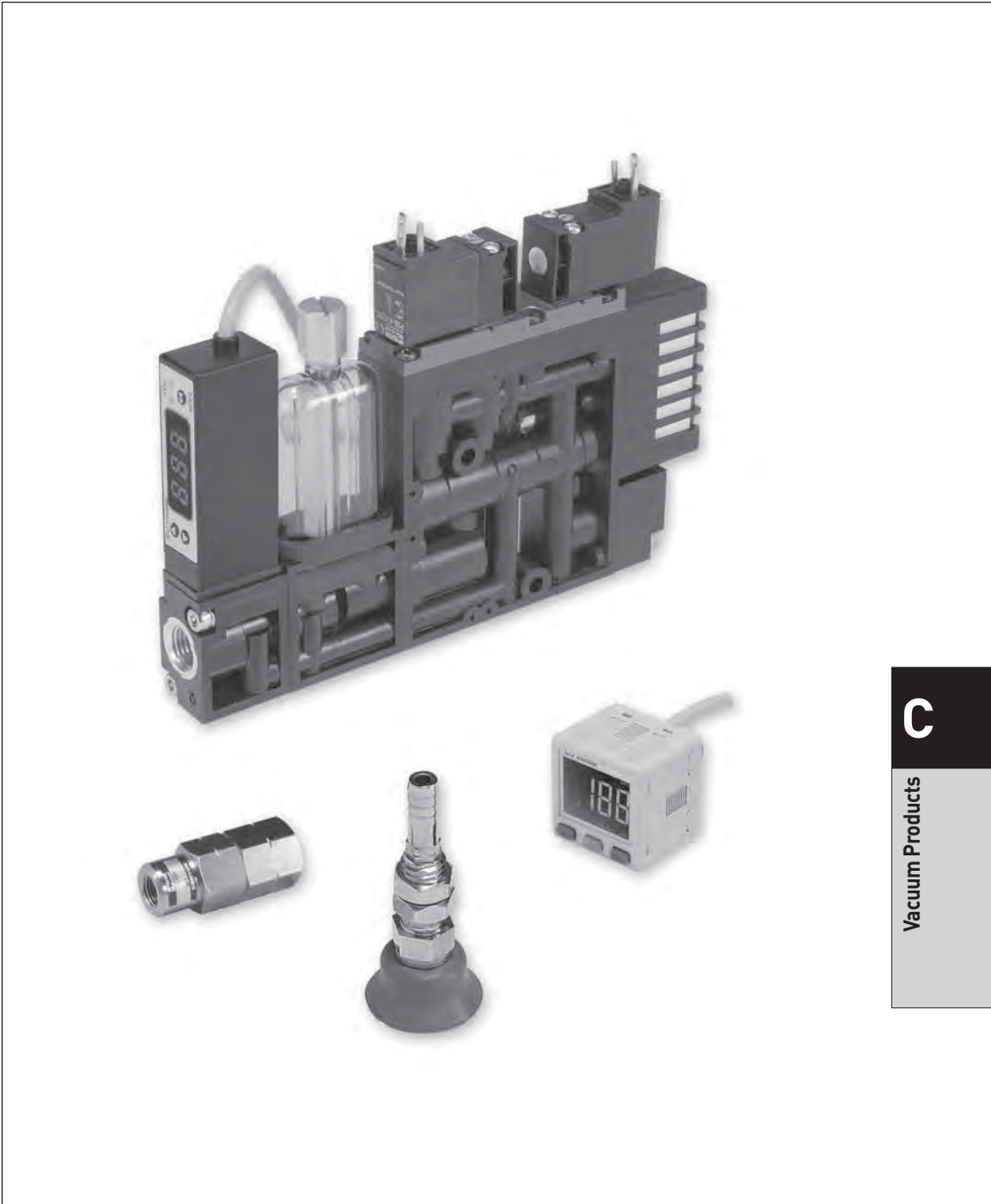
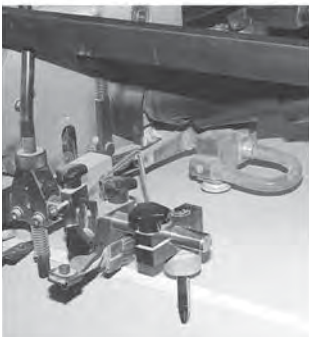
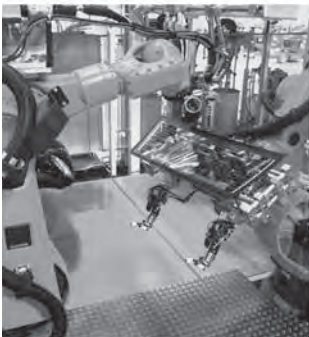
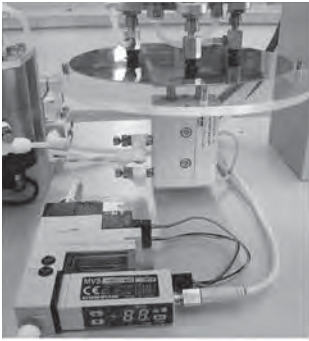
Clevis Mount Assembly

Used With	Part #	Used With	Part #
MA 33 ML 33 MC 33 MAS MLS MCS	250-0225	ML 6425 ML 6425M	250-0625 250-0626
MA 33M ML 33M MC 33M MAS 33M MLS 33M MCS 33M	250-0323	MA 6450 ML 6450 MC 6450	250-0625
		MA 6450M ML 6450M MC 6450M	250-0626
		MA 64100 MC 64100	250-0625
		MA 64100M MC 64100M	250-0626
MAN 33 MLN 33 MCN 33 MAA 33 MLA 33 MCA 33	250-0018	MAN 64150 MCN 64150 MAA 64150 MCA 64150	250-0625
		MAN 64150M MCN 64150M	250-0626
MAN 33M MLN 33M MCN 33M MAA 33M MLA 33M MCA 33M	250-0322	MAA 64150M MCA 64150M	
		MA 64150 MCA 64150 MAS 64150 MCS 64150	250-0627
MA 45 ML 45 MC 45	250-0324	MA 64150M MCA 64150M MAS 64150M MCS 64150M	250-0628
MA 45M ML 45M MC 45M	250-0325		

B
 Shock Absorbers
 Actuator Products
 Shock Absorbers

B

Actuator Products



C
Vacuum Products

Vacuum Products

Vacuum Cups

PFG Flat Cups



- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Low profile design makes flat pads ideal for fast response.
- Cup Sizes: 1.5mm to 200mm

C4

PBG Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and flexible products
- Cup sizes: 10mm to 150mm

C17

P5V-CFS Flat Cups



- Precision molded double lip flat cup for slightly curved surfaces
- Double lip for additional security. If outside lip bends and loses its seal, the inner lip remains sealed.
- Outer ribs prevent the cup lip from being cut
- Cup Sizes: 50mm to 150mm

C29

PJG Short Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and slightly flexible products
- Shorter stroke provides fast response
- Cup sizes: 6mm to 80mm

C30

PCG Multiple Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, or curved surfaces
- 2-1/2 bellows design minimizes contact pressure applied to products
- Cup sizes: 5mm to 90mm

C42

PUGB Flat Swivel Cups



- 30° swivel single lip flat cup for smooth surfaces, slightly curved surfaces, and flexible products
- Rigid stem or level compensator provides good stability for horizontal lift
- Cup Sizes: 60mm to 100mm

C50

Vacuum Generators

MCA, CV, CV-CK Inline Generators



- MCA: Light weight vacuum generator
- CV: Basic aluminum body vacuum generator
- CV-CK: Basic aluminum body vacuum generator with mechanical switch for part present confirmation

C54

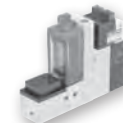
CHF Inline Generators



- CHF- High Flow Series is a multistage vacuum generator
- Intended for high flow vacuum applications
- Ideal for porous applications
- Standard with flow thru exhaust mufflers to reduce clogging in dirty environments

C56

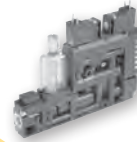
MC22 Integrated Generators



- Compact vacuum generator includes vacuum and blow-off solenoids and vacuum filters
- Optional check valve and MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 8 stations

C58

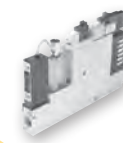
MC72 Integrated Generators



- Light weight vacuum generator includes vacuum and blow-off solenoids.
- Includes check valve, vacuum filter and optional MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 5 stations

C61

CEK Integrated Generators



- Air-economizing functions with emergency stop logic that maintains degree of vacuum with loss of output power
- Includes vacuum and blow-off solenoids, check valve, vacuum filter and optional MPS-23 pressure sensor
- Inline versions can be mounted in manifolds up to 5 stations

C64

CVXCEK Integrated Generators




- Basic 2 station CEK generator manifold with additional electrical capabilities
- Integrates MPS-23 sensor for on board air-economizing programming
- M12 electrical wiring package with optional 18-pin single connection

C67

Vacuum Generator Sensors


MPS-23 Integrated Generator Sensors



- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C69

MVS-201 Integrated Generator Sensors




- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C71

Pressure Sensors / Cables


MPS-33 Pressure Sensors



- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C73


MPS-34 Pressure Sensors



- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C75


SCP01 Pressure Sensor



- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

C77

SCPSD Pressure Sensors




- CV-CK is a Venturi Generator with adjustable open contact mechanical switch for vacuum confirmation.
- Great for low cost vacuum confirmation.

C78

Cables – continued

Cables




- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: swivel straight or angled
- IP67 swivel connector

C80

Vacuum Generator Accessories


FSV Metered Flow Sensing Valve



- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter

C81


CH01 One Way Check Valve



- Poppet design
- Low leakage
- Low cracking pressure

C82


VF & VFL Vacuum Filters



- Filters the vacuum system to protect the components from damaging particles absorbed from the environment
- Elements easily replaced

C83


VFP Vacuum Filters



- Provides easy monitoring, economy and safety
- 10 micron porous plastic element prolongs element life
- Shatterproof and airtight
- Replaceable filter element

C84

Vacuum Silencers



- Pressure up to 128 PSIG
- Temperature 41°F to 132°F (5°C to 55.5°C)
- Silencing effect 20 dB

C85

PFG Flat Vacuum Cup Series

Exceptional for any smooth flat or surface that will benefit from stability and fast response of the cup design. This is a multi-versatile and multi-industry cup. Typical applications could be chip mounting, electrical components, semiconductor chips, glass, injection mold, sheet metal, press transfer, fixtures, woodworking.

Features

- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Universal flat design for most smooth surface applications
- Stable vertical / horizontal lift
- Strong low profile design for fast response needed for short cycles
- 5mm to 200mm diameters
- Bottom cleats on 60 to 200mm diameters



Styles

- PFTM series male thread connector
- PFTF series female thread connector
- PFTK series barbed bulkhead
- PFYK series 90° barbed adapter
- PFTYS series bulkhead level compensator

Operating information

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*	Urethane
Material code	NBR	NBRE	SI	SIE	U
Operating temperature	-20°C to 120°C (-4°F to 248°F)	0°C to 60°C (32°F to 40°F)	-60° to 250°C (-76°F to 482°F)	-10° to 130°C (-14°F to 266°F)	-20° to 75°C (-4°F to 167°F)
Color	Black	Black / Blue Dot	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	5 to 15	—

* ESD: Electric Static Dissipative Material

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PFTM-20B-NBR-G1 becomes PFTM-20B-U-G1. Inquire with factory for availability.

Application guide

Flat - Smooth surface



Flat surface, thin section



Flat surface, any section



Slightly bowed surface, thin section



Slightly bowed surface, any section



Metal sheet handling



Corrugated sheet handling



Ø 120/200 only

High lifting force



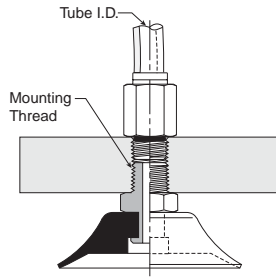
Vertical lift

PFTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
 Fitting material: aluminum.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PFTM-5A-NBR-M5	PFG-5A-NBR	PFTM-5A-SI-M5	PFG-5A-SI	FTM-5A-M5H
5	1/8 BSPP	PFTM-5A-NBR-G1	PFG-5A-NBR	PFTM-5A-SI-G1	PFG-5A-SI	FTM-5A-G1
6	M5	PFTM-6A-NBR-M5	PFG-6A-NBR	PFTM-6A-SI-M5	PFG-6A-SI	FTM-5A-M5H
6	1/8 BSPP	PFTM-6A-NBR-G1	PFG-6A-NBR	PFTM-6A-SI-G1	PFG-6A-SI	FTM-5A-G1
8	M5	PFTM-8A-NBR-M5	PFG-8A-NBR	PFTM-8A-SI-M5	PFG-8A-SI	FTM-5A-M5H
8	1/8 BSPP	PFTM-8A-NBR-G1	PFG-8A-NBR	PFTM-8A-SI-G1	PFG-8A-SI	FTM-5A-G1
10	M5	PFTM-10A-NBR-M5	PFG-10A-NBR	PFTM-10A-SI-M5	PFG-10A-SI	FTM-5A-M5H
10	1/8 BSPP	PFTM-10A-NBR-G1	PFG-10A-NBR	PFTM-10A-SI-G1	PFG-10A-SI	FTM-5A-G1
15	M5	PFTM-15A-NBR-M5	PFG-15A-NBR	PFTM-15A-SI-M5	PFG-15A-SI	FTM-5A-M5H
15	1/8 BSPP	PFTM-15A-NBR-G1	PFG-15A-NBR	PFTM-15A-SI-G1	PFG-15A-SI	FTM-5A-G1
20	1/8 BSPP	PFTM-20B-NBR-G1	PFG-20B-NBR	PFTM-20B-SI-G1	PFG-20B-SI	FTM-20B-G1H
20	1/4 BSPP	PFTM-20B-NBR-G2	PFG-20B-NBR	PFTM-20B-SI-G2	PFG-20B-SI	FTM-20B-G2
20	M10	PFTM-20B-NBR-M10	PFG-20B-NBR	PFTM-20B-SI-M10	PFG-20B-SI	FTM-20B-M10
20	1/8 NPT	PFTM-20B-NBR-N1	PFG-20B-NBR	PFTM-20B-SI-N1	PFG-20B-SI	FTM-20B-N1
30	1/8 BSPP	PFTM-30-NBR-G1	PFG-30-NBR	PFTM-30-SI-G1	PFG-30-SI	FTM-20B-G1H
30	1/4 BSPP	PFTM-30-NBR-G2	PFG-30-NBR	PFTM-30-SI-G2	PFG-30-SI	FTM-20B-G2
30	M10	PFTM-30-NBR-M10	PFG-30-NBR	PFTM-30-SI-M10	PFG-30-SI	FTM-20B-M10
30	1/8 NPT	PFTM-30-NBR-N1	PFG-30-NBR	PFTM-30-SI-N1	PFG-30-SI	FTM-20B-N1
40	1/8 BSPP	PFTM-40-NBR-G1	PFG-40-NBR	PFTM-40-SI-G1	PFG-40-SI	FTM-20B-G1H
40	1/4 BSPP	PFTM-40-NBR-G2	PFG-40-NBR	PFTM-40-SI-G2	PFG-40-SI	FTM-20B-G2
40	M10	PFTM-40-NBR-M10	PFG-40-NBR	PFTM-40-SI-M10	PFG-40-SI	FTM-20B-M10
40	1/8 NPT	PFTM-40-NBR-N1	PFG-40-NBR	PFTM-40-SI-N1	PFG-40-SI	FTM-20B-N1
50	1/8 BSPP	PFTM-50-NBR-G1	PFG-50-NBR	PFTM-50-SI-G1	PFG-50-SI	FTM-50-G1H
50	1/4 BSPP	PFTM-50-NBR-G2	PFG-50-NBR	PFTM-50-SI-G2	PFG-50-SI	FTM-50-G2
50	1/8 NPT	PFTM-50-NBR-N1	PFG-50-NBR	PFTM-50-SI-N1	PFG-50-SI	FTM-50-N1
60	1/4 BSPP	PFTM-60-NBR-G2	PFG-60-NBR	PFTM-60-SI-G2	PFG-60-SI	FTM-60-G2
60	M10	PFTM-60-NBR-M10	PFG-60-NBR	PFTM-60-SI-M10	PFG-60-SI	FTM-60-M10
60	1/4 NPT	PFTM-60-NBR-N2	PFG-60-NBR	PFTM-60-SI-N2	PFG-60-SI	FTM-60-N2
80	1/4 BSPP	PFTM-80-NBR-G2	PFG-80-NBR	PFTM-80-SI-G2	PFG-80-SI	FTM-60-G2
80	M10	PFTM-80-NBR-M10	PFG-80-NBR	PFTM-80-SI-M10	PFG-80-SI	FTM-60-M10
80	1/4 NPT	PFTM-80-NBR-N2	PFG-80-NBR	PFTM-80-SI-N2	PFG-80-SI	FTM-60-N2
95	1/4 BSPP	PFTM-95-NBR-G2	PFG-95-NBR	PFTM-95-SI-G2	PFG-95-SI	FTM-60-G2
95	M10	PFTM-95-NBR-M10	PFG-95-NBR	PFTM-95-SI-M10	PFG-95-SI	FTM-60-M10
95	1/4 NPT	PFTM-95-NBR-N2	PFG-95-NBR	PFTM-95-SI-N2	PFG-95-SI	FTM-60-N2

Most popular.

C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 P5V-CFS Series
 PJG Series
 PCG Series
 PUGB Series

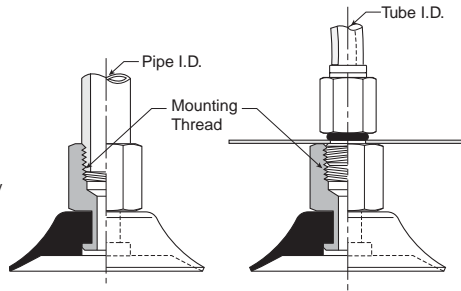


PFTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads. Fitting material: aluminum.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PFTF-5A-NBR-M5	PFG-5A-NBR	PFTF-5A-SI-M5	PFG-5A-SI	FTF-5A-M5
5	1/8 BSPP	PFTF-5A-NBR-G1	PFG-5A-NBR	PFTF-5A-SI-G1	PFG-5A-SI	FTF-5A-G1
6	M5	PFTF-6A-NBR-M5	PFG-6A-NBR	PFTF-6A-SI-M5	PFG-6A-SI	FTF-5A-M5
6	1/8 BSPP	PFTF-6A-NBR-G1	PFG-6A-NBR	PFTF-6A-SI-G1	PFG-6A-SI	FTF-5A-G1
8	M5	PFTF-8A-NBR-M5	PFG-8A-NBR	PFTF-8A-SI-M5	PFG-8A-SI	FTF-5A-M5
8	1/8 BSPP	PFTF-8A-NBR-G1	PFG-8A-NBR	PFTF-8A-SI-G1	PFG-8A-SI	FTF-5A-G1
10	1/8 BSPP	PFTF-10A-NBR-G1	PFG-10A-NBR	PFTF-10A-SI-G1	PFG-10A-SI	FTF-5A-G1
10	M5	PFTF-10A-NBR-M5	PFG-10A-NBR	PFTF-10A-SI-M5	PFG-10A-SI	FTF-5A-M5
15	1/8 BSPP	PFTF-15A-NBR-G1	PFG-15A-NBR	PFTF-15A-SI-G1	PFG-15A-SI	FTF-5A-G1
15	M5	PFTF-15A-NBR-M5	PFG-15A-NBR	PFTF-15A-SI-M5	PFG-15A-SI	FTF-5A-M5
20	1/8 BSPP	PFTF-20B-NBR-G1	PFG-20B-NBR	PFTF-20B-SI-G1	PFG-20B-SI	FTF-20B-G1
30	1/8 BSPP	PFTF-30-NBR-G1	PFG-30-NBR	PFTF-30-SI-G1	PFG-30-SI	FTF-20B-G1
30	1/4 BSPP	PFTF-30-NBR-G2	PFG-30-NBR	PFTF-30-SI-G2	PFG-30-SI	FTF-20B-G2
40	1/8 BSPP	PFTF-40-NBR-G1	PFG-40-NBR	PFTF-40-SI-G1	PFG-40-SI	FTF-20B-G1
40	1/4 BSPP	PFTF-40-NBR-G2	PFG-40-NBR	PFTF-40-SI-G2	PFG-40-SI	FTF-20B-G2
50	1/8 BSPP	PFTF-50-NBR-G1	PFG-50-NBR	PFTF-50-SI-G1	PFG-50-SI	FTF-50-G1
50	1/4 BSPP	PFTF-50-NBR-G2	PFG-50-NBR	PFTF-50-SI-G2	PFG-50-SI	FTF-50-G2
60	1/4 BSPP	PFTF-60-NBR-G2	PFG-60-NBR	PFTF-60-SI-G2	PFG-60-SI	FTF-60-G2
60	1/4 NPT	PFTF-60-NBR-N2	PFG-60-NBR	PFTF-60-SI-N2	PFG-60-SI	FTF-60-N2
80	1/4 BSPP	PFTF-80-NBR-G2	PFG-80-NBR	PFTF-80-SI-G2	PFG-80-SI	FTF-60-G2
80	1/4 NPT	PFTF-80-NBR-N2	PFG-80-NBR	PFTF-80-SI-N2	PFG-80-SI	FTF-60-N2
95	1/4 NPT	PFTF-95-NBR-N2	PFG-95-NBR	PFTF-95-SI-N2	PFG-95-SI	FTF-60-N2
95	1/4 BSPP	PFTF-95-NBR-G2	PFG-95-NBR	PFTF-95-SI-G2	PFG-95-SI	FTF-60-G2
120	1/2 BSPP	PFTF-120-NBR-G4	PFG-120-NBR	PFTF-120-SI-G4	PFG-120-SI	FTF-120-G4
120	1/2 NPT	PFTF-120-NBR-N4	PFG-120-NBR	PFTF-120-SI-N4	PFG-120-SI	FTF-120-N4
150	1/2 NPT	PFTF-150-NBR-G4	PFG-150-NBR	PFTF-150-SI-G4	PFG-150-SI	FTF-120-G4
150	1/2 NPT	PFTF-150-NBR-N4	PFG-150-NBR	PFTF-150-SI-N4	PFG-150-SI	FTF-120-N4
200	1/2 BSPP	PFTF-200-NBR-G4	PFG-200-NBR	PFTF-200-SI-G4	PFG-200-SI	FTF-120-G4
200	1/2 NPT	PFTF-200-NBR-N4	PFG-200-NBR	PFTF-200-SI-N4	PFG-200-SI	FTF-120-N4

Most popular.



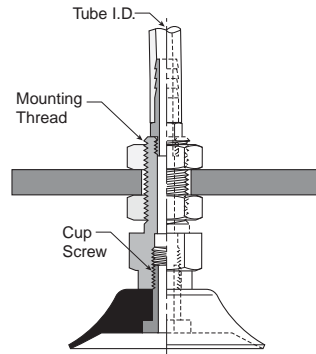
PFTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	PFTK-5A-NBR	PFG-5A-NBR	PFTK-5A-SI	PFG-5A-SI	FTK-5A
6	Barb	PFTK-6A-NBR	PFG-6A-NBR	PFTK-6A-SI	PFG-6A-SI	FTK-5A
8	Barb	PFTK-8A-NBR	PFG-8A-NBR	PFTK-8A-SI	PFG-8A-SI	FTK-5A
10	Barb	PFTK-10A-NBR	PFG-10A-NBR	PFTK-10A-SI	PFG-10A-SI	FTK-5A
15	Barb	PFTK-15-NBR	PFG-15-NBR	PFTK-15-SI	PFG-15-SI	FTK-15
20	Barb	PFTK-20-NBR	PFG-20-NBR	PFTK-20-SI	PFG-20-SI	FTK-20
30	Barb	PFTK-30-NBR	PFG-30-NBR	PFTK-30-SI	PFG-30-SI	FTK-25
40	Barb	PFTK-40-NBR	PFG-40-NBR	PFTK-40-SI	PFG-40-SI	FTK-25
50	Barb	PFTK-50-NBR	PFG-50-NBR	PFTK-50-SI	PFG-50-SI	FTK-50
60	1/8 BSPP	PFTK-60-NBR-G1	PFG-60-NBR	PFTK-60-SI-G1	PFG-60-SI	FTK-60-G1
60	1/8 NPT	PFTK-60-NBR-N1	PFG-60-NBR	PFTK-60-SI-N1	PFG-60-SI	FTK-60-N1
80	1/8 BSPP	PFTK-80-NBR-G1	PFG-80-NBR	PFTK-80-SI-G1	PFG-80-SI	FTK-60-G1
80	1/8 NPT	PFTK-80-NBR-N1	PFG-80-NBR	PFTK-80-SI-N1	PFG-80-SI	FTK-60-N1
95	1/8 BSPP	PFTK-95-NBR-G1	PFG-95-NBR	PFTK-95-SI-G1	PFG-95-SI	FTK-60-G1
95	1/8 NPT	PFTK-95-NBR-N1	PFG-95-NBR	PFTK-95-SI-N1	PFG-95-SI	FTK-60-N1

Most popular.



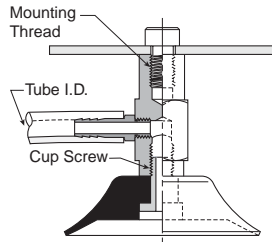
PFYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt thru a plate or “L” bracket to allow the tube connection from the side port. Fitting material: plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	PFYK-5A-NBR	PFG-5A-NBR	PFYK-5A-SI	PFG-5A-SI	FYK-5A
6	Barb	PFYK-6A-NBR	PFG-6A-NBR	PFYK-6A-SI	PFG-6A-SI	FYK-5A
8	Barb	PFYK-8A-NBR	PFG-8A-NBR	PFYK-8A-SI-M5	PFG-8A-SI	FYK-5A
10	Barb	PFYK-10A-NBR	PFG-10A-NBR	PFYK-10A-SI	PFG-10A-SI	FYK-5A
15	Barb	PFYK-15-NBR	PFG-15-NBR	PFYK-15-SI	PFG-15-SI	FYK-15
20	Barb	PFYK-20-NBR	PFG-20-NBR	PFYK-20-SI	PFG-20-SI	FYK-20
30	Barb	PFYK-30-NBR	PFG-30-NBR	PFYK-30-SI	PFG-30-SI	FYK-25
40	Barb	PFYK-40-NBR	PFG-40-NBR	PFYK-40-SI	PFG-40-SI	FYK-25
50	Barb	PFYK-50-NBR	PFG-50-NBR	PFYK-50-SI	PFG-50-SI	FYK-50
60	1/8 BSPP	PFYK-60-NBR-G1	PFG-60-NBR	PFYK-60-SI-G1	PFG-60-SI	FYK-60-G1
60	1/8 NPT	PFYK-60-NBR-N1	PFG-60-NBR	PFYK-60-SI-N1	PFG-60-SI	FYK-60-N1
80	1/8 BSPP	PFYK-80-NBR-G1	PFG-80-NBR	PFYK-80-SI-G1	PFG-80-SI	FYK-60-G1
80	1/8 NPT	PFYK-80-NBR-N1	PFG-80-NBR	PFYK-80-SI-N1	PFG-80-SI	FYK-60-N1
95	1/8 BSPP	PFYK-95-NBR-G1	PFG-95-NBR	PFYK-95-SI-G1	PFG-95-SI	FYK-60-G1
95	1/8 NPT	PFYK-95-NBR-N1	PFG-95-NBR	PFYK-95-SI-N1	PFG-95-SI	FYK-60-N1
120	1/8 BSPP	PFYK-120-NBR-G1	PFG-120-NBR	PFYK-120-SI-G1	PFG-120-SI	FYK-120-G1
120	1/8 NPT	PFYK-120-NBR-N1	PFG-120-NBR	PFYK-120-SI-N1	PFG-120-SI	FYK-120-N1
150	1/8 BSPP	PFYK-150-NBR-G1	PFG-150-NBR	PFYK-150-SI-G1	PFG-150-SI	FYK-120-G1
150	1/8 NPT	PFYK-150-NBR-N1	PFG-150-NBR	PFYK-150-SI-N1	PFG-150-SI	FYK-120-N1
200	1/8 BSPP	PFYK-200-NBR-G1	PFG-200-NBR	PFYK-200-SI-G1	PFG-200-SI	FYK-120-G1
200	1/8 NPT	PFYK-200-NBR-N1	PFG-200-NBR	PFYK-200-SI-N1	PFG-200-SI	FYK-120-N1

Most popular.

C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 PSV-CFS Series
 PJG Series
 PCG Series
 PUGB Series

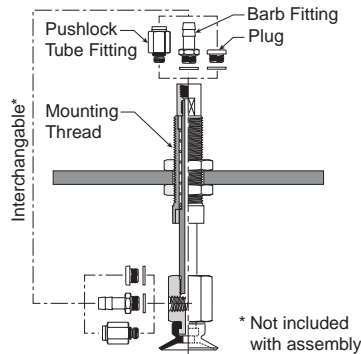


PFTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N)		Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
			0%	100%					
5	M5	10	.14 (.61)	.26 (1.17)	PFTYS5A10NBRM5	PFG-5A-NBR	PFTYS5A10SIM5	PFG-5A-SI	TYS-5A-10
5	M5	15	.15 (.64)	.26 (1.17)	PFTYS5A15NBRM5	PFG-5A-NBR	PFTYS5A15SIM5	PFG-5A-SI	TYS-5A-15
6	M5	10	.14 (.61)	.26 (1.17)	PFTYS6A10NBRM5	PFG-6A-NBR	PFTYS6A10SIM5	PFG-6A-SI	TYS-5A-10
6	M5	15	.15 (.64)	.26 (1.17)	PFTYS6A15NBRM5	PFG-6A-NBR	PFTYS6A15SIM5	PFG-6A-SI	TYS-5A-15
8	M5	10	.14 (.61)	.26 (1.17)	PFTYS8A10NBRM5	PFG-8A-NBR	PFTYS8A10SIM5	PFG-8A-SI	TYS-5A-10
8	M5	15	.15 (.64)	.26 (1.17)	PFTYS8A15NBRM5	PFG-8A-NBR	PFTYS8A15SIM5	PFG-8A-SI	TYS-5A-15
10	M5	10	.11 (.49)	.13 (.59)	PFTYS10A10NBRM5	PFG-10A-NBR	PFTYS10A10SIM5	PFG-10A-SI	TYS-5A-10
10	M5	15	.11 (.49)	.13 (.59)	PFTYS10A15NBRM5	PFG-10A-NBR	PFTYS10A15SIM5	PFG-10A-SI	TYS-5A-15
15	M5	10	.11 (.49)	.13 (.59)	PFTYS15A10NBRM5	PFG-15A-NBR	PFTYS15A10SIM5	PFG-15A-SI	TYS-5A-10
15	M5	15	.11 (.49)	.13 (.59)	PFTYS15A15NBRM5	PFG-15A-NBR	PFTYS15A15SIM5	PFG-15A-SI	TYS-5A-15
20	M5	15	.56 (2.5)	.79 (3.4)	PFTYS20B15NBRM5	PFG-20B-NBR	PFTYS20B15SIM5	PFG-20B-SI	TYS-20B-15
20	M5	30	.56 (2.5)	1.2 (4.9)	PFTYS20B30NBRM5	PFG-20B-NBR	PFTYS20B30SIM5	PFG-20B-SI	TYS-20B-30
30	M5	15	.56 (2.5)	.79 (3.4)	PFTYS3015NBRM5	PFG-30-NBR	PFTYS3015SIM5	PFG-30-SI	TYS-20B-15
30	M5	30	.56 (2.5)	1.2 (4.9)	PFTYS3030NBRM5	PFG-30-NBR	PFTYS3030SIM5	PFG-30-SI	TYS-20B-30
40	M5	15	.56 (2.5)	.79 (3.4)	PFTYS4015NBRM5	PFG-40-NBR	PFTYS4015SIM5	PFG-40-SI	TYS-20B-15
40	M5	30	.56 (2.5)	1.2 (4.9)	PFTYS4030NBRM5	PFG-40-NBR	PFTYS4030SIM5	PFG-40-SI	TYS-20B-30
50	M5	15	.56 (2.5)	1.2 (4.9)	PFTYS5015NBRM5	PFG-50-NBR	PFTYS5015SIM5	PFG-50-SI	TYS-50-15
50	M5	30	.67 (2.9)	1.4 (5.9)	PFTYS5030NBRM5	PFG-50-NBR	PFTYS5030SIM5	PFG-50-SI	TYS-50-30
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PFTYS6030NBRN1	PFG-60-NBR	PFTYS6030SIN1	PFG-60-SI	TYS-60-30
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PFTYS6050NBRN1	PFG-60-NBR	PFTYS6050SIN1	PFG-60-SI	TYS-60-50
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PFTYS8030NBRN1	PFG-80-NBR	PFTYS8030SIN1	PFG-80-SI	TYS-60-30
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PFTYS8050NBRN1	PFG-80-NBR	PFTYS8050SIN1	PFG-80-SI	TYS-60-50
95	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PFTYS9530NBRN1	PFG-95-NBR	PFTYS9530SIN1	PFG-95-SI	TYS-60-30
95	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PFTYS9550NBRN1	PFG-95-NBR	PFTYS9550SIN1	PFG-95-SI	TYS-60-50
120	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PFTYS12020NBRN2	PFG-120-NBR	PFTYS12020SIN2	PFG-120-SI	TYS-120-20
120	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PFTYS12070NBRN2	PFG-120-NBR	PFTYS12070SIN2	PFG-120-SI	TYS-120-70
150	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PFTYS15020NBRN2	PFG-150-NBR	PFTYS15020SIN2	PFG-150-SI	TYS-120-20
150	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PFTYS15070NBRN2	PFG-150-NBR	PFTYS15070SIN2	PFG-150-SI	TYS-120-70
200	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PFTYS20020NBRN2	PFG-200-NBR	PFTYS20020SIN2	PFG-200-SI	TYS-120-20
200	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PFTYS20070NBRN2	PFG-200-NBR	PFTYS20070SIN2	PFG-200-SI	TYS-120-70

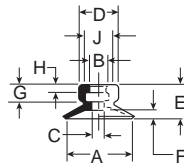
Most popular.

C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 P5V-CFS Series
 PJG Series
 PCG Series
 PUGB Series

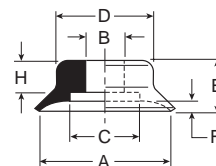


PFG Series Replacement Cup Dimensions

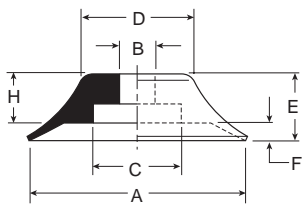
**PFG-5A
PFG-15A**



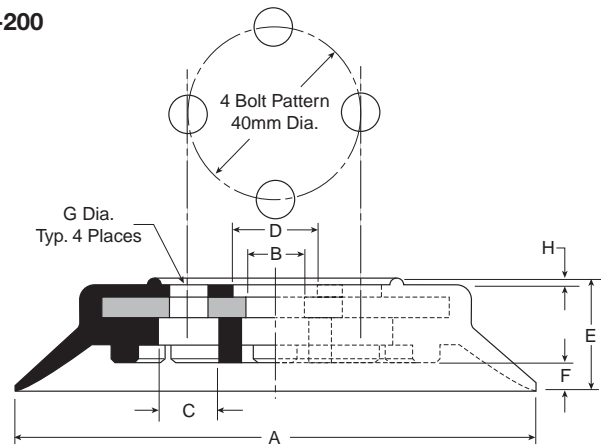
**PFG-15 thru
PFG-40**



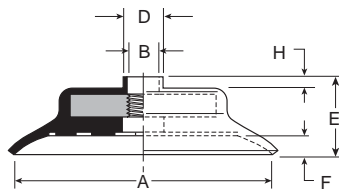
PFG-50



**PFG-120 thru
PFG-200**



**PFG-60 thru
PFG-95**



Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PFG-5A-*	.20 (5)	.16 (4)	.06 (1.4)	.30 (7.5)	.26 (6.5)	.03 (.8)	.16 (4)	.08 (2)	.24 (6)
PFG-6A-*	.24 (6)	.16 (4)	.08 (2)	.30 (7.5)	.26 (6.5)	.03 (.8)	.16 (4)	.08 (2)	.24 (6)
PFG-8A-*	.31 (8)	.16 (4)	.08 (2)	.31 (8)	.28 (7)	.05 (1.2)	.16 (4)	.08 (2)	.24 (6)
PFG-10A-*	.39 (10)	.16 (4)	.08 (2)	.33 (8.5)	.30 (7.5)	.06 (1.5)	.16 (4)	.08 (2)	.24 (6)
PFG-15-*	.59 (15)	—	.31 (7.8)	.47 (12)	.31 (8)	.07 (1.9)	—	—	—
PFG-15A-*	.59 (15)	.16 (4)	.08 (2)	.35 (9)	.31 (8)	.08 (2)	.16 (4)	.08 (2)	.24 (6)
PFG-20-*	.79 (20)	.18 (4.6)	.43 (11)	.59 (15)	.39 (10)	.09 (2.3)	—	.18 (4.5)	—
PFG-20B-*	.79 (20)	.24 (6)	.43 (11)	.59 (15)	.49 (12.5)	.09 (2.3)	—	.28 (7)	—
PFG-30-*	1.18 (30)	.24 (6)	.43 (11)	.55 (14)	.47 (12)	.08 (2)	—	.28 (7)	—
PFG-40-*	1.57 (40)	.24 (6)	.43 (11)	.94 (24)	.55 (14)	.16 (4)	—	.28 (7)	—
PFG-50-*	1.97 (50)	.31 (8)	.79 (20)	1.06 (27)	.59 (15)	.14 (3.5)	—	.28 (7)	—
PFG-60-*	2.36 (60)	M10x1.25	—	.79 (12.5)	.73 (18.5)	.20 (5)	—	.10 (2.5)	—
PFG-80-*	3.15 (80)	M10x1.25	—	.79 (12.5)	.81 (20.5)	.24 (6)	—	.10 (2.5)	—
PFG-95-*	3.74 (95)	M10x1.25	—	.79 (12.5)	.83 (21)	.24 (6)	—	.10 (2.5)	—
PFG-120-*	4.72 (120)	.55 (14)	.55 (14)	.79 (20)	1.00 (25.5)	.24 (6)	4xØ8.7xØ40	.059 (1.5)	—
PFG-150-*	5.91 (150)	.51 (13)	.55 (14)	.79 (20)	1.28 (32.5)	.35 (9)	4xØ8.7xØ40	.059 (1.5)	—
PFG-200-*	7.87 (200)	.51 (13)	.47 (12)	.79 (20)	1.48 (37.5)	.51 (13)	4xØ8.7xØ40	.059 (1.5)	—

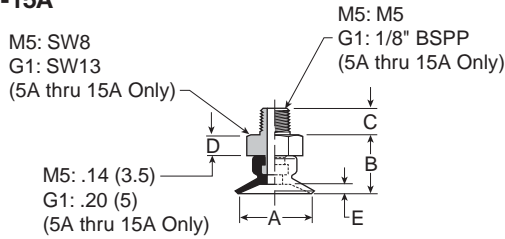
Inches (mm)
* Cup material

C
Vacuum Cups
Vacuum Products
PFG Series
PBG Series
P5V-CFS Series
PJG Series
PCG Series
PUGB Series

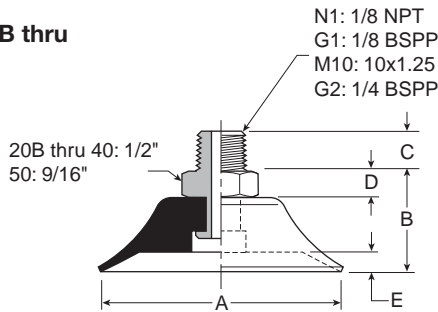


Dimensions

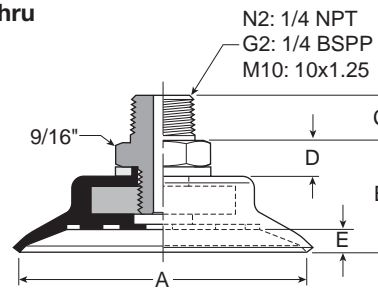
**PFTM-5A thru
PFTM-15A**



**PFTM-20B thru
PFTM-50**



**PFTM-60 thru
PFTM-95**



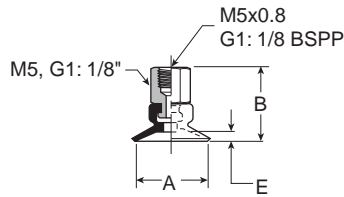
Model number	ØA	B	C (M3)	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PFTM-5A-*†	.20 (5)	.39 (10)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.31 (8)
PFTM-6A-*†	.24 (6)	.39 (10)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.31 (8)
PFTM-8A-*†	.31 (8)	.41 (10.5)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.05 (1.2)
PFTM-10A-*†	.39 (10)	.43 (11)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.06 (1.5)
PFTM-15A-*†	.59 (15)	.45 (11.5)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.08 (2)
PFTM-20B-*†	.79 (20)	.69 (17.5)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.10 (2.5)
PFTM-30-*†	1.18 (30)	.67 (17)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.08 (2)
PFTM-40-*†	1.57 (40)	.75 (19)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.14 (3.5)
PFTM-50-*†	1.97 (50)	.79 (20)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.16 (4)
PFTM-60-*†	2.36 (60)	.90 (23)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.20 (5)
PFTM-80-*†	3.15 (80)	.98 (25)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.24 (6)
PFTM-95-*†	3.74 (95)	1.00 (25.5)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.24 (6)

Inches (mm)
* Cup material
† Thread size

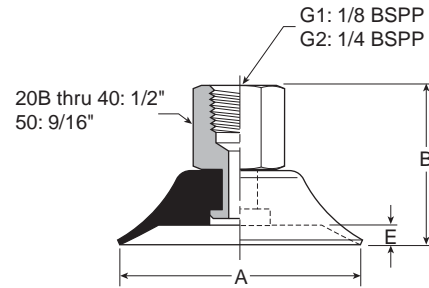
C
Vacuum Cups
Vacuum Products
PFG Series
PBG Series
P5V-CFS Series
PJG Series
PCG Series
PUGB Series

Dimensions

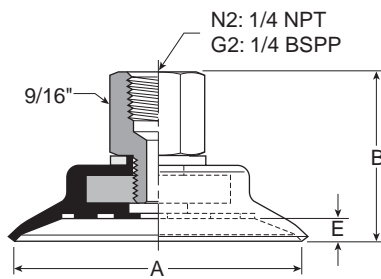
**PFTF-5A thru
PFTF-15A**



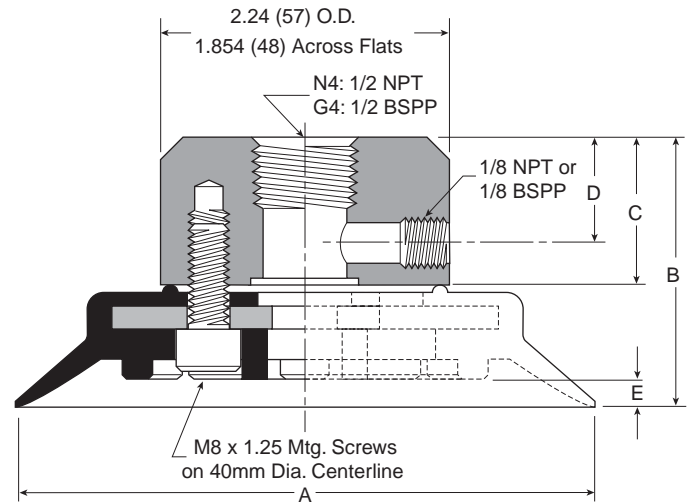
**PFTF-20B thru
PFTF-50**



**PFTF-60 thru
PFTF-95**



**PFTF-120 thru
PFTF-200**



Model number	ØA	B	B (M5)	C	D	E
PFTF-5A-*†	.20 (5)	.57 (14.5)	.81 (20.5)	—	—	.03 (.8)
PFTF-6A-*†	.24 (6)	.57 (14.5)	.81 (20.5)	—	—	.03 (.8)
PFTF-8A-*†	.31 (8)	.59 (15)	.83 (21)	—	—	.05 (1.2)
PFTF-10A-*†	.39 (10)	.57 (14.5)	.81 (20.5)	—	—	.06 (1.5)
PFTF-15A-*†	.59 (15)	.63 (16)	.87 (22)	—	—	.08 (2)
PFTF-20B-*†	.79 (20)	1.04 (26.5)	—	—	—	.10 (2.5)
PFTF-30-*†	1.18 (30)	1.02 (26)	—	—	—	.08 (2)
PFTF-40-*†	1.57 (40)	1.10 (28)	—	—	—	.16 (4)
PFTF-50-*†	1.97 (50)	1.14 (29)	—	—	—	.16 (4)
PFTF-60-*†	2.36 (60)	1.40 (35.5)	—	—	—	.20 (5)
PFTF-80-*†	3.15 (80)	1.48 (37.5)	—	—	—	.24 (6)
PFTF-95-*†	3.74 (95)	1.50 (38)	—	—	—	.24 (6)
PFTF-120-*†	4.72 (120)	1.83 (46.5)	—	.94 (24)	.51 (13)	.24 (6)
PFTF-150-*†	5.91 (150)	2.11 (53.5)	—	.94 (24)	.51 (13)	.35 (9)
PFTF-200-*†	7.87 (200)	2.30 (58.5)	—	.94 (24)	.51 (13)	.51 (13)

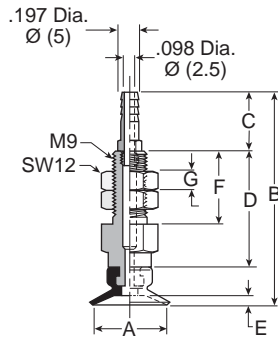
Inches (mm)
* Cup material
† Thread size

C
Vacuum Cups
Vacuum Products
Series
PF6
Series
PB6
Series
PSV-CFS
Series
PI6
Series
PC6
Series
PUGB
Series

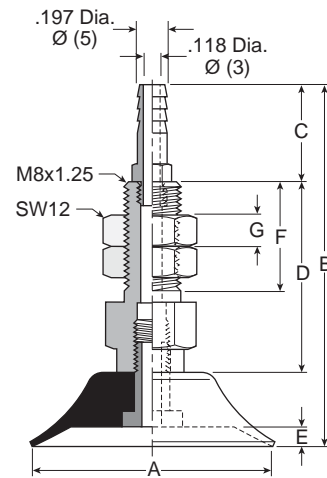


Dimensions

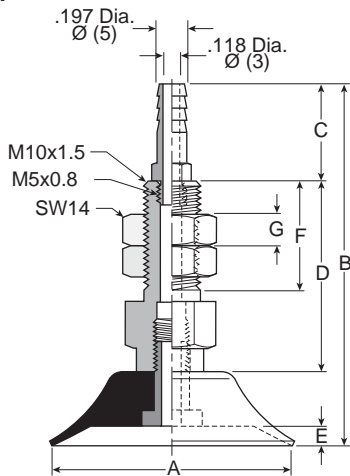
**PFTK-5A thru
PFTK-10A**



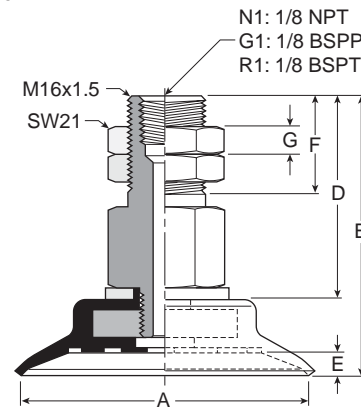
**PFTK-15 thru
PFTK-20**



**PFTK-30 thru
PFTK-50**



**PFTK-60 thru
PFTK-95**



Model number	ØA	B	C	D	E	F	G	Wt oz. (g)
PFTK-5A-*	.20 (5)	1.20 (30.5)	.39 (10)	.55 (14)	.03 (.8)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-6A-*	.24 (6)	1.20 (30.5)	.39 (10)	.55 (14)	.03 (.8)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-8A-*	.31 (8)	1.22 (31)	.39 (10)	.55 (14)	.05 (1.2)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-10A-*	.39 (10)	1.81 (46)	.63 (16)	.88 (22.5)	.06 (1.5)	.61 (15.5)	.12 (3)	.53 (15)
PFTK-15-*	.59 (15)	1.81 (46)	.63 (16)	.86 (22)	.07 (1.9)	.59 (15)	.12 (3)	.71 (20)
PFTK-20-*	.79 (20)	1.89 (48)	.63 (16)	.86 (22)	.09 (2.3)	.59 (15)	.20 (5)	.71 (20)
PFTK-30-*	1.18 (30)	2.36 (60)	.63 (16)	1.26 (32)	.08 (2)	.71 (20)	.20 (5)	1.41 (40)
PFTK-40-*	1.57 (40)	2.44 (62)	.63 (16)	1.26 (32)	.14 (3.5)	.71 (20)	.20 (5)	1.41 (40)
PFTK-50-*	1.97 (50)	2.48 (63)	.63 (16)	1.26 (32)	.16 (4)	.71 (20)	.20 (5)	1.77 (50)
PFTK-60-*,†	2.36 (60)	2.30 (58.5)	—	1.67 (42.5)	.20 (5)	.79 (20)	.24 (6)	4.59 (130)
PFTK-80-*,†	3.15 (80)	2.38 (60.5)	—	1.67 (42.5)	.24 (6)	.79 (20)	.24 (6)	6.00 (170)
PFTK-95-*,†	3.74 (95)	2.40 (61)	—	1.67 (42.5)	.24 (6)	.79 (20)	.24 (6)	7.77 (220)

Inches (mm)
* Cup material
† Vacuum port

C
Vacuum Cups
Vacuum Products

PFG
Series

PBG
Series

P5V-CFS
Series

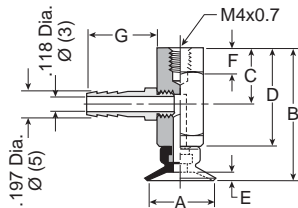
PJG
Series

PCG
Series

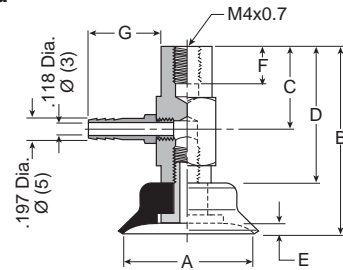
PUGB
Series

Dimensions

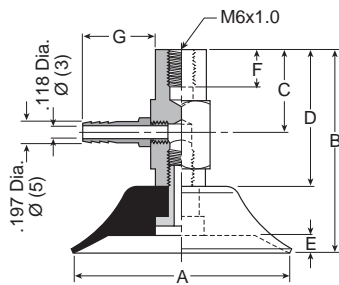
**PFYK-5A thru
 PFYK-10A**



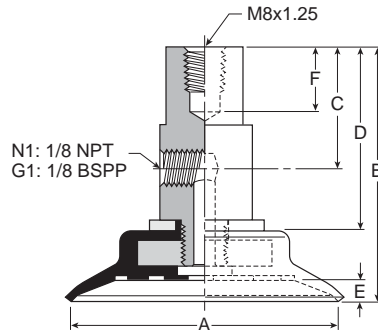
**PFYK-15 thru
 PFYK-20**



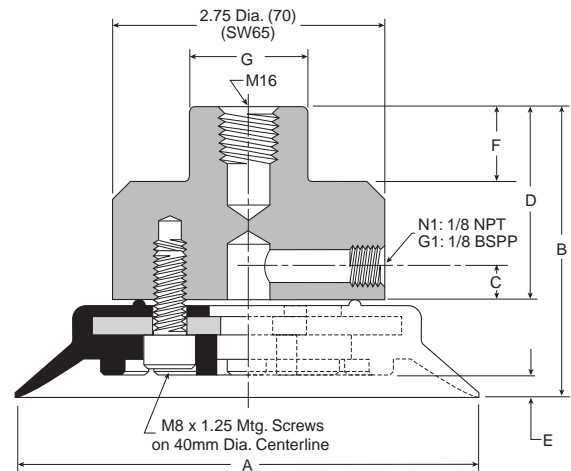
**PFYK-30 thru
 PFYK-50**



**PFYK-60 thru
 PFYK-95**



**PFYK-120 thru
 PFYK-200**



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PFYK-5A-*	.20 (5)	1.14 (29)	.51 (13)	.89 (22.5)	.03 (.8)	.24 (6)	.63 (16)	.56 (16)
PFYK-6A-*	.24 (6)	1.14 (29)	.51 (13)	.89 (22.5)	.03 (.8)	.24 (6)	.63 (16)	.56 (16)
PFYK-8A-*	.31 (8)	1.16 (29.5)	.51 (13)	.89 (22.5)	.05 (1.2)	.24 (6)	.63 (16)	.56 (16)
PFYK-10A-*	.39 (10)	1.18 (30)	.51 (13)	.89 (22.5)	.06 (1.5)	.24 (6)	.63 (16)	.56 (16)
PFYK-15-*	.59 (15)	1.18 (30)	.55 (14)	.87 (22)	.07 (1.9)	.24 (6)	.63 (16)	.71 (20)
PFYK-20-*	.79 (20)	1.26 (32)	.55 (14)	.87 (22)	.09 (2.3)	.24 (6)	.63 (16)	.71 (20)
PFYK-30-*	1.18 (30)	1.73 (44)	.79 (20)	1.26 (32)	.08 (2)	.31 (8)	.63 (16)	1.41 (40)
PFYK-40-*	1.57 (40)	1.81 (46)	.79 (20)	1.26 (32)	.14 (3.5)	.31 (8)	.63 (16)	1.77 (50)
PFYK-50-*	1.97 (50)	1.85 (47)	.79 (20)	1.26 (32)	.16 (4)	.31 (8)	.63 (16)	1.94 (55)
PFYK-60-*-†	2.36 (60)	2.30 (58.5)	1.10 (28)	1.57 (40)	.20 (5)	.43 (11)	—	4.24 (120)
PFYK-80-*-†	3.15 (80)	2.38 (60.5)	1.10 (28)	1.57 (40)	.24 (6)	.43 (11)	—	5.65 (160)
PFYK-95-*-†	3.74 (95)	2.40 (61)	1.10 (28)	1.57 (40)	.24 (6)	.43 (11)	—	7.42 (210)
PFYK-120-*-†	4.72 (120)	2.94 (75.5)	.47 (12)	1.97 (50)	.24 (6)	.79 (20)	1.18 Dia. (30)	22.6 (640)
PFYK-150-*-†	5.91 (150)	3.25 (82.5)	.47 (12)	1.97 (50)	.35 (9)	.79 (20)	1.18 Dia. (30)	32.1 (910)
PFYK-200-*-†	7.87 (200)	3.44 (87.5)	.47 (12)	1.97 (50)	.51 (13)	.79 (20)	1.18 Dia. (30)	42.4 (1200)

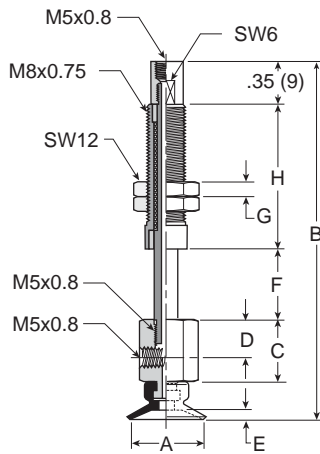
Inches (mm)
 * Cup material
 † Vacuum port

C
 Vacuum Cups
 Vacuum Products
 Series
 PFG
 PBG
 PSV-CFS
 PIG
 PCG
 PUGB

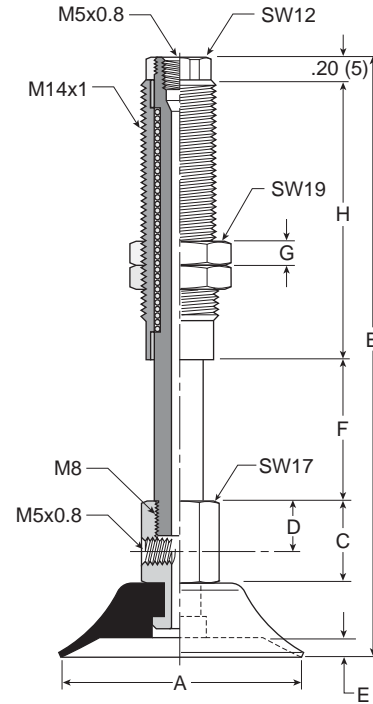


Dimensions

**PFTYS5A thru
PFTYS15A**



**PFTYS20B thru
PFTYS50**



Model number	ØA	B	C	D	E	F	G	H	Wt oz (g)
PFTYS5A10**	.20 (5)	2.42 (61.5)	.51 (13)	.31 (8)	.03 (.8)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS5A15**	.20 (5)	2.91 (74)	.51 (13)	.31 (8)	.03 (.8)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS6A10**	.24 (6)	2.42 (61.5)	.51 (13)	.31 (8)	.03 (.8)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS6A15**	.24 (6)	2.91 (74)	.51 (13)	.31 (8)	.03 (.8)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS8A10**	.31 (8)	2.44 (62)	.51 (13)	.31 (8)	.05 (1.2)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS8A15**	.31 (8)	2.93 (74.5)	.51 (13)	.31 (8)	.05 (1.2)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS10A10**	.39 (10)	2.48 (63)	.51 (13)	.31 (8)	.06 (1.5)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS10A15**	.39 (10)	2.95 (75)	.51 (13)	.31 (8)	.06 (1.5)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS15A10**	.59 (15)	2.50 (63.5)	.51 (13)	.31 (8)	.08 (2)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS15A15**	.59 (15)	2.97 (75.5)	.51 (13)	.31 (8)	.08 (2)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS20B15**	.79 (20)	3.37 (85.5)	.67 (17)	.39 (10)	.09 (2.3)	.59 (15)	.20 (5)	1.42 (36)	2.5 (71)
PFTYS20B30**	.79 (20)	4.82 (122.5)	.67 (17)	.39 (10)	.09 (2.3)	1.18 (30)	.20 (5)	2.28 (58)	3.4 (96)
PFTYS3015**	1.18 (30)	3.35 (85)	.67 (17)	.39 (10)	.08 (2)	.59 (15)	.20 (5)	1.42 (36)	2.5 (72)
PFTYS3030**	1.18 (30)	4.80 (122)	.67 (17)	.39 (10)	.08 (2)	1.18 (30)	.20 (5)	2.28 (58)	3.5 (97)
PFTYS4015**	1.57 (40)	3.43 (87)	.67 (17)	.39 (10)	.14 (3.5)	.59 (15)	.20 (5)	1.42 (36)	2.7 (76)
PFTYS4030**	1.57 (40)	4.88 (124)	.67 (17)	.39 (10)	.14 (3.5)	1.18 (30)	.20 (5)	2.28 (58)	3.6 (101)
PFTYS5015**	1.97 (50)	3.46 (88)	.67 (17)	.39 (10)	.16 (4)	.59 (15)	.20 (5)	1.42 (36)	3.0 (85)
PFTYS5030**	1.97 (50)	4.92 (125)	.67 (17)	.39 (10)	.16 (4)	1.18 (30)	.20 (5)	2.28 (58)	3.9 (110)

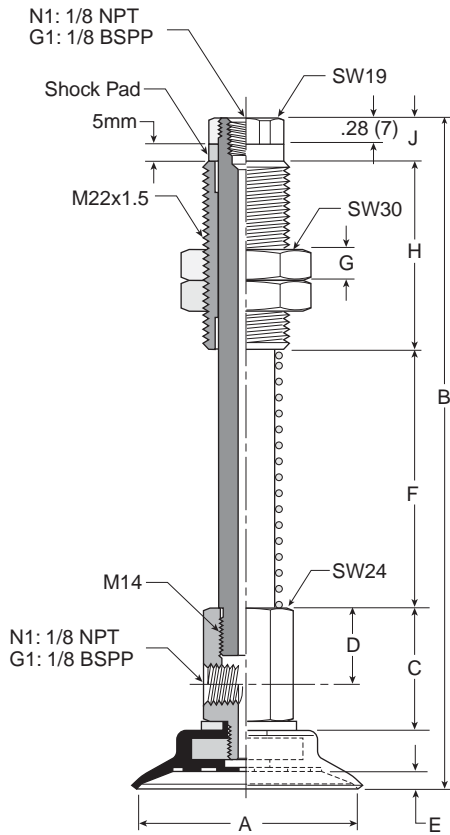
Inches (mm)
* Cup material
† Vacuum port

C
Vacuum Cups
Vacuum Products
PFG Series
PBG Series
P5V-CFS Series
PJP Series
PCG Series
PUGB Series

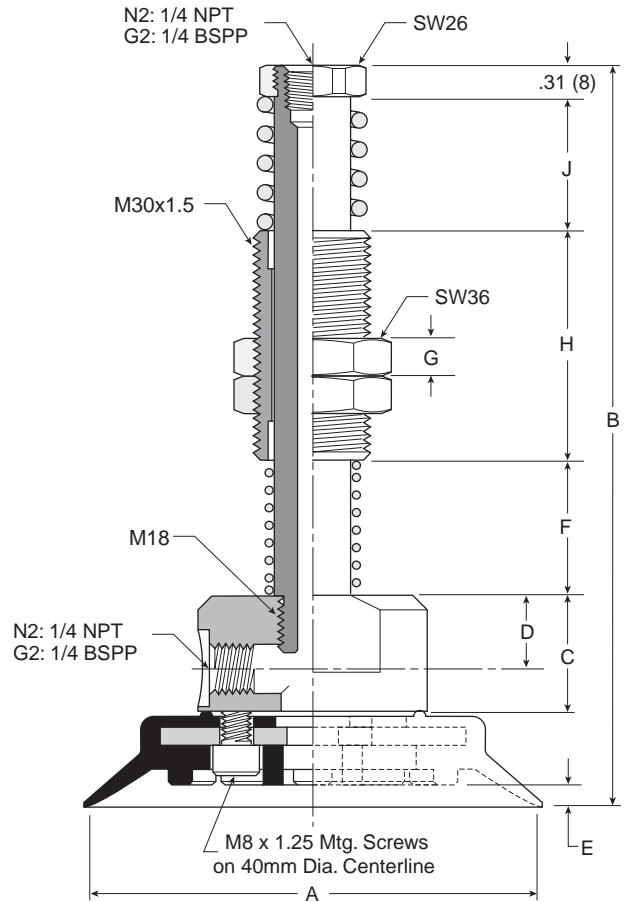


Dimensions

**PFTYS60 thru
PFTYS95**



**PFTYS120 thru
PFTYS200**



C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 PSV-CFS Series
 PJG Series
 PCG Series
 PUGB Series

Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PFTYS6030**	2.36 (60)	6.02 (153)	1.28 (32.5)	.78 (20)	.20 (5)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	9.7 (282)
PFTYS6050**	2.36 (60)	7.01 (178)	1.28 (32.5)	.78 (20)	.20 (5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	11.2 (316)
PFTYS8030**	3.15 (80)	6.10 (155)	1.28 (32.5)	.78 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	11 (310)
PFTYS8050**	3.15 (80)	7.09 (180)	1.28 (32.5)	.78 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	12.2 (344)
PFTYS9530**	3.74 (95)	6.12 (156)	1.28 (32.5)	.78 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	12.4 (350)
PFTYS9550**	3.74 (95)	7.11 (181)	1.28 (32.5)	.78 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13.6 (384)
PFTYS12020**	4.72 (120)	7.56 (192)	1.28 (32.5)	.71 (18)	.24 (6)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	41.2 (1165)
PFTYS12070**	4.72 (120)	10.12 (257)	1.28 (32.5)	.71 (18)	.24 (6)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	44 (1246)
PFTYS15020**	5.91 (150)	7.83 (199)	1.28 (32.5)	.71 (18)	.35 (9)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	49 (1389)
PFTYS15070**	5.91 (150)	10.39 (264)	1.28 (32.5)	.71 (18)	.35 (9)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	52 (1471)
PFTYS20020**	7.87 (200)	8.03 (204)	1.28 (32.5)	.71 (18)	.51 (13)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	62 (1755)
PFTYS20070**	7.87 (200)	10.59 (269)	1.28 (32.5)	.71 (18)	.51 (13)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	64.9 (1836)

Inches (mm)
 * Cup material
 † Vacuum port



PBG Bellows Vacuum Cup Series

These cups are for curved, corrugated, lightly textured surfaces and flexible product. Under vacuum, the bellow cup will collapse on contact and lift the product for a short distance. This inherent performance facilitates lifting and destack operations by breaking the vacuum between stacked product. The bellow style adds level compensation for applications that have inconsistent stack heights or uneven surfaces. The inclusive 30-degree rotation of the bellow helps maintain the vacuum seal when lifting sheet products that flex. Because of its shape however the bellows suction cup is not very well suitable for applications involving lifting vertical surfaces.



Features

- Bellows design for level compensation within restricted clearances
- Sheet separation for flexible and stacked products
- Soft seal lip for flexible products
- 10mm to 150mm diameters

Styles

- PBTM series male thread connector
- PBTF series female thread connector
- PBTK series barbed bulkhead
- PBYK series 90° barbed adapter
- PBTYS series bulkhead level compensator

Operating information			
Cup material	Nitrile	Silicon	Urethane
Material code	NBR	SI	U
Operating temperature	-20°C to 120°C (-4°F to 248°F)	-60° to 250°C (-76°F to 482°F)	-20° to 75°C (-4°F to 167°F)
Color	Black	White	Blue
Hardness, shore A (°Sh)	55 ±5	55 ±5	55 ±5
* ESD: Electric Static Dissipative Material			

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PBTM-20B-NBR-G1 becomes PBTM-20B-U-G1. Inquire with factory for availability.

Application guide

Bellows

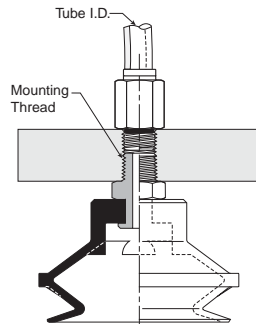
Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, thin section	Bowed surface, any section	Soft porous material, any section	Differences in heights and levels	Corrugated sheet handling	Not for vertical lift	Metal sheet handling

PBTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
 Fitting material: aluminum.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	M5	PBTM-10A-NBR-M5	PBG-10A-NBR	PBTM-10A-SI-M5	PBG-10A-SI	FTM-5A-M5H
10	1/8 BSPP	PBTM-10A-NBR-G1	PBG-10A-NBR	PBTM-10A-SI-G1	PBG-10A-SI	FTM-5A-G1
15	M5	PBTM-15A-NBR-M5	PBG-15A-NBR	PBTM-15A-SI-M5	PBG-15A-SI	FTM-5A-M5H
15	1/8 BSPP	PBTM-15A-NBR-G1	PBG-15A-NBR	PBTM-15A-SI-G1	PBG-15A-SI	FTM-5A-G1
20	1/8 BSPP	PBTM-20B-NBR-G1	PBG-20B-NBR	PBTM-20B-SI-G1	PBG-20B-SI	FTM-20B-G1H
20	1/4 BSPP	PBTM-20B-NBR-G2	PBG-20B-NBR	PBTM-20B-SI-G2	PBG-20B-SI	FTM-20B-G2
20	M10	PBTM-20B-NBR-M10	PBG-20B-NBR	PBTM-20B-SI-M10	PBG-20B-SI	FTM-20B-M10
20	1/8 NPT	PBTM-20B-NBR-N1	PBG-20B-NBR	PBTM-20B-SI-N1	PBG-20B-SI	FTM-20B-N1
30	1/8 BSPP	PBTM-30-NBR-G1	PBG-30-NBR	PBTM-30-SI-G1	PBG-30-SI	FTM-20B-G1H
30	1/4 BSPP	PBTM-30-NBR-G2	PBG-30-NBR	PBTM-30-SI-G2	PBG-30-SI	FTM-20B-G2
30	M10	PBTM-30-NBR-M10	PBG-30-NBR	PBTM-30-SI-M10	PBG-30-SI	FTM-20B-M10
30	1/8 NPT	PBTM-30-NBR-N1	PBG-30-NBR	PBTM-30-SI-N1	PBG-30-SI	FTM-20B-N1
40	1/8 BSPP	PBTM-40-NBR-G1	PBG-40-NBR	PBTM-40-SI-G1	PBG-40-SI	FTM-20B-G1H
40	1/4 BSPP	PBTM-40-NBR-G2	PBG-40-NBR	PBTM-40-SI-G2	PBG-40-SI	FTM-20B-G2
40	M10	PBTM-40-NBR-M10	PBG-40-NBR	PBTM-40-SI-M10	PBG-40-SI	FTM-20B-M10
40	1/8 NPT	PBTM-40-NBR-N1	PBG-40-NBR	PBTM-40-SI-N1	PBG-40-SI	FTM-20B-N1
50	1/8 BSPP	PBTM-50-NBR-G1	PBG-50-NBR	PBTM-50-SI-G1	PBG-50-SI	FTM-50-G1H
50	1/4 BSPP	PBTM-50-NBR-G2	PBG-50-NBR	PBTM-50-SI-G2	PBG-50-SI	FTM-50-G2
50	1/8 NPT	PBTM-50-NBR-N1	PBG-50-NBR	PBTM-50-SI-N1	PBG-50-SI	FTM-50-N1
75	1/4 BSPP	PBTM-75-NBR-G2	PBG-75-NBR	PBTM-75-SI-G2	PBG-75-SI	FTM-60-G2
75	M10	PBTM-75-NBR-M10	PBG-75-NBR	PBTM-75-SI-M10	PBG-75-SI	FTM-60-M10
75	1/4 NPT	PBTM-75-NBR-N2	PBG-75-NBR	PBTM-75-SI-N2	PBG-75-SI	FTM-60-N2

Most popular.



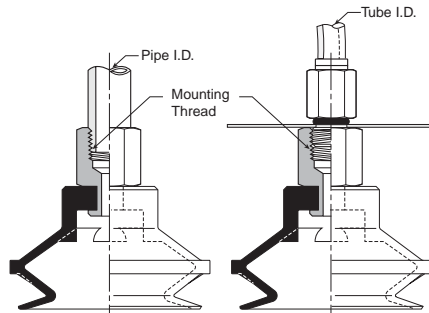
PBTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.
 Fitting material: aluminum.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	1/8 BSPP	PBTF-10A-NBR-G1	PBG-10A-NBR	PBTF-10A-SI-G1	PBG-10A-SI	FTF-5A-G1
10	M5	PBTF-10A-NBR-M5	PBG-10A-NBR	PBTF-10A-SI-M5	PBG-10A-SI	FTF-5A-M5
15	1/8 BSPP	PBTF-15A-NBR-G1	PBG-15A-NBR	PBTF-15A-SI-G1	PBG-15A-SI	FTF-5A-G1
15	M5	PBTF-15A-NBR-M5	PBG-15A-NBR	PBTF-15A-SI-M5	PBG-15A-SI	FTF-5A-M5
20	1/8 BSPP	PBTF-20B-NBR-G1	PBG-20B-NBR	PBTF-20B-SI-G1	PBG-20B-SI	FTF-20B-G1
30	1/8 BSPP	PBTF-30-NBR-G1	PBG-30-NBR	PBTF-30-SI-G1	PBG-30-SI	FTF-20B-G1
30	1/4 BSPP	PBTF-30-NBR-G2	PBG-30-NBR	PBTF-30-SI-G2	PBG-30-SI	FTF-20B-G2
40	1/8 BSPP	PBTF-40-NBR-G1	PBG-40-NBR	PBTF-40-SI-G1	PBG-40-SI	FTF-20B-G1
40	1/4 BSPP	PBTF-40-NBR-G2	PBG-40-NBR	PBTF-40-SI-G2	PBG-40-SI	FTF-20B-G2
50	1/8 BSPP	PBTF-50-NBR-G1	PBG-50-NBR	PBTF-50-SI-G1	PBG-50-SI	FTF-50-G1
50	1/4 BSPP	PBTF-50-NBR-G2	PBG-50-NBR	PBTF-50-SI-G2	PBG-50-SI	FTF-50-G2
75	1/4 BSPP	PBTF-75-NBR-G2	PBG-75-NBR	PBTF-75-SI-G2	PBG-75-SI	FTF-60-G2
75	1/4 NPT	PBTF-75-NBR-N2	PBG-75-NBR	PBTF-75-SI-N2	PBG-75-SI	FTF-60-N2
110	1/2 BSPP	PBTF-110-NBR-G4	PBG-110-NBR	PBTF-110-SI-G4	PBG-110-SI	FTF-120-G4
110	1/2 NPT	PBTF-110-NBR-N4	PBG-110-NBR	PBTF-110-SI-N4	PBG-110-SI	FTF-120-N4
150	1/2 BSPP	PBTF-150-NBR-G4	PBG-150-NBR	PBTF-150-SI-G4	PBG-150-SI	FTF-120-G4
150	1/2 NPT	PBTF-150-NBR-N4	PBG-150-NBR	PBTF-150-SI-N4	PBG-150-SI	FTF-120-N4

 Most popular.

Vacuum Cups Vacuum Products	C
	PFG Series
	PBG Series
	P5V-CFS Series
	PJG Series
	PCG Series
	PUGB Series

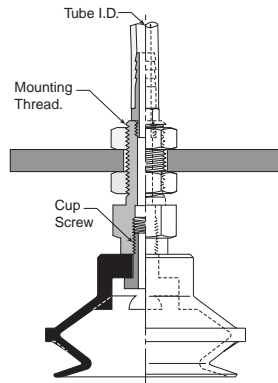


PBTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	Barb	PBTK-10A-NBR	PBG-10A-NBR	PBTK-10A-SI	PBG-10A-SI	FTK-5A
15	Barb	PBTK-15A-NBR	PBG-15A-NBR	PBTK-15A-SI	PBG-15-SI	FTK-5A
20	Barb	PBTK-20-NBR	PBG-20-NBR	PBTK-20-SI	PBG-20-SI	FTK-20
30	Barb	PBTK-30-NBR	PBG-30-NBR	PBTK-30-SI	PBG-30-SI	FTK-25
40	Barb	PBTK-40-NBR	PBG-40-NBR	PBTK-40-SI	PBG-40-SI	FTK-25
50	Barb	PBTK-50-NBR	PBG-50-NBR	PBTK-50-SI	PBG-50-SI	FTK-50
75	1/8 BSPP	PBTK-75-NBR-G1	PBG-75-NBR	PBTK-75-SI-G1	PBG-75-SI	FTK-60-G1
75	1/8 NPT	PBTK-75-NBR-N1	PBG-75-NBR	PBTK-75-SI-N1	PBG-75-SI	FTK-60-N1

Most popular.

C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 PSV-CFS Series
 PJG Series
 PCG Series
 PUGB Series



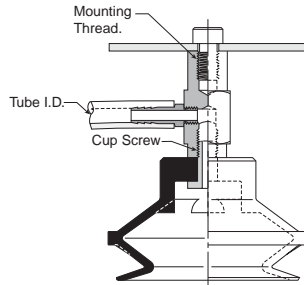
PBYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt through a plate or "L" bracket to allow the tube connection from the side port. Fitting material: nickel plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	Barb	PBYK-10A-NBR	PBG-10A-NBR	PBYK-10A-SI	PBG-10A-SI	FYK-5A
15	Barb	PBYK-15A-NBR	PBG-15A-NBR	PBYK-15A-SI	PBG-15A-SI	FYK-15
20	Barb	PBYK-20-NBR	PBG-20-NBR	PBYK-20-SI	PBG-20-SI	FYK-20
30	Barb	PBYK-30-NBR	PBG-30-NBR	PBYK-30-SI	PBG-30-SI	FYK-25
40	Barb	PBYK-40-NBR	PBG-40-NBR	PBYK-40-SI	PBG-40-SI	FYK-25
50	Barb	PBYK-50-NBR	PBG-50-NBR	PBYK-50-SI	PBG-50-SI	FYK-50
75	1/8 BSPP	PBYK-75-NBR-G1	PBG-75-NBR	PBYK-75-SI-G1	PBG-75-SI	FYK-60-G1
75	1/8 NPT	PBYK-75-NBR-N1	PBG-75-NBR	PBYK-75-SI-N1	PBG-75-SI	FYK-60-N1
110	1/8 BSPP	PBYK-110-NBR-G1	PBG-110-NBR	PBYK-110-SI-G1	PBG-110-SI	FYK-120-G1
110	1/8 NPT	PBYK-110-NBR-N1	PBG-110-NBR	PBYK-110-SI-N1	PBG-110-SI	FYK-120-N1
150	1/8 BSPP	PBYK-150-NBR-G1	PBG-150-NBR	PBYK-150-SI-G1	PBG-150-SI	FYK-120-G1
150	1/8 NPT	PBYK-150-NBR-N1	PBG-150-NBR	PBYK-150-SI-N1	PBG-150-SI	FYK-120-N1

 Most popular.

C
 Vacuum Cups
 Vacuum Products
 PFJ Series
 PBG Series
 P5V-CFS Series
 PJG Series
 PCG Series
 PUGB Series



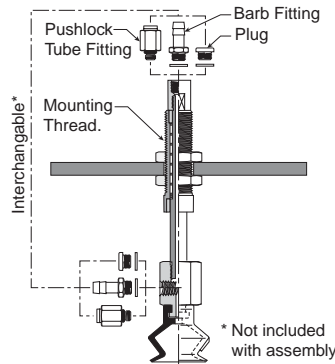
PBTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage. Shown are interchangeable connectors & plugs for port connections.



Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N)		Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
			0%	100%					
10	M5	10	.11 (.49)	.13 (.59)	PBTYS10A10NBRM5	PBG-10A-NBR	PBTYS10A10SIM5	PBG-10A-SI	TYS-5A-10
10	M5	15	.11 (.49)	.13 (.59)	PBTYS10A15NBRM5	PBG-10A-NBR	PBTYS10A15SIM5	PBG-10A-SI	TYS-5A-15
15	M5	10	.11 (.49)	.13 (.59)	PBTYS15A10NBRM5	PBG-15A-NBR	PBTYS15A10SIM5	PBG-15A-SI	TYS-5A-10
15	M5	15	.11 (.49)	.13 (.59)	PBTYS15A15NBRM5	PBG-15A-NBR	PBTYS15A15SIM5	PBG-15A-SI	TYS-5A-15
20	M5	15	.56 (2.5)	.79 (3.4)	PBTYS20B15NBRM5	PBG-20B-NBR	PBTYS20B15SIM5	PBG-20B-SI	TYS-20B-15
20	M5	30	.56 (2.5)	1.2 (4.9)	PBTYS20B30NBRM5	PBG-20B-NBR	PBTYS20B30SIM5	PBG-20B-SI	TYS-20B-30
30	M5	15	.56 (2.5)	.79 (3.4)	PBTYS3015NBRM5	PBG-30-NBR	PBTYS3015SIM5	PBG-30-SI	TYS-20B-15
30	M5	30	.56 (2.5)	1.2 (4.9)	PBTYS3030NBRM5	PBG-30-NBR	PBTYS3030SIM5	PBG-30-SI	TYS-20B-30
40	M5	15	.56 (2.5)	.79 (3.4)	PBTYS4015NBRM5	PBG-40-NBR	PBTYS4015SIM5	PBG-40-SI	TYS-20B-15
40	M5	30	.56 (2.5)	1.2 (4.9)	PBTYS4030NBRM5	PBG-40-NBR	PBTYS4030SIM5	PBG-40-SI	TYS-20B-30
50	M5	15	.56 (2.5)	1.2 (4.9)	PBTYS5015NBRM5	PBG-50-NBR	PBTYS5015SIM5	PBG-50-SI	TYS-50-15
50	M5	30	.67 (2.9)	1.4 (5.9)	PBTYS5030NBRM5	PBG-50-NBR	PBTYS5030SIM5	PBG-50-SI	TYS-50-30
75	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PBTYS7530NBRN1	PBG-75-NBR	PBTYS7530SIN1	PBG-75-SI	TYS-60-30
75	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PBTYS7550NBRN1	PBG-75-NBR	PBTYS7550SIN1	PBG-75-SI	TYS-60-50
110	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PBTYS12020NBRN2	PBG-110-NBR	PBTYS11020SIN2	PBG-110-SI	TYS-120-20
110	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PBTYS12070NBRN2	PBG-110-NBR	PBTYS11070SIN2	PBG-110-SI	TYS-120-70
150	1/4 NPT	20	3.6 (15.6)	6.8 (29)	PBTYS15020NBRN2	PBG-150-NBR	PBTYS15020SIN2	PBG-150-SI	TYS-120-20
150	1/4 NPT	70	3.4 (14.7)	6.8 (29)	PBTYS15070NBRN2	PBG-150-NBR	PBTYS15070SIN2	PBG-150-SI	TYS-120-70

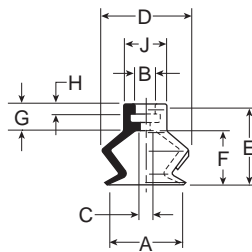
Most popular.



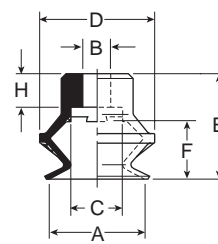
C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 P5V-CFS Series
 PJG Series
 PCG Series
 PUGB Series

PBG Series Replacement Cup Dimensions

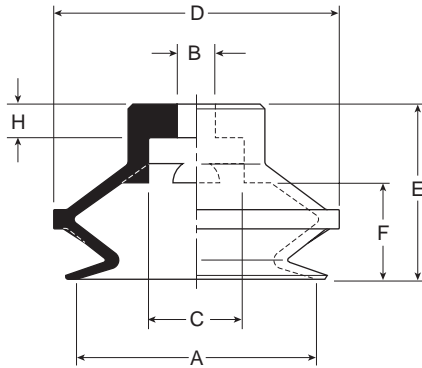
**PBG-10A and
PBG-20B**



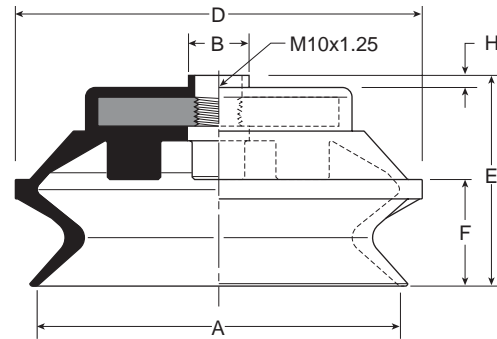
**PBG-20 thru
PBG-40**



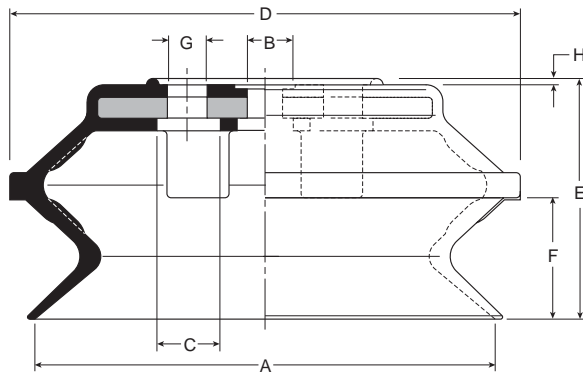
PBG-50



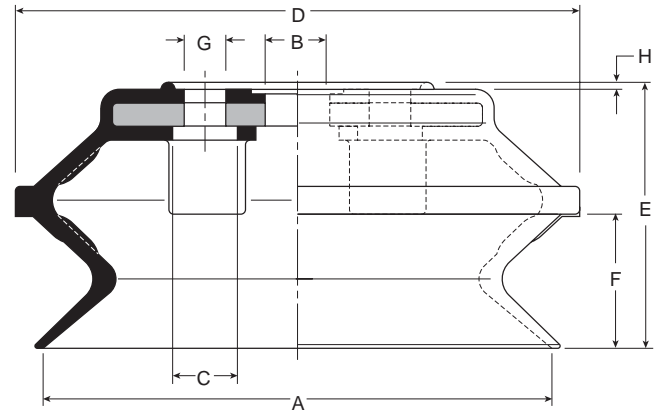
PBG-75



PBG-110



PBG-150



Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PBG-10A-*	.42 (10.6)	.16 (4)	.08 (2)	.49 (12.4)	.53 (13.5)	.30 (7.5)	.24 (6)	.08 (2)	.24 (6)
PBG-15A-*	.59 (15)	.16 (4)	.16 (4)	.67 (17)	.63 (16)	.39 (10)	.24 (6)	.08 (2)	.24 (6)
PBG-20B-*	.79 (20)	.24 (6)	.43 (10.8)	.94 (24)	.87 (22)	.47 (12)	—	.28 (7)	—
PBG-20-*	.79 (20)	.18 (4.6)	.43 (10.8)	.94 (24)	.77 (19.5)	.47 (12)	—	.18 (4.5)	—
PBG-30-*	1.18 (30)	.23 (5.8)	.43 (10.8)	1.42 (36)	1.20 (30.5)	.67 (17)	—	.28 (7)	—
PBG-40-*	1.57 (40)	.23 (5.8)	.43 (10.8)	1.81 (46)	1.20 (30.5)	.61 (15.5)	—	.28 (7)	—
PBG-50-*	1.97(50)	.31 (7.8)	.78 (19.8)	2.34 (59.5)	1.44 (36.5)	.79 (20)	—	.28 (7)	—
PBG-75-*	2.95 (75)	.49 (12.5)	—	3.31 (84)	1.71 (43.5)	.87 (22)	—	.10 (2.5)	—
PBG-110-*	4.33 (110)	.55 (14)	.55 (14)	4.80 (122)	2.26 (57.5)	1.14 (29)	—	.059 (1.5)	—
PBG-150-*	5.91 (150)	.79 (20)	.55 (14)	6.57 (167)	3.01 (76.5)	1.50 (38)	4xØ9xØ40	.059 (1.5)	—

Inches (mm)
* Cup material

C

Vacuum Cups
Vacuum Products

PFG
Series

PBG
Series

P5V-CFS
Series

PJG
Series

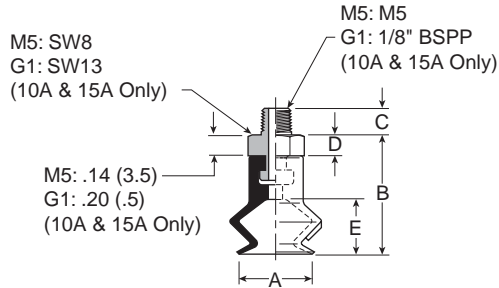
PCG
Series

PUGB
Series

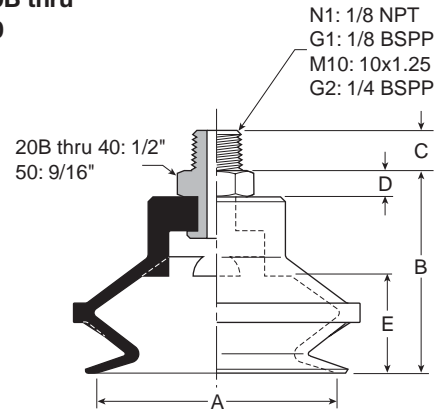


Dimensions

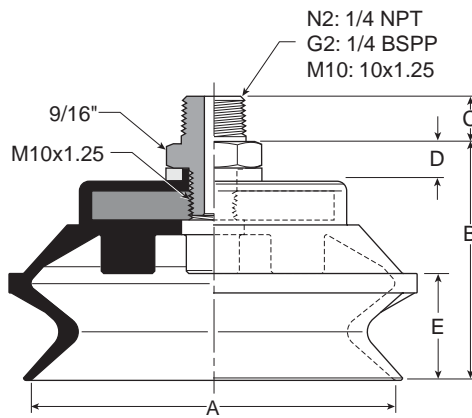
**PBTM-10A thru
PBTM-15**



**PBTM-20B thru
PBTM-50**



PBTM-75



Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PBTM-10A-*†	.39 (10)	.67 (17)	.18 (4.5)	.31 (8)	—	—	See Dwg.	.30 (7.5)
PBTM-15A-*†	.59 (15)	.77 (19.5)	.18 (4.5)	.31 (8)	—	—	See Dwg.	.39 (10)
PBTM-20B-*†	.79 (20)	1.06 (27)	—	.31 (8)	.39 (10)	—	.20 (5)	.47 (12)
PBTM-30-*†	1.18 (30)	1.40 (35.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.67 (17)
PBTM-40-*†	1.57 (40)	1.40 (35.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.61 (15.5)
PBTM-50-*†	1.97 (50)	1.63 (41.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.79 (20)
PBTM-75-*†	3.74 (95)	1.99 (50.5)	—	—	.39 (10)	.59 (15)	.28 (7)	.87 (22)

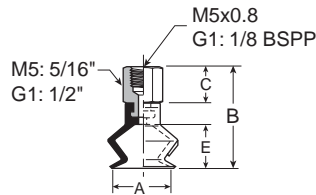
Inches (mm)
* Cup material
† Thread size

C
Vacuum Cups
Vacuum Products
PF6 Series
PB6 Series
PSV-CFS Series
PI6 Series
PC6 Series
PUGB Series

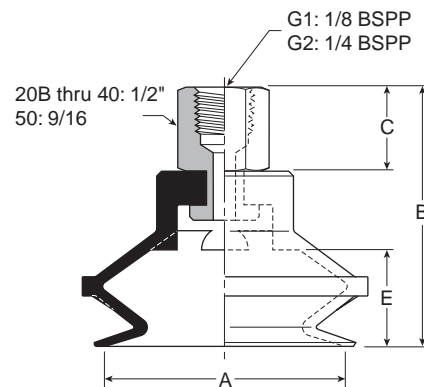


Dimensions

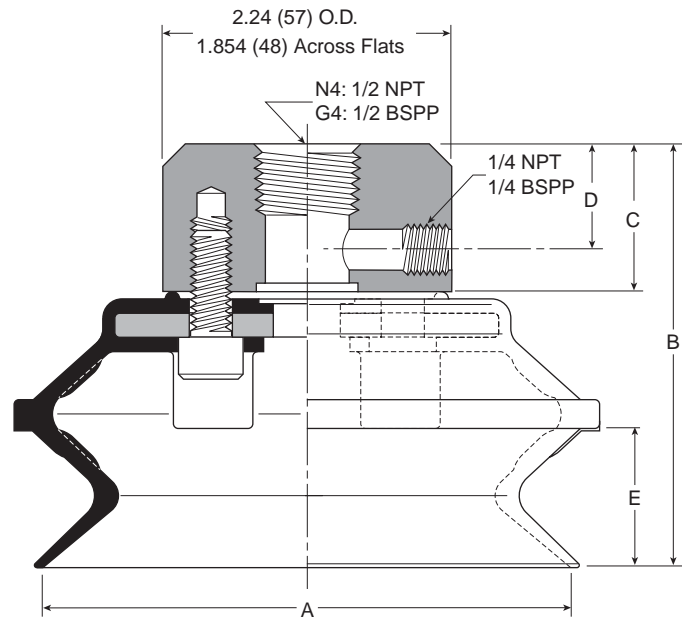
**PBTF-10A thru
 PBTF-15A**



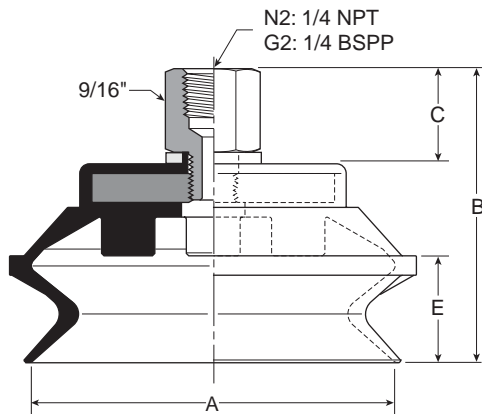
**PBTF-20B thru
 PBTF 50**



**PBTF-110 thru
 PBTF-150**



PBTF-75



Model number	ØA	B	B (M5)	C	C (M5)	D	E
PBTF-10A-*†	.39 (10)	.85 (21.5)	1.08 (27.5)	.31 (8)	.55 (14)	—	.30 (7.5)
PBTF-15A-*†	.59 (15)	.94 (24)	1.18 (30)	.31 (8)	.55 (14)	—	.39 (10)
PBTF-20B-*†	.79 (20)	1.42 (36)	—	.55 (14)	—	—	.47 (12)
PBTF-30-*†	1.18 (30)	1.75 (44.5)	—	.55 (14)	—	—	.70 (17)
PBTF-40-*†	1.57 (40)	1.75 (44.5)	—	.55 (14)	—	—	.61 (15.5)
PBTF-50-*†	1.97 (50)	1.99 (50.5)	—	.55 (14)	—	—	.79 (20)
PBTF-75-*†	3.74 (95)	2.38 (60.5)	—	.77 (19.5)	—	—	.87 (22)
PBTF-110-*†	4.72 (120)	3.07 (78)	—	.94 (24)	—	.51 (13)	1.14 (29)
PBTF-150-*†	5.91 (150)	3.82 (97)	—	.94 (24)	—	.51 (13)	1.50 (38)

Inches (mm)
 * Cup material
 † Thread size

C

Vacuum Cups
 Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

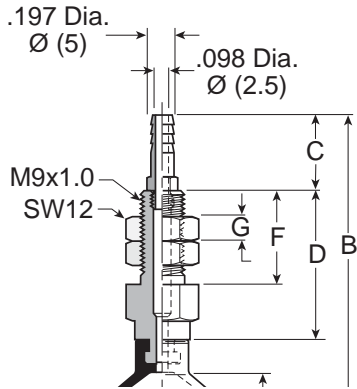
PCG Series

PUGB Series

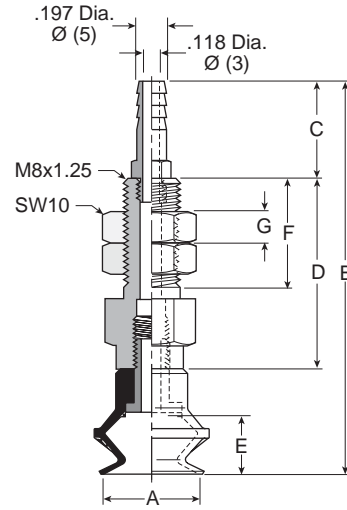


Dimensions

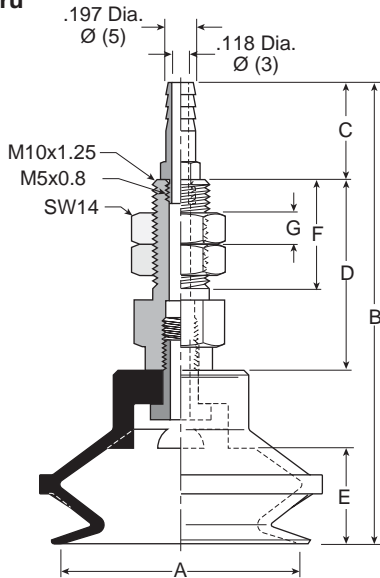
**PBTK-10A thru
 PBTK-15A**



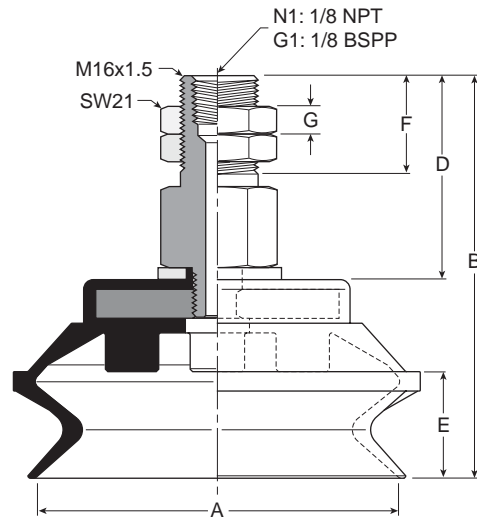
PBTK-20



**PBTK-30 thru
 PBTK-50**



PBTK-75



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PBTK-10A-*	.39 (10)	2.05 (52)	.39 (10)	.89 (22.5)	.30 (7.5)	.24 (6)	.61 (15.5)	.5 (15)
PBTK-15A-*	.59 (15)	2.15 (54.5)	.39 (10)	.89 (22.5)	.39 (10)	.24 (6)	.61 (15.5)	.5 (15)
PBTK-20-*	.79 (20)	2.26 (57.5)	.63 (16)	.87 (22)	.47 (12)	.24 (6)	.59 (15)	.7 (21)
PBTK-30-*	1.18 (30)	3.09 (78.5)	.63 (16)	1.26 (32)	.67 (17)	.24 (6)	.79 (20)	1.6 (45)
PBTK-40-*	1.57 (40)	3.09 (78.5)	.63 (16)	1.26 (32)	.61 (15.5)	.24 (6)	.79 (20)	1.7 (48)
PBTK-50-*	1.97 (50)	3.33 (84.5)	.63 (16)	1.26 (32)	.79 (20)	.24 (6)	.79 (20)	2.2 (62)
PBTK-75-*,†	3.74 (95)	3.29 (83.5)	—	1.67 (42.5)	.87 (22)	.43 (11)	—	6.5 (186)

Inches (mm)
 * Cup material
 † Vacuum port

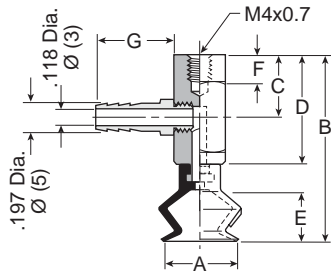
C
 Vacuum Cups
 Vacuum Products

Series
 PFG
 PBG
 PSV-CFS
 PJG
 PCG
 PUGB

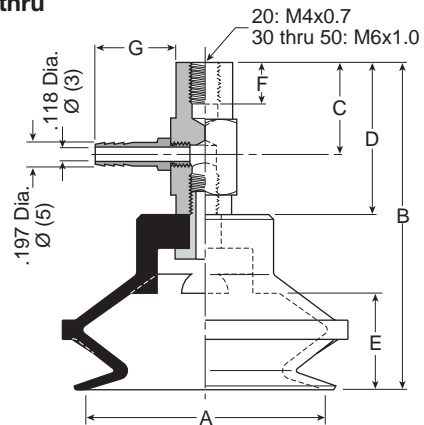


Dimensions

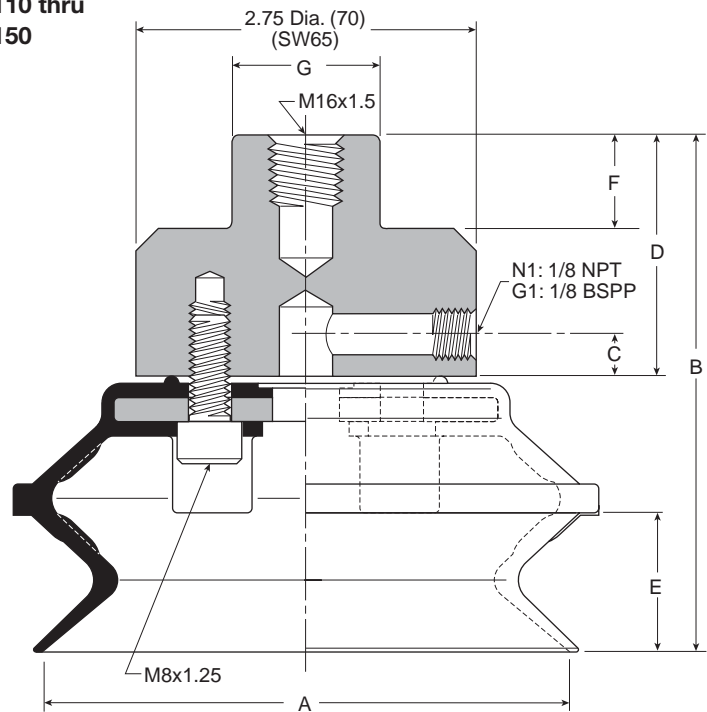
**PBYK-10A thru
PBYK-15A**



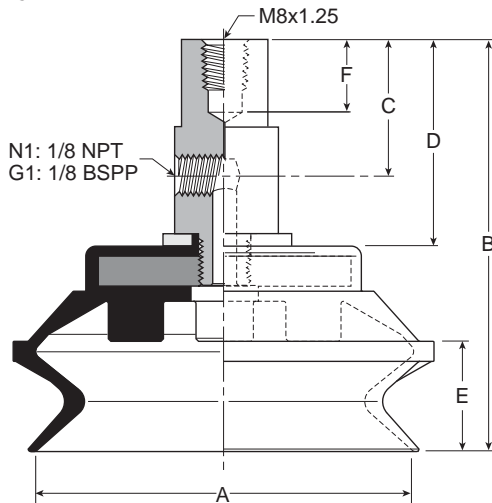
**PBYK-20 thru
PBYK-50**



**PBYK-110 thru
PBYK-150**



PBYK-75



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PBYK-10A-*	.39 (10)	1.42 (36)	.51 (13)	.89 (22.5)	.29 (7.5)	.24 (6)	.63 (16)	.6 (16)
PBYK-15A-*	.59 (15)	1.52 (38.5)	.51 (13)	.89 (22.5)	.39 (10)	.24 (6)	.63 (16)	.6 (16)
PBYK-20-*	.79 (20)	1.63 (41.5)	.55 (14)	.87 (22)	.47 (12)	.24 (6)	.63 (16)	.7 (21)
PBYK-30-*	1.18 (30)	2.46 (62.5)	.79 (20)	1.26 (32)	.67 (17)	.24 (6)	.63 (16)	1.6 (45)
PBYK-40-*	1.57 (40)	2.46 (62.5)	.79 (20)	1.26 (32)	.61 (15.5)	.24 (6)	.63 (16)	2.0 (58)
PBYK-50-*	1.97 (50)	2.70 (68.5)	.79 (20)	1.26 (32)	.78 (20)	.24 (6)	.63 (16)	2.4 (67)
PBYK-75-*,†	3.74 (95)	3.29 (83.5)	1.10 (28)	1.67 (42.5)	.86 (22)	.43 (11)	—	6.9 (176)
PBYK-110-*,†	4.72 (120)	4.17 (106)	.47 (12)	1.97 (50)	1.14 (29)	.79 (20)	1.18 Dia. (30)	26.4 (670)
PBYK-150-*,†	5.91 (150)	4.92 (125)	.47 (12)	1.97 (50)	1.50 (38)	.79 (20)	1.18 Dia. (30)	46.5 (1180)

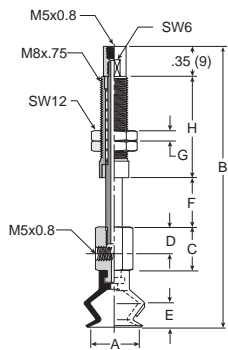
Inches (mm)
* Cup material
† Vacuum port

C
Vacuum Cups
Vacuum Products
PFG Series
PBG Series
P5V-CFS Series
PJG Series
PCG Series
PUGB Series

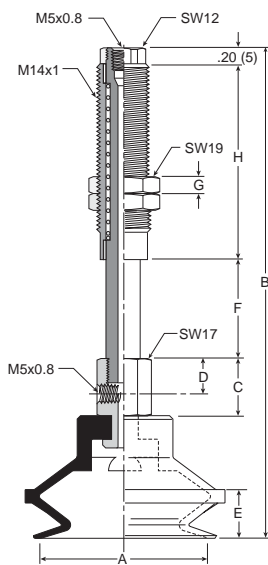


Dimensions

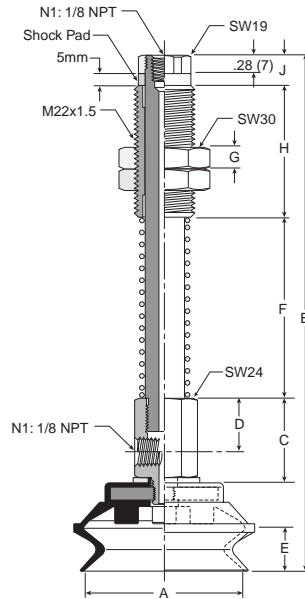
**PBTYS10A thru
PBTYS15A1**



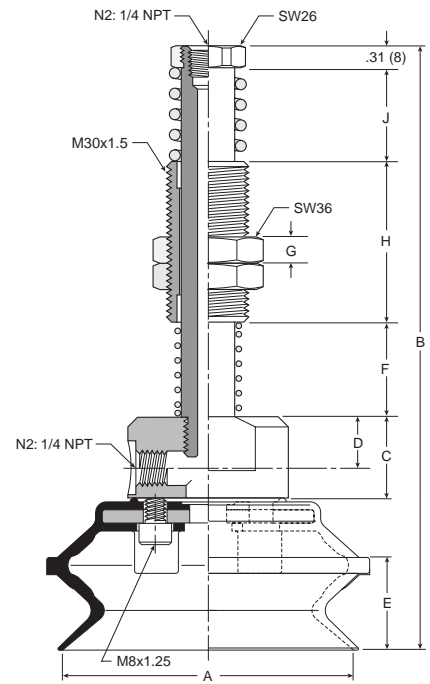
**PBTYS20B thru
PBTYS50**



PBTYS75



**PBTYS110 thru
PBTYS150**



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PBTYS10A10*	.39 (10)	2.70 (68.5)	.51 (13)	.31 (8)	.30 (7.5)	.39 (10)	.12 (3)	.91 (23)	—	.65 (18.5)
PBTYS10A15*	.39 (10)	3.19 (81)	.51 (13)	.31 (8)	.30 (7.5)	.59 (15)	.12 (3)	1.20 (30.5)	—	.7 (21)
PBTYS15A10*	.59 (15)	2.80 (71)	.51 (13)	.31 (8)	.39 (10)	.39 (10)	.12 (3)	.91 (23)	—	.65 (18.5)
PBTYS15A15*	.59 (15)	3.29 (83.5)	.51 (13)	.31 (8)	.39 (10)	.59 (15)	.12 (3)	1.20 (30.5)	—	.7 (21)
PBTYS20B15*	.79 (20)	3.90 (99)	.67 (17)	.39 (10)	.47 (12)	.59 (15)	.20 (5)	1.42 (36)	—	2.5 (72)
PBTYS20B30*	.79 (20)	5.36 (136)	.67 (17)	.39 (10)	.47 (12)	1.18 (30)	.20 (5)	2.28 (58)	—	3.4 (97)
PBTYS3015**†	1.18 (30)	4.07 (103.5)	.67 (17)	.39 (10)	.67 (17)	.59 (15)	.20 (5)	1.42 (36)	—	3.4 (97)
PBTYS3030**†	1.18 (30)	5.53 (140.5)	.67 (17)	.39 (10)	.67 (17)	1.18 (30)	.20 (5)	2.28 (58)	—	3.6 (102)
PBTYS4015**†	1.57 (40)	4.07 (103.5)	.67 (17)	.39 (10)	.61 (15.5)	.59 (15)	.20 (5)	1.42 (36)	—	2.9 (83)
PBTYS4030**†	1.57 (40)	5.53 (140.5)	.67 (17)	.39 (10)	.61 (15.5)	1.18 (30)	.20 (5)	2.28 (58)	—	3.8 (108)
PBTYS5015**†	1.97 (50)	4.31 (109.5)	.67 (17)	.39 (10)	.78 (20)	.59 (15)	.20 (5)	1.42 (36)	—	3.4 (97)
PBTYS5030**†	1.97 (50)	5.77 (146.5)	.67 (17)	.39 (10)	.78 (20)	1.18 (30)	.20 (5)	2.28 (58)	—	4.3 (122)
PBTYS7530**†	2.95 (75)	7.01 (178)	1.28 (32.5)	.78 (20)	.87 (22)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	12 (339)
PBTYS7550**†	2.95 (75)	7.99 (203)	1.28 (32.5)	.78 (20)	.87 (22)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13 (373)
PBTYS11020**†	4.33 (110)	8.82 (224)	1.18 (30)	.71 (18)	1.14 (29)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	42 (1194)
PBTYS11070**†	4.33 (110)	11.38 (289)	1.18 (30)	.71 (18)	1.14 (29)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	45 (1276)
PBTYS15020**†	5.91 (150)	9.57 (243)	1.18 (30)	.71 (18)	1.50 (38)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	60 (1704)
PBTYS15070**†	5.91 (150)	12.13 (308)	1.18 (30)	.71 (18)	1.50 (38)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	63 (1786)

Inches (mm)
* Cup material
† Vacuum port

C
Vacuum Cups
Vacuum Products
Series
PF6
Series
PB6
Series
PSV-CFS
Series
PJ6
Series
PC6
Series
PUGB
Series



P5V-CFS Vacuum Cup Series

Features

- Double sealing lips for flexible sheet handling
- Vacuum cup grooves on underside increase holding area
- Resists acceleration and deceleration shear forces
- Strong low profile for fast response
- Metal insert fitting for stable vertical and horizontal lifts

Applications

These suction cups are ideal for applications where the product may flex when being lifted. All cups have a double sealing lip and cleats to increase holding capacity. The top of the cup has a ribbed outer lip to prevent it from rolling over the surface to be lifted.

Dual sealing lips provide 2 seals for vacuum. As the product flexes, the outer lip seal may break, but the inner lip seal will hold the degree of vacuum for continued lifting capacity. In these types of applications, sizing should be done on the inner diameter cup dimension.

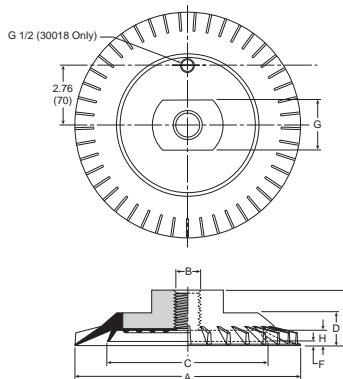
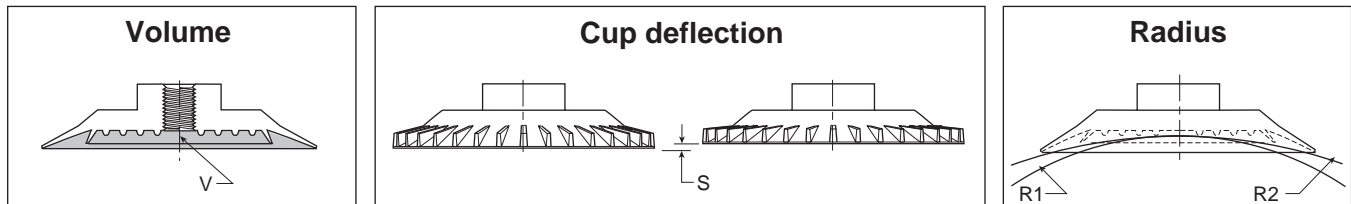


Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Area*** cm ²	Cup volume (V) liters	Deflection (S) (mm)	Radius R (mm)	
						R1*	R2**
50	1/8 BSPP	P5V-CFS05011N	19.6	.001	.16 (4)	3.86 (98)	3.15 (80)
100	3/8 BSPP	P5V-CFS10013N	78.5	.0667	.30 (8)	10.00 (254)	6.34 (161)
150	1/2 BSPP	P5V-CFS15014N	176.7	.2083	.43 (11)	12.17 (309)	9.92 (252)

* Minimum permissible radius for lifting using inner lip.

** Minimum permissible radius for lifting using outer lip.

*** Area based on Outer Cup Diameter



Dimensions

Model number	ØA	B	ØC	D	E	F	G	H
P5V-CFS50*	1.97 (50)	G1/8	1.38 (35)	0.43 (11)	0.71 (18)	0.087 (2.2)	0.51 (13)	0.146 (3.7)
P5V-CFS100*	3.94 (100)	G3/8	2.83 (72)	0.71 (18)	1.10 (28)	0.197 (5)	0.87 (22)	0.295 (7.5)
P5V-CFS150*	5.91 (150)	G1/2	4.17 (106)	1.02 (26)	1.65 (42)	0.276 (7)	1.06 (27)	0.43 (11)

Inches (mm)

* Cup material

 Most popular.



PJG Short Bellows Vacuum Cup Series

Versatile bellow cup design provides increased sealing lip and level compensation for products with irregular, smooth, curved surfaces, or flexible sheets.

The short stroke bellow suction cup has an extra thin sealing edge and shorter stroke versus the traditional bellows for faster response. The cups are good for corrugated and smooth surfaces.

Features

- Short bellows for fast response
- More lip seal contact for corrugated, textured surfaces
- Soft sealing lip
- 6mm to 80mm



Styles

- PJTM series male thread connector
- PJTF series female thread connector
- PJTK series barbed bulkhead
- PJYK series 90° barbed adapter
- PJTYS series bulkhead level compensator

Operating information

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*
Material code	NBR	NBRE	SI	SIE
Operating temperature	-20°C to 120°C (-4°F to 248°F)	0°C to 60°C (32°F to 40°F)	-60° to 250°C (-76°F to 482°F)	-10° to 130°C (-14°F to 266°F)
Color	Black	Black / Blue Dot	White	Black / Red Dot
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	5 to 15

* ESD: Electric Static Dissipative Material

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with silicon ESD (SIE), replace (NBR) with (SIE) in the part number. PJTM-20B-NBR-G1 becomes PJTM-20B-SIE-G1. Inquire with factory for availability.

Application guide

Short Bellows



Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, thin section	Soft porous material, thin section	Soft porous material, any section	Metal sheet handling	Corrugated sheet handling	Not for vertical lift
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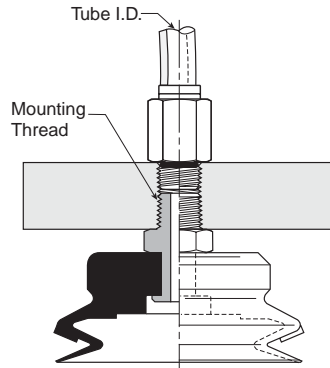
PJTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
 Fitting material: aluminum.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	M5	PJTM-6-NBR-M5	PJG-6-NBR	PJTM-6-SI-M5	PJG-6-SI	FTM-5A-M5H
6	1/8 BSPP	PJTM-6-NBR-G1	PJG-6-NBR	PJTM-6-SI-G1	PJG-6-SI	FTM-5A-G1
8	M5	PJTM-8-NBR-M5	PJG-8-NBR	PJTM-8-SI-M5	PJG-8-SI	FTM-5A-M5H
8	1/8 BSPP	PJTM-8-NBR-G1	PJG-8-NBR	PJTM-8-SI-G1	PJG-8-SI	FTM-5A-G1
10	M5	PJTM-10-NBR-M5	PJG-10-NBR	PJTM-10-SI-M5	PJG-10-SI	TN-PF-15-M5
15	M5	PJTM-15-NBR-M5	PJG-15-NBR	PJTM-15-SI-M5	PJG-15-SI	TN-PF-15-M5
20	M5	PJTM-20-NBR-M5	PJG-20-NBR	PJTM-20-SI-M5	PJG-20-SI	TN-PF-20-M5
30	1/8 BSPP	PJTM-30-NBR-G1	PJG-30-NBR	PJTM-30-SI-G1	PJG-30-SI	FTM-20B-G1H
30	1/4 BSPP	PJTM-30-NBR-G2	PJG-30-NBR	PJTM-30-SI-G2	PJG-30-SI	FTM-20B-G2
30	M10	PJTM-30-NBR-M10	PJG-30-NBR	PJTM-30-SI-M10	PJG-30-SI	FTM-20B-M10
30	1/8 NPT	PJTM-30-NBR-N1	PJG-30-NBR	PJTM-30-SI-N1	PJG-30-SI	FTM-20B-N1
40	1/8 BSPP	PJTM-40-NBR-G1	PJG-40-NBR	PJTM-40-SI-G1	PJG-40-SI	FTM-20B-G1H
40	1/4 BSPP	PJTM-40-NBR-G2	PJG-40-NBR	PJTM-40-SI-G2	PJG-40-SI	FTM-20B-G2
40	M10	PJTM-40-NBR-M10	PJG-40-NBR	PJTM-40-SI-M10	PJG-40-SI	FTM-20B-M10
40	1/8 NPT	PJTM-40-NBR-N1	PJG-40-NBR	PJTM-40-SI-N1	PJG-40-SI	FTM-20B-N1
50	1/8 BSPP	PJTM-50-NBR-G1	PJG-50-NBR	PJTM-50-SI-G1	PJG-50-SI	FTM-50-G1H
50	1/4 BSPP	PJTM-50-NBR-G2	PJG-50-NBR	PJTM-50-SI-G2	PJG-50-SI	FTM-50-G2
50	1/8 NPT	PJTM-50-NBR-N1	PJG-50-NBR	PJTM-50-SI-N1	PJG-50-SI	FTM-50-N1
60	1/4 BSPP	PJTM-60-NBR-G2	PJG-60-NBR	PJTM-60-SI-G2	PJG-60-SI	FTM-60-G2
60	M10	PJTM-60-NBR-M10	PJG-60-NBR	PJTM-60-SI-M10	PJG-60-SI	FTM-60-M10
60	1/4 NPT	PJTM-60-NBR-N2	PJG-60-NBR	PJTM-60-SI-N2	PJG-60-SI	FTM-60-N2
80	1/4 BSPP	PJTM-80-NBR-G2	PJG-80-NBR	PJTM-80-SI-G2	PJG-80-SI	FTM-60-G2
80	M10	PJTM-80-NBR-M10	PJG-80-NBR	PJTM-80-SI-M10	PJG-80-SI	FTM-60-M10
80	1/4 NPT	PJTM-80-NBR-N2	PJG-80-NBR	PJTM-80-SI-N2	PJG-80-SI	FTM-60-N2

☐ Most popular.

C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 P5V-CFS Series
 PJG Series
 PCG Series
 PUGB Series

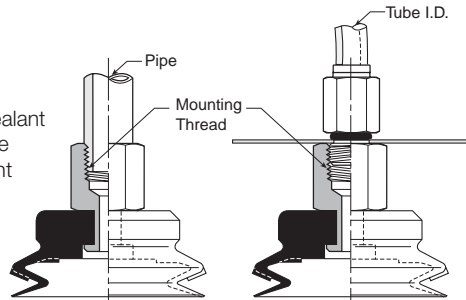


PJTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.
 Fitting material: aluminum.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	M5	PJTF-6-NBR-M5	PJG-6-NBR	PJTF-6-SI-M5	PJG-6-SI	FTF-5A-M5
6	1/8 BSPP	PJTF-6-NBR-G1	PJG-6-NBR	PJTF-6-SI-G1	PJG-6-SI	FTF-5A-G1
8	M5	PJTF-8-NBR-M5	PJG-8-NBR	PJTF-8-SI-M5	PJG-8-SI	FTF-5A-M5
8	1/8 BSPP	PJTF-8-NBR-G1	PJG-8-NBR	PJTF-8-SI-G1	PJG-8-SI	FTF-5A-G1
10	M5	PJTF-10-NBR-M5	PJG-10-NBR	PJTF-10-SI-M5	PJG-10-SI	FTF-5A-M5
10	1/8 BSPP	PJTF-10-NBR-G1	PJG-10-NBR	PJTF-10-SI-G1	PJG-10-SI	FTF-5A-G1
15	M5	PJTF-15-NBR-M5	PJG-15-NBR	PJTF-15-SI-M5	PJG-15-SI	FTF-5A-M5
15	1/8 BSPP	PJTF-15-NBR-G1	PJG-15-NBR	PJTF-15-SI-G1	PJG-15-SI	FTF-5A-G1
30	1/8 BSPP	PJTF-30-NBR-G1	PJG-30-NBR	PJTF-30-SI-G1	PJG-30-SI	FTF-20B-G1
30	1/4 BSPP	PJTF-30-NBR-G2	PJG-30-NBR	PJTF-30-SI-G2	PJG-30-SI	FTF-20B-G2
40	1/8 BSPP	PJTF-40-NBR-G1	PJG-40-NBR	PJTF-40-SI-G1	PJG-40-SI	FTF-20B-G1
40	1/4 BSPP	PJTF-40-NBR-G2	PJG-40-NBR	PJTF-40-SI-G2	PJG-40-SI	FTF-20B-G2
50	1/8 BSPP	PJTF-50-NBR-G1	PJG-50-NBR	PJTF-50-SI-G1	PJG-50-SI	FTF-50-G1
50	1/4 BSPP	PJTF-50-NBR-G2	PJG-50-NBR	PJTF-50-SI-G2	PJG-50-SI	FTF-50-G2
60	1/4 BSPP	PJTF-60-NBR-G2	PJG-60-NBR	PJTF-60-SI-G2	PJG-60-SI	FTF-60-G2
60	1/4 NPT	PJTF-60-NBR-N2	PJG-60-NBR	PJTF-60-SI-N2	PJG-60-SI	FTF-60-N2
80	1/4 BSPP	PJTF-80-NBR-G2	PJG-80-NBR	PJTF-80-SI-G2	PJG-80-SI	FTF-60-G2
80	1/4 NPT	PJTF-80-NBR-N2	PJG-80-NBR	PJTF-80-SI-N2	PJG-80-SI	FTF-60-N2

Most popular.



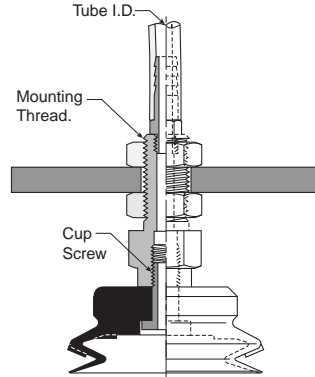
PJTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting materials: nickel plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	Barb	PJTK-6-NBR	PJG-6-NBR	PJTK-6-SI	PJG-6-SI	FTK-5A
8	Barb	PJTK-8-NBR	PJG-8-NBR	PJTK-8-SI	PJG-8-SI	FTK-5A
10	Barb	PJTK-10-NBR	PJG-10-NBR	PJTK-10-SI	PJG-10-SI	FTK-15
15	Barb	PJTK-15-NBR	PJG-15-NBR	PJTK-15-SI	PJG-15-SI	FTK-15
20	Barb	PJTK-20-NBR	PJG-20-NBR	PJTK-20-SI	PJG-20-SI	FTK-20
30	Barb	PJTK-30-NBR	PJG-30-NBR	PJTK-30-SI	PJG-30-SI	FTK-25
40	Barb	PJTK-40-NBR	PJG-40-NBR	PJTK-40-SI	PJG-40-SI	FTK-25
50	Barb	PJTK-50-NBR	PJG-50-NBR	PJTK-50-SI	PJG-50-SI	FTK-50
60	1/8 BSPP	PJTK-60-NBR-G1	PJG-60-NBR	PJTK-60-SI-G1	PJG-60-SI	FTK-60-G1
60	1/8 NPT	PJTK-60-NBR-N1	PJG-60-NBR	PJTK-60-SI-N1	PJG-60-SI	FTK-60-N1
80	1/8 BSPP	PJTK-80-NBR-G1	PJG-80-NBR	PJTK-80-SI-G1	PJG-80-SI	FTK-60-G1
80	1/8 NPT	PJTK-80-NBR-N1	PJG-80-NBR	PJTK-80-SI-N1	PJG-80-SI	FTK-60-N1

Most popular.

C Vacuum Cups Vacuum Products	PFG Series
	PBG Series
	P5V-CFS Series
	PJG Series
	PCG Series
	PUGB Series



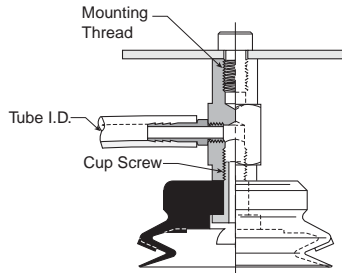
PJYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt through a plate or "L" bracket to allow the tube connection from the side port. Fitting materials: nickel plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	Barb	PJYK-6-NBR	PJG-6-NBR	PJYK-6-SI	PJG-6-SI	FYK-5A
8	Barb	PJYK-8-NBR	PJG-8-NBR	PJYK-8-SI	PJG-8-SI	FYK-5A
10	Barb	PJYK-10-NBR	PJG-10-NBR	PJYK-10-SI	PJG-10-SI	FYK-15
15	Barb	PJYK-15-NBR	PJG-15-NBR	PJYK-15-SI	PJG-15-SI	FYK-15
20	Barb	PJYK-20-NBR	PJG-20-NBR	PJYK-20-SI	PJG-20-SI	FYK-20
30	Barb	PJYK-30-NBR	PJG-30-NBR	PJYK-30-SI	PJG-30-SI	FYK-25
40	Barb	PJYK-40-NBR	PJG-40-NBR	PJYK-40-SI	PJG-40-SI	FYK-25
50	Barb	PJYK-50-NBR	PJG-50-NBR	PJYK-50-SI	PJG-50-SI	FYK-50
60	1/8 BSPP	PJYK-60-NBR-G1	PJG-60-NBR	PJYK-60-SI-G1	PJG-60-SI	FYK-60-G1
60	1/8 NPT	PJYK-60-NBR-N1	PJG-60-NBR	PJYK-60-SI-N1	PJG-60-SI	FYK-60-N1
80	1/8 BSPP	PJYK-80-NBR-G1	PJG-80-NBR	PJYK-80-SI-G1	PJG-80-SI	FYK-60-G1
80	1/8 NPT	PJYK-80-NBR-N1	PJG-80-NBR	PJYK-80-SI-N1	PJG-80-SI	FYK-60-N1

■ Most popular.

C
 Vacuum Cups
 Vacuum Products
 PF6 Series
 PB6 Series
 PSV-CFS Series
 PJG Series
 PCG Series
 PUGB Series



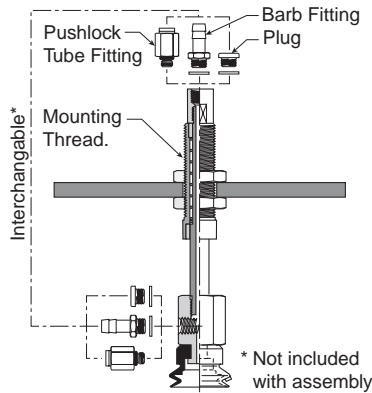
PJTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage. Shown are interchangeable connectors & plugs for port connections.



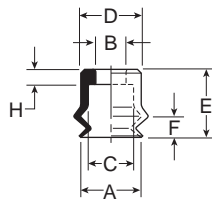
Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N)		Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
			0%	100%					
10	M5	10	.56 (2.5)	1.2 (4.9)	PJTYS1010NBRM5	PJG-10-NBR	PJTYS1010SIM5	PJG-10-SI	JTYS-10-10
10	M5	15	.67 (2.5)	1.4 (5.9)	PJTYS1015NBRM5	PJG-10-NBR	PJTYS1015SIM5	PJG-10-SI	JTYS-10-15
15	M5	10	.56 (2.5)	1.2 (4.9)	PJTYS15A10NBRM5	PJG-15A-NBR	PJTYS15A10SIM5	PJG-15A-SI	JTYS-10-10
15	M5	15	.67 (2.5)	1.4 (5.9)	PJTYS15A15NBRM5	PJG-15A-NBR	PJTYS15A15SIM5	PJG-15A-SI	JTYS-10-15
30	M5	15	.56 (2.5)	.79 (3.4)	PJTYS3015NBRM5	PJG-30-NBR	PJTYS3015SIM5	PJG-30-SI	TYS-20B-15
30	M5	30	.67 (2.9)	1.4 (5.9)	PJTYS3030NBRM5	PJG-30-NBR	PJTYS3030SIM5	PJG-30-SI	TYS-20B-30
40	M5	15	.56 (2.5)	.79 (3.4)	PJTYS4015NBRM5	PJG-40-NBR	PJTYS4015SIM5	PJG-40-SI	TYS-20B-15
40	M5	30	.67 (2.9)	1.4 (5.9)	PJTYS4030NBRM5	PJG-40-NBR	PJTYS4030SIM5	PJG-40-SI	TYS-20B-30
50	M5	15	.56 (.25)	1.2 (4.9)	PJTYS5015NBRM5	PJG-50-NBR	PJTYS5015SIM5	PJG-50-SI	TYS-50-15
50	M5	30	.67 (2.9)	1.4 (5.9)	PJTYS5030NBRM5	PJG-50-NBR	PJTYS5030SIM5	PJG-50-SI	TYS-50-30
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PJTYS6030NBRN1	PJG-60-NBR	PJTYS6030SIN1	PJG-60-SI	TYS-60-30
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PJTYS6050NBRN1	PJG-60-NBR	PJTYS6050SIN1	PJG-60-SI	TYS-60-50
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PJTYS8030NBRN1	PJG-80-NBR	PJTYS8030SIN1	PJG-80-SI	TYS-60-30
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PJTYS8050NBRN1	PJG-80-NBR	PJTYS8050SIN1	PJG-80-SI	TYS-60-50

Most popular.

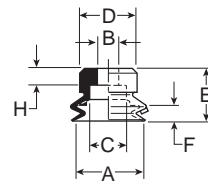


PJG Series Replacement Cup Dimensions

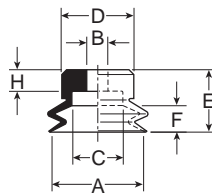
**PJG-6 and
 PJG-8**



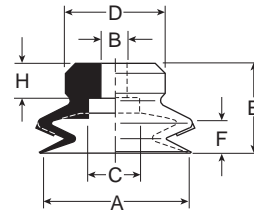
**PJG-10 and
 PJG-15**



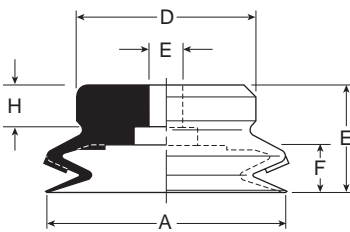
PJG-20



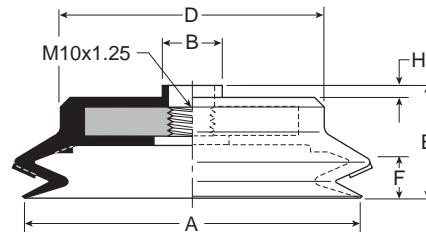
**PJG-30 thru
 PJG-40**



PJG-50



**PJG-60 thru
 PJG-80**



C
 Vacuum Cups
 Vacuum Products

Series
 PFG
 PBG
 PSV-CFS
 PJG
 PCG
 PUGB

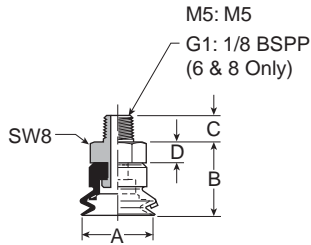
Model number	ØA	ØB	ØC	ØD	E	F	H
PJG-6-*	.24 (6)	.16 (4)	.24 (6)	.30 (7.5)	.35 (9)	.17 (4.2)	.08 (2)
PJG-8-*	.31 (8)	.16 (4)	.24 (6)	.31 (8)	.35 (9)	.16 (4)	.08 (2)
PJG-10-*	.39 (10)	.18 (4.6)	.31 (7.8)	.43 (11)	.37 (9.5)	.12 (3)	.14 (3.5)
PJG-15-*	.59 (15)	.18 (4.6)	.31 (7.8)	.47 (12)	.43 (11)	.13 (3.3)	.14 (3.5)
PJG-20-*	.79 (20)	.18 (4.6)	.43 (10.8)	.59 (15)	.51 (13)	.22 (5.5)	.18 (4.5)
PJG-30-*	1.18 (30)	.23 (5.8)	.43 (10.8)	.78 (20)	.71 (18)	.28 (7)	.28 (7)
PJG-35-*	1.38 (35)	.23 (5.8)	.43 (10.8)	.98 (25)	.71 (18)	.28 (7)	.28 (7)
PJG-40-*	1.57 (40)	.23 (5.8)	.43 (10.8)	1.18 (30)	.71 (18)	.28 (7.2)	.28 (7)
PJG-50-*	1.97 (50)	.31 (7.8)	.78 (19.8)	1.57 (40)	.79 (20)	.35 (9)	.28 (7)
PJG-60-*	2.36 (60)	.49 (12.5)	—	1.77 (45)	.89 (22.5)	.31 (8)	.10 (2.5)
PJG-70-*	2.75 (70)	.49 (12.5)	—	2.17 (55)	.93 (23.5)	.37 (9.5)	.10 (2.5)
PJG-80-*	3.15 (80)	.49 (12.5)	—	2.68 (68)	.93 (23.5)	.37 (9.5)	.10 (2.5)

Inches (mm)
 * Cup material

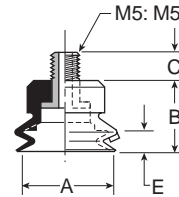


Dimensions

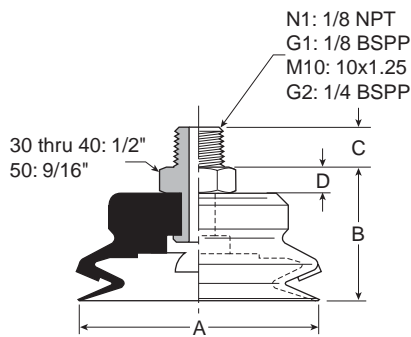
**PJTM-6 and
 PJTM-8**



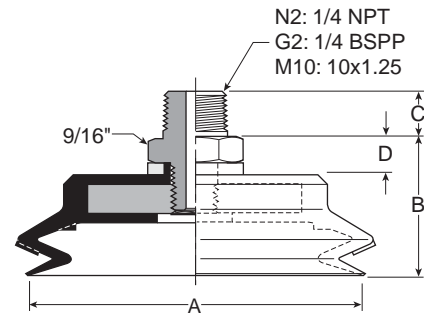
**PJTM-10 thru
 PJTM-20**



**PJTM-30 thru
 PJTM-50**



**PJTM-60 thru
 PJTM-80**



Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D
PJTM-6-*†	.24 (6)	.49 (12.5)	.18 (4.5)	.31 (8)	—	—	.14 (3.5)
PJTM-8-*†	.31 (8)	.49 (12.5)	.18 (4.5)	.31 (8)	—	—	.14 (3.5)
PJTM-10-*†	.39 (10)	.37 (9.5)	.20 (5)	—	—	—	—
PJTM-15-*†	.59 (15)	.43 (11)	.20 (5)	—	—	—	—
PJTM-20-*†	.79 (20)	.51 (13)	.20 (5)	—	—	—	—
PJTM-30-*†	1.18 (30)	.91 (23)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-40-*†	1.57 (40)	.91 (23)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-50-*†	1.97 (50)	.98 (25)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-60-*†	2.36 (60)	1.06 (27)	—	—	.39 (10)	.59 (15)	.28 (7)
PJTM-80-*†	3.15 (80)	1.10 (28)	—	—	.39 (10)	.59 (15)	.28 (7)

Inches (mm)
 * Cup material
 † Thread size

C

Vacuum Cups
 Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

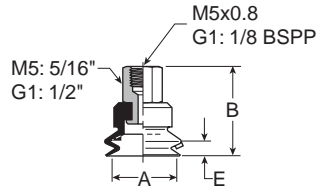
PCG Series

PUGB Series

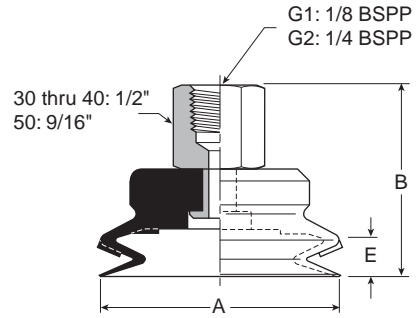


Dimensions

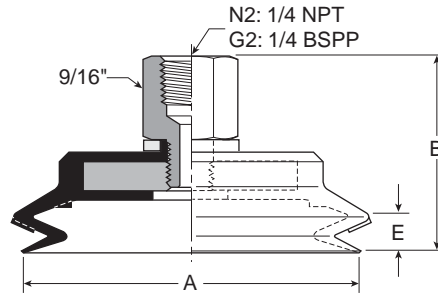
**PJTF-6 and
 PJTF-8**



**PJTF-30 thru
 PJTF-50**



**PJTF-60 thru
 PJTF-80**



Model number	ØA	B	B (M5)	E
PJTF-6-*†	.24 (6)	.79 (20)	.55 (14)	.16 (4)
PJTF-8-*†	.31 (8)	.79 (20)	.55 (14)	.16 (4)
PJTF-10-*†	.39 (10)	.79 (20)	.55 (14)	.12 (3)
PJTF-15-*†	.59 (15)	.79 (20)	.55 (14)	.13 (3.3)
PJTF-30-*†	1.18 (30)	1.25 (32)	—	.28 (7)
PJTF-40-*†	1.57 (40)	1.25(32)	—	.28 (7.2)
PJTF-50-*†	1.97 (50)	1.34 (34)	—	.35 (9)
PJTF-60-*†	2.36 (60)	1.56 (39.5)	—	.31 (8)
PJTF-80-*†	3.15 (80)	1.59 (40.5)	—	.37 (9.5)

Inches (mm)
 * Cup material
 † Thread size

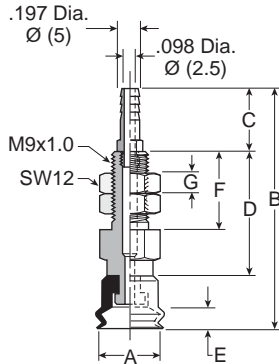
C
 Vacuum Cups
 Vacuum Products

Series
 PFG
 PBG
 PSV-CFS
 PJG
 PCG
 PUGB

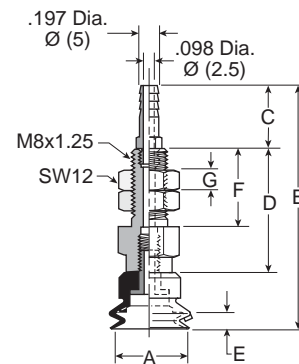


Dimensions

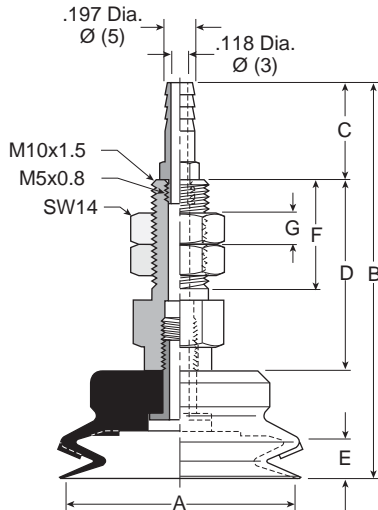
**PJTK-6 and
 PJTK-8**



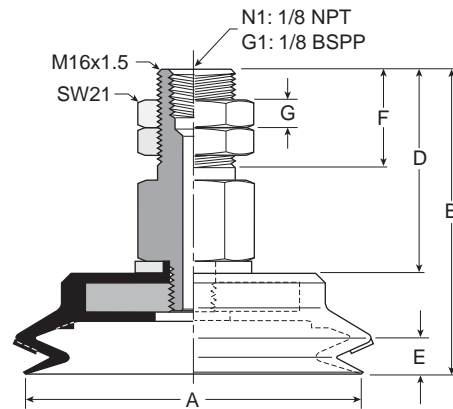
**PJTK-10 thru
 PJTK-20**



**PJTK-30 thru
 PJTK-50**



**PJTK-60 thru
 PJTK-80**



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PJTK-6-*	.24 (6)	1.30 (33)	.39 (10)	.55 (14)	.17 (4.2)	.47 (12)	.12 (3)	.4 (11)
PJTK-8-*	.31 (8)	1.30 (33)	.39 (10)	.55 (14)	.16 (4)	.47 (12)	.12 (3)	.4 (11)
PJTK-10-*	.39 (10)	1.87 (47.5)	.63 (16)	.87 (22)	.12 (3)	.59 (15)	.12 (3)	.5 (14)
PJTK-15-*	.59 (15)	1.93 (49)	.63 (16)	.87 (22)	.13 (3.3)	.59 (15)	.12 (3)	.5 (15)
PJTK-20-*	.79 (20)	2.01 (51)	.63 (16)	.87 (22)	.22 (5.5)	.59 (15)	.20 (5)	.6 (17)
PJTK-30-*	1.18 (30)	2.60 (66)	.63 (16)	1.26 (32)	.28 (7)	.79 (20)	.20 (5)	1.5 (42)
PJTK-40-*	1.57 (40)	2.60 (66)	.63 (16)	1.26 (32)	.28 (7.2)	.79 (20)	.20 (5)	1.6 (44)
PJTK-50-*	1.97 (50)	2.68 (68)	.63 (16)	1.26 (32)	.35 (9)	.79 (20)	.20 (5)	25.0 (58)
PJTK-60-*-†	2.36 (60)	2.46 (62.5)	—	1.67 (42.5)	.31 (8)	.79 (20)	.24 (6)	5.1 (144)
PJTK-80-*-†	3.15 (80)	2.50 (63.5)	—	1.67 (42.5)	.37 (9.5)	.79 (20)	.24 (6)	6.7 (190)

Inches (mm)
 * Cup material
 † Vacuum port

C

Vacuum Cups
 Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

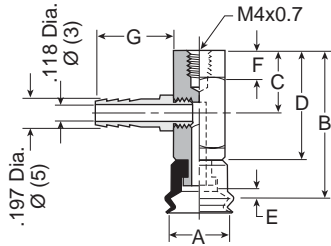
PCG Series

PUGB Series

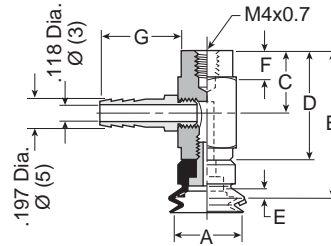


Dimensions

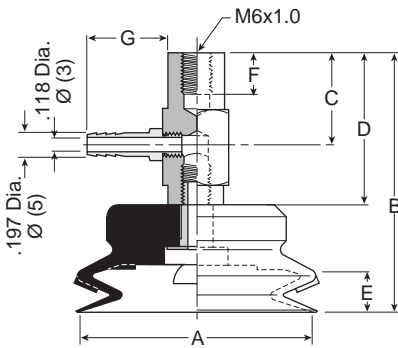
**PJK-6 and
PJK-8**



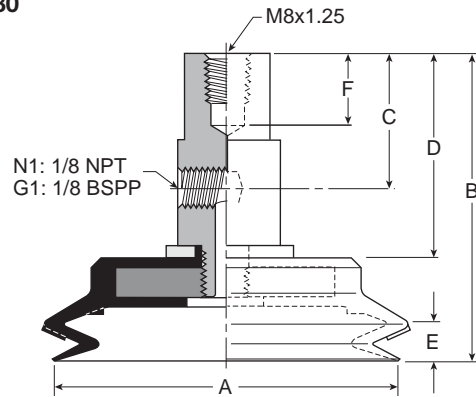
**PJK-10 thru
PJK-20**



**PJK-25 thru
PJK-50**



**PJK-60 thru
PJK-80**



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PJK-6-*	.24 (6)	1.24 (31.5)	.51 (13)	.89 (22.5)	.17 (4.2)	.24 (6)	.63 (16)	.56 (16)
PJK-8-*	.31 (8)	1.24 (31.5)	.51 (13)	.89 (22.5)	.17 (4.2)	.24 (6)	.63 (16)	.56 (16)
PJK-10-*	.39 (10)	1.24 (31.5)	.55 (14)	.87 (22)	.12 (3)	.24 (6)	.63 (16)	.59 (17)
PJK-15-*	.59 (15)	1.30 (33)	.55 (14)	.87 (22)	.13 (3.3)	.24 (6)	.63 (16)	.63 (18)
PJK-20-*	.79 (20)	1.38 (35)	.55 (14)	.87 (22)	.22 (5.5)	.24 (6)	.63 (16)	.7 (20)
PJK-30-*	1.18 (30)	1.97 (50)	.79 (20)	1.26 (32)	.28 (7)	.31 (8)	.63 (16)	1.6 (46)
PJK-40-*	1.57 (40)	1.97 (50)	.79 (20)	1.26 (32)	.28 (7.2)	.31 (8)	.63 (16)	1.7 (48)
PJK-50-*	1.97 (50)	2.05 (52)	.79 (20)	1.26 (32)	.35 (9)	.31 (8)	.63 (16)	2.2 (62)
PJK-60-*-†	2.36 (60)	2.46 (62.5)	1.10 (28)	1.67 (42.5)	.31 (8)	.43 (11)	—	4.9 (139)
PJK-80-*-†	3.15 (80)	2.50 (63.5)	1.10 (28)	1.67 (42.5)	.37 (9.5)	.43 (11)	—	6.5 (185)

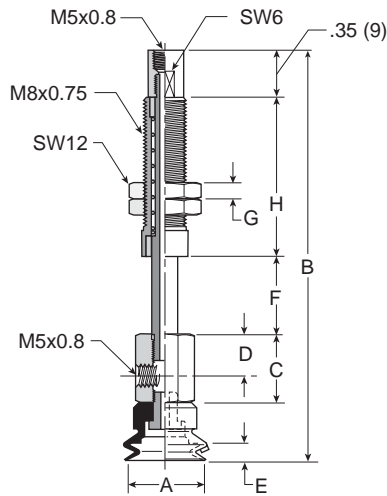
Inches (mm)
* Cup material
† Vacuum port

C
Vacuum Cups
Vacuum Products
Series
PF6
Series
PB6
Series
PSV-CFS
Series
PJ6
Series
PC6
Series
PJ6B
Series

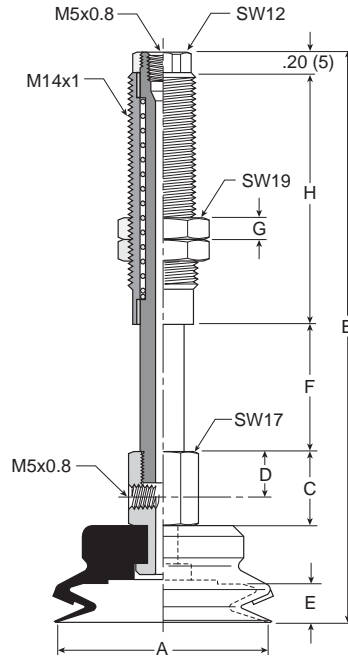


Dimensions

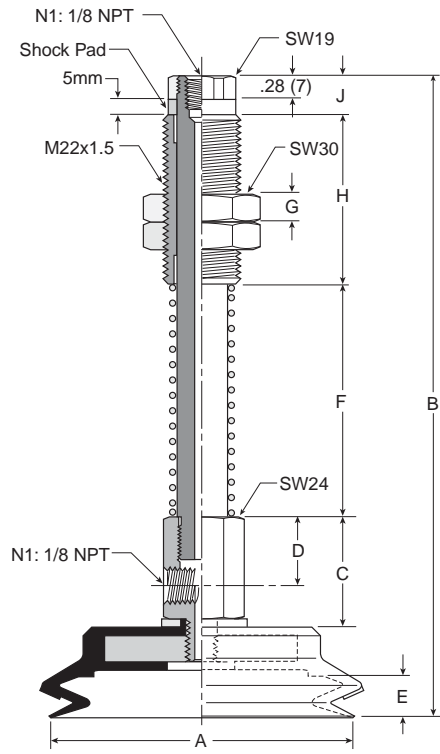
**PJTYS10 thru
PJTYS20**



**PJTYS30 thru
PJTYS50**



**PJTYS60 thru
PJTYS80**



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PJTYS1010*†	.39 (10)	2.52 (64)	.51 (13)	.31 (8)	.12 (3)	.39 (10)	.20 (5)	.91 (23)	—	1.1 (31)
PJTYS1015*†	.39 (10)	3.01 (76.5)	.51 (13)	.31 (8)	.12 (3)	.59 (15)	.20 (5)	1.20 (30.5)	—	1.2 (33.5)
PJTYS1510*†	.59 (15)	2.60 (66)	.51 (13)	.31 (8)	.13 (3.3)	.39 (10)	.20 (5)	.91 (23)	—	1.1 (32)
PJTYS1515*†	.59 (15)	3.07 (78)	.51 (13)	.31 (8)	.13 (3.3)	.59 (15)	.20 (5)	1.20 (30.5)	—	1.3 (34.5)
PJTYS2010*†	.79 (20)	2.83 (72)	.51 (13)	.31 (8)	.22 (5.5)	.39 (10)	.20 (5)	.91 (23)	—	1.1 (32)
PJTYS2015*†	.79 (20)	4.29 (109)	.51 (13)	.31 (8)	.22 (5.5)	.59 (15)	.20 (5)	1.20 (30.5)	—	1.3 (34.5)
PJTYS3015*†	1.18 (30)	3.58 (91)	.67 (17)	.39 (10)	.28 (7)	.59 (15)	.20 (5)	1.42 (36)	—	2.6 (74)
PJTYS3030*†	1.18 (30)	5.04 (128)	.67 (17)	.39 (10)	.28 (7)	1.18 (30)	.20 (5)	2.28 (58)	—	3.5 (99)
PJTYS3515*†	1.38 (35)	3.58 (91)	.67 (17)	.39 (10)	.28 (7)	.59 (15)	.20 (5)	1.42 (36)	—	2.7 (76.5)
PJTYS3530*†	1.38 (35)	5.04 (128)	.67 (17)	.39 (10)	.28 (7)	1.18 (30)	.20 (5)	2.28 (58)	—	3.6 (101.5)
PJTYS4015*†	1.57 (40)	3.58 (91)	.67 (17)	.39 (10)	.28 (7.2)	.59 (15)	.20 (5)	1.42 (36)	—	2.8 (78.5)
PJTYS4030*†	1.57 (40)	5.04 (128)	.67 (17)	.39 (10)	.28 (7.2)	1.18 (30)	.20 (5)	2.28 (58)	—	3.7 (103.5)
PJTYS5015*†	1.97 (50)	3.66 (93)	.67 (17)	.39 (10)	.35 (9)	.59 (15)	.20 (5)	1.42 (36)	—	3.3 (94)
PJTYS5030*†	1.97 (50)	5.12 (130)	.67 (17)	.39 (10)	.35 (9)	1.18 (30)	.20 (5)	2.28 (58)	—	4.2 (119)
PJTYS6030*†	2.36 (60)	6.18 (157)	1.18 (30)	.79 (20)	.31 (8)	1.18 (45)	.39 (10)	1.97 (50)	.47 (12)	10.4 (294)
PJTYS6050*†	2.36 (60)	7.17 (182)	1.18 (30)	.79 (20)	.31 (8)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	11.6 (328)
PJTYS8030*†	3.15 (80)	6.22 (158)	1.18 (30)	.79 (20)	.37 (9.5)	1.18 (45)	.39 (10)	1.97 (50)	.47 (12)	11.9 (338)
PJTYS8050*†	3.15 (80)	7.20 (183)	1.18 (30)	.79 (20)	.37 (9.5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13.1 (372)

Inches (mm)
** Cup material
† Vacuum port

C

Vacuum Cups
Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

PCG Series

PUGB Series



PCG Multiple Bellows Vacuum Cup Series

2-1/2 bellows design minimizes contact pressure applied to the product. The soft seal lip and touch allows the cup to conform to the product's surface to make a vacuum seal.

These multiple bellow cups are designed for applications that require additional level compensation, more flexibility, or minimum back pressure for a "soft touch". The multiple bellow has a soft sealing edge good for a variety of sensitive applications; such as food packaging, CD / DVD, medical packaging, and highly irregular curved surfaces. Cups can also be used to assist with sheet separation in destack operations.



Features

- Soft touch
- Extra level compensation
- Flexible sealing lip for irregular curved surfaces
- 5mm to 90mm in diameter

Styles

- PCTM series male thread connector
- PCTF series female thread Connector
- PCTK series barbed bulkhead

Operating information

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*	Urethane
Material code	NBR	NBRE	SI	SIE	U
Operating temperature	-20°C to 120°C (-4°F to 248°F)	0°C to 60°C (32°F to 40°F)	-60° to 250°C (-76°F to 482°F)	-10° to 130°C (-14°F to 266°F)	-20° to 75°C (-4°F to 167°F)
Color	Black	Black / Blue Dot	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	5 to 15	—

* ESD: Electric Static Dissipative Material

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PCTM-20B-NBR-G1 becomes PCTM-20B-U-G1. Inquire with factory for availability.

Application guide

2-1/2 Bellows



- | | | | | | | | | |
|---------------------------|-----------------------------|-------------------------------------|----------------------------|---------------|----------------------|---------------------------|-----------------------------------|-----------------------|
| Flat surface, any section | Bowed surface, thin section | Slightly bowed surface, any section | Bowed surface, any section | Soft material | Metal sheet handling | Corrugated sheet handling | Differences in heights and levels | Not for vertical lift |
|---------------------------|-----------------------------|-------------------------------------|----------------------------|---------------|----------------------|---------------------------|-----------------------------------|-----------------------|

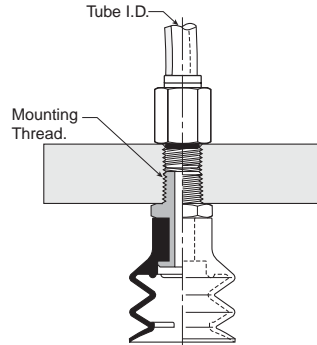
PCTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
 Fitting material: aluminum.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PCTM-5-NBR-M5	PCG-5-NBR	PCTM-5-SI-M5	PCG-5-SI	FTM-5A-M5H
7	M5	PCTM-7-NBR-M5	PCG-7-NBR	PCTM-7-SI-M5	PCG-7-SI	FTM-5A-M5H
10	M5	PCTM-10-NBR-M5	PCG-10-NBR	PCTM-10-SI-M5	PCG-10-SI	CTM-10-M5H
10	G1	PCTM-10-NBR-G1	PCG-10-NBR	PCTM-10-SI-G1	PCG-10-SI	CTM-10-G1H
15	M5	PCTM-15-NBR-M5	PCG-15-NBR	PCTM-15-SI-M5	PCG-15-SI	CTM-10-M5H
15	G1	PCTM-15-NBR-G1	PCG-15-NBR	PCTM-15-SI-G1	PCG-15-SI	CTM-10-G1H
20	M5	PCTM-20-NBR-M5	PCG-20-NBR	PCTM-20-SI-M5	PCG-20-SI	CTM-10-M5H
20	G1	PCTM-20-NBR-G1	PCG-20-NBR	PCTM-20-SI-G1	PCG-20-SI	CTM-10-G1H
30	G1	PCTM-30-NBR-G1	PCG-30-NBR	PCTM-30-SI-G1	PCG-30-SI	CTM-30-G1H
30	G2	PCTM-30-NBR-G2	PCG-30-NBR	PCTM-30-SI-G2	PCG-30-SI	CTM-30-G2
30	N1	PCTM-30-NBR-N1	PCG-30-NBR	PCTM-30-SI-N1	PCG-30-SI	CTM-30-N1
40	G1	PCTM-40-NBR-G1	PCG-40-NBR	PCTM-40-SI-G1	PCG-40-SI	CTM-30-G1H
40	G2	PCTM-40-NBR-G2	PCG-40-NBR	PCTM-40-SI-G2	PCG-40-SI	CTM-30-G2
40	N1	PCTM-40-NBR-N1	PCG-40-NBR	PCTM-40-SI-N1	PCG-40-SI	CTM-30-N1
60	G1	PCTM-60-NBR-G1	PCG-60-NBR	PCTM-60-SI-G1	PCG-60-SI	CTM-30-G1H
60	N1	PCTM-60-NBR-N1	PCG-60-NBR	PCTM-60-SI-N1	PCG-60-SI	CTM-30-N1
90	G2	PCTM-90-NBR-G2	PCG-90-NBR	PCTM-90-SI-G2	PCG-90-SI	CTM-90-G2
90	N2	PCTM-90-NBR-N2	PCG-90-NBR	PCTM-90-SI-N2	PCG-90-SI	CTM-90-N2

Most popular.

C	Vacuum Cups
	Vacuum Products
	PFG Series
	PBG Series
	P5V-CFS Series
	PJG Series
	PCG Series
	PUGB Series



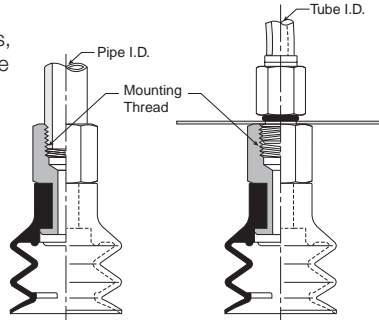
PCTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.
 Fitting material: aluminum.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	PCTF-5-NBR-M5	PCG-5-NBR	PCTF-5-SI-M5	PCG-5-SI	FTF-5A-M5
7	M5	PCTF-7-NBR-M5	PCG-7-NBR	PCTF-7-SI-M5	PCG-7-SI	FTF-5A-M5
10	1/8 BSPP	PCTF-10-NBR-G1	PCG-10-NBR	PCTF-10-SI-G1	PCG-10-SI	CTF-10-G1
15	1/8 BSPP	PCTF-15-NBR-G1	PCG-15-NBR	PCTF-15-SI-G1	PCG-15-SI	CTF-10-G1
20	1/8 BSPP	PCTF-20-NBR-G1	PCG-20-NBR	PCTF-20-SI-G1	PCG-20-SI	CTF-10-G1
30	1/8 BSPP	PCTF-30-NBR-G1	PCG-30-NBR	PCTF-30-SI-G1	PCG-30-SI	CTF-30-G1
30	1/8 NPT	PCTF-30-NBR-N1	PCG-30-NBR	PCTF-30-SI-N1	PCG-30-SI	CTF-30-N1
40	1/8 BSPP	PCTF-40-NBR-G1	PCG-40-NBR	PCTF-40-SI-G1	PCG-40-SI	CTF-30-G1
40	1/8 NPT	PCTF-40-NBR-N1	PCG-40-NBR	PCTF-40-SI-N1	PCG-40-SI	CTF-30-N1
60	1/8 NPT	PCTF-60-NBR-N1	PCG-60-NBR	PCTF-60-SI-N1	PCG-60-SI	CTF-30-G1
60	1/4 NPT	PCTF-60-NBR-N1	PCG-60-NBR	PCTF-60-SI-N1	PCG-60-SI	CTF-30-N1
90	1/4 BSPP	PCTF-90-NBR-G2	PCG-90-NBR	PCTF-90-SI-G2	PCG-90-SI	CTF-90-G2
90	1/4 NPT	PCTF-90-NBR-N2	PCG-90-NBR	PCTF-90-SI-N2	PCG-90-SI	CTF-90-N2

Most popular.

C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 PSV-CFS Series
 PJG Series
 PCG Series
 PUGB Series

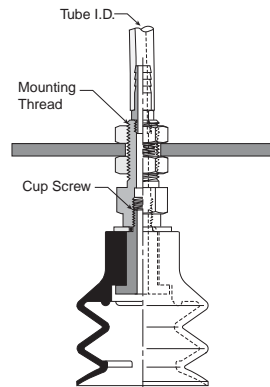


PCTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: Nickel plated brass.

Installation

Note:
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



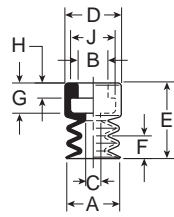
Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	PCTK-5-NBR	PCG-5-NBR	PCTK-5-SI	PCG-5-SI	FTK-5A
7	Barb	PCTK-7-NBR	PCG-7-NBR	PCTK-7-SI	PCG-7-SI	FTK-5A
10	Barb	PCTK-10-NBR	PCG-10-NBR	PCTK-10-SI	PCG-10-SI	CTK-10
15	Barb	PCTK-15-NBR	PCG-15-NBR	PCTK-15-SI	PCG-15-SI	CTK-10
20	Barb	PCTK-20-NBR	PCG-20-NBR	PCTK-20-SI	PCG-20-SI	CTK-10
30	Barb	PCTK-30-NBR	PCG-30-NBR	PCTK-30-SI	PCG-30-SI	CTK-30
40	Barb	PCTK-40-NBR	PCG-40-NBR	PCTK-40-SI	PCG-40-SI	CTK-30
60	Barb	PCTK-60-NBR	PCG-60-NBR	PCTK-60-SI	PCG-60-SI	CTK-30
90	NPT	PCTK-90-NBR-N1	PCG-90-NBR	PCTK-90-SI-N1	PCG-90-SI	CTK-90-N1
90	BSPP	PCTK-90-NBR-G1	PCG-90-NBR	PCTK-90-SI-G1	PCG-90-SI	CTK-90-G1

Most popular.

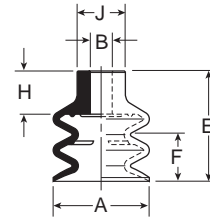


PCG Series Replacement Cup Dimensions

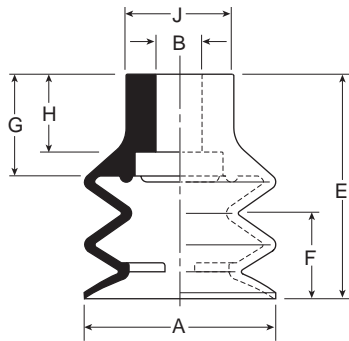
**PCG-5 and
 PCG-7**



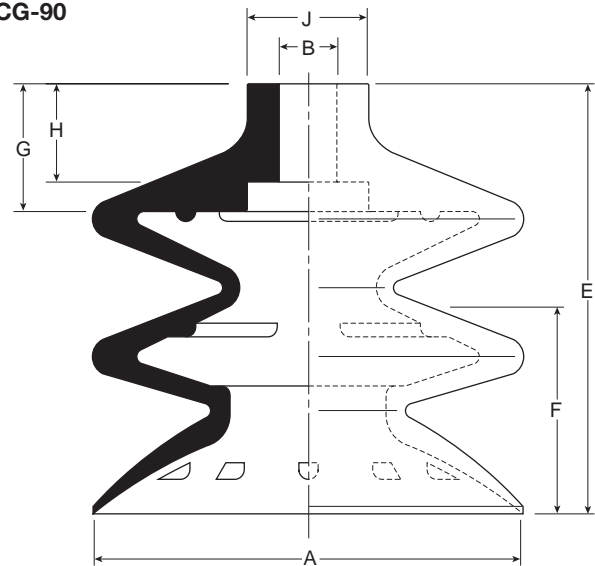
**PCG-10 thru
 PCG-20**



**PCG-30 thru
 PCG-60**



PCG-90



Model number	ØA	ØB	ØC	ØD	E	F	G	H	J
PCG-5-*	.20 (5)	.16 (4)	.08 (2)	.30 (7.5)	.37 (9.5)	.12 (3)	.16 (4)	.08 (2)	.24 (6)
PCG-7-*	.28 (7)	.16 (4)	.08 (2)	.30 (7.5)	.39 (10)	.12 (3)	.16 (4)	.08 (2)	.24 (6)
PCG-10-*	.35 (9)	.20 (5)	—	—	.59 (15)	.12 (3)	.28 (7)	—	.35 (9)
PCG-15-*	.60 (15.2)	.20 (5)	—	—	.90 (22)	.39 (10)	.35 (9)	—	.39 (10)
PCG-20-*	.79 (20)	.20 (5)	—	—	.91 (23)	.39 (10)	.35 (9)	—	.39 (10)
PCG-30-*	1.26 (32)	.31 (8)	—	—	1.48 (37.5)	.57 (14.5)	.67 (17)	.51 (13)	.71 (18)
PCG-40-*	1.65 (42)	.31 (8)	—	—	1.81 (46)	.87 (22)	.67 (17)	.51 (13)	.79 (20)
PCG-60-*	2.44 (62)	.31 (8)	—	—	2.17 (55)	1.06 (27)	.71 (18)	.51 (13)	.85 (21.5)
PCG-90-*	3.46 (88)	.47 (12)	—	—	3.44 (87.5)	1.65 (42)	1.02 (26)	.79 (20)	.98 (25)

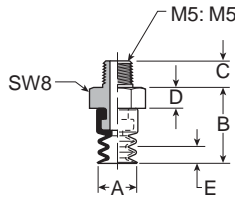
Inches (mm)
 * Cup material

C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 PSV-CFS Series
 PJG Series
 PCG Series
 PUGB Series

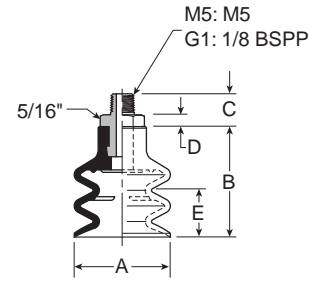


Dimensions

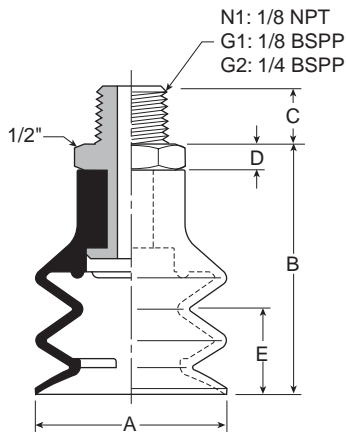
**PCTM-5 and
PCTM-7**



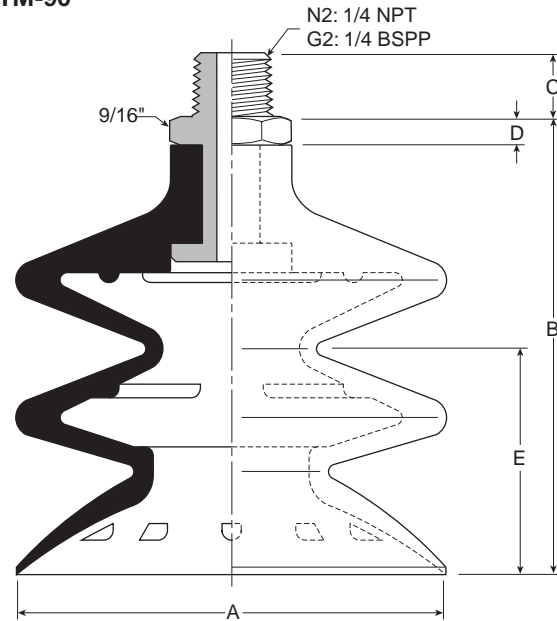
**PCTM-10 thru
PCTM-20**



**PCTM-30 thru
PCTM-60**



PCTM-90



Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PCTM-5-*†	.20 (5)	.51 (13)	.18 (4.5)	—	—	—	.14 (3.5)	.12 (3)
PCTM-7-*†	.28 (7)	.53 (13.5)	.18 (4.5)	—	—	—	.14 (3.5)	.12 (3)
PCTM-10-*†	.35 (9)	.69 (17.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.12 (3)
PCTM-15-*†	.60 (15.2)	1.04 (25.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.39 (10)
PCTM-20-*†	.79 (20)	1.04 (25.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.39 (10)
PCTM-30-*†	1.26 (32)	1.67 (42.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.57 (14.5)
PCTM-40-*†	1.65 (42)	2.01 (51)	—	.31 (8)	.39 (10)	—	.20 (5)	.87 (22)
PCTM-60-*†	2.44 (62)	2.36 (60)	—	.31 (8)	.39 (10)	—	.20 (5)	1.06 (27)
PCTM-90-*†	3.46 (88)	3.64 (92.5)	—	—	.39 (10)	.59 (15)	.20 (5)	1.65 (42)

Inches (mm)
* Cup material
† Thread size

C
Vacuum Cups
Vacuum Products

PFG
Series

PBG
Series

P5V-CFS
Series

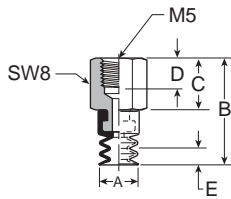
PJG
Series

PCG
Series

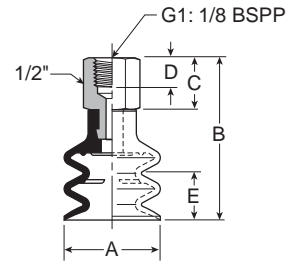
PUGB
Series

Dimensions

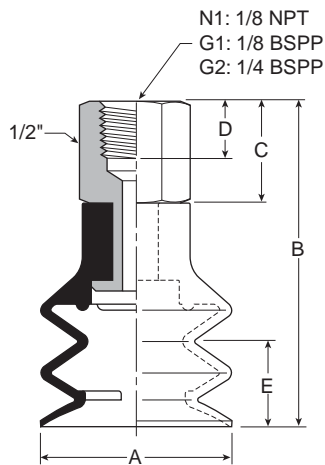
PCTF-5 and PCTF-7



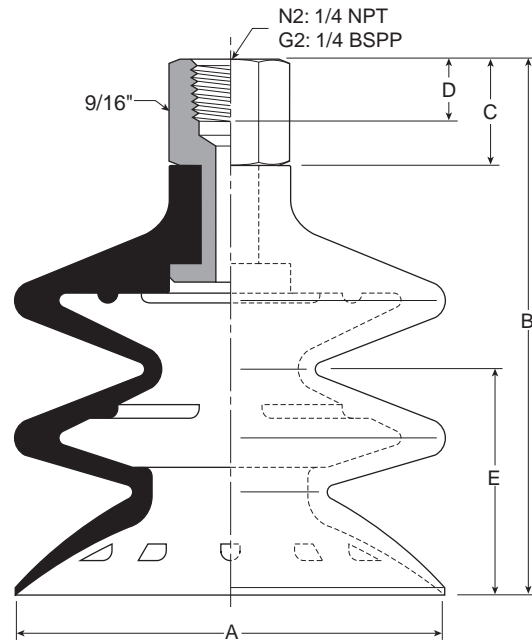
PCTF-10 thru PCTF-20



PCTF-30 thru PCTF-60



PCTF-90



Model number	ØA	B	C	D	E
PCTF-5*†	.20 (5)	.85 (21.5)	.47 (12)	.31 (8)	.12 (3)
PCTF-7*†	.28 (7)	.87 (22)	.47 (12)	.31 (8)	.12 (3)
PCTF-10*†	.35 (9)	1.06 (27)	.47 (12)	.31 (8)	.12 (3)
PCTF-15*†	.60 (15.2)	1.38 (35)	.47 (12)	.31 (8)	.39 (10)
PCTF-20*†	.79 (20)	1.38 (35)	.47 (12)	.31 (8)	.39 (10)
PCTF-30*†	1.26 (32)	2.03 (51.5)	.55 (14)	.31 (8)	.57 (14.5)
PCTF-40*†	1.65 (42)	2.36 (60)	.55 (14)	.31 (8)	.87 (22)
PCTF-60*†	2.44 (62)	2.72 (69)	.55 (14)	.31 (8)	1.06 (27)
PCTF-90*†	3.46 (88)	4.13 (105)	.69 (17.5)	.39 (10)	1.65 (42)

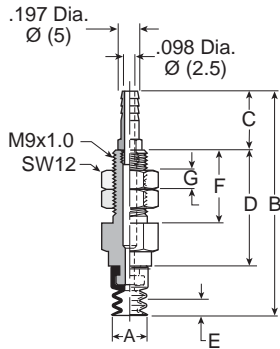
Inches (mm)
 * Cup material
 † Thread size

C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 PSV-CFS Series
 PJG Series
 PCG Series
 PUGB Series

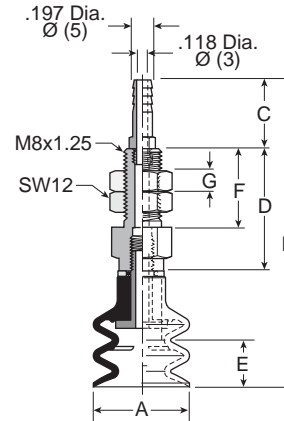


Dimensions

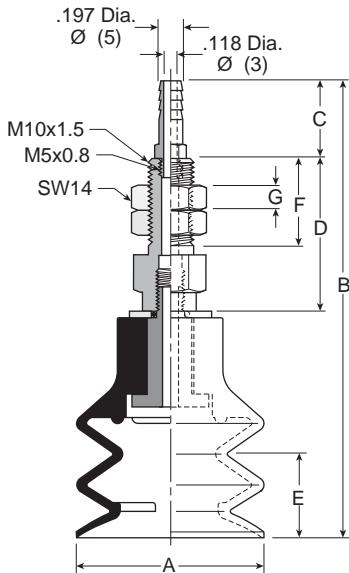
PCTK-5 and PCTK-7



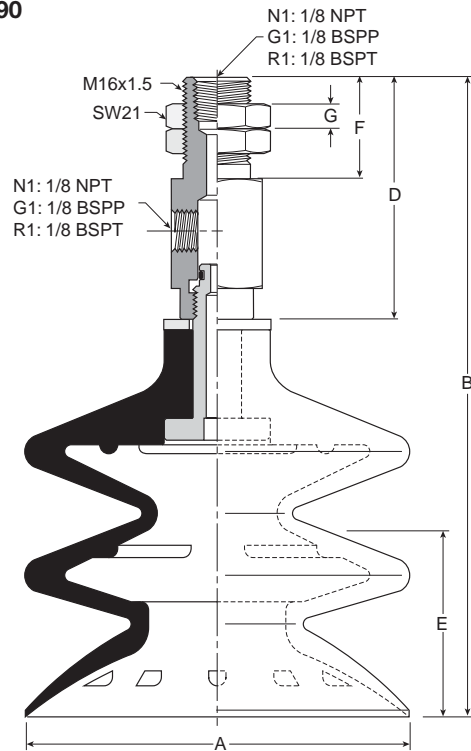
PCTK-10 thru PCTK-20



PCTK-30 thru PCTK-60



PCTK-90



Model number	ØA	B	C	D	E	F	G	Wt oz. (g)
PCTK-5-*	.20 (5)	1.32 (33.5)	.39 (10)	.55 (14)	.12 (3)	.47 (12)	.12 (3)	.56 (11)
PCTK-7-*	.28 (7)	1.34 (34)	.39 (10)	.55 (14)	.12 (3)	.47 (12)	.12 (3)	.56 (11)
PCTK-10-*	.35 (9)	2.21 (56.2)	.63 (16)	.88 (22.5)	.12 (3)	.59 (15)	.16 (4)	.78 (22)
PCTK-15-*	.60 (15.2)	2.53 (64.2)	.63 (16)	.86 (22)	.39 (10)	.59 (15)	.16 (4)	.78 (22)
PCTK-20-*	.79 (20)	2.53 (64.2)	.63 (16)	.86 (22)	.39 (10)	.59 (15)	.16 (4)	.78 (22)
PCTK-30-*	1.26 (32)	3.42 (86.8)	.63 (16)	1.26 (32)	.57 (14.5)	.79 (20)	.20 (5)	1.62 (46)
PCTK-40-*	1.65 (42)	3.75 (95.3)	.63 (16)	1.26 (32)	.86 (22)	.79 (20)	.20 (5)	1.94 (55)
PCTK-60-*	2.44 (62)	4.11 (104.3)	.63 (16)	1.26 (32)	1.06 (27)	.79 (20)	.20 (5)	3.00 (85)
PCYK-90-*	3.46 (88)	5.70 (144.8)	.91 (23)	2.17 (55)	1.65 (42)	.43 (11)	—	10.58 (300)

Inches (mm)
 * Cup material
 † Vacuum port

C
 Vacuum Cups
 Vacuum Products
 PFG Series
 PBG Series
 P5V-CFS Series
 PJG Series
 PCG Series
 PUGB Series



PUGB Flat Swivel Vacuum Cup Series

30° inclusive swivel, single lip cup for smooth, slightly curved surfaces and flexible products. Rigid construction provides good stability against acceleration and deceleration forces during product transfer.

The single edge swivel cup is for smooth surfaces with slightly curved surfaces or flexible sheets with substantial weights. Typically, lift capacities and break away forces are higher for flat cups which may be necessary for good stability during lift and transfer. The position of the internal swivel joint minimizes moments during lift and transfer. The swivel joint compensates for load and angular misalignment instead of the cup material, prolonging cup life. Maintenance costs are minimized by replacing only the cup portion of the assembly.



Features

- Internal swivel joint design
- 30° Inclusive angle for flexible products
- Increased stability for horizontal lifts
- Lower maintenance costs
- 60mm to 100mm diameters

Styles

- PUTK series barbed bulkhead
- PUTYS series bulkhead level compensator

Operating information

Cup material	Nitrile	Silicon
Material code	NBR	SI
Operating temperature	-20°C to 120°C (-4°F to 248°F)	-60° to 250°C (-76°F to 482°F)
Color	Black	White
Hardness, shore A (°Sh)	55 ±5	55 ±5

* ESD: Electric Static Dissipative Material

Application guide

Swivel Bellows



Flat surface, thin section

Flat surface, any section

Slightly bowed surface, thin section

Slightly bowed surface, any section

Metal sheet handling

Not for vertical lift

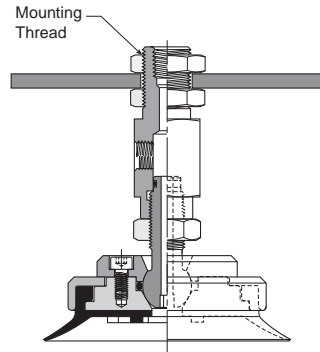
PUTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup size	Vacum port	Cup material Nitrile assembly (NBR)	Replacement PUGB swivel with cup only	Replacement cup only (NBR)	Cup fitting
60	1/8 NPT	PUTK-60-NBR-N1	PUGB-60-NBR	PUG-60-NBR	UTK-60-N1
80	1/8 NPT	PUTK-80-NBR-N1	PUGB-80-NBR	PUG-80-NBR	UTK-60-N1
100	1/8 NPT	PUTK-100-NBR-N1	PUGB-100-NBR	PUG-100-NBR	UTK-60-N1

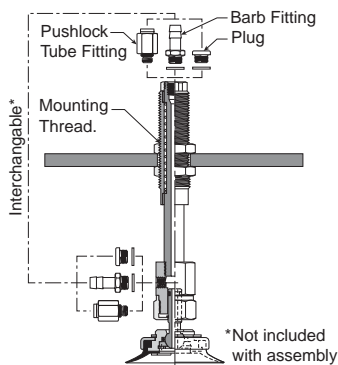
PUTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage. Shown are interchangeable connectors & plugs for port connections.



Cup diameter (mm)	Vacum port	Stroke (mm)	Spring compression Force lbf (N)		PUTYS assembly (NBR)	Replacement PUGB swivel with cup only	Replacement cup only NBR	Level compensator P/N
			0%	100%				
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PUTYS6030NBRN1	PUGB-60-NBR	PUG-60-NBR	UTYS-60-30
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PUTYS6050NBRN1	PUGB-60-NBR	PUG-60-NBR	UTYS-60-50
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PUTYS8030NBRN1	PUGB-80-NBR	PUG-80-NBR	UTYS-60-30
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PUTYS8050NBRN1	PUGB-80-NBR	PUG-80-NBR	UTYS-60-50
100	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	PUTYS10030NBRN1	PUGB-100-NBR	PUG-100-NBR	UTYS-60-30
100	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	PUTYS10050NBRN1	PUGB-100-NBR	PUG-100-NBR	UTYS-60-50

Most popular.

C

Vacuum Cups
Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PVG Series

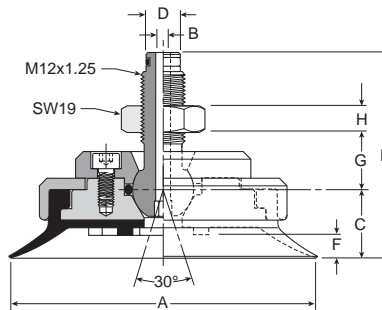
PCG Series

PUGB Series



PUGB Series Barbed Bulkhead Dimensions

**PUGB-60 thru
PUGB-100**



Model number	ØA	ØB	C	ØD	E	F	G	H
PUGB-60-*	2.36 (60)	.15 (3.9)	.63 (16)	.35 (9)	2.05 (52)	.20 (5)	.59 (15)	.28 (7)
PUGB-80-*	3.15 (80)	.15 (3.9)	.71 (18)	.35 (9)	2.13 (54)	.24 (6)	.59 (15)	.28 (7)
PUGB-100-*	3.94 (100)	.15 (3.9)	.71 (18)	.35 (9)	2.13 (54)	.24 (6)	.59 (15)	.28 (7)

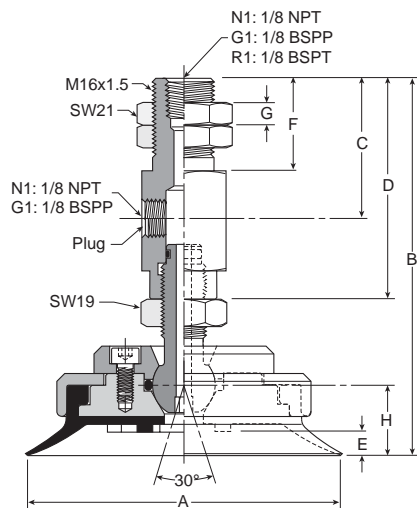
Inches (mm)
* Cup material

C

Vacuum Cups
Vacuum Products

PUTK Series Barbed Bulkhead Dimensions

**PUTK-60 thru
PUTK-100**



Model number	ØA	B	C	D	E	F	G	H	Wt oz (g)
PUTK-60-*	2.36 (60)	3.66 (93)	.63 (16)	1.89 (48)	.20 (5)	.91 (23)	.24 (6)	.63 (16)	12.4 (352)
PUTK-80-*	3.15 (80)	3.74 (95)	1.38 (35)	2.16 (55)	.24 (6)	.91 (23)	.24 (6)	.71 (18)	15.7 (444)
PUTK-100-*	3.94 (100)	3.74 (95)	1.38 (35)	2.16 (55)	.24 (6)	.91 (23)	.24 (6)	.71 (18)	20.0 (568)

Inches (mm)
* Cup material

PFG
Series

PBG
Series

PSV-CFS
Series

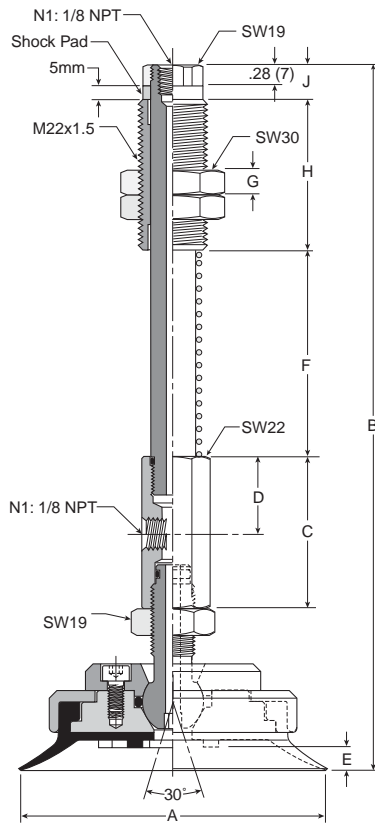
PJG
Series

PCG
Series

PUGB
Series

Dimensions

**PUTYS60 thru
 PUTYS100**



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PUTYS6030*	2.36 (60)	7.28 (185)	1.57 (40)	.79 (20)	.20 (5)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	17.2 (487)
PUTYS6050*	2.36 (60)	8.27 (210)	1.57 (40)	.79 (20)	.20 (5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	18.4 (521)
PUTYS8030*	3.15 (80)	7.36 (187)	1.57 (40)	.79 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	19.7 (559)
PUTYS8050*	3.15 (80)	8.35 (212)	1.57 (40)	.79 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	20.1 (595)
PUTYS10030*	1.18 (30)	7.36 (187)	1.57 (40)	.79 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	25.7 (729)
PUTYS10050*	1.18 (30)	8.35 (212)	1.57 (40)	.79 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	26.7 (756)

Inches (mm)
 * Cup material

C

Vacuum Cups
 Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

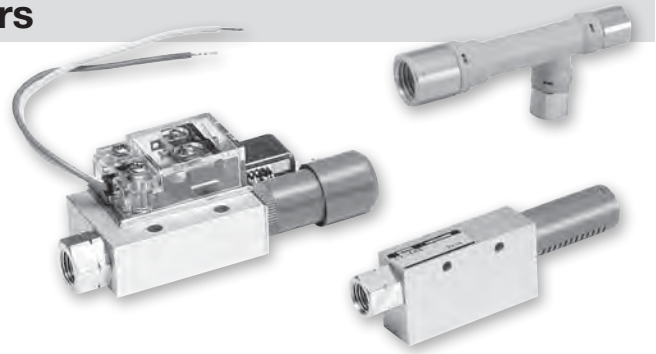
PJP Series

PCG Series

PUGB Series

MCA, CV, CV-CK Vacuum Generators

Parker Inline Single Stage Vacuum Generators is a compact design offering multiple vacuum flow ranges in 3 styles. These Generators are meant to be mounted near the vacuum application for improved vacuum response time. A Normally Open or Normally Closed 3 way valve can be used to control the supply pressure to obtain up to a 27 InHg degree of vacuum.



Features

- **MCA:**
 - light weight vacuum generator
 - vacuum flow rates to 1.26 SCFM
- **CV:**
 - basic aluminum body generator with exhaust muffler
 - vacuum flow rates to 12.36 SCFM
 - degree of vacuum to 27 inHg
- **CV-CK**
 - basic aluminum body generator with mechanical vacuum switch
 - vacuum flow rates to 5.85 SCFM
 - degree of vacuum to 27 inHg

Operating information

Media:	Non-lubricated air, non-corrosive gases
Operating pressure:	14 to 114 PSI
Operating temperature:	32° to 120°F (0°C to 49°C) (MCA, CV); 32 to 140°F (0°C to 60°C) (CV-CK)
CV-CK Switch:	
Hysteresis:	1.1 to 3.9 inHg
Switch output:	N.O., AC125V; 5A, AC250V: 3A, DC250V: 0.2A

Material specifications

MCA	Polycarbonate, Aluminum fittings
Body	Aluminum (CV, CV-CK)
Nozzle	Nickel plated brass (CV, CV-CK)

MCA, CV, CV-CK Vacuum Generators

Symbol	Port size			Max. vacuum flow SCFM	Air consumption SCFM	Max. degree of vacuum inHg	Part number	
	Pressure	Vacuum	Exhaust				NPT	BSPP
MCA Series								
	1/8	1/8	1/4	1.68	1.68	24	MCA10HSN1N1N2	MCA10HSG1G1N2
	1/8	1/8	1/4	2.81	2.81	24	MCA13HSN1N1N2	MCA13HSG1G1G2
CV Series								
	1/8	1/8	Muffler	0.21	0.46	27	CV05HSN	CV05HSG
	1/8	1/8	Muffler	0.32	0.46	17	CV05LSN	CV05LSG
	1/8	1/8	Muffler	0.95	1.55	27	CV10HSN	CV10HSG
	1/8	1/8	Muffler	1.27	1.55	17	CV10LSN	CV10LSG
	1/4	3/8	Muffler	2.22	3.53	27	CV15HSN	CV15HSG
	1/4	3/8	Muffler	3.35	3.53	17	CV15LSN	CV15LSG
	1/4	3/8	Muffler	3.88	6.36	27	CV20HSN	CV20HSG
	1/4	1/2	Muffler	5.85	6.36	17	CV20LSN	CV20LSG
	3/8	1/2	Muffler	5.65	9.36	27	CV25HSN	CV25HSG
	3/8	1/2	Muffler	8.83	9.36	17	CV25LSN	CV25LSG
CV-CK Series								
	1/8	1/8	—	0.95	1.55	27	CV10HSCKN	CV10HSCKG
	1/4	1/4	—	2.22	3.53	27	CV15HSCKN	CV15HSCKG
	1/4	3/8	—	3.88	6.36	27	CV20HSCKN	CV20HSCKG

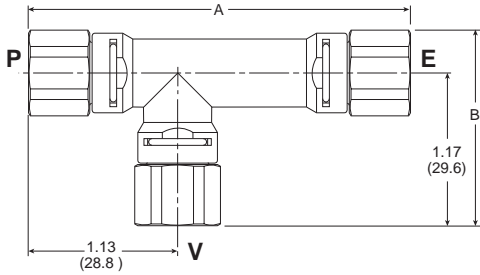
Most popular.

C
 Vacuum Generators
 Vacuum Products
 MCA, CV, CV-CK
 Series
 CHF
 Series
 MC22
 Series
 MC72
 Series
 CEK
 Series
 CVXCEK
 Series

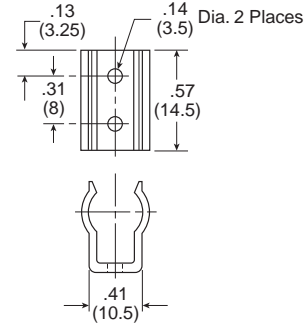


Dimensions

MCA



MCA Mounting bracket: MCA-B

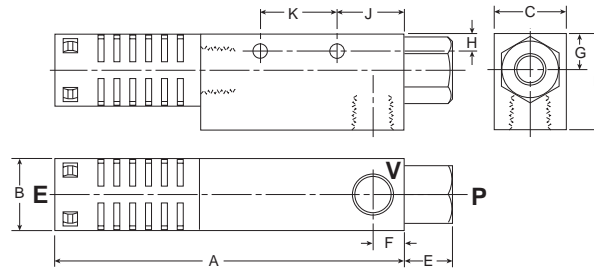


MCA**N1N1N2**

Part number	A	B
MCA10HS*****	2.76 (70)	1.16 (29.5)
MCA13HS*****	2.76 (70)	1.16 (29.5)

Inches (mm)

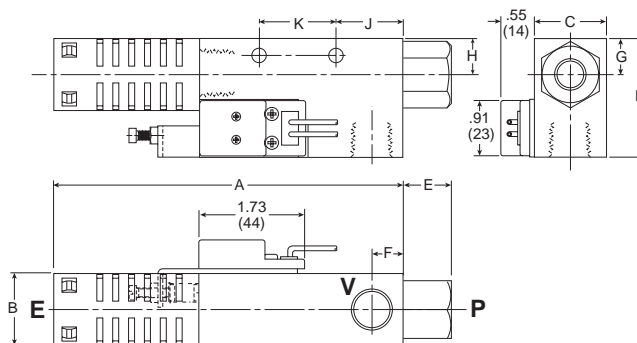
CV



Part number	A	B	C	D	E	F	G	H	J	K
CV05HS/LS	3.19 (81)	.73 (18.5)	.63 (16)	1.30 (33)	.39 (10)	.31 (8)	.39 (10)	.18 (4.5)	.55 (14)	.79 (20)
CV10HS/LS	3.19 (81)	.73 (18.5)	.63 (16)	1.30 (33)	.39 (10)	.31 (8)	.39 (10)	.18 (4.5)	.55 (14)	.79 (20)
CV15HS/LS	4.27 (108.5)	.79 (20)	.79 (20)	1.38 (35)	.59 (15)	.39 (10)	.43 (11)	.20 (5)	.79 (20)	.98 (25)
CV20HS/LS	5.73 (145.5)	1.18 (30)	1.18 (30)	1.57 (40)	.79 (20)	.51 (13)	.59 (15)	.28 (7)	1.10 (28)	1.26 (32)
CV25HS/LS	7.72 (196)	1.57 (40)	1.57 (40)	2.36 (60)	.67 (17)	.63 (16)	.79 (20)	.22 (5.5)	.79 (20)	1.97 (50)
CV30AHS/ALS	8.43 (214)	1.57 (40)	1.57 (40)	2.36 (60)	.79 (20)	.79 (20)	.79 (20)	.22 (5.5)	1.30 (33)	1.97 (50)

Inches (mm)

CV-CK



Part number	A	B	C	D	E	F	G	H	J	K
CV10HS/LSCK	3.19 (81)	.73 (18.5)	.63 (16)	1.30 (33)	.39 (10)	.31 (8)	.39 (10)	.18 (4.5)	17 (4.2)	.79 (20)
CV15HS/LSCK	4.27 (108.5)	.79 (20)	.79 (20)	1.38 (35)	.59 (15)	.39 (10)	.43 (11)	.20 (5)	.18 (4.5)	.98 (25)
CV20HS/LSCK	5.73 (145.5)	1.18 (30)	1.18 (30)	1.57 (40)	.79 (20)	.51 (13)	.59 (15)	.28 (7)	.24 (6)	1.26 (32)

Inches (mm)



CHF High Flow Vacuum Generators

CHF- High Flow Series is a multistage vacuum generator. CHF unit is ideal for porous applications.

4 bolt mounting pattern with gauge opposite of vacuum and pressure inlet ports enables this generator to be panel mounted.

CHF Series comes standard with flow thru exhaust mufflers to reduce clogging in dirty environments. Additional Pneumatic Control Valve is required to create vacuum flow.



Features

- Classic multi-stage venturi
- Anodized aluminum body
- Aluminum body includes exhaust muffler
- Maximum vacuum level, 27.3 inHg
- Vacuum flow rates from 12.5 to 31.8 SCFM
- Mounting brackets included

Operating information

Media:	Non-lubricated air, non-corrosive gases
Operating pressure:	80 PSI
Operating temperature:	32°F to 120°F (0°C to 49°C)

Material specifications

Body	Aluminum
Seals	BUNA N
Nozzle & Diffuser	Polymer

CHF High Flow Vacuum Generators

Symbol	Port size			Max. vacuum flow SCFM	Air consumption SCFM	Max. degree of vacuum inHg	Part number NPT
	Pressure	Vacuum	Exhaust				
	1/4	3/8	Muffler	20.9	6.5	27	CHF-20ZNE
	1/4	3/8	Muffler	26.3	9.6	27	CHF-30ZNE
	1/4	3/8	Muffler	31.8	14.0	27	CHF-40ZNE

Accessories

Port size	Description	Part number
3/8	Filter with 10 micron element	VFP2CFC01
1/2		VFP3CFC01
3/8	Filter with 10 micron element and 2 replacement elements	VFP2CFC03
1/2		VFP3CFC03

See Accessories Section for more options

VFP Series filter



Replacement components

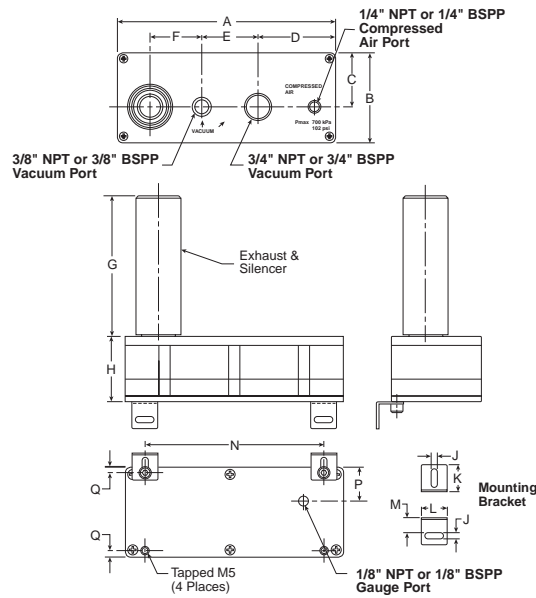
Description	Part number
CHF- Repair kit	SFCHF90NN
0 to 30 inHg gauge	266298A
Bracket kit (Includes 4 brackets & 4 M5 x 15 screws)	SFBW15
Silencer (flow thru)	SIS-001

Most popular.

C
 Vacuum Generators
 Vacuum Products
 MCA, CV, CV-CK Series
 CHF Series
 MC22 Series
 MC72 Series
 CEK Series
 CVXCEK Series



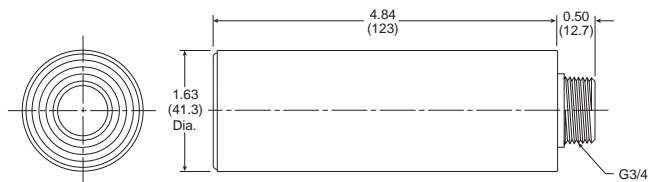
Dimensions



Part number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	Weight (grams)
CHF-20	7.64 (194)	3.15 (80)	1.89 (48)	2.72 (69)	1.97 (50)	1.81 (46)	4.84 (123)	1.69 (43)	.22 (5.5)	.94 (24)	.91 (23)	.51 (13)	6.26 (159)	1.26 (32)	.20 (5)	875
CHF-30	7.64 (194)	3.15 (80)	1.89 (48)	2.72 (69)	1.97 (50)	1.81 (46)	4.84 (123)	1.69 (43)	.22 (5.5)	.94 (24)	.91 (23)	.51 (13)	6.26 (159)	1.26 (32)	.20 (5)	885
CHF-40	7.64 (194)	3.15 (80)	1.89 (48)	2.72 (69)	1.97 (50)	1.81 (46)	4.84 (123)	2.28 (58)	.22 (5.5)	.94 (24)	.91 (23)	.51 (13)	6.26 (159)	1.26 (32)	.20 (5)	965

Inches (mm)

SIS-001 silencer dimensions



C
Vacuum Generators
Vacuum Products

MCA, CV,
CV-CK

CHF
Series

MC22
Series

MC72
Series

CEK
Series

CYXCEK
Series

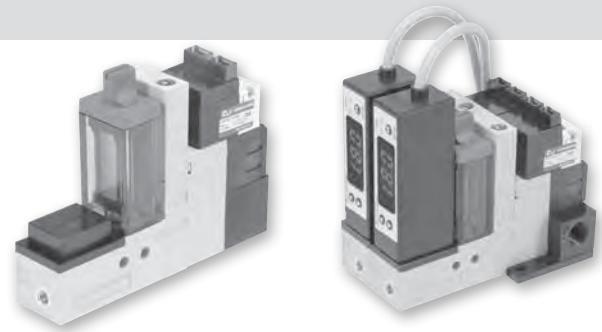


MC22 Vacuum Generators

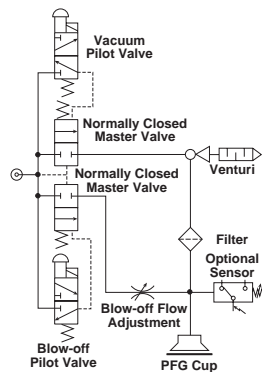
The MC22 is a complete package for factory automation. The MC22 has integrated vacuum generating and blow-off release pilot valves to minimize the response time to achieve vacuum. The small foot print and lightweight body allows the unit to be located close to the suction cup for maximum performance. The MC22 has additional features; regulating blow-off needle, 37 micron mesh filter, and a sensor platform for vacuum confirmation. The MC22 can be assembled into a maximum 8 station manifold. The unit can be ordered normally open or normally closed, with or without MPS-23 or MVS-201 pressure sensors.

Features

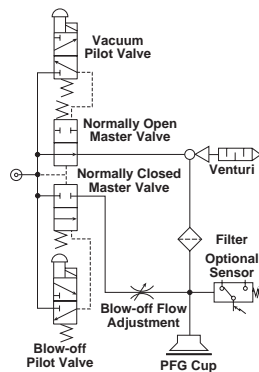
- Vacuum generating pilot valve
- Vacuum blow-off pilot valve
- Vacuum sensor - filter - silencer available
- Regulating blow-off adjustment
- Manifold system
- Short cycle times for high speed pick and place
- Vacuum flow rates to 1.55 SCFM



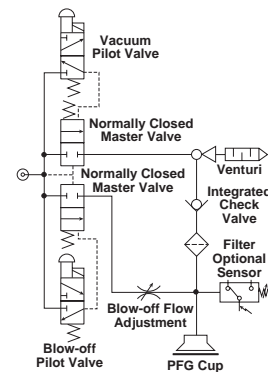
Add-A-Fold Manifold



MC2, Normally Closed Vacuum Valve



MC2, Normally Open Vacuum Valve



MC2, Normally Closed Vacuum Valve with Integrated Check Valve

Operating information

Media	Non-lubricated compressed air, non-corrosive gases
Operating pressure	21 to 84 PSI (1.5 to 6 kgf/cm ²)
Optimum operating pressure	70 PSI (5 kgf/cm ²)
Humidity	35 to 85%
Pressure port	N: 1/8 NPT female, G: 1/8 BSPP female
Vacuum port	M5 female
Operating temperature	41 to 132°F (5 to 50°C)
Material	Aluminum, Polyamide, NBR
Vacuum generating and blow-off release pilot	
Type of control valve	Pilot valve, includes 300mm clip wire connector
Manual operation	Non-locking manual override
Electrical connection	Clip type connector with LED and surge protection
Power supply	24VDC ± 10%
Power consumption	1W
Pressure range	21 to 84 PSI (1.5 to 6 kgf/cm ²)
Pilot valve air supply	Normally closed
Generator weight	4.1 oz. (117G) without sensor
Manifold weight	2-Station: 1.4 oz. (40g), 3-Station: 2 oz. (54g), 4-Station: 2.4 oz. (68g), 5-Station: 2.8 oz. (82g) 6-Station: 3.4 oz. (96g), 7-Station: 3.8 oz. (110g), 8-Station: 4.4 oz. (124g)

MC2 Unit Without Integrated Check Valve, Normally Closed Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/8	M5	Muffler	1.55	24	None	MC22S10HSZL4BLN	MC22S10HSZL4BLG
1/8	M5	Muffler	1.55	24	MPS-V23C-PC, PNP	MC22S10HS42L4BLN	MC22S10HS42L4BLG
1/8	M5	Muffler	1.55	24	MVS-201-PCP, PNP	MC22S10HS06L4BLN	MC22S10HS06L4BLG
1/8	M5	Muffler	1.55	24	MPS-V23C-NC, NPN	MC22S10HS41L4BLN	MC22S10HS41L4BLG
1/8	M5	Muffler	1.55	24	MVS-201-NC, NPN	MC22S10HS01L4BLN	MC22S10HS01L4BLG

MC2 Unit Without Integrated Check Valve, Normally Open Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/8	M5	Muffler	1.55	24	None	MC22S10HSZL4ALN	MC22S10HSZL4ALG
1/8	M5	Muffler	1.55	24	MPS-V23C-PC, PNP	MC22S10HS42L4ALN	MC22S10HS42L4ALG
1/8	M5	Muffler	1.55	24	MPS-V23C-NC, NPN	MC22S10HS41L4ALN	MC22S10HS41L4ALG

MC2 Unit With Integrated Check Valve, Normally Closed Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/8	M5	Muffler	1.55	24	None	MC22S10HSZLC4BLN	MC22S10HSZLC4BLG
1/8	M5	Muffler	1.55	24	MPS-V23C-PC, PNP	MC22S10HS42LC4BLN	MC22S10HS42LC4BLG
1/8	M5	Muffler	1.55	24	MVS-201-PCP, PNP	MC22S10HS06LC4BLN	MC22S10HS06LC4BLG
1/8	M5	Muffler	1.55	24	MPS-V23C-NC, NPN	MC22S10HS41LC4BLN	MC22S10HS41LC4BLG
1/8	M5	Muffler	1.55	24	MVS-201-NC, NPN	MC22S10HS01LC4BLN	MC22S10HS01LC4BLG

Add-A-Fold assembly ordering information



Station 1 Station 2

Example 1: Application requires a 2-Station MC22 manifold with NPT supply ports.

Qty.	Part number	Comment
1	AAMC2-M02N	Add-A-Fold
1	MC22S10HS42L4BLN.....	Station #1
1	MC22S10HS42L4BLN.....	Station #2

Alternative Method

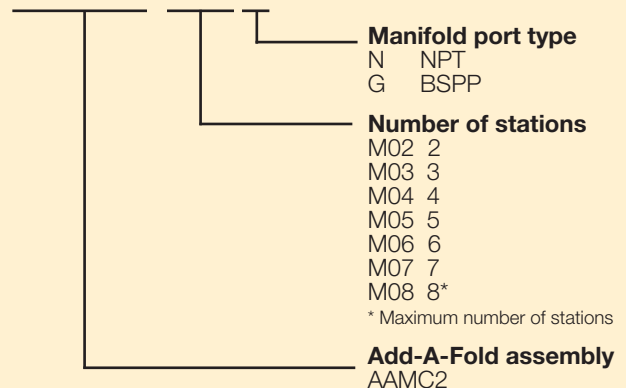
1	AAMC2-M02N	Add-A-Fold
2	MC22S10HS42L4BLN.....	Station #1-2

Most popular.

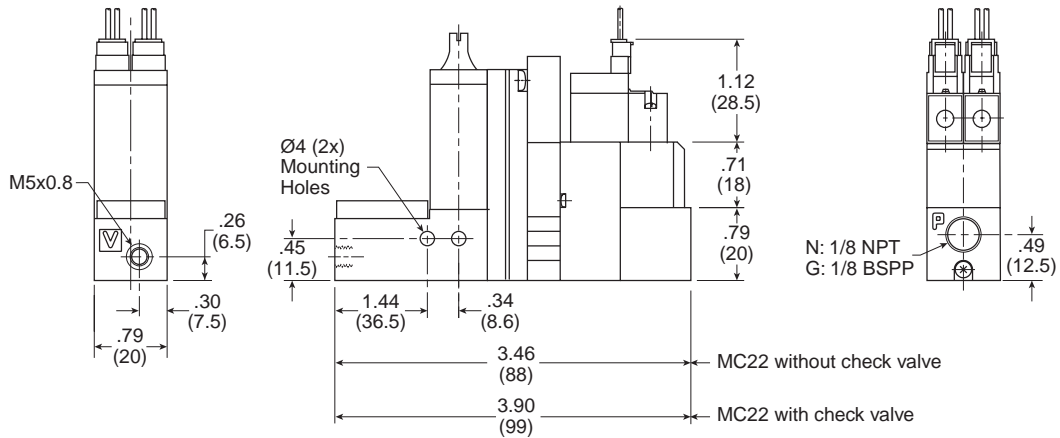
How to order Add-A-Fold assemblies

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the MC22 Generator or a blank plate for each station of the manifold.
6. See model number index code for MC22 Generator number and MC22 accessories for blank plate part numbers.

AAMC2-M08N

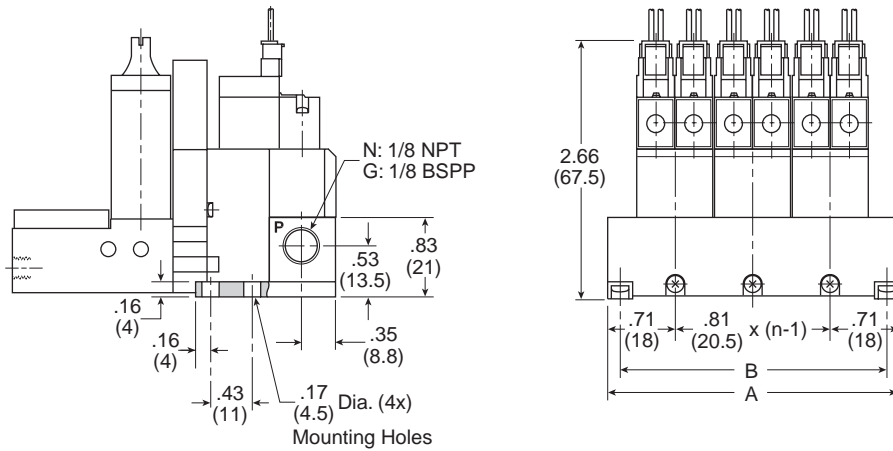


Dimensions



Manifold

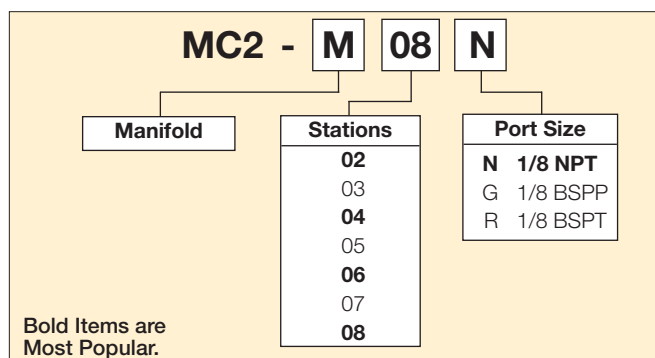
3-Station manifold without check valve shown



n	2	3	4	5	6	7	8
A	2.22 (56.5)	3.03 (77)	3.84 (97.5)	4.65 (118)	5.45 (138.5)	6.26 (159)	7.07 (179.5)
B	1.91 (48.5)	2.72 (69.0)	3.52 (89.5)	4.33 (110)	5.14 (130.5)	5.95 (151)	6.75 (171.5)

Inches (mm)
 n = Number of stations

Manifold part number



C
 Vacuum Generators
 Vacuum Products
 MCA, CV,
 CV-CK
 Series
 CHF
 Series
 MC22
 Series
 MC72
 Series
 CEK
 Series
 CVXCEK
 Series

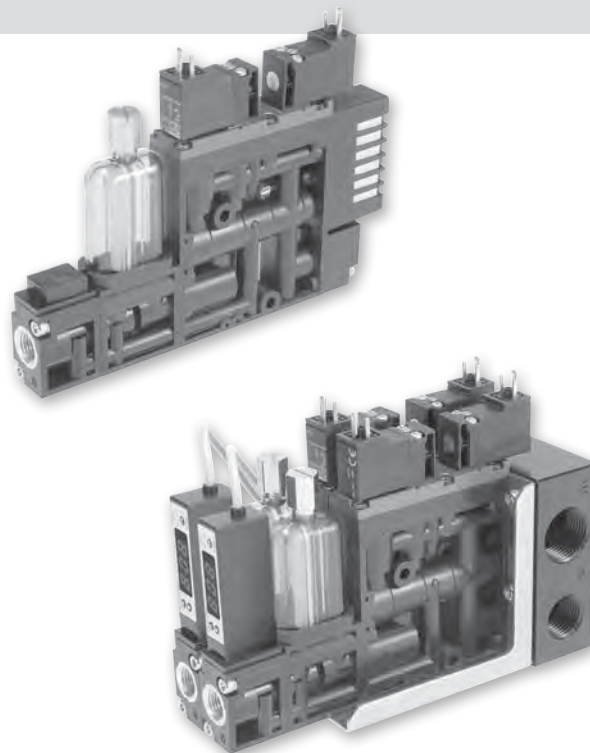


MC72 Vacuum Generators

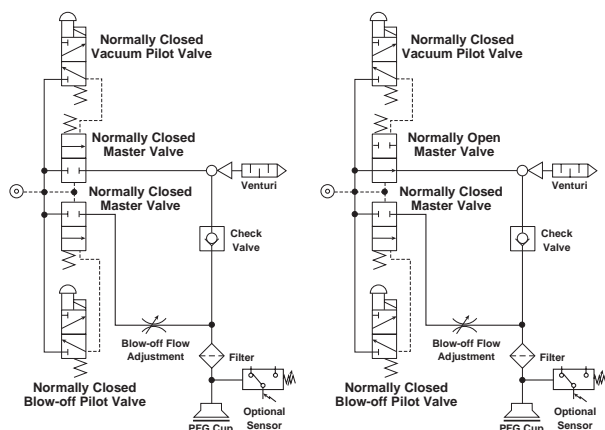
The MC72 Series vacuum generator provides a complete solution for factory automation. The MC72 is perfect for non-porous applications such as material handling, critical applications involving glass, or general transfer applications. The MC72 has integrated vacuum pilot and blow-off release pilot valves to minimize response times. The MC72 has additional features; regulating blow-off needle, 130 micron filter, optional check valve, and a sensor platform for vacuum confirmation. The MC72 can be assembled into a maximum 5 station manifold. The unit can be ordered normally open or normally closed.

Features

- Vacuum generating pilot valve
- Vacuum release pilot valve option
- Vacuum sensor - filter - silencer available
- Regulating blow-off
- Check valve option
- Air-economizing controls
- Manifold system
- Vacuum flow rates from 2.1 to 5.5 SCFM
- 3-Pin, EN175301-803, 15mm, 8mm 3-Pin



Add-A-Fold assembly (Silencer included)



Operating information

Media	Non-lubricated compressed air, non-corrosive gases
Optimum operating pressure	70 PSI (5 kgf/cm ²)
Humidity	35 to 85%
Pressure port	N: 1/4 NPT female, G: 1/4 BSPP female
Vacuum port	N: 1/4 NPT female, G: 1/4 BSPP female
Operating temperature	41 to 132°F (5 to 50°C)
Material	Body (PA and PBT) with other internal components (Brass, Al.NBR, SUS, FKM), filter elements (PVF)
Manual operation	Non-locking manual override
Electrical connection	DIN connector with LED and surge protection, connectors included
Power supply	24VDC ± 10%
Power consumption	1.8W
Operating pressure	70 PSI (5 kgf/cm ²)
Pilot valve air supply	Normally closed
Generator weight	12.0 oz. (340g)
Manifold weight	2-Station: 24 oz. (680g), 3-Station: 31 oz. (880g), 4-Station: 38 oz. (1080g), 5-Station: 45 oz. (1280g)

MC72 Unit With Integrated Check Valve, Normally Closed Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/4	1/4	Muffler	2.20	24	No sensor	MC72S15HSZSC4BPN	MC72S15HSZSC4BPG
1/4	1/4	Muffler	2.20	24	MPS-V23C-PC, PNP	MC72S15HS42C4BPN	MC72S15HS42C4BPG
1/4	1/4	Muffler	2.20	24	MVS-201-PCP, PNP	MC72S15HS06C4BPN	MC72S15HS06C4BPG
1/4	1/4	Muffler	2.20	24	MPS-V23C-NC, NPN	MC72S15HS41C4BPN	MC72S15HS41C4BPG
1/4	1/4	Muffler	2.20	24	MVS-201-NC, NPN	MC72S15HS01C4BPN	MC72S15HS01C4BPG
1/4	1/4	Muffler	3.67	24	No sensor	MC72S20HSZSC4BPN	MC72S20HSZSC4BPG
1/4	1/4	Muffler	3.67	24	MPS-V23C-PC, PNP	MC72S20HS42C4BPN	MC72S20HS42C4BPG
1/4	1/4	Muffler	3.67	24	MVS-201-PCP, PNP	MC72S20HS06C4BPN	MC72S20HS06C4BPG
1/4	1/4	Muffler	3.67	24	MPS-V23C-NC, NPN	MC72S20HS41C4BPN	MC72S20HS41C4BPG
1/4	1/4	Muffler	3.67	24	MVS-201-NC, NPN	MC72S20HS01C4BPN	MC72S20HS01C4BPG
1/4	1/4	Muffler	5.20	24	No sensor	MC72S25HSZSC4BPN	MC72S25HSZSC4BPG
1/4	1/4	Muffler	5.20	24	MPS-V23C-PC, PNP	MC72S25HS42C4BPN	MC72S25HS42C4BPG
1/4	1/4	Muffler	5.20	24	MVS-201-PCP, PNP	MC72S25HS06C4BPN	MC72S25HS06C4BPG
1/4	1/4	Muffler	5.20	24	MPS-V23C-NC, NPN	MC72S25HS41C4BPN	MC72S25HS41C4BPG
1/4	1/4	Muffler	5.20	24	MVS-201-NC, NPN	MC72S25HS01C4BPN	MC72S25HS01C4BPG

MC72 Unit With Integrated Check Valve, Normally Open Vacuum Valve

Port size			Max. vacuum flow SCFM	Max. degree of vacuum inHg	Sensor option	Part number	
Pressure	Vacuum	Exhaust				NPT	BSPP
1/4	1/4	Muffler	2.20	24	No sensor	MC72S15HSZSC4APN	MC72S15HSZSC4APG
1/4	1/4	Muffler	2.20	24	MPS-V23C-PC, PNP	MC72S15HS42C4APN	MC72S15HS42C4APG
1/4	1/4	Muffler	2.20	24	MPS-V23C-NC, NPN	MC72S15HS41C4APN	MC72S15HS41C4APG
1/4	1/4	Muffler	3.67	24	No sensor	MC72S20HSZSC4APN	MC72S20HSZSC4APG
1/4	1/4	Muffler	3.67	24	MPS-V23C-PC, PNP	MC72S20HS42C4APN	MC72S20HS42C4APG
1/4	1/4	Muffler	3.67	24	MPS-V23C-NC, NPN	MC72S20HS41C4APN	MC72S20HS41C4APG
1/4	1/4	Muffler	5.20	24	No sensor	MC72S25HSZSC4APN	MC72S25HSZSC4APG
1/4	1/4	Muffler	5.20	24	MPS-V23C-PC, PNP	MC72S25HS42C4APN	MC72S25HS42C4APG
1/4	1/4	Muffler	5.20	24	MPS-V23C-NC, NPN	MC72S25HS41C4APN	MC72S25HS41C4APG

Add-A-Fold assembly ordering information



How to order Add-A-Fold assemblies

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the manifold type generator or a blank plate for each station of the manifold.
6. See model number index code for MC72 Generator number and accessories for blank plate part numbers.

Most popular.



C
 Vacuum Generators
 Vacuum Products
 MCA, CV,
 CV-CK
 Series
 CHF
 Series
 MC22
 Series
 MC72
 Series
 CEK
 Series
 CVXCEK
 Series

Example 1: Shown above is a 2-Station MC72 manifold with sensors and NPT Ports.

Qty.	Part number	Comment
1	AAMC72-M02N.....	Add-A-Fold
1	MC72SHS42C4BPN.....	Station #1
1	MC72SHS42C4BPN.....	Station #1

Alternative Method

1	AAMC72-M02N.....	Add-A-Fold
2	MC72SHS42C4BPN.....	Station #1-2

AAMC72-M02N

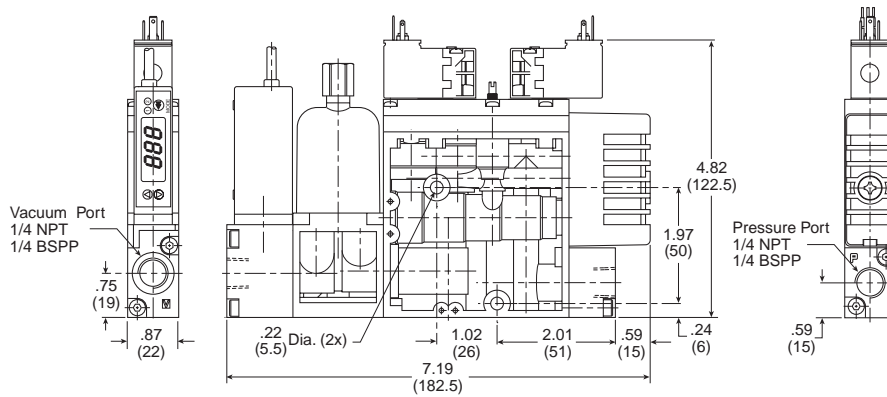
Port type
N NPT
G BSPP

Number of stations
M02 2
M03 3
M04 4
M05 5*

* Maximum number of stations

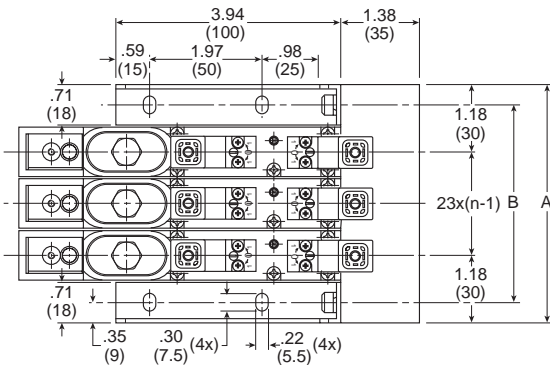
Add-A-Fold assembly
AAMC72

Dimensions



Manifold

3-Station manifold shown



Manifold part number

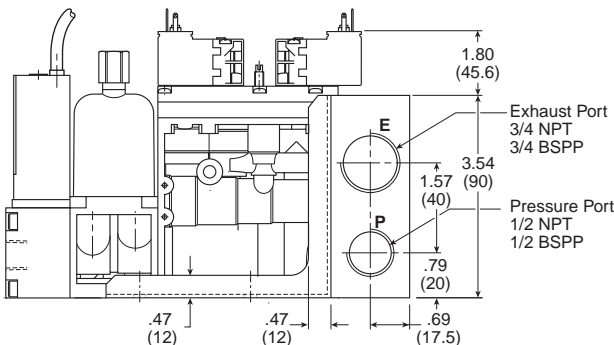
MC72 - M 05 N

Manifold

Stations
02
03
04
05

Port Size
N 1/8 NPT
G 1/8 BSPP

Bold Items are Most Popular.



n	2	3	4	5
A	3.27 (83)	4.17 (106)	5.08 (129)	5.98 (152)
B	2.56 (65)	3.46 (88)	4.37 (111)	5.28 (134)

Inches (mm)
n = Number of Stations

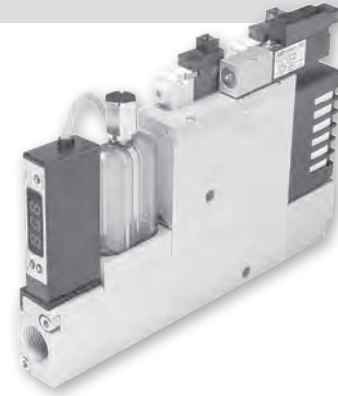


CEK Emergency Stop Vacuum Generators

The CEK is a Normally Closed Vacuum On / Off valve that maintains the last state of air during an emergency stop or power loss. In addition to this, an air-economizing valve has been added to interrupt the air supply by connecting the output signal from the sensor to minimize air consumption.

This unit is ideal for non-porous applications that require fast response of large vacuum and blow-off release flow.

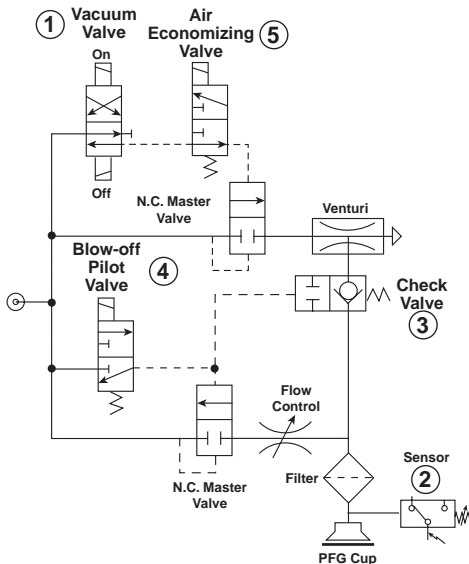
Typically, with a normally closed air circuit, the user controls vacuum with a command signal. During an Emergency Stop Event or power failure event, the vacuum command signal is lost, but, the Vacuum valve (1) remains in the current operating position due to the construction of the valve. The air-economizing valve (5), in a Normally Open configuration, passes the air supply from the Vacuum On / Off valve (1). The Sensor (2) output activates the air-economizing valve (5) closing the air supply to the Normally Closed master valve. The Check Valve (3) maintains the achieved vacuum level until the hysteresis value of the Sensor (2) is reached or when the Vacuum valve (1) has been returned to the closed position to stop the vacuum operation.



Features

- Integrated double solenoid for last state
- Integrated vacuum pilot
- Integrated blow-off pilot
- Integrated filter, silencer
- Air economizing capabilities
- Manifolds for up to 5 units

Valve controlled emergency stop circuit



Model numbers

Nozzle size	Maximum degree of vacuum	Sensor option	Valve option	Part number
1.5mm	27 inHg	No Sensor	24 VDC, PNP	CEK15HSZC24PBLN
		MPS-V23 (NPN)	24 VDC, NPN	CEK15HS41C24NBLN
		MPS-V23 (PNP)	24 VDC, PNP	CEK15HS42C24PBLN
2.0mm	27 inHg	No Sensor	24 VDC, PNP	CEK20HSZC24PBLN
		MPS-V23 (NPN)	24 VDC, NPN	CEK20HS41C24NBLN
		MPS-V23 (PNP)	24 VDC, PNP	CEK20HS42C24PBLN
2.7mm	27 inHg	No Sensor	24 VDC, PNP	CEK27HSZC24PBLN
		MPS-V23 (NPN)	24 VDC, NPN	CEK27HS41C24NBLN
		MPS-V23 (PNP)	24 VDC, PNP	CEK27HS42C24PBLN

 Most popular.

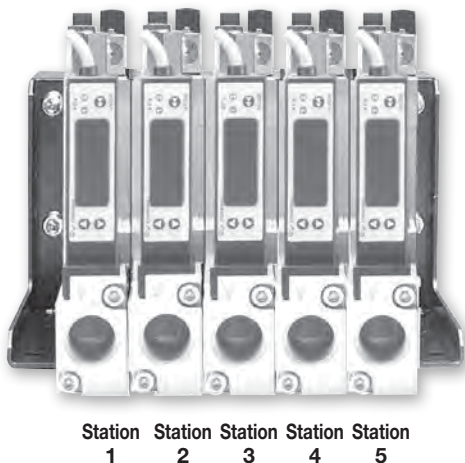
C
 Vacuum Generators
 Vacuum Products
 MCA, CV,
 CV-CK
 Series
 CHF
 Series
 MC22
 Series
 MC72
 Series
 CEK
 Series
 CVXCEK



Operating information

Media	Non-lubricated compressed air, non-corrosive gases	
Operating pressure	70 PSI (5 kgf/cm ²)	
Humidity	35 to 85%	
Pressure port	N: 1/4 NPT female, G: 1/4 BSPP female	
Vacuum port	N: 3/8 NPT female, G: 3/8 BSPP female	
Operating temperature	41 to 132°F (5 to 50°C)	
Material	Aluminum, Brass, NBR	
Air-economizing valve and blow-off release pilot		Emergency stop valve
Type of control valve	Pilot valve	Double solenoid
Manual operation	Manual override	Manual overrides
Electrical connection	Clip connector with LED and surge	Clip connector with LED and surge
Power supply	24VDC ± 10%	24VDC ± 10%
Power consumption	0.9W	0.9W
Operating pressure	70 PSI (5 kgf/cm ²)	70 PSI (5 kgf/cm ²)
Air supply	Normally closed	Normally closed
Generator weight	26.3 oz. (750g)	
Manifold weight	2-Station: 24 oz. (680g), 3-Station: 31 oz. (880g), 4-Station: 38 oz. (1080g), 5-Station: 45 oz. (1280g)	

Add-A-Fold assembly ordering information

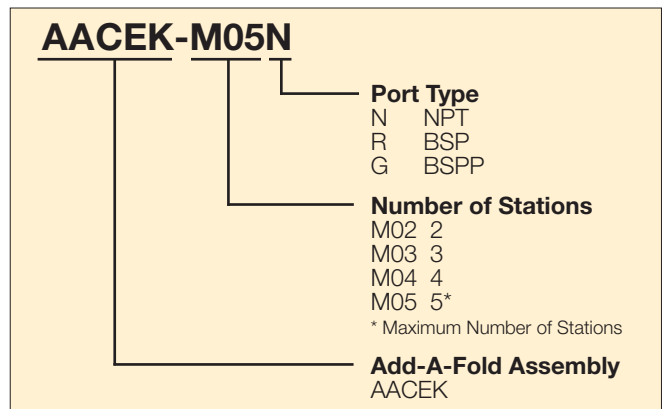


Example 1: Shown above is a 5-Station CVK manifold with sensors and NPT Ports.

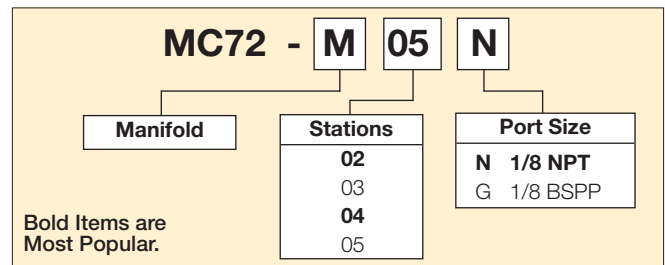
Qty.	Part number	Comment
1	AACEK-M04N.....	Add-A-Fold
1	CEK15HS21C24NBLN	Station #1
1	CEK15HS21C24NBLN	Station #2
1	CEK20HS21C24NBLN	Station #3
1	CEK20HS21C24NBLN	Station #4
1	CEK27HS21C24NBLN	Station #5
<i>Alternative Method</i>		
1	AACEK-M04N.....	Add-A-Fold
2	CEK15HS21C24NBLN	Station #1-2
2	CEK20HS21C24NBLN	Station #3-4
1	CEK27HS21C24NBLN	Station #5

How to order Add-A-Fold assemblies

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the manifold type generator or a blank plate for each station of the manifold.
6. See model number index code for CEK Generator number and accessories for blank plate part numbers.



Manifold part number



C

Vacuum Generators
Vacuum Products

MCA, CV,
CV-CK

CHF
Series

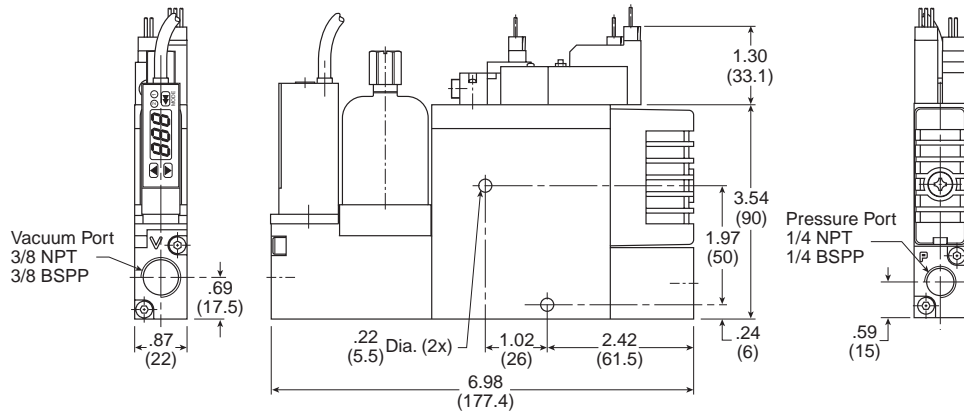
MC22
Series

MC72
Series

CEK
Series

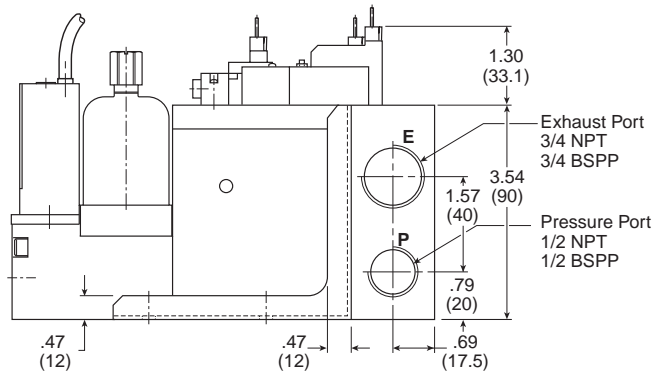
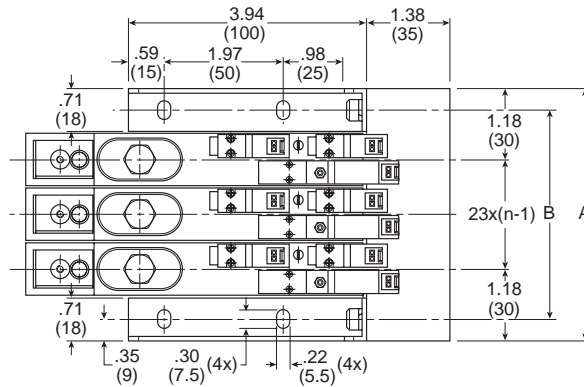
CVXCEK
Series

Dimensions



Manifold

3-Station manifold shown



n	2	3	4	5
A	3.27 (83)	4.17 (106)	5.08 (129)	5.98 (152)
B	2.56 (65)	3.46 (88)	4.37 (111)	5.28 (134)

Inches (mm)
 n = Number of stations

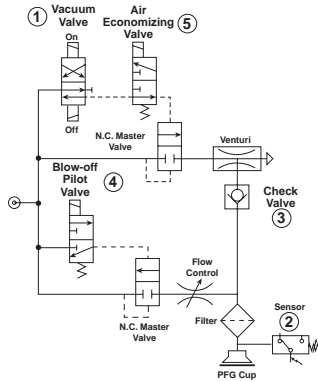
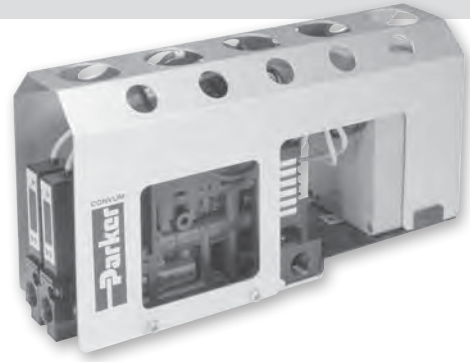
C
 Vacuum Generators
 Vacuum Products
 MCA, CV,
 CV-CK
 Series
 CHF
 Series
 MC22
 Series
 MC72
 Series
 CEK
 Series
 CVXCEK
 Series



CVXCEK Vacuum Generators

The CVXCEK vacuum generator creates vacuum and blow-off pressure in a vacuum system and has additional Air-economizing and emergency operating system functions.

Each CVXCEK unit consists of 2 independent vacuum generators labeled channel 1 and channel 2. Each vacuum generator has a vacuum ON / OFF solenoid pilot valve, blow-off solenoid pilot valve, Air-Economizing valve, blow-off needle control valve, pressure sensor, vacuum check valve, vacuum filter, and exhaust filter. Each Vacuum Generator is mounted to a 2-Station bar manifold with an optional electrical mounting kit. The pressure provided to inlet port of the bar manifold is common to both vacuum generators.



Features

- Integrated double solenoid for hold last state conditions
- Integrated vacuum pilot
- Integrated blow-off pilot
- Integrated filter, silencer
- Air economizing capabilities

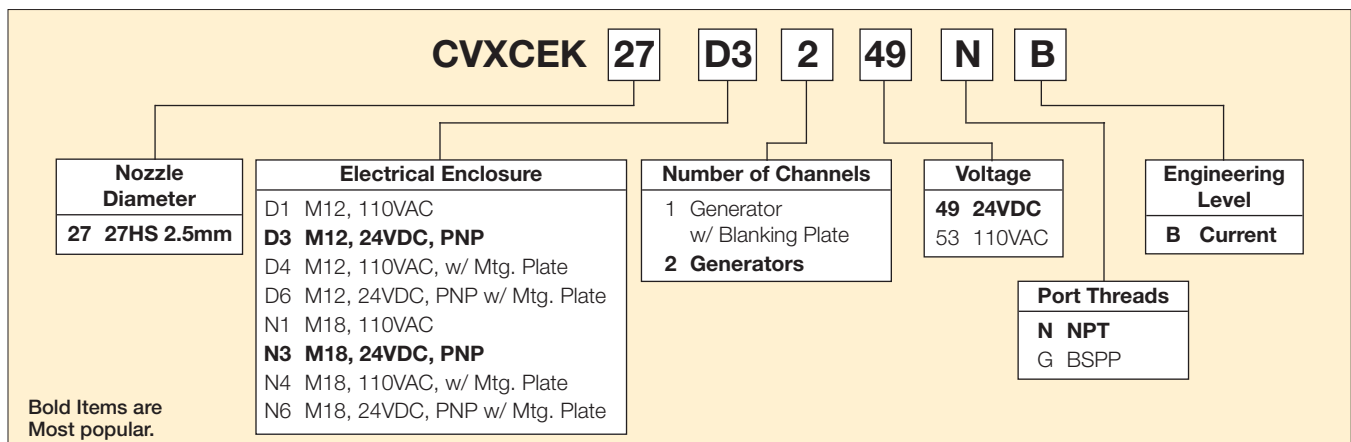
General operation of CVXCEK vacuum units

A vacuum generator is a single stage Venturi that creates vacuum pressure using compressed air. In principle, compressed air is throttled as the air exits the nozzle and is discharged into the diffuser. This increased velocity of air lowers the pressure in the diffusion chamber. The volume of air within the closed vacuum system flows into the low-pressure area of the diffusion chamber and is exhausted thru the diffuser. This effect increases the vacuum level and evacuates most of the air within the closed vacuum. The vacuum generator will produce the specified degrees of vacuum as cataloged if the vacuum system is closed, inlet pressure is to design pressure, and there are no major restrictions in the exhaust flow.

Vacuum is created when the unit receives a momentary or maintained command vacuum "ON" signal, (high signal is sent

to Vacuum Pilot Valve (1). Once a preset vacuum degree (P-1) of the pressure sensor (2) is achieved, the Air-Economizing Valve is enabled to conserve compressed air. The vacuum level will be maintained by the Check Valve (3) until (P-2). At this point vacuum is turned back "ON" until the switch point (P-1) is achieved again. This cycle, which is called Air-economizing, will repeat until a blow-off signal is sent to the unit. When the Blow-off Pilot Valve (4) is activated to decay the vacuum pressure, the unit will release the part. Command vacuum "ON" should be turned "OFF" when command blow-off is turned "ON". The Emergency Stop operating system provides Air-Economizing or maximum degree of vacuum at the time of disruption of Input and Output Power.

Model Number Index



C

Vacuum Generators
 Vacuum Products

MCA, CV,
 CV-CK

CHF
 Series

MC22
 Series

MC72
 Series

CEK
 Series

CVXCEK
 Series



Operating information

Media	Non-lubricated compressed air, non-corrosive gases		
Operating pressure	70 PSI		
Humidity	35 to 85%		
Pressure port	N: 1/4 NPT female, G: 1/4 BSPP female		
Vacuum port	N: 3/8 NPT female, G: 3/8 BSPP female		
Operating temperature	41 to 132°F (5 to 50°C)		
Material	Body (PA and PBT) with other internal components (Brass, Al.NBR, SUS, FKM), filter elements (PVF)		
Air-economizing valve and blow-off release pilot	Vacuum pilot valve	Sensors	
Type of control	Single solenoid	Double solenoid	MPS-23 Pressure Sensor
Manual operation	Manual override	Manual overrides	N/A
Electrical connection	Clip connector	Clip connector	M8, 4-pin
Power supply*	24VDC ± 10%	24VDC ± 10%	10.8 to 30VDC
Solenoid power consumption	0.6W with LED and surge	2.0W with LED and surge	55mA
Operating pressure	70 PSI	70 PSI	-14.7 PSI to 72.5 PSI
Air supply	Normally closed	Normally closed	N/A
Manifold weight	1-Station: 49 oz. (1404g), 2-Station: 63 oz. (1787g)		

* 110VAC units use 24VDC solenoids and sensors.

Performance

Series / nozzle diameter	Nozzle diameter (mm)	Vacuum degree at 70 PSI (inHg)	Vacuum flow per channel (SCFM)	Air consumption per channel (SCFM)
CVXCEK27	2.5	24	5.20	10.41

Evacuation time

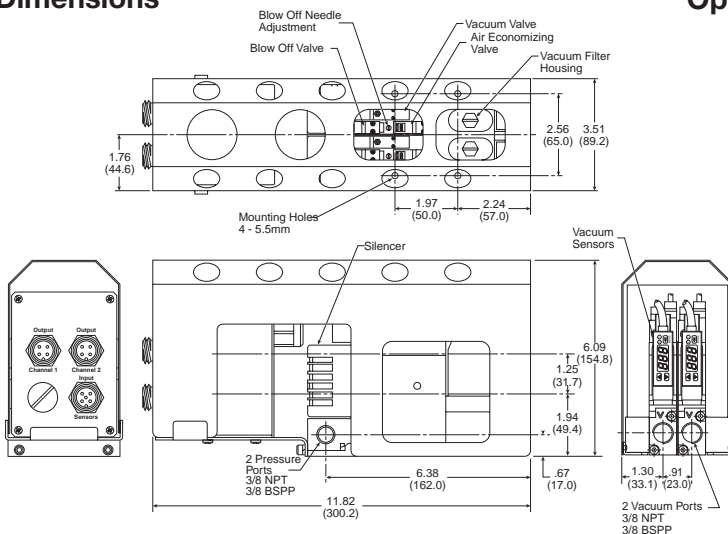
Series / nozzle diameter	Air supply pressure PSI	Air consumption per channel SCFM	Evacuation time per channel in sec / ft ³ * to reach different vacuum levels (inHg)								
			3	6	9	12	15	18	21	24	27
CVXCEK27	70	10.42	0.66	2.19	3.29	6.14	9.3	14.55	23.21	46.13	—

* 1 ft³ = 28.31 liters

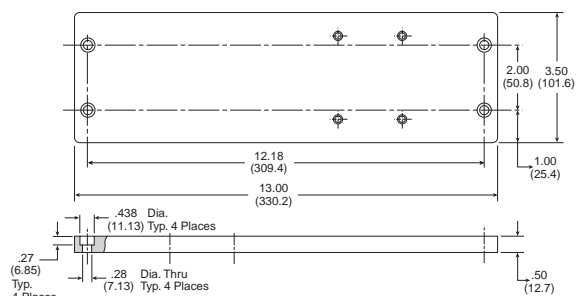
Vacuum flow (SCFM)

Nozzle diameter	inHg										
	0	3	6	9	12	15	18	21	24	27	30
25HS	5.20	4.61	4.01	3.41	2.82	2.22	1.63	1.04	0.46	—	—

Dimensions



Optional mounting plate



C
Vacuum Generators
Vacuum Products
MCA, CV, CV-CK, CHF, MC22, MC72, CEK, CVXCEK
Series



MPS-23 1-Color Generator Mount

Features

- Pressure range:
 Vacuum pressure: 0 to -30 inHg
- Sensor output:
 2 NPN or PNP open collector
 Transistor output, 30VDC, 125mA
- Switch Point and Window Comparator Mode
- Selectable units of measure
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases
- Error message



MPS-23 Sensor Only Ordering Numbers

Pressure range	Port thread	Electrical output	Electrical connection	Part number
0-30 inHg	Ejector mount	(2) PNP	M8 on 1M cable, 4-pin	MPS-V23C-PC
0-30 inHg	Ejector mount	(2) NPN	M8 on 1M cable, 4-pin	MPS-V23C-NC

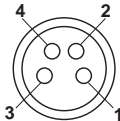
MPS-23 Accessories

M8, 4-pin, 2 meter cable	CB-M8-4P-2M-PUR
M8, 4-pin, 5 meter cable	CB-M8-4P-5M-PUR

Sensor pin out

Pin

- 1 Brown: 24VDC
- 2 White: PNP/NPN Open Collector Output 2
- 3 Blue: 0VDC
- 4 Black: PNP/NPN Open Collector Output 1

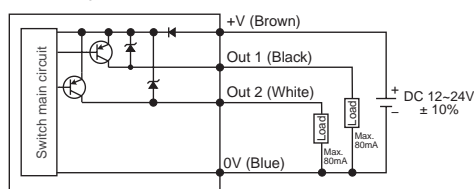


Programming options

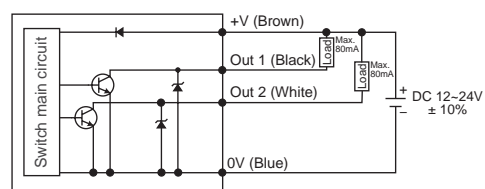
Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Window comparator mode	✓
Auto teach mode	✓
Output response time	✓
Lockout option	✓
Password lockout	—
Max. value display	✓
Min. value display	✓
Zero reset	✓
Error output mode	✓

Internal circuit for open collector and analog output wiring

PNP Output



NPN Output



Most popular.

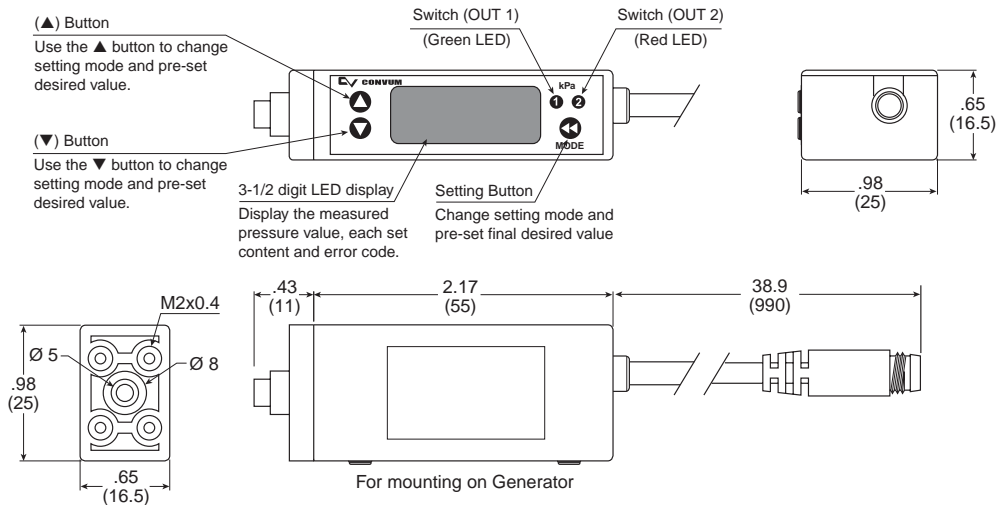


Operating information

Pressure range	-101.3 - 0 kPa (-14.5 to 0 PSI)
Proof pressure	0.3 Mpa (44 PSI)
Display resolution, Units of measure	0.1, kPa
	0.001, kgf/cm ²
	0.001, bar
	0.01, PSI
	0.1, inHg
	1, mmHg
	0.1, mmH ₂ O
Media	Air & non-corrosive gases, incombustible gases
Pressure port	Generator mount only
Operating temperature	32 to 122°F (0 to 50°C)
Storage temperature	-4 to 140°F (-20 to 60°C)
Humidity	40 - 85% RH (no condensation)
Electrical connection	(C) 4-pin, M8 connector on 1M lead wire
Power supply	12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less
Display	3 + 1/2 digit, 1 color, 7-segment RED LED
Display refresh	.1 to 3.0 Seconds, Variable (factory set at 0.1)
Control output	NPN (Sinking), PNP (Sourcing), Open collector, max 80mA, 2 output
Switch output	Output signal, NPN or PNP, Normally open or closed, LED indicator
Output indicator	Green LED (OUT1), Red LED (OUT2)
Output modes	Hysteresis or Window Comparator
Response time	≤ 2.5ms (chattering-proof function: 24ms, 192ms, 786m selections)
Repeatability	± 0.2% of F.S. ± 1 digit or less
Thermal error	≤ ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)
General protection	IP40, CE marked, EMC-EN61000-6-2: 2001
Current consumption	<55mA
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.
Shock resistance	980 m/s ² (about 10G), 3 times/each directions X, Y, Z
Noise resistance	Vp-p400V, 10 ms, 0.5µs noise simulator
Material	Housing: ABS (black) , Pressure port: Zinc die-cast, Diaphragm: Silicon
Mass	2 oz. (65g) (including 1m cable)

Dimensions

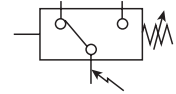
Generator mount



C
Generator Sensors
Vacuum Products
MPS-23 Series
MVS-201 Series

MVS-201 Integrated Generator Sensor

The MVS-201 is a winning combination with the MC2, CVR-2, and CVK vacuum generators. The MVS-201 automatically provides an output signal for the blow-off function without the need of an additional output from the PLC. Begin the vacuum cycle with an output signal from the PLC to the "201" sensor. The "201" sensor has one NPN or PNP output for vacuum confirmation and a control output that interfaces directly with the blow-off release pilot valve. With programmable time control features and a special chip driver, the sensor automatically activates the blow-off release when the NPN or PNP vacuum signal from the PLC is discontinued. This eliminates, THE PREVIOUSLY REQUIRED, PLC output to activate the blow-off release. This technology eliminates PLC output requirements by 50% and reduces installation to a simple 4 wire system by wiring the sensor only. There are 3 modes of operation for various applications. The output response time of the sensor is less than 2.5 msec. Peak limit prevention maintenance feature is automatically recorded internally.



For use with MC22 / MC72 generators

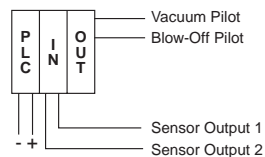
Features

- Time controlled sensor
- Intelligent simple 4-wire system
- Eliminate I/O for release valve
- 2 functions with one rung of code
- Automatic timer (0-9.9 Sec.) function by sensor control driver for vacuum generating and release valves
- Peak value preventative maintenance confirmation
- Response time less than 2 milliseconds

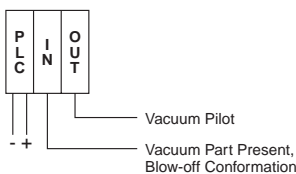
Programming options

Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Lockout option	✓
Zero reset	✓
Energy savings mode	✓
Air conservation / blow-off timer	✓
Vacuum timer option	✓
Signal controlled vacuum	✓
Blow-off activation timer	✓
Blow-off timer	✓
Vacuum confirmation signal	✓
Blow-off confirmation signal	✓
Peak vacuum error message	✓
Vacuum response error message	✓
Blow-off time error message	✓

Basic PLC System



PLC System with 201 Sensor



MVS-201 Ordering Numbers

Pressure range	Output circuit	Input circuit	Electrical connector *	Part number
-14.7 to 72.5 PSI	PNP sourcing	PNP sourcing	4 Pin, M8	MVS-201-PCP
	NPN sinking	NPN sinking		MVS-201-NC

* Requires sensor to valve electrical connector

Note:

Output Circuit provides vacuum and blow-off confirmation signal (Input Signal to PLC).
 Input Circuit controls vacuum solenoid valve (Output Signal from PLC).

Sensor to valve electrical connector

Generator series	Sensor connection	Valve connection	Part number
MC22	5 Pin Clip Type	2 with clip type	MC22-C201G
MC72		2 wire leads	CVK-D201G

Most popular.

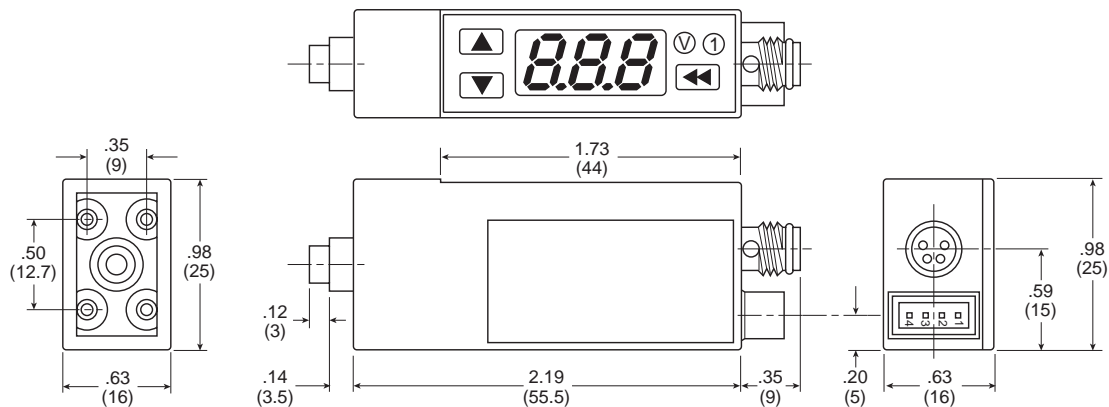


Operating information

Pressure range	Compound pressure: -14.7 to 72.5 PSI
	bar: 0.01
Display resolution, Units of measure	kPa: 1
	kgf/cm ² : 0.01
	PSI: 0.1
Media	Non-lubricated air and non-corrosive gases
Proof pressure	116.0 PSI
Operating temperature	32 to 122°F (0 to 50°C)
Storage temperature	14 to 140°F (-10 to 60°C)
Humidity	35 to 85% RH
Electrical connection	4-pin, M8 connector
Power supply	10.8 to 30VDC, Ripple Vp-p 10% Max., Reverse voltage protection
Display	3-Digit, 7-Segment LED
Display frequency	5Hz
Circuit	NPN (Sinking), PNP (Sourcing) open collector transistor
Digital output	Individually selectable N.O. or N.C., max 125mA, 30V, with overcurrent protection
Mode	OP1, OP2, OP3 hysteresis: 0 to 100% of switch point
Response time	< 2ms
Repeatability	± 0.3% F.S.
Thermal error	±0.2% F.S. in temperature range: 32 to 122°F (0 to 50°C)
General protection	IP40, CE marked, EMC-EN55011 Class B, EN50082-1
Current consumption	< 45mA, < 25mA when utilizing screen saver option
Spike protection	350 Vp, 1, μs
Dielectric strength	1000 VAC 1 min.
Insulation resistance	> 100M ohms at 500VDC
Vibration resistance	10 to 55Hz, 1.5mm, XYZ, 2 hrs.
Shock resistance	10 G, XYZ
Material	Body: Polycarbonate
Mass	1.7 oz. (45g)

Dimensions

M8, 4-pin

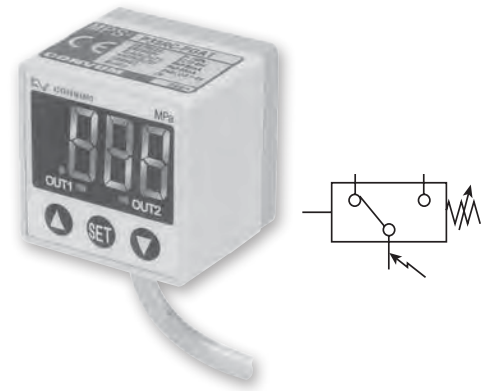


C
 Generator Sensors
 Vacuum Products
 MPS-23 Series
 MVS-201 Series

MPS-33, 1-Color Panel Mount Pressure Sensor

Features

- Sensor output:
 - 2 NPN or PNP open collector
 - Transistor output, 30VDC, 125mA with
 - Analog output, 1 to 5VDC
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases



Programming options

Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Window comparator mode	✓
Auto teach mode	✓
Output response time	✓
Lockout option	✓
Password lockout	—
Max. value display	✓
Min. value display	✓
Zero reset	✓
Red LED display	✓
Error output mode	✓

MPS-33 Sensor Only Ordering Numbers

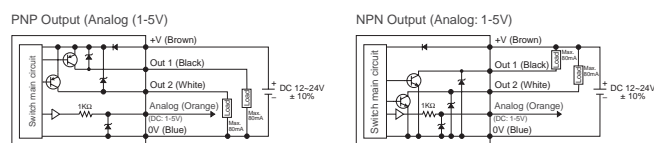
Pressure range	Electrical output	Electrical connection	Part number	
			1/8 NPSF Female	1/8 BSPP Female
0-30 inHg	(2) PNP with (1) 1-5VDC	2M 5 wire lead wire	MPS-V33N-PGAT	MPS-V33G-PGAT
0-30 inHg	(2) NPN with (1) 1-5VDC	2M 5 wire lead wire	MPS-V33N-NGAT	MPS-V33G-NGAT
-14.5 to 72 PSI	(2) PNP with (1) 1-5VDC	2M 5 wire lead wire	MPS-R33N-PGAT	MPS-R33G-PGAT
-14.5 to 72 PSI	(2) NPN with (1) 1-5VDC	2M 5 wire lead wire	MPS-R33N-NGAT	MPS-R33G-NGAT
0-145 PSI	(2) PNP with (1) 1-5VDC	2M 5 wire lead wire	MPS-P33N-PGAT	MPS-P33G-PGAT
0-145 PSI	(2) NPN with (1) 1-5VDC	2M 5 wire lead wire	MPS-P33N-NGAT	MPS-P33G-NGAT

MPS-33 Accessories

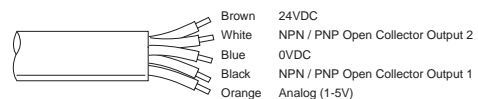
Description	Part Number
Panel mounting bracket Note : Add "H" in suffix of Sensor Only Part Number to include with sensor	MPS-ACCH8
Surface mounting bracket Note : Add "K" in suffix of Sensor Only Part Number to include with sensor	MPS-ACCK8

Example: MPS-P33N-PGAT**K**, includes sensor MPS-P33N-PGA with bracket MPS-ACCK8

Internal circuit for open collector and analog output wiring



Lead wiring



Most popular.

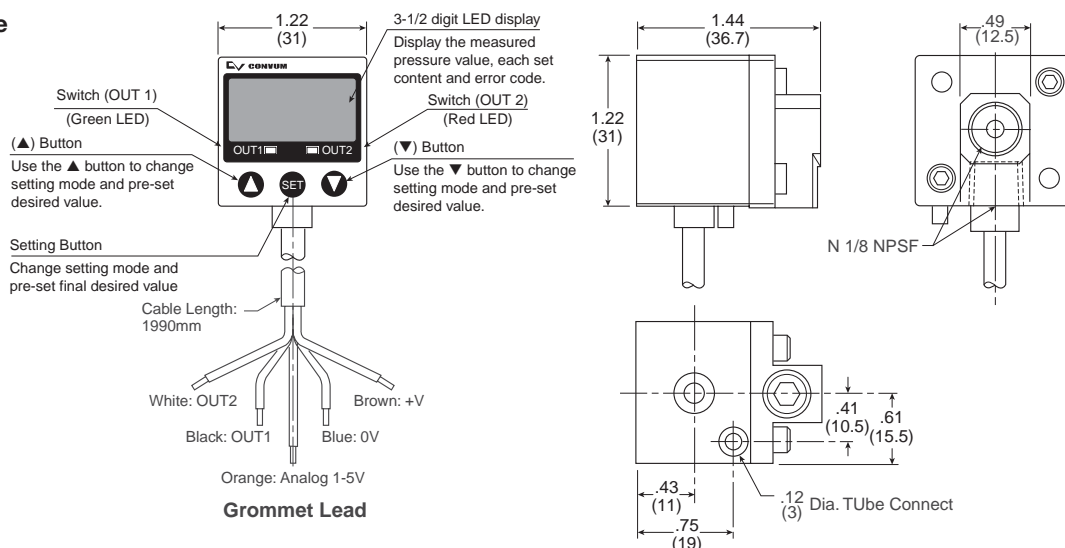


Operating information

	Vacuum (V)	Compound (R)	Positive (P)
Pressure range	-101.3 - 0 kPa (-14.5 to 0 PSI)	0 - 500 kPa (0 to 72 PSI)	-0.1 - 1 Mpa (0 to 145 PSI)
Proof pressure	0.3 Mpa (44 PSI)	0.8 Mpa (116 PSI)	1.5 Mpa (218 PSI)
Display resolution, Units of measure	0.1, kPa	1, kPa	0.001, Mpa
	0.001, kgf/cm ²	0.01, kgf/cm ²	0.01, kgf/cm ²
	0.001, bar	0.01, bar	0.01, bar
	0.01, PSI	0.1, PSI	0.1, PSI
	0.1, inHg	—	—
	1, mmHg	—	—
	0.1, mmH ₂ O	—	—
Media	Air & non-corrosive gases, incombustible gases		
Pressure port	(N) 1/8" NPSF, (G) 1/8" BSPP female		
Operating temperature	32 to 122°F (0 to 50°C)		
Storage temperature	-4 to 140°F (-20 to 60°C)		
Humidity	40 - 85% RH (no condensation)		
Electrical connection	(G) Grommet open lead, 5 wire (0.15mm ²)		
Power supply	12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less		
Display	3 + 1/2 digit, 1 color, 7-segment RED LED		
Display refresh	.1 to 3.0 Seconds, Variable (factory set at 0.1)		
Control output	NPN (Sinking), PNP (Sourcing), Open collector, max 80mA, 2 output		
Analog output	1 to 5VDC ≤ ±2.5% F.S. Linearity ≤1% of F.S.;		
Switch output	Output signal, NPN or PNP, Normally open or closed, LED indicator		
Output indicator	Green LED (OUT1), Red LED (OUT2)		
Output modes	Hysteresis or Window Comparator		
Response time	≤ 2.5ms (chattering-proof function: 24ms, 192ms, 786m selections)		
Repeatability	± 0.2% of F.S. ± 1 digit or less		
Thermal error	≤ ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)		
General protection	IP65, CE marked, EMC-EN61000-6-2: 2001, with dust tube connection		
Current consumption	<55mA		
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.		
Shock resistance	980 m/s ² (about 10G), 3 times/each directions X, Y, Z		
Noise resistance	Vp-p400V, 10 ms, 0.5µs noise simulator		
Material	Housing: ABS (gray) , Pressure port: Zinc die-cast, Diaphragm: Silicon		
Mass	3.3 oz. (105g) (including cable)		

Dimensions

1/8" Female

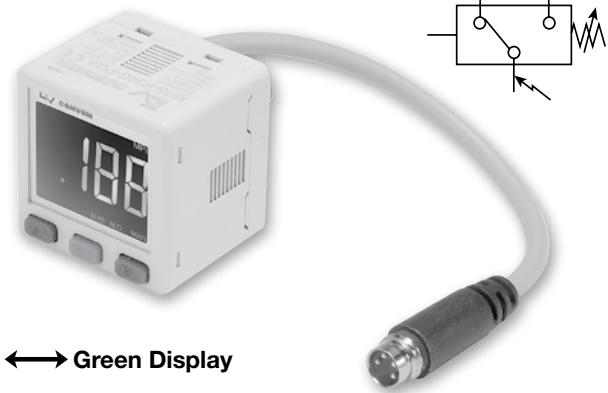


C
Pressure Sensors
Vacuum Products
 MPS-33 Series
 MPS-34 Series
 SCP01 Series
 SCP5D Series
 Cables

MPS-34, 1-Color Panel Mount Pressure Sensor

Features

- Sensor output:
 - PNP Open collector
 - Transistor output, 30VDC, 125mA with
 - Analog output, 4 to 20mA
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases
- Sensor face includes icons to show sensor programming status



Red ←→ Green Display

Programming options

Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Window comparator mode	✓
Auto teach mode	✓
Output response time	✓
Lockout option	✓
Password lockout	—
Max. value display	✓
Min. value display	✓
Zero reset	✓
Red / Green LED display options	✓
Error output mode	✓

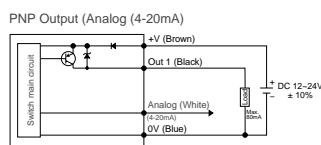
MPS-34 Sensor Only Ordering Numbers

Pressure range	Electrical output	Electrical connection	Part number	
			1/8 NPSF male	1/8 BSPP male
0-30 inHg	(1) PNP with (1) 4-20ma	M8, 4 Pin	MPS-V34N-PCI	MPS-V34G-PCI
0-145 PSI	(1) PNP with (1) 4-20ma	M8, 4 Pin	MPS-P34N-PCI	MPS-P34G-PCI

MPS-34 Accessories

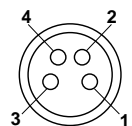
Description	Part number
Panel mounting bracket Note : Add "H" in suffix of Sensor Only Part Number to include with sensor	MPS-ACCH9
Surface mounting bracket Note : Add "K" in suffix of Sensor Only Part Number to include with sensor	MPS-ACCK10
Example: <i>MPS-P34N-PCIK</i> , includes sensor <i>MPS-P34N-PCI</i> with bracket <i>MPS-ACCK10</i>	
M8, 4-pin, 2 meter cable	CB-M8-4P-2M-PUR
M8, 4-pin, 5 meter cable	CB-M8-4P-5M-PUR

Internal circuit for open collector and analog output wiring



Sensor pin out with analog output

- Pin #
- 1 Brown: 24VDC
 - 2 White: 4 to 20mA
 - 3 Blue: 0VDC
 - 4 Black: PNP Open Collector Output 1



Most popular.

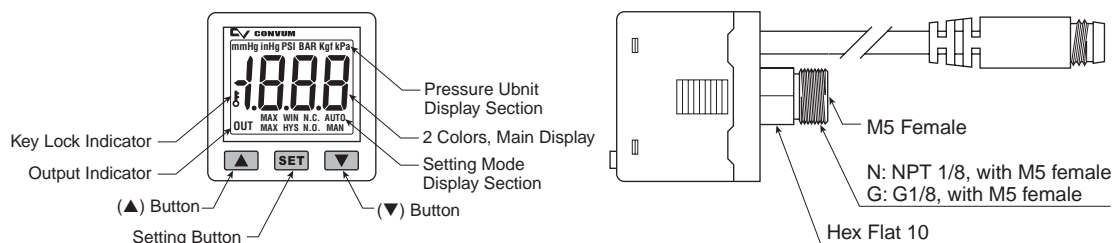
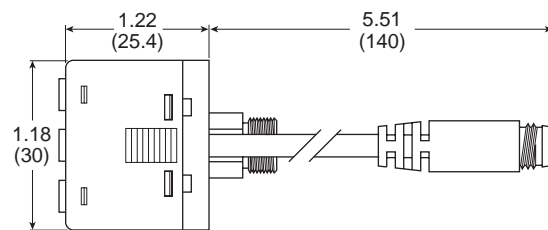


Operating information

	Vacuum (V)	Positive (P)
Pressure range	-101.3 to 0 kPa (-14.5 to 0 PSI)	-0.1 to 1 Mpa (0 to 145 PSI)
Proof pressure	0.3 Mpa (44PSI)	1.5 Mpa (218 PSI)
Display resolution, Units of measure	0.1, kPa	1, kPa
	0.001, kgf/cm ²	0.01, kgf/cm ²
	0.001, bar	0.01, bar
	0.01, PSI	0.1, PSI
	0.01, inHg	-
	1, mmHg	-
Media	Air & non-corrosive gases	
Pressure port	(N) 1/8" NPT male, (G) 1/8 BSPP male both with M5 female port	
Operating temperature	32 to 122°F (0 to 50°C)	
Storage temperature	-4 to 140°F (-20 to 60°C)	
Humidity	35 to 85% RH (no condensation)	
Electrical connection	(C) 4-pin, M8 connector on 150mm lead wire	
Power supply	12 to 24VDC ±10%, Ripple (P-P) 10% or less	
Display	3 + 1/2 digit, 2 color, 7-segment RED / GREEN LED	
Display refresh	Timing update : 0.1 ~ 3 sec. (Factory Set Unit: 0.1 sec.)	
Switch output	Output signal, PNP, Normally open or closed, LED indicator, 125 mA max. output load	
Output modes	Hysteresis or Window Comparator	
Response time	≤ 2.5ms (chattering-proof function: 24ms, 250ms, 500ms, 1000ms and 1500ms selections)	
Repeatability	± 0.2% of F.S. ± 1 digit	
Output current	Output current 4 to 20mA; Linearity ±1.0% of F.S.; Maximum load impedance 300Ω at power supply of 12V; 600Ω at power supply of 12V; Minimum load impedance 50Ω	
Thermal error	32 to 122°F (0 to 50°C) 25°C (77°C) + 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)	
General protection	IP40, CE marked, EMC-EN61000-6-2: 2001	
Current consumption	45mA (with no load)	
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.	
Shock resistance	980 m/s ² (about 10G), 3 times/each directions X, Y, Z	
Noise Resistance	Vp-p400V, 10 ms, 0.5μs noise simulator	
Material	Housing: ABS (gray) , Pressure port: Zinc die-cast, Diaphragm: Silicon	
Mass	1.45 oz. (45g) with M8 connector	

Dimensions

1/8" Male



C
Pressure Sensors
Vacuum Products
MPS-33 Series
MPS-34 Series
SCP01 Series
SCP5D Series
Cables

SCP01 High Pressure 316 Stainless Steel Pressure Sensor

SCP01 Pressure Sensors are industrial pressure sensors offering long-term stability, resistance to interference and rugged construction. They are available in a wide range of standard and configured to order versions to meet your application needs.

These sensors are manufactured with the highest quality standards for reliable and repeatable measurements.

Features:

- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

Applications include:

- Test and measurement
- Hydraulic power units
- Power generation
- Mobile hydraulics



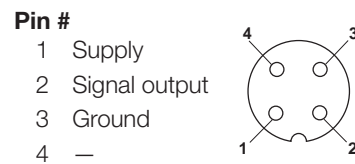
SCP01 Ordering Numbers

Pressure range (psi)	Electrical output	Electrical connection	Part number	
			1/4 NPT male	7/16-20UNF-2A, male SAE-4 with o-ring
-14.5 to 250	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-0250P-25-07	SCP01-0250P-27-07
0 to 1000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-1000P-25-07	SCP01-1000P-27-07
0 to 3000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-3000P-25-07	SCP01-3000P-27-07
0 to 5000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-5000P-25-07	SCP01-5000P-27-07
0 to 9000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	SCP01-9000P-25-07	N/A

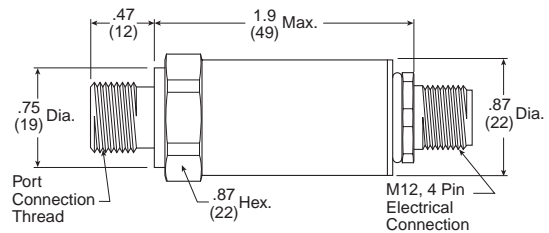
Operating information

Overload pressure	200% FS
Burst pressure	250% FS
Accuracy	+/- 0.5% FS
Protection class	IP67
Response time	< 1ms
Long term stability	< 0.1% FS/a
Load reversals	> 20 M
Electrical protection	Short circuit, reverse polarity, overload production
Supply voltage	9-30VDC
Temperature range:	
Environmental	-40°F to 185°F
Media, storage	-40°F to 257°F
Compensated	-4°F to 185°F
Temperature coefficient	< +/- 0.3% FS/10K
Vibration resistance	Meets IEC 60068-2-29
Shock resistance	Meets IEC 60068 2-32
EMI compatibility	DIN EN 61000-6-3, DIN EN 61000-6-2
Material - housing	304 SS
Material - fitting	630 SS
Material - seal	Fluorocarbon
Sensing element	Thin film (poly Si on SiO ₂)
Pressure bore	0.024 in.
Long term stability	< 0.1% FS/a
Load reversals	> 20 M

Sensor pin out with analog output



Dimensions



Most popular.



SCPSD High Pressure 316 Stainless Steel Pressure Sensor

Features

- Stainless steel or ceramic diaphragms
- UL listed and CE marked
- Sensor outputs
 - 2 PNP Open collector transistor
 - Output, 30 VDC, 100mA
- Optional additional current, 4 to 20mA
- Output response time less than 5.0ms
- Polarity protected
- Short circuit protected
- 4 digit LED display
- Display head swivels 290°



SCPSD-1000P-1727 SCPSD-600-14-15

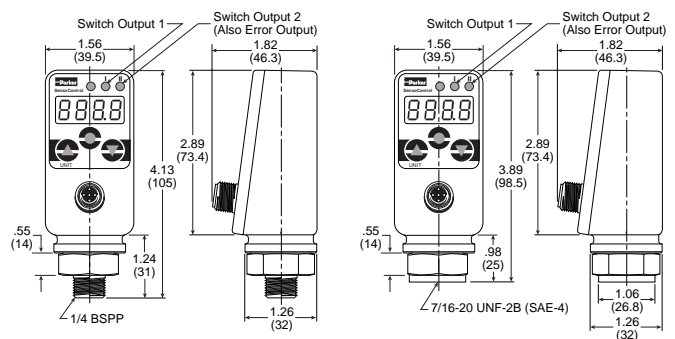
SCPSD Ordering Numbers

Pressure range	Port size	Electrical output	Electrical connection	Part number
-14.7 to 250 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP	M12, 4 Pin	SCPSD-0250P-0727
-14.7 to 250 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	SCPSD-0250P-1727
0 to 1000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 5 Pin	SCPSD-1000P-1725
0 to 1000 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	SCPSD-1000P-1727
0 to 3000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP	M12, 4 Pin	SCPSD-3000P-0727
0 to 3000 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	SCPSD-3000P-1727
0 to 3000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 5 Pin	SCPSD-3000P-1725
0 to 5000 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	SCPSD-5000P-1727
0 to 5000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 5 Pin	SCPSD-5000P-1725
0 to 9000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP	M12, 4 Pin	SCPSD-9000P-0727
0 to 9000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 4 Pin	SCPSD-9000P-1725
-1 to 16 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	SCPSD-016-04-17
-1 to 16 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	SCPSD-016-14-15
0 to 250 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	SCPSD-250-04-17
0 to 250 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	SCPSD-250-14-15
0 to 600 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	SCPSD-600-04-17
0 to 600 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	SCPSD-600-14-15

Programming options

Outputs change N.O. / N.C.	✓
Units of measure change	✓
Hysteresis mode	✓
Window comparator mode	✓
Auto teach mode	—
Output response time	✓
Lockout option	—
Password lockout	✓
Max. value display	—
Min. value display	—
Zero reset	✓
Red / Green LED display options	—
Error output mode	✓
Setting of decimal point	✓

Dimensions



☐ Most popular.



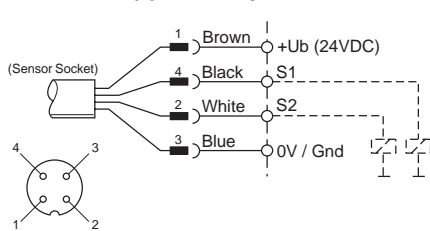
C
 Pressure Sensors
 Vacuum Products
 MPS-33 Series
 MPS-34 Series
 SCP01 Series
 SCPSD Series
 Cables

Operating information

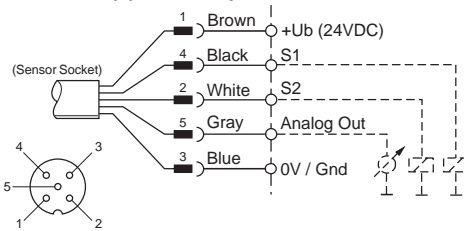
Pressure code	0250	016	1000	3000	5000	9000	250	600
Measure range PSI, (bar)	-14.7 to 250	(-1 to 16)	0 to 1000	0 to 3000	0 to 5000	0 to 9000	(0 to 250)	(0 to 600)
Overload pressure PSI, (bar)	725	(40)	2900	7250	11600	21750	(500)	(1200)
Burst pressure PSI, (bar)	725	(50)	11600	17400	24650	31900	(1200)	(2200)
Sensing element	Ceramic			Stainless steel				
Parts in contact with media	Stainless steel 1.4404			Stainless steel 1.4404, 1.4542, NBR*				
	Ceramic AL203, NBR*							
	*FPDM, EPDM special request							
Units of measure	PSI, bar, MPA							
Switch cycles	>100 million							
Output response time	< 10ms							
Power supply	15 to 30VDC, Class 2 power supply							
Short circuit protection	Yes, 2.4 amp / open collector output							
Reverse polarity protection	Yes							
Overload protection	Yes							
Current consumption	< 100mA							
Output circuit	2 PNP (Sourcing) open collector transistor							
Analog output	0/4...20mA, Programmable, freely scaleable							
Output functions	Hysteresis, Window comparator							
Switching voltage	-1.5VDC							
Maximum current output	1A with 2 open collector outputs, .5A per output							
Accuracy	± 0.5% F.S. Typ., ± 1% Max.							
Repeatability	± 0.25% F.S.							
Display accuracy	± 0.5% F.S. Typ., ± 1 Digit							
Thermal error max.	±0.03% F.S. at -4 to 185°F (-20 to 85°C)							
Material	Pressure Die-cast zinc Z 410: Surface-finishing							
Display material	Polyester							
General protection	IP 67, EN60529, UL, CE Marked, EMC-EN50082-2 Class B, EN 50081-2							
Temperature range of media	-4 to 185°F (-20 to 85°C)							
Ambient temperature range	-4 to 185°F (-20 to 85°C)							
Storage temperature	-40 to 212°F (-40 to 100°C)							
Display	4-Digit, 7-Segment LED, Red, 9mm height							
Tightening torque	35Nm							
Vibration resistance	20G, 10 to 500Hz, IEC60068-2-6							
Shock resistance	50 G, XYZ, 11ms, IEC60068-2-29							
Mass	10.6 oz. (300g)							

Internal circuit

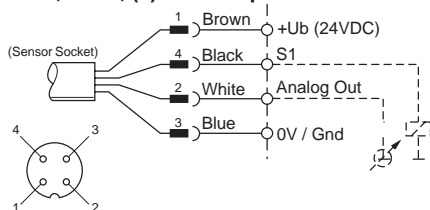
M12, 4-Pin, (2) PNP Outputs



M12, 5-Pin, (2) PNP Outputs with 4 to 20mA Analog



M12, 4-Pin, (1) PNP Output with 4 to 20mA Analog



Note: M12, 5-pin Female Cable Connector will fit on both M12, 4-pin and 5-pin Male Sensor Connector.

Cables

Features

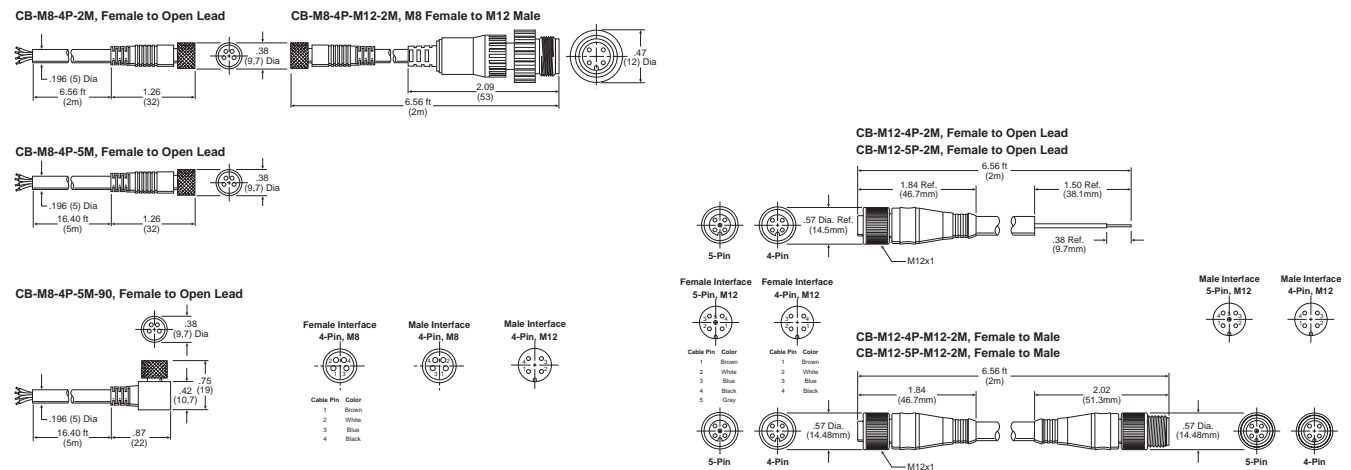
- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: Swivel straight or angled
- IP67 swivel connector



Common Part Numbers

Connector	Contacts	Length	Cover	Part number
M8 female	4	2m	PUR	CB-M8-4P-2M-PUR
M8 female	4	5m	PUR	CB-M8-4P-5M-PUR
M8 angled female	4	5m	PUR	CB-M8-4P-5M-90-PUR
M8 female to M12 male	4	2m	PVC	CB-M8-4P-M12-2M
M12 female	4	2m	PVC	CB-M12-4P-2M
M12 female	5	2m	PVC	CB-M12-5P-2M
M12 female to M12 male	4	2m	PVC	CB-M12-4P-M12-2M
M12 female to M12 male	5	2m	PVC	CB-M12-5P-M12-2M

Dimensions



Most popular.



C
 Pressure Sensors
 Vacuum Products
 MPS-33 Series
 MPS-34 Series
 SCP01 Series
 SCP5D Series
 Cables

FSV Series – M5, G1, G2 & G3 Flow Sensing Valve

Maintaining an acceptable level of vacuum is critical to the performance of vacuum systems that have a single source vacuum generator with multiple cups. The Parker Flow Sensing Valve assists in maintaining an acceptable vacuum level if the vacuum cup does not make a proper seal. The valve will automatically close if the cup loses the seal with the product during a pick and place motion.

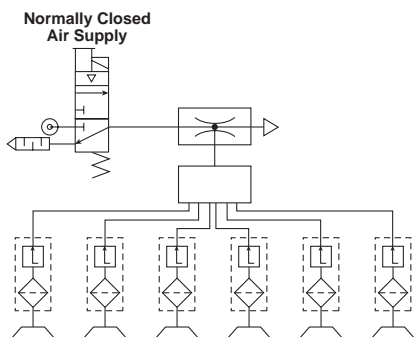
The Parker Flow Sensing Valve is a normally open valve that switches to a closed metered state when the vacuum flow rate from the cup side to the generator side is greater than the switching flow rate of the flow sensing valve. The Flow Sensing Valve “Checks” the vacuum flow. The vacuum flow rate of the generator must be more than the switching flow rate of the Flow Sensing Valve or it will not switch to a “Checked” position.

When using multiple Flow Sensing Valves per generator, the flow rate of the generator must be more than the combined switching flow rates of the flow valves and any other leak path. For example, a CV20-HSN has a maximum flow rate of 3.88 SCFM and a 1/8 Flow Sensing Valve has a switching flow rate of 0.28 SCFM. Therefore 13 Flow Sensing Valves can be connected in parallel to a CV20-HSN.

Once a Flow Sensing Valve is “Checked”, a small amount of by-pass flow occurs. This leakage allows a generator to be turned on prior to the cup being in place on a product and is the flow path used to evacuate the cup volume. The by-pass flow will decrease the maximum degree of vacuum in a system, and is considered a leak path when the cup is not sealed on a product. Blow off functions will still operate by forcing the Flow Sensing Valve to a full open position, allowing the part to be blown off.

Features

- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter



FSV Series Ordering Information

Description	Part number
1/8" BSPP	FSV-G1
1/4" BSPP	FSV-G2
3/8" BSPP	FSV-G3

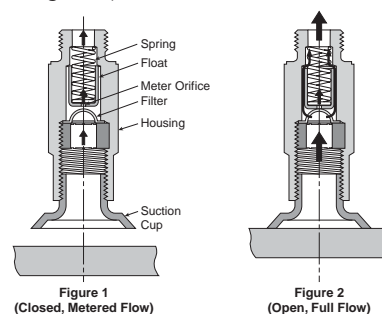
 Most popular.



Operation

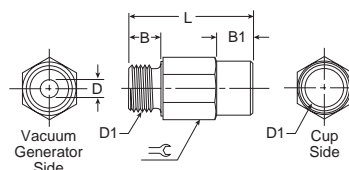
When the flow of air from the cup side to the generator side is greater than the switching flow rate of the valve, the float is drawn back against the spring and seals on the housing. In this state, flow passes through an orifice on the float. Vacuum flow is “Checked”. (See Figure 1).

When the cup comes in contact and seals on a product, flow is reduced and the spring forces the float towards the cup side inlet. This breaks the seal at the float and the full open state is restored. (See Figure 2).



Operating information

Description	FSV-G1	FSV-G2	FSV-G3
Switching flow rate:	0.28 SCFM		0.875 SCFM
Nominal size:	4mm		
Housing material:	Anodized aluminum		
Filter material:	Al-Niro mesh		
Temperature range:	14°F to 140°F (-10°C to 60°C)		
Maximum pressure:	145 PSI		115 PSI
Media:	Atmospheric air		
Weight (grams):	0.009	0.016	0.029



Dimensions

	B	B1	D	D1	L	⌀
FSV-G1	0.26 (6.5)	0.43 (11)	0.16 (4)	G	1.42 (36)	0.51 (13)
FSV-G2	0.33 (8.5)	0.43 (11)	0.16 (4)	G1/4	1.50 (38)	0.67 (17)
FSV-G3	0.47 (12)	0.51 (13)	0.16 (4)	G3/8	1.65 (42)	0.87 (22)

inches (mm)

CH01 Series Check Valve

The CH check valve is used to hold a degree of vacuum downstream from the check valve when the vacuum generator upstream from the check valve is turned off. A separate blow-off connection downstream from the CH check valve is required to destroy the vacuum pressure and blow off the part.

This check valve is an open or passing flow path when there is a differential pressure from the pad side to the generator side.



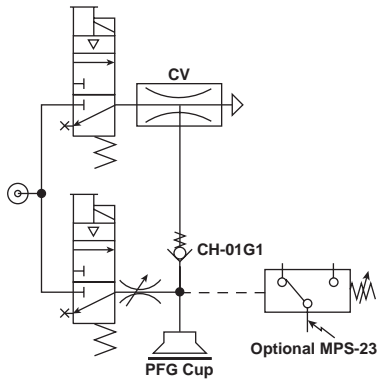
Features

- Poppet design
- Low leakage
- Low cracking pressure

Operating information

Temperature range:	32°F to 140°F (0° to 60°C)
Operating vacuum:	-4.25 to -13.89 PSIG (-8.7 to -28.3 inHg)
Port size:	Pad side = 1/4", Generator side = 1/8"
Leakage rate:	0.2 PSI / minute (0.4 inHg / minute)
Cracking pressure:	2.9 PSIG (5.9 inHg)

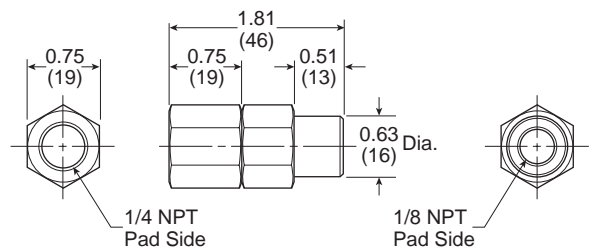
Normally Closed Air Supply with Blow-off & Optional Sensor



Material specifications

Valve body / Fittings	Brass / Aluminum
Seals	BUNA
Spring	SUS

Dimensions



CH01 Series Ordering Information

Description	Part number
BSPP Ports	CH-01G1
NPT Ports	CH-01N1

Most popular.

VF & VFL Series Filters

Always filtrate the vacuum system to protect the components from damaging particles absorbed from the environment. Elements should be replaced periodically to prevent slower response and overall performance of the system.

Material specifications

Part number	Material housing	Material element	Weight (oz.)
VF-2G	Aluminum	Acrylic, Stainless steel	1.54
VF-3G	Aluminum	PC, Polyvinyl	3.10
VF-5G	Aluminum	PC, Polyvinyl	5.15
VF-6G	Aluminum	PC, Polyvinyl	8.25
VFL-44	Poly-carbonate	PC, Polyvinyl	0.67
VFL-66	Poly-carbonate	PC, Polyvinyl	0.74
VFL-88	Poly-carbonate	PC, Polyvinyl	0.81



Operating information

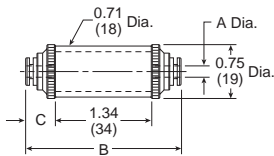
Media:	Non-corrosive air
Operating vacuum:	0 to 28 inHg
Maximum pressure:	60 PSI
Operating temperature:	32°F to 140°F (0°C to 60°C)
Filtration:	120 μm (VF-2), 130 μm (VF-3, VF-5, VF-6, VFL-44, 66, 88)

VF & VL Series Ordering Information

Application	Male connection	Replacement elements	Replacement cover, o-ring	Part number
CV-05, CV-10	G1/8"	VF-2E	—	VF-2G
CV-05, CV-10	G1/8"	VF-3E	VF-3K	VF-3G
CV-15, MCA-10/13	G1/4"	VF-5E	VF-3K	VF-5G
CV-20/25/30	G3/8"	VF-6E	VF-3K	VF-6G
General use	4mm - Tube	VFL-E	VFL-44K	VFL-44
General use	6mm - Tube	VFL-E	VFL-66K	VFL-66
General use	8mm - Tube	VFL-88E	VFL-88K	VFL-88

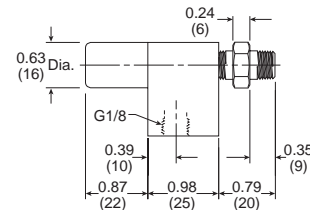
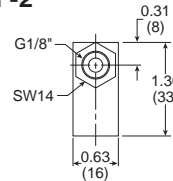
Dimensions

VFL Series

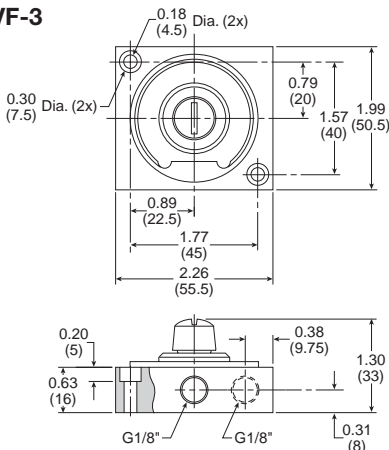


Part number	A	B	C
VFL-44	0.16 (4)	2.17 (55)	0.41 (10.5)
VFL-66	0.24 (6)	2.28 (58)	0.47 (12)
VFL-88	0.31 (8)	2.44 (62)	0.55 (14)

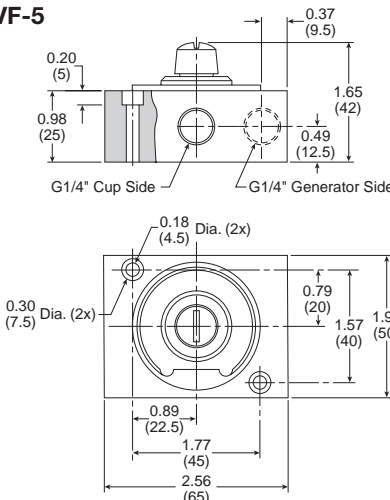
VF-2



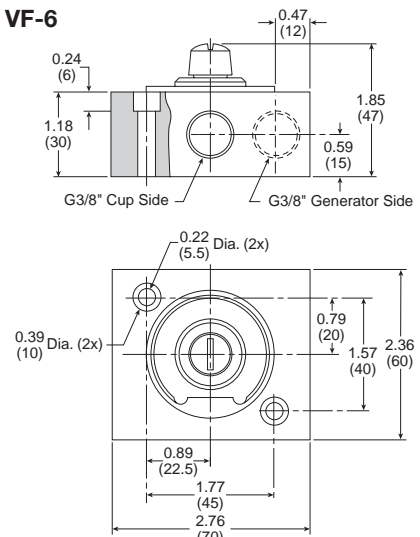
VF-3



VF-5



VF-6



Most popular.



VFP Series Filters

Parker plastic in-line filters provide easy monitoring, economy and safety. These shatterproof filters are airtight and can withstand high pressures.

A 10 micron porous plastic element prolongs element life under the most adverse environmental conditions.

Features

- To filter dust and other small particles from the vacuum flow
- Reduces the risk of operation breakdown or stoppage in the vacuum pump
- Replaceable filter element
- Made in the U.S.A.

Operating information

Media:	Non-corrosive air
Temperature range:	-4°F to 176°F (-20°C to 80°C)
Operating vacuum:	-14.5 to 0 PSI (0 to 28 inHg)
Maximum pressure:	150 PSI
Removal efficiency:	10 µm

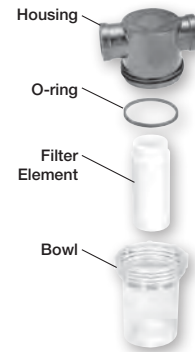
Material specifications

Housing	Polypropylene (PP)
Bowl	Polyamide nylon (PA)
Filter element	Polyethylene (PE)



Replacement components

Description	Size	Part number
Clear Bowl Kit (Includes O-ring)	1/8, 1/4, 3/8	PS577601
	1/2, 3/4	PS577602
	1, 1-1/2	PS577603
BUNA O-ring	1/8, 1/4, 3/8	PS577701
	1/2, 3/4	PS577702
	1, 1-1/2	PS577703
Filter Element Kit*	1/8, 1/4	PS577801
	3/8	PS577801
	1/2, 3/4	PS577802
	1	PS577803
	1-1/2	PS577804



* All Filter Elements are sold as a 3-pack.

VFP Series Ordering information

Port size	Flow SCFM*	Weight (oz)	Internal Volume in ³	Filter area in ²	Basic filter with element		Basic filter with 2 spare elements	
					NPT	BSPP	NPT	BSPP
1/8	25	1.7	2.10	4.9	VFP0CFC01	VFP0CFC11	VFP0CFC03	VFP0CFC13
1/4	35	1.98	2.4	4.9	VFP1CFC01	VFP1CFC11	VFP1CFC03	VFP1CFC13
3/8	45	2.47	2.7	4.9	VFP2CFC01	VFP2CFC11	VFP2CFC03	VFP2CFC13
1/2	130	6.61	11.9	16.0	VFP3CFC01	VFP3CFC11	VFP3CFC03	VFP3CFC13
3/4	175	6.42	12.5	16.0	VFP4CFC01	VFP4CFC11	VFP4CFC03	VFP4CFC13
1	290	15	30.2	29.5	VFP5CFC01	VFP5CFC11	VFP5CFC03	VFP5CFC13
1-1/2	430	18.80	41.2	35.0	VFP6CFC01	VFP6CFC11	VFP6CFC03	VFP6CFC13

* 90 PSIG inlet and 5 PSIG pressure drop

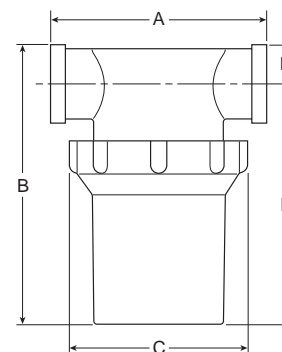
Dimensions

Part number	A	B	C	D	E
VFP0CFC*1 , VFP1CFC*1 , VFP2CFC*1	3.1 (78.7)	2.4 (61)	1.9 (48.3)	2.0 (50.8)	0.4 (10.2)
VFP3CFC*1	3.6 (91.4)	5.1 (129.5)	2.9 (73.6)	4.4 (111.6)	0.7 (17.8)
VFP4CFC*1	3.6 (91.4)	5.1 (129.5)	2.9 (73.6)	4.6 (116.9)	0.5 (12.7)
VFP5CFC*1	4.9 (124.5)	6.4 (162.6)	4.0 (101.6)	5.6 (142.2)	0.8 (20.3)
VFP6CFC*1	5.2 (132.1)	8.1 (209.9)	4.0 (101.6)	6.9 (175.3)	1.2 (30.5)

inches (mm)

* 0 (NPT), 1 (BSPP)

Most popular.



Silencers

Protect the environment against harmful noise levels with quality silencers.



Silencer Ordering Information

For generator series	Male connection	Part number
CV-05, CV-10	G1/8"	MSS-01
CV-05, CV-10	G1/8"	MSS-02
CV-15, MCA-10/13	G1/4"	MSM-01
CV-20	G1/2"	MSL-02
CV-25, CV-30	G3/4"	MS6-01

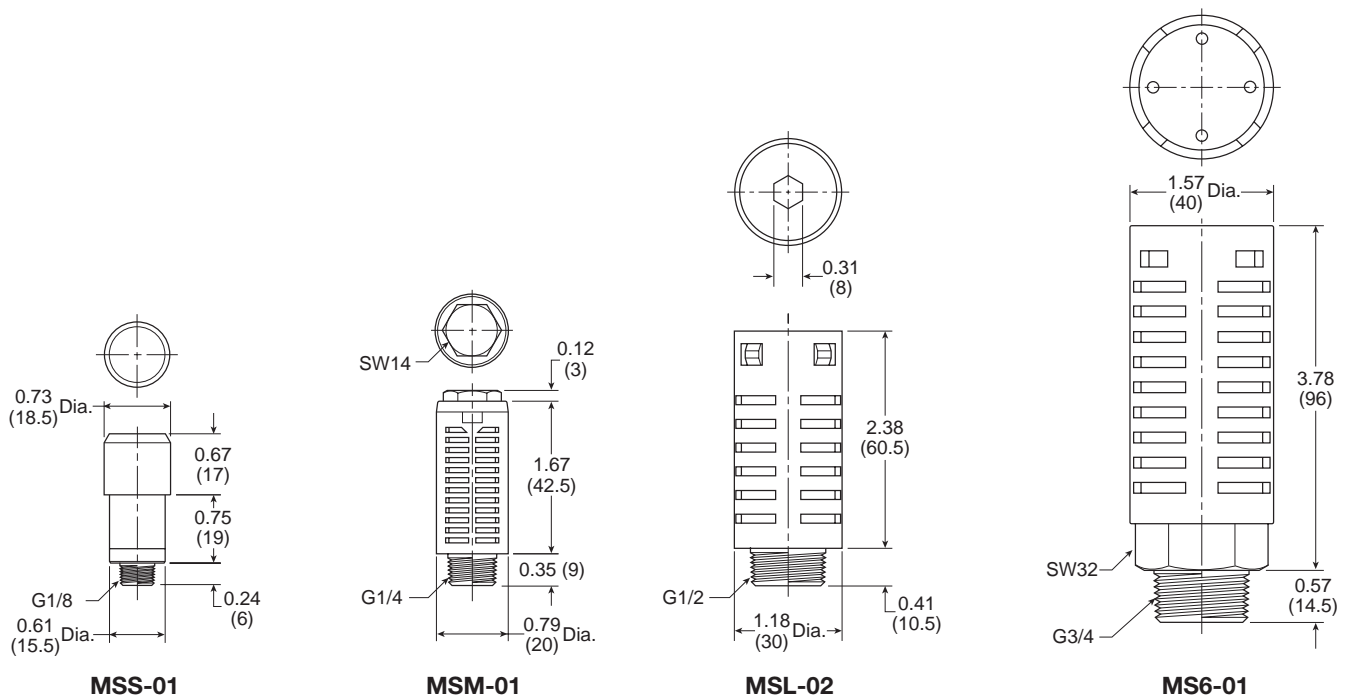
Operating information

Media:	Non-corrosive air
Maximum pressure:	128 PSI
Operating temperature:	41°F to 132°F (5°C to 55.5°C)
Silencing effect:	20 dB

Material specifications

Part number	Material housing	Material element	Media	Weight (oz.)
MSS-01	Polyacetal	Felt, Urethane	Air	0.17
MSS-02	Polyacetal	Stainless steel	Oil	0.17
MSM-01	Polyurethane	Felt	Air	0.24
MSL-02	Nylon	Vinyl	Air	0.88
MS6-01	Nylon	Polyvinyl Forma	Air	2.01

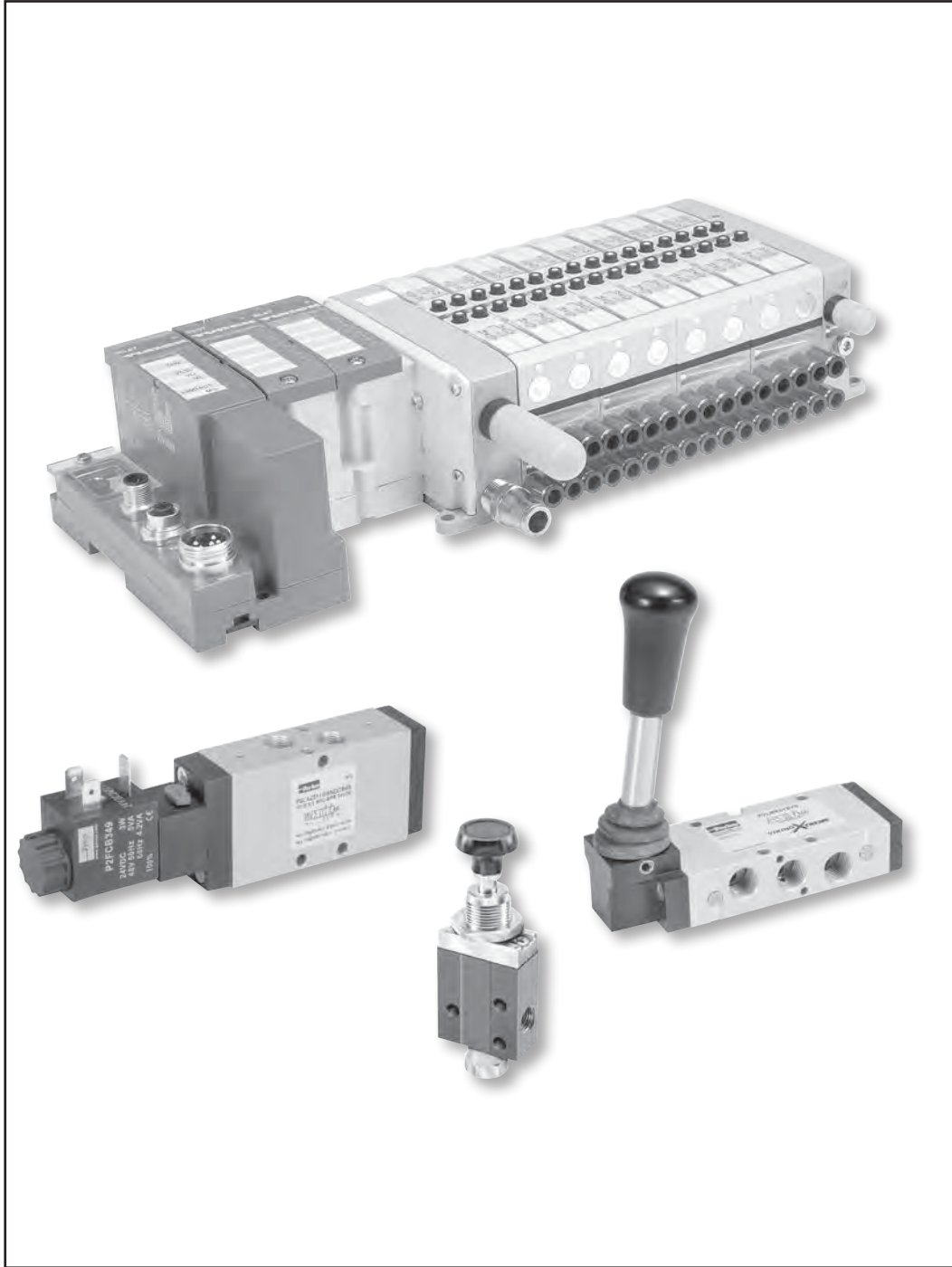
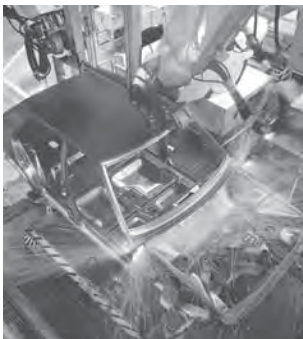
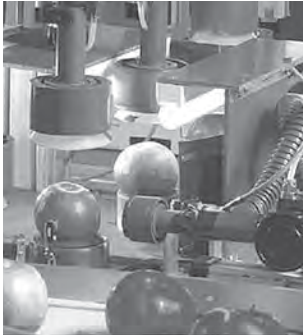
Dimensions



Most popular.

C

Vacuum Products



D
Valve Products

Valve Products

Direct Acting Valves

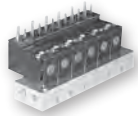
XM Series - Direct Acting



D4

- Inline or stacking
- 1/8 inch ports
- Pressures 0 to 125 PSIG
- Temperatures 32°F to 125°F
- Flow - .15 Cv

15mm Series - Direct Acting



D8

- Subbase or manifold
- 1/8 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 140°F
- Flow - .033 to .05 Cv

Inline Valves

Viking Lite Series - Inline



D11

- Inline or bar manifold
- 1/8 through 3/8 inch ports
- Pressures 22 to 145 PSIG
- Temperatures 14°F to 122°F
- Flow - .6 to 2.5 Cv

Viking Xtreme Series - Inline



D19

- Inline or bar manifold
- 1/8 through 1/2 inch ports
- Pressures VAC to 232 PSIG
- Temperatures -40°F to 140°F
- Flow - .7 to 2.7 Cv

B Series - Inline



D43

- Inline, subbase or bar manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .75 to 7.0 Cv

ADEX Series - Inline



D68

- Inline, subbase or bar manifold
- M3, M5, 1/8 inch ports
- Pressures VAC to 100 PSIG
- Temperatures 32°F to 122°F
- Flow - .1 to .47 Cv

Inline – continued

N Series - Inline Poppet



D78

- Inline mounted
- 3/8 through 1-1/2 inch ports
- Pressures 30 to 250 PSIG
- Temperatures 0°F to 200°F
- Flow - 3.6 to 29.9 Cv

Subbase & Manifold Valves

Moduflex Series Valves



D89

- Inline or stacking
- 4mm tube, 1/4, 3/8 inch ports
- Pressures VAC to 120 PSIG
- Temperatures 5°F to 140°F
- Flow - .18 to .80 Cv

Isys Micro Series



D113

- Subbase or manifold
- 4mm through 1/4 tube
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .35 Cv

Isys ISO Series



D124

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .55 to 6.0 Cv

Fieldbus Series

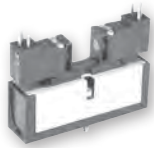


D166

- Fieldbus interface for Isys and Moduflex valves
- Up to 256 inputs
- Up to 256 outputs
- Digital or analog

Subbase & Manifold – continued

DX ISOMAX Series



D185

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 14°F to 140°F
- Flow - .55 to 4.15 Cv

Valvair II Series

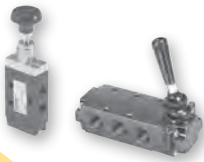


D198

- Subbase or manifold
- 3/8 through 1-1/2 inch ports
- Pressures VAC to 225 PSIG
- Temperatures 0°F to 200°F
- Flow - 1.9 to 12.0 Cv

Manual / Mechanical Valves

Directair 2 & 4



D208

- Manual / mechanical
- 1/8 and 1/4 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 32°F to 175°F
- Flow - .20 to .84 Cv

Viking Xtreme



D218

- Manual / mechanical
- 1/8, 1/4 and 3/8 inch ports
- Pressures:
Type A & B - VAC to 232 PSIG
Type C & D - VAC to 174 Psig
- Temperatures -40°F to 140°F
- Flow - .5 to 2.7 Cv

42 Series



D225

- Manual / mechanical
- 1/4 and 3/8 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 0°F to 140°F
- Flow - 1.3 to 2.9 Cv

Manual / Mechanical – continued

M0 Series



D227

- Air Pilot, Manual / mechanical
- 1/4 and 1 inch ports
- Pressures VAC to 225 PSIG
- Temperatures -15°F to 200°F
- Flow - .5 to 1.25 Cv

LV / EZ Lockout Valves



D231

- Port sizes 3/8 through 1-1/4 inch
- Max. supply pressure 300 PSIG
- Max. operating temperature 175°F
- Cv from 3.7 to 14

Brass Poppet, Sliding Seal



D233

- 4-way, 3-position rotary disc, direct air operated valves
- Pressures 0 to 150 PSIG
- Temperatures 18°F to 200°F
- Flow - 2.5 to 6.2 Cv

Valve Accessories

Control Panel Products



D236

- A wide variety of push buttons and selector switches
- Visual indicators
- Foot pedal switches
- Modular pneumatic / electric push buttons

Sensing / Limit Switches



D240

- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleen or blocking for detection

XM Valve Series

XM series is a 1/8 inch ported, 3-way and 4-way, 2-position, spring return, normally open or normally closed, general purpose air valve.

Ports

- 1/8" NPT

Mounting

- Inline
- IEM bar manifold
- Subbase valve manifold

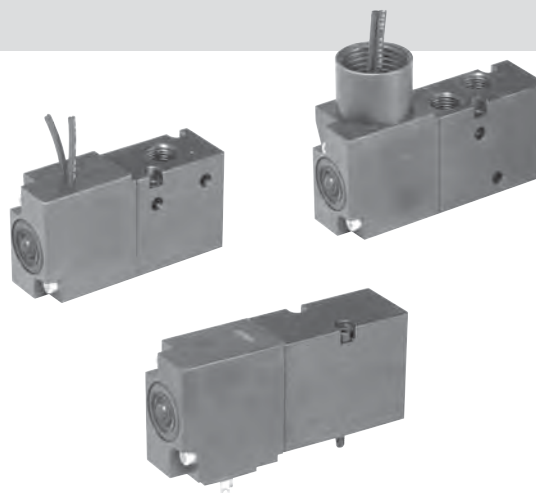
Solenoids

- Continuous duty rated
- 24" grommet
- 15mm 3-pin (9.4mm pin spacing)
- 1/2" conduit
- 12VDC to 240VAC

Balanced poppet

- 3-way N.O. & N.C.
- Diverter
- Selector
- Vacuum option

ROHS compliant



Operating information

3-way, N operating pressure:	0 to 125 PSIG
3-way, V* operating pressure:	0.28" Hg to 125 PSIG
4-way, N operating pressure:	0.28" Hg to 125 PSIG
Temperature range:	32°F to 125°F (0°C to 50°C)

* For vacuum service

Material specifications

Body	Aluminum
Center post and armature	Stainless steel
Stem	Brass
Spring	Stainless steel
Seals	Buna N
Center post sleeve	Acetal
Coil	General purpose Class B, encapsulated

Performance information

Code	Electrical			Power consumption (W / VA)	Holding current (Amps)	Flow	
	Voltage		Cv chart			3-way	4-way
	60Hz AC	50Hz DC					
42	24	22	—	4.8VA	.200	.15	.15
45*	—	—	12	4.5W	.375	.15	.15
49*	—	—	24	4.5W	.188	.15	.15
53	120	110	—	4.32VA	.036	.15	.15
57	240	220	—	4.32VA	.018	.15	.15

* Mobile voltage, +25/-30%

Note: Voltage tolerance: +10 / -15%

Cv tested per ANSI / (NFPA) T3.21.3

Response time

Code	Voltage	0 Cu. in. test chamber		12 Cu. in. test chamber	
		Fill	Exhaust	Fill	Exhaust
49	24VDC	.011	.007	.240	.384
53	120VAC	.011	.020	.240	.384

Average Fill Time (Seconds): With 100 PSIG supply, time required to fill from 0-90 PSIG and exhaust from 100 PSIG to 10 PSIG is measured from instant of energizing, or de-energizing solenoid. Times shown are average.

Tested per ANSI / (NFPA) T3.21.8.

XM Series

15mm Solenoid







D

Direct Acting Valve Products

Most popular.


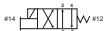



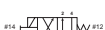


3-way Inline Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Inline	4 oz	XM30NBG49A
		1/8"	.15	24" Grommet, 120VAC	Inline	(.11 Kg)	XM30NBG53A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Inline	4 oz	XM30NB549A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Inline	(.11 Kg)	XM30NB553A
		1/8"	.15	1/2" Conduit / 24" leads, 24VDC	Inline	5 oz	XM30NBH49A
		1/8"	.15	1/2" Conduit / 24" leads, 120VAC	Inline	(.14 Kg)	XM30NBH53A


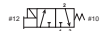

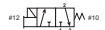
Note: All units with non-locking flush override. Can be used as N.O / N.C. / Diverter / Selector function.

4-way Inline Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Inline	4.3 oz	XM40NBG49A
		1/8"	.15	24" Grommet, 120VAC	Inline	(.12 Kg)	XM40NBG53A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Inline	4.3 oz	XM40NB549A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Inline	(.12 Kg)	XM40NB553A
		1/8"	.15	1/2" Conduit / 24" leads, 24VDC	Inline	5.3 oz	XM40NBH49A
		1/8"	.15	1/2" Conduit / 24" leads, 120VAC	Inline	(.15 Kg)	XM40NBH53A





Note: All units with non-locking flush override.

3-way Subbase Mount Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Subbase mount	4 oz	XM3VNBG49A
		1/8"	.15	24" Grommet, 120VAC	Subbase mount	(.11 Kg)	XM3VNBG53A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Subbase mount	4 oz	XM3VNB549A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Subbase mount	(.11 Kg)	XM3VNB553A

Note: All units with non-locking flush override. Can be used as N.O / N.C. / Diverter / Selector function.

4-way Subbase Mount Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Subbase mount	4.3 oz	XM4VNBG49A
		1/8"	.15	24" Grommet, 120VAC	Subbase mount	(.12 Kg)	XM4VNBG53A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Subbase mount	4.3 oz	XM4VNB549A
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Subbase mount	(.12 Kg)	XM4VNB553A

Note: All units with non-locking flush override.

XM Series

15mm Solenoid

D

Direct Acting Valve Products

Manifold



Description	Part number
IEM bar manifold (NPT)	PSMXN##NP

- stations 02 to 12 (04 Shown)

Subbase



Description	Part number
Manifold subbase kit (NPT)	PSXM530CP

Plug-in Electrical Connectors - 9.4mm



Description	Indication	Voltage	Part number
Unwired Plug	None	N/A	PESC10
	LED & Suppression	12/24V	PESC2020B
		120VAC	PESC2001F



Plug with 6" lead	None	N/A	PESC12
	LED & Suppression	12/24V	PESC2220B
		120VAC	PESC2201F

Accessories



Description	Part number
End plate kit (NPT)	PSXM1010P



Description	Part number
Blanking plate kit	PSXM8310P
Subbase Kit includes: (1) Plate, (3) Screws, (4) Gaskets	
Fits subbase or IEM type manifold.	



Description	Part number
Mounting Bracket - Inline valve	PSXM8288P



Description	Part number
Isolator plugs - Subbase manifold	PSXM40900P



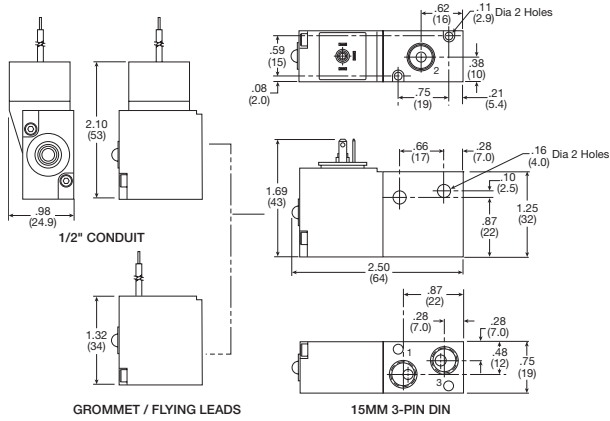
Description	Part number
IEM valve / manifold o-ring kit	PSXM2186P



Description	Part number
Subbase valve / manifold bolt kit	PSXM8100P

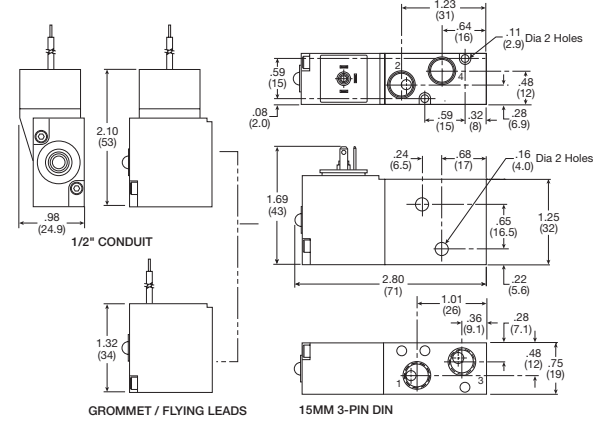
XM Series
15mm Solenoid
D
Direct Acting Valve Products

XM 3-way Inline



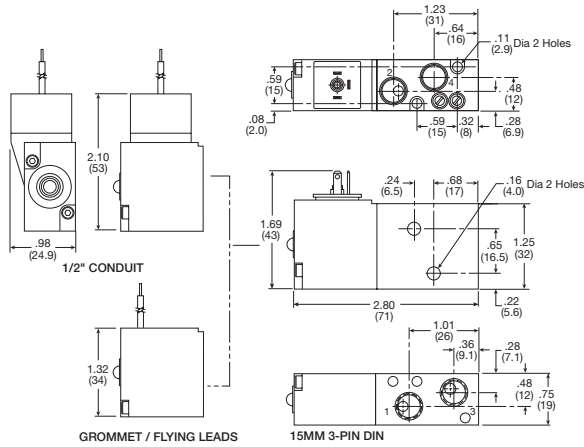
Inches (mm)
 Note: 22 AWG black cross linked polyethylene insulated lead wire.

XM 4-way Inline



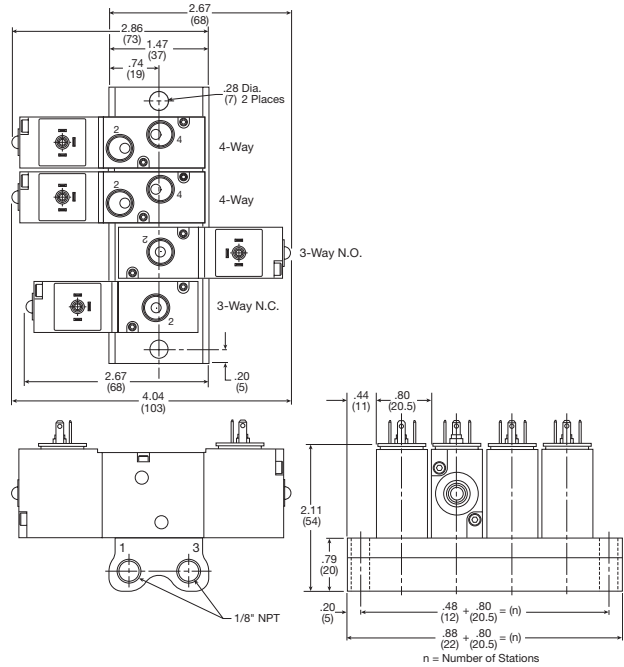
Inches (mm)
 Note: 22 AWG black cross linked polyethylene insulated lead wire.

XM 4-way Inline with Flow Controls

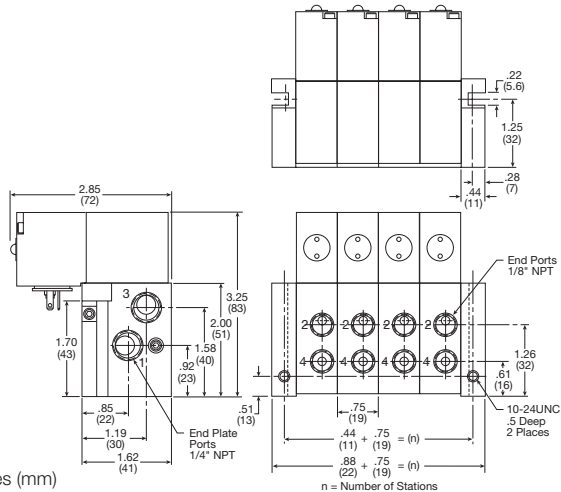


Inches (mm)
 Note: 22 AWG black cross linked polyethylene insulated lead wire.

XM IEM Manifold



XM IEM Subbase



Inches (mm)

XM Series
 15mm Solenoid
 D
 Direct Acting Valve Products



15mm Solenoid Valve

A compact 15mm, 3-way subbase or manifold mounted valve. Ideally suited for use in stationary or mobile equipment applications, where flow rates and low temperatures are a key consideration.

Features

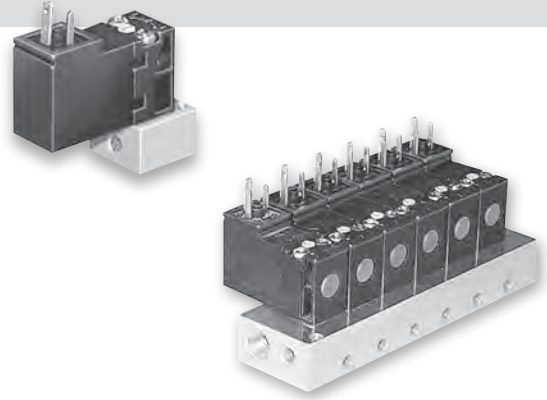
- Compact and simple design
- Utilizes 15mm solenoid operators
- Manifold allows mounting of normally open and normally closed operators simultaneously
- Up to 20 stations available

Solenoids

- 15mm low watt solenoids are UL certified and approved to be CE marked
- Wide range of voltages available

Applications

- Piloting for process control valves
 - pharmaceutical equipment
 - waste water treatment systems
 - food processing
 - chemical batching
- Industrial laundry equipment
- Paint spray & dyeing equipment
- Textile winding applications
- Vacuum and conveyor applications



Operating information

Operating pressure:	Vacuum to 145 PSIG (Vacuum to 10 bar)
Operating temperature:	
Standard Flow:	5°F to 140°F (-15°C to 60°C)
High Flow:	5°F to 122°F (-15°C to 50°C)
Mobile Applications (47 & 48 Voltage Options):	-40°F to 158°F (-40°C to 70°C)
Storage temperature:	
All applications:	-40°F to 158°F (-40°C to 70°C)

Material specifications

Body	Glass filled polyamide
Internal metal parts	Steel
Screws	Steel
Bottom plug	Thermoplastic
Poppet seals	Nitrile for standard, fluorocarbon for mobile

Technical data

Electrical interface per:	Din 43650 Form C (EN175301-803C)
Pneumatic interface per:	AFNOR E 0652 110 N
Protection:	IP65 (Washdown)
Air flow:	Standard flow 0.033 Cv (33 Lpm) (1.2W) (1.6VA)
Voltage tolerance:	All voltages except 47 & 48: Rated voltage +10% / -15% options 47 & 48: Rated voltage +25% / -30%

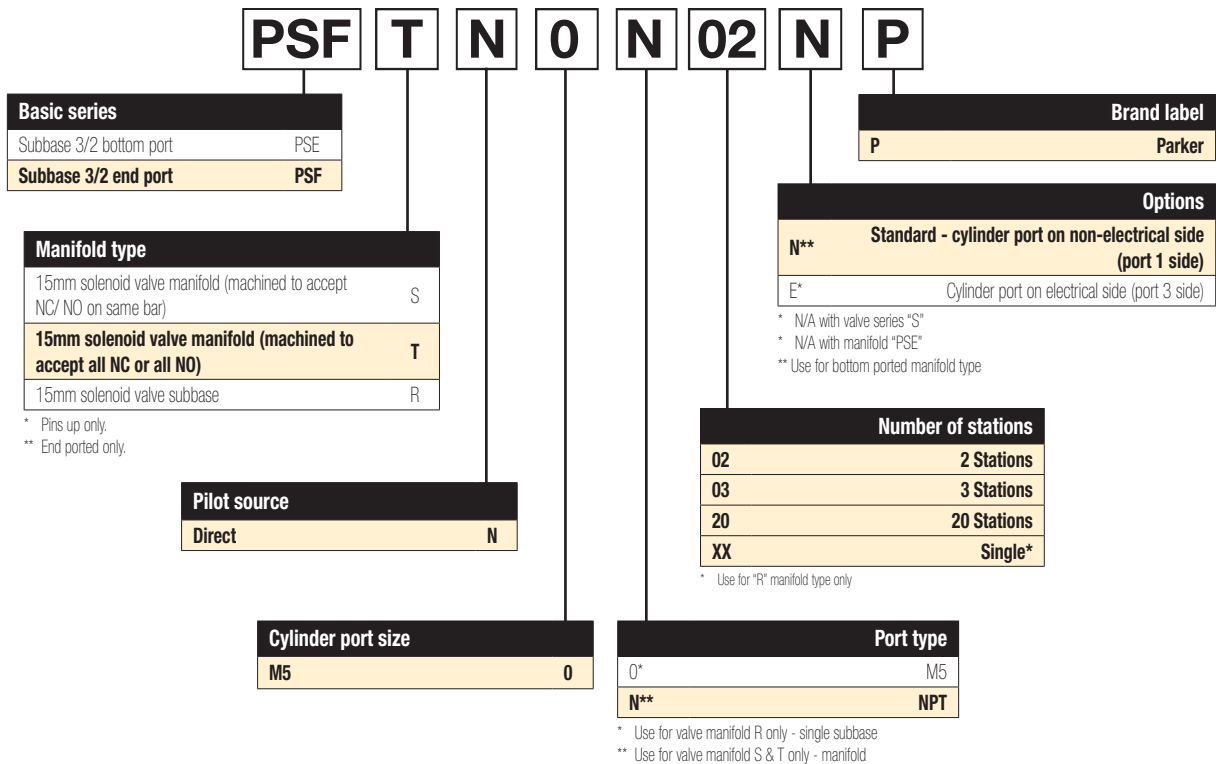
Most popular.

NC (NNP) Solenoids / Kits

	## Voltage (S = Standard, O = Optional, — = N/A)					Kit No.
	42 (24VAC)	45 (12VDC)	49 (24VDC)	53 (120VAC)	57 (230VAC)	
* Override						
B (Non-lock, Flush)	O	O	S	S	O	PS2982*##P Pins: UP NC / NNP 1.2W / 1.6VA
C (Lock, Flush)	O	O	S	S	O	
D (Non-lock, Ext)	—	—	O	O	—	
B (Non-lock, Flush)	O	O	S	S	—	PS3541*##P Pins: DOWN NC / NNP 1.8W / 2.4VA
C (Lock, Flush)	O	O	S	S	—	
D (Non-lock, Ext)	—	—	O	O	—	
E (Lock, Ext)	—	—	O	O	—	
B (Non-lock, Flush)	O	O	O	O	O	PS3441*##P Pins: DOWN NC / NNP 1.2W / 1.6VA
C (Lock, Flush)	O	O	O	O	O	
B (Non-lock, Flush)	O	O	S	S	—	PS3202*##P Pins: UP NO / NP 1.2W / 1.6VA

* Override
 ## Voltage

Model Number Index



XM Series
 15mm Solenoid
 D Direct Acting Valve Products

Examples:

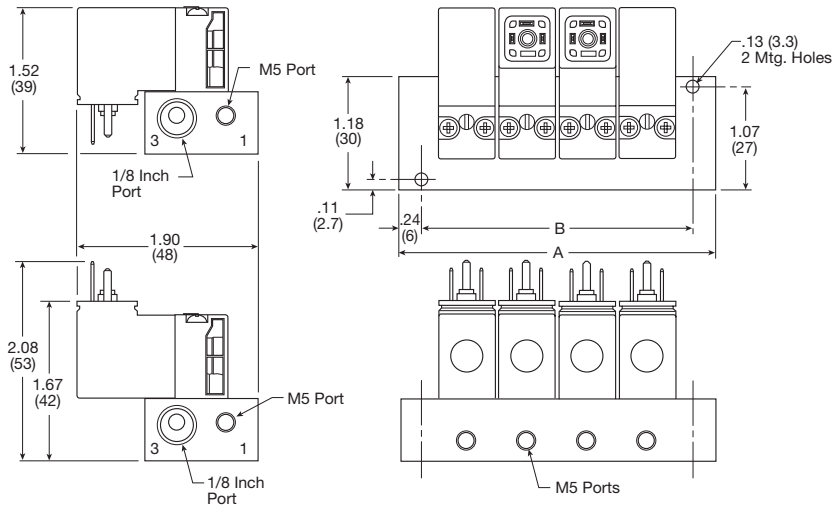
PSFTN0N16EP - End port manifold - Cyl ports and electrical on same side
 PSESN0N10NP - Bottom port manifold - N/C and N/O can be interchanged
 PSFTN0N10NP - End port manifold - Cyl ports and electrical are opposite

BOLD OPTIONS ARE MOST POPULAR.



Manifold Dimensions

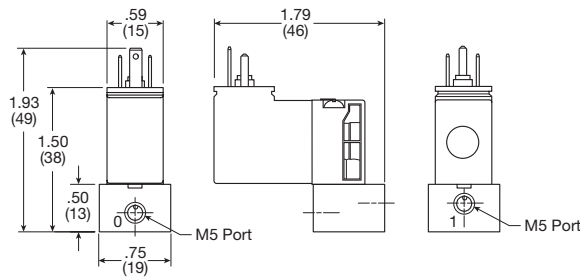
Special mounting considerations must be made for connector assembly clearance when mounting solenoid valves with pins down.



Number of stations	Dim. A	Dim. B
2	2.04 (52)	1.57 (40)
3	2.68 (68)	2.20 (56)
4	3.31 (84)	2.83 (72)
5	3.94 (100)	3.46 (88)
6	4.57 (116)	4.09 (104)
7	5.20 (132)	4.72 (120)
8	5.83 (148)	5.35 (136)
9	6.46 (164)	5.98 (152)
10	7.09 (180)	6.61 (168)
11	7.72 (196)	7.24 (184)
12	8.35 (212)	7.87 (200)
13	8.98 (228)	8.50 (216)
14	9.61 (244)	9.13 (232)
15	10.23 (260)	9.76 (248)
16	10.87 (276)	10.39 (264)
17	11.50 (292)	11.02 (280)
18	12.13 (308)	11.65 (296)
19	12.76 (324)	12.28 (312)
20	13.39 (340)	12.91 (328)

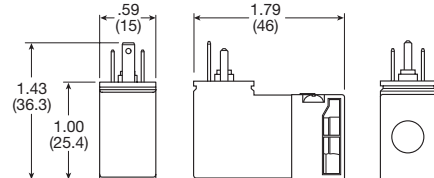
Subbase Dimensions

Pins up only.



15mm Solenoid Dimensions

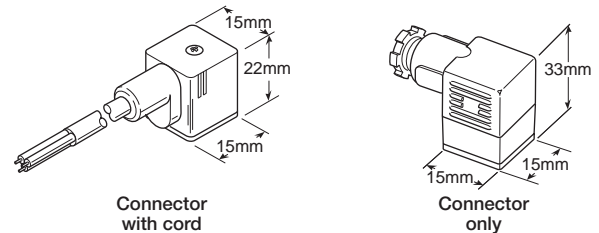
Pins up only.



Female Electrical Connectors

15mm 3-Pin DIN 43650C (Use with enclosure "5")

Description		Connector	Connector with cord
Unlighted	18 Inches	PS2932BP	PS2932HBP
Unlighted	6 Feet	PS2932BP	PS2932JBP
Light - 12VAC or DC	6 Feet	PS294675BP	PS2946J75BP*
Light - 24VAC or DC	6 Feet	PS294679BP	PS2946J79BP*
Light - 110/120VAC	6 Feet	PS294683BP	PS2946J83BP*
Light - 240/230VAC		PS294687BP	N/A



* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord.
 IP65 rated when properly installed.

Engineering Data:

- Conductors: 2 poles plus ground
- Cable range (Connector only): 4 to 6mm (0.16 to 0.24 Inch)
- Contact spacing: 8mm



XM Series
 15mm Solenoid
 D Direct Acting Valve Products

Viking Lite Series

The Viking Lite valve range is robust, versatile and combines a large flow capacity with short change-over times, designer may choose 1/8, 1/4 or 3/8 port sizes along with 24VDC and 120VAC voltage options. Viking Lite valves are fitted with dynamic bi-directional spool seals suitable for pressures up to 10 bar and ambient temperatures between -10°C to + 50°C. When in service, radial expansion of the spool seal occurs to maintain sealing contact with the valve bore. This sealing method reduces friction and produces a lower required pilot pressure. Valves do not require lubrication in operation but they can also be installed in systems that are lubricated.

Ports

- P2LAZ: 1/8 inch NPT & BSPP, Cv = 0.6
- P2LBZ: 1/4 inch NPT & BSPP, Cv = 1.5
- P2LCZ: 3/8 inch NPT & BSPP, Cv = 2.5

Mounting

- Inline
- IEM aluminum bar

Solenoids

2.5 watts
 - 22mm, 3-pin (DIN 43650)
 24VDC and 120VAC

• Certification / approval

- IP65 Rated, RoHS, CE

Materials

Valve body	Anodized aluminium
End covers	Anodized aluminium
Spool	Aluminium
Piston	Acetal plastic / Anodized aluminium
End cover sealings	Nitrile rubber
End cover screws	Zinc plated steel
Springs	Stainless steel
Mounting screws for solenoid	Stainless steel
Spool seals	Nitrile

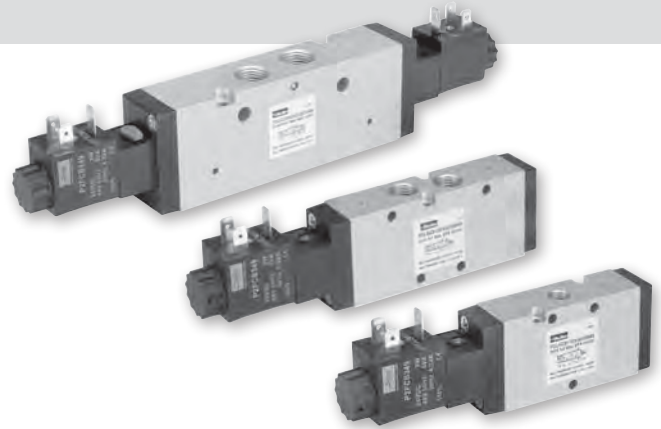
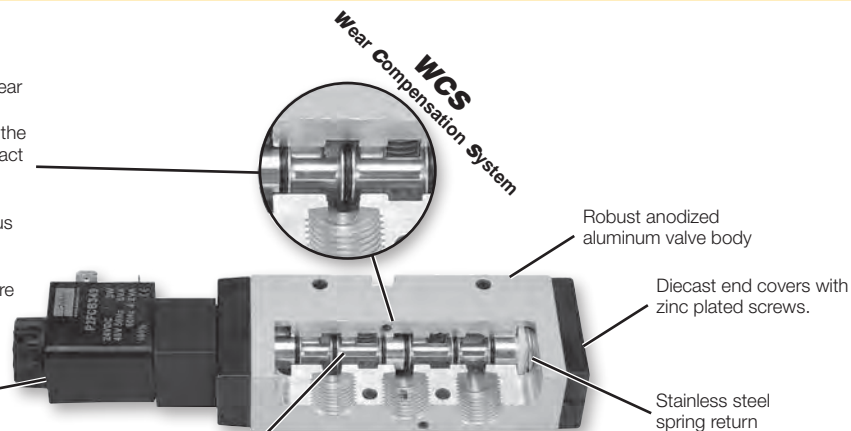
Features

WCS

- Maximum Performance
 - Low friction - fast response - less wear
- Long Cycle Life
 - Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore
- Non-Lube Service
 - No lubrication required for continuous valve shifting
- Bi-Directional Spool Seals
 - Common spool used for any pressure

- Solenoid operated, IP65, RoHS, CE
- 90° rotation

The bore is polished to a very high surface finish for maximum flow capacity and long life.



Operating information

Operating pressure: 145 PSIG (10 bar)
 Minimum: See chart
 Operating temperature: 14°F to 122°F (-10°C to 50°C)

Minimum operating pressure, PSIG (bar)

Valve type - Internal pilot	P2LAZ	P2LBZ	P2LCZ
Single solenoid - spring return	43.5 (3.0)	43.5 (3.0)	43.5 (3.0)
Double solenoid - 2-position	22 (1.5)	22 (1.5)	22 (1.5)
Double solenoid - 3-position (APB, PC, CE)	43.5 (3.0)	43.5 (3.0)	43.5 (3.0)

Recommended air quality for valves

For best possible service life and trouble free operation, ISO 8573-1 quality class 3.4.3 should be used. This means 5µm filter (standard filter) dew point +3°C for indoor operation (a lower dew point should be selected for outdoor operation) and oil concentration 1.0 mg oil/m³, which is what a standard compressor with a standard filter gives.

Viking Lite Series

Viking Xtreme Series

B Series

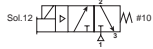
ADEX Series

N Series

D

Inline Valve Products

3/2 - 2 Position Single Solenoid



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	15 / 35	0.35 (0.16)	24VDC	P2LAZ391ESNDBB49	P2LAZ311ESNDBB49
				120VAC	P2LAZ391ESNDBB53	P2LAZ311ESNDBB53
1/4	1.5	18 / 45	0.35 (0.16)	24VDC	P2LBZ392ESNDBB49	P2LBZ312ESNDBB49
				120VAC	P2LBZ392ESNDBB53	P2LBZ312ESNDBB53
3/8	2.5	27 / 45	0.77 (0.35)	24VDC	P2LCZ393ESNDBB49	P2LCZ313ESNDBB49
				120VAC	P2LCZ393ESNDBB53	P2LCZ313ESNDBB53

3/2 - 2 Position Double Solenoid



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	10 / 10	0.40 (0.18)	24VDC	P2LAZ391EENDBB49	P2LAZ311EENDBB49
				120VAC	P2LAZ391EENDBB53	P2LAZ311EENDBB53
1/4	1.5	12 / 12	0.40 (0.18)	24VDC	P2LBZ392EENDBB49	P2LBZ312EENDBB49
				120VAC	P2LBZ392EENDBB53	P2LBZ312EENDBB53
3/8	2.5	17 / 17	0.80 (0.36)	24VDC	P2LCZ393EENDBB49	P2LCZ313EENDBB49
				120VAC	P2LCZ393EENDBB53	P2LCZ313EENDBB53

5/2 - 2 Position Single Solenoid



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	15 / 35	.037 (0.17)	24VDC	P2LAZ591ESNDBB49	P2LAZ511ESNDBB49
				120VAC	P2LAZ591ESNDBB53	P2LAZ511ESNDBB53
1/4	1.5	18 / 45	0.44 (0.20)	24VDC	P2LBZ592ESNDBB49	P2LBZ512ESNDBB49
				120VAC	P2LBZ592ESNDBB53	P2LBZ512ESNDBB53
3/8	2.5	27 / 45	0.95 (0.43)	24VDC	P2LCZ593ESNDBB49	P2LCZ513ESNDBB49
				120VAC	P2LCZ593ESNDBB53	P2LCZ513ESNDBB53

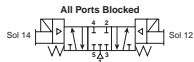
5/2 - 2 Position Double Solenoid



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	10 / 10	.042 (0.19)	24VDC	P2LAZ591EENDBB49	P2LAZ511EENDBB49
				120VAC	P2LAZ591EENDBB53	P2LAZ511EENDBB53
1/4	1.5	12 / 12	0.46 (0.21)	24VDC	P2LBZ592EENDBB49	P2LBZ512EENDBB49
				120VAC	P2LBZ592EENDBB53	P2LBZ512EENDBB53
3/8	2.5	17 / 17	0.97 (0.44)	24VDC	P2LCZ593EENDBB49	P2LCZ513EENDBB49
				120VAC	P2LCZ593EENDBB53	P2LCZ513EENDBB53

5/3 - 3 Position, All Ports Blocked



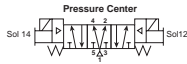
P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	18 / 40	0.57 (0.26)	24VDC	P2LAZ691EENDBB49	P2LAZ611EENDBB49
				120VAC	P2LAZ691EENDBB53	P2LAZ611EENDBB53
1/4	1.5	22 / 55	0.62 (0.28)	24VDC	P2LBZ692EENDBB49	P2LBZ612EENDBB49
				120VAC	P2LBZ692EENDBB53	P2LBZ612EENDBB53
3/8	2.5	30 / 90	1.32 (0.60)	24VDC	P2LCZ693EENDBB49	P2LCZ613EENDBB49
				120VAC	P2LCZ693EENDBB53	P2LCZ613EENDBB53

Most popular. **Notes:** Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C)



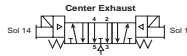
5/3 - 3 Position, Pressure Center



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	18 / 40	0.57 (0.26)	24VDC	P2LAZ791EENDBB49	P2LAZ711EENDBB49
				120VAC	P2LAZ791EENDBB53	P2LAZ711EENDBB53
1/4	1.5	22 / 55	0.62 (0.28)	24VDC	P2LBZ792EENDBB49	P2LBZ712EENDBB49
				120VAC	P2LBZ792EENDBB53	P2LBZ712EENDBB53
3/8	2.5	30 / 90	1.32 (0.60)	24VDC	P2LCZ793EENDBB49	P2LCZ713EENDBB49
				120VAC	P2LCZ793EENDCB53	P2LCZ713EENDBB53

5/3 - 3 Position, Center Exhaust



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	18 / 40	0.57 (0.26)	24VDC	P2LAZ891EENDBB49	P2LAZ811EENDBB49
				120VAC	P2LAZ891EENDBB53	P2LAZ811EENDBB53
1/4	1.5	22 / 55	0.62 (0.28)	24VDC	P2LBZ892EENDBB49	P2LBZ812EENDBB49
				120VAC	P2LBZ892EENDBB53	P2LBZ812EENDBB53
3/8	2.5	30 / 90	1.32 (0.60)	24VDC	P2LCZ893EENDBB49	P2LCZ813EENDBB49
				120VAC	P2LCZ893EENDBB53	P2LCZ813EENDBB53

Notes: Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C)

Single & Double Solenoid Operated Valves

P2LAZ591ESND CB49

Valve size

1/8"	A
1/4"	B
3/8"	C

Series

Viking Lite	Z
-------------	---

Valve type / function

<i>Internal pilot supply to solenoid</i>	
3/2 NC - 2-position	3
5/2 2-position	5
5/3 3-position, APB	6
5/3 3-position, PC	7
5/3 3-position, CE	8

Main port thread

G1/8 (P2LA)	11
G1/4 (P2LB)	12
G3/8 (P2LC)	13
1/8" NPT (P2LA)	91
1/4" NPT (P2LB)	92
3/8" NPT (P2LC)	93

12 End operator

E	Double solenoid operated valve
S*	Single solenoid spring return

Voltage / frequency

49	24VDC
53	120VAC
Blank	Valve less coil

Enclosures / lead length

B	22mm rectangular 3-pin - type B industrial (male only)
N	Valve less coil

Overrides

C	Extended - locking
B	Flush - non-locking

Solenoid pilot type

D	Pilot exhaust vented
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Valve type

N	14°F to 122°F (-10°C to 50°C)
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* Not available with 3-position valves.

Most popular.



Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D
 Inline Valve Products

IEM Bar Manifold, Inline Valve Only*



Valve series	Valve function	# of Stations	Weight lb (kg)	Manifold only (NPT)	Manifold only (BSPP)
P2LAZ / P2LBZ	3-way	2	0.84 (0.38)	91213202SXZN	91213202SXZ
P2LAZ / P2LBZ	3-way	4	1.41 (0.64)	91213204SXZN	91213204SXZ
P2LAZ / P2LBZ	3-way	6	1.96 (0.89)	91213206SXZN	91213206SXZ
P2LAZ / P2LBZ	3-way	8	2.54 (1.15)	91213208SXZN	91213208SXZ
P2LAZ / P2LBZ	3-way	10	3.09 (1.40)	91213210SXZN	91213210SXZ

Kits include: Manifold, valve hold down bolts, gaskets.



Valve series	Valve function	# of Stations	Weight lb (kg)	Manifold only (NPT)	Manifold only (BSPP)
P2LAZ	4-way	2	0.68 (0.31)	9121658068N	9121658068
P2LAZ	4-way	4	1.06 (0.48)	9121658075N	9121658075
P2LAZ	4-way	6	1.39 (0.63)	9121658076N	9121658076
P2LAZ	4-way	8	1.76 (0.80)	9121658077N	9121658077
P2LAZ	4-way	10	2.16 (0.98)	9121658078N	9121658078

Kits include: Manifold, valve hold down bolts, gaskets.



Valve series	Valve function	# of Stations	Weight lb (kg)	Manifold only (NPT)	Manifold only (BSPP)
P2LBZ	4-way	2	1.53 (0.69)	9121594805XN	9121594805X
P2LBZ	4-way	4	2.49 (1.13)	9121594806XN	9121594806X
P2LBZ	4-way	6	3.44 (1.56)	9121594807XN	9121594807X
P2LBZ	4-way	8	4.41 (2.00)	9121594808XN	9121594808X
P2LBZ	4-way	10	5.40 (2.45)	9121594812XN	9121594812X

Kits include: Manifold, valve hold down bolts, gaskets.

* For odd number of stations, consider Viking Xtreme bar manifold.

IEM Bar Manifold, Inline Valve Only



Valve series	Valve function	# of Stations	Manifold only (NPT)	Manifold only (BSPP)
P2LCZ	4-way	Use Viking Xtreme IEM bar manifold		

Note: P2LCZ 3-way has no IEM manifold

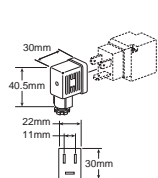
Manifold Accessories / Parts



Valve series	Description	Weight lb (kg)	Kit number
P2LAZ / P2LBZ *	3-way: Blanking kit with mounting screws (2)	0.22 (0.10)	912132BPSXZ
P2LAZ *	4-way: Blanking kit with mounting screws (2)	0.11 (0.05)	9121658063
P2LBZ *	4-way: Blanking kit with mounting screws (2)	0.04 (0.02)	9121594809X

*Note: O-ring for blanking kit included with manifold. For replacement o-rings or fastener bolts, use Viking Xtreme Kits.

22mm Rectangular 3-Pin – Type B Industrial (Use with Enclosure “B”)



Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2429JBP	PS2429BP
Light – 24VDC	PS2430J79BP*	PS243079BP
Light – 120V/60Hz	PS2430J83BP*	PS243083BP

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:

conductors: 2 poles plus ground; cable range (connector only): 6 to 8mm (0.24 To 0.31 Inch); contact spacing: 11mm

Most popular.

Valve Less Coil

Remove the last 3 digits of the part number of the full valve and add “N” at the end for valve less coil.



Part number example :
P2LBZ592ESNDBBB49
 valve with 24VDC solenoid
P2LBZ592ESNDBN valve less coil

Replacement Solenoid Coil



Description	Part number
24VDC coil kit	P2FCB449
110VAC coil kit	P2FCB453

Replacement Solenoid Nut



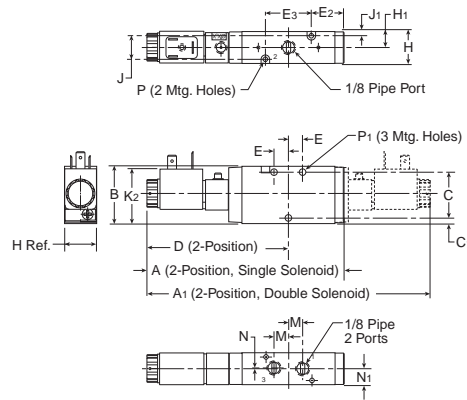
Description Solenoid diffuser nut
Part number **PS1556**



Description Solenoid vented nut
Part number **PS2892P**



P2LAZ 3/2 Single & Double Operators – Solenoid

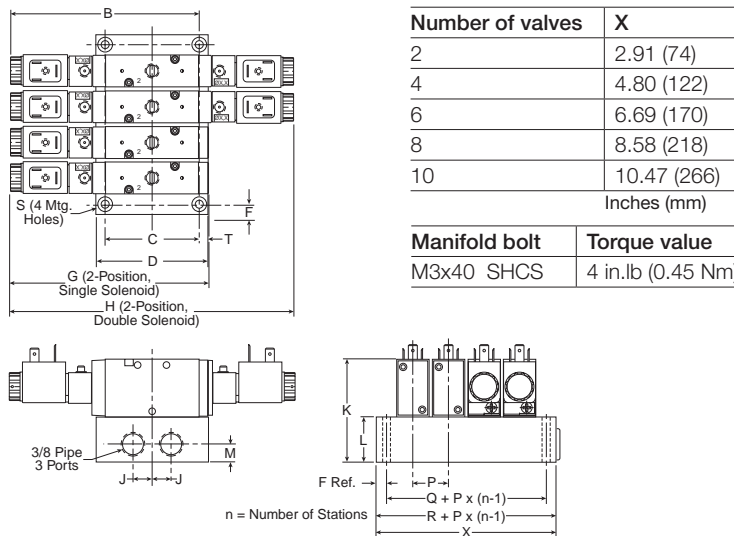


P2LAZ 3/2 (solenoid)

A	A1	B	C	C1
5.35 (136)	7.68 (195)	1.57 (40)	1.26 (32)	.16 (4)
D	E	E2	E3	H
3.84 (97.5)	.39 (10)	.91 (23)	1.26 (32)	.87 (22)
H1	J	J1	K2	M
.43 (11)	.65 (16.5)	.11 (2.75)	1.50 (38)	.39 (10)
N	N1	P	P1	
.02 (.5)	.43 (11)	Ø .12 (3.1)	Ø .17 (4.3)	

Inches (mm)

P2LAZ 3/2 Single & Double Operators – IEM Aluminum Bar Manifold

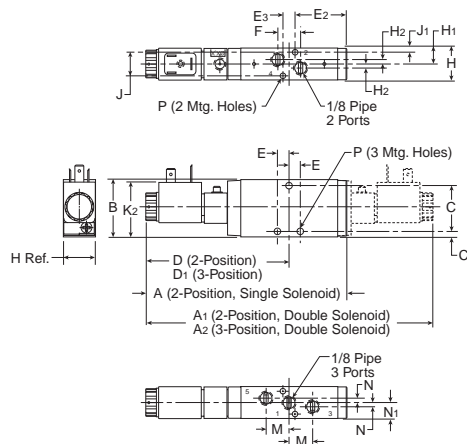


**P2LAZ 3/2
IEM Aluminum bar manifold**

B	C	D	F	G
5.06 (128.5)	2.44 (62)	2.99 (76)	.28 (7)	5.35 (136)
H	J	K	L	M
7.68 (195)	.51 (13)	2.78 (70.5)	1.20 (30.5)	.47 (12)
P	Q	R	S	T
.94 (24)	1.42 (36)	1.97 (50)	Ø .22 (5.5)	.88 (7)

Inches (mm)

P2LAZ 5/2 & 5/3 Single & Double Operators – Solenoid

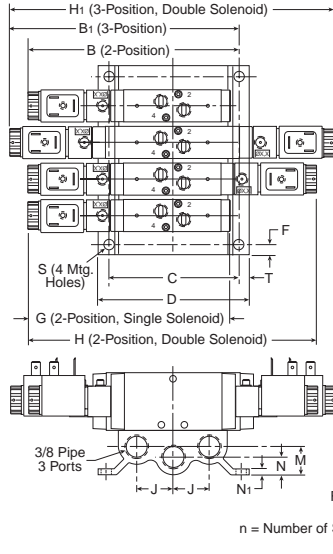


P2LAZ 5/2 & 5/3 (solenoid)

A	A1	A2	B	C
5.47 (139)	7.76 (197)	8.70 (221)	1.57 (40)	1.30 (33)
C1	D	D1	E	E2
.14 (3.5)	3.88 (98.5)	4.35 (110.5)	.31 (8)	1.86 (47.3)
E3	F	H	H1	H2
.33 (8.5)	.63 (16)	.87 (22)	.43 (11)	.12 (3)
J	J1	K2	M	N
.63 (16)	.12 (3)	1.50 (38)	.63 (16)	.12 (3)
N1	P			
.43 (11)	Ø .16 (4.1)			

Inches (mm)

P2LAZ 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



Number of valves	X
2	3.07 (78)
4	4.96 (126)
6	6.85 (174)
8	8.74 (222)
10	10.63 (270)
Inches (mm)	
Manifold bolt	Torque value
M4x45 Screw MRX	9 in.lb (0.75 Nm)

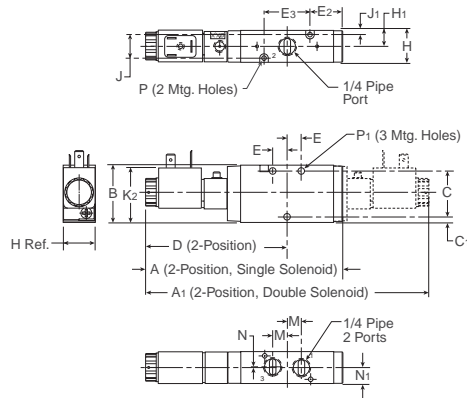
P2LAZ 5/2 & 5/3
IEM Aluminum bar manifold

B	B ₁	C	D	F
5.10 (149.5)	6.36 (161.5)	3.46 (88)	4.02 (102)	.28 (7)
G	H	H ₁	J	K
5.47 (139)	7.76 (197)	8.70 (221)	.96 (24.5)	2.76 (70)
L	M	N	N ₁	P
1.18 (30)	.75 (19)	.47 (12)	.16 (4)	.94 (24)
Q	R	S	T	
1.57 (40)	2.13 (54)	∅.28 (7)	.28 (7)	
Inches (mm)				

Viking Lite
Series

Viking Xtreme
Series

P2LBZ 3/2 Single & Double Operators – Solenoid



P2LBZ 3/2 (solenoid)

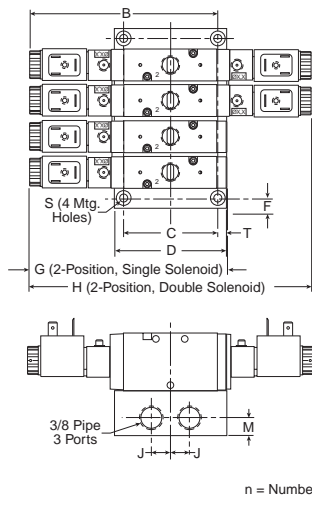
A	A ₁	B	C	C ₁
5.35 (136)	7.68 (195)	1.57 (40)	1.26 (32)	.16 (4)
D	E	E ₂	E ₃	H
3.84 (97.5)	.39 (10)	.91 (23)	1.26 (32)	.87 (22)
H ₁	J	J ₁	K ₂	M
.43 (11)	.65 (16.5)	.11 (2.75)	1.50 (38)	.39 (10)
N	N ₁	P	P ₁	
.02 (.5)	.43 (11)	∅.12 (3.1)	∅.17 (4.3)	
Inches (mm)				

B
Series

ADEX
Series

N
Series

P2LBZ 3/2 Single & Double Operators – IEM Aluminum Bar Manifold



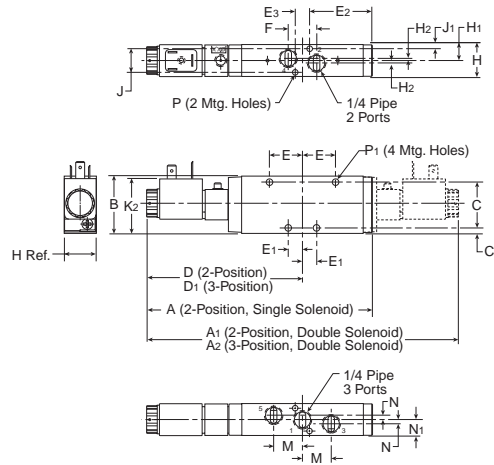
Number of valves	X
2	2.91 (74)
4	4.80 (122)
6	6.69 (170)
8	8.58 (218)
10	10.47 (266)
Inches (mm)	
Manifold bolt	Torque value
M3x40 SCHS	4 in.lb (0.45 Nm)

P2LBZ 3/2
IEM Aluminum bar manifold

B	C	D	F	G
5.06 (128.5)	2.44 (62)	2.99 (76)	.28 (7)	5.35 (136)
H	J	K	L	M
7.68 (195)	.51 (13)	2.78 (70.5)	1.20 (30.5)	.47 (12)
P	Q	R	S	T
.94 (24)	1.42 (36)	1.97 (50)	∅.22 (5.5)	.88 (7)
Inches (mm)				

D
Inline
Valve Products

P2LBZ 5/2 & 5/3 Single & Double Operators – Solenoid

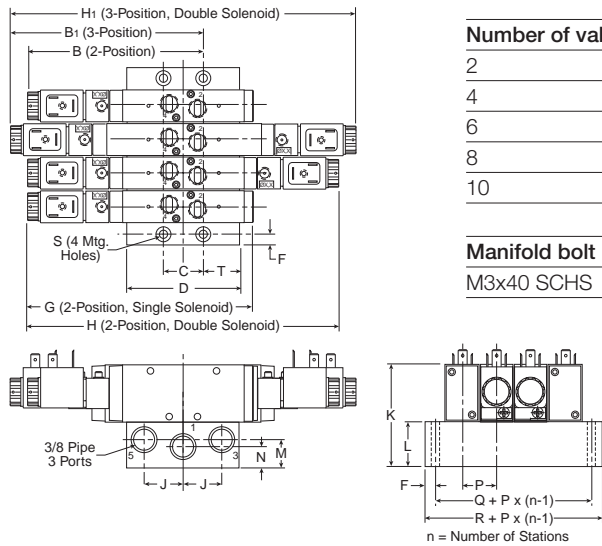


P2LBZ 5/2 & 5/3 (solenoid)

A	A1	A2	B	C
6.14 (156)	8.46 (215)	9.29 (236)	1.57 (40)	1.26 (32)
C1	D	D1	E	E1
.16 (4)	4.23 (107.5)	4.65 (118)	.91 (23)	.39 (10)
E2	E3	F	H	H1
1.14 (29)	.39 (10)	.79 (20)	.87 (22)	.43 (11)
H2	J	J1	K2	M
.06 (1.5)	.65 (16.5)	.11 (2.8)	1.50 (38)	.79 (20)
N	N1	P	P1	
.08 (2)	.43 (11)	Ø .12 (3.1)	Ø .17 (4.3)	

Inches (mm)

P2LBZ 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



Number of valves	X
2	2.91 (74)
4	4.80 (122)
6	6.69 (170)
8	8.58 (218)
10	10.47 (266)

Inches (mm)

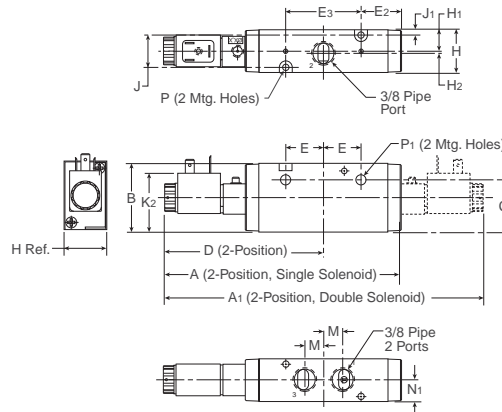
Manifold bolt	Torque value
M3x40 SCHS	9 in.lb (0.75 Nm)

P2LBZ 5/2 & 5/3 IEM Aluminum bar manifold

B	B1	C	D	F
4.43 (112.5)	4.84 (123)	1.04 (26.5)	2.99 (76)	.28 (7)
G	H	H1	J	K
6.14 (156)	8.46 (215)	9.29 (236)	1.02 (26)	2.781 (70.5)
L	M	N	P	Q
1.20 (30.5)	.75 (19)	.57 (14.5)	.94 (24)	1.57 (40)
R	S	T		
1.97 (50)	Ø .22 (5.5)	.97 (25)		

Inches (mm)

P2LCZ 3/2 Single & Double Operators – Solenoid

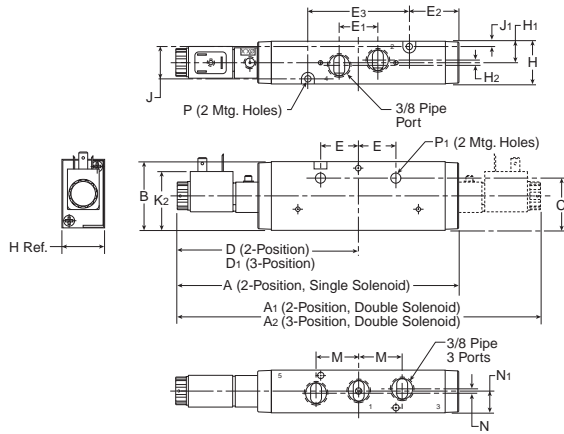


P2LCZ 3/2 (solenoid)

A	A1	B	C	D
6.50 (165)	8.66 (220)	1.89 (48)	1.46 (37)	4.33 (110)
E	E2	E3	H	H1
1.04 (26.5)	1.10 (28)	2.09 (53)	1.18 (30)	.59 (15)
H2	J	J1	K2	M
.06 (1.55)	.91 (23)	.14 (3.5)	1.50 (38)	.53 (13.5)
N1	P	P1		
.59 (15)	Ø .17 (4.4)	Ø .27 (6.9)		

Inches (mm)

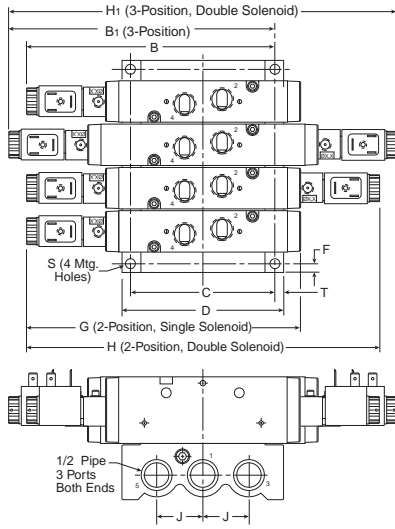
P2LCZ 5/2 & 5/3 Single & Double Operators – Solenoid



P2LBZ 5/2 & 5/3 (solenoid)

A	A1	A2	B	C
7.68 (195)	9.88 (251)	10.70 (272)	1.89 (48)	1.46 (37)
D	D1	E	E1	E2
4.94 (125.5)	5.35 (136)	1.04 (26.5)	1.06 (27)	1.71 (43.5)
E3	H	H1	H2	J
2.80 (71)	1.18 (30)	.59 (15)	.12 (.3)	.91 (23)
J1	K2	M	N	N1
.14 (3.5)	1.50 (38)	1.18 (30)	.08 (2)	.59 (15)
P	P1			
Ø .17 Ø (4.4)	Ø .27 Ø (6.9)			
Inches (mm)				

P2LCZ 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



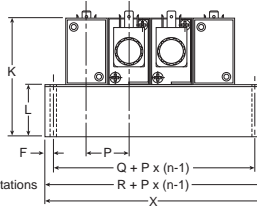
Number of valves	X
2	3.29 (84)
4	5.96 (152)
6	8.44 (215)
8	10.93 (278)
10	13.41 (341)
Inches (mm)	

Manifold bolt	Torque value
M4x50 SCHS	15 in.lb (2.0 Nm)

P2LCZ 5/2 & 5/3

IEM Aluminum bar manifold

C	D	F	G	H
3.97 (101)	4.41 (112)	.24 (6)	7.68 (195)	9.88 (251)
H1	J	K	L	P
10.70 (272)	1.26 (32)	3.43 (87)	1.54 (39)	1.24 (31.5)
Q	R	S	T	
1.77 (45)	2.24 (57)	Ø .26 Ø (6.5)	.24 (6)	
Inches (mm)				



Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

Viking Xtreme Series

The Viking Xtreme valve range is robust, versatile and combines high performance with compact installation dimensions. Large flow capacity, short change-over times and low change-over pressure are important characteristics of this valve range.

Ports

- P2LAX: 1/8 inch NPT & BSPP
- P2LBX: 1/4 inch NPT & BSPP
- P2LCX: 3/8 inch NPT & BSPP
- P2LDX: 1/2 inch NPT & BSPP

Mounting

- Inline
- IEM aluminum bar

Solenoids

2.5 watts to 7.3 watts

- Conduit
- Grommet
- 22mm & 30mm 3-pin (DIN 43650)

- 12VDC to 240VAC

Certification / approval

- IP65 Rated, RoHS, CE
- ATEX option available

Mobile applications

- Viking Xtreme tested to +5g shock and vibration
- Solenoids operate with wide voltage tolerance bands
- Corrosion resistant design
- Passed 500 hour salt spray test

Material specifications

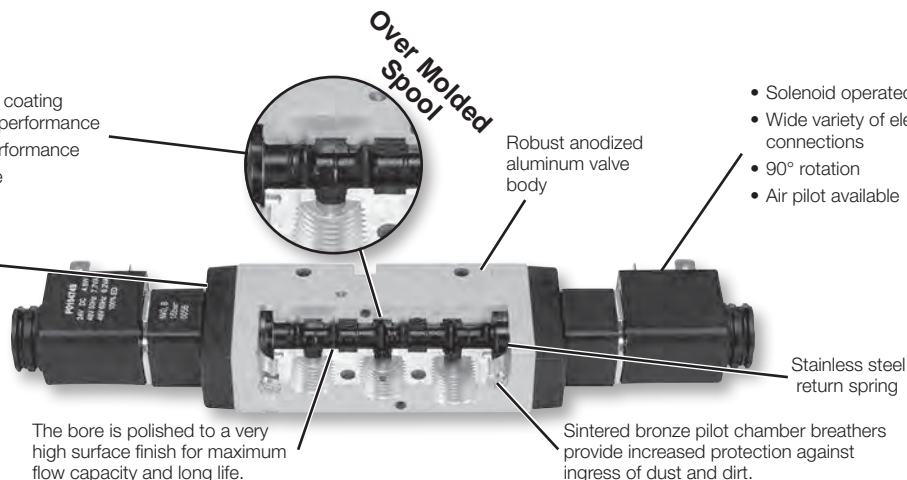
Body	Anodized aluminum
End caps	Anodized aluminum
Coils	Thermoplastic
Fasteners	Stainless steel
Spool	Aluminum and nitrile rubber
Springs	Stainless steel

Features

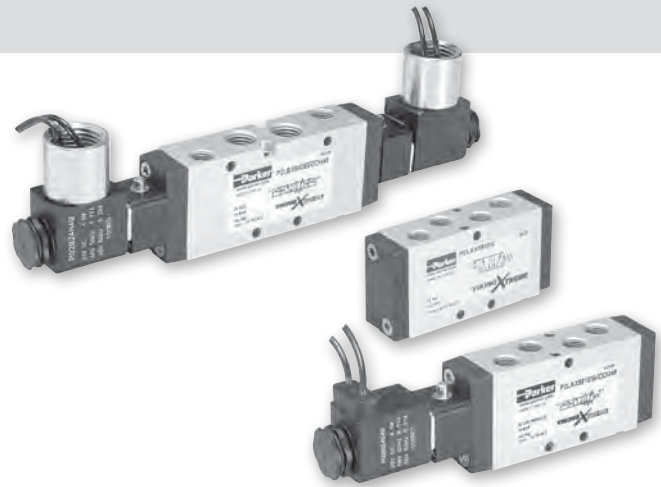
Over Molded Spool

- Aluminum spool with nitrile rubber coating ground to exact size for optimum performance
- Precision ground for maximum performance
- Wide operating temperature range
 - Low temperature to -40°

Diecast end covers with stainless steel screws to resist aggressive environments.



The bore is polished to a very high surface finish for maximum flow capacity and long life.



Operating information

Operating pressure:

Normal: Vacuum to 145 PSIG (Vacuum to 10 bar)
 Xtreme: (P2LAX & P2LBX) Vacuum to 232 PSIG (Vacuum to 16 bar)
 (P2LCX & P2LDX) Vacuum to 174 PSIG (Vacuum to 12 bar)
 Minimum: See chart

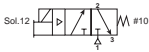


Operating temperature:

Normal: 14°F to 122°F (-10°C to 50°C)
 Xtreme: -40°F to 140°F (-40°C to 60°C)

Minimum operating pressure, PSIG (bar)

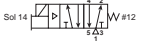


Valve type - Internal pilot	P2LAX	P2LBX	P2LCX	P2LDX
Single solenoid - spring return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Single remote pilot - spring return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Double solenoid - 2-position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double remote pilot - 2-position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double solenoid - 3-position (APB, PC, CE)	51 (3.5)	51 (3.5)	51 (3.5)	51 (3.5)
Double remote pilot - 3-position (APB, PC, CE)	51 (3.5)	51 (3.5)	51 (3.5)	51 (3.5)

Single Solenoid, 3-way, 2-position, Normal Operating Pressure / Temperature

	Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
  P2LAX 22mm DIN Shown	22mm DIN	1/8"	0.7	P2LAX	18 / 40	0.84 (0.38)	24VDC	P2LAX391ESNDDDB49
							120VAC	P2LAX391ESNDDDB53
		1/4"	1.3	P2LBX	18 / 45	0.84 (0.38)	24VDC	P2LBX392ESNDDDB49
							120VAC	P2LBX392ESNDDDB53
		3/8"	2.5	P2LCX	25 / 75	1.72 (0.78)	24VDC	P2LCX393ESNDDDB49
							120VAC	P2LCX393ESNDDDB53
1/2"	2.7	P2LDX	25 / 75	1.72 (0.78)	24VDC	P2LDX394ESNDDDB49		
					120VAC	P2LDX394ESNDDDB53		
 P2LAX 18" Grommet Shown	18" Grommet	1/8"	0.7	P2LAX	18 / 40	0.84 (0.38)	24VDC	P2LAX391ESNDDDG49
							120VAC	P2LAX391ESNDDDG53
		1/4"	1.3	P2LBX	18 / 45	0.84 (0.38)	24VDC	P2LBX392ESNDDDG49
							120VAC	P2LBX392ESNDDDG53
		3/8"	2.5	P2LCX	25 / 75	1.72 (0.78)	24VDC	P2LCX393ESNDDDG49
							120VAC	P2LCX393ESNDDDG53
1/2"	2.7	P2LDX	25 / 75	1.72 (0.78)	24VDC	P2LDX394ESNDDDG49		
					120VAC	P2LDX394ESNDDDG53		

Notes: Above valves are rated for an operating temperature from 14°F to 122°F (-10°C to 50°C). See model code matrix for additional options.
 Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Single Solenoid, 4-way, 2-position, Normal Operating Pressure / Temperature




	Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
  P2LBX 22mm DIN Shown	22mm DIN	1/8"	0.7	P2LAX	15 / 35	0.49 (0.22)	24VDC	P2LAX591ESNDDDB49
							120VAC	P2LAX591ESNDDDB53
		1/4"	1.3	P2LBX	18 / 45	0.84 (0.38)	24VDC	P2LBX592ESNDDDB49
							120VAC	P2LBX592ESNDDDB53
		3/8"	2.5	P2LCX	27 / 75	1.68 (0.76)	24VDC	P2LCX593ESNDDDB49
							120VAC	P2LCX593ESNDDDB53
1/2"	2.7	P2LDX	25 / 75	1.68 (0.76)	24VDC	P2LDX594ESNDDDB49		
					120VAC	P2LDX594ESNDDDB53		
 P2LAX 18" Grommet Shown	18" Grommet	1/8"	0.7	P2LAX	15 / 35	0.49 (0.22)	24VDC	P2LAX591ESNDDDG49
							120VAC	P2LAX591ESNDDDG53
		1/4"	1.3	P2LBX	18 / 45	0.84 (0.38)	24VDC	P2LBX592ESNDDDG49
							120VAC	P2LBX592ESNDDDG53
		3/8"	2.5	P2LCX	27 / 75	1.68 (0.76)	24VDC	P2LCX593ESNDDDG49
							120VAC	P2LCX593ESNDDDG53
1/2"	2.7	P2LDX	25 / 75	1.68 (0.76)	24VDC	P2LDX594ESNDDDG49		
					120VAC	P2LDX594ESNDDDG53		

Notes: Above valves are rated for an operating temperature from 14°F to 122°F (-10°C to 50°C). See model code matrix for additional options.
 Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

 Most popular.




Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

Double Solenoid, 4-way, 2-position, Normal Operating Pressure / Temperature

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
  22mm DIN P2LBX 22mm DIN Shown	1/8"	0.7	P2LAX	10 / 10	0.60 (0.27)	24VDC 120VAC	P2LAX591EENDDDB49 P2LAX591EENDDDB53
	1/4"	1.3	P2LBX	12 / 12	0.93 (0.42)	24VDC 120VAC	P2LBX592EENDDDB49 P2LBX592EENDDDB53
	3/8"	2.5	P2LCX	17 / 17	1.78 (0.81)	24VDC 120VAC	P2LCX593EENDDDB49 P2LCX593EENDDDB53
	1/2"	2.7	P2LDX	17 / 17	1.78 (0.81)	24VDC 120VAC	P2LDX594EENDDDB49 P2LDX594EENDDDB53
	1/8"	0.7	P2LAX	10 / 10	0.60 (0.27)	24VDC 120VAC	P2LAX591EENDDG49 P2LAX591EENDDG53
	1/4"	1.3	P2LBX	12 / 12	0.93 (0.42)	24VDC 120VAC	P2LBX592EENDDG49 P2LBX592EENDDG53
 18" Grommet P2LAX 18" Grommet Shown	3/8"	2.5	P2LCX	17 / 17	1.78 (0.81)	24VDC 120VAC	P2LCX593EENDDG49 P2LCX593EENDDG53
	1/2"	2.7	P2LDX	17 / 17	1.78 (0.81)	24VDC 120VAC	P2LDX594EENDDG49 P2LDX594EENDDG53

Notes: Above valves are rated for an operating temperature from 14°F to 122°F (-10°C to 50°C). See model code matrix for additional options.
 Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Double Solenoid, 4-way, 3-position All Ports Blocked, 3-position Center Exhaust, Normal Operating Pressure / Temperature

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number	
							All ports blocked	Center exhaust
  22mm DIN P2LBX 22mm DIN Shown	1/8"	0.5	P2LAX	18 / 40	0.62 (0.28)	24VDC 120VAC	P2LAX691EENDDDB49 P2LAX691EENDDDB53	P2LAX891EENDDDB49 P2LAX891EENDDDB53
	1/4"	0.9	P2LBX	22 / 55	0.97 (0.44)	24VDC 120VAC	P2LBX692EENDDDB49 P2LBX692EENDDDB53	P2LBX892EENDDDB49 P2LBX892EENDDDB53
	3/8"	1.8	P2LCX	30 / 90	2.45 (1.11)	24VDC 120VAC	P2LCX693EENDDDB49 P2LCX693EENDDDB53	P2LCX893EENDDDB49 P2LCX893EENDDDB53
	1/2"	1.9	P2LDX	30 / 90	2.45 (1.11)	24VDC 120VAC	P2LDX694EENDDDB49 P2LDX694EENDDDB53	P2LDX894EENDDDB49 P2LDX894EENDDDB53
 18" Grommet P2LBX 18" Grommet Shown	1/8"	0.5	P2LAX	18 / 40	0.62 (0.28)	24VDC 120VAC	P2LAX691EENDDG49 P2LAX691EENDDG53	P2LAX891EENDDG49 P2LAX891EENDDG53
	1/4"	0.9	P2LBX	22 / 55	0.97 (0.44)	24VDC 120VAC	P2LBX692EENDDG49 P2LBX692EENDDG53	P2LBX892EENDDG49 P2LBX892EENDDG53
	3/8"	1.8	P2LCX	30 / 90	2.45 (1.11)	24VDC 120VAC	P2LCX693EENDDG49 P2LCX693EENDDG53	P2LCX893EENDDG49 P2LCX893EENDDG53
	1/2"	1.9	P2LDX	30 / 90	2.45 (1.11)	24VDC 120VAC	P2LDX694EENDDG49 P2LDX694EENDDG53	P2LDX894EENDDG49 P2LDX894EENDDG53

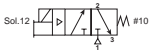

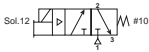

Notes: Above valves are rated for an operating temperature from 14°F to 122°F (-10°C to 50°C). See model code matrix for additional options.
 Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Most popular.







Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D
 Inline Valve Products

Single Solenoid, 3-way, 2-position, Xtreme Operating Pressure / Temperature

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
  22mm DIN P2LAX 22mm DIN Shown	1/8"	0.7	P2LAX	15 / 45	0.84 (0.38)	12VDC	P2LAX391ESHDDDB47
						24VDC	P2LAX391ESHDDDB48
	1/4"	1.3	P2LBX	25 / 65	0.84 (0.38)	12VDC	P2LBX392ESHDDDB47
						24VDC	P2LBX392ESHDDDB48
	3/8"	2.5	P2LCX	25 / 85	1.01 (0.46)	12VDC	P2LCX393ESHDDDB47
						24VDC	P2LCX393ESHDDDB48
1/2"	2.7	P2LDX	25 / 85	1.01 (0.46)	12VDC	P2LDX394ESHDDDB47	
					24VDC	P2LDX394ESHDDDB48	
  18" Grommet P2LBX 18" Grommet Shown	1/8"	0.7	P2LAX	15 / 45	0.84 (0.38)	12VDC	P2LAX391ESHDDG47
						24VDC	P2LAX391ESHDDG48
	1/4"	1.3	P2LBX	25 / 65	0.84 (0.38)	12VDC	P2LBX392ESHDDG47
						24VDC	P2LBX392ESHDDG48
	3/8"	2.5	P2LCX	25 / 85	1.01 (0.46)	12VDC	P2LCX393ESHDDG47
						24VDC	P2LCX393ESHDDG48
1/2"	2.7	P2LDX	25 / 85	1.01 (0.46)	12VDC	P2LDX394ESHDDG47	
					24VDC	P2LDX394ESHDDG48	

Notes: Above valves have Mobile Rate Coils and are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
 Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

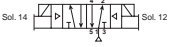


Single Solenoid, 4-way, 2-position, Xtreme Operating Pressure / Temperature

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
  22mm DIN P2LAX 22mm DIN Shown	1/8"	0.7	P2LAX	15 / 45	0.84 (0.38)	12VDC	P2LAX591ESHDDDB47
						24VDC	P2LAX591ESHDDDB48
	1/4"	1.3	P2LBX	20 / 55	0.84 (0.38)	12VDC	P2LBX592ESHDDDB47
						24VDC	P2LBX592ESHDDDB48
	3/8"	2.5	P2LCX	25 / 85	1.01 (0.46)	12VDC	P2LCX593ESHDDDB47
						24VDC	P2LCX593ESHDDDB48
1/2"	2.7	P2LDX	25 / 85	1.01 (0.46)	12VDC	P2LDX594ESHDDDB47	
					24VDC	P2LDX594ESHDDDB48	
  18" Grommet P2LAX 18" Grommet Shown	1/8"	0.7	P2LAX	15 / 45	0.84 (0.38)	12VDC	P2LAX591ESHDDG47
						24VDC	P2LAX591ESHDDG48
	1/4"	1.3	P2LBX	25 / 65	0.84 (0.38)	12VDC	P2LBX592ESHDDG47
						24VDC	P2LBX592ESHDDG48
	3/8"	2.5	P2LCX	28 / 85	1.01 (0.46)	12VDC	P2LCX593ESHDDG47
						24VDC	P2LCX593ESHDDG48
1/2"	2.7	P2LDX	25 / 85	1.01 (0.46)	12VDC	P2LDX594ESHDDG47	
					24VDC	P2LDX594ESHDDG48	

Notes: Above valves have Mobile Rate Coils and are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
 Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

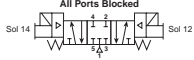

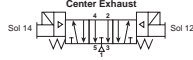

 Most popular.

Double Solenoid, 4-way, 2-position, Xtreme Operating Pressure / Temperature

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
  P2LAX 18" Grommet Shown	1/8"	0.7	P2LAX	11 / 11	0.60 (0.27)	12VDC 24VDC	P2LAX591EEHDDDB47 P2LAX591EEHDDDB48
	1/4"	1.3	P2LBX	13 / 13	0.93 (0.42)	12VDC 24VDC	P2LBX592EEHDDDB47 P2LBX592EEHDDDB48
	3/8"	2.5	P2LCX	18 / 18	1.06 (0.48)	12VDC 24VDC	P2LCX593EEHDDDB47 P2LCX593EEHDDDB48
	1/2"	2.7	P2LDX	18 / 18	1.06 (0.48)	12VDC 24VDC	P2LDX594EEHDDDB47 P2LDX594EEHDDDB48
 P2LAX 22mm DIN Shown	1/8"	0.7	P2LAX	11 / 11	0.60 (0.27)	12VDC 24VDC	P2LAX591EEHDDG47 P2LAX591EEHDDG48
	1/4"	1.3	P2LBX	13 / 13	0.93 (0.42)	12VDC 24VDC	P2LBX592EEHDDG47 P2LBX592EEHDDG48
	3/8"	2.5	P2LCX	18 / 18	1.06 (0.48)	12VDC 24VDC	P2LCX593EEHDDG47 P2LCX593EEHDDG48
	1/2"	2.7	P2LDX	18 / 18	1.06 (0.48)	12VDC 24VDC	P2LDX594EEHDDG47 P2LDX594EEHDDG48

Notes: Above valves have Mobile Rate Coils and are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
 Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Double Solenoid, 4-way, 3-position All Ports Blocked, 3-position Center Exhaust, Xtreme Operating Pressure / Temperature

Solenoid	Port size	Cv	Valve type (NPT)	Response time (msec)	Weight lb (kg)	Voltage	Part number	
							All ports blocked	Center exhaust
  P2LAX 22mm DIN Shown	1/8"	0.5	P2LAX	18 / 40	0.62 (0.28)	12VDC 24VDC	P2LAX691EEHDDDB47 P2LAX691EEHDDDB48	P2LAX891EEHDDDB47 P2LAX891EEHDDDB48
	1/4"	0.9	P2LBX	22 / 55	0.97 (0.44)	12VDC 24VDC	P2LBX692EEHDDDB47 P2LBX692EEHDDDB48	P2LBX892EEHDDDB47 P2LBX892EEHDDDB48
	3/8"	1.8	P2LCX	30 / 90	2.45 (1.11)	12VDC 24VDC	P2LCX693EEHDDDB47 P2LCX693EEHDDDB48	P2LCX893EEHDDDB47 P2LCX893EEHDDDB48
	1/2"	1.9	P2LDX	30 / 90	2.45 (1.11)	12VDC 24VDC	P2LDX694EEHDDDB47 P2LDX694EEHDDDB48	P2LDX894EEHDDDB47 P2LDX894EEHDDDB48
  P2LAX 18" Grommet Shown	1/8"	0.5	P2LAX	18 / 40	0.62 (0.28)	12VDC 24VDC	P2LAX691EEHDDG47 P2LAX691EEHDDG48	P2LAX891EEHDDG47 P2LAX891EEHDDG48
	1/4"	0.9	P2LBX	22 / 55	0.97 (0.44)	12VDC 24VDC	P2LBX692EEHDDG47 P2LBX692EEHDDG48	P2LBX892EEHDDG47 P2LBX892EEHDDG48
	3/8"	1.8	P2LCX	30 / 90	2.45 (1.11)	12VDC 24VDC	P2LCX693EEHDDG47 P2LCX693EEHDDG48	P2LCX893EEHDDG47 P2LCX893EEHDDG48
	1/2"	1.9	P2LDX	30 / 90	2.45 (1.11)	12VDC 24VDC	P2LDX694EEHDDG47 P2LDX694EEHDDG48	P2LDX894EEHDDG47 P2LDX894EEHDDG48

Notes: Above valves have Mobile Rate Coils and are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
 Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Most popular.



Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

Single & Double Solenoid Operated Valves

P2L A X 5 91 E S H D D G 49

Valve size	
1/8"	A
1/4"	B
3/8"	C
1/2"	D

Series	
Viking Xtreme	X

Voltage / frequency	
42	24VAC
45	12VDC
47*	12 VDC mobile
48*	24 VDC mobile
49	24VDC
53	120VAC
57	240VAC
Blank	Valve less coil

* Only available with enclosures "A", "B" & "G". Additional voltages are available upon request. Contact customer support for more information.

Enclosures / lead length	
A	30mm square 3-pin – ISO 4400 Form A (male only)
B	22mm rectangular 3-pin – type B industrial (male only)
E*	Intrinsically safe, FM / CSA
F†	Hazardous duty, FM / CSA
G	Grommet - 18" leads
H	1/2" NPT conduit - 18" leads
N	Solenoid pilot operator less coil

* Only available with voltage code "49" & override option "A", valve type "N" Only.

† Valve Type "N" Only.

Valve type / function		
<i>Internal pilot supply to solenoid*</i>		
3/2 NC - 2-position		3
5/2 2-position		5
5/3 3-position, APB		6
5/3 3-position, PC		7
5/3 3-position, CE		8
<i>External pilot supply to the solenoids through ports #12 & #14</i>		
3/2 NC - 2-position		L
5/2 2-position		N
5/3 3-position, APB		P
5/3 3-position, PC		Q
5/3 3-position, CE		R

* Size A & B solenoid valves can be field converted from internal to external pilot. See page D31 for details.

Main port thread	
G1/8 (P2LA)	11
G1/4 (P2LB)	12
G1/4 (P2LB) NAMUR Mount	1N*
G3/8 (P2LC)	13
G1/2 (P2LD)	14
1/8" NPT (P2LA)	91
1/4" NPT (P2LB)	92
1/4" NPT (P2LB) NAMUR Mount	9N*
3/8" NPT (P2LC)	93
1/2" NPT (P2LD)	94

* NAMUR mount available for 5/2, 2-position only.

Overrides	
A	No override
C*	Flush - locking
D	Extended non-locking

* Override for valve type N only.

Solenoid pilot type	
D	Pilot exhaust vented
N	Tapped pilot exhaust (M5)

Valve type	
N	Normal vacuum to 145 PSIG (16 bar) 14°F to 122°F (-10°C to 50°C)
H*	Xtreme vacuum to 232 PSIG (10 bar) 14°F to 122°F (-10°C to 50°C)

* P2LC and P2LD solenoid operated valves have a maximum pressure rating of 175 PSIG (12 bar)

12 End operator	
Double solenoid operated valve	E
Single solenoid spring return	S*

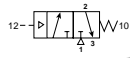
* Not available with 3-position valves.

- Viking Lite Series
- Viking Xtreme Series
- B Series
- ADEX Series
- N Series
- D Inline Valve Products

Most popular.



Single Remote Pilot, 3-way, 2-position, Xtreme Operating Pressure / Temperature



P2LAX Shown

Port size (NPT)	Cv	Response time (msec)	Weight lb (kg)	Valve type	Part number
1/8"	0.7	15 / 45	0.68 (0.31)	P2LAX	P2LAX391PS
1/4"	1.3	25 / 65	0.68 (0.31)	P2LBX	P2LBX392PS
3/8"	2.5	25 / 65	0.88 (0.40)	P2LCX	P2LCX393PS
1/2"	2.7	25 / 65	0.88 (0.40)	P2LDX	P2LDX394PS

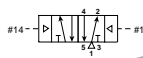
Single Remote Pilot, 4-way, 2-position, Xtreme Operating Pressure / Temperature



P2LAX Shown

Port size (NPT)	Cv	Response time (msec)	Weight lb (kg)	Valve type	Part number
1/8"	0.7	15 / 45	0.33 (0.15)	P2LAX	P2LAX591PS
1/4"	1.3	20 / 55	0.68 (0.31)	P2LBX	P2LBX592PS
3/8"	2.5	25 / 85	0.90 (0.41)	P2LCX	P2LCX593PS
1/2"	2.7	25 / 85	0.90 (0.41)	P2LDX	P2LDX594PS

Double Remote Pilot, 4-way, 2-position, Xtreme Operating Pressure / Temperature



P2LBX Shown

Port size (NPT)	Cv	Response time (msec)	Weight lb (kg)	Valve type	Part number
1/8"	0.7	11 / 11	0.33 (0.15)	P2LAX	P2LAX591PP
1/4"	1.3	13 / 13	0.68 (0.31)	P2LBX	P2LBX592PP
3/8"	2.5	18 / 18	0.90 (0.41)	P2LCX	P2LCX593PP
1/2"	2.7	18 / 18	0.90 (0.41)	P2LDX	P2LDX594PP

Double Remote Pilot, 4-way, 3-position All Ports Blocked, 3-position Center Exhaust, Xtreme Operating Pressure / Temperature



P2LAX Shown

Port size (NPT)	Cv	Response time (msec)	Weight lb (kg)	Valve type	Part number	
					All ports blocked	Center exhaust
1/8"	0.5	18 / 50	0.31 (0.14)	P2LAX	P2LAX691PP	P2LAX891PP
1/4"	0.9	25 / 65	0.73 (0.33)	P2LBX	P2LBX692PP	P2LBX892PP
3/8"	1.8	30 / 90	0.93 (0.42)	P2LCX	P2LCX693PP	P2LCX893PP
1/2"	1.9	30 / 90	0.93 (0.42)	P2LDX	P2LDX694PP	P2LDX894PP

Notes: Above valves are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
 Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Remote Air Pilot Operated Valves

P2L A X 5 91 PS

Valve size	
1/8"	A
1/4"	B
3/8"	C*
1/2"	D*

* P2LCX and P2LDX manual & remote air pilot valves have a maximum pressure rating of 175 PSIG (12 bar).

Operators / return	
PP	Double remote pilot
PS*	Single remote pilot, spring return

* Not available with 3-position valves.

Main port thread	
11	G1/8 (P2LA)
12	G1/4 (P2LB)
13	G3/8 (P2LC)
14	G1/2 (P2LD)
91	1/8" NPT (P2LA)
92	1/4" NPT (P2LB)
93	3/8" NPT (P2LC)
94	1/2" NPT (P2LD)

Note: NAMUR Mount for P2LBX is available upon request.

Valve type / function	
<i>Internal pilot supply to solenoid</i>	
3/2 NC - 2-position	3
5/2 2-position	5
5/3 3-position, APB	6
5/3 3-position, PC	7
5/3 3-position, CE	8

Most popular.



Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

ATEX Certified Single & Double Solenoid Operated Valves

Vacuum to 145 PSIG (vacuum to 10 bar)
 14°F to 122°F 22mm coils (enclosure option M)
 -4°F to 122°F 30mm coils (enclosure option S)

P2L A X 5 91 E S A D D M 49

Valve size	
1/8"	A
1/4"	B
3/8"	C
1/2"	D

Voltage	
49	24VDC

Enclosures	
M	ATEX 8-22T EExm T4 135°C
S	ATEX 8-30T EExm T6 85°C

Overrides	
D	Extended non-locking

Solenoid pilot type	
D	Vented pilot exhaust
N	Tapped pilot exhaust (M5)

12 end operator	
E	Double solenoid operated valve
S	Single solenoid spring return

Valve type / function	
<i>Internal Pilot Supply to Solenoid</i>	
2-position valve	5
3-position valve APB	6
3-position valve PC	7
3-position valve CE	8
<i>External Pilot Supply to Solenoids through Ports #12 & #14</i>	
2-position valve	N
3-position valve APB	P
3-position valve PC	Q
3-position valve CE	R

Main port thread	
G1/8 (P2LA)	11
G1/4 (P2LB)	12
G3/8 (P2LC)	13
G1/2 (P2LD)	14
1/8" NPT (P2LA)	91
1/4" NPT (P2LB)	92
3/8" NPT (P2LC)	93
1/2" NPT (P2LD)	94

NOTE: For ATEX certified remote air pilot valves, build the valve part number from the model number index for remote pilot and add "-EX" following the number.

Example: P2LAX591PS-EX

Note: all valves include a 3 meter sealed cable with assembly.



ATEX Certified Solenoid Pilot Assemblies

P2F S 1 3 A 3 D M 49

Voltage	
49	24VDC

Enclosures	
M	ATEX 8-22T EExm T4 135°C
S	ATEX 8-30T EExm T6 85°C

Note: all valves include a 3 meter sealed cable with assembly.

IEM Bar Manifold, Viking Xtreme Solenoid / Remote Pilot Valves



Valve series	Valve function	## -Stations	Manifold only (NPT)	Manifold only (BSPP)
P2LAX*	3-way	02 - 12	P2LAXGAXG##NP	P2LAXGAXG##GP
P2LAX*	4-way	02 - 12	P2LAXMAXN##NP	P2LAXMAXN##GP
P2LBX*	3-way	02 - 12	P2LBXGAXG##NP	P2LBXGAXG##GP
P2LBX*	4-way	02 - 12	P2LBXMAXN##NP	P2LBXMAXN##GP
P2LCX	3-way / 4-way	02 - 12	P2LCXMAXN##NP	P2LCXMAXN##GP

Kits include: (1) manifold, valve hold down bolts and o-rings. Replace ## with number of valve stations.
 * 30mm solenoid coil option "A" not available on IEM bar manifold P2LAX or P2LBX.

IEM Bar Manifold Add-A-Fold Assembly (Viking Xtreme Solenoid / Remote Pilot Valves Only)



Valve series	Valve function	## -Stations	Manifold only (NPT)	Manifold only (BSPP)
P2LAX*	3-way	02 - 12	AAP2LAXGAXG##NP	AAP2LAXGAXG##GP
P2LAX*	4-way	02 - 12	AAP2LAXMAXN##NP	AAP2LAXMAXN##GP
P2LBX*	3-way	02 - 12	AAP2LBXGAXG##NP	AAP2LBXGAXG##GP
P2LBX*	4-way	02 - 12	AAP2LBXMAXN##NP	AAP2LBXMAXN##GP
P2LCX	3-way / 4-way	02 - 12	AAP2LCXMAXN##NP	AAP2LCXMAXN##GP

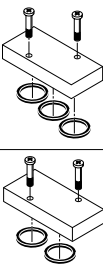
Kits include: (1) manifold, valve hold down bolts, o-rings and assembly. Replace ## with number of valve stations.
 * 30mm solenoid coil option "A" not available on IEM bar manifold P2LAX or P2LBX.

- How to Order: 1. List Add-A-Fold assembly part number as line item 1
 2. List the desired valves series part number in subsequent line items after the Add-A-Fold Assembly part number to complete the ordering code. Include all valves and blanking kits required. The left most station is station # 1 looking at the #12 end of the manifold.

Example: B3, 4-way manifold with station #1 blanked off with valves assembled

Line	Qty	Part number	Comment
1	1	AAP2LBXMAXN02NP	Add-A-Fold Assembly, 2-station IEM bar manifold
2	2	P2LBX591ESNNDDDB49	4-way, Station 1, 2

Blanking Plate



Type	Kit number
P2LAX 4-way	9121658063
P2LBX 4-way	9121594809X
P2LCX 3 & 4 way	P2LCXK20P
P2LAX 3-way	912132BPSXZ
P2LBX 3-way	912132BPSXZ

Kit includes: plate, screws, o-rings

Manifold Bolts

Type	Qty.	Kit number
P2LAX	12	P2LAXK87P
P2LBX	12	P2LBXK87P
P2LCX	12	P2LCXK87P

Manifold O-rings

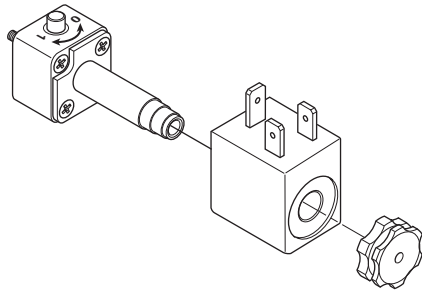
Type	Qty.	Kit number
P2LAX	30	P2LAXK84P
P2LBX	18	P2LBXK84P
P2LCX	12	P2LCXK84P

Most popular.



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22mm Solenoid Pilot Operators & Coils



22mm solenoid pilot options

The P2FP13*4* (NC) 3/2 solenoid pilot operators are designed for piloting pneumatic control valves with compressed air or other inert gases.

The P2FP operator is available for Normal operating pressures up to 10 bar or the Xtreme maximum operating pressure of 16 bar and wide band voltage tolerances required for mobile applications.

Corrosion resistant design

The pilot valve body is manufactured in thermoplastic PA6 material and the core tube brass / stainless steel. The plunger / core is made from stainless steel and the valve seats from FKM.

Solenoid pilot exhaust

These operators all exhaust out of the top of the core tube which is tapped M5. The standard solenoid nut (Solenoid pilot type "D") fitted to the core tube is a diffuser nut which allows the exhaust to escape to atmosphere. This nut also minimizes ingress of dirt into the valve through this port. The alternative plastic knurled nut (Solenoid pilot type "N") can be specified (refer to part number system) if the exhaust air needs captured and piped away using the M5 tapped port.

Mobile applications

Viking Xtreme valves are tested to +5g shock and vibration. Solenoid operated valves are designed to operate with wide voltage tolerance bands within the ambient temperature ranges stated in the technical section.

Coils

Coils are wound with enameled copper wire, having a temperature index of 180°C with class F insulation (155°C) and are encapsulated in Thermoplastic resin. When fitted with suitable connector and correct gasket, they give protection to IP65.

Manual override options

The pilot operators can be supplied with locking or non-locking manual override. The standard manual override is the monostable (spring return) extended brass override. Alternatively the bistable (locking) override can be specified as an alternative for the Normal duty 10 bar option.

Spares

Solenoid operators are available as spares complete with mounting screws and seals. Coils and connectors should be ordered separately unless ATEX certified and intrinsically safe is needed. ATEX certified operators and coils must be ordered together.

Transients

Interrupting the current through the solenoid coil produces momentary voltage peaks which, under unfavorable conditions, can amount to several hundred times the rated operating voltage. Normally, these transients do not cause problems, but to achieve the maximum life of relays in the circuit (and particularly of transistors, thyristors and integrated circuits) it is desirable to provide protection by means of voltage-dependent resistors (varistors). All connectors / cable plugs with LEDs include this type of circuit protection.

Materials

Pilot Valve

Body	Polyamide
Armature tube:	
Normal pilot operator	Brass
Xtreme pilot operator	Stainless steel
Plunger & core.....	Corrosion resistant CR-NI steel
Seals	FKM (viton™)
Screws.....	Stainless steel

Coil

Encapsulation material.....	Thermoplastic
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ATEX

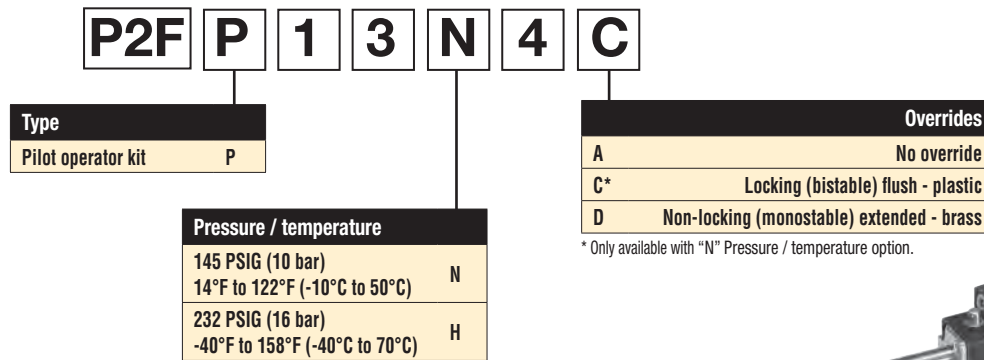


ATEX is a European Directive (94/9/EC) valid for products to be used within an explosive atmosphere.

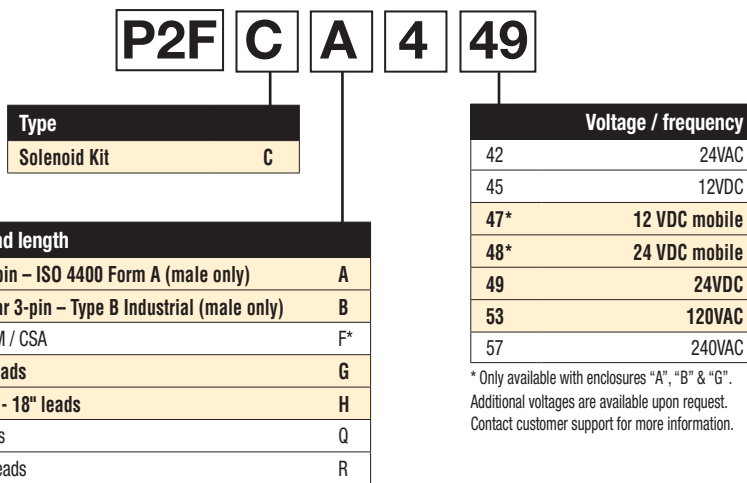
Both ATEX certified solenoid, remote pilot and manual operated valves, as well as complete solenoid pilot assemblies are available. For specific information regarding ATEX certification please visit www.parker/pneumatics.

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Pilot Operator Kits



Solenoid Kits



* Only available with voltage codes "45", "49", "53" & "57". Not for use with the Xtreme version (-40°C to 70°C).

Solenoid Enclosures



Solenoid Information (Solenoids are rated for continuous duty.)

Voltage Code	Enclosure "A"			Enclosure "B" to "R"			
	AC 60Hz	DC 50Hz	DC	Power consumption	Holding (amps)	Power consumption	Holding (amps)
42	24	22		3.9VA	.14	7.3VA	.31
45	—	—	12	2.6W	.21	4.6W	.37
47*	—	—	12	6.2W	.52	5.5W	.46
48*	—	—	24	6.8W	.29	6.0W	.25
49	—	—	24	2.7W	.11	4.8W	.20
53	120	110	—	4.1VA	.04	6.3VA	.05
57	240	230	—	3.7VA	.02	6.4VA	.03

* Mobile voltages. Solenoid voltage characteristics for all coils located on page D31.

Replacement Solenoid Nut

Description	Part number	Description	Part number
Solenoid diffuser nut	PS1556	Solenoid vented nut	PS2892P

Most popular.



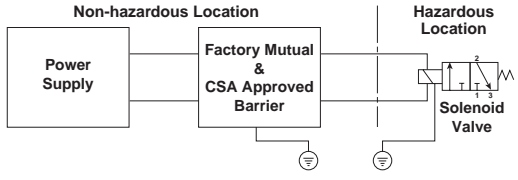
Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D
 Inline Valve Products

Intrinsically safe solenoid valves (“E” option)

Hazardous location class:
Class I; Groups A, B, C & D
Class II; Groups E, F, & G
Class III; Div. I

For use in low voltage (24VDC) Intrinsically Safe applications. **NO OTHER VOLTAGE IS APPROVED.**
 Comes standard with non-lighted solenoid connector.
 36mm Coil width.

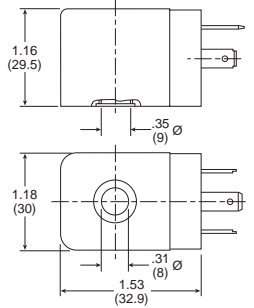
Must be connected to an FM approved Barrier.
 For dimensions, reference standard solenoid models. Maximum internally piloted valve pressure is 115 PSIG. Pressures to 145 PSIG can be used when external pilot is utilized and pilot pressure is limited to 115 PSIG.



Intrinsically safe solenoid pilot assembly kits

Description	Part number
24VDC	P2FS13N1AE49

Kit includes: coil, connector, o-ring & screws

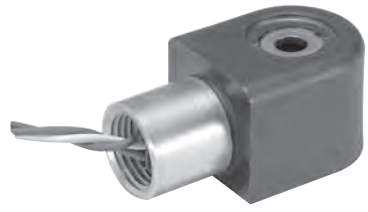


Hazardous duty solenoid valves (“F” option)

Hazardous location class:
Class I; Zone I EX, M, II & T4
Class I; Div. I, Groups A, B, C, & D
Class II & III; Div. I, Groups E, F, & G
 Comes standard with 1/2" conduit connection.

Voltage range = ±10%
 Ambient temperature range = -20°C (-4°F) to 60°C (140°F)
 Duty factor = 100%
 IP65 Rated (with connected conduit connector)

- Notes:**
1. Maximum non-hazardous location voltage not to exceed 250V RMS.
 2. Connect per Barrier Manufacturers instructions.
 3. Factory Mutual requires connections per ISA RP 12.6 instructions.
 4. CSA requires “Installation to be in accordance with the Canadian Electrical Code, Part I.”
 5. The hazardous duty coils are wider in size than size A, B, C & D valves.
 If mounted on a manifold, the valves need to be staggered to fit.

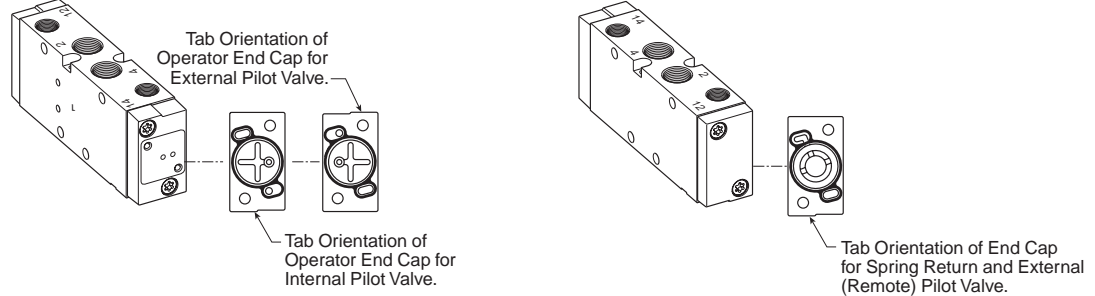


Option F
Hazardous Duty FM / CSA

Internal to external pilot conversion (size A & B only)

To convert from Internal to External Pilot Valve, simply remove the (2) fasteners that attach the end cap to the valve body. Rotate the end cap 180° and attach back to the valve body. For single solenoid valves, only the 14-End needs to be rotated. For double solenoid valves, both ends must be converted for proper function.

The 12 & 14-Ports are always tapped no matter what Valve Type / Function is selected. For Internal Pilot Function, ports do NOT need to be plugged.



Viking Lite Series
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 B Series
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Operating temperature

- **Normal**.....14°F to 122°F (-10°C to 50°C)
- **Xtreme**..... -40°F to 158°F (-40°C to 70°C)

Flow Rating

Valve size	Port size	2-position	3-position
P2LAX	1/8"	0.7	0.5
P2LBX	1/4"	1.3	0.9
P2LCX	3/8"	2.5	1.8
P2LDX	1/2"	2.7	1.9

Operating pressure*

Maximum: Normal Valve Type.....145 PSIG (10 bar)
Xtreme Valve Type.....232 PSIG (16 bar)

Minimum:

Valve type - internal pilot	Minimum PSIG (bar)			
	P2LAX	P2LBX	P2LCX	P2LDX
Single solenoid - spring return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Single remote pilot - spring return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Double solenoid - 2-position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double remote pilot - 2-position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double solenoid - 3-position (APB, PC, CE)	51 (3.5)	51 (3.5)	51 (3.5)	51 (3.5)
Double remote pilot - 3-position (APB, PC, CE)	51 (3.5)	51 (3.5)	51 (3.5)	51 (3.5)

Valve type - External pilot	P2LAX	P2LBX	P2LCX	P2LDX
All Viking series	Vacuum			

* P2LC and P2LD solenoid operated valves have a maximum pressure rating of 175 PSIG (12 bar)

Solenoid voltage characteristics

Non-mobile coils

+10% / -10% for all coils with Normal and Xtreme Operators

Mobile coils - normal pilot operator

22mm 12 & 24VDC - Mobile (47 & 48 voltage code)

Operating temperature			
Minimum inlet pressure (bar)	-10°C	+10°C	+50°C
	3	+30 / -25% VDC	+30 / -20% VDC
6	+30 / -30% VDC	+30 / -25% VDC	+25 / -20% VDC
8	+30 / -30% VDC	+30 / -30% VDC	+25 / -25% VDC
10	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC

30mm 12 & 24VDC - Mobile (47 & 48 voltage code)

Operating temperature			
Minimum inlet pressure (bar)	-10°C	+10°C	+50°C
	3	+30 / -30% VDC	+30 / -30% VDC
6	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC
8	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC
10	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC

Mobile coils - Xtreme pilot operator

22mm 12 & 24VDC - Mobile (47 & 48 voltage code)

Operating temperature				
Minimum inlet pressure (bar)	-40°C	+10°C	+50°C	+70°C
	4	+30 / -25% VDC	+30 / -25% VDC	+30 / -10% VDC
8	+30 / -30% VDC	+30 / -25% VDC	+30 / -15% VDC	+20 / -15% VDC
12	+30 / -30% VDC	+30 / -30% VDC	+30 / -15% VDC	+20 / -15% VDC
16	+30 / -30% VDC	+30 / -30% VDC	+30 / -20% VDC	+20 / -20% VDC

30mm 12 & 24VDC - Mobile (47 & 48 voltage code)

Operating temperature				
Minimum inlet pressure (bar)	-40°C	+10°C	+50°C	+70°C
	4	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC
8	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC	+15 / -30% VDC
12	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC	+15 / -30% VDC
16	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC	+15 / -30% VDC

Note: All table ratings are based on 100% continuous duty and 5G shock vibration. At 50% continuous duty all ratings are +30% / -30% for all Temperatures and Pressures.

Viking Lite Series

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Female Electrical Connectors / Accessories

**30mm Square 3-Pin – ISO 4400, DIN 43650A
 (Use with Enclosure “A”)**

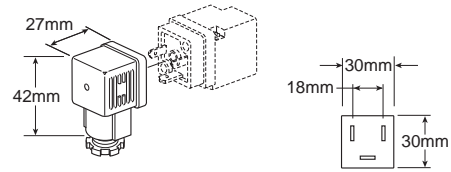
Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	PS2028BP
Light – 6-48V, 50/60Hz, 6-48VDC	PS2032J79CP*	PS203279BP
Light – 120V/60Hz	PS2032J83CP*	PS203283BP
Light – 240V/60Hz	N/A	PS203283BP

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm.



Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

**22mm Rectangular 3-Pin – Type B Industrial
 (Use with Enclosure “B”)**

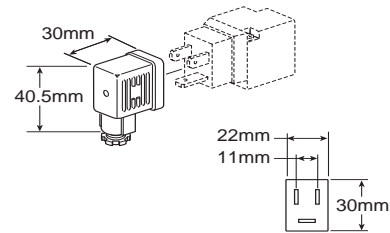
Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2429JBP	PS2429BP
Light – 24V60Hz, 24VDC	PS2430J79BP*	PS243079BP
Light – 120V/60Hz	PS2430J83BP*	PS243083BP
Light – 240V/60Hz	N/A	PS243087BP

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:

Conductors: 2 poles plus ground; cable range (connector only): 6 to 8mm (0.24 To 0.31 Inch); contact spacing: 11mm.



Exhaust Mufflers

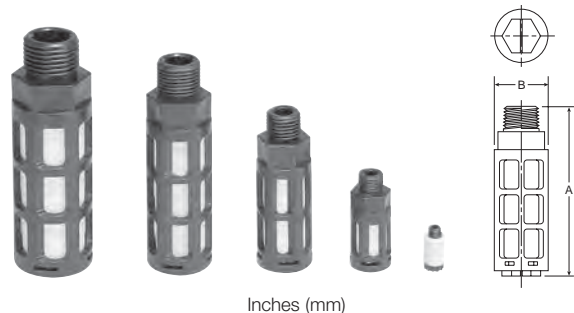
Pipe thread	Part number
M5	P6M-PAC5
1/8" NPT	EM12
1/4" NPT	EM25
3/8" NPT	EM37
1/2" NPT	EM50

P6M - Plastic; EM - Sintered bronze



Plastic Silencers

Thread size	A (mm)	B (mm)	Part number	
			NPT	BSPT
M5	.43 (11)	.32 (8)	AS-5	
1/8"	1.57 (40)	.63 (16)	ASN-6	AS-6
1/4"	2.56 (65)	.83 (21)	ASN-8	AS-8
3/8"	3.35 (85)	.98 (25)	ASN-10	AS-10
1/2"	3.74 (95)	1.18 (30)	ASN-15	AS-15



Inches (mm)

Exhaust Protector

Features

- • 1/8 and 1/4 NPT male sizes
- • Fitted with a brass pipe adapter and a fluorocarbon membrane
- • Resistant to rust, clog, wash down and contamination

• Applications

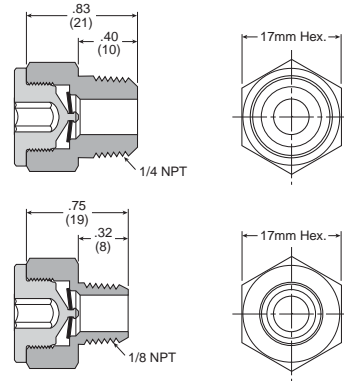
These protectors are intended for mobile applications, quick venting applications and alternative exhaust port breathers that require protection against clogging.

Ideal for valves exposed to harsh environmental conditions (which can cause a “caking up” in the exhaust pipe ports where the bronze mufflers or breather vents are installed).

Particularly suitable for time-sensitive applications such as axle-lift suspensions or pushers or tag axles.

Flow data (SCFM)

Size	60 PSIG Inlet	90 PSIG Inlet	125 PSIG Inlet	Part number
1/8"	40.1	56.5	75.5	E90016
1/4"	44.6	62.7	83.5	E90017



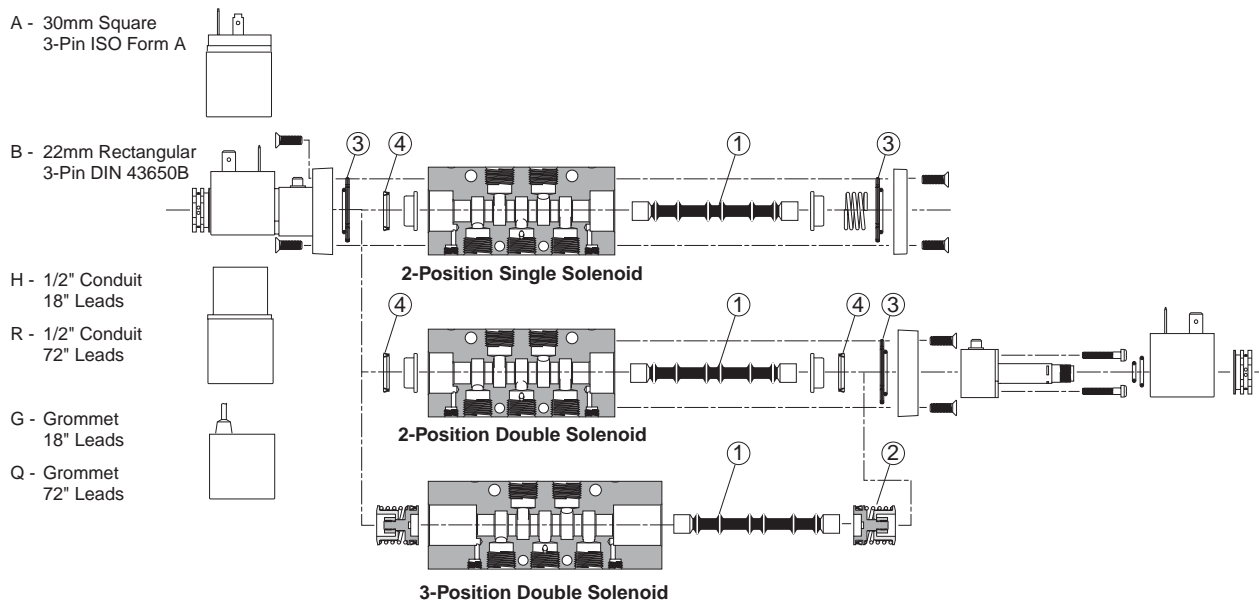
Operating information	
Operating pressure:	0 to 150 PSIG (0 to 10 bar)
Operating temperature:	-40°F to 140°F (-40°C to 60°C)

Material specifications

Body & pipe adapter	Brass
Membrane	Fluorocarbon

Spool Service Kits

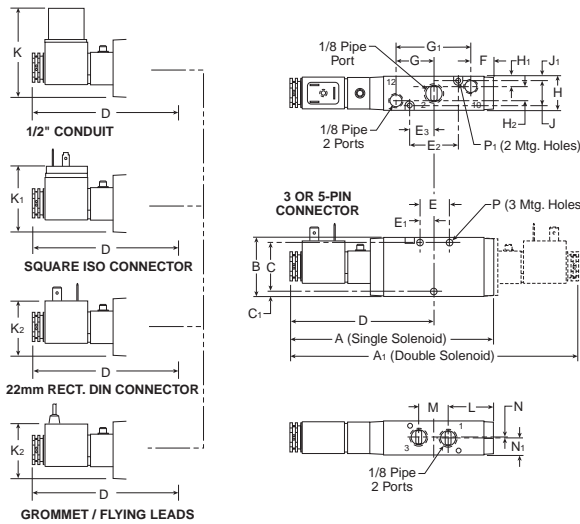
Description	Includes items (qty.)	Part number
Size A, 4-way, 2-position, solenoid & air pilot valves	1 (1), 3 (2), 4 (2)	P2LAXSK1
Size A, 4-way, 3-position, solenoid & air pilot valves	1 (1), 2 (2), 3 (2), 4 (2)	P2LAXSK2
Size A, 4-way, 2-position, manual valves	Spool only (not shown)	P2LAXSK3
Size A, 4-way, 3-position, manual valves	Spool only (not shown)	P2LAXSK4
Size B, 4-way, 2 & 3-position valves	1 (1), 3 (2), 4 (2)	P2LBXSK1
Size C & Size D, 4-way, 2 & 3-position valves	1 (1), 3 (2), 4 (2)	P2LCDXSK1



Viking Lite Series
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 B Series
 ADEX Series
 N Series
D
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P2LAX 3/2 Single & Double Operators – Solenoid

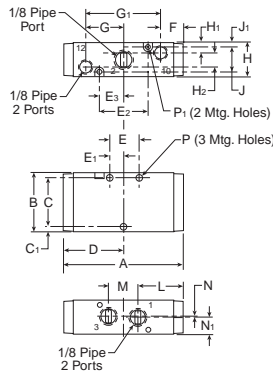


P2LAX 3/2 (solenoid)

A	A ₁	B	C	C ₁
5.35 (136)	7.60 (193)	1.57 (40)	1.26 (32)	.16 (4)
D	E	E ₁	E ₂	E ₃
3.80 (97)	.79 (20)	.39 (10)	1.26 (32)	.63 (16)
F	G	G ₁	H	H ₁
.55 (14)	.98 (25)	1.97 (50)	.87 (22)	.26 (6.6)
H ₂	J	J ₁	K	K ₁
.35 (9)	.65 (16.5)	.11 (2.9)	2.36 (60)	1.61 (41)
K ₂	L	M	N	N ₁
1.50 (38)	1.14 (29)	.79 (20)	.02 (0.5)	.42 (11)
P	P ₁			
∅ .17 ∅ (4.3)	∅ .12 ∅ (3.1)			

Inches (mm)

P2LAX 3/2 Single & Double Operators – Remote Pilot

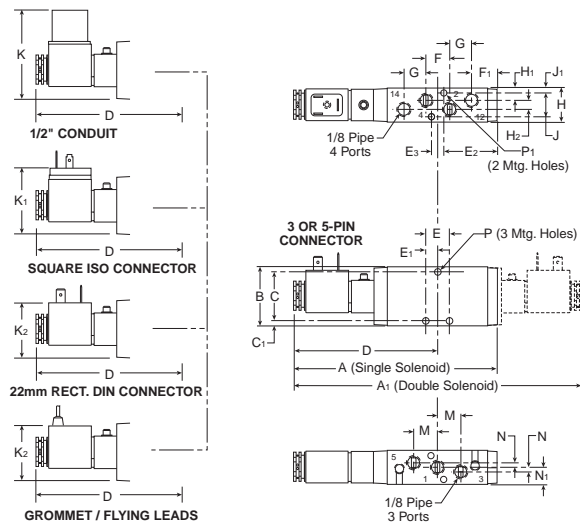


P2LAX 3/2 (remote)

A	B	C	C ₁	D
3.07 (78)	1.57 (40)	1.26 (32)	.16 (4)	1.54 (39)
E	E ₁	E ₂	E ₃	F
.79 (20)	.39 (10)	1.26 (32)	.63 (16)	.55 (14)
G	G ₁	H	H ₁	H ₂
.98 (25)	1.97 (50)	.87 (22)	.26 (6.6)	.35 (9)
J	J ₁	L	M	N
.65 (16.5)	.11 (2.9)	1.14 (29)	.79 (20)	.02 (0.5)
N ₁	P	P ₁		
.42 (11)	∅ .17 ∅ (4.3)	∅ .12 ∅ (3.1)		

Inches (mm)

P2LAX 5/2 & 5/3 Single & Double Operators, 4-way



P2LAX 5/2 & 5/3 (solenoid)

A	A ₁	B	C	C ₁
5.47 (139)	7.72 (196)	1.57 (40)	1.30 (33)	.14 (3.5)
D	E	E ₁	E ₂	E ₃
3.86 (98)	.63 (16)	.31 (8)	1.42 (36)	.33 (8.5)
F	F ₁	G	H	H ₁
.63 (16)	.67 (17)	.59 (15)	.87 (22)	.31 (8)
H ₂	J	J ₁	K	K ₁
.24 (6)	.63 (16)	.12 (3.9)	2.36 (60)	1.61 (41)
K ₂	M	N	N ₁	P
1.50 (38)	.63 (16)	.12 (3)	.43 (11)	∅ .17 ∅ (4.3)
P ₁				
∅ .12 ∅ (3.1)				

Inches (mm)

Viking Lite Series
 Viking Xtreme Series

B Series

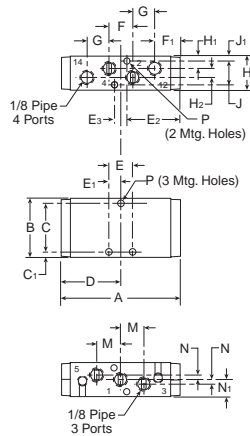
ADEX Series

N Series

D Inline Valve Products



P2LAX 5/2 & 5/3 Single & Double Operators – Remote Pilot

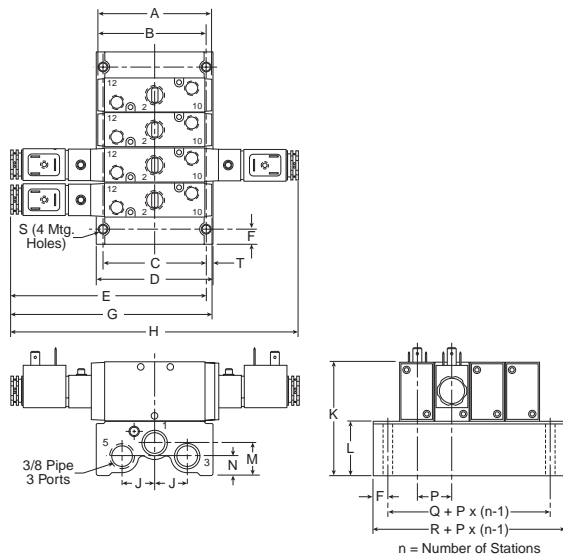


P2LAX 5/2 & 5/3 (remote)

A	B	C	C ₁	D
3.19 (81)	1.57 (40)	1.30 (33)	.14 (3.5)	1.59 (40.5)
E	E ₁	E ₂	E ₃	F
1.47 (16)	.31 (8)	1.42 (36)	.33 (8.5)	.63 (16)
F ₁	G	H	H ₁	H ₂
.67 (17)	.59 (15)	.87 (22)	.31 (8)	.24 (6)
J	J ₁	M	N	N ₁
.63 (16)	.12 (3)	.63 (16)	.12 (3)	.43 (11)
P	P ₁			
Ø .17 Ø (4.3)	Ø .12 Ø (3.1)			

Inches (mm)

P2LAX 3/2 Single & Double Operators – IEM Aluminum Bar Manifold

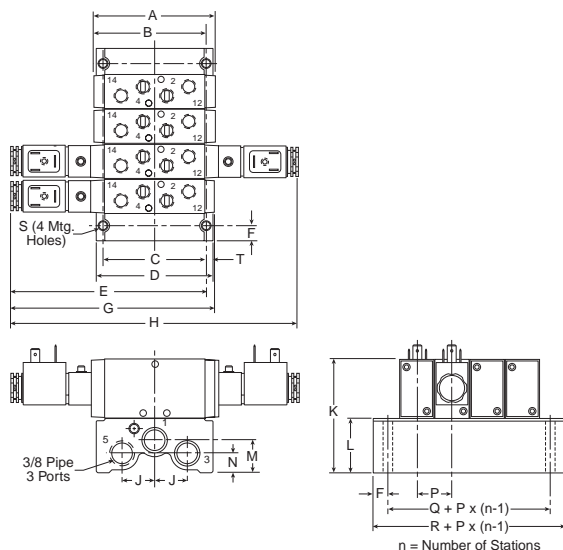


**P2LAX 3/2
 IEM Aluminum bar manifold**

A	B	C	D	E
3.07 (78)	2.83 (72)	2.76 (70)	3.12 (79)	5.18 (132)
F	G	H	J	K
41 (10.5)	5.35 (136)	7.72 (193)	.87 (22)	3.11 (79)
L	M	N	P	Q
1.54 (39)	.87 (22)	.52 (13.2)	.93 (23.5)	1.56 (39.5)
R	S	T		
2.36 (60)	Ø .22 Ø (5.5)	.18 (4.5)		

Inches (mm)

P2LAX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



**P2LAX 5/2 & 5/3
 IEM Aluminum bar manifold**

A	B	C	D	E
3.19 (81)	2.97 (76)	2.76 (70)	3.12 (79)	5.26 (134)
F	G	H	J	K
41 (10.5)	5.47 (139)	7.72 (196)	.87 (22)	3.11 (79)
L	M	N	P	Q
1.54 (39)	.87 (22)	.52 (13.2)	.93 (23.5)	1.56 (39.5)
R	S	T		
2.36 (60)	Ø .22 Ø (5.5)	.18 (4.5)		

Inches (mm)



Viking Lite
Series

Viking Xtreme
Series

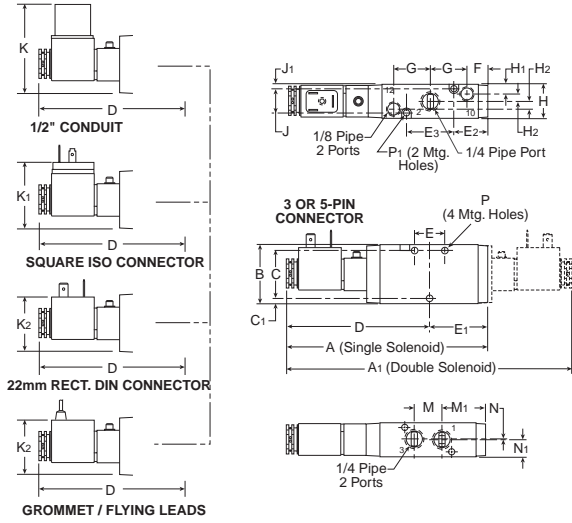
B
Series

ADEX
Series

N
Series

D
 Inline
 Valve Products

P2LBX 3/2 Single & Double Operators – Solenoid

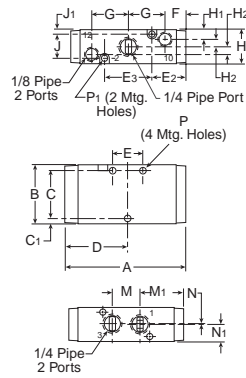


P2LBX 3/2 (solenoid)

A	A ₁	B	C	C ₁
5.35 (136)	7.60 (193)	1.57 (40)	1.26 (32)	.16 (4)
D	E	E ₁	E ₂	E ₃
3.80 (96.5)	.79 (20)	1.54 (39)	.51 (13)	1.26 (32)
F	G	H	H ₁	H ₂
.55 (14)	.98 (25)	.87 (22)	.26 (6.6)	.18 (4.5)
J	J ₁	K	K ₁	K ₂
.65 (16.5)	.11 (2.9)	2.36 (60)	1.61 (41)	1.50 (38)
M	M ₁	N	N ₁	P
.79 (20)	1.14 (29)	.02 (0.5)	.42 (11)	Ø .17 Ø (4.3)
P ₁	Ø .12 Ø (3.1)			

Inches (mm)

P2LBX 3/2 Single & Double Operators – Remote Pilot

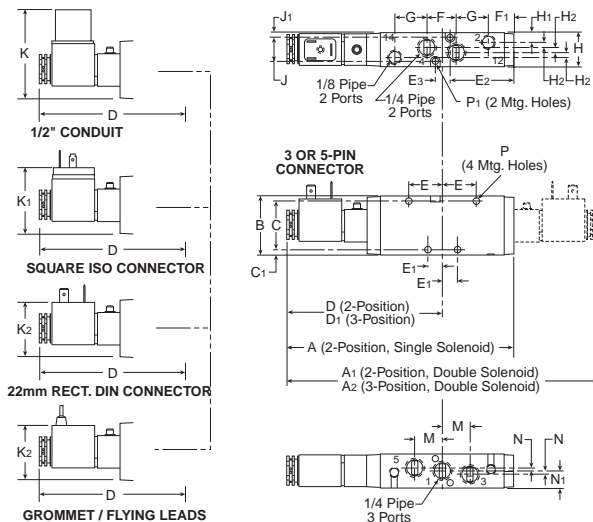


P2LBX 3/2 (remote)

A	B	C	C ₁	D
3.08 (78)	1.57 (40)	1.26 (32)	.16 (4)	1.54 (39)
E	E ₂	E ₃	F	G
.79 (20)	.51 (13)	1.26 (32)	.55 (14)	.98 (25)
H	H ₁	H ₂	J	J ₁
.87 (22)	.26 (6.6)	.18 (4.5)	.65 (16.5)	.11 (2.9)
M	M ₁	N	N ₁	P
.79 (20)	1.14 (29)	.02 (0.5)	.42 (11)	Ø .17 Ø (4.3)
P ₁	Ø .12 Ø (3.1)			

Inches (mm)

P2LBX 5/2 & 5/3 Single & Double Operators – Solenoid



P2LBX 5/2 & 5/3 (solenoid)

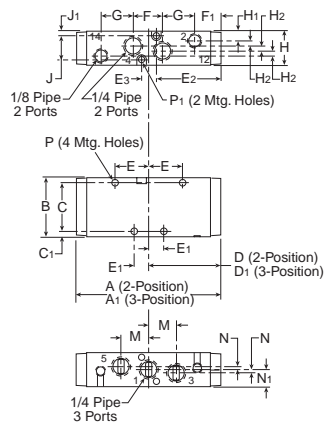
A	A ₁	A ₂	B	C
6.14 (156)	8.39 (213)	9.23 (235)	1.57 (40)	1.26 (32)
C ₁	D	D ₁	E	E ₁
.16 (4)	4.21 (107)	4.64 (118)	.91 (23)	.39 (10)
E ₂	E ₃	F	F ₁	G
1.73 (44)	.39 (10)	.79 (20)	.67 (17)	.87 (22)
H	H ₁	H ₂	J	J ₁
.87 (22)	.26 (6.6)	.12 (3)	.65 (16.5)	.12 (3)
K	K ₁	K ₂	M	N
2.36 (60)	1.61 (41)	1.50 (38)	.79 (20)	.08 (2)
N ₁	P	P ₁		
.43 (11)	Ø .17 Ø (4.3)	Ø .12 Ø (3.1)		

Inches (mm)



Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

P2LBX 5/2 & 5/3 Single & Double Operators – Remote Pilot

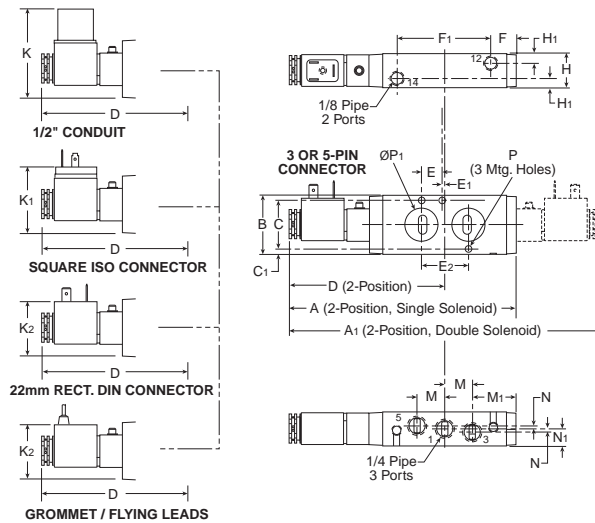


P2LBX 5/2 & 5/3 (remote)

A	A1	B	C	C1
3.95 (100)	4.61 (117)	1.57 (40)	1.26 (32)	.16 (4)
D	D1	E	E1	E2
1.93 (49)	2.28 (58)	.91 (23)	.39 (10)	1.73 (44)
E3	F	F1	G	H
.39 (10)	.79 (20)	.67 (17)	.87 (22)	.8 (22)
H1	H2	J	J1	K
.26 (6.6)	.12 (3)	.65 (16.5)	.11 (2.8)	2.90 (74)
M	N	N1	P	P1
.79 (20)	.08 (2)	.43 (11)	Ø .17 Ø (4.3)	Ø .12 Ø (3.1)

Inches (mm)

P2LBX 5/2 Single & Double Operators – Solenoid _ NAMUR

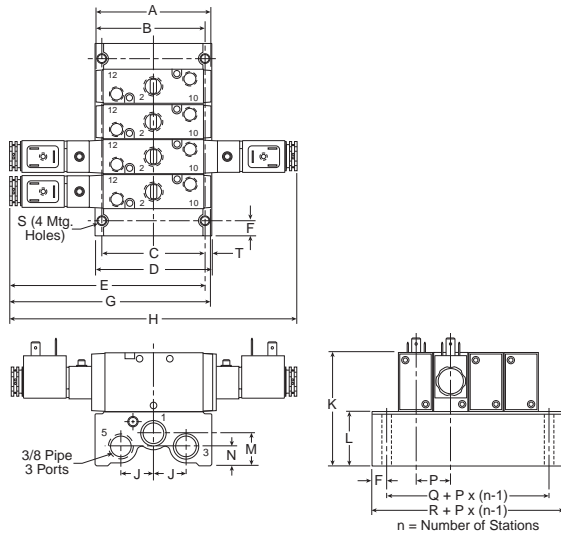


P2LBX 5/2 (NAMUR)

A	A1	B	C	C1
6.15 (156)	8.39 (213)	1.57 (40)	1.26 (32)	.16 (4)
D	E	E1	E2	F
4.21 (107)	.47 (12)	.08 (2)	.94 (24)	.67 (17)
F1	H	H1	M	M1
2.52 (64)	.87 (22)	.26 (6.6)	.79 (20)	1.14 (29)
N	N1	P	P1	
.08 (2)	.43 (11)	Ø .22 Ø (5.5)	Ø .76 Ø (19.4)	

Inches (mm)

P2LBX 3/2 Single & Double Operators – IEM Aluminum Bar Manifold

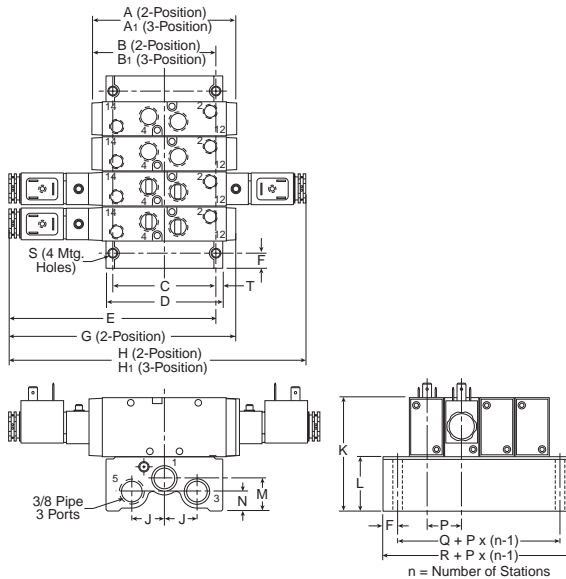


**P2LBX 3/2
 IEM Aluminum bar manifold**

A	B	C	D	E
3.86 (78)	2.91 (74)	2.76 (70)	3.12 (79)	5.17 (131)
F	G	H	J	K
.40 (10.2)	5.33 (136)	7.6 (193)	.87 (22)	3.11 (79)
L	M	N	P	Q
1.47 (37)	.87 (22)	.52 (13.2)	.93 (23.5)	1.56 (39.6)
R	S	T		
2.36 (60)	∅ .22 (5.5)	.18 (4.6)		

Inches (mm)

P2LBX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



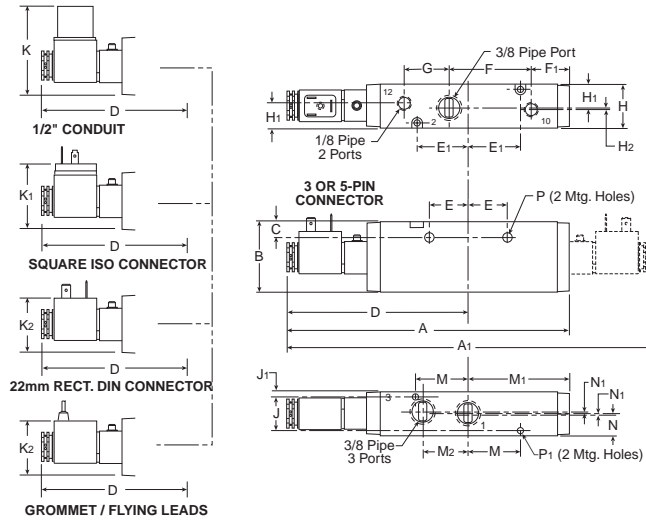
**P2LBX 5/2 & 5/3
 IEM Aluminum bar manifold**

A	A ₁	B	B ₁	C
3.86 (98)	4.70 (120)	3.42 (84)	3.73 (95)	2.76 (70)
D	E	F	G	H
3.12 (79)	5.59 (142)	.40 (10.2)	6.14 (156)	8.39 (213)
H ₁	J	K	L	M
9.23 (235)	.87 (22)	3.11 (79)	1.47 (37)	.87 (22)
N	P	Q	R	S
.52 (13.2)	.93 (23.5)	1.56 (39.6)	2.36 (60)	∅ .22 (5.5)
T				
.18 (4.6)				

Inches (mm)

- Viking Lite Series
- Viking Xtreme Series
- B Series
- ADEX Series
- N Series
- D Inline Valve Products

P2LCX 3/2 Single & Double Operators – Solenoid

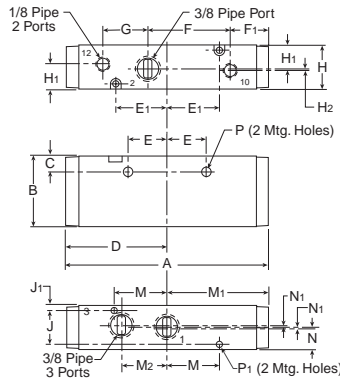


P2LCX 3/2 (solenoid)

A	A ₁	B	C	D
7.66 (194.5)	9.80 (249)	1.89 (48)	.43 (11)	4.90 (124.5)
E	E ₁	F	F ₁	G
1.04 (26.5)	1.40 (35.5)	2.24 (57)	1.02 (26)	1.22 (31)
H	H ₁	H ₂	J	J ₁
1.18 (30)	.67 (17)	.02 (0.5)	.91 (23)	.14 (3.5)
K	K ₁	K ₂	M	M ₁
2.52 (64)	1.77 (45)	1.65 (42)	1.40 (35.5)	2.76 (70)
M ₂	N	N ₁	P	P ₁
1.18 (30)	.55 (14)	.04 (1)	∅ .27 (∅ 6.9)	∅ .17 (∅ 4.4)

Inches (mm)

P2LCX 3/2 Single & Double Operators – Remote Pilot



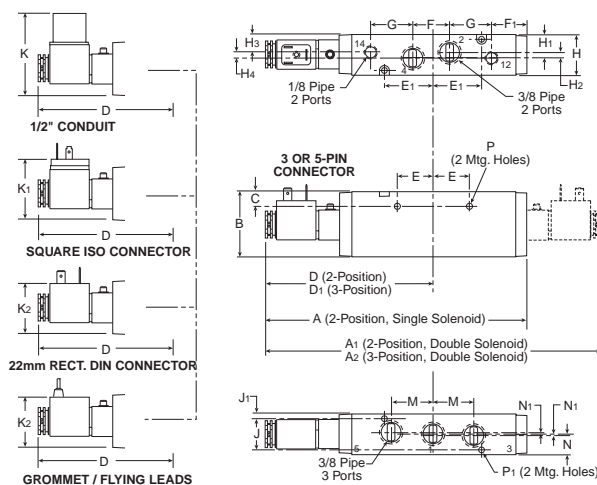
P2LCX 3/2 (remote)

A	B	C	D	E
5.51 (140)	1.89 (48)	.43 (11)	2.76 (70)	1.04 (26.5)
E ₁	F	F ₁	G	H
1.40 (35.5)	2.24 (57)	1.02 (26)	1.22 (31)	1.18 (30)
H ₁	H ₂	J	J ₁	M
.67 (17)	.02 (0.5)	.91 (23)	.14 (3.5)	1.40 (35.5)
M ₁	M ₂	N	N ₁	P
2.76 (70)	1.18 (30)	.55 (14)	.04 (1)	∅ .27 (∅ 6.9)

P₁
 ∅ .17
 ∅ (4.4)

Inches (mm)

P2LCX 5/2 & 5/3 Single & Double Operators – Solenoid



P2LCX 5/2 & 5/3 (solenoid)

A	A ₁	A ₂	B	C
7.68 (195)	9.84 (250)	10.71 (272)	1.89 (48)	.43 (11)
D	D ₁	E	E ₁	F
4.92 (125)	5.35 (136)	1.04 (26.5)	1.40 (35.5)	1.06 (27)
F ₁	G	H	H ₁	H ₂
1.02 (26)	1.22 (31)	1.18 (30)	.53 (13.5)	.12 (3)
H ₃	H ₄	J	J ₁	K
.51 (13)	.16 (4)	.91 (23)	.14 (3.5)	2.52 (64)
K ₁	K ₂	M	N	N ₁
1.77 (45)	1.65 (42)	1.18 (30)	.55 (14)	.04 (1)

P ∅ .27 ∅ (6.9)
P₁ ∅ .17 ∅ (4.4)

Inches (mm)



Viking Lite
Series

Viking Xtreme
Series

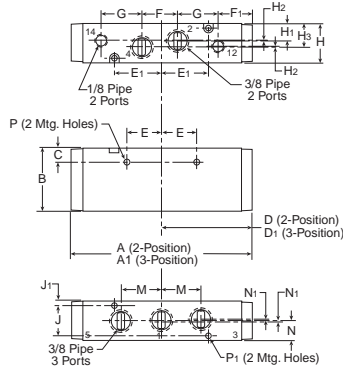
B
Series

ADEX
Series

N
Series

D
 Inline
 Valve Products

P2LCX 5/2 & 5/3 Single & Double Operators – Remote Pilot

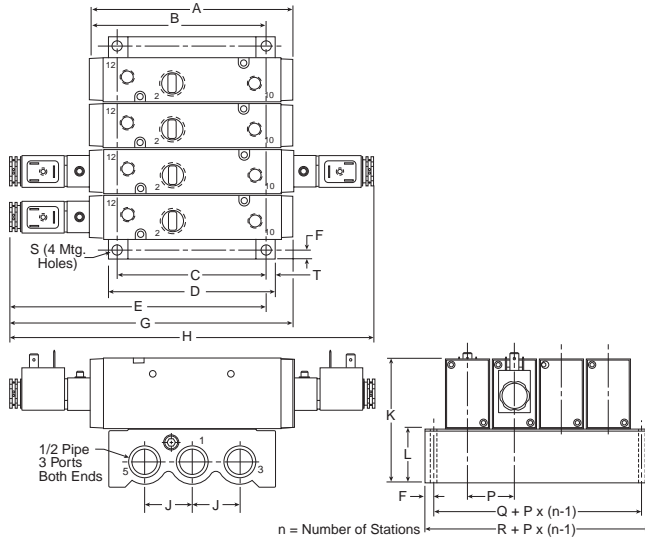


P2LCX 5/2 & 5/3 (remote)

A	A ₁	B	C	D
5.51 (140)	6.38 (162)	1.89 (48)	.43 (11)	2.76 (70)
D ₁	E	E ₁	F	F ₁
3.18 (81)	1.04 (26.5)	1.40 (35.5)	1.06 (27)	1.02 (26)
G	H	H ₁	H ₂	H ₃
1.22 (31)	1.18 (30)	.51 (13)	.02 (0.5)	.12 (3)
J	J ₁	M	N	N ₁
.91 (23)	.14 (3.5)	1.18 (30)	.55 (14)	.04 (1)
P	P ₁			
Ø .27 Ø (6.9)	Ø .17 Ø (4.4)			

Inches (mm)

P2LCX 3/2 Single & Double Operators – IEM Aluminum Bar Manifold

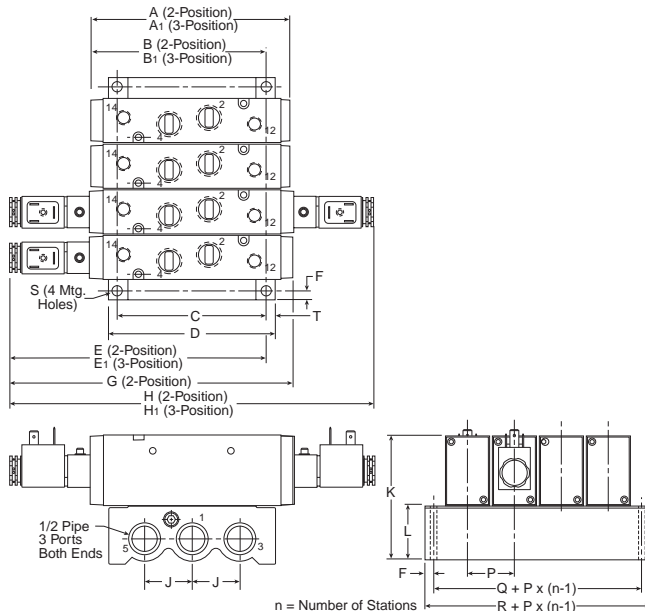


**P2LCX 3/2
 IEM Aluminum bar manifold**

A	B	C	D	E
5.51 (140)	4.96 (126)	3.94 (100)	4.41 (112)	7.11 (180.5)
F	G	H	J	K
.24 (6)	7.66 (194.5)	9.80 (249)	1.26 (32)	3.43 (87)
L	P	Q	R	S
1.54 (39)	1.24 (31.5)	1.77 (45)	2.24 (57)	Ø .26 Ø (6.5)
T				
.24 (6)				

Inches (mm)

P2LCX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



**P2PCX 5/2 & 5/3
 IEM Aluminum bar manifold**

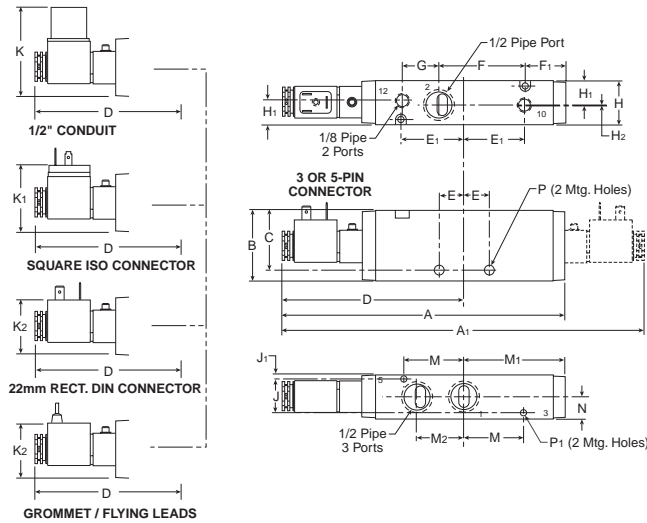
A	A ₁	B	B ₁	C
5.51 (140)	6.38 (162)	4.72 (120)	5.16 (131)	3.94 (100)
D	E	E ₁	F	G
4.41 (112)	6.89 (170)	7.13 (181)	.24 (6)	7.68 (195)
H	H ₁	J	K	L
9.84 (250)	10.71 (272)	1.26 (32)	3.43 (87)	1.54 (39)
P	Q	R	S	T
1.24 (31.5)	1.77 (45)	2.24 (57)	Ø .26 Ø (6.5)	.24 (6)

Inches (mm)

Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products



P2LDX 3/2 Single & Double Operators – Solenoid

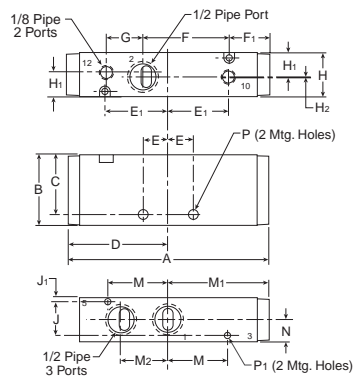


P2LDX 3/2 (solenoid)

A	A ₁	B	C	D
7.66 (194.5)	9.80 (249)	1.89 (48)	1.59 (40.5)	4.90 (124.5)
E	E ₁	F	F ₁	G
.67 (17)	1.65 (42)	2.36 (60)	1.08 (27.5)	.98 (25)
H	H ₁	H ₂	J	J ₁
1.18 (30)	.67 (17)	.02 (0.5)	.91 (23)	.14 (3.5)
K	K ₁	K ₂	M	M ₁
2.52 (64)	1.77 (45)	1.65 (42)	1.65 (42)	2.76 (70)
M ₂	N	P	P ₁	
1.30 (33)	.59 (15)	Ø .26 Ø (6.6)	Ø .17 Ø (4.4)	

Inches (mm)

P2LDX 3/2 Single & Double Operators – Remote Pilot

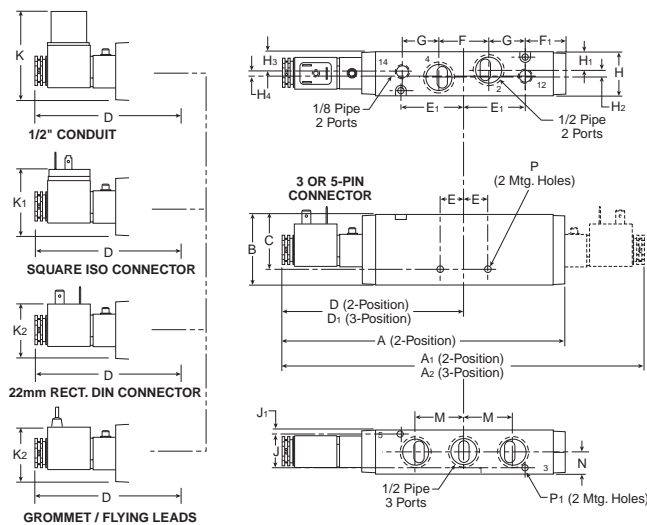


P2LDX 3/2 (remote)

A	B	C	D	E
5.51 (140)	1.89 (48)	1.59 (40.5)	2.76 (70)	.67 (17)
E ₁	F	F ₁	G	H
1.65 (42)	2.36 (60)	1.08 (27.5)	.98 (25)	1.18 (30)
H ₁	H ₂	J	J ₁	M
.67 (17)	.02 (0.5)	.91 (23)	.14 (3.5)	1.65 (42)
M ₁	M ₂	N	P	P ₁
2.76 (70)	1.30 (33)	.59 (15)	Ø .26 Ø (6.6)	Ø .17 Ø (4.4)

Inches (mm)

P2LDX 5/2 & 5/3 Single & Double Operators – Solenoid



P2LDX 5/2 & 5/3 (solenoid)

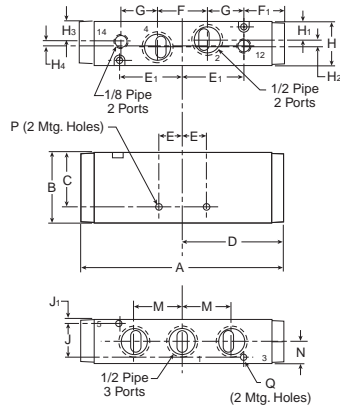
A	A ₁	A ₂	B	C
7.67 (195)	9.84 (250)	10.7 (272)	1.89 (48)	1.59 (40.5)
D	D ₁	E	E ₁	F
4.92 (125)	5.79 (147)	.67 (17)	1.65 (42)	1.34 (34)
F ₁	G	H	H ₁	H ₂
1.10 (28)	.98 (25)	1.18 (30)	.49 (12.5)	.20 (5)
H ₃	H ₄	J	J ₁	K
.51 (13)	.16 (4)	.91 (23)	.14 (3.5)	2.52 (64)
K ₁	K ₂	M	N	P
1.77 (45)	1.65 (42)	1.30 (33)	.59 (15)	Ø .26 Ø (6.6)

P₁
 Ø .17
 Ø (4.4)

Inches (mm)



P2LDX 5/2 & 5/3 Single & Double Operators – Remote Pilot



P2LDX 5/2 & 05/3 (remote)

A	B	C	D	E
5.47 (139)	1.89 (48)	1.59 (40.5)	2.63 (67)	.67 (17)
E1	F	F1	G	H
1.65 (42)	1.34 (34)	1.08 (27.5)	.98 (25)	1.18 (30)
H1	H2	H3	H4	J
.49 (12.5)	.20 (5)	.51 (13)	.16 (4)	.91 (23)
J1	P	M	N	Q
.14 (3.5)	Ø .26 Ø (6.6)	1.29 (32.7)	.59 (15)	Ø .17 Ø (4.4)

Inches (mm)

- Viking Lite Series
- Viking Xtreme Series
- B Series
- ADEX Series
- N Series
- D**
- Inline Valve Products

B Series

B Series, an exceptional performing industrial valve in a compact size with an enhanced flow range.

Available in solenoid pilot operated and remote air pilot models. The B series features Parker's proven WCS (Wear Compensating Seal) system ensuring long life and fast response, making it ideally suited for OEM applications.

Ports

- B3: 1/8, 1/4 inch
- B5: 1/4, 3/8 inch
- B6: 3/8 inch
- B7: 1/2 inch
- B8: 3/4 inch

Mounting

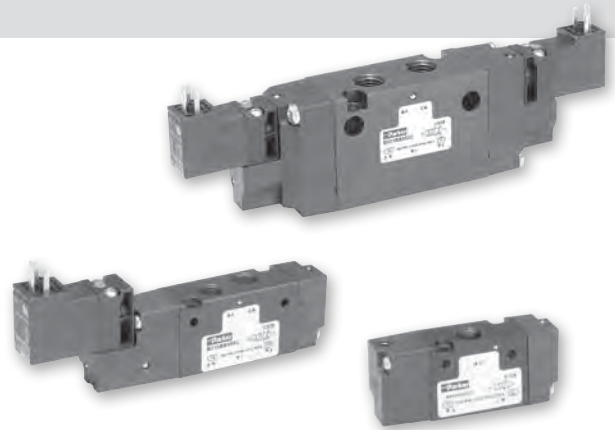
- Inline
- Subbase
- IEM stackable base
- IEM aluminum bar
- 5-port subbase aluminum bar

Solenoids

- 1.2 W – 15mm, 3-pin EN175301-803
- 2.5 to 7.3 watt - conduit, grommet, 22mm & 30mm, 3-pin DIN (433650)
- 12VDC to 240VAC
- Female DIN electrical connectors

Certification / Approval

- Approved to be CE marked
- IP65 rated
- CSA, C/US



Operating information

Operating pressure:	Vacuum to 145 PSIG (Vacuum to 10 bar)
Minimum:	See chart below
CSA-NRTL/C:	See chart below
Operating temperature:	5°F to 120°F (-15°C to 49°C)

Material specifications

Body	Anodized aluminum
End caps	Nylon polymer - 33% glass filled
Seals	Nitrile
Solenoid	Polyamide
Spool	Aluminum

Minimum operating pressure

Operator / function	Internal pilot	Minimum PSIG (kPa)				
		B3	B5	B6	B7	B8
1. G. H	Single solenoid - air return					
2. A. J. S	Double solenoid	20 (138)	20 (138)	20 (138)	35 (241)	35 (241)
3. K. L	Single remote pilot - air return					
4. M	Double remote pilot	Vacuum				
5. 6. 7	Double solenoid - APB, CE, PC	30 (207)	30 (207)	30 (207)	45 (310)	45 (310)
8. 9. 0	Double remote pilot - APB, CE, PC	Vacuum				
E. V. W	Single solenoid - air return / spring assist	35 (241)	35 (241)	35 (241)	35 (241)	35 (241)
F. X. Y	Single remote pilot - air return / spring assist					
	External pilot*†					
All	"B" series	Vacuum				

* External Pilot Pressure / Remote Pilot Signal 35-145 PSIG (241-1000 kPa).

† Not Available with B3 Dual 3/2.

CSA-NRTL/C operating pressure

Note: For CSA-NRTL/C approved solenoid valves – insert an 'L' at the end of the valve part number.

Valve	Maximum PSIG (kPa)
B3	120 (827)
B5 & B6	145 (1000)*§
B7 & B7	145 (1000)*†

* Enclosure Option E is CSA / FM approved at source. For certification of valve / solenoid assembly, consult factory.

† Not Available with Enclosure 5

§ Not available with Enclosures 0. 5 & X

Most popular.

Viking Lite Series

Viking Xtreme Series

B Series

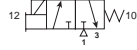
ADEX Series

N Series

D

Inline Valve Products

Single Solenoid, 3-way, 2-position, NC



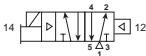
B3 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.

Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.75 Cv	120VAC 24VDC	B3 Inline	B3G0BB553C B3G0BB549C
	1/4"	1.4 Cv	120VAC 24VDC	B5 Inline	B5G1BB553C B5G1BB549C
	3/8"	1.4 Cv	120VAC 24VDC	B5 Inline	B5G2BB553C B5G2BB549C
	3/8"	2.7 Cv	120VAC 24VDC	B6 Inline	B6V2BB553A B6V2BB549A
	1/2"	5.9 Cv	120VAC 24VDC	B7 Inline	B7V3BB553A B7V3BB549A
	3/4"	7.0 Cv	120VAC 24VDC	B8 Inline	B8V4BB553A B8V4BB549A

Viking Lite Series

Viking Xtreme Series

Single Solenoid, 4-way, 2-position



B3 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.

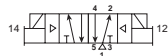
Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.75 Cv	120VAC 24VDC	B3 Inline	B310BB553C B310BB549C
	1/4"	1.4 Cv	120VAC 24VDC	B5 Inline	B511BB553C B511BB549C
	3/8"	1.4 Cv	120VAC 24VDC	B5 Inline	B512BB553C B512BB549C
	3/8"	2.7 Cv	120VAC 24VDC	B6 Inline	B612BB553A B612BB549A
	1/2"	5.9 Cv	120VAC 24VDC	B7 Inline	B713BB553A B713BB549A
	3/4"	7.0 Cv	120VAC 24VDC	B8 Inline	B814BB553A B814BB549A
	Less base	0.65 Cv	120VAC 24VDC	B3 Subbase	B31VBB553C B31VBB549C

B Series

ADEX Series

N Series

Double Solenoid, 4-way, 2-position



B5 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.

Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.75 Cv	120VAC 24VDC	B3 Inline	B320BB553C B320BB549C
	1/4"	1.4 Cv	120VAC 24VDC	B5 Inline	B521BB553C B521BB549C
	3/8"	1.4 Cv	120VAC 24VDC	B5 Inline	B522BB553C B522BB549C
	3/8"	2.7 Cv	120VAC 24VDC	B6 Inline	B622BB553A B622BB549A
	1/2"	5.9 Cv	120VAC 24VDC	B7 Inline	B723BB553A B723BB549A
	3/4"	7.0 Cv	120VAC 24VDC	B8 Inline	B824BB553A B824BB549A
	Less base	0.65 Cv	120VAC 24VDC	B3 Subbase	B32VBB553C B32VBB549C

D

Inline Valve Products

Double Solenoid, 4-way, 3-position, APB



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.60 Cv	120VAC 24VDC	B3 Inline	B350BB553C B350BB549C
	1/4"	1.1 Cv	120VAC 24VDC	B5 Inline	B551BB553C B551BB549C
	3/8"	1.1 Cv	120VAC 24VDC	B5 Inline	B552BB553C B552BB549C
	3/8"	2.1 Cv	120VAC 24VDC	B6 Inline	B652BB553A B652BB549A
	1/2"	5.7 Cv	120VAC 24VDC	B7 Inline	B753BB553A B753BB549A
	3/4"	6.6 Cv	120VAC 24VDC	B8 Inline	B854BB553A B854BB549A
	Less base	0.50 Cv	120VAC 24VDC	B3 Subbase	B35VBB553C B35VBB549C

B5 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.

Double Solenoid, 4-way, 3-position, CE



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.60 Cv	120VAC 24VDC	B3 Inline	B360BB553C B360BB549C
	1/4"	1.1 Cv	120VAC 24VDC	B5 Inline	B561BB553C B561BB549C
	3/8"	1.1 Cv	120VAC 24VDC	B5 Inline	B562BB553C B562BB549C
	3/8"	2.1 Cv	120VAC 24VDC	B6 Inline	B662BB553A B662BB549A
	1/2"	5.7 Cv	120VAC 24VDC	B7 Inline	B763BB553A B763BB549A
	3/4"	6.6 Cv	120VAC 24VDC	B8 Inline	B864BB553A B864BB549A
	Less base	0.50 Cv	120VAC 24VDC	B3 Subbase	B36VBB553C B36VBB549C

B5 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.

Double Solenoid, 4-way, 3-position, PC



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.60 Cv	120VAC 24VDC	B3 Inline	B370BB553C B370BB549C
	1/4"	1.1 Cv	120VAC 24VDC	B5 Inline	B571BB553C B571BB549C
	3/8"	1.1 Cv	120VAC 24VDC	B5 Inline	B572BB553C B572BB549C
	3/8"	2.1 Cv	120VAC 24VDC	B6 Inline	B672BB553A B672BB549A
	1/2"	5.7 Cv	120VAC 24VDC	B7 Inline	B773BB553A B773BB549A
	3/4"	6.6 Cv	120VAC 24VDC	B8 Inline	B874BB553A B874BB549A
	Less base	0.50 Cv	120VAC 24VDC	B3 Subbase	B37VBB553C B37VBB549C

B5 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

Single Remote Pilot, 3-way, 2-position, NC



Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.75 Cv	B3 Inline, remote pilot	B3K0000XXC
	1/4"	1.4 Cv	B5 Inline, remote pilot	B5K1000XXC
	3/8"	1.4 Cv	B5 Inline, remote pilot	B5K2000XXC
	3/8"	2.7 Cv	B6 Inline, remote pilot	B6X2000XXA
	1/2"	5.9 Cv	B7 Inline, remote pilot	B7X3000XXA
	3/4"	7.0 Cv	B8 Inline, remote pilot	B8X4000XXA
	Less base	0.65 Cv	B3 Subbase, remote pilot	B33V000XXC

B3 Shown, M5 remote pilot ports

Single Remote Pilot, 4-way, 2-position



Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.75 Cv	B3 Inline, remote pilot	B330000XXC
	1/4"	1.4 Cv	B5 Inline, remote pilot	B531000XXC
	3/8"	1.4 Cv	B5 Inline, remote pilot	B532000XXC
	3/8"	2.7 Cv	B6 Inline, remote pilot	B632000XXA
	1/2"	5.9 Cv	B7 Inline, remote pilot	B733000XXA
	3/4"	7.0 Cv	B8 Inline, remote pilot	B834000XXA
	Less base	0.65 Cv	B3 Subbase, remote pilot	B33V000XXC

B5 Shown, M5 remote pilot ports

Double Remote Pilot, 4-way, 2-position



Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.75 Cv	B3 Inline, remote pilot	B340000XXC
	1/4"	1.4 Cv	B5 Inline, remote pilot	B541000XXC
	3/8"	1.4 Cv	B5 Inline, remote pilot	B542000XXC
	3/8"	2.7 Cv	B6 Inline, remote pilot	B642000XXA
	1/2"	5.9 Cv	B7 Inline, remote pilot	B743000XXA
	3/4"	7.0 Cv	B8 Inline, remote pilot	B844000XXA
	Less base	0.65 Cv	B3 Subbase, remote pilot	B34V000XXC

B5 Shown, M5 remote pilot ports

Double Remote Pilot, 4-way, 3-position, APB



Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.60 Cv	B3 Inline, remote pilot	B380000XXC
	1/4"	1.1 Cv	B5 Inline, remote pilot	B581000XXC
	3/8"	1.1 Cv	B5 Inline, remote pilot	B582000XXC
	3/8"	2.1 Cv	B6 Inline, remote pilot	B682000XXA
	1/2"	5.7 Cv	B7 Inline, remote pilot	B783000XXA
	3/4"	6.6 Cv	B8 Inline, remote pilot	B884000XXA
	Less Base	0.50 Cv	B3 Subbase, remote pilot	B38V000XXC

B5 Shown, M5 remote pilot ports

Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

B3 Subbase Side Ported Subbase Manifold, Subbase Valves Only



Valve series	Valve function	## – Stations	Manifold only (NPT)	Manifold only (BSPP)
B3	4-way	02 to 12	PSJ3B1N##NP	PSJ3B1G##NP

Kits include: (1) manifold, valve hold down bolts, gaskets. For external pilot valve option "X", external manifold galley must be pressurized. Replace ## with number of valve stations.

B3 Subbase Side Ported Subbase Manifold Add-A-Fold Assembly



Valve series	Valve function	## – Stations	Manifold assembly (NPT)	Manifold assembly (BSPP)
B3	4-way	02 to 12	AAPSJ3B1N##NP	AAPSJ3B1G##GP

Kits include: (1) manifold, valve hold down bolts, gaskets and assembly. For external pilot valve option "X", external manifold galley must be pressurized.

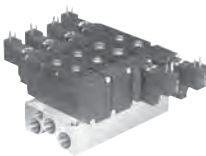
IEM Bar Manifold, Inline Valves Only



Valve series	Valve function	## – Stations	Manifold only (NPT)	Manifold only (BSPP)
B3	3-way	02 to 12	PSG3BXN##NP	PSG3BXG##NP
B3	4-way	02 to 12	PSM3BXN##NP	PSM3BXG##NP
B5	3-way	02 to 12	PSG5BXN##NP	PSG5BXG##NP
B5	4-way	02 to 12	PSM5BXN##NP	PSM5BXG##NP
B6	3-way	02 to 12	PSG6BXN##NP	PSG6BXG##NP
B6	4-way	02 to 12	PSM6BXN##NP	PSM6BXG##NP
B7, B8	4-way	02 to 12	PSM7BXN##NP	PSM7BXG##NP

Kits include: (1) manifold, valve hold down bolts, gaskets. For external pilot valve option "X", external manifold galley must be pressurized.

IEM Bar Manifold Add-A-Fold Assembly



Valve series	Valve function	## – Stations	Manifold assembly (NPT)	Manifold assembly (BSPP)
B3	3-way	02 to 12	AAPSG3BXN##NP	AAPSG3BXG##NP
B3	4-way	02 to 12	AAPSM3BXN##NP	AAPSM3BXG##NP
B5	3-way	02 to 12	AAPSG5BXN##NP	AAPSG5BXG##NP
B5	4-way	02 to 12	AAPSM5BXN##NP	AAPSM5BXG##NP
B6	3-way	02 to 12	AAPSG6BXN##NP	AAPSG6BXG##NP
B6	4-way	02 to 12	AAPSM6BXN##NP	AAPSM6BXG##NP
B7, B8	4-way	02 to 12	AAPSM7BXN##NP	AAPSM7BXG##NP

Kits include: (1) manifold, valve hold down bolts, gaskets and assembly. For external pilot valve option "X", external manifold galley must be pressurized.

How to Order: 1. List Add-A-Fold Assembly Part Number as line item 1

2. List the desired valves series part number in subsequent line items after the Add-A-Fold Assembly part number to complete the ordering code. Include all valves and blanking kits required. The left most station is station # 1 looking at the #12 end of the manifold.

Example: B3, 4-way manifold with station #1 blanked off with valves assembled

Line	Qty	Part number	Comment
1	1	AAPSM3BXN03NP	Add-A-Fold Assembly
2	1	PS2920P	Blank Plate - station 1
3	2	B3100BB549C	4-way B3 - station 2, 3

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

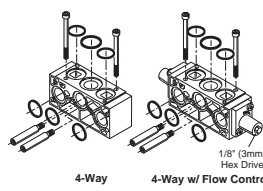
D

Inline Valve Products

IEM Stackable Manifolds

- Individual Manifold Bases stack together to form lightweight custom length manifold system.
- Easy-to-connect male / female tie rods for modular assembly.
- Utilizes B3 and B5 4-way Inline Valves.
- Low-cost built-in Flow Controls with heavy-duty brass adjusting needles to control meter-out exhaust flow.
- Accessories include Isolator Plugs for pressure isolation and Universal Blanking Plates for auxiliary inlet and exhaust supply and future valve additions.

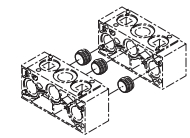
Series	Type	Kit number	
		Standard	Flow control
B3	4-way	PS2917P	PS2918P
B5	4-way	PS2817P	PS2818P



Kit includes: (1) manifold base, (2) hold-down bolts, tie-rods, gaskets and o-rings.

Isolator Plugs

Series	Description	Kit number
B3	4-way, IEM stackable	PS2919P
B5	4-way, IEM stackable	PS2819P

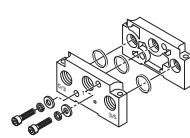


Used to isolate the #1, #3 or #5 gallery between two manifold bases. (IEM stackable only)

Kit includes: (3) plugs and (6) o-rings

End Plate Kits

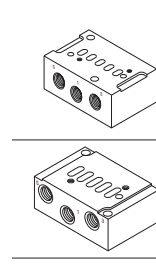
Series	Type	Kit number
B3	4-way, NPT	PS2915P
B5	4-way, NPT	PS2815P



Kit includes: right and left end plate, o-rings, socket head cap screws, flat washers and lockwashers.

Single Subbase, Subbase Valves Only

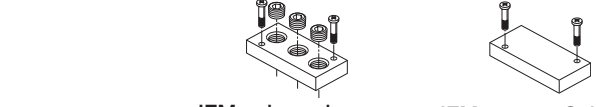
Series	Type	Kit number
B3	4-way, 1/4" NPT	PS2934P
B5	4-way, 3/8" NPT	PS2834P



Kit includes: (1) subbase.
 (Hold down bolts & gasket are included with valve.)

Blanking Plate

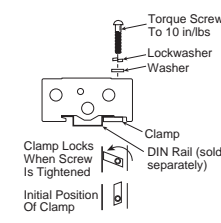
Series	Type	IEM universal		IEM Subbase	
		NPT	BSPP "G"	Blank	Blank
B3	3-way	PS2966P	PS2967P	PS2968P	—
	4-way	PS2920P	PS2921P	PS2969P	PS2994P
B5	3-way	PS2866P	PS2867P	PS2868P	—
	4-way	PS2820P	—	PS2869P	—
B6	3-way	PS2620P	—	—	—
	4-way	—	—	—	—
B7-B8	4-way	PS2520P	—	PS2569P	—



Kit includes: (1) plate, (2) screws, seal / gaskets

DIN Rail Hardware Kit

Valve type	IEM bar	Part number
B3	(2) Screws, (2) Nuts, (2) Clamps	PS2991P



Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

B3 Series

B3 1 0 B B 5 49 - C

Basic series	
B3 series	B3

Engineering level	
C	Current

Operator Function	
3-way	
Single solenoid, 2-position NC - air return	G
Single solenoid, 2-position NO - air return	H
Double solenoid, 2-position	J
Single remote pilot, 2-position NC - air return	K
Single remote pilot, 2-position NO - air return	L
Double remote pilot, 2-position	M
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X
Single remote pilot, 2-position NO - air return / spring assist	Y
4-way	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Single remote pilot, 2-position - air return	3
Double remote pilot, 2-position	4
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	8
Double remote pilot, 3-position - CE	9
Double remote pilot, 3-position - PC	0
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F

Options	
Blank	None
02	Solenoid rotated 180° - pins down

	Voltage [§]		
	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			24
53	120	110	
57	240	230	
XX	Remote pilot - M5 or valve less 15mm solenoid		
YY	Remote pilot - 5/32" (4mm) tube		

Enclosure / lead length	
0	None, remote pilot valve
5	15mm 3-pin DIN 43650C (male only)
X	Valve less 15mm solenoid

Overrides [§]	
0	None, remote pilot valve
B	Flush - non-locking
C	Flush - locking
D	Extended - non-locking
E	Extended - locking
X	Valve less 15mm solenoid

Port size / thread type	
3-way	
1/8" NPT inline	0*
1/8" BSPP "G" inline	5*
4-way	
1/8" NPT inline	0*
1/8" BSPP "G" inline	5*
1/4" NPT subbase	H†
1/8" NPT face mount	T**
Subbase valve less base	V‡

* Available for use on IEM Manifolds.
 ** 4-way only.
 ‡ Subbase valves available for 4-way valves only.

Pilot source / pilot exhaust	
0	None, remote pilot valve
B†	Internal - port #1 / vented
E*	Dual pressure - port #3 / vented
K†	External - body / tapped M5
X‡	External - manifold / vented

* Not available for 3-way Valves.
 † Not available for Remote Pilot Valves.
 ‡ See Pilot Source Note below.

§ Enclosure '5'
 - Override / Voltage Availability

S - Standard
 O - Option

Voltage code	Override code Standard			
	B	C	D	E
42	O	O	-	-
45	O	O	-	-
49	S	S	O	O
53	S	S	O	O
57	O	O	-	-

Voltage code	"02" Option			
	B	C	D	E
42	O	O	-	-
45	O	O	-	-
49	S	S	O	O
53	S	S	O	O
57	O	O	-	-

Pilot Source 'X'
 External-Manifold / Vented

INLINE & SUBBASE Valves -
 Only used IF an IEM or 5-Ported Subbase Aluminum Bar Manifold requires a common external pilot signal through the manifold for low pressure / vacuum applications OR when used with Sandwich Regulators.

Most popular.



Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

B5 Series

B5 1 1 B B 5 49 - C

Basic series
 B5 series **B5**

Engineering level
C Current

Operator function	
3-way	
Single solenoid, 2-position NC - air return	G
Single solenoid, 2-position NO - air return	H
Double solenoid, 2-position	J
Single remote pilot, 2-position NC - air return	K*
Single remote pilot, 2-position NO - air return	L*
Double remote pilot, 2-position	M*
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X*
Single remote pilot, 2-position NO - air return / spring assist	Y*
4-way	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Single remote pilot, 2-position - air return	3*
Double remote pilot, 2-position	4*
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	8*
Double remote pilot, 3-position - CE	9*
Double remote pilot, 3-position - PC	0*
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F*

* Pilot source/pilot exhaust, override, and enclosure must be "0".

Port Size / Thread Type	
3-way	
1/4" NPT inline	1*
3/8" NPT inline	2*
1/4" BSPP "G" inline	6*
3/8" BSPP "G" inline	7*
4-way	
1/4" NPT inline	1*
3/8" NPT inline	2*
1/4" BSPP "G" inline	6*
3/8" BSPP "G" inline	7*
3/8" NPT subbase	J†
1/4" NPT NAMUR mount	T‡
Subbase valve less base - NPT	V‡
1/4" BSPP "G" NAMUR mount	W‡

* Available for use on IEM manifolds.
 † 4-way only.
 ‡ Available with pilot source "0", "A", and "B" only.

Pilot Source / Pilot Exhaust	
Enclosures "0, 5 & X"	
None, remote pilot valve	0
Internal - port #1 / tapped M5	A†
Internal - port #1 / vented	B†
Dual pressure - port #3 / vented	E*
External - body / tapped M5	K†
External - manifold / vented	X†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - port #1 / tapped M5	A†
Internal - port #1 / vented	B†
Dual pressure - port #3 / tapped M5	D‡
External - body / tapped 1/8"	K†

* Not available for 3-way valves.
 † Not available for remote pilot valves.
 ‡ See pilot source note below.

Overrides§	
None. Remote pilot valve	0
No override	A†
Flush - non-locking	B*
Flush - locking	C
Extended - non-locking	D
Extended - locking	E*
Valve less 15mm solenoid	X

* Only available with encl. "5".
 † Only available with encl. "E".

Options	
Blank	None
02	Solenoid rotated 180° - pins down
MD††	Manual detent
VO*	Fluorocarbon seals

* Not available with enclosure "0", "5", "X", "E" or "F".
 †† Only available with operator function 1 & 3 and Enclosure "N", "X" or mobile voltages upon request.

	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			24
53	120	110	
57	240	230	
XX	Remote pilot - M5 or valve less solenoid		
YY	Remote pilot - 5/32" (4mm) tube		

Enclosure / lead length	
0	None, remote pilot valve
5	15mm 3-pin DIN 43650C (male only)
A	30mm square 3-pin - ISO 4400 form A (male only)
B	22mm rectangular 3-pin - type B industrial (male only)
C	3-pin automotive - mini
D	5-pin automotive - mini
E*	Intrinsically safe - 30mm 3-pin
F**	Hazardous duty 1/2" NPT conduit - 18" leads
G	Grommet - 18" leads
H	1/2" NPT conduit - 18" leads
N	Valve less "A-R" coil
Q†	Grommet - 72" leads
R	1/2" NPT conduit - 72" leads
X	Valve less 15mm solenoid

* 24 VDC & override "A" only.
 ** 12 VDC, 24 VDC, 120 VAC or 240 VAC.
 † 24 VDC only.

Note: for mobile voltages, contact the application team.

§ Enclosure '5' - Override / Voltage Availability

S - Standard
 O - Option

Voltage code	Override code Standard				Voltage code	Override code "02" Option			
	B	C	D	E		B	C	D	E
42	O	O	-	-	42	O	O	-	-
45	O	O	-	-	45	O	O	-	-
49	S	S	O	O	49	S	S	O	O
53	S	S	O	O	53	S	S	O	O
57	O	O	-	-	57	O	O	-	-

□ Most popular.

Pilot Source 'X'
 External-Manifold / Vented or Tapped M5

INLINE & SUBBASE Valves -
 Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal through the manifold for low pressure / vacuum applications.



B6 Series

B6 1 2 B B 5 49 - A

Basic series	
B6 series	B6

Engineering level	
A	Current

Operator function	
3-way	
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X
Single remote pilot, 2-position NO - air return / spring assist	Y
4-way	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Single remote pilot, 2-position - air return	3
Double remote pilot, 2-position	4
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	8
Double remote pilot, 3-position - CE	9
Double remote pilot, 3-position - PC	0
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F

Options	
Blank	None
02	Solenoid rotated 180° - pins down
42*	Series cylinder mount replacement

* Only available with port size "T" and "0", "A", "B", and "L" pilot source.

	Voltage [§]		
	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			24
53	120	110	
57	240	230	
XX	Remote pilot - M5 or valve less 15mm solenoid		
YY	Remote pilot - 5/32" (4mm) tube		

Port size / thread type	
3-way / 4-way	
3/8" NPT inline	2*
3/8" BSPP "G" inline	7*
3/8" NPT NAMUR mount	T†

*Available for use on IEM manifolds.

†4-way only. Available with pilot source "0", "A", "B" and "L" only.

Pilot source / pilot exhaust	
Enclosures "0, 5 & X"	
None. Remote pilot valve	0
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	B†
Dual pressure - port #5 / vented	H
External - Body / tapped M5	K†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	B†
External - Body / tapped 1/8"	K†

* Not available for 3-way valves.

† Not available for remote pilot valves.

Overrides [§]	
None, remote pilot valve	0
No override	A†
Flush - non-locking	B*
Flush - locking	C
Extended - non-locking	D
Extended - locking	E*
Valve less 15mm solenoid	X

* Only available with enclosure "5".

† Only available with enclosure "E".

Enclosure / lead length	
0	None, remote pilot valve
5	15mm 3-pin DIN 43650C (male only)
A	30mm square 3-pin - ISO 4400 form A (male only)
B	22mm rectangular 3-pin - Type B industrial (male only)
E*	Intrinsically safe - 30mm 3-pin
F**	Hazardous duty 1/2" NPT conduit - 18" leads
G	Grommet - 18" leads
H	1/2" NPT conduit - 18" leads
N	Valve less "A - R" coil
Q	Grommet - 72" leads
R	1/2" NPT conduit - 72" leads
X	Valve less 15mm solenoid

* 24 VDC & override "A" only.

** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

† 24 VDC only.

§ Enclosure '5' - Override / Voltage Availability

S - Standard

O - Option

Voltage code	Override code Standard				Voltage code	Override code "02" Option			
	B	C	D	E		B	C	D	E
42	O	O	-	-	42	O	O	-	-
45	O	O	-	-	45	O	O	-	-
49	S	S	O	O	49	S	S	O	O
53	S	S	O	O	53	S	S	O	O
57	O	O	-	-	57	O	O	-	-

INLINE Valves -
 Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal through the manifold for low pressure / vacuum applications.

Most popular.

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products



B7 & B8 Series

B7 1 3 A B G 53 - A

Basic series	
B7 series	B7
B8 series	B8

Engineering level	
A	Current

Options	
Blank	None

Operator function	
3-way	
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X
Single remote pilot, 2-position NO - air return / spring assist	Y
4-way	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Single remote pilot, 2-position - air return	3
Double remote pilot, 2-position	4
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	8
Double remote pilot, 3-position - CE	9
Double remote pilot, 3-position - PC	0
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F

	Voltage [§]		
	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			24
53	120	110	
57	240	230	
XX	Remote pilot - M5 or valve less solenoid		
YY	Remote pilot - 5/32" (4mm) tube		

Enclosure / lead length	
0	None, remote pilot valve
5	15mm 3-pin DIN 43650C (male only)
A	30mm square 3-pin - ISO 4400 form A (male only)
B	22mm rectangular 3-pin - Type B industrial (male only)
E*	Intrinsically safe - 30mm 3-pin
F**	Hazardous duty 1/2" NPT conduit - 18" leads
G	Grommet - 18" leads
H	1/2" NPT conduit - 18" leads
N	Valve less "A - R" coil
R	1/2" NPT conduit - 72" leads
X	Valve less 15mm solenoid

* 24 VDC & Override "A" only.

** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

Port size / thread type	
B7 series	
1/2" NPT inline	3*
1/2" BSPP "G" inline	8*
B8 series	
3/4" NPT inline	4*
3/4" BSPP "G" inline	9*

* Available for use on IEM manifolds.

Pilot source / pilot exhaust	
Enclosures "0, 5 & X"	
None. Remote pilot valve	0
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	B†
External - Body / tapped M5	K†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	B†
External - Body / tapped 1/8"	K†

† Not available for remote pilot valves.

Overrides [§]	
None, remote pilot valve	0
No override	A†
Flush - non-locking	B*
Flush - locking	C
Extended - non-locking	D
Extended - locking	E*
Valve less 15mm solenoid	X

* Only available with encl. "5".

† Only available with encl. "E".

§ Enclosure '5' - Override / Voltage Availability

S - Standard

O - Option

Voltage code	Override code			
	B	C	D	E
42	O	O	-	-
45	O	O	-	-
49	S	S	O	O
53	S	S	O	O
57	O	O	-	-

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

INLINE Valves -

Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal through the manifold for low pressure / vacuum applications.



Voltage		Enclosure "5"			Voltage		Enclosure "A"			Enclosure "B" to "R"		
AC		Power consumption	Holding (Amps)	Code	AC		Power consumption	Holding (Amps)	Power consumption	Holding (Amps)	Code	
60Hz	50Hz				60Hz	50Hz						
42	24	22	1.6VA	.065	42	24	22	3.9VA	.136	7.3VA	.309	
45		12	1.2W	.098	45		12	2.6W	.208	4.6W	.365	
47*		12	0.91W	.074	47*		12	—	—	4.9W	.298	
48*		24	0.91W	.033	48*		24	—	—	4.8W	.142	
49		24	1.2W	.049	49		24	2.7W	.112	4.8W	.200	
53	120	110	1.6W	.013	53	120	110	4.1VA	.033	6.3VA	.047	
57	240	230	1.6W	.007	57	240	230	3.7VA	.017	6.4VA	.026	

Note: For enclosure "5" with "02" Option, solenoid wattage is 1.8W (2.4VA). Response time is 10% faster. Voltage rated +10 / -15%.

* 47 and 48 code are mobile voltages. voltage +25 / -30%.

15mm 3-Pin DIN 43650C

Description	Cord length	Connector	
		Connector with cord	Connector only
Unlighted	18 Inches	PS2932BP	PS2932HBP
Unlighted	6 Feet	PS2932BP	PS2932JBP
Light – 12VAC or DC	6 Feet	PS294675BP	PS2946J75BP*
Light – 24VAC or DC	6 Feet	PS294679BP	PS2946J79BP*
Light – 110/120VAC	6 Feet	PS294683BP	PS2946J83BP*
Light – 240/230VAC		PS294687BP	N/A

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:

- Conductors: 2 poles plus ground
- Cable range (connector only): 4 to 6mm (0.16 To 0.24 Inch)
- Contact spacing: 8mm

15mm 3-Pin DIN 43650C to 1/2" Conduit

Description	Connector
1/2" NPTF conduit – Unlighted with 3' (1m) leads 20 AWG wire	PS2998P

Note: Rated up to 250VAC or VDC; 6 amps IP65 rated when properly installed.

30mm Square 3-Pin – ISO 4400, DIN 43650A (Use with Enclosure "A")

Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	PS2028BP
Light – 6-48V, 50/60Hz, 6-48VDC	PS2032J79CP*	PS203279BP
Light – 120V/60Hz	PS2032J83CP*	PS203283BP
Light – 240V/60Hz	N/A	PS203283BP

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:

- Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm

22mm Rectangular 3-Pin – Type B Industrial (Use with Enclosure "B")

Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2429JBP	PS2429BP
Light – 24V60Hz, 24VDC	PS2430J79BP*	PS243079BP
Light – 120V/60Hz	PS2430J83BP*	PS243083BP
Light – 240V/60Hz	N/A	PS243087BP

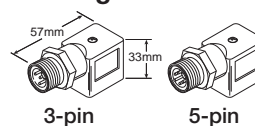
* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering Data:

- Conductors: 2 Poles Plus Ground; Cable Range (Connector Only): 6 to 8mm (0.24 to 0.31 Inch); Contact Spacing: 11mm

3-Pin / 5-Pin Male Automotive Connectors (Use on 22mm Rectangular 3-Pin Solenoid)



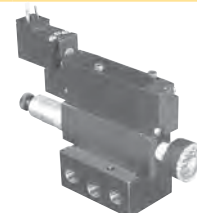
Description	3-pin	5-pin
Unlighted	PS2893CP	PS2893DP
Lighted - Voltage	PS2893C##P	PS2893D##P

– 79 = 6 to 48VAC/VDC

83 = 100 to 240VAC/48 to 120 VDC

Sandwich Regulators

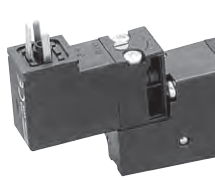
- Use with B3 subbase valves on 5-ported subbase bar manifolds.
- Common port or dual port regulation control.
- Unregulated pressure supplied to valve pilot - use pilot source - 'X'.
- Easy adjust knob control.



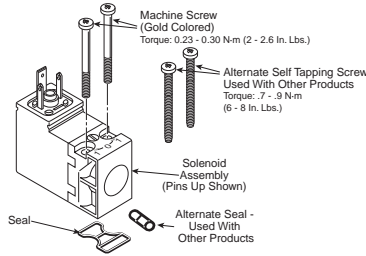
Pressure range	Cv	Common port with gauge *	Dual port without gauge
5-125 PSI	.33	PS2930166P	PS2930233P

* Gauge is 160 PSI. Gauge shipped unassembled. For different gauge mounting configuration, use brass adapters listed at bottom of page.

Solenoid Kits – B3 ‘C’, B5 ‘C’, B6 ‘A’, B7 ‘A’, B8 ‘A’ 3-Pin, EN175301-803 (Former DIN 43650C), 15mm



Standard



“02” Option

PS2982*##P – Enclosure ‘5’

	## Voltage						
Override	42	45	47*	48*	49	53	57
B	O	O	-	-	S	S	O
C	O	O	-	-	S	S	O
D	-	-	O	O	O	O	-
E	-	-	O	O	O	O	-

S - Standard; O - Option

* Mobile voltage

Kit includes: Solenoid, (2) machine screws, (2) self threading screws, (1) gasket, (1) 3-cell gasket.

PS3541*##P – Enclosure ‘5 with “02” Option

	## Voltage				
Override	42	45	49	53	57
B	O	O	S	S	O
C	O	O	S	S	O
D	-	-	O	O	-
E	-	-	O	O	-

Solenoid Kits Alternate Enclosures

P2FC A 4 49

Enclosures / lead length	
30mm square 3-pin – ISO 4400 form A (male only)	A
22mm rectangular 3-pin – type B industrial (male only)	B
Hazardous duty, FM / CSA	F*
Grommet - 18" leads	G
1/2" NPT conduit - 18" leads	H
Grommet 72" leads	Q
1/2" Conduit 72" leads	R

Voltage / frequency	
42	24VAC
45	12VDC
47*	12 VDC mobile
48*	24 VDC mobile
49	24VDC
53	120VAC
57	240VAC

* Only available with enclosures "A", "B" & "G".

* Only available with voltage codes "45", "49", "53" & "57".



Option A & E
 30mm Square
 3-pin ISO 4400, DIN 43650A



Option B
 22mm Rectangular
 3-pin DIN, Type B Industrial



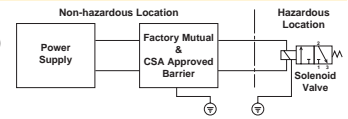
Option G & Q
 Grommet, 18" or 72" Leads



Option F, H & R
 1/2" Conduit, 18" or 72" Leads

Intrinsically Safe Solenoid Valves (“E” Option)

Hazardous Location Class:
 Class I; Groups A, B, C & D
 Class II; Groups E, F, & G
 Class III; Div. I



For use in low voltage (24VDC) Intrinsically Safe applications.
NO OTHER VOLTAGE IS APPROVED.

36mm coil width.
 Comes standard with non-lighted solenoid connector.
Must be connected to an FM approved Barrier.

For dimensions, reference standard solenoid models.
 Maximum internally piloted valve pressure is 115 PSIG.
 Pressures to 145 PSIG can be used when external pilot is utilized and pilot pressure is limited to 115 PSIG.

Intrinsically Safe Solenoid Pilot Assembly Kits

Description	Part number
24VDC	P2FS13N1AE49

Hazardous Duty Solenoid Valves (“F” Option)

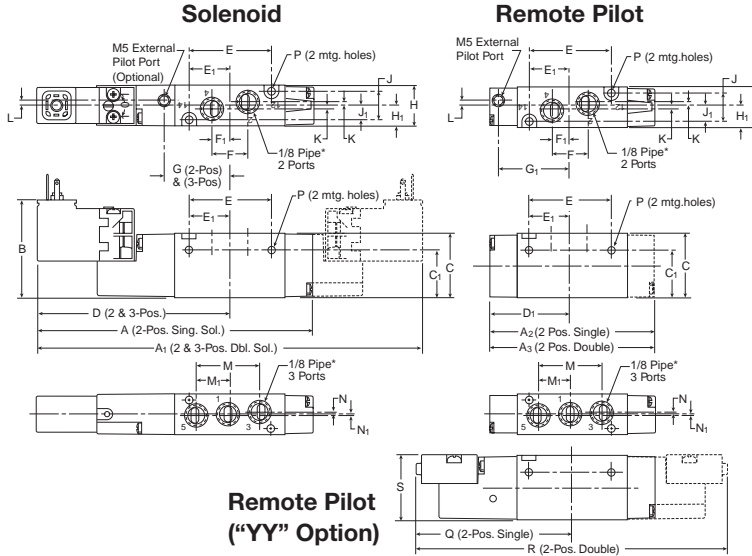
Hazardous Location Class:
 Class I; Zone I EX, M, II & T4
 Class I; Div. I. Groups A, B, C, & D
 Class II & III; Div. I. Groups E, F, & G



Comes standard with 1/2" conduit connection.
 Voltage range = ± 10%
 Ambient temperature range = -20°C (-4°F) to 60°C (140°F)
 Duty factor = 100%

- Notes:**
- Maximum non-hazardous location voltage not to exceed 250V RMS.
 - Connect per Barrier Manufacturers instructions.
 - Factory Mutual requires connections per ISA RP 12.6 instructions.
 - CSA requires "Installation to be in accordance with the Canadian Electrical Code. Part I."
 - The hazardous duty coils are wider in size than both the B5 and the B6 valve.
 If mounted on a manifold, the valves need to be staggered to fit.

B3 Single & Double Operators – 4-way Inline

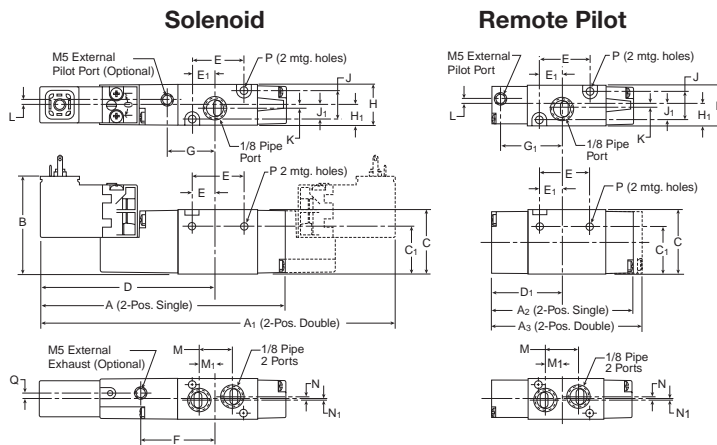


B3 4-way Inline

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	1.66 (42)
C	C1	D	D1	E
1.13 (39)	.84 (21)	3.22 (82)	1.66 (42)	1.47 (37)
E1	F	F1	G	G1
.74 (19)	.63 (16)	.32 (8)	1.13 (29)	1.50 (38)
H	H1	J	J1	K
.71 (18)	.36 (9)	.51 (13)	.26 (7)	.06 (2)
L	M	M1	N	N1
.11 (3)	1.12 (28)	.56 (14)	.05 (1)	.05 (1)
P	Q	R	S	
∅ .13 (3.3)	2.69 (68)	5.37 (136)	1.16 (29)	

Inches (mm)

B3 Single & Double Operators – 3-way Inline

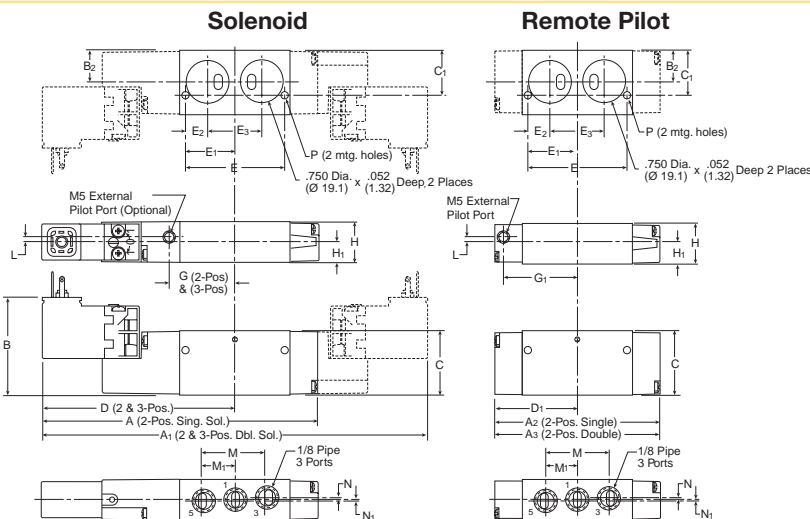


B3 3-way Inline

A	A1	A2	A3	B
4.20 (107)	5.96 (151)	2.65 (67)	2.86 (73)	1.66 (42)
C	C1	D	D1	E
1.13 (39)	.84 (21)	2.93 (74)	1.38 (35)	.98 (25)
E1	F	G	G1	H
.44 (11)	1.32 (34)	.85 (22)	1.22 (31)	.71 (18)
H1	J	J1	K	L
.36 (9)	.51 (13)	.26 (7)	.06 (2)	.11 (3)
M	M1	N	N1	P
.63 (16)	.27 (7)	.12 (3)	.06 (2)	∅ .13 (3.3)
Q				
.08 (2)				

Inches (mm)

B3 Single & Double Operators – 4-way Face Mount



B3 4-way Face Mount

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	1.66 (42)
B2	C	C1	D	D1
.58 (15)	1.13 (29)	.81 (21)	3.22 (82)	1.66 (42)
E	E1	E2	E3	G
1.74 (44)	.87 (22)	.39 (10)	.95 (24)	1.13 (29)
G1	H	H1	L	M
1.50 (38)	.71 (18)	.36 (9)	.11 (3)	1.12 (28)
M1	N	N1	P	
.56 (14)	.05 (1)	.05 (1)	∅ .13 (3.3)	

Inches (mm)



Viking Lite Series
 Viking Xtreme Series

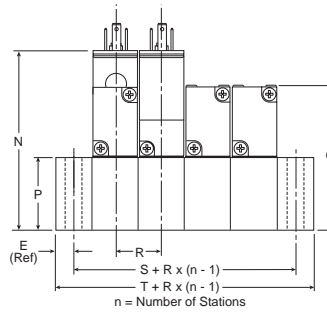
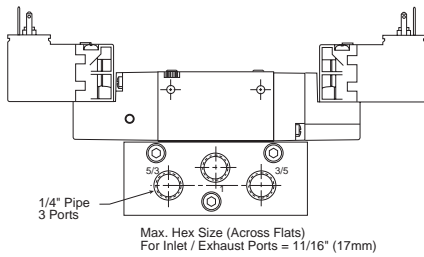
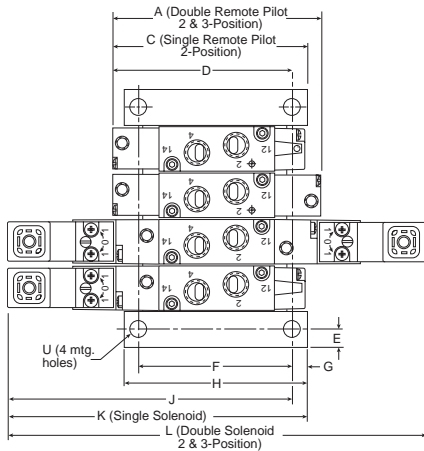
B Series

ADEX Series

N Series

D
 Inline Valve Products

B3 Single & Double Operators – 4-way IEM Stackable



B3 4-way IEM Stackable

A	C	D	E	F
3.33 (84.6)	3.12 (79.2)	2.91 (73.9)	.30 (7.6)	2.49 (63.3)
G	H	J	K	L
.25 (6.4)	3.00 (76.2)	4.46 (113.3)	4.67 (118.6)	6.43 (163.3)
N	P	Q	R	
2.91 (73.9)	1.25 (31.8)	2.38 (60.5)	.74 ±.01 (18.8) ± .3	
S	T	U		
1.34 (34.0)	1.94 (49.3)	Ø .28 Ø (7.1)		

Inches (mm)

Viking Lite
Series

Viking Xtreme
Series

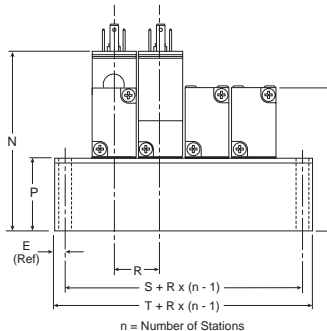
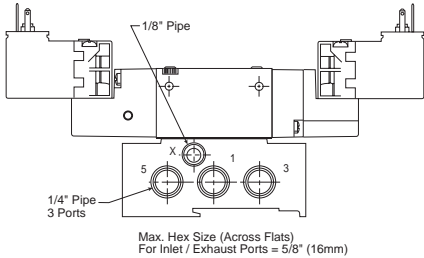
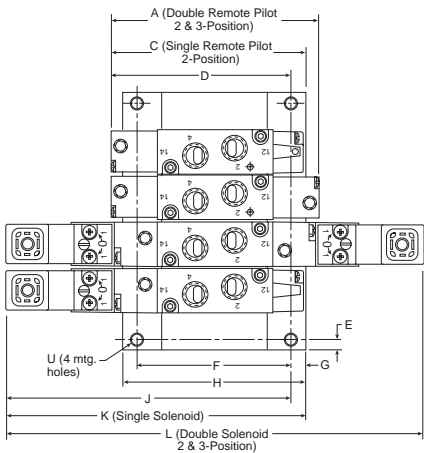
B
Series

ADEX
Series

N
Series

D
Inline
Valve Products

B3 Single & Double Operators – 4-way IEM Aluminum Bar

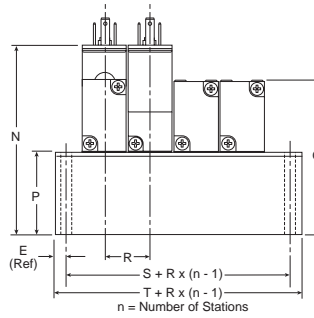
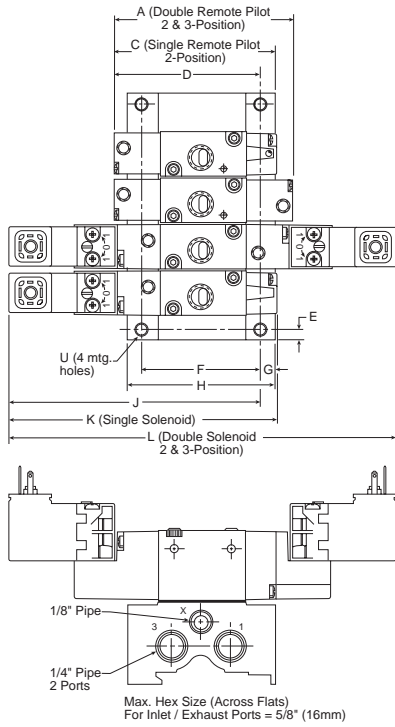


**B3 4-way IEM Aluminum
Bar Manifold**

A	C	D	E	F
3.33 (84.6)	3.17 (80.5)	2.94 (74.7)	.25 (6.4)	2.54 (64.5)
G	H	J	K	L
.23 (5.9)	3.00 (76.2)	4.50 (114.2)	4.73 (120.1)	6.43 (163.3)
N	P	Q	R	S
2.94 (74.7)	1.28 (32.5)	2.41 (61.2)	.81 (20.5)	1.13 (28.8)
T	U			
1.64 (41.6)	Ø .23 Ø (5.8)			

Inches (mm)

B3 Single & Double Operators – 3-way IEM Aluminum Bar

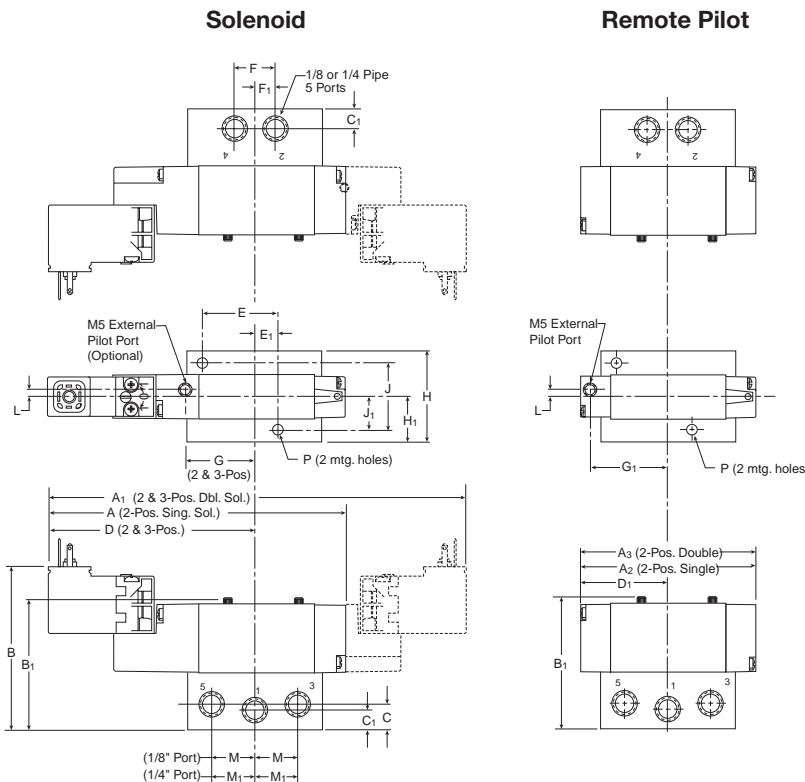


B3 4-way IEM Aluminum Bar Manifold

A	C	D	E	F
2.86 (72.6)	2.65 (67.3)	2.33 (59.2)	.25 (6.4)	1.80 (45.7)
G	H	J	K	L
.23 (5.9)	2.25 (57.2)	3.88 (98.6)	4.20 (106.7)	5.96 (151.4)
N	P	Q	R	S
2.93 (74.5)	1.27 (32.4)	2.40 (61.1)	.81 (20.5)	1.13 (28.8)
T	U			
1.64 (41.6)	Ø .23 (5.8)			

Inches (mm)

B3 Single & Double Operators – 4-way Single Subbase



B3 4-way Single Subbase

A	A ₁	A ₂	A ₃	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	2.63 (67)
B ₁	C	C ₁	D	D ₁
2.21 (56)	.47 (12)	.37 (9)	3.22 (82)	1.66 (42)
E	E ₁	F	F ₁	G
1.25 (32)	.38 (10)	.69 (18)	.34 (9)	1.13 (29)
G ₁	H	H ₁	J	J ₁
1.50 (38)	1.50 (38)	.75 (19)	1.12 (28)	.56 (14)
L	M	M ₁	P	
.11 (3)	.71 (18)	.76 (19)	Ø .18 (4)	Ø (4)

Inches (mm)

Viking Lite Series

Viking Xtreme Series

B Series

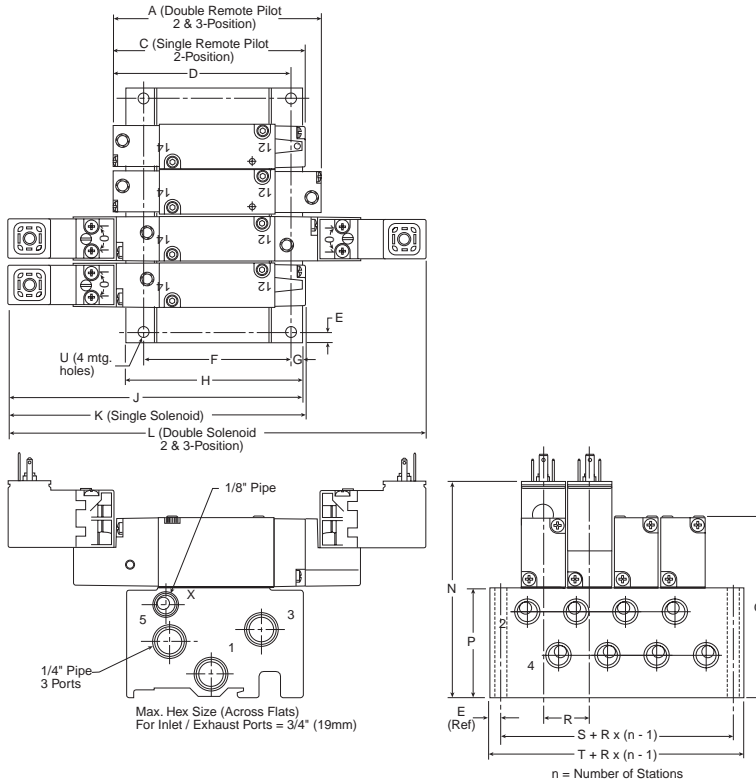
ADEX Series

N Series

D

Inline Valve Products

B3 Single & Double Operators – 5-port Subbase Bar Manifold



B3 5-port Subbase Bar Manifold

A	C	D	E	F
3.33 (84.6)	3.12 (79.2)	2.88 (73.2)	.25 (6.3)	2.43 (61.7)
G	H	J	K	L
.22 (5.5)	2.93 (74.5)	4.66 (118.3)	4.67 (118.6)	6.43 (166.3)
N	P	Q	R	S
3.47 (88.2)	1.81 (46.0)	2.94 (74.7)	.81 (20.5)	1.39 (35.4)
T	U			
1.89 (48.0)	Ø .22 Ø (5.6)			

Inches (mm)

Viking Lite Series

Viking Xtreme Series

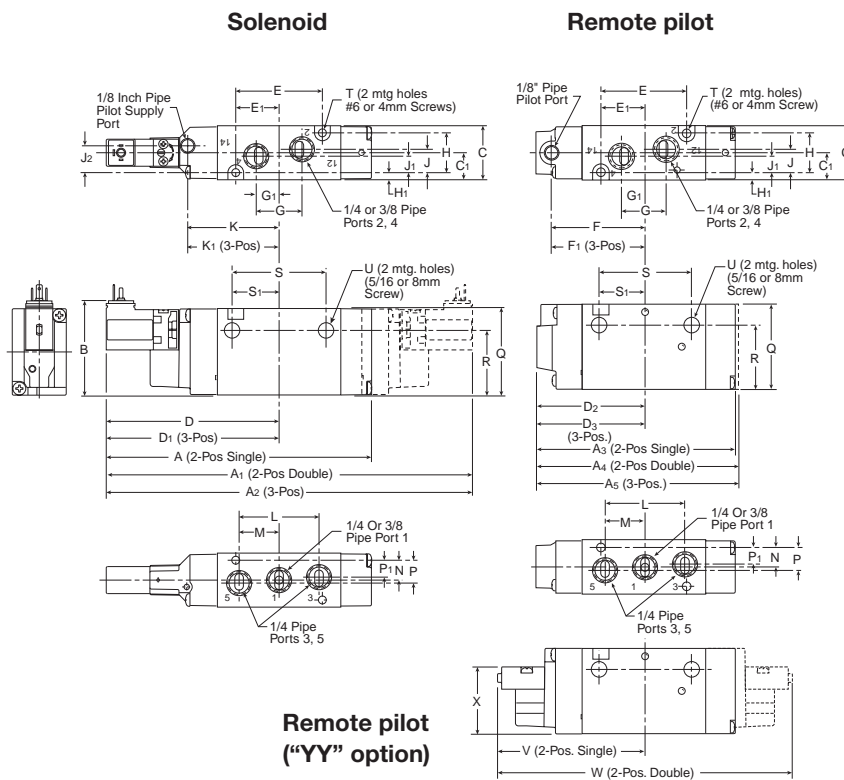
B Series

ADEX Series

N Series

D Inline Valve Products

B5 Single & Double Operators – 4-way Inline



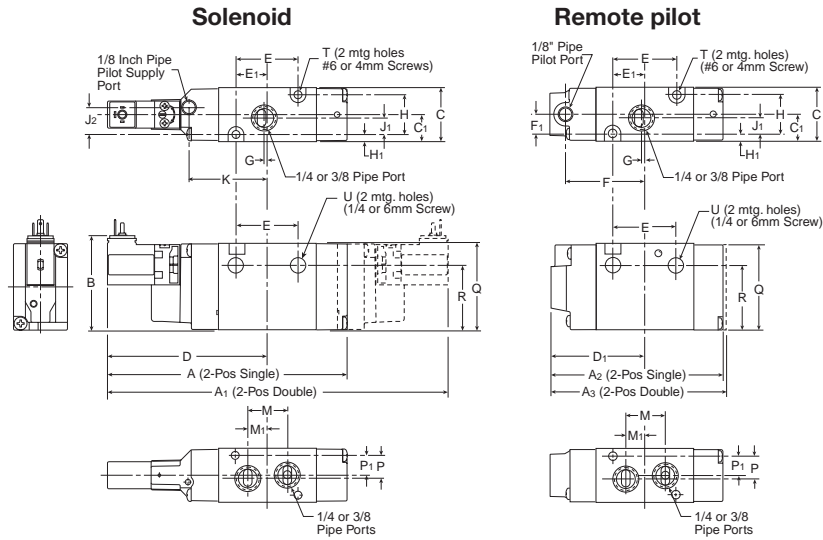
B5 4-way Inline

A	A₁	A₂	A₃	A₄
5.78 (147)	7.51 (191)	8.45 (215)	4.37 (110)	4.70 (119)
A₅	B	C	C₁	D
5.64 (143)	2.06 (52)	1.18 (30)	.59 (15)	3.76 (96)
D₁	D₂	D₃	E	E₁
4.23 (107)	2.35 (60)	2.82 (72)	1.89 (48)	.95 (24)
F	F₁	G	G₁	H
2.01 (51)	2.47 (63)	1.00 (25)	.50 (13)	.87 (22)
H₁	J	J₁	J	K
.16 (4)	.51 (13)	.36 (9)	.58 (15)	2.00 (51)
K₁	L	M	N	P
2.47 (63)	1.75 (44)	.88 (22)	.43 (48)	.50 (13)
P₁	Q	R	S	S₁
.37 (92)	1.89 (48)	1.41 (36)	2.05 (52)	1.03 (26)
T	U	V	W	X
Ø .177 Ø (4.5)	Ø .34 Ø (9)	3.24 (82)	6.48 (165)	1.50 (383)

Inches (mm)



B5 Single & Double Operators – 3-way Inline

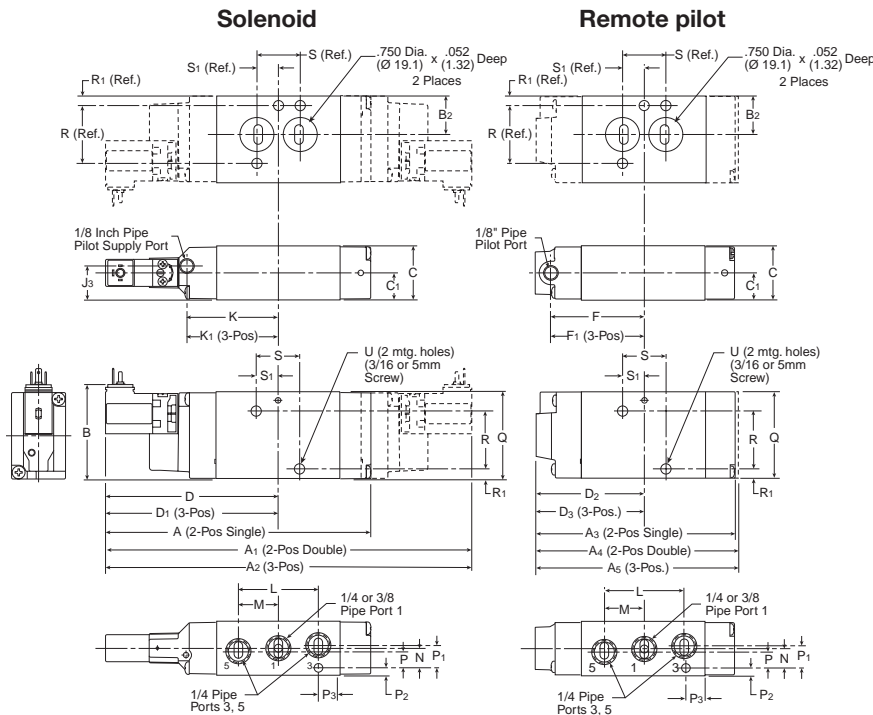


B5 3-way Inline

A 5.29 (134)	A₁ 7.03 (179)	A₂ 3.88 (99)	A₃ 4.21 (107)	B 2.06 (52)
C 1.18 (30)	C₁ .59 (15)	D 3.43 (87)	D₁ 2.11 (54)	E 1.40 (36)
E₁ .70 (18)	F 1.77 (45)	F₁ .43 (11)	G .06 (2)	H .87 (22)
H₁ .16 (4)	J₁ .36 (9)	J₂ .58 (15)	K 1.67 (42)	M .88 (22)
M₁ .44 (11)	P .50 (13)	P₁ .37 (9)	Q 1.89 (48)	R 1.41 (36)
T Ø .177 Ø (4.5)		U Ø .26 Ø (6.6)		

Inches (mm)

B5 Single & Double Operators – 4-way NAMUR Mount

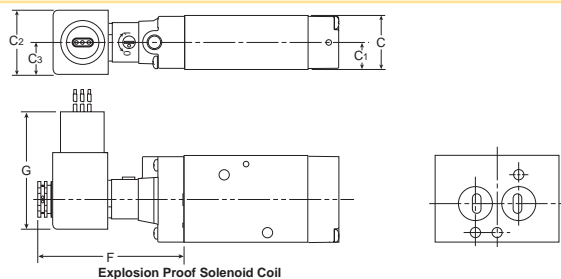


B5 4-way NAMUR Mount

A 5.78 (147)	A₁ 7.51 (191)	A₂ 8.45 (215)	A₃ 4.37 (110)	A₄ 4.70 (119)
A₅ 5.64 (143)	B 2.06 (52)	B₂ .84 (21)	C 1.18 (30)	C₁ .59 (15)
D 3.76 (96)	D₁ 4.23 (107)	D₂ 2.35 (60)	D₃ 2.82 (72)	F 2.01 (51)
F₁ 2.47 (63)	J₃ .74 (19)	K 2.00 (51)	K₁ 2.47 (63)	L 1.75 (44)
M .88 (22)	N .44 (11)	P .37 (9.4)	P₁ .50 (13)	P₂ .16 (4)
P₃ .40 (10)	Q 1.89 (48)	R 1.26 (32)	R₁ .21 (5)	S .94 (24)
S₁ .47 (12)		U Ø .224 Ø (5.7)		

Inches (mm)

B5 Alternative Electrical Enclosure Option F



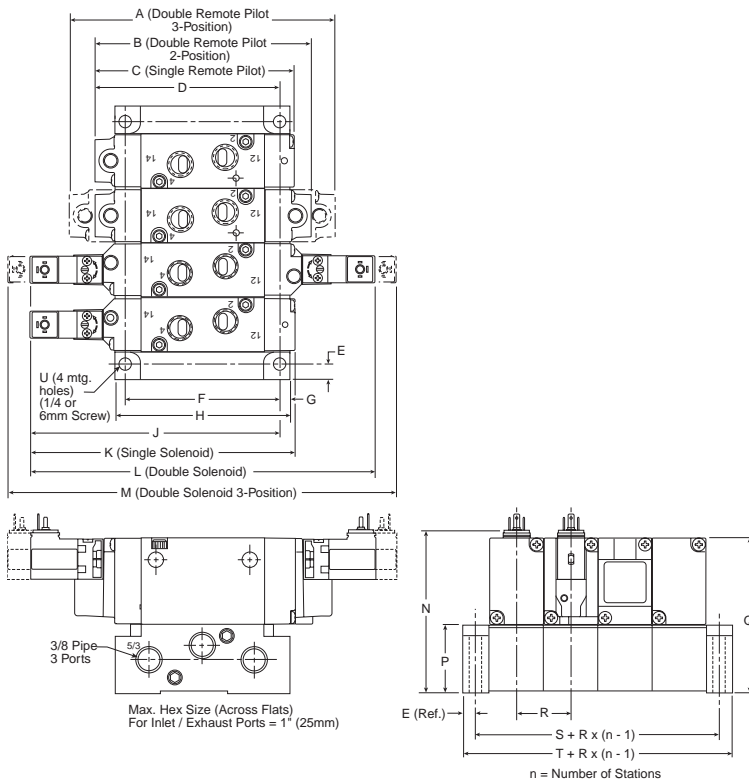
B5 4-way NAMUR Mount with Option F Enclosure

C 1.18 (30)	C₁ .59 (15)	C₂ 1.42 (36)	C₃ .71 (18)	F 3.15 (80)
G 2.60 (66)				

Inches (mm)



B5 Single & Double Operators – 4-way IEM Stackable

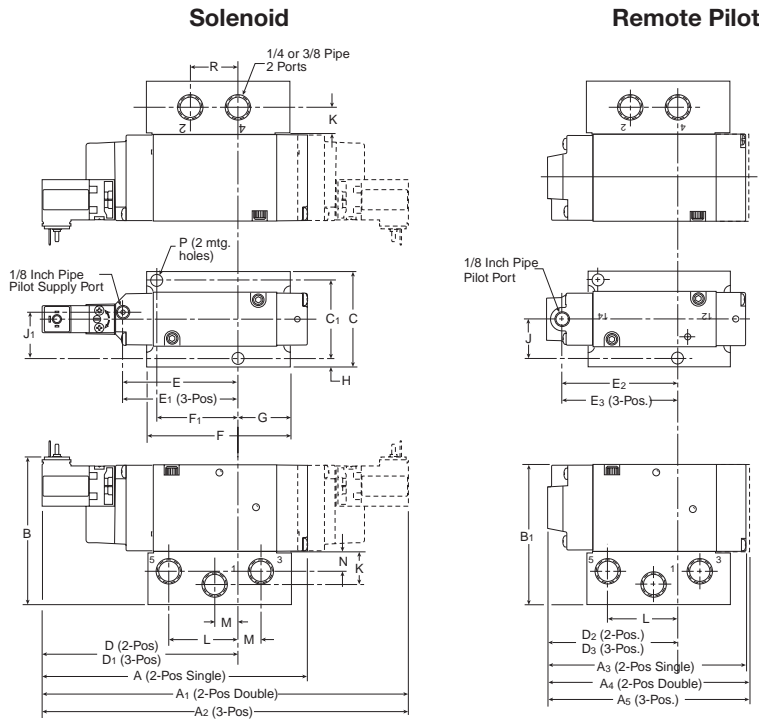


B5 4-way IEM Stackable

A	B	C	D	E
5.64 (143.3)	4.70 (119.4)	4.37 (110.0)	4.29 (109.0)	.29 (7.4)
F	G	H	J	K
3.44 (87.4)	.24 (6.1)	3.92 (99.6)	5.48 (139.2)	5.78 (146.8)
L	M	N	P	Q
7.52 (191.0)	8.46 (214.9)	3.56 (90.4)	1.50 (38.1)	3.42 (86.9)
R	S	T	U	
1.21 ± .01 (30.7) ± (.3)	1.79 (45.5)	2.37 (60.2)	Ø .28 (7.1)	

Inches (mm)

B5 Single & Double Operators – 4-way Single Subbase

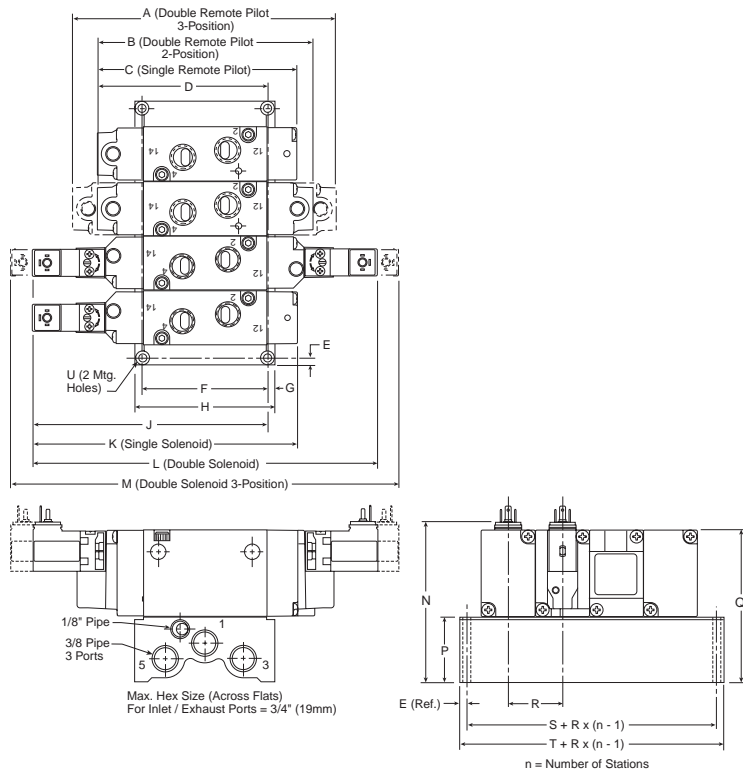


B5 4-way Subbase

A	A ₁	A ₂	A ₃	A ₄
5.78 (147)	7.52 (191)	8.46 (215)	4.37 (110)	4.70 (119)
A ₅	B	B ₁	C	C ₁
5.64 (143)	3.21 (82)	3.03 (77)	2.12 (54)	1.69 (43)
D	D ₁	D ₂	D ₃	E
4.26 (108)	4.73 (120)	2.85 (72)	3.32 (40)	2.51 (65)
E ₁	E ₂	E ₃	F	F ₁
2.98 (76)	2.60 (66)	3.07 (80)	2.90 (74)	1.69 (43)
G	H	J	J ₁	K
.95 (24)	.22 (5)	.84 (21)	.99 (25)	.71 (18)
L	M	N	P	R
1.50 (38)	.50 (13)	.46 (12)	Ø .27 (7)	1.00 (25)

Inches (mm)

B5 Single & Double Operators – 4-way IEM Aluminum Bar

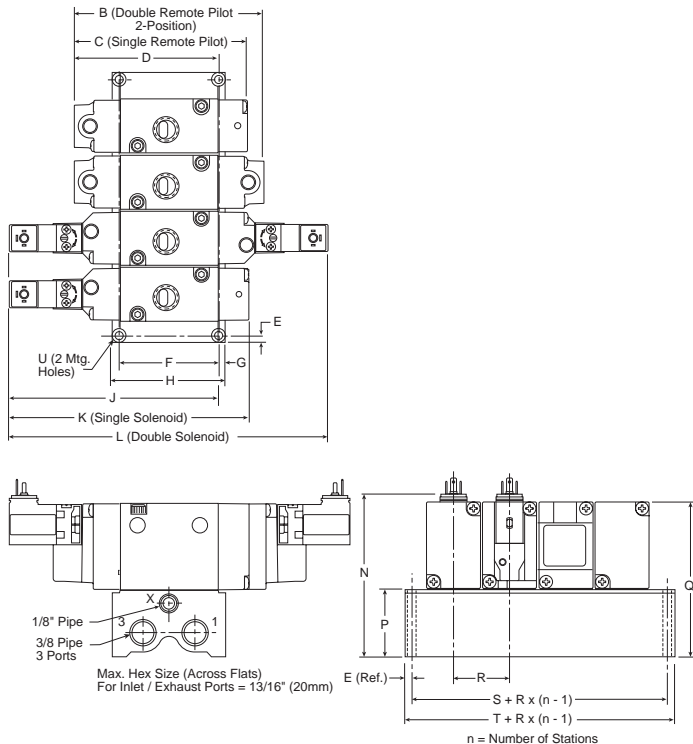


B5 4-way IEM Aluminum Bar Manifold

A	B	C	D	E
5.64 (143.3)	4.70 (119.4)	4.37 (110.0)	3.74 (95.0)	.18 (4.6)
F	G	H	J	K
2.78 (70.6)	.17 (4.3)	3.12 (79.2)	5.15 (130.8)	5.78 (146.8)
L	M	N	P	Q
7.52 (191.0)	8.46 (214.9)	3.50 (89.0)	1.44 (36.6)	3.36 (85.3)
R	S	T	U	
1.26 (32.0)	1.78 (45.2)	2.14 (54.4)	Ø .22 Ø (5.5)	

Inches (mm)

B5 Single & Double Operators – 3-way IEM Aluminum Bar



B5 3-way IEM Aluminum Bar Manifold

B	C	D	E	F
4.21 (106.9)	3.88 (98.6)	3.41 (86.6)	.18 (4.6)	2.12 (53.8)
G	H	J	K	L
.17 (4.3)	2.46 (62.5)	4.82 (122.4)	5.29 (134.4)	7.03 (178.6)
N	P	Q	R	S
3.50 (89.0)	1.44 (36.6)	3.36 (85.3)	1.26 (32.0)	1.76 (44.7)
T	U			
2.12 (53.8)	Ø .18 Ø (4.6)			

Inches (mm)

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

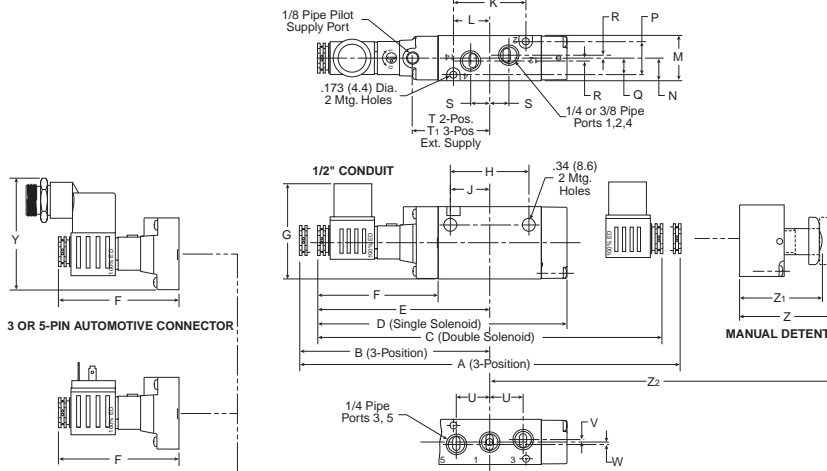
N Series

D Inline Valve Products

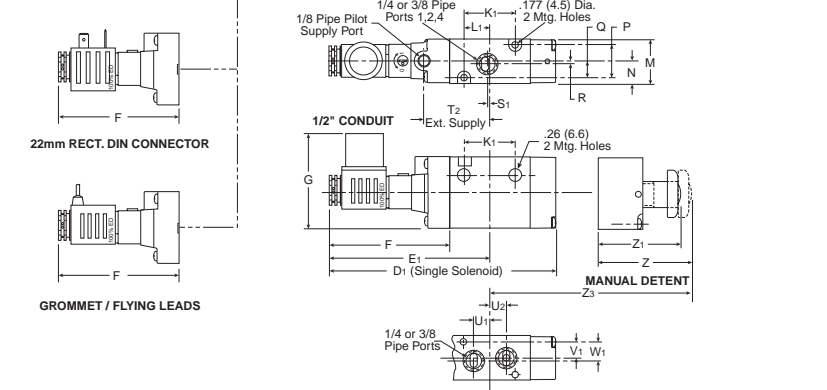


B5 3 & 4-way Alternative Electrical Enclosures

4-way



3-way



B5 Alternative – Electrical Enclosures

A	A1	B	C	D
9.94 (252.5)	.872 (221.4)	4.97 (126.2)	9.00 (228.6)	6.52 (165.6)
D1	E	E1	F	G
6.02 (152.9)	4.50 (114.3)	4.26 (108.1)	3.15 (80.0)	2.47 (62.8)
H	J	K	K1	L
2.05 (52.1)	1.03 (26.2)	1.89 (48.0)	1.40 (35.5)	.95 (24.1)
L1	M	N	P	Q
.70 (17.8)	1.18 (30.0)	.59 (15.0)	.87 (22.1)	.43 (10.9)
R	S	S1	T	T1
.08 (2.0)	.50 (12.7)	.06 (1.5)	2.01 (51.1)	2.47 (62.7)
T2	U	U1	U2	V
1.76 (44.8)	.87 (22.1)	.43 (10.9)	.45 (11.3)	.06 (1.5)
V1	W	W1	Y	Z
.37 (9.3)	.07 (1.8)	.50 (13)	2.90 (73.6)	2.40 (60.9)
Z1	Z2	Z3		
2.12 (53.8)	3.75 (95.2)	4.17 (105.8)		

Inches (mm)

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

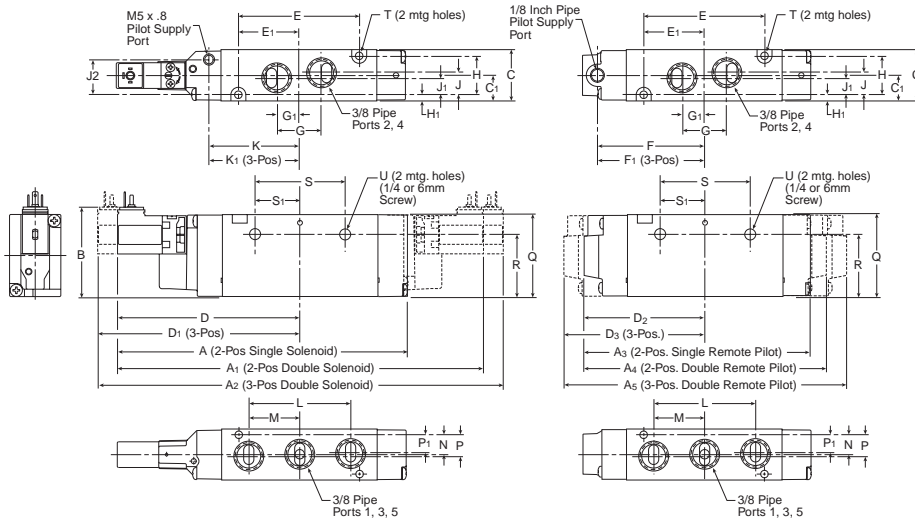
D

Inline Valve Products

B6 Single & Double Operators – 4-way Inline

Solenoid

Remote pilot



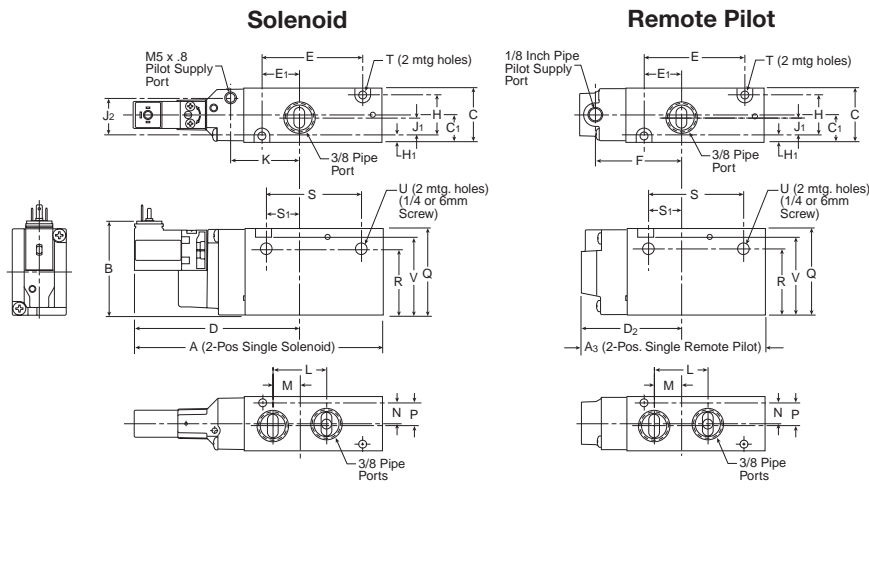
B6 4-way Inline

A	A1	A2	A3	A4
6.67 (169.5)	8.41 (213.7)	9.35 (237.6)	5.26 (133.7)	5.59 (142.1)
A5	B	C	C1	D
6.54 (166)	2.06 (52)	1.18 (30.0)	.59 (15)	4.21 (106.8)
D1	D2	D3	E	E1
4.68 (118.8)	2.80 (71)	3.27 (83.0)	2.79 (70.8)	1.39 (35.4)
F	F1	G	G1	H
2.45 (62.3)	2.92 (74.3)	1.03 (26.1)	.51 (13.1)	.91 (23)
H1	J	J1	J2	K
.14 (3.5)	.51 (13.1)	.39 (10)	.81 (20.6)	2.09 (53)
K1	L	M	N	P
2.56 (64.9)	2.34 (59.4)	1.17 (29.7)	.45 (11.5)	.49 (12.5)
P1	Q	R	S	S1
.41 (10.5)	1.89 (48)	1.45 (36.8)	2.09 (53)	1.04 (26.5)
T	U			
Ø .17 Ø (4.4)	Ø .27 Ø (6.9)			

Inches (mm)



B6 Single Operators – 3-way Inline

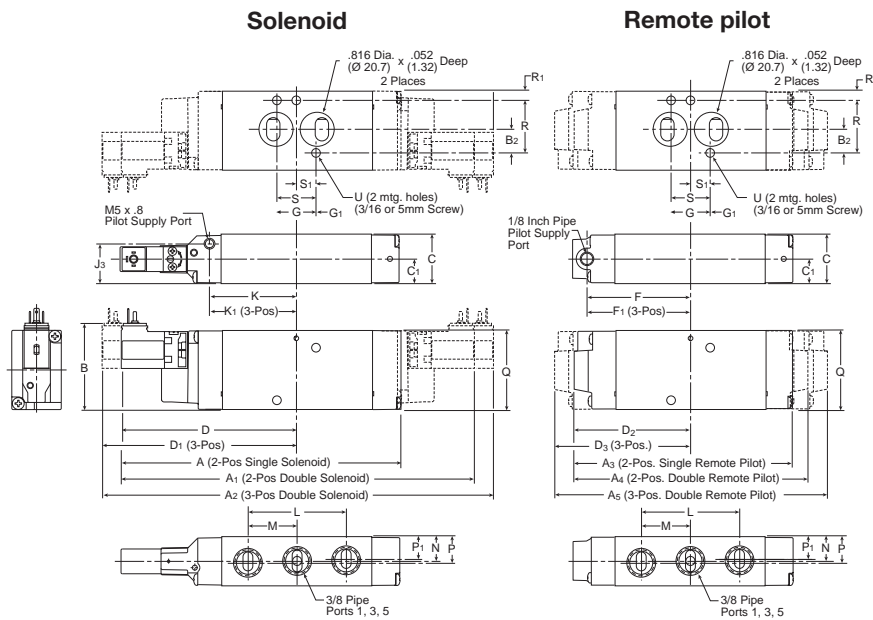


B6 3-way Inline

A 5.42 (137.7)	A3 4.01 (101.9)	B 2.06 (52)	C 1.18 (30.0)	C1 .59 (15.0)
D 3.63 (92.1)	D2 2.22 (56.3)	E 2.19 (55.6)	E1 0.82 (20.7)	F 1.87 (47.6)
H .91 (23.0)	H1 .14 (3.5)	J1 .39 (10.0)	J2 .81 (20.6)	K 1.51 (38.3)
L 1.17 (29.7)	M .59 (15.0)	N .45 (11.5)	P .49 (12.5)	Q 1.89 (48.0)
R 1.45 (36.8)	S 2.09 (53.0)	S1 0.76 (19.4)	T Ø .17 Ø (4.4)	U Ø .27 Ø (6.9)
V 1.69 (43.0)				

Inches (mm)

B6 Single & Double Operators – 4-way NAMUR Mount

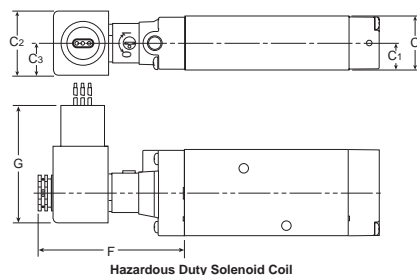


B6 4-way NAMUR Mount

A 6.67 (169.5)	A1 8.41 (213.7)	A2 9.35 (237.6)	A3 5.26 (133.7)	A4 5.59 (142.1)
A5 6.54 (166.0)	B 2.06 (52)	B2 .57 (14.4)	C 1.18 (30.0)	C1 .59 (15)
D 4.21 (106.8)	D1 4.68 (118.8)	D2 2.80 (71.0)	D3 3.27 (83.0)	F 2.45 (62.3)
F1 2.92 (74.3)	G .95 (24.2)	G1 .02 (0.53)	J3 .95 (24.1)	K 2.09 (53.0)
K1 2.56 (64.9)	L 2.34 (59.4)	M 1.17 (29.7)	N .59 (15)	P .63 (16)
P1 .55 (14)	Q 1.89 (48.0)	R 1.26 (32)	R1 .22 (5.5)	S .94 (24)
S1 .47 (12)	T Ø .17 Ø (4.4)	U Ø .27 Ø (6.9)		

Inches (mm)

B6 Alternative Electrical Enclosure Option F



Hazardous Duty Solenoid Coil

B6 4-way NAMUR Mount with Option F Enclosure

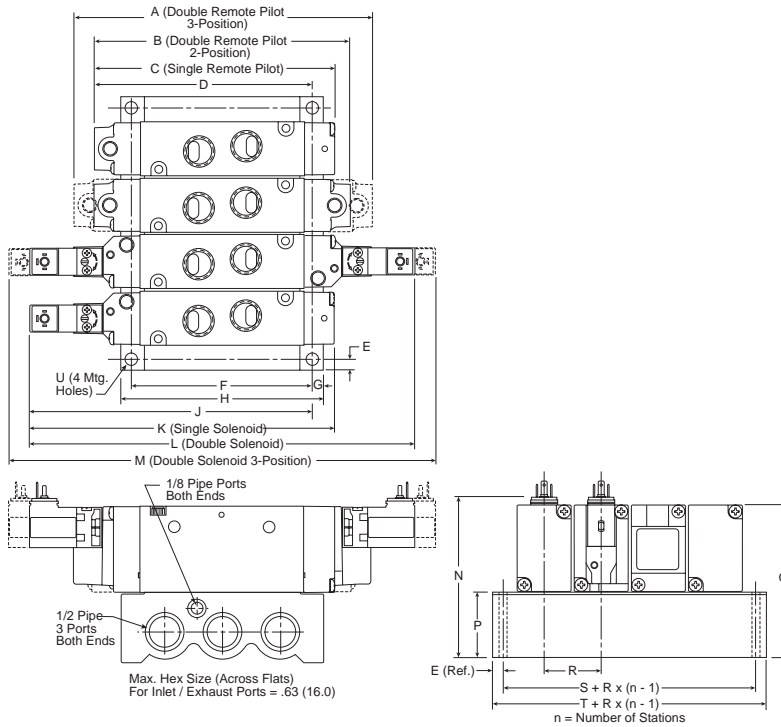
C 1.18 (30)	C1 .59 (15)	C2 1.42 (36)	C3 .71 (18)	F 3.15 (80)
G 2.60 (66)				

Inches (mm)



Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

B6 Single & Double Operators – 4-way IEM Aluminum Bar

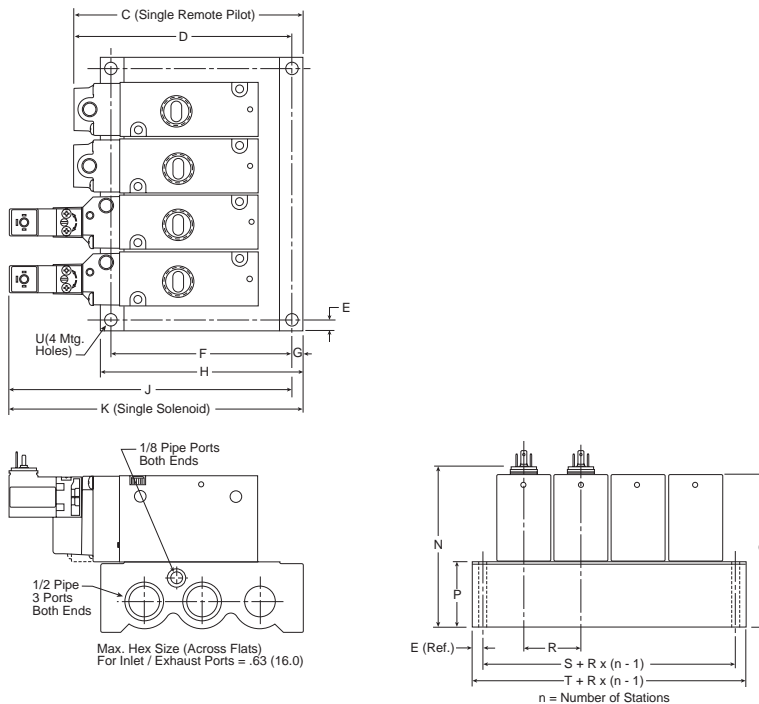


B6 4-way IEM Aluminum Bar Manifold

A	B	C	D	E
6.54 (166.0)	5.59 (142.1)	5.26 (133.7)	4.76 (121.0)	.24 (6.0)
F	G	H	J	K
3.94 (100.0)	.24 (6.0)	4.41 (112.0)	6.17 (156.8)	6.67 (169.5)
L	M	N	P	Q
8.41 (213.7)	9.35 (237.6)	3.60 (91.3)	1.54 (39.0)	3.43 (87.0)
R	S	T	U	
1.24 (31.5)	1.77 (45.0)	2.24 (57.0)	ø .26 ø (6.5)	

Inches (mm)

B6 Single Operators – 3-way IEM Aluminum Bar

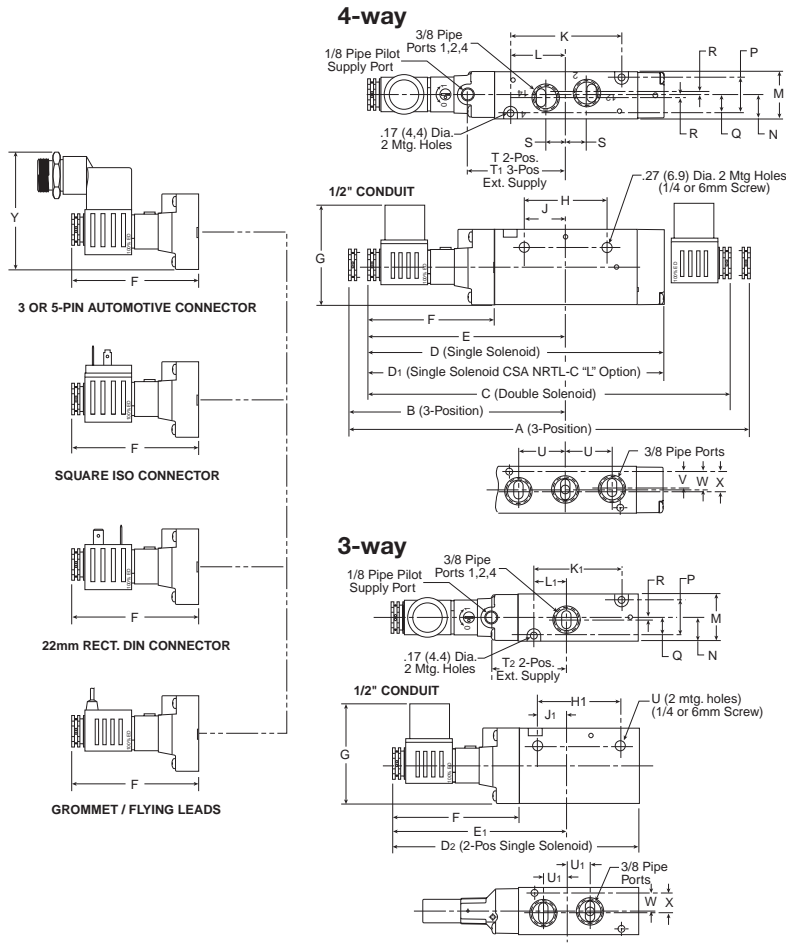


B6 3-way IEM Aluminum Bar Manifold

C	D	E	F	G
5.00 (127.0)	4.76 (121.0)	.24 (6.0)	3.94 (100.0)	.24 (6.0)
H	J	K	N	P
4.41 (112.0)	6.17 (156.8)	6.41 (162.8)	3.60 (91.3)	1.54 (39.0)
Q	R	S	T	U
3.43 (87.0)	1.24 (31.5)	1.77 (45.0)	2.24 (57.0)	Ø .26 Ø (6.5)

Inches (mm)

B6 3 & 4-way Alternative Electrical Enclosures

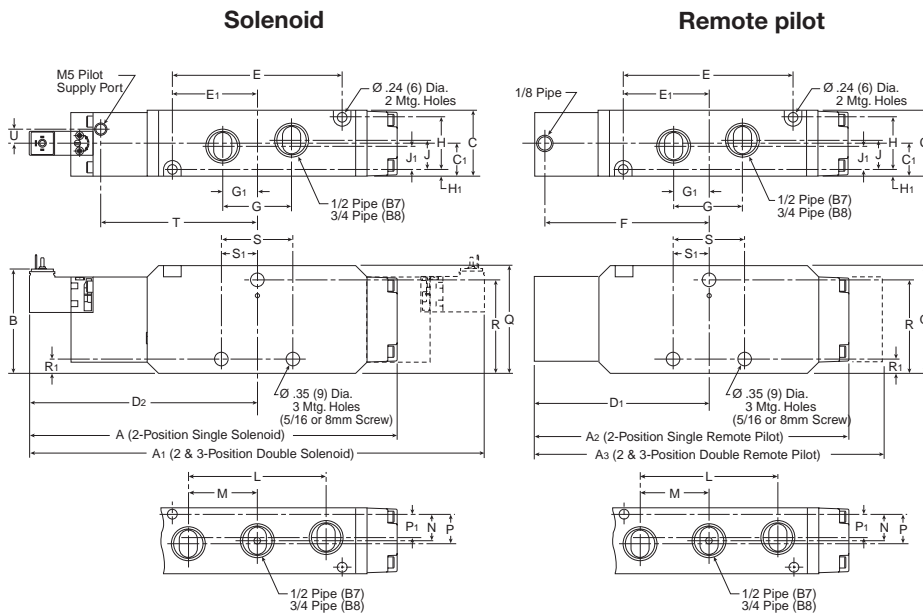


B6 Alternative – Electrical Enclosures

A	B	C	D	D1
10.84 (275.3)	5.41 (137.5)	9.89 (251.3)	7.41 (188.2)	7.74 (196.6)
D2	E	E2	F	G
6.17 (156.6)	4.94 (125.6)	4.37 (111.0)	3.15 (80.0)	2.47 (62.8)
H	H1	J	J1	K
2.09 (53.0)	2.09 (53.0)	1.04 (26.5)	0.76 (19.4)	2.79 (70.8)
K1	L	L1	M	N
2.19 (55.6)	1.39 (35.4)	.82 (20.7)	1.18 (30.0)	.59 (15.0)
P	Q	R	S	T
.91 (23.0)	.45 (11.5)	.06 (1.6)	.51 (13.1)	2.45 (62.3)
T1	T2	U	U1	V
2.93 (29.7)	1.89 (48.0)	.59 (15.0)	.59 (15.0)	.41 (10.5)
W	X	Y		
.45 (11.5)	.49 (12.5)	2.90 (73.6)		

Inches (mm)

B7& B8 Single & Double Operators – 4-way Inline



B7 & B8 4-way Inline

A	A1	A2	A3	B
9.13 (232)	11.29 (287)	7.79 (198)	8.62 (219)	2.59 (66)
C	C1	D1	D2	E
1.65 (42)	.83 (21)	4.29 (109)	5.63 (143)	4.21 (107)
E1	F	G	G1	H
2.13 (54)	4.06 (103)	1.73 (44)	.87 (22)	1.29 (33)
H1	J	J1	L	M
.16 (4)	.75 (19)	.59 (15)	3.39 (86)	1.69 (43)
N	P	P1	Q	R
.67 (17)	.75 (19)	.59 (15)	2.68 (68)	2.32 (59)
R1	S	S1	T	U
.35 (9)	1.81 (46)	.90 (23)	3.94 (100)	.35 (9)

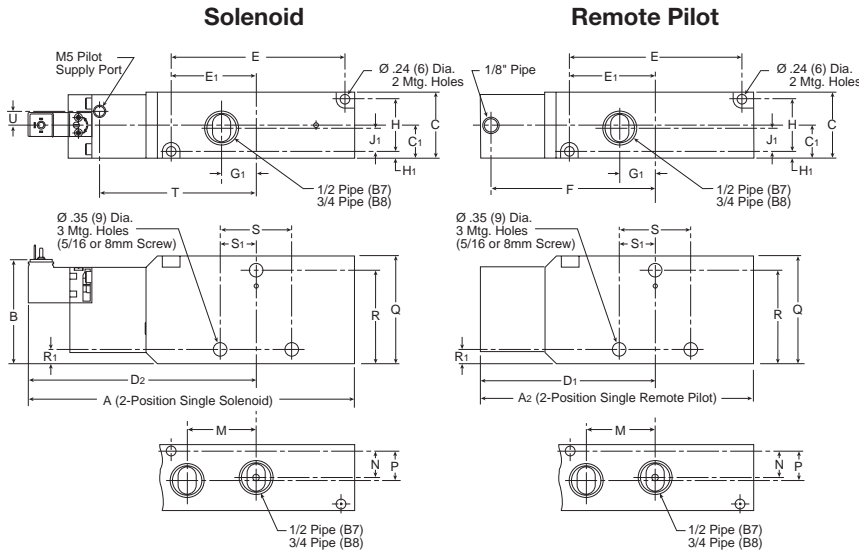
Inches (mm)



Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series

D
 Inline Valve Products

B7 & B8 Single Operators – 3-way Inline

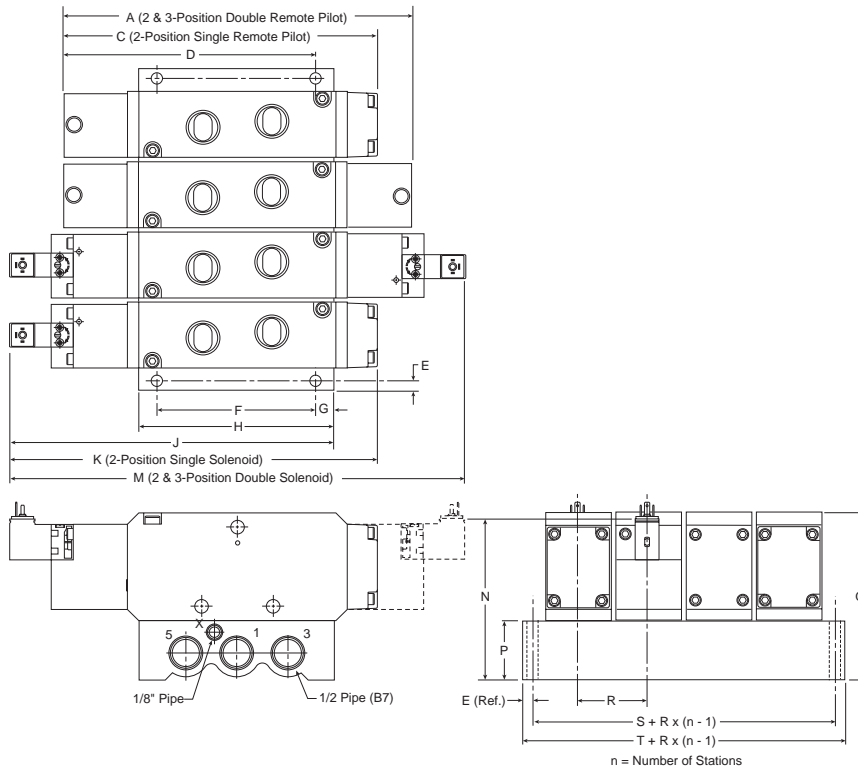


B7 & B8 3-way Inline

A	A₂	B	C	C₁
7.99 (203)	6.65 (169)	2.59 (66)	1.65 (42)	.83 (21)
D₁	D₂	E	E₁	F
4.29 (109)	5.63 (143)	4.21 (107)	2.13 (54)	4.06 (103)
G₁	H	H₁	J₁	M
.86 (22)	1.29 (33)	.16 (4)	.59 (15)	1.69 (43)
N	P	Q	R	R₁
.67 (17)	.75 (19)	2.68 (68)	2.32 (59)	.35 (9)
S	S₁	T	U	
1.81 (46)	.90 (23)	3.94 (100)	.35 (9)	

Inches (mm)

B7 & B8 Single & Double Operators – 4-way IEM Aluminum Bar

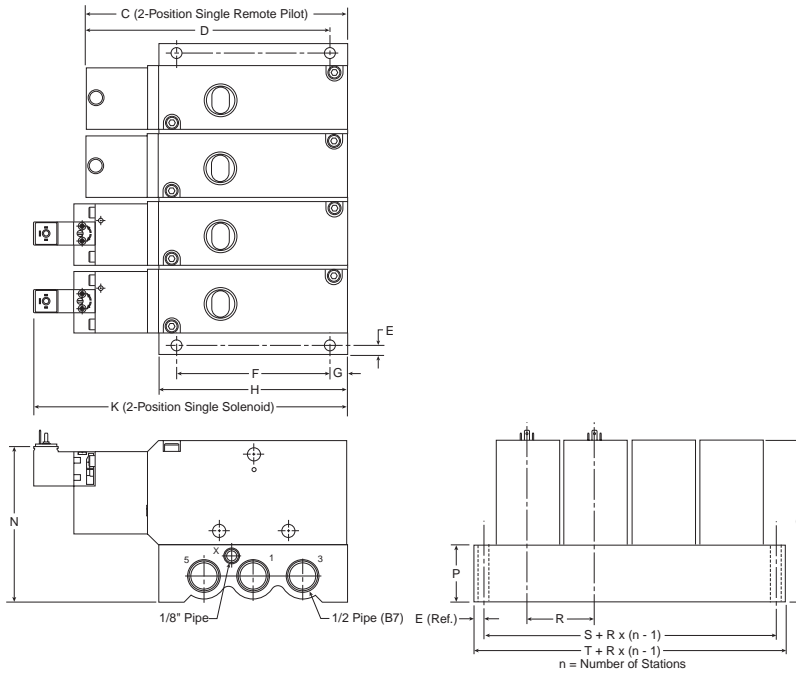


**B7 & B8 4-way IEM
 Aluminum Bar Manifold**

A	C	D	E	F
7.79 (198)	8.62 (219)	6.26 (159)	.24 (6)	3.94 (100)
G	H	J	K	M
.45 (11.5)	4.84 (123)	8.07 (205)	9.13 (232)	11.29 (287)
N	P	Q	R	S
4.00 (101.5)	1.48 (37.5)	4.15 (105.5)	1.77 (45)	2.24 (57)
T				
2.72 (69)				

Inches (mm)

B7 & B8 Single Operators – 3-way IEM Aluminum Bar

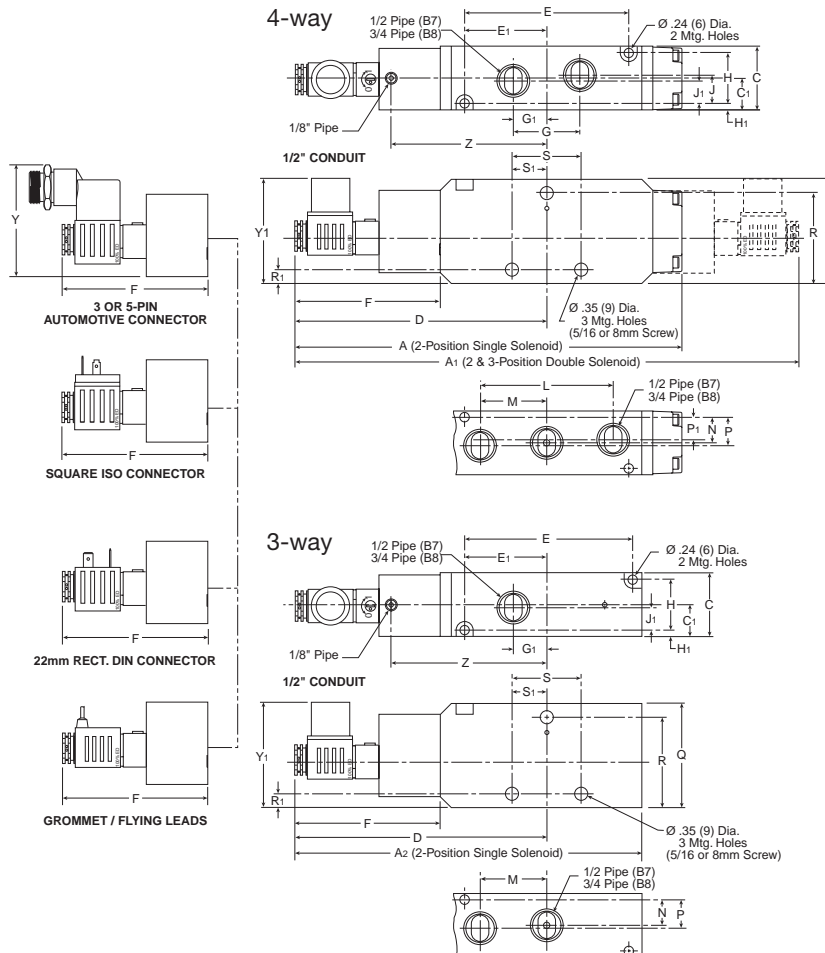


**B7 & B8 3-way IEM
 Aluminum Bar Manifold**

C	D	E	F	G
6.65 (169)	4.92 (124.9)	.24 (6)	3.94 (100)	.45 (11.5)
H	K	N	P	Q
4.84 (123)	7.99 (203)	4.00 (101.5)	1.48 (37.5)	4.15 (105.5)
R	S	T		
1.77 (45)	2.24 (57)	2.72 (69)		

Inches (mm)

B7 & B8 3 & 4-way Alternative Electrical Enclosures



**B7 & B8 3 & 4-way Alternative
 Electrical Enclosures**

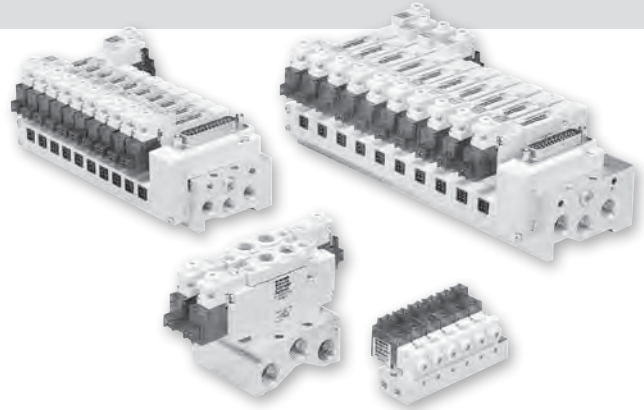
A	A ₁	A ₂	C	C ₁
9.92 (252)	12.91 (328)	8.78 (223)	1.65 (42)	.83 (21)
D	E	E ₁	F	G
6.46 (164)	4.21 (107)	2.13 (54)	3.74 (95)	1.73 (44)
G ₁	H	H ₁	J	J ₁
.86 (22)	1.29 (33)	.16 (4)	.75 (19)	.59 (15)
L	M	N	P	P ₁
3.39 (86)	1.69 (43)	.67 (17)	.75 (19)	.59 (15)
Q	R	R ₁	S	S ₁
2.68 (68)	2.32 (59)	.35 (9)	1.81 (46)	.90 (23)
Y	Y ₁	Z		
2.87 (73)	2.71 (69)	3.98 (101)		

Inches (mm)



ADEX Series

ADEX Series are miniature low power consumption solenoid valves, ideal for powering small to mid-sized pneumatic actuators used in automation and process applications. ADEX's versatility is further enhanced through its three mounting styles and electronic connectivity options.



Features

- Compact body size
- Fast response < 10ms

Ports

- A00S: M3 – .02 Cv
- A05: M5 – .18 Cv
- A12: 1/8 inch – .47 Cv

Mounting

- Inline
- Subbase mount

Solenoids

- 0.6 W
- 5VDC, 12VDC, 24VDC and 110/220VAC
- LED and surge suppression

Operating information

Maximum operating pressure*:

A05 & A12	Vacuum to 100 PSIG (Vacuum to 6.8 bar)
A00S (NC)	Vacuum to 100 PSIG (Vacuum to 6.8 bar)
A00S (NO)	Vacuum to 70 PSIG (Vacuum to 4.8 bar)

Minimum operating pressure: See chart below

Operating temperature:

Intermittent Duty (AC & DC Voltage):	32°F to 122°F (0°C to 50°C)
	Voltage Rated +10 / -10%
Continuous Duty (DC Voltage Only):	32°F to 104°F (0°C to 40°C)
	Voltage Rated +0 / -10%

* When using vacuum and pressure simultaneously on ports 1 & 3, normally closed valve, the maximum pressure is 85 PSIG (586 kPa).

When using vacuum and pressure simultaneously on ports 1 & 3, normally open valve, the maximum pressure is 58 PSIG (400 kPa).

Material specifications

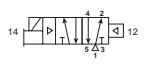
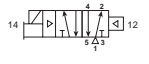
Body	Anodized aluminum
End caps	Anodized aluminum
Coils	Thermoplastic
Fasteners	Stainless steel
Spool	Aluminum and nitrile rubber

Minimum operating pressure

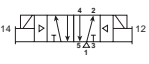

Description	Internal pilot		External pilot		
	PSIG	kPa	PSIG	kPa	
4-way	Single Solenoid	22	152	Vacuum	
				36	248
				Vacuum	
4-way	Double Solenoid – 2-position	15	104	Vacuum	
				36	248
4-way	Double Solenoid – 3-position	30	207	Vacuum	
				36	248
3-way	A00 Series	Vacuum			

Most popular.

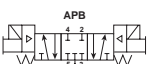
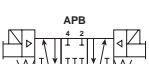
Single Solenoid, 4-way, 2-position

Symbol	Port size	Cv	Voltage	Valve type	Part number
	M5	.17 Cv	24VDC	A05 inline	A05RS251PM5MF
	M5	.17 Cv	12VDC	A05 inline	A05RS252PM5MF
	1/8"	.47 Cv	24VDC	A12 inline	A12RS251PN1MF
	1/8"	.47 Cv	12VDC	A12 inline	A12RS252PN1MF
	Less base	.18 Cv	24VDC	A06 subbase	A05PS251P
	Less base	.18 Cv	12VDC	A06 subbase	A05PS252P
	Less base	.44 Cv	24VDC	A12 subbase	A12PS251P
	Less base	.44 Cv	12VDC	A12 subbase	A12PS252P

Double Solenoid, 4-way, 2-position

Symbol	Port size	Cv	Voltage	Valve type	Part number
	M5	.17 Cv	24VDC	A05 inline	A05RD251PM5MF
	M5	.17 Cv	12VDC	A05 inline	A05RD252PM5MF
	1/8"	.47 Cv	24VDC	A12 inline	A12RD251PN1MF
	1/8"	.47 Cv	12VDC	A12 inline	A12RD252PN1MF
	Less base	.18 Cv	24VDC	A06 subbase	A05PD251P
	Less base	.18 Cv	12VDC	A06 subbase	A05PD252P
	Less base	.44 Cv	24VDC	A12 subbase	A12PD251P
	Less base	.44 Cv	12VDC	A12 subbase	A12PD252P

Double Solenoid, 4-way, 3-position, APB

Symbol	Port size	Cv	Voltage	Valve type	Part number
	M5	.16 Cv	24VDC	A05 inline	A05RD351PM5MF
	M5	.16 Cv	12VDC	A05 inline	A05RD352PM5MF
	1/8"	.43 Cv	24VDC	A12 inline	A12RD351PN1MF
	1/8"	.43 Cv	12VDC	A12 inline	A12RD352PN1MF
	Less base	.16 Cv	24VDC	A06 subbase	A05PD351P
	Less base	.16 Cv	12VDC	A06 subbase	A05PD352P
	Less base	.40 Cv	24VDC	A12 subbase	A12PD351P
	Less base	.40 Cv	12VDC	A12 subbase	A12PD352P

Locking flush override. Mounting screws and gaskets included with valve.

A00 Valve Only – Single Solenoid, 3-way, 2-position*



A00SC231P Shown

* Screwdriver-Operated, Locking Manual Override (LMOR).

A00S	C23	—	1	P
Function Single solenoid normally open 023 Single solenoid normally closed C23				Connector Position P With indicator light & surge suppression
Flow Standard type Blank Large flow type J			Voltage 1 24VDC 2 12VDC 4* 5VDC 8* 110/50 VAC 9 120/60 VAC	

* Special Order

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

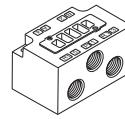
A00 Valve Subbase



Valve type	All Ports	Part number
A00	M3	A00SBM3

Mounting screws and gaskets included with valve.

A05 & A12 Subbases



A05PB

Valve type	Port size	Part number
A05	1/8" NPT	A05PBN1
	1/8" BSPP "G"	A05PBG1
A12	1/4" NPT	A12PBN2
	1/4" BSPP "G"	A12PBG2

Kit Includes: (1) Subbase (Holddown bolts and gasket are included with valve)

A00 Valve Manifold*



MMFS6A00M3 Shown

* Normally closed valves (A00SC23•P) and Normally open valves (A00S023•P) cannot be mounted on the same manifold simultaneously.

MMFS	2	A00	M5
Number of stations		Port size	
2 Stations	2	M3	
3 Stations	3	M5	
4 Stations	4		
•	•		
•	•		
20 Stations	20		

A05 Valve IEM Bar Manifold



MMFU10A05F Shown

4-way, NPTF (Individual wiring type)	MMFU##A05F
4-way, NPTF (Collective wiring type)	MMCU##A05F

– stations 2 to 20
 ## – stations 2 to 12
 (Even numbers only)

A12 Valve IEM Bar Manifold



MMFU10A12F Shown

4-way, NPTF (Individual wiring type)	MMFU##A12F
4-way, NPTF (Collective wiring type)	MMCU##A12F

– stations 2 to 20
 ## – stations 2 to 12
 (Even numbers only)

A05 Valve Subbase Bar Manifold (5-Ported)



4-way, M5 (Individual Wiring Type)	MMFS##A05FM5
4-way, M5 (Collective Wiring Type)	MMCS##A05FM5

– stations 2 to 20
 ## – stations 2 to 12
 (Even numbers only)

A12 Valve Subbase Bar Manifold (5-Ported)



4-way, 1/8" NPTF (Individual Wiring Type)	MMFS##A12FF1
4-way, 1/8" NPTF (Collective Wiring Type)	MMCS##A12FF1

– stations 2 to 20
 ## – stations 2 to 12
 (Even numbers only)

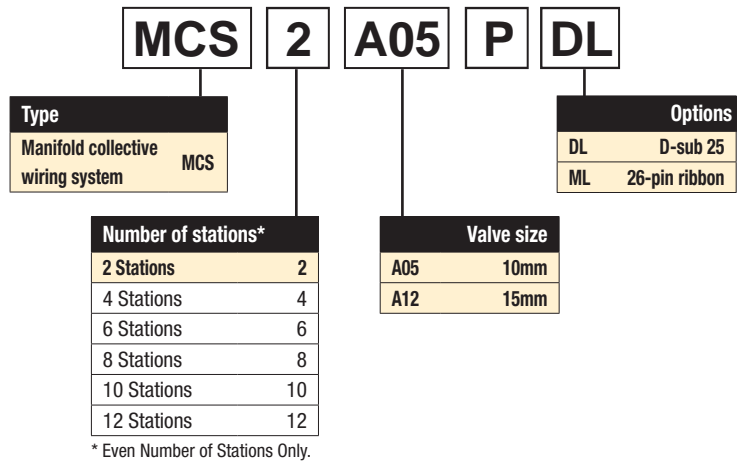
Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products



Collective Wiring



MCS10A05PDL Shown



Individual Wired Connectors P / R Type

Size	Voltage	Length	Part number
	DC	.5 meter	A05PDCCL5
		1 meter	A05PDCCL10
		3 meter	A05PDCCL30
A12	AC	.5 meter	A05PACCL5
		1 meter	A05PACCL10

A05PDCCL##

DC Voltage: Positive "+" (Red Wire)
 Negative "-" (Black Wire)

AC Voltage: Both Wires are Blue (Polarity Neutral)

Wired Connectors with Protective Cover - P / R Type

Size	Length	Part number
A00	1 meter	A05PDCCB10
A05		
A12		

The cover is made of chloroprene rubber for electrical use, assuring excellent weather and insulation resistance. However, be careful not to place it under splash of cutting oil.

Collective Wired Connectors P / R Type

Size	Part number	Part number	
		PNP	NPN
A05 Single		A05PSCCM	A05PSCC
A12 Double		A05PDCCM	A05PDCC

A05PDCC

PNP = SOURCING = "Negative Common" = Yellow Wires
 NPN = SINKING = "Positive Common" = Red Wires

Cable with Female D-Sub, 25-Pin Connector

Description	Part number
 25-Pin, D-Sub cable, 1 meter (3.3 ft.)	DSS25FB1K

Note: For use with ADEX MCS system only.
 Connection to control system is through 25 colored wires AWG 24. Includes (2) M2.5 mm screws.

Viking Lite Series

Viking Xtreme Series

B Series

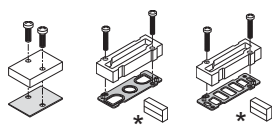
ADEX Series

N Series

D

Inline Valve Products

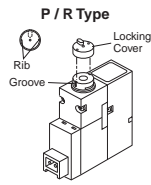
Blanking Plate



Size	Type	Part number
A00	Subbase	A00SBP
A05	Body ported	A05RGBP
	Subbase	A05PGBP
A12	Body ported	A12RGBP
	Subbase	A12PGBP

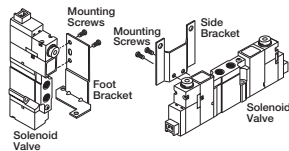
* Outlet pin cover used with collective wiring system only.

Extended Override Cover



Size	Orange: for 14 side solenoid	Green: for 12 side solenoid
A00	A05PLA	A05PLB
A05		
A12		

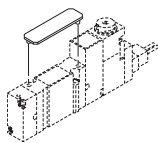
Mounting Bracket



Size	Type	Part number
A05	Side	A05RBS
	Foot	A05RBF
A12	Side	A12RBS
	Foot	A12RBF

Kit Includes: (1) Bracket, (2) Screws

Labeling Tag



Size	Description	Part number
A05	White Label Tag	A05PN
A12		

Exhaust Mufflers



Pipe thread	Part number
M5	P6M-PAC5
1/8" NPT	EM12
1/4" NPT	EM25

P6M - Plastic; EM - Sintered Bronze

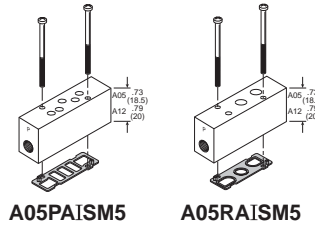
Plastic Silencers



Thread size	Part number	
	NPT	BSPT
M5	AS-5	N/A
1/8"	ASN-6	AS-6
1/4"	ASN-8	AS-8

Individual Air Supply Spacer

Mounts between valve and manifold. Supply from the manifold is blocked and only the valve mounted on the spacer receives the individual supply.



Size	Type	Port size	Internal pilot part number	External pilot* part number
A05	Inline	M5	A05RAISM5	A05RAXISM5
	Subbase	M5	A05PAISM5	A05PAXISM5
A12	Inline	1/8" NPT	A12RAISN1	A12RAXISN1
	Subbase	1/8" NPT	A12PAISN1	A12PAXISN1

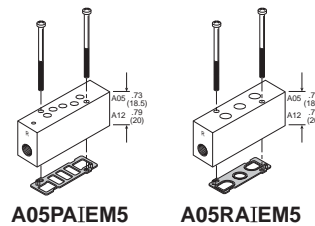
Can only be used on Collective wiring type manifolds.

* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket

Individual Air Exhaust Spacer

Mounts between valve and manifold. Exhaust from the manifold is blocked and only the valve mounted on the spacer has the individual exhaust.



Size	Type	Port size	Internal pilot part number	External pilot* part number
A05	Inline	M5	A05RAIEM5	A05RAXIEM5
	Subbase	M5	A05PAIEM5	A05PAXIEM5
A12	Inline	1/8" NPT	A12RAIEN1	A12RAXIEN1
	Subbase	1/8" NPT	A12PAIEN1	A12PAXIEN1

Can only be used on Collective wiring type manifolds.





* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket

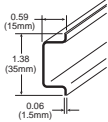
Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products



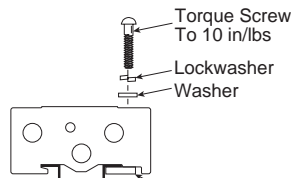
M3 & M5 Fittings

	Description	Part number
	M5 Plug Fitting	N220-1900J
	M3 to 3mm Barb	BC03M3
	M3 to 4mm Barb	BC04M3
	M5 to 3mm Barb	BC03M5

DIN Rail

	Length	Part number
	6 Feet	AM1DE200

DIN Rail Hardware Kit



Size	Type	Dimensions			Part number
		A	B	C	
A05	IEM	2.24	1.00	.31	MFUA05DB
	Subbase	(57)	(25)	(8)	MFSA05DB
A12	IEM	2.91	1.00	.39	MFUA12DB
	Subbase	(74)	(25)	(10)	MFSA12DB

Kit includes: (2) Screws, (2) Clamps

Replacement Cylinder Port Plate Kits

Size	Fitting	Part number
A05	M5	A05RABM5
A12	1/8" NPT	A12RABN1
	1/8" BSPP "G"	A12RABG1

Replacement Base Gasket Kits

Size	Type	Gaskets	
		Gasket only	Screw
A00	Subbase	A00SG	A00SS
	Body Ported	A05RG	A05RS
A05	Subbase Int.	A05PG	A05PS
	Subbase Ext.	A05PXG	A05PS
A12	Body Ported	A12RG	A12RS
	Subbase Int.	A12PG	A12PS
	Subbase Ext.	A12PXG	A12PS

These are spare parts, mounting screws and gaskets included with valves.

Viking Lite Series

Viking Xtreme Series

B Series

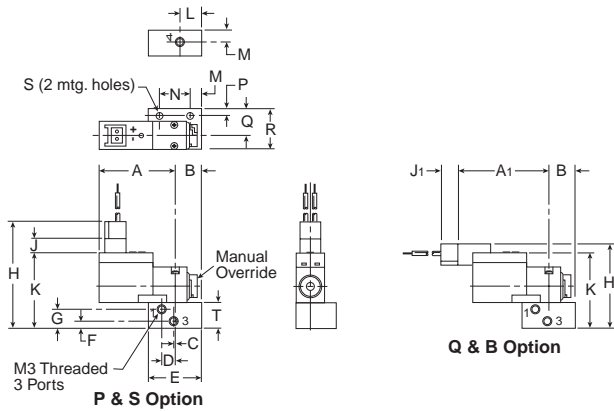
ADEX Series

N Series

D

Inline Valve Products

A00 Subbase

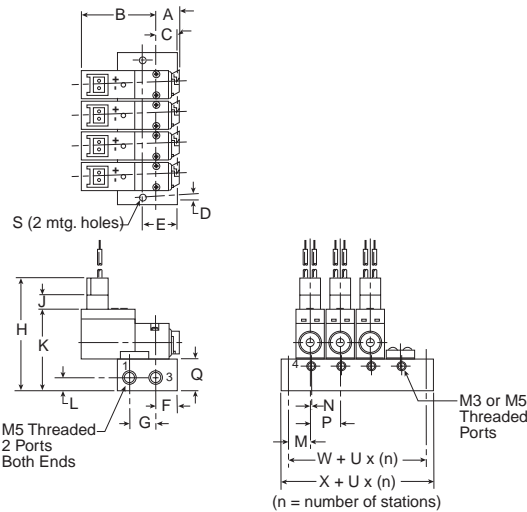


A00 - Subbase

A	A1	B	C	D
1.00 (25)	1.18 (30)	.41 (11)	.015 (.4)	.17 (4)
E	F	G	H	H1
.79 (20)	.12 (3)	.28 (7)	1.54 (39)	1.38 (34)
J	J1	K	L	M
.24 (6)	.20 (5)	1.11 (28)	.32 (8)	.18 (5)
N	P	Q	R	S
.47 (12)	.10 (3)	.39 (10)	.59 (15)	.106 (2.7)
T	.38 (10)			

Inches (mm)

A00 Manifold

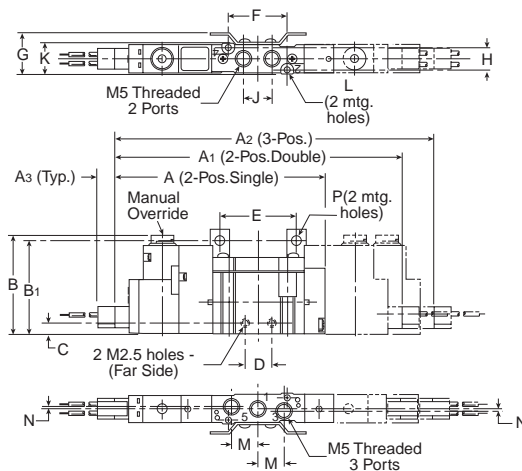


A00 - Manifold

A	B	C	D	E
.36 (9)	1.00 (25)	.31 (8)	.10 (3)	.51 (13)
F	G	H	J	K
.31 (8)	.39 (10)	1.63 (42)	.20 (5)	1.22 (31)
L	M	N	P	Q
.20 (5)	.33 (9)	.02 (.6)	.41 (10.5)	.47 (12)
S	U	X	W	
.125 (3.2)	.41 (10.5)	.45 (11.5)	.26 (6.5)	

Inches (mm)

A05R Single & Double Operators – Inline



A05R – Inline

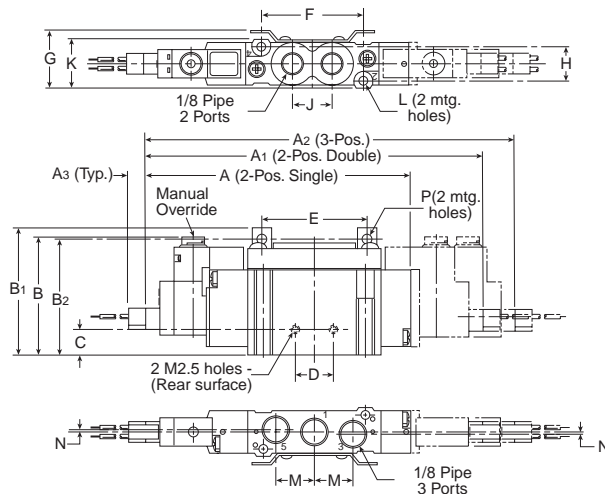
A	A1	A2	A3	B
2.91 (74)	3.94 (100)	4.25 (108)	.24 (6)	1.38 (35)
B1	C	D	E	F
1.30 (33)	.16 (4)	.38 (10)	1.06 (27)	.83 (21)
G	H	J	K	L
.57 (15)	.33 (9)	.40 (10)	.45 (11.4)	∅ .08 ∅ (2.1)
M	N	P		
.37 (10)	.04 (1)	∅ .14 ∅ (3.5)		

Inches (mm)



Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

A12R Single & Double Operators – Inline

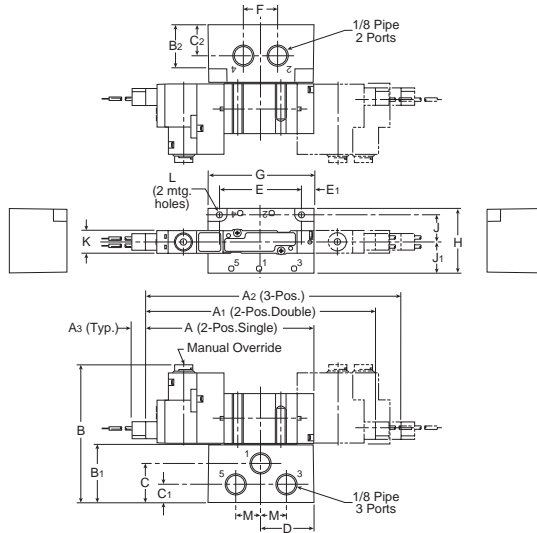


A12R – Inline

A	A1	A2	A3	B
3.68 (94)	4.69 (119)	5.12 (130)	.24 (6)	1.64 (42)
B1	B2	C	D	E
1.77 (45)	1.70 (43)	.35 (9)	.51 (13)	1.46 (37)
F	G	H	J	K
1.42 (36)	.80 (20)	.47 (12)	.55 (14)	.68 (17)
L	M	N	P	
Ø .12 Ø (3.1)	.55 (14)	.03 (0.8)	Ø .14 Ø (3.5)	

Inches (mm)

A05P Single & Double Operators – Subbase

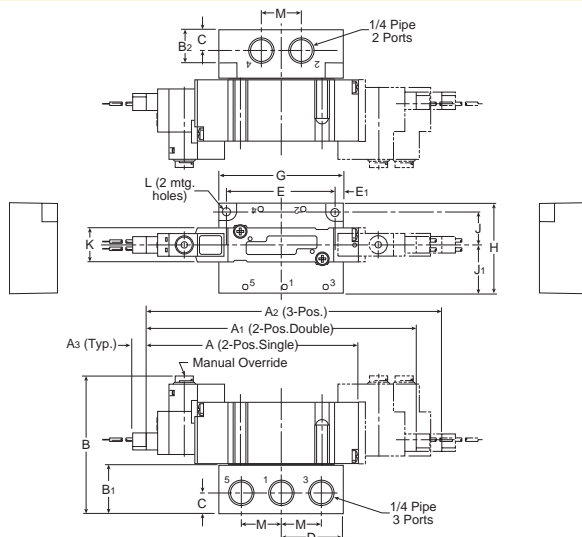


A05P – Subbase

A	A1	A2	A3	B
2.91 (74)	3.94 (100)	4.25 (108)	.24 (6)	2.35 (60)
B1	B2	C	C1	C2
.96 (25)	.75 (19)	.65 (17)	.30 (8)	.53 (14)
D	E	E1	F	G
.89 (23)	1.38 (35)	.20 (5)	.57 (15)	1.77 (45)
H	J	J1	K	L
.08 (28)	.45 (11.5)	.51 (13)	.39 (10)	Ø .13 Ø (3.2)
M				
.45 (12)				

Inches (mm)

A12P Single & Double Operators – Subbase



A12P – Subbase

A	A1	A2	A3	B
3.68 (94)	4.69 (119)	5.12 (130)	.24 (6)	2.41 (61)
B1	B2	C	D	E
.87 (22)	.75 (19)	.37 (10)	1.10 (28)	1.89 (48)
E1	G	H	J	J1
.16 (4)	2.20 (56)	1.59 (41)	.57 (14.5)	.87 (22)
K	L	M		
.59 (15)	Ø .17 Ø (4.3)	.71 (18)		

Inches (mm)



Viking Lite
Series

Viking Xtreme
Series

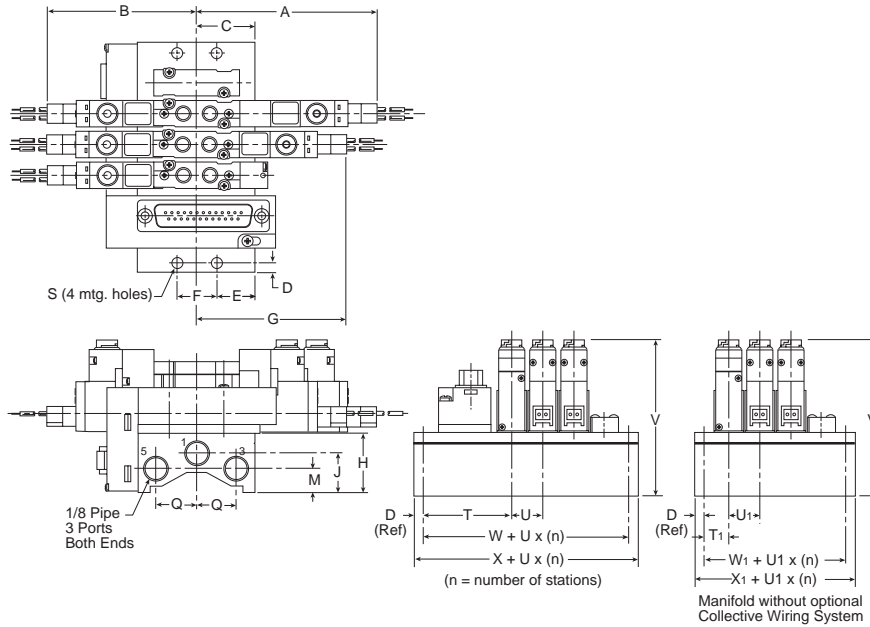
B
Series

ADEX
Series

N
Series

D
 Inline
 Valve Products

A05R Manifold – Valve Inline

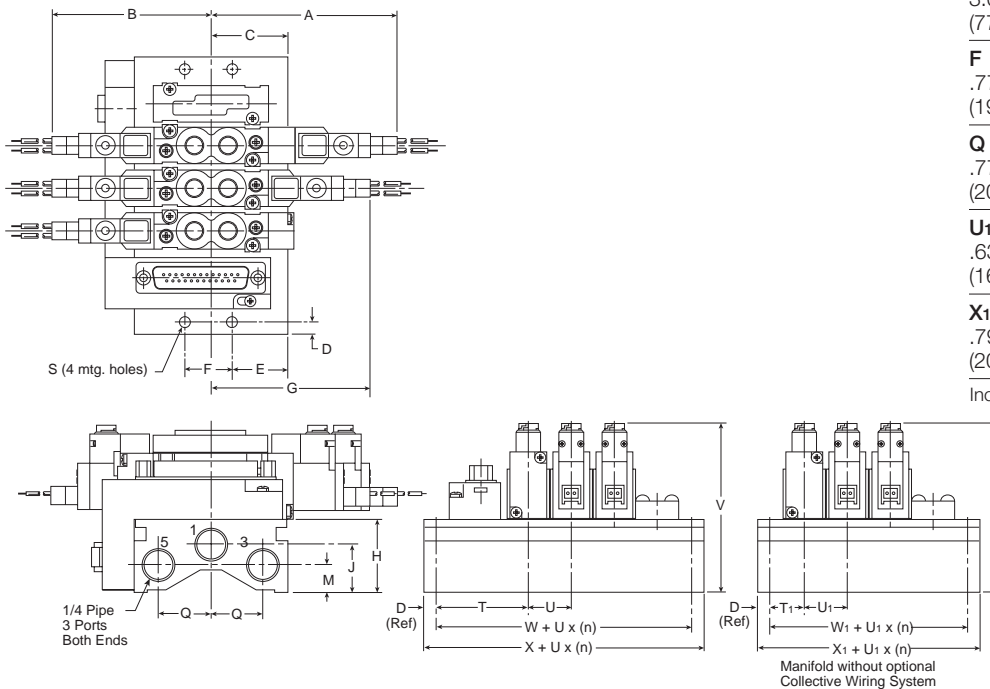


A05R - Manifold, Valve Inline

A	B	C	D	E
2.52 (64)	2.21 (56)	.94 (24)	.16 (4)	.61 (16)
F	G	H	J	M
.63 (16)	2.21 (56)	.94 (24)	.61 (16)	.37 (10)
Q	S	T	T ₁	U
.63 (16)	∅ .18 ∅ (4.5)	1.34 (34)	.51 (13)	.49 (12.5)
U ₁	V	W	W ₁	X
.41 (10.5)	2.32 (59)	1.36 (35)	.37 (9.5)	.167 (43)
X ₁	.68 (17.5)			

Inches (mm)

A12R Manifold – Valve Inline



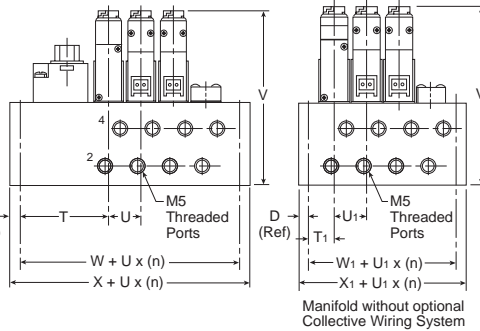
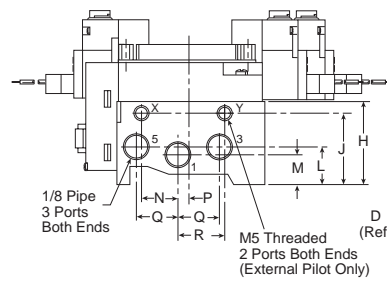
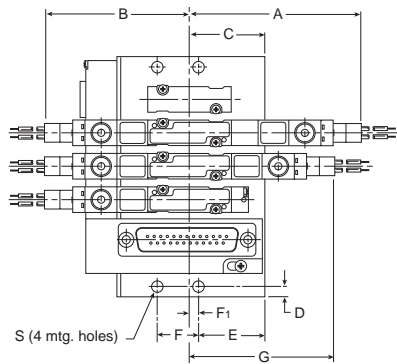
A12R - Manifold, Valve Inline

A	B	C	D	E
3.01 (77)	2.58 (66)	1.14 (29)	.20 (5)	.76 (19)
F	G	H	J	M
.77 (19.6)	2.58 (66)	1.08 (28)	.71 (18)	.41 (11)
Q	S	T	T ₁	U
.77 (20)	∅ .18 ∅ (4.5)	1.48 (38)	.51 (13)	.69 (17.5)
U ₁	V	W	W ₁	X
.63 (16)	2.74 (70)	1.34 (34)	.39 (10)	1.73 (44)
X ₁	.79 (20)			

Inches (mm)

Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

A05P Manifold – Side Ports

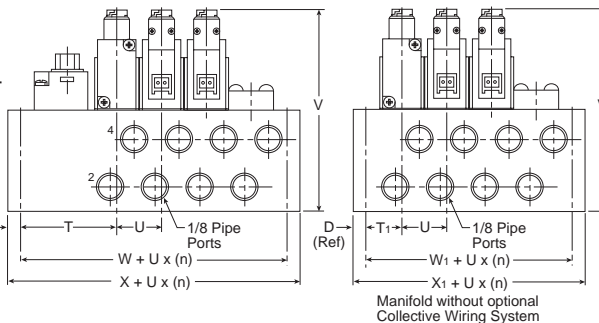
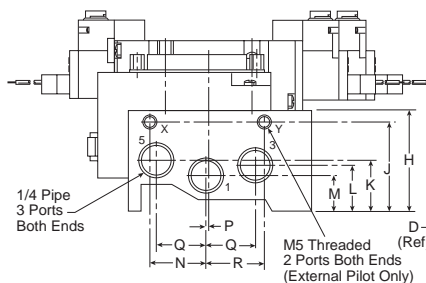
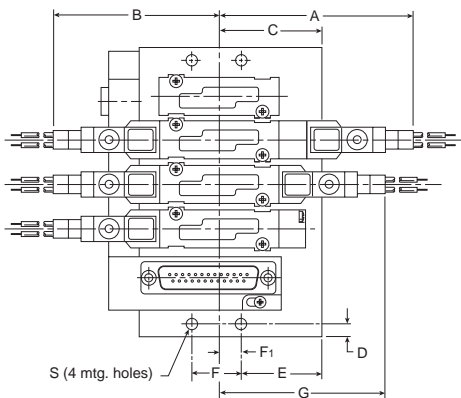


A05P – Manifold, Side Ports

A	B	C	D	E
2.52 (64)	2.21 (56)	1.12 (29)	.16 (4)	1.00 (26)
F	F1	G	H	J
.63 (16)	.19 (5)	2.21 (56)	1.26 (32)	1.08 (28)
L	M	N	P	Q
.59 (15)	.45 (11.5)	.55 (14)	.13 (3)	.63 (16)
R	S	T	T1	U
.71 (18)	∅ .18 ∅ (4.5)	1.34 (34)	.39 (10)	.49 (12.5)
U1	V	W	W1	X
.41 (10.5)	2.64 (67)	1.32 (34)	.37 (10)	1.65 (42)
X1	.67 (18)			

Inches (mm)

A12P Manifold – Side Ports



A12P – Manifold, Side Ports

A	B	C	D	E	F
3.01 (77)	2.58 (66)	1.59 (40)	.20 (5)	1.25 (32)	.77 (20)
F	G	H	J	K	L
.34 (9)	2.58 (66)	1.57 (40)	1.38 (35)	.79 (20)	.71 (18)
M	N	P	Q	R	S
.55 (14)	.87 (22)	.04 (1)	.77 (20)	.91 (23)	∅ .18 ∅ (4.5)
T	T1	U	V	W	W1
1.48 (38)	.59 (13)	.69 (17.5)	3.09 (79)	1.34 (34)	.33 (9)
X	X1				
1.73 (44)	.73 (19)				

Inches (mm)

N Series

For decades Parker Pneumatics and Heavy Industrial have been synonymous with durability and long life. High flow-speed N Series poppet valves have been operating in foundries, steel mills, and automotive casting & stamping plants without fail.

Features

- Continuous duty rated option
- Non-lube service
- Hi-flow, short stroke poppet
- Indicator lights available

Specifications

- 2-way NC
- 3-way NO & NC
- Selector function

Ports

- 3/8" Body – 3/8", 1/2" NPT
- 3/4" Body – 1/2", 3/4", 1" NPT
- 1-1/4" Body – 1", 1-1/4", 1-1/2" NPT
- BSPP "G" threads available

Certification / approval

- Approved to be CE marked (Standard L-Pilot & P-Pilot)
- NEMA 4 Option
- Hazardous Duty Option IP 65 Rating / NEMA 4

Material specifications

Valve body	Cast aluminum
Poppet assembly	Aluminum and stainless steel
Pilot Valve	Zinc, stainless steel, brass, copper, zinc plated steel
Seals	Nitrile

Lubrication

The high speed poppet valves are pre-lubricated to permit use with non-lubricated air. However, air should be lubricated to assure maximum seal life.

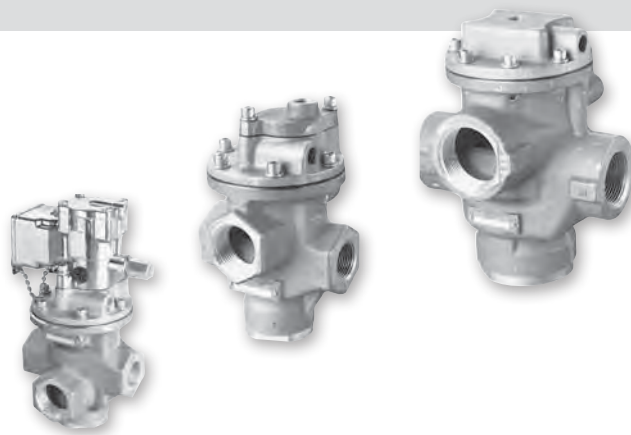
F442 lubricating oil is recommended. This oil is specially formulated to provide peak performance and maximum service life from air-operated equipment.

Installation

CAUTION: DO NOT RESTRICT THE INLET TO POPPET VALVES

Restriction of the inlet can starve the air supply to the pilot section of internally piloted poppet valves and result in slow shifting or failure of the valve to shift properly. Always connect the supply line directly to the inlet of the valve using the full pipe size of the valve inlet. Never use a quick coupling to connect a poppet valve to the air supply. On valves with a small inlet port, use of an upstream surge tank may be required at lower operating pressures to insure an adequate air supply and proper operation.

 Most popular.



Operating information

Operating pressure:

Solenoid valves - internal pilot

3/8" Basic	3/4" Basic
20 to 140 PSIG (standard)	25 to 140 PSIG (200 PSIG option available)

Solenoid valves - external supply

Air pressure thru valve (PSI)	External pilot pressure required (PSI)*	
	3/8" Basic	3/4" Basic
25 PSI	35-200	35-200
50 PSI	45-200	40-200
75 PSI	55-200	50-200
100 PSI	65-200	65-200

Vacuum up to 1" HG, less than a perfect vacuum.

* With 200 PSI option. Do not exceed 140 PSI with standard pilots.

Internal pilot - remote pilot valve

Air pressure thru valve (PSI)	Remote pilot pressure (PSI)		
	3/8" Basic	3/4" Basic	1-1/4" Basic
25 PSI	30-250	30-250	30-250
50 PSI	50-250	50-250	50-250
75 PSI	70-250	75-250	70-250
100 PSI	95-250	95-250	90-250
150 PSI	140-250	145-250	130-250
200 PSI	175-250	185-250	175-250
250 PSI	215-250	230-250	205-250

Operating temperature:

Operator type	Duty cycle*	Minimum ambient temperature	Maximum ambient temperature
Standard service	Intermittent	0°F (-18°C)	125°F (52°C)
Solenoid	Continuous	0°F (-18°C)	100°F (38°C)
Special service	Intermittent	0°F (-18°C)	125°F (52°C)
Solenoid	Continuous	0°F (-18°C)	125°F (52°C)
Remote pilot	Not applicable	0°F (-18°C)	200°F (93°C)

* Applications with pilot valves energized for ten (10) minutes or longer with a duty cycle greater than 70% are considered to be continuously energized.

$$\text{Duty cycle} = \frac{\text{Time energized}}{\text{Time energized} + \text{time off}} \times 100\% = \% \text{ Duty Cycle}$$

Viking Lite Series

Viking Xtreme Series

B Series



ADEX Series

N Series

D



Inline Valve Products

Single Solenoid, Non-locking manual override, internal "P" pilot 140 PSI, standard service, junction box w/ light.

		Body size	Cv	In / cyl ports	Exhaust port	Voltage	2-way, 2-position normally closed	3-way, 2-position normally closed	3-way, 2-position normally open
 	3/8"	3.0 to 4.4	3/8"	1/2"	120VAC	N3153904553	N3553904553	N3753904553	
					24VDC	N3153904549	N3553904549	N3753904549	
			1/2"	1/2"	120VAC	N3154904553	N3554904553	N3754904553	
					24VDC	N3154904549	N3554904549	N3754904549	
			1/2"	3/4"	120VAC	N3155904553	N3555904553	N3755904553	
					24VDC	N3155904549	N3555904549	N3755904549	
	3/4"	9.0 to 11.0	3/4"	1"	120VAC	N3156904553	N3556904553	N3756904553	
					24VDC	N3156904549	N3556904549	N3756904549	
			1"	1"	120VAC	N3157904553	N3557904553	N3757904553	
					24VDC	N3157904549	N3557904549	N3757904549	



Normally Closed Normally Open

Single Solenoid, Non-locking manual override, internal "P" pilot 125 PSI, standard service, P-pilot junction box w/ light.

		Body size	Cv	In / cyl ports	Exhaust port	Voltage	2-way, 2-position normally closed	3-way, 2-position normally closed	3-way, 2-position normally open
 	1-1/4"	20.0 to 30.0	1"	1-1/4"	120VAC	N3257904753	N3657904753	N3857904753	
			1-1/4"	1-1/2"	120VAC	N3258904753	N3658904753	N3858904753	
			1-1/2"	1-1/2"	120VAC	N3259904753	N3659904753	N3859904753	



Normally Closed Normally Open

Single Remote Pilot, 1/4" NPT remote pilot port with internal pilot return.

		Body size	Cv	In / cyl ports	Exhaust port	2-way, 2-position normally closed	3-way, 2-position normally closed	3-way, 2-position normally open
 	3/8"	3.0 to 4.4	3/8"	1/2"	N31431091	N35431091	N37431091	
					N31441091	N35441091	N37441091	
			1/2"	3/4"	N31451091	N35451091	N37451091	
	3/4"	9.0 to 11.0	3/4"	1"	N31461091	N35461091	N37461091	
					N31471091	N35471091	N37471091	

Normally Closed Normally Open

Single Remote Pilot, 1/4" NPT remote pilot port with internal pilot return.

		Body size	Cv	In / cyl ports	Exhaust port	2-way, 2-position normally closed	3-way, 2-position normally closed	3-way, 2-position normally open
 	1-1/4"	20.0 to 30.0	1"	1-1/4"	N32471091	N36471091	N38471091	
			1-1/4"	1-1/2"	N32481091	N36481091	N38481091	
			1-1/2"	1-1/2"	N32491091	N36491091	N38491091	

Normally Closed Normally Open

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

“N” Series 3/8", 3/4" & 1-1/4" Body Sizes - Solenoid ‘L’ Pilot

N 315 3 9 0 45 53

Valve function - solenoid	
3/8" & 3/4" Body	
2-way, normally closed	315
3-way, normally closed	355
3-way, normally open	375
1-1/4" Body	
2-way, normally closed	325
3-way, normally closed	365
3-way, normally open	385

Port size / thread type	
3/8" Body size	
3/8" Inlet & cyl - 1/2" exhaust - NPT	3
1/2" inlet & cyl - 1/2" exhaust - NPT	4
1/2" inlet & cyl - 1/2" exhaust - BSPP	N
3/4" body size	
1/2" inlet & cyl - 3/4" exhaust - NPT	5
3/4" inlet & cyl - 1" exhaust - NPT	6
3/4" inlet & cyl - 1" exhaust - BSPP	Q
1" inlet & cyl - 1" exhaust - NPT	7
1-1/4" body size	
1" inlet & cyl - 1 1/4" exhaust - NPT	7
1-1/4" inlet & cyl - 1-1/2" exhaust - NPT	8
1-1/4" inlet & cyl - 1-1/2" exhaust - BSPP	S*
1-1/2" inlet & cyl - 1-1/2" exhaust - NPT	9
1-1/2" inlet & cyl - 1-1/2" exhaust - BSPP	T*

* Not available with valve function 325.
 Note: BSPP is to the ISO 228 standard, and requires an R-BSPT male fitting.

“L” pilot code						
Code	Voltage			Solenoid enclosure options		
	AC 60hz	AC 50hz	DC	Standard duty (01, 45)	Cont. duty (04, 48)	200 PSI (46)
49			24	1, 2, 3, 5, 6, 8, 9, W	6, 8, 9	9
53	120	110		1, 2, 3, 5, 6, 8, 9, E, N, W	1, 6, 8, 9, N	8, 9, E
57	240	220		1, 3, W		

“L” pilot configuration	
01*	External pilot, std service, 140 PSI
04*	External pilot, cont duty, 140 PSI
45	Internal pilot, std service, 140 PSI
48	Internal pilot, cont duty, 140 PSI

* Not available with valve function 325, 365, and 385 (1-1/4" body).

Solenoid type	
0	Standard

Solenoid enclosure	
1	Basic pilot
2	Basic pilot NLMO
3	Basic pilot LMO
5	Junction box NLMO
6	Junction box LMO
8	Junction box NLMO w/ light
9	Junction box LMO w/ light
W	Basic pilot ext. LMO

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

D

Inline Valve Products

“N” Series 1-1/4" Body Sizes - Solenoid Hi-Flow ‘P’ Pilot

N 365 8 9 0 47 53

Valve function - solenoid	
1-1/4" body	
2-Way, normally closed	325
3-Way, normally closed	365
3-Way, normally open	385

Port size / thread type	
1-1/4" body size	
1" inlet & cyl - 1 1/4" exhaust - NPT	7
1-1/4" inlet & cyl - 1-1/2" exhaust - NPT	8
1-1/4" inlet & cyl - 1-1/2" exhaust - BSPP	S
1-1/2" inlet & cyl - 1-1/2" exhaust - NPT	9
1-1/2" inlet & cyl - 1-1/2" exhaust - BSPP	T

Note: BSPP is to the ISO 228 standard, and requires an R-BSPT male fitting.

“P” pilot code					
Code	Voltage			Enclosure options	
	AC 60hz	AC 50hz	DC	Standard duty	
49			24	5, 6	
53	120	110		5, 6, 8, 9	

“P” pilot configuration	
02	External pilot, std service, 125 PSI
47	Internal pilot, std service, 125 PSI

Solenoid type	
0	Standard

Solenoid enclosure	
5	Junction box NLMO
6	Junction box LMO
8	Junction box NLMO w/ light
9	Junction box LMO w/ light

Replacement Pilots

Description	Standard L-pilot		Continuous duty L-pilot	
	Locking	Non-locking	Locking	Non-locking
Basic with override	K0653035**	K0652035**	K0853025**	K0852025**
JIC with junction box & override	K0656035**	K0655035**	K0856025**	K0855025**
JIC pilot with junction box & override & indicator lights (120VAC only)	K0659035**	K0658035**	K0859025**	K0858025**

** Voltage code - (reference model index for availability)



Replacement Pilots

Description	Hazardous duty L-pilot		NEMA 4 L-pilot	
	Locking	Non-Locking	Locking	Non-Locking
Hazardous duty L-pilot - UL & CSA	K0451025**	N/A		
Hazardous duty with override	K0453025**	K0452025**		
NEMA 4 with override			K2553025**	K255202549

** Voltage code - 49 & 53



Replacement Pilots

Description	Heavy duty P-Pilot		
	No override	Non-locking	Locking
Basic with override	K1351045**	N/A	N/A
JIC with junction box & override	N/A	K1355045**	K1356045**
JIC Pilot with junction box & override & indicator lights (120VAC only)	N/A	K135804553	K135904553

** Voltage code - 49 & 53



Coils for L-Pilot Operated Valves

Voltage Code **	Voltage			Coil	
	60Hz	50Hz	DC	19" Leads	72" Leads
40	12	—	—	K593007	—
41,42	24	—	6	K593003	—
45*	—	—	12	K593010	—
49*	—	—	24 (Standard)	K593014	—
79	—	—	24 (Arc Suppressed)	K593271	—
51*	—	—	48	—	K593185
53*	120	110	—	K593025	—
57*	240	240	—	K593035	—
60	240	220	—	K593035	—
61	—	—	120	K593041	—

* Indicates voltages approved for solenoid operators designed for use in hazardous locations.

Coils for P-Pilot Operated Valves

Voltage Code **	Voltage			Coil	
	60Hz	50Hz	DC	19" Leads	72" Leads
42	24	—	—	K593099	—
43	—	24	—	K593098	—
45	—	—	12	K593094	—
49	—	—	24	K593097	—
51	—	—	48	—	K593254
53	115	—	—	K593108	—
58	—	230	—	K593111	—

N □ □ □ □ □ □ □ * *
 Voltage Code

Viking Lite Series

Viking Xtreme Series

B Series

ADEX Series

N Series

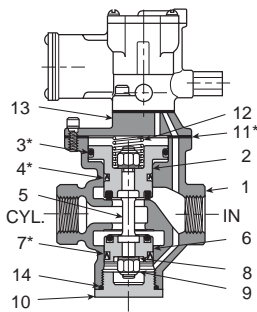
D

Inline Valve Products

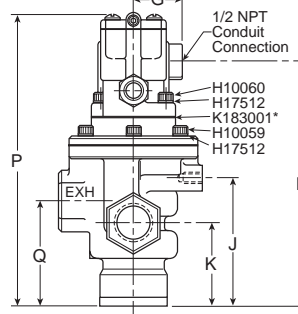
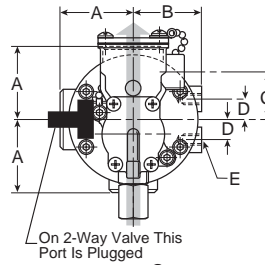
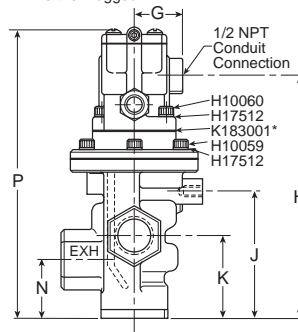
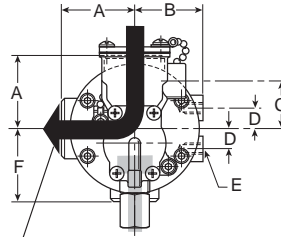
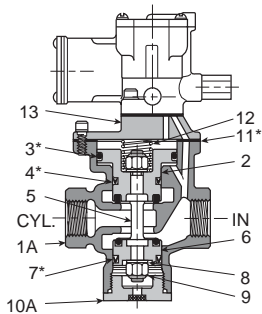


Internal Pilot - 3/8" & 3/4" Basic Body

Normally Closed



Normally Open



Exhaust
Pressure

Top view indicates flow through 3-Way valve with coil de-energized.

NOTE: For normal valve operation, override must be in "out" position.

Internal Pilot - 3/8" & 3/4" Basic Body

Key	3/8" Body		3/4" Body	
	Inch	mm	Inch	mm
A	1.56	40	2.13	54
B	1.50	38	1.94	49
C	1.81	46	1.34	34
D	.56	14	.56	14
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep	
F	1.75	44	2.25	57
G	1.50	38	1.50	38
H	5.92	150	7.14	181
J	3.19	81	3.75	95
K	1.88	47	2.44	62
N	1.44	37	1.78	45
P	7.36	196	8.58	218
Q	2.31	59	3.09	84

Service Kits

Include all parts normally required for in-service maintenance:

- 3/8" Basic valve with standard service L-Pilots..... **K352076**
- 3/8" Basic valve with continuous duty L-Pilots..... **K352276**
- 3/4" Basic valve with standard service L-Pilots..... **K352077**
- 3/4" Basic valve with continuous duty L-Pilots..... **K352277**

Key	3/8" Valve	3/4" Valve	Description
1	—	1/2" Tap K053075	Body (N.C.)
	3/8" Tap K053022	3/4" Tap K053076	
	1/2" Tap K053023	1" Tap K053220	
1A	—	3/4" Tap K053077	Body (N.O.)
	3/8" Tap K053025	3/4" Tap K053078	
	1/2" Tap K053026	1" Tap K053218	
2	K212001	K212002	Upper piston assy
3*	H13648	H13728	Seal

Key	3/8" Valve	3/4" Valve	Description
4*	H14510	H13676	U-cup (3/8), o-ring (3/4)
5	K493002	K493009	Stem
6	K202001	K202002	Lower piston assy.
7*	H14509	H13676	U-cup (3/8), o-ring (3/4)
8	H17811	H17813	Washer (2)
9	H06326	H06332	Stop nut (2)
10	K103035	K103053	Bottom cap (N.C.)
10A	K092020	K092034	Bottom cap assy. (N.O.)
11*	K183049	K183057	Gasket
12	K473014	K473015	Spring
13	K563015	K563017	Adapter
14*	K41RB72121	K41RB72221	O-ring

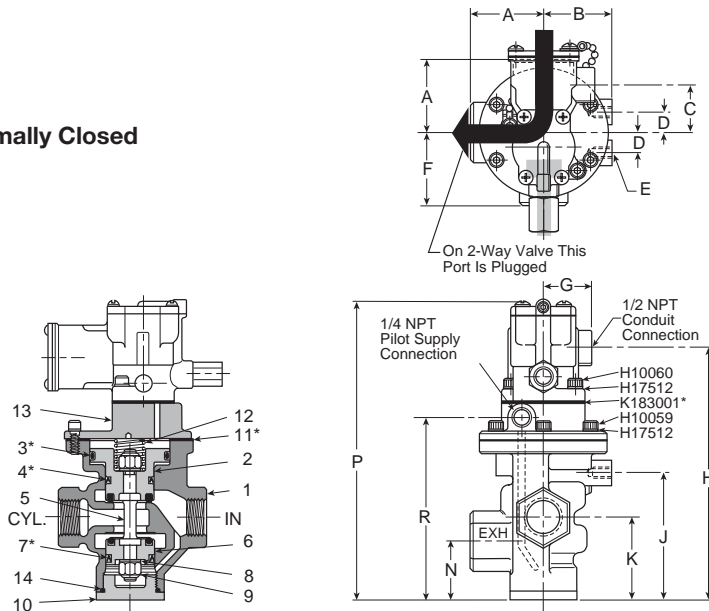
* Parts included in seal kit



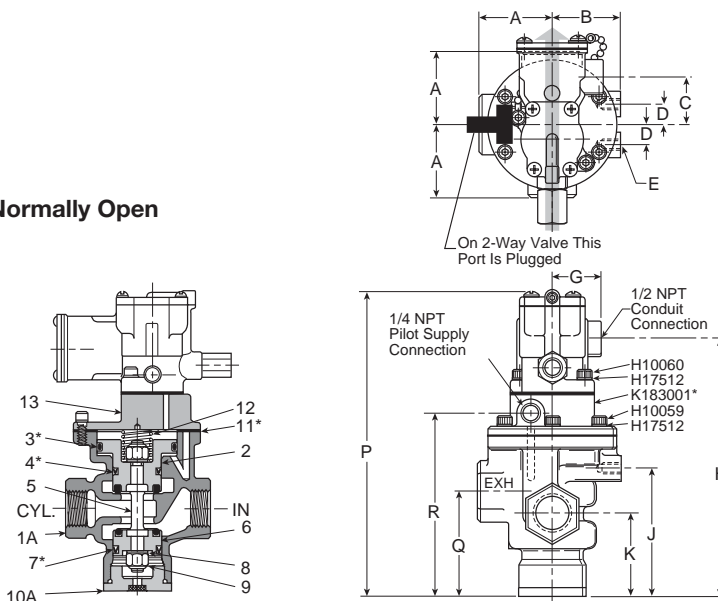
Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

External Pilot - 3/8" & 3/4" Basic Body

Normally Closed



Normally Open



Exhaust
Pressure

Top view indicates flow through 3-Way valve with coil de-energized.

NOTE: For normal valve operation, override must be in "out" position.

External Pilot - 3/8" & 3/4" Basic Body

Key	3/8" Body		3/4" Body	
	Inch	mm	Inch	mm
A	1.56	40	2.13	54
B	1.50	38	1.94	49
C	1.81	46	1.34	34
D	.56	14	.56	14
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep	
F	1.75	44	2.25	57
G	1.50	38	1.50	38
H	6.42	163	7.45	189
J	3.19	81	3.75	95
K	1.88	47	2.44	62
N	1.44	37	1.78	45
P	7.86	200	8.89	226
Q	2.31	59	3.09	84
R	4.34	110	5.38	137

Service Kits

Include all parts normally required for in-service maintenance:

- 3/8" Basic valve with standard service L-Pilots..... **K352076**
- 3/8" Basic valve with continuous duty L-Pilots..... **K352276**
- 3/4" Basic valve with standard service L-Pilots..... **K352077**
- 3/4" Basic valve with continuous duty L-Pilots..... **K352277**

Key	3/8" Valve	3/4" Valve	Description
1	—	1/2" Tap K053067	Body (N.C.)
	3/8" Tap K053019	3/4" Tap K053069	
	1/2" Tap K053157	1" Tap K053221	
1A	—	3/4" Tap K053065	Body (N.O.)
	3/8" Tap K053018	3/4" Tap K053070	
	1/2" Tap K053064	1" Tap K053219	
2	K212001	K212002	Upper piston Assy
3*	H13648	H13728	Seal

Key	3/8" Valve	3/4" Valve	Description
4*	K41RB72211	H13676	O-ring
5	K493002	K493009	Stem
6	K202001	K202002	Lower piston Assy.
7*	K41RB72210	H13676	O-ring
8	H17811	H17813	Washer (2)
9	H06326	H06332	Stop nut (2)
10	K103035	K103053	Bottom cap (N.C.)
10A	K092020	K092034	Bottom cap Assy. (N.O.)
11	K473014	K473015	Spring
12*	K183049	K183057	Gasket
13	K563016	K563021	Adapter
14*	K41RB72121	K41RB72221	O-ring

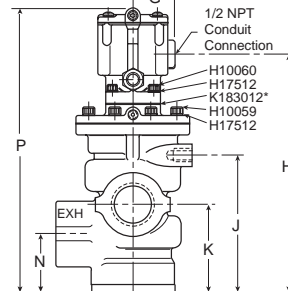
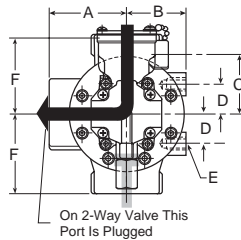
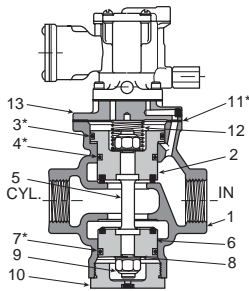
* Parts included in seal kit



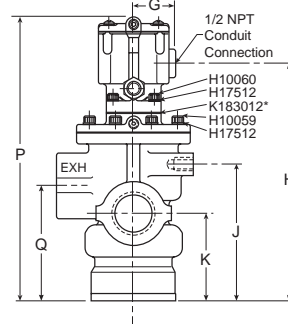
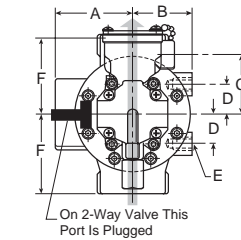
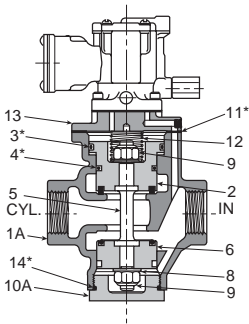
Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D
 Inline Valve Products

Internal Pilot - 1-1/4" Basic Body

Normally Closed



Normally Open



Exhaust
Pressure

Top view indicates flow through 3-Way valve with coil de-energized.

NOTE: For normal valve operation, override must be in "out" position.

Internal Pilot - 1-1/4" Basic Body

Key	1-14" Body	
	Inch	mm
A	3.00	76
B	2.25	57
C	1.34	34
D	1.19	30
E	1/2-13 UNC	3/4 Deep
F	3.13	80
G	1.50	38
H	9.30	236
J	5.34	136
K	3.44	87
N	2.31	59
P	11.14	283
Q	4.56	116

Service Kits

Include all parts normally required for in-service maintenance:

1-1/4" Basic valve with standard service P-Pilots **K352078**

Key	1-1/4" Valve	Description
1	1" Tap K053111	Body (N.C.)
	1-1/4" Tap K053112	
	1-1/2" Tap K053113	
1A	1" Tap K053114	Body (N.O.)
	1-1/4" Tap K053115	
	1-1/2" Tap K053116	
2	K313029	Upper piston assy
3*	H13752	O-ring

Key	1-1/4" Valve	Description
4*	H13728	Seal
5	K493016	Stem
6	K313028	Lower piston
7*	H13728	Seal
8	H17817	Washer
9	H06338	Stop nut
10	K092046	Bottom cap (N.C.)
10A	K103061	Bottom cap (N.O.)
11*	K183058	Gasket
12	K473016	Spring
13	K012003	Adapter
14*	K41RB72143	O-ring

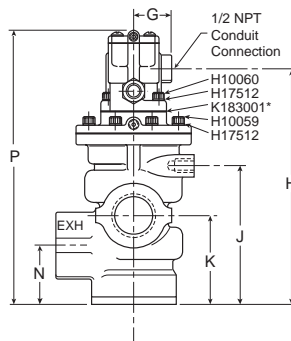
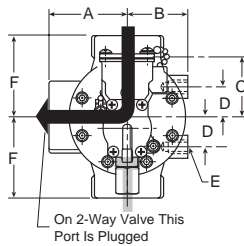
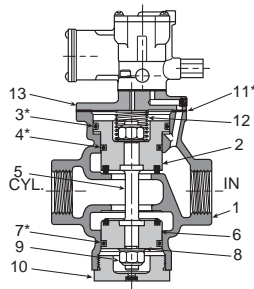
* Parts included in seal kit



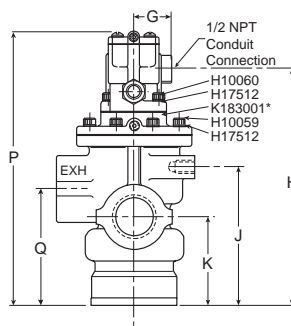
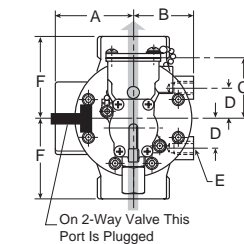
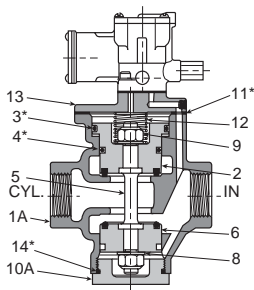
Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

Continuous Duty Pilot - 1-1/4" Basic Body

Normally Closed



Normally Open



Exhaust
Pressure

Top view indicates flow through 3-Way valve with coil de-energized.

NOTE: For normal valve operation, override must be in "out" position.

Continuous Duty Pilot - 1-1/4" Basic Body

Key	1-1/4" Body	
	Inch	mm
A	3.00	76
B	2.25	57
C	1.34	34
D	1.19	30
E	1/2-13 UNC	3/4 Deep
F	3.13	80
G	1.50	38
H	9.02	229
J	5.34	136
K	3.44	87
N	2.31	59
P	10.45	265
Q	4.56	116

Service Kits

Include all parts normally required for in-service maintenance:

1-1/4" Basic valve with continuous duty L-Pilot **K352080**

Key	1-1/4" Valve	Description
1	1" Tap K053111	Body (N.C.)
	1-1/4" Tap K053112	
	1-1/2" Tap K053113	
1A	1" Tap K053114	Body (N.O.)
	1-1/4" Tap K053115	
	1-1/2" Tap K053116	
2	K313029	Upper piston assy
3*	H13752	O-Ring

Key	1-1/4" Valve	Description
4*	H13728	Seal
5	K493016	Stem
6	K313028	Lower piston
7*	H13728	Seal
8	H17817	Washer
9	H06338	Stop nut
10	K092046	Bottom cap (N.C.)
10A	K103061	Bottom cap (N.O.)
11*	K183058	Gasket
12	K473016	Spring
13	K012003	Adapter
14*	K41RB72143	O-ring

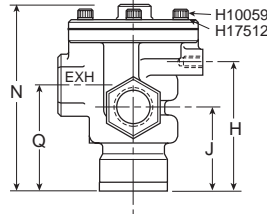
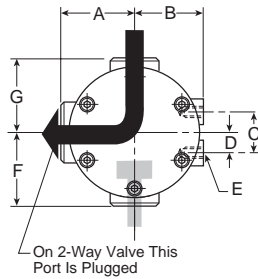
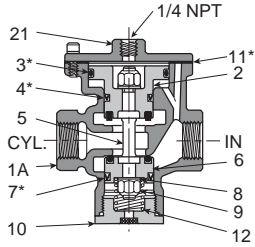
* Parts included in seal kit



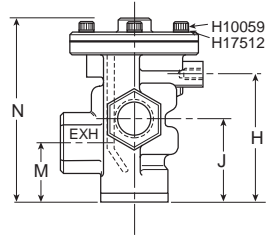
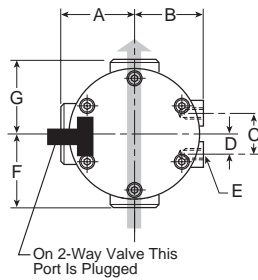
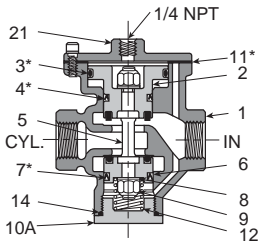
Viking Lite Series
Viking Xtreme Series
B Series
ADEX Series
N Series
D Inline Valve Products

Internal Return - 3/8", 3/4", 1-1/4" Basic Body

Normally Closed



Normally Open



Exhaust
Pressure

Top view indicates flow through 3-Way valve.

NOTE: For normal valve operation, override must be in "out" position.

Internal Return - 3/8", 3/4", 1-1/4" Basic Body

Key	3/8" Body		3/4" Body		1-1/4" Body	
	Inch	mm	Inch	mm	Inch	mm
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
M	1.44	37	1.78	45	2.66	67
N	4.22	107	5.31	135	7.19	183
Q	2.31	59	3.09	78	4.56	116

Service Kits

Include all parts normally required for in-service maintenance:

3/8" Basic valve.....	K352073
3/4" Basic valve.....	K352074
1-1/4" Basic valve	K352075

Key	3/8" Valve	3/4" Valve	1-1/4" Valve	Description
1	—	1/2" Tap K053075	1" Tap K053111	Body (N.O.)
	3/8" Tap K053022	3/4" Tap K053076	1-1/4" Tap K053112	
	1/2" Tap K053023	1" Tap K053220	1-1/2" Tap K053113	
1A	—	1/2" Tap K053077	1" Tap K053114	Body (N.C.)
	3/8" Tap K053025	3/4" Tap K053078	1-1/4" Tap K053115	
	1/2" Tap K053026	1" Tap K053218	1-1/2" Tap K053116	
2	K212001	K212002	K313029	Upper piston assy
3*	H13648	H13728	H13752	Seal
4*	H14510	H13676	H13728	Seal

Key	3/8" Valve	3/4" Valve	1-1/4" Valve	Description
5	K493002	K493009	K493016	Stem
6	K202001	K202002	K313028	Lower piston assy.
7*	H13499	H13676	H13728	Seal
8	H17811	H17813	H17817	Washer (2)
9	H06326	H06332	H06338	Stop nut (2)
10	K092020	K092034	K092046	Bottom cap (N.C.)
10A	K103035	K103053	K103061	Bottom cap (N.O.)
11*	K183049	K183057	K183058	Gasket
12	K473014	K473015	K473016	Spring
14*	K41RB72121	K41RB72221	K41RB72143	O-ring
21	K123018	K123021	K123024	Cover

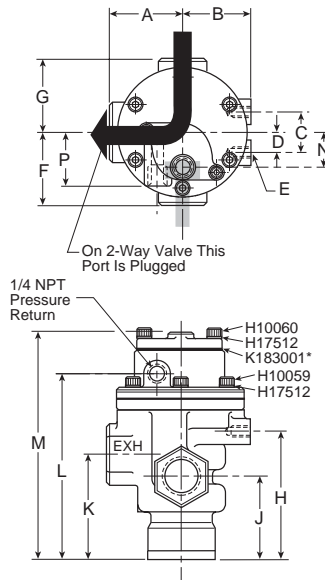
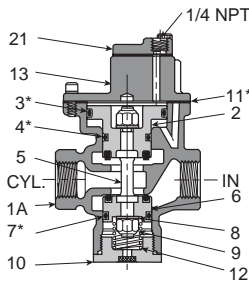
* Parts included in seal kit



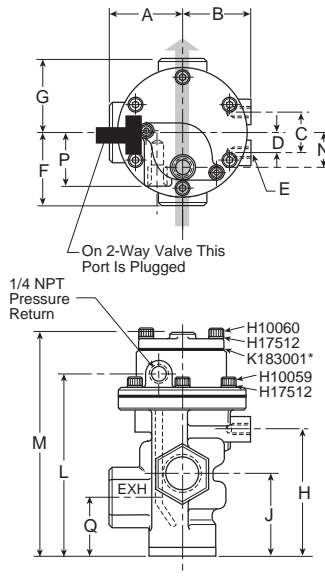
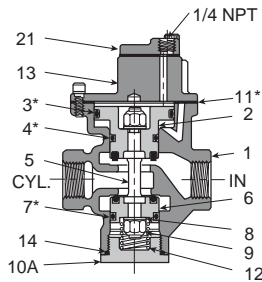
Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

External Return - 3/8", 3/4", 1-1/4" Basic Body

Normally Closed



Normally Open



Exhaust
Pressure

Top view indicates flow through 3-Way valve.

NOTE: For normal valve operation, override must be in "out" position.

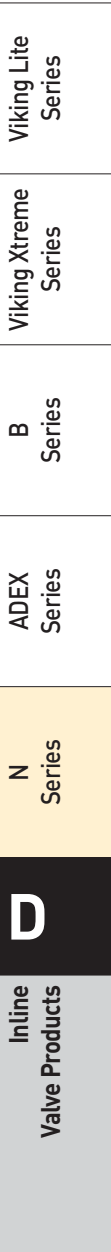
Internal Return - 3/8", 3/4", 1-1/4" Basic Body

Key	3/8" Body		3/4" Body		1-1/4" Body	
	Inch	mm	Inch	mm	Inch	mm
A	1.56	40	2.13	54	3.00	76
B	1.50	38	1.94	49	2.25	57
C	1.13	29	1.13	29	2.38	60
D	.56	14	.56	14	1.19	30
E	3/8-16UNC 7/16" deep		3/8- 16UNC 9/16" deep		1/2-13UNC 3/4" deep	
F	1.75	44	2.25	57	3.13	79
G	1.56	40	2.13	54	3.13	79
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
K	2.31	59	3.09	78	4.56	116
L	4.34	110	5.38	137	7.31	186
M	5.31	135	6.34	161	7.88	200
N	Left of center .53		On center 1.00		On center 25	
Q	1.44	37	1.78	45	2.31	59

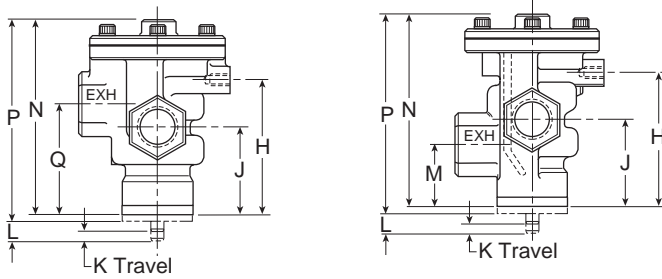
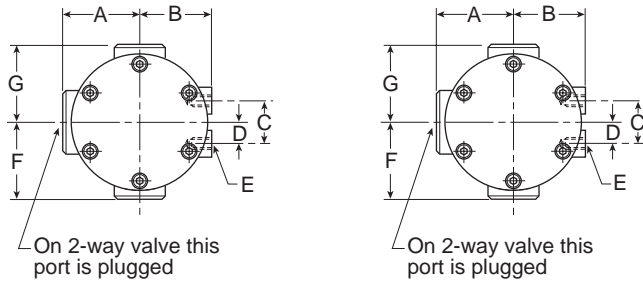
Key	3/8" Valve	3/4" Valve	1-1/4" Valve	Description
1	1/4" Tap K053011	1/2" Tap K053067	1" Tap K053143	Body (N.O.)
	—	3/4" Tap K053069	1-1/4" Tap K053110	
	1/2" Tap K053157	1" Tap K053221	1-1/2" Tap K053146	
1A	1/4" Tap K053010	1/2" Tap K053065	1" Tap K053159	Body (N.C.)
	—	3/4" Tap K053070	1-1/4" Tap K053144	
	1/2" Tap K053064	1" Tap K053219	1-1/2" Tap K053145	
2	K212001	K212002	K313029	Upper piston assy
3*	H13648	H13728	H13752	Seal
4*	H13529	H13676	H13728	Seal

Key	3/8" Valve	3/4" Valve	1-1/4" Valve	Description
5	K493002	K493009	K493016	Stem
6	K202001	K202002	K313028	Lower piston assy.
7*	H13499	H13676	H13728	Seal
8	H17811	H17813	H17817	Washer (2)
9	H06326	H06332	H06338	Stop nut (2)
10	K092020	K092034	K092046	Bottom cap assy. (N.C.)
10A	K103035	K103053	K103061	Bottom cap (N.O.)
11*	K183049	K183057	K183058	Gasket
12	K473014	K473015	K473016	Spring
13	K563016	K563021	K563027	Adapter
14*	K41RB72121	K41RB72221	K41RB72143	O-ring
21	K323027	K323027	Not used	Cover

* Parts included in seal kit



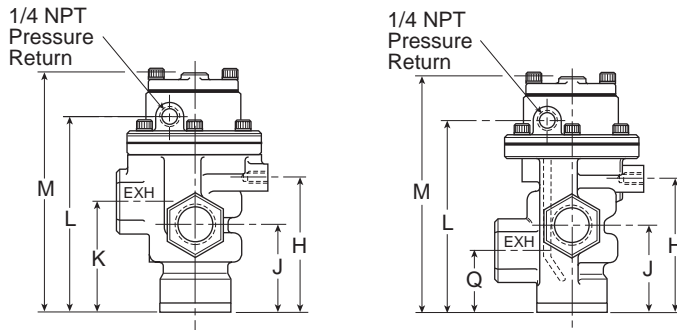
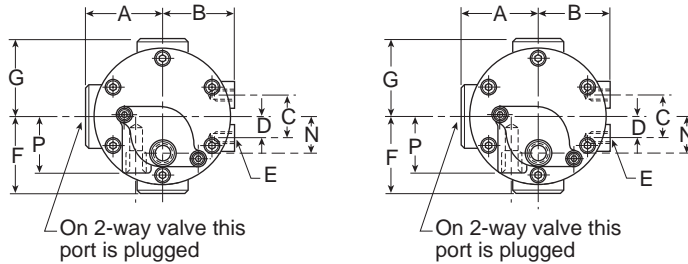
Internal Return - 3/8" & 3/4" Basic Body



Internal Return - 3/8" & 3/4" Basic Body

Key	3/8" Body		3/4" Body		1-1/4" Body	
	Inch	mm	Inch	mm	Inch	mm
A	1.56	40	2.13	54	3.00	76
B	1.50	38	1.94	49	2.25	57
C	1.13	29	1.13	29	2.38	60
D	.56	14	.56	14	1.19	30
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep		1/2-13UNC 3/4" deep	
F	1.75	44	2.25	57	3.13	79
G	1.56	40	2.13	54	3.13	79
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
K	.50	13	.50	13	.50	13
L	.11	3	.16	4	.25	6
M	1.44	37	1.78	45	2.66	67
N	4.22	107	5.31	135	7.19	183
P	4.78	121	5.56	141	7.53	191
Q	2.31	59	3.09	78	4.56	116

External Return - 3/8" & 3/4" Basic Body



Internal Return - 3/8" & 3/4" Basic Body

Key	3/8" Body		3/4" Body		1-1/4" Body	
	Inch	mm	Inch	mm	Inch	mm
A	1.56	40	2.13	54	3.00	76
B	1.50	38	1.94	49	2.25	57
C	1.13	29	1.13	29	2.38	60
D	.56	14	.56	14	1.19	30
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep		1/2-13UNC 3/4" deep	
F	1.75	44	2.25	57	3.13	79
G	1.56	40	2.13	54	3.13	79
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
K	2.31	59	3.09	78	4.56	116
L	4.34	110	5.38	137	7.31	186
M	5.31	135	6.34	161	7.88	200
N	Left of center .53 13		On center 1.00 25			
Q	1.44	37	1.78	45	2.31	59

Viking Lite Series
 Viking Xtreme Series
 B Series
 ADEX Series
 N Series
 D Inline Valve Products

Moduflex Series

The Moduflex Valve System redefines flexibility for pneumatic users. Whether configured from basic components or ordered as a pre-assembled and tested valve manifold, Moduflex flexibility is unmatched in the market place.

Ports

- Size 1: Push-in connectors for 5/32, 1/4 inch, 4, 6mm OD tube
- Size 2: Push-in connectors for 1/4, 3/8, 1/2 inch, 6, 8, 10, 12 mm OD tube

Mounting

- S Series – Individual subbase
- T Series – Manifold mount with individual connectors
- V Series – Manifold mount with collective wiring or fieldbus

Fieldbus options

- DeviceNet, Profibus, CANopen, AS-i, Interbus-S

Solenoids

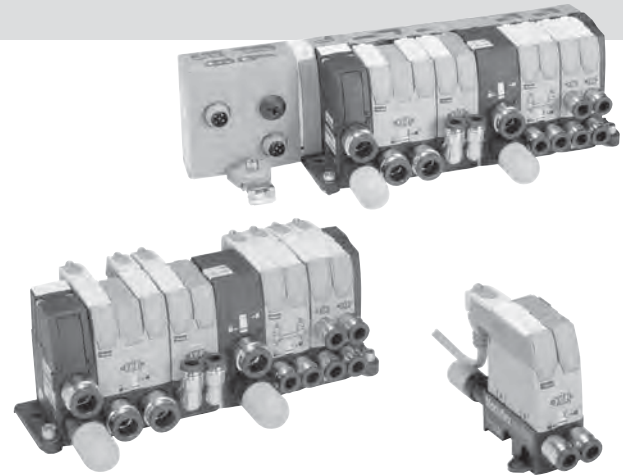
- 1.0 Watt
- 24 VDC
- Compatible with PNP or NPN outputs

Certification / approval

- IP65 rated
- CE, as marked

Material specifications

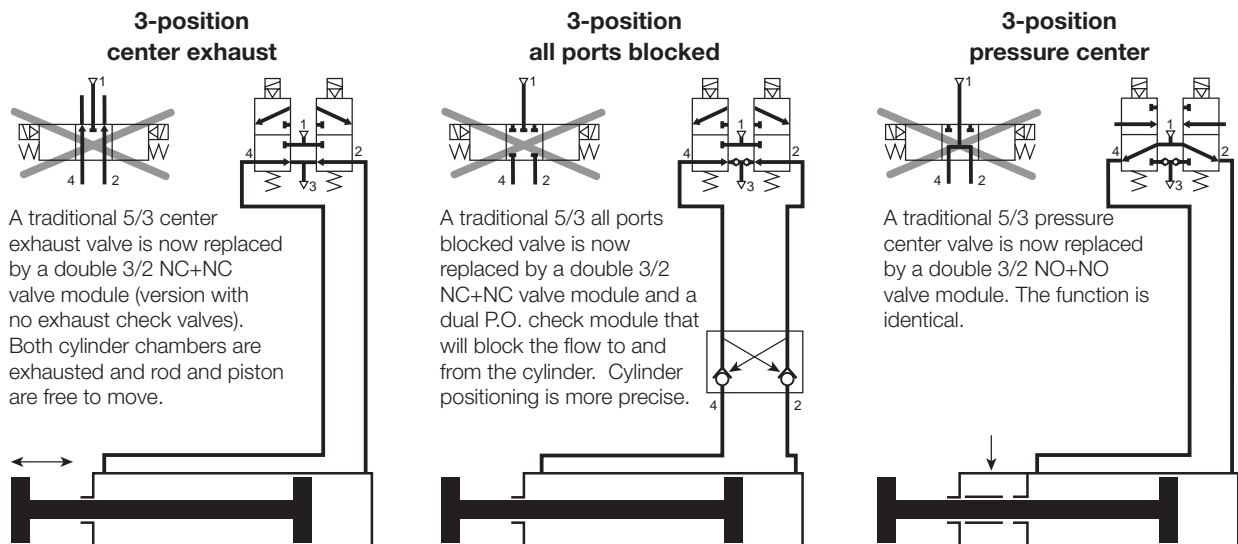
End plates (T and V series)	Plastic
Fasteners	Nickel plated steel
Spool	Aluminum and nitrile rubber or ceramic plate
Subbase or manifold	Plastic
Valve body	Plastic



Operating information

Operating pressure:	Vacuum to 123 PSIG (Vacuum to 8.3 bar)
Operating temperature:	5°F to 140°F (-15°C to 60°C)
Fieldbus operating temperature:	32°F to 130°F (0°C to 55°C)

Dual 3/2 valves replace all 3-position valves for a better performance



Most popular.



Moduflex Series

Isys Micro Series

Isys ISO Series

Fieldbus













DX ISOMAX Series

Valvair II Series









D

Subbase & Manifold Valve Products











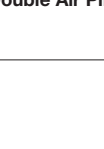



“S” Series Individual Subbase Valves Size 1 (Valve & Base without Pneumatic Connectors)

	Symbol	Type	Cv	Operator	Part number
Moduflex Series		 4-way, 2-position	0.32	Single solenoid	P2M1S4ES2C
				Single air pilot	P2M1S4PS
		 4-way, 2-position	0.32	Double solenoid	P2M1S4EE2C
				Double air pilot	P2M1S4PP
Isys Micro Series		 3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.22	Double solenoid	P2M1SDEE2C
				Double air pilot	P2M1SDPP
Isys ISO Series		 3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.22	Double solenoid	P2M1SCEE2C
				Double air pilot	P2M1SCPP
Fieldbus Series		 3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Double solenoid	P2M1SEEE2C
				Single solenoid	P2M1S3ES2C
DX ISOMAX Series		 3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Single air pilot	P2M1S3PS
				Double solenoid	P2M1SGEE2C











“S” Series Size 1 Accessories

	Description	Tube Size	Option	Part number
	Size 1 push to connect fitting	5/32"	Elbow	CMD04-1
			Straight	FMD04-1
	Size 1 push to connect fitting	1/4"	Elbow	CMD07-1B
			Straight	FMD07-1B
	Size 1 push to connect fitting	6mm	Elbow	CMD06-1
			Straight	FMD06-1
	Muffler for exhaust port			MMDVA1
	Plug			PMDYY1
	Double male union		Connecting peripheral modules	HMDXX1
	M8 female connector to flying lead - IP67 LED and surge protection		2m Cable	P8LS08L226C
			5m Cable	P8LS08L526C
			9m Cable	P8LS08L926C
	Field wireable connector		M8 Connector	P8CS0803J
			M12 Connector	P8CS1204J

“S” Series Individual Subbase Valves Size 2 (Valve & Base without Pneumatic Connectors)

	Symbol	Type	Cv	Operator	Part number
 Single Solenoid		4-way, 2-position	0.8	Single solenoid	P2M2S4ES2C
				Single air pilot	P2M2S4PS
 Single Air Pilot		4-way, 2-position	0.8	Double solenoid	P2M2S4EE2C
				Double air pilot	P2M2S4PP
 Double Solenoid		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.44	Double solenoid	P2M2SDEE2C
				Double air pilot	P2M2SDPP
 Double Air Pilot		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.44	Double solenoid	P2M2SCEE2C
				Double air pilot	P2M2SCPP
 Double Solenoid		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Double solenoid	P2M2SEEE2C
				Single solenoid	P2M2S3ES2C
 Double Air Pilot		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Single air pilot	P2M2S3PS
				Double solenoid	P2M2SGEE2C
 Double Solenoid		3-way, 2-position, dual valve, NC/NC	0.44	Double solenoid	P2M2SGEE2C

“S” Series Size 2 Accessories

	Description	Tube Size	Option	Part number
	Size 2 push to connect fitting	1/4" OD tube	Elbow	CMD07-2B
			Straight	FMD07-2B
	Size 2 push to connect fitting	3/8" OD tube	Elbow	CMD09-2B
			Straight	FMD09-2B
	Size 2 push to connect fitting	1/2" OD tube	Straight	FMD13-2B
			Size 2 push to connect fitting	6mm OD tube
Size 2 push to connect fitting	8mm OD tube	Straight		
		Size 2 push to connect fitting	10mm OD tube	Elbow
Size 2 push to connect fitting	12mm OD tube			Straight
			Size 2 push to connect fitting	10mm OD tube
Size 2 push to connect fitting	12mm OD tube			
			Size 2 push to connect fitting	12mm OD tube
Size 2 push to connect fitting	12mm OD tube			
			Muffler for exhaust port	
	Plug			PMDYY2
	Double male union		Connecting peripheral modules	HMDXX2
	M8 female connector to flying lead - IP67 LED and surge protection		2m Cable	P8LS08L226C
			5m Cable	P8LS08L526C
			9m Cable	P8LS08L926C
	Field wireable connector		M8 Connector	P8CS0803J
			M12 Connector	P8CS1204J

Moduflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

D

Subbase & Manifold Valve Products

“S” Series Individual Subbase Valve
(Complete with Pneumatic and Electrical Connectors)

- Moduflex Series
- Isys Micro Series
- Isys ISO Series
- Fieldbus
- DX ISOMAX Series
- Valvair II Series
- D** Subbase & Manifold Valve Products

P2M 1 S 4ES 2C 00 A F4

Basic series	
Moduflex	P2M

Size	
Size 1	1
Size 2	2

Valve series	
Individual subbase	S

Valve type / function	
3-way / 2-position	
Single solenoid, NC spring return	3ES
Single air pilot, NC spring return	3PS
4-way / 2-position	
Single solenoid, spring return	4ES
Single air pilot, spring return	4PS
Double solenoid	4EE
Double air pilot	4PP
Dual 3-way, 2-position, spring return	
Solenoid, NC / NC + PO check (4/3 APB)	BEE*
Air pilot, NC / NC + PO check (4/3 APB)	BPP*
Solenoid, NO / NO (4/3 Pressure Ctr.)	CEE
Air pilot NO / NO (4/3 Pressure Ctr.)	CPP
Solenoid, NC / NC with exhaust check	DEE
Air pilot, NC / NC with exhaust check	DPP
Solenoid, NO / NC with exhaust check	EEE
Solenoid, NC / NC without check (4/3 Exh. Ctr.)	GEE

* Valve includes peripheral P. O. Check Valve and union fittings.

Operator voltage	
24VDC	2C
Remote pilot - 5/32" (4mm) Tube	00

Ports (all ports)	
C0*	10mm Elbow fitting
C2*	12mm Elbow fitting
C4	5/32" (4mm) Elbow fitting
C6	6mm Elbow fitting
C7	1/4" Elbow fitting
C8*	8mm Elbow fitting
C9*	3/8" Elbow fitting
F0*	10mm Straight fitting
F2*	12mm Straight fitting
F3*	1/2" Straight fitting
F4	5/32" (4mm) Straight fitting
F6	6mm Straight fitting
F7	1/4" Straight fitting
F8*	8mm Straight fitting
F9*	3/8" Straight fitting

* Only available with size 2 valves.

Fitting configuration	
A*	Straight fittings
B*	Elbow fittings
C*†	Straight fitting & muffler
D*†	Elbow fitting & muffler

* Ports 1 & 3 fittings sizes are same as ports 2 & 4 (see example at left.)

† Fitting in port 1, muffler in port 3.

LED / Cable	
00	No cable, no LED, no surge suppression
V2	2 Meter cable with LED and surge suppression
V5	5 Meter cable with LED and surge suppression
V9	9 Meter cable with LED and surge suppression

Example for fitting configuration:
Size 1

CF7 Ports 1 & 3
 1/4" straight fitting & muffler
 Ports 2 & 4
 1/4" straight fittings

Size 2

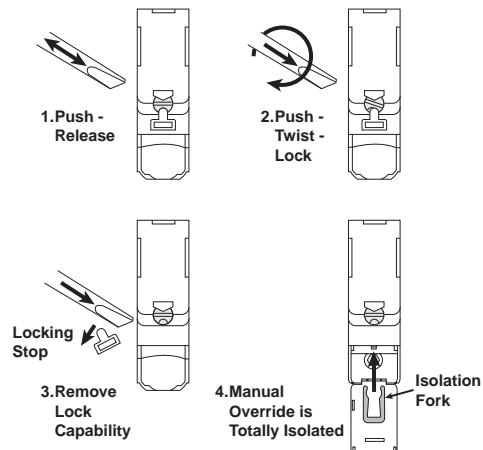
AC0 Ports 1 & 3
 10mm elbow fittings
 Ports 2 & 4
 10mm elbow fittings

With only one universal solenoid pilot for all configurations

















24VDC is now a global standard for all machines.

The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.













Multi-function adaptable manual override



“T” Series Manifold Valves with Individual Connectors Size 1

	Symbol	Type	Cv	Operator	Part number
 Single Solenoid		4-way, 2-position	0.32	Single solenoid	P2M1T4ES2C
				Single air pilot	P2M1T4PS
 Single Air Pilot		4-way, 2-position	0.32	Double solenoid	P2M1T4EE2C
				Double air pilot	P2M1T4PP
 Double Solenoid		4-way, 2-position, dual valve w/ exhaust check	0.18	Double solenoid	P2M1TJEE2C
				Double air pilot	P2M1TJPP
 Double Air Pilot		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.22	Double solenoid	P2M1TDEE2C
				Double air pilot	P2M1TDPP
 Double Solenoid		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.22	Double solenoid	P2M1TCEE2C
				Double air pilot	P2M1TCPP
 Double Air Pilot		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Double solenoid	P2M1TEEE2C
				Single solenoid	P2M1T3ES2C
 Double Solenoid		3-way, 2-position, NC w/ exhaust check	0.22	Single air pilot	P2M1T3PS
				Double solenoid	P2M1TGEE2C
 Double Air Pilot		3-way, 2-position, dual valve, NC/NC	0.22	Double solenoid	P2M1TGEE2C

“T” Series Size 1 Accessories

	Description	Tube size	Option	Part number
 	Size 1 push to connect fitting	5/32" or 4mm	Elbow	CMD04-1
			Straight	FMD04-1
 	Size 1 push to connect fitting	1/4"	Elbow	CMD07-1B
			Straight	FMD07-1B
 	Size 1 push to connect fitting	6mm	Elbow	CMD06-1
			Straight	FMD06-1
	Muffler for exhaust port			MMDVA1
	Plug			PMDYY1
	Double male union		Connecting peripheral modules	HMDXX1
	M8 female connector to flying lead - IP67 LED and surge protection		2M cable	P8LS08L226C
			5M cable	P8LS08L526C
			9M cable	P8LS08L926C
	Field wireable connector		M8 connector	P8CS0803J
			M12 connector	P8CS1204J
	Torx screwdriver			P2M1K0TASD

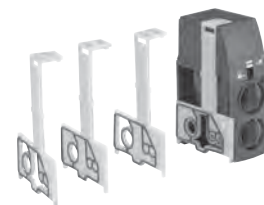
Manifold Options

Module	Part number
Pneumatic end plate kit	P2M2HXT01*
Pneumatic end plate kit with torx screwdriver	P2M2HXT0T*
Intermediate supply module (Includes 4 configuration plates)	P2M2BXT0A*

* Use Fittings for Size 2 Modules Only













P2M2HXT01






P2M2BXT0A

“T” Series Manifold Valves with Individual Connectors Size 2

	Symbol	Type	Cv	Operator	Part number
 <p>Single Solenoid Single Air Pilot</p>		4-way, 2-position	0.8	Single solenoid	P2M2T4ES2C
				Single air pilot	P2M2T4PS
		4-way, 2-position	0.8	Double solenoid	P2M2T4EE2C
				Double air pilot	P2M2T4PP
 <p>Double Solenoid Double Air Pilot</p>		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.44	Double solenoid	P2M2TDEE2C
				Double air pilot	P2M2TDPP
		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.44	Double solenoid	P2M2TCEE2C
				Double air pilot	P2M2TCPP
 <p>Double Solenoid Double Air Pilot</p>		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Double solenoid	P2M2TEEE2C
		3-way, 2-position, dual valve, NC w/ exhaust check	0.44	Single solenoid	P2M2T3ES2C
				Single air pilot	P2M2T3PS
		3-way, 2-position, dual valve, NC/NC	0.44	Double solenoid	P2M2TGEE2C

“T” Series Size 2 Accessories

	Description	Tube size	Option	Part number
 <p>Fieldbus Series</p>	Size 2 push to connect fitting	1/4"	Elbow	CMD07-2B
			Straight	FMD07-2B
	Size 2 push to connect fitting	3/8"	Elbow	CMD09-2B
			Straight	FMD09-2B
	Size 2 push to connect fitting	1/2"	Straight	FMD13-2B
 <p>DX ISOMAX Series</p>	Size 2 push to connect fitting	6mm	Elbow	CMD06-2
			Straight	FMD06-2
	Size 2 push to connect fitting	8mm	Elbow	CMD08-2
			Straight	FMD08-2
	Size 2 push to connect fitting	10mm	Elbow	CMD10-2
			Straight	FMD10-2
Size 2 Push to connect fitting	12mm	Elbow	CMD12-2	
		Straight	FMD12-2	
 <p>Valvar II Series</p>	Muffler for exhaust port			MMDVA2
	Plug			PMDYY2
	Double male union		Connecting peripheral modules	HMDXX2
	M8 female connector to flying lead - IP67 LED and surge protection		2M cable	P8LS08L226C
			5M cable	P8LS08L526C
			9M cable	P8LS08L926C
	Field wireable connector		M8 connector	P8CS0803J
			M12 connector	P8CS1204J
Torx screwdriver			P2M1K0TASD	

Manifold Options

Module	Part number
Pneumatic end plate kit	P2M2HXT01*
Pneumatic end plate kit with torx screwdriver	P2M2HXT0T*
Intermediate supply module (Includes 4 configuration plates)	P2M2BXT0A*

* Use Fittings for Size 2 Modules Only



“T” Series Valve Manifold with Individual Connectors
(Complete with Pneumatic and Electrical Connectors)

P2M 1 T 4ES 2C 00 0 F4

Basic series			
Valvetronic modules	P2M		
Size			
Size 1	1		
Size 2	2		
Valve series			
Individual wire	T		
Valve type / function			
3-way / 2-position			
Single solenoid, NC spring return	3ES		
Single air pilot, NC spring return	3PS		
4-way / 2-position			
Single solenoid, spring return	4ES		
Single air pilot, spring return	4PS		
Double solenoid	4EE		
Double air pilot	4PP		
Dual 3-way, 2-position, spring return			
Solenoid, NC / NC + PO check (4/3 APB)	BEE*		
Air pilot, NC / NC + PO check (4/3 APB)	BPP*		
Solenoid, NO / NO (4/3 Pressure Ctr.)	CEE		
Air pilot NO / NO (4/3 Pressure Ctr.)	CPP		
Solenoid, NC / NC with exhaust check	DEE		
Air pilot, NC / NC with exhaust check	DPP		
Solenoid, NO / NC with exhaust check	EEE		
Solenoid, NC / NC without check (4/3 Exh. Ctr.)	GEE		
Dual 4-way, 2-position, Spring Return			
Solenoid	JEE**		
Air pilot	JPP**		

	Ports 2 & 4
	C0* 10mm Elbow fitting
	C2* 12mm Elbow fitting
	C4 5/32" (4mm) Elbow fitting
	C6 6mm Elbow fitting
	C7 1/4" Elbow fitting
	C8* 8mm Elbow fitting
	C9* 3/8" Elbow fitting
	F0* 10mm Straight fitting
	F2* 12mm Straight fitting
	F3* 1/2" Straight fitting
	F4 5/32" (4mm) Straight fitting
	F6 6mm Straight fitting
	F7 1/4" Straight fitting
	F8* 8mm Straight fitting
	F9* 3/8" Straight fitting

* Only available with size 2 valves.

	Ports 1 & 3
	0 None

Led / Cable	
00	No cable, no led, no surge suppression
V2	2 Meter cable with led and surge suppression
V5	5 Meter cable with led and surge suppression
V9	9 Meter cable with led and surge suppression

Operator Voltage	
2C	24VDC
00	Remote pilot - 5/32" (4mm) tube

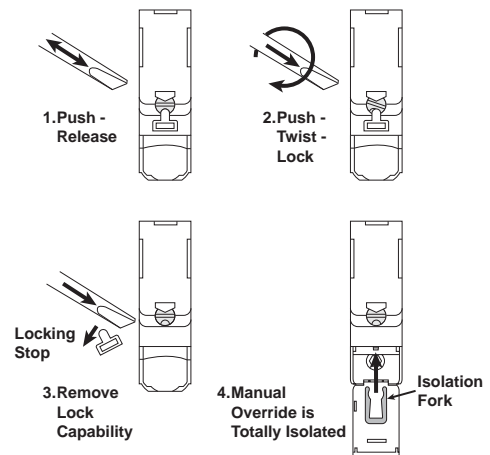
* Valve includes peripheral P. O. check valve and union fittings.
 ** Size 1 only.

Moduflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus
 DX ISOMAX Series
 Valvair II Series
D
 Subbase & Manifold Valve Products









With only one universal solenoid pilot for all configurations

24VDC is now a global standard for all machines. The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.








Multi-function adaptable manual override



“V” Series Manifold Valves with Collective Wiring Size 1

	Symbol	Type	Cv	Operator	Part number
 <p>Single Solenoid</p> <p>Double Solenoid</p>		4-way, 2-position	0.32	Single solenoid	P2M1V4ES2CV
		4-way, 2-position	0.32	Double solenoid	P2M1V4EE2CV
		4-way, 2-position, dual valve, w/ exhaust check	0.18		P2M1VJEE2CV
		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.22	Double solenoid	P2M1VDEE2CV
		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.22	Double solenoid	P2M1VCEE2CV
		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Double solenoid	P2M1VEEE2CV
		3-way, 2-position, NC w/ exhaust check	0.22	Single solenoid	P2M1V3ES2CV
		3-way, 2-position, dual valve, NC/NC	0.22	Double solenoid	P2M1VGEE2CV

“V” Series Size 1 Accessories

	Description	Tube size	Option	Part number	
	Size 1 push to connect fitting	5/32"	Elbow	CMD04-1	
			Straight	FMD04-1	
	Size 1 push to connect fitting	1/4"	Elbow	CMD07-1B	
			Straight	FMD07-1B	
	Size 1 push to connect fitting	6mm	Elbow	CMD06-1	
			Straight	FMD06-1	
	Muffler for exhaust port			MMDVA1	
	Plug			PMDYY1	
	Double male union		Connecting peripheral modules	HMDXX1	
		Electrical 20-pin multi-connector cable with flying leads	IP65 rated	2M cable	P8LMH20M2A
				5M cable	P8LMH20M5A
				9M cable	P8LMH20M9A
		Electrical 25-pin D-sub cable	IP20 rated	3M cable	P8LMH25M3A
				9M cable	SCD259D
			IP65 rated	3M cable	SCD253W
				9M cable	SCD259WE
		Field wireable connector for power supply	Female	M12 - A code	P8CS1205AA
Line termination resistor		Profibus DP	M12 type B	P8BPA00MB	
		Devicenet or Canopen	M12 type A	P8BPA00MA	
	AS-i M12 cable with jack for addressing		1M cable	P8LS12JACK	
	Torx screwdriver			P2M1K0TASD	

Electrical Connections

Description	Part number
20-pin, Multi-connector electrical head module	P2M2HEV0A
25-pin, D-sub, electrical head module	P2M2HEV0D

Fieldbus Connections

Description	Part number	
Profibus DP	P2M2HBVP21600	
DeviceNet	P2M2HBVD21600	
CANopen	P2M2HBVC21600	
Interbus S	P2M2HBVS11600	
AS-i	0 inputs and 8 solenoid outputs	P2M2HBVA10800
AS-i	8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	P2M2HBVA10808A
AS-i	8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs	P2M2HBVA10808B
AS-i Version 2.1 ProtocolAS-i	0 inputs and 6 solenoid outputs	P2M2HBVA20600
AS-i Version 2.1 ProtocolAS-i	8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs	P2M2HBVA20608A
AS-i Version 2.1 ProtocolAS-i	8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	P2M2HBVA20608B

Manifold Options

Module	Part number
Pneumatic end plate kit	P2M2HXT01*
Pneumatic end plate kit with torx screwdriver	P2M2HXT0T*
Intermediate supply module (Includes 4 configuration plates)	P2M2BXV0A*

* Use Fittings for Size 2 Modules Only



P2M2HXT01



P2M2BXV0A

Moduflex
Series

Isys Micro
Series

Isys ISO
Series

Fieldbus










DX ISOMAX
Series

Valvair II
Series








D

Subbase & Manifold
Valve Products

“V” Series Manifold Valves with Collective Wiring Size 2

	Symbol	Type	Cv	Operator	Part number
 		4-way, 2-position	0.8	Single solenoid	P2M2V4ES2CV
		4-way, 2-position	0.8	Double solenoid	P2M2V4EE2CV
		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.44	Double solenoid	P2M2VDEE2CV
		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.44	Double solenoid	P2M2VCEE2CV
		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Double solenoid	P2M2VEEE2CV
		3-way, 2-position, dual valve, NC w/ exhaust check	0.44	Single solenoid	P2M2V3ES2CV
		3-way, 2-position, dual valve, NC/NC	0.44	Double solenoid	P2M2VGEE2CV

“V” Series Size 2 Accessories

	Description	Tube size	Option	Part number
	Size 2 push to connect fitting	1/4" OD tube	Elbow	CMD07-2B
			Straight	FMD07-2B
	Size 2 push to connect fitting	3/8" OD tube	Elbow	CMD09-2B
			Straight	FMD09-2B
	Size 2 push to connect fitting	1/2" OD tube	Straight	FMD13-2B
			Size 2 push to connect fitting	6mm OD tube
	Straight	FMD06-2		
	Size 2 push to connect fitting	8mm OD tube	Elbow	CMD08-2
			Straight	FMD08-2
	Size 2 push to connect fitting	10mm OD tube	Elbow	CMD10-2
			Straight	FMD10-2
	Size 2 push to connect fitting	12mm OD tube	Elbow	CMD12-2
Straight			FMD12-2	
	Muffler for exhaust port			MMDVA2
	Plug			PMDYY2
	Double Male Union		Connecting peripheral modules	HMDXX2
	Electrical 20-pin multi-connector cable with flying leads	IP65 rated	2M cable	P8LMH20M2A
			5M cable	P8LMH20M5A
			9M cable	P8LMH20M9A
	Electrical 25-pin D-sub cable	IP20 rated	3M cable	P8LMH25M3A
			9M cable	SCD259D
			IP65 rated	3M cable
9M cable	SCD259WE			
	Torx screwdriver			P2M1K0TASD

Electrical Connections

Description	Part number
20-pin, Multi-connector electrical head module	P2M2HEV0A
25-pin, D-sub, electrical head module	P2M2HEV0D

Fieldbus Connections

Description	Part number	
Profibus DP	P2M2HBVP21600	
DeviceNet	P2M2HBVD21600	
CANopen	P2M2HBVC21600	
Interbus S	P2M2HBVS11600	
AS-i	0 inputs and 8 solenoid outputs	P2M2HBVA10800
AS-i	8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	P2M2HBVA10808A
AS-i	8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs	P2M2HBVA10808B
AS-i Version 2.1 Protocol AS-i	0 inputs and 6 solenoid outputs	P2M2HBVA20600
AS-i Version 2.1 Protocol AS-i	8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs	P2M2HBVA20608A
AS-i Version 2.1 Protocol AS-i	8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	P2M2HBVA20608B

Manifold Options

Module	Part number
Pneumatic end plate kit	P2M2HXT01*
Pneumatic end plate kit with torx screwdriver	P2M2HXT0T*
Intermediate supply module (Includes 4 configuration plates)	P2M2BXV0A*

* Use Fittings for Size 2 Modules Only



P2M2HXT01



P2M2BXV0A

Moduflex
Series

Isys Micro
Series

Isys ISO
Series

Fieldbus

DX ISOMAX
Series

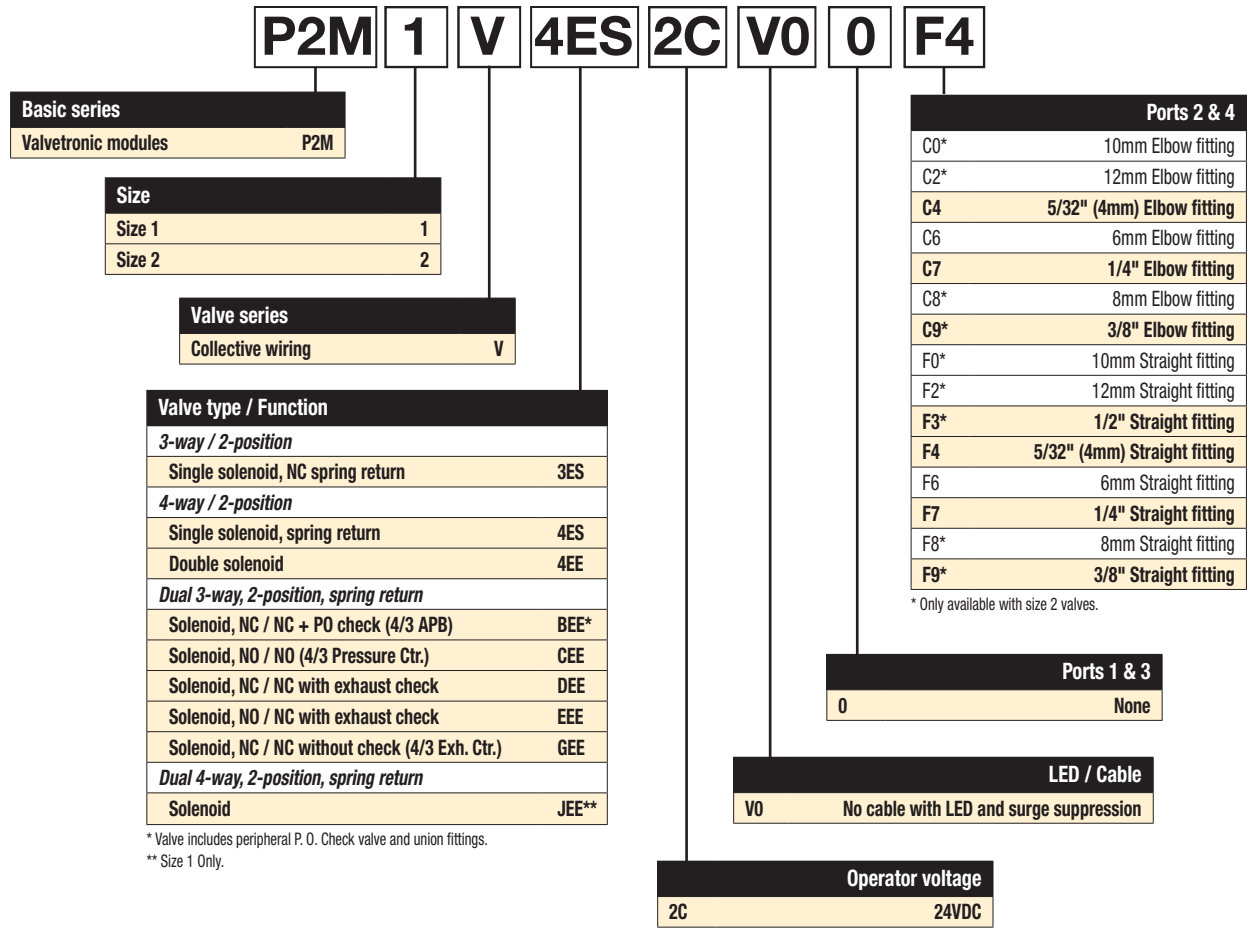
Valvair II
Series

D

Subbase & Manifold
Valve Products

“V” Series Valve Manifold with Collective Wiring
(Complete with Pneumatic Connectors)

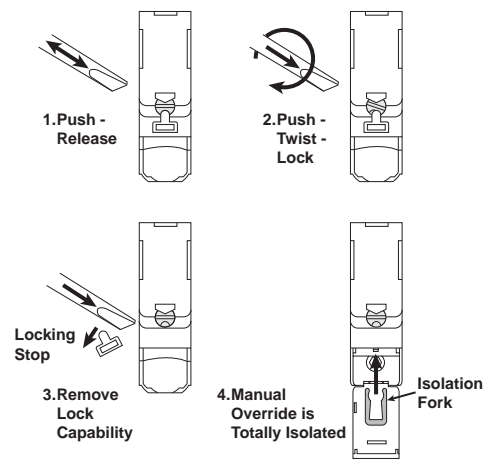
Moduflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus
 DX ISOMAX Series
 Valvair II Series
D
 Subbase & Manifold Valve Products














With only one universal solenoid pilot for all configurations

24VDC is now a global standard for all machines. The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

Multi-function adaptable manual override

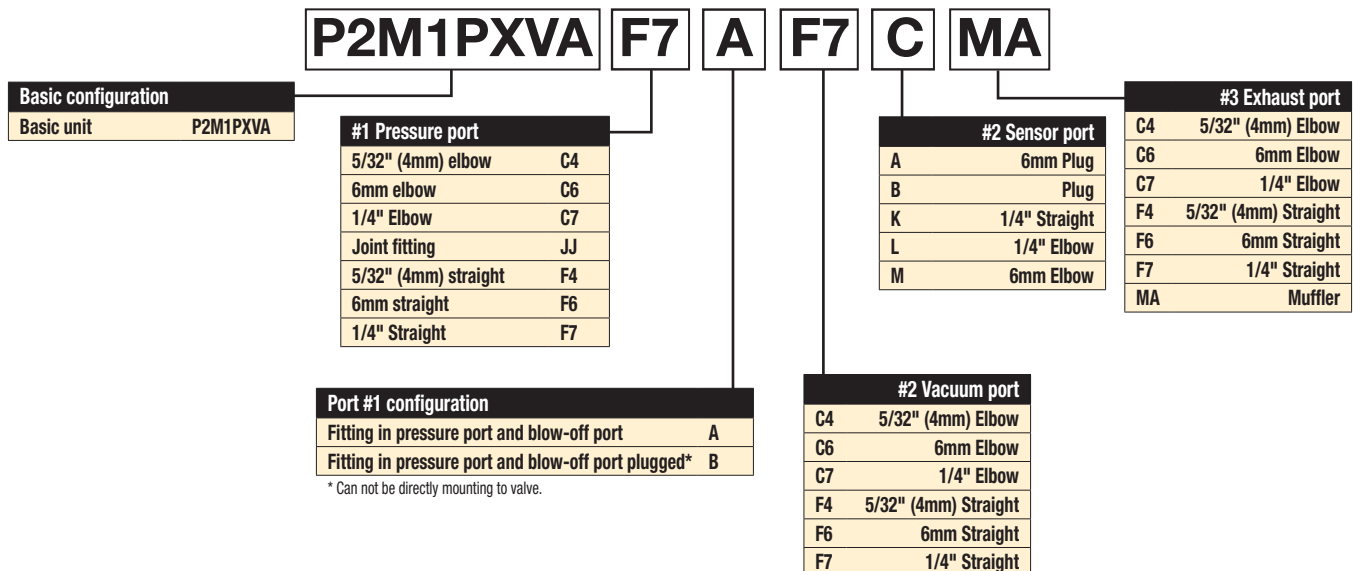


Peripheral Modules Size 1

Accessories	Description	Option	Part number
	Pressure regulator without gauge	0 to 30 PSI	P2M1PXST
		0 to 60 PSI	P2M1PXSL
		0 to 120 PSI	P2M1PXSN
	Pressure regulator with gauge	0 to 30 PSI	P2M1PXSR
		0 to 60 PSI	P2M1PXSM
		0 to 120 PSI	P2M1PXSG
	Gauge	0 to 30 PSI	P2M1K0GT
		0 to 60 PSI	P2M1K0GL
		0 to 120 PSI	P2M1K0GN
	Dual P.O. Check valve		P2M1PXCA
	Dual flow control		P2M1PXFA
	Vacuum generator	See ordering information below	P2M1PXVA
	Size 1 push to connect fitting	5/32" or 4mm OD tube	Elbow CMD04-1 Straight FMD04-1
		1/4" OD tube	Elbow CMD07-1B Straight FMD07-1B
	Size 1 push to connect fitting	6mm OD tube	Elbow CMD06-1 Straight FMD06-1
			Connecting peripheral modules
	Double male union		HMDXX1
	Muffler for vacuum exhaust port		MMDVA1
	Plug		PMDYY1










Moduflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus
 DX ISOMAX Series
 Valvair II Series

Vacuum Generator Model Number Index

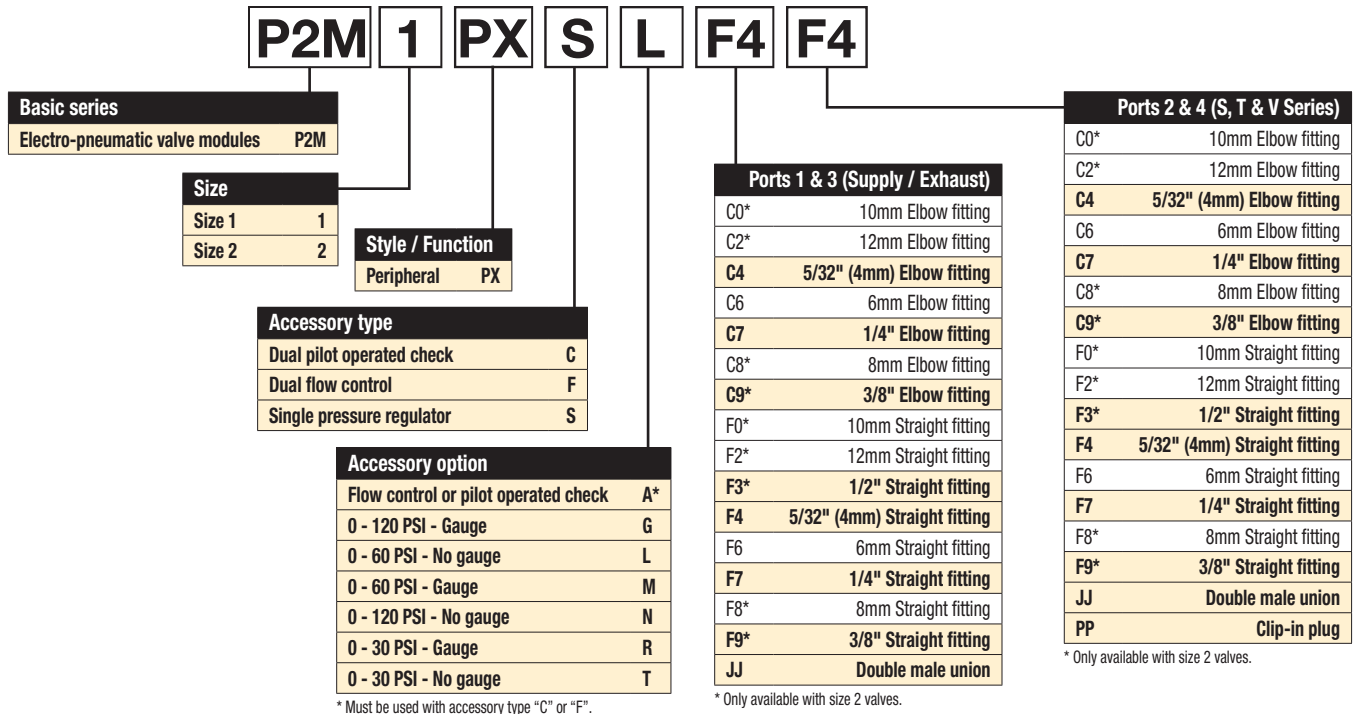


D
 Subbase & Manifold Valve Products

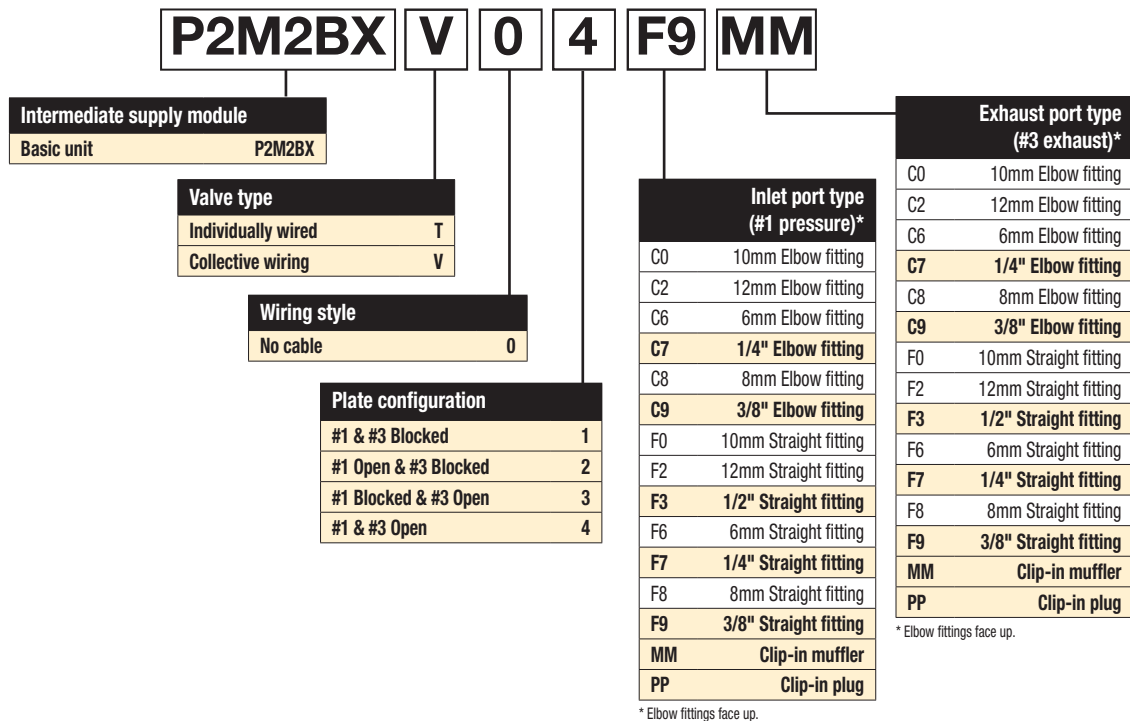
Peripheral Modules Size 2

	Accessories	Description	Option	Part number
Moduflex Series		Pressure regulator without gauge	0 to 30 PSI	P2M2PXST
			0 to 60 PSI	P2M2PXSL
			0 to 120 PSI	P2M2PXSN
Moduflex Series		Pressure regulator with gauge	0 to 30 PSI	P2M2PXSR
			0 to 60 PSI	P2M2PXSM
			0 to 120 PSI	P2M2PXSG
Isys Micro Series		Gauge	0 to 30 PSI	P2M1K0GT
			0 to 60 PSI	P2M1K0GL
			0 to 120 PSI	P2M1K0GN
Isys ISO Series		Dual P.O. check valve		P2M2PXCA
				Dual flow control
Fieldbus Series		Size 2 push to connect fitting	1/4" OD tube	Elbow CMD07-2B
			3/8" OD tube	Straight FMD07-2B
			1/2" OD tube	Elbow CMD09-2B
				Straight FMD09-2B
DX ISOMAX Series		Size 2 push to connect fitting	6mm OD tube	Elbow CMD06-2
			8mm OD tube	Straight FMD06-2
			10mm OD tube	Elbow CMD08-2
			12mm OD tube	Straight FMD08-2
				Elbow CMD10-2
				Straight FMD10-2
Valvair II Series		Size 2 push to connect fitting	12mm OD tube	Elbow CMD12-2
				Straight FMD12-2
Subbase & Manifold Valve Products		Muffler for exhaust port		MMDVA2
		Plug		PMDYY2
		Double Male Union	Connecting peripheral modules	HMDXX2

“P” Series Peripheral Modules Model Number Index
(Complete with Pneumatic Connectors)



Intermediate Supply Module Model Number Index



Moduflex Add-A-Fold Assembly Model Number Index
(Complete with Pneumatic and Electrical Connectors)

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List valves and manifolds. List left to right, LOOKING AT THE CYLINDER PORTS on the manifold.

P2MA V 0 1 C9 C9 ##

Moduflex island assembly	
Add-A-Fold	P2MA*

*Includes pneumatic H & T end plate kit.

Style	
Individually wired	T
Collective wiring	V*

* Includes 20-pin multi-connector or 25-pin, D-sub electrical head module.

Wiring / Bus protocol	
No cable (20-pin multi-connector T series)	0
2 Meter cable (20-pin)	2
5 Meter cable (20-pin)	5
9 Meter cable (20-pin)	9
Bus	
No cable (25-pin, D-sub)	D
3 Meter cable (25-pin, D-sub)	F

* Order bus module as a separate line item.
 † Default to option "0" for T series.

Pilot source	
Internal supply / Internal exhaust	1
Internal supply / External exhaust	2
External supply / Internal exhaust	3
External supply / External exhaust	4

Number of stations [†]	
01 - 19*	V-Type
01 - 30	T-Type

* Max. number of addresses for V type is 19. Single solenoid valves equal one address. Double solenoid valves equal two addresses. Maximum address may depend upon choice of bus protocol.

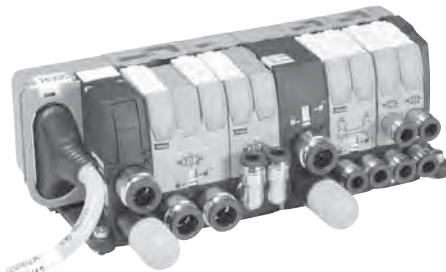
† Intermediate modules are considered stations, but do not count against maximum number of addresses for manifold.

Exhaust port type (#3 Exhaust)*	
C0	10mm Elbow fitting
C2	12mm Elbow fitting
C6	6mm Elbow fitting
C7	1/4" Elbow fitting
C8	8mm Elbow fitting
C9	3/8" Elbow fitting
F0	10mm Straight fitting
F2	12mm Straight fitting
F3	1/2" Straight fitting
F6	6mm Straight fitting
F7	1/4" Straight fitting
F8	8mm Straight fitting
F9	3/8" Straight fitting
MM	Clip-in muffler
PP	Clip-in plug

* Elbow fittings face up.

Inlet port type (#1 pressure)*	
C0	10mm Elbow fitting
C2	12mm Elbow fitting
C6	6mm Elbow fitting
C7	1/4" Elbow fitting
C8	8mm Elbow fitting
C9	3/8" Elbow fitting
F0	10mm Straight fitting
F2	12mm Straight fitting
F3	1/2" Straight fitting
F6	6mm Straight fitting
F7	1/4" Straight fitting
F8	8mm Straight fitting
F9	3/8" Straight fitting
MM	Clip-in muffler
PP	Clip-in plug

* Elbow fittings face up.



"V" Series with 20-pin Connector



"V" Series with Field Bus Connection

Moduflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus
 DX ISOMAX Series
 Valvair II Series
D
 Subbase & Manifold Valve Products

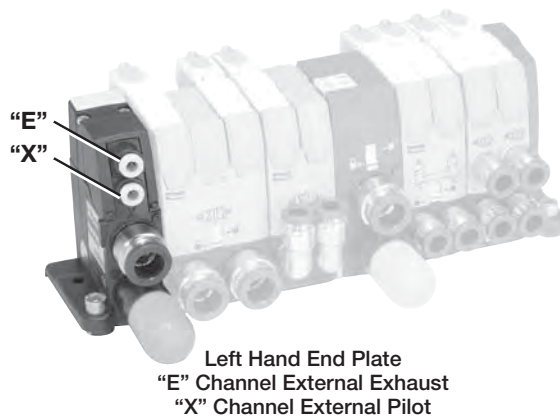
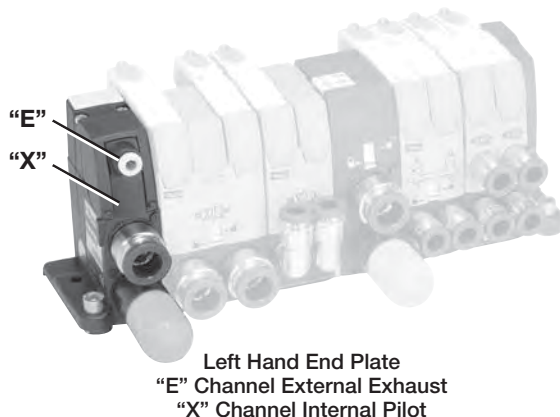
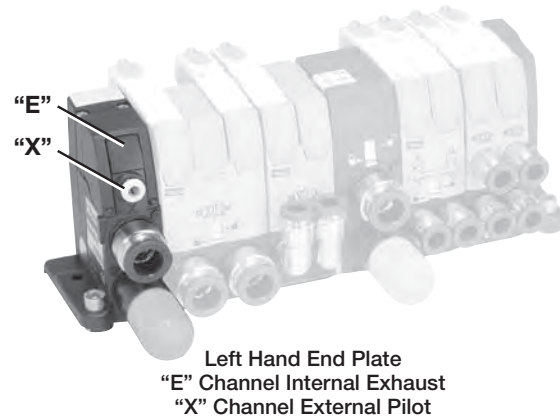
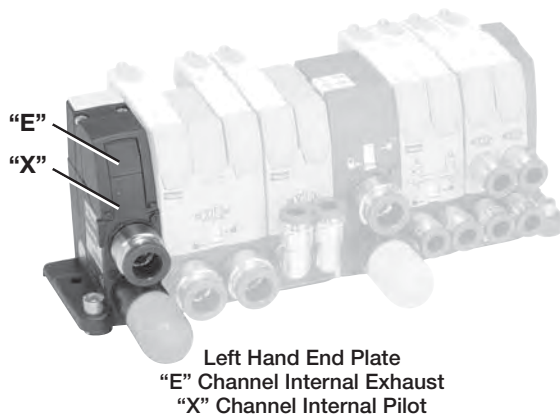
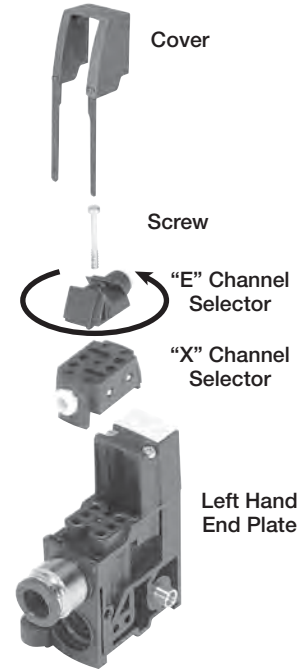
Internal and external pilot supply options

All T and V Series Valve bases incorporate an auxiliary channel "X" to supply pressure to the solenoid pilots. The "X" galley is pressurized from the left hand end plate. Depending on the configuration of the left hand end plate, this pressure is either supplied from the #1 port in the left hand end plate or supplied externally through a 4mm OD tube fitting in the left hand end plate. This fitting is supplied in all left hand end plates and can be converted in the field.

Internal and external solenoid pilot exhaust options

All T and V Series Valve bases incorporate an auxiliary channel "E" which is used to exhaust the solenoid pilot pressure from each solenoid valve. The "E" galley is connected to the left hand end plate. Depending on the configuration of the left hand end plate, this exhaust is either connected to the #3 exhaust port or is connected to a 4mm OD Tube fitting in the left hand end plate. This fitting is supplied in all left hand end plates and can be converted in the field.

To configure the left hand end plate, with pressure off, remove head cover to expose the selector section. Loosen selector section and rotate "X" or "E" channel selector to desired position. Tighten selector section and assemble cover.



Moduflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products

Solenoid Pilot 24VDC

Description	Part number
Solenoid pilot (without plug-in electrical connector)	P2D8V32C5
Air pilot with 5/32" (4mm) tube fitting	P2M2K0PA



P2D8V32C5



P2M2K0PA

Moduflex Series

Isys Micro Series

Size 1 Valve Without Solenoid Pilot and Without Subbase

4-way / 2-position / Single Valve



P2M1X4EE

Solenoid	Part number
Single solenoid (Monostable)	P2M1X4ES
Double solenoid (Bistable)	P2M1X4EE

4-way / 2-position / Dual Valve

Solenoid	Part number
Solenoid spring with exhaust check	P2M1XJEE

3-way / 2-position / Dual Valve

Solenoid	Part number
Double solenoid NC + NC with exhaust check	P2M1XDDE
Double solenoid NO + NO with exhaust check	P2M1XCEE
Double solenoid NC + NO with exhaust check	P2M1XEEE
Single solenoid NC with exhaust check	P2M1X3ES

Size 2 Valve Without Solenoid Pilot and Without Subbase

4-way / 2-position / Dual Valve



P2M2X4EE

Solenoid	Part number
Single solenoid (Monostable)	P2M2X4ES
Double solenoid (Bistable)	P2M2X4EE

3-way / 2-position / Dual Valve

Solenoid	Part number
Double solenoid NC + NC with exhaust check	P2M2XDDE
Double solenoid NO + NO with exhaust check	P2M2XCEE
Double solenoid NC + NO with exhaust check	P2M2XEEE
Single solenoid NC with exhaust check	P2M2X3ES

Isys ISO Series

Fieldbus

DX ISOMAX Series

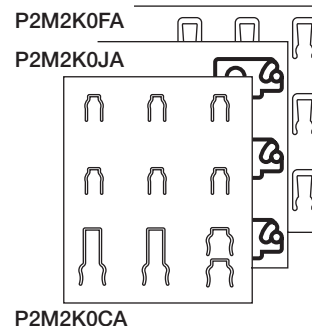
Valvair II Series

D

Subbase & Manifold Valve Products

Set of Maintenance Parts

Description	Part number
Clips Set of 10 clips: 6 for size 1 valves, 2 for size 2 valves, 2 for end plate and intermediate modules	P2M2K0CA
Seals Set of 10 seals: 3 for manifold to manifold seals, 3 under solenoid pilot seals, 4 under valve seals (two size 1 seals, two size 2 seals)	P2M2K0JA
Forks Set of 10 isolation forks for solenoid pilot manual override	P2M2K0FA



“S” Series Individual Subbase Valve Dimensions and Mounting

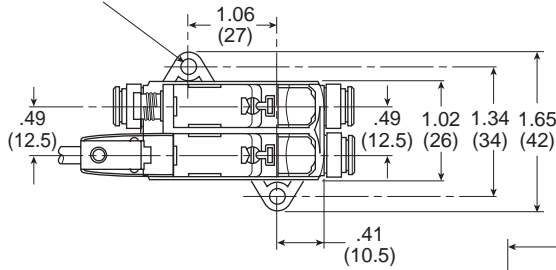
Subbase Valve Size 1



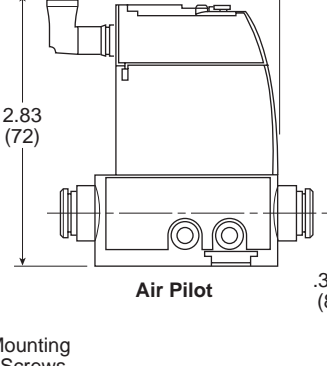
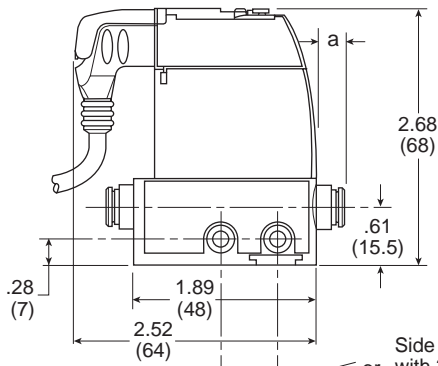
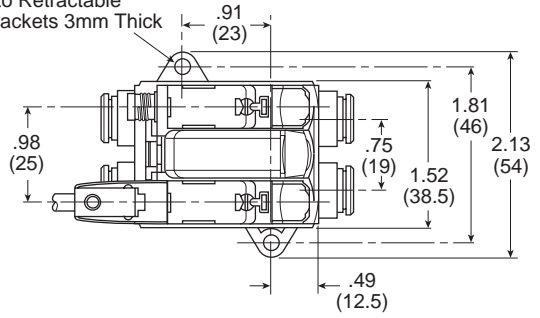
Subbase Valve Size 2



Surface Mounting with Screws 4 mm Dia. into Retractable Brackets 3mm Thick



Surface Mounting with Screws 4 mm Dia. into Retractable Brackets 3mm Thick



Side Mounting with 2 Screws 4mm Dia.

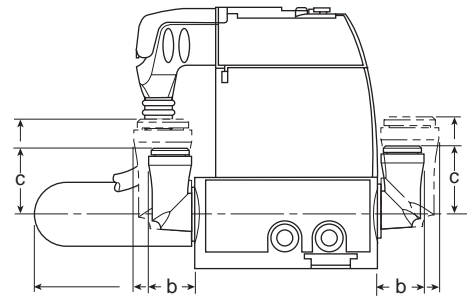
Side Mounting with 2 Screws 4mm Dia.

Size 1

Size 2

	OD Tube Ext.	a	b	c
Size 1 Valves	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
	Muffler	31		
Size 2 Valves	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22
	Muffler	40		

Special Case: 4/3 all ports blocked. Add the dual P.O. check valve that has been plugged in the basic valve.



Moduflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

D

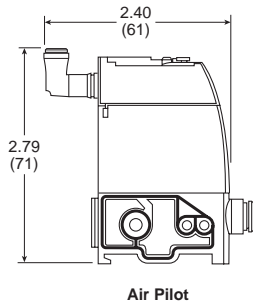
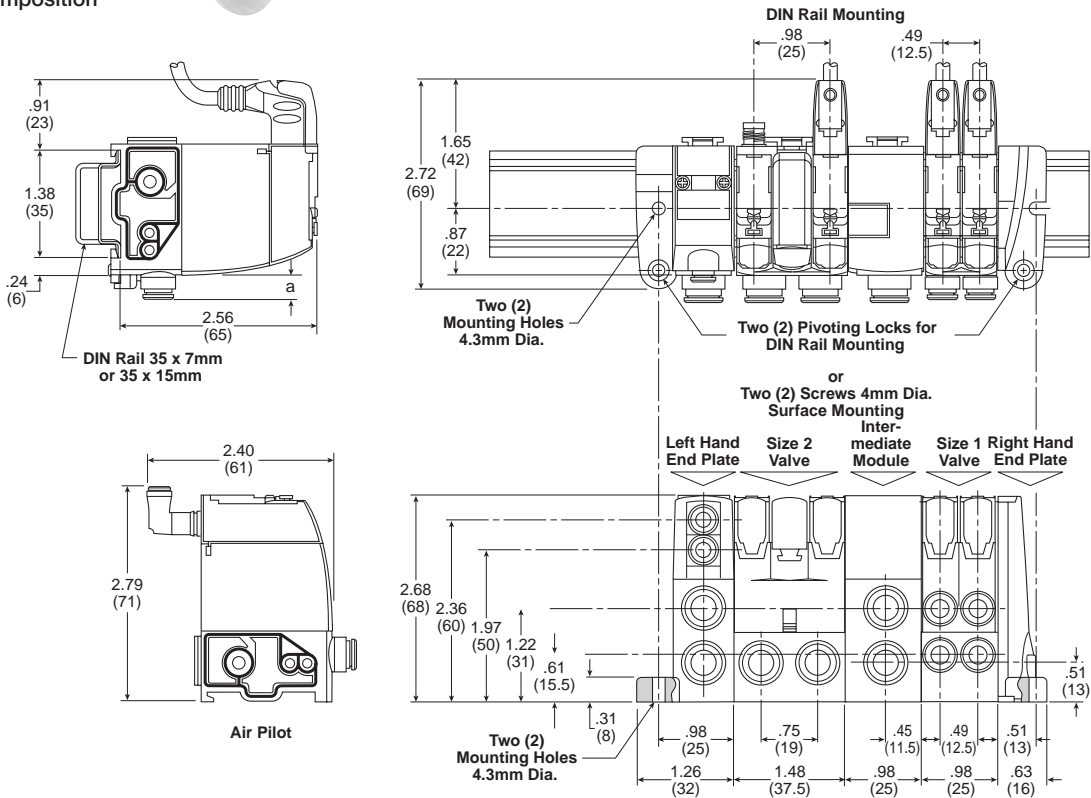
Subbase & Manifold Valve Products

"T" Series Manifold Dimensions and Mounting

- Moduflex Series
- Isys Micro Series
- Isys ISO Series
- Fieldbus
- DX ISOMAX Series
- Valvair II Series
- D**
- Subbase & Manifold Valve Products



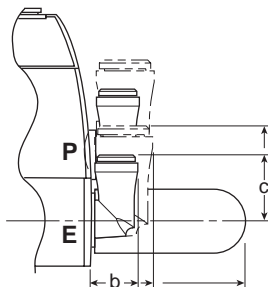
Total Width Depends on Valve Composition



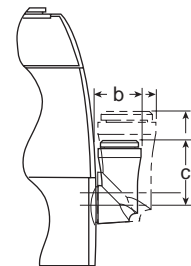
Special Case: 4/3 all ports blocked function within island version, add the dimensions of the dual P.O. check valve plugged into the island.

End Plate and Intermediate Modules

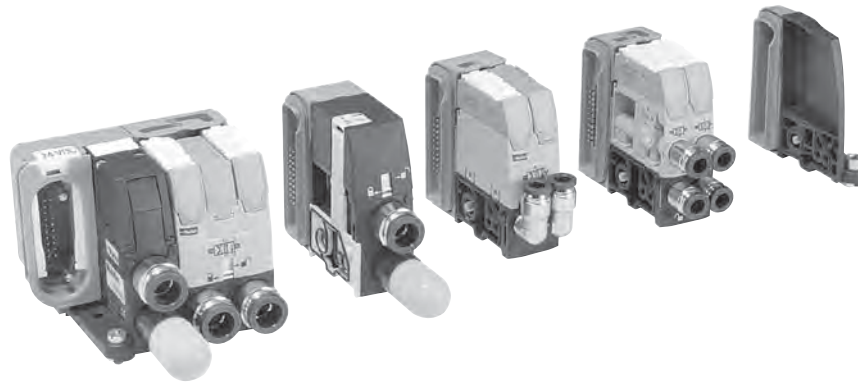
	a	b	c
6 mm Tube OD	8	13	16
1/4" Tube OD	12	18	22
8 mm Tube OD	9	16	19
3/8" Tube OD	16	23	26
10 mm Tube OD	13	18	25
12 mm Tube OD	13	19	25
1/2" Tube OD	13		
Muffler	40		



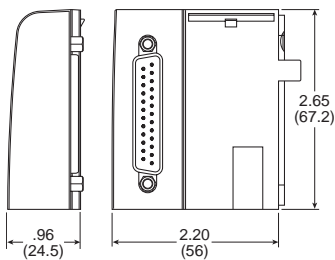
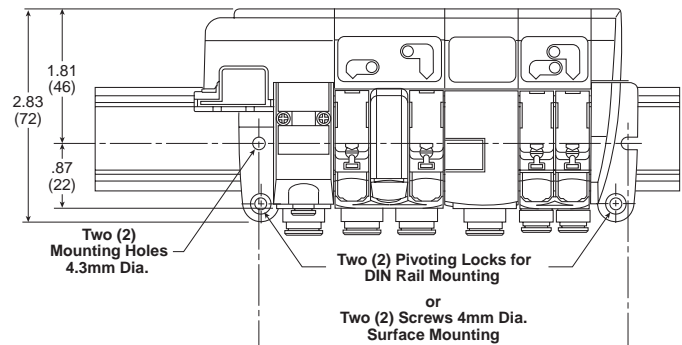
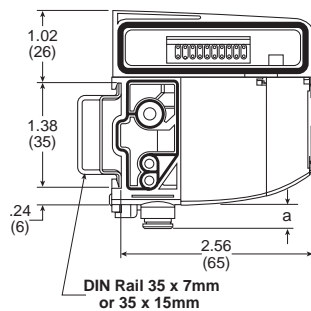
OD Tube	Ext.	a	b	c
Size 1 Valves	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
Size 2 Valves	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22



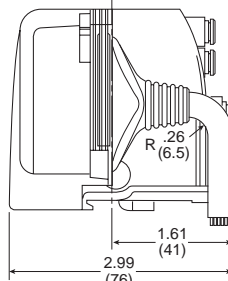
“V” Series Manifold Dimensions and Mounting
 20-pin, Multi-Connector Valve Manifold



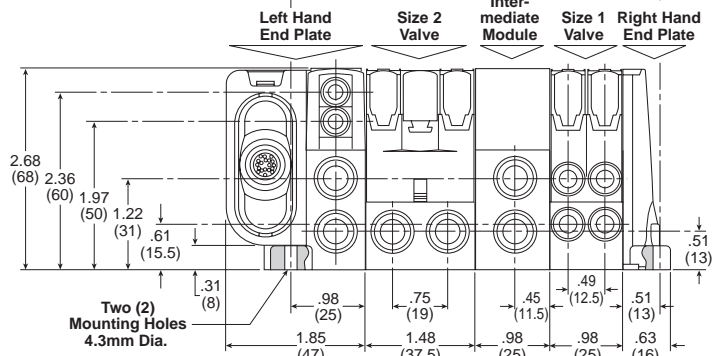
Total Width Depends
 on Valve Composition



25-pin,
 D-Sub

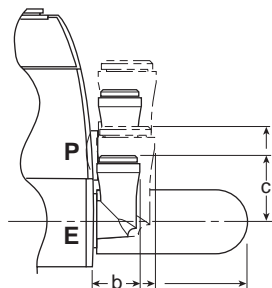


20-pin,
 Multi-Connector

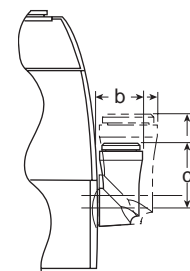


**End Plate and
 Intermediate Modules**

	a	b	c
6 mm Tube OD	8	13	16
1/4" Tube OD	12	18	22
8 mm Tube OD	9	16	19
3/8" Tube OD	16	23	26
10 mm Tube OD	13	18	25
12 mm Tube OD	13	19	25
1/2" Tube OD	13		
Muffler	40		



OD Tube	Ext.	a	b	c
Size 1 Modules	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
	1/4"	12	18	22
Size 2 Modules	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22

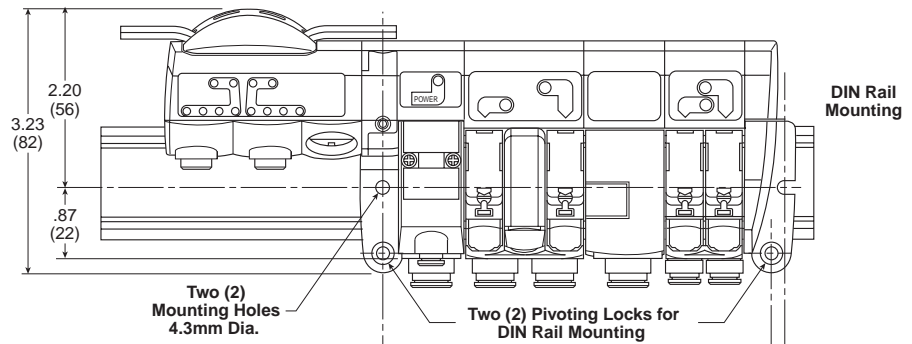
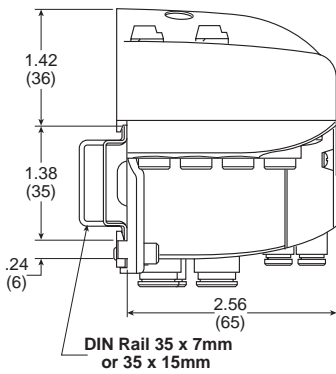


“V” Series Manifold Dimensions and Mounting
 Fieldbus Connected Manifolds

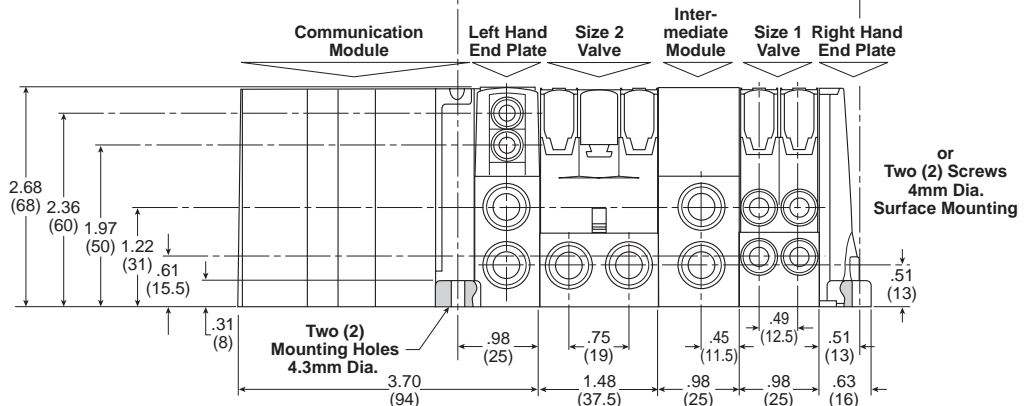
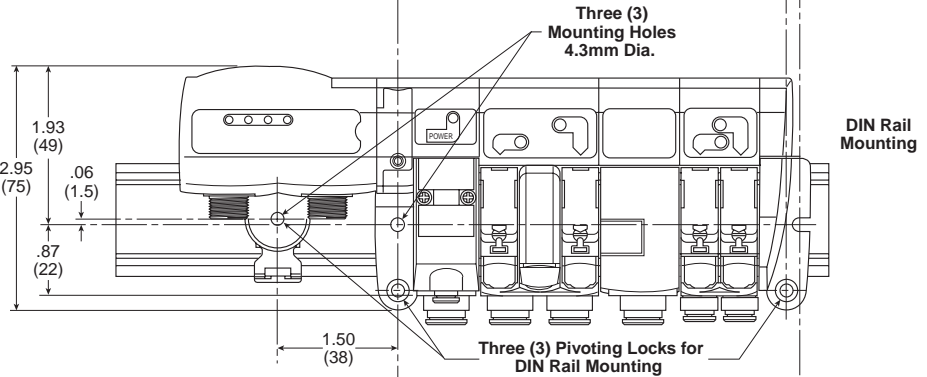
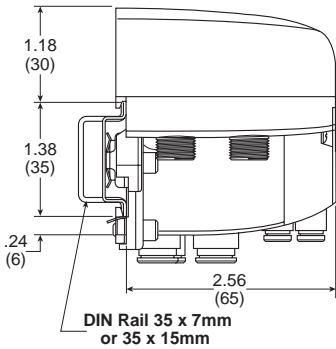
Total Width Depends
 on Valve Composition



AS-i Bus Islands



Device Bus Islands

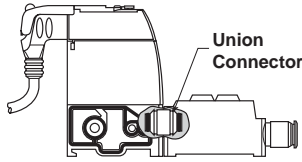


Moduflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products

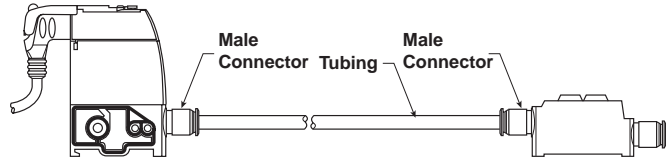
“P” Series Peripheral Modules Dimensions and Mounting

Reminder: Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

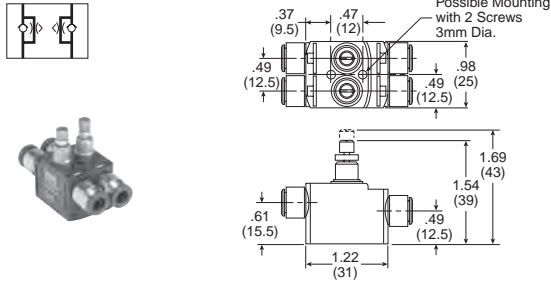
Peripheral Module
 Plugged in a Valve



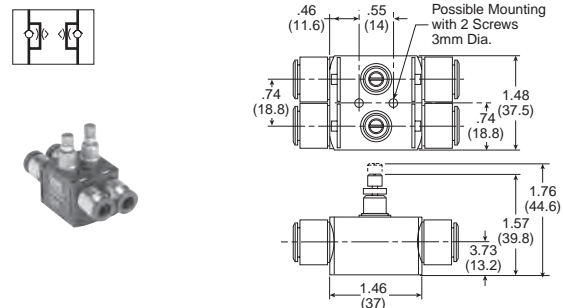
In-Line Peripheral Modules:
 Mounting is Required



Dual Flow Control Size 1

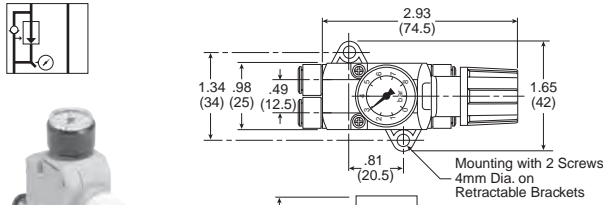


Dual Flow Control Size 2



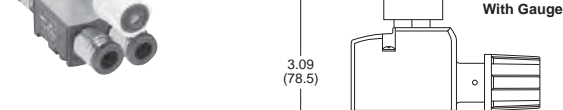
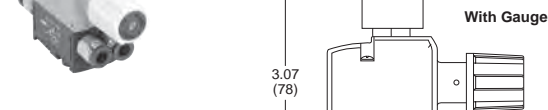
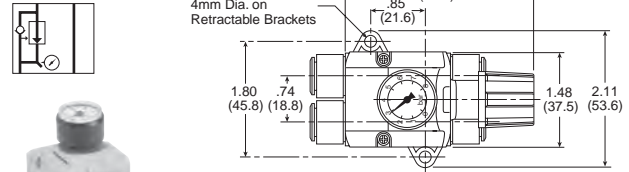
Pressure Regulator Size 1

With Gauge

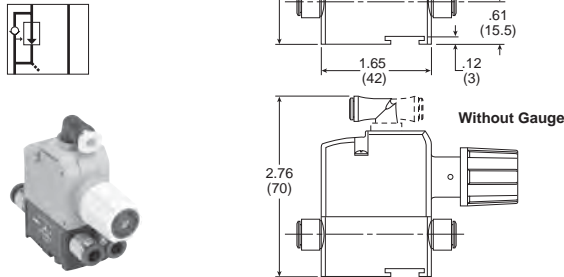


Pressure Regulator Size 2

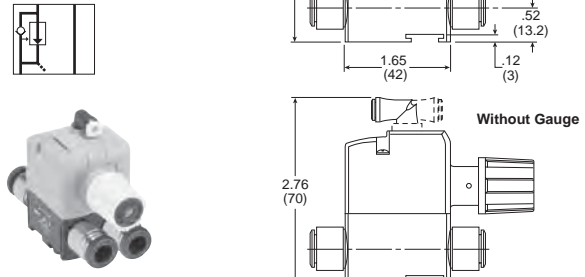
With Gauge



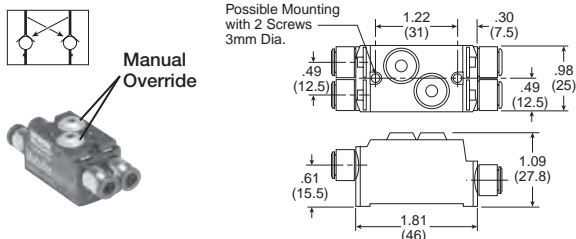
Without Gauge



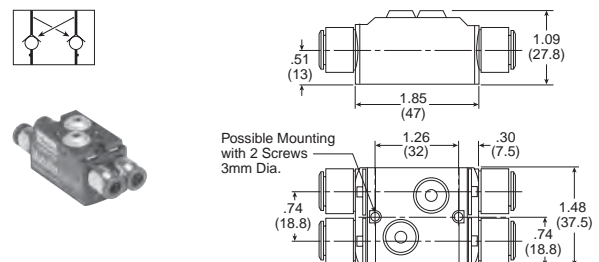
Without Gauge



Dual P.O. Check Valve Size 1



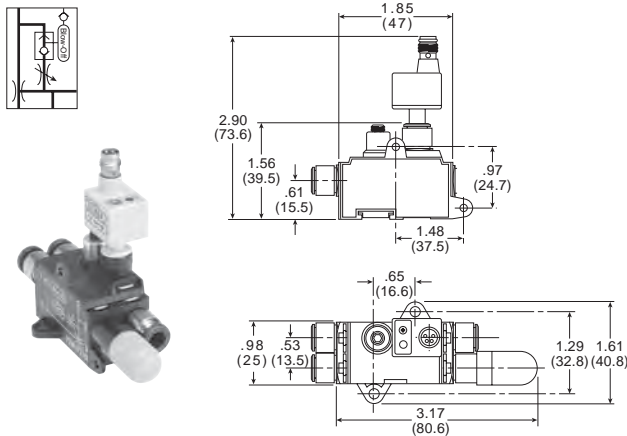
Dual P.O. Check Valve Size 2



“P” Series Peripheral Modules Dimensions and Mounting

Reminder: Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

Vacuum Generator Size 1

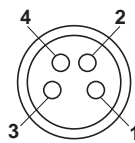


Sensor specifications

Fieldbus	Media	Air and non-corrosives gases
	Proof pressure	(V) 72.5 PSI
	Operating temperature	32 to 122°F (0 to 50°C)
DX ISOMAX Series	Storage temperature	14 to 140°F (-10 to 60°C)
	Humidity	35 to 85% RH
	Electrical connection	(C) 4-pin, M8 connector
Valvar II Series	Power supply	10.8 to 30 VDC, ripple Vp-p 10% max., reverse voltage protection
	Switch output	1 output signal open and closed, NPN or PNP, 30VDC, 125mA
	Linear output	Analog output 1 to 5 VDC
	Switch point setting	2/3 turn trimmer
	Hysteresis setting	< 2% of F.S.
D Subbase & Manifold Valve Products	Output response time	<1ms
	Repeatability	<0.2% F.S.
	Shock resistance	100 G, XYZ
	Material	Housing: Polycarbonate, pressure port: Zinc die-cast
	Mass	T Port: 0.25 oz. (7g)

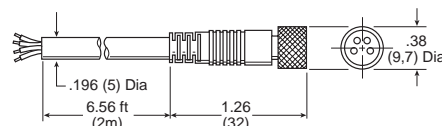
Sensor pin out

- Pin #
- 1 Brown: 24VDC
 - 2 White: NPN / PNP open collector output
 - 3 Blue: 0VDC
 - 4 Black: NPN / PNP open collector output

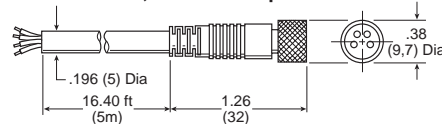


Cables

CB-M8-4P-2M, Female to Open Lead



CB-M8-4P-5M, Female to Open Lead



Isys Micro Series

The Isys Micro Valve System incorporates a space saving back to back valve mounting design, and achieves flow rates of 0.35 Cv per valve with 4 valves having a combined width of 42mm. This plug-in valve solution simplifies wiring with the use of 25 pin connectors or fieldbus systems.

Ports

- M7 on manifolds
- 3/8 Inch on end plates

Mounting

- Manifold

Solenoids

- 24 VDC, 1.0 watt

Certification / approval

- IP65 rated
- EMC / CE Mark: According to EN 61 000-6-2

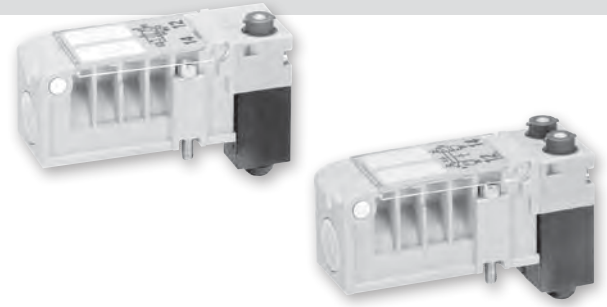
Material specifications

Body	Polyamide reinforced fiberglass
End plates	Aluminum
Fasteners	Zinc plated steel
Manifolds	Aluminum
Spool	Brass and nitrile rubber
Spool enclosure	Brass

Pilot configuration

Manifolds can be configured for either internal or external pilot in the field. Side ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the front of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.

Bottom ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the bottom of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.



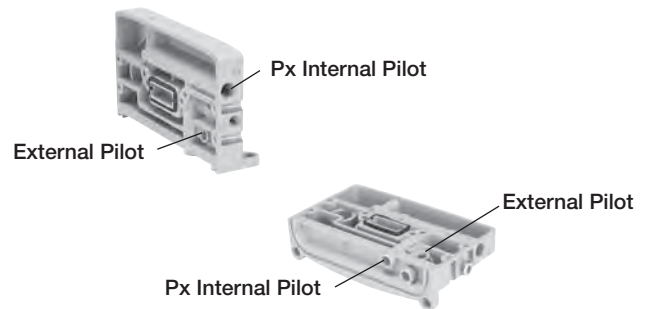
Operating information

Operating pressure: Vacuum to 145 PSIG (Vacuum to 10 bar)

Pilot pressure requirements:

Valve number	Minimum pilot pressure	Maximum pilot pressure
HMEVX2049A	40 PSI	120 PSI
HM2VX2049A	25 PSI	120 PSI
HM5VX2049A	45 PSI	120 PSI
HMN VX2049A	40 PSI	120 PSI
HMPVX2049A	40 PSI	120 PSI
HMQVX2049A	40 PSI	120 PSI

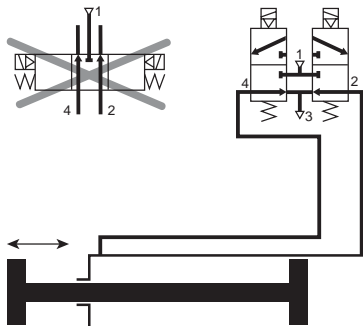
Temperature range: 5°F to 120°F (-15°C to 49°C)



Dual 3/2 valves replace 3-position valves for better performance

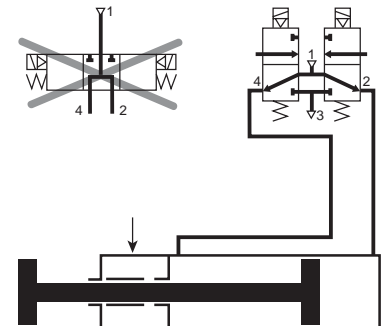
3-position center exhaust

A traditional 5/3 center exhaust valve is now replaced by a double 3/2 NC+NC valve module. Both cylinder chambers are exhausted and rod and piston are free to move.



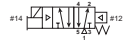
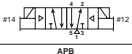
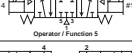
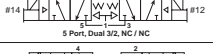
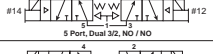



3-position pressure center

A traditional 5/3 pressure center valve is now replaced by a double 3/2 NO+NO valve module. The function is identical.



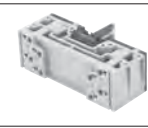
Most popular.

Isys Micro Valves









	Symbol	Type	Cv	Operator	Part number
Modulflex Series		4-way, 2-position	0.35	Single solenoid	HMEVX2049A
		4-way, 2-position	0.35	Double solenoid	HM2VX2049A
		4-way, 3-position, all ports blocked	0.3	Double solenoid	HM5VX2049A
Isys Micro Series		3-way, 2-position, dual valve, NC/NC	0.35	Double solenoid	HMNVX2049A
		3-way, 2-position, dual valve, NO/NO	0.35	Double solenoid	HMPVX2049A
		3-way, 2-position, dual valve, NO/NC	0.35	Double solenoid	HMQVX2049A
Isys ISO Series		Blanking plate	N/A	N/A	HMBVX00XXA
		Intermediate air supply	N/A	N/A	HMCVX00XXA

Manifold Bases

	Part numbers
Plug-in valve manifolds	
Single solenoid outputs only	PSM21JAP
Double or single solenoid outputs	PSM21MAP

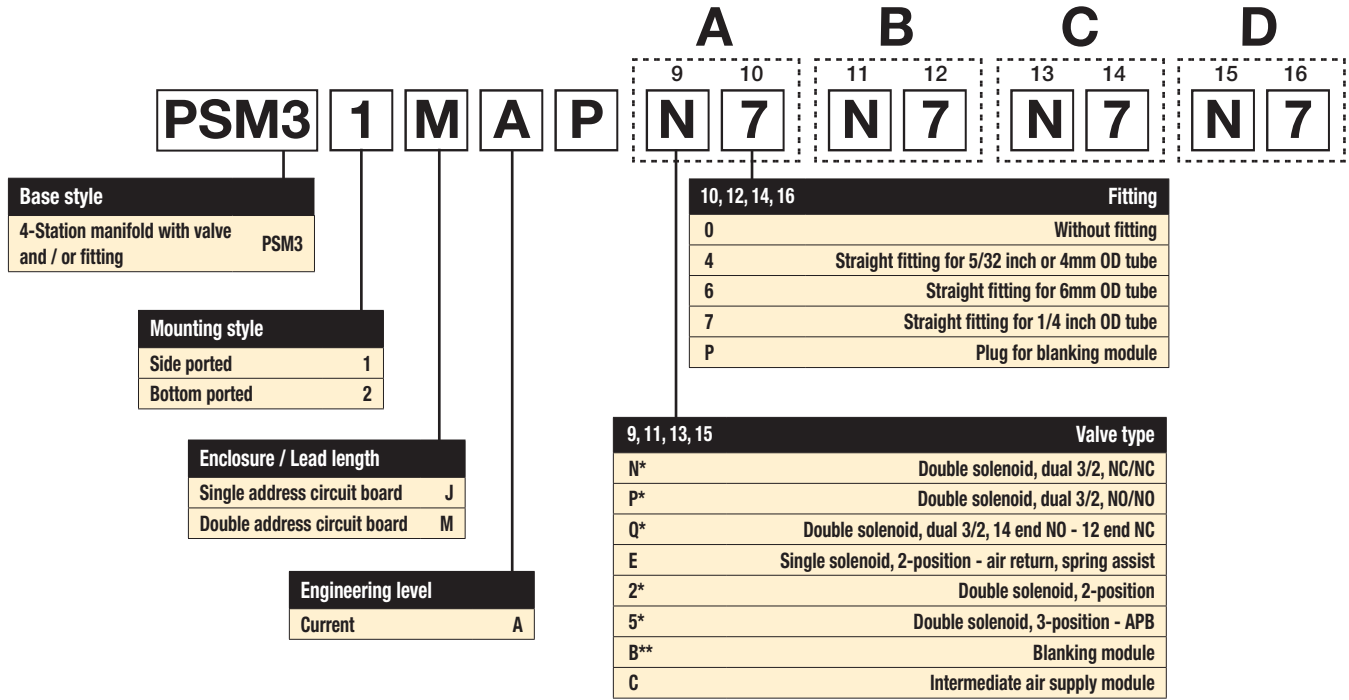


Internal Pilot End Plate Kits

	Electrical option	Porting	Side port	Bottom port
	25-pin, D-sub	NPT	PSML25AP	PSML26AP
		BSPP	PSML21AP	PSML22AP
	Turck fieldbus with valve driver module - 16 outputs	NPT	PSMT15AP	PSMT16AP
		BSPP	PSMT11AP	PSMT12AP
	Turck fieldbus with valve driver module - 32 outputs	NPT	PSMT25AP	PSMT26AP
		BSPP	PSMT21AP	PSMT22AP
	Modulflex 16 outputs	NPT	PSMM45AP	PSMM46AP
		BSPP	PSMM41AP	PSMM42AP
	Isysnet with valve driver module	NPT	PSML65AP	PSML66AP
		BSPP	PSML61AP	PSML62AP
	Isysnet with valve driver module and bus extension connector	NPT	PSMM55AP	PSMM56AP
		BSPP	PSMM51AP	PSMM52AP
	Isysnet with valve driver module and 24VDC connector	NPT	PSMM65AP	PSMM66AP
		BSPP	PSMM61AP	PSMM62AP
	Isysnet with valve driver module, bus extension connector and 24VDC connector	NPT	PSMM75AP	PSMM76AP
		BSPP	PSMM71AP	PSMM72AP

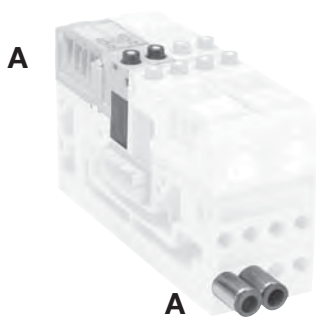
Simple Manifold Assemblies

Includes a valve manifold with 4 valves and fittings installed.
 End Plates must be ordered separately.

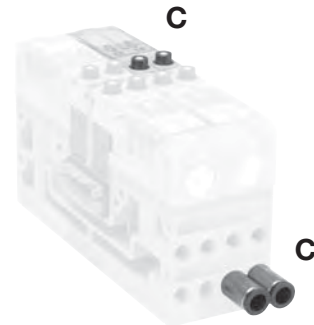


BOLD OPTIONS ARE MOST POPULAR.

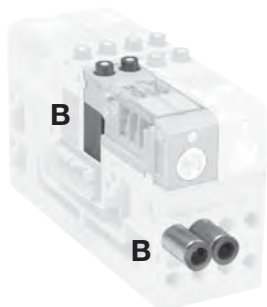
* Requires double address circuit board, enclosure "M".
 ** Requires fitting "P".



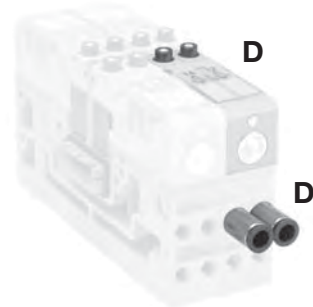
Valve Position A - Character 9
 Fitting Position A - Character 10



Valve Position C - Character 13
 Fitting Position C - Character 14



Valve Position B - Character 11
 Fitting Position B - Character 12



Valve Position D - Character 15
 Fitting Position D - Character 16

Modulflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List Simple Manifold Assemblies. List left to right, LOOKING AT THE CYLINDER PORTS on the manifold.

Maximum Number of Solenoids (Maximum Energized Simultaneously)

24VDC	25-pin D-sub	Moduflex	Isysnet*	Turck	
				16 Outputs	32 Outputs
	24 (24)	16 (16)	32 (32)	16 (16)	32 (32)

* Maximum of 32 solenoids per manifold. With Bus Extension functionality, 4 manifolds with up to 32 solenoids each can be connected on the same network.

Add-A-Fold Assembly Model Number

AAHM D 3 24 0 0 0 0

Valve series	
Isys micro add-a-fold	AAHM

End plate option	
Turck fieldbus with valve driver module - 16 outputs	A
Turck fieldbus with valve driver module - 32 outputs	B
25-pin, D-sub - 24 outputs	D
Isysnet with valve drive module - 32 outputs	Y
Isysnet with valve drive module and bus extension connector - 32 outputs	W
Isysnet with valve drive module and 24VDC connector - 32 outputs	X
Isysnet with valve drive module and bus extension and 24VDC connector - 32 outputs	Z
Moduflex - 16 outputs	T

Isysnet and Moduflex communication modules must be ordered separately.

End plate type		
BSPP Threads	BSPP side port, internal pilot	1
	BSPP bottom port, internal pilot	2
	BSPP side port, external pilot	3
	BSPP bottom port, external pilot	4
NPT Threads	NPT side port, internal pilot	5
	NPT bottom port, internal pilot	6
	NPT side port, external pilot	7
	NPT bottom port, external pilot	8

Number of stations*	
4 Valve manifold	04
8 Valve manifold	08
12 Valve manifold	12
16 Valve manifold	16
20 Valve manifold	20
24 Valve manifold	24
28 Valve manifold	28
32 Valve manifold	32

* For an Add-A-Fold part number to be valid, all stations must have a corresponding electrical connection at the end plate. See Maximum Number of Solenoids chart.

Pilot exhaust on end plate		
0	Without fitting	
M	Muffler	
4	Straight fitting for 4mm OD tube	BSPP Threads
6	Straight fitting for 6mm OD tube	
4	Straight fitting for 5/32 inch OD tube	NPT Threads
7	Straight fitting for 1/4 inch OD tube	

M7 pilot port on end plate		
<i>Internal pilot end plate</i>		
0	With standard plug	
<i>External pilot end plate</i>		
0	Without fitting	
4	Straight fitting for 4mm OD tube	BSPP Threads
6	Straight fitting for 6mm OD tube	
4	Straight fitting for 5/32 inch OD tube	NPT Threads
7	Straight fitting for 1/4 inch OD tube	

3/8" exhaust on end plate		
0	Without fitting	
M	Muffler	
8	Straight fitting for 8mm OD tube	BSPP Threads
A	Straight fitting for 10mm OD tube	
7	Straight fitting for 1/4 inch OD tube	NPT Threads
9	Straight fitting for 3/8 inch OD tube	

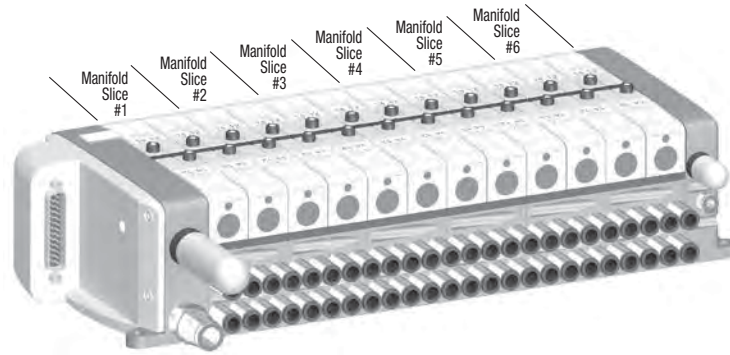
3/8" inlet port on end plate		
0	Without fitting	
8	Straight fitting for 8mm OD tube	BSPP Threads
A	Straight fitting for 10mm OD tube	
7	Straight fitting for 1/4 inch OD tube	NPT Threads
9	Straight fitting for 3/8 inch OD tube	

Note:
 BSPP fittings can only be used with BSPP Manifolds.
 NPT fittings can only be used with NPT Manifolds.



25-pin, D-Sub Manifolds

24 Single Solenoid Valves



Add-A-Fold


Manifold is factory assembled and tested for pneumatic leaks and electrical continuity.

Item	Qty	Description	Part number
01	1	24 valve Add-A-Fold with end plates	AAHMD5249M0M
02	6	4 valve simple manifold slices #1-6	PSM31JAPE7E7E7E7

Component Level




Item	Qty	Description	Part number
01	1	25-pin, D-sub, end plate	PSML25AP
02	24	Single solenoid valve	HMEVX2049A
03	6	Manifold, side ported, single address	PSM21JAP
04	50	1/4" Tube fittings (in box quantity)	PS567925
05	10	3/8" Tube fittings (in box quantity)	PS568338
06	1	3/8" Exhaust muffer	P6M-PAB3
07	1	1/8" Exhaust muffer	P6M-PAB1

Sandwich Regulator


Description	Kit number
 Common port regulator, 5 to 125 PSI with gauge	PSMRAX6AP

Note: Cv values are reduced when using a sandwich regulator to 0.20 for 2-position and Dual 3/2 valves, and 0.17 for 3-position APB valves.
 Note: The sandwich regulator passes full pilot pressure from the manifold, allowing the regulated pressure to adjusted down to 5 PSI without affecting valve functionality.


Mufflers

Description	Part number
 1/8" pilot exhaust – BSPP or NPT	P6M-PAB1
 3/8" main exhaust – BSPP or NPT	P6M-PAB3
 M7 bottom port pilot exhaust (must be ordered in multiples of 10)	PS568800




Flow Controls

Description	Kit number
 4mm to 4mm or 5/32" to 5/32" OD tube	FC800-5/32
1/4" to 1/4" O.D. tube	FC800-4

25-pin, D-Sub Cable (Female)

Description	Length	Part number
 25-pin, D-sub cable, IP20	3 meters	P8LMH25M3A
25-pin, D-sub cable, IP20	9 meters	SCD259D
25-pin, D-sub cable, IP65	3 meters	SCD253W
25-pin, D-sub cable, IP65	9 meters	SCD259WE

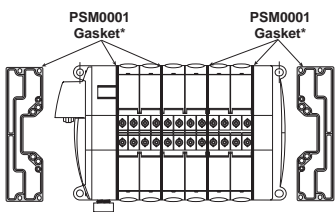
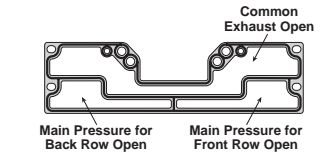
Fittings – Must be ordered in multiples of 10

Thread	Tube O.D.	Part number
Manifold or pilot supply ports – straight		
 M7	4mm or 5/32"	PS567904
M7	6mm	PS567906
M7	1/4"	PS567925
Main inlet or exhaust ports		
 3/8" NPT	1/4"	PS568325
3/8" NPT	3/8"	PS568338
3/8" BSPP	8mm	PS568308
3/8" BSPP	10mm	PS568310
Pilot exhaust ports		
 1/8" NPT	5/32"	PS568215
1/8" NPT	1/4"	PS568225
1/8" BSPP	4mm	PS568204
1/8" BSPP	6mm	PS568206

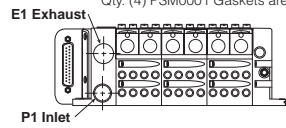
Multiple Pressure Zones

PSM0001 –

All ports open. Common pressure for front and rear manifold.
 Common exhausts.
 Standard gasket included with each manifold and end plate.

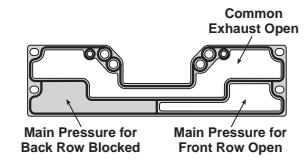


* Qty. (4) PSM0001 Gaskets are required.

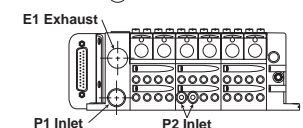
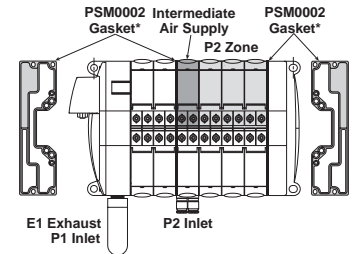


PSM0002 –

Rear manifold blocked for separate pressure supply.
 Common exhausts.
 Flip gasket to block front of manifold.



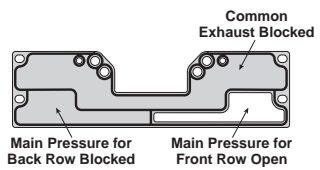
Internal Pilot Pressure from P1 Inlet



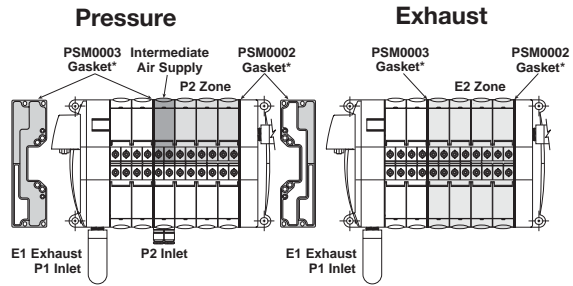
* Qty. (2) PSM0002 Gaskets are required.
 Remainder are PSM0001 Gaskets (Not shown)

PSM0003 –

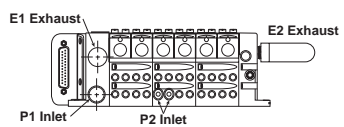
Rear manifold blocked for separate pressure supply.
 Exhaust blocked also.
 Flip gasket to block front of manifold.
 If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.



Internal Pilot Pressure from P1 Inlet

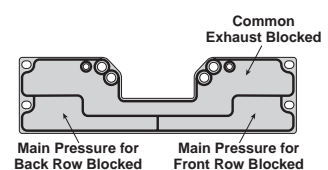


* Qty. (1) PSM0003 and Qty. (1) PSM0002 Gaskets are required.
 Remainder are PSM0001 Gaskets (Not shown)

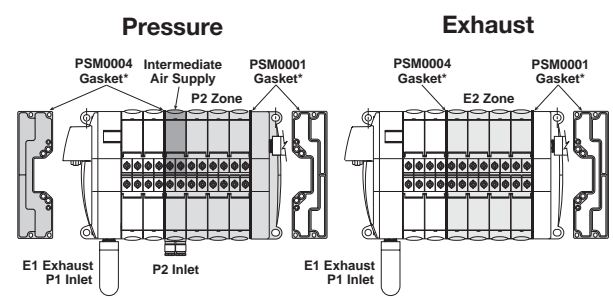


PSM0004 –

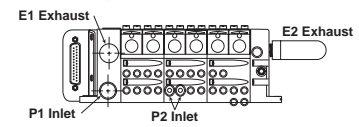
All galleys blocked.
 Two pressure zones and two exhaust zones.
 If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.



Internal Pilot Pressure from P2 Inlet



* Qty. (1) PSM0004 Gasket is required.
 Remainder are PSM0001 Gaskets (Not shown)



Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus Series

DX ISOMAX Series



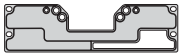

Valvair II Series

D

Subbase & Manifold Valve Products




Manifold to Manifold Gaskets*


	Description	Part number
	All galleys passing	PSM0001
	Main pressure to rear or front valves blocked, exhaust passing	PSM0002
	Main pressure to rear or front valves blocked, exhaust blocked	PSM0003
	All galleys blocked	PSM0004

* Includes 1 Gasket


Replacement Solenoid Kit

	Description	Part number
	24VDC solenoid kit with screws	PSM0010


Replacement Override Caps

	Description	Part number
	Set of 10 manual override caps	PSM0011

Replacement Gaskets and Valve Screws

	Description	Part number
	Set of 5 valve to manifold gaskets and 10 screws	PSM0012

Replacement Plugs


	Description	Part number
	Set of 10 M7 plugs (Part No. PS567900) for auxiliary and pilot pressure ports	PSM0013

Valve Labels*


Description	Part number
Single solenoid diagram	PSM002E
Double solenoid diagram	PSM0022
Double solenoid diagram – APB	PSM0025
Double solenoid diagram – Dual 3/2 NC/NC	PSM002N
Double solenoid diagram – Dual 3/2 NO/NO	PSM002P
Double solenoid diagram – Dual 3/2, 14 end NO, 12 end NC	PSM002Q

*Includes 10 Labels.


Replacement Screws

	Description	Part number
	Set of 10 manifold to manifold M3 screws	PSM0014

Replacement Regulator Gauge

	Description	Part number
	5 to 125 PSI Gauge	P0566202

Replacement Protective Cover

	Description	Part number
	Protective Polyester Cover Set of 10	PS5706

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

D

Subbase & Manifold Valve Products

25-pin, D-Sub with Isys Micro Valves, Side Ported

Dimensions

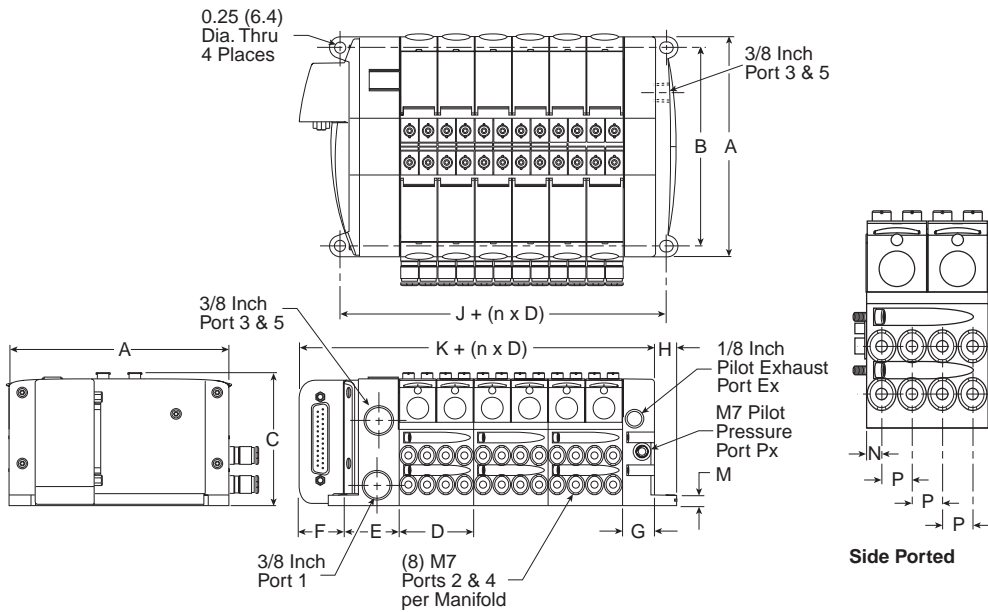
A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)

E	F	G	H
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)

J	K	M	N
2.28 (58.0)	3.44 (87.5)	0.24 (6.1)	0.21 (5.2)

P
0.41 (10.5)

Inches (mm)
 n = Number of manifolds



Side Ported

25-pin, D-Sub with Isys Micro Valves, Bottom Ported

Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)

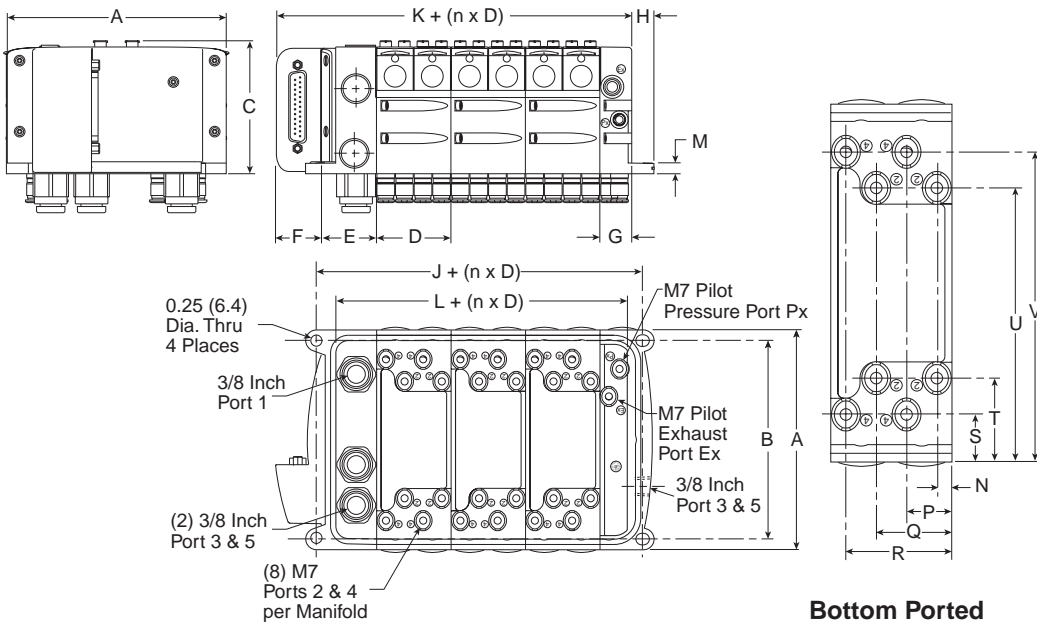
E	F	G	H
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)

J	K	L	M
2.28 (58.0)	3.44 (87.5)	1.69 (43.0)	0.24 (6.1)

N	P	Q	R
0.21 (5.3)	0.62 (15.8)	1.03 (26.3)	1.45 (36.8)

S	T	U	V
0.64 (16.40)	1.14 (29.0)	3.73 (94.9)	4.23 (107.4)

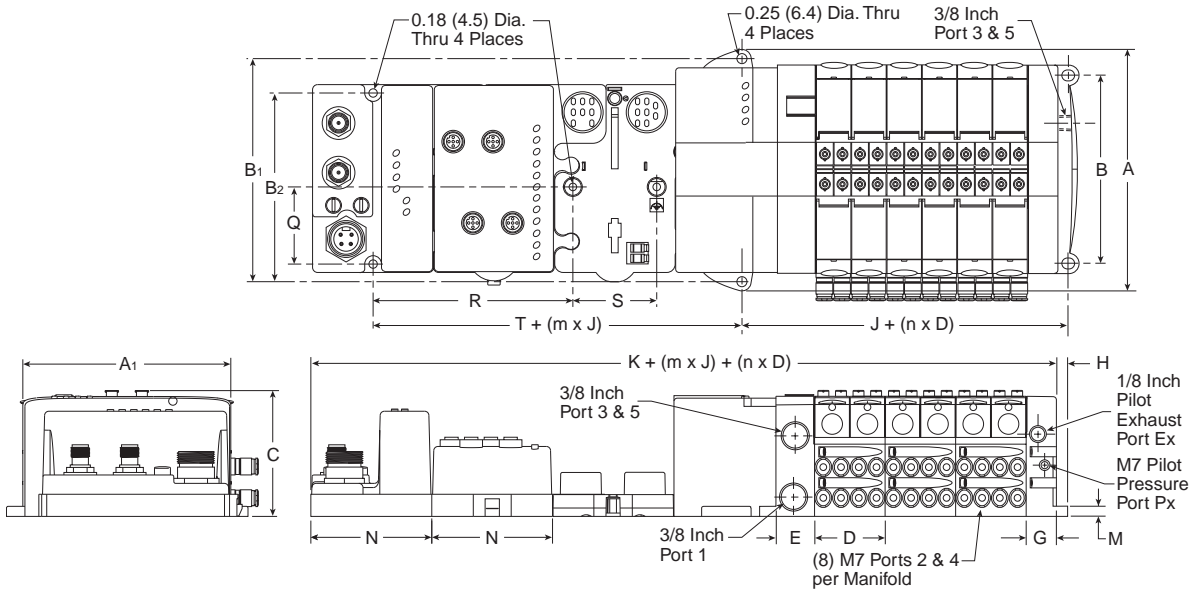
Inches (mm)
 n = Number of manifolds



Bottom Ported Detail

Note:
 See Fieldbus Section for the dimensions of manifolds utilizing the Isysnet, Turck, or Moduflex end plate type.

Isysnet with Isys Micro Valves, Side Ported

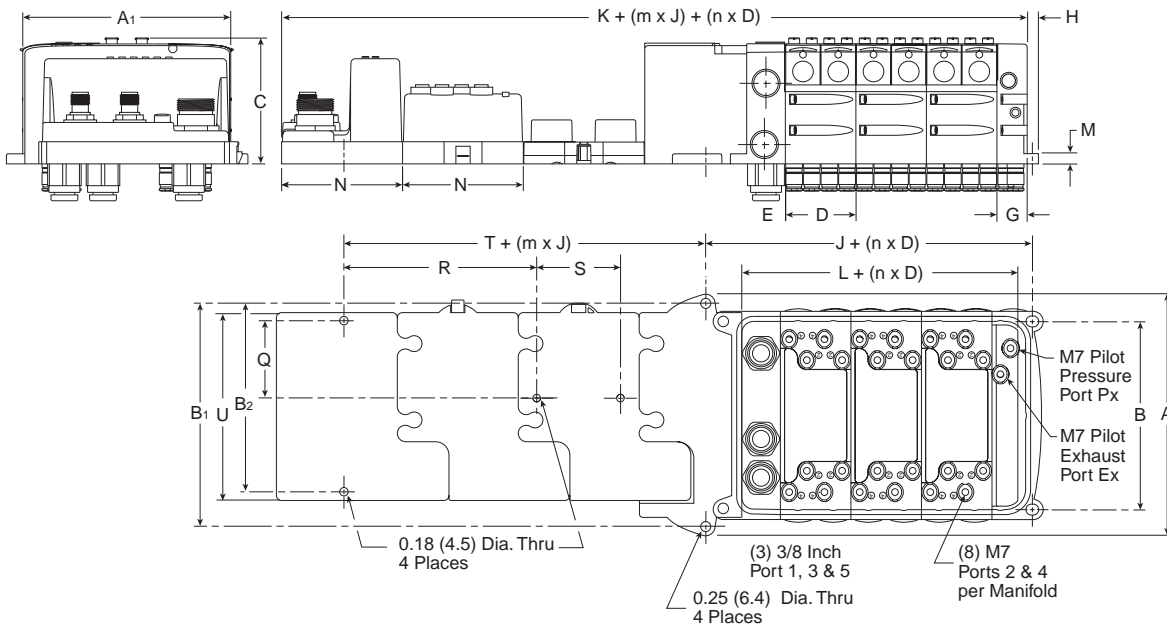


Dimensions

A	A₁	B	B₁	B₂	C	D	E	G
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	0.71 (18.0)
H	J	K	M	N	Q	R	S	T
0.49 (12.5)	2.72 (69.0)	7.32 (186.0)	0.24 (6.1)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)

Inches (mm)
 n = Number of Manifolds
 m = Number of Modules

Isysnet with Isys Micro Valves, Bottom Ported



Dimensions

A	A₁	B	B₁	B₂	C	D	E	G	H
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	0.71 (18.0)	0.49 (12.5)
J	K	L	M	N	Q	R	S	T	U
2.72 (69.0)	7.32 (186.0)	1.69 (43.0)	0.24 (6.1)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)	4.41 (112)

Inches (mm)
 n = Number of Manifolds
 m = Number of Modules

Modulflex
Series

Isys Micro
Series

Isys ISO
Series

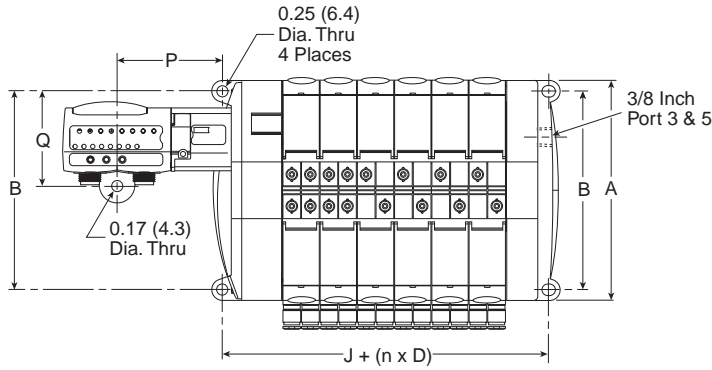
Fieldbus

DX ISOMAX
Series

Valvair II
Series

D
Subbase & Manifold
Valve Products

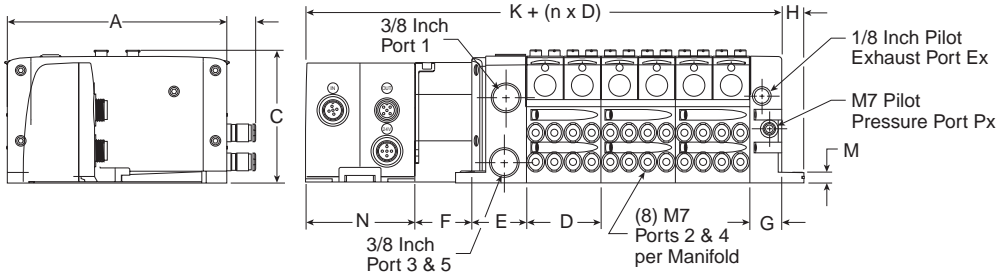
Modflex with Isys Micro Valves, Side Ported



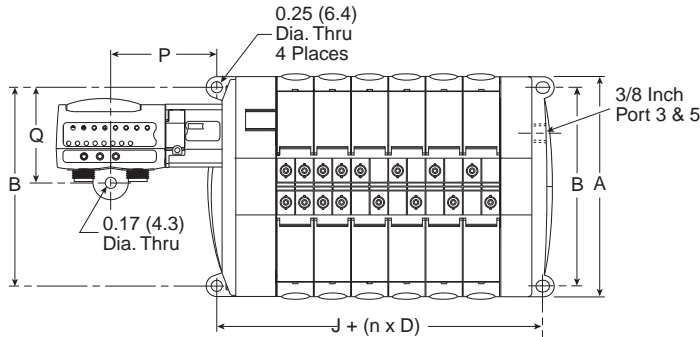
Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)
E	F	G	H
1.22 (31.0)	1.28 (32.5)	0.71 (18.0)	0.49 (12.5)
J	K	M	N
2.28 (58.0)	6.10 (155.0)	0.24 (6.1)	2.40 (61.0)
P	Q		
2.36 (60.0)	2.07 (52.55)		

Inches (mm)
 n = Number of manifolds



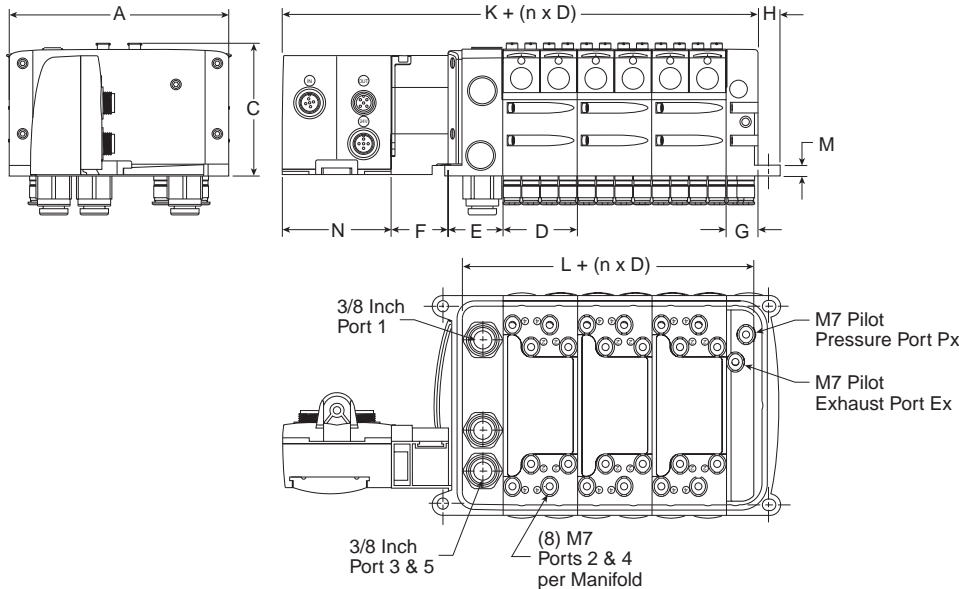
Modflex with Isys Micro Valves, Bottom Ported



Dimensions

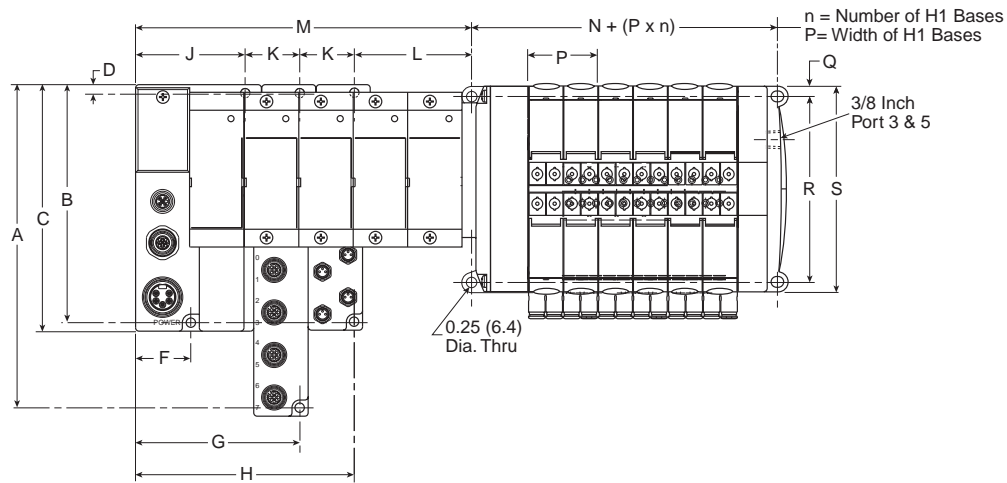
A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)
E	F	G	H
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)
J	K	L	M
2.28 (58.0)	6.10 (155.0)	1.69 (43.0)	0.24 (6.1)
N	P	Q	
2.40 (61.0)	2.36 (60.0)	2.07 (52.55)	

Inches (mm)
 n = Number of manifolds



- Modflex Series
- Isys Micro Series
- Isys ISO Series
- Fieldbus
- DX ISOMAX Series
- Valvair II Series
- D** Subbase & Manifold Valve Products

Turck with Isys Micro Valves, Side Ported



Dimensions

A	B	C	D
7.48 (190)	5.51 (140)	5.71 (145)	0.20 (5)
F	G	H	J
1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)
K	L	M	N
1.26 (32)	2.54 (64)	See note 1	2.28 (58)
P	Q	R	S
1.65 (42)	.19 (4.9)	4.41 (112)	4.88 (124)

Note 1: $M = J + L + n_2 \times K$, where n_2 = Number of Turck input / output modules
 Inches (mm)

Modulflex
Series

Isys Micro
Series

Isys ISO
Series

Fieldbus

DX ISOMAX
Series

Valvair II
Series

D

Subbase & Manifold
Valve Products

Isys ISO Series

The Isys ISO valve conforms to international standards 15407 and 5599, providing maximum flexibility for end users. As Parker's premier manifold mount product offering, Isys ISO offers machine builders a complete offering with a wide variety of accessories and options in a valve family with flow ranges from 0.55 Cv up to 6.0 Cv. Individual wiring is available with DIN or central connectors, and collective solutions offer installation time savings with either multi-pin connectors or fieldbus solutions.

Ports, Flow

- HB: 1/8 inch, 0.55 Cv
- HA: 1/4 inch, 1.1 Cv
- H1: 3/8 inch, 1.5 Cv
- H2: 1/2 inch, 3.0 Cv
- H3: 3/4 inch, 6.0 Cv

Mounting

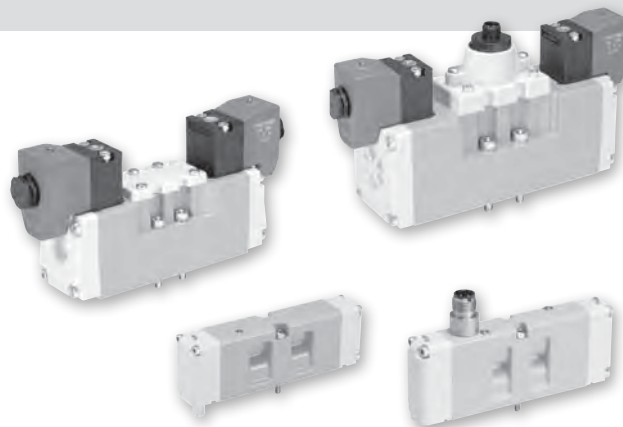
- Manifold or subbase

Solenoids

- HB & HA: 24 VDC, 1.0 Watt, and 120 VAC, 1.0 VA
- H1, H2, & H3: 24 VDC, 3.2 Watt, and 120 VAC, 4.5 VA

Certification / approval

- IP65 rated
- CSA / C-US approved



Operating information

Operating pressure:	Vacuum to 145 PSIG (Vacuum to 10 bar)
Pilot pressure:	See chart
Temperature range:	5°F to 120°F (-15°C to 49°C)

Material specifications

Body	Aluminum
End caps	PBT
End plates	Aluminum
Fasteners	Zinc plated steel
Manifolds	Aluminum
Seals	Nitrile
Spool	Aluminum

Operating Pressure

Maximum: 145 PSIG (1000 kPa)

Minimum:

Operator / function	Internal pilot	PSIG (Min. kPa) HB	PSIG (Min. kPa) HA	PSIG (Min. kPa) H1	PSIG (Min. kPa) H2	PSIG (Min. kPa) H3
1	Single solenoid - 2-position	30	25	25	25	35
2	Double solenoid- 2-position	(207)	(173)	(173)	(173)	(241)
3	Single remote pilot - 2-position **	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
4	Double remote pilot - 2-position**	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
5, 6, 7	Double solenoid - 3-position APB, CE, PC	35 (241)	35 (241)	35 (241)	50 (345)	50 (345)
8, 9, 0	Double remote pilot - 3-position** APB, CE, PC	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
E	Single solenoid pilot - 2-position					
	Air return / spring assist	30 (207)	30 (207)	35 (241)	45 (310)	45 (310)
F	Single remote pilot - 2-position**					
	Air return / spring assist					
N, P, Q	Double solenoid - dual 3/2	30 (207)	N/A	N/A	N/A	N/A
	External pilot *	*	*	*	*	*
All	Isys	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum

* External Pilot Pressure / Remote Pilot Supply - Must meet or exceed minimum pilot pressure for internal pilot option. Not available on Operator / Function N, P, or Q.

** Must be equal to or greater than operating pressure.

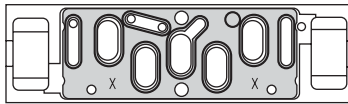
Most popular.



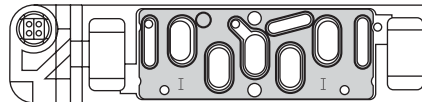
Modulflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus Series
 DX ISOMAX Series
 Valvair II Series
D
 Subbase & Manifold Valve Products

ISO Pneumatic Valve Standard Definitions

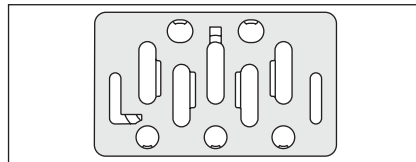
15407-1: Non-Plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



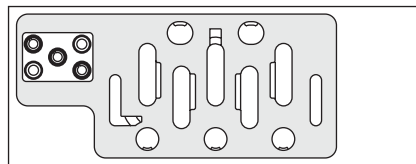
15407-2: Plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



5599-1: Non-Plug-in Standards for Sizes 1, 2, 3

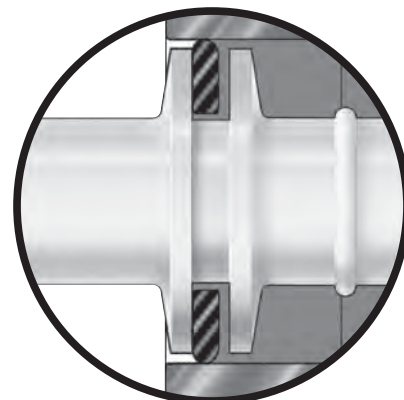


5599-2: Plug-in Standards for Size 1, 2, 3






Wear Compensation System




- Maximum Performance
 - Low Friction
 - Lower Operating Pressures
 - Fast Response
 - Less Wear
- Long Cycle Life - Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore.
- Non-Lube Service - No lubrication required for continuous valve shifting.
- Bi-Directional Spool Seals - Common spool used for any pressure, including vacuum.




Modulflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products

15407-2, Plug-in, Size 18mm (HB)


	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
Modulflex Series	 Sol. 14	4-way, 2-position, spring return	0.55	Single solenoid	24 VDC	Internal	HBEVXBG0G9A	HBEVXBH0G9A
						External	HBEVXLG0G9A	HBEVXLH0G9A
		4-way, 2-position, air return	0.55	Single solenoid	24 VDC	Internal	HB1VXBG0G9A	HB1VXBH0G9A
Isys Micro Series		4-way, 2-position	0.55	Double solenoid	24 VDC	Internal	HB2VXBG0G9A	HB2VXBH0G9A
						External	HB2VXLG0G9A	HB2VXLH0G9A
		4-way, 3-position, all ports blocked	0.5	Double solenoid	24 VDC	Internal	HB5VXBG0G9A	HB5VXBH0G9A
						External	HB5VXLG0G9A	HB5VXLH0G9A
		4-way, 3-position, center exhaust	0.5	Double solenoid	24 VDC	Internal	HB6VXBG0G9A	HB6VXBH0G9A
						External	HB6VXLG0G9A	HB6VXLH0G9A
4-way, 3-position, pressure center	0.5	Double solenoid	24 VDC	Internal	HB7VXBG0G9A	HB7VXBH0G9A		
				External	HB7VXLG0G9A	HB7VXLH0G9A		
Isys ISO Series		3-way, 2-position, dual valve, NC/NC	0.45	Double solenoid	24 VDC	Internal	HBNVXBG0G9A	HBNVXBH0G9A
		3-way, 2-position, dual valve, NO/NO	0.45	Double solenoid	24 VDC	Internal	HBPVXBG0G9A	HBPVXBH0G9A

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
Fieldbus		4-way, 2-position, spring return	0.55	Single solenoid	120 VAC	Internal	HBEVXBG023A	HBEVXBH023A
						External	HBEVXLG023A	HBEVXLH023A
DX ISOMAX Series		4-way, 2-position, air return	0.55	Single solenoid	120 VAC	Internal	HB1VXBG023A	HB1VXBH023A
						External	HB1VXLG023A	HB1VXLH023A
		4-way, 2-position	0.55	Double solenoid	120 VAC	Internal	HB2VXBG023A	HB2VXBH023A
						External	HB2VXLG023A	HB2VXLH023A
		4-way, 3-position, all ports blocked	0.5	Double solenoid	120 VAC	Internal	HB5VXBG023A	HB5VXBH023A
						External	HB5VXLG023A	HB5VXLH023A
4-way, 3-position, center exhaust	0.5	Double solenoid	120 VAC	Internal	HB6VXBG023A	HB6VXBH023A		
				External	HB6VXLG023A	HB6VXLH023A		
4-way, 3-position, pressure center	0.5	Double solenoid	120 VAC	Internal	HB7VXBG023A	HB7VXBH023A		
				External	HB7VXLG023A	HB7VXLH023A		
Valvair II Series		3-way, 2-position, dual valve, NC/NC	0.45	Double solenoid	120 VAC	Internal	HBNVXBG023A	HBNVXBH023A
		3-way, 2-position, dual valve, NO/NO	0.45	Double solenoid	120 VAC	Internal	HBPVXBG023A	HBPVXBH023A








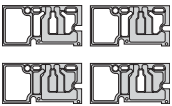
15407-2, Plug-in, Size 18mm (HB), 2-Station Manifold Bases

End ported bases	Enclosure / Lead length	Solenoid addresses	1/8" NPT	1/8" BSPP
	Circuit board	Single solenoid - 1 address	PS561151JP	PS561152JP
	Circuit board	Double solenoid - 2 addresses	PS561151MP	PS561152MP
	Circuit board with 32 output expansion	Single solenoid - 1 address	PS561151NP	PS561152NP
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	PS561151PP	PS561152PP

Bottom / end ported bases

	Circuit board	Single solenoid - 1 address	PS561161JP	PS561162JP
	Circuit board	Double solenoid - 2 addresses	PS561161MP	PS561162MP
	Circuit board with 32 output expansion	Single solenoid - 1 address	PS561161NP	PS561162NP
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	PS561161PP	PS561162PP

15407-2, Plug-in, Size 18mm (HB) Accessories

Accessories	Description	Part number
 Sandwich regulator	Common pressure	2-60 PSIG w/ gauge PS5638155P
	Common pressure	5-125 PSIG w/ gauge PS5638166P
	Independent pressure	2-60 PSIG w/ gauge PS5638255P
	Independent pressure	5-125 PSIG w/ gauge PS5638266P
 Gauge adapter kit	Includes 1/8" coupling and long nipple	PS5651160P
 Blanking plate kit		PS5634P
 Sandwich supply module	1/8" NPT	PS561600P
	1/8" BSPP	PS561601P
 Sandwich exhaust module	1/8" NPT	PS561700P
	1/8" BSPP	PS561701P
 Intermediate air supply module	1/8" NPT	D02P-01-80
 Sandwich flow control		PS5635P
 Manifold to manifold gasket kits	Standard	PS561AP
	Blocked #1 port	PS561BP
	Blocked #1, 3, 5, ports	PS561CP
	Blocked #3, 5 ports	PS561DP

Modulflex
Series

Isys Micro
Series

Isys ISO
Series

Fieldbus










DX ISOMAX
Series

Valvair II
Series


D

Subbase & Manifold
Valve Products



15407-2, Plug-in, Size 26mm (HA)

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
Modulflex Series	 Sol. 14	4-way, 2-position, spring return	1.1	Single solenoid	24 VDC	Internal	HAEVXBG0G9A	HAEVXBH0G9A
		4-way, 2-position, air return	1.1	Single solenoid	24 VDC	External	HAEVXLG0G9A	HAEVXLH0G9A
	 Sol. 14	4-way, 2-position	1.1	Double solenoid	24 VDC	Internal	HA2VXBG0G9A	HA2VXBH0G9A
		4-way, 3-position, all ports blocked	1.0	Double solenoid	24 VDC	External	HA2VXLG0G9A	HA2VXLH0G9A
Isys Micro Series	 APB	4-way, 3-position, all ports blocked	1.0	Double solenoid	24 VDC	Internal	HA5VXBG0G9A	HA5VXBH0G9A
		4-way, 3-position, center exhaust	1.0	Double solenoid	24 VDC	External	HA5VXLG0G9A	HA5VXLH0G9A
	 CE	4-way, 3-position, center exhaust	1.0	Double solenoid	24 VDC	Internal	HA6VXBG0G9A	HA6VXBH0G9A
Isys ISO Series	 Sol. 14	4-way, 2-position, spring return	1.1	Single solenoid	120 VAC	Internal	HAEVXBG023A	HAEVXBH023A
		4-way, 2-position, air return	1.1	Single solenoid	120 VAC	External	HAEVXLG023A	HAEVXLH023A
Fieldbus Series	 Sol. 14	4-way, 2-position	1.1	Double solenoid	120 VAC	Internal	HA2VXBG023A	HA2VXBH023A
		4-way, 3-position, all ports blocked	1.0	Double solenoid	120 VAC	External	HA2VXLG023A	HA2VXLH023A
DX ISOMAX Series	 APB	4-way, 3-position, all ports blocked	1.0	Double solenoid	120 VAC	Internal	HA5VXBG023A	HA5VXBH023A
		4-way, 3-position, center exhaust	1.0	Double solenoid	120 VAC	External	HA5VXLG023A	HA5VXLH023A
	 CE	4-way, 3-position, center exhaust	1.0	Double solenoid	120 VAC	Internal	HA6VXBG023A	HA6VXBH023A
Valvair II Series	 PC	4-way, 3-position, pressure center	1.0	Double solenoid	120 VAC	Internal	HA7VXBG023A	HA7VXBH023A
		4-way, 3-position, pressure center	1.0	Double solenoid	120 VAC	External	HA7VXLG023A	HA7VXLH023A

15407-2, Plug-in, Size 26mm (HA), Single Subbase








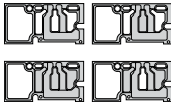
Enclosure / Lead length	Solenoid addresses	1/4" NPT	1/4" BSPP
 Terminal strip in the base	Double solenoid - 2 addresses	PS55113CP	PS55114CP

15407-2, Plug-in, Size 26mm (HA), 2-Station Manifold Bases

End ported bases	Enclosure / Lead length	Solenoid addresses	1/4" NPT	1/4" BSPP
	Circuit board	Single solenoid - 1 address	PS551153JP	PS551154JP
	Circuit board	Double solenoid - 2 addresses	PS551153MP	PS551154MP
	Circuit board with 32 output expansion	Single solenoid - 1 address	PS551153NP	PS551154NP
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	PS551153PP	PS551154PP
	Terminal strip in the base	Double solenoid - 2 addresses	PS551153CP	PS551154CP
Bottom / end ported bases				
	Circuit board	Single solenoid - 1 address	PS551163JP	PS551164JP
	Circuit board	Double solenoid - 2 addresses	PS551163MP	PS551164MP
	Circuit board with 32 output expansion	Single solenoid - 1 address	PS551163NP	PS551164NP
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	PS551163PP	PS551164PP
	Terminal strip in the base	Double solenoid - 2 addresses	PS551163CP	PS551164CP

Modulflex Series
Isys Micro Series
Isys ISO Series
Fieldbus Series
DX ISOMAX Series
Valvair II Series
Subbase & Manifold Valve Products

15407-2, Plug-in, Size 26mm (HA) Accessories

Accessories	Description	Part number
 Sandwich regulator	Common pressure	2-60 PSIG w/ gauge PS5538155P
	Common pressure	5-125 PSIG w/ gauge PS5538166P
	Independent pressure	2-60 PSIG w/ gauge PS5538255P
	Independent pressure	5-125 PSIG w/ gauge PS5538266P
 Gauge adapter kit	Includes 1/8" coupling and long nipple	PS5651160P
 Blanking plate kit		PS5534P
 Sandwich supply module	1/4" NPT	PS551600P
	1/4" BSPP	PS551601P
 Sandwich exhaust module	1/4" NPT	PS551700P
	1/4" BSPP	PS551701P
 Intermediate air supply module	1/4" NPT	D01P-02-80
 Sandwich flow control		PS5535P
 Manifold to manifold gasket kits	Standard	PS561AP
	Blocked #1 port	PS561BP
	Blocked #1, 3, 5, ports	PS561CP
	Blocked #3, 5 ports	PS561DP

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus











DX ISOMAX Series

Valvair II Series


D

Subbase & Manifold Valve Products

15407-2, Plug-in, Size 18mm & 26mm End Plate Kits

	Electrical option	NPT port	BSPP port
Modulflex Series	 No connector - use with terminal strip in base	PS5631010P	PS5631011P
	 25-pin, D-Sub	PS5620L20P	PS5620L21P
Isys Micro Series	 19-pin, round, Brad Harrison	PS5620L30P	PS5620L31P
	 12-pin, M23	PS5620L40P	PS5620L41P
Isys ISO Series	 16-point terminal strip	PS5620L50P	PS5620L51P
	 19-pin, M23	PS5620M20P	PS5620M21P
Fieldbus	 Modulflex fieldbus	PS5620M40P	PS5620M41P
	 Isysnet, with valve driver module	PS5620L60P	PS5620L61P
DX ISOMAX Series	 Turck fieldbus with valve driver module - 16 outputs	PS5620T10P	PS5620T11P
	 Turck fieldbus with valve driver module - 32 outputs	PS5620T20P	PS5620T21P

15407-2 End Plate Kits with Transition to H2

	Electrical option	NPT port	BSPP port
	25-pin, D-sub	PS5624L20P	PS5624L21P
	19-pin, round, Brad Harrison	PS5624L30P	PS5624L31P
	12-pin, M23	PS5624L40P	PS5624L41P
	16-point terminal strip	PS5624L50P	PS5624L51P
	19-pin, M23	PS5624M20P	PS5624M21P
	Modulflex fieldbus	PS5624M40P	PS5624M41P
	Isysnet, with valve driver module	PS5624L60P	PS5624L61P
	Turck fieldbus with valve driver module - 16 outputs	PS5624T10P	PS5624T11P
	Turck fieldbus with valve driver module - 32 outputs	PS5624T20P	PS5624T21P

Turck, Isysnet, and Modulflex communication modules must be ordered separately. See Fieldbus Section for more information.

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Example

Application requires a 4-Station manifold.
 (Two 18mm + Two 26mm Stations)

Item	Qty.	Part No.	Location
01	1	AAHBD004	
02	1	HB1VXBGOG9A	Station 1
03	1	HB2VXLGOG9A	Station 2
04	1	PS561151MP	Station 1 & 2
05	2	HA1VXBGOG9A	Station 3 & 4
06	1	PS551151MP	Station 3 & 4

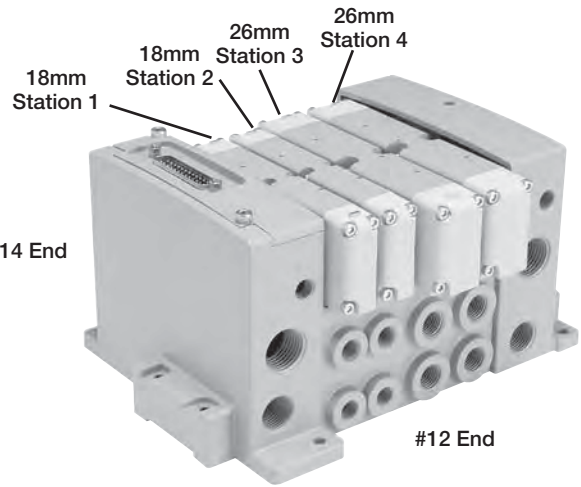
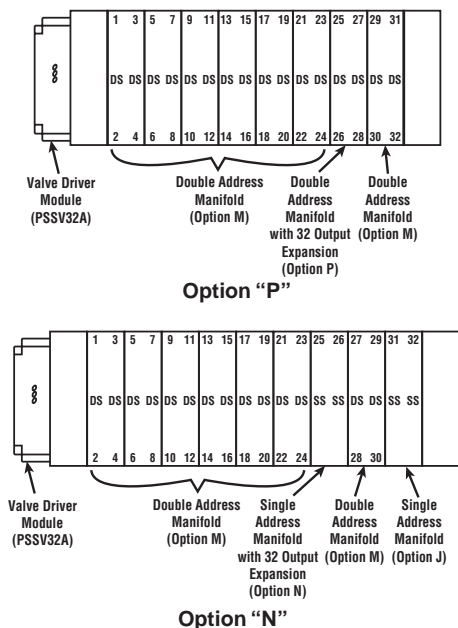
NOTE: Construct manifold assemblies from left to right while looking at the ports. Valves must be ordered as External Pilot when using Sandwich Regulator.

When using an HA or HB manifold base with the "N" Enclosure / Lead Length option:

- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 26 are a single address base. Use a base with "N" Enclosure / Lead Length option (this is a single address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 27 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.

When using an HA or HB manifold base with the "P" Enclosure / Lead Length option:

- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 28 are a double address base. Use a base with "P" Enclosure / Lead Length option (this is a double address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 29 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.



Example:
 4-Station Manifold with (2) 18mm and (2) 26mm Valves on Manifold Bases with 25-pin, D-Sub End Plates

Maximum Number of Solenoids (Maximum energized simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or		Turck			
			Brad Harrison	12-pin M23	16	32		
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	32 (32)	16 (16)	32 (32)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-pin, D-Sub option.

Add-A-Fold Assembly Model Number

AA	HB	D	0	04
Valve series Right & left end plate 15407-2 (plug-in, HB 18mm & HA 26mm)		Number of stations*		
		02		
		04		
		•		
		24		
		•		
		32		
End plate type		Thread type		
Turck fieldbus with valve driver module - 16 outputs		0 NPT		
Turck fieldbus with valve driver module - 32 outputs		1* BSPP "G"		
25-pin, D-sub				
19-pin, Brad Harrison				
16 Point terminal strip				
12-pin, M23				
19-pin, M23				
Moduflex fieldbus				
Isysnet, with valve driver module				

* Common end plates for HA & HB.

* Must be ordered in multiples of (2) unless using the HB / HA to H2 Transition Plate.

* BSPP conforms to ISO 1179-1 with 228-1 threads.

*Must order communication modules separately.

Moduflex Series

Isys Micro Series

Isys ISO Series

Fieldbus Series

DX ISOMAX Series

Valvair II Series

D

Subbase & Manifold Valve Products

15407-2, Plug-in, Size 18mm (HB) & 26mm (HA)

- Modulflex Series
- Isys Micro Series
- Isys ISO Series
- Fieldbus Series
- DX ISOMAX Series
- Valvair II Series
- D** Subbase & Manifold Valve Products

HB 1 VX B G 0 G9 A

Basic series 15407-2	
ISO 15407-2 18mm	HB
ISO 15407-2 26mm	HA

15407-2 Engineering level	
A	Current

15407-2 Operator / Function	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Single solenoid, 2-position - air return, spring assist	E
Double solenoid, dual 3/2, NC/NC	N*
Double solenoid, dual 3/2, NO/NO	P*
Double solenoid, dual 3/2, 14 end NC - 12 end NO	Q*

15407-2 Voltage & frequency				
	AC		DC	Light & surge suppression
	60Hz	50Hz		
G9			24	LED & suppression
23	120	115		LED & suppression

15407-2 Enclosure / Lead length	
0	Valve less base

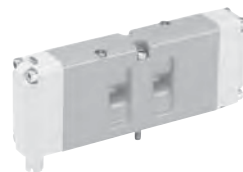
15407-2 Overrides / Lights	
G	Non-locking, flush, push - w/ light
H	Locking, flush, push / turn - w/ light

* Available on HB Only, must use Internal Pilot Source Option "B".

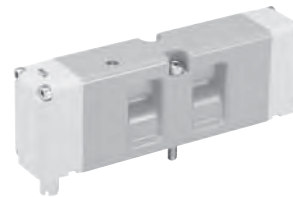
Mounting	
15407-2 Valve less base	VX

15407-2 Pilot source / Pilot exhaust	
Internal pilot, port #1 / vented	B
External pilot, port #14 / vented	L*

* Must be specified when using Sandwich Regulators.



HB: 18mm

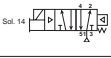

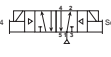
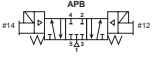
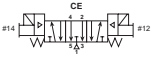
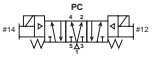


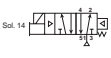
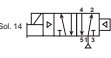
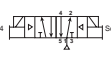
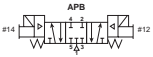
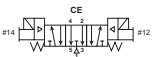
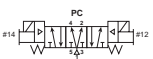
HA: 26mm

Most popular.




5599-2, Plug-in, Size 1 (H1)


Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	1.5	Single solenoid	24 VDC	Internal	H1EVXBG0B9D	H1EVXBH0B9D
					External	H1EVXXG0B9D	H1EVXXH0B9D
	4-way, 2-position, air return	1.5	Single solenoid	24 VDC	Internal	H11VXBG0B9D	H11VXBH0B9D
					External	H11VXXG0B9D	H11VXXH0B9D
	4-way, 2-position	1.5	Double solenoid	24 VDC	Internal	H12VXBG0B9D	H12VXBH0B9D
					External	H12VXXG0B9D	H12VXXH0B9D
	4-way, 3-position, all ports blocked	1.2	Double solenoid	24 VDC	Internal	H15VXBG0B9D	H15VXBH0B9D
					External	H15VXXG0B9D	H15VXXH0B9D
	4-way, 3-position, center exhaust	1.2	Double solenoid	24 VDC	Internal	H16VXBG0B9D	H16VXBH0B9D
					External	H16VXXG0B9D	H16VXXH0B9D
	4-way, 3-position, pressure center	1.2	Double solenoid	24 VDC	Internal	H17VXBG0B9D	H17VXBH0B9D
					External	H17VXXG0B9D	H17VXXH0B9D

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	1.5	Single solenoid	120 VAC	Internal	H1EVXBG023D	H1EVXBH023D
					External	H1EVXXG023D	H1EVXXH023D
	4-way, 2-position, air return	1.5	Single solenoid	120 VAC	Internal	H11VXBG023D	H11VXBH023D
					External	H11VXXG023D	H11VXXH023D
	4-way, 2-position	1.5	Double solenoid	120 VAC	Internal	H12VXBG023D	H12VXBH023D
					External	H12VXXG023D	H12VXXH023D
	4-way, 3-position, all ports blocked	1.2	Double solenoid	120 VAC	Internal	H15VXBG023D	H15VXBH023D
					External	H15VXXG023D	H15VXXH023D
	4-way, 3-position, center exhaust	1.2	Double solenoid	120 VAC	Internal	H16VXBG023D	H16VXBH023D
					External	H16VXXG023D	H16VXXH023D
	4-way, 3-position, pressure center	1.2	Double solenoid	120 VAC	Internal	H17VXBG023D	H17VXBH023D
					External	H17VXXG023D	H17VXXH023D

5599-2, Plug-in Single Subbase, Size 1 (H1)

Side ported	Enclosure / Lead length	Solenoid addresses	3/8" NPT	3/8" BSPP
	Terminal strip in base	Double solenoid - 2 address	PS401115CDP	PS401116CDP
	6" flying leads	Double solenoid - 2 addresses	PS401115ADP	PS401116ADP
	4-pin, M12 micro connector in base, SAE / Ford wiring	Double solenoid - 2 addresses	PS4011158FDP	PS4011168FDP

5599-2, Plug-in Manifold Bases, Size 1 (H1)

Bottom / End	Enclosure / Lead length	Solenoid addresses	3/8" NPT	3/8" BSPP
	Circuit board	Single solenoid - 1 address	PS401165JCP	PS401166JCP
	Circuit board	Double solenoid - 2 addresses	PS401165MCP	PS401166MCP
	Terminal strip in base	Double solenoid - 2 address	PS401165CCP	PS401166CCP
	6" flying leads	Double solenoid - 2 addresses	PS401165ACP	PS401166ACP
	4-pin, M12 micro connector in base, SAE / Ford wiring	Double solenoid - 2 addresses	PS4011658FCP	PS4011668FCP

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus Series




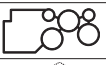
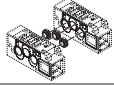

DX ISOMAX Series

Valvair II Series






D

Subbase & Manifold Valve Products

5599-2, Size 1 (H1) Accessories

	Accessory	Description	Part number
		Common pressure	5-125 PSIG w/ gauge PS4038166CP
		Independent pressure	5-125 PSIG w/ gauge PS4038266CP
Modulflex Series		Blanking plate kit	PS4034CP
		Sandwich flow control	PS4035CP
Isys Micro Series		Manifold to manifold gasket kits	PS4013P
		Main galley (1, 3, 5)	PS4032CP
		Pilot galley	PS4033CP
Isys ISO Series		1/4" & 3/8" NPT	PS403000CP
		BSPP	PS403001CP

Plug-in, 5599-2 End Plate Kits, Size 1 (H1)

	Electrical option	Description	NPT port	BSPP port
DX ISOMAX Series		No connector - use with individually wired base	PS4031010DP	PS4031011DP
		25-pin, D-sub	PS4020L20DP	PS4020L21DP
Valvair II Series		19-pin, round, Brad Harrison	PS4020L30DP	PS4020L31DP
		12-pin, M23	PS4020L40DP	PS4020L41DP
D Subbase & Manifold Valve Products		19-pin, M23	PS4020M20DP	PS4020M21DP
		Modulflex fieldbus	PS4020M40DP	PS4020M41DP
		Isysnet, with valve driver module	PS4020L60DP	PS4020L61DP
		Turck fieldbus with valve driver module - 16 outputs	PS4020T10DP	PS4020T11DP
		Turck fieldbus with valve driver module - 32 outputs	PS4020T20DP	PS4020T21DP

Turck, Isysnet, and Modulflex communication modules must be ordered separately. See Fieldbus Section for more information.

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

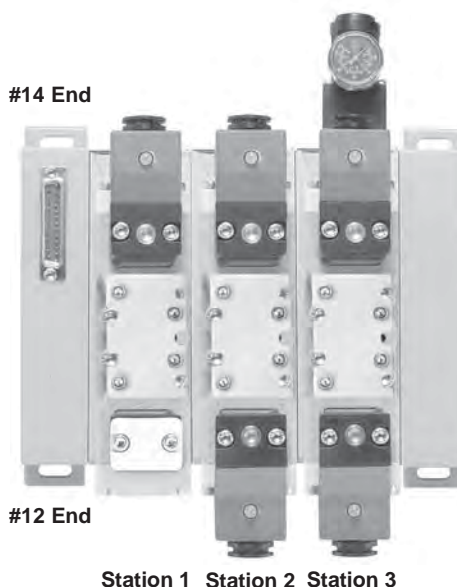
Example

Application requires a 3-Station manifold with a valve, regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH1D003	
02	1	H11VXBG0B9D	Station 1
03	1	PS401155MCP	Station 1
04	1	H12VXBG0B9D	Station 2
05	1	PS401155MCP	Station 2
06	1	H12VXXG0B9D	Station 3
07	1	PS4038166CP	Station 3
08	1	PS401155MCP	Station 3

NOTE:

Construct manifold assemblies from left to right while looking at the cylinder ports. Valves must be ordered as External Pilot when using Sandwich Regulator.



**Example:
 3-Station Manifold with (3) H1 Valves
 on Manifold Bases
 and Regulator at Station 3**

Maximum Number of Solenoids (Maximum energized simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or Brad Harrison		Turck			
			12-pin M23	Moduflex	Isysnet	16 Outputs	32 Outputs	
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-pin, D-Sub option.

Add-A-Fold Assembly Model Numbers


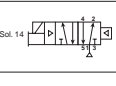
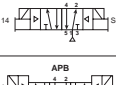

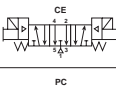

AA	H1	D	0	03
Valve series Right & left end plate H1				Number of stations 01 02 03 04 • • 24
End plate type Turck fieldbus with valve driver module - 16 outputs A* Turck fieldbus with valve driver module - 32 outputs B* 25-pin, D-sub D 19-pin, brad harrison E 12-pin, M23 G 19-pin, M23 H Moduflex fieldbus T* Isysnet, with valve driver module X*				Thread type 0 NPT 1* BSPP "G"


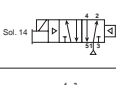
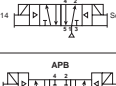

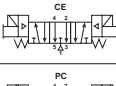
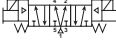
* Must order communication modules separately.

* BSPP conforms to ISO 1179-1 w 228-1 threads.


Moduflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products

5599-2, Plug-in, Size 2 (H2)


Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
 Sol. 14	4-way, 2-position, spring return	3.0	Single solenoid	24 VDC	Internal	H2EVXBG0B9D	H2EVXBH0B9D
					External	H2EVXXG0B9D	H2EVXXH0B9D
 Sol. 14	4-way, 2-position, air return	3.0	Single solenoid	24 VDC	Internal	H21VXBG0B9D	H21VXBH0B9D
					External	H21VXXG0B9D	H21VXXH0B9D
 Sol. 14 Sol. 12	4-way, 2-position	3.0	Double solenoid	24 VDC	Internal	H22VXBG0B9D	H22VXBH0B9D
					External	H22VXXG0B9D	H22VXXH0B9D
 #14	4-way, 3-position, all ports blocked	2.8	Double solenoid	24 VDC	Internal	H25VXBG0B9D	H25VXBH0B9D
					External	H25VXXG0B9D	H25VXXH0B9D
 #14	4-way, 3-position, center exhaust	2.8	Double solenoid	24 VDC	Internal	H26VXBG0B9D	H26VXBH0B9D
					External	H26VXXG0B9D	H26VXXH0B9D
 #14	4-way, 3-position, pressure center	2.8	Double solenoid	24 VDC	Internal	H27VXBG0B9D	H27VXBH0B9D
					External	H27VXXG0B9D	H27VXXH0B9D

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
 Sol. 14	4-way, 2-position, spring return	3.0	Single solenoid	120 VAC	Internal	H2EVXBG023D	H2EVXBH023D
					External	H2EVXXG023D	H2EVXXH023D
 Sol. 14	4-way, 2-position, air return	3.0	Single solenoid	120 VAC	Internal	H21VXBG023D	H21VXBH023D
					External	H21VXXG023D	H21VXXH023D
 Sol. 14 Sol. 12	4-way, 2-position	3.0	Double solenoid	120 VAC	Internal	H22VXBG023D	H22VXBH023D
					External	H22VXXG023D	H22VXXH023D
 #14	4-way, 3-position, all ports blocked	2.8	Double solenoid	120 VAC	Internal	H25VXBG023D	H25VXBH023D
					External	H25VXXG023D	H25VXXH023D
 #14	4-way, 3-position, center exhaust	2.8	Double solenoid	120 VAC	Internal	H26VXBG023D	H26VXBH023D
					External	H26VXXG023D	H26VXXH023D
 #14	4-way, 3-position, pressure center	2.8	Double solenoid	120 VAC	Internal	H27VXBG023D	H27VXBH023D
					External	H27VXXG023D	H27VXXH023D

5599-2, Plug-in Single Subbase, Size 2 (H2)

Side ported base	Enclosure / Lead length	Solenoid addresses	1/2" NPT	1/2" BSPP
	Terminal strip in base	Double solenoid - 2 address	PS411117CCP	PS411118CCP
	6" flying leads	Double solenoid - 2 addresses	PS411117ACP	PS411118ACP

5599-2, Plug-in Manifold Bases, Size 2 (H2)

Bottom / End ported bases	Enclosure / Lead length	Solenoid addresses	1/2" NPT	1/2" BSPP
	Circuit board	Single solenoid - 1 address	PS411167JCP	PS411168JCP
	Circuit board	Double solenoid - 2 addresses	PS411167MCP	PS411168MCP
	Terminal strip in base	Double solenoid - 2 address	PS411167CCP	PS411168CCP
	6" flying leads	Double solenoid - 2 addresses	PS411167ACP	PS411168ACP

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus




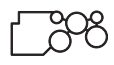
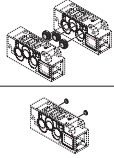
DX ISOMAX Series

Valvair II Series





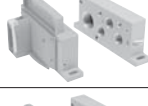


D

Subbase & Manifold Valve Products

5599-2, Size 2 (H2) Accessories

Accessory	Description	Part number
 Sandwich regulator	Common pressure 5-125 PSIG w/ gauge	PS4138166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4138266CP
 Blanking plate kit		PS4134CP
 Sandwich flow control		PS4135CP
 Manifold to manifold gasket kits		PS4113P
 Manifold port isolation kit	Main galley (1, 3, 5)	PS4132CP
	Pilot galley	PS4033CP

Plug-in, 5599-2 End Plate Kits, Size 2 (H2)

Electrical option	Description	NPT port	BSPP port
 No connector - use with individually wired base		PS4131010DP	PS4131011DP
 25-pin, D-sub		PS4120L20DP	PS4120L21DP
 19-pin, round, Brad Harrison		PS4120L30DP	PS4120L31DP
 12-pin, M23		PS4120L40DP	PS4120L41DP
	19-pin, M23	PS4120M20DP	PS4120M21DP
 Moduflex fieldbus		PS4120M40DP	PS4120M41DP
 Isysnet, with valve driver module		PS4120L60DP	PS4120L61DP
 Turck fieldbus with valve driver module - 16 outputs		PS4120T10DP	PS4120T11DP
	Turck fieldbus with valve driver module - 32 outputs	PS4120T20DP	PS4120T21DP

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

Moduflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

D

Subbase & Manifold Valve Products

How To Order Plug-in Add-A-Fold Assemblies

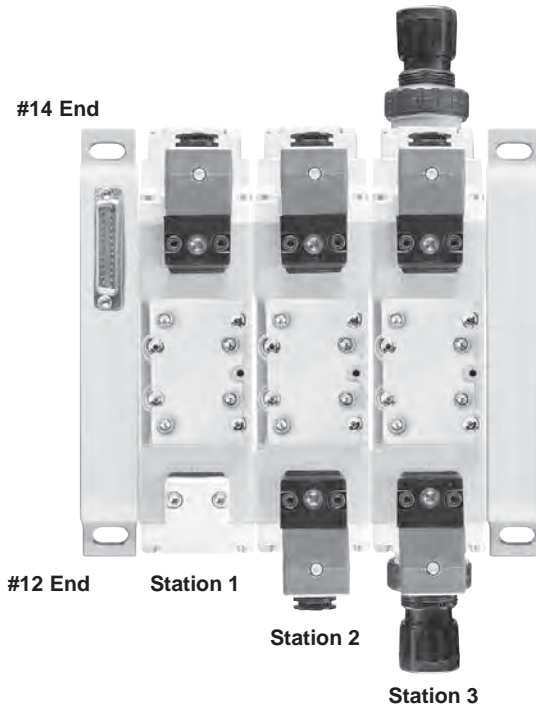
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH2D003	
02	1	H21VXBG0B9D.....	Station 1
03	1	PS411157MCP.....	Station 1
04	1	H22VXBG0B9D.....	Station 2
05	1	PS411157MCP.....	Station 2
06	1	H22VXXG0B9D.....	Station 3
07	1	PS4138166CP.....	Station 3
08	1	PS411157MCP.....	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
 Valves must be ordered as External Pilot when using Sandwich Regulator.



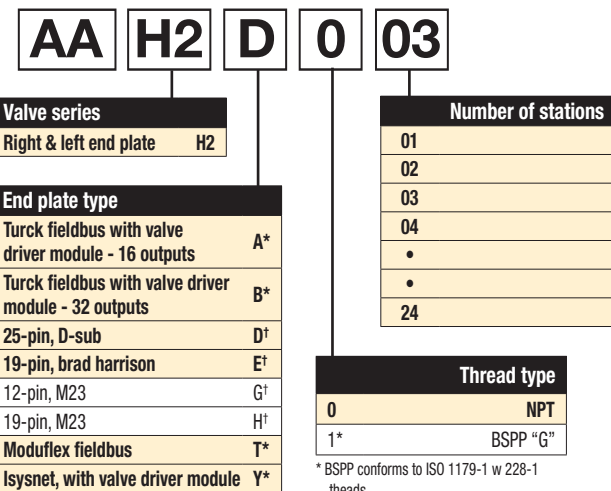
**Example:
 3-Station Manifold with (3) H2 Valves
 on Manifold Bases and Regulator at Station 3**

**Maximum Number of Solenoids
 (Maximum energized simultaneously)**

Voltage	Voltage code	25-pin D-sub	19-pin M23 or		Modulflex Isysnet	Turck		
			Brad Harrison	12-pin M23		16	32	
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-pin, D-Sub option.

Add-A-Fold Assembly Model Numbers

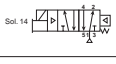
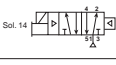
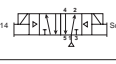
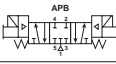
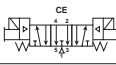
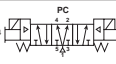


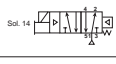
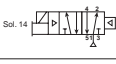
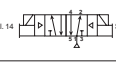
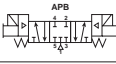
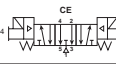
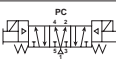
* Must order communication modules separately.
 † Collective wiring module included.

* BSPP conforms to ISO 1179-1 w 228-1 threads.


- Modulflex Series
- Isys Micro Series
- Isys ISO Series
- Fieldbus Series
- DX ISOMAX Series
- Valvair II Series
- D** Subbase & Manifold Valve Products

5599-2, Plug-in, Size 3 (H3)


Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
 Sol. 14	4-way, 2-position, spring return	6.0	Single solenoid	24 VDC	Internal	H3EVXBG0B9D	H3EVXBH0B9D
					External	H3EVXXG0B9D	H3EVXXH0B9D
 Sol. 14	4-way, 2-position, air return	6.0	Single solenoid	24 VDC	Internal	H31VXBG0B9D	H31VXBH0B9D
					External	H31VXXG0B9D	H31VXXH0B9D
 Sol. 14 Sol. 12	4-way, 2-position	6.0	Double solenoid	24 VDC	Internal	H32VXBG0B9D	H32VXBH0B9D
					External	H32VXXG0B9D	H32VXXH0B9D
 #14	4-way, 3-position, all ports blocked	5.0	Double solenoid	24 VDC	Internal	H35VXBG0B9D	H35VXBH0B9D
					External	H35VXXG0B9D	H35VXXH0B9D
 #14	4-way, 3-position, center exhaust	5.0	Double solenoid	24 VDC	Internal	H36VXBG0B9D	H36VXBH0B9D
					External	H36VXXG0B9D	H36VXXH0B9D
 #14	4-way, 3-position, pressure center	5.0	Double solenoid	24 VDC	Internal	H37VXBG0B9D	H37VXBH0B9D
					External	H37VXXG0B9D	H37VXXH0B9D

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
 Sol. 14	4-way, 2-position, spring return	6.0	Single solenoid	120 VAC	Internal	H3EVXBG023D	H3EVXBH023D
					External	H3EVXXG023D	H3EVXXH023D
 Sol. 14	4-way, 2-position, air return	6.0	Single solenoid	120 VAC	Internal	H31VXBG023D	H31VXBH023D
					External	H31VXXG023D	H31VXXH023D
 Sol. 14 Sol. 12	4-way, 2-position	6.0	Double solenoid	120 VAC	Internal	H32VXBG023D	H32VXBH023D
					External	H32VXXG023D	H32VXXH023D
 #14	4-way, 3-position, all ports blocked	5.0	Double solenoid	120 VAC	Internal	H35VXBG023D	H35VXBH023D
					External	H35VXXG023D	H35VXXH023D
 #14	4-way, 3-position, center exhaust	5.0	Double solenoid	120 VAC	Internal	H36VXBG023D	H36VXBH023D
					External	H36VXXG023D	H36VXXH023D
 #14	4-way, 3-position, pressure center	5.0	Double solenoid	120 VAC	Internal	H37VXBG023D	H37VXBH023D
					External	H37VXXG023D	H37VXXH023D

5599-2, Plug-in Single Subbase, Size 3 (H3)

Side ported base	Enclosure / Lead length	Solenoid addresses	3/4" NPT	3/4" BSPP
	Terminal strip in base	Double solenoid - 2 address	PS421119CCP	PS401110CCP
	6" flying leads	Double solenoid - 2 addresses	PS421119ACP	PS421110ACP

5599-2, Plug-in Manifold Bases, Size 3 (H3)

Bottom / End ported bases	Enclosure / Lead length	Solenoid addresses	3/4" NPT	3/4" BSPP
	Circuit board	Single solenoid - 1 address	PS421169JCP	PS421160JCP
	Circuit board	Double solenoid - 2 addresses	PS421169MCP	PS421160MCP
	Terminal strip in base	Double solenoid - 2 address	PS421169CCP	PS421160CCP
	6" flying leads	Double solenoid - 2 addresses	PS421169ACP	PS421160ACP

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus Series





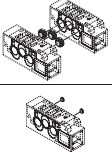
DX ISOMAX Series

Valvair II Series








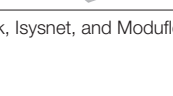
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Subbase & Manifold Valve Products

5599-2, Size 3 (H3) Accessories

	Accessory	Description	Part number
Modulflex Series		Common pressure 5-125 PSIG w/ gauge	PS4238166CP
		Independent pressure 5-125 PSIG w/ gauge	PS4238266CP
Isys Micro Series		Blanking plate kit	PS4234CP
			Sandwich flow control
Isys ISO Series		Manifold to manifold gasket kits	PS4213P
			Main galley (1, 3, 5)
	Pilot galley		PS4033CP

Plug-in, 5599-2 End Plate Kits, Size 3 (H3)

	Electrical option	NPT port	BSPP port
DX ISOMAX Series	 No connector - use with individually wired base	PS4231010DP	PS4231011DP
	 25-pin, D-sub	PS4220L20DP	PS4220L21DP
Valvair II Series	 19-pin, round, Brad Harrison	PS4220L30DP	PS4220L31DP
	 12-pin, M23	PS4220L40DP	PS4220L41DP
Subbase & Manifold Valve Products	 19-pin, M23	PS4220M20DP	PS4220M21DP
	 Modulflex fieldbus	PS4220M40DP	PS4220M41DP
	 Isysnet, with valve driver module	PS4220L60DP	PS4220L61DP
	 Turck fieldbus with valve driver module - 16 outputs	PS4220T10DP	PS4220T11DP
Turck fieldbus with valve driver module - 32 outputs		PS4220T20DP	PS4220T21DP

Turck, Isysnet, and Modulflex communication modules must be ordered separately. See Fieldbus Section for more information.

How To Order Plug-in Add-A-Fold Assemblies

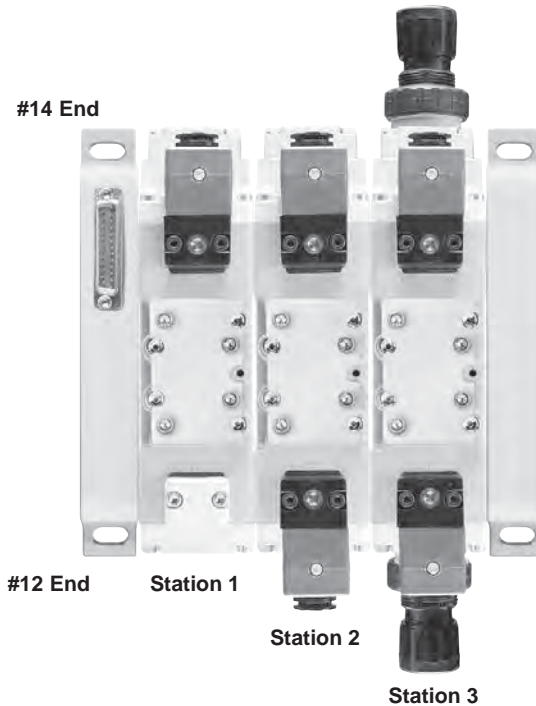
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH3D003	
02	1	H31VXBG0B9D.....	Station 1
03	1	PS421159MCP.....	Station 1
04	1	H32VXBG0B9D.....	Station 2
05	1	PS421159MCP.....	Station 2
06	1	H32VXXG0B9D.....	Station 3
07	1	PS4238166CP.....	Station 3
08	1	PS421159MCP.....	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
 Valves must be ordered as External Pilot when using Sandwich Regulator.



**Example:
 3-Station Manifold with (3) H3 Valves
 on Manifold Bases and Regulator at Station 3**

Maximum Number of Solenoids (Maximum energized simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or		Modulflex Isysnet	Turck	
			Brad Harrison	12-pin M23		16 Outputs	32 Outputs
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	24 (21)	16 (16) 24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A N/A

* Not CSA certified for 25-pin, D-Sub option.

Add-A-Fold Assembly Model Numbers

AA H3 D 0 03

Valve series
 Right & left end plate H3

End plate type

Turck fieldbus with valve driver module - 16 outputs	A*
Turck fieldbus with valve driver module - 32 outputs	B*
25-pin, D-sub	D†
19-pin, brad harrison	E†
12-pin, M23	G†
19-pin, M23	H†
Modulflex fieldbus	T*
Isysnet, with valve driver module	Y*

Number of stations

01
02
03
04
•
•
24

Thread type

0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Threads.

* Must order communication modules separately.

† Collective wiring module included.

Plug-in, 5599-2, Size 1, 2, & 3

H1 E VX B G O B9 D

Basic series 5599-2	
ISO 5599-2 Size 1	H1
ISO 5599-2 Size 2	H2
ISO 5599-2 Size 3	H3

5599-2 Engineering level	
D	Current

5599-2 Voltage & Frequency				
	AC		DC	Light & surge suppression
	60Hz	50Hz		
42	24			
45			12	
B9			24	LED & suppression
23	120	115		LED & suppression
57	240			

5599-2 Operator / Function	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Single solenoid, 2-position - air return, spring assist	E

5599-2 Mounting	
5599-2 Valve less vase	VX

5599-2 Enclosure / Lead length	
0	None, valve less base

5599-2 Pilot source / Pilot exhaust	
Internal pilot, port #1 / vented	B
External pilot, port #12 or #14 / vented	X*

* Must be specified when using Sandwich Regulators.

5599-2 Overrides / Lights		
	Voltage code	
B	42, 45, 57	Non-locking, flush, push - w/o light
C	42, 45, 57	Locking, flush, push / turn - w/o light
G	B9, 23	Non-locking, flush, push - w/ light
H	B9, 23	Locking, flush, push / turn - w/ light

Plug-in, 5599-2 Transition Plate Kits

PS4026 L2 0 C P

Transition plate type*	
H1 to H2 to H3	PS4025
H1 to H3	PS4026
H1 to H2	PS4027
H2 to H3	PS4028

* Includes Left Hand and Right Hand End Plates

Engineering level	
C	Basic series PS40

Thread type	
0	NPT
1*	BSPP "G"









* BSPP conforms to ISO 1179-1 w 228-1 threads.

Options	
25-pin, D-sub	L2
19-pin, round, brad harrison	L3
12-pin, M23	L4
19-pin, M23	M2
Modulflex fieldbus	M4*
Isysnet, with valve driver module	L6*
Turck fieldbus with valve driver module - 16 outputs	T1
Turck fieldbus with valve driver module - 32 outputs	T2




* Must order communication module separately
 turck, isysnet, and modulflex communication modules must be ordered separately.
 See fieldbus section for more information.










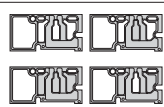
15407-1, Non Plug-in, Size 18mm (HB)

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
 Sol. 14	4-way, 2-position, spring return	0.55	Single solenoid	24 VDC	Internal	HBEWXBG2G9000FA	HBEWXBH2G9000FA
					External	HBEWXLG2G9000FA	HBEWXLH2G9000FA
 Sol. 14	4-way, 2-position, air return	0.55	Single solenoid	24 VDC	Internal	HB1WXBG2G9000FA	HB1WXBH2G9000FA
					External	HB1WXLG2G9000FA	HB1WXLH2G9000FA
 Sol. 14 Sol. 12	4-way, 2-position	0.55	Double solenoid	24 VDC	Internal	HB2WXBG2G9000FA	HB2WXBH2G9000FA
					External	HB2WXLG2G9000FA	HB2WXLH2G9000FA
 #14	4-way, 3-position, all ports blocked	0.5	Double solenoid	24 VDC	Internal	HB5WXBG2G9000FA	HB5WXBH2G9000FA
					External	HB5WXLG2G9000FA	HB5WXLH2G9000FA
 #14	4-way, 3-position, center exhaust	0.5	Double solenoid	24 VDC	Internal	HB6WXBG2G9000FA	HB6WXBH2G9000FA
					External	HB6WXLG2G9000FA	HB6WXLH2G9000FA
 #14	4-way, 3-position, pressure center	0.5	Double solenoid	24 VDC	Internal	HB7WXBG2G9000FA	HB7WXBH2G9000FA
					External	HB7WXLG2G9000FA	HB7WXLH2G9000FA
 #14	3-way, 2-position, dual valve, NC/NC	0.45	Double solenoid	24 VDC	Internal	HBNWXBG2G9000FA	HBNWXBH2G9000FA
					External	HBNWXLG2G9000FA	HBNWXLH2G9000FA
 #14	3-way, 2-position, dual valve, NO/NO	0.45	Double solenoid	24 VDC	Internal	HBPWXBG2G9000FA	HBPWXBH2G9000FA
					External	HBPWXLG2G9000FA	HBPWXLH2G9000FA

15407-1, Non Plug-in, Size 18mm (HB)

Single subbase	Description	1/8" NPT	1/8" BSPP
	Side ported base	PL02-01-80	PL02-01-70
	End ported bases	PS5611510P	PS5611520P
2 Station manifold bases	Description	1/8" NPT	1/8" BSPP
	End ported bases	PS5611510P	PS5611520P
	Non-collective wiring end plate	PS5631010P	PS5631011P
End plate kit	Description	NPT port	BSPP port
	Non-collective wiring end plate	PS5631010P	PS5631011P

15407-1, Non-Plug-in, Size 18mm (HB) Accessories

Accessories	Description	Part number
	Common pressure	2-60 PSIG w/ gauge PS5637155P
	Common pressure	5-125 PSIG w/ gauge PS5637166P
	Independent pressure	2-60 PSIG w/ gauge PS5637255P
	Independent pressure	5-125 PSIG w/ gauge PS5637266P
	Gauge adapter kit	Includes 1/8" coupling and long nipple PS5651160P
	Blanking plate kit	PS5634P
	1/8" NPT	PS562600P
	1/8" BSPP	PS562601P
	1/8" NPT	PS562700P
	1/8" BSPP	PS562701P
	Intermediate air supply module	1/8" NPT D02P-01-80
	Sandwich flow control	PS5642P
	Standard	PS561AP
	Blocked #1 port	PS561BP
	Blocked #1, 3, 5, ports	PS561CP
	Blocked #3, 5 ports	PS561DP

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

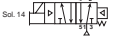
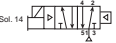

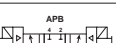
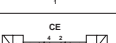
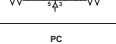
DX ISOMAX Series

Valvair II Series




D

Subbase & Manifold Valve Products








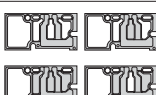
15407-1, Non Plug-in, Size 26mm (HA)

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	1.1	Single solenoid	24 VDC	Internal	HAEWXBG2G9000FA	HAEWXBH2G9000FA
					External	HAEWXLG2G9000FA	HAEWXLH2G9000FA
	4-way, 2-position, air return	1.1	Single solenoid	24 VDC	Internal	HA1WXBG2G9000FA	HA1WXBH2G9000FA
					External	HA1WXLG2G9000FA	HA1WXLH2G9000FA
	4-way, 2-position	1.1	Double solenoid	24 VDC	Internal	HA2WXBG2G9000FA	HA2WXBH2G9000FA
					External	HA2WXLG2G9000FA	HA2WXLH2G9000FA
	4-way, 3-position, all ports blocked	1.0	Double solenoid	24 VDC	Internal	HA5WXBG2G9000FA	HA5WXBH2G9000FA
					External	HA5WXLG2G9000FA	HA5WXLH2G9000FA
	4-way, 3-position, center exhaust	1.0	Double solenoid	24 VDC	Internal	HA6WXBG2G9000FA	HA6WXBH2G9000FA
					External	HA6WXLG2G9000FA	HA6WXLH2G9000FA
	4-way, 3-position, pressure center	1.0	Double solenoid	24 VDC	Internal	HA7WXBG2G9000FA	HA7WXBH2G9000FA
					External	HA7WXLG2G9000FA	HA7WXLH2G9000FA

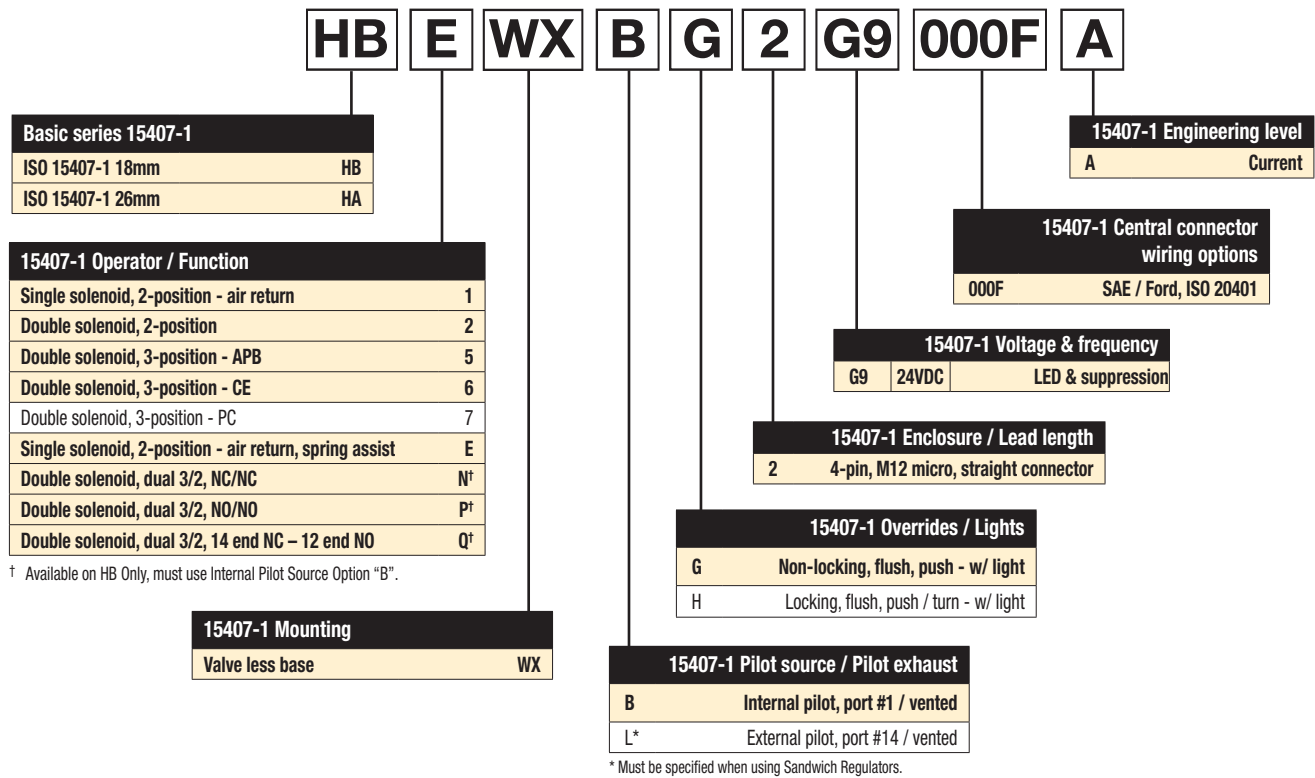
15407-1, Non Plug-in, Size 26mm (HA)

Single subbase	Description	1/4" NPT	1/4" BSPP
	Side ported base	PL01-02-80	PL01-02-70
2 Station manifold bases	Description	1/4" NPT	1/4" BSPP
	End ported bases	PS5511530P	PS5511540P
End plate kit	Description	NPT port	BSPP port
	Non-collective wiring end plate	PS5631010P	PS5631011P

15407-1, Non-Plug-in, Size 18mm (HB) Accessories

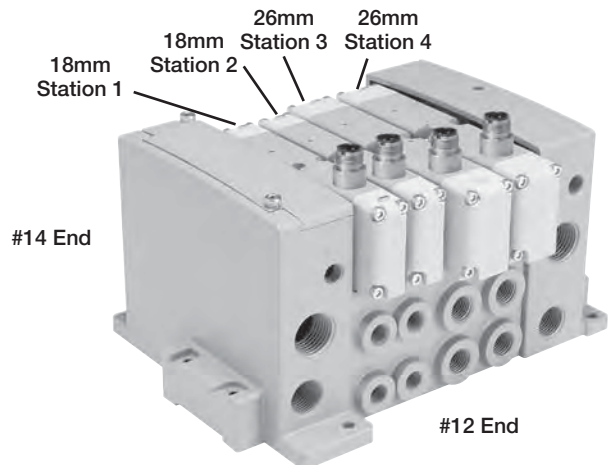
Accessories	Description	Part number
	Common pressure	2-60 PSIG w/ gauge PS5537155P
	Common pressure	5-125 PSIG w/ gauge PS5537166P
	Independent pressure	2-60 PSIG w/ gauge PS5537255P
	Independent pressure	5-125 PSIG w/ gauge PS5537266P
	Gauge adapter kit	Includes 1/8" coupling and long nipple PS5651160P
	Blanking plate kit	PS5634P
	Sandwich supply module	1/8" NPT PS562600P
		1/8" BSPP PS562601P
	Sandwich exhaust module	1/8" NPT PS562700P
		1/8" BSPP PS562701P
	Intermediate air supply module	1/8" NPT D01P-02-80
	Sandwich flow control	PS5542P
	Standard	PS561AP
	Blocked #1 port	PS561BP
	Blocked #1, 3, 5, ports	PS561CP
	Blocked #3, 5 ports	PS561DP

Non Plug-in, 15407-1, Size 18mm (HB) & 26mm (HA)



How To Order 15407-1 Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example:
 4-Station Manifold with (2) 18mm and (2) 26mm Valves on Manifold Bases

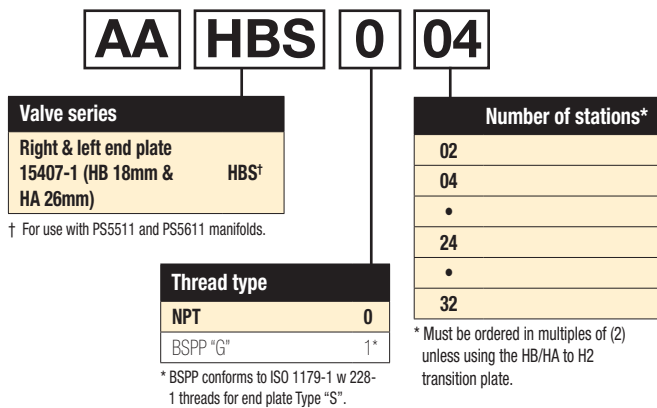
Example

Application requires a 4-Station manifold. (Two 18mm + Two 26mm Stations)

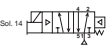

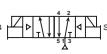
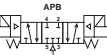
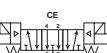
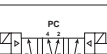
Item	Qty.	Part No.	Location
01	1	AAHBS004	
02	1	1HB1WXBG2G9000FA	Station 1
03	1	1HB2WXBG2G9000FA	Station 2
04	1	1PS5611510P	Station 1 & 2
05	2	2HA1WXBG2G9000FA	Station 3 & 4
06	1	1PS5511510P	Station 3 & 4

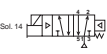
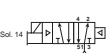

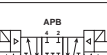
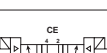
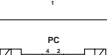
NOTE: Construct manifold assemblies from left to right while looking at the ports. Valves must be ordered as External Pilot when using Sandwich Regulator.

Add-A-Fold Assembly Model Number



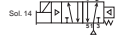
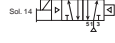
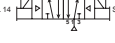


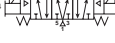
5599-1, Non Plug-in, Size 1 (H1) with Central Connectors

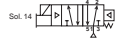
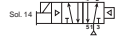

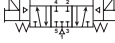
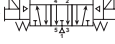

	Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
Modulflex Series		4-way, 2-position, spring return	1.5	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H1EWXBG2B9000FD	H1EWXBH2B9000FD
		4-way, 2-position, air return	1.5	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H11WXXBG2B9000FD	H11WXXH2B9000FD
		4-way, 2-position	1.5	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H12WXXBG2B9000FD	H12WXXH2B9000FD
Isys Micro Series		4-way, 3-position, all ports blocked	1.2	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H15WXXBG2B9000FD	H15WXBH2B9000FD
		4-way, 3-position, center exhaust	1.2	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H16WXXBG2B9000FD	H16WXBH2B9000FD
		4-way, 3-position, pressure center	1.2	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H17WXXBG2B9000FD	H17WXBH2B9000FD

	Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Non-locking	Locking
Fieldbus Series		4-way, 2-position, spring return	1.5	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H1EWXBG323000FD	H1EWXBH323000FD
		4-way, 2-position, air return	1.5	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H11WXXBG323000FD	H11WXXH323000FD
		4-way, 2-position	1.5	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H12WXXBG323000FD	H12WXXH323000FD
DX ISOMAX Series		4-way, 3-position, all ports blocked	1.2	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H15WXXBG323000FD	H15WXBH323000FD
		4-way, 3-position, center exhaust	1.2	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H16WXXBG323000FD	H16WXBH323000FD
		4-way, 3-position, pressure center	1.2	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H17WXXBG323000FD	H17WXBH323000FD




Modulflex Series
Isys Micro Series
Isys ISO Series
Fieldbus Series
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products

5599-1, Non Plug-in, Size 1 (H1) with 3-Pin DIN Connectors





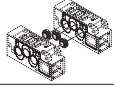


Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
	4-way, 2-position, spring return	1.5	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H1EWXBBL49D	H1EWXBDL49D
						External	H1EWXXBL49D	H1EWXXDL49D
	4-way, 2-position, air return	1.5	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H11WXBBL49D	H11WXBDL49D
						External	H11WXXBL49D	H11WXXDL49D
	4-way, 2-position	1.5	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H12WXBBL49D	H12WXBDL49D
						External	H12WXXBL49D	H12WXXDL49D
	4-way, 3-position, all ports blocked	1.2	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H15WXBBL49D	H15WXBDL49D
						External	H15WXXBL49D	H15WXXDL49D
	4-way, 3-position, center exhaust	1.2	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H16WXBBL49D	H16WXBDL49D
						External	H16WXXBL49D	H16WXXDL49D
	4-way, 3-position, pressure center	1.2	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H17WXBBL49D	H17WXBDL49D
						External	H17WXXBL49D	H17WXXDL49D

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	1.5	Single solenoid	120 VAC	Internal	H1EWXBBL53D	H1EWXBDL53D
					External	H1EWXXBL53D	H1EWXXDL53D
	4-way, 2-position, air return	1.5	Single solenoid	120 VAC	Internal	H11WXBBL53D	H11WXBDL53D
					External	H11WXXBL53D	H11WXXDL53D
	4-way, 2-position	1.5	Double solenoid	120 VAC	Internal	H12WXBBL53D	H12WXBDL53D
					External	H12WXXBL53D	H12WXXDL53D
	4-way, 3-position, all ports blocked	1.2	Double solenoid	120 VAC	Internal	H15WXBBL53D	H15WXBDL53D
					External	H15WXXBL53D	H15WXXDL53D
	4-way, 3-position, center exhaust	1.2	Double solenoid	120 VAC	Internal	H16WXBBL53D	H16WXBDL53D
					External	H16WXXBL53D	H16WXXDL53D
	4-way, 3-position, pressure center	1.2	Double solenoid	120 VAC	Internal	H17WXBBL53D	H17WXBDL53D
					External	H17WXXBL53D	H17WXXDL53D

5599-1, Non Plug-in, Size 1 (H1)

	Single subbase	Description	3/8" NPT	3/8" BSPP
		Side ported base	PS4011150CP	PS4011160CP
	Manifold bases	Description	3/8" NPT	3/8" BSPP
		Bottom / End ported bases	PS4011650CP	PS4011660CP
	End plate kits	Description	NPT port	BSPP port
		H1 Non-collective wiring end plates	PS4031010CP	PS4031011CP

5599-1, Non Plug-in, Size 1 (H1) Accessories

	Accessory	Description	Part number
		Common pressure	5-125 PSIG w/ gauge PS4037166CP
		Independent pressure	5-125 PSIG w/ gauge PS4037266CP
Modulflex Series		Blanking plate kit	PS4034CP
		Sandwich flow control	PS4042CP
Isys Micro Series		Manifold to manifold gasket kits	PS4013P
		Manifold port isolation kit	Main galley (1, 3, 5) PS4032CP
Isys ISO Series		Manifold port isolation kit	Pilot galley PS4033CP
		Auxiliary access plate kit	1/4" & 3/8" NPT BSPP PS403000CP PS403001CP

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

D

Subbase & Manifold Valve Products

How To Order Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

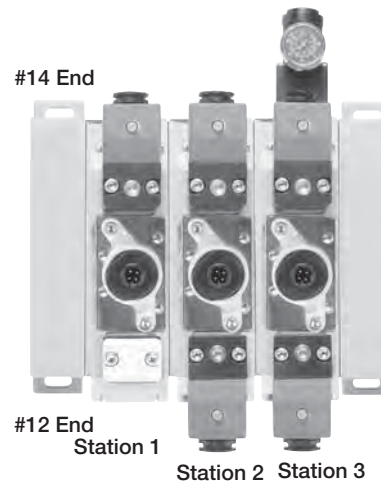
Example

Application requires a 3-Station manifold with a valve, regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH1S003	
02	1	H11WXBG2B9000FD	Station 1
03	1	PS4011550CP	Station 1
04	1	H12WXBG2B9000FD	Station 2
05	1	PS4011550CP	Station 2
06	1	H12WXXG2B9000FD	Station 3
07	1	PS4037166CP	Station 3
08	1	PS4011550CP	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.

Valves must be ordered as External Pilot when using Sandwich Regulator.



Example:
 3-Station Manifold with (3) H1 Valves
 on Manifold Bases
 and Regulator at Station 3

Add-A-Fold Assembly Model Number

AA	H1	S	0	03	
-----------	-----------	----------	----------	-----------	--

Valve series

Right & left end plate	H1
------------------------	----

End plate type

Standard - non-collective wiring	S
----------------------------------	---

Thread type

NPT	0
BSPP "G"	1*

* BSPP Conforms to ISO 1179-1 w 228-1 Threads.

Transition plate

Blank	No transition plate
C	H1 to H2
D	H1 to H3

Number of stations

01
02
03
04
•
•
24

Modulflex
Series

Isys Micro
Series

Isys ISO
Series

Fieldbus

















DX ISOMAX
Series














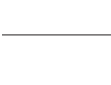


Valvair II
Series

D

















Subbase & Manifold
Valve Products

5599-1, Non Plug-in, Size 2 (H2) with Central Connectors

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
 Sol. 14 	4-way, 2-position, spring return	3.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H2EWXBG2B9000FD	H2EWXBH2B9000FD
						External	H2EWXXG2B9000FD	H2EWXXH2B9000FD
 Sol. 14 	4-way, 2-position, air return	3.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H21WXBG2B9000FD	H21WXBH2B9000FD
						External	H21WXXG2B9000FD	H21WXXH2B9000FD
 Sol. 14  Sol. 12 	4-way, 2-position	3.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H22WXBG2B9000FD	H22WXBH2B9000FD
						External	H22WXXG2B9000FD	H22WXXH2B9000FD
 #14  #12 	4-way, 3-position, all ports blocked	2.8	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H25WXBG2B9000FD	H25WXBH2B9000FD
						External	H25WXXG2B9000FD	H25WXXH2B9000FD
 #14  #12 	4-way, 3-position, center exhaust	2.8	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H26WXBG2B9000FD	H26WXBH2B9000FD
						External	H26WXXG2B9000FD	H26WXXH2B9000FD
 #14  #12 	4-way, 3-position, pressure center	2.8	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H27WXBG2B9000FD	H27WXBH2B9000FD
						External	H27WXXG2B9000FD	H27WXXH2B9000FD

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Non-locking	Locking
 Sol. 14 	4-way, 2-position, spring return	3.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H2EWXBG323000FD	H2EWXBH323000FD
						External	H2EWXXG323000FD	H2EWXXH323000FD
 Sol. 14 	4-way, 2-position, air return	3.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H21WXBG323000FD	H21WXBH323000FD
						External	H21WXXG323000FD	H21WXXH323000FD
 Sol. 14  Sol. 12 	4-way, 2-position	3.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H22WXBG323000FD	H22WXBH323000FD
						External	H22WXXG323000FD	H22WXXH323000FD
 #14  #12 	4-way, 3-position, all ports blocked	2.8	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H25WXBG323000FD	H25WXBH323000FD
						External	H25WXXG323000FD	H25WXXH323000FD
 #14  #12 	4-way, 3-position, center exhaust	2.8	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H26WXBG323000FD	H26WXBH323000FD
						External	H26WXXG323000FD	H26WXXH323000FD
 #14  #12 	4-way, 3-position, pressure center	2.8	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H27WXBG323000FD	H27WXBH323000FD
						External	H27WXXG323000FD	H27WXXH323000FD

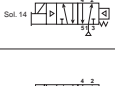

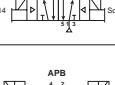
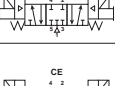
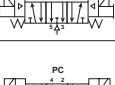

5599-1, Non Plug-in, Size 2 (H2) with 3-Pin DIN Connectors

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
 Sol. 14 	4-way, 2-position, spring return	3.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H2EWXBBL49D	H2EWXBCL49D
						External	H2EWXXBL49D	H2EWXXCL49D
 Sol. 14 	4-way, 2-position, air return	3.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H21WXBBL49D	H21WXBCL49D
						External	H21WXXBL49D	H21WXXCL49D
 Sol. 14  Sol. 12 	4-way, 2-position	3.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H22WXBBL49D	H22WXBCL49D
						External	H22WXXBL49D	H22WXXCL49D
 #14  #12 	4-way, 3-position, all ports blocked	2.8	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H25WXBBL49D	H25WXBCL49D
						External	H25WXXBL49D	H25WXXCL49D
 #14  #12 	4-way, 3-position, center exhaust	2.8	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H26WXBBL49D	H26WXBCL49D
						External	H26WXXBL49D	H26WXXCL49D
 #14  #12 	4-way, 3-position, pressure center	2.8	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H27WXBBL49D	H27WXBCL49D
						External	H27WXXBL49D	H27WXXCL49D






Modulflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus Series
 DX ISOMAX Series
 Valvair II Series
 Subbase & Manifold Valve Products





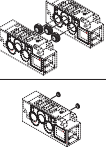
5599-1, Non Plug-in, Size 2 (H2) with 3-Pin DIN Connectors

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	3.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H2EWXBBL53D	H2EWXBCL53D
						External	H2EWXXBBL53D	H2EWXXCL53D
	4-way, 2-position, air return	3.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H21WXBBL53D	H21WXBCL53D
						External	H21WXXBBL53D	H21WXXCL53D
	4-way, 2-position	3.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H22WXBBL53D	H22WXBCL53D
						External	H22WXXBBL53D	H22WXXCL53D
	4-way, 3-position, all ports blocked	2.8	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H25WXBBL53D	H25WXBCL53D
						External	H25WXXBBL53D	H25WXXCL53D
	4-way, 3-position, center exhaust	2.8	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H26WXBBL53D	H26WXBCL53D
						External	H26WXXBBL53D	H26WXXCL53D
	4-way, 3-position, pressure center	2.8	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H27WXBBL53D	H27WXBCL53D
						External	H27WXXBBL53D	H27WXXCL53D

5599-1, Non Plug-in, Size 2 (H2)

Single subbase	Description	1/2" NPT	1/2" BSPP
	Side ported base	PS4111170CP	PS4111180CP
Manifold bases	Description	1/2" NPT	1/2" BSPP
	Bottom / End ported bases Note: Manifolds include 2 pipe plugs	PS4111670CP	PS4111680CP
End plate kits	Description	NPT port	BSPP port
	H2 Non-collective wiring end plates	PS4131010CP	PS4131011CP

5599-1, Non Plug-in, Size 2 (H2) Accessories

Accessory	Description	Part number
	Common pressure 5-125 PSIG w/ gauge	PS4137166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4137266CP
	Blanking plate kit	PS4134CP
	Sandwich flow control	PS4142CP
	Manifold to manifold gasket kits	PS4113P
	Main galley (1, 3, 5)	PS4132CP
	Pilot galley	PS4033CP

Modulflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus Series
 DX ISOMAX Series
 Valvair II Series

D
 Subbase & Manifold Valve Products

How To Order Non Plug-in Add-A-Fold Assemblies

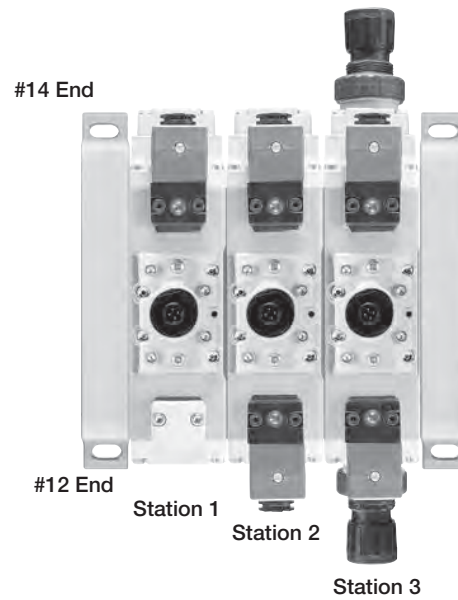
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blanking plate part number and the individual manifold number in the station specified.)

Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

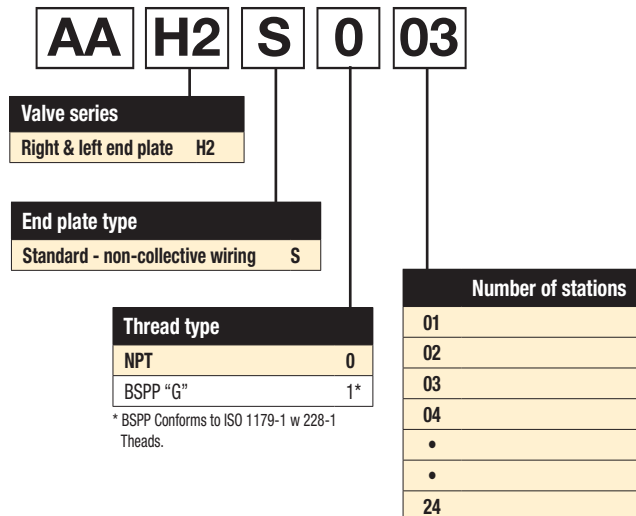
Item	Qty.	Part No.	Location
01	1	AAH2S003	
02	1	H21WXBG2B9000FD	Station 1
03	1	PS4111570CP	Station 1
04	1	H22WXBG2B9000FD	Station 2
05	1	PS4111570CP	Station 2
06	1	H22WXXG2B9000FD	Station 3
07	1	PS4137166CP	Station 3
08	1	PS4111570CP	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
 Valves must be ordered as External Pilot when using Sandwich Regulator.



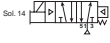
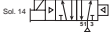
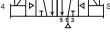



Example:
 3-Station Manifold with (3) H2 Valves on Manifold Bases and Regulator at Station 3

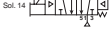
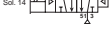
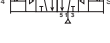
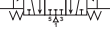

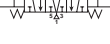
Add-A-Fold Assembly Model Number



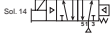
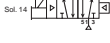
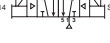



Modulflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products

5599-1, Non Plug-in, Size 3 (H3) with Central Connectors

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
	4-way, 2-position, spring return	6.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H3EWXBG2B9000FD	H3EWXBH2B9000FD
						External	H3EWXG2B9000FD	H3EWXH2B9000FD
	4-way, 2-position, air return	6.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	H31WXBG2B9000FD	H31WXBH2B9000FD
						External	H31WXXG2B9000FD	H31WXXH2B9000FD
	4-way, 2-position	6.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H32WXBG2B9000FD	H32WXBH2B9000FD
						External	H32WXXG2B9000FD	H32WXXH2B9000FD
	4-way, 3-position, all ports blocked	5.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H35WXBG2B9000FD	H35WXBH2B9000FD
						External	H35WXXG2B9000FD	H35WXXH2B9000FD
	4-way, 3-position, center exhaust	5.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H36WXBG2B9000FD	H36WXBH2B9000FD
						External	H36WXXG2B9000FD	H36WXXH2B9000FD
	4-way, 3-position, pressure center	5.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	H37WXBG2B9000FD	H37WXBH2B9000FD
						External	H37WXXG2B9000FD	H37WXXH2B9000FD

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	6.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H3EWXBG323000FD	H3EWXBH323000FD
						External	H3EWXG323000FD	H3EWXH323000FD
	4-way, 2-position, air return	6.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H31WXBG323000FD	H31WXBH323000FD
						External	H31WXXG323000FD	H31WXXH323000FD
	4-way, 2-position	6.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H32WXBG323000FD	H32WXBH323000FD
						External	H32WXXG323000FD	H32WXXH323000FD
	4-way, 3-position, all ports blocked	5.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H35WXBG323000FD	H35WXBH323000FD
						External	H35WXXG323000FD	H35WXXH323000FD
	4-way, 3-position, center exhaust	5.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H36WXBG323000FD	H36WXBH323000FD
						External	H36WXXG323000FD	H36WXXH323000FD
	4-way, 3-position, pressure center	5.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	H37WXBG323000FD	H37WXBH323000FD
						External	H37WXXG323000FD	H37WXXH323000FD

5599-1, Non Plug-in, Size 3 (H3) with 3-Pin DIN Connectors

Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
	4-way, 2-position, spring return	6.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H3EWXBBL49D	H3EWXBCL49D
						External	H3EWXBL49D	H3EWXCL49D
	4-way, 2-position, air return	6.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	H31WXBBL49D	H31WXBCL49D
						External	H31WXXBL49D	H31WXXCL49D
	4-way, 2-position	6.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H32WXBBL49D	H32WXBCL49D
						External	H32WXXBL49D	H32WXXCL49D
	4-way, 3-position, all ports blocked	5.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H35WXBBL49D	H35WXBCL49D
						External	H35WXXBL49D	H35WXXCL49D
	4-way, 3-position, center exhaust	5.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H36WXBBL49D	H36WXBCL49D
						External	H36WXXBL49D	H36WXXCL49D
	4-way, 3-position, pressure center	5.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	H37WXBBL49D	H37WXBCL49D
						External	H37WXXBL49D	H37WXXCL49D



Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

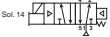
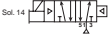
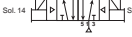
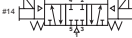


DX ISOMAX Series

Valvair II Series




D

Subbase & Manifold Valve Products






5599-1, Non Plug-in, Size 3 (H3) with 3-Pin DIN Connectors

	Symbol	Type	Cv	Operator	Voltage		Pilot	Non-locking	Locking
Modulflex Series		4-way, 2-position, spring return	6.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H3EWXBBL53D	H3EWXBCL53D
							External	H3EWXXBL53D	H3EWXXCL53D
		4-way, 2-position, air return	6.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	H31WXBBL53D	H31WXBCL53D
							External	H31WXXBL53D	H31WXXCL53D
		4-way, 2-position	6.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H32WXBBL53D	H32WXBCL53D
							External	H32WXXBL53D	H32WXXCL53D
Isys Micro Series		4-way, 3-position, all ports blocked	5.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H35WXBBL53D	H35WXBCL53D
							External	H35WXXBL53D	H35WXXCL53D
		4-way, 3-position, center exhaust	5.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H36WXBBL53D	H36WXBCL53D
							External	H36WXXBL53D	H36WXXCL53D
Isys ISO Series		4-way, 3-position, pressure center	5.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	H37WXBBL53D	H37WXBCL53D
							External	H37WXXBL53D	H37WXXCL53D

5599-1, Non Plug-in, Size 3 (H3)

Fieldbus Series	Single subbase	Description	3/4" NPT	3/4" BSPP
		Side ported base	PS4211190CP	PS4211180CP
DX ISOMAX Series	Manifold bases	Description	3/4" NPT	3/4" BSPP
		Bottom / End ported bases	PS4211690CP	PS4211600CP
		Note: Manifolds include 2 pipe plugs		
Valvair II Series	End plate kits	Description	NPT port	BSPP port
		H3 Non-collective wiring end plates	PS4231010CP	PS4231011CP

5599-1, Non Plug-in, Size 3 (H3) Accessories

	Accessory	Description	Part number
	Sandwich regulator	Common pressure 5-125 PSIG w/ gauge	PS4237166CP
		Independent pressure 5-125 PSIG w/ gauge	PS4237266CP
	Blanking plate kit		PS4234CP
	Sandwich flow control		PS4242CP
	Manifold to manifold gasket kits		PS4213P
	Manifold port isolation kit	Main galley (1, 3, 5)	PS4232CP
		Pilot galley	PS4033CP

How To Order Non Plug-in Add-A-Fold Assemblies

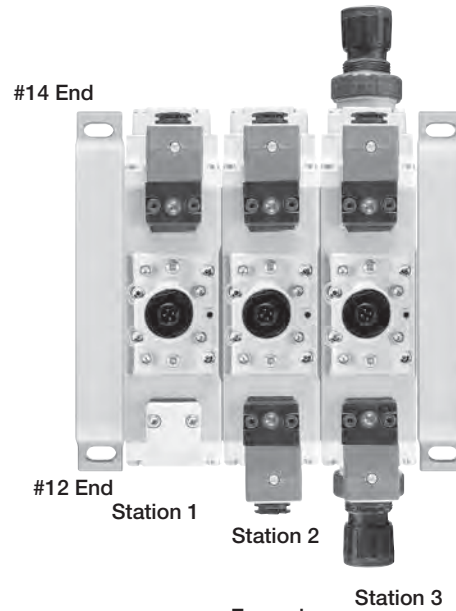
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

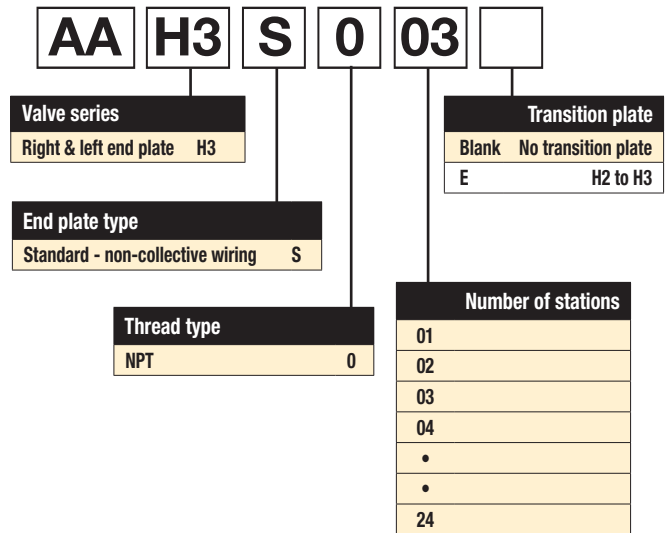
Item	Qty.	Part No.	Location
01	1	AAH3S003	
02	1	H31WXBG2B9000FD	Station 1
03	1	PS4211590CP	Station 1
04	1	H32WXBG2B9000FD	Station 2
05	1	PS4211590CP	Station 2
06	1	H32WXXG2B9000FD	Station 3
07	1	PS4237166CP	Station 3
08	1	PS4211590CP	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
 Valves must be ordered as External Pilot when using Sandwich Regulator.

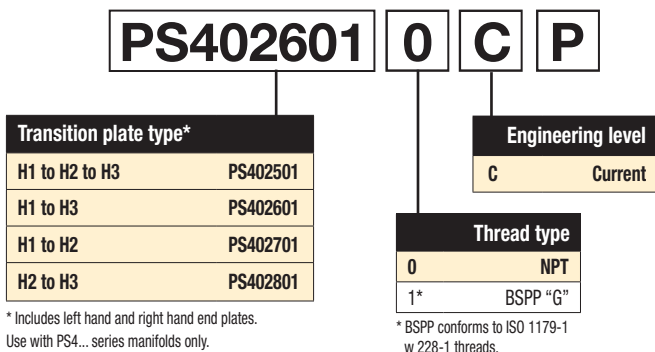


Example:
 3-Station Manifold with (3) H3 Valves
 on Manifold Bases and Regulator at Station 3

Add-A-Fold Assembly Model Number



5599-1 Non Plug-in Transition Plate Kits



Non Plug-in, 5599-1, Central Connector - Size 1, 2, & 3

Modulflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus
 DX ISOMAX Series
 Valvair II Series
D
 Subbase & Manifold Valve Products

H1 E WX B G 2B9 000F D

Basic series 5599-1	
ISO 5599-1 Size 1	H1
ISO 5599-1 Size 2	H2
ISO 5599-1 Size 3	H3

5599-1 Engineering level	
D	Current

5599-1 Operator / Function	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Single solenoid, 2-position - air return, spring assist	E

5599-1 Central connector wiring options	
000C	Chrysler
000F*	SAE / Ford, ISO 20401
000G	General Motors

* Complies to ISO 20401 with Enclosure Lead Length "2".

5599-1 Mounting	
Valve less base	WX

5599-1 Pilot source / Pilot exhaust	
Internal pilot, port #1 / vented	B
External pilot, port #12 or #14 / vented	X*

* Must be specified when using Sandwich Regulators.

5599-1 Overrides / Lights	
Non-locking, flush, with light	G
Locking, flush, with light	H

Enclosure / Lead length / Voltage*				
	AC		DC	
	60Hz	50Hz		
1B9†			24	3-pin, central mini connector
123†	120	115		3-pin, central mini connector
2B9			24	4-pin, central M12 connector
3B9			24	5-pin, central mini connector
323	120	115		5-pin, central mini connector
619†			24	2-pin, M12 connector on coil

* All coils include LED & suppression

† Operator function "1" or "E"

* Only available with wiring option "000F"

Non Plug-in, 5599-1, CNOMO - Size 1, 2, & 3

H1 E WX B B L53 D

Basic series 5599-1	
ISO 5599-1 Size 1	H1
ISO 5599-1 Size 2	H2
ISO 5599-1 Size 3	H3

5599-1 Engineering level	
D	Current

5599-1 Operator / Function	
Single solenoid, 2-position - air return	1
Double solenoid, 2-position	2
Double solenoid, 3-position - APB	5
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Single solenoid, 2-position - air return, spring assist	E

Enclosure / Lead length / Voltage				
	AC		DC	
	60Hz	50Hz		
L42	24			3-pin, 30mm DIN 43650A with CNOMO connector
L45			12	3-pin, 30mm DIN 43650A with CNOMO connector
L49			24	3-pin, 30mm DIN 43650A with CNOMO connector
L53	120	115		3-pin, 30mm DIN 43650A with CNOMO connector
L57	240			3-pin, 30mm DIN 43650A with CNOMO connector
NXX				Valve less coil

5599-1 Mounting	
Valve less base	WX

5599-1 Pilot source / Pilot exhaust	
Internal pilot, port #1 / vented	B
External pilot, port #12 or #14 / vented	X*

* Must be specified when using Sandwich Regulators.

5599-1 Overrides / Lights	
B	Non-locking, flush, push - no light
C	Locking, flush, push / turn - no light

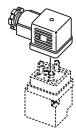
Maximum Number of Solenoids
 (Maximum energized simultaneously)

HA & HB	Voltage code	25-pin D-sub	19-pin Brad Harrison	12-Pin M23	19-pin M23	Moduflex	Isysnet	Turck	
								16 Outputs	32 Outputs
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	16 (16)	32 (32)	16 (16)	32 (32)
120VAC*	23	24 (24)	16 (16)	8 (8)	16 (16)	N/A	N/A	N/A	N/A

H1, H2 & H3	Voltage code	25-pin D-sub	19-pin Brad Harrison	12-Pin M23	19-pin M23	Moduflex	Isysnet	Turck	
								16 Outputs	32 Outputs
12VDC	45	24 (13)	16 (13)	8 (8)	16 (13)	N/A	N/A	N/A	N/A
24VAC*	42	24 (24)	16 (16)	8 (8)	16 (16)	N/A	N/A	N/A	N/A
24VDC	B9	24 (20)	16 (16)	8 (8)	16 (16)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	16 (16)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-pin, D-sub option.

Female Electrical Connectors (IP65 Rated) 30mm, 3-Pin ISO 4400, (DIN 43650A)



Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	PS2028BP
Light – 6-48V, 50/60Hz; 6-48VDC	PS2032J79CP*	PS203279BP
Light – 120V/60Hz	PS2032J83CP*	PS203283BP
Light – 240V/60Hz	N/A	PS203283BP

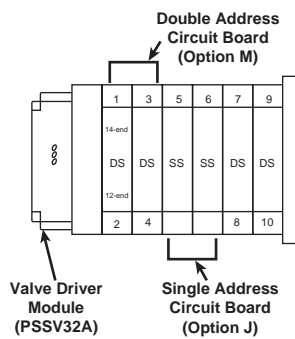
* With surge suppression.

Engineering data:

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 inch); Contact spacing: 18mm

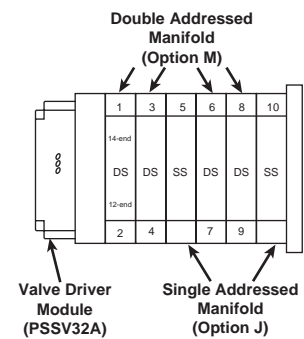
I/O Addressing Examples

HB & HA Example
 Two Station Manifold Bases



Notes: SS = Single Solenoid Valve
 DS = Double Solenoid Valve
 First output address the #14 end of the valve closest to the valve driver module.

H1, H2 & H3 Example:
 Single Station Manifold Bases



5599-2 & 5599-1 AUTO Solenoid Kits

Valve size	Voltage code	Coil kit number
	42 (24VAC)	PS404142P
	45 (12VDC)	PS404145P
	H1, H2 & H3	PS4041B9P
	23 (120VAC)	PS404123P
	57 (240VAC)	PS404157P

Quantity 1

5599-1 CNOMO Solenoid Kits

Voltage code	3-pin, 30mm 'L' coil kit	2-pin, M12 Euro '6' coil kit
19	—	PS2828619P
42	P2FCA442	—
45	P2FCA445	—
49	P2FCA449	—
53	P2FCA453	—
57	P2FCA457	—

Quantity 1



Moduflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

D

Subbase & Manifold Valve Products

Pilot Operator - CNOMO

Valve size		Kit number
H1, H2 & H3	Locking	PS4052CP
	Non-locking	PS4053CP

Manifold Hardware Kits – PS Series

Valve size	Kit number
HA & HB	PS5612P
	PS5512P
	PS4012P
H1, H2 & H3	PS4112P
	PS4212P

Quantity 12

Valve Bolt Kits

Valve size	Kit number
HA & HB	PS5687P
	PS5587P
	PS4087DP
H1, H2 & H3	PS4187DP
	PS4287DP

Quantity 12

Valve to Base Gasket Kits

Valve size	Standard	Remote pilot	Dual pressure #3	Dual pressure #5
HA & HB	PS5605P*	—	—	—
	PS5505P*	—	—	—
H1, H2 & H3	PS4005DP	PS4006DP	PS40D3DP	—
	PS4105DP	PS4106DP	PS41D3DP	PS41D5DP
	PS4205DP	PS4206DP	PS42D3DP	PS42D5DP

Quantity 1
 * Quantity 10

Body Service Kits



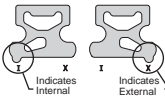
Valve size	2-position	3-position		
		APB	CE	PC
HA & HB	PS5601P	PS5602P	PS5603P	PS5604P
	PS5501P	PS5502P	PS5503P	PS5504P
H1, H2 & H3	PS4001CP	PS4002CP	PS4003CP	PS4004CP
	PS4101CP	PS4102CP	PS4103CP	PS4104CP
	PS4201CP	PS4202CP	PS4203CP	PS4204CP

HB / HA Kit Includes: Spool assembly with seals.

H1, H2, H3 Kit Includes: Spool assembly with seals, all piston seals, return spring, pilot selector gasket, coil to end cap gasket.

Quantity 1

Pilot Select Gasket Kits

	Valve size	Kit number
	HB	PS5605P
	HA	PS5505P
	H1, H2 & H3	PS4007P

Quantity 10

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

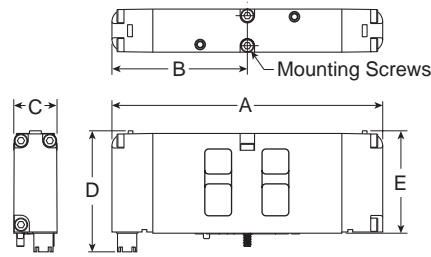
DX ISOMAX Series

Valvair II Series

D

Subbase & Manifold Valve Products

Isys ISO 15407-2, Plug-in, Size 18mm (HB)



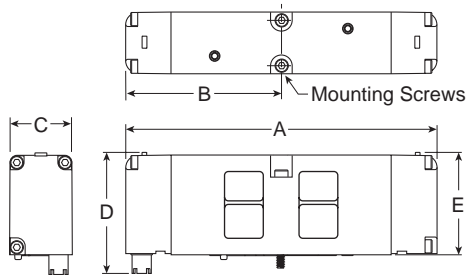
18mm Dimensions

A	B	C	D
4.43	2.22	.72	1.98
(113)	(56)	(18)	(50)

E
 1.68
 (43)

Inches (mm)

Isys ISO 15407-2, Plug-in, Size 26mm (HA)



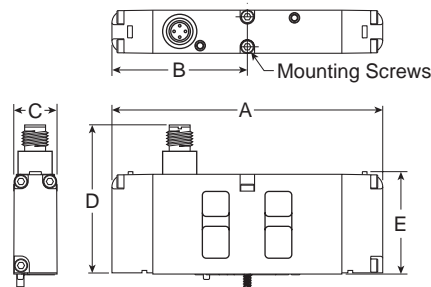
26mm Dimensions

A	B	C	D
5.10	2.55	1.02	1.98
(130)	(65)	(26)	(50)

E
 1.66
 (42)

Inches (mm)

Isys ISO 15407-1, Non Plug-in, Size 18mm (HB)



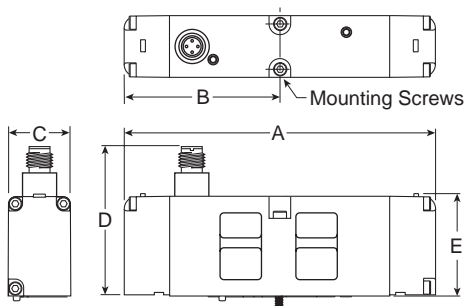
18mm Dimensions

A	B	C	D
4.43	2.22	.72	2.40
(113)	(56)	(18)	(61)

E
 1.68
 (43)

Inches (mm)

Isys ISO 15407-1, Non Plug-in, Size 26mm (HA)



26mm Dimensions

A	B	C	D
5.10	2.55	1.02	2.40
(130)	(65)	(26)	(61)

E
 1.66
 (42)

Inches (mm)

Modulflex
 Series

Isys Micro
 Series

Isys ISO
 Series

Fieldbus

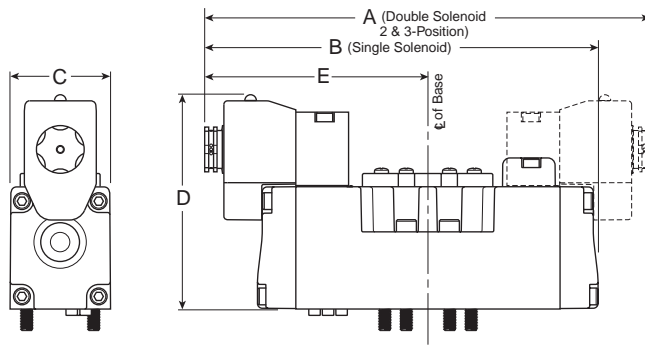
DX ISOMAX
 Series

Valvair II
 Series

D

Subbase & Manifold
 Valve Products

Isys ISO 5599-2



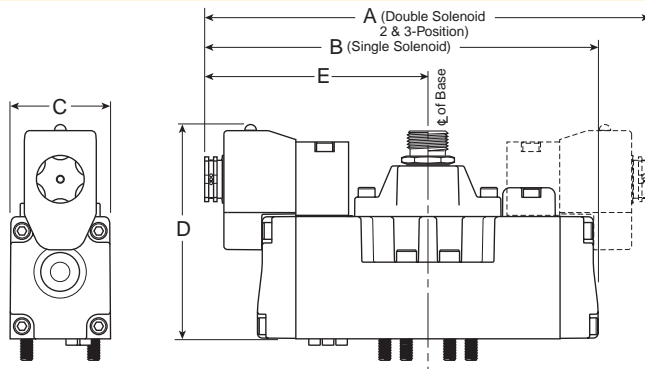
H1 Valves Shown

H1 Dimensions

A	A ₁	B	C
7.32 (186)	5.59 (142)	6.46 (164)	1.65 (42)
D	D ₁	D ₂	D ₃
3.54 (90)	4.29 (109)	4.29 (109)	2.50 (63.5)
D ₄	E	E ₁	
2.48 (63)	3.66 (93)	2.80 (71)	

Inches (mm)

Isys ISO 5599-1 Auto

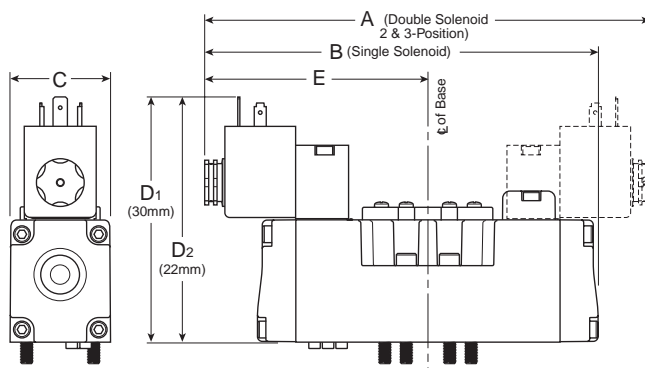


H2 Dimensions

A	A ₁	B	C
8.35 (212)	6.62 (168)	7.48 (190)	2.17 (55)
D	D ₁	D ₂	D ₃
4.05 (103)	4.80 (122)	4.57 (116)	2.99 (76)
E	E ₁		
4.17 (106)	3.31 (84)		

Inches (mm)

Isys ISO 5599-1 CNOMO

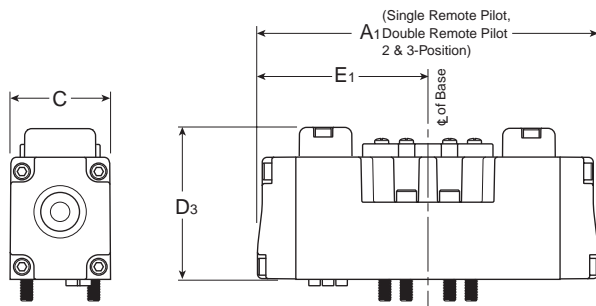


H3 Dimensions

A	A ₁	B	C
9.68 (246)	6.98 (177)	8.68 (220)	2.17 (55)
D	D ₁	D ₂	D ₃
4.05 (103)	4.80 (122)	4.57 (116)	2.99 (76)
E	E ₁		
4.74 (121)	3.49 (89)		

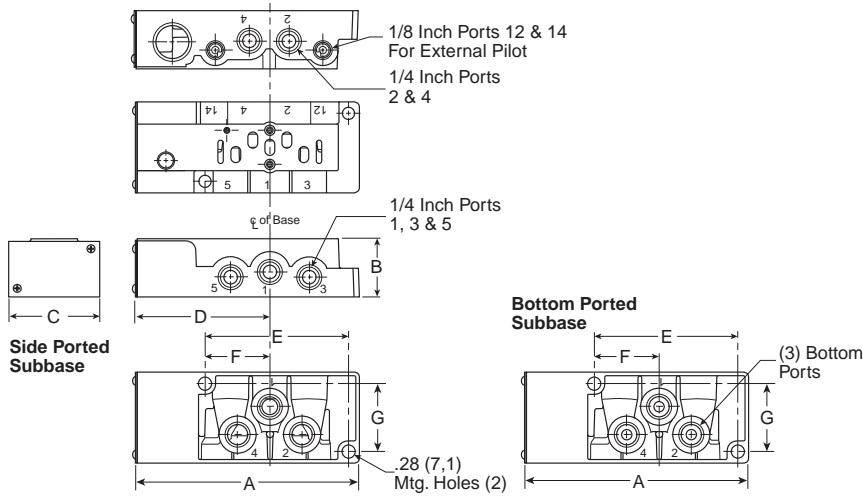
Inches (mm)

Isys ISO 5599-2 / 5599-1 Remote Pilot



Modulflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus
 DX ISOMAX Series
 Valvair II Series
D
 Subbase & Manifold Valve Products

Isys ISO 15407-2 & 15407-1 Size 26mm (HA), Plug-in Subbases

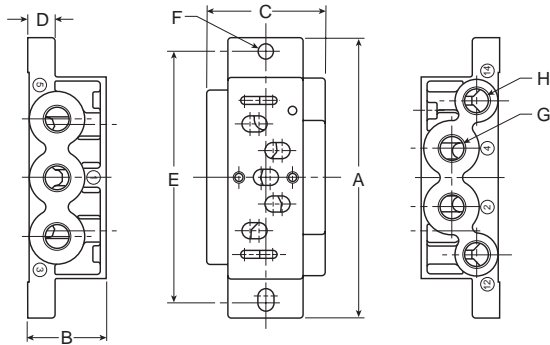


HA Dimensions

A	B	C	D
4.88 (124)	1.28 (32.5)	2.00 (50.8)	2.91 (74)
E	F	G	
1.43 (36.2)	3.16 (80.2)	1.49 (37.9)	

Inches (mm)

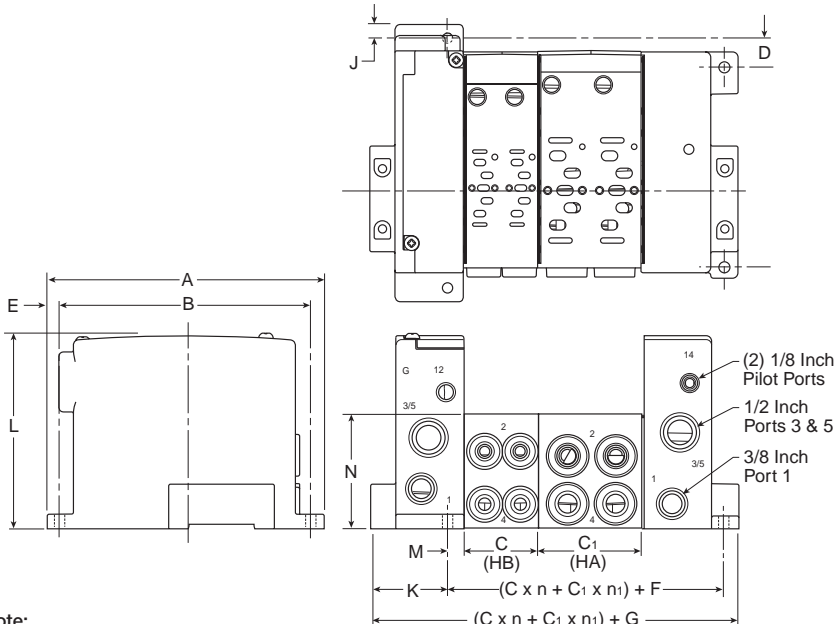
Isys ISO Size 18mm (HB) & 26mm (HA), Non-Plug-in Compact Subbase



Series	Part number	A	B	C	D	E	F	G	H
HB	PL02	3.15 (80)	.87 (22)	1.06 (27)	.31 (8)	2.76 (70)	.216 Dia. (Ø 5.5)	1/8	M5
HA	PL01	3.94 (100)	1.10 (28)	1.65 (42)	.39 (10)	3.54 (90)	.216 Dia. (Ø 5.5)	1/4	1/8

Inches (mm)

Isys ISO 15407-2 & 15407-1 Size 18mm (HB) & 26mm (HA), PS5611 & PS5511 Manifolds



HB & HA Dimensions

A	B	C	C ₁	D	E
5.98 (152)	5.39 (137)	1.61 (40.8)	2.24 (56.8)	.63 (16)	.30 (7.5)
F	G	H	J	K	L
2.14 (54.4)	4.12 (104.6)	4.32 (109.8)	.15 (4)	1.68 (42.7)	4.17 (106)
M	N				
.33 (8.4)	2.48 (63)				

Inches (mm)

Note:
 See Fieldbus Section for the dimensions of manifolds utilizing the Isysnet, Turck, or Moduflex end plate type.

n = Number of HB Bases C = HB Series
 n₁ = Number of HA Bases C₁ = HA Series



Moduflex Series

Isys Micro Series

Isys ISO Series

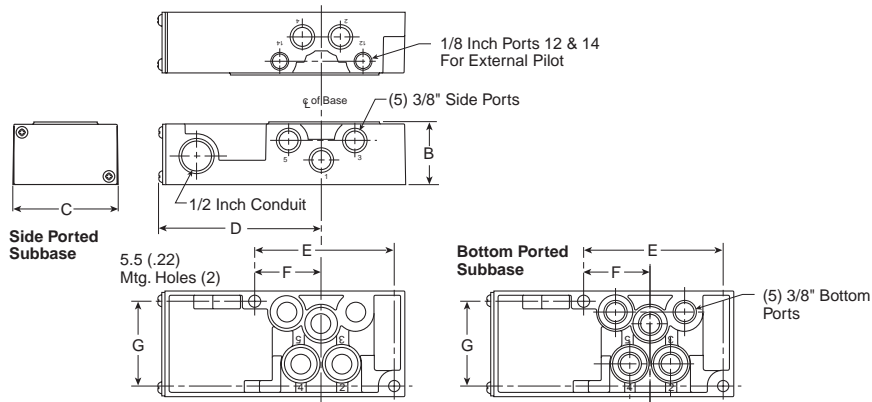
Fieldbus

DX ISOMAX Series

Valvair II Series

D
 Subbase & Manifold Valve Products

Isys ISO 5599-1 Size H1, PS4011 Subbase



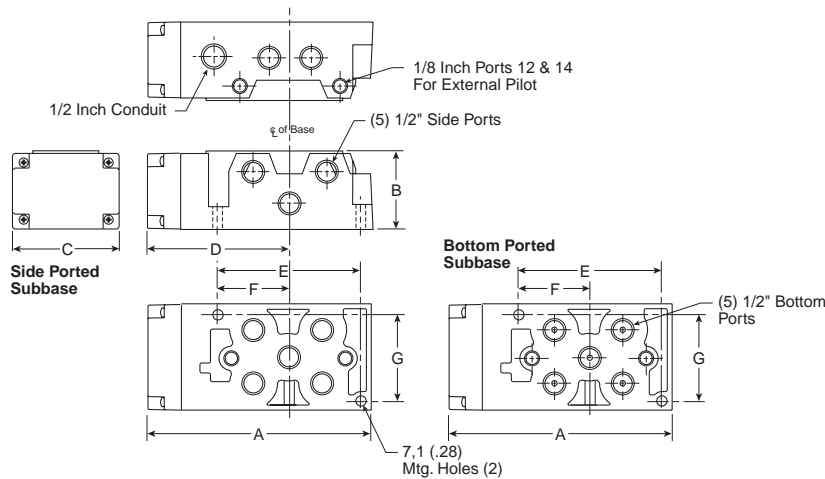
PS4011 Subbase Dimensions

A	B	C	D
5.83	1.48	2.50	3.86
(148)	(38)	(64)	(98)

E	F	G
3.29	1.57	2.00
(84)	(40)	(51)

Inches (mm)

Isys ISO 5599-1 Size H2, PS4111 Subbase



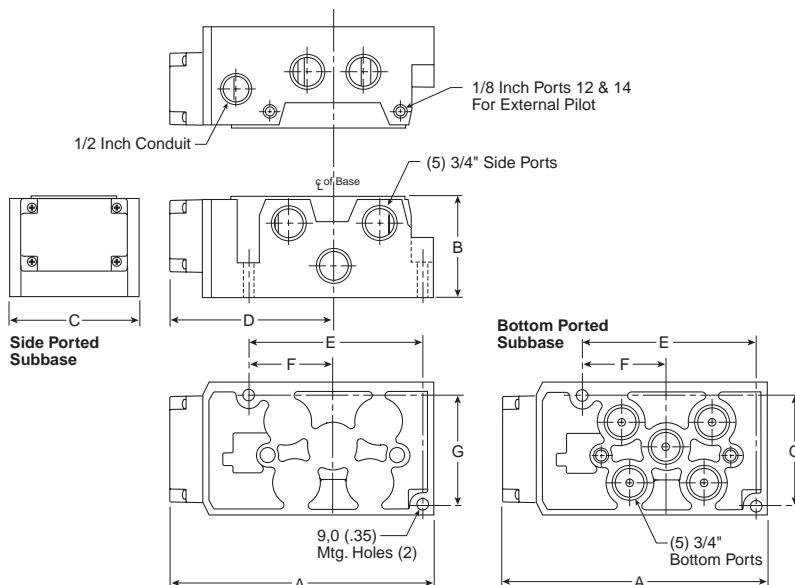
PS4111 Subbase Dimensions

A	B	C	D
6.69	2.33	3.15	4.25
(170)	(59)	(80)	(108)

E	F	G
4.21	2.07	2.56
(107)	(52)	(65)

Inches (mm)

Isys ISO 5599-1 Size H3, PS4211 Subbase



PS4211 Subbase Dimensions

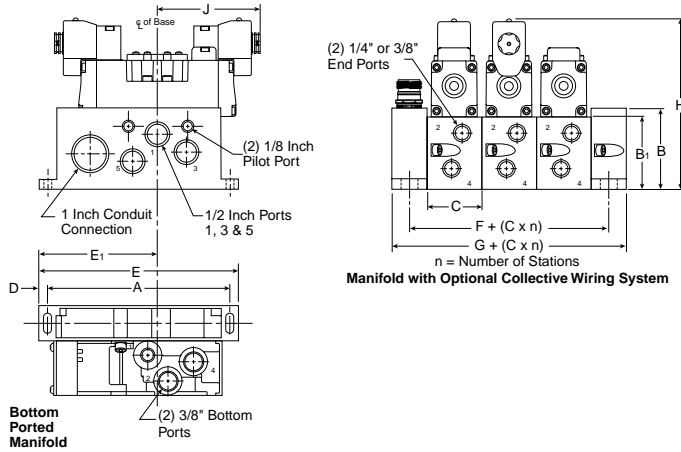
A	B	C	D
7.90	2.96	3.90	4.92
(201)	(75)	(99)	(125)

E	F	G
5.14	2.50	3.24
(131)	(64)	(82)

Inches (mm)

- Modulflex Series
- Isys Micro Series
- Isys ISO Series
- Fieldbus Series
- DX ISOMAX Series
- Valvair II Series
- D** Subbase & Manifold Valve Products

Isys ISO 5599 Size H1, PS4011 Manifold

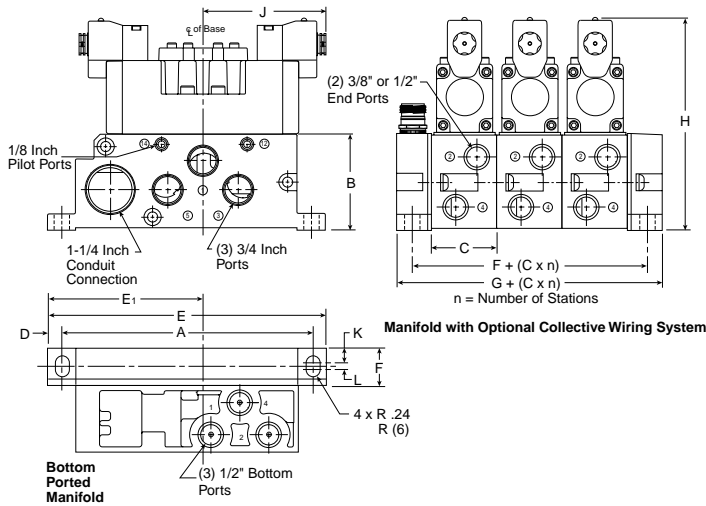


PS4011 Manifold Dimensions

A	B	B ₁	C	D
6.50 (165)	2.87 (73)	2.64 (67)	1.96 (50)	.33 (8)
E	E ₁	F	G	H
7.15 (182)	4.25 (108)	1.25 (32)	2.50 (63.5)	6.18 (157)
J	3.66 (93)			

Inches (mm)

Isys ISO 5599 Size H2, PS4111 Manifold

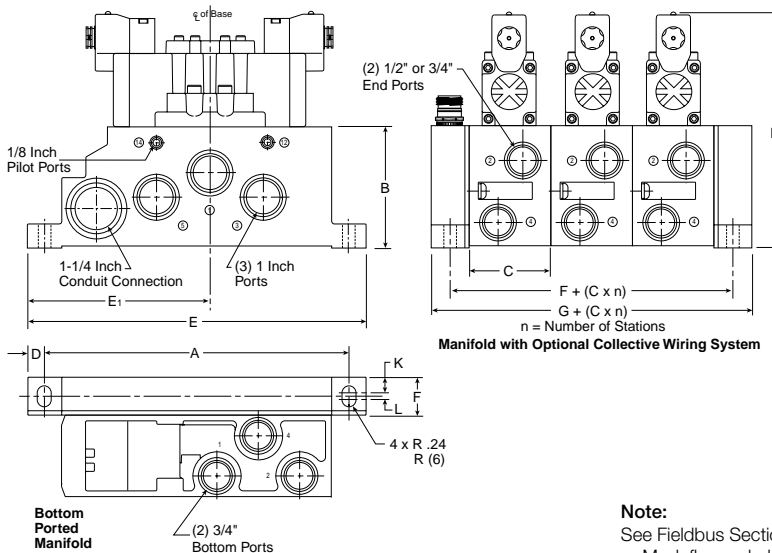


PS4111 Manifold Dimensions

A	B	C	D	E
8.46 (215)	3.35 (85)	2.20 (56)	.47 (12)	9.41 (239)
E ₁	F	G	H	J
5.28 (134)	1.26 (32)	2.60 (63)	7.40 (188)	4.17 (106)
K	L			
.65 (16.5)	.24 (6)			

Inches (mm)

Isys ISO 5599 Size H3, PS4211 Manifold



PS4211 Manifold Dimensions

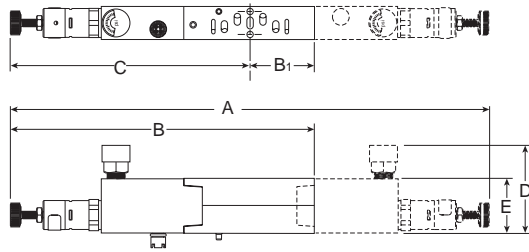
A	B	C	D	E
10.41 (265)	4.13 (105)	2.80 (71)	.59 (15)	11.61 (295)
E ₁	F	G	H	
6.26 (159)	1.30 (33)	2.60 (63)	8.19 (208)	
K	L			
.53 (13.5)	.24 (6)			

Inches (mm)

Note:

See Fieldbus Section for the dimensions of manifolds utilizing the Isysnet, Turck, or Modflex end plate type.

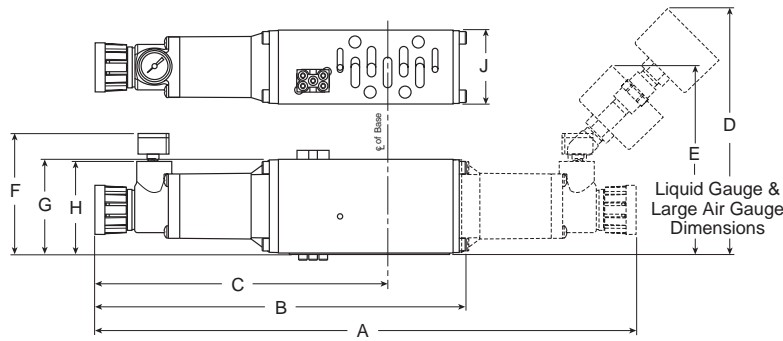
Isys ISO 15407 Sandwich Regulator



Series	Part number	A	B	B ₁	C	D	E
HB	PS5637	10.28 (261)	6.14 (156)	1.02 (26)	5.13 (130)	2.60 (66)	1.18 (30)
HA	PS5537	10.00 (254)	6.42 (163)	1.42 (36)	5.00 (127)	2.72 (69)	1.18 (30)

Inches (mm)

Isys ISO 5599, Size H1 Sandwich Regulator

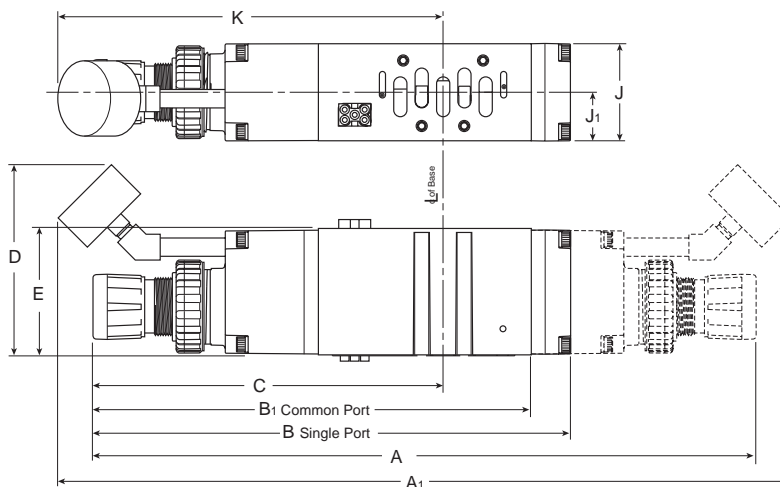


Series	Part number	A	B	C	D	E	F	G	H	J
H1	PS4037	11.84	8.13	6.40	5.45	4.25	2.85	2.09	2.05	1.63
	PS4038	(301)	(207)	(163)	(138)	(108)	(72)	(53)	(52)	(41)

Inches (mm)

Isys ISO 5599, Size H2 & H3 Sandwich Regulator

H2 Sandwich Regulator Shown

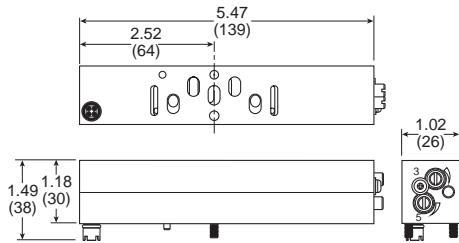


Series	Part number	A	A ₁	B	B ₁	C	D	E	J	J ₁	K
H2	PS4137	14.65	16.18	10.56	9.84	7.71	4.20	2.80	2.15	1.07	8.50
	PS4138	(372)	(411)	(268)	(250)	(196)	(107)	(71)	(55)	(27)	(216)
H3	PS4237	15.67	17.15	11.53	10.67	8.37	4.20	2.93	2.50	1.25	9.10
	PS4238	(398)	(436)	(293)	(271)	(213)	(107)	(75)	(64)	(32)	(231)

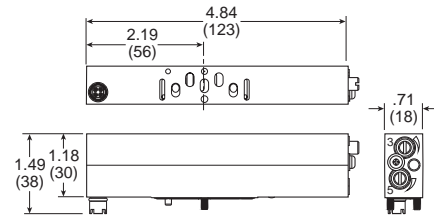
Inches (mm)

Isys ISO 15407, Size 18mm (HB) & 26mm (HA), Flow Control

HA Flow Control

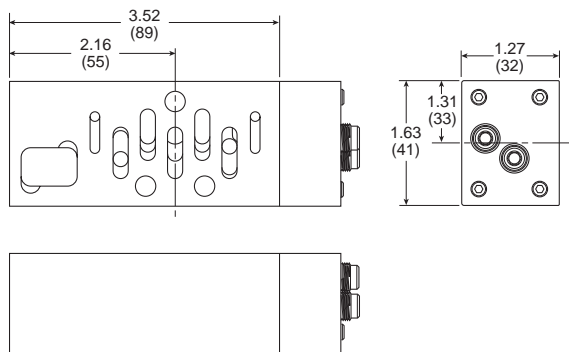


HB Flow Control

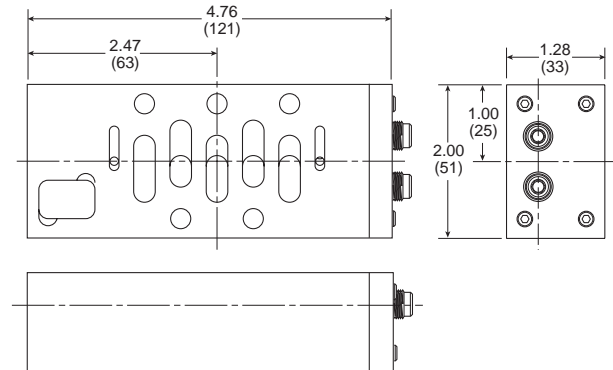


Isys ISO 5599, Size H1, H2 & H3, Flow Control

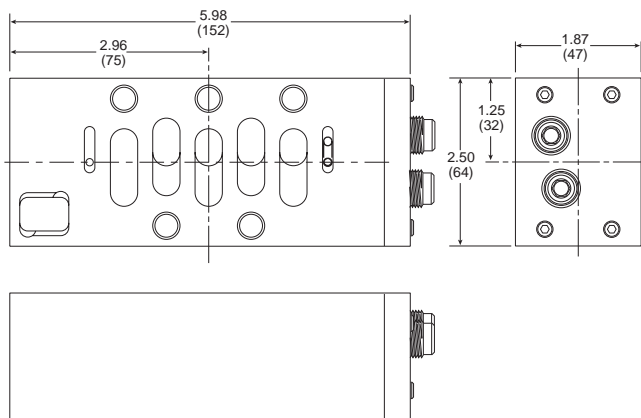
H1 Flow Control



H2 Flow Control



H3 Flow Control



Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

D

Subbase & Manifold Valve Products

Fieldbus Systems

Fieldbus Offering

Valve series	Moduflex	Isysnet	Turck
Moduflex	X		
Isys Micro	X	X	X
Isys ISO	X	X	X

Protocol	Moduflex	Isysnet	Turck
DeviceNet	X	X	X
Ethernet/IP		X	X
Profibus-DP	X	X	X
Profinet			X
Modbus/TCP			X
AS-i	X		
CANopen	X		X
Interbus-S	X		
ControlNet		X	

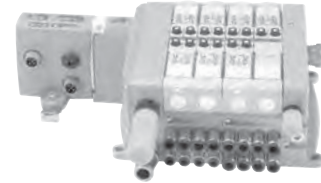
Options	Moduflex	Isysnet	Turck
Digital inputs / outputs*		X	X
Analog inputs / outputs		X	X
16 Solenoid control*	X		X
32 Solenoid control		X	X
Short circuit protection on inputs			X
Current sensing outputs			X
Bus expansion		X	
DeviceNet subnet			X
Programmable comm modules			X
Power over DeviceNet / CANopen			X
Preferred connectivity		X	
CANopen expansion			X

* Moduflex AS-i modules are available with 6 or 8 inputs and 6 or 8 solenoid outputs

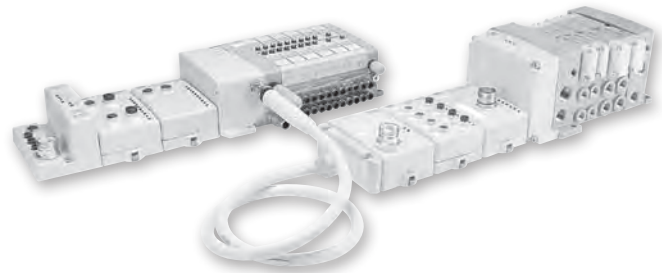
	Turck fieldbus	Isysnet	Moduflex
Solenoid control	Up to 32 solenoids on main valve manifold. DeviceNet Subnet Allows an additional 32 solenoids per node 63 nodes maximum. CANopen expansion Allows an additional 64 solenoids per expansion 5 expansions maximum.	Up to 32 solenoids on main valve manifold Isys Micro Bus Expansion Allows an additional 32 solenoids per expansion 3 expansions maximum 1 meter fixed cable length per expansion	Up to 16 solenoids on main valve manifold
I/O capabilities	256 maximum inputs and outputs directly connected to communication module. DeviceNet Subnet Allows an additional 256 I/O per node 63 nodes maximum Third party DeviceNet modules can be used CANopen expansion Allows an additional 64 I/O per expansion 5 expansions maximum Third party CANopen modules can be used	Maximum of 256 inputs and 256 outputs directly connected to the communication module, including Isys Micro Bus Expansion.	8 Inputs available on AS-i communication only.
Short circuit protection	SXG and diagnostic electronic modules have each point isolated. All other electronic modules are isolated from the backplane.	Devices must be fused between input / output and electronic module.	

 Most popular.

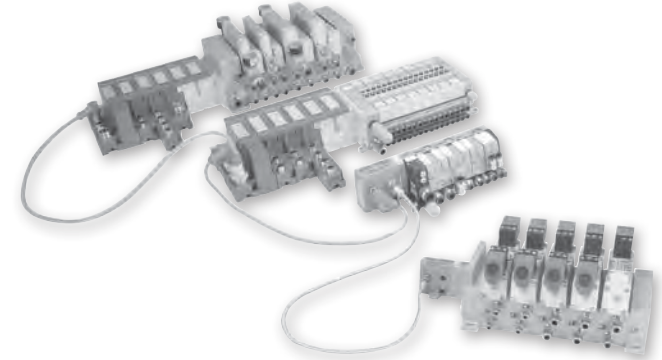
The Moduflex Fieldbus System



The Isysnet Fieldbus System



The Turck Fieldbus System

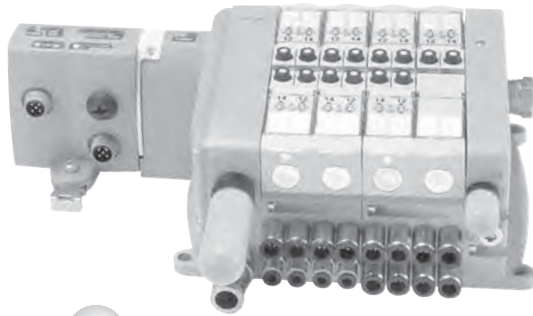


D

Subbase & Manifold
 Valve Products

The Moduflex Fieldbus System

Moduflex communication modules directly attach to the end plate. It offers a compact and low cost fieldbus solution.



CANopen

INTERBUS-S



P2M2HBVA10808A



P2M2HBVA10808B

Standard AS-i Protocol (up to 31 nodes)
Communication module for 8 solenoids max.
(2 nodes per module, 4 inputs, 4 solenoids per node)

Input / Output capability	Weight (oz)	Part number
0 inputs and 8 solenoid outputs	5.29	P2M2HBVA10800
8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	7.05	P2M2HBVA10808A
8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs	7.05	P2M2HBVA10808B

Moduflex Features

- Small, compact product design
- Broad protocol offering, including DeviceNet, Profibus, AS-i, CANopen, and Interbus
- Channel-level diagnostics (LED and Electronic)
- Inputs available with AS-i modules
- Horizontal and vertical mounting without derating
- 5g vibration
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- CE certification

Protocol	Part number
Profibus DP	P2M2HBVP21600
DeviceNet	P2M2HBVD21600
CANopen	P2M2HBVC21600
InterBus-S	P2M2HBVS11600

Fieldbus Accessories

	Protocol	Connector type	Part number
Power supply	Profibus DP / InterBus-S /	M12 type A female	P8CS1205AA
Field wireable connector	DeviceNet / CANopen		
Line termination resistor	Profibus DP	M12 type B	P8BPA00MB
	DeviceNet / CANopen	M12 type A	P8BPA00MA

AS-i Version 2.1 Protocol (up to 62 nodes)
Communication module for 6 solenoids max.
(2 nodes per module, 4 inputs, 3 solenoids per node)

Input / Output capability	Weight (oz)	Part number
0 inputs and 6 solenoid outputs	5.29	P2M2HBVA20600
8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs	7.05	P2M2HBVA20608A
8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	7.05	P2M2HBVA20608B

Moduflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

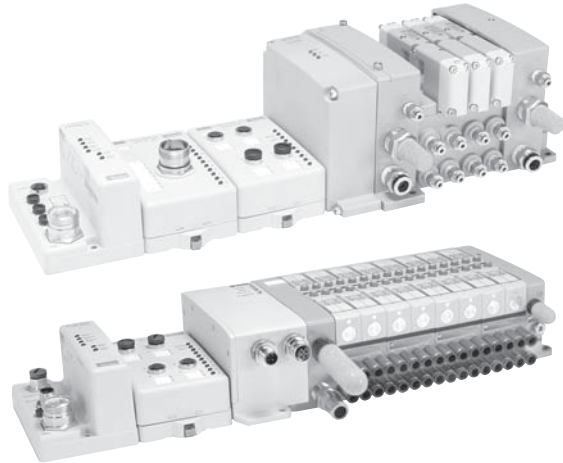
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Subbase & Manifold Valve Products

The Isysnet System

Isysnet has four major components:

- Valve driver module provide control for 32 solenoids on a manifold, with bus extension providing connectivity to 3 more manifolds
- I/O modules provide the field interface, system-interface circuitry, and bases for mounting
- Communication modules provide the network-interface circuitry
- Power distribution module provide 5 additional power inputs to the Isysnet system



Isysnet Features

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Channel-level diagnostics (LED)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Parameter-level explicit messaging
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, C-UL, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

D

Subbase & Manifold Valve Products

Communications Module



Protocol	Part number
DeviceNet™	PSSCDM18PA (7/8" Mini) or PSSCDM12A (M12)
ControlNet™	PSSCCNA
EtherNet I/P™	PSSCENA
Profibus-DP®	PSSCPBA

PSSCENA

All Modules IP67 Certified
 EDS and GSD files located at www.parker.com/pneu/Isysnet

Digital Inputs






PSSN16M12A



PSSN8M8A


I/O modules	Voltage	Part number
16 digital inputs M12, 5-pin used with PNP sourcing input device	10 to 28.8VDC	PSSN16M12A
8 digital inputs M12, 5-pin used with PNP sourcing input device	10 to 28.8VDC	PSSN8M12A
8 digital inputs M12, 5-pin used with NPN sinking input device	10 to 28.8VDC	PSSP8M12A
8 digital inputs M8, 3-pin used with PNP sourcing input device	10 to 28.8VDC	PSSN8M8A
8 digital inputs M23, 12-pin used with PNP sourcing input device	10 to 28.8VDC	PSSN8M23A

Digital Outputs

	I/O modules	Voltage	Part number
 PSST16D25A	16 digital outputs M23, 19-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST16M23A
	16 digital outputs D-sub, 25-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST16D25A
 PSST16M12A	16 digital outputs M12, 5-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST16M12A
	8 digital outputs M12, 5-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST8M12A
 PSST8M12A	8 digital outputs M8, 3-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST8M8A
	4 digital output, high watt relay M12, 5-pin used with PNP sourcing outputs (2 Amp)	24VDC	PSSTR4M12A
	8 digital outputs M23, 12-pin used with PNP sourcing outputs	10 to 28.8VDC	PSST8M23A


All modules IP67 certified
 See www.parker.com/pneu/Isysnet

Analog Inputs

	I/O modules	Voltage	Part number
 PSSNACM12A	2 Analog inputs voltage M12, 5-pin	-10 to 10VDC or 0 to 10VDC	PSSNAVM12A
	2 Analog inputs current M12, 5-pin	4 to 20mA or 0 to 20mA	PSSNACM12A


All modules IP67 certified
 See www.parker.com/pneu/Isysnet

Analog Outputs

	I/O modules	Voltage	Part number
 PSSTACM12A	2 Analog outputs voltage M12, 5-pin	0 to 10V ± 10V	PSSTAVM12A
	2 Analog outputs current M12, 5-pin	4 to 20mA or 0 to 20mA	PSSTACM12A


All modules IP67 certified
 See www.parker.com/pneu/Isysnet

Terminating Base Module

	Base module	Part number
	Termination base for stand alone units	PSSTERM

Used as the last terminating module for a stand alone isysnet assembly.

Power Extender Module

	Extender module	Part number
	24VDC field power module	PSSSE24A

A Power Extender Module must be used on every 14th Module in an Isysnet assembly. See www.parker.com/pneu/Isysnet

Modulflex
Series

Isys Micro
Series

Isys ISO
Series

Fieldbus


DX ISOMAX
Series

Valvair II
Series

D

Subbase & Manifold
Valve Products


Bus Extender Cable

	Description	Voltage	Part number
	1 Meter Cable*	24VDC	PSSEXT1
	3 Meter Cable*	24VDC	PSSEXT3

* Requires a PSSSE24 Power Extender Module
 IP67 certified
 See www.parker.com/pneu/Isysnet

Modulflex
Series

Isys Micro Bus Extender Cable

	Description	Voltage	Part number
	1 Meter Cable*	24VDC	PSSVEXT1

* IP67 certified.

Isys Micro
Series

Isys ISO
Series

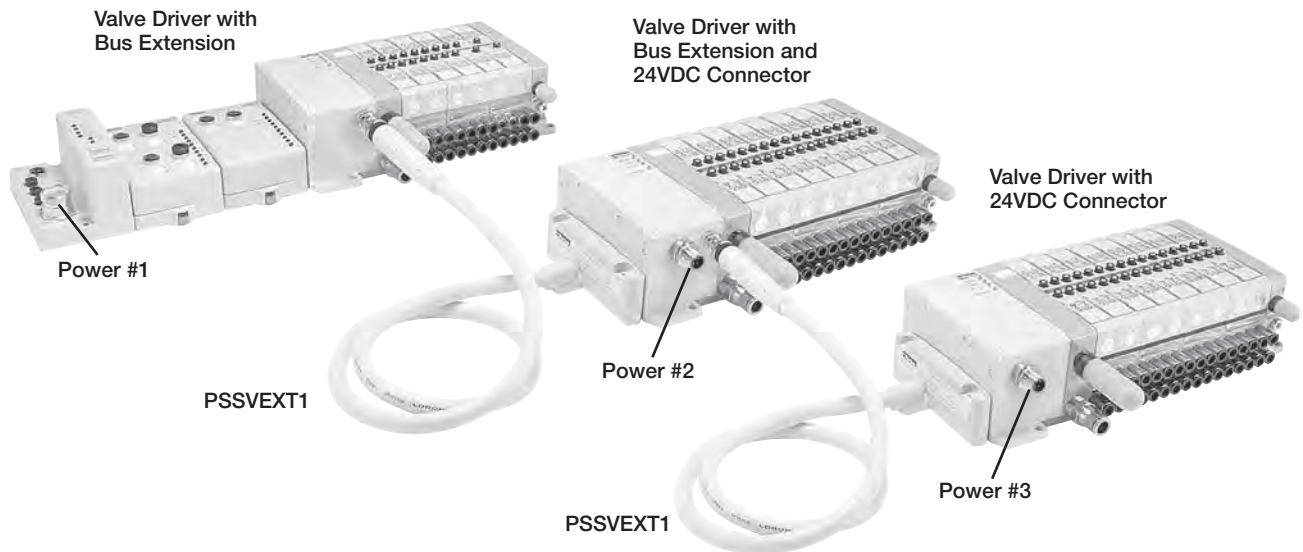
Example

Isys Micro with Bus Extension on Valve Driver Module – No additional I/O at the Extension

- Add up to three additional valve manifolds without adding another communication module.
- No PSSSE24A is needed on the Extension when the Valve Driver Module with 24VDC Connector is used.
- Commonly used when many valves are required.
- Bus expansion only available with Isys Micro valves.

DXISOMAX
Series

Valvair II
Series



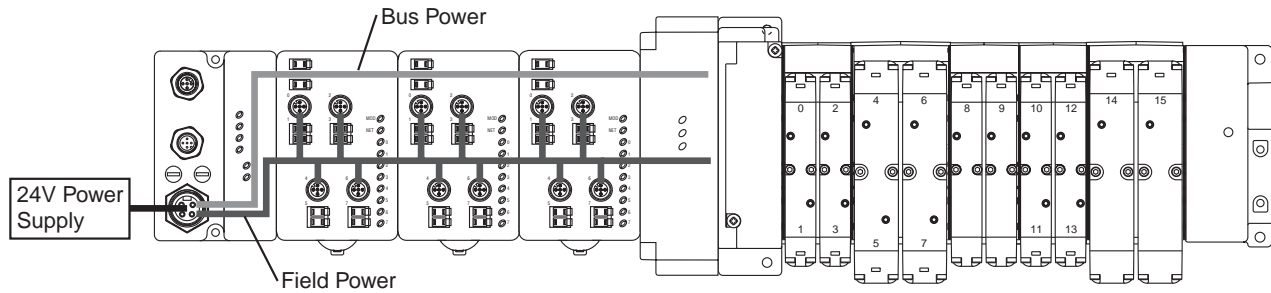
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Subbase & Manifold
Valve Products

Power Distribution Options for Isys ISO

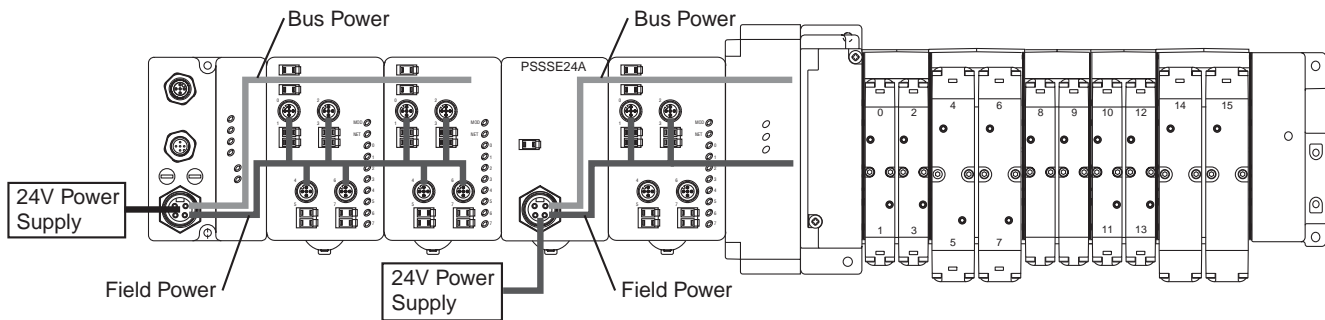
Isysnet Communication and I/O Modules

An auxiliary 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 I/O modules with a maximum of 10 A field power, using the auxiliary power.



Isysnet System with 24VDC Expansion Power Unit (PSSSE24A)

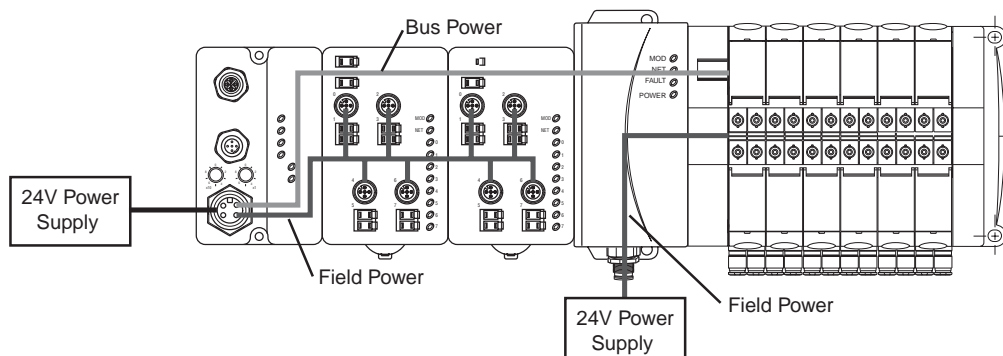
The auxiliary power from the communication module supports up to 13 I/O modules with a maximum of 10 A field power. The 24VDC Power Extender Module (PSSSE24A) extends the backplane bus power and I/O Module field power to support up to 13 more I/O modules. Connect additional Power Extender Modules to expand the I/O assembly up to the maximum of 63 I/O modules. This secondary 24VDC connector on the PSSSE24A can be wired into an Emergency Stop circuit.



Additional Power Distribution Options for Isys Micro

Isysnet Communication Module and Valve Driver Module with 24VDC Connector

The 24VDC power supply from the Communication Adaptor provides power to the backplane bus power and I/O module field power for up to 13 modules and an adapter with a maximum of 10 A Field Power. In this configuration, backplane bus power and I/O module field power are supplied to the input and output modules. The communication module only supplies backplane bus power to the Valve Driver Module, as the Isys Micro with 24VDC Connector separates the field power from the rest of the network. This secondary 24VDC Connector on the Valve Driver Module supplies Field Power to the valves, and can be wired into an Emergency Stop Circuit.

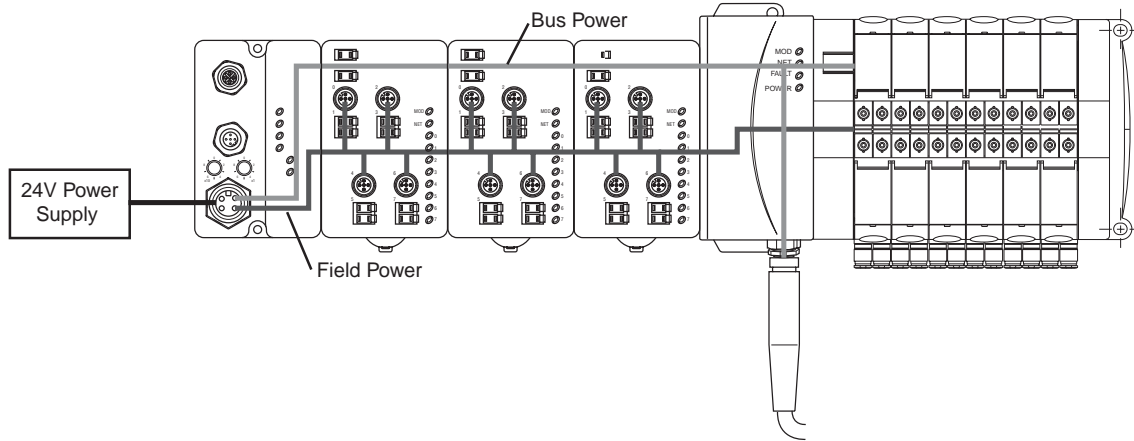


Modulflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
Subbase & Manifold Valve Products

Power Distribution Options for Isys Micro (Continued)

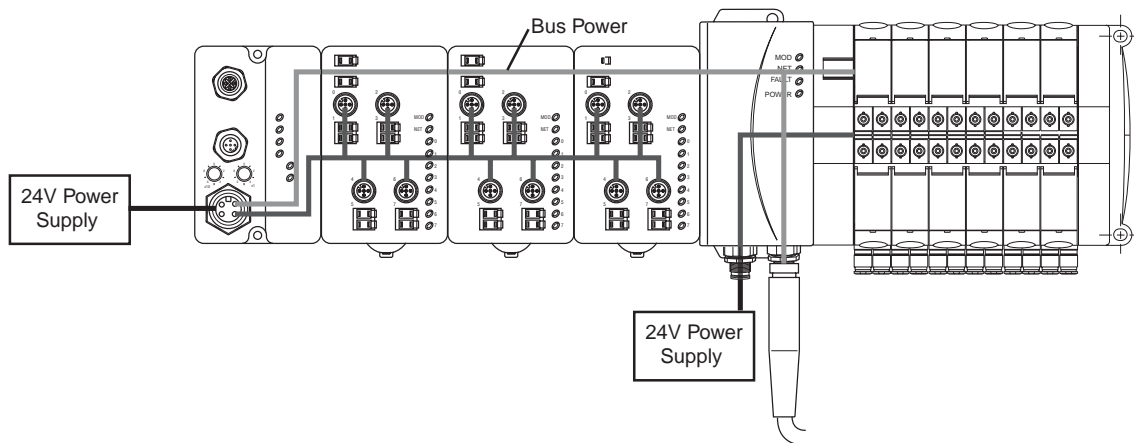
Isysnet Communication Module with Bus Extension Connector and I/O Modules

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 modules and an adapter with a maximum of 10 A field power, using this power source. The Isys Micro with Bus Extension Connector carries backplane bus power and communication down to another Isysnet Assembly through the PSSVEXT1 cable. If additional Isysnet Input and Output Modules or Isys ISO valve manifold is used on this extension, a PSSSE24A Power Extender Module is required to provide Field Power. If the extension is attached directly to an Isys Micro Manifold, Field Power can be supplied directly by using the 24VDC Connector option.



Isysnet Communication Module with 24VDC and Bus Extension Connectors and I/O Modules

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. In this configuration, bus power and field power are supplied to the input and output modules. The communication module only supplies bus power to the Valve Driver Module, as the 24VDC Connector separates the Field Power from the rest of the network. This secondary 24VDC connector on the Valve Driver Module supplies field power to the valves, and can be wired into an Emergency Stop Circuit. The Bus Extension Connector carries bus power and communication down to another Isysnet Assembly through the PSSVEXT1 cable. If additional Isysnet input and output modules or Isys ISO valve manifold is used on this extension, a PSSSE24A Power Extender Module is required to provide field power. If the extension is attached directly to an Isys Micro Manifold with 24VDC Connector, field power can be supplied directly by using the 24VDC Connector option.

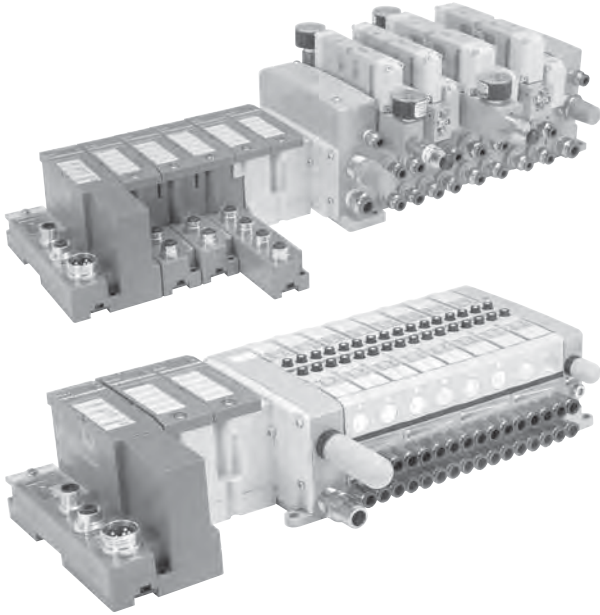


Modulflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products

The Turck Fieldbus System

Isysnet has four major components:

- **Valve driver module** provide control for either 16 or 32 solenoids on a manifold
- **I/O modules** provide the field interface and system-interface circuitry
- **Communication modules** provide the network-interface circuitry
- **Power distribution module** provide 5 additional power inputs to the Turck system



Turck Features

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Channel-level diagnostics (LED and electronic)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Channel-level short-circuit detection with electronic feedback
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, C-UL, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits

Communication Modules

CANopen	BL67-GW-CO
CANopen with power over network	BL67-GW-CO-T
DeviceNet with power over network	BL67-GW-DN
Profibus DP	BL67-GW-DPV1
Multiprotocol communication module (Ethernet / IP, Profinet, Modbus / TCP)	BL67-GW-EN
Ethernet / IP communication module	BL67-GW-EN-IP
Profinet communication module	BL67-GW-EN-PN
Modbus / TCP communication module with DeviceNet subnet	BL67-GW-EN-DN
Ethernet / IP communication module with DeviceNet subnet	BL67-GW-EN-IP-DN

Programmable Communication Modules

Profibus DP	BL67-PG-DP
Modbus / TCP communication module	BL67-PG-EN
Ethernet / IP communication module	BL67-PG-EN-IP
Modbus / TCP communication module with DeviceNet subnet	BL67-PG-EN-DN
Ethernet / IP communication module with DeviceNet subnet	BL67-PG-EN-IP-DN

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Digital Input Modules

I/O modules	Voltage	Part number
 8 PNP input module	7 to 30 VDC	BL67-8DI-P
8 PNP input module, with diagnostics	7 to 30 VDC	BL67-8DI-PD
8 NPN input module	24 VDC	BL67-8DI-N


Base module	Part number
 8 x M8, 3 pole, female	BL67-B-8M8


 4 x M12, 5 pole, female, A-code	BL67-B-4M12
---	--------------------


 4 x M12, 5 pole, female, A-code	BL67-B-4M12-P
---	----------------------


 1 x M23, 12 pole, female	BL67-B-1M23
--	--------------------

I/O modules	Voltage	Part number
4 PNP input module	7 to 30 VDC	BL67-4DI-P
4 PNP input module, with diagnostics	7 to 30 VDC	BL67-4DI-PD
4 NPN input module	24 VDC	BL67-4DI-N

Base module	Part number
 4 x M8, 3 pole, female	BL67-B-4M8


 2 x M12, 5 pole, female, A-code	BL67-B-2M12
---	--------------------


 2 x M12, 5 pole, female, A-code	BL67-B-2M12-P
---	----------------------


 4 x M12, 5 pole, female, A-code	BL67-B-4M12
---	--------------------


 1 x M23, 12 pole, female	BL67-B-1M23
--	--------------------


Digital Output Modules

I/O modules	Output current	Part number
 8 PNP output module	0.5 amps per channel	BL67-8DO-0.5A-P
8 NPN output module	0.5 amps per channel	BL67-8DO-0.5A-N


Base module	Part number
 8 x M8, 3 pole, female	BL67-B-8M8


 4 x M12, 5 pole, female, A-code	BL67-B-4M12
---	--------------------


 4 x M12, 5 pole, female, A-code	BL67-B-4M12-P
---	----------------------


 1 x M23, 12 pole, female	BL67-B-1M23
--	--------------------


I/O modules	Output Current	Part number
4 PNP output module	0.5 amps per channel	BL67-4DO-0.5A-P
4 PNP output module	2 amps per channel	BL67-4DO-2A-P
4 PNP output module	4 amps per channel	BL67-4DO-4A-P
4 NPN output module	2 amps per channel	BL67-4DO-2A-N

Base module	Part number
 4 x M8, 3 pole, female	BL67-B-4M8

 2 x M12, 5 pole, female, A-code	BL67-B-2M12
---	--------------------

 2 x M12, 5 pole, female, A-code	BL67-B-2M12-P
---	----------------------

 4 x M12, 5 pole, female, A-code	BL67-B-4M12
---	--------------------

 1 x M23, 12 pole, female	BL67-B-1M23
--	--------------------

Modulflex Series

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Digital Output Modules

I/O modules	Output current	Part number
16 PNP output module	0.14 amps per channel	BL67-16DO-0.1A-P

Base module	Part number
 1 x M23, 19 pole, female	BL67-B-1M23-19


Relay Output Modules

I/O modules	Output current	Part number
8 normally open relays	0.14 amps per channel	BL67-8DO-R-NO


Base module	Part number
 4 x M12, 5 pole, female, A-code	BL67-B-4M12-P

Analog Input Modules

I/O modules	Input type	Part number
4 configurable current or voltage analog input module	4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC	BL67-4AI-V/I

Base module	Part number
 4 x M12, 5 pole, female, A-code	BL67-B-4M12


I/O modules	Input type	Part number
2 Current analog input module	4 to 20 mA or 0 to 20 mA	BL67-2AI-I
2 Voltage analog input module	-10 to +10 VDC or 0 to +10 VDC	BL67-2AI-V
2 Temperature analog input module	PT100, PT200, PT500, PT1000, Ni100, Ni1000	BL67-2AI-PT
2 Temperature analog input module	Type B, E, J, K, N, R, S, T	BL67-2AI-TC


Base module	Part number
 2 x M12, 5 pole, female, A-code	BL67-B-2M12

Combination Input / Output Modules

I/O modules	Input voltage & output current	Part number
4 PNP output 4 PNP input module, with diagnostics	7 to 30 VDC 0.5 Amps	BL67-4DI4DO-PD
8 PNP configurable input or output module, with diagnostics	7 to 30 VDC 0.5 Amps	BL67-8XSG-PD


Base module	Part number
 8 x M8, 3 pole, female	BL67-B-8M8

 4 x M12, 5 pole, female, A-code	BL67-B-4M12
---	--------------------


 4 x M12, 5 pole, female, A-code	BL67-B-4M12P
---	---------------------

Analog Output Modules

I/O modules	Input type	Part number
4 Voltage analog output module	-10 to +10 VDC or 0 to +10 VDC	BL67-4AO-V

Base module	Part number
 4 x M12, 5 pole, female, A-code	BL67-B-4M12

I/O modules	Input type	Part number
2 Current analog output module	4 to 20 mA or 0 to 20 mA	BL67-2AO-I
2 Voltage analog output module	-10 to +10 VDC or 0 to +10 VDC	BL67-2AO-V

Base module	Part number
 2 x M12, 5 pole, female, A-code	BL67-B-2M12

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Combination Analog Input / Output Modules

I/O modules	Output current	Part number
4 configurable input and 4 configurable output current or voltage analog module	4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC	BL67-4AI4AO-V/I

Base module	Part number
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8 x M8, 3 pole, female

BL67-B-8M8



4 x M12, 5 pole, female, A-code

BL67-B-4M12

CANopen Subnet Module

Extender module	Capacity	Part number
1 CANopen connection	64 bits of inputs or outputs	BL67-1CVI

Base module	Part number
-------------	-------------



1 x M12, 5 pole, female, A-code

BL67-B-1M12

Power Extender Module

Extender module	Current capacity	Part number
24 VDC field power module	10 amps input	BL67-PF-24VDC

Base module	Part number
-------------	-------------



5 Pole mini connector to supply bus power and field power

BL67-B-1RSM



5 Pole mini connector to field power only

BL67-B-1RSM-VO



4 Pole mini connector to supply bus power and field power

BL67-B-1RSM-4

I/O modules	Output current	Part number
2 configurable input and 2 configurable output current or voltage analog module	4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC	BL67-2AI2AO-V/I

Base module	Part number
-------------	-------------



8 x M8, 3 pole, female

BL67-B-8M8

Serial Interface Module

Extender module	Capacity	Part number
1 RS232 serial interface	300 to 115200 bps	BL67-1RS232
1 RS485 or 422 serial interface	300 to 115200 bps	BL67-1RS485/422

Base module	Part number
-------------	-------------



1 x M12, 5 pole, female, A-code

BL67-B-1M12



1 x M12, 8 pole, female, A-code

BL67-B-1M12-8



1 x M23, 12 pole, female

BL67-B-1M23

SSI and Counting Modules

Extender module	Capacity	Part number
1 SSI sensor interface	65 kbps up to 1 Mbps	BL67-1SSI
1 counter interface	Up to 250 kHz	BL67-1CNT/ENC

Base module	Part number
-------------	-------------



1 x M12, 8 pole, female, A-code

BL67-B-1M12-8



1 x M23, 12 pole, female

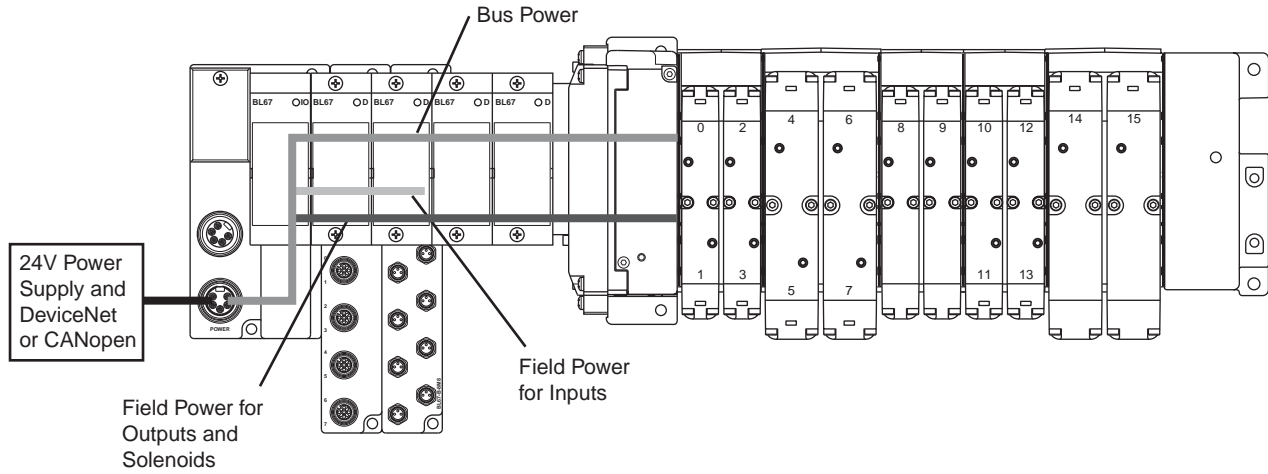
BL67-B-1M23

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Power Distribution Options for Turck Fieldbus

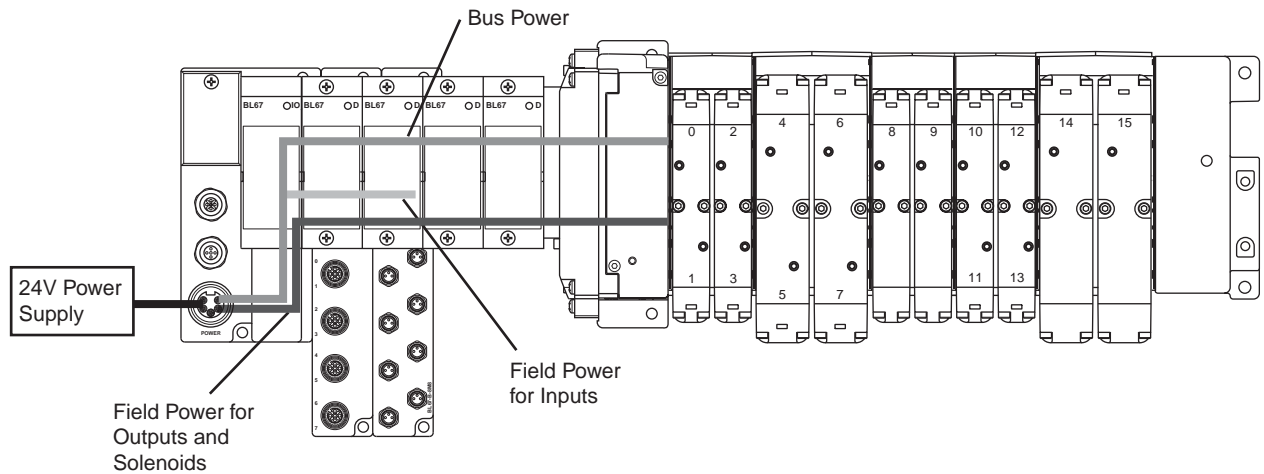
Turck Communication and I/O Modules - DeviceNet and CANopen, Power over Network

The 24VDC power supply pins from the DeviceNet or CANopen network connection on the communication module provides a single power circuit. This circuit provides 1.5 A bus power, 4 A field power for inputs and 8A field power for outputs.



Turck Communication and I/O Modules - Ethernet/IP, Modbus/TCP, Profinet, Profibus, and CANopen

An auxiliary 24VDC power supply from the communication module provides power across two separate circuits. The first circuit provides 1.5 A bus power and 4 A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs.

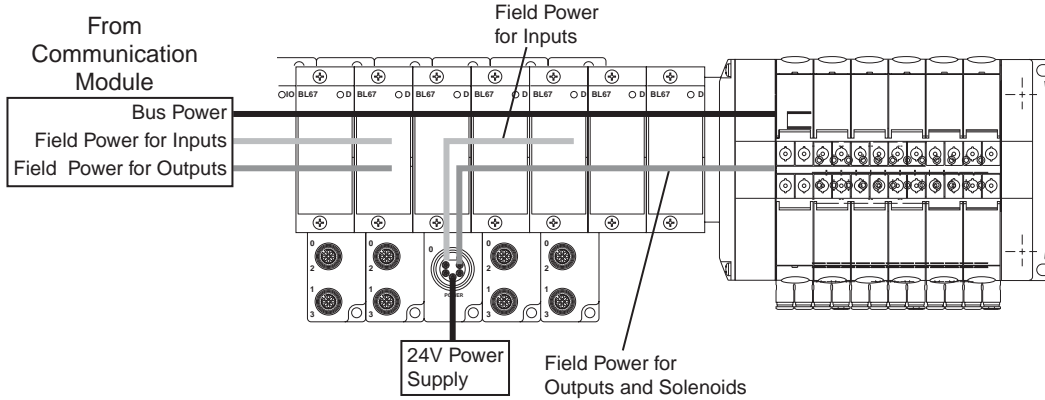


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Isys ISO Series
Fieldbus
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Valvair II Series
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Power Distribution Options for Turck Fieldbus

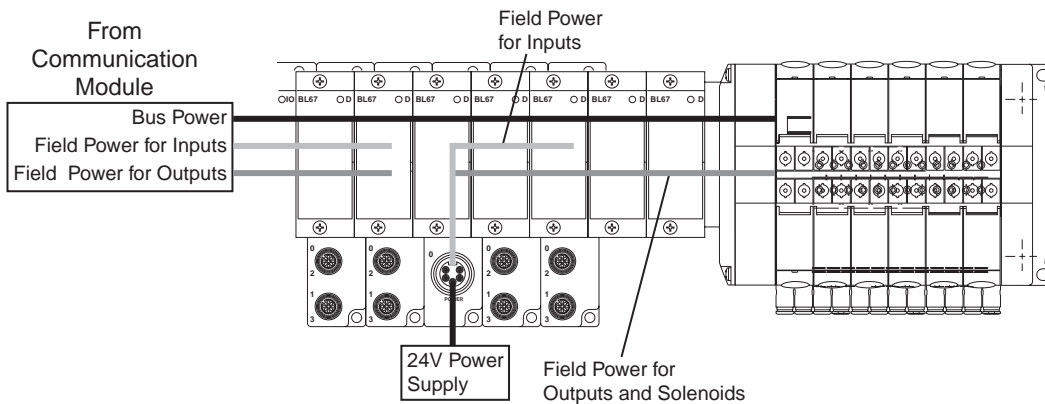
24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM

This configuration creates an auxiliary 24VDC power supply and provides power across two separate circuits, regardless of the communication module used. The first circuit provides 4 A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5 A bus power is uninterrupted, and is still supplied from the communication module.



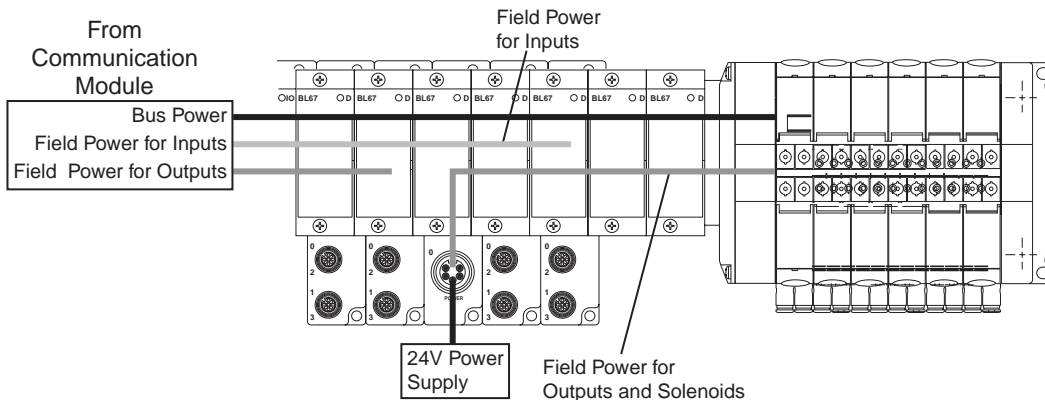
24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-4

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 4 A field power for inputs and 10A field power for outputs. The 1.5 A bus power is uninterrupted, and is still supplied from the communication module.



24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-VO

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5 A bus power and 4 A field power for inputs are uninterrupted, and are still supplied from the communication module.



Modulflex Series
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Fieldbus
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Valvair II Series
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Subbase & Manifold Valve Products

7/8" Mini Power Cables

Description	Part number
4 pin female to flying lead cable, TPE	RKM 46-xM/S1587
5 pin female to flying lead cable, TPE	RKM 56-xM/S1587
4 pin male to female cable, TPE	RSM RKM 46-x/S1587
5 pin male to female cable, TPE	RSM RKM 56-x/S1587
4 pin right angle female to flying lead cable, TPE	WKM 46-xM/S1587
5 pin right angle female to flying lead cable, TPE	WKM 56-xM/S1587

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

Power Tee

Description	Part number
4 pin Male to 2 female sockets	RSM-2RKM 40
5 pin Male to 2 female sockets	RSM-2RKM 50

M12 A-code Cables

Description	Part number
4 pin female to flying lead cable, PVC	RKC 4.4T-*
4 pin male to flying lead cable, PVC	RSC 4.4T-*
4 pin male to female cable, PVC	RKC 4.4T-*/RSC 4.4T
5 pin female to flying lead cable, TPE	RKC 4.5T-*/S1587
5 pin male to flying lead cable, TPE	RSC 4.5T-*/S1587
5 pin male to female cable, TPE	RKC 4.5T-*/RSC 4.5T/S1587

Where * = 1, 2, 3, 4 meter standard lengths

M8 Cables

Description	Part number
3 pin female to flying lead cable, PUR	PKG 3M-*/M/S90
3 pin male to flying lead cable, PUR	PSG 3M-*/M/S90
3 pin male to female cable, PUR	PKG 3M-*/M-PSG 3M/S90

Where * = 1, 2, 3, 4 meter standard lengths

M23 Cables

Description	Part number
12 pin, double ended female thread with male pins and female socket, PUR. Pinout optimized for isysnet fieldbus.	CSCM CKCM 12-11-x/S90
19 pin, double ended female thread with male pins and female socket, PUR. Pinout optimized for isysnet fieldbus.	CSM CKM 19-19-x/S90
19 pin, 90° double ended female thread with male pins and female socket, PUR. Pinout optimized for turck fieldbus.	CSWM CKWM 19-19-x/CS12852

Where x = 1, 2, 3, 4 meter standard lengths

Profibus Cables

Description	Part number
M12 Male to M12 Female, PUR	RSSW RKSX 455-xM

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

M12 A-code Cables

Description	Part number
4 pin female to flying lead cable, PVC	RKC 4.4T-*
4 pin male to flying lead cable, PVC	RSC 4.4T-*
4 pin male to female cable, PVC	RKC 4.4T-*/RSC 4.4T
5 pin female to flying lead cable, TPE	RKC 4.5T-*/S1587
5 pin male to flying lead cable, TPE	RSC 4.5T-*/S1587
5 pin male to female cable, TPE	RKC 4.5T-*/RSC 4.5T/S1587

Where * = 1, 2, 3, 4 meter standard lengths

Profibus Terminating Resistor

Description	Part number
M12 male pin terminating resistor	P8BPA00MB

Ethernet Cables

Description	Part number
M12 female to M12 male, PUR	RSSD RKSD 443-xM
RJ45 to M12 male, PUR	RSSD RJ45S 443-xM

Where x = 2, 5, 10, 15, 20, 30 meter standard lengths

DeviceNet and CANopen Cables

Description	Part number
7/8" mini male to 7/8" mini female, PUR	RSM RKM 5711-xM
7/8" mini male to M12 female, PUR	RSM RKC 5711-xM
M12 male to M12 female, PUR	RSC RKC 5711-xM
M12 male to 7/8" mini female, PUR	RSC RKM 5711-xM

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

Bus Power Tee

Description	Part number
Bus power tee	RSM RKM 57 WSM 40 PST

For systems not equipped with Power over network, combines separate network and power feeds into the communication module. Includes reverse current protection

DeviceNet and CANopen Terminating Resistor

Description	Part number
7/8" Mini Male Pin Terminating Resistor	RSM 57-TR2
M12 Male Pin Terminating Resistor	P8BPA00MA



Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

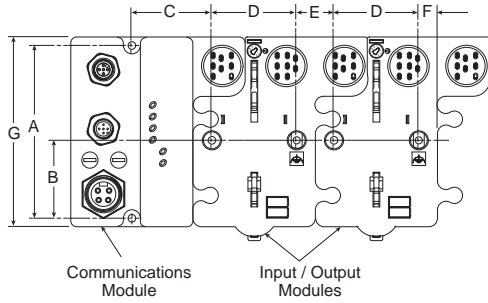
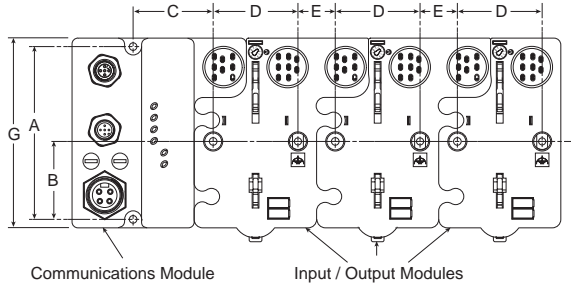
DX ISOMAX Series

Valvair II Series

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Subbase & Manifold Valve Products

Isysnet with Isys ISO Valves



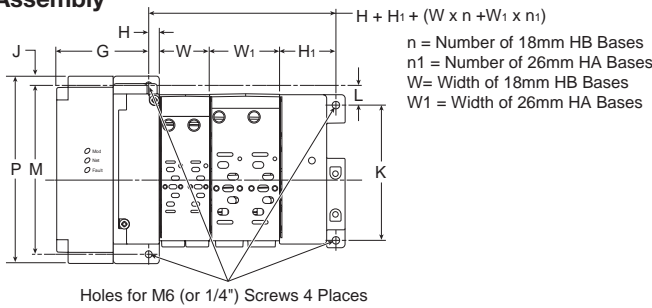
Dimensions

A	B	C	D
4.00 (102)	1.80 (46)	1.90 (48)	2.00 (50)

E	F	G
.87 (22)	.43 (11)	4.41 (112)

Inches (mm)

HB - HA Manifold Assembly



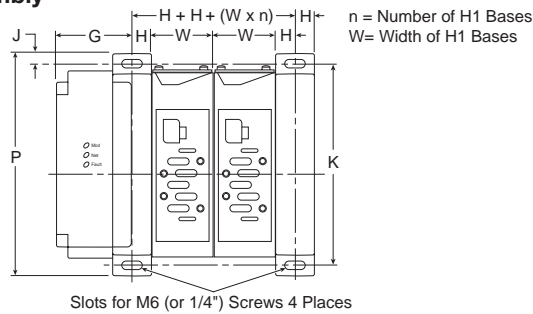
HB - HA Dimensions

G	H	H ₁	J	K
2.68 (68)	.33 (8.4)	1.80 (45.8)	.15 (4)	4.32 (110)

L	M	P	W	W ₁
.63 (16)	5.39 (137)	5.98 (152)	1.61 (40.8)	2.24 (56.8)

Inches (mm)

H1 Manifold Assembly



H1 Dimensions

G	H	J	K	P
2.20 (56)	.63 (15.9)	.33 (8.5)	6.50 (165)	7.17 (182)

W
1.93 (49)

Inches (mm)

H2 Dimensions

G	H	J	K	P
2.34 (59.5)	.65 (16.5)	.47 (12)	8.46 (215)	9.41 (239)

W
2.20 (56)

Inches (mm)

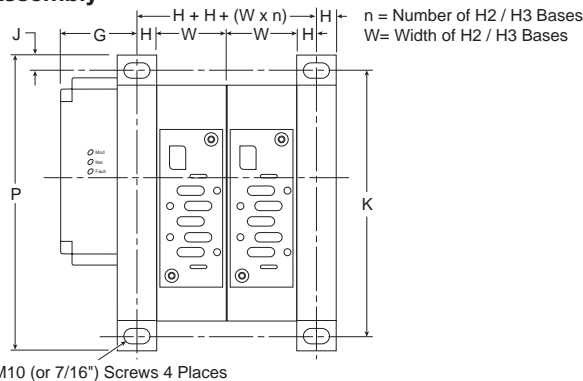
H3 Dimensions

G	H	J	K	P
2.34 (59.5)	.65 (16.5)	.59 (15)	10.43 (265)	11.61 (295)

W
2.80 (71)

Inches (mm)

H2 - H3 Manifold Assembly



Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

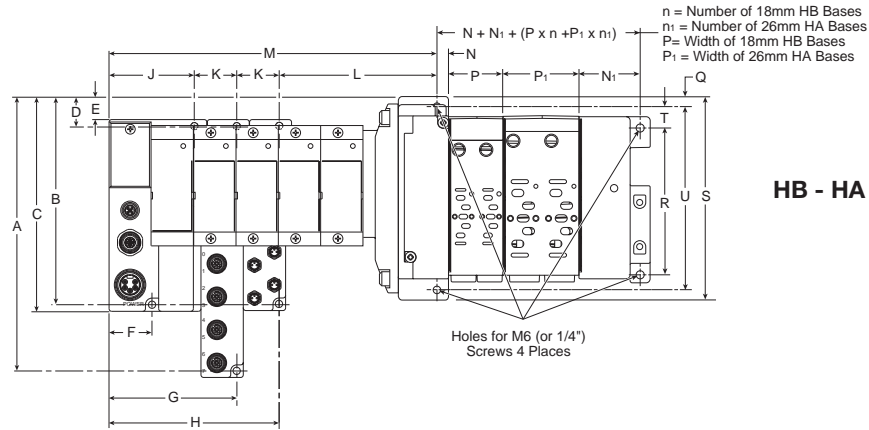
DX ISOMAX Series

Valvair II Series

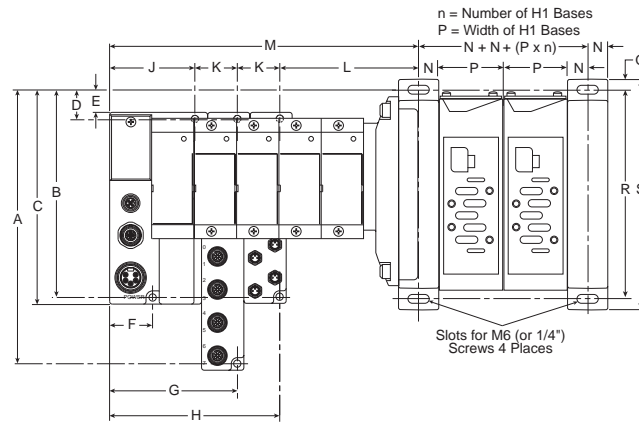
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Subbase & Manifold Valve Products

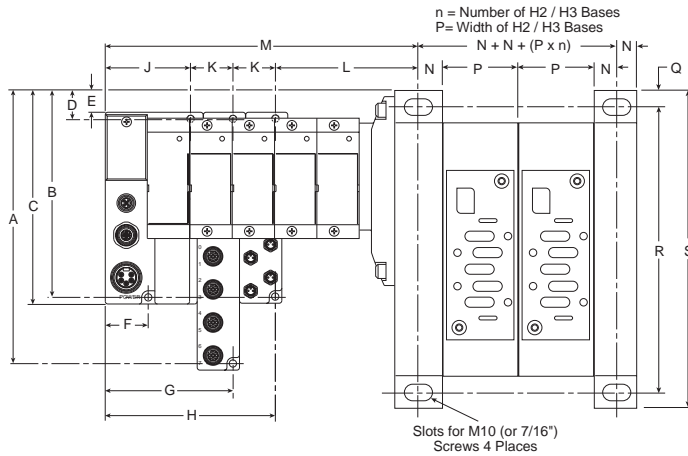
Turck with Isys ISO Valves



HB - HA Manifold Assembly



H1 Manifold Assembly



H2 - H3 Manifold Assembly

Dimensions

	A	B	C	D	E	F	G	H	J	K	L	M	N	N ₁	P	P ₁	Q	R	S	T	U
HA / HB	8.05 (204.5)	6.08 (154.5)	6.28 (159.5)	0.75 (19.5)	0.57 (14.5)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.75 (120.8)	See note 1	.33 (8.4)	1.80 (45.8)	1.61 (40.8)	2.24 (56.8)	.15 (4)	4.32 (110)	5.98 (152)	.63 (16)	5.39 (137)
H1	8.53 (216.7)	6.56 (166.7)	6.76 (171.7)	1.25 (31.7)	1.05 (26.7)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.27 (108.5)	See note 1	.63 (15.9)	—	1.93 (49)	—	.33 (8.5)	6.50 (165)	7.17 (182)	—	—
H2	8.38 (212.9)	6.41 (162.9)	6.61 (167.9)	1.10 (27.9)	.90 (22.9)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.34 (110)	See note 1	.65 (16.5)	—	2.20 (56)	—	.47 (12)	8.46 (215)	9.41 (239)	—	—
H3	8.62 (218.9)	6.65 (168.9)	6.85 (173.9)	1.33 (33.9)	1.14 (28.9)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.34 (110)	See note 1	.65 (16.5)	—	2.80 (71)	—	.59 (15)	10.43 (265)	11.61 (295)	—	—

Note 1: $M = J + L + n_2 \times K$, where n_2 = Number of Turk input / output modules
 Inches (mm)

Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus

DX ISOMAX Series

Valvair II Series

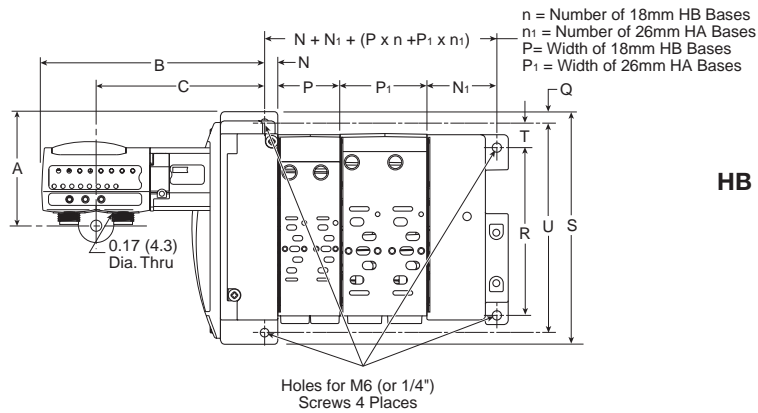
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Subbase & Manifold Valve Products

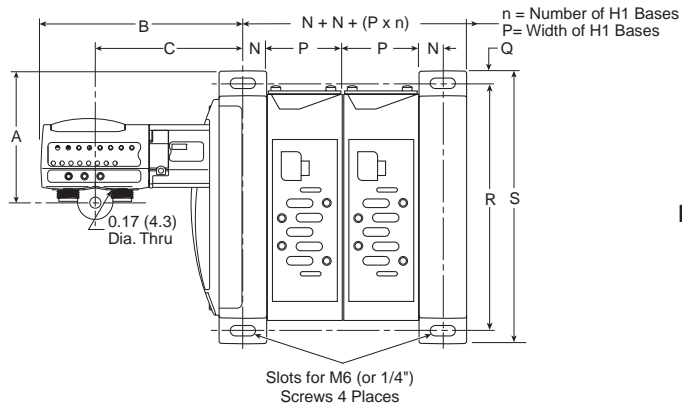


Moduflex with Isys ISO Valves

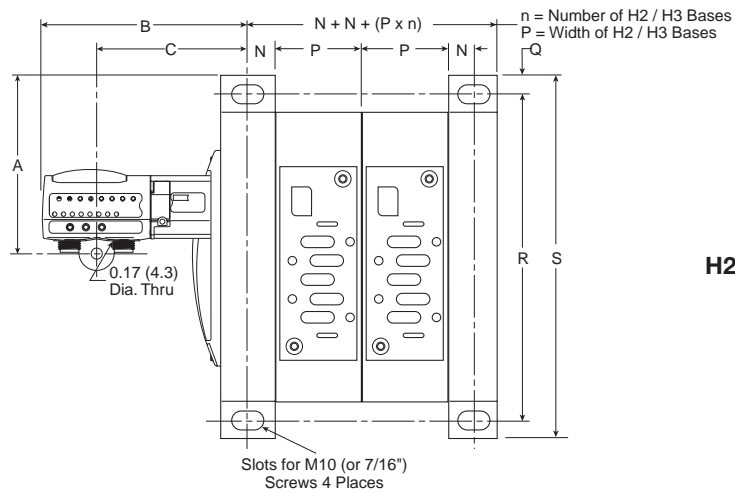
- Moduflex Series
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HB - HA Manifold Assembly



H1 Manifold Assembly



H2 - H3 Manifold Assembly

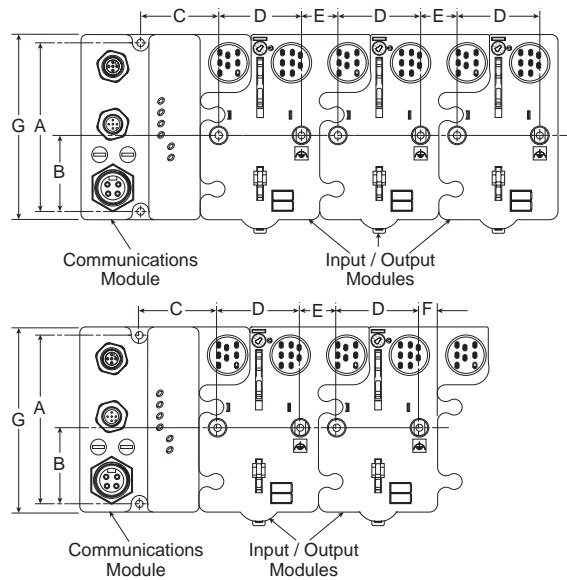
Dimensions

	A	B	C	N	N ₁	P	P ₁	Q	R	S	T	U
HA / HB	2.75 (69.8)	5.61 (142.5)	4.40 (111.8)	.33 (8.4)	1.80 (45.8)	1.61 (40.8)	2.24 (56.8)	.15 (4)	4.32 (110)	5.98 (152)	.63 (16)	5.39 (137)
H1	3.23 (82)	6.33 (160.9)	5.13 (130.2)	.63 (15.9)	—	1.93 (49)	—	.33 (8.5)	6.50 (165)	7.17 (182)	—	—
H2	3.08 (78.2)	6.40 (161.5)	5.19 (131.8)	.65 (16.5)	—	2.20 (56)	—	.47 (12)	8.46 (215)	9.41 (239)	—	—
H3	3.31 (84.2)	6.40 (161.5)	5.19 (131.8)	.65 (16.5)	—	2.80 (71)	—	.59 (15)	10.43 (265)	11.61 (295)	—	—

Inches (mm)



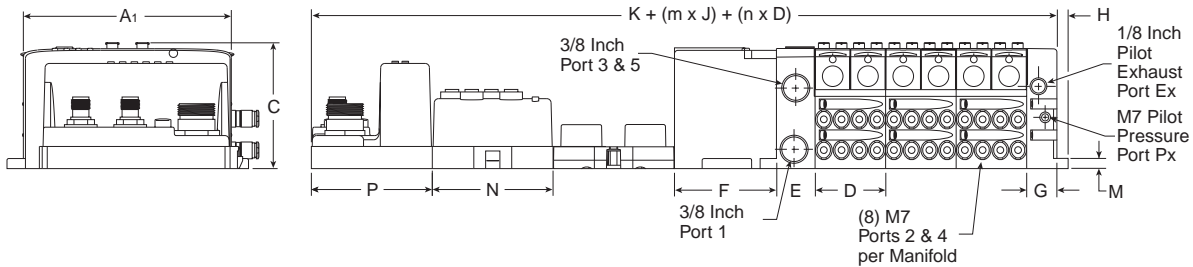
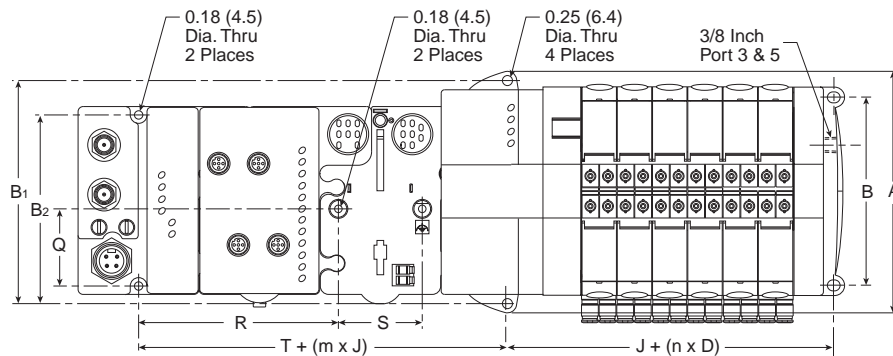
Isysnet with Isys Micro Valves



Dimensions

A	B	C	D
4.00 (102)	1.80 (46)	1.90 (48)	2.00 (50)
E	F	G	
.87 (22)	.43 (11)	4.41 (112)	

Inches (mm)



Dimensions

A	A1	B	B1	B2	C	D	E	F	G
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	2.40 (61.0)	0.71 (18.0)
H	J	K	M	N	P	Q	R	S	T
0.49 (12.5)	2.72 (69.0)	7.32 (186.0)	0.24 (6.1)	2.83 (72.0)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)

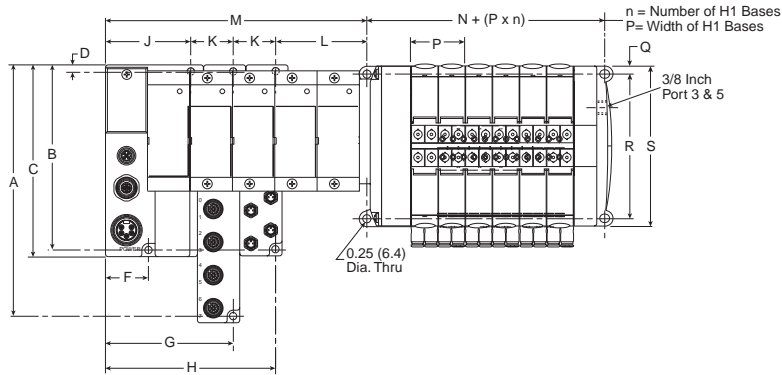
n = Number of Manifolds
 m = Number of Modules

Inches (mm)

Modulflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products



Turck with Isys Micro Valves

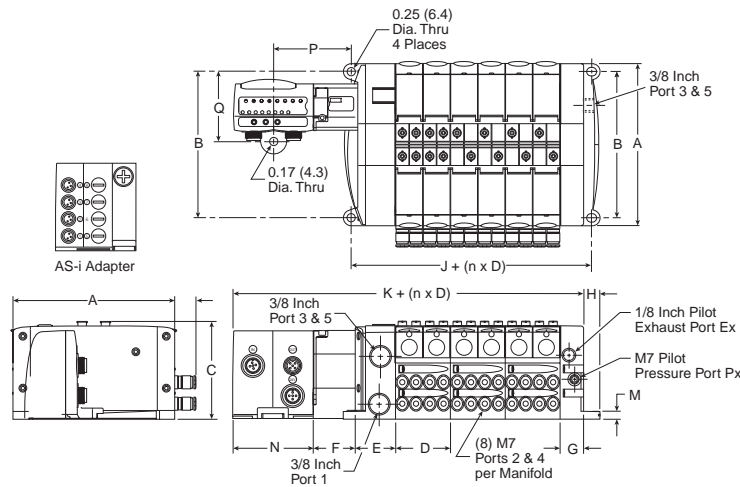


Dimensions

A	B	C	D	F	G	H	J	K	L	M	N	P	Q	R	S
7.48	5.51	5.71	0.20	1.28	3.79	5.06	2.53	1.26	2.54	See note 1	2.28	1.65	.19	4.41	4.88
(190)	(140)	(145)	(5)	(32.5)	(96.5)	(128.5)	(64.5)	(32)	(64)		(58)	(42)	(4.9)	(112)	(124)

Note 1: $M = J + L + n_2 \times K$, where $n_2 =$ Number of Turck input / output modules
 Inches (mm)

Moduflex Adapter, Side Ported



Dimensions

A	B	C	D	E	F	G	H	J	K	M	N	P	Q
4.88	4.41	2.95	1.65	1.22	1.28	0.71	0.49	2.28	6.10	0.24	2.40	2.36	2.07
(124.0)	(112.0)	(75.0)	(42.0)	(31.0)	(32.5)	(18.0)	(12.5)	(58.0)	(155.0)	(6.1)	(61.0)	(60.0)	(52.5)

Inches (mm)

n = Number of Manifolds

DX ISOMAX Series

The ISOMAX range of directional control valves complies with ISO 15407-1 and VDMA 24563 for sizes 02 and 01 and ISO 5599-1 for sizes 1, 2 and 3. ISOMAX provides flows from 0.55 Cv to 4.15 Cv.

The ISOMAX range includes valves for pneumatic and electrical actuation with a wide choice of subbases and manifolds to suit different application needs.

All ISOMAX products use high-tech ceramic switching technology providing:

Excellent reliability

- Long life in excess of 100 million operations*
- Operates with lubricated or non-lubricated air
- Low sensitivity to air quality changes

High performance

- Slide valve concept allows high flow / size ratio and short response time due to short slide stroke and low friction

Stable long lasting performances

- Low friction switching: minimum wear of the valve member / seal assembly

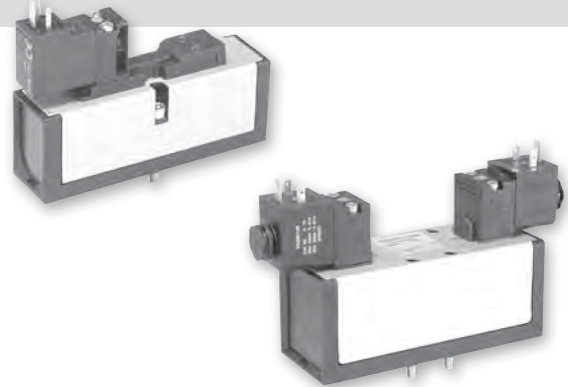
Valves fitted with switchable selector to give internal or external pilot supply

Corrosion free and modern design

Vacuum operation

Dual pressure

* Refer to our warranty conditions.



Operating information

Operating Pressure: Vacuum to 145 PSIG (10 bar)

Function		M.O.P (PSIG)
20, 21, 22, 23	2-position, spring return	36
50, 51, 53, 54	2-position, air return	30
04, 05, 06, 08	2-position	15
09, 11, 12, 27	3-position, CE	45
16, 18, 19, 25	3-position, APB	45

Working temperatures: -10°C to 60°C (14°F to 140°F)

Storage temperatures: -20°C to 70°C (-4°F to 158°F)

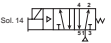
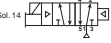



Material specifications

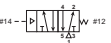



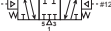
Body	Polyamide reinforced fiberglass
Casing	Anodized aluminum
End plates	Painted zinc plated steel
Function selector	Polyamide reinforced fiberglass
Screws	Zinc plated steel
Seals	Nitrile
Seat	Ceramic
Springs	Stainless steel
Top cover seals	Polyester
Valve members	Self lubricating acetal
Valve plate	Zinc

 Most popular.






DX02 ISO Valves

Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
	4-way, 2-position, spring return	0.55	Single solenoid	Internal	Non-locking	DX02-621-951M	DX02-621-951J
	4-way, 2-position, air return	0.55	Single solenoid	Internal	Non-locking	DX02-651-951M	DX02-651-951J
	4-way, 2-position	0.55	Double solenoid	Internal	Non-locking	DX02-606-951M	DX02-606-951J
	4-way, 3-position, center exhaust	0.4	Double solenoid	Internal	Non-locking	DX02-611-951M	DX02-611-951J
	4-way, 3-position, all ports blocked	0.4	Double solenoid	Internal	Non-locking	DX02-616-951M	DX02-616-951J

Symbol	Type	Cv	Operator	Pilot	Part number
	4-way, 2-position, spring return	0.55	Single remote pilot	Remote	DX02-421-60
	4-way, 2-position, air return	0.55	Single remote pilot	Remote	DX02-451-60
	4-way, 2-position	0.55	Double remote pilot	Remote	DX02-406-60
	4-way, 3-position, center exhaust	0.4	Double remote pilot	Remote	DX02-411-60
	4-way, 3-position, all ports blocked	0.4	Double remote pilot	Remote	DX02-416-60

DX02 Series Subbase & Manifolds

Single subbase	1/8" NPT	1/8" BSPP
 Side ported base	PL02-01-80	PL02-01-70
2 Station manifold bases		
 End ported bases	1/8" NPT	1/8" BSPP
	PJLP02-201-80	PJLP02-201-70
End plate kit	1/8" NPT port	1/8" BSPP port
	PEJ02-02-80	PEJ02-02-70

Add-A-Fold Assembly Model Number

AA 02U 0 04


Valve series	Number of stations*
Right & left end plate DX02	02
	04
	•
	24
	•
	32

* For use with PJLP02 Manifolds.

Thread type	
NPT	0
BSPP "G"	1

* Must be ordered in multiples of (2)

DX02 Series Accessories

Accessory	Description	Part number
Sandwich regulator 	Common pressure	2-60 PSIG w/ gauge PS5637155P
	Common pressure	5-125 PSIG w/ gauge PS5637166P
	Independent pressure	2-60 PSIG w/ gauge PS5637255P
	Independent pressure	5-125 PSIG w/ gauge PS5637266P
Gauge adapter kit	Includes 1/8" coupling and long nipple	PS5651160P
Blanking plate kit		PS5634P
Sandwich supply module	1/8" NPT	PS562600P
	1/8" BSPP	PS562601P
Sandwich exhaust module	1/8" NPT	PS562700P
	1/8" BSPP	PS562701P
Intermediate air supply module	1/8" NPT	D02P-01-80
Sandwich flow control		PS5642P
Manifold to manifold gasket kits	Used with manifold PJLP02	DX02M2MGSKT
Manifold port isolation kits (main galley 1, 3, & 5)	For use on PJLP and PJL series manifolds. Kit includes: plugs with o-rings.	D02BD0
Manifold hardware kit	Includes 10 bolts, 10 washers, 10 nuts	DX02M2MB

DX01 ISO Valves

Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
	4-way, 2-position, spring return	0.75	Single solenoid	Internal	Non-locking	DX01-621-951M	DX01-621-951J
	4-way, 2-position, air return	0.75	Single solenoid	Internal	Non-locking	DX01-651-951M	DX01-651-951J
	4-way, 2-position	0.75	Double solenoid	Internal	Non-locking	DX01-606-951M	DX01-606-951J
	4-way, 3-position, center exhaust	0.5	Double solenoid	Internal	Non-locking	DX01-611-951M	DX01-611-951J
	4-way, 3-position, all ports blocked	0.5	Double solenoid	Internal	Non-locking	DX01-616-951M	DX01-616-951J

Symbol	Type	Cv	Operator	Pilot	Part number
	4-way, 2-position, spring return	0.75	Single remote pilot	Remote	DX01-421-60
	4-way, 2-position, air return	0.75	Single remote pilot	Remote	DX01-451-60
	4-way, 2-position	0.75	Double remote pilot	Remote	DX01-406-60
	4-way, 3-position, center exhaust	0.5	Double remote pilot	Remote	DX01-411-60
	4-way, 3-position, all ports blocked	0.5	Double remote pilot	Remote	DX01-416-60

DX01 Series Subbase & Manifolds

Single subbase	1/4" NPT	1/4" BSPP
Side ported base	PL01-02-80	PL01-02-70
2 Station manifold bases	1/4" NPT	1/4" BSPP
End ported bases	PJLP01-202-80	PJLP01-202-70
End plate kit	1/4" NPT port	1/4" BSPP port
End plate kit	PEJ01-03-80	PEJ01-03-70

Add-A-Fold Assembly Model Number

AA	01U	0	04
Valve series Right & left end plate DX01	01U*	Number of stations*	
		02	
		04	
		•	
		24	
		•	
		32	
Thread type			
NPT	0		
BSPP "G"	1		

* For use with PJLP01 or PJL01 Manifolds.
 * Must be ordered in multiples of (2)

DX01 Series Accessories

Accessory	Description	Part number
Sandwich regulator	Common pressure	2-60 PSIG w/ gauge PS5537155P
	Common pressure	5-125 PSIG w/ gauge PS5537166P
	Independent pressure	2-60 PSIG w/ gauge PS5537255P
	Independent pressure	5-125 PSIG w/ gauge PS5537266P
	Gauge adapter kit	Includes 1/8" coupling and long nipple PS5651160P
Remote pilot access plate kit	1/4" NPT	PS551500P
	1/4" BSPP	PS551501P
Blanking plate kit		PS5534P
Sandwich supply module	1/4" NPT	PS552600P
	1/4" BSPP	PS552601P
Sandwich exhaust module	1/4" NPT	PS552700P
	1/4" BSPP	PS552701P
Intermediate air supply module	1/4" NPT	D01P-02-80
Sandwich flow control		PS5542P
Manifold to manifold gasket kits	Used with manifold PJLP02	DX01M2MGSKT
Manifold port isolation kits (main galley 1, 3, & 5)	For use on PJLP and PJL series manifolds. Kit includes: plugs with o-rings.	D01BD0
Manifold hardware kit	Includes 10 bolts, 10 washers, 10 nuts	DX02M2MB



Modulflex Series

Isys Micro Series

Isys ISO Series




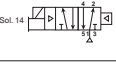

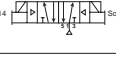
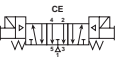

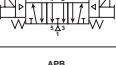




Fieldbus Series


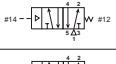
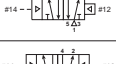

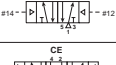
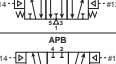

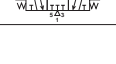

DX ISOMAX Series

Valvair II Series




D
 Subbase & Manifold Valve Products

DX1 ISO Valves


Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
 Sol. 14 	4-way, 2-position, spring return	1.15	Single solenoid	Internal	Non-locking	DX1-621-BL49	DX1-621-BL53
					Locking	DX1-621-CL49	DX1-621-CL53
 Sol. 14 	4-way, 2-position, air return	1.15	Single solenoid	Internal	Non-locking	DX1-651-BL49	DX1-651-BL53
					Locking	DX1-651-CL49	DX1-651-CL53
 Sol. 14  Sol. 12 	4-way, 2-position	1.15	Double solenoid	Internal	Non-locking	DX1-606-BL49	DX1-606-BL53
					Locking	DX1-606-CL49	DX1-606-CL53
 #14  #12 	4-way, 3-position, center exhaust	0.75	Double solenoid	Internal	Non-locking	DX1-611-BL49	DX1-611-BL53
					Locking	DX1-611-CL49	DX1-611-CL53
 #14  #12 	4-way, 3-position, all ports blocked	0.75	Double solenoid	Internal	Non-locking	DX1-616-BL49	DX1-616-BL53
					Locking	DX1-616-CL49	DX1-616-CL53

Symbol	Type	Cv	Operator	Pilot	Part number
 #14  #12 	4-way, 2-position, spring return	1.15	Single remote pilot	Remote	DX1-421-60
	4-way, 2-position, air return	1.15	Single remote pilot	Remote	DX1-451-60
 #14  #12 	4-way, 2-position	1.15	Double remote pilot	Remote	DX1-406-60
	4-way, 3-position, center exhaust	0.75	Double remote pilot	Remote	DX1-411-60
 #14  #12 	4-way, 3-position, all ports blocked	0.75	Double remote pilot	Remote	DX1-416-60

DX1 Series Subbase & Manifolds

Single subbase	Description	3/8" NPT	3/8" BSPP
	Side ported base	PS4011150CP	PS4011160CP
Manifold bases		3/8" NPT	3/8" BSPP
	End ported bases	PS4011550CP	PS4011560CP
	Bottom / End ported bases	PS4011650CP	PS4011660CP
End plate kits		NPT port	BSPP port
	DX1 non-collective wiring end plates	PS4031010CP	PS4031011CP

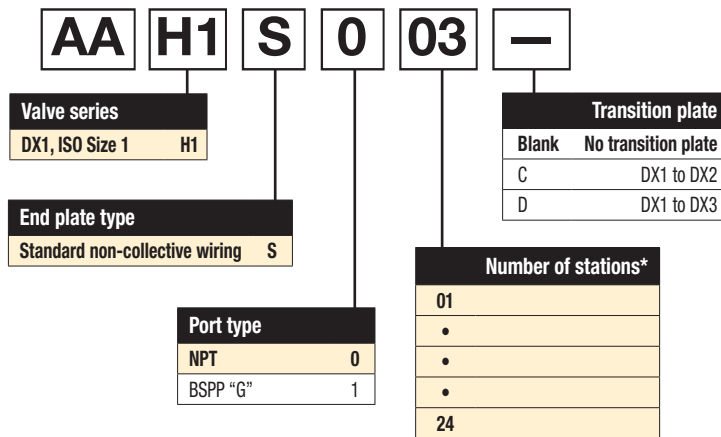
5599-1, DX1 Accessories

Accessories	Description	Part number
	Common pressure	5-125 PSIG w/ gauge PS4037166CP
	Independent pressure	5-125 PSIG w/ gauge PS4037266CP
Remote pilot access plate kit	1/8" NPT 1/8" BSPP	PS401500CP PS401501CP
Blanking plate kit		PS4034CP
Sandwich flow control		PS4042CP
Manifold to manifold gasket kit		PS4013P
Manifold port isolation kits	Main galley (1, 3, 5)	PS4032CP
Manifold port isolation kits	Pilot galley	PS4033CP
Auxiliary access plate kit	1/4" & 3/8"	NPT PS403000CP
		BSPP PS403001CP

Modulflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus Series
 DX ISOMAX Series
 Valvair II Series
D
 Subbase & Manifold Valve Products

How To Order Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.
 (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example: Application requires a 3-Station manifold.

Qty.	Part No.	
1	AAH1S003	
1	DX1-621-BL49.....	Valve Station 1
1	PS4011550CP.....	Base Station 1
1	DX1-616-BL49.....	Valve Station 2
1	PS4011550CP.....	Base Station 2
1	DX1-611-BL49.....	Valve Station 3
1	PS4011550CP.....	Base Station 3



DX2 ISO Valves

Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
	4-way, 2-position, spring return	2.5	Single solenoid	Internal	Non-locking	DX2-621-BL49	DX2-621-BL53
					Locking	DX2-621-CL49	DX2-621-CL53
	4-way, 2-position, air return	2.5	Single solenoid	Internal	Non-locking	DX2-651-BL49	DX2-651-BL53
					Locking	DX2-651-CL49	DX2-651-CL53
	4-way, 2-position	2.5	Double solenoid	Internal	Non-locking	DX2-606-BL49	DX2-606-BL53
					Locking	DX2-606-CL49	DX2-606-CL53
	4-way, 3-position, center exhaust	2.4	Double solenoid	Internal	Non-locking	DX2-611-BL49	DX2-611-BL53
					Locking	DX2-611-CL49	DX2-611-CL53
	4-way, 3-position, all ports blocked	2.4	Double solenoid	Internal	Non-locking	DX2-616-BL49	DX2-616-BL53
					Locking	DX2-616-CL49	DX2-616-CL53

Symbol	Type	Cv	Operator	Pilot	Part number
	4-way, 2-position, spring return	2.5	Single remote pilot	Remote	DX2-421-60
	4-way, 2-position, air return	2.5	Single remote pilot	Remote	DX2-451-60
	4-way, 2-position	2.5	Double remote pilot	Remote	DX2-406-60
	4-way, 3-position, center exhaust	2.4	Double remote pilot	Remote	DX2-411-60
	4-way, 3-position, all ports blocked	2.4	Double remote pilot	Remote	DX2-416-60



Modulflex Series

Isys Micro Series

Isys ISO Series

Fieldbus


DX ISOMAX Series


Valvair II Series


D

Subbase & Manifold Valve Products


DX2 Series Subbase & Manifolds

Single subbase	Description	1/2" NPT	1/2" BSPP
	Side ported base	PS4111170CP	PS4111180CP

Manifold bases	Description	1/2" NPT	1/2" BSPP
	Bottom / End ported bases Note: Manifolds include 2 pipe plugs	PS4111670CP	PS4111680CP

End plate kits	Description	NPT port	BSPP port
	H2 Non-collective wiring end plates	PS4131010CP	PS4131011CP

5599-1, DX2 Accessories

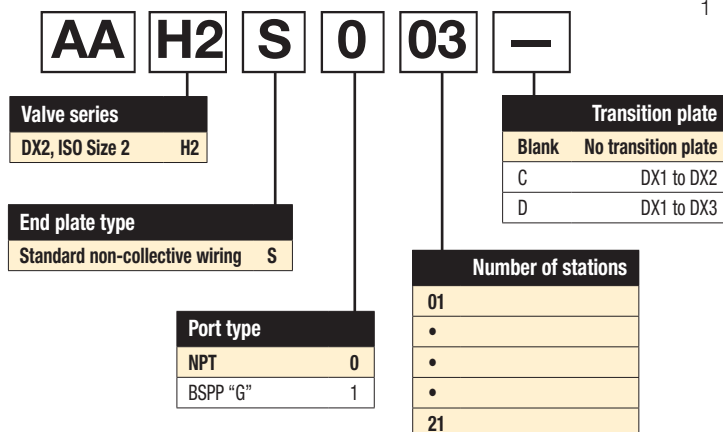
Accessories	Description	Part number
Sandwich regulator 	Common pressure 5-125 PSIG w/ gauge	PS4137166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4137266CP
Remote pilot access plate kit	1/8" NPT	PS411500CP
	1/8" BSPP	PS411501CP
Blanking plate kit		PS4134CP
Sandwich flow control		PS4142CP
Manifold to manifold gasket kit		PS4113P
Manifold port isolation kits	Main galley (1, 3, 5)	PS4132CP
Manifold port isolation kits	Pilot galley	PS4033CP

How To Order Add-A-Fold Assemblies

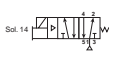
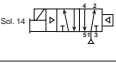
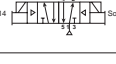

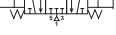
- List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
- List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.
(If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

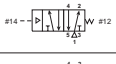
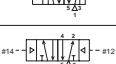
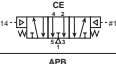
Example: Application requires a 3-station manifold.

Qty.	Part No.
1	AAH2S003
1	DX2-621-BL49..... Valve Station 1
1	PS4111570CP.....Base Station 1
1	DX2-616-BL49 Valve Station 2
1	PS4111570CP.....Base Station 2
1	DX2-611-BL49 Valve Station 3
1	PS4111570CP.....Base Station 3



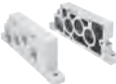


DX3 ISO Valves


Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
	4-way, 2-position, spring return	4.15	Single solenoid	Internal	Non-locking	DX3-621-BL49	DX3-621-BL53
					Locking	DX3-621-CL49	DX3-621-CL53
	4-way, 2-position, air return	4.15	Single solenoid	Internal	Non-locking	DX3-651-BL49	DX3-651-BL53
					Locking	DX3-651-CL49	DX3-651-CL53
	4-way, 2-position	4.15	Double solenoid	Internal	Non-locking	DX3-606-BL49	DX3-606-BL53
					Locking	DX3-606-CL49	DX3-606-CL53
	4-way, 3-position, center exhaust	4.0	Double solenoid	Internal	Non-locking	DX3-611-BL49	DX3-611-BL53
					Locking	DX3-611-CL49	DX3-611-CL53
	4-way, 3-position, all ports blocked	4.0	Double solenoid	Internal	Non-locking	DX3-616-BL49	DX3-616-BL53
					Locking	DX3-616-CL49	DX3-616-CL53

Symbol	Type	Cv	Operator	Pilot	Part number
	4-way, 2-position, spring return	4.15	Single remote pilot	Remote	DX3-421-60
					DX3-451-60
	4-way, 2-position, air return	4.15	Single remote pilot	Remote	DX3-406-60
					DX3-411-60
	4-way, 3-position, center exhaust	4.0	Double remote pilot	Remote	DX3-416-60
					DX3-416-60

DX3 Series Subbase & Manifolds

Single subbase	Description	3/4" NPT	3/4" BSPP
	Side ported base	PS4211170CP	PS4211180CP
Manifold bases	Description	3/4" NPT	3/4" BSPP
	Bottom / End ported bases Note: Manifolds include 2 pipe plugs	PS4211690CP	PS4211600CP
End plate kits	Description	NPT port	BSPP port
	H3 Non-collective wiring end plates	PS4231010CP	PS4231011CP

5599-1, DX3 Accessories

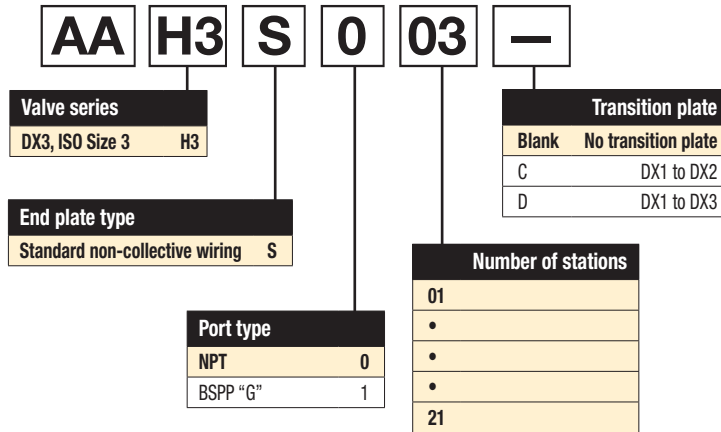
Accessories	Description	Part number
Sandwich regulator 	Common pressure 5-125 PSIG w/ gauge	PS4237166CP
	Independent pressure 5-125 PSIG w/ gauge	PS4237266CP
Remote pilot access plate kit	1/8" NPT	PS421500CP
	1/8" BSPP	PS421501CP
Blanking plate kit		PS4134CP
Sandwich flow control		PS4242CP
Manifold to manifold gasket kit		PS4213P
Manifold port isolation kits	Main galley (1, 3, 5)	PS4232CP
Manifold port isolation kits	Pilot galley	PS4033CP

How To Order Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.
 (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

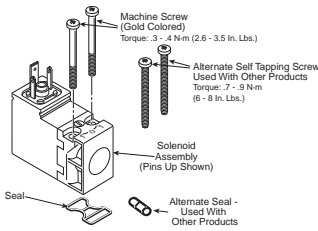
Example: Application requires a 3-station manifold.

Qty.	Part No.
1	AAH3S003
1	DX3-621-BL49..... Valve Station 1
1	PS4111590CPBase Station 1
1	DX3-616-BL49 Valve Station 2
1	PS4111590CPBase Station 2
1	DX3-611-BL49 Valve Station 3
1	PS4111590CPBase Station 3



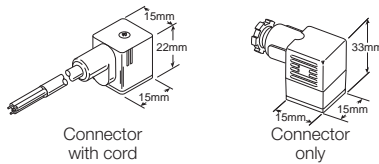
Modulflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus
 DX ISOMAX Series
 Valvair II Series
D
 Subbase & Manifold Valve Products

15mm 3-Pin DIN 43650C Replacement Solenoid Kits



Voltage	Non-locking	Locking
24VDC	PS2982B49P	PS2982C49P
110/50, 120/60	PS2982B53P	PS2982C53P

15mm 3-Pin DIN 43650C Connectors



Description	Connector with 6' (2m) Cord	Connector
No circuit board	PS2932JBP	PS2932BP
Light - 24DC	PS2946J79BP*	PS294679BP
Light - 110/120VAC	PS2946J83BP*	PS294683BP

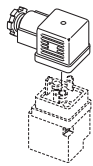
* LED with surge suppression.

Note: Max. ø6.5mm cable size required for connector without 6' (2m) cord. IP65 rated when properly installed.

Engineering Data:

Conductors: 2 poles plus ground
 Cable range (Connector only): 4 to 6mm (0.16 to 0.24 Inch)
 Contact spacing: 8mm

Female Electrical Connectors (IP65 Rated) 30mm, 3-Pin ISO 4400, (DIN 43650A)



Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	PS2028BP
Light - 6-48V, 50/60Hz; 6-48VDC	PS2032J79CP*	PS203279BP
Light - 120V/60Hz	PS2032J83CP*	PS203283BP
Light - 240V/60Hz	N/A	PS203283BP

* With surge suppression.

Engineering data:

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 inch); Contact spacing: 18mm

5599-1 CNOMO Solenoid Kits

Voltage code	3-pin, 30mm 'L' coil kit	2-pin, M12 Euro '6' coil kit
19	—	PS2828619P
42	P2FCA442	—
45	P2FCA445	—
49	P2FCA449	—
53	P2FCA453	—
57	P2FCA457	—

Quantity 1

CNOMO Operator Adapter

Description	Kit number
Operator adapter	PS2855P

Manifold to Manifold Gasket Kits

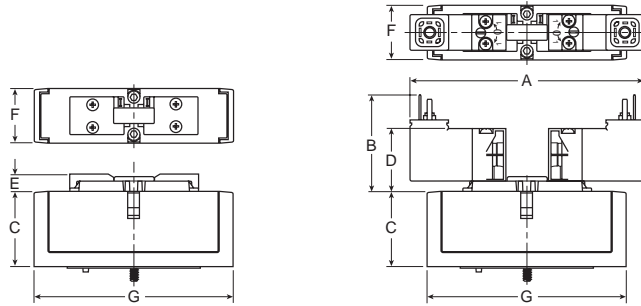
Size	Part number
DX02*	DX02M2MGSKT (PJLP02)
DX01*	DX01M2MGSKT (PJLP01)

* Gaskets used with PS5611 & PS5511 manifolds.

Pilot Operator - CNOMO

Valve size	Kit number
DX1, DX2 & DX3	Locking PS4052CP
	Non-locking PS4053CP

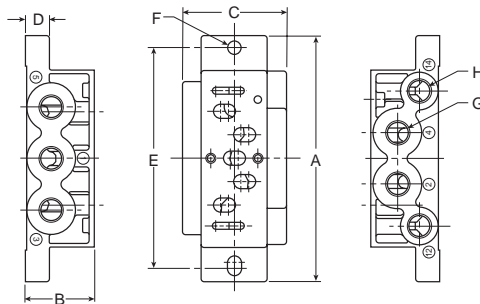
DX01 & DX02 Valve Dimensions



Series	A	B	C	D	E	F	G
DX02	4.06 (103)	1.61 (41)	1.41 (36)	1.06 (27)	.31 (8)	.71 (18)	3.15 (80)
DX01	4.06 (103)	1.61 (41)	1.41 (36)	1.06 (27)	.31 (8)	1.02 (26)	3.94 (100)

Inches (mm)

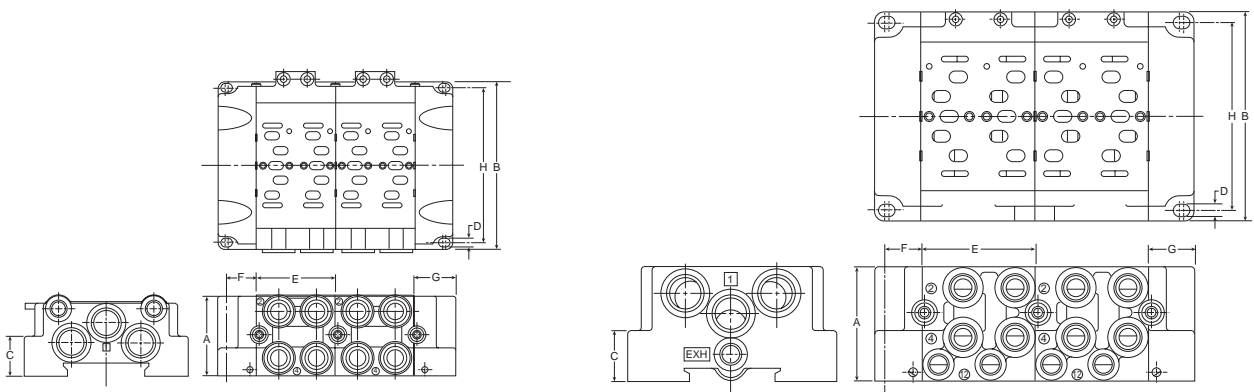
DX01 & DX02 Individual Subbase Dimensions



Series	Part number	A	B	C	D	E	F	G	H
DX02	PL02	3.15 (80)	.87 (22)	1.06 (27)	.31 (8)	2.76 (70)	.216 Dia. (Ø 5.5)	1/8	M5
DX01	PL01	3.94 (100)	1.10 (28)	1.65 (42)	.39 (10)	3.54 (90)	.216 Dia. (Ø 5.5)	1/4	1/8

Inches (mm)

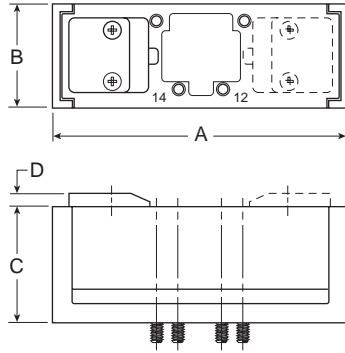
DX01 & DX02 2-Station Manifold Base Dimensions



Series	Part number	A	B	C	D	E	F	G	H
DX02	PJLP02 / PEJ02	1.52 (38.5)	3.15 (80)	.47 (12)	.165 Dia. (Ø 4.2)	1.50 (38)	.55 (14)	.71 (18)	2.83 (72)
DX01	PJL01 / PJLP01 / PEJ01	2.17 (55)	3.94 (100)	.94 (24)	.216 Dia. (Ø 5.5)	2.13 (54)	.67 (17)	.87 (22)	3.54 (90)

Inches (mm)

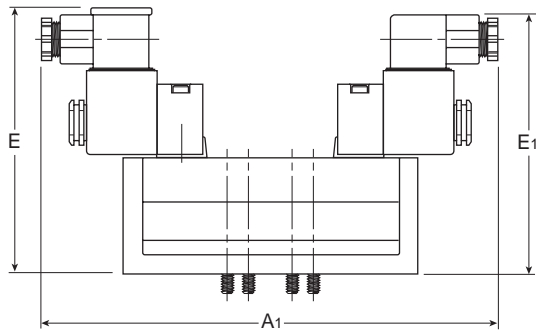
DX1, DX2 & DX3 Air Operated Valve Dimensions



Series	A	B	C	D
DX1	4.72 (120)	1.65 (42)	1.85 (47)	.20 (5)
DX2	5.51 (140)	2.13 (54)	2.30 (58.5)	.20 (5)
DX3	6.69 (170)	2.68 (68)	2.80 (71)	.20 (5)

Inches (mm)

DX1, DX2 & DX3 Solenoid Operated Valve Dimensions



Series	A ₁	E	E ₁	E ₂
DX1	7.97 (202.5)	4.43 (112.5)	4.69 (119)	4.53 (115)
DX2	8.58 (218)	4.86 (123.5)	5.12 (130)	4.98 (126.5)
DX3	9.27 (235.5)	5.35 (136)	5.61 (142.5)	5.47 (139)

Inches (mm)

Modulflex
Series

Isys Micro
Series

Isys ISO
Series

Fieldbus
Series

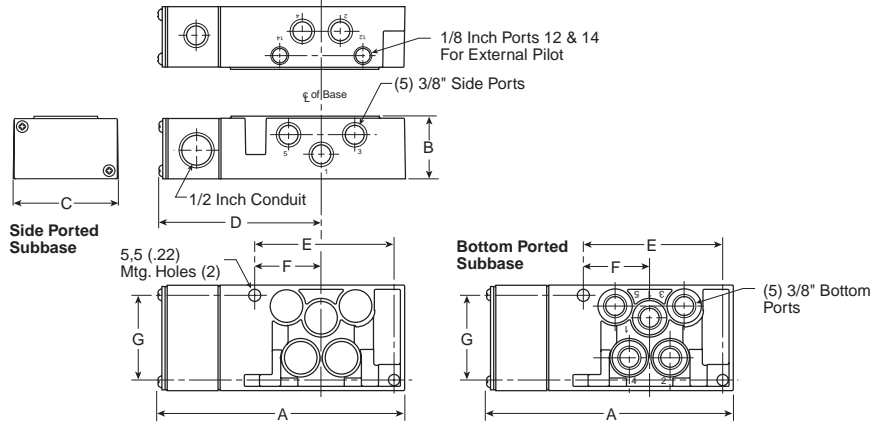
DX ISOMAX
Series

Valvair II
Series

D

Subbase & Manifold
Valve Products

DX1 Subbase Dimensions

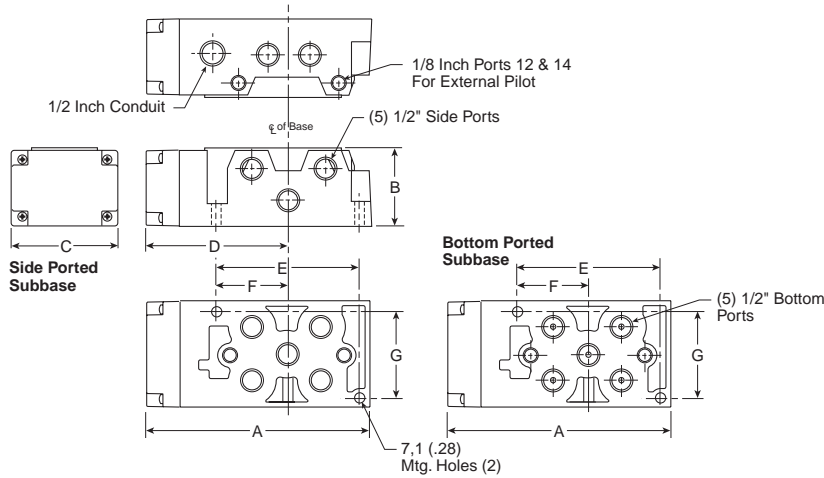


PS4011 Subbase

A	B	C	D
5.83 (148)	1.48 (38)	2.50 (64)	3.86 (98)
E	F	G	
3.29 (84)	1.57 (40)	2.00 (51)	

Inches (mm)

DX2 Subbase Dimensions

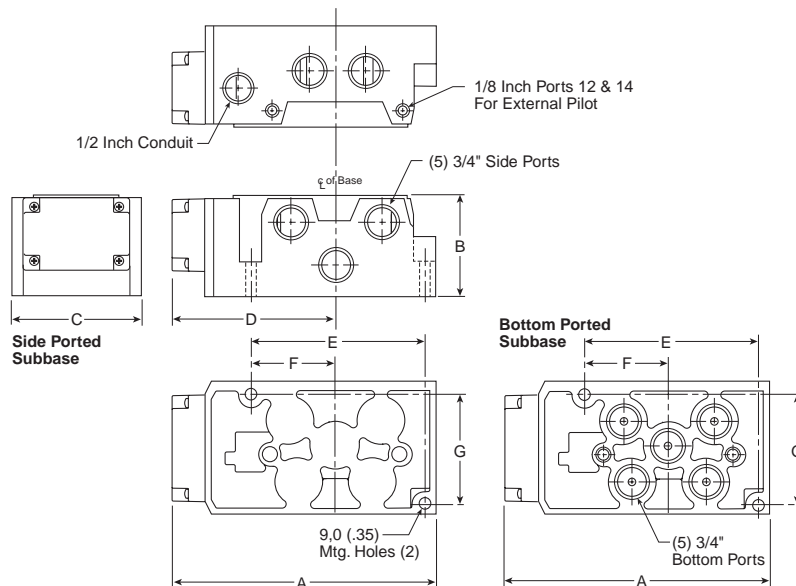


PS4111 Subbase

A	B	C	D
6.69 (170)	2.33 (59)	3.15 (80)	4.25 (108)
E	F	G	
4.21 (107)	2.07 (52)	2.56 (65)	

Inches (mm)

DX3 Subbase Dimensions



PS4211 Subbase

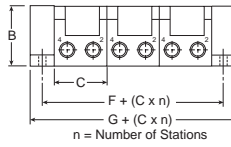
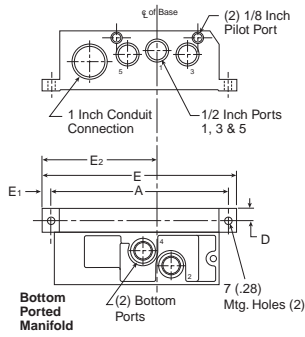
A	B	C	D
7.90 (201)	2.96 (75)	3.90 (990)	4.92 (125)
E	F	G	
5.14 (131)	2.50 (64)	3.24 (82)	

Inches (mm)

- Modulflex Series
- Isys Micro Series
- Isys ISO Series
- Fieldbus Series
- DX ISOMAX Series
- Valvair II Series
- Subbase & Manifold Valve Products



DX1 Manifold Dimensions



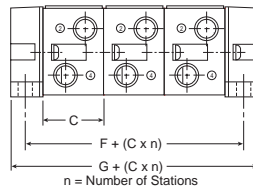
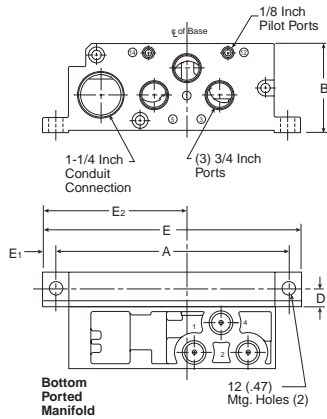
PS4011 Manifold

A	B	C	D	E
6.50 (165)	2.20 (56)	1.93 (49)	.44 (11)	7.15 (182)

E1	E2	F	G
.33 (8)	4.25 (108)	.87 (22)	1.80 (46)

Inches (mm)

DX2 Manifold Dimensions



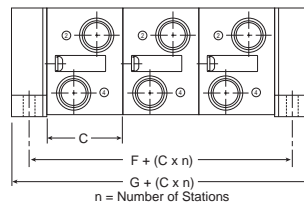
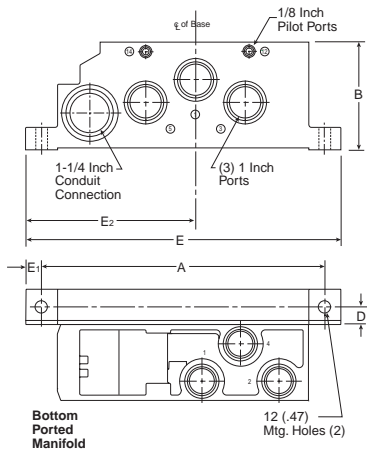
PS4111 Manifold

A	B	C	D	E
8.46 (215)	3.35 (85)	2.20 (56)	.59 (15)	9.41 (239)

E1	E2	F	G
.47 (12)	5.28 (134)	1.18 (30)	2.36 (60)

Inches (mm)

DX3 Manifold Dimensions



PS4211 Manifold

A	B	C	D	E
10.41 (265)	4.13 (105)	2.80 (71)	.65 (175)	11.61 (295)

E1	E2	F	G
.59 (15)	6.26 (159)	1.30 (33)	2.60 (63)

Inches (mm)

Modulflex
Series

Isys Micro
Series

Isys ISO
Series

Fieldbus

DX ISOMAX
Series

Valvair II
Series

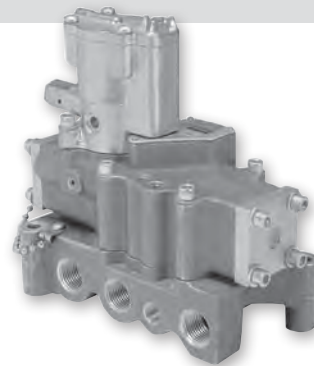
D

Subbase & Manifold
Valve Products

Valvair II Series

Features

- Full air operation for fastest response
- “Plug-In” option simplifies maintenance and installation
Reduces downtime. No wiring or plumbing to disturb
- “Direct pipe” design for economy and performance
- Variety of operators available; direct conduit, (JIC) junction box, NEMA 4, hazardous duty, (UL, CSA), and remote air pilot
- Field convertible to external pilot supply for vacuum or other services
- Synthetic rubber o-ring seals are specially compounded for minimum compression and friction for superior wear and abrasion resistance
- Precision ground spool “floats” on o-ring seals. Closed center cross-over design saves air
- General Purpose Approvals
 - CSA - Canadian Standards Association
File number 42024
- Hazardous Duty Approvals
 - UL - Underwriters Laboratories, Inc.
File number E42542 Category Y107
 - CSA - Canadian Standards Association
File number 24349



Operating information

Pressure range for solenoid operated valves

Media	Internal pilot supply			External pilot supply			
	1/4"	3/8"	1/2"	1/4"	3/8"	1/2"	1"
Air	35-140* PSIG			N.A.	Main 0-250 PSIG	Pilot 35-140* PSIG	
Vacuum	do not use			N.A.	Main within 1 Hg of perfect	Pilot 35-140* PSIG	
Other	Consult supplier						

* 200 PSIG solenoid is optional (consult supplier).

Pressure range for remote pilot operated valves

Media		Valve type	
		Single	Double & 3-position
Air	Main	35-250 PSIG	0-250 PSIG
	Pilot	35-200 PSIG	35-200 PSIG
Vacuum	Main	Do not use	Within 1" Hg of perfect
	Pilot	Do not use	35-200 PSIG
Other	Consult supplier		

Ambient temperature – standard service solenoid operator

Minimum	Maximum	
	Intermittent duty	Continuous duty
0°F	125°F	100°F

Special service (continuous duty) solenoid operator

0°F	125°F	125°F
-----	-------	-------

Ambient temperature – remote pilot operated valves

0°F	200°F
-----	-------

Material specifications

Manifolds & subbases	Aluminum alloy	
Other seals	Nitrile	
Resilient seals: in valve body		
Dynamic	Polyurethane base on 3/8" basic valves*	
Static / dynamic	Nitrile base w / 12% Molybdenum Disulphide on 1/4" & 1/2" basic valves	
Shock pads	Polyurethane	
Solenoid bodies	Plated zinc alloy	
Internal components	Corrosion resistant steel	
Resilient seals	Standard service	Nitrile
	Special service (continuous duty)	Fluorocarbon & Silicone
Other seals	Nitrile	
Coil	Class “B” epoxy encapsulated (Class “H” also available on some models, consult supplier)	
Valve bodies	Aluminum alloy	
Valve spacers	Brass	
Valve spool	Aluminum alloy with special coating on 3/8" basic valves*.	
	Hard chrome plated AISI type 416 stainless steel on 1/4" & 1/2" basic valves.	

* These materials are specially designed for valves used on non-lubricated service

As the above chart indicates, Standard Duty Solenoids may be used on continuous duty but ambient temperature is de-rated.

In some cases, Special Service Solenoids may be rated for higher ambient temperatures (consult supplier).





Caution:



If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage and unpredictable behavior.

 Most popular.





4-way, 5-port, 2-position, Plug-in

L675 (3/8" basic valve) Single solenoid	L655 (3/8" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (Side ports)	Manifold† (End & bottom ports)	Voltage	Valve only						
							Single solenoid	Double solenoid					
		4.8	3/8"	K022090	K142230	120V 60Hz	L6753910253	L6553910253					
							4.8	1/2"	K022091	K142231	110V 50Hz	L6753910253	L6553910253
							4.8	3/4"	K022101	K142270	24VDC	L6753310249	L6553310249



L675 (1" basic valve) Single solenoid	L655 (1" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (Side ports)	Manifold† (End & bottom ports)	Voltage	Valve only						
							Single solenoid	Double solenoid					
		11.3	1"	K022095	K142230	120V 60Hz	L6758910253	L6558910253					
							11.3	1"	K022095	K142231	110V 50Hz	L6758910253	L6558910253
							11.3	1"	K022095	K142270	24VDC	L6758310249	L6558310249



4-way, 5-port, 3-position, Plug-in

L665 (3/8" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (side ports)	Manifold † (end & bottom ports)	Voltage	Valve only						
						Double solenoid						
	4.8	3/8"	K022090	K142230	120V 60Hz	L6653921153						
						4.8	1/2"	K022091	K142231	110V 50Hz	L6653921153	
						4.8	3/4"	K022101	K142270	24VDC	L6653321149	



L665 (1" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (side ports)	Manifold (end & bottom ports)	Voltage	Valve only						
						Double solenoid						
	11.3	1"	K022095	K142230	120V 60Hz	L6658921153						
						11.3	1"	K022095	K142231	110V 50Hz	L6658921153	
						11.3	1"	K022095	K142270	24VDC	L6658321149	

4-way, 5-port, 2-position, Direct Pipe Ported

L705 (3/8" basic valve) single solenoid	L685 (3/8" basic valve) double solenoid	Port size (NPT)		Nominal Cv	Voltage	Operator type	Valve	
		P, A & B	EA & EB				Single solenoid	Double solenoid
		3/8"	1/2"	4.8	120V 60Hz	Junction box	L7053910253	L6853910253
							L7054910253	L6854910253
		3/8"	1/2"	4.8	24VDC	Junction box	L7053610249	L6853610249
							L7054610249	L6854610249
		3/8"	1/2"	4.8	120V 60Hz	Basic	L7053310253	L6853310253
							L7054310253	L6854310253
L7054310253	L6854310253							

L705 (1" basic valve) single solenoid	L685 (1" basic valve) double solenoid	Port size (NPT)		Nominal Cv	Voltage	Operator type	Valve	
		P, A & B	EA & EB				Single solenoid	Double solenoid
		1"	1-1/4"	12.0	120V 60Hz	Junction box	L7058910253	L6858910253
							L7059910253	L6859910253
		1"	1-1/4"	12.0	24VDC	Junction box	L7058610249	L6858610249
							L7059610249	L6859610249

4-way, 5-port, 3-position, Direct Pipe Ported

L695 (3/8" basic valve) double solenoid	L695 (1" basic valve) double solenoid	Port size (NPT)		Nominal Cv	Voltage	Operator type	Valve	
		P, A & B	EA & EB				3/8" basic size	1" basic size
		3/8"	1/2"	4.5	120V 60Hz	Junction box	L6953921153	—
							L6954921153	—
		1"	1-1/4"	12.0	110V 50Hz	Junction box	—	L6958921153
							—	L6959921153

† Manifolds include mounting hardware, except for port adapters.

Modulflex
Series

Isys Micro
Series

Isys ISO
Series

Fieldbus

DX ISOMAX
Series

Valvair II
Series

D

Subbase & Manifold
Valve Products

Lubricated Non-Lubricated Service
2-position, Plug-In, 3/8" & 1" Basic Size

- Modulflex Series
- Isys Micro Series
- Isys ISO Series
- Fieldbus
- DX ISOMAX Series
- Valvair II Series
- D** Subbase & Manifold Valve Products

L 67 5 3 9 10 2 53

Type	
Double	65
Single	67

Operator	
Remote	4
Solenoid	5

Size	
3/8" Basic	3
1" Basic	8

Operator options	
Solenoid (basic) or remote	1
Solenoid with locking override	3
Solenoid w/light (120VAC, 24VDC) & non-locking override	8
Solenoid w/light (120VAC, 24VDC) & locking override	9

Voltage & frequency			
	60Hz	50Hz	DC
45			12
49			24
53	120	110	
57	240	220	

Duty Cycle	
2	Standard service, solenoid or remote
4	Continuous service solenoid

Enclosure "Class"	
10	Standard (NEMA 1 & 12) or remote

Lubricated or Non-Lubricated Service
3-position, Plug-In, 3/8" & 1" Basic Size

L 66 5 3 9 21 1 53

Type	
Double	66

Operator	
Remote	4
Solenoid	5

Size	
3/8" Basic	3
1" Basic	8

Operator options	
Solenoid (basic) or remote	1
Solenoid with locking override	3
Solenoid w/light (120VAC, 24VDC) & non-locking override	8
Solenoid w/light (120VAC, 24VDC) & locking override	9

Voltage & frequency			
	60Hz	50Hz	DC
45			12
49			24
53	120	110	
57	240	220	

Duty cycle	
1	Standard service, solenoid or remote
5	Continuous service solenoid

Enclosure "class"	
21	All ports blocked in neutral (NEMA 1 & 12 enclosure) or remote
22	Cyl. Ports open to exhaust in neutral (NEMA 1 & 12 enclosure) or remote
23	Cyl. Ports open to inlet in neutral (NEMA 1 & 12 enclosure) or remote

Lubricated or Non-Lubricated Service
2-position, Direct Pipe Ported, 3/8" & 1" Basic Size

L	70	5	3	9	10	2	53	—
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Type	
Double	68
Single	70

Operator	
Remote	4
Solenoid	5

Size	
3/8" NPT inlet & cylinder 1/2" NPT exhaust	3
1/2" NPT inlet, cylinder & exhaust	4
1" NPT inlet & cylinder 1-1/4" NPT exhaust	8
1-1/4" NPT inlet cylinder & exhaust	9*

* Not available operator option 4 - Remote pilot.

Operator options	
Solenoid (basic) or remote	1
Solenoid with locking override	3
Solenoid w/ junction box & locking override	6
Solenoid w/ junction box & light (120VAC, 24VDC) & non-locking override	8
Solenoid w/ junction box & light (120VAC, 24VDC) & locking override	9

Lead length	
Blank	19" (Standard)

Voltage & frequency			
	60Hz	50Hz	DC
45			12
49			24
53	120	110	
57	240	220	

Duty cycle	
2	Standard service, solenoid or remote
4	Continuous service solenoid

Enclosure "Class"	
10	Standard (NEMA 1 & 12) or remote
60*†	Hazardous duty (NEMA 7 & 9)
80*†	NEMA 4

* Voltage 49 / 53 only.
 † Use with operator options 1, 2 & 3 only, voltage 53 only.

Lubricated or Non-Lubricated Service
3-position, Direct Pipe Ported, 3/8" & 1" Basic Size

L	69	5	3	9	21	1	53	—
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Type	
Double	69

Operator	
Remote	4
Solenoid	5

Size	
3/8" NPT inlet & cylinder 1/2" NPT exhaust	3
1/2" NPT inlet, cylinder & exhaust	4
1" NPT inlet & cylinder 1-1/4" NPT exhaust	8
1-1/4" NPT inlet cylinder & exhaust	9*

* Not available operator option 4 - Remote pilot.

Operator options	
Solenoid (basic) or remote	1
Solenoid with locking override	3
Solenoid w/ junction box & locking override	6
Solenoid w/ junction box & light (120VAC, 24VDC) & non-locking override	8
Solenoid w/ junction box & light (120VAC, 24VDC) & locking override	9

Lead length	
Blank	19" (Standard)

Voltage & frequency			
	60Hz	50Hz	DC
45			12
49			24
53	120	110	
57	240	220	


Duty cycle	
1	Standard service, solenoid or remote
5	Continuous service solenoid

Enclosure "Class"	
All ports blocked in neutral	
21	Standard (NEMA 1 & 12) or remote
71*†	Hazardous duty (NEMA 7 & 9)
91*†	NEMA 4
Cylinder ports open to exhaust in neutral	
22	Standard (NEMA 1 & 12) or remote
72*†	Hazardous duty (NEMA 7 & 9)
92*†	NEMA 4
Cylinder ports open to inlet in neutral	
23	Standard (NEMA 1 & 12) or remote
73*†	Hazardous duty (NEMA 7 & 9)
93*†	NEMA 4

* Voltage 49 / 53 only.
 † Use with operator options 1, 2 & 3 only, voltage 53 only.


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DX ISOMAX Series
Valvair II Series
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Subbase & Manifold Valve Products


Plug-in Pilot

	Description	Standard service		Special service	
	Override type	Locking	Non-locking	Locking	Non-locking
	With override (120VAC)	K175903553	K175803553	K185902553	K185802553
With override (Other than 120VAC)	K1753035**	—	K1853025**	—	

** Voltage code - (reference model index for availability)


NEMA 1 & 12

	Description	Standard service		Special service	
	Override type	Locking	Non-locking	Locking	Non-locking
	Basic with override	K0653035**	—	K0853025**	—

	JIC with junction box & override	K0656035**	K0655035**	K0856025**	K0855025**
	JIC pilot with junction box & override & indicator lights (120VAC Only)	K0659035**	K0658035**	K0859025**	K0858025**

** Voltage code - (reference model index for availability)

NEMA 4, 7 & 9

	Description	Standard service		Special service	
	Override type	Locking	Non-locking	Locking	Non-locking
	Hazardous duty pilot - UL & CSA	K0251035***	—	K0451025***	—
NEMA 4 pilot	K2351035***	—	—	—	
Hazardous duty with override	K0253035***	K0252035***	K0453025***	K0452025***	
NEMA 4 with override	—	K2353035***	K2352035***	—	

† 49 / 53 only ** Voltage code - (reference model index for availability)

Service Kits

Basic valve	Solenoid operated *						Remote pilot operated	
	Size	Series (prefix)	Standard service (intermittent duty)		Special service ** (continuous duty)		Single	Double 2 & 3-position
			Single	Double 2 & 3-position	Single	Double 2 & 3-position		
3/8"	L65	—	K352126	—	K352127	—	K352355	
	L66	—	K352126	—	K352127	—	K352355	
	L67	K352124	—	K352125	—	K352362	—	
	L68	—	K352126	—	K352127	—	K352355	
	L69	—	K352126	—	K352127	—	K352355	
	L70	K352124	—	K352125	—	K352362	—	
	L65	—	K352130	—	K352131	—	K352360	
1"	L66	—	K352130	—	K352131	—	K352360	
	L67	K352128	—	K352129	—	K352359	—	
	L68	—	K352130	—	K352131	—	K352360	
	L69	—	K352130	—	K352131	—	K352360	
	L70	K352128	—	K352129	—	K352359	—	

Notes:

* Kits for solenoid operated valves include solenoid service kits.
 ** Special service (continuous duty) solenoids may be identified as having gold colored solenoid tops.



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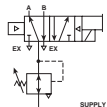
Modular Pneumatic Controls, Plug-In Sandwich Block Design for Modular Port Regulation

These modular regulators assemble to any 3/8" basic valve interface pattern.

Common Port Regulator

Pressure Adjustment	Pressure Range PSIG	Part number	
		Assembly "A"	Assembly "B"
Manual	1 - 60	L55402308C	L55408302C
	2 - 125	L55403308C	L55408303C
Remote	0 - 140	L55411308C	L55408311C

* Assembly "A" places the regulator on the end opposite the electrical junction box. Assembly "B" places the regulator over the electrical junction box.

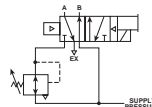


Regulated pressure at both "A" & "B"

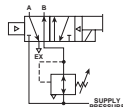
Single Port Regulator

Pressure adjustment	Pressure range PSIG	Part number	
		Cyl. port "A"	Cyl. port "B"
Manual	1 - 60	L55405307C	L55407305C
	2 - 125	L55406307C	L55407306C
Remote	0 - 140	L55414307C	L55407314C

* Assembly "A" places the regulator on the end opposite the electrical junction box. Assembly "B" places the regulator over the electrical junction box. Convert valve to external pilot.



Supply pressure at "B" & regulated at "A"

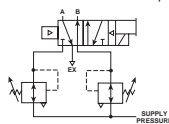


Supply pressure at "A" & regulated at "B"

Independent Port Regulator

Pressure adjustment	Cylinder port "A" PSIG	Part number	
		Cylinder port "B"	10 - 125†
Manual	1 - 60	L55405305C	—
Remote	0 - 140	—	L55414314C†

† Remote operator units 0-140 PSIG. Convert valve to external pilot.



Independently regulated pressure at both "A" & "B"

Blank Station Covers

Manifold assembly	Blank cover kit
K142230	3/8" Basic valve
K142231	3/8" Basic valve
K142270	3/8" Basic valve

Flush Type Hex Drive Pipe Plugs for Port Isolation

Size (NPTF)	Part number
1/8"	K21R02012L
1/4"	K21R02025L
3/8"	K21R02037L
1/2"	K21R02050L
3/4"	K21R02075L

Interchangeable Manual Override Assemblies for Solenoid Operators



Non-locking type	Locking type
K162001	K152003

Replacement Solenoid Coil

L □ □ □ □ □ □ □ □ □ □ ** Voltage Code

Voltage code	Voltage			Coil number	
	60 Hz	50 Hz	DC	Plug-In	Flying lead (19") *
49	—	—	24†	K593060 K593274‡	K593014
53	120†	110	—	K593071 K593125‡	K593025
57	240†	220	—	K593081	K593035

Notes: **Bold Face** type indicated primary coil rating.

† Indicates voltages approved for solenoid operators designed for use in hazardous locations.

* 19" Coil lead length is standard. Other lead lengths may be available, consult supplier.

‡ Assembly includes indicator light socket, less light.

Conversion Kits: Lubricated to Non-Lubricated Operation

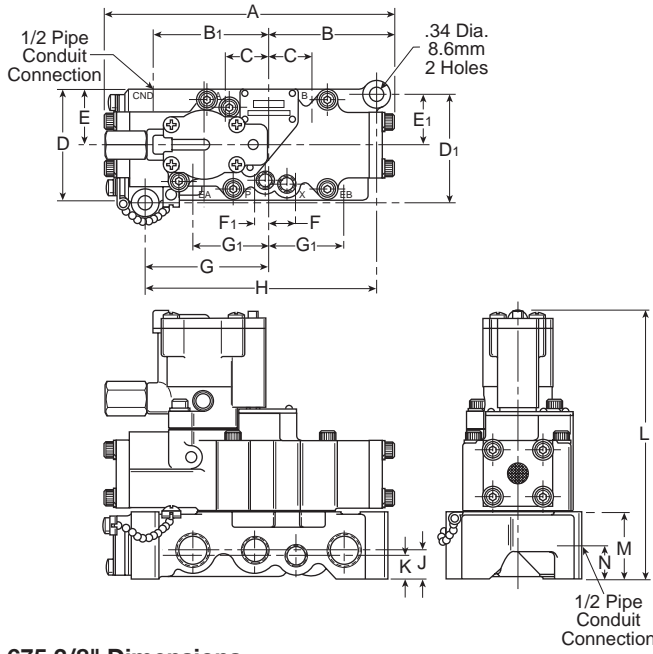
Basic size	Operators (solenoid or remote pilot)	
	Single	Double (2-position)
3/8"	K322012	K322013

Electrical Connectors Single or Double Solenoid Valves

Basic size	Valve body		Subbase / manifold	
	Single solenoid	Double solenoid	19" leads	72" leads
3/8"	H02723	H02722	H02713	H02789
1"				



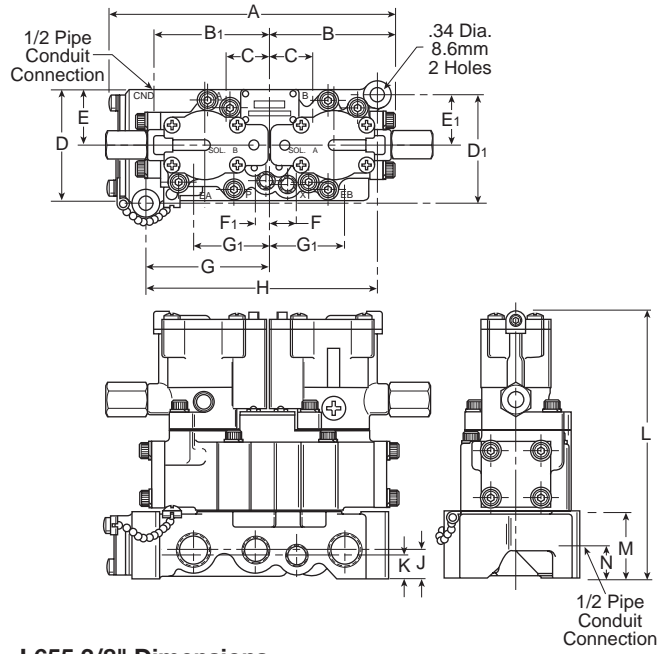
Modulflex Series
 Isys Micro Series
 Isys ISO Series
 Fieldbus
 DX ISOMAX Series
 Valvair II Series
D
 Subbase & Manifold Valve Products



L675 3/8" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
7.56 (192)	3.32 (84.3)	2.94 (74.7)	1.12 (28.4)	2.88 (73.2)	2.84 (72.1)	1.44 (36.6)	1.34 (34)	.75 (19.1)
F ₁	G	G ₁	H	J	K	L	M	N
.38 (9.7)	3.16 (80.3)	2.00 (50.8)	6.03 (153.2)	.75 (19.1)	.62 (15.7)	6.93 (176)	1.75 (44.5)	1.00 (25.4)

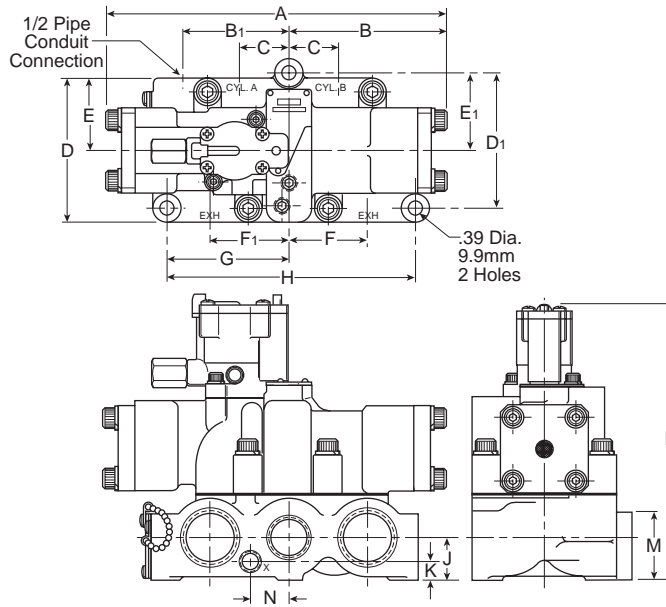
Inches (mm)



L655 3/8" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
7.38 (187.5)	3.32 (84.3)	2.94 (74.7)	1.12 (28.4)	2.88 (73.2)	2.84 (72.1)	1.44 (36.6)	1.34 (34)	.75 (19.1)
F ₁	G	G ₁	H	J	K	L	M	N
.38 (9.7)	3.16 (80.3)	2.00 (50.8)	6.03 (153.2)	.75 (19.1)	.62 (15.7)	6.93 (176)	1.75 (44.5)	1.00 (25.4)

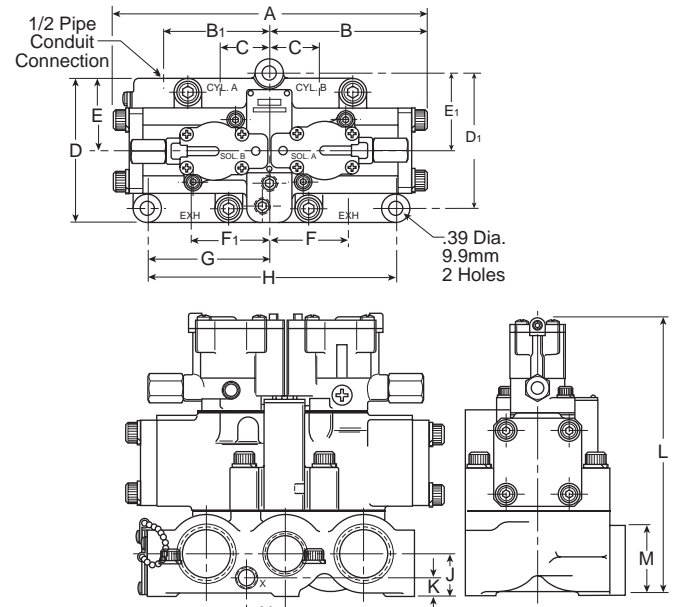
Inches (mm)



L675 1" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
10.46 (265.7)	4.75 (120.6)	2.94 (74.7)	3.38 (85.8)	4.56 (115.8)	4.28 (108.7)	2.28 (57.9)	2.44 (62)	2.45 (62.2)
F ₁	G	H	J	K	L	M	N	
2.46 (62.5)	3.81 (96.8)	7.62 (193.5)	1.31 (33.3)	.59 (15)	8.74 (222)	2.09 (53.1)	1.22 (31)	

Inches (mm)

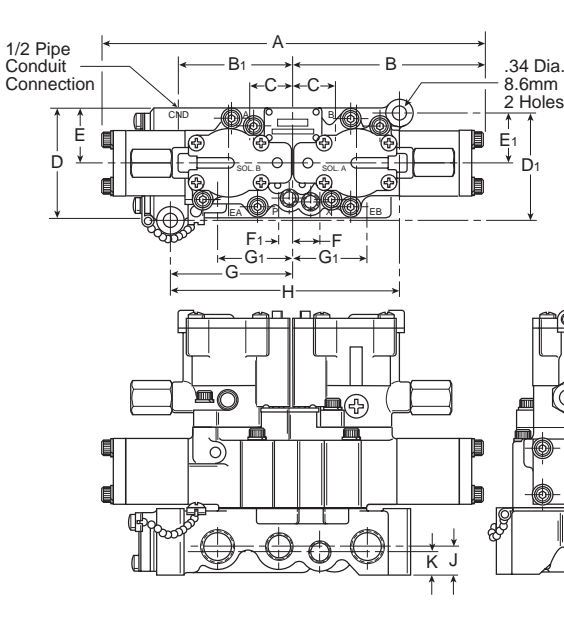


L655 1" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
9.50 (241.3)	4.75 (120.6)	3.38 (85.8)	1.53 (38.9)	4.56 (115.8)	4.28 (108.7)	2.28 (57.9)	2.44 (62)	2.45 (62.2)
F ₁	G	H	J	K	L	M	N	
2.46 (62.5)	3.81 (96.8)	7.62 (193.5)	1.31 (33.3)	.59 (15)	8.74 (222)	2.09 (53.1)	1.22 (31)	

Inches (mm)

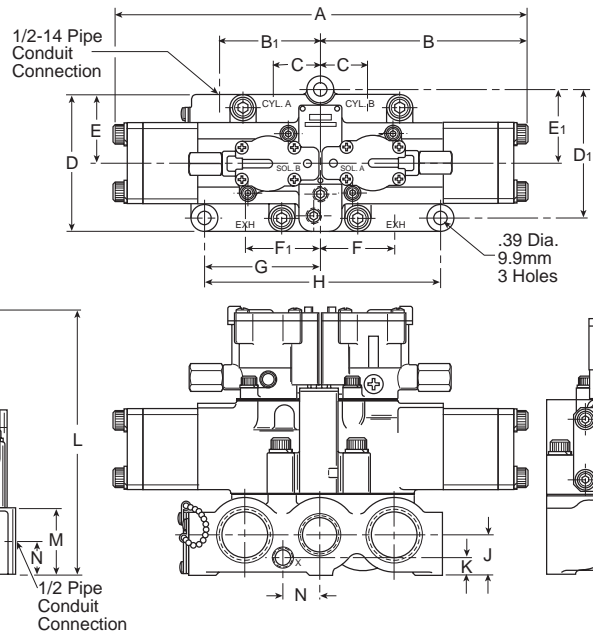




L665 3/8" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
9.64 (244.8)	4.82 (122.4)	2.94 (74.7)	1.12 (28.4)	2.88 (73.2)	2.84 (72.1)	1.44 (36.6)	1.34 (34)	.75 (19.1)
F ₁	G	G ₁	H	J	K	L	M	
.38 (9.7)	3.16 (80.3)	2.00 (50.8)	6.03 (153.2)	.75 (19.1)	.62 (15.7)	6.93 (176)	1.00 (25.4)	

Inches (mm)



L665 1" Dimensions

A	B	B ₁	C	D	D ₁	E	E ₁	F
13.62 (345.9)	6.81 (173)	3.38 (85.8)	1.53 (38.9)	4.56 (115.8)	4.28 (108.7)	2.28 (57.9)	2.44 (62)	2.45 (62.2)
F ₁	G	H	J	K	L	M	N	
2.46 (62.5)	3.81 (96.8)	7.62 (193.5)	1.31 (33.3)	.59 (15)	8.74 (222)	2.09 (53.1)	1.22 (31)	

Inches (mm)

Modulflex Series

Isys Micro Series

Isys ISO Series

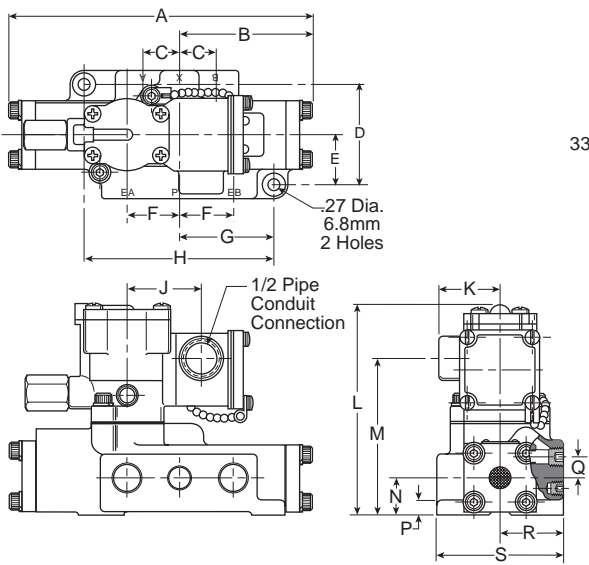
Fieldbus

DX ISOMAX Series

Valvair II Series

D

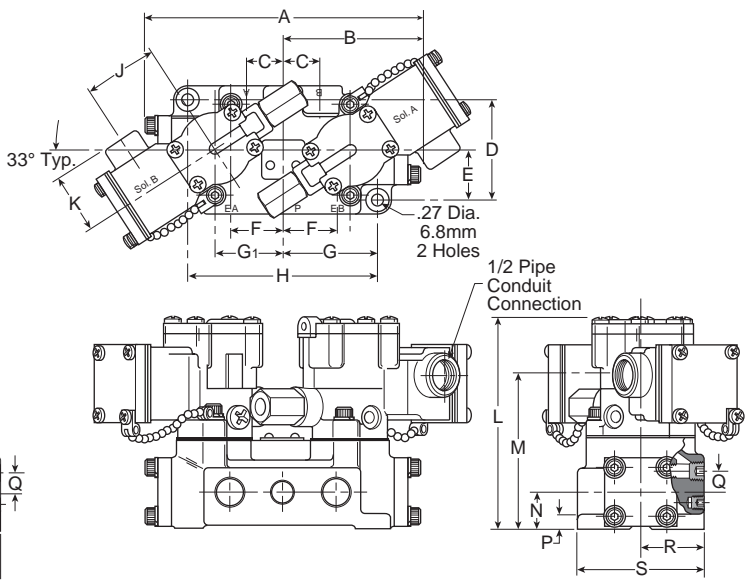
Subbase & Manifold Valve Products



L705 3/8" Dimensions

A	B	C	D	E	F	G	H	J
7.56 (192)	3.32 (84.3)	.90 (22.9)	2.56 (65)	1.28 (32.5)	1.33 (33.8)	2.34 (59.4)	4.69 (119.1)	1.82 (46.2)
K	L	M	N	P	Q	R	S	
1.50 (38.1)	5.35 (135.9)	3.91 (99.3)	.94 (23.9)	.38 (9.7)	.53 (13.5)	1.62 (41.1)	3.25 (82.6)	

Inches (mm)

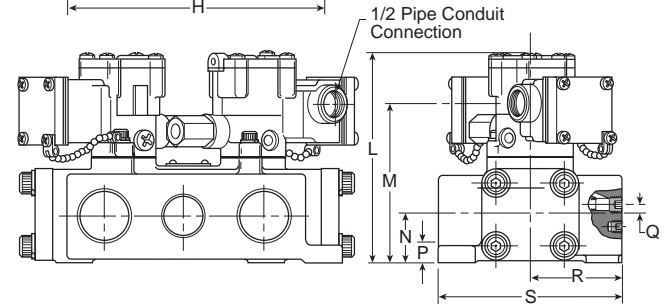
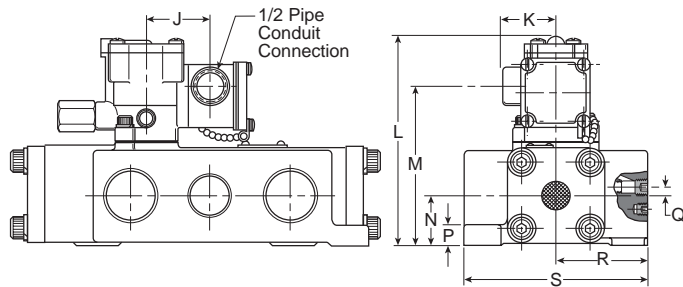
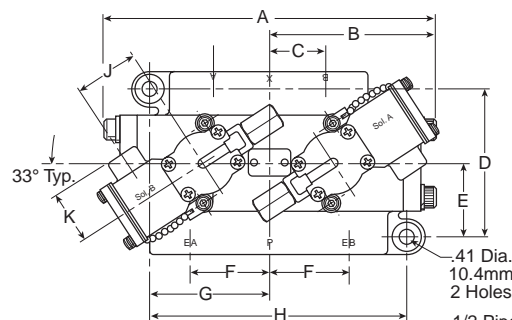
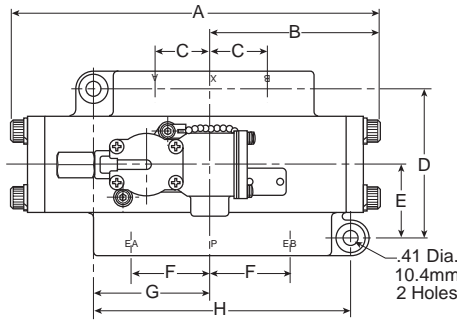


L685 3/8" Dimensions

A	B	C	D	E	F	G	G ₁	H
7.56 (192)	3.32 (84.3)	.90 (22.9)	2.56 (65)	1.28 (32.5)	1.33 (33.8)	2.34 (59.4)	1.66 (42.4)	4.69 (119.1)
J	K	L	M	N	P	Q	R	S
1.82 (46.2)	1.50 (38.1)	5.35 (135.9)	3.91 (99.3)	.94 (23.9)	.38 (9.7)	.53 (13.5)	1.62 (41.1)	3.25 (82.6)

Inches (mm)





L705 1" Dimensions

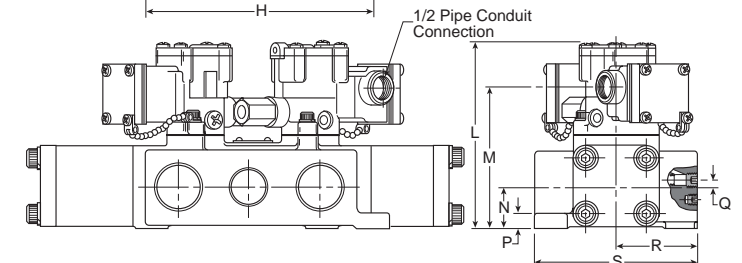
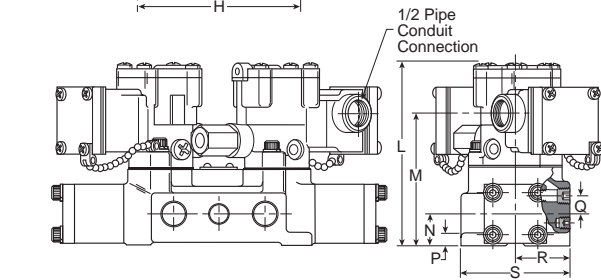
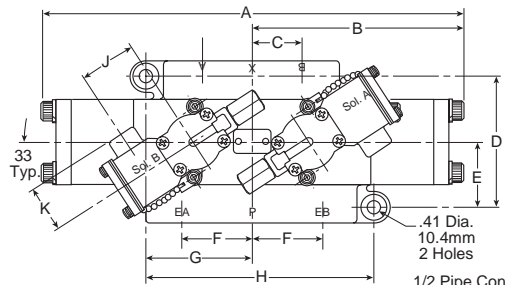
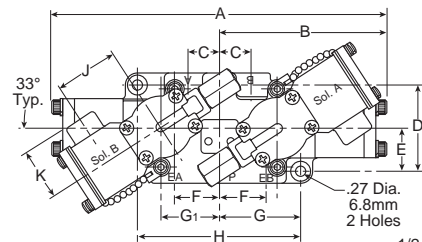
A	B	C	D	E	F	G	H	J
10.46	4.75	1.62	4.25	2.12	2.19	3.44	7.44	1.82
(265.7)	(120.6)	(41.1)	(108)	(53.8)	(55.6)	(87.4)	(189)	(46.2)
K	L	M	N	P	Q	R	S	
1.50	6.44	4.95	1.50	.69	.20	2.62	5.25	
(38.1)	(163.6)	(125.7)	(38.1)	(17.5)	(5.1)	(66.5)	(133.4)	

Inches (mm)

L685 1" Dimensions

A	B	C	D	E	F	G	H	J
9.50	4.75	1.62	4.25	2.12	2.19	3.44	7.44	1.82
(241.3)	(120.6)	(41.1)	(108)	(53.8)	(55.6)	(87.4)	(189)	(46.2)
K	L	M	N	P	Q	R	S	
1.50	6.44	4.95	1.50	.69	.20	2.62	5.25	
(38.1)	(163.6)	(125.7)	(38.1)	(17.5)	(5.1)	(66.5)	(133.4)	

Inches (mm)



L695 3/8" Dimensions

A	B	C	D	E	F	G	G1	H
9.64	4.82	.90	2.56	1.28	1.33	2.34	1.66	4.69
(244.8)	(122.4)	(22.9)	(65)	(32.5)	(33.8)	(59.4)	(42.4)	(119.1)
J	K	L	M	N	P	Q	R	S
1.82	1.50	5.35	3.91	.94	.38	.53	1.62	3.25
(46.2)	(38.1)	(135.9)	(99.3)	(23.9)	(9.7)	(13.5)	(41.1)	(82.6)

Inches (mm)

L695 1" Dimensions

A	B	C	D	E	F	G	H	J
13.63	6.81	1.62	4.25	2.12	2.19	3.44	7.44	1.82
(346.2)	(173)	(41.1)	(108)	(53.8)	(55.6)	(87.4)	(189)	(46.2)
K	L	M	N	P	Q	R	S	
1.50	6.44	4.95	1.50	.69	.20	2.62	5.25	
(38.1)	(163.6)	(125.7)	(38.1)	(17.5)	(5.1)	(66.5)	(133.4)	

Inches (mm)



Plug-in Manifold, 3/8" Basic

- K142230Cylinder ports 3/8" NPTF
- K142231Cylinder ports 1/2" NPTF
- K142270Cylinder ports 3/4" NPTF
 - Exhaust port..... 1" NPTF
 - Inlet port..... 1" NPTF
 - Conduit port..... 1-1/4" NPTF

Note: Manifold assemblies include mounting hardware.

Modulflex Series
Isys Micro Series
Isys ISO Series
Fieldbus
DX ISOMAX Series
Valvair II Series
D
Subbase & Manifold Valve Products

Directair 2 & 4 Series

Features

Directair 2, 1/8" valves

Poppet style – .17 Cv

- Economical
- 3-way normally closed function

Directair 2, 1/8" valves

Packed bore style – .20 Cv

- Stainless steel spool
- Fluorocarbon o-rings
- 3-way & 4-way

Directair 4, 1/4" valves

Packed bore style – .83 Cv

- Stainless steel spool
- Fluorocarbon o-rings
- 3-way & 4-way



Material specifications

Body and operator housings	Aluminum extrusion
Bushings and pilot piston	Brass
Dynamic seals	Fluorocarbon
O-rings	Buna (nitrile)
Poppet ball	Nylon
Spacers - Directair 2	Aluminum
Spacers - Directair 4	Zinc die cast
Spool	Stainless steel

Lubrication

For maximum service life use clean, lubricated air. Valves are shipped pre-lubricated and can be operated without additional lubrication with reduced service life.

Suggested Lubricant

F442 Oil

Operating information

Operating pressure	Vacuum to 150 PSI (28 inHg to 1035 kPa)*
Temperature range	32°F to 175°F (0°C to 80°C)

* Poppet valves cannot be used for vacuum.
 Minimum operating pressure = 0 PSIG.



CAUTION:

If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage or unpredictable behavior.

Mechanically operated actuating forces in lbs. 1/4" Directair 4 valves


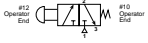
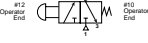
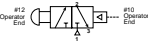
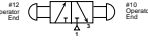
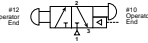

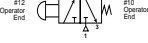

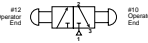

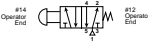
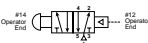

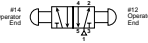
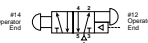

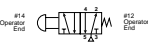
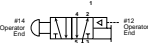


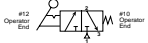
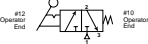



	2-Position Spring Return	2-Position Manual Return	3-Position Spring Return	3-Position Manual Return
Button Actuator	13.0	2.0	13.0	N/A
Roller Actuator	13.0	N/A	N/A	N/A
Lever Actuator	4.0	2.0	4.0	2.5

Notes: N/A = Not Applicable
 All valves are at 100 PSIG inlet pressure to the valve.

Most popular.

Directair 2, Directair 4
 Viking Xtreme Lever Series
 42 Lever / Pedal Series
 M0 Series
 LV-EZ Series Lockout Valves
 Brass Poppet / Sliding Seal
 D Manual / Mechanical Valve Products

3-way & 4-way Valves

	Symbol	Port size	Cv	Description	Valve type	Part number	
		1/8"	.17	3-way, spring return	Poppet	404411000	
		1/8"	.20	3-way, spring return	Spool	414411000	
		1/8"	.20	3-way, spring return, foot mounted	Spool	414421000	
		1/8"	.20	3-way, pilot return	Spool	414451000	
		1/8"	.20	3-way, manual return	Spool	414931000	
		1/8"	.20	3-way, manual return, foot mounted	Spool	414941000	
		1/8"	.20	3-way, manual or pilot return	Spool	414951000	
		1/4"	.83	3-way, spring return	Spool	524411000	
		1/4"	.83	3-way, pilot return	Spool	524451000	
		1/4"	.83	3-way, manual return	Spool	524431000	
			1/8"	.20	4-way, spring return	Spool	410411000
			1/8"	.20	4-way, spring return, foot mounted	Spool	410421000
		1/8"	.20	4-way, pilot return	Spool	410451000	
		1/8"	.20	4-way, manual return	Spool	410931000	
		1/8"	.20	4-way, manual return, foot mounted	Spool	410941000	
		1/8"	.20	4-way, manual or pilot return	Spool	410951000	
		1/4"	.83	4-way, spring return	Spool	520411000	
		1/4"	.83	4-way, pilot return	Spool	520451000	
		1/4"	.83	4-way, manual return	Spool	520431000	
			1/8"	.17	3-way, spring return	Poppet	404811000
			1/8"	.20	3-way, spring return	Spool	414811000
			1/8"	.20	3-way, spring return, foot mounted	Spool	414821000
		1/8"	.20	4-way, spring return	Spool	410811000	
		1/8"	.20	4-way, spring return, foot mounted	Spool	410821000	

Directair 2,
Directair 4

Viking Xtreme
Lever Series

42 Lever/
Pedal Series

M0
Series

LV-EZ Series
Lockout Valves


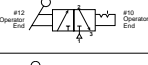
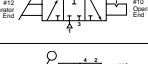

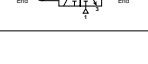

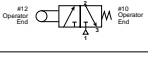
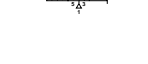
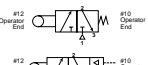
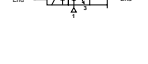

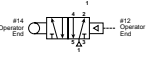


Brass Poppet /
Sliding Seal

D



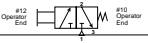
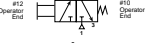
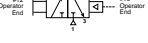
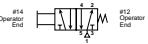
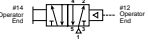


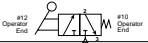
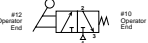
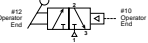
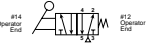



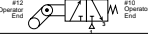
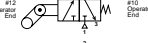
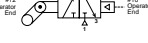
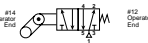
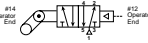

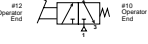
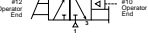
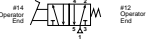
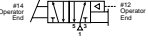


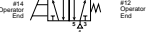
Manual / Mechanical
Valve Products



3-way & 4-way Valves

	Symbol	Port size	Cv	Description	Valve type	Part number
Lever operated 		1/4"	.83	3-way, spring return	Spool	524811000
		1/4"	.83	3-way, manual return	Spool	524831000
		1/4"	.83	3-way, 3-Position detented, all ports blocked	Spool	523831000
		1/4"	.83	4-way, spring return	Spool	520811000
		1/4"	.83	4-way, manual return	Spool	520831000
		1/4"	.83	4-way, spring centered, closed center	Spool	521811000
		1/4"	.83	4-way, spring centered, pressure center	Spool	522811000
		1/4"	.83	4-way, spring centered, exhaust center	Spool	529811000
		1/4"	.83	4-way, detented, closed center	Spool	521831000
		1/4"	.83	4-way, detented, pressure center	Spool	522831000
		1/4"	.83	4-way, detented, exhaust center	Spool	529831000
	Roller operated 		1/8"	.20	3-way, spring return	Poppet
		1/8"	.20	3-way, spring return	Spool	414211000
		1/8"	.20	3-way, spring return, foot mounted	Spool	414221000
		1/8"	.20	3-way, pilot return	Spool	414251000
		1/8"	.20	4-way, spring return	Spool	410211000
		1/8"	.20	4-way, spring return, foot mounted	Spool	410221000
		1/8"	.20	4-way, pilot return	Spool	410251000
		1/4"	.83	3-way, spring return, delrin roller	Spool	524211000
		1/4"	.83	3-way, pilot return, delrin roller	Spool	524251000
		1/4"	.83	3-way, spring return, steel roller	Spool	524A11000
	1/4"	.83	3-way, pilot return, steel roller	Spool	524A51000	
	1/4"	.83	4-way, spring return, delrin roller	Spool	520211000	
	1/4"	.83	4-way pilot return, delrin roller	Spool	520251000	
	1/4"	.83	4-way, spring return, steel roller	Spool	520A11000	
	1/4"	.83	4-way, pilot return, steel roller	Spool	520A51000	

3-way & 4-way Valves

	Symbol	Port size	Cv	Description	Valve type	Part number	
Plunger operated  		1/8"	.17	3-way, spring return	Poppet	404111000	
		1/8"	.20	3-way, spring return	Spool	414111000	
		1/8"	.20	3-way, spring return, foot mounted	Spool	414121000	
		1/8"	.20	3-way, pilot return	Spool	414151000	
		1/8"	.17	4-way, spring return	Spool	410111000	
		1/8"	.20	4-way, spring return, foot mounted	Spool	410121000	
		1/8"	.20	4-way, pilot return	Spool	410151000	
	Hand lever operated  		1/8"	.17	3-way, spring return	Poppet	404711000
			1/8"	.20	3-way, spring return	Spool	414711000
			1/8"	.20	3-way, spring return, foot mounted	Spool	414721000
		1/8"	.20	3-way, pilot return	Spool	414751000	
		1/8"	.20	4-way, spring return	Spool	410711000	
		1/8"	.20	4-way, spring return, foot mounted	Spool	410721000	
		1/8"	.20	4-way, pilot return	Spool	410751000	
One way tripper operated  			1/8"	.17	3-way, spring return	Poppet	404311000
			1/8"	.20	3-way, spring return	Spool	414311000
			1/8"	.20	3-way, spring return, foot mounted	Spool	414321000
		1/8"	.20	3-way, pilot return	Spool	414351000	
		1/8"	.20	4-way, spring return	Spool	414311000	
		1/8"	.20	4-way, spring return, foot mounted	Spool	414321000	
		1/8"	.20	4-way, pilot return	Spool	414351000	
	Pedal operated 		1/4"	.83	3-way, spring return	Spool	524711000
			1/4"	.83	3-way, pilot return	Spool	524751000
			1/4"	.83	4-way, spring return	Spool	520711000
		1/4"	.83	4-way, pilot return	Spool	520751000	
<p>CAUTION: <i>This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.</i></p>							
Treadle operated 		1/4"	.83	3-way, treadle operated, detented	Spool	524931000	
		1/4"	.83	4-way, treadle operated, detented	Spool	520931000	
<p>CAUTION: <i>This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.</i></p>							

Directair 2,
Directair 4

Viking Xtreme
Lever Series

42 Lever/
Pedal Series

M0
Series

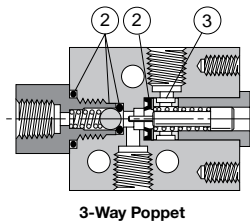
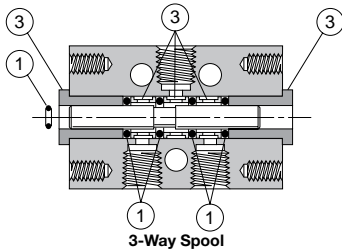
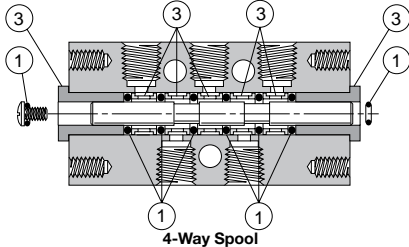
LV-EZ Series
Lockout Valves

Brass Poppet/
Sliding Seal

D
Manual / Mechanical
Valve Products

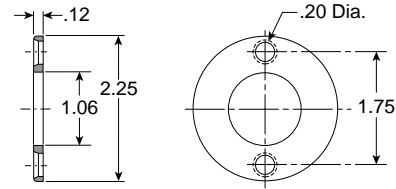
Service kits – 1/8 port size valves (DA2)

①	Spool valve seal kit (3 & 4-way, direct pipe ported)	410008000
②	Poppet valve seal kit	404118000
③	Body service kit	410008005



Panel Mounting Kit – No. 520838004

Available for panel mounting direct pipe ported, lever operated 1/4" Directair 4 Series valves only. Kit includes a flange and two screws.

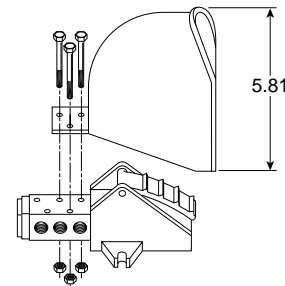


Pedal Guard Kit – No. 520718001

Pedal guard meets safety requirements for foot operated valves by protecting pedal from accidental tripping from all angles. Guard is constructed of lightweight aluminum casting for strength and durability. Bolts quickly into place with only three screws without special valve mounting. One model fits any pedal (not treadle) operated 1/4" Directair 4 Series valve.

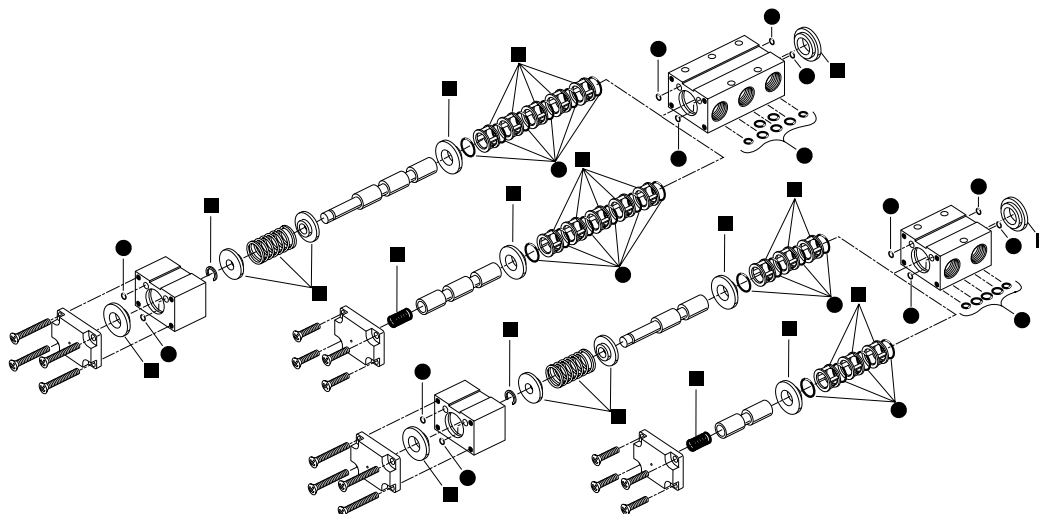
⚠ CAUTION:

*This valve shall not be used to actuate a punch press.
 Do not use this valve on punch presses or press brakes.
 See OSHA 1910.217.*



Service kits – 1/4 port size valves (DA4)

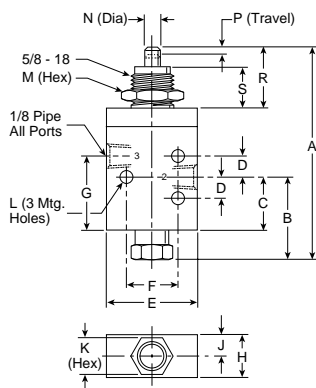
●	Valve seal kit (Contains all soft seals found in 3 & 4-way bodies and all actuator styles.) All fluorocarbon	520008050
■	Body service kit (Contains bushing, springs, retainers and shell from 2 & 3-position, 3 & 4-way bodies.)	520018005



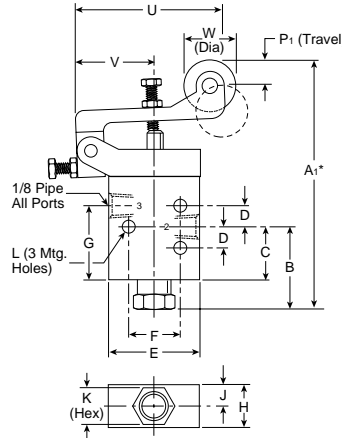
Directair 2, Directair 4
 Viking Xtreme Lever Series
 42 Lever / Pedal Series
 M0 Series
 LV-EZ Series Lockout Valves
 Brass Poppet / Sliding Seal
 Manual / Mechanical Valve Products

Plunger, Roller, One-way Tripper & Toggle Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

Plunger Operated



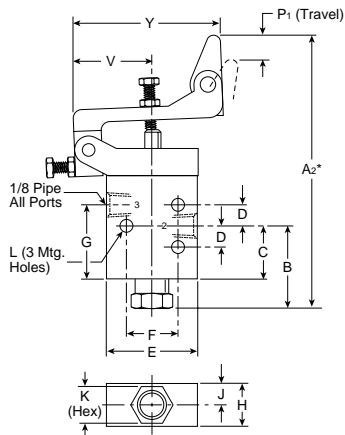
Roller Operated



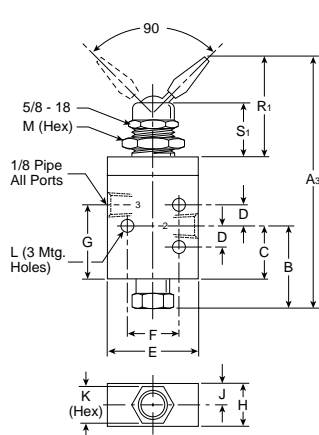
3-Way, 3-Port, 2-Position

A	A1*	A2*	A3	B
3.37 (86)	4.21 (107)	4.46 (113)	3.99 (101)	1.03 (26)
C	D	E	F	G
.55 (14)	.31 (8)	1.31 (33)	.75 (19)	.90 (23)
H	J	K	L	M
.62 (16)	.31 (8)	.56 (14)	.19 (5)	.88 (22)
N	P	P1	R	R1
.25 (6)	.17 (4)	.38 (10)	.91 (23)	1.53 (39)
S	S1	U	V	W
.62 (16)	.78 (20)	2.28 (58)	1.19 (30)	.75 (19)
X	Y			
.19 (5)	2.19 (56)			

One-Way Tripper Operated



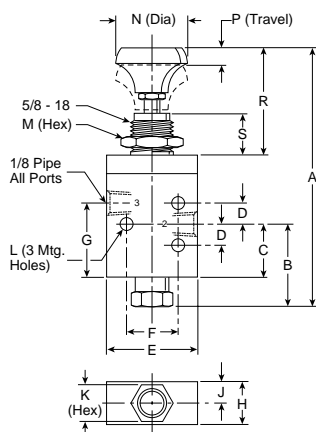
Toggle Operated



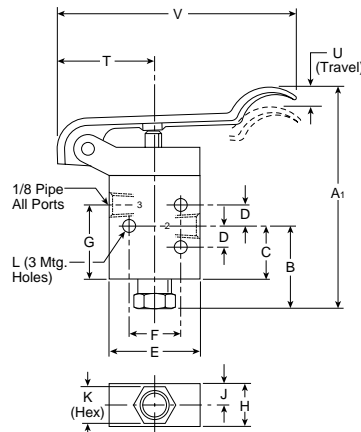
* Dimensions may be reduced .44" using adjusting screw.
 Inches (mm)

Button & Hand Lever Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

Button Operated



Hand Lever Operated



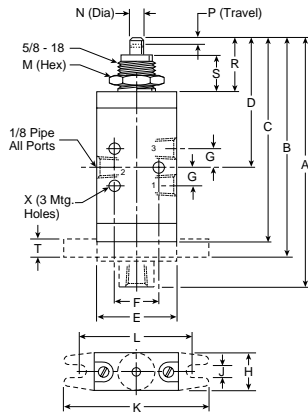
3-Way, 3-Port, 2-Position

A	A1	B	C	D
4.13 (105)	3.34 (85)	1.03 (26)	.55 (14)	.31 (8)
E	F	G	H	J
1.31 (33)	.75 (19)	.90 (23)	.62 (16)	.31 (8)
K	L	M	N	P
.56 (14)	.19 (5)	.88 (22)	1.06 (27)	.17 (4)
R	S	T	U	V
1.67 (42)	.63 (16)	1.19 (30)	.53 (13)	3.38 (86)

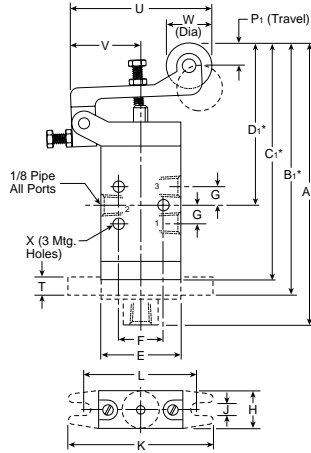
Inches (mm)

Plunger, Roller, One-way Tripper & Toggle Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

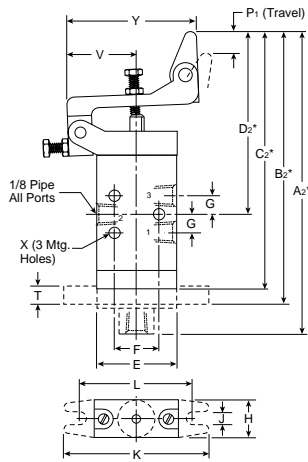
Plunger Operated



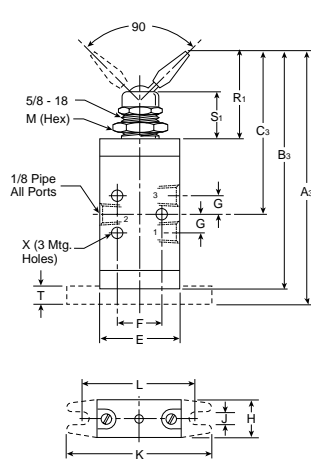
Roller Operated



One-Way Tripper Operated



Toggle Operated



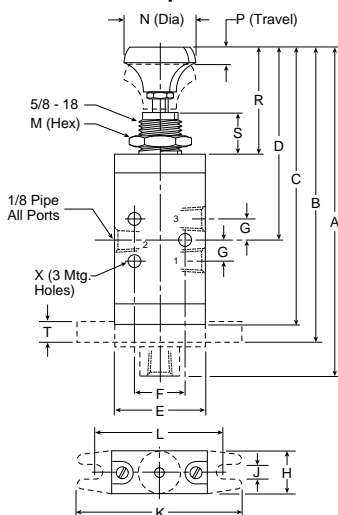
3-Way, 3-Port, 2-Position

A 4.14 (105)	A1* 4.98 (126)	A2* 5.23 (133)	A3 4.23 (107)	B 3.61 (92)
B1 4.45 (113)	B2 4.70 (119)	B3 4.00 (102)	C 3.38 (86)	C1 4.22 (107)
C2 4.47 (113)	C3 2.75 (70)	D 2.05 (52)	D1 2.98 (76)	D2 3.22 (82)
E 1.31 (33)	F .75 (19)	G .31 (8)	H .62 (16)	J .20 (5)
K 2.38 (60)	L 1.88 (48)	M .88 (22)	N .25 (6)	P .17 (4)
P1 .38 (10)	R .91 (23)	R1 1.53 (39)	S .62 (16)	S1 .78 (20)
T .25 (6)	U 2.28 (58)	V 1.19 (30)	W .75 (19)	X .19 (5)
Y 2.19 (56)				

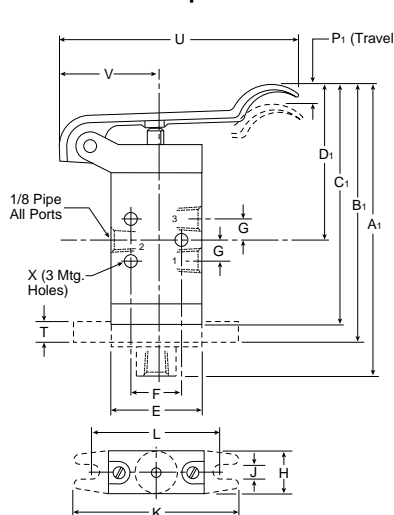
* Dimensions may be reduced .44" using adjusting screw.
 Inches (mm)

Button, Hand Lever Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

Button Operated



Hand Lever Operated



3-Way, 3-Port, 2-Position

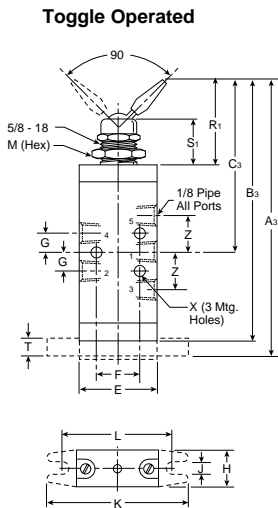
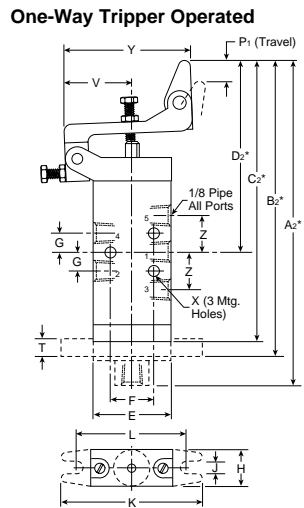
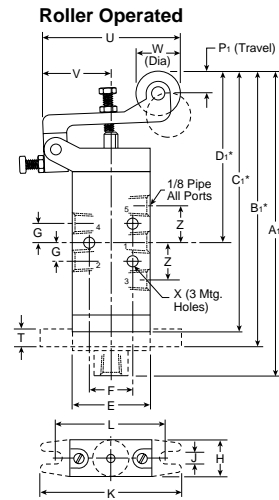
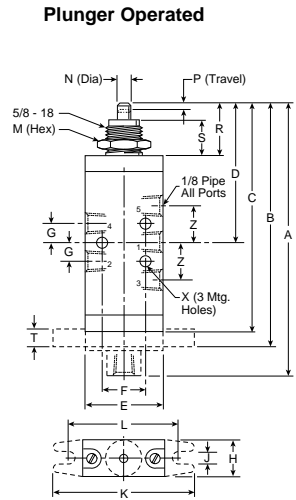
A 5.08 (129)	A1 4.29 (109)	B 4.55 (115)	B1 3.77 (96)	C 4.31 (109)
C1 3.53 (90)	D 3.08 (78)	D1 2.29 (58)	E 1.31 (33)	F .75 (19)
G .31 (8)	H .62 (16)	J .20 (5)	K 2.38 (60)	L 1.88 (48)
M .88 (22)	N 1.06 (27)	P .17 (4)	P1 .53 (13)	R 1.67 (42)
S .63 (16)	T .25 (6)	U 3.38 (86)	V 1.19 (30)	X .19 (5)
Y .59 (15)				

Inches (mm)



Directair 2,
 Directair 4
 Viking Xtreme
 Lever Series
 42 Lever /
 Pedal Series
 M0
 Series
 LV-EZ Series
 Lockout Valves
 Brass Poppet /
 Sliding Seal
D
 Manual / Mechanical
 Valve Products

Plunger, Roller, One-way Tripper & Toggle Operated — 4-Way, 5-Port, 2-Position – 1/8" Ports

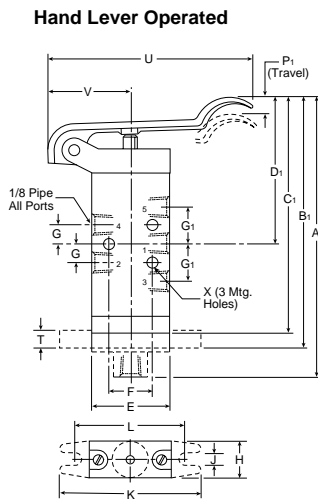
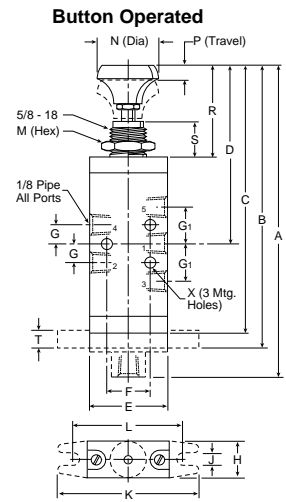


4-Way, 5-Port, 2-Position

A 4.75 (121)	A1* 5.59 (142)	A2* 5.84 (148)	A3 4.84 (123)	B 4.22 (107)
B1* 5.06 (128)	B2* 5.31 (135)	B3 4.61 (117)	C 3.99 (102)	C1* 4.83 (123)
C2* 5.08 (129)	C3 3.06 (78)	D 2.44 (62)	D1* 3.28 (83)	D2* 3.53 (90)
E 1.31 (33)	F .75 (19)	G .31 (8)	H .62 (16)	J .20 (5)
K 2.38 (60)	L 1.88 (48)	M .88 (22)	N .25 (6)	P .17 (4)
P1 .38 (10)	R .91 (23)	R1 1.53 (39)	S .62 (16)	S1 .78 (20)
T .25 (6)	U 2.28 (58)	V 1.19 (30)	W .75 (19)	X .19 (5)
Y 2.19 (56)	Z .62 (16)			

* Dimensions may be reduced .44" using adjusting screw.
 Inches (mm)

Button & Hand Lever Operated — 4-Way, 5-Port, 2-Position – 1/8" Ports



4-Way, 5-Port, 2-Position

A 5.69 (144)	A1 4.90 (124)	B 5.16 (131)	B1 4.38 (111)	C 4.92 (125)
C1 4.14 (105)	D 3.67 (93)	D1 2.90 (74)	E 1.31 (33)	F .75 (19)
G .31 (8)	G1 .63 (16)	H .62 (16)	J .20 (5)	K 2.38 (60)
L 1.88 (48)	M .88 (22)	N 1.06 (27)	P .17 (4)	P1 .53 (13)
R 1.67 (42)	S .63 (16)	T .25 (6)	U 3.38 (86)	V 1.19 (30)
X .19 (5)	Y .59 (15)			

Inches (mm)



Directair 2,
Directair 4

Viking Xtreme
Lever Series

42 Lever/
Pedal Series

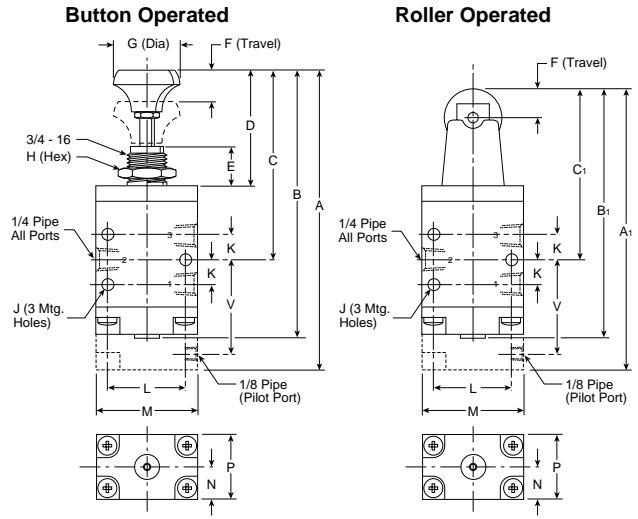
M0
Series

LV-EZ Series
Lockout Valves

Brass Poppet /
Sliding Seal

D
Manual / Mechanical
Valve Products

Button & Roller Operated — 3-Way, 3-Port, 2-Position

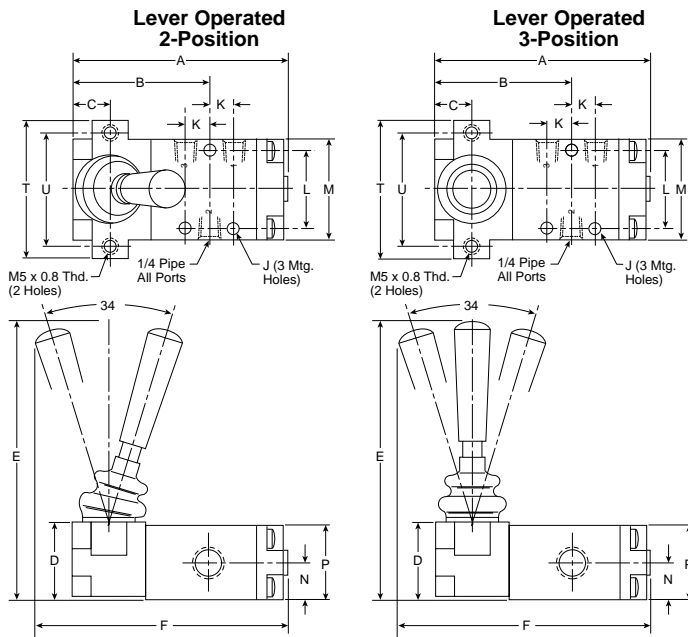


3-Way, 3-Port, 2-Position

A	A ₁	B	B ₁	C
4.91 (125)	4.25 (108)	4.44 (113)	3.78 (96)	3.10 (79)
C ₁	D	E	F	G
2.44 (62)	2.00 (51)	.63 (16)	.32 (8)	1.05 (27)
H	J	K	L	M
1.00 (25)	.19 (5)	.41 (10)	1.25 (32)	1.63 (42)
N	P	V		
.53 (14)	1.06 (27)	1.52 (39)		

Inches (mm)

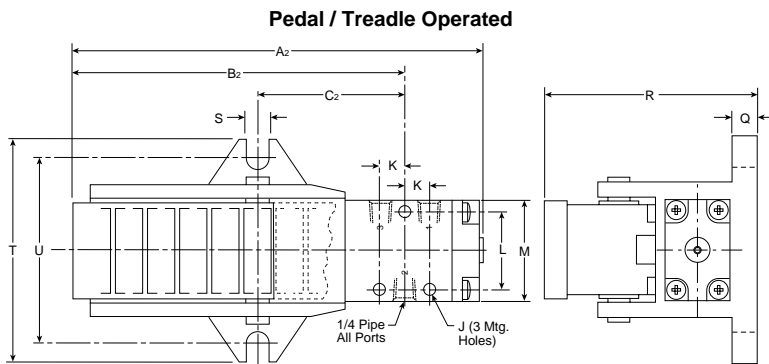
Lever & Pedal Operated — 3-Way, 3-Port, 2 & 3-Position



3-Way, 3-Port, 2 & 3-Position

A	A ₁	B	B ₁	C
3.31 (84)	6.55 (166)	1.97 (50)	5.20 (132)	.53 (14)
C ₁	D	E	F	J
2.19 (56)	1.12 (28)	4.06 (103)	3.90 (99)	.19 (5)
K	L	M	N	P
.41 (10)	1.25 (32)	1.63 (42)	.53 (14)	1.06 (27)
Q	R	S	T	T ₁
.37 (10)	2.40 (61)	.34 (9)	2.13 (54)	3.50 (89)
U	U ₁			
1.75 (44)	3.00 (76)			

Inches (mm)

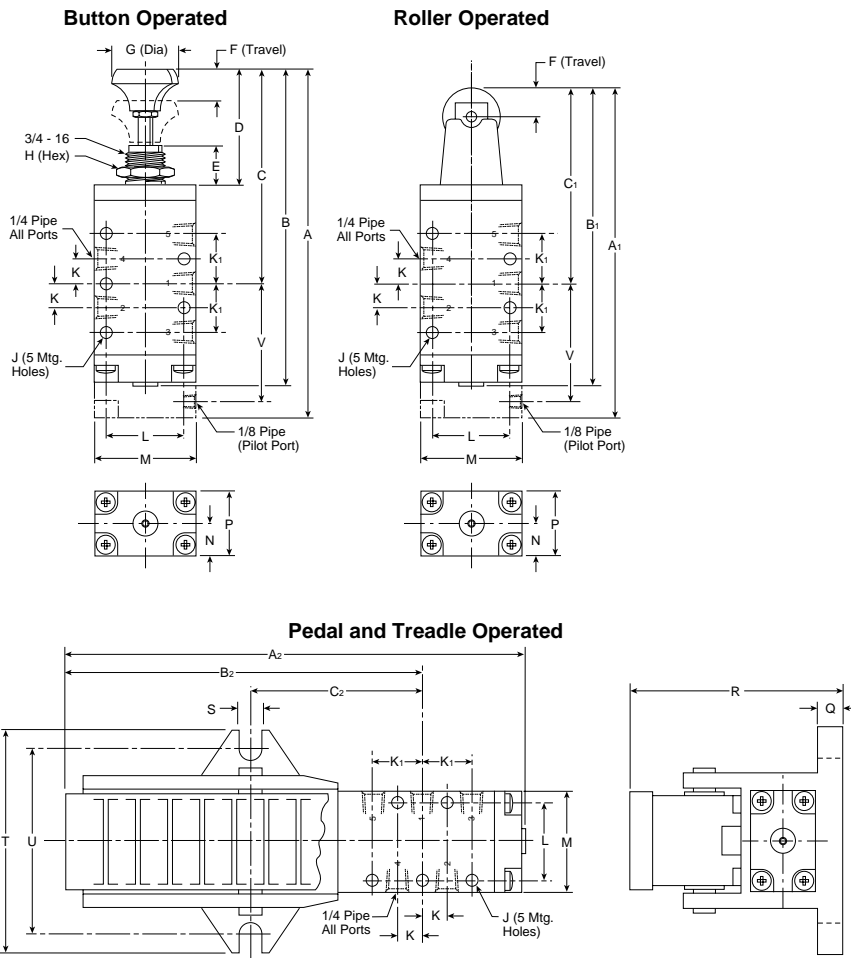


CAUTION:

This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

Directair 2,
 Directair 4
 Viking Xtreme
 Lever Series
 42 Lever /
 Pedal Series
 M0
 Series
 LV-EZ Series
 Lockout Valves
 Brass Poppet /
 Sliding Seal
D
 Manual / Mechanical
 Valve Products

Button, Roller, Pedal & Treadle, Lever Operated — 4-Way, 5-Port, 2-Position



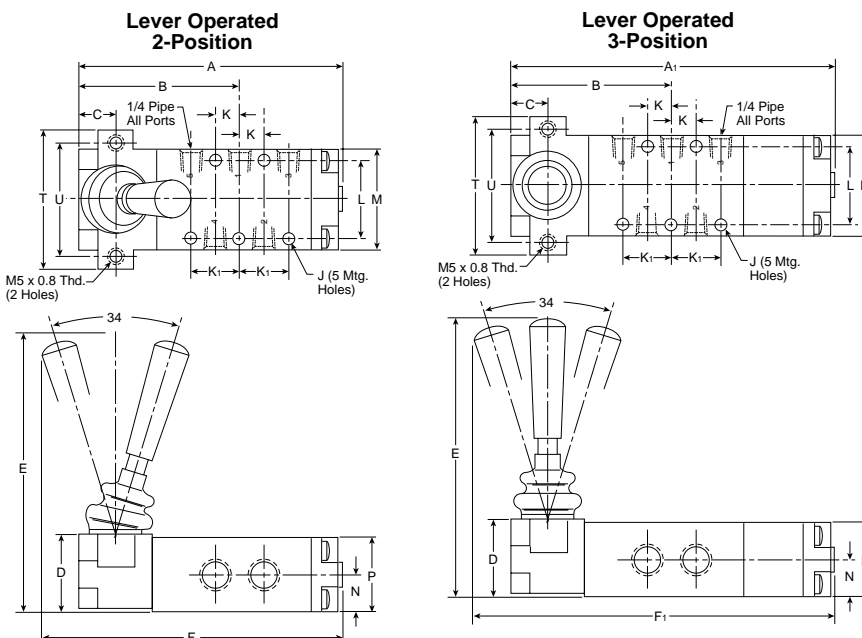
4-Way, 5-Port, 2-Position

A	A₁	A₂	B	B₁
5.75 (146)	5.13 (130)	7.41 (189)	5.28 (134)	4.66 (118)
B₂	C	C₁	C₂	D
5.63 (143)	3.50 (89)	2.88 (73)	2.64 (67)	2.00 (51)
E	F	G	H	J
.63 (16)	.32 (8)	1.05 (27)	1.00 (25)	.19 (5)
K	K₁	L	M	N
.44 (11)	.84 (21)	1.25 (32)	1.63 (41)	.53 (14)
P	Q	R	S	T
1.06 (27)	.37 (10)	2.40 (61)	.34 (9)	3.50 (89)
U	V			
3.00 (76)	1.96 (50)			

Inches (mm)

CAUTION:
 This valve shall not be used to actuate a punch press.
 Do not use this valve on punch presses or press brakes.
 See OSHA 1910.217.

Lever Operated — 4-Way, 5-Port, 2 & 3-Position



4-Way, 5-Port, 2 & 3-Position

A	A₁	B	C	D
4.19 (106)	5.09 (129)	2.41 (61)	.53 (14)	1.12 (28)
E	F	F₁	J	K
4.06 (103)	4.78 (121)	5.78 (147)	.19 (5)	.44 (11)
K₁	L	M	N	P
.84 (21)	1.25 (32)	1.63 (42)	.53 (14)	1.06 (27)
T	U			
2.13 (54)	1.75 (44)			

Inches (mm)

Directair 2,
 Directair 4

Viking Xtreme
 Lever Series

42 Lever/
 Pedal Series

M0
 Series

LV-EZ Series
 Lockout Valves

Brass Poppet/
 Sliding Seal

D
 Manual / Mechanical
 Valve Products

Viking Xtreme Lever Operated Series

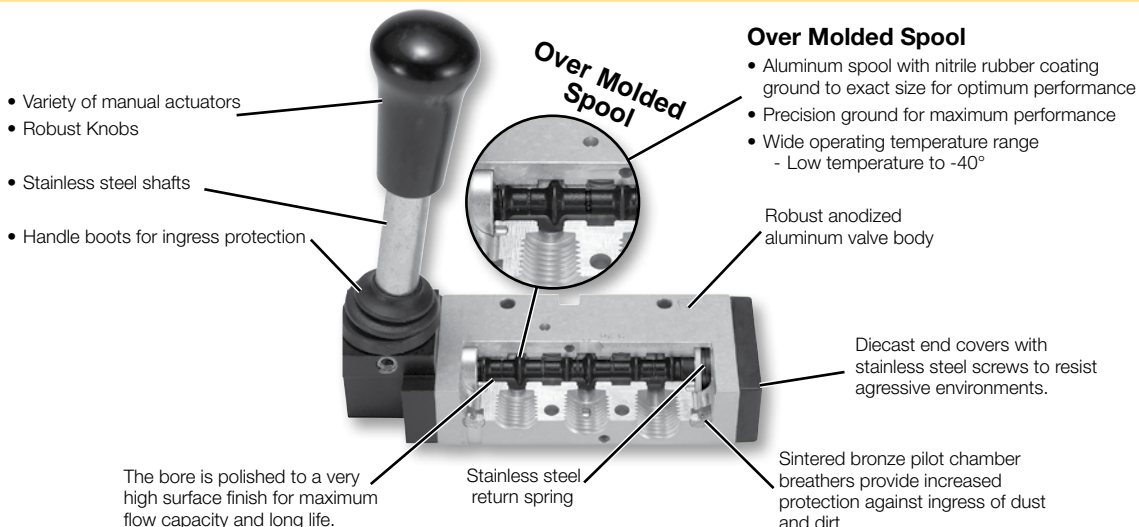
The Viking Xtreme Manual valve range is robust, versatile and combines high performance with compact installation dimensions. The valves rugged lever actuator has been specifically designed for gloved hands to suit mobile applications in the most arduous of environments. Available in 3/2, 5/2 and 5/3 functions with either spring return or detented lever. The lever actuated versions are available across the entire range from 1/8 to 1/2 port sizes.

- **Heavy duty lever**
- **Inline valve**
 - 1/8", 1/4", 3/8", 1/2" NPT & BSPP
- **2-position models**
 - 4-way & 3-way
- **3-position models**
 - all ports blocked
 - pressure center
 - center exhaust
- **Over-moulded single piece aluminium spool**
 - Reduced product complexity
 - Increased flow
 - Wide operating temperature range
 - Stable seal performance even with high flow / pressure drop across spool.

Material specifications

End covers	Anodized aluminum
Lever	Reinforced polyamide plastic
Lever housing	Acetal plastic
Piston	Acetal plastic / anodized aluminum
Seals	Nitrile rubber
Screws	Stainless steel
Spool	Aluminum & nitrile rubber
Springs	Stainless steel
Valve body	Anodized aluminum

Features



Operating information

Operating pressure: Type A & B: Vacuum to 232 PSIG (Vacuum to 16 bar Max.)
 Type C & D: Vacuum to 174 PSIG (Vacuum to 12 bar Max.)
 Temperature range: Xtreme: -40°F to 140°F (-40°C to 60°C)

**Lever Handle –
 1/8" valve size,
 5/2 & 5/3 only**


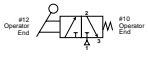

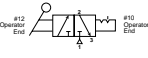

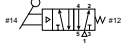

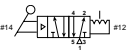

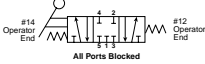

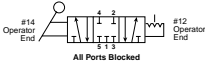






**Twist Handle –
 1/4" valve sizes**



**Lever Handle –
 All other valve
 sizes**



3/2 - 2-position	Symbol	Valve type	Port size	Cv	Weight lb (kg)	Part number NPT	Part number BSPP
		Lever spring return	1/8	0.6	0.73 (0.33)	P2LAX391VS	P2LAX311VS
			1/4	1.5	0.73 (0.33)	P2LBX392VS	P2LBX312VS
			3/8	2.5	0.88 (0.40)	P2LCX393VS	P2LCX313VS
			1/2	2.7	1.32 (0.60)	P2LDX394VS	P2LDX314VS
		Lever detent	1/8	0.7	0.73 (0.33)	P2LAX391VV	P2LAX311VV
			1/4	1.3	0.73 (0.33)	P2LBX392VV	P2LBX312VV
			3/8	2.5	0.88 (0.40)	P2LCX393VV	P2LCX313VV
			1/2	2.7	1.32 (0.60)	P2LDX394VV	P2LDX314VV
5/2 - 2-position	Symbol	Valve type	Port size	Cv	Weight lb (kg)	Part number NPT	Part number BSPP
		Lever spring return	1/8	0.6	0.40 (0.18)	P2LAX591VS	P2LAX511VS
			1/4	1.5	0.73 (0.33)	P2LBX592VS	P2LBX512VS
			3/8	2.5	0.88 (0.40)	P2LCX593VS	P2LCX513VS
			1/2	2.7	1.32 (0.60)	P2LDX594VS	P2LDX514VS
		Lever detent	1/8	0.7	0.40 (0.18)	P2LAX591VV	P2LAX511VV
			1/4	1.3	0.73 (0.33)	P2LBX592VV	P2LBX512VV
			3/8	2.5	0.88 (0.40)	P2LCX593VV	P2LCX513VV
			1/2	2.7	1.32 (0.60)	P2LDX594VV	P2LDX514VV
5/3 - 3-position, all ports blocked	Symbol	Valve type	Port size	Cv	Weight lb (kg)	Part number NPT	Part number BSPP
		Lever spring center	1/8	0.6	0.40 (0.18)	P2LAX69111	P2LAX61111
			1/4	1.5	0.73 (0.33)	P2LBX69211	P2LBX61211
			3/8	2.5	1.56 (0.71)	P2LCX69311	P2LCX61311
			1/2	2.7	1.61 (0.73)	P2LDX69411	P2LDX61411
		Lever detent	1/8	0.7	0.40 (0.18)	P2LAX69122	P2LAX61122
			1/4	1.3	0.73 (0.33)	P2LBX69222	P2LBX61222
			3/8	2.5	1.56 (0.71)	P2LCX69322	P2LCX61322
			1/2	2.7	1.61 (0.73)	P2LDX69422	P2LDX61422
5/3 - 3-position, pressure center	Symbol	Valve type	Port size	Cv	Weight lb (kg)	Part number NPT	Part number BSPP
		Lever spring center	1/8	0.6	0.40 (0.18)	P2LAX79111	P2LAX71111
			1/4	1.5	0.73 (0.33)	P2LBX79211	P2LBX71211
			3/8	2.5	1.56 (0.71)	P2LCX79311	P2LCX71311
			1/2	2.7	1.61 (0.73)	P2LDX79411	P2LDX71411
		Lever detent	1/8	0.7	0.40 (0.18)	P2LAX79122	P2LAX71122
			1/4	1.3	0.73 (0.33)	P2LBX79222	P2LBX71222
			3/8	2.5	1.56 (0.71)	P2LCX79322	P2LCX71322
			1/2	2.7	1.61 (0.73)	P2LDX79422	P2LDX71422

Directair 2,
Directair 4

Viking Xtreme
Lever Series


42 Lever /
Pedal Series

M0
Series

LV-EZ Series
Lockout Valves

Brass Poppet /
Sliding Seal

D
Manual / Mechanical
Valve Products

 Most popular.



5/3 - 3-position, center exhaust		Symbol	Valve type	Port size	Cv	Weight lb (kg)	Part number NPT	Part number BSPP
			Lever spring center	1/8	0.6	0.40 (0.18)	P2LAX89111	P2LAX81111
				1/4	1.5	0.73 (0.33)	P2LBX89211	P2LBX81211
				3/8	2.5	1.56 (0.71)	P2LCX89311	P2LCX81311
				1/2	2.7	1.61 (0.73)	P2LDX89411	P2LDX81411
			Lever detent	1/8	0.7	0.40 (0.18)	P2LAX89122	P2LAX81122
				1/4	1.3	0.73 (0.33)	P2LBX89222	P2LBX81222
				3/8	2.5	1.56 (0.71)	P2LCX89322	P2LCX81322
				1/2	2.7	1.61 (0.73)	P2LDX89422	P2LDX81422
3/2 - 2-position		Symbol	Valve type	Port size	Cv		Part number NPT	Part number BSPP
			Twist handle detent	1/4	1.3	0.73 (0.33)	P2LBX392JJ	P2LBX312JJ
5/2 - 2-position		Symbol	Valve type	Port size	Cv		Part number NPT	Part number BSPP
			Twist handle detent	1/4	1.3	0.73 (0.33)	P2LBX592JJ	P2LBX512JJ

Manual Operated Valves

Vacuum to 232 PSIG (Vacuum to 16 bar) -40°F to 158°F (-40°C to 70°C)

P2L A X 5 91 VS

Valve size	
1/8"	A
1/4"	B
3/8"	C
1/2"	D

Valve type / function	
3/2 NC - 2-position	3
5/2 2-position	5
5/3 3-position, APB	6
5/3 3-position, PC	7
5/3 3-position, CE	8

Actuator / return	
JJ*	Twist handle detent, 2-position
VS	Spring return lever, 2-position, 90° to ports
VV	Lever, detent, 2-position, 90° to ports
11	Spring centered lever, 3-position, 90° to ports
22	Lever, detent, 3-position, 90° to ports

* Not available with 3-position valves. Available Size B only.

Main port thread	
11	G1/8 (P2LA)
12	G1/4 (P2LB)
13	G3/8 (P2LC)
14	G1/2 (P2LD)
91	1/8" NPT (P2LA)
92	1/4" NPT (P2LB)
93	3/8" NPT (P2LC)
94	1/2" NPT (P2LD)

NOTE: For ATEX certified remote air pilot valves, build the valve part number from the model number index for remote pilot and add "-EX" following the number.

Example: P2LAX591PS-EX

Most popular.



Exhaust Mufflers

Pipe thread	Part number
M5	P6M-PAC5
1/8" NPT	EM12
1/4" NPT	EM25
3/8" NPT	EM37
1/2" NPT	EM50

P6M - Plastic; EM - Sintered bronze

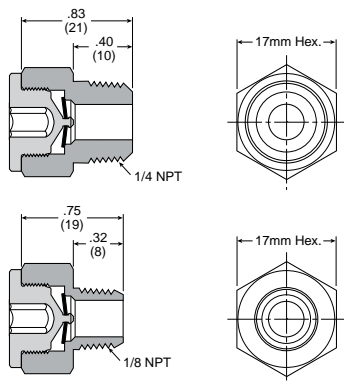


Plastic Silencers

Thread size	Part number		A (mm)	B (mm)
	NPT	BSPT		
M5	AS-5		.43 (11)	.32 (8)
1/8"	ASN-6	AS-6	1.57 (40)	.63 (16)
1/4"	ASN-8	AS-8	2.56 (65)	.83 (21)
3/8"	ASN-10	AS-10	3.35 (85)	.98 (25)
1/2"	ASN-15	AS-15	3.74 (95)	1.18 (30)



Exhaust Protector



Features

- 1/8 and 1/4 NPT male sizes
- Fitted with a brass pipe adapter and a fluorocarbon membrane
- Resistant to rust, clog, wash down and contamination

Applications

These protectors are intended for mobile applications, quick venting applications and alternative exhaust port breathers that require protection against clogging.

Ideal for valves exposed to harsh environmental conditions (which can cause a "caking up" in the exhaust pipe ports where the bronze mufflers or breather vents are installed).

Particularly suitable for time-sensitive applications such as axle-lift suspensions or pushers or tag axles.

Specifications

Operating pressure 0 – 150 PSIG
 (0 to 10 bar, 0 to 1034 kPa)

Operating temperature -40°F to 158°F (-40°C to 70°C)

Material:

Body and pipe adapter Brass
 Membrane Fluorocarbon

Flow Data (SCFM)

Part number	Size	60 PSIG inlet	90 PSIG inlet	125 PSIG inlet
E90016	1/8"	40.1	56.5	75.5
E90017	1/4"	44.6	62.7	83.5

Directair 2,
Directair 4

Viking Xtreme
Lever Series

42 Lever /
Pedal Series

M0
Series

LV-EZ Series
Lockout Valves

Brass Poppet /
Sliding Seal

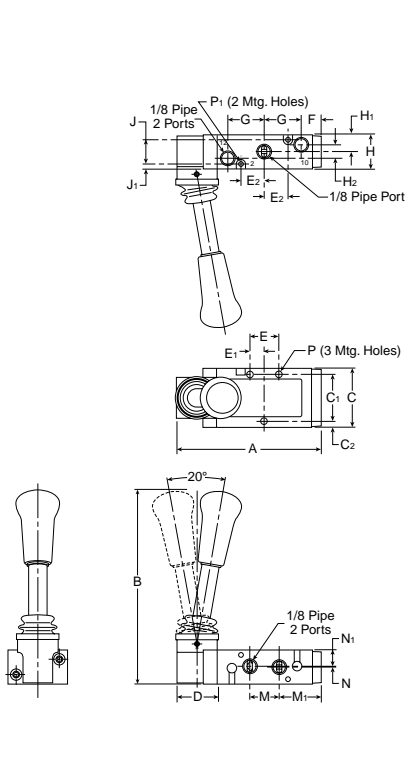
D

Manual / Mechanical
Valve Products

P2LAX 3/2 Hand Lever Operated

P2LAX 5/2 & 5/3 Hand Lever Operated

Directair 2,
 Directair 4
 Viking Xtreme
 Lever Series
 42 Lever /
 Pedal Series
 Series M0
 LV-EZ Series
 Lockout Valves
 Brass Poppet /
 Sliding Seal
D
 Manual / Mechanical
 Valve Products



**P2LAX 3/2
 (hand lever)**

A	B	C
3.88 (99)	5.23 (133)	1.57 (40)
C ₁	C ₂	D
1.26 (32)	.16 (4)	1.06 (27)
E	E ₁	E ₂
.79 (20)	.39 (10)	.63 (16)
F	G	H
.55 (14)	.98 (25)	.87 (22)
H ₁	H ₂	J
.42 (10.6)	.02 (0.5)	.65 (16.5)
J ₁	M	M ₁
.11 (2.9)	.79 (20)	1.14 (29)
N	N ₁	P
.18 (4.5)	.26 (6.6)	Ø .17 (Ø 4.3)
P ₁	Ø .12 (Ø 3.1)	

Inches (mm)

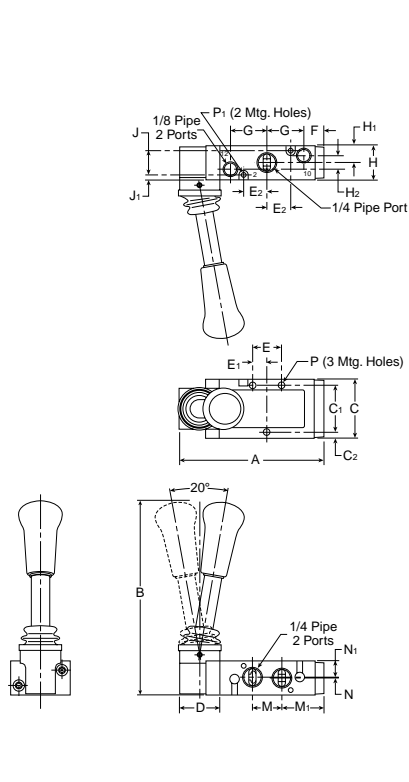
**P2LAX 5/2 & 5/3
 (hand lever)**

A	A ₁	B
4.02 (102)	1.89 (48)	3.23 (82)
C	C ₁	C ₂
1.57 (40)	1.30 (33)	.14 (3.5)
D	E ₂	E ₃
1.18 (30)	1.42 (36)	.33 (8.5)
F	F ₁	G
.63 (16)	.67 (17)	.59 (15)
H	H ₁	H ₂
.87 (22)	.31 (8)	.24 (6)
J	J ₁	M
.63 (16)	.12 (3)	.63 (16)
N	N ₁	P
.12 (3)	.43 (11)	Ø .16 (Ø 4.1)

Inches (mm)

P2LBX 3/2 Hand Lever Operated

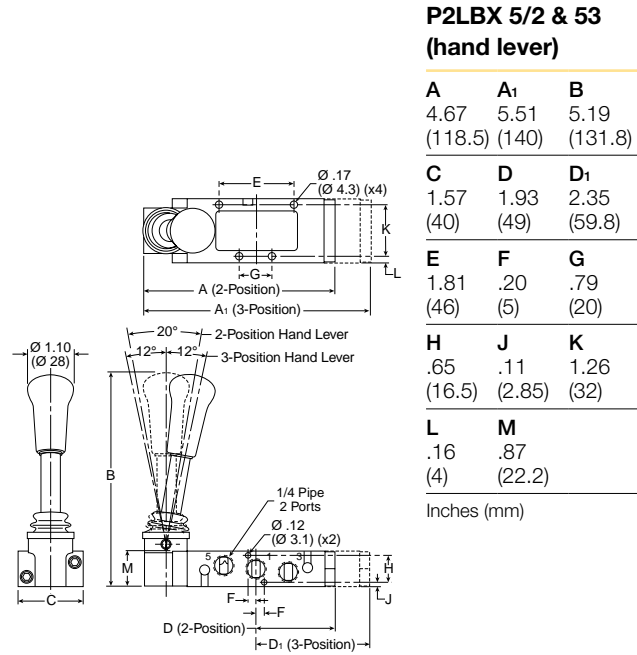
P2LBX 5/2 & 5/3 Hand Lever Operated



**P2LBX 3/2
 (hand lever)**

A	B	C
3.88 (99)	5.23 (133)	1.57 (40)
C ₁	C ₂	D
1.26 (32)	.16 (4)	1.06 (27)
E	E ₁	E ₂
.79 (20)	.39 (10)	.63 (16)
F	G	H
.55 (14)	.98 (25)	.87 (22)
H ₁	H ₂	J
.42 (10.6)	.02 (0.5)	.65 (16.5)
J ₁	M	M ₁
.11 (2.9)	.79 (20)	1.14 (29)
N	N ₁	P
.18 (4.5)	.26 (6.6)	Ø .17 (Ø 4.3)
P ₁	Ø .12 (Ø 3.1)	

Inches (mm)



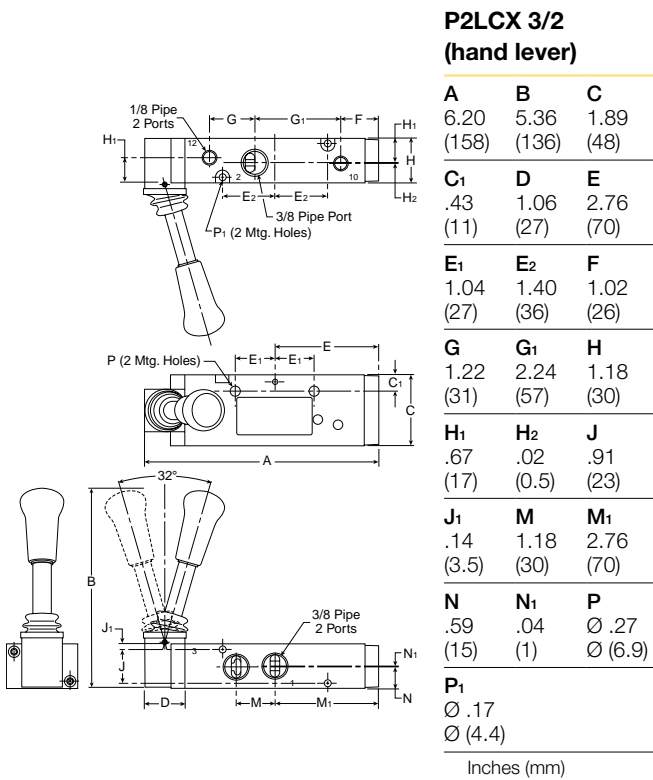
**P2LBX 5/2 & 5/3
 (hand lever)**

A	A ₁	B	
4.67 (118.5)	5.51 (140)	5.19 (131.8)	
C	D	D ₁	
1.57 (40)	1.93 (49)	2.35 (59.8)	
E	F	G	
1.81 (46)	.20 (5)	.79 (20)	
H	J	K	
.65 (16.5)	.11 (2.85)	1.26 (32)	
L	M		
.16 (4)	.87 (22.2)		

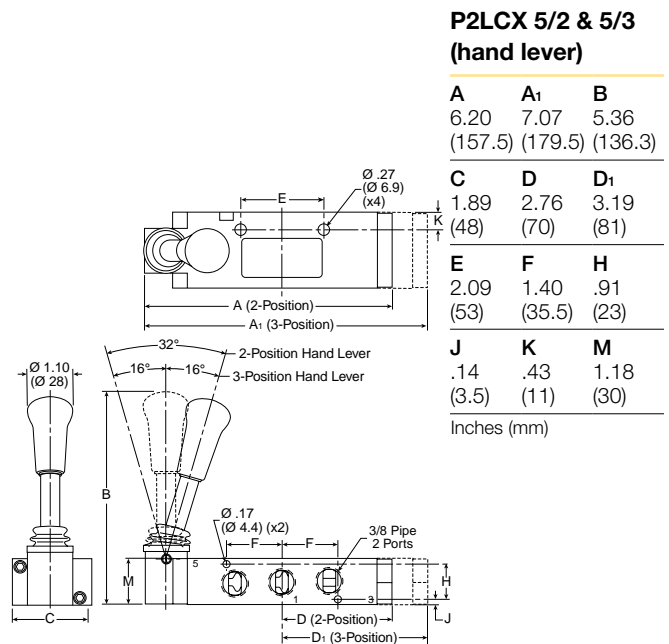
Inches (mm)



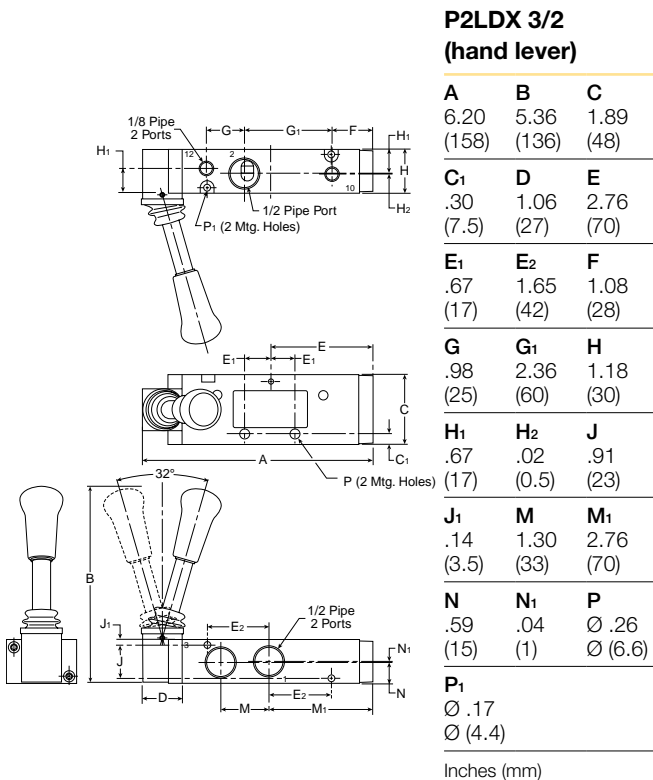
P2LCX 3/2 Hand Lever Operated



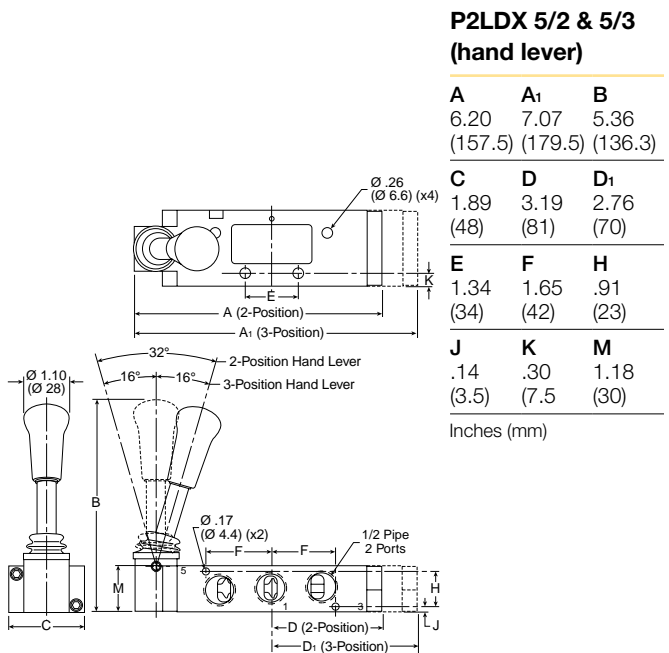
P2LCX 5/2 & 5/3 Hand Lever Operated



P2LDX 3/2 Hand Lever Operated



P2LDX 5/2 & 5/3 Hand Lever Operated



Directair 2,
Directair 4

Viking Xtreme
Lever Series

42 Lever/
Pedal Series

M0
Series

LV-EZ Series
Lockout Valves

Brass Poppet/
Sliding Seal

D
Manual / Mechanical
Valve Products

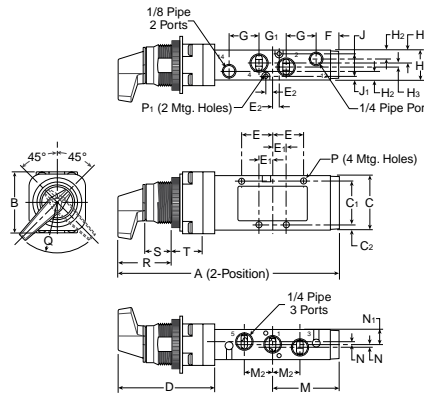
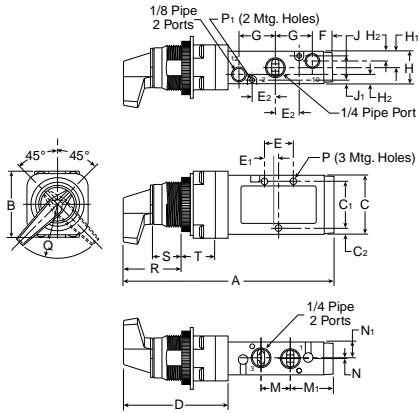
P2LBX 3/2 Twist Lever Operated

P2LBX 5/2 Twist Lever Operated

Directair 2,
 Directair 4
 Viking Xtreme
 Lever Series
 4/2 Lever /
 Pedal Series
 M0
 Series
 LV-EZ Series
 Lockout Valves
 Brass Poppet /
 Sliding Seal
D
 Manual / Mechanical
 Valve Products

**P2LBX 3/2
 (hand lever)**

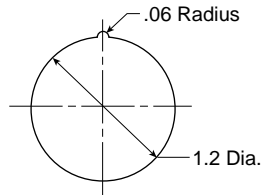
**P2LBX 5/2
 (hand lever)**



A	B	C
5.67 (144)	1.79 (45.5)	1.57 (40)
C ₁	C ₂	D
1.26 (32)	.16 (4)	2.87 (73)
E	E ₁	E ₂
.79 (20)	.39 (10)	.63 (16)
F	G	H
.55 (14)	.98 (25)	.87 (22.2)
H ₁	H ₂	J
.44 (11.1)	.26 (6.6)	.65 (16.5)
J ₁	M	M ₁
.11 (2.9)	.79 (20)	1.14 (29)
N	N ₁	P
.02 (0.5)	.42 (10.6)	∅ .17 ∅ (4.3)
P ₁	Q	R
∅ .12 ∅ (3.1)	1.5R (38.1)R	1.85 (47)
S	T	
1.10 (28)	.67 (17)	

A	B	C
6.46 (164)	1.79 (45.5)	1.57 (40)
C ₁	C ₂	D
1.26 (32)	.15 (4)	2.87 (73)
E	E ₁	E ₂
.91 (23)	.39 (10)	.20 (5)
F	G	G ₁
.67 (17)	.87 (22)	.79 (20)
H	H ₁	H ₂
.87 (22.2)	.44 (11.1)	.26 (6.6)
H ₃	J	J ₁
.12 (3)	.65 (16.5)	.11 (2.9)
M	N	N ₁
1.93 (49)	.08 (0.2)	.44 (11.1)
P	P ₁	Q
∅ .17 ∅ (4.3)	∅ .12 ∅ (3.1)	1.5R (38.1)R
R	S	T
1.85 (47)	1.10 (28)	.67 (17)

Panel Cutout Detail (All Port Sizes)



42 Lever / Pedal Series

Features

Heavy duty lever

- Parallel mount handle
- Perpendicular mount handle

Heavy duty foot pedal

2 port sizes

- 1/4" port – 1.3 to 2.2 Cv
- 3/8" port – 1.3 to 2.9 Cv

2-position and 3-position valves



Operating information

Operating pressure: Vacuum to 150 PSI (710 mmHg to 1035 kPa)
 Temperature range: 0°F to 140°F (-18°C to 60°C)

Lever Valve - 2-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/4"	2.2	Inline, parallel	2-position, spring return	422CS011K
		3/8"	2.9	Inline, parallel	2-position, spring return	422CS021K
		1/4"	2.2	Inline, parallel	2-position, detent	422CS011W
		3/8"	2.9	Inline, parallel	2-position, detent	422CS021W
		1/4"	2.2	Inline, perpendicular	2-position, spring return	422CR011K
		3/8"	2.9	Inline, perpendicular	2-position, spring return	422CR021K
		1/4"	2.2	Inline, perpendicular	2-position, detent	422CR011W
		3/8"	2.9	Inline, perpendicular	2-position, detent	422CR021W

Lever Valve - 3-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/4"	1.3	Inline, parallel	3-position APB	422CS013W
		3/8"	1.3	Inline, parallel	3-position, APB	422CS023W
		1/4"	1.3	Inline, parallel	3-position, CE	422CS014W
		3/8"	1.3	Inline, parallel	3-position, CE	422CS024W
		1/4"	1.3	Inline, perpendicular	3-position, APB	422CR013W
		3/8"	1.3	Inline, perpendicular	3-position, APB	422CR023W
		1/4"	1.3	Inline, perpendicular	3-position, CE	422CR014W
		3/8"	1.3	Inline, perpendicular	3-position, CE	422CR024W

Foot Pedal Valve - 2-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/4"	2.2	Foot pedal	2-position, spring return	422CT011K
		3/8"	2.9	Foot pedal	2-position, spring return	422CT021K
				Foot pedal guard		PS2043P



CAUTION:

This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

Valve body service kits, single pressure

2-position valve	PS2038P
3-position valve	PS2041P

Kit includes: all soft seals and spool.

Most popular.



Directair 2,
 Directair 4

Viking Xtreme
 Lever Series

42 Lever /
 Pedal Series

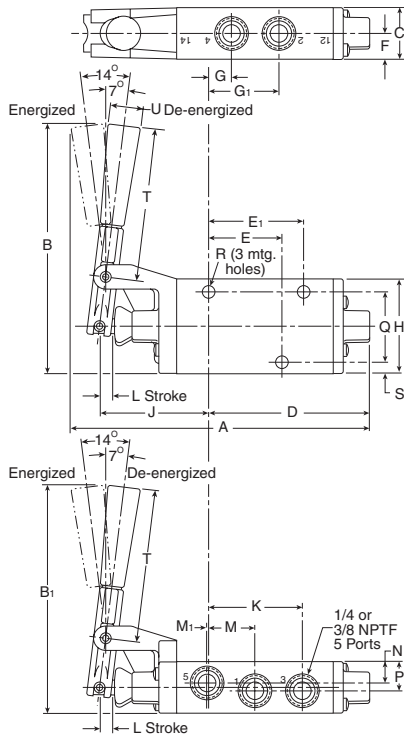
M0
 Series

LV-EZ Series
 Lockout Valves

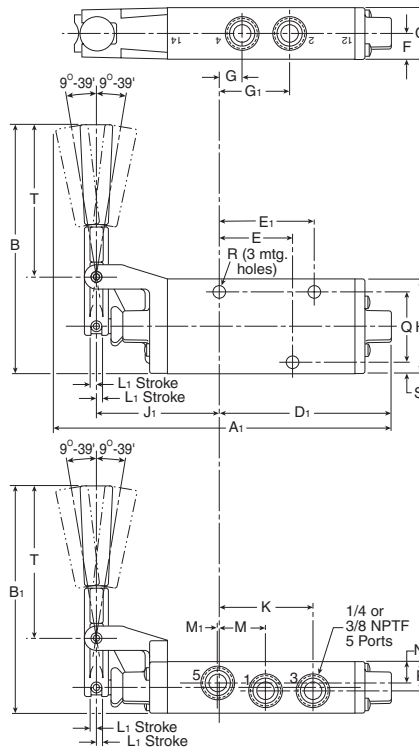
Brass Poppet /
 Sliding Seal

D
 Manual / Mechanical
 Valve Products

2-Position



3-Position



Lever Valve

A	A ₁	B	B ₁	C		
6.70 (170)	7.58 (193)	5.55 (141)	5.05 (128)	1.15 (29)		
D	D ₁	E	E ₁	F		
3.59 (91)	3.83 (97)	1.58 (40)	2.06 (52)	.57 (14)		
G NPT	G ₁ NPT	H				
1/4" .51 (13) 3/8" .55 (14)	1/4" 1.56 (40) 3/8" 1.51 (38)	2.13 (54)				
J	J ₁	K NPT	L			
2.44 (62)	2.80 (71)	1/4" 2.08 (53) 3/8" 2.13 (54)	.25 (6)			
L ₁	M	M ₁ NPT	N			
.18 (5)	1.03 (36)	1/4" .02 (.5) 3/8" .06 (2)	.50 (13)			
P	Q	R	S	T		
.65 (17)	1.58 (40)	.33 (8)	.27 (7)	3.42 (87)		
U Dia						
.75 (19)						

Inches (mm)

Foot Pedal Valve

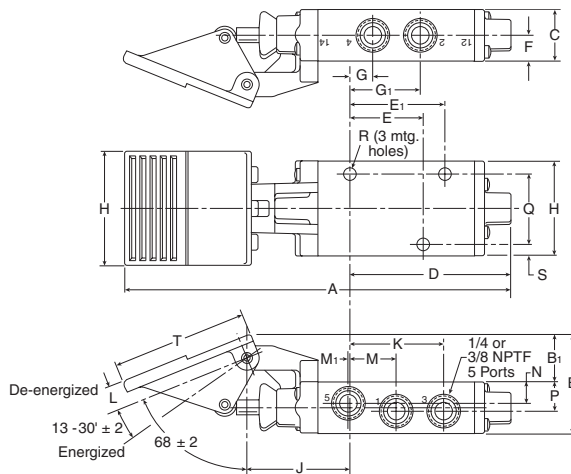
A	B	B ₁	C	D	
8.64 (220)	2.18 (55)	1.03 (26)	1.15 (29)	3.59 (91)	
E	E ₁	F	G NPT		
1.58 (40)	2.06 (52)	.57 (14)	1/4" .51 (13) 3/8" .55 (14)		
G ₁ NPT	H	H ₁	J		
1/4" 1.56 (40) 3/8" 1.51 (38)	2.13 (54)	2.50 (64)	2.32 (59)		
K NPT	L	M			
1/4" 2.08 (53) 3/8" 2.13 (54)	.60 (15)	1.03 (26)			
M ₁ NPT	N	P	Q		
1/4" .02 (.5) 3/8" .06 (2)	.50 (13)	.65 (17)	1.58 (40)		
R	S	T	U		
.33 (8)	.27 (7)	3.00 (76)	.48 (11)		

Inches (mm)

Foot Valve Guard: PS2043P

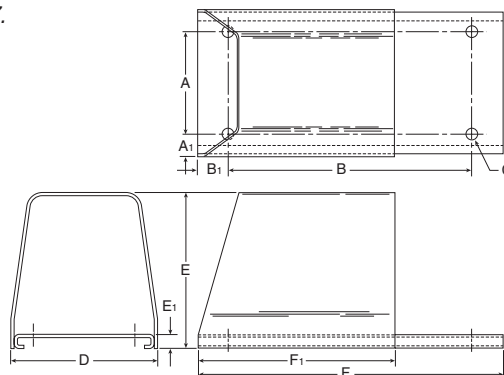
A	A ₁	B	B ₁	C
4.50 (114)	.75 (19)	10.50 (267)	1.25 (32)	.48 (11)
D	E	E ₁	F	F ₁
6.00 (152)	7.13 (181)	.50 (13)	13.00 (330)	8.38 (213)

Inches (mm)



CAUTION:

*This valve shall not be used to actuate a punch press.
 Do not use this valve on punch presses or press brakes.
 See OSHA 1910.217.*



M0 Series

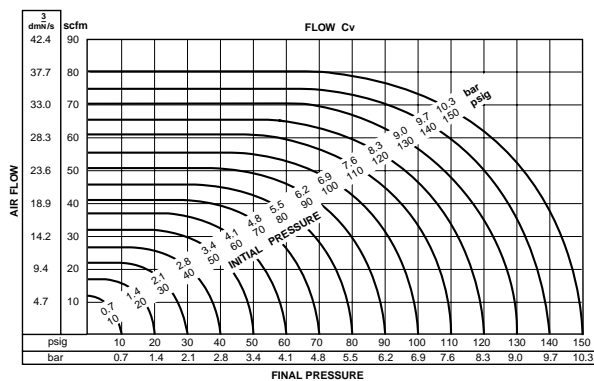
Features

- 1/4" to 3/4" NPTF ports
- Standard operators listed. Consult factor for variations in orientation
- Standard 2 position 3-way and 4-way valves listed. Consult factory for 2-way and 3 position valves
- Corrosion resistant bronze body
- High flow brass spacers position o-ring, permit reverse piping and vacuum service
- Specially compounded o-rings suitable for non-lube air service and low pressure oil service
- Floating stem of hard chrome plated stainless steel; no metal to metal contact
- Closed at crossover design for air savings
- Piped exhaust convenient for muffling
- Interchangeable operators
- Interchangeable end sections
- Service without disturbing plumbing
- Dual mounting brackets on most models

Flow Cv ratings

Valve type	Port size	Port 1 to 2	Port 1 to 3	Port 2 to 3	Port 2 to 4	Port 3 to 4
3-way 2-position	1/4	2.4	—	2.4	—	—
	3/8	3.2	—	3.4	—	—
	1/2	5.0	—	5.1	—	—
	3/4	9.5	—	9.8	—	—
4-way 2-position	1/4	2.4	2.4	—	2.0	2.2
	3/8	3.4	3.2	—	3.0	3.1
	1/2	5.2	5.3	—	4.7	4.7
	3/4	8.7	9.2	—	7.9	8.0

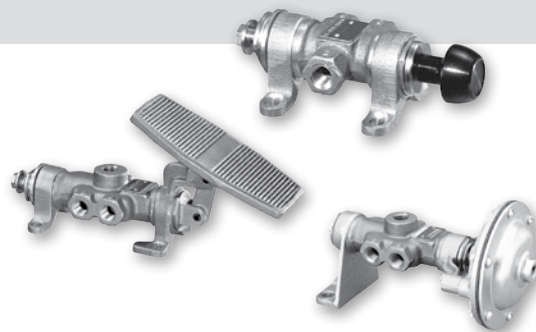
Flow Cv



Flow capacities

The capacity curves shown in the chart are for a theoretical valve having a Cv = 1.0 for air at standard conditions.

Flow rating determined in accordance with NFPA recommended standard NFPA/T3.21.3 - 1974.



Operating information

Pressure limitations
knob (manual and spring return) and palm operators (manual and spring return)

Media	Port size	PSI (kPa)	
		3-way	4-way
Air and Hydraulic	1/4	200 (1380)	180 (1240)
	3/8	175 (1210)	170 (1170)
	1/2	160 (1100)	150 (1030)
	3/4	150 (1030)	150 (1030)
Vacuum	All	Within 1" Hg of perfect	
Other	Consult factory		

Pressure limitations
knob (detent), lever, pedal, treadle, clevis, cam air operated diaphragm and cylinder

Media	Port size	PSI (kPa)	
		3-way	4-way
Air and Hydraulic	1/4	225 (1550)	225 (1550)
	3/8	225 (1550)	225 (1550)
	1/2	215 (1480)	215 (1480)
	3/4	200 (1380)	200 (1380)
Vacuum	All	Within 1" Hg of perfect	
Other	Consult factory		

Temperature range: -15°F to 200°F (-26° to 93°C)

Lubrication: For best results and service life use clean, moisture free lubricated air.

Material specifications






































Body	High pressure valve bronze
Knobs and palm buttons	Anodized aluminum
Operators	Iron castings; steel rod, bar and tube, and plated for corrosion resistance
O-rings	Buna-N and impregnated with Molybdenum Disulfide
Spacers and end bearings	Brass bar stock
Springs	high quality steel and plated for corrosion resistance
Stem	Stainless steel and hard chrome plated


Warnings

⚠ Install guards on all hand operated valves if accidental operation can cause personal injury.

⚠ Foot operated valves must be protected against inadvertent operation that can cause serious bodily injury. Use of a guard is strongly recommended as it will reduce the likelihood of inadvertent operation.









M0 Series Air Pilot, Manual & Mechanically Actuated Valves

	3-way and 4-way knob operated	Description	Part number 1/4 NPT	Part number 3/8 NPT	Part number 1/2 NPT	Part number 3/4 NPT
Directair 2, Directair 4		 3-way, detent ball, foot bracket	M05422448	M05432448	M05442448	M05462448
		 3-way, detent ball, panel mount with nut	M05822451	M05832451	M05842451	M05862451
		 3-way, N.C., manual, foot bracket	M08521848	M08531848	M08541848	M08561848
		 3-way, N.C., manual, panel nut	M08521851	M08531851	M08541851	M08561851
		 3-way, N.C., pull to operate, spring return, foot bracket	M09721848	M09731848	M09741848	M09761848
		 3-way, N.C., pull to operate, spring return, panel mount with nut	M06421851	M06431851	M06441851	M06461851
Viking Xtreme Lever Series		 3-way, N.C., push to operate, spring return, foot bracket	M09821848	M09831848	M09841848	M09861848
		 3-way, N.C., push to operate, spring return, panel mount with nut	M06521851	M06531851	M06541851	M06561851
		 3-way, N.C., push to operate, spring return, foot bracket	M09821848	M09831848	M09841848	M09861848
4/2 Lever / Pedal Series		 4-way, detent ball, foot bracket	M05425448	M05435448	M05445448	M05465448
		 4-way, detent ball, panel mount with nut	M05825451	M05835451	M05845451	M05865451
		 4-way, manual, foot bracket	M08524648	M08534648	M08544648	M08564648
		 4-way, manual, panel nut	M08524651	M08534651	M08544651	M08564651
		 4-way, pull to operate, spring return, foot bracket	M09724648	M09734648	M09744648	M09764648
		 4-way, pull to operate, spring return, panel mount with nut	M06424651	M06434651	M06444651	M06464651
M0 Series		 4-way, push to operate, spring return, foot bracket	M09824648	M09834648	M09844648	M09864648
		 4-way, push to operate, spring return, panel mount with nut	M06524651	M06534651	M06544651	M06564651
LV-EZ Series Lockout Valves		 3-way, N.C., pull palm button to operate, spring return, panel mount with nut	M06421859	M06431859	M06441859	M06461859
		 3-way, N.C., push palm button to operate, spring return, panel mount with nut	M06521859	M06531859	M06541859	M06561859
		 4-way, pull palm button to operate, spring return panel mount with nut	M06424659	M06434659	M06444659	M06464659
		 4-way, push palm button to operate, spring return, panel mount with nut	M06524659	M06534659	M06544659	M06564659
Brass Poppet / Sliding Seal		 3-way, detent ball, foot bracket	M05422443	M05432443	M05442443	M05462443
		 3-way, manual, foot bracket	M08521843	M08531843	M08541843	M08561843
		 3-way, N.C., pull lever to operate, spring return, foot bracket	M09621843	M09631843	M09641843	M09661843
		 3-way, N.C., push lever to operate, spring return, foot bracket	M09521843	M09531843	M09541843	M09561843
		 4-way, detent ball, foot bracket	M05425443	M05435443	M05445443	M05465443
		 4-way, manual, foot bracket	M08524643	M08534643	M08544643	M08564643
		 4-way, pull lever to operate, spring return, foot bracket	M09624643	M09634643	M09644643	M09664643
		 4-way, push lever to operate, spring return, foot bracket	M09524643	M09534643	M09544643	M09564643

 Most popular.










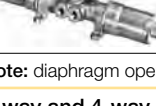




M0 Series Air Pilot, Manual & Mechanically Actuated Valves

3-way and 4-way, foot operated: treadle / pedal type	Description	Part number 1/4 NPT	Part number 3/8 NPT	Part number 1/2 NPT	Part number 3/4 NPT
	 3-way, treadle operated, detent ball, foot bracket	M05422488	M05432488	M05442488	—
	 3-way, treadle operated, manual return, foot bracket	M08521888	M08531888	M08541888	—
	 3-way, N.C., spring return, pedel operated, foot bracket	M06221840	M06231840	M06241840	—
	 4-way, treadle operated, denent ball, foot bracket	M05425488	M05435488	M05445488	—
	 4-way, treadle operated, manual return, foot bracket	M08524688	M08534688	M08544688	—
	 4-way, spring return, pedel operated, foot bracket	M06224640	M06234640	M06244640	—









CAUTION: This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

3-way and 4-way air operated : diaphragm or cylinder




	 3-way, N.C., single air diaphragm, air signal to actuate, spring return foot bracket	M08421830	M08431830	M08441830	—
	 3-way, single air cylinder signal to actuate, spring return foot bracket	M08521826	M08531826	M08541826	M08561826
	 3-way, double air diaphragm	M03321833	M03331833	M03341833	—
	 3-way, double air cylinder foot bracket	M01921819	M01931819	M01941819	M01961819
	 4-way, single air diaphragm, air signal to actuate, spring return foot bracket	M08424630	M08434630	M08444630	—
	 4-way, single air cylinder signal to actuate, spring return foot bracket	M08524626	M08534626	M08544626	M08564626
	 4-way, double air diaphragm	M03324633	M03334633	M03344633	—
	 4-way, double air cylinder foot bracket	M01924619	M01934619	M01944619	M01964619

Note: diaphragm operators : pilot signal pressures from 20 to 60 psi. Cylinder operators : pilot signal pressures from 20 to 250 psi.

3-way and 4-way clevis operated

	 3-way, manual, foot bracket	M08521805	M08531805	M08541805	M08561805
	 3-way, N.C., pull to operate, spring return foot bracket	M09621805	M09631805	M09641805	M09661805
	 3-way, N.C., push to operate, spring return, foot bracket	M09521805	M09531805	M09541805	M09561805
	 4-way, manual, foot bracket	M08524605	M08534605	M08544605	M08564605
	 4-way, pull clevis to operate, spring return, foot bracket	M09624605	M09634605	M09644605	M09664605
	 4-way, push clevis to operate, spring return, foot bracket	M09524605	M09534605	M09544605	M09564605

3-way and 4-way cam operated

	 3-way, N.C., spring return, cam operated, foot bracket	M09521803	M09531803	M09541803	M09561803
	 4-way, spring return, cam operated, foot bracket	M09524603	M09534603	M09544603	M09564603

Directair 2,
Directair 4

Viking Xtreme
Lever Series

42 Lever/
Pedal Series

M0
Series

LV-EZ Series
Lockout Valves

Brass Poppet/
Sliding Seal

D
Manual / Mechanical
Valve Products

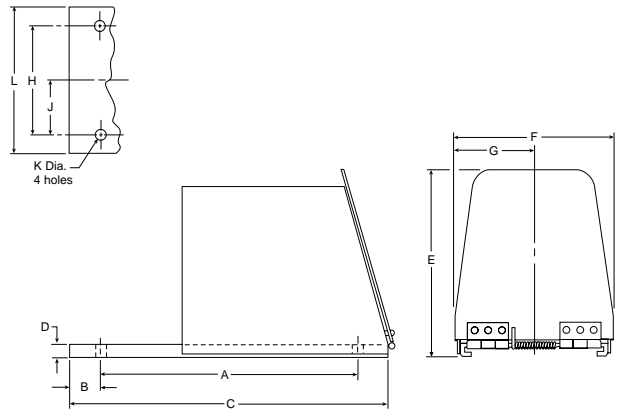
Pedal Guard
(Fits all pedal operated valves)

Description	Model number
Guard with door	M232001
Guard without door	M232002
Guard with door for 1/4 and 3/8 valve	M232003*
Guard without door for 1/4 and 3/8 valve	M232004*
Guard with door for 1/2 and 3/4	M232005*
Guard without door for 1/2 and 3/4	M232006*

* Includes mounting hardware.

CAUTION:

Foot valves utilizing this guard shall not be used to actuate a punch press.
 Do not use this valve on punch presses or press brakes.
 See OSHA 1910.217.



Dimensions

A	B	C	D	E	F	G
10.50	1.25	13.00	.50	7.38	6.36	3.18
266.7	31.8	330.2	12.7	187.4	161.5	80.8
H	J	K	L			
4.50	2.25	.44	6.00			
114.3	57.2	11.2	152.4			

Service Kits

(Field service instructions)

Description (For all 3 & 4-way valves)	1/4	3/8	1/2	3/4
Manual & mechanical operators	M242001	M242002	M242003	M242004
Cylinder (single, double & double-acting)	M242006	M242007	M242008	M242009
Diaphragm (single & double)	M242011	M242012	M242013	M242014

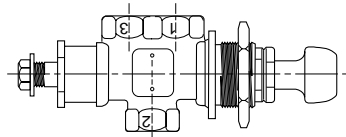
M0 valve 9 digit part number dissection

The M0 Valve Series has with wide variety of operating and return ends which can be ordered either on the left or right hand side of the valve body. Common part numbers on the previous pages can be ordered with the left and right hand ends swapped. Swapping operator and return end sections does not change the spool function, but can reverse the

expected function of the valve. For example, a 3-way, normally closed, "NC", spring return valve will become a 3-way normally open, "NO", valve when the operator and return section is swapped. There are other non-cataloged options available and this part number dissection will enable you to discuss your valve part number with the factory for options.

3-way

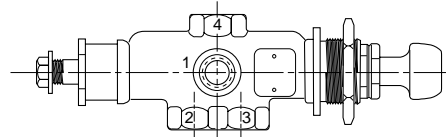
Series name	Left end	Port size	Body function	Right end
M0	XX	X	XX	XX



Left End Section in relation to port #2 ← → Right End Section in relation to port #2

4-way

Series name	Left end	Port size	Body function	Right end
M0	XX	X	XX	XX



Left End Section in relation to port #2 ← → Right End Section in relation to port #3

Directair 2,
 Directair 4
 Viking Xtreme
 Lever Series
 42 Lever /
 Pedal Series
 M0
 Series
 LV-EZ Series
 Lockout Valves
 Brass Poppet /
 Sliding Seal
 D
 Manual / Mechanical
 Valve Products

LV / LVSS Series

Lockout valves are installed in pneumatic drop legs, or individual pneumatic control lines. In accordance with OSHA procedures, lockout valves are used during maintenance and service procedures of pneumatically (air) operated equipment.

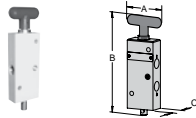
- Used for compliance with OSHA 29 CFR part 1910
- 1/4" to 2" pipe sizes. NPT or BSPP
- Yellow cast aluminum body with red handle or stainless steel (NACE MR0175 / ISO 15156)
- Inline or surface mountable
- Built in port for pressure verification to meet ANSI B11 and PMMI B155 requirements

Material specifications

Description	LV / EZ	LVSS
Body:	Cast aluminum alloy	Stainless steel
Handle:	Plastic	Stainless steel
Spool:	Aluminum	Stainless steel
Seals:	Carboxylated nitrile	Carboxylated nitrile
Detent spring:	Stainless steel	Stainless steel
Grease:	Magnalube G [†]	Magnalube G [†]

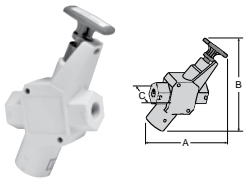
[†] Trademark Magnalube

Compact



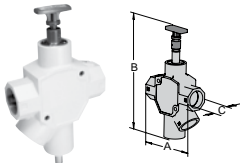
Port in / out	Port exhaust	A (in)	B (in)	C (in)	Wt (lb)	Part number *
1/4	3/8	2.3	6.5	1.0	0.9	LV2N3B
3/8	3/8	2.3	6.5	1.0	0.9	LV3N3B

Standard



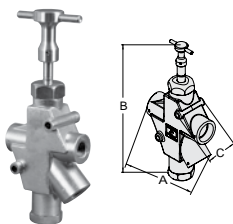
Port in / out	Port exhaust	A (in)	B (in)	C (in)	Wt (lb)	Part number *
3/8	3/4	6.4	8.8	2.0	2.0	LV3N6B
1/2	3/4	6.4	8.8	2.0	2.0	LV4N6B
3/4	3/4	6.4	8.8	2.0	2.0	LV6N6B
3/4	1-1/4	7.6	10.6	2.3	3.2	LV6NAB
1	1-1/4	7.6	10.6	2.3	3.2	LV8NAB
1-1/4	1-1/4	7.6	10.6	2.3	3.2	LVANAB

High Flow



Port in / out	Port exhaust	A (in)	B (in)	C (in)	Wt (lb)	Part number *
1-1/2	2	8.2	14.9	3.0	8.2	LVBNCB
2	2	8.2	14.9	3.0	8.2	LVCNCB

Stainless Steel



Port in / out	Port exh.	A (in)	B (in)	C (in)	Wt (lb)	Part number *
1/4	1/4	3.5	8.6	2.1	3.8	LV2N2BSS
3/8	1/2	4.3	10.5	1.8	6.0	LV3N4BSS
1/2	1/2	4.3	10.5	1.8	6.0	LV4N4BSS
3/4	1	6.0	14.1	2.5	13	LV6N8BSS
1	1	6.0	14.1	2.5	13	LV8N8BSS
1-1/2	2	8.2	18.5	4.0	35	LVBNCBSS
2	2	8.2	18.5	4.0	35	LVCNCBSS

* For BSPP ports, change 4th digit from "N" to "B"

Most popular.



Operating information

Operating pressure:	LV	EZ	LVSS
Compact	15 to 145 PSIG	–	–
Standard	15 to 300 PSIG	15 to 300 PSIG	15 to 300 PSIG
High flow	15 to 300 PSIG	–	–
Operating temperature:	40°F to 175°F	40°F to 175°F	30°F to 175°F
Operating media:	Clean, dry, compressed air (5 micron)		

Directair 2,
Directair 4

Viking Xtreme
Lever Series

42 Lever/
Pedal Series

M0
Series

LV-EZ Series
Lockout Valves

Brass Poppet/
Sliding Seal

D

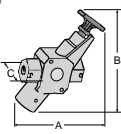
Manual / Mechanical
Valve Products

EZ Series

The EZ series meets all the same standards as the LV series with the added feature of a soft start when opened. There are still 2 detented positions for the handle (push close, pull to open), but when pulled open, an adjustable needle valve controls the rate of pressure build-up. This can protect equipment during start up after maintenance. The EZ is distinguishable from the LV series by the blue dot on the label.



EZ Series



Port in / out	Port exhaust	A (in)	B (in)	C (in)	Wt (lb)	Part Number *
3/8	3/4	6.4	8.8	2.0	2.1	EZ03NB6
1/2	3/4	6.4	8.8	2.0	2.1	EZ04NB6
3/4	3/4	6.4	8.8	2.0	2.1	EZ06NB6
3/4	1-1/4	7.7	10.8	2.3	3.2	EZ06NBA
1	1-1/4	7.7	10.8	2.3	3.2	EZ08NBA
1-1/4	1-1/4	7.7	10.8	2.3	3.2	EZ0ANBA

* For BSPP ports, change 5th digit from "N" to "B"

LV / EZ Accessories

High Flow Silencers

Pipe size	Part number NPT	Part number BSPT
3/8	ES37MC	ESB37MC
3/4	ES75MC	ESB75MC
1-1/4	ES125MC	ESB125MC
2	ES200MC	ESB200MC

Stainless Steel Mufflers

Pipe size	Part number NPT
1/4	5500A2004
1/2	5500A4004
1	5500A6004
2	5500A9004 **

** Nickel Plated

Pop-up Pressure Indicator



Brass – Part # 988A30 – Can be used on all LV or EZ series to provide visual verification of line exhaust



Stainless – Part# 1155H30 – Can be used on SS LV series to provide visual verification of line exhaust

Pressure Switch



- Part # PPS1-2C3-RHM (DIN 9.4mm connector)
- Part # PPS1-2C3-RWL (18" leads)
- Signal verification of line exhaust
- Field adjustable set point

Most popular.

Directair 2,
 Directair 4
 Viking Xtreme
 Lever Series
 42 Lever /
 Pedal Series
 M0
 Series
 LV-EZ Series
 Lockout Valves
 Brass Poppet /
 Sliding Seal
D
 Manual / Mechanical
 Valve Products

PL / VL Series

These are 4-Way, 3-Position, rotary disc, direct-operated air valves. Two different types of control are offered. The forged bronze disc and the cast iron surface upon which the disc works are ground and lapped to provide a leak-proof seal. Air pressure from the inlet port is confined beneath the disc, making the seal tighter as the pressure increases, yet friction between the lapped surfaces is so low that only 15 pounds of force is required to move the lever at 100 PSI line pressure. The need for packing to seal around the stem is eliminated.

Valve can be furnished for gasketing to a manifold on customer's machine or with an adaptor for tapped bottom porting.

Valves are detented.

Operating handles may be installed in any of four positions.



Operating information

Operating pressure: 0 to 150 PSI (0 to 1035 kPa)

Temperature range: 18°F to 200°F (-8°C to 93°C)

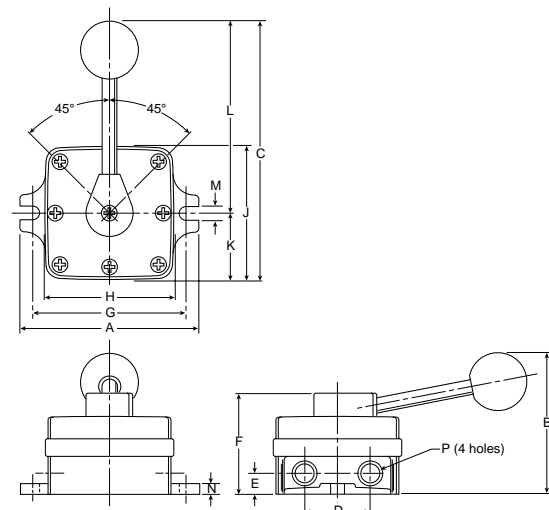
Lubrication: Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

PL-VL Series Valves

Symbol	Port Size	Description	Cv	Part number
	1/4" NPT	4-way, 3-position, detent, closed center	2.5	PL25
	3/8" NPT	4-way, 3-position, detent, closed center	3.0	PL37
	1/2" NPT	4-way, 3-position, detent, closed center	6.2	PL50
	1/4" NPT	4-way, 3-position, detent, exhaust center	2.5	VL25
	3/8" NPT	4-way, 3-position, detent, exhaust center	3.0	VL37
	1/2" NPT	4-way, 3-position, detent, exhaust center	6.2	VL50

Service kits

Description	Valve size	Part number
Lever assembly service kits	PL25, PL25HP, PL37, PL37HP, VL25, & VL37	PL2425BP
	PL50, PL50HP & VL50	PL2424BP
Body gasket	PL25, PL25HP, PL37, PL37HP, VL25, & VL37	P66837
	PL50, PL50HP & VL50	P66829



PL-VL Dimensions

	A	B	C	D	E	F	G	H	J	K	L	M	N	P
PL-25	4.75	3.81	6.81	1.69	.56	2.75	4.12	3.50	3.50	1.69	5.06	.34	.28	1/4
VL-25	(121)	(97)	(173)	(43)	(14)	(70)	(105)	(89)	(89)	(43)	(129)	(9)	(7)	NPT
PL-37	4.75	3.81	6.81	1.69	.56	.56	4.12	3.50	3.50	1.69	5.06	.34	.28	3/8
VL-37	(121)	(97)	(173)	(43)	(14)	(14)	(105)	(89)	(89)	(43)	(129)	(9)	(7)	NPT
PL-50	5.62	4.44	8.94	2.12	.66	3.25	5.00	4.38	4.38	2.12	6.75	.34	.34	1/2
VL-50	(143)	(113)	(227)	(54)	(17)	(83)	(127)	(111)	(111)	(54)	(171)	(9)	(9)	NPT

inches (mm)

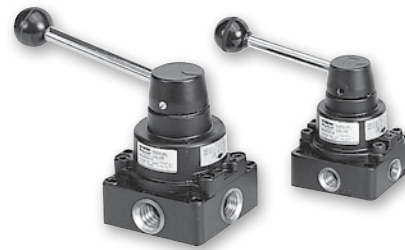
Most popular.



HV Valve Series

Features

- Compact and simple design
- Rotary disc, direct operated valves
- Side porting
- Detent action smooth lever actuation
- General pneumatic applications



Lubrication

Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

Material specifications

Cover	Zinc
Body	Aluminum
Seals	Polyurethane

Operating information

Operating pressure: 0 to 150 PSI (0 to 10 bar)

Temperature range: 32°F to 166°F (0°C to 60°C)

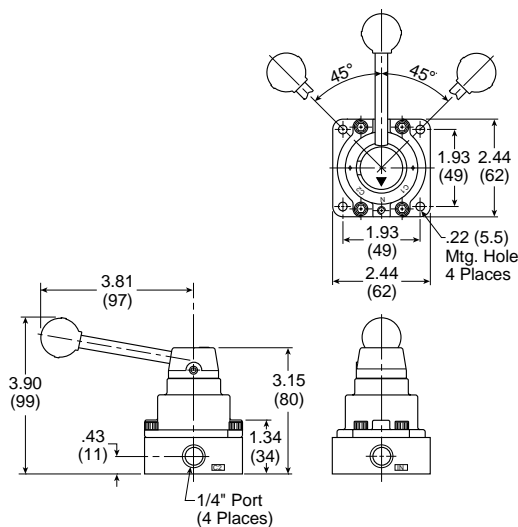
Lubrication: Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

HV Valve Series

Symbol	Port size	Description	Cv (ANSI)	Cv (JIS)	Part number
	1/4" NPT	4-way, 3-position	0.5	0.4	HVN4200-8
	3/8" NPT	4-way, 3-position	1.4	2.72	HVN4400-10
	1/2" NPT	4-way, 3-position	1.5	3.26	HVN4400-15

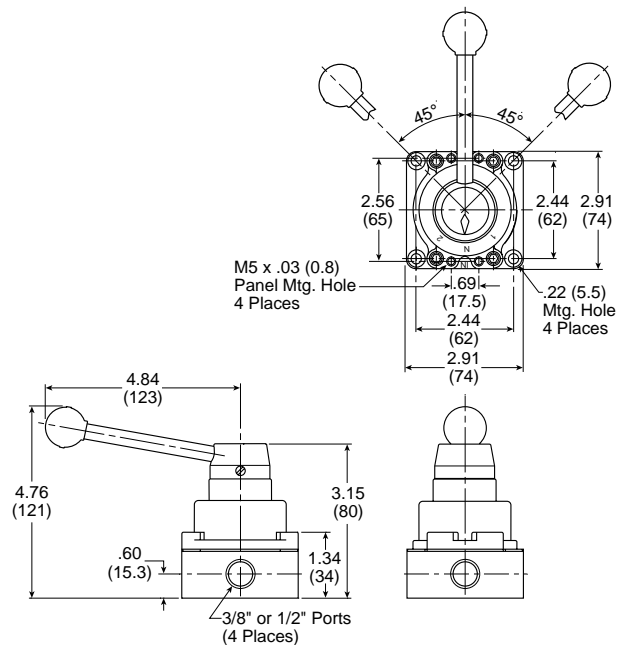
Service kits

Description	Valve size	Part number
Disk & seal service kits	HV4200	HVRK420001
	HV4400	HVRK440001



HVN4200-8

Most popular.



HVN4400-10, 15

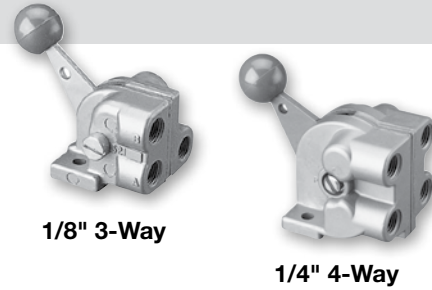
Hand Operated Sliding Seal Valves

Sliding seal valves provide 3 or 4-Way directional control in a compact body size. Comfortable hand lever is easy to operate and maintains set position. Disc type valve has minimum number of moving parts. Valves should be used with filtered and lubricated air.

CAUTION:
 Install guards on all hand operated valves.
 Accidental operation can cause personal injury.

Material specifications

Internal components	Brass, stainless steel
Body	Die cast zinc
Seals	Buna N



1/8" 3-Way

1/4" 4-Way

Operating information

Operating pressure: Max. 200 PSIG air only
 Min. 26" Hg vacuum

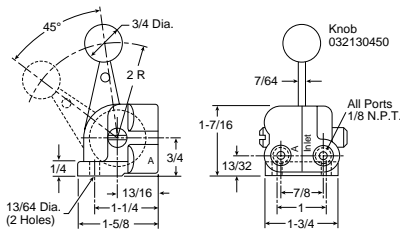
Temperature range: -40°F to 212°F (-40°C to 100°C)
 (If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage or unpredictable behavior.)

Hand Operated Sliding Seal Valve

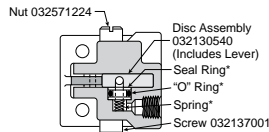
Symbol	Port size	Function	Cv (Avg)	Service kit*	Part number
	1/8"	3-way, 2-position, detented	0.54	032130899	032130599
	1/8"	4-way, 2-position, detented	0.54	032130899	032140299
	1/4"	3-way, 2-position, detented	1.25	008230299	008230109
	1/4"	4-way, 3-position, detented, center blocked	1.25	008230299	008240109

Note: 3-Way exhaust passage is through an untapped hole in bottom side of valve.

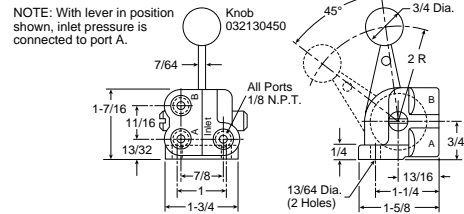
1/8" 3-Way 032130599



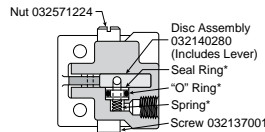
Service Kit 032130899*



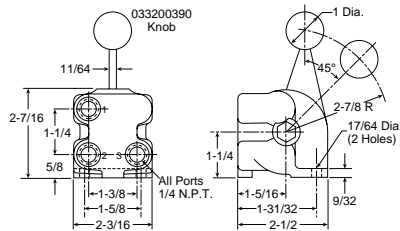
1/8" 4-Way 032140299



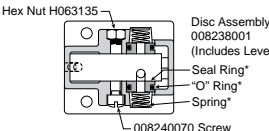
Service Kit 032130899*



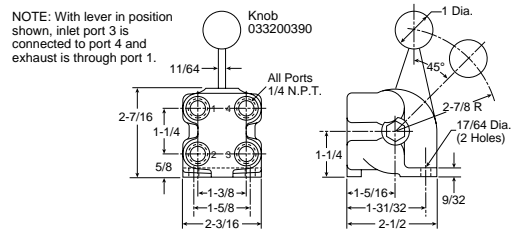
1/4" 3-Way 008230109



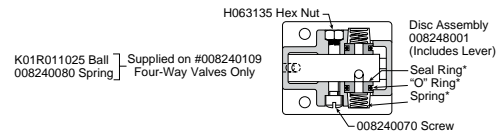
Service Kit 032130899*



1/4" 4-Way 008240109



Service Kit 032130899*



Most popular.

* Service kits contain asterisk items



Directair 2,
Directair 4

Viking Xtreme
Lever Series

42 Lever/
Pedal Series

M0
Series

LV-EZ Series
Lockout Valves

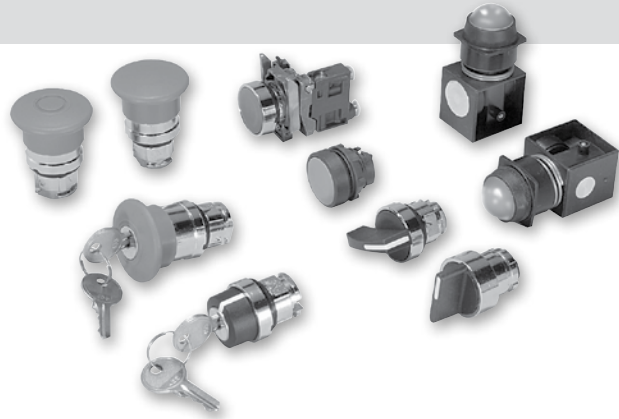
Brass Poppet /
Sliding Seal

D

Manual / Mechanical
Valve Products

Control Panel Products

HUMAN-MACHINE DIALOG requires devices such as push buttons and selector switches to provide command inputs. A wide variety of these devices are available to meet most application needs; in both pneumatic and electrical switch bodies. All of these devices use the 22 mm (7/8") mounting standard.



Complete Assemblies— 3/2 Valve Bodies with 5/32" Instant Straight Connections

Flush Push Buttons

	Color	Function	Type of switching*	Part number
	Black			PXBB3111BA2
	Green	Spring return	NNP	PXBB3111BA3
	Red			PXBB3111BA4
	Black	Spring return	NNP+NP	PXBB3251BA2
	Black		Single universal 3-way	PXBB4131BA2
	Green	Spring return		PXBB4131BA3
	Red			PXBB4131BA4
	Black	Spring return	Dual universal 3-way	PXBB4231BA2

* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.
Note: Mount up to three valves on mounting ring.

Mushroom Head Push Buttons (40mm Diameter)

	Color	Function	Type of switching*	Part number
	Black	Spring return	NNP	PXBB3111BC2
	Red	Push-pull		PXBB3111BT4
	Red	Push-pull	NP	PXBB3121BT4
	Black	Spring return	Single universal 3-way	PXBB4131BC2
	Red	Push-pull		PXBB4131BT4

* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.
Note: Mount up to three valves on mounting ring.

Selector Switches

	Color	Function	Type of switching*	Part number
	Black	2 maintained positions with std. handle	NNP	PXBB3111BD2
	Black		NNP+NP	PXBB3211BD2
	Black		NNP+NP	PXBB3251BD2
	Black	3 maintained positions with std. handle	NNP+NP	PXBB3211BD3
	Black		NNP+NP	PXBB3251BD3
	Black	3 positions, spring return to center with long handle	NNP+NP	PXBB3211BJ5
	Black	2 maintained positions with std. Handle	Single universal 3-way	PXBB4131BD2
	Black	2 maintained positions with std. handle	Dual universal 3-way	PXBB4231BD2
	Black	3 maintained positions with std. handle	Dual universal 3-way	PXBB4231BD3
	Black	3 maintained positions with long handle	Dual universal 3-way	PXBB4231BJ5





* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.

Most popular.

Control Panel Products
 Sensing / Limit Switches
D
 Accessories Valve Products



For Use With PXBB Valve Bodies and ZBE Electrical Switch Bodies

Push Buttons

	Color	Function	Type	Part number	Plastic head**	Metal head*
	Black	Spring return	Flush	ZB5AA2	—	ZB4BA2
	Green			ZB5AA3		ZB4BA3
	Red			ZB5AA4		ZB4BA4
	Yellow			—		ZB4BA5
	Blue			—		ZB4BA6
	Black	Spring return	Extended	ZB5AL2	—	ZB4BL2
	Green			ZB5AL3		ZB4BL3
	Red			ZB5AL4		ZB4BL4
	Yellow			—		ZB4BL5
	Black	Spring return	Booted	—	—	ZB4BP2
	Green			—		ZB4BP3
	Red			—		ZB4BP4
	Black	Detent 2 position	Flush	—	—	ZB4BH02
	Green			—		ZB4BH03
	Red			—		ZB4BH04



* ZB4*** model numbers are metal head operators
 ** ZB5*** model numbers are plastic head operators

Selector Switches

Standard black handle				
	Description	Function	Part number*	
	Maintained	2 positions	ZB4BD2	
	Spring return from right to left		ZB4BD4	
	Maintained	3 positions	ZB4BD3	
	Spring return to center from left and right		ZB4BD5	
	Maintained right spring return from left to center	3 positions	ZB4BD7	
	Maintained left spring return from right to center		ZB4BD8	
	Long Black Handle			
		Maintained	2 positions	ZB4BJ2
Spring return from right to left		ZB4BJ4		
Maintained		3 positions	ZB4BJ3	
Spring return to center from left and right			ZB4BJ5	

* ZB4*** model numbers are metal head operators



Mushroom Head Push Buttons

	Color	Function	Description	Part number*
	Black	Spring return	Ø 40mm head	ZB4BC2
	Green			ZB4BC3
	Red			ZB4BC4
	Black	Latching push-pull	ZB4BT2	
	Black	Spring return	Ø 60mm head	ZB4BR2
	Green			ZB4BR3
	Red			ZB4BR4

* ZB4*** model numbers are metal head operators


For Push Buttons and Visual Indicators

Mounting Ring for Valve Bodies, Switch Bodies and Operating Heads

Description	Part number
 Metal mounting ring	ZB4BZ009
 Plastic mounting ring	ZB5AZ009


Note: To release push button from mounting ring, pull lever on top of mounting ring up and remove push button operator. To assemble push button operator to mounting ring, align arrows and snap into place.

Key Operated Selectors

	Key withdrawal	Function	Part number*
	Left	2 maintained positions	ZB4BG2
	Left and right		ZB4BG4
	Center	3 maintained positions	ZB4BG3
	Left and right		ZB4BG5
	Center	3 positions 2 spring return to center	ZB4BG7

* ZB4*** Model numbers are metal head operators

Mushroom Head Push Buttons with Key Select

	Color	Function	Description	Part number*
	Red	Latching turn to release	Ø 40mm head	ZB4BS844
	Red	Key latching		ZB4BS944

* ZB4**** model numbers are metal head operators

For Use With 2B4* Metal Operating Heads**

3/2 Valve Bodies with Mounting Ring



Connections	Function	Type of switching*	Part number
5/32" Instant	3/2	NNP	PXBB3111B
5/32" Instant	3/2	NP	PXBB3121B
5/32" Instant	3/2	Universal 3-way	PXBB4131B

* NNP: Normally non-passing.
 Note: Mount up to 3 valves on mounting ring for push buttons.
 Mount up to 2 valves on mounting ring for selector switches, valves cannot be mounted in center position.

Additional Valve Bodies



Connections	Function	Type of switching*	Part number
5/32" instant straight	3/2	NNP	PXBB3911
5/32" instant swivel			PXBB3912
5/32" instant straight	3/2	NP	PXBB3921
5/32" instant swivel			PXBB3922
5/32" instant straight	3/2	Universal	PXBB4931
5/32" instant swivel			3 way

* NNP: Normally non-passing.

For Push Buttons and Visual Indicators

Legend Plates for PXBB Devices (22mm)

Description	Part number		
Without text for customer engraving			
Black / red background (white letters)	ZBY2101		
Yellow / white background (black letters)	ZBY4101		
With text for push buttons			
Start	ZBY2303		
Stop	ZBY2304		
Forward	ZBY2305		
Reverse	ZBY2306		
Up	ZBY2307		
Down	ZBY2308		
Right	ZBY2309		
Left	ZBY2310		
On	ZBY2311		
Off	ZBY2312		
Open	ZBY2313		
Close	ZBY2314		
Inch	ZBY2321		
Reset	ZBY2323		
Power On	ZBY2326		
Slow	ZBY2327		
Fast	ZBY2328		
Emergency stop	ZBY2330		
Run	ZBY2334		
With text for 2-position selectors			
Off	On	ZBY2367	
With text for 3-position selectors			
Hand	Off	Auto	ZBY2387



Blank Legend Plates for Inscription

For PXBB devices (2 lines of 11 characters maximum)

Please indicate the required text when ordering.
 (Allow 3 weeks for delivery)

Description	Part number
Black background / White letters	ZBY2002

For 22mm Visual Indicators Only

2 lines of 11 characters maximum

Please indicate the required text when ordering.
 (Allow 3 weeks for delivery)

Description	Part number
Black background / white letters	ZB2BY2002

Electrical Switch Bodies

When combined with pneumatic valves, these contact blocks allow different forms of power to be provided from a single push button. Can be mounted with both types of valves PXBB3 / PXBB4.

Type of contact	Part number
Normally open (NO)	ZBE101
Normally closed (NC)	ZBE102


Note: Plastic mounting ring ZB5AZ009 to be used with ZB5 plastic operating heads. Metal mounting ring ZB4BZ009 to be used with ZB4 metal operating heads.

Electrical specification: 240V, 10 Amp

Control Panel Products
 Sensing / Limit Switches
D
 Accessories Valve Products


With 5/32" Instant Connections

22mm Visual Indicators


Black Plastic Bezel	Color	Part number "ON" indicator	Part number "OFF" indicator
	Green	PXVF131	PXVF1213
	Red	PXVF141	PXVF1214
	Yellow	PXVF151	PXVF1215
	Blue	PXVF161	PXVF1216
	White	PXVF111	PXVF1211

Notes: The Pneumatic Indicators are black in one position and colored in the other. The colored position corresponds either to the presence of a pressure ("ON" Indicator) or the absence of pressure ("OFF" Indicator).


Two-Hand Controls

	Connections	Part number
	5/32" Instant	PXPC111


Mounting Accessories

	Color	Description	Part number
	—	Plastic head (ZB5) mounting nut tightening tool	ZB5AZ905
	Black plastic	Guard for 40mm	ZBZ1602

Two-Hand Control Module

	Connections	Part number
	5/32" Instant	PXPA11

Two-Hand Control Module Guard

	Base component	Part number
	PXPC111	PPRL15

Control Panel Products

Sensing / Limit Switches

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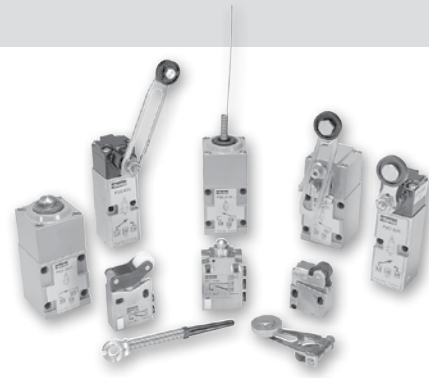
Accessories Valve Products

Sensing

To achieve the sensing or feedback function, pneumatic sensors can be:

- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleed or blocking for detection.

A wide variety of pneumatic sensors are available to suit any application requirement.



Material specifications



Body	Zinc alloy
Poppets	Polyurethane
Seals	Nitrile (Buna N)

Operating information

Operating pressure:	40 to 115 PSIG (3 to 8 bar)
Operating temperature:	
Operating	32°F to 122°F (0°C to 50°C)
Storage	-22°F to 140°F (-30°C to 60°C)

3/2 Miniature Direct Acting Limit Switches

1/16" I.D. Internal Orifice

	Actuator	Type of switching*	Flow SCFM (NI/min)	Nominal bore	Connection	Part number
	Steel plunger operating levers available	NNP	2.2 (60)	1/16" (1.5mm)	5/32" instant	PXCM111
					10-32 UNF	PXCM115
	Plastic roller	NNP	3.0 (85)	1/16" (1.5mm)	5/32" instant	PXCM121
					10-32 UNF	PXCM125

7/64" I.D. Internal Orifice




	Plastic roller	NNP			5/32" instant	PXCM521
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Actuators For Steel Plunger (Use with PXCM11*)


	Plastic roller lever					PXCZ11
	Plastic roller lever, one way trip					PXCZ12

3/2 Compact Pilot Operated Limit Switches

7/64" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port

	Actuator	Type of switching*	Flow SCFM (NI/min)	Nominal bore	Connection	Part number
	Steel plunger operating levers available					PXCM601A110
	Steel roller plunger	NNP	8.8 (250)	7/64" (2.5mm)	5/32" instant	PXCM601A102
	90° Steel roller plunger					PXCM601A103





* NNP: Normally non-passing. 

 Most popular.

Standard Duty Limit Switches – “K” Series



Plunger Operated Limit Switches

1/8" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port


	Actuator	Type of switching*	Flow SCFM (NI/min)	Nominal bore	Connection	Part number
	Steel plunger	NNP	7.4 (210)	1/8" (3mm)	5/32" instant	PXCK21101
		NP				PXCK22101
	Steel roller plunger	NNP				PXCK21102
		NP				PXCK22102
	Plastic roller plunger	NNP				PXCK21121
		NP				PXCK22121
	Cats whisker	NNP				PXCK21106
		NP				PXCK22106

Roller Operated Limit Switches


1/8" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port



	Actuator	Type of switching*	Flow SCFM (NI/min)	Nominal bore	Connection	Part number
	Fixed delrin roller lever multi-function head actuates: - from right and left - from right - from left	NNP	7.4 (210)	1/8" (3mm)	5/32" instant	PXCK2110031
		NP				PXCK2210031
	Adjustable delrin roller lever multi-function head actuates: - from right and left - from right - from left	NNP				PXCK2110041
		NP				PXCK2210041

Separate Pneumatic Switch Bodies

	Actuator	Type of switching*	Part number
	For use with ZCK series operating heads	NNP	PXCK211
		NP	PXCK221

Pneumatic Switch Bodies with Rotary Heads


	Actuator	Type of switching*	Part number
	Multi-function head actuates: - from right and left - from right - from left	NNP	PXCK21100
		NP	PXCK22100

* NNP: Normally non-passing. 
 NP: Normally passing. 

Standard Duty Limit Switches – “K” Series



Operating Heads

For Use With PXCK Switch Bodies

Actuator	Description	Part number
Rotary operated		
	Die cast zinc	ZCKG00
Plunger operated		
Roller plunger	Plunger operated	ZCKD02
Whisker		ZCKD06
Rod plunger		ZCKD10
Delrin roller lever on plunger		ZCKD21
Steel roller lever on plunger		ZCKD23


Operating Levers for Rotary Heads

For Use With Rotary Head ZCKG00


Actuator	Description	Part number
	Steel 1/8" square	ZCKY51
	Fiberglass 1/8" dia. round	ZCKY52
	Plastic spring rod lever	ZCKY81
	Metal spring rod lever	ZCKY91
	Delrin roller lever	ZCKY11
	Steel roller lever	ZCKY13
	Adjust. delrin roller lever	ZCKY41
	Adjust. steel roller lever	ZCKY43

Heavy Duty Limit Switches – “J” Series

Switch Bodies Only





	Type of switching*	Part number
	NNP	PXCJ117
	NP	PXCJ127

Separate Pneumatic Switch Bodies

	Direction of actuator	Type of switching*	Part number
	Right & left, spring return	NNP	PXCJ11701
	Right or left, spring return		PXCJ11705
	Right & left, spring return	NP	PXCJ12701
	Right or left, spring return		PXCJ12705



Operating Levers for Rotary Heads



Die Cast Zinc. For Use With PXCJ Switch Bodies

Operator	Description	Part number
	Delrin roller	ZC2JY11
	Steel roller	ZC2JY13
	Offset delrin roller	ZC2JY21
	Plastic spring rod	ZC2JY81
	Metal spring rod	ZC2JY91
	Delrin roller	ZC2JY31
	Offset delrin roller	ZC2JY41
	Rod lever	ZC2JY51
	Single track, delrin roller	ZC2JY71
	Double track, delrin rollers	ZC2JY61

Top Plunger & Rotary Operating Heads

Die Cast Zinc. For Use With PXCJ Switch Bodies

Operation	Description	Part number	
Top Plunger Type			
	Top push	ZC2JE61	
	Top roller push	ZC2JE62	
	Side push	Spring return	ZC2JE63
	Cat's whisker		ZC2JE70
Rotary Type			
	From left & right	ZC2JE01	
	Counterclockwise from right	Spring return	ZC2JE02
	Clockwise from left		ZC2JE03
	From left or right		ZC2JE05
	Maintained positions	ZC2JE09	

* NNP: Normally non-passing. 
 NNP: Normally passing. 

Control Panel Products
 Sensing / Limit Switches
D
 Accessories Valve Products

The blocking valve is a single acting spring return 2/2 valve in a fitting format. The device requires a pneumatic pilot signal to open, which allows free flow of air or neutral gas. As long as a pilot signal is present, the device will remain open. When the pilot signal is removed, the internal spring will close the blocking valve, bubble tight.

These devices have two primary design uses: (1) to prevent unwanted gravity induced motion in cylinders during shut down procedures or during periods of lost supply pressure and (2) freezing the cylinder position by using a blocking valve at each end of the cylinder. Application needs such as tool or work piece protection, horizontal indexing or inspection stops are often satisfied by these devices.





Material specifications

Body	Zinc alloy
------	------------



Operating information

Operating pressure:	0 to 150 PSIG (0 to 10.3 bar)
Operating temperature:	
Operating	5°F to 140°F (-15°C to 60°C)
Storage	-40°F to 160°F (-40°C to 70°C)

For Cylinder Mounting
 (Can also be mounted in Threshold Sensor Banjo)
With Instant Tube Fittings

BSPP				NPT				
Symbol	Connection for pilot	Cylinder port thread (male)	Connection for tube	Part number	Connection for pilot	Cylinder port thread (male)	Connection for tube	Part number
  PWBA3469	4mm Tube	1/8"	6mm	PWBA1468	5/32" Tube	1/8"	1/4"	PWBA3468
		1/4"	6mm	PWBA1469		1/4"	1/4"	PWBA3469
		1/4"	8mm	PWBA1489		3/8"	3/8"	PWBA3493
		3/8"	8mm	PWBA1483		1/2"	1/2"	PWBA3412
		3/8"	10mm	PWBA1493				
		1/2"	12mm	PWBA1412				

With Threaded Connections and Tube Pilot Port

BSPP				NPT				
Symbol	Connection for pilot	Cylinder port thread (male)	Connection from valve (female)	Part number	Connection for pilot	Cylinder port thread (male)	Connection from valve (female)	Part number
  PWBA3833	4mm Tube	1/8"	1/4"	PWBA1898	5/32" * Tube	1/8"	1/8"	PWBA3888
		1/4"	1/4"	PWBA1899		1/4"	1/4"	PWBA3899
	M5 Female	3/8"	3/8"	PWBA1833		3/8"	3/8"	PWBA3833
		1/2"	1/2"	PWBA1822		1/2"	1/2"	PWBA3822

* Instant fitting

With Threaded Connections and Threaded Pilot Port

NPT			
Connection for pilot	Cylinder port thread (male)	Connection from valve	Part number
1/8" pipe	1/8"	1/8"	PWBA38887
	1/4"	1/4"	PWBA38997
	3/8"	3/8"	PWBA38337
	1/2"	1/2"	PWBA38227

The plug-in threshold sensors provide feedback information on pneumatic cylinder status in either pneumatic or electrical outputs. Mounted into the cylinder port, these devices monitor the back pressure of the cylinder's exhaust. When the cylinder's piston stops, the back pressure rapidly drops and the threshold sensor provides the desired output. Ideal for variable stroke applications such as robotics where other sensor type devices such as limit switches are impractical, these devices provide a signal whenever the cylinder stops motion.

The threshold sensor consists of two complementary sub assemblies (1) the banjo fitting and (2) the plug-in sensor element. In all cases, the sensor is easily plugged into the banjo fitting and locked in place with a spring clip. The banjo fitting is designed to accept (piggy backed) other functional fittings such as flow controls or blocking valves. Simply select the sensor based on the type feedback signal that best fits the application.




Material specifications

Body	Thermoplastic
Mounting screw	Brass



Operating information

Operating pressure:	0 to 150 PSIG (0 to 10.3 bar)
Operating temperature:	
Operating	5°F to 140°F (-15°C to 60°C)
Storage	-40°F to 160°F (-40°C to 70°C)

Banjo Sockets (with Sensor Clip)

	Port size	Wrench	Part number
	10-32	5/16" Hex	PWSB1557
	1/8"	3/16" Allen	PWSB1887
	1/4"	5/16" Allen	PWSB1997
	3/8"	3/8" Allen	PWSB1337
	1/2"	1/2" Allen	PWSB1227

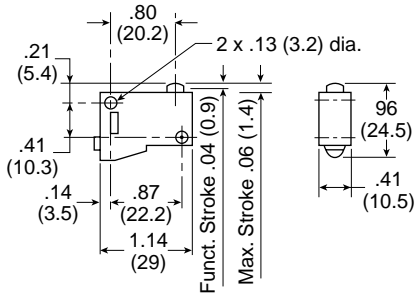
Plug-in Sensors

	Output	Connection	Part number
	Pneumatic	5/32" push-in	PWSP111
	Electrical	3-wire cable (6 ft)	PWSM1012

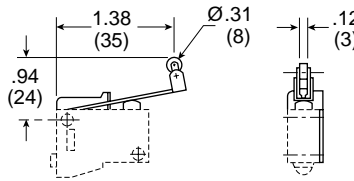
Control Panel Products
 Sensing / Limit Switches
D
 Accessories Valve Products

Miniature Limit Switches

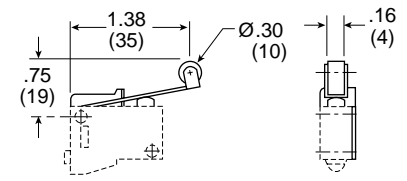
PXCM111



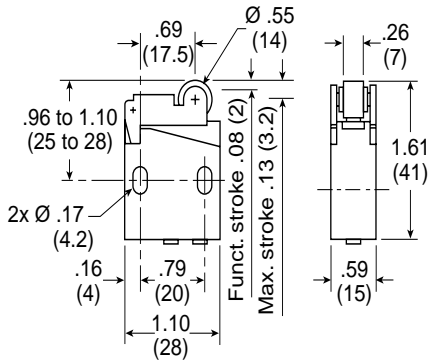
PXCZ12



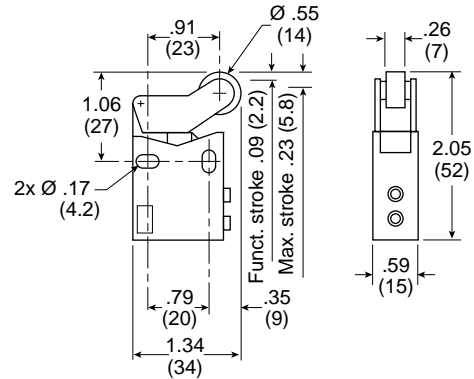
PXCZ11



PXCM121, PXCM131

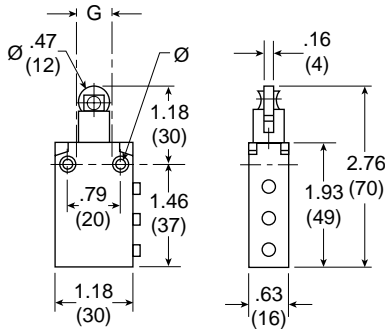


PXCM521

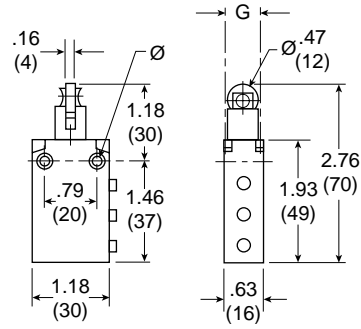


Compact Limit Switches

PXCM601A102



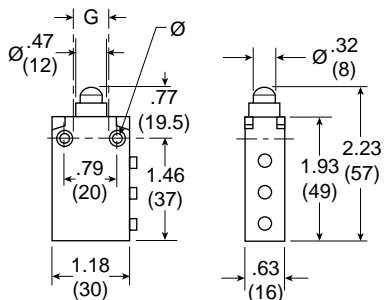
PXCM601A103



Ø:
 2 mounting holes Ø .17" (4.3)
 2 countersunk Ø .32" (8.2)
 depth 4 mm

G:
 top mounting holes, 2 x M5
 .71" (18 mm) centers

PXCM601A110



Control Panel
 Products

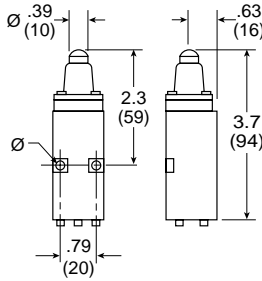
Sensing /
 Limit Switches

D

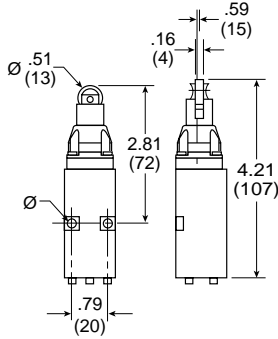
Accessories
 Valve Products

K Series

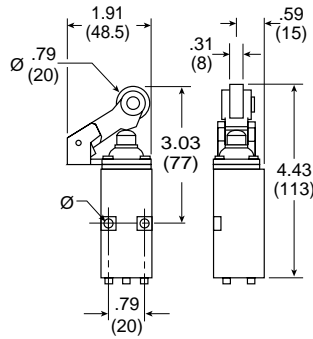
PXCK21101, PXCK22101



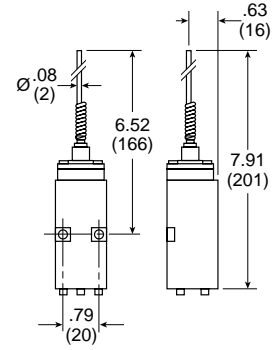
PXCK21102, PXCK22102



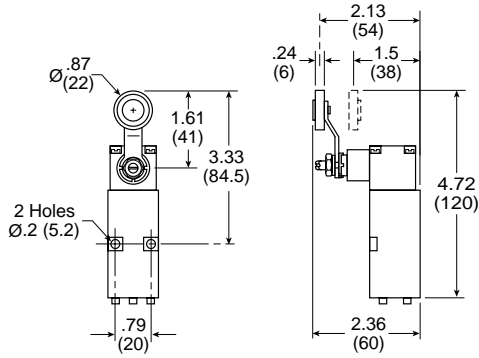
PXCK21121, PXCK22121



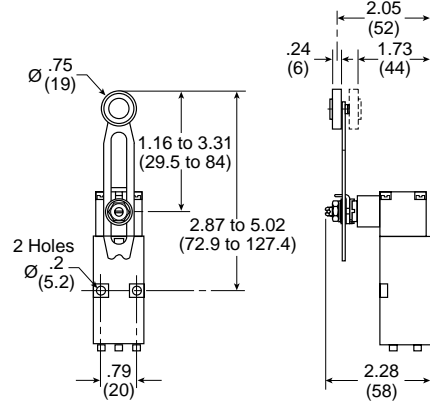
PXCK21106, PXCK22106



PXCK2110031, PXCK2210031

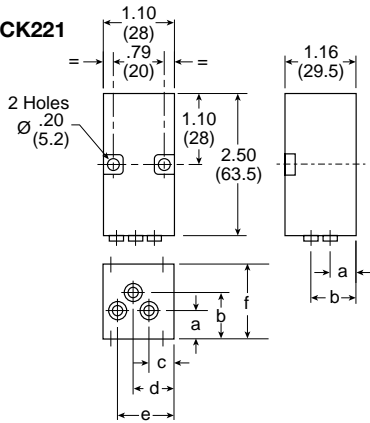


PXCK2110041, PXCK2210041



Pneumatic Switch Bodies

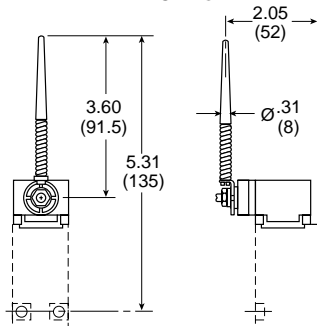
PXCK211, PXCK221



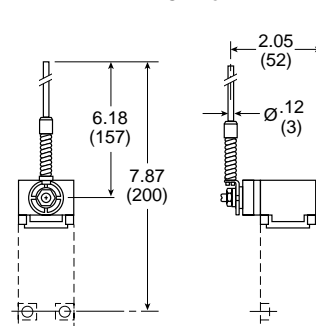
	inch	mm
a	.39	10
b	.77	19.5
c	.35	9
d	.61	15.5
e	.87	22
r	1.66	29.5

Rotary Heads with Operating Levers

ZCKY81



ZCKY91



Control Panel
 Products

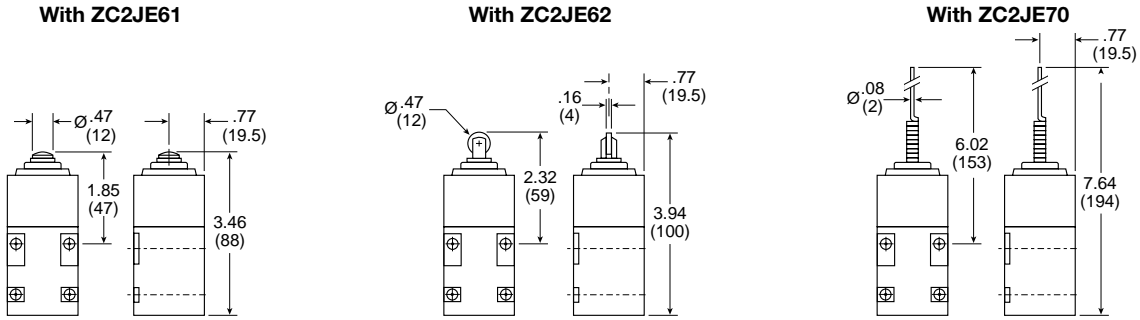
Sensing /
 Limit Switches

D

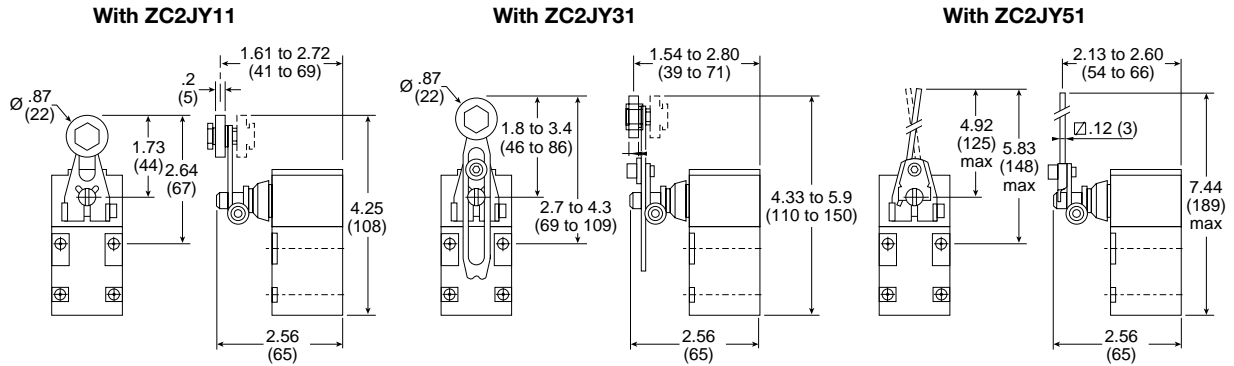
Accessories
 Valve Products

J Series

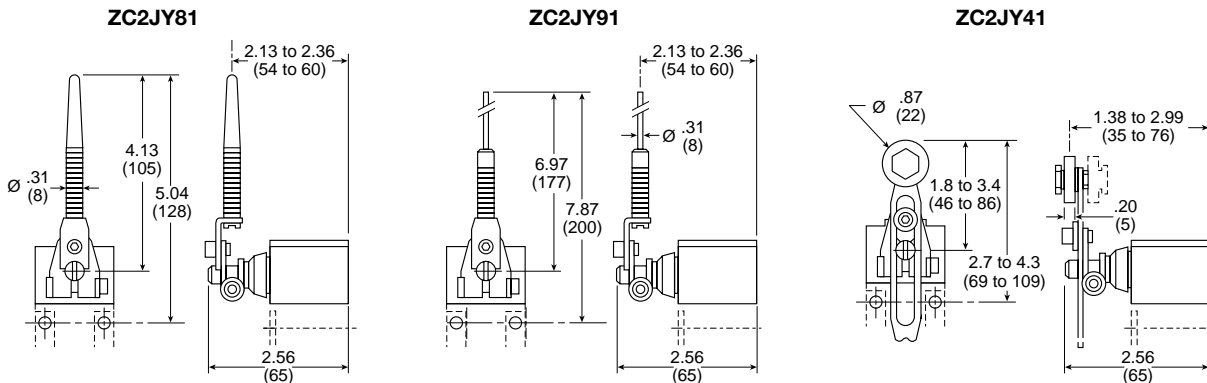
Switch Body With Plunger Heads



Switch Body With Rotary Heads and Operating Levers

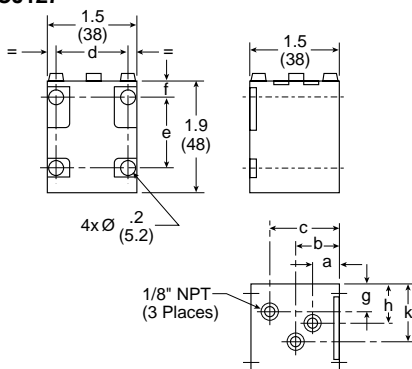


Rotary Heads With Operating Levers



Pneumatic Switch Bodies

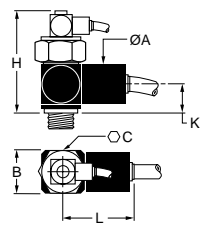
PXCJ117, PXCJ127



	inch	mm
a	.47	12
b	.75	19
c	1.16	29.5
d	1.14 to 1.18	29 to 30
e	1.18	30
f	.28	7
g	.43	11
h	.51	13
k	.94	24

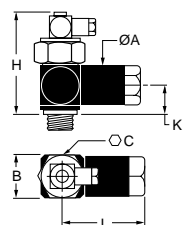
Blocking Valves

PWBA14/34



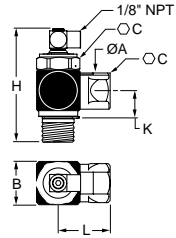
ØA	B	C	K	H	L	Flow*	Part number
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.32" (59)	1.54" (39)	14.8	PWBA1468/3468
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.09" (53)	1.54" (39)	19.4	PWBA1469/3469 PWBA1489
1.06" (27)	1.10" (28)	0.94" (24)	0.55" (14)	2.09" (53)	1.98" (50)	45.9	PWBA1483 PWBA1493/3493
1.22" (31)	1.30" (33)	1.30" (33)	0.94" (24)	2.59" (66)	2.59" (66)	81.2	PWBA1412/3412

PWBA18/38



0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.32" (59)	1.71" (43.5)	14.8	PWBA1898/3888
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.09" (53)	1.71" (43.5)	19.4	PWBA1899/3899
1.06" (27)	1.10" (28)	0.94" (24)	0.55" (14)	2.09" (53)	2.18" (55)	45.9	PWBA1833/3833
1.22" (31)	1.30" (33)	1.30" (33)	0.94" (24)	2.59" (66)	2.47" (63)	81.2	PWBA1822/3822

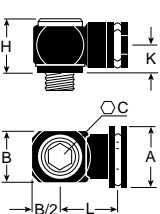
PWBA38



0.75" (19)	0.87" (22)	0.83" (21)	0.67" (17)	2.20" (56)	1.73" (44)	14.8	PWBA38887
0.75" (19)	0.87" (22)	0.83" (21)	0.67" (17)	2.20" (56)	1.73" (44)	19.4	PWBA38997
1.06" (27)	1.18" (30)	1.06" (27)	0.91" (23)	2.64" (67)	1.42" (36)	45.9	PWBA38337
1.06" (27)	1.18" (30)	1.06" (27)	0.91" (23)	2.64" (67)	1.42" (36)	81.2	PWBA38227

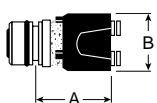
Threshold Sensors

Banjo Socket



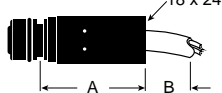
A	B	C	H	K	L	Part number
.98 (25)	.43 (11)	5/16" Hex	.79 (20)	.40 (10)	.67 (17)	PWSB1557
.98 (25)	.63 (16)	3/16" Allen	.71 (18)	.40 (10)	.79 (20)	PWSB1887
.98 (25)	.83 (21)	5/16" Allen	.71 (18)	.40 (10)	.87 (22)	PWSB1997
.98 (25)	1.10 (28)	3/8" Allen	.79 (20)	.47 (12)	.98 (25)	PWSB1337
.98 (25)	1.30 (33)	1/2" Allen	.93 (24)	.55 (14)	1.02 (26)	PWSB1227

PWSP111



A	B	Part number
.87 (22)	.79 (20)	PWSP111
1.26 (32)	.79 (20)	PWSM1012

PWSM1012

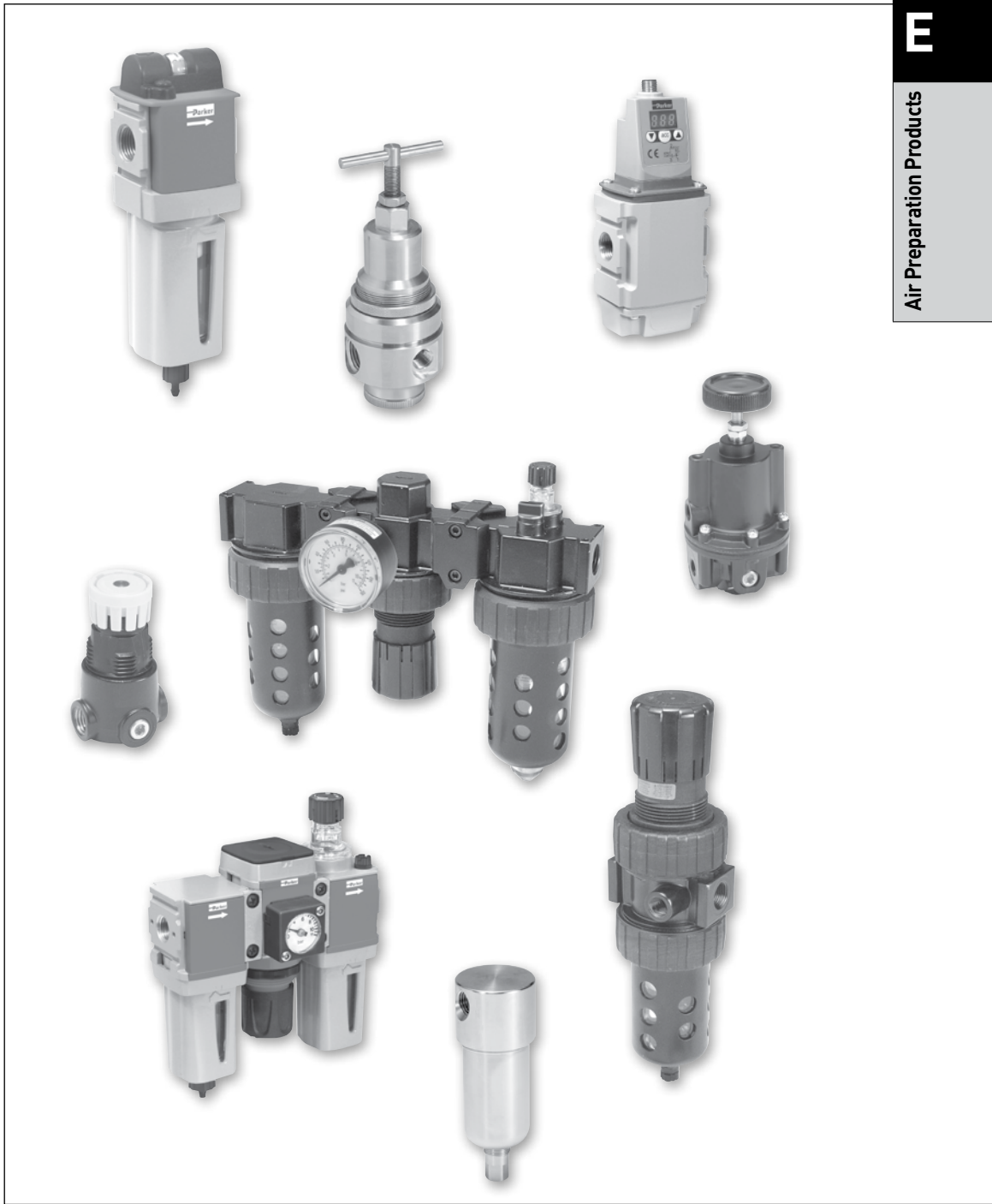
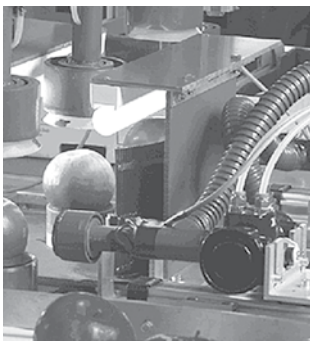
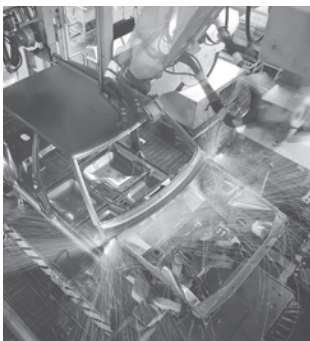


Control Panel
Products

Sensing /
Limit Switches

D

Accessories
Valve Products



E

Air Preparation Products

Air Preparation Products

Air Preparation Products

Global FRL's



- Port size: 1/4 through 3/4 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -13°F through 150°F
- Filters, regulators, filter / regulators, lubricators and accessories

E3

General Industrial FRL's



- Port size: 1/8 through 3 inch
- Maximum supply pressure: 250 PSIG
- Operating temperature: 32°F through 150°F
- Filters, regulators, filter / regulators, lubricators and accessories

E83

Prep-Air II FRL's



- Compact & standard
- Port size: 1/4 through 3/4 inch
- Filters, regulators, filter / regulators, lubricators and accessories
- Operating temperature: 32°F through 175°F
- Point of use applications
- Modular construction

E44

Stainless Steel FRL's



- Port sizes: 1/4 and 1/2 inch
- Stainless steel construction handles most corrosive environments
- Operating temperature -40°F through 180°F
- Meets NACE specifications MR-01-75/ISO 15156
- Filters, regulators, filter / regulators, and lubricators

E104

Miniature FRL's



- Port size: 1/8 through 3/8 inch
- Filters, regulators, filter / regulators, lubricators and accessories
- Operating temperature: -4°F through 125°F
- Non-modular construction
- Ideal for point of use applications

E63

Precision / Proportional Regulators



- Port sizes: 1/4 through 2 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -40°F through 200°F
- High precision
- Electronic proportional

E111

P3N FRL's



- Port size: 3/4 through 1-1/2 inch
- Filters, regulators, filter / regulators, lubricators and accessories
- Operating temperature: 32°F through 175°F
- High flow

E74

Bulk Liquid Separators



- Port sizes 1/4 through 6 inch flange
- High liquid removal efficiencies at all flow conditions
- Low maintenance
- Suitable for variable flow compressors

E122

Global Modular Particulate Filters

- Integral 1/4", 3/8", 1/2", or 3/4" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting



P31



P32



P33

Operating information

	P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max):			
Plastic Bowl	10 bar (150 PSIG)	10 bar (150 PSIG)	10 bar (150 PSIG)
Metal Bowl	17 bar (250 PSIG)	17 bar (250 PSIG)	17 bar (250 PSIG)
Operating temperature:			
Plastic Bowl	-10°C to 52°C (14°F to 25°F)	-25°C to 52°C (-13°F to 25°F)	-25°C to 52°C (-13°F to 25°F)
Metal Bowl	-10°C to 65.5°C (14°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Standard filtration:	5 micron	5 micron	5 micron
Flow Capacity*:			
1/4	12 dm ³ /s (25 SCFM)*	18 dm ³ /s (38 SCFM)*	—
3/8	—	30 dm ³ /s (64 SCFM)*	—
1/2	—	38 dm ³ /s (80 SCFM)*	40 dm ³ /s (85 SCFM)*
3/4	—	—	48 dm ³ /s (102 SCFM)*

*Inlet pressure 6.3 bar (91.3 PSIG), pressure 0.34 bar (4.9 PSIG).

For Flow Curve Charts please see page E34.

Ordering information

P31F A 9 2 E G M N

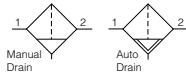
Basic series Global modular mini particulate filter P31F Global modular compact particulate filter P32F Global modular standard particulate filter P33F	Engr level Current A	Thread type BSPP 1 BSPT 2 NPT 9	Port size 1/4 (P31, P32) 2 3/8 (P32) 3 1/2 (P32, P33) 4 3/4 (P33) 6	Element 5µ Element E	Mounting N No bracket	Drain type M Manual drain A Auto drain (P32, P33) B Pulse drain (P31)	Bowl type G Poly bowl with bowl guard M Metal bowl without sight gauge S* Metal bowl with sight gauge
--	---------------------------------------	--	--	---------------------------------------	---------------------------------	---	---

Bold items are most common.

* Not available with P31 Series.



Particulate Filters



Port size	Bowl type	Drain type	Element type	Part number		
				P31	P32	P33
1/4"	Poly	Manual	5 micron	P31FA92EGMN	P32FA92EGMN	
1/4"	Poly	Pulse	5 micron	P31FA92EGBN		
1/4"	Poly	Auto	5 micron		P32FA92EGAN	
1/4"	Metal	Manual	5 micron	P31FA92EMMN	P32FA92ESMN	
1/4"	Metal	Pulse	5 micron	P31FA92EMBN		
1/4"	Metal	Auto	5 micron		P32FA92ESAN	
3/8"	Poly	Manual	5 micron		P32FA93EGMN	
3/8"	Poly	Auto	5 micron		P32FA93EGAN	
3/8"	Metal	Manual	5 micron		P32FA93ESMN	
3/8"	Metal	Auto	5 micron		P32FA93ESAN	
1/2"	Poly	Manual	5 micron		P32FA94EGMN	P33FA94EGMN
1/2"	Poly	Auto	5 micron		P32FA94EGAN	P33FA94EGAN
1/2"	Metal	Manual	5 micron		P32FA94ESMN	P33FA94ESMN
1/2"	Metal	Auto	5 micron		P32FA94ESAN	P33FA94ESAN
3/4"	Poly	Manual	5 micron			P33FA96EGMN
3/4"	Poly	Auto	5 micron			P33FA96EGAN
3/4"	Metal	Manual	5 micron			P33FA96ESMN
3/4"	Metal	Auto	5 micron			P33FA96ESAN

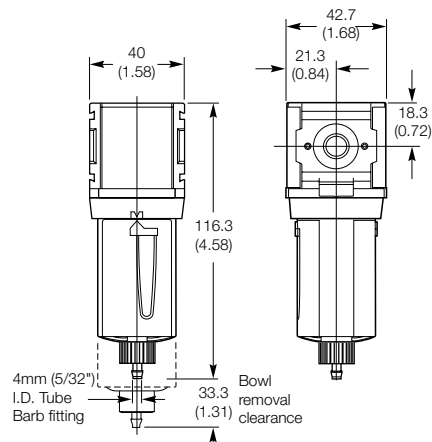
Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard	Manual drain	P31KA00BGM	P32KA00BGM	P33KA00BGM
	Pulse drain	P31KA00BGB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl w/o sight gauge	Manual drain	P31KA00BMM		
	Pulse drain	P31KA00BMB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl / sight gauge	Manual drain		P32KA00BSM	P33KA00BSM
	Auto drain		P32KA00DA	P32KA00DA
Filter element	5µ particulate	P31KA00ESE	P32KA00ESE	P33KA00ESE
C-bracket	Fits to body	P31KA00MW		
L-bracket	Fits to body		P32KA00ML	P33KA00ML
	Fits to body connector		P32KA00MB	P32KA00MB
T-bracket	With body connector	P31KA00MT	P32KA00MT	P33KA00MT
Body connector		P31KA00CB	P32KA00CB	P32KA00CB
Differential pressure indicator (replacement)		P31KA00RQ	P32KA00RQ	P32KA00RQ

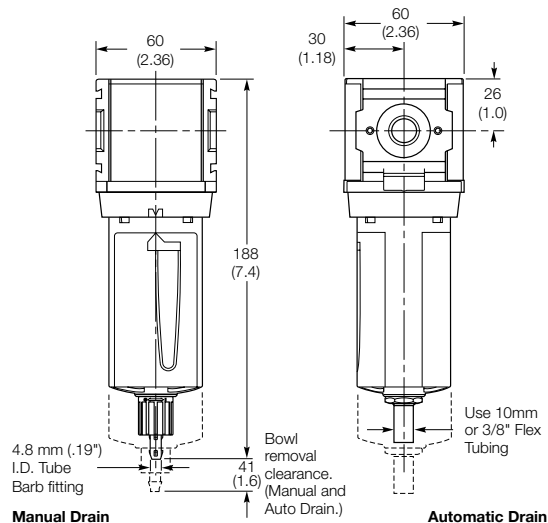
☐ Most popular.



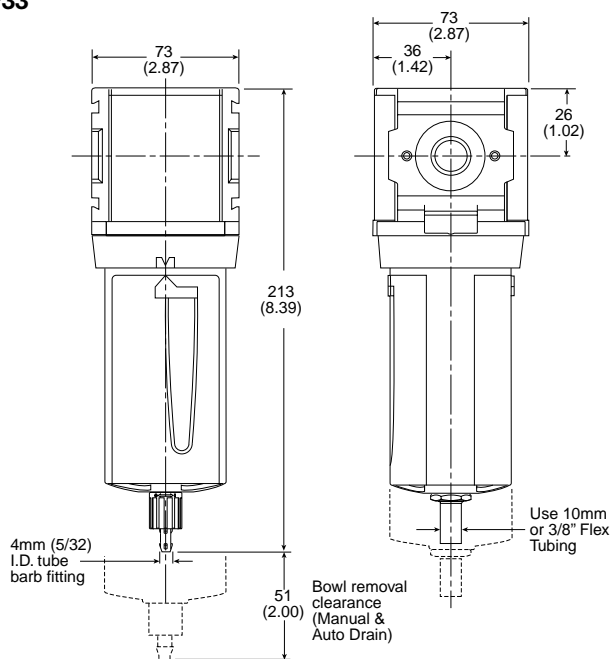
P31



P32



P33



Material specifications

Description		P31	P32	P33
Body		Aluminum	Aluminum	Aluminum
Body cap		N/A	N/A	ABS
Bowl	Plastic bowl	Polycarbonate	Polycarbonate	Polycarbonate
	Metal bowl	Aluminum	Aluminum	Aluminum
Bowl guard		Nylon	Nylon	Nylon
Deflector		N/A	Polypropylene	Polypropylene
Element retainer / baffle		Acetal	Acetal	Acetal
Filter element		Sintered Polyethylene	Sintered Polyethylene	Sintered Polyethylene
Seals		Nitrile	Nitrile	Nitrile
Sight gauge	Metal bowl	N/A	Polycarbonate	Polycarbonate

E
Air Preparation Products
Global
Prep-Air II
Miniature
P3N
General Industrial
Stainless Steel
Precision / Proportional
Bulk Liquid Separators

Global Modular Coalescing & Adsorber Filters

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Removes liquid aerosols and sub micron particles
- Oil free air for critical applications, such as air gauging, pneumatic instrumentation and control
- Positive bayonet latch to ensure correct & safe fitting
- Adsorbing activated carbon element removes oil vapors and most hydrocarbons

Note: To optimize the life of coalescing element, it is advisable to install a pre-filter with a 5 micron element upstream of the coalescing filter. To optimize the life of an Adsorber it is advisable to install a Coalescing Filter upstream of the Adsorber. Adsorber element should be replaced approximately every 1000 hours of service.



P31

P32

P33

Operating information

	P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max):			
Plastic Bowl	10 bar (150 PSIG)	10 bar (150 PSIG) [§]	10 bar (150 PSIG) [§]
Metal Bowl	17 bar (250 PSIG)	10 bar (150 PSIG) [§]	10 bar (150 PSIG) [§]
Operating temperature:			
Plastic Bowl	-10°C to 52°C (14°F to 125°F)	-25°C to 52°C (-13°F to 125°F)	-25°C to 52°C (-13°F to 125°F)
Metal Bowl	-10°C to 65.5°C (14°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Standard filtration:	1.0 and 0.01 micron	1.0 and 0.01 micron	1.0 and 0.01 micron
Flow Capacity:			
1.0 Micron Coalescing –			
Energy Efficient Flow*	3.8 dm ³ /s (8 SCFM)	17 dm ³ /s (36 SCFM)	32 dm ³ /s (68 SCFM)
Maximum Flow**	6 dm ³ /s (13 SCFM)	27 dm ³ /s (57 SCFM)	44 dm ³ /s (93 SCFM)
0.01 Micron Coalescing –			
Energy Efficient Flow*	2 dm ³ /s (4.2 SCFM)	11 dm ³ /s (23 SCFM)	20 dm ³ /s (42 SCFM)
Maximum Flow**	3.8 dm ³ /s (8 SCFM)	28 dm ³ /s (38 SCFM)	34 dm ³ /s (72 SCFM)
Activated Carbon Adsorber			
Rated Flow*:	6 dm ³ /s (13 SCFM)	27 dm ³ /s (57 SCFM)	44 dm ³ /s (93 SCFM)

* Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.2 bar (3 PSIG) saturated element.

** Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.4 bar (6 PSIG) saturated element.

§ Without pressure indicator (DPI) – max. supply pressure for metal bowl version is 17 bar (250 psig).

For Flow Curve Charts please see page E35.

Ordering information

P31F A 9 2 C G M N

Basic series	Engr level	Thread type	Port size	Drain type	Bowl type	Element
Global modular mini coalescing filter P31	Current A	BSPP 1	1/4 (P31, P32) 2	M Manual drain	G Poly bowl with bowl guard	C 0.01µ Element
Global modular compact coalescing filter P32		BSPT 2	3/8 (P32) 3	A Auto drain (P32, P33)	M Metal bowl without sight gauge	D 0.01µ Element with DPI
Global modular standard coalescing filter P33		NPT 9	1/2 (P32, P33) 4	B Pulse drain (P31)	S* Metal bowl with sight gauge	9 1µ Element
			3/4 (P33) 6			Q 1µ Element with DPI
						A Adsorber

Mounting
N No bracket

* Not available with P31 Series.

Bold items are most common.

Coalescing and Adsorber Filters,



(1 micron and adsorber elements available)



Port size	Bowl type	Drain type	Element type	Part number		
				P31	P32	P33
1/4"	Poly	Manual	0.01 micron	P31FA92CGMN	P32FA92DGMN	
1/4"	Poly	Pulse	0.01 micron	P31FA92CGBN		
1/4"	Poly	Auto	0.01 micron		P32FA92DGAN	
1/4"	Metal	Manual	0.01 micron	P31FA92CMMN	P32FA92DSMN	
1/4"	Metal	Pulse	0.01 micron	P31FA92CMBN		
1/4"	Metal	Auto	0.01 micron		P32FA92DSAN	
3/8"	Poly	Manual	0.01 micron		P32FA93DGMN	
3/8"	Poly	Auto	0.01 micron		P32FA93DGAN	
3/8"	Metal	Manual	0.01 micron		P32FA93DSMN	
3/8"	Metal	Auto	0.01 micron		P32FA93DSAN	
1/2"	Poly	Manual	0.01 micron		P32FA94DGMN	P33FA94DGMN
1/2"	Poly	Auto	0.01 micron		P32FA94DGAN	P33FA94DGAN
1/2"	Metal	Manual	0.01 micron		P32FA94DSMN	P33FA94DSMN
1/2"	Metal	Auto	0.01 micron		P32FA94DSAN	P33FA94DSAN
3/4"	Poly	Manual	0.01 micron			P33FA96DGMN
3/4"	Poly	Auto	0.01 micron			P33FA96DGAN
3/4"	Metal	Manual	0.01 micron			P33FA96DSMN
3/4"	Metal	Auto	0.01 micron			P33FA96DSAN

Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard	Manual drain	P31KA00BGM	P32KA00BGM	P33KA00BGM
	Pulse drain	P31KA00BGB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl w/o sight gauge	Manual drain	P31KA00BMM		
	Pulse drain	P31KA00BMB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl / sight gauge	Manual drain		P32KA00BSM	P33KA00BSM
	Auto drain		P32KA00DA	P32KA00DA
Filter element	1µ coalescing	P31KA00ES9	P32KA00ES9	P33KA00ES9
	0.01µ coalescing	P31KA00ESC	P32KA00ESC	P33KA00ESC
	Activated carbon adsorber	P31KA00ESA	P32KA00ESA	P33KA00ESA
C-bracket	Fits to body	P31KA00MW		
L-bracket	Fits to body		P32KA00ML	P33KA00ML
T-bracket	Fits to body connector		P32KA00MB	P32KA00MB
	With body connector	P31KA00MT	P32KA00MT	P32KA00MT
Body connector		P31KA00CB	P32KA00CB	P32KA00CB
Differential pressure indicator (replacement)		P31KA00RQ	P32KA00RQ	P32KA00RQ

Most popular.



Air Preparation Products

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Bulk Liquid Separators



Air Preparation Products

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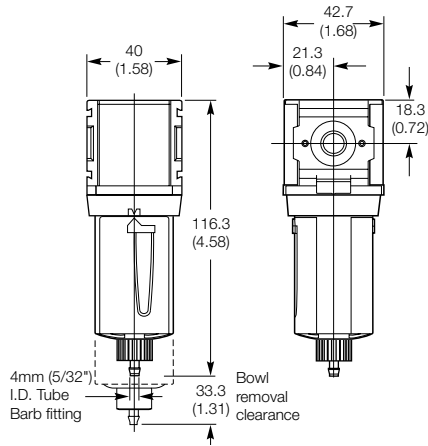
General Industrial

Stainless Steel

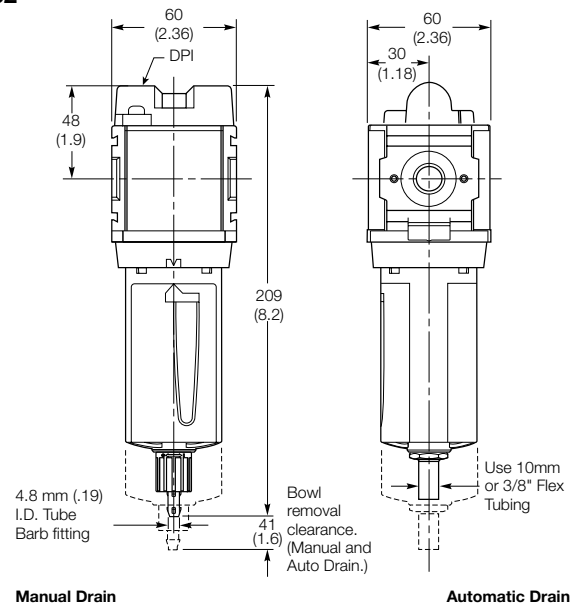
Precision / Proportional

Bulk Liquid Separators

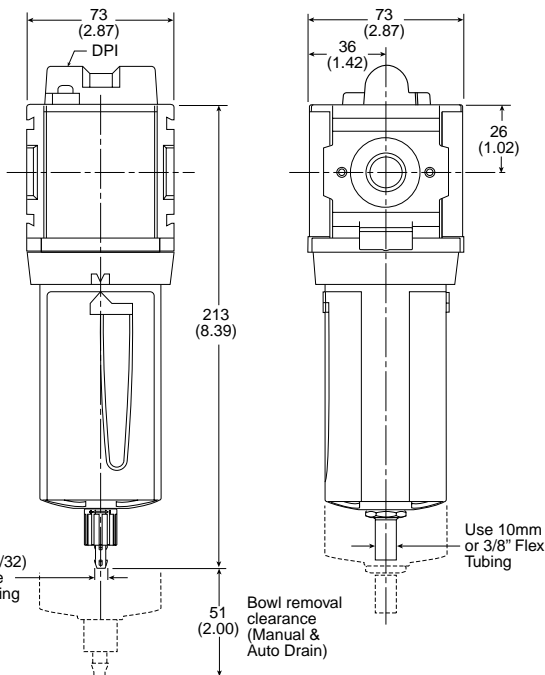
P31



P32



P33



Material specifications

Description	P31	P32	P33
Body	Aluminum	Aluminum	Aluminum
Body cap	N/A	N/A	ABS
Bowl	Plastic bowl	Polycarbonate	Polycarbonate
	Metal bowl	Aluminum	Aluminum
Bowl guard	Nylon	Nylon	Nylon
Filter element	Borosilicate cloth, 1.0 and .01 micron	Borosilicate cloth, 1.0 and .01 micron	Borosilicate cloth, 1.0 and .01 micron
Adsorber	Activated carbon	Activated carbon	Activated carbon
Seals	Nitrile	Nitrile	Nitrile
Sight gauge	Metal bowl	N/A	Polycarbonate



Global Modular Regulators

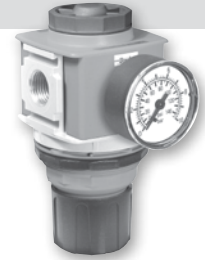
- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Robust but lightweight aluminum construction
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation.
- Relieving & Non-relieving types
- Non-rising knob



P31



P32



P33

⚠ WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT -

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

	P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max):	20 bar (300 PSIG)	20 bar (300 PSIG)	20 bar (300 PSIG)
Operating temperature:	-20°C to 65.5°C (-4°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Units with square gauges:	-15°C to 65.5°C (5°F to 150°F)		
Flow Capacity*:	1/4 30 dm³/s (64 SCFM)	41 dm³/s* (81 SCFM)*	—
	3/8 —	65 dm³/s* (138 SCFM)*	—
	1/2 —	67 dm³/s* (142 SCFM)*	100 dm³/s* (212 SCFM)*
	3/4 —	—	100 dm³/s* (212 SCFM)*

* Inlet pressure 10 bar (145 PSIG). Secondary pressure 6.3 bar (91.3 PSIG), pressure drop 1 bar (14.7 PSIG)

For Flow Curve Charts please see page E36.

Ordering information

P31R A 9 2 B N N P

Basic series	Engr level	Thread type	Mounting
Global modular mini regulator P31R	Current A	BSPP 1	P Plastic panel mount nut
Global modular compact regulator P32R		BSPT 2	
Global modular standard regulator P33R		NPT 9	

Port size	Relief	Adjustment range	
1/4 (P31, P32) 2	Relieving B	P31 & P32 with square gauge	
3/8 (P32) 3	Non-relieving N	psig	bar
1/2 (P32, P33) 4	Reverse flow-relieving R	1 = 30*	V = 2*
3/4 (P33) 6		3 = 60	S = 4
		5 = 125	T = 8
			J‡
			Without gauge
			Y 2 bar; 30 psig; 0.2 MPa
			L 4 bar; 60 psig; 0.4 MPa
			N 8 bar; 125 psig; 0.8 MPa
			H‡ 17 bar; 250 psig; 1.7 MPa

Bold items are most common.

* Unit comes with 0-4 bar or 0-60 psig gauge respectively.
 † Not available with poly bowl with bowl guard.
 ‡ Not available with P31 Series.



Regulators



Port size	Pressure (relieving)	Gauge	Part number		
			P31	P32	P33
1/4"	8 bar (125 PSIG)	—	P31RA92BNNP	P32RA92BNNP	
1/4"	8 bar (125 PSIG)	Square	P31RA92BN5P		
1/4"	8 bar (125 PSIG)	Round		P32RA92BNGP	
3/8"	8 bar (125 PSIG)	—		P32RA93BNNP	
3/8"	8 bar (125 PSIG)	Round		P32RA93BNGP	
1/2"	8 bar (125 PSIG)	—		P32RA94BNNP	P33RA94BNNP
1/2"	8 bar (125 PSIG)	Round		P32RA94BNGP	P33RA94BNGP
3/4"	8 bar (125 PSIG)	—			P33RA96BNNP
3/4"	8 bar (125 PSIG)	Round			P33RA96BNGP

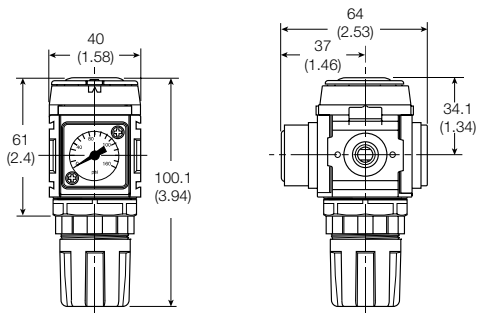
Service kits

Description		P31	P32	P33
Regulator repair kit	Relieving	P31KA00RB	P32KA00RB	P33KA00RB
	Non-relieving	P31KA00RC	P32KA00RC	P33KA00RC
Panel mount nut	Aluminum	P31KA00MM	P32KA00MM	P33KA00MM
	Plastic	P31KA00MP	P32KA00MP	P33KA00MP
Angle bracket	Uses panel mount threads	P31KA00MR	P32KA00MR	P33KA00MR
T-bracket	With body connector	P31KA00MT	P32KA00MT	P32KA00MT
T-bracket				P32KA00MB
Body connector		P31KA00CB	P32KA00CB	P32KA00CB
Gauges - Square flush mount gauge	0-4 bar	K4511SCR04B	K4511SCR04B	
	0-10 bar	K4511SCR11B	K4511SCR11B	
	0-60 PSIG	K4511SCR060	K4511SCR060	
	0-160 PSIG	K4511SCR160	K4511SCR160	
1.00" round 1/8" center back mount	0-60 PSIG / 0-4 bar	K4510N18060		
	0-160 PSIG / 0-11 bar	K4510N18160		
40mm round 1/8" center back mount	0-30 PSIG / 0-2 bar	K4515N18030		
	0-60 PSIG / 0-4 bar	K4515N18060		
	0-160 PSIG / 0-11 bar	K4515N18160		
50mm (2") round 1/4" center back mount	0-30 PSIG / 0-2 bar / 0-0.2 MPa		K4520N14030	K4520N14030
	0-60 PSIG / 0-4 bar / 0-0.4 MPa		K4520N14060	K4520N14060
	0-160 PSIG / 0-11 bar / 0-1.1 MPa		K4520N14160	K4520N14160
	0-300 PSIG / 0-20 bar / 0-2 MPa		K4520N14300	K4520N14300
44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa		K4517N14160D	K4517N14160D

Most popular.

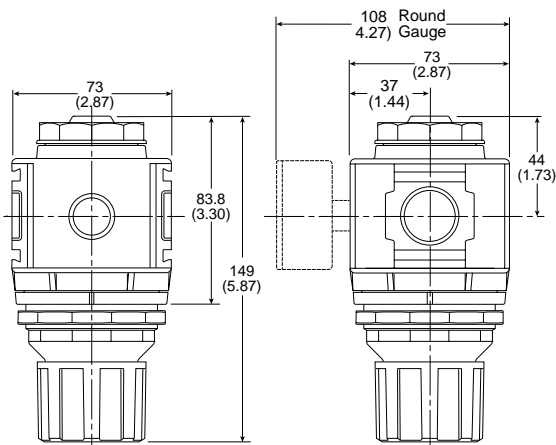


P31



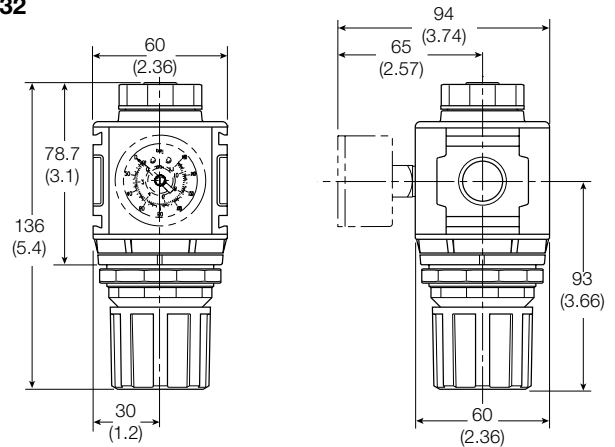
NOTE: 31.7 mm (1.25 in.) hole required for panel nut mounting.

P33



NOTE: 61 mm (2.40 in.) hole required for panel nut mounting.

P32



NOTE: 51 mm (2.00 in.) hole required for panel nut mounting.

Material specifications

Description	P31	P32	P33
Body	Aluminum	Aluminum	Aluminum
Adjustment knob	N/A	N/A	Acetal
Body cap	ABS	ABS	ABS
Bonnet	PBT	33% glass-filled nylon	33% glass-filled nylon
Diaphragm assembly	Brass / nitrile	Nitrile / zinc	Nitrile / zinc
Valve assembly	Brass / nitrile	Brass / nitrile	Brass / nitrile / acetal
Springs	Steel	Steel S.S. (main regulating valve)	Steel S.S. (main regulating valve)
Seals	Nitrile	Nitrile	Nitrile
Panel nut	Acetal	Acetal	Acetal



Air Preparation Products

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Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

Global Modular Common Regulators

- Manifold style regulator with line pressure on both sides
- Pressure output is at front or rear
- Integral 1/4", 3/8" or 1/2" ports (NPT, BSPP & BSPT)
- Robust construction
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG), 0-17 bar (0-250 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Relieving & Non-relieving types
- Non-rising knob



WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

	P31 (Mini)	P32 (Compact)
Supply pressure (max):	20 bar (300 PSIG)	20 bar (300 PSIG)
Operating temperature:	-20°C to 65.5°C (-4°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Flow Capacity*:		
1/4	18 dm ³ /s* (38 SCFM)*	28 dm ³ /s* (59 SCFM)*
3/8	—	28 dm ³ /s* (59 SCFM)*
1/2	—	28 dm ³ /s* (59 SCFM)*

* Inlet pressure 10 bar (145 PSIG). Secondary pressure 6.3 bar (91.3 PSIG), pressure drop 1 bar (14.7 PSIG)

For Flow Curve Charts please see page E36.

Ordering information

P31H		A	9	2	B	N	N	P
Basic series		Engr level	Thread type	Relief		Mounting		
Global modular mini common regulator	P31H	Current	BSPP 1	B Relieving	P Plastic panel mount nut			
Global modular compact common regulator	P32H		BSPT 2	N Non-relieving				
			NPT 9	Port size		Adjustment range		
				2 1/4 (P31, P32)	Without gauge			
				3 3/8 (P32)	Y 2 bar; 30 psig; 0.2 MPa			
				4 1/2 (P32)	L 4 bar; 60 psig; 0.4 MPa			
					N 8 bar; 125 psig; 0.8 MPa			
					H* 17 bar; 250 psig; 1.7 MPa			

* Not available with P31 Series.
 Order gauges separately - see next page.

Bold items are most common.

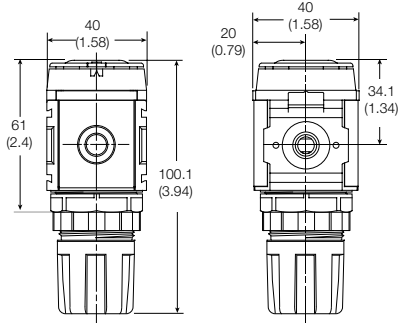
Regulators



Port size	Pressure	Part number	
		P31	P32
1/4"	8 bar (125 PSIG) relieving	P31HA92BNNP	P32HA92BNNP
3/8"	8 bar (125 PSIG) relieving		P32HA93BNNP
1/2"	8 bar (125 PSIG) relieving		P32HA94BNNP



P31



NOTE: 31.7 mm (1.25 in.) hole required for panel nut mounting.

Service kits

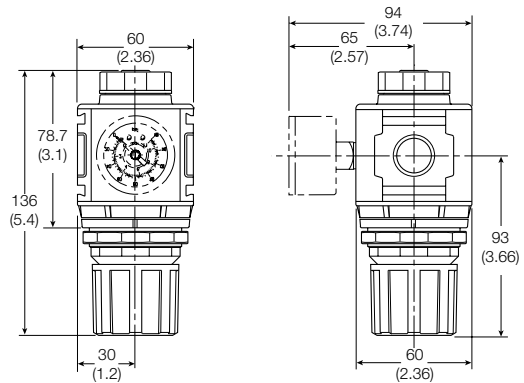
Description			P31	P32
Regulator repair kit	Relieving		P31KA00RB	P32KA00RB
	Non-relieving		P31KA00RC	P32KA00RC
Panel mount nut	Aluminum		P31KA00MM	P32KA00MM
	Plastic		P31KA00MP	P32KA00MP
Angle bracket (uses panel mount threads)			P31KA00MR	P32KA00MR
T-bracket	With body connector		P31KA00MT	P32KA00MT
	Fits to body connector		P31KA00MB	P32KA00MB
Body connector			P31KA00CB	P32KA00CB
Gauges -	Square flush mount gauge	0-4 bar	K4511SCR04B	K4511SCR04B
		0-10 bar	K4511SCR11B	K4511SCR11B
		0-60 PSIG	K4511SCR060	K4511SCR060
		0-160 PSIG	K4511SCR160	K4511SCR160
	Square with adapter kit	0-4 bar	P6G-PR11040	P6G-PR11040
		0-10 bar	P6G-PR11100	P6G-PR11100
		0-60 PSIG	P6G-PR11P06	P6G-PR11P06
		0-160 PSIG	P6G-PR11P16	P6G-PR11P16
	1.00" round 1/8" center back mount	0-60 PSIG / 0-4 bar	K4510N18060	
		0-160 PSIG / 0-11 bar	K4510N18160	
	50mm (2") round 1/4" center back mount	0-30 PSIG / 0-2 bar / 0-0.2 MPa		K4520N14030
		0-60 PSIG / 0-4 bar / 0-0.4 MPa		K4520N14060
		0-160 PSIG / 0-11 bar / 0-1.1 MPa		K4520N14160
		0-300 PSIG / 0-20 bar / 0-2 MPa		K4520N14300
44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa		K4517N14160D	

Material specifications

Description	P31	P32
Body	Aluminum	Aluminum
Adjustment knob	Acetal	Acetal
Bonnet	33% Glass-filled PBT	33% Glass-filled nylon
Diaphragm assembly	Brass / nitrile	Nitrile / zinc
Valve assembly	Brass / nitrile	Brass / nitrile
Springs		Steel S.S. (Main regulating valve)
Seals		Nitrile
Panel nut		Acetal

Most popular.

P32



NOTE: 51 mm (2.0 in.) hole required for panel nut mounting.



Air Preparation Products

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Bulk Liquid Separators





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Stainless Steel

Precision / Proportional

Bulk Liquid Separators

Global Modular Filter / Regulators

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG), 0-17 bar (0-250 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation



P31

P32

P33

⚠ WARNING

Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT -

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

	P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max):			
Plastic Bowl	10 bar (150 PSIG)	10 bar (150 PSIG)	10 bar (150 PSIG)
Metal Bowl	17 bar (250 PSIG)	17 bar (250 PSIG)	17 bar (250 PSIG)
Operating temperature:			
Plastic Bowl	-10°C to 52°C (14°F to 125°F)	-25°C to 52°C (-13°F to 125°F)	-25°C to 52°C (-13°F to 125°F)
Metal Bowl	-10°C to 65.5°C (14°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Units with square gauges:	-15°C to 65.5°C (5°F to 150°F)		
Standard filtration:	5 micron	5 micron	5 micron
Flow Capacity*:			
1/4	14 dm ³ /s* (30 SCFM)*	42 dm ³ /s* (89 SCFM)*	-
3/8	-	58 dm ³ /s* (123 SCFM)*	-
1/2	-	64 dm ³ /s* (136 SCFM)*	90 dm ³ /s* (191 SCFM)*
3/4	-	-	98 dm ³ /s* (208 SCFM)*

* Inlet pressure 10 bar (145 PSIG). Secondary pressure 6.3 bar (91.3 PSIG), pressure drop 1 bar (14.7 PSIG)

For Flow Curve Charts please see page E37.

Ordering information

P31E A 9 2 E G M B N 5 P

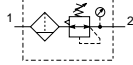
Basic series Global modular mini filter / regulator P31E Global modular compact filter / regulator P32E Global modular standard filter / regulator P33E	Engr level Current A	Thread type BSPP 1 BSPT 2 NPT 9	Element 5µ Element E	Relief B Relieving N Non-relieving	Mounting P Plastic panel mount nut
		Port size 1/4 (P31, P32) 2 3/8 (P32) 3 1/2 (P32, P33) 4 3/4 (P33) 6	Bowl type Poly bowl with bowl guard G Metal bowl without sight gauge M Metal bowl with sight gauge S	Drain type M Manual drain A Auto drain (P32, P33) B Pulse drain (P31)	
				Adjustment range	
				P31 & P32 with square gauge psig bar 1 = 30* V = 2* 3 = 60 S = 4 5 = 125 T = 8	With round gauge Z 2 bar; 30 psig; 0.2 MPa M 4 bar; 60 psig; 0.4 MPa G 8 bar; 125 psig; 0.8 MPa J [‡] 17 bar; 250 psig; 1.7 MPa
					Without gauge Y 2 bar; 30 psig; 0.2 MPa L 4 bar; 60 psig; 0.4 MPa N 8 bar; 125 psig; 0.8 MPa H [‡] 17 bar; 250 psig; 1.7 MPa

* Unit comes with 0-4 bar or 0-60 psig gauge respectively.
 † Not available with poly bowl with bowl guard.
 ‡ Not available with P31 Series.

Bold items are most common.



Filter / Regulator



Port size	Pressure (relieving)	Bowl type	Drain type	Part number		
				P31	P32	P33
1/4"	8 bar (125 PSIG)	Poly	Manual	P31EA92EGMBN5P	P32EA92EGMBNGP	
1/4"	8 bar (125 PSIG)	Poly	Pulse	P31EA92EGBBN5P		
1/4"	8 bar (125 PSIG)	Poly	Auto		P32EA92EGMBNGP	
1/4"	8 bar (125 PSIG)	Metal	Manual	P31EA92EMMBN5P	P32EA92ESMBNGP	
1/4"	8 bar (125 PSIG)	Metal	Pulse	P31EA92EMBBN5P		
1/4"	8 bar (125 PSIG)	Metal	Auto		P32EA92ESABNGP	
3/8"	8 bar (125 PSIG)	Poly	Manual		P32EA93EGMBNGP	
3/8"	8 bar (125 PSIG)	Poly	Auto		P32EA93EGABNGP	
3/8"	8 bar (125 PSIG)	Metal	Manual		P32EA93ESMBNGP	
3/8"	8 bar (125 PSIG)	Metal	Auto		P32EA93ESABNGP	
1/2"	8 bar (125 PSIG)	Poly	Manual		P32EA94EGMBNGP	P33EA94EGMBNGP
1/2"	8 bar (125 PSIG)	Poly	Auto		P32EA94EGABNGP	P33EA94EGABNGP
1/2"	8 bar (125 PSIG)	Metal	Manual		P32EA94ESMBNGP	P33EA94ESMBNGP
1/2"	8 bar (125 PSIG)	Metal	Auto		P32EA94ESABNGP	P33EA94ESABNGP
3/4"	8 bar (125 PSIG)	Poly	Manual			P33EA96EGMBNGP
3/4"	8 bar (125 PSIG)	Poly	Auto			P33EA96EGABNGP
3/4"	8 bar (125 PSIG)	Metal	Manual			P33EA96ESMBNGP
3/4"	8 bar (125 PSIG)	Metal	Auto			P33EA96ESABNGP

Most popular.

Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard	Manual drain	P31KA00BGM	P32KA00BGM	P33KA00BGM
	Pulse drain	P31KA00BGB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl w/o sight gauge	Manual drain	P31KA00BMM		
	Pulse drain	P31KA00BMB		
	Auto drain		P32KA00DA	P32KA00DA
Metal bowl / sight gauge	Manual drain		P32KA00BSM	P33KA00BSM
	Auto drain		P32KA00DA	P32KA00DA
Filter element	5µ particulate	P31KA00ESE	P32KA00ESE	P33KA00ESE
Regulator repair kit	Relieving	P31KB00RB	P32KB00RB	P33KA00RB
	Non-relieving	P31KB00RC	P32KB00RC	P33KA00RC
Panel mount nut	Aluminum	P31KA00MM	P32KA00MM	P33KA00MM
	Plastic	P31KA00MP	P32KA00MP	P33KA00MP
Angle bracket (uses panel mount threads)		P31KA00MR	P32KA00MR	P33KA00MR
C-bracket	Fits to body	P31KA00MW		
T-bracket	Fits to body connector		P32KA00MB	P32KA00MB
	With body connector	P31KA00MT	P32KA00MT	P32KA00MT
Body connector		P31KA00CB	P32KA00CB	P32KA00CB
Gauges - square flush mount gauge	0-4 bar	K4511SCR04B		
	0-10 bar	K4511SCR11B		
	0-60 PSIG	K4511SCR060		
	0-160 PSIG	K4511SCR160		
50mm (2") round 1/4" center back mount	0-30 PSIG / 0-2 bar / 0-0.2 MPa		K4520N14030	K4520N14030
	0-60 PSIG / 0-4 bar / 0-0.4 MPa		K4520N14060	K4520N14060
	0-160 PSIG / 0-11 bar / 0-1.1 MPa		K4520N14160	K4520N14160
	0-300 PSIG / 0-20 bar / 0-2 MPa		K4520N14300	K4520N14300
44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa		K4517N14160D	K4517N14160D



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

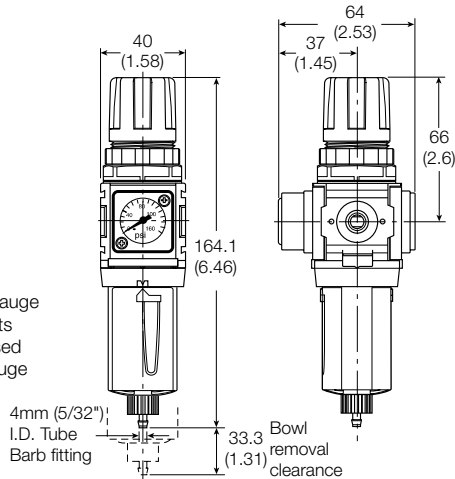
General Industrial

Stainless Steel

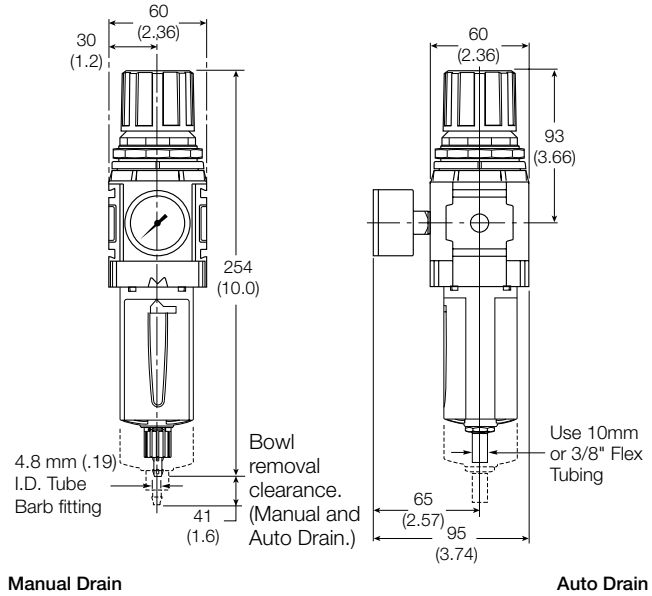
Precision / Proportional

Bulk Liquid Separators

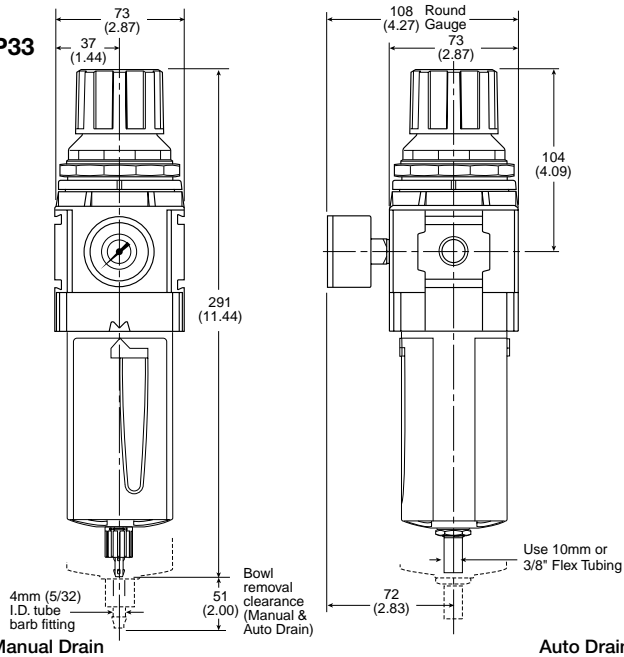
P31



P32



P33



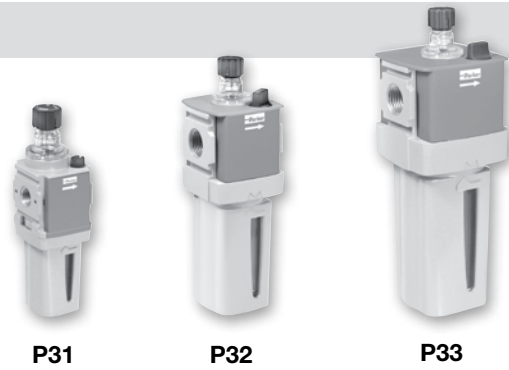
Material Specifications

Description	P31	P32	P33
Body	Aluminum	Aluminum	Aluminum
Adjustment knob	Acetal	Acetal	Acetal
Body cap	ABS	ABS	ABS
Bonnet	PBT	33% glass-filled nylon	33% glass-filled nylon
Element retainer/baffle	N/A	Acetal	Acetal
Bowl	Plastic bowl Metal bowl	Polycarbonate Aluminum	Polycarbonate Aluminum
Bowl guard	Nylon	Nylon	Nylon
Filter element	Sintered polyethylene	Sintered polyethylene	Polyethylene
Seals	Nitrile	Nitrile	Nitrile
Springs	Main regulating / valve Steel	Steel / S.S.	Steel
Valve assembly	Brass / nitrile	Brass / nitrile	Brass / nitrile
Diaphragm assembly	Brass / nitrile	Nitrile / zinc	Nitrile / zinc
Panel nut	Acetal	Acetal	Acetal
Sight gauge	Metal bowl N/A	Polycarbonate	Polycarbonate



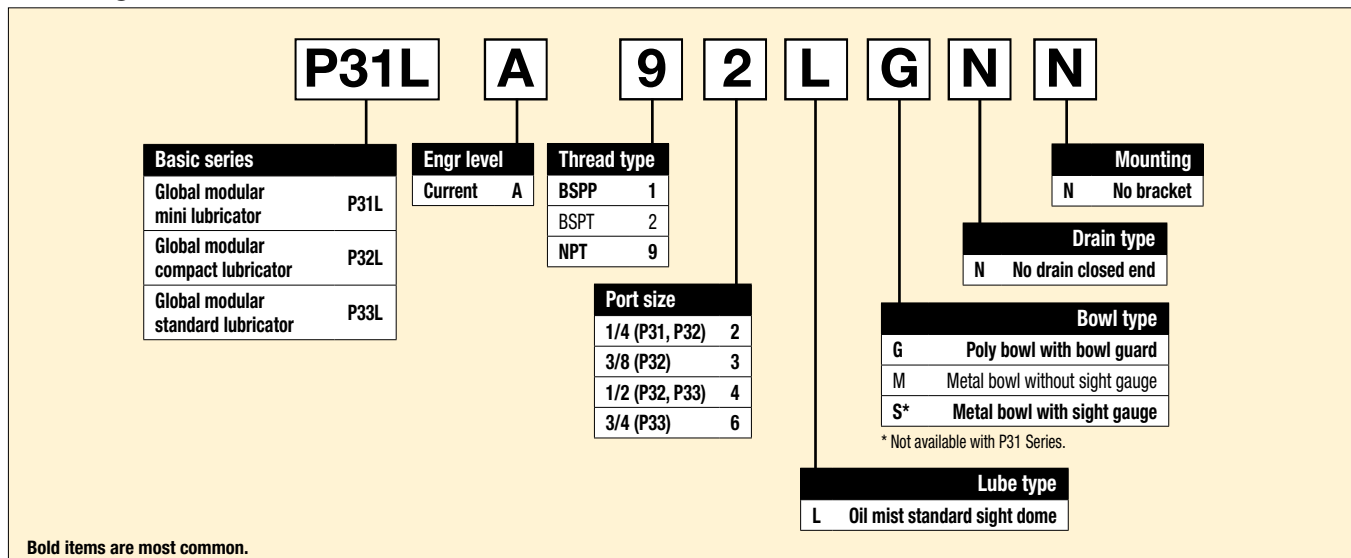
Global Modular Lubricators

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Robust but lightweight aluminum construction
- Proportional oil delivery over a wide range of air flows
- Finger tip ratchet control for precise oil drip rate adjustment



Operating information			
Supply pressure (max):	Plastic Bowl	10 bar (150 PSIG)	
	Metal Bowl	17 bar (250 PSIG)	
Operating temperature:	Plastic Bowl	-10°C to 52°C (14°F to 125°F)	
	Metal Bowl	-10°C to 65.5°C (14°F to 150°F)	
Standard filtration:	5 micron		
	P31 (Mini)	P32 (Compact)	P33 (Standard)
Flow Capacity*:	1/4	13 dm ³ /s (28 SCFM)	18 dm ³ /s (38 SCFM)
	3/8	-	32 dm ³ /s (68 SCFM)
	1/2	-	47 dm ³ /s (100 SCFM)
	3/4	-	48 (102 SCFM)
			68 dm ³ /s (144 SCFM)
* Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.34 bar (4.9 PSIG). For Flow Curve Charts please see page E38.			

Ordering information





Lubricators



Port size	Bowl type	Type	Part number		
			P31	P32	P33
1/4"	Poly / no drain	Mist	P31LA92LGNN	P32LA92LGNN	
1/4"	Metal / no drain	Mist / sight gauge	P31LA92LMNN	P32LA92LSNN	
3/8"	Poly / no drain	Mist		P32LA93LGNN	
3/8"	Metal / no drain	Mist / sight gauge		P32LA93LSNN	
1/2"	Poly / no drain	Mist		P32LA94LGNN	P33LA94LGNN
1/2"	Metal / no drain	Mist / sight gauge		P32LA94LSNN	P33LA94LSNN
3/4"	Poly / no drain	Mist			P33LA96LGNN
3/4"	Metal / no drain	Mist / sight gauge			P33LA96LSNN

Service kits

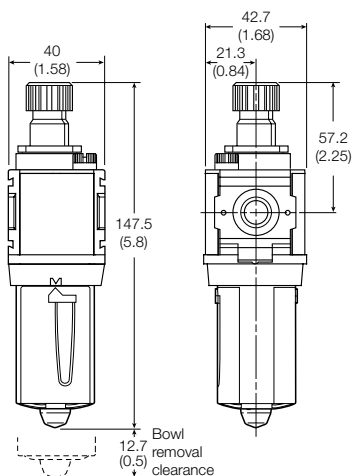
Description	P31	P32	P33
Plastic bowl / bowl guard / no drain	P31KA00BGN	P32KA00BGN	P33KA00BGN
Drip control assembly	P32KA00PG	P32KA00PG	P32KA00PG
Fill plug	P31KA00PL	P32KA00PL	P32KA00PL
C-bracket	Fits to body	P31KA00MW	
L-bracket		P32KA00ML	P33KA00ML
T-bracket	Fits to body connector	P32KA00MB	P32KA00MB
	With body connector	P31KA00MT	P32KA00MT
Body connector	P31KA00CB	P32KA00CB	P32KA00CB
Lubricant* (1 quart)	F442001	F442001	F442001

* Petroleum based oil of 100 to 200 SUS viscosity at 38°C (100°F) and an aniline point greater than 93°C (200°F). **DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.**

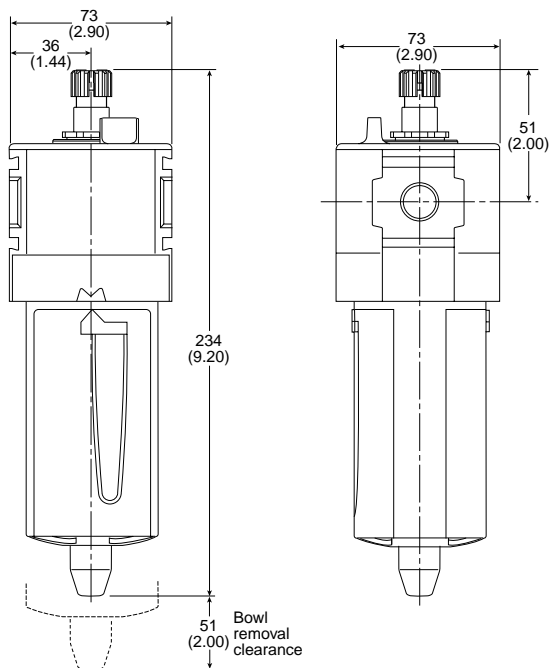
Most popular.



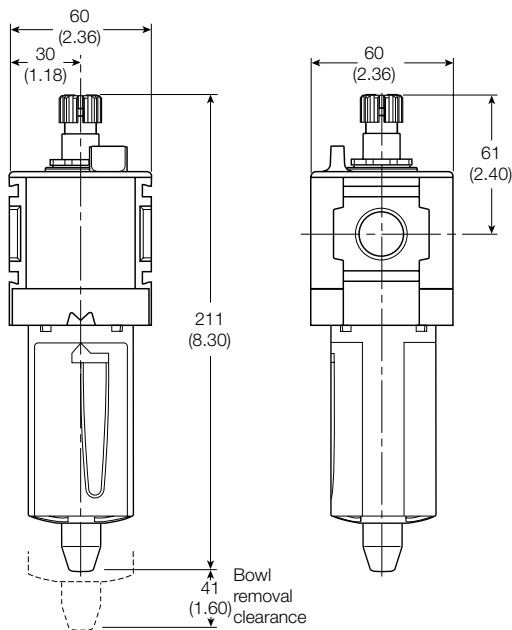
P31



P33



P32



Material Specifications

Description		P31	P32	P33
Body		Aluminum	Aluminum	Aluminum
Body cap		N/A	N/A	ABS
Bowl	Plastic bowl	Polycarbonate	Polycarbonate	Polycarbonate
	Metal bowl	Aluminum	Aluminum	Aluminum
Bowl guard		Nylon	Nylon	Nylon
Seals		Nitrile	Nitrile	Nitrile
Sight dome		Polycarbonate	Polycarbonate	Polycarbonate
Suggested lubricant		ISO / ASTM VG32	ISO / ASTM VG32	ISO / ASTM VG32
Pick-up filter		Sintered bronze	Sintered bronze	Sintered bronze
Sight gauge	Metal bowl	N/A	Polycarbonate	Polycarbonate



P

Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

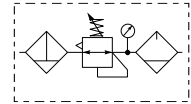
Precision / Proportional

Bulk Liquid Separators

Global Modular Combinations

Filter + Regulator + Lubricator Combinations + Poly Bowl

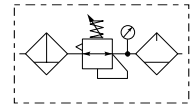
5 micron element, 8 bar (116 PSIG) Regulator + Gauge and Wall Mounting Brackets
 Inlet pressure 10 bar (145 PSIG), Secondary pressure 6.3 bar (91.3 PSIG),
 1 bar (14.5 PSIG) pressure drop.



Port size	Drain type	Part number		
		P31 Series	P32 Series	P33 Series
1/4"	Manual	P31CB92GEMN5LNW	P32CB92GEMNGLNW	
1/4"	Pulse	P31CB92GEBN5LNW		
1/4"	Auto		P32CB92GEANGLNW	
3/8"	Manual		P32CB93GEMNGLNW	
3/8"	Auto		P32CB93GEANGLNW	
1/2"	Manual		P32CB94GEMNGLNW	P33CB94GEMNGLNW
1/2"	Auto		P32CB94GEANGLNW	P33CB94GEANGLNW
3/4"	Manual			P33CB96GEMNGLNW
3/4"	Auto			P33CB96GEANGLNW

Filter / Regulator + Lubricator Combinations + Poly Bowl

5 micron element, 8 bar (116 PSIG) Regulator + Gauge and Wall Mounting Brackets
 Inlet pressure 10 bar (145 PSIG), Secondary pressure 6.3 bar (91.3 PSIG),
 1 bar (14.5 PSIG) pressure drop.



Port size	Drain type	Part number		
		P31 Series	P32 Series	P33 Series
1/4"	Manual	P31CA92GEMN5LNW	P32CA92GEMNGLNW	
1/4"	Pulse	P31CA92GEBN5LNW		
1/4"	Auto		P32CA92GEANGLNW	
3/8"	Manual		P32CA93GEMNGLNW	
3/8"	Auto		P32CA93GEANGLNW	
1/2"	Manual		P32CA94GEMNGLNW	P33CA94GEMNGLNW
1/2"	Auto		P32CA94GEANGLNW	P33CA94GEANGLNW
3/4"	Manual			P33CA96GEMNGLNW
3/4"	Auto			P33CA96GEANGLNW

WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT -

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

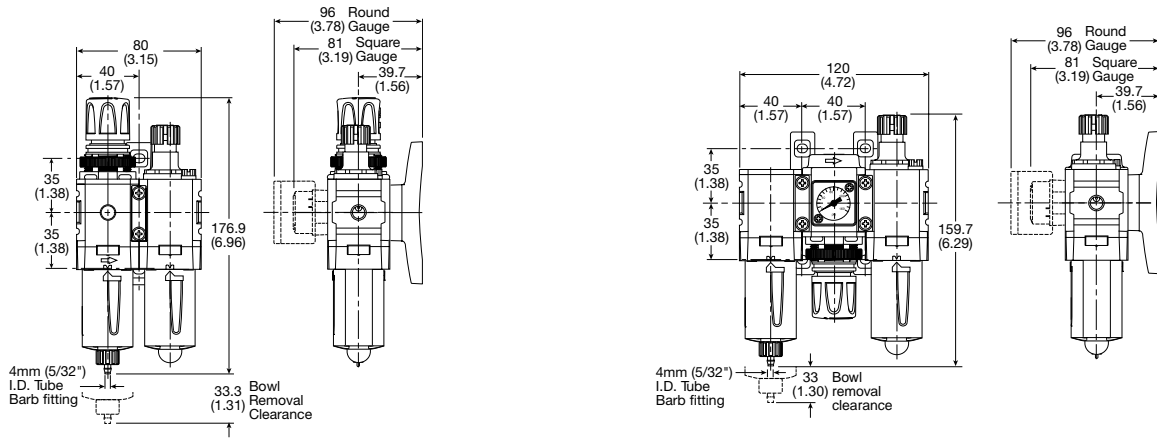
Ordering information

Filter / Regulator coding (use with codes: A M)		Filter coding (use with combo codes: B F G). For multiple filters, repeat as needed		Regulator coding (use with combo code: B)		Lubricator coding (use with combo codes: A B)		Assembly configuration									
P31	C	B	9	2	G	E	M	N	5	L	N	W					
Combination B/V + Combination Q* Combination + B/V* X Combination C			Thread type BSPP 1 BSPT 2 NPT 9			Element 0.01µ Element C 0.01µ Element with DPI D* 5µ Element E 5µ Element with DPI F† 1µ Element 9 1µ Element with DPI Q* Adsorber A			Relief adjustment Non-rising knob relieving N			Lube type Oil mist standard sight dome L			Mounting No bracket A Port blocks C* Port blocks with wall brkt D* Wall bracket W		
* B/V = Ball valve.			Port size 1/4 (P31, P32) 2 3/8 (P32) 3 1/2 (P32, P33) 4 3/4 (P33) 6			Drain type Auto drain A† Manual drain M Pulse drain B			Drain type No drain closed end N			* For P31 Series 3/8" Port Blocks please order separately. See Kits section.					
Combination type* F/R+L A F+Fc+Fa G F+R+L B F/R+Fc M F+Fc F F+Fc1+Fc Q			Combination type F = 5µ Fc1 = 1µ Fc = .01µ Fa = Adsorber			Bowl type Poly bowl with bowl guard G Metal bowl without sight gauge M* Metal bowl with sight gauge S‡			Adjustment range P31 & P32 with square gauge			* Not available when using lubricator. † Not available with P31 Series.					
Note: All bowl types are the same for each component. Example: If a "G" is specified for a F+L, both units would get a poly bowl with bowl guard.			* Not available with F/R. † Not available on P31 Series			Adjustment range With round gauge Z 2 bar; 30 psig; 0.2 MPa M 4 bar; 60 psig; 0.4 MPa G 8 bar; 125 psig; 0.8 MPa J [§] 17 bar; 250 psig; 1.7 MPa			* Unit comes with 0-4 bar or 0-60 psig gauge respectively. § Not available with poly bowl with bowl guard. ‡ Not available with P31 Series.								
Without gauge Y 2 bar; 30 psig; 0.2 MPa L 4 bar; 60 psig; 0.4 MPa N 8 bar; 125 psig; 0.8 MPa H [§] 17 bar; 250 psig; 1.7 MPa			Auto drain A† Manual drain M Pulse drain B			Adjustment range With round gauge Z 2 bar; 30 psig; 0.2 MPa M 4 bar; 60 psig; 0.4 MPa G 8 bar; 125 psig; 0.8 MPa J [§] 17 bar; 250 psig; 1.7 MPa			* Unit comes with 0-4 bar or 0-60 psig gauge respectively. § Not available with poly bowl with bowl guard. ‡ Not available with P31 Series.								
Bold items are most common.																	

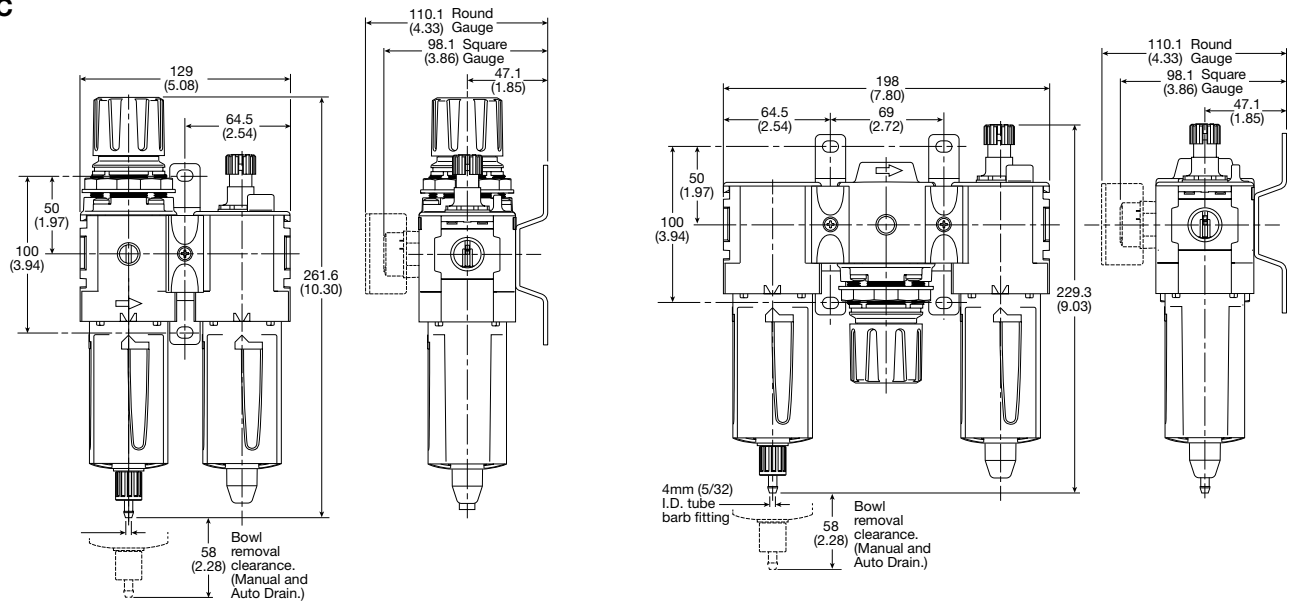
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Air Preparation Products
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Prep-Air II
Miniature
P3N
General Industrial
Stainless Steel
Precision / Proportional
Bulk Liquid Separators

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Stainless Steel
Precision / Proportional
Bulk Liquid Separators

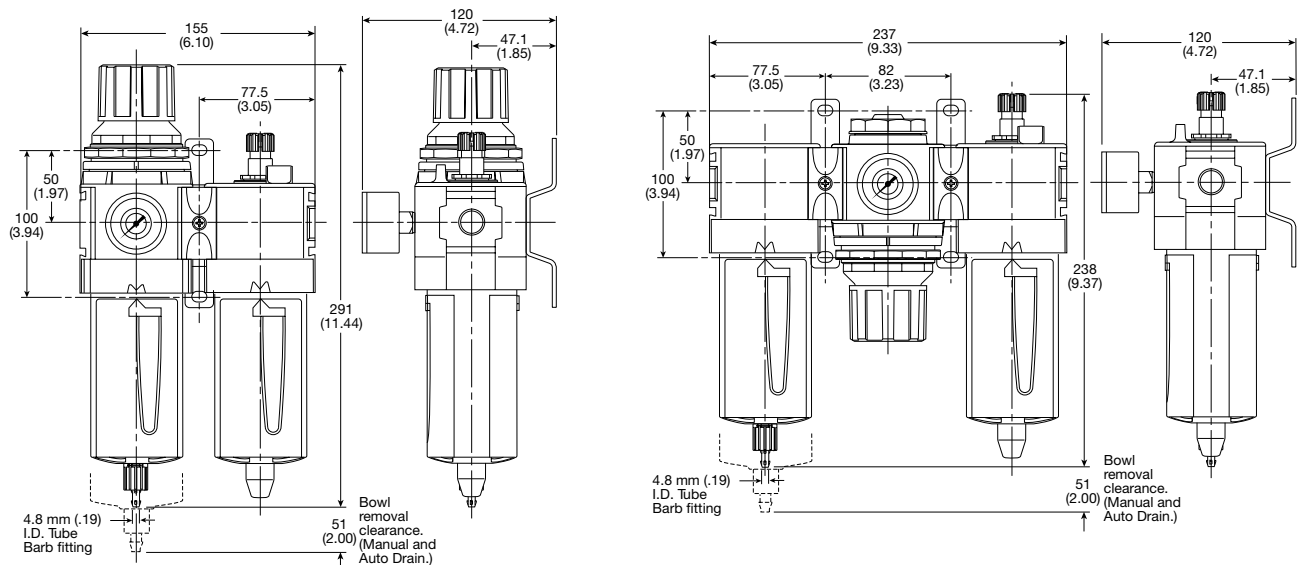
P31C



P32C



P33C



Global Modular Electronic Proportional Regulators

- Very fast response times
- Accurate output pressure
- Micro parameter settings
- Selectable I/O parameters
- Quick, full flow exhaust
- LED display indicates output pressure
- No air consumption in steady state
- Multiple mounting options
- Protection to IP65
- P31P flows to 19 dm³/s (40 SCFM)
- P32P flows to 57 dm³/s (120 SCFM)



P31PA Series
Bottom exhaust



P32PA Series
Bottom exhaust

Ordering information

P31P	A	9	2	A	D	2	V	D	1	
-------------	----------	----------	----------	----------	----------	----------	----------	----------	----------	--

Body size	P31P
Global modular mini (1/4")	
Global modular compact (1/2")	P32P

Engr level	A
Current	

Thread type	1
BSPP	
BSPT	2
NPT	9

Port size	2
Global modular mini (1/4")	
Global modular compact (1/2")	4

Version	A
Bottom ported exhaust (NC)	
Bottom ported forced exhaust (NO) [†]	E

Power supply	2
24 volts	

Control signal	V
0-10V [‡]	

[‡] Factory setting is 0-10 V control signal. 4-20 mA control signal available via parameter 4 on keypad.

Pressure range	Z
0 - 2 bar (0-29 PSIG)	
D	
0 - 10 bar (0-145 PSIG)	

Input Connector	1
M12 (4-pin)	

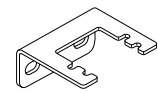
Output signal	D
Digital, PNP	
P	
PNP or 0-10V	
N	
NPN or 0-10V	
M	
4-20mA fixed	

D) Digital PNP output only, no analog output selectable
P) Digital PNP and analogue 0-10V outputs selectable, by means of parameter 6. (Factory default 0-10V)
N) Digital NPN and analog 0-10 V outputs selectable by means of parameter 6. (Factory default 0-10V)
M) Analog 4-20mA output only.
Note: On all analog outputs the F.S. value can be adjusted by means of parameter 8.

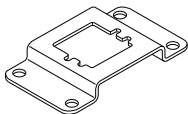
[†] When the supply voltage is lost the unit will automatically exhaust the regulated pressure to 0 bar (atmospheric pressure)

Bold items are most common.

P31P mounting brackets



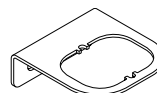
L-bracket



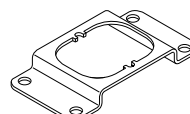
Foot bracket

Description	Part number
L-bracket mounting kit	P3HKA00ML
Foot bracket mounting kit	P3HKA00MC

P32P mounting brackets



L-bracket



Foot bracket

Description	Part number
L-bracket mounting kit	P3KKA00ML
Foot bracket mounting kit	P3KKA00MC

Cables

Part number	Description
CB-M12-4P-2M	2 mtr. cable with moulded straight M12x1 connector

Most popular.

For Flow Curve Charts please see page E39.





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

Technical information

Working medium

Compressed air or inert gasses, filtered to 40µ.

Supply pressure

Max. operating pressure:

2 bar unit:3 bar (43.5 PSIG)

10 bar unit:10.5 bar (152 PSIG)

Min. Operating Pressure P2 pressure + 0.5 bar (7.3 PSIG)

Pressure control range

Available in three pressure ranges, 0-2 bar (0-29 PSIG), 0-7 bar (0-101.5 PSIG) or 0-10 bar (0-145 PSIG). Pressure range can be changed through the software at all times. (parameter 19)

Temperature range

0°C up to +50°C (32°F up to 122°F)

Weights:

P31P = 0.291 kg (0.64 lbs)

P32P = 0.645 kg (1.42 lbs)

Air consumption

No consumption in stable regulated situation.

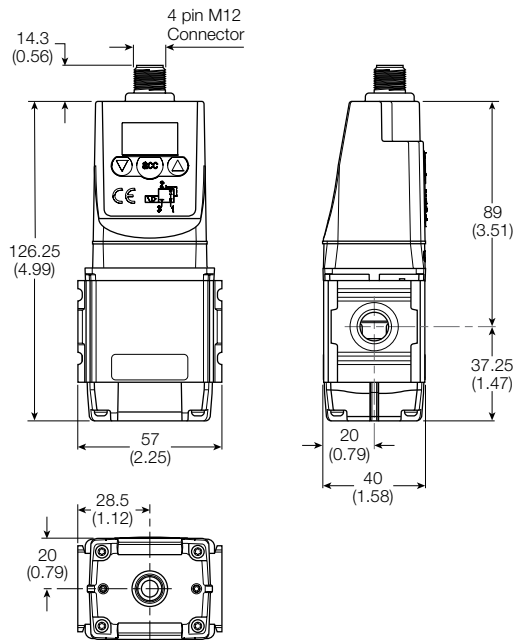
Display

The regulator is provided with a digital display, indicating the output pressure, either in bar or PSIG.

The factory setting is as indicated on the label, can be changed through to software at all times (parameter 14)

<p>WARNING</p> <p>Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.</p>

P31P



Supply voltage

24 VDC +/- 10%

Power consumption

Max. 1.1W with unloaded signal outputs

Control signals

The electronic pressure regulator can be externally controlled through an analogue control signal of either 0-10V or 4-20mA. (parameter 4).

Output signals

As soon as the output pressure is within the signal band a signal is given of 24VDC, PNP Ri = 1 kOhm
 Outside the signal band this connection is 0V.

Connections

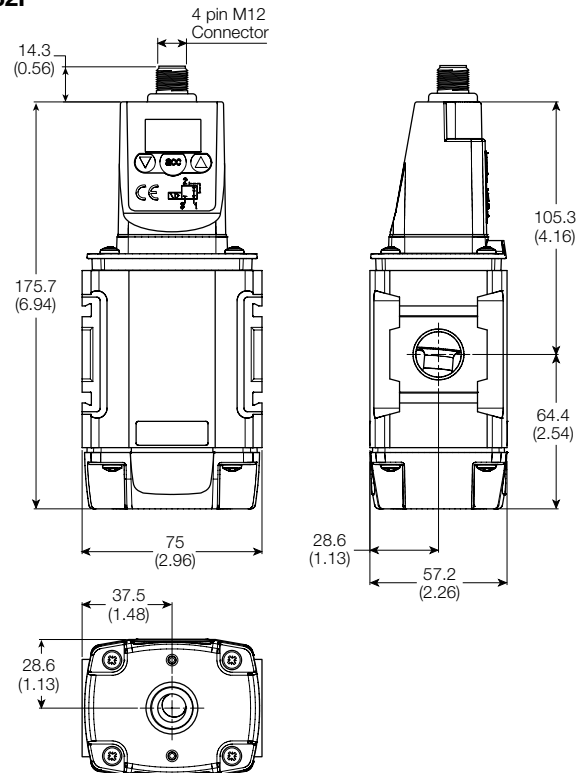
(In case of output signal (Option D))

Central M12 connector 4-pole

The electrical connections are as follows:

Pin No.	Function	Color	
1	24 V	Supply	Brown
2	0 to 10 V 4 to 20mA	Control Signal Ri = 100k Ω Control Signal Ri = 500 Ω	White
3	0 V (GND)	Supply	Blue
4	24 V	Alarm Output Signal	Black

P32P



Global Modular Soft Start / Dump Valves

- Modular design with 1/4" or 1/2" integral ports (NPT, BSPP & BSPT)
- The 3-way, 2-position function automatically dumps downstream pressure on the loss of pilot signal
- Adjustable slow start
- Solenoid or air pilot options
- High flow & exhaust capability
- Silencer included



P31TA Series shown
Bottom exhaust



P32TA Series shown
Bottom exhaust

Operating information

Operating pressure (max):	Solenoid	10 bar (150 PSIG)
	Air pilot	17 bar (250 PSIG)
Operating pressure (min):		3 bar (44 PSIG)
Operating temperature (max):	Solenoid	50°C (122°F)
	Air pilot	80°C (176°F)
Flow Capacity*:	P31 Series	17 dm ³ /s (36 SCFM)
	P32 Series	48 dm ³ /s (97 SCFM)

*Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 1 bar (14.5 PSIG).
 For Flow Curve Charts please see page E39.

Ordering information

P31T A 9 2 S G N C 2CN

Body size	Engr level	Thread type	Pilot type	Actuator interface	Solenoid voltage	Solenoid type
Combined soft start / dump valve (1/4") P31T	Current A	BSPP 1	P External air pilot	0 Internal Pilot	2CN 24VDC non locking manual override	C 15mm (P31 series only)
Combined soft start / dump valve (1/2") P32T		BSPT 2	S Solenoid pilot	G 15mm solenoid (P31 only)	3GN 120VAC non locking manual override	A 30mm CNOMO coil (P32 only)
Dump valve (1/4") P31D		NPT 9	Y* Internal air pilot	C 30mm solenoid	1FN 120VAC non locking manual override (P31 series only)	D 30mm CNOMO coil (M12 connection) (P32 only)
Dump valve (1/2") P32D				P* Threaded air pilot		
Soft start P31S						
Soft start P32S						

Port size

Global modular mini (1/4")	2
Global modular compact (1/2")	4

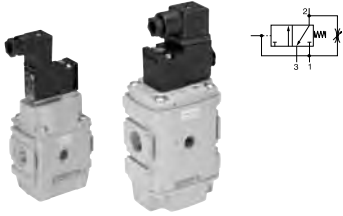
Note:
 P32 unit used for both P32 & P33 series
Bold items are most common.

* Only available on P31SA & P32SA Dump Valves.



Air Preparation Products

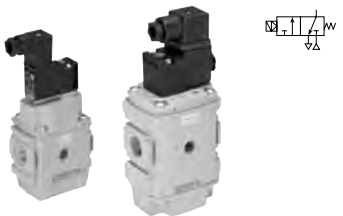
Combined soft start / Dump valves (P31T / P32T)



Port size	Description	Part number
1/4"	120VAC Solenoid & cable plug	P31TA92SGNC1FN
1/4"	24VDC Solenoid & cable plug	P31TA92SGNC2CN
1/4"	External air pilot operated	P31TA92PPN
1/2"	120VAC 30mm coil & cable plug included	P32TA94SCNA3GN
1/2"	24VDC 30mm coil & cable plug included	P32TA94SCNA2CN
1/2"	External air pilot operated	P32TA94PPN

Note: Includes exhaust silencer. Flow with 6.3 bar (91.3 PSIG) inlet and 1 bar (14.5 PSIG) pressure drop.

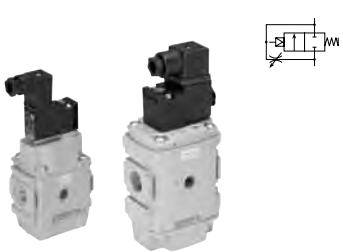
Dump valves (P31D / P32D)



Port size	Description	Part number
1/4"	120VAC Solenoid & cable plug	P31DA92SGNC1FN
1/4"	24VDC Solenoid & cable plug	P31DA92SGNC2CN
1/4"	External air pilot operated	P31DA92PPN
1/2"	120VAC 30mm coil & cable plug included	P32DA94SCNA3GN
1/2"	24VDC 30mm coil & cable plug included	P32DA94SCNA2CN
1/2"	External air pilot operated	P32DA94PPN

Note: Includes exhaust silencer.

Soft starts (P31S / P32S)

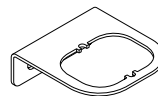


Port size	Description	Part number
1/4"	120VAC Solenoid & cable plug	P31SA92SGNC1FN
1/4"	24VDC Solenoid & cable plug	P31SA92SGNC2CN
1/4"	Internal air pilot operated	P31SA92Y0N
1/4"	External air pilot operated	P31SA92PPN
1/2"	120VAC 30mm coil & cable plug included	P32SA94SCNA3GN
1/2"	Internal air pilot operated	P32SA92Y0N
1/2"	24VDC 30mm coil & cable plug included	P32SA94SCNA2CN
1/2"	External air pilot operated	P32SA94PPN

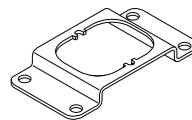
Material specifications

Body	Aluminum
Body cover	Polyester
Seals	Nitrile NBR

P31P mounting brackets



L-bracket



Foot bracket

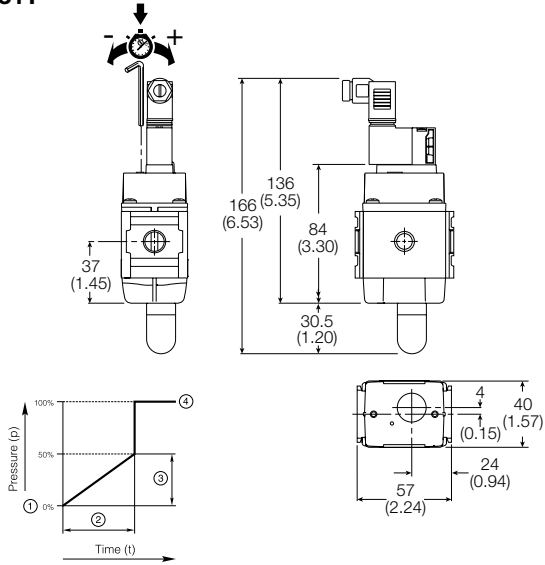
Description	Part number
L-bracket mounting kit	P3HKA00ML
Foot bracket mounting kit	P3HKA00MC

Most popular.

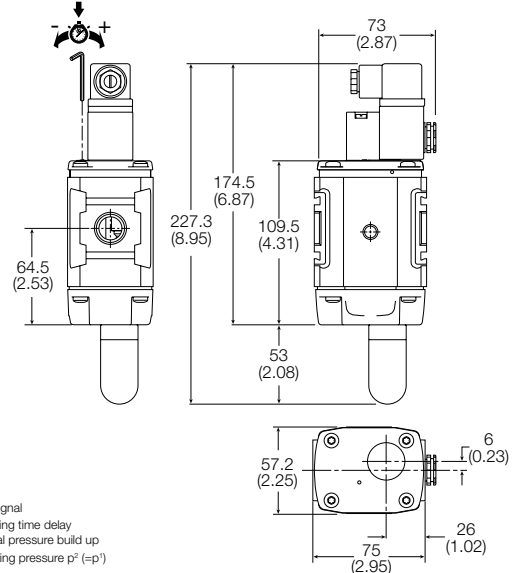
Note: For solenoid operators and cable plugs (connectors) see pages E28 to E29.



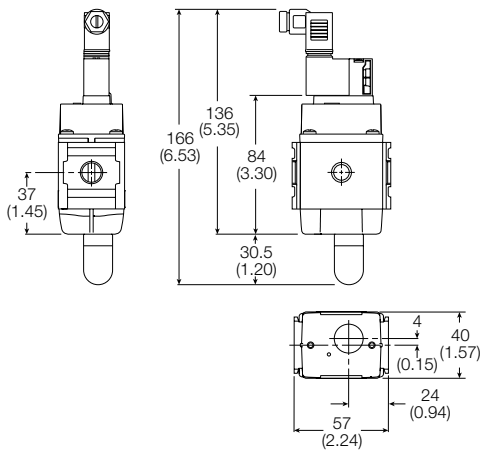
P31T



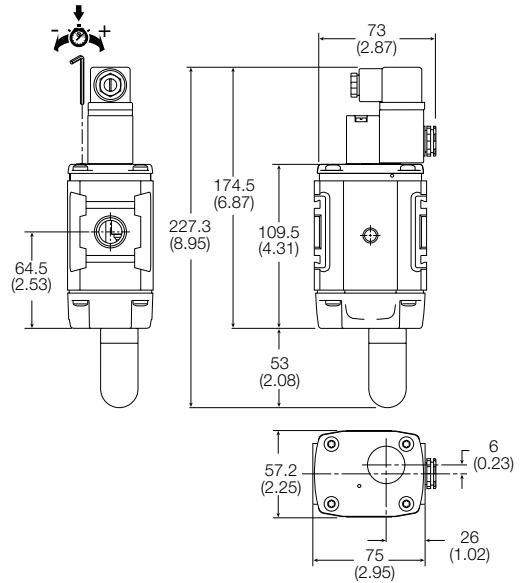
P32T



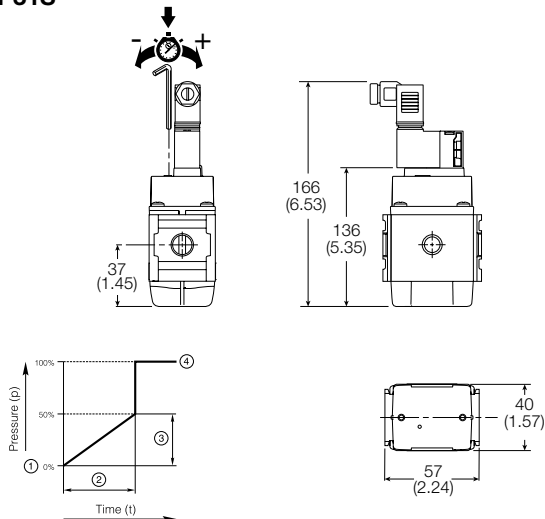
P31D



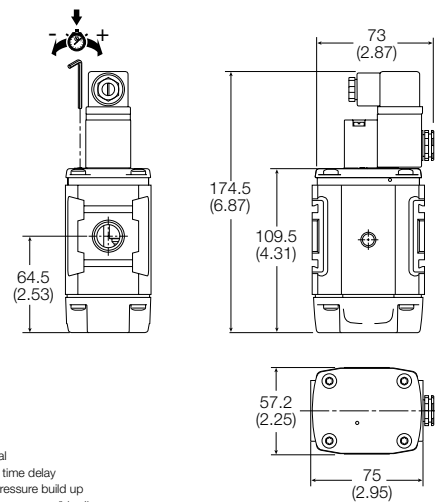
P32D



P31S



P32S



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

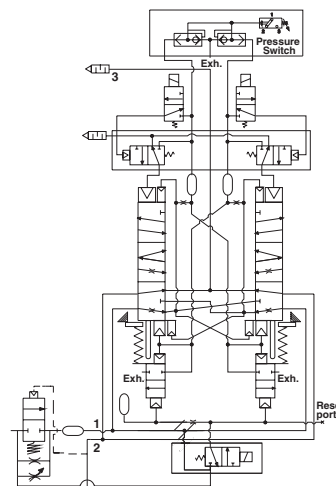
Bulk Liquid Separators

Redundant Safety Exhaust Valves

- Proven control reliable technology with integrated soft start
- Soft start application of air to the system when energized; can be adjusted for slower or faster buildup of system pressure
- Rapid exhaust of downstream air when de-energized to remove stored energy and allow safe access
- Memory, monitoring, and air flow control functions are integrated into two identical valve elements. Valves lock-out if asynchronous movement of valve elements occurs during actuation or de-actuation, resulting in a residual outlet pressure of less than 1% of supply.
- Reset can only be accomplished by the integrated electrical (solenoid) reset. Cannot be reset by removing and re-applying supply pressure.
- Basic 3/2 normally closed valve function: Dirt tolerant, wear compensating poppet design for quick response and high flow capacity.
- LED indicators of main solenoid operation, reset solenoid operation, and status indicator condition.
- Optional transducer for monitoring of downstream pressure in the system.
- Dual exhaust silencers included.
- Not for use with clutch / brake applications.
- For use in conjunction with a safety relay or safety PLC

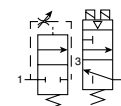


P33T Schematic



Options:

P33TA	9	6 R	G 4	F	2CN
Body size Standard P33T	Port size 3/4" 6	Operator 15mm Solenoid G	Solenoid Dual M12 connector without transducer F Triple M12 connector with transducer G	Voltage 24VDC with manual override 2CN	
Thread type BSPP 1 NPT 9	Type Solenoid pilot + gauge R	Mounting Cat 4 w/bracket 4			



Redundant Safety Exhaust Valves

Port size			Cv		Height mm (inches)	Width mm (inches)	Depth mm (inches)	Weight kg (lb)	Part number*
Inlet	Outlet	Transducer	1 to 2	2 to 3					
3/4	3/4	w/o transducer	3.7	8.5	273.8 (10.78)	136.0 (5.35)	147.6 (581)	7.3 (16.1)	P33TA96RG4F2CN
3/4	3/4	w/ transducer	3.7	8.5	273.8 (10.78)	136.0 (5.35)	147.6 (581)	7.4 (16.3)	P33TA96RG4G2CN

* NPT port threads. For BSPP threads, replace "9" in the part number with a "1".

Technical data

Pilot solenoidsAccording to VDE 0580
 Enclosure rating..... According to DIN 400 50 IP 65
 Connector socket..... According to DIN 43650 Form A
 three solenoids, rated for continuous duty

Standard voltages24VDC

Power consumption (each solenoid):
 for primary and reset solenoids 1.2 watts on DC

Enclosure rating.....IP65, IEC 60529

Electrical connection..... M12, 5-pin

Ambient temperature 15°F to 122°F (-10°C to 50°C)

Media temperature40°F to 175°F (4°C to 80°C)

Flow media Compressed air, filtered to minimum 40 micron

Inlet pressure30 to 150 psig (2 to 10 bar)

Pressure switch rating
 (Status indicator) 5 amps at 30 volts DC.

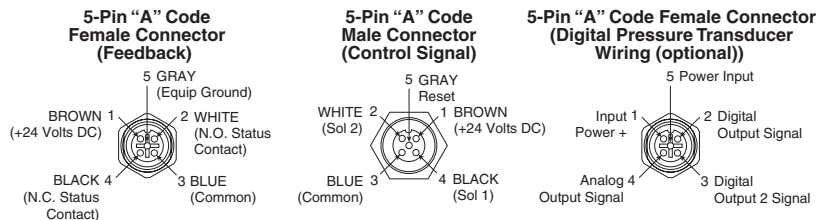
Monitoring..... Dynamically, cyclically, internally during each
 actuating and de-actuating movement.
 Monitoring function has memory and requires
 an overt act to reset unit after lockout.

Mounting orientation Vertically with pilot solenoids on top

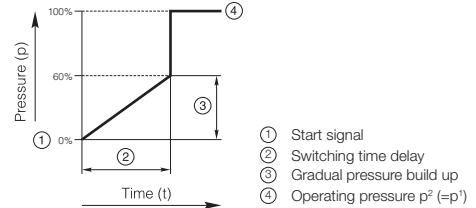
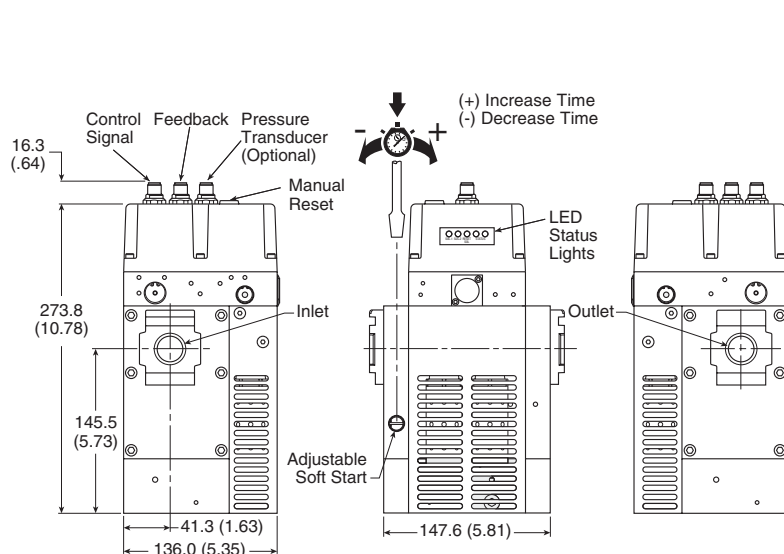
Port threads 3/4 NPT, 3/4 BSPP

Control reliable Category 4 (Cat 4); performance
 Level e (PLe) in accordance with Machine Directive -
 EN ISO 13849-1 (Certification pending)

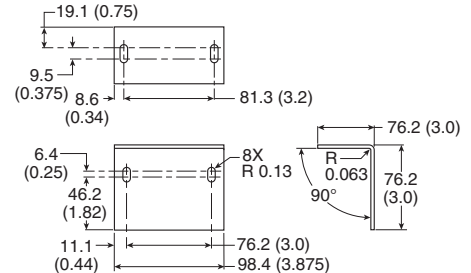
Valve wiring



Dimensions mm (inches)



Angle Mounting Bracket



Note: Mounting bracket and installation screws included and required to install unit in the system.

Service kits

Description	P33T
Black grill	1834C05-001
Body connector	P32KA00CB
Cables	
M12, 5-pin female to flying lead cable, TPE; 2 m (6.6 ft)	RKC 4.5-2/S1587
M12, 5-pin male to flying lead cable, TPE; 2 m (6.6 ft)	RSC 4.5-2/S1587
Port block kit	
1/2 NPT	P32KA94CP
3/4 NPT	P32KA96CP
1/2 BSPP	P32KA14CP
3/4 BSPP	P32KA16CP
1/2 BSPT	P32KA24CP
3/4 BSPT	P32KA26CP
Pressure switch	1227A30-001
Pressure transducer (Optional)	1232H30-001
T-bracket w/ body connector	P32KA00MT
T-bracket (Fits to body connector or port block)	P32KA00MB
Silencer(s) 3/4"	5500A5013
Solenoid (Main & reset)	1527B7916-001
Square flush mounting gauge kit 0-160 psig	K4511SCR160



Air Preparation Products

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Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

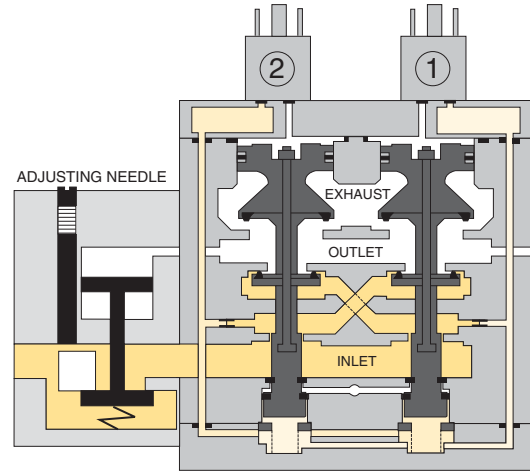
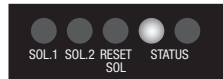
Precision / Proportional

Bulk Liquid Separators

Valve de-actuated (ready-to-run):

The flow of inlet air pressure to the inlet chamber of the main valve internals is restricted by a fixed orifice and an adjustable flow control as well as an air piloted 2-way normally closed poppet valve. The flow of inlet air pressure into the crossover passages is restricted by the size of the passage between the stem and the valve body opening. Flow is sufficient to quickly pressurize pilot supply / timing chambers 1 and 2. The inlet poppets prevent air flow from crossover passages into the outlet chamber. Air pressure acting on the inlet poppets and return pistons securely hold the valve elements in the closed position. (Reset adapter omitted for clarity.)

The green "Status" LED will be illuminated indicating the valve is operational.

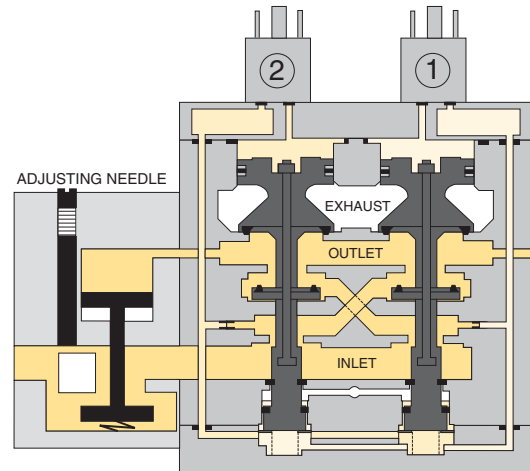
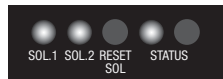


Valve actuated:

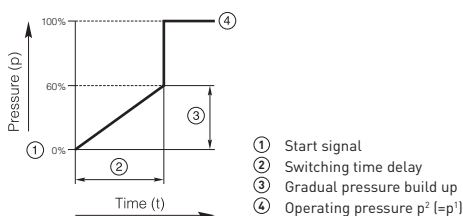
Energizing the pilot valves simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated (open) position, where inlet air flow to crossover passages is fully open, inlet poppets are fully open and exhaust poppets are fully closed. The outlet is then pressurized at a rate allowed by the fixed orifice and the adjusted flow control. Once the air pressure in the outlet chamber reaches approximately 60% of inlet pressure, the air piloted 2-way normally closed poppet valve opens fully and the pressure in the inlet, crossovers, outlet, and timing chambers are quickly equalized. The adjustable flow control will control the time it takes for the outlet air pressure to reach approximately 60% of inlet pressure.

De-energizing the pilots quickly causes the valve elements to return to the ready-to-run position.

Solenoid 1, Solenoid 2 and the green "Status" LED's will be illuminated indicating the valve is operating properly.



Soft start function:

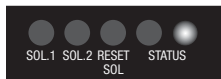


Valve fault and lock-out:

Whenever the valve elements operate in a sufficiently asynchronous manner, either on actuation or de-actuation, the valve will move to a locked-out position. In the locked-out position, one crossover and its related timing chamber will be exhausted, and the other crossover and its related timing chamber will be fully pressurized. The valve element (side 2) that is partially actuated has pilot air available to fully actuate it, but no air pressure on the return piston to fully de-actuate the valve element.

Air pressure in the crossover acts on the differential of side 2 stem diameters creating a latching force. Side 1 is in a fully closed position, and has no pilot air available to actuate, but has full pressure on the inlet poppet and return piston to hold the element in the fully closed position. Inlet air flow on side 1 into its crossover is restricted, and flows through the open inlet poppet on side 2, through the outlet into the exhaust port, and from the exhaust port to atmosphere. Residual pressure in the outlet is less than 1% of inlet pressure. The return springs are limited in travel, and can only return the valve elements to the intermediate (locked-out) position. Sufficient air pressure acting on the return pistons is needed to return the valve elements to a fully closed position.

The red "Status" LED will be illuminated indicating the valve in fault and lock-out must be reset



Valve reset (electrical or manual):

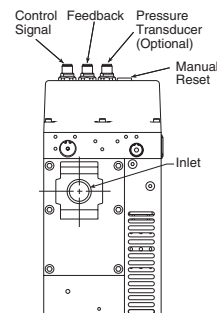
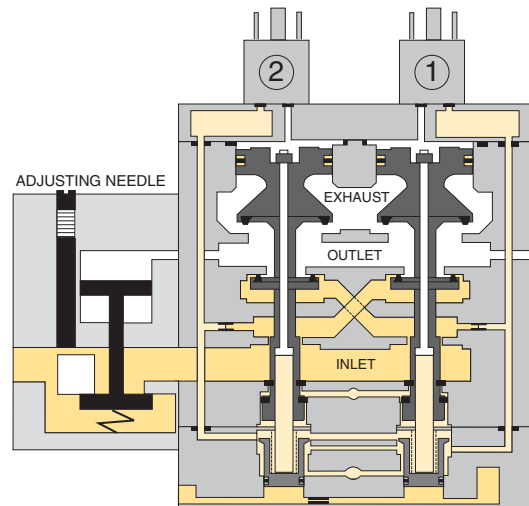
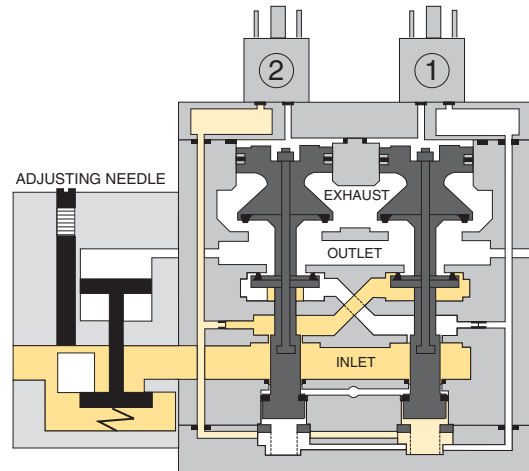
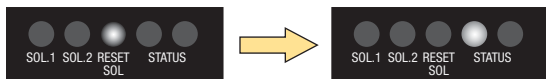
The reset procedure is as follows:

- Remove the electrical signals to the main coils
- Ensure there is air supplied to the valve
- Energize the reset solenoid for a minimum of 200 ms
- Allow a 200 ms delay after de-energizing the reset solenoid and re-energizing the main solenoids

The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied.

A remote reset signal must be applied to reset the valve. A momentary, remote electrical signal must be applied to the reset solenoid to apply pressure to the reset pistons in the valve. Actuation of the reset piston physically pushes the main valve elements to their closed position. Inlet air fully pressurizes the crossovers and holds the inlet poppets on seat. Actuation of the reset piston opens the reset poppet, thereby, immediately exhausting pilot supply air, thus, preventing valve operation during reset (Reset adapter added to illustration.). De-actuation of reset pistons causes the reset poppets to close and pilot supply to fully pressurize. Reset adapter pressure is applied by a 3/2 normally closed solenoid, or a manual push button mounted on the reset adapter in the top valve cover.

The green "Status" LED will be illuminated once the valve is reset.



P
Air Preparation Products
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Miniature
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General Industrial
Stainless Steel
Precision / Proportional
Bulk Liquid Separators

Global Modular Solenoid Operators

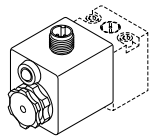
Solenoid Operators - CNOMO

Technical data - Solenoid operators, coil combinations

	NC Normal Operator with 22 x 30 standard coil	NC Normal Operator with 30 x 30 standard coil
Working pressure	0 to 10 bar	0 to 10 bar
Ambient temperature	-10°C to 60°C *	-10°C to 60°C *
Power (DC)	4.8W	2.7W
Power (AC)	8.5VA	4.9VA
Voltage tolerance	+/-10%	+/-10%
Duty cycle	100%	100%
Insulation class	F	F
Electric connection	B Industrial	DIN 43650A
Protection	IP65	IP65
Approval		UL/CSA
Working media	All neutral media such as compressed air	

* Limited to 50°C if use with 100% duty cycle

Solenoid Coils with M12 Connection



Voltage	Order code	Weight (Kg)
Direct current		
24VDC	P2FC6449	0.065

Transients

Interrupting the current through the solenoid coil produces momentary voltage peaks which, under unfavourable conditions, can amount to several hundred times the rated operating voltage. Normally, these transients do not cause problems, but to achieve the Maximum life of relays in the circuit (and particularly of transistors, thyristors and integrated circuits) it is desirable to provide protection by means of voltage-dependent resistors (varistors). All connectors/cable plugs EN175301-803 with LED's include this type of circuit protection.

Materials

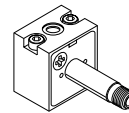
Pilot Valve

Body:	Polyamide
Armature tube:	Brass
Plunger & core:	Corrosion resistant Cr-Ni steel
Seals:	Fluorocarbon
Screws:	Stainless steel

Coil

Encapsulation material:	Thermoplastic as standard Duroplast for M12 connection
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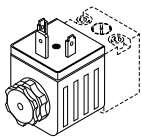
Spare Base Solenoid Pilot Operator CNOMO NC



Description	Order code non-lock manual override	Weight (Kg)
Standard Duty	P2FP23N4B	0.065
No Override	P2FP23N4A	0.065

Note: Solenoid pilot operators are fitted to the Global range. Order the above part numbers for spares. The operators are supplied with mounting screws and interface 'O' rings. Coils and connectors must be ordered separately.

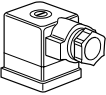
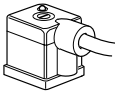
Solenoid Coils with DIN A or Industrial B Connection



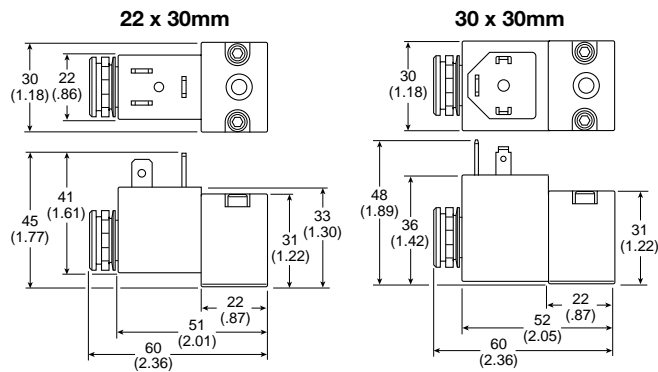
Voltage	22mm x 30mm Order code B industrial standard	Weight (Kg)	30mm x 30mm Order code DIN 43650A standard	Weight (Kg)
Direct current				
24VDC	P2FCB449	0.093	P2FCA449	0.105
Alternative current				
110V 50Hz, 120V 60Hz	P2FCB453	0.093	P2FCA453	0.105

Most popular.

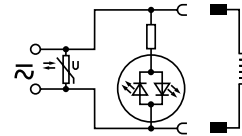
Solenoid Connectors / Cable Plugs EN175301-803

	Description	Order code 22mm Form B Industrial	Order code 30mm Form A DIN 43650A
	With standard screw	PS2429BP	PS2028BP
	With LED and protection 24VAC/DC	PS243079BP	PS203279BP
	With LED and protection 110VAC	PS243083BP	PS203283BP
	With cable	PS2429JBP	PS2028JCP
	Standard with 2m cable IP65	PS2429JBP	PS2028JCP
	24VAC/DC, 2m cable LED and protection IP65	PS2430J79BP	PS2032J79CP
	110VAC/DC, 2m cable LED and protection IP65	PS2430J83BP	PS2032J83CP

Solenoid coil dimensions mm (inches)



Electrical schematics

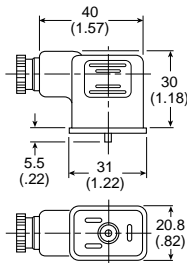


PS243079BP	PS203279BP
PS2430J79BP	PS2032J79CP
PS243083BP	PS203283BP
PS2430J83BP	PS2032J83CP
PS294679BP	PS294683BP
PS2946J79BP	PS2946J83BP

Cable plug dimensions mm (inches)

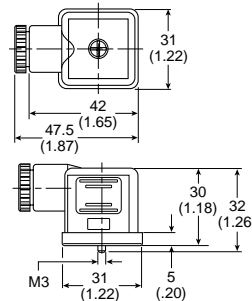
22mm Form B Industrial
Cable plugs

PS2429BP



30mm DIN 43650A
Cable plugs




PS2028BP



 Most popular.




Global Modular Accessories

Safety Lockout Valves

	Model type	Port size	Thread type	Flow dm ³ /s (SCFM)	Part number Flow from left to right	Part number Flow from right to left
	P31	1/4"	NPT	47.2 (100)	P31VA92LSAN	
	P32	1/4"	NPT	66.5 (141)	P32VA92LSAN	P32VA92LSBN
		3/8"	NPT	101.9 (216)	P32VA93LSAN	P32VA93LSBN
		1/2"	NPT	128.4 (272)	P32VA94LSAN	P32VA94LSBN
	P33	1/2"	NPT	136.9 (290)	P33VA94LSAN	P33VA94LSBN
		3/4"	NPT	141.6 (300)	P33VA96LSAN	P33VA96LSBN




For thread type: BSPP 1, BSPT 2, NPT 9

Modular Ball Valve

	Model type	Port size	Exhaust port	Thread type	Flow dm ³ /s (SCFM)	Part number Flow from left to right
	P31	1/4"	1/4"	NPT	20 (42.4)	P31VB92LBNN
	P32	3/8"	1/4"	NPT	90 (190.7)	P32VB93LBNN
		1/2"	1/4"	NPT	122 (258.5)	P32VB94LBNN
	P33	1/2"	1/2"	NPT	265 (561.5)	P33VB94LBNN
		3/4"	1/2"	NPT	320 (678)	P33VB96LBNN

For thread type: BSPP 1, BSPT 2, NPT 9







Manifold Blocks

	Model type	In / Out port size	Auxiliary port size top	Auxiliary port size bottom	Thread type	Part number
	P31	1/4"	1/4"	1/4"	NPT	P31MA92022N
	P32	1/2"	1/4"	1/2"	NPT	P32MA94024N
	P33	3/4"	1/4"	1/2"	NPT	P33MA96024N



For thread type: BSPP 1, BSPT 2, NPT 9

 Most popular.





P31 Series Accessories

Description	Port size	Part number
 C-bracket (Fits to filter and lubricator body)	—	P31KA00MW
 T-bracket w/ body connector	—	P31KA00MT
 Body connector	—	P31KA00CB
 Port block kit	1/8 NPT	P31KA91CP
	1/4 NPT	P31KA92CP
	3/8 NPT	P31KA93CP
	1/8 BSPP	P31KA11CP
	1/4 BSPP	P31KA12CP
	3/8 BSPP	P31KA13CP
	1/8 BSPT	P31KA21CP
	1/4 BSPT	P31KA22CP
	3/8 BSPT	P31KA23CP
	 Port block kit with T-bracket	1/8 NPT
1/4 NPT		P31KA92CN
3/8 NPT		P31KA93CN
1/8 BSPP		P31KA11CN
1/4 BSPP		P31KA12CN
3/8 BSPP		P31KA13CN
1/8 BSPT		P31KA21CN
1/4 BSPT	P31KA22CN	
3/8 BSPT	P31KA23CN	
 Angle bracket (Fits to regulator and filter / regulator body)	—	P31KA00MR



P32 Series Accessories

Description	Part number
 Angle bracket (Fits to regulator and filter / regulator body)	P32KA00MR
 L-bracket (Fits to filter and lubricator body)	P32KA00ML

P32 & P33 Series Accessories

Description	Port size	Part number
 T-bracket with body connector	—	P32KA00MT
 Body connector	—	P32KA00CB
 Port block kit	1/4 NPT	P32KA92CP
	3/8 NPT	P32KA93CP
	1/2 NPT	P32KA94CP
	3/4 NPT	P32KA96CP
	1/4 BSPP	P32KA12CP
	3/8 BSPP	P32KA13CP
	1/2 BSPP	P32KA14CP
	3/4 BSPP	P32KA16CP
	1/4 BSPT	P32KA22CP
	3/8 BSPT	P32KA23CP
1/2 BSPT	P32KA24CP	
3/4 BSPT	P32KA26CP	
 T-bracket (fits to body connector or port block)	—	P32KA00MB

P33 Series Accessories

Description	Part number
 Angle bracket (Fits to regulator and filter / regulator body)	P33KA00MR
 L-bracket (Fits to filter and lubricator body)	P33KA00ML

PPS1 Pressure Switch

Thread size	Part number
1/4 NPT	PPS1-1C3-RHM
1/8 NPT	PPS1-2C3-RHM
1/4" NPT	PPS1-1C3-RWL
1/8" NPT	PPS1-2C3-RWL

 Most popular.



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators
















Service Kits

	Description	P31	P32	P33
Air Preparation Products	Panel mount (plastic)	P31KA00MP	P32KA00MP	P33KA00MP
	Panel mount nut (aluminum)	P31KA00MM	P32KA00MM	P33KA00MM
Global	5µ element kit	P31KA00ESE	P32KA00ESE	P33KA00ESE
	1µ element kit	P31KA00ES9	P32KA00ES9	P33KA00ES9
Prep-Air II	0.01µ element kit	P31KA00ESC	P32KA00ESC	P33KA00ESC
	Adsorber element kit	P31KA00ESA	P32KA00ESA	P33KA00ESA
Miniature	Auto drain kit		P32KA00DA	P32KA00DA
	Differential pressure indicator kit	P31KA00RQ	P32KA00RQ	P32KA00RQ
P3N	Fill plug kit	P31KA00PL	P32KA00PL	P32KA00PL
	Drip control assembly kit	P32KA00PG	P32KA00PG	P32KA00PG
General Industrial	Plastic bowl w/ bowl guard & manual drain	P31KA00BGM	P32KA00BGM	P33KA00BGM
		P31KA00BGB		
Stainless Steel	Plastic bowl w/ bowl guard & pulse drain		P32KA00BGA	P33KA00BGA
		P31KA00BGN	P32KA00BGN	P33KA00BGN
Precision / Proportional	Metal bowl w/o sight gauge & manual drain	P31KA00BMM	P32KA00BMM	P33KA00BMM
		P31KA00BMB		
Bulk Liquid Separators	Metal bowl w/o sight gauge & pulse drain		P32KA00BMA	P33KA00BMA
		P31KA00BMN		
Bulk Liquid Separators	Metal bowl w/ sight gauge & manual drain		P32KA00BSM	P33KA00BSM
			P32KA00BSA	P33KA00BSA
Bulk Liquid Separators	Metal bowl w/ sight gauge & auto drain		P32KA00BSN	P33KA00BSN
		P31KA00BSN		

Most popular.



Service Kits

Port size	Description	P31	P32	P33
	Regulator - relieving repair kit	P31KA00RB	P32KA00RB	P33KA00RB
	Regulator - non relieving repair kit	P31KA00RC	P32KA00RC	P33KA00RC
	Regulator - main adjusting spring 0-2 bar (0-30 PSIG) kit	P31KA00PR	P32KA00PR	P33KA00PR
	Regulator - main adjusting spring 0-4.1 bar (0-60 PSIG) kit	P31KA00PS	P32KA00PS	P33KA00PS
	Regulator - main adjusting spring 0-8.6 bar (0-125 PSIG) kit	P31KA00PT	P32KA00PT	P33KA00PT
	Regulator - main adjusting spring 0-17 bar (0-250 PSIG) kit		P32KA00PV	P33KA00PV
	Square flush mount gauge kit	0-4 bar K4511SCR04B		
		0-11 bar K4511SCR11B		
		0-60 PSIG K4511SCR060		
		0-160 PSIG K4511SCR160		
	1.00" round gauge	0-60 PSIG / 0-4.1 bar K4510N18060		
	1.00" gauge	0-160 PSIG / 0-10 bar K4510N18160		
	40mm round gauge	0-30 PSIG / 0-2 bar K4515N18030		
	(Not for use with common port regulators)	0-60 PSIG / 0-4.1 bar K4515N18060		
		0-160 PSIG / 0-10 bar K4515N18160		
	50mm round gauge	0-30 PSIG / 0-2 bar	K4520N14030	K4520N14030
		0-60 PSIG / 0-4.1 bar	K4520N14060	K4520N14060
		0-160 PSIG / 0-10 bar	K4520N14160	K4520N14160
		0-300 PSIG / 0-20 bar	K4520N14300	K4520N14300
	44mm (1-3/4") digital round	0-160 PSIG / 0-11 bar / 0-1.1 MPa	K4517N14160D	K4517N14160D
	Body connector o-ring (spares kit) (pack of 10)	P31KA00CY	P32KA00CY	P33KA00CY
	Tamperproof knob kit	P31KB00AT	P32KB00AT	



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

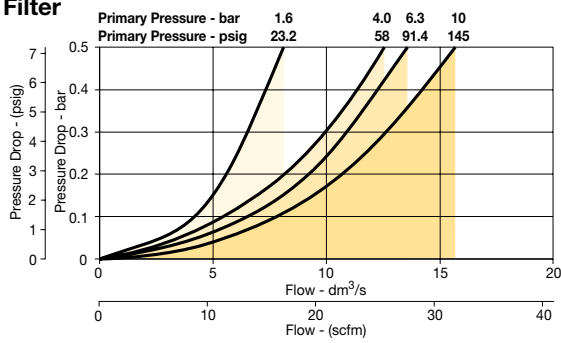
 Most popular.



Global FRL Flow Charts

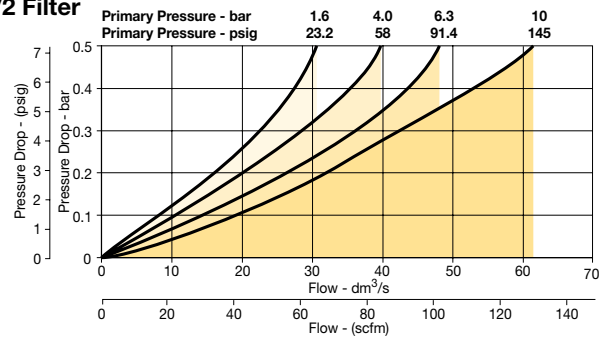
Mini Particulate Filter - P31

1/4 Filter



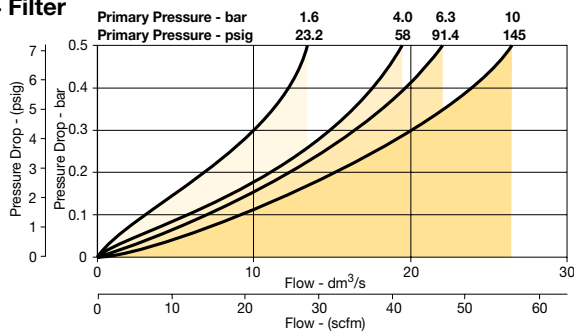
Standard Particulate Filter - P33

1/2 Filter

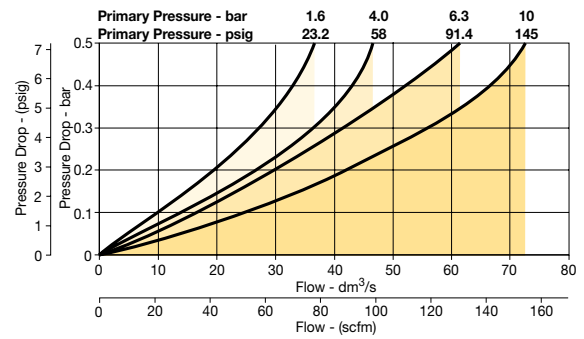


Compact Particulate Filter - P32

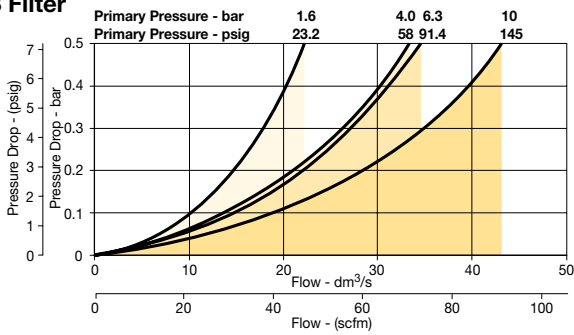
1/4 Filter



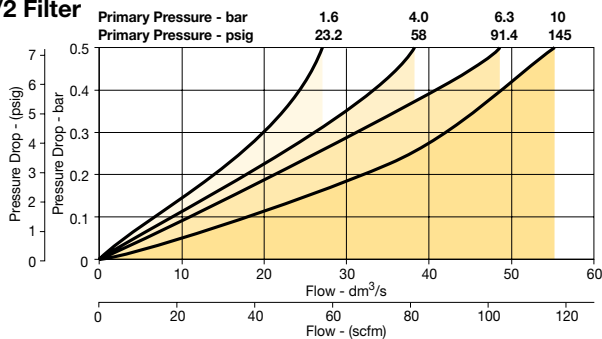
3/4 Filter



3/8 Filter

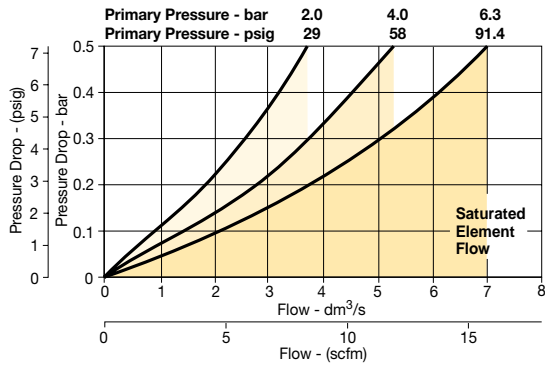


1/2 Filter

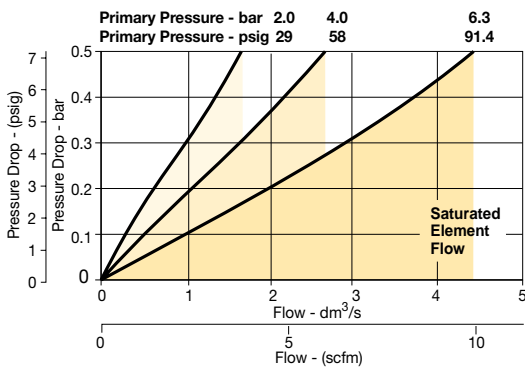


Mini Coalescing and Adsorber Filters - P31

P31 - 1.0 micron flow

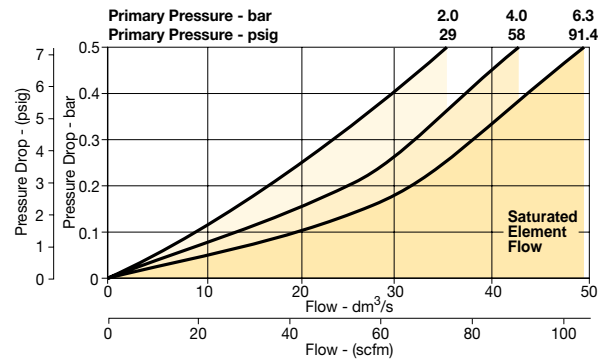


P31 - 0.01 micron flow

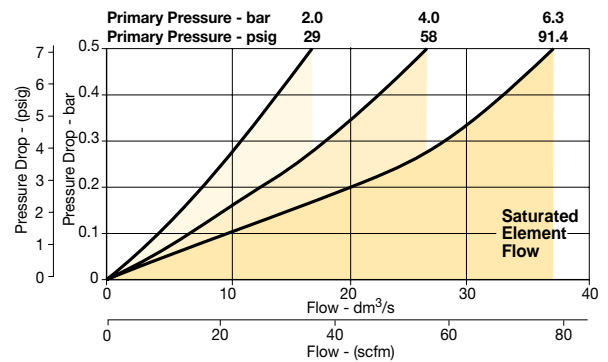


Standard Coalescing and Adsorber Filter - P33

P33 - 1.0 micron flow

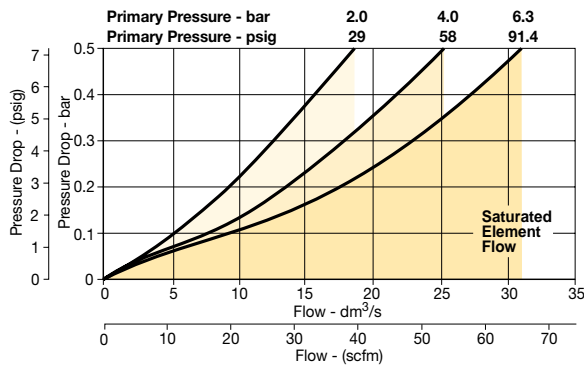


P33 - 0.01 micron flow

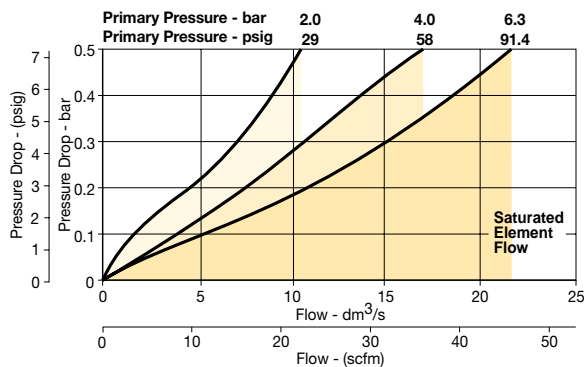


Compact Coalescing and Adsorber Filter - P32

P32 - 1.0 micron flow



P32 - 0.01 micron flow



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

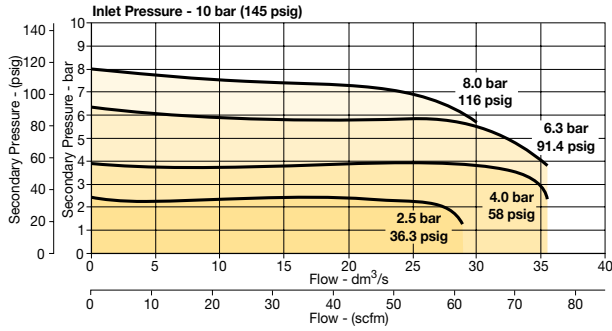
Stainless Steel

Precision / Proportional

Bulk Liquid Separators

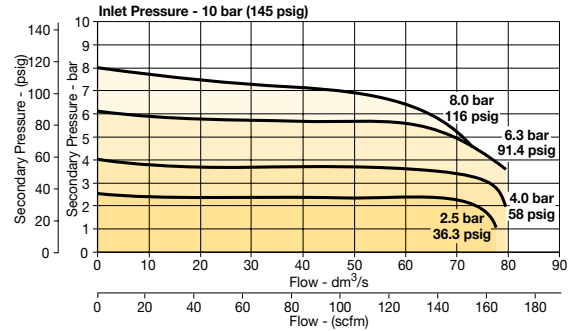
Mini Regulator - P31

1/4 Regulator



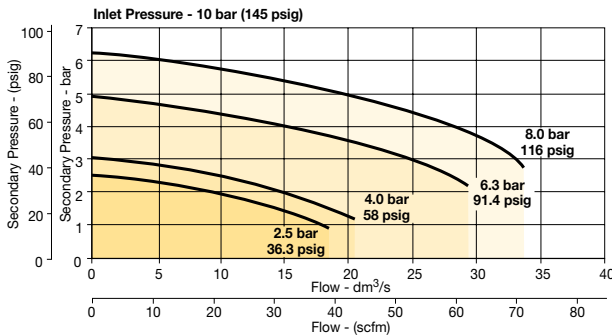
Compact Regulator - P32

1/2 Regulator



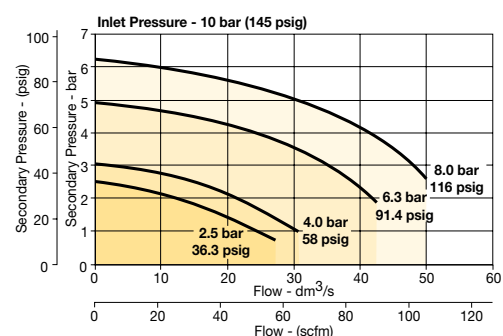
Mini Common - P1 Regulator - P31

1/4 Common Regulator



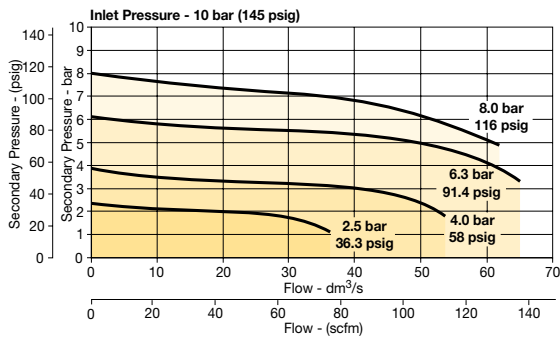
Compact Common - P1 Regulator - P32

1/4, 3/8 or 1/2 Common Regulator



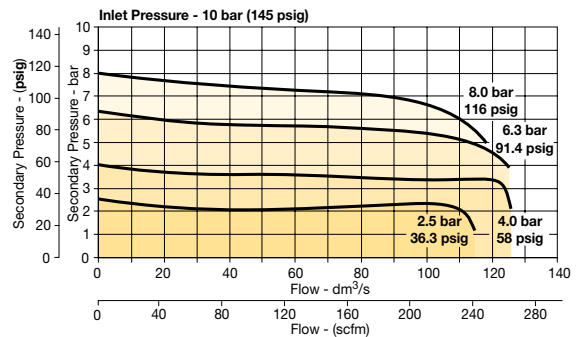
Compact Regulator - P32

1/4 Regulator

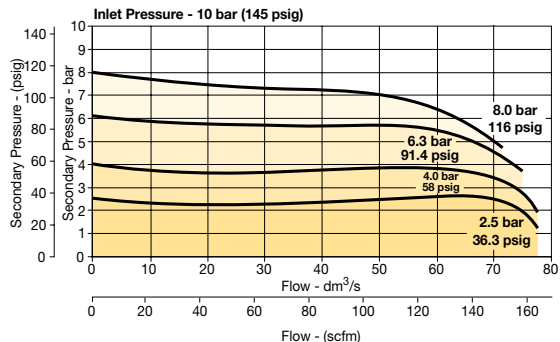


Standard Regulator - P33

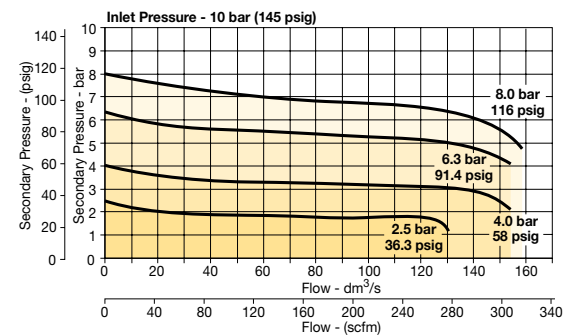
1/2 Regulator



3/8 Regulator

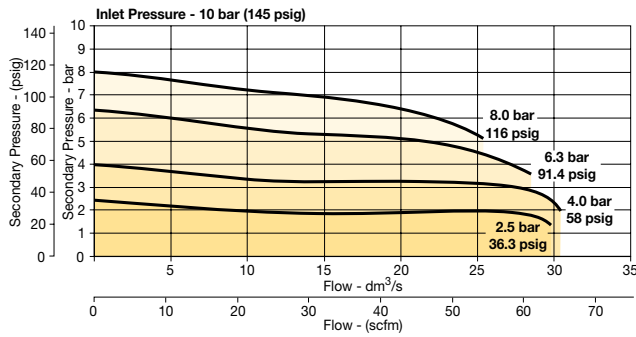


3/4 Regulator



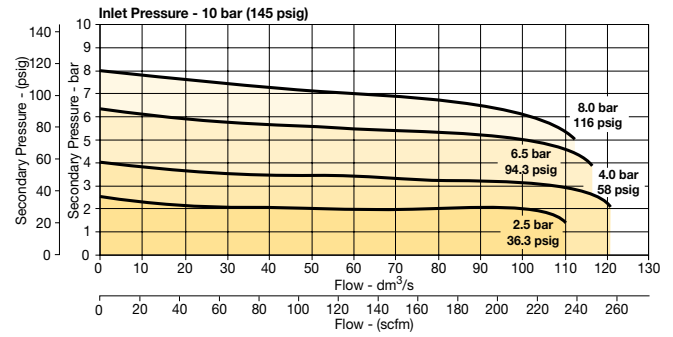
Mini Filter / Regulator - P31

1/4 Filter/Regulator



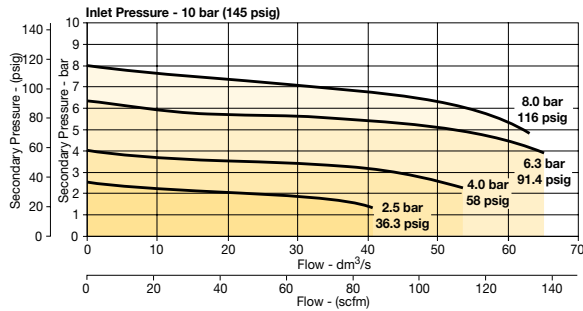
Standard Filter / Regulator - P33

1/2 Filter/Regulator

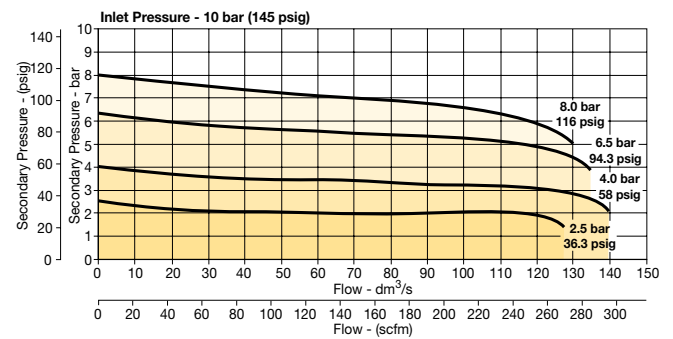


Compact Filter / Regulator - P32

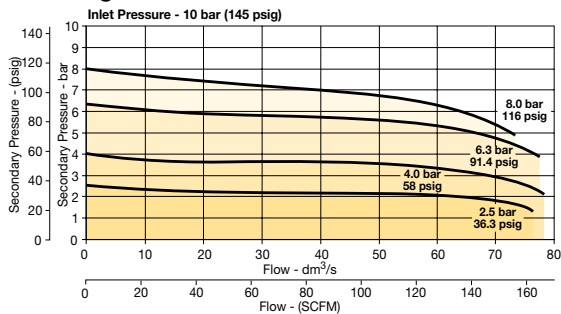
1/4 Filter/Regulator



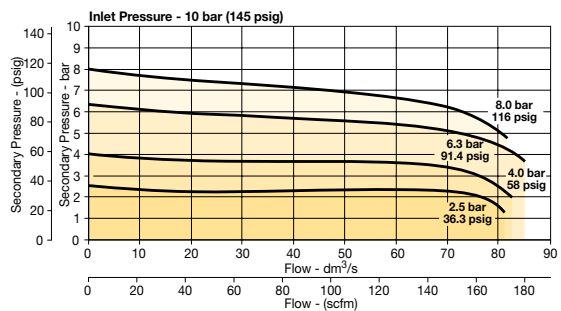
3/4 Filter/Regulator



3/8 Filter/Regulator



1/2 Filter/Regulator



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

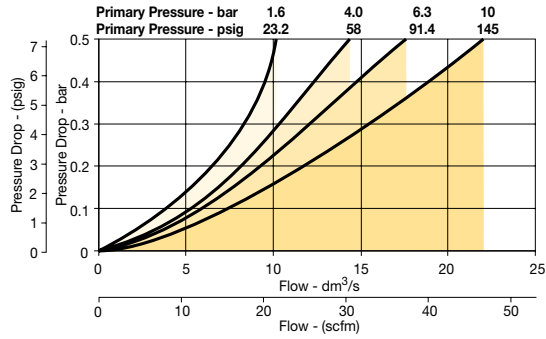
Stainless Steel

Precision / Proportional

Bulk Liquid Separators

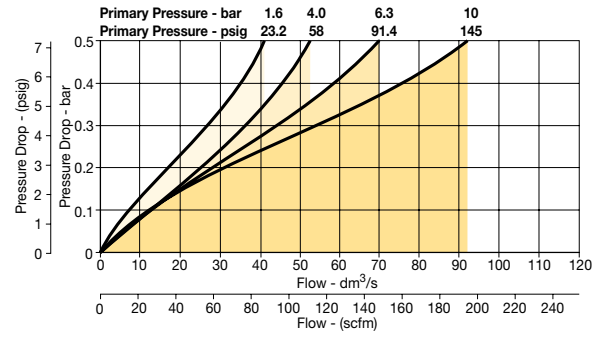
Mini Lubricator - P31

1/4 Lubricator

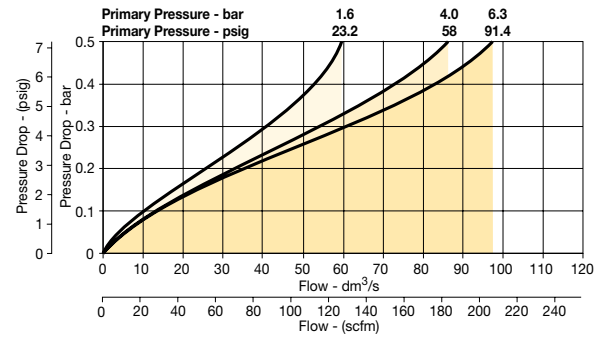


Standard Lubricator - P33

1/2 Lubricator

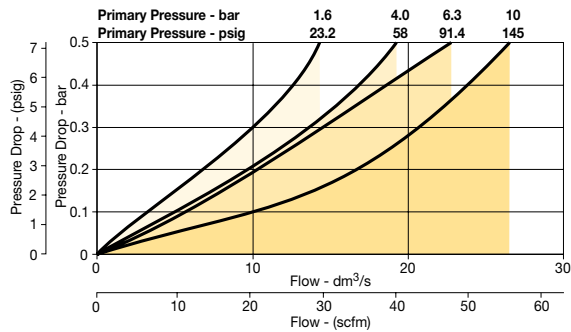


3/4 Lubricator

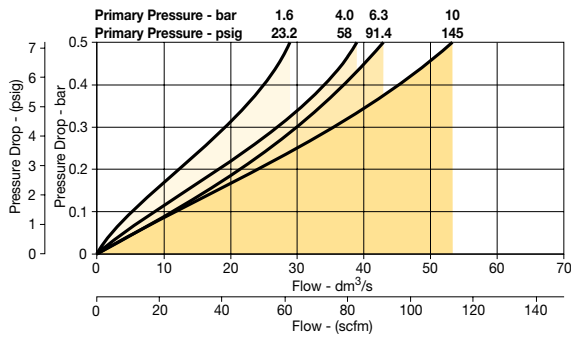


Compact Lubricator - P32

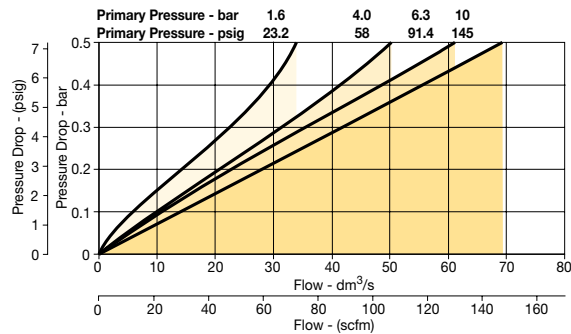
1/4 Lubricator



3/8 Lubricator

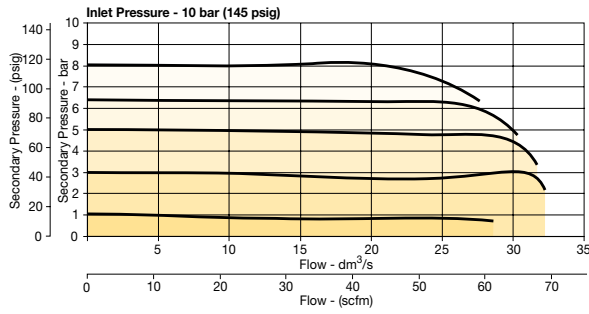


1/2 Lubricator

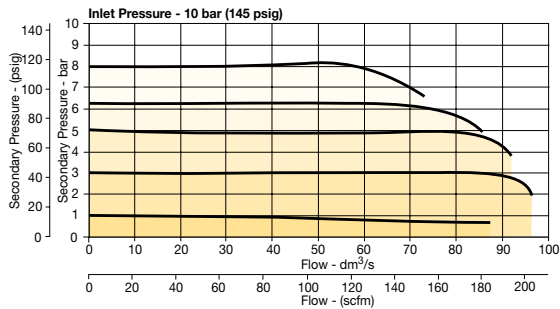


Proportional Regulators

P31P Regulator 1/4" Ports

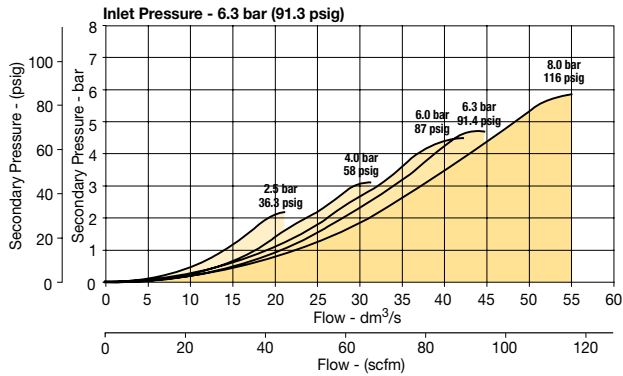


P32P Regulator 1/2" Ports

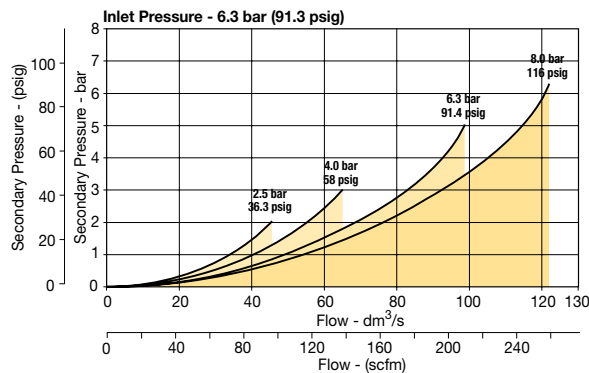


Combined Soft Start / Dump Valve

1/4 Soft Start & Dump Valve

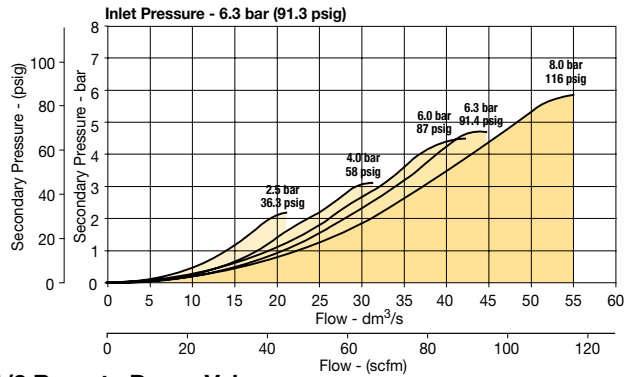


1/2 Soft Start & Dump Valve

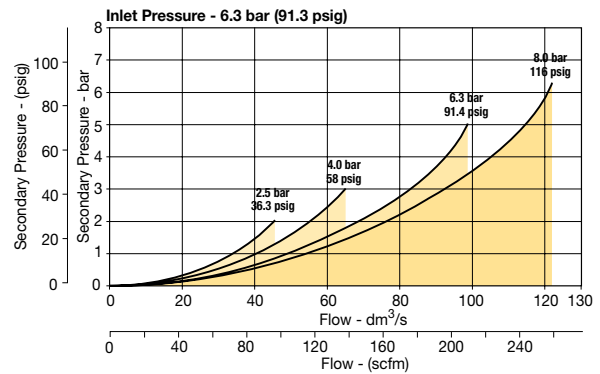


Dump Valve

1/4 Remote Dump Valve

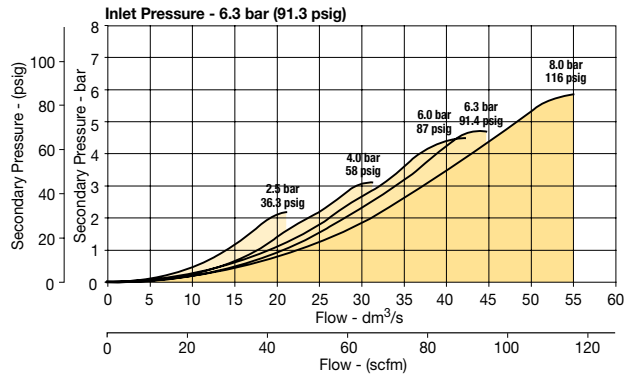


1/2 Remote Dump Valve

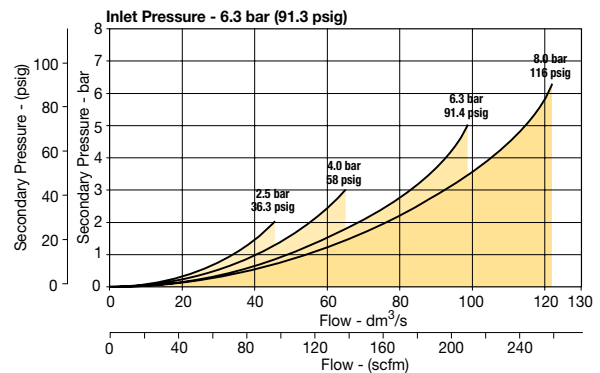


Soft Start Valve

1/4 Soft Start Valve



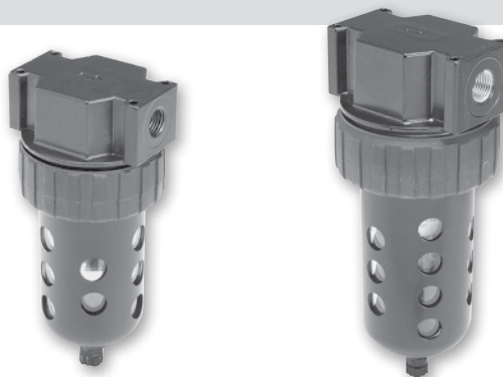
1/2 Soft Start Valve





06F, 07F Prep-Air II Particulate Filters

- Excellent water removal efficiency
- Unique deflector plate and shroud creates a swirling of the air stream ensuring maximum water and dirt separation
- Large filter element surface guarantees low pressure drop and increased element life
- Optional automatic float drain available
- 06F: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07F: 1/2" & 3/4" ports (NPT & BSPP)



06F

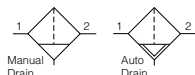
07F

Material specifications



Body	Zinc
Bowls	Transparent polycarbonate or Metal (zinc) with or without sight gauge
Bowl guards	Steel
Collar	Plastic (06, 07) or metal (07)
Deflector, shroud & baffle	Plastic
Drain	Plastic
Automatic float drain –	
Housing, float	Plastic
Seals	Nitrile
Springs, push rod	Stainless steel
Filter elements –	
40 Micron (standard)	Plastic
5 Micron (optional)	Plastic
Seals	Nitrile
Sight gauge	Polyamide

Operating information

06F & 07F		
Operating pressure:	Poly bowl Metal bowl	0 to 150 PSIG (0 to 10.3 bar) 0 to 250 PSIG (0 to 17.2 bar)
Auto float drain:	Poly bowl Metal bowl	15 to 250 PSIG (1.0 to 17.2 bar)
Operating temperature:	Poly bowl Metal bowl	32°F to 125°F (0°C to 52°C) 32°F to 175°F (0°C to 80°C)



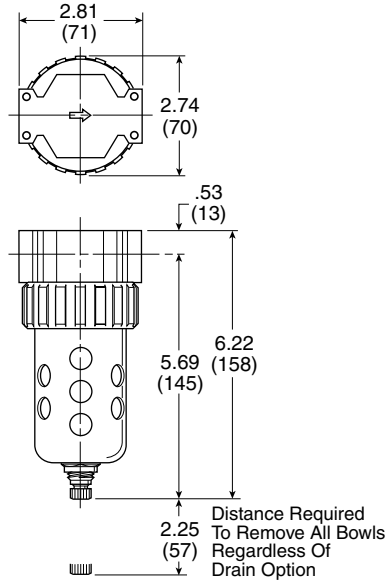
06F, 07F Particulate Filters

	Port size	Bowl type	Flow SCFM	Element type	Part number (NPT)	
					Twist drain	Automatic float drain
06F 	1/4"	Poly bowl / Metal guard	53	40 micron	06F12AC	06F16AC
	1/4"	Metal bowl / Sight gauge	53	40 micron	06F14AC	06F18AC
	3/8"	Poly bowl / Metal guard	80	40 micron	06F22AC	06F26AC
	3/8"	Metal bowl / Sight gauge	80	40 micron	06F24AC	06F28AC
	1/2"	Poly bowl / Metal guard	85	40 micron	06F32AC	06F36AC
	1/2"	Metal bowl / Sight gauge	85	40 micron	06F34AC	06F38AC
07F 	1/2"	Poly bowl / Metal guard	75	40 micron	07F32AC	07F36AC
	1/2"	Metal bowl / Sight gauge	75	40 micron	07F34AC	07F38AC
	3/4"	Poly bowl / Metal guard	80	40 micron	07F42AC	07F46AC
	3/4"	Metal bowl / Sight gauge	80	40 micron	07F44AC	07F48AC

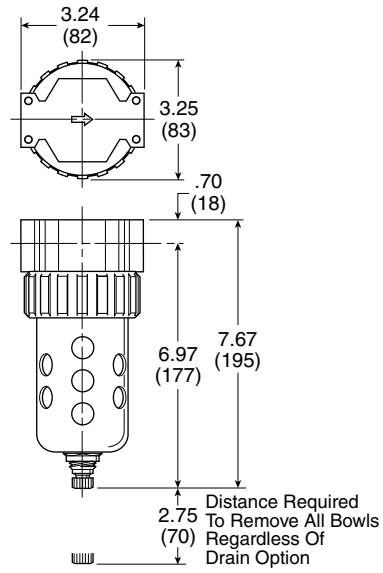
 Most popular.



06F (Compact)



07F (Standard)



Service kits

Description	06F (Compact)	07F (Standard)
Bowl guard kit	PS705P	PS805P
Bowl Kits –		
Poly bowl –		
Auto float drain	PS722P	PS822P
Twist drain	PS732P	PS832P
Metal bowl –		
Auto float drain	PS726P	PS826P
Twist drain	PS734P	PS834P
Sight gauge / automatic float drain	PS723P	PS823P
Sight gauge / twist drain	PS735P	PS835P
DPI replacement kit	PS781P	PS781P
Drain kits –		
Auto float drain	PS506P	PS506P
Twist drain	PS512P	PS512P
Filter element kit –		
40 micron	PS701P	PS801P
5 micron	PS702P	PS802P
Adsorber	PS731P	PS831P
Mounting bracket kit	PS743P	PS843P
Sight gauge kit	PS914P	PS914P

☐ Most popular.





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

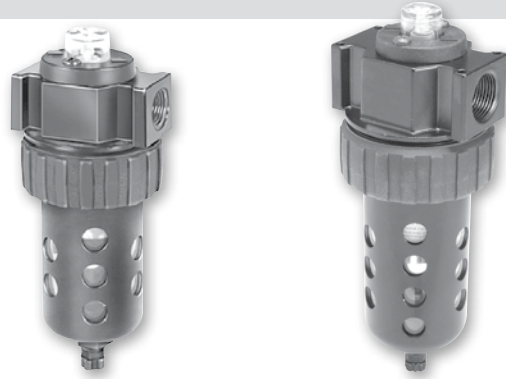
Stainless Steel

Precision / Proportional

Bulk Liquid Separators

11F, 12F Prep-Air II Coalescing Filters

- Removes liquid aerosols and sub-micron particles
- Liquids gravitate to the bottom of the element and will not re-enter the airstream
- Oil free air for critical applications, such as air gauging and pneumatic instrumentation and controls
- Interchangeable twist and automatic float drains
- Differential pressure indicator standard
- 11F: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 12F: 1/2" & 3/4" ports (NPT & BSPP)



11F

12F

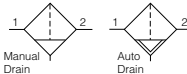
Material specifications

Body	Zinc
Bowls	Transparent polycarbonate or Metal (zinc) with or without sight gauge
Bowl guards	Steel
Collar	Plastic (06, 07) or metal (07)
Drain	Plastic
Automatic float drain –	
Housing, float	Plastic
Seals	Nitrile
Springs, push rod	Stainless steel
Filter element –	
Borosilicate & felt glass fibers 99.97% DOP efficiency	0.01 Micron
Largest Aerosol Particle Passed (Grade 6)	
Largest Solid Particle Passed (Grade 6)	0.30 Micron
Seals	Nitrile
Sight gauge	Polyamide

Operating information

11F & 12F		
Operating pressure:	Poly bowl Metal bowl	0 to 150 PSIG (0 to 10.3 bar) 0 to 250 PSIG (0 to 17.2 bar)
Auto float drain:	Poly bowl Metal bowl	15 to 250 PSIG (1.0 to 17.2 bar)
Operating temperature:	Poly bowl Metal bowl	32°F to 125°F (0°C to 52°C) 32°F to 175°F (0°C to 80°C)

Coalescing Filters



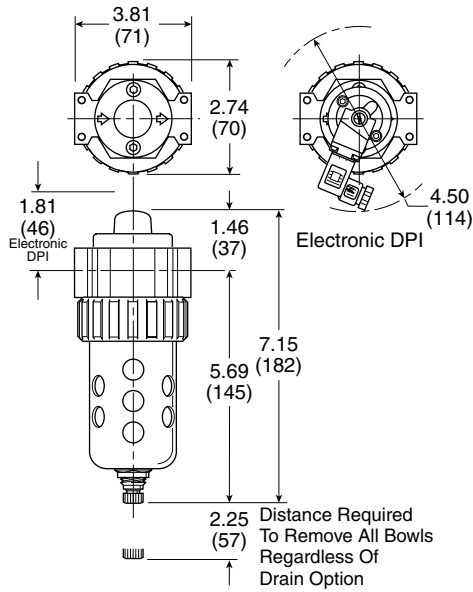
	Port size	Bowl type	Flow SCFM	Element type	Part number (NPT)	
					Twist drain	Automatic float drain
11F	1/4"	Poly bowl / Metal guard	45	0.01 micron	11F12EC	11F16EC
	1/4"	Metal bowl / Sight gauge	60	1.0 micron	11F14HC	11F18HC
	1/4"	Metal bowl / Sight gauge	45	0.01 micron	11F14EC	11F18EC
	1/4"	Metal bowl / Sight gauge	60	1.0 micron	11F14HC	11F18HC
	3/8"	Poly bowl / Metal guard	48	0.01 micron	11F22EC	11F26EC
	3/8"	Poly bowl / Metal guard	72	1.0 micron	11F22HC	11F26HC
	3/8"	Metal bowl / Sight gauge	48	0.01 micron	11F24EC	11F28EC
	3/8"	Metal bowl / Sight gauge	72	1.0 micron	11F24HC	11F28HC
	1/2"	Poly bowl / Metal guard	65	0.01 micron	11F32EC	11F36EC
	1/2"	Poly bowl / Metal guard	95	1.0 micron	11F32HC	11F36HC
12F	1/2"	Metal bowl / Sight gauge	65	0.01 micron	11F32EC	11F36EC
	1/2"	Metal bowl / Sight gauge	95	1.0 micron	11F34HC	11F38HC
	1/2"	Poly bowl / Metal guard	75	0.01 micron	12F32EC	12F36EC
	1/2"	Poly bowl / Metal guard	125	1.0 micron	12F32HC	12F36HC
	1/2"	Metal bowl / Sight gauge	75	0.01 micron	12F34EC	12F38EC
	1/2"	Metal bowl / Sight gauge	125	1.0 micron	12F34HC	12F38HC
	3/4"	Poly bowl / Metal guard	80	0.01 micron	12F42EC	12F46EC
	3/4"	Poly bowl / Metal guard	160	1.0 micron	12F42HC	12F46HC
	3/4"	Metal bowl / Sight gauge	80	0.01 micron	12F44EC	12F48EC
	3/4"	Metal bowl / Sight gauge	160	1.0 micron	12F44HC	12F48HC



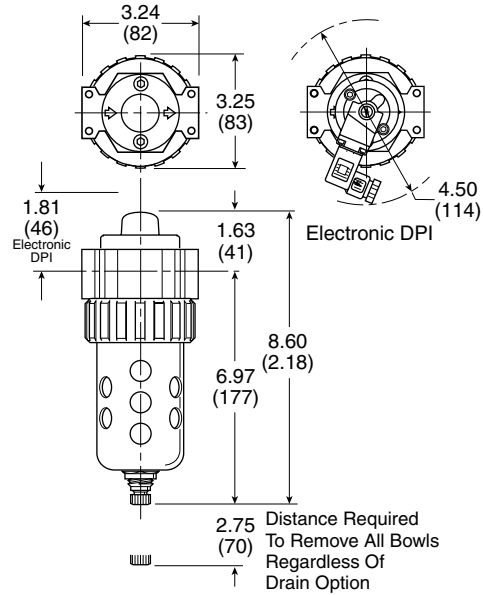
Most popular.



11F (Compact)



12F (Standard)



Service kits

Description	11F (Compact)	12F (Standard)
Bowl guard kit	PS705P	PS805P
Bowl Kits –		
Poly bowl –		
Auto float drain	PS722P	PS822P
Twist drain	PS732P	PS832P
Metal bowl –		
Auto float drain	PS726P	PS826P
Twist drain	PS734P	PS834P
Sight gauge / automatic float drain	PS723P	PS823P
Sight gauge / twist drain	PS735P	PS835P
DPI replacement kit	PS781P	PS781P
Drain kits –		
Auto float drain	PS506P	PS506P
Twist drain	PS512P	PS512P
Electronic DPI replacement kit	PS764	PS764
Electrical connector - 15mm, 3-pin DIN, 6 Ft. Cord	PS2932JBP	PS2932JBP
Filter element kit –		
Grade 6 (Standard)	PS701P	PS824P
Grade 10 (Optional)	PS702P	PS830P
Mounting bracket kit	PS743P	PS843P
Sight gauge kit	PS914P	PS914P

Most popular.





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

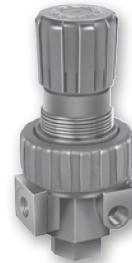
Stainless Steel

Precision / Proportional

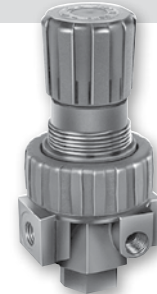
Bulk Liquid Separators

06R, 07R Prep-Air II Regulators

- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Rolling diaphragm for extended life
- Two high flow 1/4" gauge ports can be used as additional outlets
- Easily serviced
- Removable non-rising knob for panel mounting and tamper resistance
- 06R: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07R: 1/2" & 3/4" ports (NPT & BSPP)



06R



07R

Material specifications



Adjusting Stem	Steel
Body	Zinc
Bonnet, piston stem, valve poppet & cap	Plastic
Collar, knob	Plastic
Diaphragm	Nitrile
Seals	Nitrile
Springs – Poppet Control	Stainless Steel

Operating information

	06R (Compact), 07R (Standard)
Pressure rating:	250 PSIG (17.2 bar)
Temperature rating:	32°F to 175°F (0°C to 80°C)
Secondary pressure ranges –	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
High pressure	5 to 250 PSIG (0.4 to 17.2 bar)



Regulators

	Port size	Pressure range	Flow SCFM	Part number (NPT)	
				Without gauge	With 160 PSI gauge
06R 	1/4"	125 PSIG	53	06R113AC	06R118AC
	3/8"	125 PSIG	60	06R213AC	06R218AC
	1/2"	125 PSIG	75	06R313AC	06R318AC
07R 	1/2"	125 PSIG	90	07R313AC	07R318AC
	3/4"	125 PSIG	90	07R413AC	07R418AC



WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

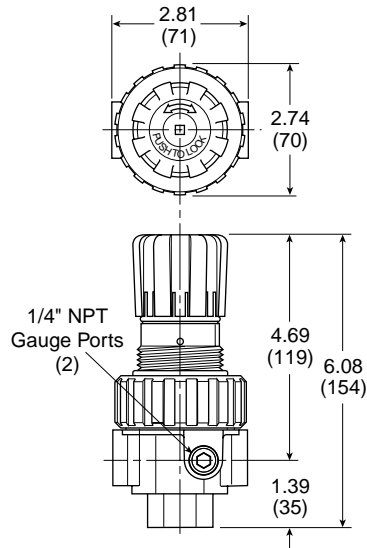
CAUTION: REGULATOR PRESSURE ADJUSTMENT –

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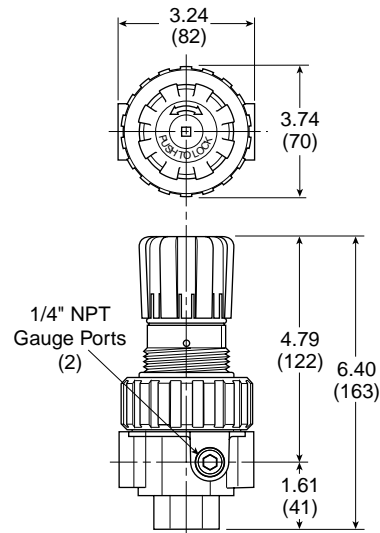
 Most popular.



06R (Compact)



07R (Standard)



Service kits

Description		06R (Compact)	07R (Standard)
Bonnet assembly		PS715P	PS715P
Control knob		P04069B	P04069B
Gauges –			
50mm (2") round	60 PSIG (0 to 4.1 bar)	K4520N14060	K4520N14060
1/4" center back mount	160 PSIG (0 to 11.0 bar)	K4520N14160	K4520N14160
	300 PSIG (0 to 20.0 bar)	K4520N14300	K4520N14300
44mm (1-3/4") digital round	0-160 PSIG / 0-11 bar /	K4517N14160D	K4517N14160D
1/4" center back mount	0-1.1 MPa		
Mounting bracket kit (Includes panel mount nut)		PS707P	PS807P
Panel mount nut –	Plastic	P04082	P04079B
	Metal	P04082	P04079B
Reverse Flow Service Conversion Kit – Relieving		PS708RP	PS808RP
Springs –	1-30 PSIG range	P01698	P01698
	1-60 PSIG range	P04062	P04062
	2-125 PSIG range	P04063	P04063
	5-250 PSIG range	P04064	P04064
Tamperproof kit		PS737P	PS737P

Most popular.



11R, 12R Prep-Air II Pilot Operated Regulators

- Balanced poppet provides quick response and accurate pressure regulation
- Pilot controlled regulators can be mounted “out of reach” with pilot regulator installed in a convenient location
- Solid control piston for extended life



11R



12R

Operating information

	11R	12R
Pressure rating:	0 to 250 PSIG (0 to 17.2 bar)	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating:	32°F to 175°F (0°C to 80°C)	32°F to 175°F (0°C to 80°C)
Flow capacity SCFM:	1/4": 85 3/8": 95 1/2": 95	1/2": 140 3/4": 140

11R, 12R Pilot Controlled Regulators



	Port size	Gauge	Part number (NPT), relieving	
			11R	12R
General Industrial	1/4"	No	11R115PC	
	3/8"	No	11R215PC	
	1/2"	No	11R315PC	12R315PB
	3/4"	No		12R415PB
Stainless Steel	1/4"	160 PSI	11R121PC	
	3/8"	160 PSI	11R221PC	
	1/2"	160 PSI	11R321PC	12R321PB
	3/4"	160 PSI		12R421PB

Material specifications

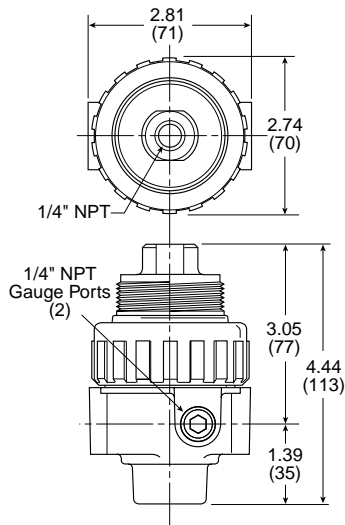
	11R	12R
Body	Zinc	Zinc
Bottom plug	-	-
Innervalve	-	-
Pilot cap	Zinc	Zinc
Piston & poppet	Plastic	Plastic
Seals	Nitrile	Nitrile
Springs – poppet	Steel	Steel

⚠ WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

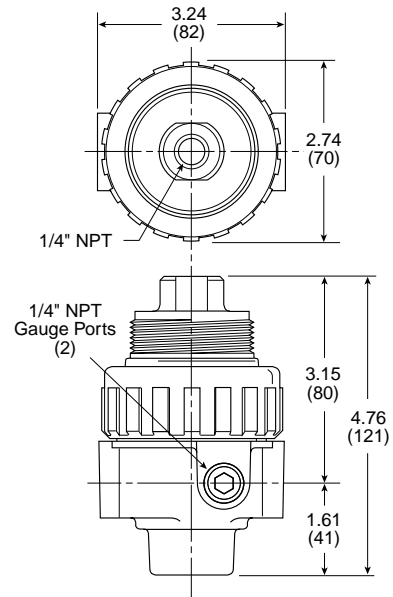
CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
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Most popular.

11R



12R



Service kits

		11R	12R
Body service kit		PS713P	PS813P
Gauges –	50mm (2") round 1/4" center back mount	60 PSIG (0 to 4.1 bar)	K4520N14060
		160 PSIG (0 to 11.0 bar)	K4520N14160
		300 PSIG (0 to 20.0 bar)	K4520N14300
	44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa	K4517N14160D
Mounting bracket kit		PS707P	PS807P
Panel mount nut –	Metal	P04079B	P04079B
	Plastic	P04082	P04082
Pilot conversion kit		PS745P	PS745P
Repair kits –	Non-relieving	PS747P	PS847P
	Relieving	PS749P	PS849P



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

06E Prep-Air II Filter / Regulators

- Space saving package offers both filter and regulator features for optimal performance
- Excellent water removal efficiency
- Rolling diaphragm for extended life
- Quick response, and accurate pressure regulation regardless of changing flow or inlet pressure
- Two high flow 1/4" gauge ports can be used as additional outlets



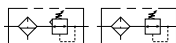
Material specifications

Adjusting stem		Steel	
Body		Zinc	
Bonnet, internal parts		Plastic	
Bowls	Transparent	Polycarbonate	
	Metal	Zinc	
Bowl guard		Steel	
Collar		Plastic	
Diaphragm		Nitrile	
Drains	Manual twist drain standard	Body & nut	Plastic
		Automatic float drain optional	Float housing
		Seals	Nitrile
		Springs, push rod	Stainless steel
Filter elements		40 Micron (standard)	Plastic
		5 Micron (optional)	Plastic
Knob		Plastic	
Seals		Nitrile	
Sight gauge		Polyamide	
Springs -	Poppet	Stainless	
	Control	Steel	

Operating information

Pressure rating -	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Automatic float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Temperature rating -	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Secondary pressure ranges -	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
High pressure	5 to 250 PSIG (0.4 to 17.2 bar)

06E Compact Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT)	
						Pressure range (Without gauge)	
						60 PSIG	125 PSIG
06E	1/4"	Poly / Metal guard	Twist	46	40 micron	06E12A11AC	06E12A13AC
	1/4"	Poly / Metal guard	Auto float	46	40 micron	06E16A11AC	06E16A13AC
	3/8"	Poly / Metal guard	Twist	55	40 micron	06E22A11AC	06E22A13AC
	3/8"	Poly / Metal guard	Auto float	55	40 micron	06E26A11AC	06E26A13AC
	1/2"	Poly / Metal guard	Twist	61	40 micron	06E32A11AC	06E32A13AC
	1/2"	Poly / Metal guard	Auto float	61	40 micron	06E36A11AC	06E36A13AC
	1/4"	Metal / Sight gauge	Twist	46	40 micron	06E14A11AC	06E14A13AC
	1/4"	Metal / Sight gauge	Auto float	46	40 micron	06E18A11AC	06E18A13AC
	3/8"	Metal / Sight gauge	Twist	55	40 micron	06E24A11AC	06E24A13AC
	3/8"	Metal / Sight gauge	Auto float	55	40 micron	06E28A11AC	06E28A13AC
	1/2"	Metal / Sight gauge	Twist	61	40 micron	06E34A11AC	06E34A13AC
	1/2"	Metal / Sight gauge	Auto float	61	40 micron	06E38A11AC	06E38A13AC



⚠ WARNING

Product rupture can cause serious injury.
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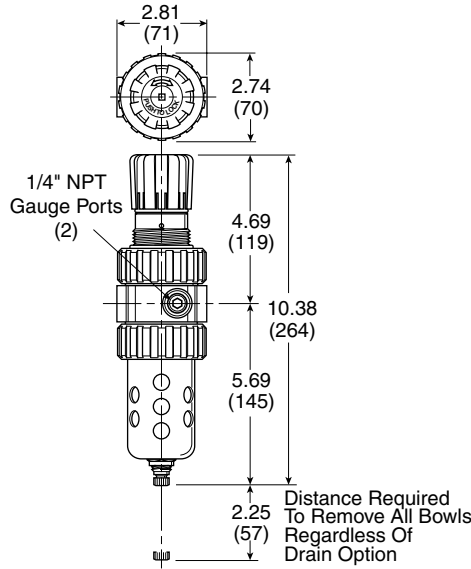
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Most popular.



06E



Service kits

Description	06E
Bonnet assembly kit	PS715P
Bowl guard kit	PS705P
Bowl kits	
Poly bowl –	Automatic float drain
	Twist drain
Metal bowl –	Automatic float drain
	Semi-auto drain
	Twist drain
	Sight gauge / Automatic drain
	Sight gauge / Twist drain
Control knob	P04069B
Drain kits –	Automatic float drain
	Twist drain
Filter element kits –	40 Micron
	5 Micron
	Adsorber
Gauges –	60 PSIG (0 to 4.1 bar)
50mm (2") round	160 PSIG (0 to 11.0 bar)
1/4" center back mount	300 PSIG (0 to 20.0 bar)
44mm (1-3/4") digital round	0-160 PSIG / 0-11 bar / 0-1.1 MPa
1/4" center back mount	
Mounting bracket kit (includes panel mount nut)	PS707P
Panel mount nut	P04082
Service kits –	Non-relieving (includes poppet)
	Relieving (includes poppet)
Seat insert kit	PS713P
Springs –	1- 30 PSIG range
	1- 60 PSIG range
	2- 125 PSIG range
	5- 250 PSIG range
Tamperproof kit (key lock)	PS737P

Most popular.



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators



Air Preparation Products

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Bulk Liquid Separators

07E Prep-Air II Filter / Regulators

- Space saving package offers both filter and regulator features for optimal performance
- Excellent water removal efficiency
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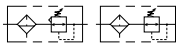
Material specifications

Adjusting stem		Steel	
Body		Zinc	
Bonnet, internal parts		Plastic	
Bowls	Transparent	Polycarbonate	
	Metal	Zinc	
Bowl guard		Steel	
Collar		Plastic or metal	
Diaphragm		Nitrile	
Drains	Manual twist drain standard	Body & nut	Plastic
		Float housing	Plastic
	Automatic float drain optional	Seals	Nitrile
		Springs, push rod	Stainless steel
Filter elements	40 Micron (standard)	Plastic	
	5 Micron (optional)	Plastic	
Knob		Plastic	
Seals		Nitrile	
Sight gauge		Polyamide	
Springs -	Poppet	Stainless	
	Control	Steel	

Operating information

Pressure rating -	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Automatic float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Temperature rating -	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Secondary pressure ranges -	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
High pressure	5 to 250 PSIG (0.4 to 17.2 bar)

07E Standard Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT)	
						Pressure range (Without gauge)	
						60 PSIG	125 PSIG
	1/2"	Poly / Metal guard	Twist	90	40 micron	07E32A11AC	07E32A13AC
	1/2"	Poly / Metal guard	Auto float	90	40 micron	07E36A11AC	07E36A13AC
	3/4"	Poly / Metal guard	Twist	90	40 micron	07E42A11AC	07E42A13AC
	3/4"	Poly / Metal guard	Auto float	90	40 micron	07E46A11AC	07E46A13AC
	1/2"	Metal / Sight gauge	Twist	90	40 micron	07E34A11AC	07E34A13AC
	1/2"	Metal / Sight gauge	Auto float	90	40 micron	07E38A11AC	07E38A13AC
	3/4"	Metal / Sight gauge	Twist	90	40 micron	07E44A11AC	07E44A13AC
	3/4"	Metal / Sight gauge	Auto float	90	40 micron	07E48A11AC	07E48A13AC

WARNING

Product rupture can cause serious injury.
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 Do not exceed maximum primary pressure rating.

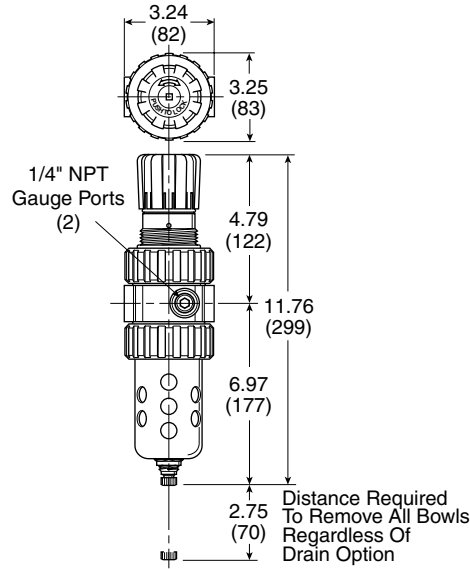
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Most popular.



07E



Service kits

Description	07E
Bonnet assembly kit	PS715P
Bowl guard kit	PS805P
Bowl kits – Poly bowl –	Automatic float drain PS822P Twist drain PS832P
Metal bowl –	Automatic float drain PS826P Semi-auto drain PS894P Twist drain PS834P Sight gauge / Automatic drain PS823P Sight gauge / Twist drain PS835P
Control knob	P04069B
Drain kits –	Automatic float drain PS506P Twist drain PS512P
Filter element kits –	40 Micron PS801P 5 Micron PS802P Adsorber PS831P
Gauges –	60 PSIG (0 to 4.1 bar) K4520N14060 50mm (2") round 1/4" center back mount 160 PSIG (0 to 11.0 bar) K4520N14160 300 PSIG (0 to 20.0 bar) K4520N14300 44mm (1-3/4") digital round 1/4" center back mount 0-160 PSIG / 0-11 bar / 0-1.1 MPa K4517N14160D
Mounting bracket kit (includes panel mount nut)	PS807P
Panel mount nut	P04082
Service kits –	Non-relieving (includes poppet) PS811P Relieving (includes poppet) PS810P
Seat insert kit	PS813P
Springs –	1- 30 PSIG range P01698 1- 60 PSIG range P04062 2- 125 PSIG range P04063 5- 250 PSIG range P04064
Tamperproof kit (key lock)	PS737P

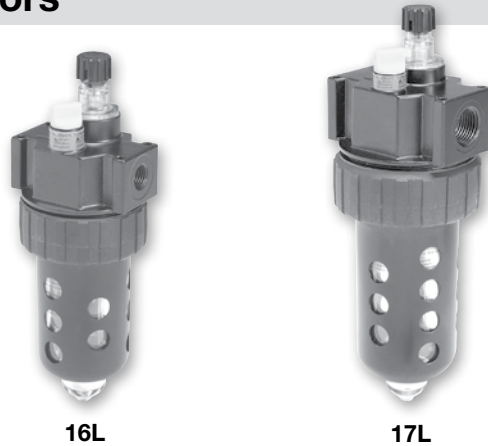
Most popular.





16L, 17L Prep-Air II Micro-Mist Lubricators

- Proportional oil delivery over a wide range of air flows
- Generates oil particles of 5 micron or smaller downstream to lubricate systems having complex piping arrangements
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Ideal for low and high flow applications with changing air flow
- Transparent sight dome for 360° visibility
- Yellow fill cap identifies Micro-Mist Lubricator
- 16L: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 17L: 1/2" & 3/4" ports (NPT & BSPP)



Material specifications

Body	Zinc
Bowls –	
Transparent	Polycarbonate
Metal	Zinc
Bowl guards	Steel
Collar	Plastic (16, 17) or metal (17)
Drains, twist / body & nut	Plastic
Injector meter block & base assembly	Plastic
Seals	Nitrile
Sight dome	Polycarbonate
Sight gauge	Polyamide (Nylon)

Operating information

Pressure rating –
 Polycarbonate bowl 0 to 150 PSIG (0 to 10.4 bar)
 Metal bowl 0 to 250 PSIG (0 to 17.2 bar)

Temperature rating –
 Polycarbonate bowl 32°F to 125°F (0°C to 52°C)
 Metal bowl 32°F to 175°F (0°C to 80°C)

Minimum flow for lubrication: 1 SCFM at 100 PSIG

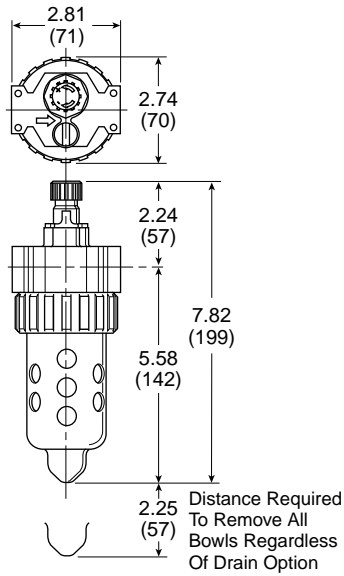
Suggested lubricant: F442 oil
 Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)
 (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

Compact & Standard Lubricators

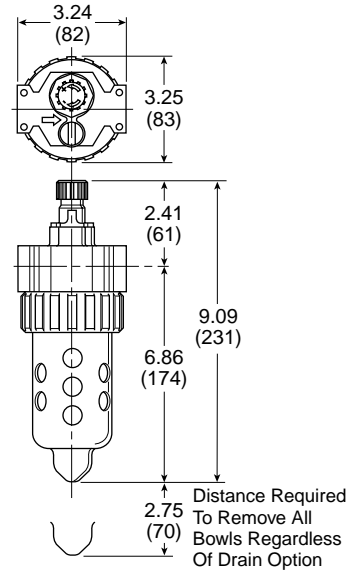


	Port size	Bowl type	Flow SCFM	Part number (NPT)	
				Twist drain	No drain
16L	1/4"	Poly / Metal guard	40		16L12BE
	1/4"	Metal / Sight gauge	40	16L14BE	
	3/8"	Poly / Metal guard	60		16L22BE
	3/8"	Metal / Sight gauge	60	16L24BE	
	1/2"	Poly / Metal guard	90		16L32BE
17L	1/2"	Metal / Sight gauge	90	16L34BE	
	1/2"	Poly / Metal guard	90		17L32BE
	1/2"	Metal / Sight gauge	90	17L34BE	
	3/4"	Poly / Metal guard	90		17L42BE
	3/4"	Metal / Sight gauge	90	17L44BE	

16L



17L



Service kits

Description			16L (Compact)	17L (Standard)
Adjustment knob			P04121	P04121
Bowl guard kit			PS705P	PS805P
Bowl Kits:	Poly bowl –	No drain	PS746P	PS846P
		Twist drain	PS717P	PS817P
		Pressure fill	PS719P	PS819P
		Remote fill	PS728P	PS828P
		Metal bowl –	Sight gauge / Twist drain	PS729P
		Sight gauge / Pressure fill	PS720P	PS820P
Drain kit		Twist drain	PS512P	PS512P
Fill cap kit			PS742P	PS742P
Lubricator service kit			PS748P	PS748P
Mounting bracket kit			PS743P	PS843P
Oil –	1 Gal		F442002	F442002
	12 Quart case		F442003	F442003
	4 Gal case		F442005	F442005
Pressure fill adapter kit			PS716P	PS716P
Pressure fill button			P11912	P11912
Remote auto-fill device			PS505CP	PS505CP
Sight dome / Fill cap kit			PS739P	PS739P
Sight dome kit			PS740P	PS740P
Nylon sight dome kit			PS740N	PS740N



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

06L, 07L Prep-Air II Mist Lubricators

- Proportional oil delivery over a wide range of air flows
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Bowl can be filled while air line is under pressure
- Transparent sight dome for 360° visibility
- 06L: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07L: 1/2" & 3/4" ports (NPT & BSPP)



06L



07L

Material specifications

Body	Zinc
Bowls –	
Transparent	Polycarbonate
Metal	Zinc
Bowl guards	Steel
Collar	Plastic (06, 07) or metal (07)
Drain	Plastic
Injector meter block & base assembly	Plastic
Seals	Nitrile
Sight dome	Polycarbonate
Sight gauge	Polyamide (Nylon)

Operating information

Pressure rating –
 Polycarbonate bowl 0 to 150 PSIG (0 to 10.4 bar)
 Metal bowl 0 to 250 PSIG (0 to 17.2 bar)



Temperature rating –
 Polycarbonate bowl 32°F to 125°F (0°C to 52°C)
 Metal bowl 32°F to 175°F (0°C to 80°C)

Minimum flow for lubrication: .5 SCFM at 100 PSIG

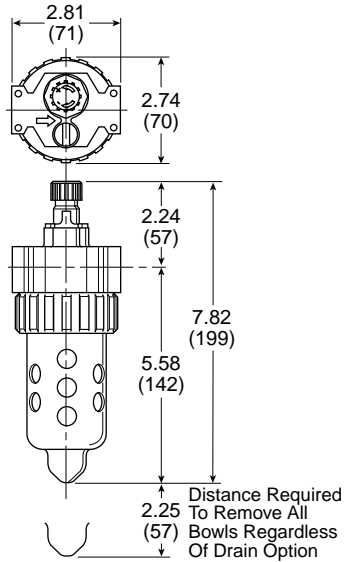
Suggested lubricant: F442 oil
 Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C)
 and an aniline point greater than 200°F (93°C)
 (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS
 CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR
 SYNTHETIC OILS.)

Compact & Standard Lubricators

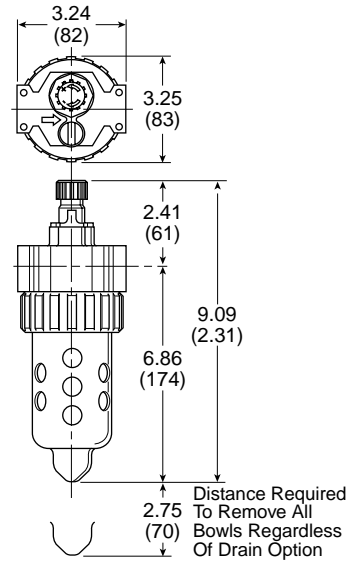


	Port size	Bowl type	Flow SCFM	Part number (NPT)	
				Twist drain	No drain
06L 	1/4"	Poly / Metal guard	40		06L12BE
	1/4"	Metal / Sight gauge	40	06L14BE	
	3/8"	Poly / Metal guard	60		06L22BE
	3/8"	Metal / Sight gauge	60	06L24BE	
	1/2"	Poly / Metal guard	90		06L32BE
07L 	1/2"	Metal / Sight gauge	90	06L34BE	
	1/2"	Poly / Metal guard	90		07L32BE
	3/4"	Poly / Metal guard	90		07L42BE
	3/4"	Metal / Sight gauge	90	07L44BE	

06L



07L



Service kits

Description	06L (Compact)	07L (Standard)
Adjustment knob	P04121	P04121
Bowl guard kit	PS705P	PS805P
Bowl Kits – Poly bowl –	No drain	PS746P
	Twist drain	PS717P
	Pressure fill	PS719P
	Remote fill	PS728P
Metal bowl –	Sight gauge / Twist drain	PS729P
	Sight gauge / Pressure fill	PS720P
Drain kit	Twist drain	PS512P
Fill cap kit	PS741P	PS741P
Lubricator service kit	PS718P	PS718P
Mounting bracket kit	PS743P	PS843P
Oil –	1 Gal	F442002
	12 Quart case	F442003
	4 Gal case	F442005
Pressure fill adapter kit	PS716P	PS716P
Pressure fill button	P11912	P11912
Remote auto-fill device	PS505CP	PS505CP
Sight dome / fill cap kit	PS738P	PS738P
Sight dome kit	PS740P	PS740P
Nylon sight dome kit	PS740N	PS740N



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

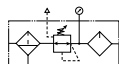
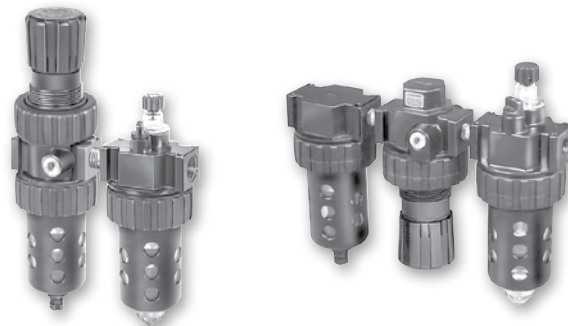
Bulk Liquid Separators




Compact & Standard Prep-Air II Combinations

Close Nippled Combinations – 06 Compact & 07 Standard Series

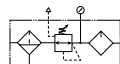
- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator




06G, 16G, 07G, 17G 2-Unit Close Nippled Combinations

	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06G Shown 	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None	06G	06G12A13A2BC	16G	16G12A13A2BC
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None		06G22A13A2BC		16G22A13A2BC
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None		06G32A13A2BC		16G32A13A2BC
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07G	07G32A13A2BD	17G	17G32A13A2BD
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07G42A13A2BD		17G42A13A2BD

06A, 16A, 07A, 17A 3-Unit Close Nippled Combinations



	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06A Shown 	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None	06A	06A12A13A2BC	16A	16A12A13A2BC
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None		06A22A13A2BC		16A22A13A2BC
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None		06A32A13A2BC		16A32A13A2BC
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07A	07A32A13A2BD	17A	17A32A13A2BD
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07A42A13A2BD		17A42A13A2BD

WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION: REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

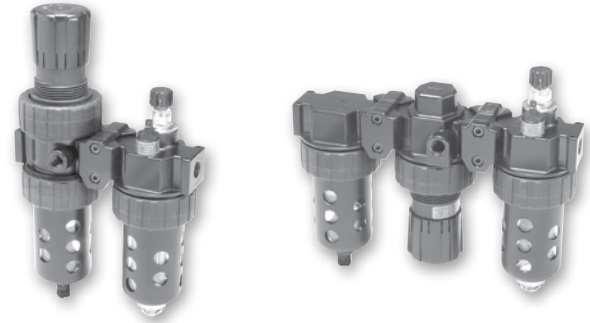
 Most popular.



Compact & Standard Prep-Air II Combinations

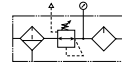
Modular Combinations – 06 Compact & 07 Standard Series

- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator




CAUTION:
REGULATOR PRESSURE ADJUSTMENT –

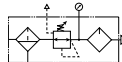
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.




06H, 16H, 07H, 17H 2-Unit Modular Combinations

	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06H Shown 	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		06H12A13A2BC		16H12A13A2BC
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None	06H	06H22A13A2BC	16H	16H22A13A2BC
	1/2" *	Poly / Metal guard	40 micron	Twist	Relieving	None		06H32A13A2BCG		16H32A13A2BCG
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07H	07H32A13A2BD	17H	17H32A13A2BD
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07H42A13A2BD		17H42A13A2BD

* 06 / 16 Available with port blocks only.



06B, 16B, 07B, 17B 3-Unit Modular Combinations

	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06B Shown 	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		06B12A13A2BC		16B12A13A2BC
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None	06B	06B22A13A2BC	16B	16B22A13A2BC
	1/2" *	Poly / Metal guard	40 micron	Twist	Relieving	None		06B32A13A2BCG		16B32A13A2BCG
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07B	07B32A13A2BD	17B	17B32A13A2BD
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07B42A13A2BD		17B42A13A2BD

* 06 / 16 available with port blocks only.

Modular service kits

Description	06 Series	07 Series	Description	Series	Size	NPT	BSPP	BSPT
Body connectors	PS754P	PS854P	Port block connector kits	06 Series –	1/4"	PS750P	PS765P†	PS761P
Lockout valves	PS756P	PS856P			3/8"	PS751P	PS766P†	PS762P
Modular manifold block	PS757P	PS857P			1/2"	PS752P*	PS767P**	PS799P*
Wall mounting kit	PS755P	PS755P	07 Series –	07 Series –	1/4"	PS850P	PS865P	PS861P
					3/8"	PS851P	PS866P	PS862P
					1/2"	PS852P	PS867P†	PS863P
					3/4"	PS853P	PS860P	PS864P

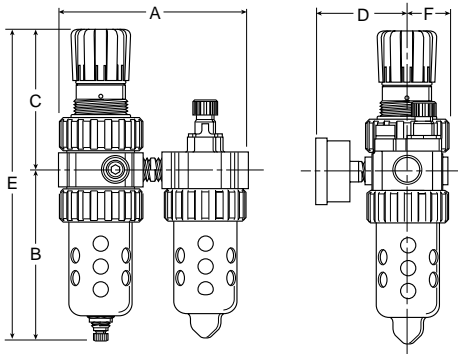
⚠ WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

Use 1/4 or 3/8 ported bodies. † 1/4, 3/8 & 1/2 inch meet ISO 1179-1 Standard. ‡ 1/2 inch meets ISO 1179-1 Standard.

Most popular.



Combination Dimensions – 06 Compact & 07 Standard Series



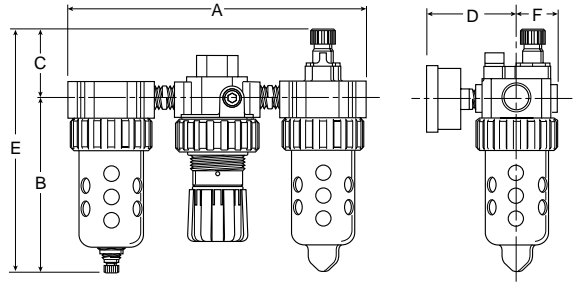
06G, 16G Series

A	B	C	D	E	F
6.13 (156)	5.69 (145)	4.69 (119)	3.18 (81)	10.38 (264)	1.37 (35)

07G, 17G Series

A	B	C	D	E	F
6.99 (178)	6.97 (177)	4.79 (122)	3.44 (87)	11.76 (299)	1.63 (41)

Inches (mm)
 • All dimensions nominal.



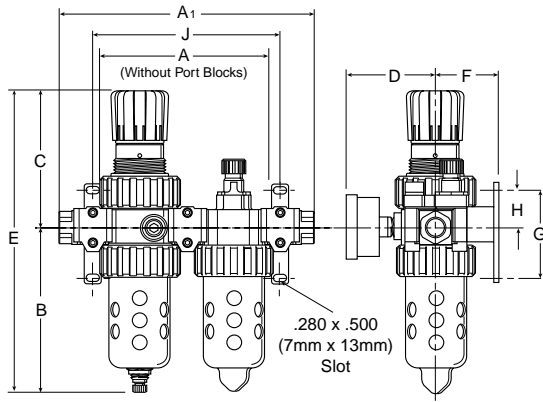
06A, 16A Series

A	B	C	D	E	F
9.45 (240)	5.69 (145)	2.24 (57)	3.18 (81)	7.93 (201)	1.37 (35)

07A, 17A Series

A	B	C	D	E	F
10.74 (2738)	6.97 (177)	2.41 (61)	3.44 (87)	9.38 (238)	1.63 (41)

Inches (mm)
 • All dimensions nominal.



06H, 16H Series

A	A1	B	C	D	E
6.10 (155)	9.04 (230)	5.69 (145)	4.69 (119)	3.18 (81)	10.38 (264)

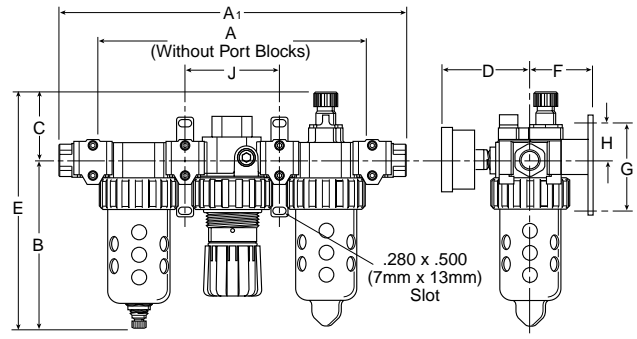
F	G	H	J
2.00 (51)	3.58 (91)	1.40 (36)	6.65 (169)

07H, 17H Series

A	A1	B	C	D	E
7.00 (178)	10.28 (261)	6.97 (177)	4.79 (122)	3.44 (87)	11.76 (299)

F	G	H	J
2.09 (53)	3.58 (91)	1.40 (36)	7.51 (191)

Inches (mm)
 • All dimensions nominal.



06B, 16B Series

A	A1	B	C	D	E
9.46 (240)	12.39 (315)	5.69 (145)	2.24 (57)	3.18 (81)	7.93 (202)

F	G	H	J
2.00 (51)	3.58 (91)	1.40 (36)	3.33 (85)

07B, 17B Series

A	A1	B	C	D	E
10.75 (273)	14.03 (356)	6.97 (177)	2.41 (61)	3.44 (87)	9.38 (238)

F	G	H	J
2.18 (55)	3.58 (91)	1.40 (36)	3.76 (95)

Inches (mm)
 • All dimensions nominal.



14F Miniature Particulate Filters

- Excellent water removal efficiency
- 5 micron element standard on 14F
- Integral 1/8", 1/4" ports (NPT, BSPP & BSPT)

Material specifications

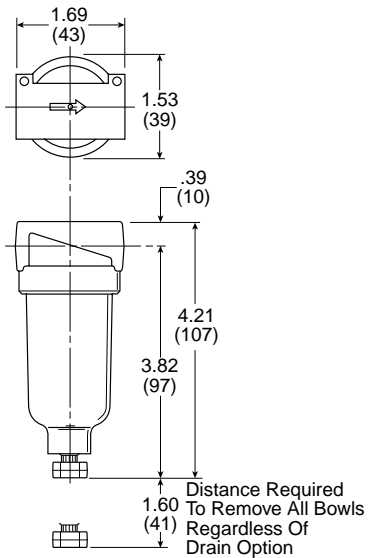
Description		14F (Mini)
Body		Zinc
Bowl		Polycarbonate
Deflector, element holder, baffle		Plastic
Drains – Twist	Body & stem	Plastic
	Seals	Nitrile
Drains – Auto pulse	Piston & seals	Nitrile
	Stem, seat, adapter & washers	Aluminum
Filter element –	5 micron (Standard)	Plastic
	40 micron (Optional)	Plastic
	Adsorber (Optional)	Activated charcoal
Seals		Nitrile



Operating information

		14F
Operating pressure:	Poly bowl	0 to 150 PSIG (0 to 10.3 bar)
	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
	Auto pulse drain	10 to 250 PSIG (0.7 to 17.2 bar)
Operating temperature:	Poly bowl	32°F to 125°F (0°C to 52°C)
	Metal bowl	32°F to 175°F (0°C to 80°C)
	Auto pulse drain	125°F (52°C) or less

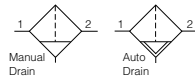
14F




Service kits

Description			14F (Mini)
Bowl Kits	Poly bowl –	Auto pulse drain	PS408BP
		Twist drain	PS404P
	Metal bowl –	Auto drain	PS451BP
		Twist drain	PS447BP
Filter element kit –	40 micron	PS401P	
	5 micron	PS403P	
	Adsorber	PS452P	
Mounting bracket kit			PS417BP

14F Particulate Filters



	Port size	Bowl type	Sight gauge	Flow SCFM	Element type	Part number (NPT)	
						Twist drain	Automatic pulse drain
14F 	1/8"	Poly	No	22	5 micron	14F01BB	14F05BB
	1/8"	Metal	No	22	5 micron	14F03BB	14F07BB
	1/4"	Poly	No	24	5 micron	14F11BB	14F15BB
	1/4"	Metal	No	24	5 micron	14F13BB	14F17BB

 Most popular.



10F Miniature Coalescing Filters

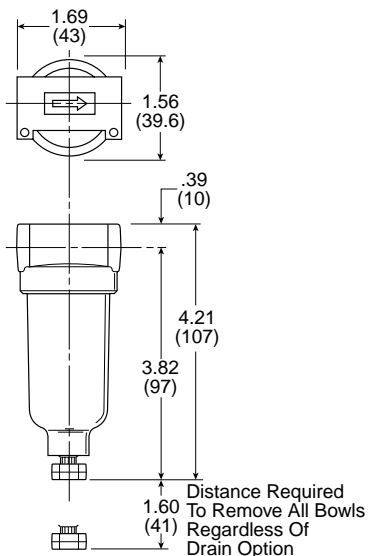
- Removes liquid aerosols and sub-micron particles
- 0.01 micron element standard
- Integral 1/8", 1/4" ports (NPT, BSPP & BSPT)

Material specifications

Description		10F (Mini)
Body		Zinc
Bowl		Polycarbonate
Drains – Twist	Body & stem	Plastic
	Seals	Nitrile
Drains – Auto Pulse	Piston & seals	Nitrile
	Stem, seat, adapter & washers	Aluminum
Element holder		Plastic
Filter element	1.0 micron	Borosilicate & felt glass fibers
	0.01 micron	
Seals		Nitrile



10F



Coalescing Filters

	Port size	Bowl type	Sight gauge	Flow SCFM	Element type	Part number (NPT)	
						Twist drain	Automatic pulse drain
10F	1/8"	Poly	No	17	0.01 micron	10F01ED	10F05ED
	1/8"	Poly	No	19	1.0 micron	10F01HD	10F05HD
	1/8"	Metal	No	17	0.01 micron	10F03ED	10F07ED
	1/8"	Metal	No	19	1.0 micron	10F03HD	10F07HD
	1/4"	Poly	No	20	0.01 micron	10F11ED	10F15ED
	1/4"	Poly	No	24	1.0 micron	10F11HD	10F15HD
	1/4"	Metal	No	20	0.01 micron	10F13ED	10F17ED
	1/4"	Metal	No	24	1.0 micron	10F13HD	10F17HD



Operating information

		10F
Operating pressure:	Poly bowl	0 to 150 PSIG (0 to 10.3 bar)
	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Operating temperature:	Auto pulse drain	10 to 250 PSIG (0.7 to 17.2 bar)
	Poly bowl	32°F to 125°F (0°C to 52°C)
	Metal bowl	32°F to 175°F (0°C to 80°C)
	Auto pulse drain	125°F (52°C) or less

Service kits

Description	10F (Mini)
Bowl Kits	Poly bowl – Auto pulse drain PS408BP
	Twist drain PS404P
	Metal bowl – Auto drain PS451BP
	Twist drain PS447BP
Filter element kit –	Grade 6 (standard) PS446P
	Grade 10 (optional) PS456P
Mounting bracket kit	PS417BP

Most popular.



14R, 15R Miniature Regulators

- Unbalanced poppet standard
- Solid control piston with lip seal for extended life
- Non-rising adjusting knob
- Compact, 2.88 inch (73.2mm) high by 1.65 inch (42mm) wide
- Easily serviced
- 14R: 1/8" & 1/4" ports (NPT, BSPP & BSPT)
- 15R: 1/4" & 3/8" ports (NPT, BSPP & BSPT)



14R



15R

Material specifications



Adjusting nut	Brass
Adjusting stem & spring	Steel
Body	Zinc
Bonnet, seat, piston & valve poppet	Plastic
Seals	Nitrile

Operating information

	14R (Mini), 15R (Economy)
Pressure rating:	0 to 300 PSIG (0 to 20.4 bar)
Temperature rating:	32°F to 125°F (0°C to 52°C)
Low temperature:	-4°F to 125°F (-20°C to 52°C)
Secondary pressure ranges –	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
Medium pressure	1 to 30 PSIG (0 to 2.1 bar)
Low pressure	1 to 15 PSIG (0 to 1 bar)



Regulators

	Port size	Pressure range	Flow SCFM	Part number (NPT)	
				Without gauge	With gauge
 14R	1/8"	30 PSIG	13	14R010FC	14R015FC
	1/8"	60 PSIG	13	14R011FC	14R016FC
	1/8"	125 PSIG	13	14R013FC	14R018FC
	1/4"	30 PSIG	15	14R110FC	14R115FC
	1/4"	60 PSIG	15	14R111FC	14R116FC
	1/4"	125 PSIG	15	14R113FC	14R118FC
 15R	1/4"	30 PSIG	21	15R110FB	15R115FB
	1/4"	60 PSIG	21	15R111FB	15R116FB
	1/4"	125 PSIG	21	15R113FB	15R118FB
	3/8"	30 PSIG	28	15R210FB	15R216FB
	3/8"	60 PSIG	28	15R211FB	15R215FB
	3/8"	125 PSIG	28	15R213FB	15R218FB

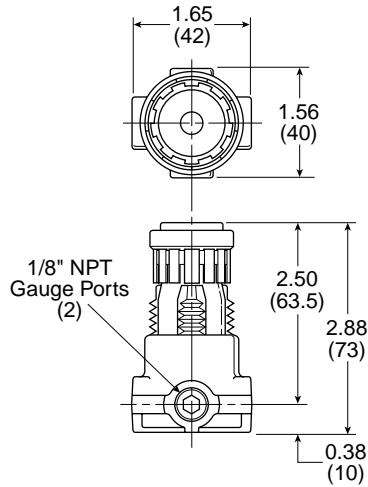
WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

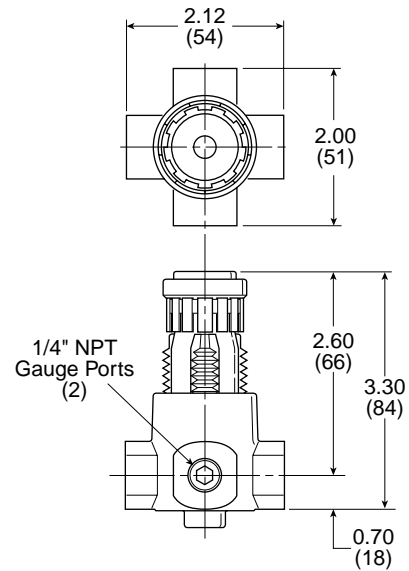
 Most popular.



14R (Mini)



15R (Economy)



Service kits

Description	14R (Mini)	15R (Economy)
Body service kit – unbalanced		PS424BP
Bonnet assembly kit	L01369	L01369
Bonnet tamperproof kit	P01265	
Gauges –		
40mm (1-1/2") round	30 PSIG, 1/8" NPT (0 to 2.1 bar)	K4515N18030
1/8" center back mount	60 PSIG, 1/8" NPT (0 to 4.1 bar)	K4515N18060
	160 PSIG, 1/8" NPT (0 to 11.0 bar)	K4515N18160
50mm (2") round	60 PSIG, 1/4" NPT (0 to 4.1 bar)	K4520N14060
1/4" center back mount	160 PSIG, 1/4" NPT (0 to 11.0 bar)	K4520N14160
Mounting bracket kit (includes panel mount nut)	PS417BP	PS417BP
Panel mount nuts –		
Plastic	P78652	P78652
Metal	P01531	P01531
Poppet / piston kits –		
Unbalanced, non-relieving	PS428P	PS428P
Unbalanced, relieving	PS426P	PS426P
Seal kit		PS454B
Springs –		
1-15 PSIG range (Yellow)	P01176	P01176
1-30 PSIG range (Black)	P01175	P01175
1-60 PSIG range (White)	P01174	P01174
2-125 PSIG range (Gold)	P01173	P01173

R34 Miniature Regulators

- Diaphragm operated for fast operation
- Large Diaphragm to valve area ratio for precise regulation and high flow capacity
- Balanced valve design for precise regulation
- Available in 2 or 4 port design
- Available with a manifold mount to minimize plumbing
- Suitable for low temperature applications
- Non-rising adjusting knob
- 1/8" & 1/4" ports (NPT & BSPP)



R342 / R344



R342-0MC

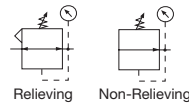
Material specifications

Description	R34 (Mini)
Body	Aluminum
Bonnet	Acetal
Diaphragm & seals	Nitrile
Springs	Steel
Panel nut	Acetal
Valve assembly	Brass

Operating information

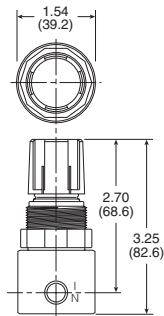
	R34 (Mini)
Supply pressure:	300 PSIG (20.4 bar) max
Temperature rating:	-40°F to 150°F (-40°C to 65.5°C)

R34 Regulator, relieving

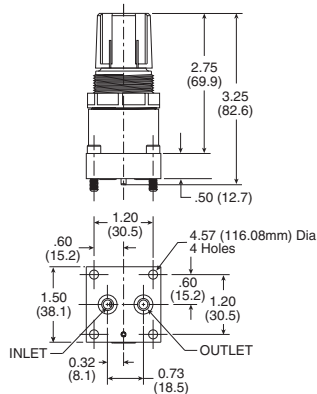


Port size	Pressure range	Flow SCFM	Part number	
			Without gauge	With gauge
1/8"	0 to 30 PSIG (0 to 2.1 bar)	17	R344-01A	R344-01AG
1/8"	0 to 60 PSIG (0 to 4.1 bar)	17	R344-01B	R344-01BG
1/8"	0 to 125 PSIG (0 to 8.6 bar)	17	R344-01C	R344-01CG
1/4"	0 to 30 PSIG (0 to 2.1 bar)	19	R344-02A	R344-02AG
1/4"	0 to 60 PSIG (0 to 4.1 bar)	19	R344-02B	R344-02BG
1/4"	0 to 125 PSIG (0 to 8.6 bar)	19	R344-02C	R344-02CG
Manifold Mount			R342-0MA	
Manifold Mount			R342-0MB	
Manifold Mount			R342-0MC	

R342 / R344



R342-0MC



Service kits

Diagram assembly	Non-relieving	GRP-96-726
	Relieving	GRP-96-725
Gauges -	60 PSIG, 1/8" NPT (0 to 4.1 bar)	K4515N18060
	160 PSIG, 1/8" NPT (0 to 11.0 bar)	K4515N18160
Mounting bracket kit (includes panel mount nut)		SA161X57
Panel mount nuts	Plastic	R05X51-P
	Aluminum	R05X51-A
Springs -	0 to 30 PSIG (0 to 2.1 bar)	GRP-95-111
	0 to 60 PSIG (0 to 4.1 bar)	GRP-96-718
	0 to 125 PSIG (0 to 8.6 bar)	GRP-96-717
Tamperproof knob kit		P31KB00AT

WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

Most popular.

CAUTION: REGULATOR PRESSURE ADJUSTMENT -
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

20R, R24 / R25, R45 / R46 Miniature Regulators

- 20R: Rugged brass body for water service
- R24 / R25, R45 / R46: Constructed with a combination of N.S.F. and F.D.A. approved materials
- Unbalanced poppet standard
- Non-rising, push-to-lock adjusting knob
- Diaphragm operated
- 20R: 1/8" & 1/4" ports (NPT & BSPP)
- R24 / R25: 1/8" & 1/4" ports (NPT & BSPP)
- R45 / R46: 1/4" & 3/8" ports (NPT & BSPP)



Material specifications




	20R	R25 / R45	R24 / R46
Adjusting screw	Steel	Steel	Steel
Body		Acetal	Acetal
Body, bottom plug, diaphragm button	Brass		
Bonnet & seat	Plastic	Acetal	Acetal
Diaphragm		Buna N	EPDM
Seals	Buna N	Buna N	EPDM
Springs	Steel	Stainless	Stainless
Valve poppet	Brass	Buna N	EPDM

Operating information

	20R
Pressure rating:	0 to 300 PSIG (0 to 20.4 bar)
Secondary pressure ranges –	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
Medium pressure	1 to 25 PSIG (0 to 2.1 bar)
Temperature rating:	32°F to 125°F (0°C to 52°C)
	R24 / R25, R45 / R46
Pressure rating:	0 to 150 PSIG (0 to 10 bar)
Temperature rating:	40°F to 125°F (4°C to 52°C)

Regulators



	Port size	Pressure range	Flow	Part number (NPT)	
				Air service, relieving	Water service, non-relieving
 R24 / R25	1/8"	25 PSIG		R25-01A	R24-01AK
	1/8"	60 PSIG		R25-01B	R24-01BK
	1/8"	125 PSIG		R25-01C	R24-01CK
	1/4"	25 PSIG		R25-02A	R24-02AK
	1/4"	60 PSIG		R25-02B	R24-02BK
	1/4"	125 PSIG		R25-02C	R24-02CK
 R45 / R46	1/4"	25 PSIG	R45: 35 SCFM; R46: 3 GPM	R45-02A	R46-02AK
	1/4"	60 PSIG	R45: 35 SCFM; R46: 3 GPM	R45-02B	R46-02BK
	1/4"	125 PSIG	R45: 35 SCFM; R46: 3 GPM	R45-02C	R46-02CK
	3/8"	25 PSIG	R45: 35 SCFM; R46: 3 GPM	R45-03A	R46-03AK
	3/8"	60 PSIG	R45: 35 SCFM; R46: 3 GPM	R45-03B	R46-03BK
	3/8"	125 PSIG	R45: 35 SCFM; R46: 3 GPM	R45-03C	R46-03CK
 20R				Water service, relieving	Water service, non-relieving
	1/8"	25 PSIG	1.25 GPM	20R011FC	20R011GC
	1/8"	60 PSIG	1.25 GPM	20R061FC	20R061GC
	1/8"	125 PSIG	1.25 GPM	20R013FC	20R013GC
	1/4"	25 PSIG	1.25 GPM	20R111FC	20R111GC
	1/4"	60 PSIG	1.25 GPM	20R161FC	20R161GC
	1/4"	125 PSIG	1.25 GPM	20R113FC	20R113GC

NOTE: 1.25 Dia. (32mm) hole required for panel mounting.



WARNING

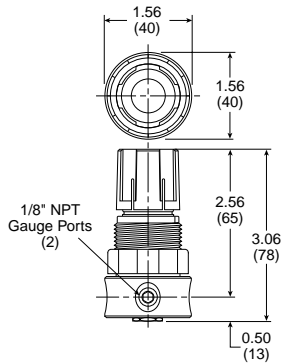
Product rupture can cause serious injury.
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 Do not exceed maximum primary pressure rating.

 Most popular.

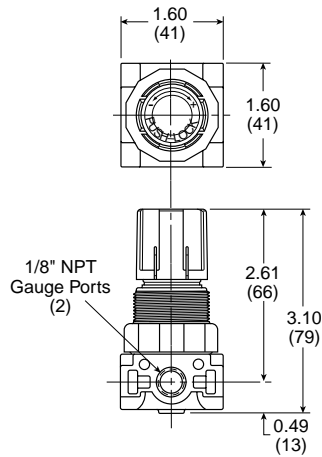
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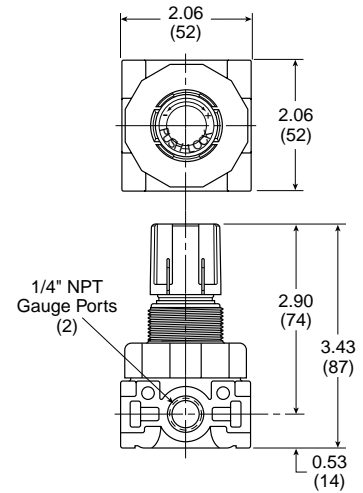
20R



R24/R25



R45/R46



Service kits

Description	20R	R24	R25	R45	R46
Bonnet kit	PCKR364Y				
Bonnet tamperproof kit	PCKR364T				
Mounting bracket kit (includes panel mount nut)	SA161X57	SA161X57	SA161X57	SA161X57	SA161X57
Panel mount nuts – Plastic	R05X51-P	R05X51-P	R05X51-P	R05X51-P	R05X51-P
Aluminum	R05X51-A	R05X51-A	R05X51-A	R05X51-A	R05X51-A
Repair kits – Non-relieving	PRKR163Y	RKR24KY	RKR25KY	RKR45KY	RKR45KY
Relieving	PRKR164Y	RKR24Y	RKR25Y	RKR45Y	RKR45Y
Springs – 0 to 25 PSIG (0 to 1.7 bar)		SPR-375-1	SPR-375-1	SPR-46	SPR-46
0 to 60 PSIG (0 to 4.1 bar)		SPR-376	SPR-376	SPR-47	SPR-47
0 to 125 PSIG (0 to 8.6 bar)		SPR-377	SPR-377	SPR-48	SPR-48

Most popular.



14E, B34 Miniature Filter / Regulators

14E

- Excellent water removal efficiency
- Unbalanced poppet standard
- Solid control piston for extended life
- Space saving package offers both filter and regulator features in one integral unit
- Non-rising adjustment knob
- Two full flow 1/8" gauge ports

B34

- Excellent water removal efficiency diaphragm operated for fast operation
- Large diaphragm to valve area for precise regulation and high flow capacity
- Balanced valve design for precise regulation
- Space saving package offers both filter and regulator features in one integral unit
- Non-rising adjustment knob



14E





B34

Operating information

	14E	B34
Pressure rating – Polycarbonate bowl Metal bowl	0 to 150 PSIG (0 to 10.3 bar) 0 to 250 PSIG (0 to 17.2 bar)	0 to 150 PSIG (0 to 10.3 bar) 0 to 300 PSIG (0 to 17.2 bar)
Secondary pressure ranges:	Standard pressure 2 to 125 PSIG (0 to 8.6 bar) Medium pressure 1 to 30 PSIG (0 to 2.1 bar) Medium pressure 1 to 60 PSIG (0 to 4.1 bar) Low pressure 1 to 15 PSIG (0 to 1 bar)	Reduced pressure ranges 0 to 25 PSIG (0 to 1.7 bar) 1 to 60 PSIG (0 to 4.1 bar) 2 to 125 PSIG (0.15 to 8.5 bar)
Temperature rating – Polycarbonate bowl Metal bowl	32°F to 125°F (0°C to 52°C) 32°F to 175°F (0°C to 80°C)	40°F to 125°F (4.4°C to 52°C) 40°F to 125°F (4.4°C to 52°C)

Miniature Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT)		
						Pressure range		
						30 PSIG	60 PSIG	125 PSIG
	1/8"	Poly	Twist	16	5 micron	14E01B10FC	14E01B11FC	14E01B13FC
	1/8"	Poly	Auto pulse	16	5 micron	14E05B10FC	14E05B11FC	14E05B13FC
	1/8"	Metal	Twist	16	5 micron	14E03B10FC	14E03B11FC	14E03B13FC
	1/8"	Metal	Auto pulse	16	5 micron	14E07B10FC	14E07B11FC	14E07B13FC
	1/4"	Poly	Twist	18	5 micron	14E11B10FC	14E11B11FC	14E11B13FC
	1/4"	Poly	Auto pulse	18	5 micron	14E15B10FC	14E15B11FC	14E15B13FC
	1/4"	Metal	Twist	18	5 micron	14E13B10FC	14E13B11FC	14E13B13FC
	1/4"	Metal	Auto pulse	18	5 micron	14E17B10FC	14E17B11FC	14E17B13FC
	1/8"	Poly	Twist	17	5 micron			B344-01AGC
	1/8"	Metal	Twist	17	5 micron			B344-01DGC
	1/4"	Poly	Twist	19	5 micron			B344-02AGC
	1/4"	Metal	Twist	19	5 micron			B344-02DGC

WARNING

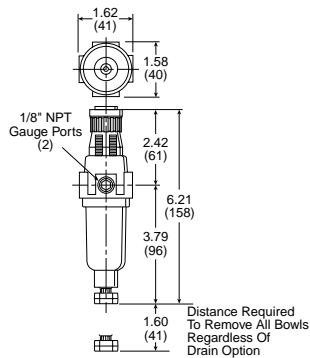
Product rupture can cause serious injury.
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 Do not exceed maximum primary pressure rating.

CAUTION: REGULATOR PRESSURE ADJUSTMENT –

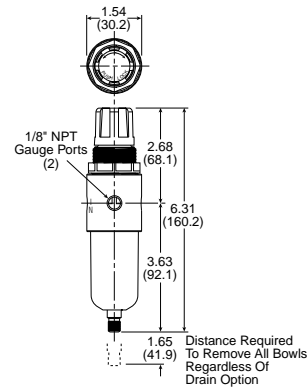
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 Most popular.

14E



B34



Material specifications

Description	14E (Mini)	B34
Adjusting nut	Brass	
Adjusting stem & spring	Steel	
Body	Zinc	Aluminum
Bonnet, knob, seat, piston, holder & deflector	Plastic	
Bowls	Transparent Metal	Polycarbonate Zinc
Drains	Manual – twist Automatic – pulse	Body & stem Seals Nitrile Piston & seals Nitrile Stem, seat, adapter & washers Aluminum
Elastomers		Buna N
Filter elements	5 Micron (standard) 40 Micron (optional) Adsorber (optional)	Plastic Plastic Activated charcoal
Filter retainer, vane plate		Acetal
Innervalve, diaphragm, button, drain		Brass
Seals		Nitrile

Service kits

Adjusting knob		RRP-16-005-000	
Bonnet tamperproof kit		P01265	
Bowl kits	Poly bowl – Automatic pulse drain	PS408BP	BK504SY
	Twist drain	PS404P	BK504Y
Metal bowl –	Automatic drain	PS451BP	BK505SY
	Twist drain	PS447BP	BK505Y
Drain kits	Automatic pulse drain		RK504SY
Filter element kits –	5 Micron	PS403P	FRP-96-729
	40 Micron	PS401P	
	Adsorber	PS452P	
Gauges –	30 PSIG (0 to 2.1 bar)	K4515N18030	
	60 PSIG (0 to 4.1 bar)	K4515N18060	K4515N18060
	160 PSIG (0 to 11.0 bar)	K4515N18160	K4515N18160
Mounting bracket kit* (includes panel mount nut)		PS417BP	SA161X57
Panel mount nuts –	Plastic	P78652	R05X51-P
	Aluminum		R05X51-A
Poppet / piston kits –	Unbalanced, non-relieving	PS428P	
	Unbalanced, relieving	PS426P	
Repair kits –	Non-relieving, diaphragm, valve assembly		GRP-96-726
	Relieving, diaphragm, valve assembly		GRP-96-725
Springs –	15 PSIG	P01176 (yellow)	GRP-95-111
	30 PSIG	P01175 (black)	
	60 PSIG	P01174 (white)	GRP-96-718 (black)
	125 PSIG	P01173 (gold)	GRP-96-717

Most popular.





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

04L Miniature Mist Lubricators

- Proportional oil delivery over a wide range of air flows
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Ideal for low and high flow applications with changing air flow
- Transparent sight dome for 360° visibility



Material specifications

Body		Zinc
Bowls	Transparent	Polycarbonate
	Metal	Zinc
Drains		Plastic
Seals		Nitrile
Sight Dome		Polycarbonate

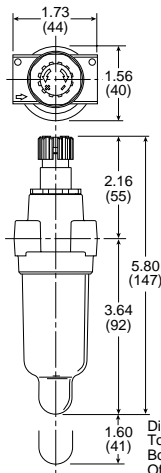
Operating information

Pressure ratings –	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.3 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating –	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Minimum flow for lubrication:	0.5 SCFM at 100 PSIG

04L Miniature Lubricators



Port size	Bowl type	Drain type	Flow SCFM	Part number (NPT)
1/8"	Poly	None	20	04L00GB
1/8"	Metal without sight gauge	Twist	20	04L03GB
1/4"	Poly	None	20	04L10GB
1/4"	Metal without sight gauge	Twist	20	04L13GB



Service kits

			04L (Mini)
Bowl kits	Poly bowl	No drain	PS421P
		Twist drain	PS420P
	Metal bowl	Twist drain	PS447BP
Mounting bracket kit			PS419
Oil	1 Quart		F442001
	12 Quart case		F442003
	4 Gallon case		F442005

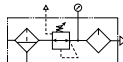
Miniature Close Nipped Combinations



Close Nipped Combinations – 14 Miniature Series

- Regulator can be mounted with knob in up or down position
- 5 micron filter element standard, 40 micron optional
- Manual twist drain
- Relieving regulator

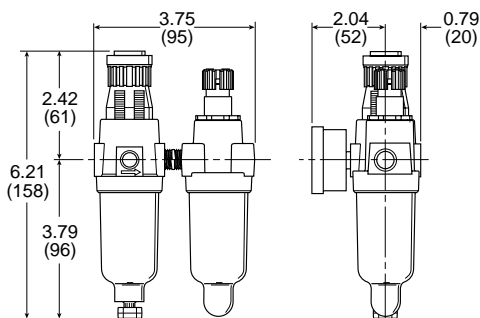


Close Nipped Combinations

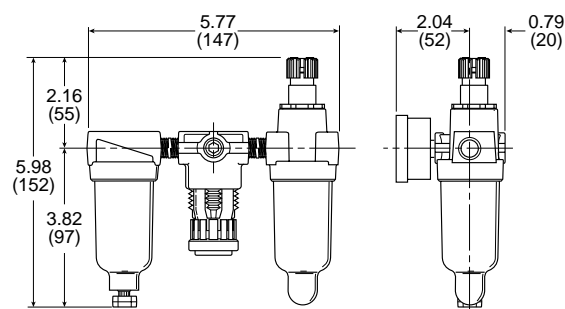


	Port size	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Part number (NPT)
14G 	1/8"	Poly	5 micron	Twist	Relieving	None	14G01B13F0GD
	1/4"	Poly	5 micron	Twist	Relieving	None	14G11B13F0GD
14A 	1/8"	Poly	5 micron	Twist	Relieving	None	14A01B13F0GF
	1/4"	Poly	5 micron	Twist	Relieving	None	14A11B13F0GF

14G (Close nipped 2-unit)



14A (Close nipped 3-unit)



Service kits

Mounting bracket kits –	14E, 14F, 14R	PS417BP
	04L	PS419

WARNING
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 Most popular.





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

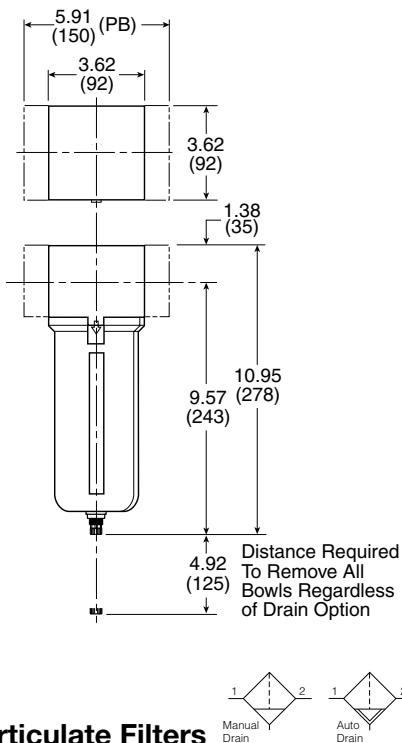
P3NF Hi-Flow Particulate Filters

- Excellent water removal efficiency
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- 40 micron element standard
- Metal bowl with sight gauge standard
- 3/4", 1", & 1-1/2" ports (NPT & BSPP)


Material specifications

Description	P3NF (Hi-Flow)	
Body	Aluminum	
Bowl	Aluminum	
Deflector	Plastic	
Drain	Plastic	
Filter element –	40 micron	Plastic
Seals	Nitrile	
Sight gauge	Polyamide (Nylon)	

P3NF (Hi-Flow)



P3NF Particulate Filters

	Port size	Bowl type	Sight gauge	Flow SCFM	Element type	Part number (NPT)	
						Twist drain	Automatic float drain
P3NF 	3/4"	Metal	Yes	270	40 micron	P3NFA96GSM	P3NFA96GSA
	1"	Metal	Yes	300	40 micron	P3NFA98GSM	P3NFA98GSA
	1-1/2" #	Metal	Yes	310	40 micron	P3NFA9PGSM	P3NFA9PGSA

1" port body with 1-1/2" port block

Note: BSPP ported units supplied using NPT ported bodies and BSPP port block kits.

Most popular.



Operating information

		P3NF (Hi-Flow)
Operating pressure:	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
	Auto float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Operating temperature:	Metal bowl	32°F to 175°F (0°C to 80°C)

Service kits

Description	P3NF (Hi-Flow)	
Bowl Kits –	Sight gauge / auto float	P3NKA00BSA
	Sight gauge / twist drain	P3NKA00BSM
Bowl latch kit	C11A33	
DPI replacement kit	PS781P	
Drain kit –	Auto drain	PS506P
	Twist drain	PS512P
Filter element kit –	40 micron	P3NKA00ESG
	5 micron	P3NKA00ESE
	Adsorber	P3NKA00ESA
Mounting bracket kit	P3NKA00MW	
Sight gauge kit	P3NKA00PE	



P3NF Hi-Flow Coalescing Filters

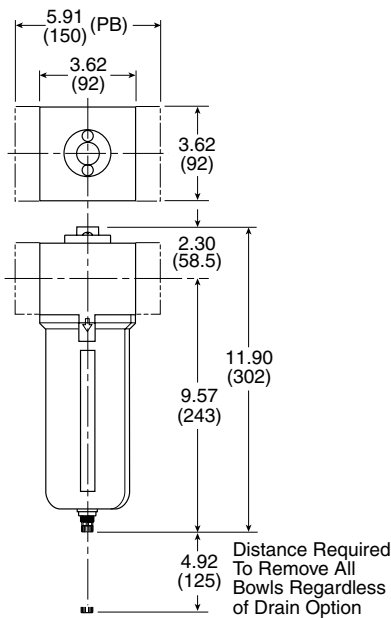
- Removes liquid aerosols and sub-micron particles
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- 0.01 micron element standard
- Metal bowl with sight gauge standard
- 3/4", 1", & 1-1/2" ports (NPT & BSPP)

Material specifications

Description	P3NF (Hi-Flow)
Body	Aluminum
Bowl	Aluminum
Deflector	Plastic
Drain	Plastic
Filter elements – 1.0 micron	Borosilicate & felt glass fibers
Seals	Nitrile
Sight gauge	Polyamide (Nylon)



P3NF (Hi-Flow)



Coalescing Filters

	Port size	Bowl type	Sight gauge	Flow SCFM	Element type	Part number (NPT)	
						Twist drain	Automatic float drain
P3NF	3/4"	Metal	Yes	130	0.01 micron	P3NFA96DSM	P3NFA96DSA
	1"	Metal	Yes	140	0.01 micron	P3NFA98DSM	P3NFA98DSA
	1-1/2" #	Metal	Yes	225	0.01 micron	P3NFA9PDSM	P3NFA9PDSA



1" port body with 1-1/2" port block

Operating information

		P3NF (Hi-Flow)
Operating pressure:	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
	Auto float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Operating temperature:	Metal bowl	32°F to 175°F (0°C to 80°C)

Service kits

Description	P3NF (Hi-Flow)	
Bowl Kits –	Sight gauge / auto float	P3NKA00BSA
	Sight gauge / twist drain	P3NKA00BSM
Bowl latch kit	C11A33	
DPI replacement kit	PS781P	
Drain kit –	Auto drain	PS506P
	Twist drain	PS512P
Filter element kit –	Grade 6 (standard)	P3NKA00ESCB
	Grade 10 (optional)	P3NKA00ES9
Mounting bracket kit	P3NKA00MW	
Sight gauge kit	P3NKA00PE	

Note: BSPP ported units supplied using NPT ported bodies and BSPP port block kits.

Most popular.



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P3NR Hi-Flow Regulators

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life
- 3/4", 1", & 1-1/2" ports (NPT & BSPP)



P3NR Hi-Flow Regulators



	Port size	Gauge	Flow (SCFM)	Part number (NPT), Relieving
	3/4"	No	200	P3NRA96BNN
	1"	No	300	P3NRA98BNN
	1-1/2"	No	300	P3NRA9PBNN
	3/4"	125 PSI	200	P3NRA96BNG
	1"	125 PSI	300	P3NRA98BNG
	1-1/2"	125 PSI	300	P3NRA9PBNG

Note: BSPP ported units supplied using NPT ported bodies and BSPP port block kits.

Material specifications

	P3NR
Adjusting screw	Steel
Body	Aluminum
Bonnet	Aluminum
Knob	Plastic
Piston	Plastic
Poppet assembly	Brass
Seals	Nitrile
Springs – poppet & control	Steel

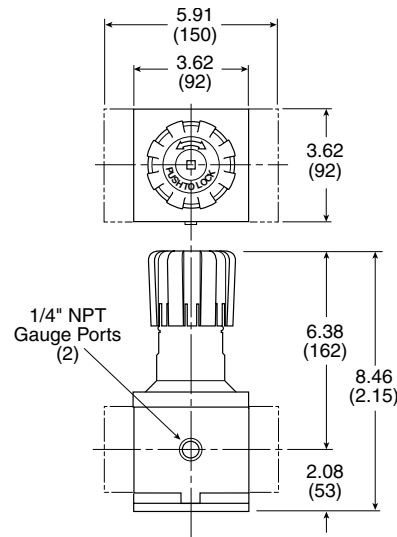
Service kits

Body service kit	
Control knob	P3NKA00PN
Gauges –	
50mm (2") round	60 PSIG (0 to 4.1 bar)
1/4" center back mount	160 PSIG (0 to 11.0 bar)
	300 PSIG (0 to 20.0 bar)
44mm (1-3/4") digital round	0-160 PSIG / 0-11 bar / 0-1.1 MPa
1/4" center back mount	K4517N14160D
Mounting bracket kit	P3NKA00MW
Repair kits –	
Non-relieving	P3NKA00RN
Relieving	P3NKA00RR
Springs –	
1-60 PSIG	C10A1304
2 to 125 PSIG	SPR-47
5 to 250 PSIG	SPR-48

Operating information

Pressure rating, maximum:	250 PSIG (17.2 bar)
Temperature rating:	32°F to 175°F (0°C to 80°C)

P3NR (Hi-Flow)



WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION: REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



P3NR Hi-Flow Pilot Operated Regulators

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life
- 3/4", 1", & 1-1/2" ports (NPT & BSPP)



Operating information

Pressure rating, maximum:	250 PSIG (17.2 bar)
Temperature rating:	32°F to 175°F (0°C to 80°C)
Flow capacity SCFM:	3/4"; 300 1"; 300 1-1/2"; 350

P3NR Hi-Flow Pilot Operated Regulators

	Port size	Gauge	Part number (NPT), relieving
P3NR	3/4"	No	P3NRA96BPP
	1"	No	P3NRA98BPP
	1-1/2"	No	P3NRA9PBPP
	3/4"	160 PSI	P3NRA96BPG
	1"	160 PSI	P3NRA98BPG
	1-1/2"	160 PSI	P3NRA9PBPG



Note: BSPP ported units supplied using NPT ported bodies and BSPP port block kits.

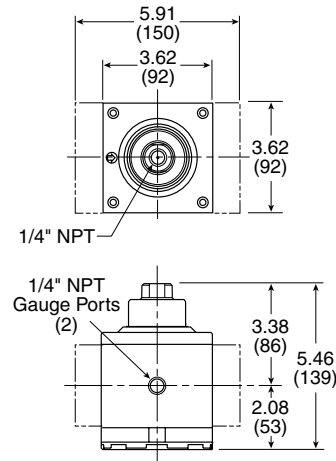
Material specifications

Adjusting stem	Steel
Body	Aluminum
Bonnet	Aluminum
Piston	Plastic
Poppet assembly	Brass
Seals	Nitrile
Springs – poppet	Steel

Service kits

Gauges – 50mm (2") round 1/4" center back mount	60 PSIG (0 to 4.1 bar)	K4520N14060
	160 PSIG (0 to 11.0 bar)	K4520N14160
	300 PSIG (0 to 20.0 bar)	K4520N14300
44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa	K4517N14160D
Mounting bracket kit		P3NKA00MW
Repair kits	Relieving	P3NKA00PD

P3NR (Hi-Flow)



WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION: REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.





P3NE Hi-Flow Filter / Regulators

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Excellent water removal efficiency
- Metal bowl with sight gauge
- Large filter element surface guarantees low pressure drop and increased element life
- 40 micron element standard
- Twist drain as standard, optional auto drain
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life
- 3/4", 1", & 1-1/2" ports (NPT & BSPP)



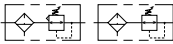
Material specifications


Adjusting stem	Steel
Body, bonnet, bowl	Aluminum
Drain	Plastic
Filter element – 40 micron	Plastic
Knob	Plastic
Piston	Plastic
Polyamide (Nylon)	Polyamide (nylon)
Springs – poppet & control	Steel

Operating information

Pressure ratings:	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating:	32°F to 175°F (0°C to 80°C)

P3NE Hi-Flow Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT)
	3/4"	Metal / Sight gauge	Twist	250	40 micron	P3NEA96GSMBNN
	3/4"	Metal / Sight gauge	Auto float	250	40 micron	P3NEA96GSABNN
	1"	Metal / Sight gauge	Twist	250	40 micron	P3NEA98GSMBNN
	1"	Metal / Sight gauge	Auto float	250	40 micron	P3NEA98GSABNN
	1-1/2" #	Metal / Sight gauge	Twist	250	40 micron	P3NEA9PGSMBNN
	1-1/2" #	Metal / Sight gauge	Auto float	250	40 micron	P3NEA9PGSABNN
	# 1" port body with 1-1/2" port block					

Note: BSPP ported units supplied using NPT ported bodies and BSPP port block kits.

WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

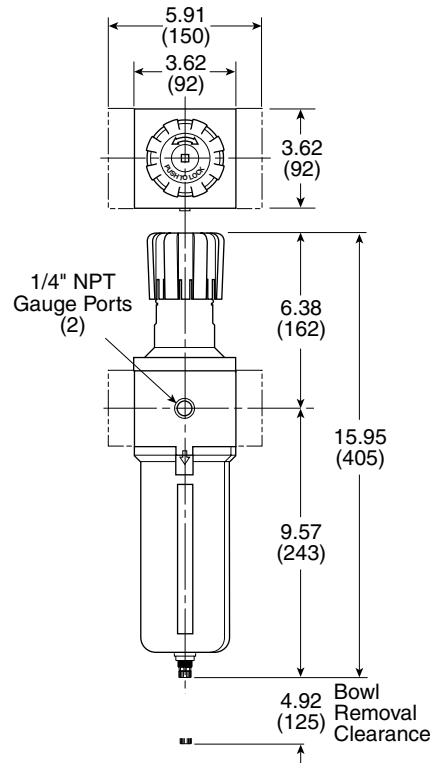
CAUTION: **REGULATOR PRESSURE ADJUSTMENT –**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

 Most popular.



P3NE (Hi-Flow)



Service kits

Description		P3NE	
Bowl kits: Metal bowl –	Automatic drain	P3NKA00BSA	
	Twist drain	P3NKA00BSM	
Bowl latch kit		C11A33	
Control knob		P3NKA00PN	
Drain kits –	Automatic float drain	PS506P	
	Twist drain	PS512P	
Filter element kits –	40 Micron	P3NKA00ESG	
	5 Micron	P3NKA00ESE	
	Adsorber	P3NKA00ESA	
Gauges –	50mm (2") round 1/4" center back mount	60 PSIG (0 to 4.1 bar)	K4520N14060
		160 PSIG (0 to 11.0 bar)	K4520N14160
		300 PSIG (0 to 20.0 bar)	K4520N14300
	44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa	K4517N14160D
Mounting bracket kit* (includes panel mount nut)		P3NKA00MW	
Service kits –	Non-relieving	P3NKA00RN	
	Relieving	P3NKA00RR	
Sight gauge kit		P3NKA00PE	
Springs –	1- 60 PSIG rang)	C10A1304	
	2- 125 PSIG range	C10A1308	
	5-250 PSIG range (white)	C10A1317	



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Bulk Liquid Separators

P3NL Hi-Flow Mist Lubricators

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Proportional oil delivery over a wide range of air flows
- Bowl can be filled while air line is under pressure
- Transparent sight dome for 360° visibility
- 3/4", 1" & 1-1/2" ports (NPT & BSPP)



Material specifications


Body	Aluminum
Bowls	Aluminum
Drains – twist (optional)	Plastic
Injector meter block & base assembly	Plastic
Seals	Nitrile
Sight dome	Polycarbonate
Sight gauge	Polyamide (Nylon)

Operating information

Pressure ratings: 0 to 250 PSIG (0 to 17.2 bar)
 Temperature rating: 32°F to 175°F (0°C to 80°C)
 Flow capacity: 3/4" – 240 SCFM
 1" – 250 SCFM
 1-1/2" – 260 SCFM
 Minimum Flow for Lubrication: 6.6 SCFM at 100 PSIG
 Suggested lubricant: F442 oil
 Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)
 (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

P3NL Hi-Flow Lubricators



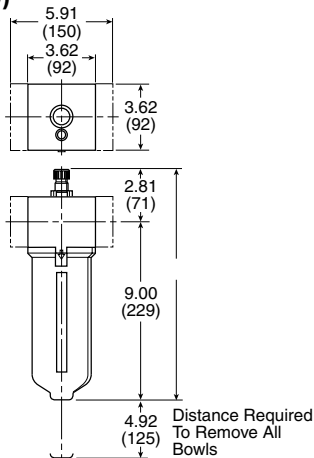
	Port size	Bowl type	Drain type	Flow SCFM	Part number (NPT)
P3NL 	3/4"	Metal / Sight gauge	None	240	P3NLA96LSN
	1"	Metal / Sight gauge	None	250	P3NLA98LSN
	1-1/2" #	Metal / Sight gauge	None	260	P3NLA9PLSN
	# 1" port body with 1-1/2" port block				

Note: BSPP ported units supplied using NPT ported bodies and BSPP port block kits.

Service kits

		P3NL
Adjustment knob		P04121
Bowl kits: Metal bowl –	No drain	P3NKA00BSN
	Twist drain	P3NKA00BSM
Bowl latch kit		C11A33
Drain kit	Twist drain	PS512P
Fill cap kit		P3NKA00PL
Mounting bracket kit		P3NKA00MW
Oil –	1 Quart	F442001
	12 Quart case	F442003
	4 Gallon case	F442005
Pressure fill adapter kit		P3NKA00PK
Service kit		P3NKA00RL
Sight dome kits –	Polycarbonate	PS740P
	Nylon	PS740N
Sight gauge kit		P3NKA00PE

P3NL (Hi-Flow)



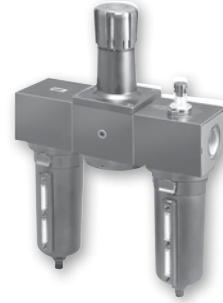
Most popular.



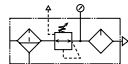
P3N Hi-Flow Combinations



Combinations – P3N Hi-Flow Series

- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard
- Manual twist drain
- Relieving regulator
- 3/4", 1", & 1-1/2" ports (NPT & BSPP)



Modular Combinations



	Port size	Bowl type	Element type	Filter drain type	Pressure range	Relief type	Lubricator drain type	Part number (NPT)
P3NCA 	3/4"	Metal	40 micron	Twist	0-125	Relieving	None	P3NCA96SGMNNLNA
	1"	Metal	40 micron	Twist	0-125	Relieving	None	P3NCA98SGMNNLNA
	1-1/2" #	Metal	40 micron	Twist	0-125	Relieving	None	P3NCA9PSGMNNLNA
P3NCB 	3/4"	Metal	40 micron	Twist	0-125	Relieving	None	P3NCB96SGMNNLNA
	1"	Metal	40 micron	Twist	0-125	Relieving	None	P3NCB98SGMNNLNA
	1-1/2" #	Metal	40 micron	Twist	0-125	Relieving	None	P3NCB9PSGMNNLNA

Notes: All combo part numbers are with regulator knob in up position.
 BSPP ported units supplied using NPT ported bodies and BSPP port block kits.
 # 1" Port body with 1-1/2" port block.

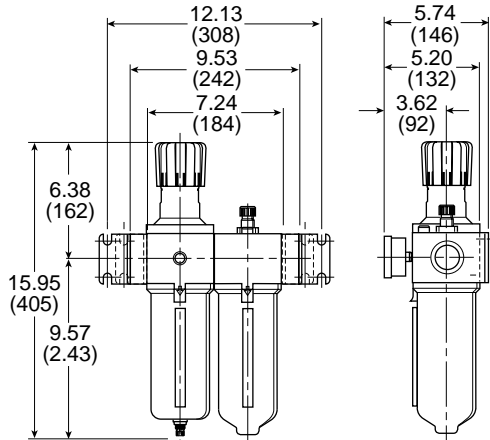
⚠ WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

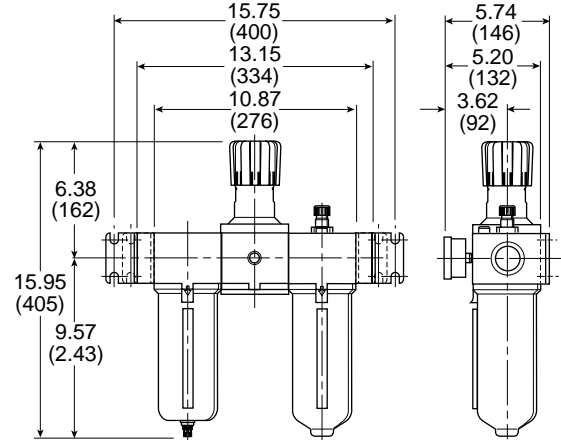
CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

 Most popular.

P3NCA (Modular 2-unit)



P3NCB (Modular 3-unit)



Service kits

Mounting bracket kit	P3NKA00MW
Replacement body cover	P3NKA00PM

Port block kits	3/4"	1"	1-1/2"
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Individual filters, individual regulators and 2-piece filter and regulator assemblies:

NPT	P3NKB96CP	P3NKB98CP	P3NKB9BCP
BSPP	P3NKB16CP	P3NKB18CP	P3NKB1BCP

2 and 3 piece combinations including a lubricator (FR/L & FRL), individual lubricators, individual coalescing filters and 2-piece filter and coalescer assemblies:

NPT	P3NKB96CL	P3NKB98CL	P3NKB9BCL
BSPP	P3NKB16CL	P3NKB18CL	P3NKB1BCL

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Bulk Liquid Separators

F602 General Industrial Particulate Filters

- Excellent water removal efficiency
- For heavy duty applications with minimum pressure drop requirement
- Unique deflector plate that creates swirling of the air stream ensuring maximum water and dirt separation
- Large filter element surface guarantees low pressure drop and increased element life
- 40 micron filter element standard, 5 micron available
- Metal bowl with sight gauge standard
- Twist drain as standard, optional auto drain
- Large bowl capacity
- Optional high capacity bowl(s) available



3/4" & 1"



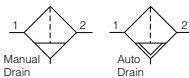
1-1/4" & 1-1/2"

Material specifications



Description	(Hi-Flow)	
	F602-06W F602-08W F602-06E F602-08E	F602-10W F602-12W F602-10E F602-12E
Body	Zinc	Zinc
Bowl	(E) 32 oz Aluminum (W) 16 oz Zinc	Aluminum Zinc
Drains	Housing R Acetal Housing Q Bronze	Acetal Bronze
Drain - Twist	Body & stem Brass	Brass
Filter element	5 micron Polypropylene 40 micron Polypropylene	Polypropylene Polypropylene
Seals	Nitrile	Nitrile
Sight gauge	Nylon	Nylon

Operating information

		F602 (Hi-Flow)
Operating pressure:	Aluminum bowl (E) 32 oz.	0 to 300 PSIG (0 to 20.4 bar)
	Zinc (W) 16 oz.	0 to 250 PSIG (0 to 17.2 bar)
	With internal auto drain (R)	20 to 175 PSIG (1.4 to 11.9 bar)
Operating temperature:	With external auto drain (Q)	0 to 250 PSIG (0 to 17.2 bar)
	Aluminum bowl (E) 32 oz.	40°F to 150°F (4.4°C to 65.6°C)
	Zinc (W) 16 oz.	40°F to 150°F (4.4°C to 65.6°C)
With internal auto drain (R)		40°F to 125°F (4.4°C to 52°C)
	With external auto drain (Q)	40°F to 150°F (4.4°C to 65.6°C)



Particulate Filters

	Port size	Bowl type	Bowl size	Flow SCFM	Element type	Part number (NPT)	
						Twist drain	Automatic float drain
	3/4"	Metal / Sight gauge	16 oz	270	40 micron	F602-06WJ	F602-06WJR
	3/4"	Metal / Without sight gauge	32 oz	270	40 micron	F602-06EJ	F602-06EJR
	1"	Metal / Sight gauge	16 oz	300	40 micron	F602-08WJ	F602-08WJR
	1"	Metal / Without sight gauge	32 oz	300	40 micron	F602-08EJ	F602-08EJR
	1-1/4"	Metal / Sight gauge	16 oz	380	40 micron	F602-10WJ	F602-10WJR
	1-1/4"	Metal / Without sight gauge	32 oz	380	40 micron	F602-10EJ	F602-10EJR
	1-1/2"	Metal / Sight gauge	16 oz	450	40 micron	F602-12WJ	F602-12WJR
	1-1/2"	Metal / Without sight gauge	32 oz	450	40 micron	F602-12EJ	F602-12EJR

 Most popular.



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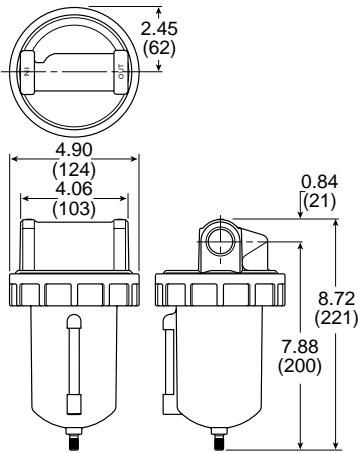
General Industrial

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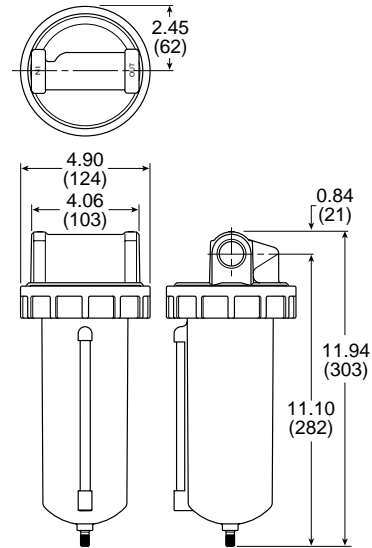
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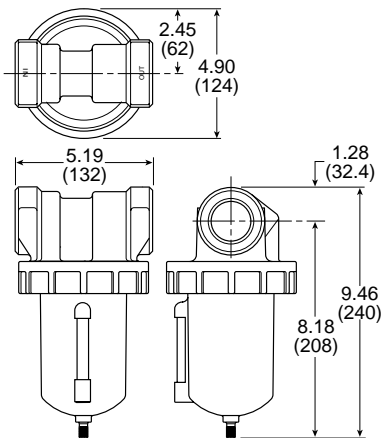
F602-06W, F602-08W (Hi-Flow)



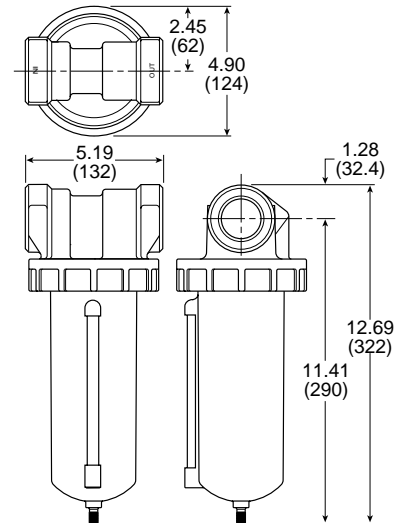
F602-06E, F602-08E (Hi-Flow)



F602-10W, F602-12W (Hi-Flow)



F602-10E, F602-12E (Hi-Flow)



Service kits

Description		(Hi-Flow) F602-06W, F602-08W, F602-06E, F602-08E	(Hi-Flow) F602-10W, F602-12W, F602-10E, F602-12E
Bowl kits –	Aluminum (E) 32 oz	BK603B	BK603B
	Zinc / sight gauge (W) 16 oz	BK605WB	BK605WB
Drain kits –	Internal auto	SA602MD	SA602MD
	Manual	SA600Y7-1	SA600Y7-1
Filter element kits –	40 micron	EK602B	EK602B
	5 micron	EK602VB	EK602VB
Mounting bracket kits –	3/4" unit	SA200AW57	
	1" unit	SA200CW57	
Repair kits –	Deflector, baffle assy, & retaining rod	RK602B	RK602B
	External auto drain	RK602D	RK602D
	Internal auto drain	RK602MD	RK602MD
	Metal bowl / sight gauge	RKB605WB	RKB605WB



35F, 43F General Industrial Particulate Filters

- Heavy-duty cast aluminum housings to withstand operating pressures up to 250 PSIG
- Differential pressure indicator to eliminate the guesswork of element replacement
- Unique drain mounting plate design offers a trouble-free method for interchanging and installing external drains



35F

43F

Material specifications



Description	35F, 43F (Hi-Flow)
Baffle	Plated steel
Body	Aluminum
Bowl	Aluminum
Deflector	Plated steel
Filter element	Polyethylene
Seals	Fluorocarbon
Stud	Plated steel

Operating information

		35F (Hi-Flow)	43F (Hi-Flow)
Operating pressure:	With DP gauge & without DPI	250 PSIG (17.2 bar)	250 PSIG (17.2 bar)
	With DPI	150 PSIG (10.3 bar)	150 PSIG (10.3 bar)
Operating temperature:		32°F to 150°F (0°C to 65.5°C)	32°F to 150°F (0°C to 65.5°C)

Particulate Filters



	Port size	Bowl type	Flow SCFM	Element type	Part number (NPT)
					Automatic drain
35F 	1-1/2	Metal	1280	5 micron	35F77BAP
	2	Metal	1400	5 micron	35F87BAP
43F 	3	Metal	2900	5 micron	43FN7BAP

 Most popular.

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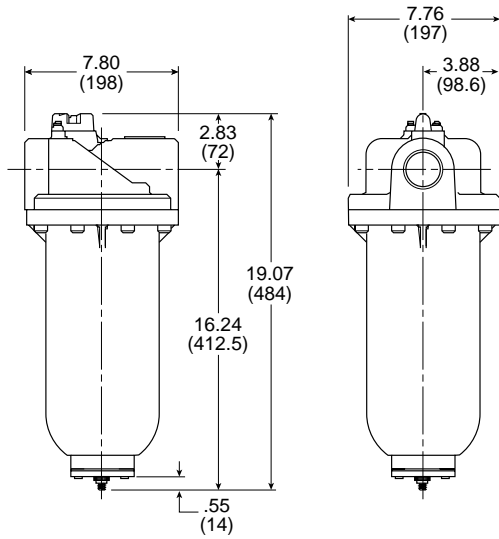
General Industrial

Stainless Steel

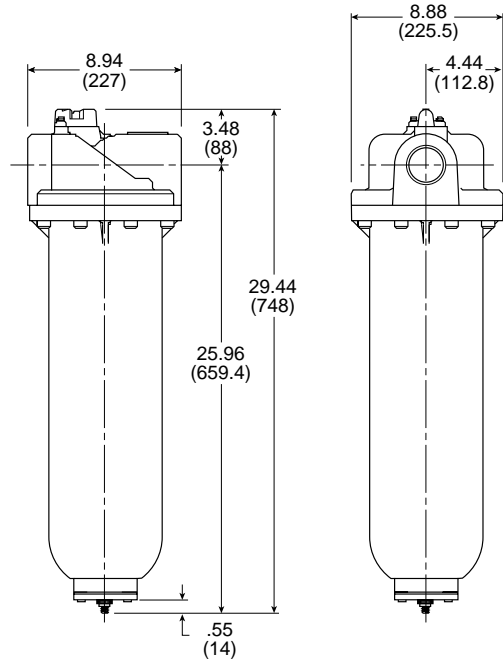
Precision / Proportional

Bulk Liquid Separators

35F (Hi-Flow)



43F (Hi-Flow)



Service kits

Description	35F (Hi-Flow)	43F (Hi-Flow)
DPI replacement kit	DP2-02-001	DP2-02-001
DPI cap	Pressures over 150 PSIG GRP-95-022	GRP-95-022
DP gauge	DP3-01-000	DP3-01-000
Automatic float drain kit	Auto internal drain 1/8" P32KA00DA	P32KA00DA
Manual drain kit	with 1/2" drain plate GRP-95-392	GRP-95-392
Drain plate kit	1/2 NPT tapped port GRP-95-393	GRP-95-393
Filter element kit	5 micron FRP-95-505	FRP-95-508

F701 General Industrial Coalescing Filters

- Removes liquid aerosols and sub-micron particles
- Protects pneumatic systems from contamination that standard particulate filters will not catch
- Two different grade elements available
- Differential pressure indicator (pop-up) standard
- Differential pressure gauge optional
- High flow design



Material specifications


Description		F701 (Hi-Flow)
Body & flange ring		Zinc
Bowl	(E) 32 oz	Aluminum
	(L) 100 oz	Aluminum
Drains	Housing R	Acetal
	Housing Q	Bronze
	Manual	Brass
Element end cap		Urethane
Filter element	0.01 micron	Borosilicate fibers & felt
	1.0 micron	
Seals & float		Buna N
Springs		Stainless steel

Operating information

	F701 (Hi-Flow)	
Maximum pressure:	"R" drain	175 PSIG (12.4 bar)
	"T" drain	250 PSIG (17.2 bar)
	"Q" drain	250 PSIG (17.2 bar)
Maximum temperature:	32°F to 150°F (0°C to 65.6°C)	
	Maximum temperature with "T", "R" or "Q" drains: 125°F (52°C)	
Minimum rated flow:	20% or rated flow	

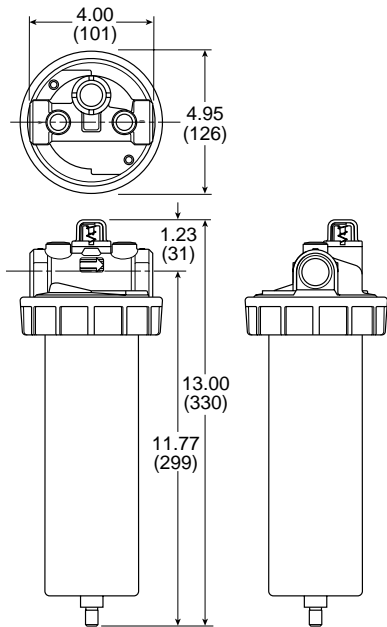
Coalescing Filters



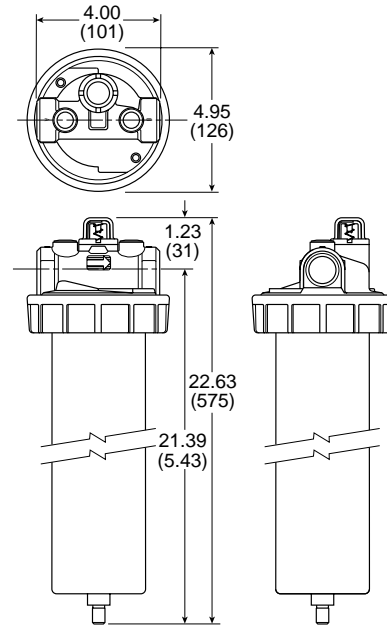
	Port size	Bowl type	Bowl size	Flow SCFM	Element type	Part number
 F701	3/4"	Metal	32 oz	95	0.01 micron	F701-06E3P
	3/4"	Metal	32 oz	158	1.0 micron	F701-06E7P
	3/4"	Metal	100 oz	170	0.01 micron	F701-06L3P
	3/4"	Metal	100 oz	285	1.0 micron	F701-06L7P
	1"	Metal	32 oz	95	0.01 micron	F701-08E3P
	1"	Metal	32 oz	158	1.0 micron	F701-08E7P
	1"	Metal	100 oz	170	0.01 micron	F701-08L3P
	1"	Metal	100 oz	285	1.0 micron	F701-08L7P

 Most popular.

F701 - 32 oz. bowl (Hi-Flow)



F701 - 100 oz. bowl (Hi-Flow)



Service kits

Description		F701 (Hi-Flow)
Bowl kits	3/4, 1 inch (E) 32 oz	BK603B
	3/4, 1 inch (L) 100 oz	BK603C
DPI repair kit		RK701P
Drain kits –	Internal auto	SA702MD
	Manual	SA600Y7-1
Filter element kits –	0.01 micron, 3/4, 1 inch (E) 32 oz	F701-C3-0773
	0.01 micron, 3/4, 1 inch (E) 100 oz	F701-C3-0774
	1.0 micron, 3/4, 1 inch (E) 32 oz	F701-C7-0773
	1.0 micron, 3/4, 1 inch (E) 100 oz	F701-C7-0773
Mounting bracket kits –	3/4" unit	SA200AW57
	1" unit	SA200CW57

- P**
- Air Preparation Products
- Global
- Prep-Air II
- Miniature
- PSN
- General Industrial
- Stainless Steel
- Precision / Proportional
- Bulk Liquid Separators

35F, 43F General Industrial Coalescing Filters

- Heavy-duty cast aluminum housings to withstand operating pressures up to 250 PSIG
- Differential pressure indicator to eliminate the guesswork of element replacement
- Unique drain mounting plate design offers a trouble-free method for interchanging and installing external drains
- 35F: 1-1/2" & 2" ports (NPT & BSPP)
- 43F: 3" ports (NPT & BSPP)



Material specifications



Description		35F, 43F (Hi-Flow)
Baffle		Plated steel
Body		Aluminum
Bowl		Aluminum
Deflector		Plated steel
Filter element	0.01 & 1.0 micron	Borosilicate cloth
	Adsorber	Activated carbon
Seals		Fluorocarbon
Stud		Plated steel

Operating information

		35F (Hi-Flow)	43F (Hi-Flow)
Operating pressure:	With DP gauge & without DPI	250 PSIG (17.2 bar)	250 PSIG (17.2 bar)
	With DPI	150 PSIG (10.3 bar)	150 PSIG (10.3 bar)
Operating temperature:		32°F to 150°F (0°C to 65.5°C)	32°F to 150°F (0°C to 65.5°C)

Coalescing Filters

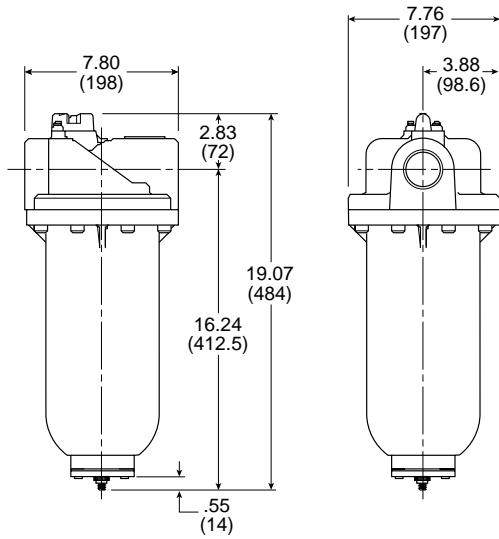


	Port size	Bowl type	Flow SCFM	Element type	Part number (NPT)
					Automatic drain
 35F	1-1/2	Metal	710	0.01 micron	35F77EAP
	1-1/2	Metal	710	1.0 micron	35F77HAP
	2	Metal	710	0.01 micron	35F87EAP
	2	Metal	710	1.0 micron	35F87HAP
 43F	3	Metal	1770	0.01 micron	43FN7EAP
	3	Metal	1770	1.0 micron	43FN7HAP

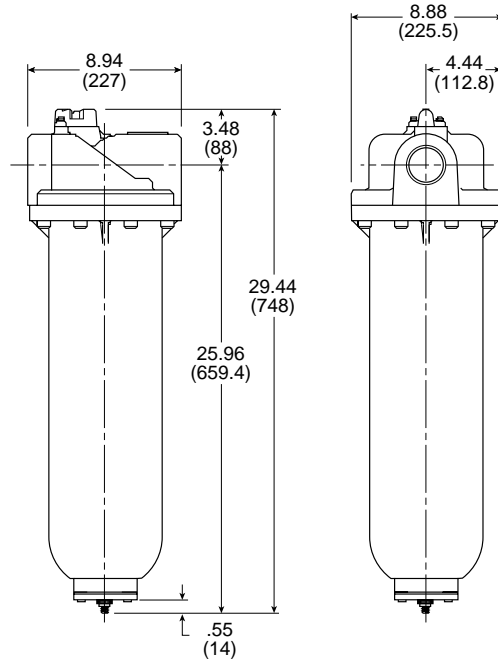
 Most popular.

P
Air Preparation Products
Global
Prep-Air II
Miniature
P3N
General Industrial
Stainless Steel
Precision / Proportional
Bulk Liquid Separators

35F (Hi-Flow)



43F (Hi-Flow)



Service kits

Description		35F (Hi-Flow)	43F (Hi-Flow)
DPI replacement kit		DP2-02-001	DP2-02-001
DPI cap	Pressures over 150 PSIG	GRP-95-022	GRP-95-022
DP gauge		DP3-01-000	DP3-01-000
Automatic float drain kit	Auto internal drain 1/8"	P32KA00DA	P32KA00DA
Manual drain kit	with 1/2" drain plate	GRP-95-392	GRP-95-392
Drain plate kit	1/2 NPT tapped port	GRP-95-393	GRP-95-393
Filter element kit –	0.01 micron	MTP-95-502	MTP-95-562
	1.0 micron	MSP-95-502	MSP-95-876
	Adsorber	MXP-95-502	MXP-95-565

P3TF Series Flanged Filters

- No tie rod element design
- Pleated element technology
- New high efficiency drainage layer
- Designed in accordance with ASME and CRN
- Connection sizes: 4 inch & 6 inch flange
- Acrylic polyurethane coating for corrosion protection



P3TF Series

Material specifications

Baffle		Plated steel
Body		Steel
Deflector		Plated steel
Filter element	0.01 & 1.0 micron	Borosilicate cloth
Seals		Fluorocarbon
Stud		Plated steel

Operating information


P3TF Series	
Operating Pressure:	232 PSIG (16 bar)
Operating Temperature:	35°F to 212°F (1.5°C to 100°C)

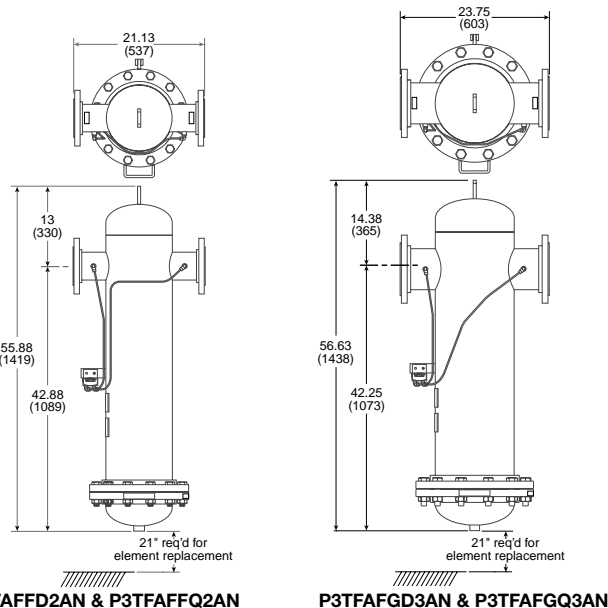
Inlet air pressure correction

For pressures above 232 PSIG (16 bar), use manual drain.

PSI	15	29	44	58	73	87	100	116	131	145	160	174	189	203	218	232	247	261	275	290
bar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Factor	0.38	0.53	0.65	0.76	0.85	0.93	1.00	1.07	1.13	1.19	1.25	1.31	1.36	1.41	1.46	1.51	1.56	1.60	1.65	1.70

Flanged filters

	Port size	Flow SCFM	Number of elements	Part number
P3TF 	4" Flange	2755	4	P3TFAFFD2AN
	4" Flange	2755	4	P3TFAFFQ2AN
	6" Flange	4132	6	P3TFAFGD3AN
	6" Flange	4132	6	P3TFAFGQ3AN

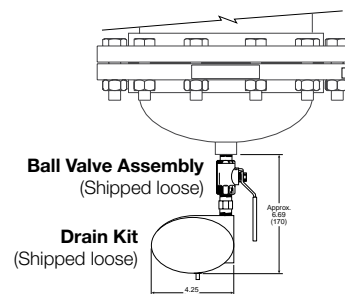


P3TFAFFD2AN & P3TFAFFQ2AN
 Most popular.

P3TFAFGD3AN & P3TFAFGQ3AN

Service kits

Description	Number required	P3TF Series
DP gauge replacement kit		DPG-Kit
Drain kit - 1/2" NPT		HDF-120-NPT-A
Filter element kit -	0.01 micron	4 or 6
	1.0 micron	4 or 6
		PSY1035002
		PSY1035001





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

R119 General Industrial Regulators

- Rugged design for the most demanding applications
- Ideal for those installations calling for constant pressure with wide variation in flow
- Diaphragm operated design with balanced poppet design for quick and accurate regulation
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Heavy duty tee handle adjustment
- Reverse flow version available
- Panel mount version available



R119

Operating information

Supply pressure rating:	300 PSIG (20.4 bar)
Reduced pressure range:	2 to 125 PSIG (0.15 to 8.5 bar)
Temperature rating:	40°F to 125°F (4.4°C to 52°C)

R119 Standard Regulators



Port size	Flow (SCFM)	Part number (NPT), Relieving	
		Without gauge	With 125 PSI gauge
1/4"	100	R119-02C/M2	R119-02CG/M2
3/8"	110	R119-03C/M2	R119-03CG/M2
1/2"	150	R119-04C/M2	R119-04CG/M2

Material specifications

Description	R119
Adjusting screw, springs	Steel
Body, spring cage	Zinc
Bottom plug	Brass
Seals	Buna N



WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT -

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

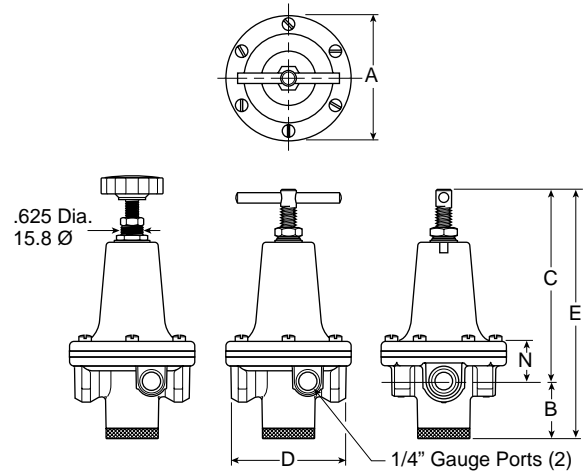


Dimensions

R119 Regulator - Standard

A	B	C	D	E	N
R119-02C, R119-03C					
3.00 (76)	1.38 (35)	5.29 (134)	2.74 (70.5)	6.67 (169)	.90 (24)
R119-04C					
3.56 (90)	1.56 (40)	5.34 (136)	3.25 (83)	6.90 (175)	1.45 (37)

inches (mm)



Service kits

Description		Part number
Gauges – 50mm (2") round 1/4" center back mount	2" dial size, 1/4" back connection, 0 to 60 PSIG (0 to 400 kPa)	K4520N14060
	2" dial size, 1/4" back connection, 0 to 160 PSIG (0 to 1100 kPa)	K4520N14160
	2" dial size, 1/4" back connection, 0 to 300 PSIG (0 to 2068 kPa)	K4520N14300
44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa	K4517N14160D
Mounting bracket kits –	1/4", 3/8"	SA15Y57
	1/2"	18A57
Panel mount conversion kits –	1/4", 3/8"	4202
	1/2"	4204
Repair kits –	Non-relieving diaphragm, valve assembly (1/4", 3/8"; All PSIG)	RK118Y
	Relieving diaphragm, valve assembly (1/4", 3/8"; All PSIG)	RK119Y
	Non-relieving diaphragm, valve assembly (1/2"; 25, 60, 125 PSIG)	RK118A
	Non-relieving diaphragm, valve assembly (1/2"; 250 PSIG)	RK118A250
	Relieving diaphragm, valve assembly (1/2"; 25, 60, 125 PSIG)	RK119A
	Relieving diaphragm, valve assembly (1/2"; 250 PSIG)	RK119A250
Spring cage & t-handle kit	1/4", 3/8"	RKC119Y
Spring cage & insert only kit	1/2"	SAC18A3/BK

For fluorocarbon repair kits, add X64 to kit number suffix.



R119 General Industrial Regulators



R119

R119

- High flow performance featuring rugged design for the most demanding applications
- Diaphragm operated design with balanced poppet design for quick and accurate regulation
- Heavy duty tee handle adjustment
- Reverse flow version available



R119 Hi-Flow Regulators



Port size	Gauge	Flow (SCFM)		Part number (NPT), Relieving
		R119	R119	R119
3/4"	No	300		R119-06C/M2
1"	No	400		R119-08C/M2
1-1/4"	No	500		R119-10C/M2
1-1/2"	No	500		R119-12C/M2
3/4"	125 PSI	300		R119-06CG/M2
1"	125 PSI	400		R119-08CG/M2
1-1/4"	125 PSI	500		R119-10CG/M2
1-1/2"	125 PSI	500		R119-12CG/M2

Operating information

Pressure rating, maximum:	300 PSIG (20.4 bar)
Reduced pressure range:	2 to 125 PSIG 0.15 to 8.5 bar
Temperature rating:	40°F to 125°F (4.4°C to 52°C)

Material specifications

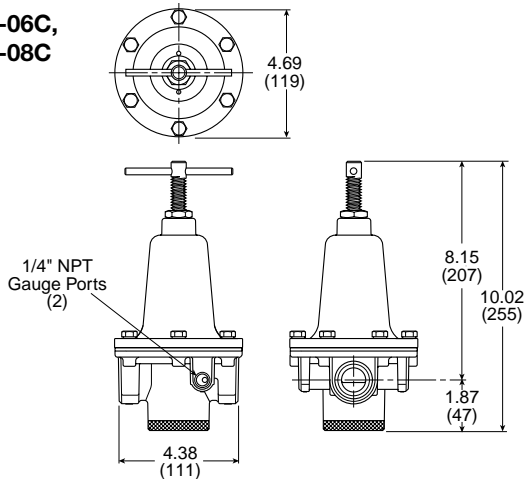
Description	R119
Adjusting screw	Steel
Body	Zinc
Bottom plug, inner valve	Brass
Seals	Buna N
Springs – poppet & control	Steels

Service kits

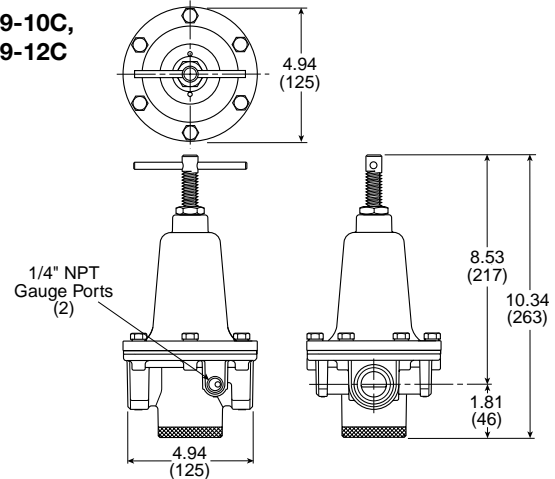
Gauges –	60 PSIG (0 to 4.1 bar)	K4520N14060	
	50mm (2") round 1/4" center back mount	160 PSIG (0 to 11.0 bar)	K4520N14160
		300 PSIG (0 to 20.0 bar)	K4520N14300
	44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa	K4517N14160D
Mounting bracket kit		18B57	
Repair kits –	Non-relieving (1-1/4", 1-1/2")	RK118B	
	Relieving (3/4", 1")	RK119B	
	Relieving (1-1/4", 1-1/2")	RK119D	

Dimensions

R119-06C, R119-08C



R119-10C, R119-12C



WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



09R General Industrial Regulators

09R

- Piston design for reduced downtime
- High flow
- Balanced poppet for quick and accurate regulation
- Self relieving piston standard



09R

09R Hi-Flow Regulators

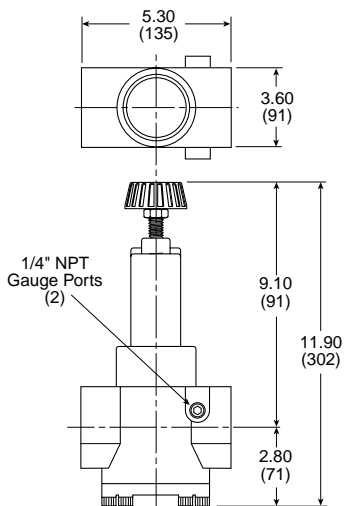


Port size	Gauge	Flow (SCFM)	Part number (NPT), Relieving
2"	No	1000	09R813BA

Operating information

Pressure rating, maximum:	300 PSIG (20.4 bar)
Secondary pressure range:	10 to 125 PSIG (0.7 to 8.6 bar) 10 to 180 PSIG (0.7 to 12.4 bar)
Temperature rating:	32°F to 150°F (0°C to 66°C)

Dimensions



Material specifications

Description	09R
Adjusting screw	Steel
Body	Zinc
Bonnet	Aluminum
Piston	Plastic
Piston stem	Aluminum
Poppet assembly	Aluminum
Seals	Nitrile
Springs – poppet & control	Stainless

Service kits

Body service kit		PS603P
Gauges – 50mm (2") round 1/4" center back mount	160 PSIG (0 to 11.0 bar)	K4520N14160
	300 PSIG (0 to 20.0 bar)	K4520N14300
44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa	K4517N14160D
Mounting bracket kit		PS605P
Repair kits –	Non-relieving	PS604P
	Relieving	PS626P
Springs –	0 to 125 PSIG	PS602P
	0 to 180 PSIG	PS627



WARNING

**Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.**

Most popular.

CAUTION: REGULATOR PRESSURE ADJUSTMENT –

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R119 General Industrial Pilot Operated Regulators

- Adapted for control by a remote or distant small pilot regulator. Ideal for maximum capacity requirements in applications where units are not readily accessible
- High flow performance featuring rugged design for the most demanding applications
- Ideal for those installations calling for constant pressure with wide variation in flow
- Diaphragm operated design with balanced poppet and constant bleed pilot for quick and accurate regulation.
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Reverse flow available



R119

Operating information

Supply pressure rating:	300 PSIG (20.4 bar)
Reduced pressure range:	Adjustable to within 5 to 7 PSIG of Supply Pressure
Air Consumption:	Constant bleed from air pilot chamber: approx. 0.17 SCFM (10 SCFH)
Temperature rating:	40°F to 125°F (4.4°C to 52°C)

R119 Standard Regulators



Port size	Gauge	Flow (SCFM)	Part number (NPT), Relieving
1/4"	No	100	R119-02J/M2
3/8"	No	110	R119-03J/M2
1/2"	No	150	R119-04J/M2

Material specifications

Description	R119
Body, ring, top plate	Zinc
Bottom plug	Nylon
Innervalve	Brass
Seals	Buna N

WARNING

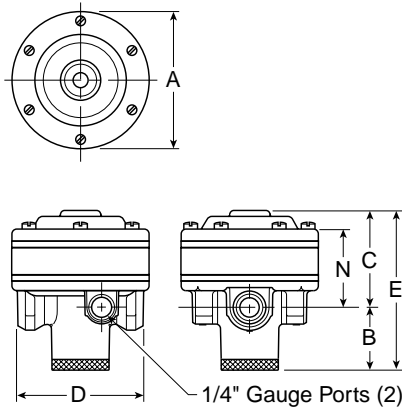
Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION: REGULATOR PRESSURE ADJUSTMENT –

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Most popular.

Dimensions



R119 Regulator - Pilot Operated

A	B	C	D	E	N
R119-02J, R119-03J					
3.00 (76)	1.38 (35)	1.98 (50)	2.74 (70)	3.55 (90)	1.57 (40)
R119-04J					
3.56 (90)	1.56 (40)	2.33 (59)	3.25 (83)	3.90 (99)	1.91 (49)

inches (mm)

Service kits

Description		Part number
Gauges – 50mm (2") round 1/4" center back mount	0 to 60 PSIG (0 to 400 kPa)	K4520N14060
	0 to 160 PSIG (0 to 1100 kPa)	K4520N14160
	0 to 300 PSIG (0 to 2068 kPa)	K4520N14300
44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa	K4517N14160D
	Repair kits –	
	Non-relieving diaphragm, valve assembly (1/2")	RK118X20A
	Non-relieving diaphragm, valve assembly (1/4", 3/8")	RK118X20Y
	Relieving diaphragm, valve assembly (1/2")	RK119X20A
	Relieving diaphragm, valve assembly (1/4", 3/8")	RK119X20Y

For fluorocarbon repair kits, add X64 to kit number suffix.

For Non-Bleed Pilot Repair Kits, add X71 to Kit Number suffix. Specifications



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

R119 General Industrial Pilot Operated Regulators

- Adapted for control by a remote or distant small pilot regulator. Ideal for maximum capacity requirements in applications where units are not readily accessible
- High flow performance featuring rugged design for the most demanding applications
- Ideal for those installations calling for constant pressure with wide variation in flow



R119 (06-12)



R119 (16-20)

Operating information

	R119-06J R119-08J R119-10J R119-12J	R119-16J R119-20J
Pressure rating, maximum:	300 PSIG (17.2 bar)	300 PSIG (17.2 bar)
Temperature rating:	40°F to 125°F (4.4°C to 52°C)	40°F to 120°F (4.4°C to 48.9°C)
Flow capacity SCFM:	3/4"; 300 1"; 300 1-1/4"; 500 1-1/2"; 500	2"; 1800 2-1/2"; 1800

R119 Pilot Operated Regulators



Port size	Gauge
3/4"	No
1"	No
1-1/4"	No
1-1/2"	No
2"	No
2-1/2"	No

Part number (NPT), relieving

R119-06J, R119-08J, R119-10J, R119-12J 0-125 PSIG reduced pressure	R119-16J, R119-20J
R119-06J/M2	
R119-08J/M2	
R119-10J/M2	
R119-12J/M2	
	R119-16J
	R119-20J

Material specifications

Description	R119-06J, R119-08J, R119-10J, R119-12J	R119-16J, R119-20J
Body		Aluminum
Body, ring, top plate	Zinc	
Bottom plug, inner valve	Brass	Brass & Stainless
Piston		Aluminum
Seals	Buna N	Buna N



WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

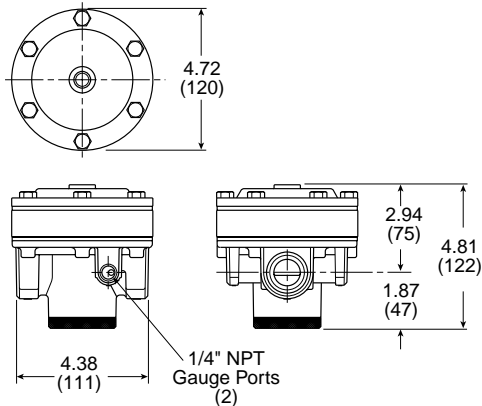
CAUTION: REGULATOR PRESSURE ADJUSTMENT –

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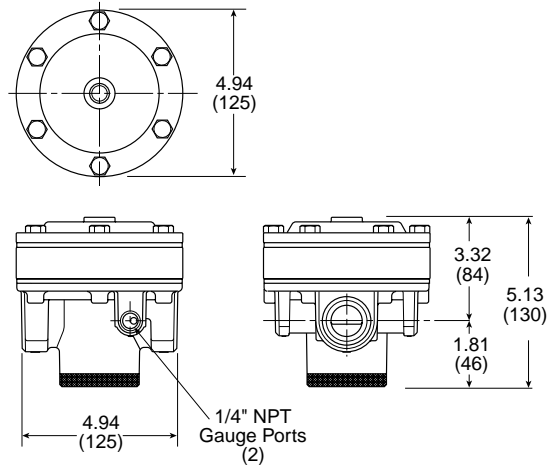
Most popular.



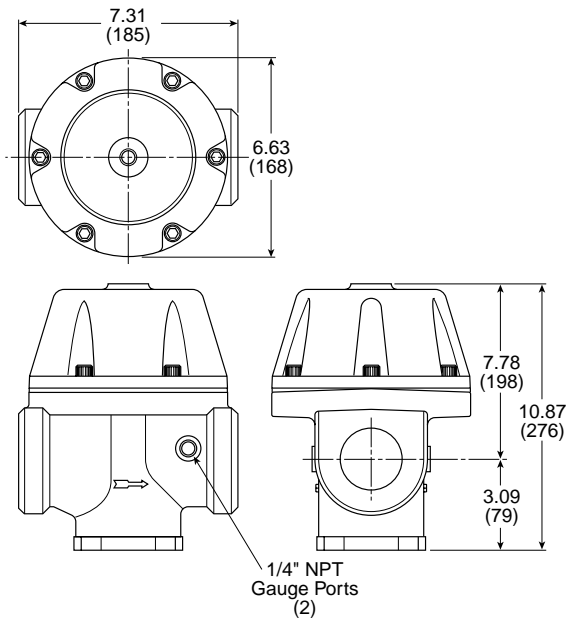
R119-06J, R119-08J



R119-10J, R119-12J



R119-16J, R119-20J



Service kits

		R119-06J, R119-08J, R119-10J, R119-12J	R119-16J, R119-20J
Gauges – 50mm (2") round 1/4" center back mount	60 PSIG (0 to 4.1 bar)	K4520N14060	K4520N14060
	160 PSIG (0 to 11.0 bar)	K4520N14160	K4520N14160
	300 PSIG (0 to 20.0 bar)	K4520N14300	K4520N14300
44mm (1-3/4") digital round 1/4" center back mount	0-160 PSIG / 0-11 bar / 0-1.1 MPa	K4517N14160D	K4517N14160D
	Mounting bracket kit		
Repair kits	Piston type regulation (2", 2-1/2")		RK119G
Non-relieving diaphragm –	Valve assembly (3/4", 1")	RK118X20B	
	Valve assembly (1-1/4", 1-1/2")	RK118X20D	
Relieving diaphragm –	Valve assembly (3/4", 1")	RK119X20B	
	Valve assembly (1-1/4", 1-1/2")	RK119X20D	
Repair kits	Relieving		



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

L606 General Industrial Mist Lubricators

- Metal bowl with sight gauge - standard
- Polycarbonate sight dome
- Bowl can be filled while air line is under pressure
- Proportional oil delivery over a wide range of air flows
- Large capacity bowl
- Optional high capacity bowl(s) available
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- 3/4", 1", 1-1/4" & 1-1/2" ports (NPT & BSPP)



L606 3/4" & 1"



L606 1-1/4" & 1-1/2"

Material specifications

Body	Zinc	
Bowl	(E) 32 oz.	Aluminum
	(G) 64 oz.	Aluminum with polycarbonate sight gauge
	(W) 16 oz.	Zinc with nylon sight gauge
Seals	Buna N	

Operating information

Operating pressure:	Aluminum bowl (E) 32 oz.	0 to 300 PSIG (0 to 20.4 bar)
	Aluminum (G) 64 oz.	0 to 150 PSIG (0 to 10.2 bar)
	Zinc (W) 16 oz.	0 to 250 PSIG (0 to 17.2 bar)
Operating temperature:	Aluminum bowl (E) 32 oz.	40°F to 150°F (4.4°C to 65.6°C)
	Aluminum (G) 64 oz.	40°F to 125°F (4.4°C to 52°C)
	Zinc (W) 16 oz.	40°F to 150°F (4.4°C to 65.6°C)
Suggested lubricant:	F442 oil Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C) (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)	

L606 Lubricators

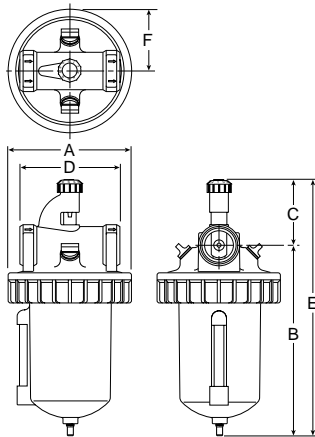


	Port size	Bowl type	Bowl capacity	Drain	Flow SCFM	Part number	
						NPT	BSPP
	3/4"	Zinc / Sight gauge	16 oz	Yes	325	L606-06W	L606G06W
	3/4"	Aluminum	32 oz	Yes	325	L606-06E	L606G06E
	3/4"	Aluminum / Sight gauge	64 oz	None	325	L606-06G	L606G06G
	1"	Zinc / Sight gauge	16 oz	Yes	350	L606-08W	L606G08W
	1"	Aluminum	32 oz	Yes	350	L606-08E	L606G08E
	1"	Aluminum / Sight gauge	64 oz	None	350	L606-08G	L606G08G
	1-1/4"	Zinc / Sight gauge	16 oz	Yes	325	L606-10W	L606G10W
	1-1/4"	Aluminum	32 oz	Yes	325	L606-10E	L606G10E
	1-1/4"	Aluminum / Sight gauge	64 oz	None	325	L606-10G	L606G10G
	1-1/2"	Zinc / Sight gauge	16 oz	Yes	400	L606-12W	L606G12W
	1-1/2"	Aluminum	32 oz	Yes	400	L606-12E	L606G12E
	1-1/2"	Aluminum / Sight gauge	64 oz	None	400	L606-12G	L606G12G

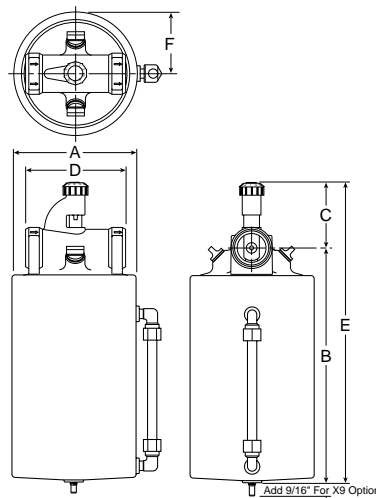
Most popular.



L606 - 3/4" and 1"



W & E size bowl

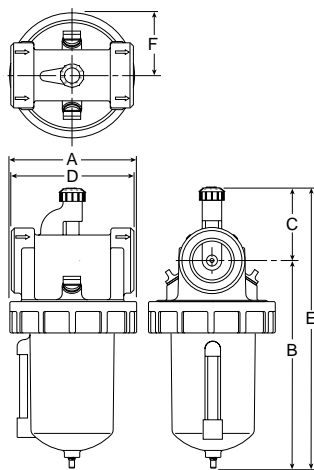


G size bowl

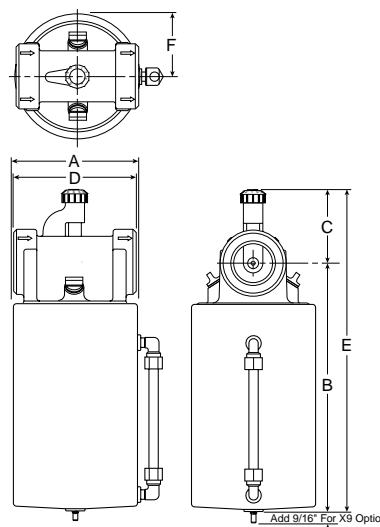
A	B	C	D	E	F
L606-06W, L606-08W					
4.97 (126)	7.25 (184)	2.63 (66.7)	4.06 (103)	9.88 (251)	2.48 (63.1)
L606-06E, L606-08E					
4.97 (126)	10.75 (273)	2.63 (66.7)	4.06 (103)	13.38 (340)	2.48 (63.1)
L606-06G, L606-08G					
5.00 (127)	9.40 (239)	2.62 (66)	4.06 (103)	12.02 (305)	2.50 (64)

inches (mm)

L606 - 1-1/4" and 1-1/2"



W & E size bowl



G size bowl

A	B	C	D	E	F
L606-10W, L606-12W					
4.97 (126)	7.63 (194)	2.84 (72.2)	4.81 (122)	10.47 (266)	2.48 (63.1)
L606-10E, L606-12E					
4.97 (126)	11.13 (283)	2.84 (72.2)	4.81 (122)	13.97 (355)	2.48 (63.1)
L606-10G, L606-12G					
5.00 (127)	7.99 (203)	2.84 (72.2)	4.81 (122)	12.80 (325)	2.50 (64)

inches (mm)

Service kits

Description	L606
Adjusting knob	606Y72
Bowl kits –	Aluminum (e) 32 oz BK603B Aluminum (g) 64 oz BK606X30B Zinc / sight gauge (w) 16 oz BK609WB
Button head fill fitting (m14 male thread)	L606C14
Dip tube kit	DTK606
Drip spout kit	RK606SY
Mounting brackets –	3/4 Inch units (2 required per unit) SA200AW57 1 Inch units (2 required per unit) SA200CW57
Oil –	1 Quart F442001 2 Quart case F442003 4 Gallon case F442005
Repair kits –	Needle valve assembly (all) RK606Y Sight gauge bowl repair kit (w) RKB605WB Sight gauge bowl repair kit (g) RKB606X30B



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

09L General Industrial Mist Lubricators

- Metal bowl with sight gauge and manual drain – standard
- Transparent sight dome for 360° visibility
- Bowl can be filled while air line is under pressure
- Proportional oil delivery over a wide range of air flows



Material specifications

Body Zinc alloy, die cast

Operating information

Pressure rating: 0 to 150 PSIG (0 to 10.3 bar)
 Temperature rating: 32°F to 150°F (0°C to 66°C)
 Suggested lubricant: F442 oil
 Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)
 (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

09L Lubricator



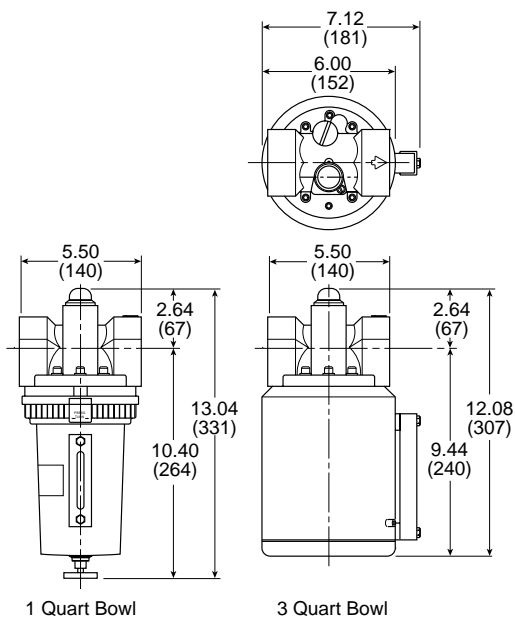
Port size	Bowl type	Bowl capacity	Flow SCFM	Part number (NPT)
2"	Metal / Sight gauge	1 quart	1000	09L84BA
2"	Metal / Sight gauge	3 quart	1000	09L8PBA

* Engineering level will be added at factory.

Service kits

Bowl kit	Metal bowl, sight gauge / twist drain	PS612P*
Fill cap kit		PS610P
Lubricator service kit		PS607P
Oil	1 Quart	F442001
	12 Quart case	F442003
	4 Gallon case	F442005
Sight dome kit		PS613P

* 1 quart bowl.



 Most popular.

C628 Standard General Industrial Combinations

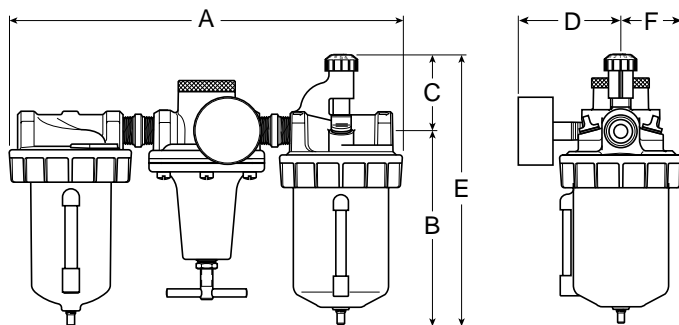
- Regulator can be mounted with knob in up or down position
- 40 micron filter element
- Gauges included on combinations
- Manual twist drain
- Relieving regulator



C628 Standard Combinations



Port size	Bowl type	Bowl capacity	Element type	Part number
3/4"	Metal / Sight gauge	16 oz	40 micron	C628-06FRLWJCW
3/4"	Metal / Without sight gauge	32 oz	40 micron	C628-06FRLEJCE
1"	Metal / Sight gauge	16 oz	40 micron	C628-08FRLWJCW
1"	Metal / Without sight gauge	32 oz	40 micron	C628-08FRLEJCE
1-1/4"	Metal / Sight gauge	16 oz	40 micron	C628-10FRLWJCW
1-1/4"	Metal / Without sight gauge	32 oz	40 micron	C628-10FRLEJCE
1-1/2"	Metal / Sight gauge	16 oz	40 micron	C628-12FRLWJCW
1-1/2"	Metal / Without sight gauge	32 oz	40 micron	C628-12FRLEJCE



A	B	C	D	E	F
C628-06FRL, C628-08FRL					
15.75 (400)	7.75 (197)	2.63 (67)	3.52 (89)	13.00 (330)	2.48 (63)
C628-10FRL, C628-12FRL					
16.50 (419)	8.13 (206)	2.84 (72)	3.86 (98)	14.13 (359)	2.64 (67)

Inches (mm)
 • All dimensions nominal.

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.





Stainless Steel Filters

The range of Stainless Steel FRLs are ideal for use in the food industry, the petrochemical or process industries or any application in a particularly harsh or aggressive environment.

- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- 1/8" female threaded drain



Air Preparation Products

Global

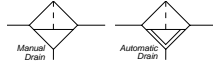
Prep-Air II

Miniature

Operating information

		PF504	PF10	PF501	PF11
Operating pressure:	Twist drain	0 to 300 PSIG (0 to 20.7 bar)	0 to 300 PSIG (0 to 20.7 bar)	0 to 300 PSIG (0 to 20.7 bar)	0 to 300 PSIG (0 to 20.7 bar)
	Auto drain	10 to 175 PSIG (0 to 12 bar)	10 to 175 PSIG (0 to 12 bar)	10 to 175 PSIG (0 to 12 bar)	10 to 175 PSIG (0 to 12 bar)
Operating temperature:	Twist drain	0°F to 180°F (-18°C to 82°C)	0°F to 180°F (-18°C to 82°C)	0°F to 180°F (-18°C to 82°C)	0°F to 180°F (-18°C to 82°C)
	Auto drain	32°F to 150°F (0°C to 66°C)	32°F to 150°F (0°C to 66°C)	32°F to 150°F (0°C to 66°C)	32°F to 150°F (0°C to 66°C)
Flow / SCFM (dm ³ /s):		23 (10.85)	70 (33.04)	16 (7.55)	45 (21.24)

Particulate Filters



Port Size	Flow SCFM (dm ³ /s)	Standard filtration	Part number manual drain	Part number auto drain
1/4	23 (10.85)	20 μ	PF504-02DHSS	PF504-02DHRSS
1/2	70 (33.04)	40 μ	PF10-04WJSS	PF10-04WJRSS

P3N

General Industrial

Coalescing Filters



Port Size	Flow SCFM (dm ³ /s)	Standard filtration	Part number manual drain	Part number auto drain
1/4	16 (7.55)	.3 μ	PF501-02DHSS	PF501-02DHRSS
1/2	45 (21.24)	.01 μ	PF11-04WJSS	PF11-04WJRSS

Stainless Steel

Precision / Proportional

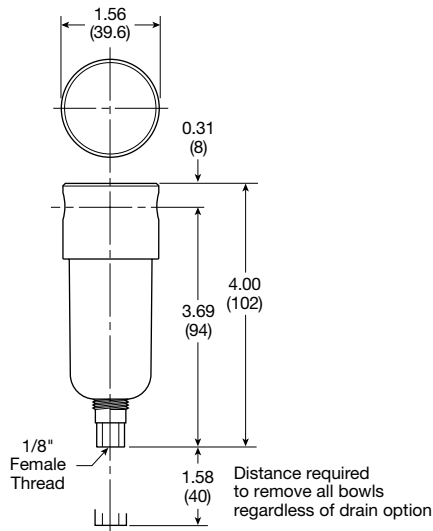
Service kits

Description	PF504	PF10	PF501	PF11
Drain kit -	automatic pulse	RK504SY-SS	RK504SY-SS	
	automatic float		SA10MDSS	SA10MDSS
	manual twist, small (old)	SA600Y7-1SS	SA600Y7-1SS	SA600Y7-1SS
	manual twist, large (new)	SAP05481	SAP05481	SAP05481
Filter element -	5 micron (particulate)	EK504VY	EK55J	
	20 micron (particulate)	EK504Y		
	40 micron (particulate)		EK55G	
	0.3 micron (coalescing)		EK501H	
	0.01 micron (coalescing)			EKF71
Pipe nipple	616Y28-SS	616A28-SS	616Y28-SS	616A28-SS

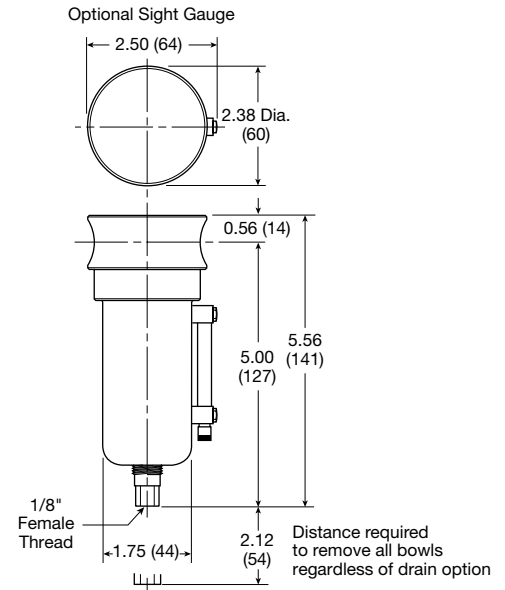
Most popular.



PF504 / PF501



PF10 / PF11



Specifications

Description	PF504	PF10	PF501	PF11
Filter rating	20 micron	40 micron	0.3 micron	0.01 micron
Port threads	1/4	1/2	1/4	1/2
Weight	0.6 lb. (0.27 kg)	1.9 lb. (0.85 kg)	0.6 lb. (0.27 kg)	1.9 lb. (0.85 kg)

Material specifications

Description	PF504	PF10	PF501	PF11
Body	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Bowls	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Deflector	Acetal	Acetal		
Drain	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Element holder	Acetal	Acetal	Acetal	Acetal
Filter element	Polyethylene	Polyethylene	Borosilicate fiber	Borosilicate fiber
Seals	Fluorocarbon	Fluorocarbon	Fluorocarbon	Fluorocarbon
Sight gauge		Isoplast		Isoplast



Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

Stainless Steel Regulators

The range of Stainless Steel FRLs are ideal for use in the food industry, the petrochemical or process industries or any application in a particularly harsh or aggressive environment.

- Stainless steel construction handles most corrosive environments
- Large diaphragm to valve area ratio for precise regulation and high flow capacity
- Meets NACE specifications MR-01-75/ISO 15156



WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT -

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

	PR354 & PR11	PR364 & PR10
Operating pressure:	300 PSIG Max (20.7 bar)	300 PSIG Max (20.7 bar)
Operating temperature:	0°F to 180°F (-18°C to 82°C)	0°F to 150°F (-18°C to 66°C)
Flow / SCFM (dm ³ /s):	12 (5.66)	80 (37.76)

Regulators



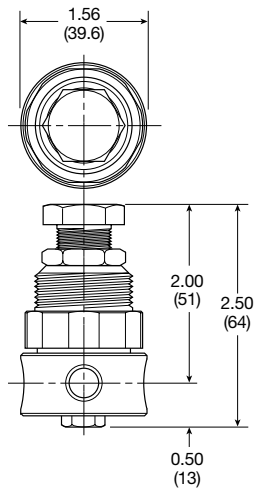
Port size	Adjustment type	Flow SCFM (dm ³ /s)	Part number 0 to 125 PSIG
1/4	Knob version	12 (5.66)	PR364-02CSS
1/4	All metal version	12 (5.66)	PR354-02CSS
1/2	Knob version	80 (37.76)	PR10-04CSS
1/2	T-handle version	80 (37.76)	PR11-04CSS

Service kits

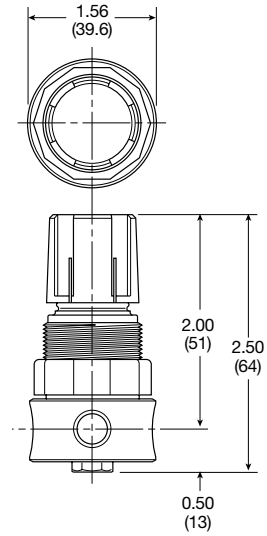
Description		PR354	PR364	PR10	PR11
Bonnet Kit		CKR354YSS	CKR364Y-1SS	CKR10YSS	CKR11YSS
Gauge, stainless – 160 PSIG (0 to 1100 kPa)	1-1/2" Face	K4515N14160SS	K4515N14160SS		
	2" Face			K4520N14160SS	K4520N14160SS
Panel mount bracket (stainless)		161X57-SS	161X57-SS	R10Y57-SS	R10Y57-SS
Panel mount nut –	stainless	R05X51-SS	R05X51-SS	R10X51-SS	R10X51-SS
	plastic	R05X51-P	R05X51-P	R10X51-P	R10X51-P
Pipe nipple, 316 stainless steel		616Y28-SS	616Y28-SS	616A28-SS	616A28-SS
Service Kit –	relieving	RKR364YSS	RKR364YSS	RKR10YSS	RKR10YSS
	non-relieving	RKR364KYSS	RKR364KYSS	RKR10KYSS	RKR10KYSS
Springs –	0-25 PSIG range	SPR-375-2-SS	SPR-375-2-SS	SPR-388-1-SS	SPR-388-1-SS
	0-60 PSIG range	SPR-376-1-SS	SPR-376-1-SS	SPR-389-1-SS	SPR-389-1-SS
	0-125 PSIG range	SPR-377-1-SS	SPR-377-1-SS	SPR-390-1-SS	SPR-390-1-SS

Most popular.

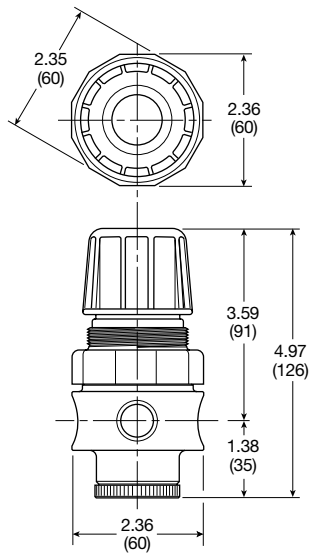
PR354



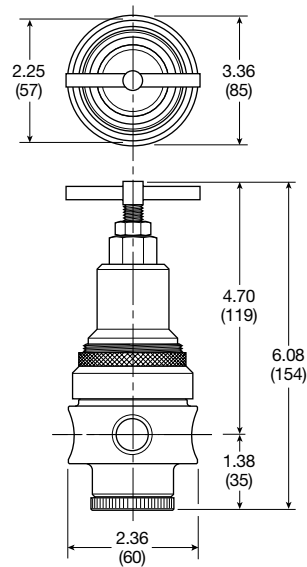
PR364



PR10



PR11



Specifications

Description	PR354	PR364	PR10	PR11
Gauge port	1/4	1/4	1/4	1/4
Operation	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm
Port threads	1/4	1/4	1/2	1/2
Weight	0.5 lb. (0.23 kg)	0.5 lb. (0.23 kg)	1.79 lb. (0.81 kg)	1.79 lb. (0.81 kg)

Material specifications

Description	PR354	PR364	PR10	PR11
Adjustment mechanism / springs:	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Adjusting knob	316 stainless steel	Polypropylene		
Body / poppet	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Bonnet	316 stainless steel	Acetal	Acetal	316 stainless steel
Bottom plug	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Seals	Fluorocarbon	Fluorocarbon	Fluorocarbon	Fluorocarbon



Stainless Steel Filter / Regulators

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- Large diaphragm to valve area ratio for precise regulation and high flow capacity
- Meets NACE specifications MR-01-75/ISO 15156



WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:

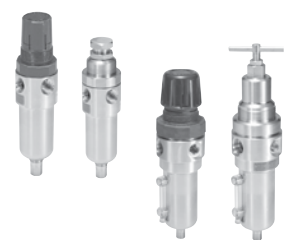
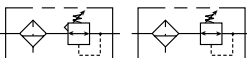
REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

	PB548 & PB558	PB11 & PB12
Operating pressure:	300 PSIG max (20.7 bar)	300 PSIG max (20.7 bar)
Operating temperature:	PB548: 0°F to 150°F (-18°C to 66°C)	PB11: 0°F to 150°F (-18°C to 66°C)
	PB558: 0°F to 180°F (-18°C to 82°C)	PB12: 0°F to 180°F (-18°C to 82°C)
Flow / SCFM (dm ³ /s):	12 (5.66)	72 (33.98)

Filter / Regulators



Port size	Adjustment type	Drain type	Flow SCFM (dm ³ /s) ft/min@100 PSI	Part number 0 to 125 PSIG
1/4	Knob version	Manual twist	12 (5.66)	PB548-02DHCSS
1/4	All metal version	Manual twist	12 (5.66)	PB558-02DHCSS
1/2	Knob version	Manual twist	72 (33.98)	PB11-04WJCSS
1/2	Knob version	Auto float	72 (33.98)	PB11-04WJCRSS
1/2	T-handle version	Manual twist	72 (33.98)	PB12-04WJCSS
1/2	T-handle version	Auto float	72 (33.98)	PB12-04WJCRSS

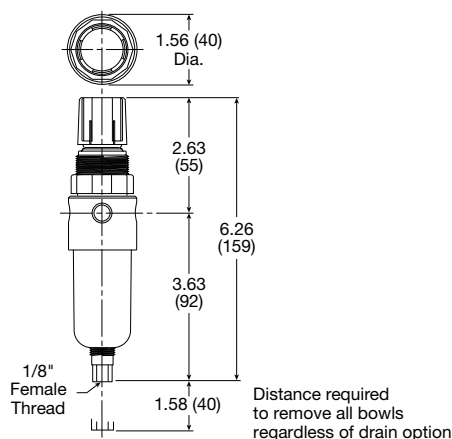
Service kits

Description	PB548	PB558	PB11	PB12
Bonnet kit	CKR364Y-1SS	CKR354YSS	CKR10YSS	CKR11YSS
Drain kit -	automatic pulse	RK504SY-SS		
	automatic float		SA10MDSS	SA10MDSS
	manual twist, small (old)	SA600Y7-1SS	SA600Y7-1SS	SA600Y7-1SS
	manual twist, large (new)	SAP05481	SAP05481	SAP05481
Filter element kits particulate	5 micron	EK504VY	EK504VY	EKF10VY
	20 micron	EK504Y	EK504Y	
	40 micron		EKF10Y	EKF10Y
Gauge, stainless 160 PSIG (0 to 1100 kPa)	1-1/2" Face	K4515N14160SS	K4515N14160SS	
	2" Face			K4520N14160SS K4520N14160SS
Panel mount bracket (stainless)	161X57-SS	161X57-SS	R10Y57-SS	R10Y57-SS
Panel mount nut -	stainless	R05X51-SS	R10X51-SS	R10X51-SS
	plastic	R05X51-P	R10X51-P	R10X51-P
Pipe nipple, 316 stainless steel	616Y28-SS	616Y28-SS	616A28-SS	616A28-SS
Service kit -	relieving	RK549YSS	RKR10YSS	RKR10YSS
	non-relieving	RK548YSS	RKR10KYSS	RKR10KYSS
Springs -	0-25 PSIG range	SPR-375-2-SS	SPR-375-2-SS	
	0-60 PSIG range	SPR-376-1-SS	SPR-376-1-SS	SPR-388-1-SS SPR-388-1-SS
	0-125 PSIG range	SPR-377-1-SS	SPR-377-1-SS	SPR-389-1-SS SPR-389-1-SS
	0-250 PSIG range			SPR-390-1-SS SPR-390-1-SS

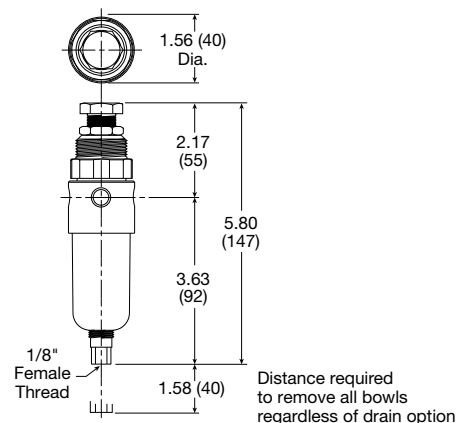
Most popular.



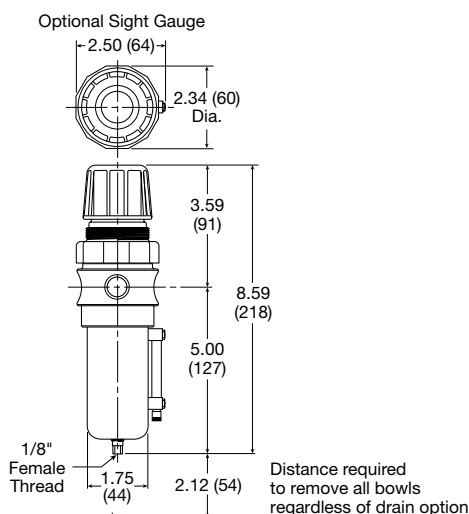
PB548



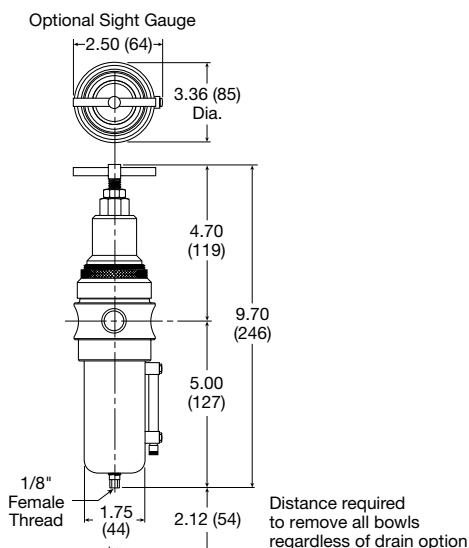
PB588



PB11



PB12



Specifications

Description	PB548	PB588	PB11	PB12
Filter rating	20 micron	20 micron	40 micron	40 micron
Gauge port	1/4	1/4	1/4	1/4
Operation	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm
Port threads	1/4	1/4	1/2	1/2
Weight	0.6 lb. (0.27 kg)	0.6 lb. (0.27 kg)	2.42 lb. (1.09 kg)	2.42 lb. (1.09 kg)

Material specifications

Description	PB548	PB588	PB11	PB12
Adjustment mechanism / springs	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Adjusting knob	Polypropylene	316 stainless steel	Acetal	316 stainless steel
Body / poppet	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Bonnet	Acetal	316 stainless steel	Acetal	316 stainless steel
Bottom plug	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Seals	Fluorocarbon	Fluorocarbon	Fluorocarbon	Fluorocarbon
Sight gauge			Isoplast	Isoplast



P

Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

Stainless Steel Lubricators

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- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- 1/8" female threaded drain
- Fillable under pressure



Operating information

Operating pressure – no sight gauge	0 to 300 PSIG (0 to 20.7 bar)
with sight gauge	0 to 250 PSIG (0 to 17.2 bar)
Operating temperature:	0°F to 150°F (-18°C to 66°C)
Flow / SCFM (dm ³ /s):	100 (47.19)

Lubricators



Port size	Flow SCFM (dm ³ /s)	Part number metal bowl with sight gauge
1/2	100 (47.19)	PL10-04WSS

Service kits

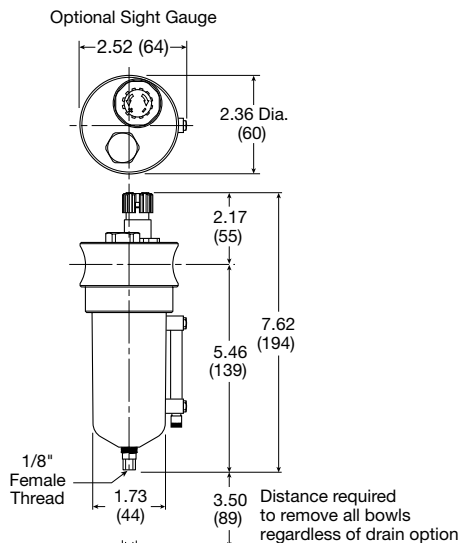
Description	Part number
Drain kit - manual twist drain, small (old)	SA600Y7-1SS
large (new)	SAP05481
Pipe nipple, 316 Stainless Steel	616A28-SS
Sight dome kit - old	RKL10SS
new	PS740N

Specifications

Description	PL10
Bowl capacity	4.0 ounces
Port threads	1/2
Weight	1.9 lb. (0.85 kg)

Material specifications

Description	PL10
Body	316 stainless steel
Bowls	316 stainless steel
Dip tube / drain / fill plug	316 stainless steel
Seals	Fluorocarbon
Sight dome	Nylon
Sight gauge	Isoplast



Most popular.

Semi-Precision Dial Regulators

51R

- Pressure reference indicating dial face
- Non-rising, pressure-adjustment dial
- Self-relieving
- Full pressure adjustment in less than one full turn
- Recommended for pilot-air applications

52R, 53R, 54R

- Balanced poppet design
- Non-rising, pressure-adjusting dial
- High-relief flow (3/16" relief orifice)
- Two 1/4" gauge ports
- Piston operated



Operating information

Adjusting range pressure: 2 to 40 PSIG (0 to 2.8 bar)
 5 to 160 PSIG (0 to 11.0 bar)

Max supply pressure: 300 PSIG (20.7 bar)

Max operating temperature: 150°F (65.5°C)

Dial Regulators, relieving



Port size	Flow capacity* SCFM (dm ³ /s)	Part number	
		Low pressure 2 to 40 PSIG (0.14 to 3 bar)	Standard pressure 5 to 160 PSIG (0.34 to 11 bar)
1/4	0.7 (.3)	51R125RA	51R126RA
1/4	117 (55)	52R125RA	52R126RA
3/8	180 (85)	52R225RA	52R226RA
1/2	195 (92)	52R325RA	52R326RA
3/4	220 (104)	52R425RA	52R426RA
3/4	400 (189)	53R425RA	53R426RA
1	650 (307)	53R525RA	53R526RA
1-1/4	700 (330)	53R625RA	53R626RA
1-1/2	1,600 (755)	54R725RA	54R726RA
2	1,600 (755)	54R825RA	54R826RA

* SCFM = Standard cubic feet per minute at 100 PSIG (6.9 bar) inlet, 90 PSIG (6.2 bar) no-flow secondary setting and 25 PSIG pressure drop.

Service kits

Description	51R	52R	53R	54R
Adjustment dial knob	RRP-16-024	RRP-16-024	RRP-16-024	RRP-16-024
O-ring, repair kit	GRP-95-260	GRP-95-260	GRP-95-261	GRP-95-262
Piston and bonnet repair kit	RRP-95-765	RRP-95-766	RRP-95-766	RRP-95-766
Piston bottom and o-ring seal		RRP-95-192	RRP-95-192	RRP-95-192
Spring, regulation, Belleville washer –				
2 to 40 PSIG (2.8 bar)	RRP-95-906	RRP-95-906	RRP-95-906	RRP-95-906
5 to 160 PSIG (11.0 bar)	RRP-95-905	RRP-95-905	RRP-95-905	RRP-95-905
Spring, main valve				RRP-95-024
Tamper resistant kit	RRP-95-585	RRP-95-585	RRP-95-585	RRP-95-585
Valve, main with u-cup seal & bottom plug		RRP-95-914		
Valve, main with u-cup seal		RRP-95-151		
Valve, main with o-ring seal			RRP-95-152	RRP-95-153
Valve, pilot with o-ring and valve spring	RRP-96-934	RRP-96-934	RRP-96-935	RRP-96-935

Most popular.



Air Preparation Products

Global

Prep-Air II

Miniature

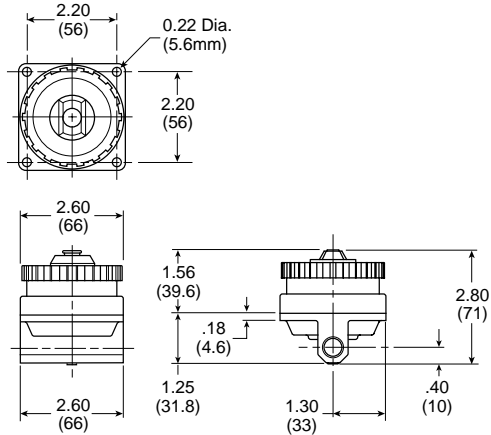
P3N

General Industrial

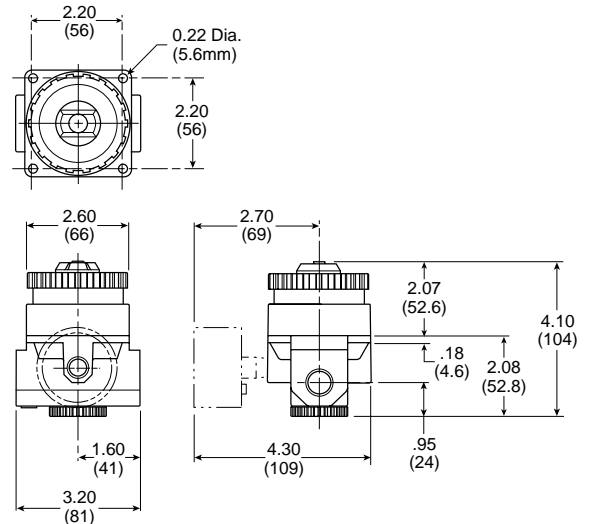
Stainless Steel

Precision / Separators

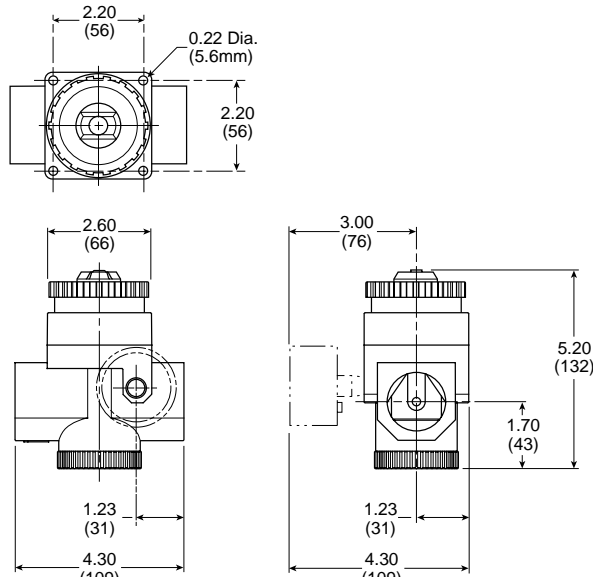
51R



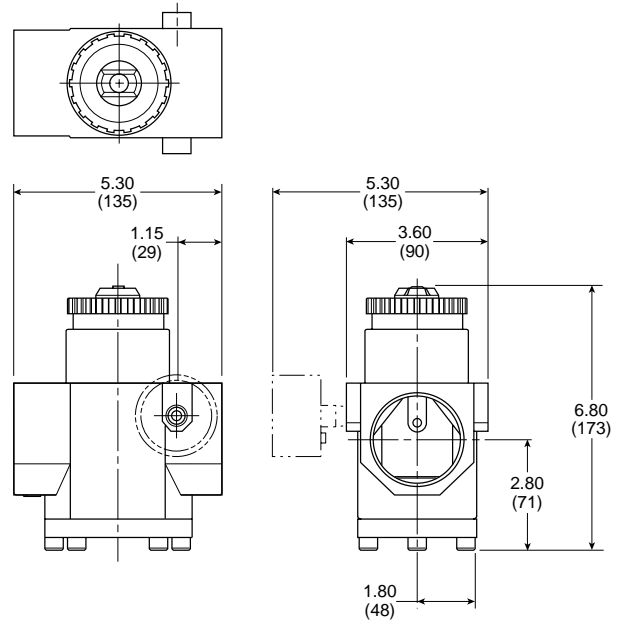
52R



53R



54R



Specifications

Description	51R	52R	53R	54R
Bleed rate	0.05 SCFM	0.05 SCFM	0.05 SCFM	0.05 SCFM
Gauge port	—	Two ports 1/4	Two ports 1/4	Two ports 1/4
Port threads	1/4	1/4, 3/8, 1/2, 3/4	3/4, 1, 1-1/4	1-1/2, 2
Weight	1.3 lb. (0.5 kg)	2.3 lb. (1.04 kg)	4.0 lb. (1.8 kg)	9 lb. (4.1 kg)

Material specifications

Description	
Body	Zinc
Bonnet	Zinc / brass
Piston	Acetal
Seals	Nitrile
Springs	Steel
Valve assembly	Brass / nitrile / acetal

WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.



Precision Filter / Regulators

- The no-brass construction is well suited to harsh environments
- Internal and external epoxy finish for superior corrosion resistance
- Non-bleed design to reduce consumption
- Integral relief valve
- A gauge port provides convenient pressure gauge mounting
- The standard 5-micron filter minimizes internal contamination
- The filter dripwell contains a drain plug to easily drain trapped liquids
- Standard tapped exhaust
- Soft relief seat minimizes air loss

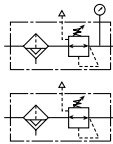


P3EA632 Series

Operating information

Supply pressure:	250 PSIG (17.2 bar), (1700 kPa) max
Temperature range:	-10°F to 160°F (-23°C to 71°C)
Sensitivity:	1.0" (.036 PSIG) (2.54 cm) water column
Flow capacity:	25 SCFM (42.5 m ³ /HR) @ 100 PSIG, (7 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint
Exhaust capacity:	0.8 (1.36 m ³ /HR) where downstream pressure is 5 PSIG, (.35 bar) (35 kPa) above 20 PSIG (1.5 bar), (150 kPa) setpoint (0.8 SCFM for 120 # unit)
Consumption:	Undetectable
Supply pressure effect:	Less than 1.25 PSIG, (.09 bar), (9 kPa) change for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure (1.90 PSIG for 120 # unit)

P3EA632 Precision Filter / Regulator



Port size	Spring	Part number
1/4"	1 to 60 PSIG	P3EA63242NS
1/4"	2 to 120 PSIG	P3EA63252NS

Note: Other spring ranges, port sizes, and options available. Please consult factory.

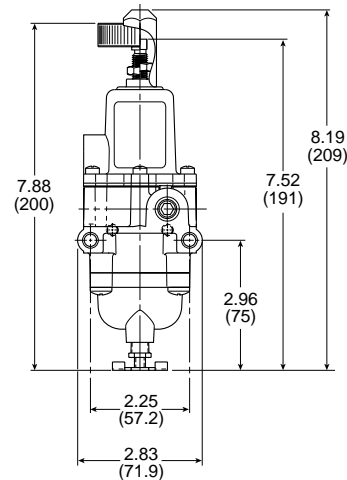
Service kits

Service kit	1 to 60, 2 to 120 PSIG	PS19968-NR
Tamper resistant kit		PS12165

Material specifications

Body and housing	Epoxy coated aluminum
Elastomers	Nitrile
Trim	Stainless steel, nickel plated steel

Most popular.



⚠ WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Precision Pneumatic Input Signal Amplifier - 1/4"

- The P3BA208 uses a pneumatic input signal to accurately control output pressure based on a predetermined ratio
- A balanced supply valve minimizes the effects of supply pressure variation
- An aspirator tube compensates downstream pressure droop under flowing conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction allows servicing without removal



P3BA208 Series
1/4" port size

Operating information

	Signal : Output	1:1	1:2	1:3
Output pressure, maximum:		150 PSIG (10 bar)	150 PSIG (10 bar)	150 PSIG (10 bar)
Supply pressure, maximum:		250 PSIG (17 bar)	250 PSIG (17 bar)	250 PSIG (17 bar)
Flow capacity – 100 PSIG, (7 bar), supply 20 PSIG, (1.5 bar) output		45 SCFM (76.5 m ³ /HR)	45 SCFM (76.5 m ³ /HR)	45 SCFM (76.5 m ³ /HR)
Exhaust capacity – Downstream pressure 5 PSIG (.35 bar) above 20 PSIG (1.5 bar) setpoint		11 SCFM (18.7 m ³ /HR)	11 SCFM (18.7 m ³ /HR)	11 SCFM (18.7 m ³ /HR)
Sensitivity, water column:		.250" (.64 cm)	.500" (1.27 cm)	.750" (1.9 cm)
Ratio accuracy – % of 100 PSIG (7 bar) output span % of output span with 100 PSIG (7 bar) input span		1.0 —	1.0 —	1.0 —
Supply pressure effect – for change of 100 PSIG (7 bar)		0.10 PSIG (.007 bar)	0.20 PSIG (.014 bar)	0.30 PSIG (.021 bar)
Ambient temperature:		-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)

P3BA208 Precision Pneumatic Input Signal Amplifier



Port size	Pilot ratio	Part number
1/4"	1:1	P3BA20812
1/4"	1:2	P3BA20822
1/4"	1:3	P3BA20823

Note: Other spring ranges, port sizes, and options available. Please consult factory.

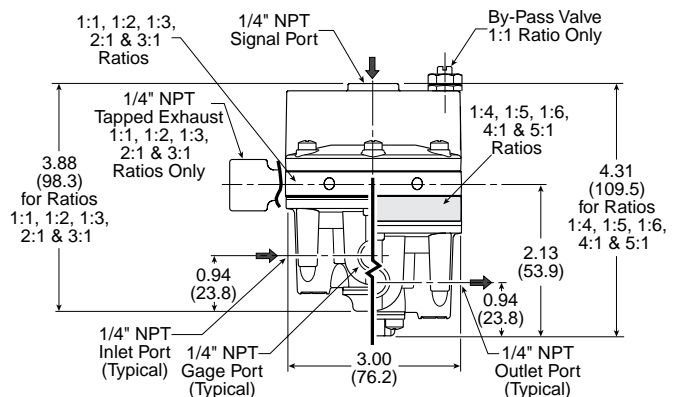
Service kits

1:1 ratio	PS19513-11
1:1 ratio w/ by-pass valve	PS19513-11
1:2 ratio	PS19513-12
1:3 ration	PS19513-13
Mounting bracket	PS09921

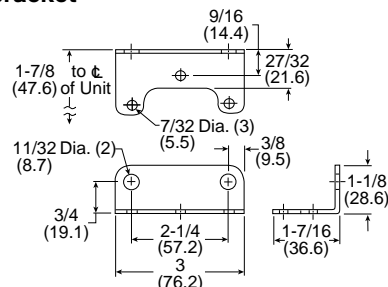
Material specifications

Body and housing	Aluminum
Elastomers	Nitrile on dacron fabric
Trim	Zinc plated steel, brass

Most popular.



Mounting bracket



Precision Pneumatic Input Signal Amplifier - 1/2" & 3/4"

- Five signal to output ratios meet most control element requirements
- Control sensitivity of water column allows use in precision applications
- Large supply and exhaust Valves provide high forward and exhaust flows
- Soft supply and exhaust Valve seats minimize air consumption
- A balanced supply valve minimizes the effect of supply pressure variation
- An aspirator tube compensates downstream pressure droop under flow conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service the P3BA45 without removing it from the line



P3BA45 Series
 1/2" & 3/4" port size

Operating information	Signal : Output 1:1	1:2	1:3
Output pressure, maximum:	150 PSIG (10 bar)	150 PSIG (10 bar)	150 PSIG (10 bar)
Supply pressure, maximum:	250 PSIG (17 bar)	250 PSIG (17 bar)	250 PSIG (17 bar)
Flow capacity – 100 PSIG, (7 bar), supply 20 PSIG, (1.5 bar) output	150 SCFM (255 m ³ /HR)	150 SCFM (255 m ³ /HR)	150 SCFM (255 m ³ /HR)
Exhaust capacity – Downstream pressure 5 PSIG (.35 bar) above 20 PSIG (1.5 bar) setpoint	40 SCFM (62.5 m ³ /HR)	40 SCFM (62.5 m ³ /HR)	40 SCFM (62.5 m ³ /HR)
Sensitivity, water column:	1.0" (2.54 cm)	2.0" (5.08 cm)	3.0" (7.62 cm)
Ratio Accuracy – % of 100 PSIG (7 bar) output span % of output span with 100 PSIG (7 bar) input span	3.0 —	3.0 —	3.0 —
Supply pressure effect – for change of 100 PSIG (7 bar)	0.10 PSIG (.007 bar)	0.20 PSIG (.014 bar)	0.30 PSIG (.021 bar)
Ambient temperature:	-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)
Hazardous locations:	Acceptable for use in zones 1 and 2 for gas atmospheres; Groups IIA and IIB and zones 21 and 22 for dust atmospheres.		

P3BA45 Precision Pneumatic Input Signal Amplifier



Port size	Pilot ratio	Part number
1/2"	1:1	P3BA4514A
1/2"	1:2	P3BA4524A
1/2"	1:3	P3BA4534A
3/4"	1:1	P3BA4516A
3/4"	1:2	P3BA4526A
3/4"	1:3	P3BA4536A

Note: Other spring ranges, port sizes, and options available. Please consult factory.

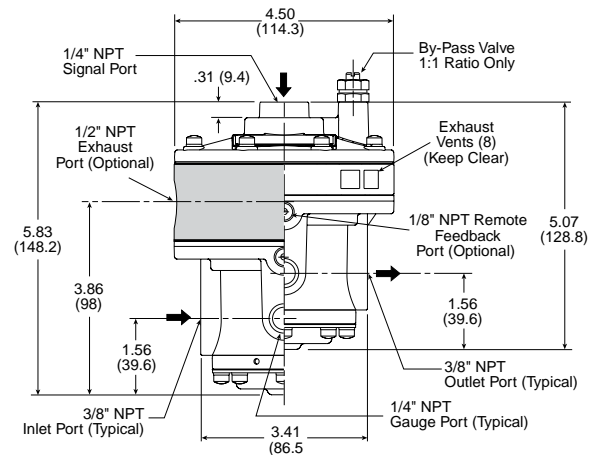
Service kits

1:1 ratio	PS19549-1
1:1 ratio w/ tapped exhaust	PS19549-1E
1:2 ratio	PS19549-2
1:3 ratio	PS19549-3
1:1 w/ tapped exhaust, I option	PS19549-20E

Most popular.

Material specifications

Body and housing	Aluminum
Diaphragm	Nitrile on dacron fabric
Trim	Zinc plated steel, brass





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

High Precision Regulators

- Control sensitivity of .250" (.010 PSIG) (.64 cm) water column variation allows use in precision applications
- A compensating diaphragm lets the regulator remain unaffected by supply pressure changes
- Flow of up to 40 SCFM with 100 PSIG supply allows use in applications with high flow requirements
- An aspirator tube compensates downstream pressure droop under flow conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service the regulator without removing it from the line



P3RA302 Series

Operating information

Supply pressure:	250 PSIG (17.2 bar), (1700 kPa) max
Ambient temperature:	-40°F to 200°F (-40°C to 93°C)
Sensitivity:	.250" (.010 PSIG) (.64 cm) water column
Flow capacity:	40 SCFM (68 m ³ /HR) @ 100 PSIG, (7.0 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint
Exhaust capacity:	2.0 SCFM (3.4 m ³ /HR) where downstream pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint
Supply pressure effect:	Less than 0.2 PSIG, (.014 bar), (.14 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure
Hazardous locations:	Acceptable for use in zones 1 and 2 for gas atmosphere: Groups IIA and IIB and zones 21 and 22 for dust atmospheres

P3RA302 Compact High Precision Regulator



Port size	Spring	Part number
1/4"	0.5 to 30 PSIG	P3RA30232
1/4"	1 to 60 PSIG	P3RA30242
1/4"	2 to 100 PSIG	P3RA30252

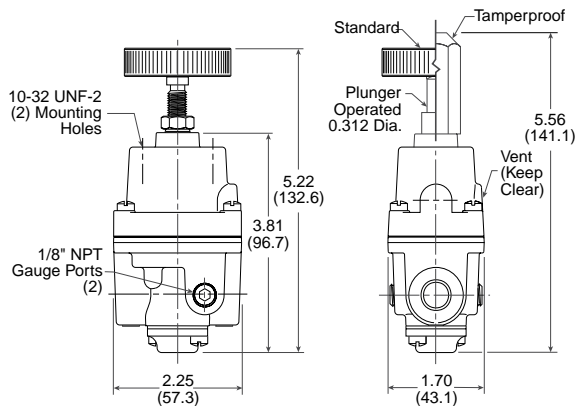
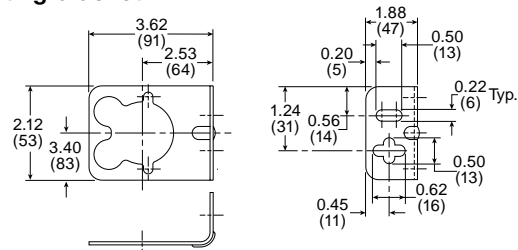
Service kits

Service kit	Nitrile, standard	PS16116-13
	Nitrile, non-relieving	PS16116-14
Tamper resistant kit		PS12163
Mounting bracket kit		PS417BP

Material specifications

Body and housing	Aluminum
Diaphragms	Nitrile on dacron
Trim	Brass

Mounting bracket



WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION: REGULATOR PRESSURE ADJUSTMENT -

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



High Precision Regulators

- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision processes
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Optional check valve permits dumping of downstream pressure when supply is opened to atmosphere
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator tube compensates downstream pressure droop under flow conditions



P3RA102 Series

Operating information

Supply pressure:	500 PSIG (35 bar), (3500 kPa) max
Ambient temperature:	-40°F to 200°F (-40°C to 93°C)
Sensitivity:	.125" (.005 PSIG) (.32 cm) water column
Flow capacity:	40 SCFM (68 m ³ /HR) @ 100 PSIG, (7.0 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint
Exhaust capacity:	5.5 SCFM (9.35 m ³ /HR) where downstream pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint
Supply pressure effect:	Less than 0.1 PSIG, (.007 bar), (.7 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure
Hazardous locations:	Acceptable for use in zones 1 and 2 for gas atmosphere: Groups IIA and IIB and zones 21 and 22 for dust atmospheres

P3RA102 Standard High Precision Regulator



Port size	Spring	Part number
1/4"	0.5 to 30 PSIG	P3RA10232
1/4"	1 to 60 PSIG	P3RA10242
1/4"	2 to 150 PSIG	P3RA10262

Service kits

Service kit	0 to 200 PSIG, relieving	PS12125-1
	0 to 200 PSIG, non-relieving	PS12125-4
Tamper resistant kit		PS12165
Mounting bracket kit, zinc plated steel		PS09921

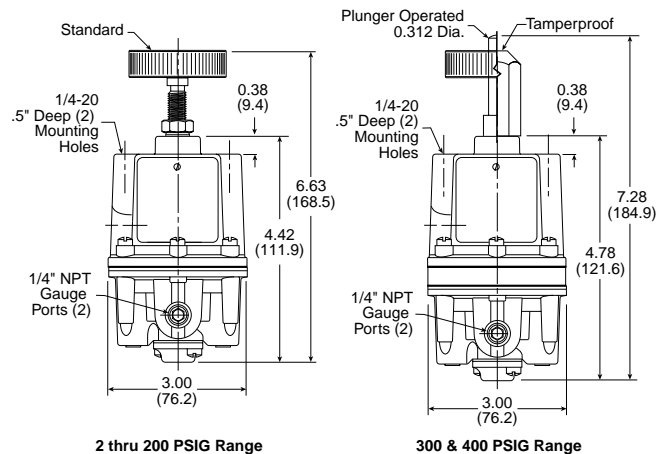
Material specifications

Body and housing	Aluminum
Diaphragms (standard unit only)	Buna N on dacron
Trim	Brass, zinc plated steel

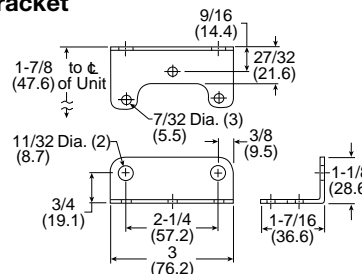
WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

Most popular.



Mounting bracket



CAUTION: REGULATOR PRESSURE ADJUSTMENT -

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

High Precision Relief Valves

- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision applications
- A separate control chamber and Aspirator Tube isolate the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service without removing it from the line
- Mounting bracket is available



P3RA102BP Series

Operating information

Setpoint range – 2 to 200 PSIG (0.15 to 14 bar) (15 to 1400 kPa)	System pressure (maximum) 300 PSIG (21 bar), (2100 kPa) max
300 to 400 PSIG (21 to 28 bar) (2100 to 2800 kPa)	500 PSIG (35 bar), (3500 kPa) max
Ambient temperature:	-40°F to 200°F (-40°C to 93°C)
Sensitivity:	.125" (.005 PSIG) (.32 cm) water column
Flow capacity:	40 SCFM (68 m ³ /HR) @ 100 PSIG, (7.0 bar), (700 kPa) system pressure

P3RA102BP High Precision Relief Valve



Port size	Spring	Part number
1/4"	0.5 to 30 PSIG	P3RA10232BP
1/4"	1 to 60 PSIG	P3RA10242BP
1/4"	2 to 150 PSIG	P3RA10262BP

Service kits

Service kit	0 to 200 PSIG, standard	PS12127-1
Tamper resistant kit		PS12165
Mounting bracket kit, zinc plated steel		PS09921

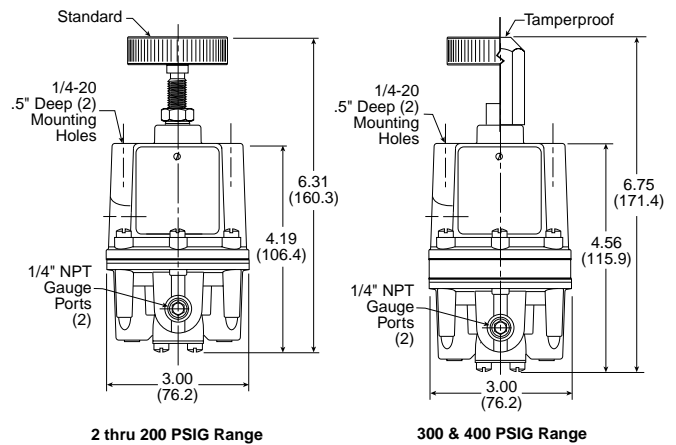
Material specifications

Body and housing	Aluminum
Nozzle	Nitrile on dacron
Trim	Zinc plated steel, brass

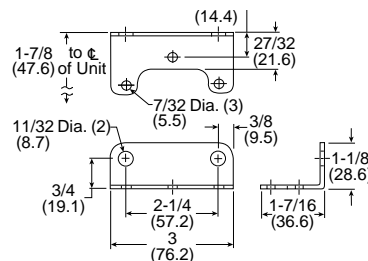
WARNING

Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

Most popular.



Mounting bracket



CAUTION: REGULATOR PRESSURE ADJUSTMENT –

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

High Precision Vacuum Regulator

- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision applications
- Balanced supply valve minimizes effects of vacuum variation
- Aspirator tube compensates for downstream pressure droop under flow conditions
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Construction allows servicing without removing from the line



P3RA171 Series

Operating information

Vacuum supply:	29.92 Hg (760 torr) max
Ambient temperature:	-40°F to 200°F (-40°C to 93°C)
Sensitivity:	.125" (.005 PSIG) (.32 cm) water column
Flow capacity:	3 SCFM @ 650 torr supply, 250 torr setpoint
Vacuum supply effect:	Less than 1 torr for 100 torr (.04 Hg for 3.94 Hg) change in vacuum supply

P3RA171 High Precision Vacuum Regulator



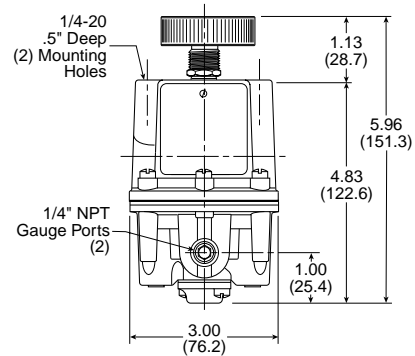
Port size	Spring	Part number
1/4"	0 to 30 Hg	P3RA17132NNKN

Service kits

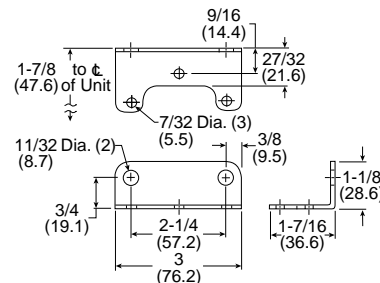
Service kit	Includes diaphragm, valve, seat assemblies and gasket	PS20966-9
Tamper resistant kit		PS20967-1
Mounting bracket kit, zinc plated steel		PS09921
Vacuum gauge		266298A

Material specifications

Body and housing	Aluminum
Elastomers	Nitrile
Trim	Zinc plated steel, brass



Mounting bracket



WARNING
 Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT -
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



Electronic Proportional Regulators

- Very fast response times
- Accurate output pressure
- Micro parameter settings
- Selectable I/O parameters
- Quick, full flow exhaust
- LED display indicates output pressure
- No air consumption in steady state
- Multiple mounting options
- Protection to IP65
- P31P flows to 19 dm³/s (40 SCFM)
- P32P flows to 57 dm³/s (120 SCFM)



P31P Series
Bottom exhaust



P32P Series
Bottom exhaust

Ordering information

P31PA 9 2 A Z 2 V D 1

Body size	Thread type	Power supply	Control signal	Input Connector
Global modular mini (1/4") P31PA	BSPP 1	2 24 volts	V 0-10V [†]	1 M12 (4-pin)
Global modular compact (1/2") P32PA	BSPT 2 NPT 9			

Port size	Pressure range	Output signal
Global modular mini (1/4") 2	Z 0 - 2 bar (0-29 PSIG)	D Digital, PNP
Global modular compact (1/2") 4	D 0 - 10 bar (0-145 PSIG)	P PNP or 0-10V
		N NPN or 0-10V
		M 4-20mA fixed

Version	Exhaust type
Bottom ported exhaust (NC) A	
Bottom ported forced exhaust (NO) [‡] E	

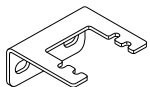
[†] When the supply voltage is lost the unit will automatically exhaust the regulated pressure to 0 bar (atmospheric pressure)

[‡] Factory setting is 0-10 V control signal. 4-20 mA control signal available via parameter 4 on keypad.

D) Digital PNP output only, no analog output selectable
P) Digital PNP and analogue 0-10V outputs selectable, by means of parameter 6. (Factory default 0-10V)
N) Digital NPN and analog 0-10 V outputs selectable by means of parameter 6. Factory default 0-10V)
M) Analog 4-20mA output only.
Note: On all analog outputs the F.S. value can be adjusted by means of parameter 8.

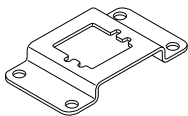
Bold items are most common.

P31P mounting brackets



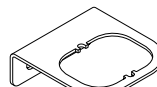
L-bracket

Part number	Description
P3HKA00ML	L-bracket mounting kit
P3HKA00MC	Foot bracket mounting kit



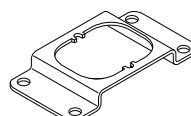
Foot bracket

P32P mounting brackets



L-bracket

Part number	Description
P3KKA00ML	L-bracket mounting kit
P3KKA00MC	Foot bracket mounting kit



Foot bracket

Cables

Part number	Description
CB-M12-4P-2M	2 mtr. cable with moulded straight M12x1 connector

Most popular.



Technical information

Working medium

Compressed air or inert gasses, filtered to 40µ.

Supply pressure

Max. operating pressure:

2 bar unit.....3 bar (43.5 PSIG)

10 bar unit.....10.5 bar (152 PSIG)

Min. Operating Pressure P2 pressure + 0.5 bar (7.3 PSIG)

Pressure control range

Available in three pressure ranges, 0-2 bar (0-29 PSIG), 0-7 bar (0-101.5 PSIG) or 0-10 bar (0-145 PSIG). Pressure range can be changed through the software at all times. (parameter 19)

Temperature range

0°C up to +50°C (32°F up to 122°F)

Weights:

P31P = 0.291 kg (0.64 lbs)

P32P = 0.645 kg (1.42 lbs)

Air consumption

No consumption in stable regulated situation.

Display

The regulator is provided with a digital display, indicating the output pressure, either in bar or PSIG.

The factory setting is as indicated on the label, can be changed through to software at all times (parameter 14)

Supply voltage

24 VDC +/- 10%

Power consumption

Max. 1.1W with unloaded signal outputs

Control signals

The electronic pressure regulator can be externally controlled through an analogue control signal of either 0-10V or 4-20mA. (parameter 4).

Output signals

As soon as the output pressure is within the signal band a signal is given of 24VDC, PNP Ri = 1 kOhm
 Outside the signal band this connection is 0V.

Connections

(In case of output signal (Option D))

Central M12 connector 4-pole

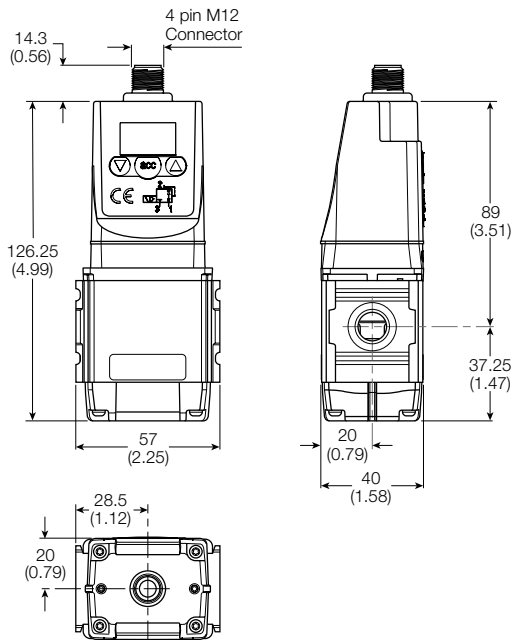
The electrical connections are as follows:

Pin number	Function	Color
1	24 V	Supply
2	0 to 10 V	Control Signal Ri = 100k Ω
	4 to 20mA	Control Signal Ri = 500k Ω
3	0 V (GND)	Supply
4	24 V	Alarm Output Signal

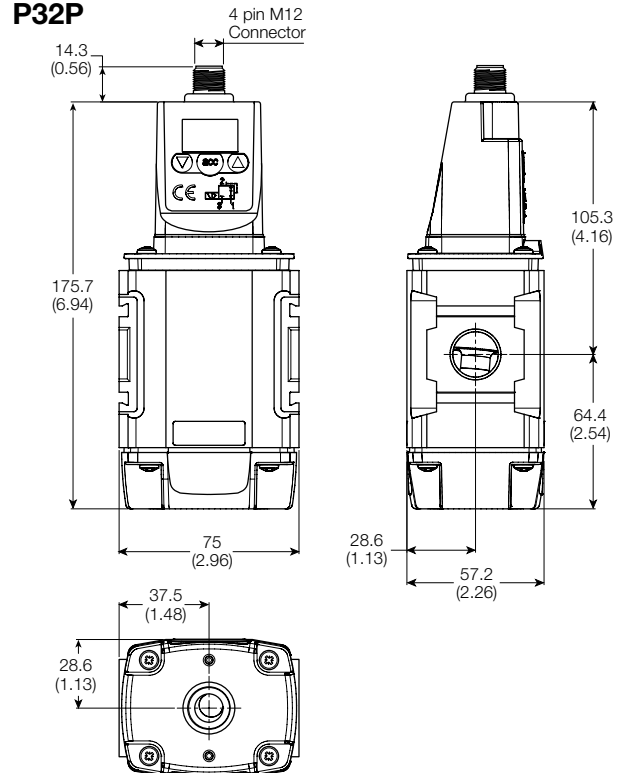
⚠ WARNING

**Product rupture can cause serious injury.
 Do not connect regulator to bottled gas.
 Do not exceed maximum primary pressure rating.**

P31P



P32P





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

P3TF Bulk Liquid Separators

- Tested in accordance with ISO 8573.9
- High liquid removal efficiencies at all flow conditions
- Low pressure losses for low operational costs
- Multiple port sizes for a given flow rate provides increased flexibility during installation
- Suitable for variable flow compressors
- Works with all types of compressor and compressor condensate
- Low maintenance
- Lightweight cast aluminum housing with 1/4" to 3" ports
- External surface epoxy painted for maximum corrosion resistance



Applications

- Bulk liquid removal at any point in a compressed air system
- Protection of refrigeration and heatless regenerative desiccant dryers
- Liquid removal from compressor Inter-coolers / after-coolers
- Liquid separation within refrigeration dryers
- Pre-filtration

Operating information

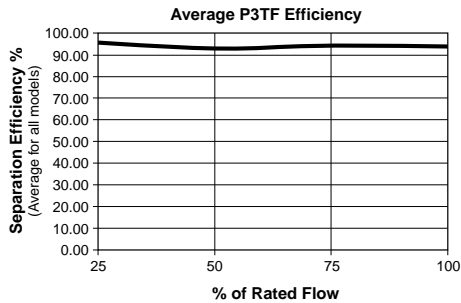
P3TF (Bulk Liquid Separator)	
Operating pressure:	232 PSIG (16 bar) Max
Operating temperature:	35°F to 176°F (1.5°C to 80°C)

Material specifications

Description	P3TF (Bulk Liquid Separator)
Auto float drain	Plastic
Housing / bowl	Aluminum
Seals	Fluorocarbon

Service kits

Drain	EF1
-------	-----



P3TF Bulk Liquid Separator

	Pipe size	Flow SCFM (L/s)	Weight lb. (kg)	Part number (NPT)
P3TF	1/4"	21 (10)	0.9 (0.4)	P3TFA92WAAN
	3/8"	85 (40)	2.2 (1.0)	P3TFA93WBAN
	1/2"	85 (40)	2.2 (1.0)	P3TFA94WCAN
	3/4"	233 (110)	4.8 (2.2)	P3TFA96WDAN
	1"	233 (110)	2.6 (5.7)	P3TFA98WEAN
	1-1/2"	742 (350)	5.3 (11.6)	P3TFA9BVGAN
	2"	742 (350)	5.3 (11.6)	P3TFA9CWHAN
	3"	1695 (800)	12.0 (26.4)	P3TFA9EWKAN



Pressure differential at rated flow ... 1.0 PSID (0.07 bar)

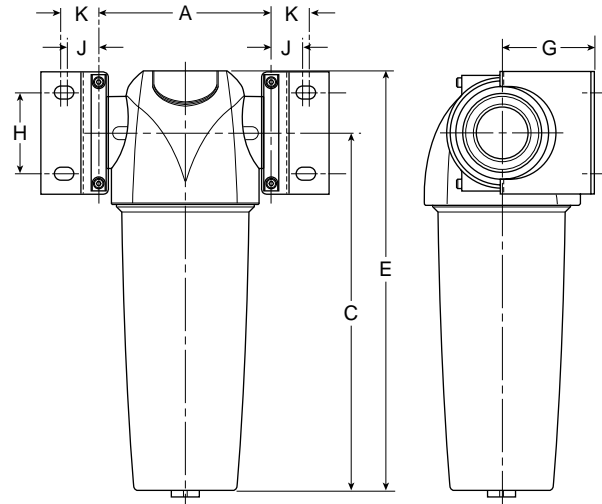
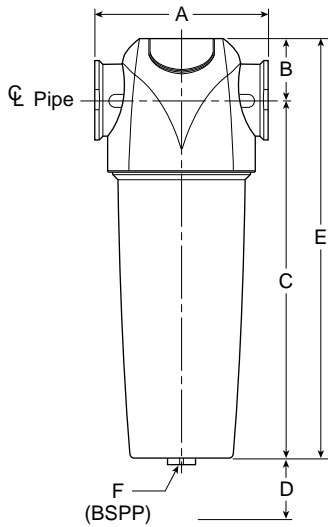
Stated flows are for operation at 102 PSIG (7 bar) with reference to 20°C, 1 bar (a), 0% relative water vapor pressure.

Note: BSPT threads available upon request.

Most popular.



P3TF (Bulk Liquid Separator)



Dimensions

Part number	Pipe size	A	B	C	D	E	BSPP F	G	H	J	K	Wall mounting bracket kit
P3TFA92WAAN	1/4"	3.00 (76)	1.12 (28.5)	6.02 (153)	1.58 (40)	7.15 (181.5)	1/2	2.05 (50)	1.18 (30)	0.71 (18)	0.96 (24.5)	P3TKA00MWA
P3TFA93WBAN	3/8"	3.83 (97.5)	1.34 (34)	7.91 (201)	1.97 (50)	9.25 (235)	1/2	2.36 (60)	1.57 (40)	0.81 (20.5)	1.00 (25.5)	P3TKA00MWB
P3TFA94WCAN	1/2"	3.83 (97.5)	1.34 (34)	7.91 (201)	1.97 (50)	9.25 (235)	1/2	2.36 (60)	1.57 (40)	0.81 (20.5)	1.00 (25.5)	P3TKA00MWB
P3TFA96WDAN	3/4"	5.07 (129)	1.67 (42.5)	13.09 (232.5)	2.76 (70)	10.80 (275)	1/2	2.68 (68)	2.36 (60)	0.91 (23)	1.10 (28)	P3TKA00MWD
P3TFA98WEAN	1"	5.07 (129)	1.67 (42.5)	12.68 (322)	2.76 (70)	14.35 (364.5)	1/2	2.68 (68)	2.36 (60)	0.91 (23)	1.10 (28)	P3TKA00MWD
P3TFA9BWGAN	1-1/2"	6.70 (170)	1.97 (50)	18.68 (474.5)	3.94 (100)	20.64 (524.5)	1/2	3.62 (92)	3.31 (84)	1.26 (32)	1.54 (39)	P3TKA00MWF
P3TFA9CWHAN	2"	6.70 (170)	1.97 (50)	18.68 (474.5)	3.94 (100)	20.64 (524.5)	1/2	3.62 (92)	3.31 (84)	1.26 (32)	1.54 (39)	P3TKA00MWF
P3TFA9EWKAN	3"	8.07 (205)	2.36 (60)	30.39 (772)	4.72 (120)	32.76 (832)	1/2	5.31 (135)	3.94 (100)	1.40 (35.5)	1.67 (42.5)	P3TKA00MWJ

Inches (mm)

Wall Mounting Bracket Kit

Mounting brackets provide additional support to filters installed in flexible piping systems or OEM equipment.





Air Preparation Products

Global

Prep-Air II

Miniature

P3N

General Industrial

Stainless Steel

Precision / Proportional

Bulk Liquid Separators

P3TF Series Bulk Liquid Separators

- Designed in accordance with ASME and CRN
- Connection sizes: 4 inch & 6 inch
- High liquid removal efficiencies at all flow conditions
- Suitable for variable flow compressors
- Works with all types of compressor and compressor condensate
- External surface epoxy painted for maximum corrosion resistance



P3TF Series

Material specifications

Baffle	Plated steel
Body	Steel
Deflector	Plated steel
Seals	Fluorocarbon
Stud	Plated steel

Operating information


P3TF Series	
Operating Pressure:	232 PSIG (16 bar)
Operating Temperature:	35°F to 150°F (1.5°C to 66°C)

Inlet air pressure correction

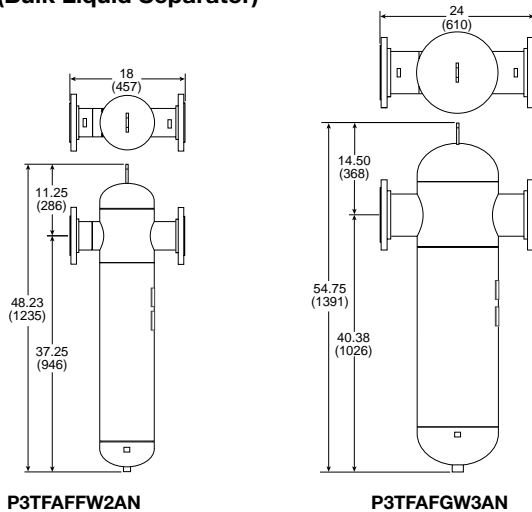
For pressures above 232 PSIG (16 bar), use manual drain.

PSI	15	29	44	58	73	87	100	116	131	145	160	174	189	203	218	232	247	261	275	290
bar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Factor	2.65	1.87	1.53	1.32	1.18	1.08	1.00	0.94	0.88	0.84	0.80	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.61	0.59

Bulk Liquid Separators

	Port size	Flow SCFM	Part number
P3TF 	4" Flange	2119	P3TFAFFW2AN
	6" Flange	3814	P3TFAFGW3AN

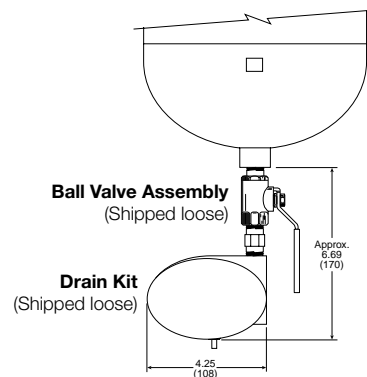
P3TF (Bulk Liquid Separator)

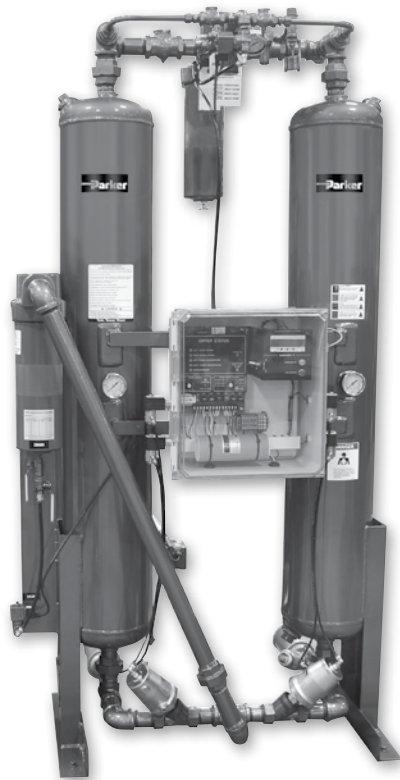


 Most popular.

Service kits

Description	P3TF Series
DP gauge replacement kit	DPG-Kit
Drain kit - 1/2" NPT	HDF-120-NPT-A





F

Dryer Products

Dryers

Dryers

Dryer Products



- Refrigeration (10-2400 SCFM)
- Inline desiccant (15-60 SCFM)
- Regenerative desiccant (3-800 SCFM)
- Heatless desiccant dryers
- Zero loss & timer drains
- Auto electrical drain valves

F3

Product	Page
PRD Refrigeration Dryers	F3-F4
DD Inline Desiccant Dryers	F5
P3TJA Regenerative Desiccant Dryers	F6
PTW Heatless Desiccant Dryers	F7-F8
ED Zero Air Loss Condensate Drains	F9
WDV3-G Auto Electrical Drain Valves	F10



PRD Refrigeration Dryer Series



PRD10 - PRD250

- “Plug & Play” design for easy installation and operation (PRD10 - PRD125)
- Small space saving design
- Oversized demister separator resulting in excellent liquid removal over all operating conditions
- Low pressure differential across the dryer (1.45 PSIG average)
- Oversized condenser to operate in ambients to 122°F (50°C)
- All models incorporate a dewpoint indicator

PRD325 - PRD2400

- Optimum dewpoint levels for highest system performance
- Advanced patented design solutions
- High reliability, easy to use and maintain
- Unique 4-in-1 SmartPack heat exchanger
- Integral drain
- Extremely low pressure drop design
- SmartControl energy saving function
- Excellent dewpoint performances
- Advanced compliant scroll compressor

PRD Series

Capacity CFM @ 100 PSIG (m ³ /min @ 6.9 bar)	Primary voltage	Part number	Pipe size	Recommended filtration		
				Bulk separator	Pre-filter (5µ particulate)*	Post-filter (.01µ coalescing)
10 (17)	115V/1ph/60Hz	PRD10-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94ESAN	P32FA94DSAN
15 (26)	115V/1ph/60Hz	PRD15-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94ESAN	P32FA94DSAN
25 (43)	115V/1ph/60Hz	PRD25-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94ESAN	P32FA94DSAN
35 (60)	115V/1ph/60Hz	PRD35-115160	1/2" NPT-F	P3TFA94WCAN	P32FA94ESAN	P32FA94DSAN
50 (85)	115V/1ph/60Hz	PRD50-115160	3/4" NPT-F	P3TFA96WDAN	P33FA96ESAN	P33FA96DSAN
75 (127)	115V/1ph/60Hz	PRD75-115160	3/4" NPT-F	P3TFA96WDAN	P33FA96ESAN	P33FA96DSAN
100 (170)	115V/1ph/60Hz	PRD100-115160	3/4" NPT-F	P3TFA96WDAN	P3NFA96ESA	P3NFA96DSA
125 (212)	115V/1ph/60Hz & 230V/1ph/60Hz	PRD125-115160 PRD125-230160	1-1/2" NPT-F	P3TFA9BWGAN	P3NFA9PESA	P3NFA9PDSA
150 (255)	115V/1ph/60Hz & 230V/1ph/60Hz	PRD150-115160 PRD150-230160	1-1/2" NPT-F	P3TFA9BWGAN	P3NFA9PESA	P3NFA9PDSA
175 (297)	115V/1ph/60Hz	PRD175-230160	1-1/2" NPT-F	P3TFA9BWGAN	35F77BAP	35F77EAP
200 (425)	230V/1ph/60Hz	PRD200-230160	1-1/2" NPT-F	P3TFA9BWGAN	35F77BAP	35F77EAP
250 (425)	230V/3ph/60Hz & 460V/3ph/60Hz	PRD250-230360 PRD250-460360	1-1/2" NPT-F	P3TFA9BWGAN	35F77BAP	35F77EAP
325 (552)	230V/3ph/60Hz & 460V/3ph/60Hz	PRD325-230360 PRD325-460360	2" NPT-F	P3TFA9CWHAN	35F87BAP	35F87EAP
400 (680)	230V/3ph/60Hz & 460V/3ph/60Hz	PRD400-230360 PRD400-460360	2" NPT-F	P3TFA9CWHAN	35F87BAP	35F87EAP
500 (849)	230V/3ph/60Hz & 460V/3ph/60Hz	PRD500-230360 PRD500-460360	2" NPT-F	P3TFA9CWHAN	35F87BAP	35F87EAP
700 (1189)	230V/3ph/60Hz & 460V/3ph/60Hz	PRD700-230360 PRD700-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
800 (1359)	230V/3ph/60Hz & 460V/3ph/60Hz	PRD800-230360 PRD800-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
1000 (1700)	460V/3ph/60Hz	PRD1000-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
1200 (2039)	460V/3ph/60Hz	PRD1200-460360	3" NPT-M	P3TFA9EWKAN	43FN7BAP	43FN7EAP
1600 (2718)	460V/3ph/60Hz	PRD1600-460360	4" Flg.	P3TFAFFW2AN	P3TFAFFQ2AN*	P3TFAFFD2AN
2000 (3400)	460V/3ph/60Hz	PRD2000-460360	6" Flg.	P3TFAFGW3AN	P3TFAFGQ3AN*	P3TFAFGD3AN
2400 (4078)	460V/3ph/60Hz	PRD2400-460360	6" Flg.	P3TFAFGW3AN	P3TFAFGQ3AN*	P3TFAFGD3AN

Most popular.

* 1µ coalescing



Operating information

		PRD10-PRD175	PRD200-PRD250	PRD325-PRD2400
Temperature:	Ambient (maximum)	122°F (50°C)	122°F (50°C)	122°F (50°C)
	Ambient (minimum)	41°F (5°C)	41°F (5°C)	41°F (5°C)
	Inlet (maximum)	149°F (65°C)	140°F (60°C)	140°F (60°C)
Pressure (maximum):		232 PSIG (16 bar)	203 PSIG (14 bar)	203 PSIG (14 bar)
Refrigerant:		R134a	R407C	R407C

Flow correction factors

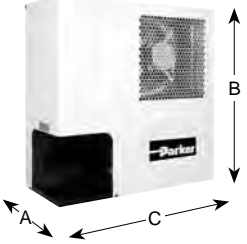
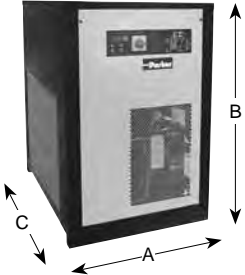
Capacities are based upon:

Ambient temperature - 100°F (38°C); inlet temperature - 100°F (38°C);
 and working pressure - 100 PSIG (7 bar g).

To obtain dryer capacity at new conditions, multiply nominal capacity x C1 x C2 x C3

PRD10 - PRD175								PRD200 - PRD250								PRD325 - PRD2400								
Ambient temperature (C1)																								
°F	60	70	80	89	100	110	120	70	80	90	100	110	120	122	90	100	110	120	122					
°C	16	21	27	32	38	43	49	21	27	32	38	43	49	50	32	38	43	49	50					
Factor	1.34	1.26	1.17	1.09	1.00	0.91	0.82	1.22	1.15	1.05	1.00	0.94	0.79	0.71	1.05	1.00	0.94	0.79	0.71					
Inlet temperature (C2)																								
°F	90	100	110	120	140	149	90	100	110	120	130	140	90	100	110	120	130	140						
°C	32	38	43	49	60	65	32	38	43	49	54	60	32	38	43	49	54	60						
Factor	1.24	1.00	0.81	0.67	0.45	0.43	1.24	1.00	0.82	0.68	0.56	0.40	1.22	1.00	0.82	0.68	0.56	0.46						
Inlet pressure (C3)																								
PSIG	60	80	100	125	150	175	200	230	50	80	100	125	150	174	203	50	80	100	125	150	174	203		
bar	4	6	7	9	10	12	14	16	3	6	7	9	10	12	14	3	6	7	9	10	12	14		
Factor	0.83	0.93	1.00	1.07	1.12	1.16	1.19	1.22	0.77	0.93	1.00	1.07	1.12	1.15	1.18	0.77	0.93	1.00	1.07	1.12	1.15	1.18		

Dimensions

	A	B	C	Weight (kg)	Part number
	PRD10-PRD250				
	8.3 (210)	17 (430)	17.7 (450)	42 (19)	PRD10
	8.3 (210)	17 (430)	17.7 (450)	42 (19)	PRD15
	8.3 (210)	19.9 (505)	19.7 (500)	52 (24)	PRD25
	8.3 (210)	19.9 (505)	19.7 (500)	52 (24)	PRD35
	8.9 (225)	22.3 (565)	20.5 (520)	58 (27)	PRD50
	8.9 (225)	22.3 (565)	20.5 (520)	68 (31)	PRD75
	8.9 (225)	22.3 (565)	20.5 (520)	77 (35)	PRD100
	16.7 (425)	23.8 (605)	21.8 (555)	115 (52)	PRD125
	16.7 (425)	23.8 (605)	21.8 (555)	128 (58)	PRD150
	PRD325-PRD2400				
	16.7 (425)	23.8 (605)	21.8 (555)	132 (60)	PRD175
	28.0 (711)	37.0 (940)	22.0 (559)	183 (83)	PRD200
	28.0 (711)	42.0 (1067)	41.0 (1041)	287 (130)	PRD250
	28.0 (711)	42.0 (1067)	41.0 (1041)	320 (145)	PRD325
	28.0 (711)	42.0 (1067)	41.0 (1041)	320 (145)	PRD400
	28.0 (711)	42.0 (1067)	41.0 (1041)	342 (155)	PRD500
	32.0 (813)	52.0 (1321)	46.0 (1168)	529 (240)	PRD700
	32.0 (813)	52.0 (1321)	46.0 (1168)	529 (240)	PRD800
	32.0 (813)	52.0 (1321)	46.0 (1168)	551 (250)	PRD1000
40.0 (1016)	67.0 (1702)	43.0 (1092)	816 (370)	PRD1200	
40.0 (1016)	68.0 (1727)	71.0 (1803)	1279 (580)	PRD1600	
40.0 (1016)	68.0 (1727)	71.0 (1803)	1477 (670)	PRD2000	
40.0 (1016)	68.0 (1727)	71.0 (1803)	1521 (690)	PRD2400	

Inches (mm)



DD Inline Desiccant Dryers

- Inline desiccant dryers are a convenient and cost effective means of ensuring your sensitive intermittent pneumatic applications are never exposed to damaging moisture
- Compact size for point-of-use applications
- Drying efficiency down to -40°F pressure dew point
- Easily and quickly serviced
- Sightglass in bowl to monitor desiccant
- Built-in particulate after filter prevents downstream dust
- No electricity needed
- Low pressure drop
- No purge air lost as with other dryer types
- Check valve required on inlet
- Desiccant must be ordered separately



Inline Desiccant Dryers

Port size	Part number SCFM / desiccant capacity ¹		
	15 SCFM / 2.5 lb.	30 SCFM / 5 lbs.	60 SCFM / 10 lbs.
1/4 ²	DD15-02		
3/8 ²	DD15-03		
1/2 ²	DD15-04	DD30-04	DD60-04
3/4	DD15-06	DD30-06	DD60-06
1		DD30-08	DD60-08

Notes:

1. Desiccant must be ordered separately.
2. These units supplied with reducer bushings.

Service kits

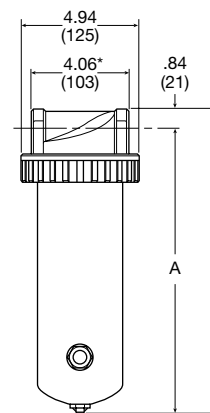
Description	Part number
Desiccant - silica gel	
DD15	DRP-14-447/003
DD30	DRP-14-447/006
DD60	DRP-14-447/012
Mounting brackets (pair of pipe mounted brackets)	
1 inch Pipe Size	SA200CW57

Specifications

Desiccant Capacity (Desiccant must be ordered separately)	
DD15	2.5 lb. (1.1 kg)
DD30	5 lb. (2.3 kg)
DD60	10 lb. (4.5 kg)

Operating information

Optimum working temperature:	Below 100°F
Operating temperature:	32°F to 180°F (0°C to 82°C)
Operating pressure:	0 to 300 PSIG Max (21 bar)



	A	B
DD15	12.69 (322)	13.5 (343)
DD30	22.44 (570)	23.25 (591)
DD60	29.44 (748)	30.25 (768)

* Dimension does not include reducer bushings for 1/4", 3/8", 1/2" versions.
 Inches (mm)

Material specifications

Bowl	DD15	Aluminum
	DD30	Aluminum
	DD60	Steel
Flow tube		CPVC
Filter element		Sintered bronze
Head & flange ring		Zinc
Other hardware		Brass
Seals		Buna-N
Sight glass		Glass & steel

Most popular.



Regenerative Desiccant Dryer – P3TJA

- Point of use application bringing clean dry air just where you need it
- Approved to international standards designed in accordance with ASME VIII Div.1, approved to CSA/UL/CRN and fully CE Marked (PED, EMC, LVD) as standard
- Simple to install - flexible installation utilising the multiple in-line inlet & outlet connection ports
- Compact and lightweight - can be floor, bench or wall / canopy mounted
- Very quiet operation - noise level less than 70dB(A)
- Can be installed almost anywhere, IP66 / NEMA 4 protection as standard
- Audible alarm - indicating service interval for optimal performance
- Simple & easy to maintain - due to the quick release top cap arrangement, which does NOT require the inlet / outlet ports to be disconnected as with traditional systems, maintenance can be achieved in under 15 minutes

The P3TJA is the reliable, cost effective and flexible way to provide clean dry air exactly where needed.



Operating information

Operating temperature:	35°F (1.5°C) max.
Inlet temperature:	122°F (50°C) max.
Operating pressure:	58 to 175 PSIG (4 to 21 bar)
Flow range:	3 SCFM to 20 SCFM @ 100 PSIG (85 L/min to 567 L/min @ 7 bar)
Noise level (Average):	70dB(A)
Pressure dewpoint – Standard	-40°F (-40°C) pdp
Standard electrical supply:	115/1ph/60Hz (Tolerance +/- 10%)
Controls:	Electronic control timer
Connections:	3/8 NPT

Regenerative Desiccant Dryer

	A	Weight (kg)	SCFM	Part number	Maintenance kit
	P3TJA	16.6 (422)	24.2 (11)	3	P3TJA93A1JN P3TKA00JA1
		19.7 (500)	28.7 (13)	5	P3TJA93A2JN P3TKA00JA2
		24.2 (616)	35.3 (16)	8	P3TJA93A3JN P3TKA00JA3
		27.2 (692)	39.7 (18)	10	P3TJA93A4JN P3TKA00JA4
		33.3 (847)	44.1 (20)	13	P3TJA93A5JN P3TKA00JA5
		35.7 (906)	50.7 (23)	15	P3TJA93A6JN P3TKA00JA6
		43.2 (1098)	61.7 (28)	20	P3TJA93A7JN P3TKA00JA7



Inches (mm)

Service kits

Description	Part number
Mounting Bracket	
Fixed wall	P3TKA00MJ
45° tilt wall	P3TKA00MK

Flow correction factors

Capacities are based upon:
 Ambient temperature - 100°F (38°C); inlet temperature - 100°F (38°C); and working pressure - 100 PSIG (7 bar g).
 To obtain dryer capacity at new conditions, multiply nominal capacity x C1 x C2 x C3

Minimum inlet pressure										
PSIG	58	73	87	100	116	135	145	160	175	
bar g	4	5	6	7	8	9	10	11	12	
Maximum inlet temperature										
95°F (35°C)	0.63	0.75	0.88	1.00	0.97	1.08	1.18	1.29	1.40	
104°F (40°C)	0.61	0.73	0.85	0.97	0.94	1.05	1.14	1.25	1.36	
113°F (45°C)	0.55	0.66	0.77	0.88	0.85	0.95	1.04	1.14	1.23	
122°F (50°C)	0.46	0.55	0.64	0.73	0.71	0.79	0.86	0.94	1.02	

Most popular.



Heatless Desiccant Air Dryer – PTW Series

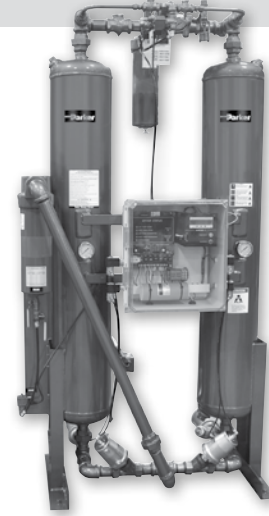
Parker PTW Series Heatless Desiccant Air Dryers remove water vapor from compressed air through a process known as pressure swing adsorption. Pressure dewpoints ranging from -40°F (-40°C) standard to -100°F (-70°C) optional are attained by directing the flow of saturated compressed air over a bed of desiccant.

Features

- Pre-filter and after filters included with dryers
- Solid state controller
- CycleLoc™ demand control
- Variable cycle control (models PTW75 - PTW800 SCFM)
- Purge Flow indicator
- Purge flow regulator (models PTW75 - PTW800 SCFM)
- Repressurization circuit (models PTW75 - PTW800 SCFM)
- Control air filter (models PTW75 - PTW800 SCFM)
- Safety valves
- Pressure equalization
- 150 PSIG design standard
- Moisture indicator (models PTW75 - PTW800 SCFM)

Options

- DDS Light / DDS (dewpoint dependent switching)



Operating information

Inlet or ambient air temperature:	120°F (49°C) maximum
Operating pressure:	50 PSIG (3.5 bar) minimum
Working pressure:	150 PSIG (10.5 bar) maximum
Pressure drop at rated flow:	less than 5 PSI (0.34 bar)

Heatless Desiccant Air Dryers

Capacity CFM @ 100 PSIG (m ³ /min @ 6.9 bar)	Approximate purge SCFM (Nm ³ /min)	Primary voltage	Part number	Port size	Filtration package included with dryer		
					Pre-filter (5μ)	Pre-filter (.01μ)	After-filter (1μ)
25 (.70)	4 (.11)	120V/1ph/60Hz	PTW25*	1/2	P32FA94FSAN	P32FA94DSAN	P32FA94QSAN
42 (1.19)	6 (.19)	120V/1ph/60Hz	PTW40*	1/2	P33FA94FSAN	P33FA94DSAN	P33FA94QSAN
60 (1.70)	9 (.25)	120V/1ph/60Hz	PTW55*	3/4	P33FA94FSAN	P33FA94DSAN	P33FA94QSAN
75 (2.13)	11 (.31)	120V/1ph/60Hz	PTW75*	3/4	P3NFA96FSA	P3NFA96DSA	P3NFA96QSA
107 (3.03)	16 (.45)	120V/1ph/60Hz	PTW100*	1	P3NFA98FSA	P3NFA98DSA	P3NFA98QSA
135 (3.82)	20 (.56)	120V/1ph/60Hz	PTW130*	1	P3NFA98FSA	P3NFA98DSA	P3NFA98QSA
200 (5.66)	30 (.84)	120V/1ph/60Hz	PTW200*	1-1/2	35F77BAP	35F77EAP	35F77HAP
250 (7.07)	38 (1.07)	120V/1ph/60Hz	PTW250*	1/1/2	35F77BAP	35F77EAP	35F77HAP
300 (8.49)	45 (1.27)	120V/1ph/60Hz	PTW300*	1-1/2	35F77BAP	35F77EAP	35F77HAP
400 (11.32)	60 (1.69)	120V/1ph/60Hz	PTW400*	2	35F87BAP	35F87EAP	35F87HAP
500 (14.44)	77 (2.18)	120V/1ph/60Hz	PTW500*	2	35F87BAP	35F87EAP	35F87HAP
600 (18.40)	98 (2.77)	120V/1ph/60Hz	PTW600*	2	35F87BAP	35F87EAP	35F87HAP
800 (22.65)	120 (3.39)	120V/1ph/60Hz	PTW800*	2	35F87BAP	35F87EAP	35F87HAP

* Options: Dewpoint dependent switching (DDS).

DDS Light includes: energy saving purge cycle control with high humidity alarm and indicator light. When ordering use -DL as suffix.

DDS includes: energy saving purge cycle control with high humidity alarm and digital dewpoint display. When ordering use -DS as suffix

Most popular.



Flow correction factors

Capacities are based upon:

- Pressure drop at rated flow less than 5 PSI (0.34 bar)
- Maximum inlet air or ambient air temperature 120°F (49°C)
- Maximum working pressure: 150 PSIG (10.5 bar g) standard units for high maximum working pressure are available
- Minimum operating pressure: 50 PSIG (3.5 bar g)

Inlet air pressure correction											
PSI	50	60	70	80	90	100	110	120	130	140	150
bar	3.5	4.1	4.9	5.5	6.2	6.9	7.6	8.3	9.0	9.7	10.3
Factor	.56	.65	.74	.83	.91	1.00	1.09	1.18	1.27	1.37	1.43

Inlet air temperature correction							
°F	90	95	100	105	110	115	120
°C	32	35	38	41	43	46	49
Factor	1.35	1.16	1.00	.85	.74	.64	.56

P

Dryer Products

Heatless Desiccant Air Dryers

	A (length)	B (width)	C (height)	Weight lbs. (kg)	Part number
PTW series	19 (483)	16 (406)	64 (1626)	156 (71)	PTW25*
	21 (533)	17 (432)	48 (1219)	190 (86)	PTW40*
	21 (533)	20 (508)	67 (1702)	230 (104)	PTW55*
	35 (889)	27 (686)	80 (2032)	384 (174)	PTW75*
	35 (889)	27 (686)	80 (2032)	468 (212)	PTW100*
	35 (899)	21 (533)	70 (1778)	496 (225)	PTW130*
	44 (1118)	28 (711)	78 (1981)	692 (314)	PTW200*
	44 (1118)	30 (762)	78 (1981)	776 (352)	PTW250*
	44 (1118)	30 (762)	78 (1981)	796 (361)	PTW300*
	74 (1880)	41 (1041)	84 (2134)	1626 (738)	PTW400*
	74 (1880)	41 (1041)	85 (2159)	1735 (787)	PTW500*
	74 (1880)	41 (1041)	86 (2184)	1740 (789)	PTW600*
	74 (1880)	41 (1041)	91 (2311)	2120 (962)	PTW800*

Inch (mm)

* Options: Dewpoint dependent switching (DDS).

DDS Light includes: energy saving purge cycle control with high humidity alarm and indicator light. When ordering use -DL as suffix.

DDS includes: energy saving purge cycle control with high humidity alarm and digital dewpoint display. When ordering use -DS as suffix.

Service kits

Element kits

	5µ	0.01µ	1.0µ
P32	P32KA00ESE	P32KA00ESC	P32KA00ES9
P33	P33KA00ESE	P33KA00ESC	P33KA00ES9
P3NF	P3NKA00ESE	P3NKA00ESCB	P3KNA00ES9
35F	FRP-95-505	MTP-95-502	MSP-95-502

Most popular.



Zero Air Loss Condensate Drains – ED Series

Zero air loss condensate drains are designed for economical removal of unwanted water, oil emulsions, and other liquids. These drains will only open when liquid is present and will not allow any compressed air to escape from the system.



Operating information

Maximum pressure:	232 PSIG (16 bar)
Ambient operating temperature:	35°F to 140°F (1.6°C to 60°C)
Voltages optional – NPT	115/50-60Hz, standard
BSPP ports	230/50-60Hz & 24VDC

Zero Air Loss Condensate Drains

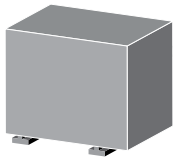


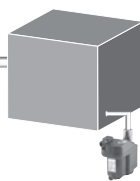
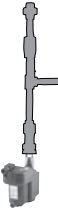
Port size (NPT)	Compressor aftercooler (SCFM)*	Capacity refrigeration dryer (SCFM)**	Filter (SCFM)	Drain capacity per day (gal/liter)	Model number	Service kit
1 @ 3/8 (in), 1 @ 3/8 (out)	—	—	424	6 (22.7)	ED3002N115-K	SKED3000N115
1 @ 1/2 (in), 1 @ 3/8 (out)	141	282	1,413	13 (49.2)	ED3004N115-K	SKED3000N115
2 @ 1/2 (in), 1 @ 3/8 (out)	247	494	2,472	23 (87.1)	ED3007N115-K	SKED3000N115
2 @ 1/2 (in), 1 @ 3/8 (out)	1,059	2,119	10,594	100 (378.5)	ED3030N115-K	SKED3000N115
2 @ 1/2 (in), 1 @ 3/8 (out)	3,532	7,063	35,315	330 (1,249.2)	ED3100N115-K	SKED3000N115

* Based on 100 PSI working pressure, air compressor inlet at 77°F (25°C) at 60% RH, air discharge temperature of 95°F (35°C) following the aftercooler, pressure dewpoint of 37°F (2.8°C) after the refrigerated dryer.

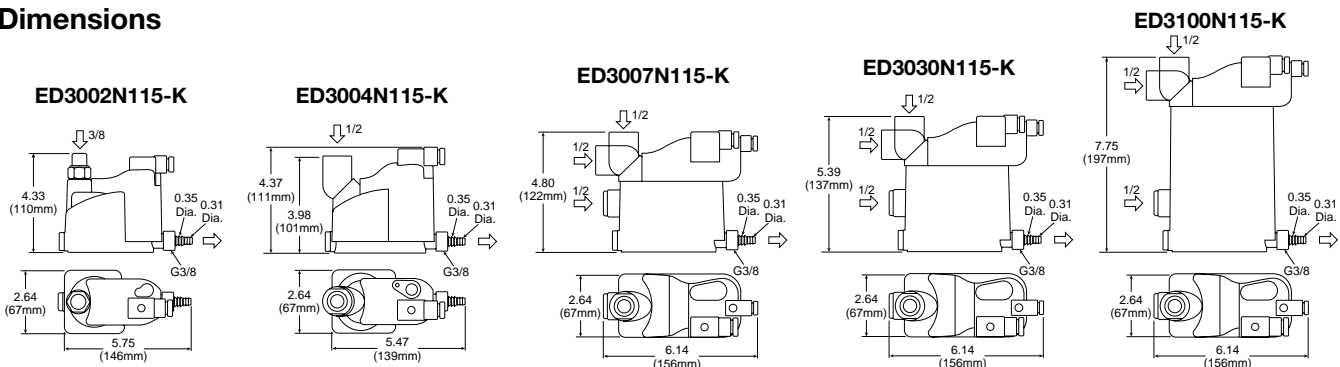
** Condensate from aftercooler or refrigerated dryer to be drained upstream – only for residual oil content or small quantities of condensate.

Note: A 6 ft. line cord will be included with each drain.

Where Are Condensate Drains Used?

				
Compressor with Aftercooler	Receiver Tank	Filter	Air Dryer	Drip Leg
Removes the condensate that is collected after the air cools in the aftercooler	Removes the condensate that is collected when the air cools inside of the receiver tank	Removes the condensate that is collected in the filter bowl	Removes the condensate that is collected in the air dryer	Point-of-use applications: removes the condensate from compressed air pipes in a plant

Dimensions



 Most popular.



Automatic Electrical Drain Valve – WDV3-G

The WDV3 Electrical Drain is designed to remove condensate from compressors, compressed air dryers and receivers up to any size, type or manufacturer.

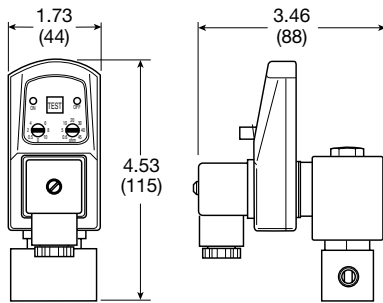
Benefits

- Does not air-lock during operation
- Compressed air systems up to any size
- The direct acting valve is serviceable
- Suitable for all types of compressors
- Test (micro-switch) feature
- High time cycle accuracy
- Large (4.5mm) valve orifice



Operating information

Operating pressure:	230 PSIG (16 bar)
Ambient operating temperature:	34°F to 130°F (1.1°C to 54°C)
Voltages:	115VAC, 230/50-60Hz, 24VDC
Coil insulation:	Class H, 340°F (171.1°C)
Current rating:	4mA maximum
Timer –	
Open time	.5 to 10 sec., adjustable
Cycle time	.5 to 45 min., adjustable



Automatic Electrical Drain Valve

Port size	Primary voltage	Weight (kg)	Model number
1/4	120VAC	1.8 (0.8 kg)	WDV3-G12BL
1/4	230VAC	1.8 (0.8 kg)	WDV3-G22BL
3/8	120VAC	1.8 (0.8 kg)	WDV3-G13BL
3/8	230VAC	1.8 (0.8 kg)	WDV3-G23BL
1/2	120VAC	1.8 (0.8 kg)	WDV3-G14BL
1/2	230VAC	1.8 (0.8 kg)	WDV3-G24BL
1/2	24VDC	1.8 (0.8 kg)	WDV3-G34BL

Material specifications

Description	
Valve body	Brass / stainless steel
Enclosure (IP65 / NEMA 4)	ABS plastic
Internal parts	Brass / stainless steel
Valve seals	FPM (Fluorocarbon)

LP

Dryer Products

PRD Series

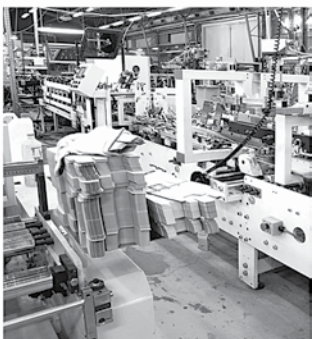
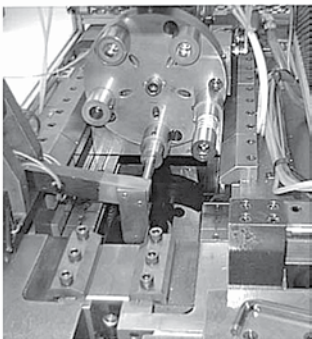
DD Series

P3TJA Series

PTW Series

ED Series

WDV3-G Series



G
Accessories

Accessories



Accessories

Ball Valves / Plug Valves



- Forged brass, general purpose, industrial ball valves
- Stainless steel, general purpose, industrial ball valves
- One piece extruded brass body plug valves

G3

Accessories – continued

Miscellaneous Accessories



- Tank valves & air chucks
- Mufflers & silencers
- Relief valves
- Quick exhaust / shuttle valves
- Pressure switches
- Blow guns
- Ports from M5 through 3/4 inch

G10

Hose & Fittings



- 801 General purpose hose
- Push-on hose barb fittings

G4

Quick Couplings



- SensoControl® (Product Highlight Only)
- Industrial interchange nipples
–1/4" to 3/4" body size
- Sleeveomatic couplers
–1/4" to 1/2" body size
- Safromatic couplers
–1/4" to 3/4" body size
- Economatic quick connect couplings
–1/4" body size

G14

Integrated Fittings



- Flow control regulators
- Inline check valves
- Blocking valves
- Threshold sensors

G5

Tubing & Fittings



- Polyethylene tubing
- Nylon tubing
- Polyurethane tubing
- Push-to-connect, Prestolok composite fittings
- Push-to-connect, Prestolok metal fittings
- Pipe fittings

G18

G

Pictorial Index

Parker Pneumatic

Female-Female Pipe Ends XV500P



Pipe thread	Flow dia.	Part number
1/4	.375	XV500P-4
3/8	.375	XV500P-6
1/2*	.500	XV500P-8
3/4**	.685	XV500P-12
1**	.875	XV500P-16

Female Pipe Ends, Lever Handle, Mini Ball Valve MV200



Pipe thread	Flow dia.	Part number
1/8	.31	MV200-2
1/4	.31	MV200-4
3/8	.31	MV200-6
1/2	.39	MV200-8

Male-Female Pipe Ends, Compact Handle, Mini Ball Valve MV608



Pipe thread	Flow dia.	Part number
1/8	.20	MV608-2
1/4	.31	MV608-4
3/8	.31	MV608-6
1/2	.39	MV608-8

Female Pipe Ends, Compact Handle, Mini Ball Valve MV609



Pipe thread	Flow dia.	Part number
1/8	.24	MV609-2
1/4	.31	MV609-4
3/8	.31	MV609-6
1/2	.39	MV609-8
3/8x1/4	.31	MV609-6-4

Female Pipe Ends, Panel Mount XV502SS



Pipe thread	Flow dia.	Part number
1/4	.380	XV502SS-4
3/8	.380	XV502SS-6
1/2	.500	XV502SS-8
3/4	.790	XV502SS-12
1	1.000	XV502SS-16
1-1/4	1.250	XV502SS-20
1-1/2	1.500	XV502SS-24
2	2.000	XV502SS-32

Most popular.

Accessories

Ball and Plug Valves, Drain Cocks

Male Pipe to Male Pipe Plug Valve PV607



Pipe thread	Flow dia.	Part number
1/8	.200	PV607-2
1/4	.200	PV607-4

Female Pipe to Male Pipe Plug Valve PV608



Pipe thread	Flow dia.	Part number
1/8	.200	PV608-2
1/4	.200	PV608-4

Female Pipe to Female Pipe Plug Valve PV609



Pipe thread	Flow dia.	Part number
1/8	.200	PV609-2
1/4	.200	PV609-4

Internal Seal Drain Cock DC602

Temperature Range: -65° to 250°F



Pipe thread	Part number
1/8	DC602-2
1/4	DC602-4

External Seal Drain Cock DC604

Temperature Range: -25° to 250°F



Pipe thread	Part number
1/8	DC604-2*
1/4	DC604-4
3/8	DC604-6*

* When assembled handle wings are down facing

G

Accessories

Ball / Plug Valves

Hose & Fittings

Integrated Fittings

Misc. Accessories

Quick Couplings

Tubing & Fittings



Hose & Fittings

801 Push-Lok Plus General Purpose Hose

Hose I.D. Inch	Hose O.D. Inch	Reel length	General part number*	Continuous part number
1/4	0.50	600 feet	801-4-***-RL	801-4-***-7200
3/8	0.63	450 feet	801-6-***-RL	801-6-***-5400
1/2	0.78	300 feet	801-8-***-RL	801-8-***-3600
5/8	0.91	250 feet	801-10-***-RL	801-10-***-3000
3/4	1.03	200 feet	801-12-***-RL	801-12-***-2400
1	1.28	200 feet	801-16-***-RL	801-16-***-2400



*** Available Colors

GRA = gray
 BLU = blue
 RED = red

GRN = green
 YEL = yellow
 BLK = black

* General reels have no more than 3 lengths per reel, each no less than 20 feet.

30182 Push-on Hose Barb to Male Pipe

Thread (in)	Hose size (in)	Part number
1/8 x 27	1/4	30182-2-4B
1/4 x 18	1/4	30182-4-4B
1/4 x 18	3/8	30182-4-6B
3/8 x 18	3/8	30182-6-6B
1/2 x 14	3/8	30182-8-6B
3/8 x 18	1/2	30182-6-8B
1/2 x 14	1/2	30182-8-8B
1/2 x 14	5/8	30182-8-10B
3/4 x 14	1/2	30182-12-8B
3/4 x 14	3/4	30182-12-12B



30282 Push-on Hose Barb to Female Pipe

Thread (in)	Hose size (in)	Part number
1/4 x 18	1/4	30282-4-4B
3/8 x 18	3/8	30282-6-6B
1/2 x 14	1/2	30282-8-8B



31382 Push-on Hose Barb to Male Pipe Swivel

Thread (in)	Hose size (in)	Part number
1/4 x 18	1/4	31382-4-4
3/8 x 18	3/8	31382-6-6
1/2 x 14	1/2	31382-8-8*



* Steel

38282 Push-on Hose Barb Union

Hose size (in)	Part number
1/4	38282-4-4B
3/8	38282-6-6B
1/2	38282-8-8B



Most popular.

30482 Push-on Hose Barb to Male SAE 45°

Thread (in)	Hose size (in)	Part number
7/16 x 20	1/4	30482-4-4B
1/2 x 20	1/4	30482-5-4B
5/8 x 18	3/8	30482-6-6B
3/4 x 16	1/2	30482-8-8B



30682 Push-on Hose Barb to Female SAE JIC 37° Swivel

Thread (in)	Hose size (in)	Part number
7/16 x 20	1/4	30682-4-4B
1/2 x 12	1/4	30682-5-4B
9/16 x 18	1/4	30682-6-6B
3/4 x 16	3/8	30682-8-6B*
3/4 x 16	1/2	30682-8-8B
7/8 x 14	1/2	30682-10-8B*
7/8 x 14	5/8	30682-10-10B
1-1/16 x 12	3/4	30682-12-12B



* 30682-8-6B & 30682-10-8B are dual 37/45 degree.

30882 Push-on Hose Barb to Female SAE 45° Swivel

Thread (in)	Hose size (in)	Part number
7/16 x 20	1/4	30882-4-4B
1/2 x 20	1/4	30882-5-4B
5/8 x 18	3/8	30882-6-6B
3/4 x 16	3/8	30682-8-6B*
3/4 x 16	1/2	30882-8-8B
7/8 x 14	1/2	30682-10-8B*
7/8 x 14	5/8	30882-10-8B
1-1/16 x 14	3/4	30882-12-12B



* 30682-8-6B & 30682-10-8B are dual 37/45 degree.

37G82 Push-on Hose Barb to Female Pipe (NPSM) Swivel with Gasket

Thread (in)	Hose size (in)	Gasket	Part number
1/4- 18	1/4	07G-4	37G82-4-4
1/4- 18	3/8	07G-4	37G82-4-6
3/8- 18	3/8	07G-6	37G82-6-6
1/2- 14	1/2	07G-8	37G82-8-8
1/2- 14	5/8	07G-8	37G82-8-10
3/4- 14	3/4	07G-12	37G82-12-12



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 Accessories
 Ball / Plug Valves
 Hose & Fittings
 Integrated Fittings
 Misc. Accessories
 Quick Couplings
 Tubing & Fittings



FCC731 Compact Meter Out



Tube size (in)	NPT	Part number
5/32	1/8	FCC731-5/32-2
5/32	1/4	FCC731-5/32-4
1/4	1/8	FCC731-4-2
1/4	1/4	FCC731-4-4
3/8	1/4	FCC731-6-4
3/8	3/8	FCC731-6-6

FCC731 Compact Meter Out - BSPP



Tube size (mm)	BSPP	Part number
4	1/8	FCC731-4M-2G
6	1/8	FCC731-6M-2G
6	1/4	FCC731-6M-4G
8	1/8	FCC731-8M-2G
8	1/4	FCC731-8M-4G
8	3/8	FCC731-8M-6G
10	1/4	FCC731-10M-4G
10	3/8	FCC731-10M-6G
12	3/8	FCC731-12M-6G
12	1/2	FCC731-12M-8G

FCCB731 Compact Bi-Directional Flow Control



Tube size (in)	NPT	Part number
5/32	1/8	FCCB731-5/32-2
1/4	1/8	FCCB731-4-2
1/4	1/4	FCCB731-4-4

FCCB731 Compact Bi-directional Flow Control - BSPP



Tube size (mm)	BSPP	Part number
4	1/8	FCCB731-4M-2G
6	1/8	FCCB731-6M-2G
6	1/4	FCCB731-6M-4G
8	1/8	FCCB731-8M-2G
8	1/4	FCCB731-8M-4G
8	3/8	FCCB731-8M-6G

FCKC731 Knobless Meter Out Flow Control



Tube size (in)	NPT / UNF	Part number
1/8	10-32	FCKC731-2-0
1/8	1/8	FCKC731-2-2
5/32	10-32	FCKC731-5/32-0
5/32	1/8	FCKC731-5/32-2
1/4	10-32	FCKC731-4-0
1/4	1/8	FCKC731-4-2
1/4	1/4	FCKC731-4-4
5/16	1/8	FCKC731-5-2
5/16	1/4	FCKC731-5-4
3/8	1/4	FCKC731-6-4
3/8	3/8	FCKC731-6-6

Most popular.

FCKC731 Knobless Compact Flow Control - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	FCKC731-4M-M5
4	1/8	FCKC731-4M-2G
6	M5x0.8	FCKC731-6M-M5
6	1/8	FCKC731-6M-2G
6	1/4	FCKC731-6M-4G
8	1/8	FCKC731-8M-2G
8	1/4	FCKC731-8M-4G
8	3/8	FCKC731-8M-6G
10	1/4	FCKC731-10M-4G
10	3/8	FCKC731-10M-6G
10	1/2	FCKC731-10M-8G
12	3/8	FCKC731-12M-6G
12	1/2	FCKC731-12M-8G

FCKCB731 Knobless Bi-directional Flow Control - BSPP



Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	FCKCB731-4M-M5
4	1/8	FCKCB731-4M-2G
6	M5x0.8	FCKCB731-6M-M5
6	1/8	FCKCB731-6M-2G
6	1/4	FCKCB731-6M-4G
8	1/8	FCKCB731-8M-2G
8	1/4	FCKCB731-8M-4G
8	3/8	FCKCB731-8M-6G

FCM731 Miniature Meter Out Flow Control



Tube size (in)	NPT	Part number
1/8	10-32	FCM731-2-0
1/8	1/8	FCM731-2-2
5/32	10-32	FCM731-5/32-0
5/32	1/8	FCM731-5/32-2
1/4	10-32	FCM731-4-0
1/4	1/8	FCM731-4-2
1/4	1/4	FCM731-4-4

FCM731 Miniature Flow Control - BSPP



Tube size (mm)	BSPP	Part number
3	M3x0.5	FCM731-3M-M3
3	M5x0.8	FCM731-3M-M5
4	M3x0.5	FCM731-4M-M3
4	M5x0.8	FCM731-4M-M5
4	1/8	FCM731-4M-2G
6	M5x0.8	FCM731-6M-M5
6	1/8	FCM731-6M-2G
6	1/4	FCM731-6M-4G
8	1/8	FCM731-8M-2G
8	1/4	FCM731-8M-4G
8	3/8	FCM731-8M-6G

Parker Pneumatic

FCMB731 Miniature Bi-directional Flow Control - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	FCMB731-4M-M5
4	1/8	FCMB731-4M-2G
6	M5x0.8	FCMB731-6M-M5
6	1/8	FCMB731-6M-2G
6	1/4	FCMB731-6M-4G

FCMK731 Knobless Mini Meter Out Flow Control



Tube size (in)	NPT	Part number
1/8	10-32	FCMK731-2-0
1/8	1/8	FCMK731-2-2
5/32	10-32	FCMK731-5/32-0
5/32	1/8	FCMK731-5/32-2
1/4	10-32	FCMK731-4-0
1/4	1/8	FCMK731-4-2
1/4	1/4	FCMK731-4-4

FCCS731 Compact Swivel Outlet Flow Control



Tube size (in)	NPT	Part number
1/4	1/8	FCCS731-4-2
1/4	1/4	FCCS731-4-4
3/8	1/4	FCCS731-6-4
3/8	3/8	FCCS731-6-6

FCMS731 Mini Swivel Outlet Flow Control



Tube size (in)	NPT	Part number
5/32	10-32	FCMS731-5/32-0
5/32	1/8	FCMS731-5/32-2

FCMS731 Miniature Swivel Outlet - BSPP



Tube size (mm)	NPT	Part number
4	M5x0.8	FCMS731-4M-M5
4	1/8	FCMS731-4M-2G
6	M5x0.8	FCMS731-6M-M5
6	1/8	FCMS731-6M-2G

FCCS731 Compact Swivel Outlet - BSPP



Tube size (mm)	BSPP	Part number
6	1/8	FCCS731-6M-2G
6	1/4	FCCS731-6M-4G
8	1/8	FCCS731-8M-2G
8	1/4	FCCS731-8M-4G
10	3/8	FCCS731-8M-6G
10	1/4	FCCS731-10M-4G
10	3/8	FCCS731-10M-6G
12	3/8	FCCS731-12M-6G
12	1/2	FCCS731-12M-8G

Most popular.

Accessories Integrated Fittings

FCMSP731 Plug-In Mini Flow Control



Tube size (in)	Part number
1/8	FCMSP731-2
5/32	FCMSP731-5/32
1/4	FCMSP731-4

FCMSP701 Plug-In Miniature Flow Control



Tube size (mm)	Part number
4	FCMSP701-4M
6	FCMSP701-6M

FCCSP731 Plug-In Compact Flow Control



Tube size (mm)	Part number
6	FCCSP731-6M
8	FCCSP731-8M
10	FCCSP731-10M
12	FCCSP731-12M

FC832 In-Line Flow Control



Tube size (in)	Part number
5/32	FC832-5/32
1/4	FC832-4
5/16	FC832-5
3/8	FC832-6
1/2	FC832-8

FC832 In-Line Flow Control



Tube size (mm)	Part number
4	FC832-4M
6	FC832-6M
8	FC832-8M
10	FC832-10M
12	FC832-12M

FCB832 In-Line Bi-directional Flow Control



Tube size (in)	Part number
5/32	FCB832-5/32
1/4	FCB832-4
5/16	FCB832-5

FCB832 In-Line Bi-directional Flow Control



Tube size (mm)	Part number
4	FCB832-4M
6	FCB832-6M
8	FCB832-8M

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FCPM832 In-Line Panel Mountable Flow Control



Tube size (mm)	Part number
4	FCPM832-4M
6	FCPM832-6M
8	FCPM832-8M
10	FCPM832-10M
12	FCPM832-12M

FC836 Threaded In-Line Flow Control



Port size (in)	Part number
1/8	FC836-2
1/4	FC836-4
3/8	FC836-6
1/2	FC836-8

FC836 Threaded In-Line Flow Control - BSPP



Port size BSPP	Part number
1/8	FC836-2G
1/4	FC836-4G
3/8	FC836-6G
1/2	FC836-8G

337 Micrometer Flow Control Valves



Port size (in)	Part number
1/8	00337 1000
1/4	00337 1001
3/8	00337 1002
1/2	00337 1003
3/4	00337 1004

337 Micrometer Flow Control Valves - BSPP



Port size (in)	Part number
1/8	00337G1000
1/4	00337G1001

338 Bi-directional Flow Control Valves



Port size (in)	Part number
1/8	00338 1100
1/4	00338 1101
3/8	00338 1102
1/2	00338 1103
3/4	00338 1104

**Accessories
Integrated Fittings**

338 Bi-directional Flow Control Valves - BSPP



Port size (in)	Part number
1/8	00338G1100
1/4	00338G1101

3250 Flow Control Valves



Port size (in)	Part number
1/8	03250 0119
1/4	03250 0219
3/8	03250 0319
1/2	03250 0419
3/4	03250 0519

3250 Flow Control Valves - BSPP



Port size (in)	Part number
1/8	3250G0119
1/4	3250G0219
3/8	3250G0319
1/2	3250G0419
3/4	3250G0519

3250 Flow Control Valves



Port size (in)	Part number
1	3250 1000
1-1/4	3250 1250
1-1/2	3250 1500

3250 Flow Control Valves - BSPP





Port size (in)	Part number
1	3250G1000
1-1/4	3250G1250
1-1/2	3250G1500

Most popular.




3251 Series Flow Control Valves


	Thread (NPT) Male	Thread (NPT) Female	Right angle flow control valves
	1/8	1/8	03251 0125
1/4	1/4	03251 0250	
3/8	3/8	03251 0375	
1/2	1/2	03251 0500	
With Prestolok fittings			
	1/8	5/32	03251 1215
	1/8	1/4	03251 1225
	1/4	1/4	03251 2525
	1/4	3/8	03251 2538
	3/8	3/8	03251 3838

CAUTION: If it is possible that the ambient temperature may fall below freezing, the medium must be moisture-free to prevent internal damage or unpredictable behavior.


FC705 Push-to-Connect Metal Flow Control

	Tube size (in)	NPT	Part number
	5/32	1/8	FC705-5/32-2
1/4	1/8	FC705-4-2	
1/4	1/4	FC705-4-4	
3/8	1/4	FC705-6-4	
3/8	3/8	FC705-6-6	

FC701 Push-to-Connect Metal Flow Control - BSPP

	Tube Size (mm)	BSPP	Part number
	4	1/8	FC701-4M-2G
6	1/8	FC701-6M-2G	
6	1/4	FC701-6M-4G	
8	1/8	FC701-8M-2G	
8	1/4	FC701-8M-4G	
8	3/8	FC701-8M-6G	
10	1/4	FC701-10M-4G	
10	3/8	FC701-10M-6G	
12	3/8	FC701-12M-6G	
12	1/2	FC701-12M-8G	
14	1/2	FC701-14M-8G	


FC708 Threaded Port Meter Out Flow Control

	Port size (in)	Part number
	1/8	FC708-2
1/4	FC708-4	
3/8	FC708-6	
1/2	FC708-8	


 Most popular.

Accessories Integrated Fittings


FC702 Threaded Port Metal Flow Control - BSPP

	Port size BSPP	Part number
	1/8	FC702-2G
1/4	FC702-4G	
3/8	FC702-6G	
1/2	FC702-8G	


32PLCK In-Line Check Valve

	Tube size (in)	Part number
	5/32	32PLCK-5/32
1/4	32PLCK-4	
5/16	32PLCK-5	
3/8	32PLCK-6	


32PLCK In-Line Check Valve

	Tube size (mm)	Part number
	4	32PLCK-4M
6	32PLCK-6M	
8	32PLCK-8M	
10	32PLCK-10M	
12	32PLCK-12M	

W68PLCK Male Check Valve

	Tube size (in)	NPT / UNF	Part number
	5/32	10-32	68PLCK-5/32-0
5/32	1/8	W68PLCK-5/32-2	
1/4	1/8	W68PLCK-4-2	
1/4	1/4	W68PLCK-4-4	
3/8	1/4	W68PLCK-6-4	
3/8	3/8	W68PLCK-6-6	

W68PLCKI Male Check Valve - Meter In

	Tube size (in)	NPT / UNF	Part number
	5/32	10-32	68PLCKI-5/32-0
5/32	1/8	W68PLCKI-5/32-2	
1/4	1/8	W68PLCKI-4-2	
1/4	1/4	W68PLCKI-4-4	
3/8	1/4	W68PLCKI-6-4	
3/8	3/8	W68PLCKI-6-6	

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 Accessories
 Ball / Plug Valves
 Hose & Fittings
 Integrated Fittings
 Misc. Accessories
 Quick Couplings
 Tubing & Fittings

Parker Pneumatic

68PLCK Male Check Valve Meter Out - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	68PLCK-4M-M5
4	1/8	68PLCK-4M-2G
6	1/8	68PLCK-6M-2G
6	1/4	68PLCK-6M-4G
8	1/8	68PLCK-8M-2G
8	1/4	68PLCK-8M-4G

68PLCKI Male Check Valve Meter In - BSPP



Tube size (mm)	BSPP	Part number
4	M5x0.8	68PLCKI-4M-M5
6	1/8	68PLCKI-6M-2G
8	1/8	68PLCKI-8M-2G
8	1/4	68PLCKI-8M-4G
10	3/8	68PLCKI-10M-6G
12	3/8	68PLCKI-12M-6G
12	1/2	68PLCKI-12M-8G

VC – Check Valve



Tube size (in)	O.D.	Part number
1/4	.66	A4VC4-MG
5/16	.70	A5VC5-MG
3/8	.80	A6VC6-MG

339 Check Valve



Port size	Part number
1/8"	00339 3000
1/4"	00339 3001
3/8"	00339 3002
1/2"	00339 3003
3/4"	00339 3004

339 Check Valve - BSPP



Port size	Part number
1/8"	00339G3000
1/4"	00339G3001

3047 Check Valve



Pipe thread	Part number
1/4"	03047 0099

Most popular.

**Accessories
Integrated Fittings**

FC601 Push-to-Connect Lock Out Valves



Tube size (in)	NPT	Part number
1/4	1/8	FC601-4-2
1/4	1/4	FC601-4-4
3/8	3/8	FC601-6-6
1/2	1/2	FC601-8-8

FC601 Push-to-Connect Lock-Out Valve - BSPP



Tube size (mm)	BSPP	Part number
6	1/8	FC601-6M-2G
6	1/4	FC601-6M-4G
8	1/4	FC601-8M-4G
8	3/8	FC601-8M-6G
10	3/8	FC601-10M-6G
12	1/2	FC601-12M-8G

FC602 Threaded Port Lock Out Valves



NPT 1	NPT 2	Part number
1/4	1/8	FC602-2
1/4	1/4	FC602-4
3/8	3/8	FC602-6
1/2	1/2	FC602-8

FC608 Threaded Port Lock-Out Valve - BSPP



BSPP 1	BSPP 2	Part number
1/8	1/4	FC608-4G-2G
1/4	1/4	FC608-4G-4G
3/8	3/8	FC608-6G-6G
1/2	1/2	FC608-8G-8G

PSBJ731 Pneumatic Threshold Sensor - 5/32 Pilot



NPT / UNF	Part number
10-32	PSBJ731-0
1/8	PSBJ731-2
1/4	PSBJ731-4
3/8	PSBJ731-6
1/2	PSBJ731-8

PSBJ731 Pneumatic Threshold Sensor - 4mm Pilot



BSPP	Part number
M5x0.8	PSBJ731-M5
1/8	PSBJ731-2G
1/4	PSBJ731-4G
3/8	PSBJ731-6G
1/2	PSBJ731-8G



Parker Pneumatic

PSPJ731 Pneumatic Threshold Sensor - 10-32 Pilot

NPT	Part number
1/8	PSPJ731-2
1/4	PSPJ731-4
3/8	PSPJ731-6



PSBJ708 Pneumatic Threshold Sensor - M5 Pilot

BSPP	Part number
1/8	PSBJ708-2G
1/4	PSBJ708-4G



Accessories

Integrated Fittings, Tank Valves, Air Chucks

PSPE731 Pneumatic / Electric Threshold Sensor - BSPP

BSPP	Part number
M5x0.8	PSPE731-M5
1/8	PSPE731-2G
1/4	PSPE731-4G
3/8	PSPE731-6G
1/2	PSPE731-8G



Tank Valves & Air Chucks

09166 0060
1/8" pipe thread, dome shaped cap



Thread size	Part number
1/8	09166 0060

05499 0000
1/4" female port, ball-foot air chuck



Thread size	Part number
1/4	05499 0000

00645 0060
1/8" pipe thread at bottom, screwdriver type cap



Thread size	Part number
1/8	00645 0060

06739 0000
1/4" port, ball-foot air chuck with clip



Thread size	Part number
1/4	06739 0000

01468 0006
1/8" pipe thread part way up the stem, screwdriver type cap



Thread size	Part number
1/8	01468 0006

Most popular.

G	Accessories
	Ball / Plug Valves
	Hose & Fittings
	Integrated Fittings
	Misc. Accessories
	Quick Couplings
	Tubing & Fittings



Mufflers / Silencers

EM Sintered Bronze Muffler / Filters



Thread size	Part number
M5	EMM5
1/8	EM12
1/4	EM25
3/8	EM37
1/2	EM50
3/4	EM75
1	EM100
1-1/4	EM125
1-1/2	EM150

Muffler / Flow Controls



Thread size	Part number
1/8	04502 0002
1/4	04504 0004
3/8	04506 0060
1/2	04508 0080
3/4	04512 0012
1	04516 0016

Breather Vents



Thread size	Part number
1/8	04702 0002
1/4	04704 0004
3/8	04706 0006
1/2	04708 0008
3/4	04712 0012
1	04716 0016
1-1/4	04720 0020
1-1/2	04724 0024

NOTE: Breather vents should not be used as exhaust mufflers.

ES Silencer



Thread size	Part number
1/8	ES12MC
1/4	ES25MC
3/8	ES37MC
1/2	ES50MC
3/4	ES75MC
1	ES100MC
1-1/4	ES125MC
1-1/2	ES150MC

Most popular.

ASN Air Line Silencer, Plastic



Thread size	Part number
M5	AS-5
1/8	ASN-6
1/4	ASN-8
3/8	ASN-10
1/2	ASN-15

P6M G Thread, Air Line Silencer, Plastic



Thread size	Part number
M5	P6M-PAC5
G1/8	P6M-PAB1
G1/4	P6M-PAB2
G3/8	P6M-PAB3
G1/2	P6M-PAB4
G3/4	P6M-PAB6
G1	P6M-PAB8

ECS Reclassifier, Air Line Muffler



Thread size	Part number
1/2	ECS3
1	ECS5

Stainless Steel Mufflers

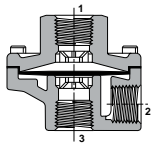


Pipe size	Part number
1/4	5500A2004
1/2	5500A4004
1	5500A6004
2	5500A9004 **

** Nickel Plated



0R Quick Exhaust



Port 1	Port 2	Port 3	Flow (SCFM)	Part number with panel nut
Standard version				
1/4	1/4	3/8	150	OR25NB
1/4	3/8	3/8	240	OR25PB
3/8	3/8	3/8	240	OR37B
1/2	1/2	1/2	450	OR50B
3/4	3/4	3/4	550	OR75B
Nitrile diaphragms				
1/8	1/8	1/8	70	OR12B
1/8	1/8	1/4	70	OR12NB
1/4	1/4	1/4	90	OR25B
1/4	1/4	3/8	90	OR25NFB
3/8	3/8	3/8	240	OR37FB
3/4	3/4	3/4	550	OR75FB
Fluorocarbon diaphragms				
1/8	1/8	1/8	70	OR12VB
1/8	1/8	1/4	70	OR12NVB
1/4	1/4	1/4	90	OR25VB
3/8	3/8	3/8	240	OR37VB
1/2	1/2	1/2	450	OR50VB
3/4	3/4	3/4	550	OR75VB
PTFE diaphragms				
3/8	3/8	3/8	240	OR37TB

RV Relief Valve



Pressure (PSI)	Part number
***	RV01AN***

*** 010 through 200 psi

130 Relief Valve



Spring range	Part number no panel nut	Part number with panel nut
0-15 PSIG	130-02AA	130-02AAP
0-25 PSIG	130-02A	130-02AP
0-50 PSIG	130-02B	130-02BP
0-100 PSIG	130-02C	130-02CP

134 Relief Valve



Spring range	Part number no panel nut	Part number with panel nut
0-15 PSIG	134-02AA	134-02AAP
0-25 PSIG	134-02A	134-02AP
0-50 PSIG	134-02B	134-02BP
0-100 PSIG	134-02C	134-02CP

N164 Shuttle Valve



Thread size	Part number
1/8	N164 1001
1/4	N164 2003
3/8	N164 3003

G	Accessories
	Ball / Plug Valves
Hose & Fittings	
Integrated Fittings	
Misc. Accessories	
Quick Couplings	
Tubing & Fittings	

Most popular.



Parker Pneumatic

Brass Nozzle Blow Gun



Inlet port	Part number
Lever operated	
1/4	00475 0010
Button operated	
1/4	00470 0010

Brass Nozzle Blow Gun



Inlet port	Part number
Lever operated	
1/4	00475 0900
Button operated	
1/4	00470 0900

Self-Regulating Blow Gun



Inlet port	Part number
Lever operated	
1/4	00475 2900

Pistol Grip Blow Gun



Inlet port	Part number
1/4	BG441-NBL

Brass Nozzle



Part number
00470 7020

Accessories

Blow Guns and Drip Leg Drain

Automatic Drip Leg Drain



Thread size	Part number
1/4	06D1NA
1/2	06D3NA

PPS1 Pressure Switch



Thread size	Part number
1/4 NPT	PPS1-1C3-RHM
1/8 NPT	PPS1-2C3-RHM
1/4" NPT	PPS1-1C3-RWL
1/8" NPT	PPS1-2C3-RWL

Most popular.





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SensoControl® Diagnostic

Optimize or troubleshoot hydraulic and pneumatic systems with SensoControl diagnostic meters.

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- Innovative recording capabilities
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- Pressure, flow, RPM, and temperature measurements



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Parker Pneumatic

Industrial Interchange Nipples

Hardened wear points and solid barstock construction provide long service life. Precision machined surfaces and hardened load-bearing areas resist the effects of mechanical shock in the most rugged applications. Industrial interchange nipples conform to MIL-C4109 and are for use with either Sleeveomatic or Saffomatic couplers.

Female Pipe Thread



Body size (inches)	Thread size	Part number Steel
1/4	1/8-27	H1C
1/4	1/4-18	H3C
1/4	3/8-18	H3C-E
3/8	1/4-18	H1E
3/8	3/8-18	H3E
3/8	1/2-14	H3E-F
1/2	3/8-18	H1F
1/2	1/2-14	H3F
1/2	3/4-14	H3F-G
3/4	1/2-14	H3G-F
3/4	3/4-14	H3G
3/4	1-11½	H3G-J

Male Pipe Thread



Body size (inches)	Thread size	Part number Steel
1/4	1/8-27	H0C
1/4	1/4-18	H2C
1/4	3/8-18	H2C-E
3/8	1/8-27	H00E
3/8	1/4-18	H0E
3/8	3/8-18	H2E
3/8	1/2-14	H2E-F
1/2	3/8-18	H0F
1/2	1/2-14	H2F
1/2	3/4-14	H2F-G
3/4	1/2-14	H2G-F
3/4	3/4-14	H2G
3/4	1-11½	H2G-J

Most popular.

Accessories

Industrial Interchange Nipples

Standard Hose Barb



Body size (inches)	Hose I.D.	Part number Steel
1/4	1/4	H8C
1/4	5/16	H8C-D
1/4	3/8	H9C
3/8	3/8	H5E
3/8	1/2	H6E
1/2	3/8	H4F
1/2	1/2	H5F
1/2	3/4	H5F-G
3/4	1/2	H5G-F
3/4	3/4	H5G
3/4	1	H5G-J

Push-Lok Hose Barb*



Body size (inches)	Hose I.D.	Part number Steel
1/4	1/4	H8CP
1/4	3/8	H9CP
3/8	1/4	H4EP
3/8	3/8	H5EP
3/8	1/2	H6EP
1/2	3/8	H4FP
1/2	1/2	H5FP
1/2	1/2	H6FP

* Push-Lok hose barbs are designed for use with a push-lok hose and do not require clamps.



Sleevmatic Couplers
Female Pipe Thread



Body size (inches)	Thread size	Part number	
		Brass	Steel
1/4	1/8-27	B23A	—
1/4	1/4-18	B23	—
1/4	3/8-18	B23E	—
3/8	1/4-18	—	25C
3/8	3/8-18	—	25
3/8	1/2-14	—	25F
1/2	3/8-18	—	17E
1/2	1/2-14	—	17
1/2	3/4-14	—	17G

Male Pipe Thread



Body size (inches)	Thread size	Part number	
		Brass	Steel
1/4	1/4-18	B22	—
1/4	3/8-18	B22E	—
3/8	1/4-18	—	24C
3/8	3/8-18	—	24
3/8	1/2-14	—	24F
1/2	3/8-18	—	16E
1/2	1/2-14	—	16
1/2	3/4-14	—	16G

Standard Hose Barb



Body size (inches)	Hose I.D.	Part number	
		Brass	Steel
1/4	1/4	B20-3B	—
1/4	5/16	B20-4B	—
1/4	3/8	B20-5B	—
3/8	3/8	—	24-5B
3/8	1/2	—	24-6B
1/2	3/8	—	16-5B
1/2	1/2	—	16-6B
1/2	3/4	—	16-7B

Push-Lok Hose Barb*



Body size (inches)	Hose I.D.	Part number	
		Brass	Steel
1/4	3/8	B20-5BP	—
3/8	3/8	—	24-5BP
1/2	3/8	—	16-5BP
1/2	1/2	—	16-6BP

* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

Most popular.

Saflomatic Couplers
Female Pipe Thread



Body size (inches)	Thread size	Part number	
		Brass	Steel
1/4	1/8-27	B33A	—
1/4	1/4-18	B33	—
1/4	3/8-18	B33E	—
3/8	1/4-18	B35C	—
3/8	3/8-18	B35	—
3/8	1/2-14	B35F	—
1/2	3/8-18	B37E	—
1/2	1/2-14	B37	—
1/2	3/4-14	B37G	—
3/4	1/2-14	B39F	—
3/4	3/4-14	B39	—
3/4	1-11½	B39J	—

Male Pipe Thread



Body size (inches)	Thread size	Part number	
		Brass	Steel
1/4	1/8-27	B32A	—
1/4	1/4-18	B32	—
1/4	3/8-18	B32E	—
3/8	1/4-18	B34C	—
3/8	3/8-18	B34	—
3/8	1/2-14	B34F	—
1/2	3/8-18	B36E	—
1/2	1/2-14	B36	—
1/2	3/4-14	B36G	—
3/4	3/4-14	B38	—
3/4	1-11½	B38J	—

Standard Hose Barb



Body size (inches)	Hose I.D.	Part number	
		Brass	Steel
1/4	1/4	B30-3B	—
1/4	5/16	B30-4B	—
1/4	3/8	B30-5B	—
3/8	3/8	B34-5B	—
3/8	1/2	B34-6B	—
1/2	1/2	B36-6B	—
1/2	3/4	B36-7B	—
3/4	3/4	B38-7B	—
3/4	1	B38-8B	—

Push-Lok Hose Barb*



Body size (inches)	Thread size	Part number	
		Brass	Steel
1/4	1/4	B30-3BP	—
1/4	3/8	B30-5BP	—
3/8	3/8	B34-5BP	—
1/2	1/2	B36-6BP	—

* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

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 Accessories
 Ball / Plug Valves
 Hose & Fittings
 Integrated Fittings
 Misc. Accessories
 Quick Couplings
 Tubing & Fittings



Parker Pneumatic

Couplers Female Pipe Thread



Body size (inches)	Thread size	Part number	Brass
1/4	1/4-18 NPTF	B53	
1/4	3/8-18 NPTF	B53E	

Couplers Male Pipe Thread



Body size (inches)	Thread size	Part number	Brass
1/4	1/4-18	B52	
1/4	3/8-18	B52E	

Couplers Push-Lok Hose Barb*



Body size (inches)	Hose I.D.	Part number	Brass
1/4	1/4	B50-03BP	
1/4	3/8	B50-05BP	

* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

Accessories

Economatic Quick Connect Couplers

Nipples Female Pipe Thread



Body size (inches)	Thread size	Part number	Steel
1/4	1/4-18	A3C	

Nipples Male Pipe Thread



Body size (inches)	Thread size	Part number	Steel
1/4	1/4-18	A2C	

Nipples Standard Hose Barb



Body size (inches)	Hose I.D.	Part number	Steel
1/4	1/4	A8C	

Nipples Push-Lok Hose Barb*



Body size (inches)	Thread size	Part number	Steel
1/4	1/4	A8CP	

* Push-Lok barbs are designed for use with push-lok hose and do not require clamps.

Most popular.



Polyethylene Tubing

O.D.	I.D.	Reel length (feet)	Color	Part number
1/4	.170	100	Natural	E-43-0100
1/4	.170	500	Natural	E-43-0500
1/4	.170	1000	Natural	E-43-1000
1/4	.170	100	Black	EB-43-0100
1/4	.170	500	Black	EB-43-0500
1/4	.170	1000	Black	EB-43-1000
1/4	.170	100	Red	E-43-R-0100
1/4	.170	500	Red	E-43-R-0500
1/4	.170	100	Blue	E-43-B-0100
1/4	.170	500	Blue	E-43-B-0500
1/4	.170	500	Orange	E-43-O-0500
1/4	.170	500	Yellow	E-43-Y-0500
1/4	.170	500	Purple	E-43-P-0500
1/4	.170	500	Green	E-43-G-0500
5/16	.187	500	Natural	E-53-0500
5/16	.187	500	Black	EB-53-0500
3/8	.250	100	Natural	E-64-0100
3/8	.250	500	Natural	E-64-0500
3/8	.250	100	Black	EB-64-0100
3/8	.250	500	Black	EB-64-0500
3/8	.250	500	Red	E-64-R-0500
3/8	.250	500	Blue	E-64-B-0500
3/8	.250	500	Orange	E-64-O-0500
3/8	.250	500	Yellow	E-64-Y-0500
3/8	.250	500	Purple	E-64-P-0500
3/8	.250	500	Green	E-64-G-0500
1/2	.375	100	Natural	E-86-0100
1/2	.375	100	Black	EB-86-0100
5/8	.500	100	Natural	E-108-0100
5/8	.500	Coil	Black	EB-108-0100



Most popular. For technical information see CD

Polyethelene Tubing

O.D.	I.D.	Reel length (feet)	Part number
5/32	.096	500	PEFR-2.5-0500
1/4	.170	500	PEFR-4-0500
1/4	.170	1000	PEFR-4-1000
3/8	.250	500	PEFR-6-0500
1/2	.375	250	PEFR-8-0250



Most popular.

Polyurethane Tubing

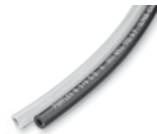
O.D.	I.D.	Reel length (feet)	Part number*
1/8	1/16	500	U-21-xxx-0500
		250	U-21-xxx-0250
1/4	1/8	500	U-42-xxx-0500
		250	U-42-xxx-0250
3/8	1/4	250	U-64-xxx-0250
		100 (coil)	U-64-xxx-0100
1/2	3/8	250	U-86-xxx-0250
		100 (coil)	U-86-xxx-0100



* xxx = Colors: Clear-Blank, Black-BLK, Green-GRN, Red-RED, Yellow-YEL, Blue-BLU, Orange-ORG, Gray-GRA (Example: U-21-BLK-0250)

Nylon Tubing

O.D.	I.D.	Reel length (feet)	Color	Part number
1/8	.093	250	Natural	NN-2-016
1/8	.093	250	Black	NB-2-016
1/8	.064	250	Natural	NN-2-031
1/8	.064	250	Black	NB-2-031
5/32	.106	250	Natural	NN-2.5-025
5/32	.106	250	Black	NB-2.5-025
3/16	.138	250	Natural	NN-3-025
3/16	.138	250	Black	NB-3-025
3/16	.096	250	Natural	NN-3-046
3/16	.096	250	Black	NB-3-046
1/4	.180	250	Natural	NN-4-035
1/4	.180	250	Black	NB-4-035
1/4	.170	250	Natural	NN-4-040
1/4	.170	250	Black	NB-4-040
1/4	.127	250	Natural	NN-4-062
1/4	.127	250	Black	NB-4-062
5/16	.233	250	Natural	NN-5-040
5/16	.233	250	Black	NB-5-040
3/8	.275	250	Natural	NN-6-050
3/8	.275	250	Black	NB-6-050
3/8	.190	250	Natural	NN-6-093
3/8	.190	250	Black	NB-6-093
1/2	.375	250	Natural	NN-8-062
1/2	.375	250	Black	NB-8-062
1/2	.253	250	Natural	NN-8-124
1/2	.253	250	Black	NB-8-124



*Suggested working pressure is 1/4 of burst pressure.

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Accessories
Ball / Plug Valves
Hose & Fittings
Integrated Fittings
Misc. Accessories
Quick Couplings
Tubing & Fittings

Nylon Tubing

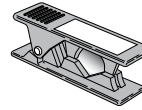
O.D.	I.D.	Reel length (feet)	Color	Part number
1/8	.091	500	Natural	NNR-2-017
1/8	.091	500	Black	NBR-2-017
1/8	.073	500	Natural	NNR-2-026
1/8	.073	500	Black	NBR-2-026
3/16	.140	500	Natural	NNR-3-024
3/16	.140	500	Black	NBR-3-024
3/16	.110	500	Natural	NNR-3-039
3/16	.110	500	Black	NBR-3-039
1/4	.180	250	Natural	NNR-4-035
1/4	.180	250	Black	NBR-4-035
1/4	.150	250	Natural	NNR-4-050
1/4	.150	250	Black	NBR-4-050
5/16	.233	250	Natural	NNR-5-040
5/16	.233	250	Black	NBR-5-040
3/8	.279	250	Natural	NNR-6-048
3/8	.279	250	Black	NBR-6-048
3/8	.225	250	Natural	NNR-6-075
3/8	.225	250	Black	NBR-6-075
1/2	.376	250	Natural	NNR-8-062
1/2	.376	250	Black	NBR-8-062
1/2	.350	250	Natural	NNR-8-075
1/2	.350	250	Black	NBR-8-075



*Suggested working pressure is 1/4 of burst pressure.

Most popular.

Plastic Tube Cutter



Part number
PTC-001

Replacement Blades



Part number
PTC-001RB

W369PLP Male Elbow Swivel 90°



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	369PLP-2-0
1/8	1/16	W369PLP-2-1
1/8	1/8	W369PLP-2-2
1/8	1/4	W369PLP-2-4
5/32	10-32	369PLP-5/32-0
5/32	1/8	W369PLP-5/32-2
5/32	1/4	W369PLP-5/32-4
3/16	1/8	W369PLP-3-2
1/4	10-32	369PLP-4-0
1/4	1/8	W369PLP-4-2
1/4	1/4	W369PLP-4-4
1/4	3/8	W369PLP-4-6
5/16	1/8	W369PLP-5-2
5/16	1/4	W369PLP-5-4
5/16	3/8	W369PLP-5-6
3/8	1/8	W369PLP-6-2
3/8	1/4	W369PLP-6-4
3/8	3/8	W369PLP-6-6
3/8	1/2	W369PLP-6-8
1/2	1/4	W369PLP-8-4
1/2	3/8	W369PLP-8-6
1/2	1/2	W369PLP-8-8

W369PLPX Extended Male Elbow



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	369PLPX-2-0
1/8	1/8	W369PLPX-2-2
1/8	1/4	W369PLPX-2-4
5/32	10-32	369PLPX-5/32-0
5/32	1/8	W369PLPX-5/32-2
5/32	1/4	W369PLPX-5/32-4
1/4	10-32	369PLPX-4-0
1/4	M7	369PLPX-4-M7
1/4	1/8	W369PLPX-4-2
1/4	1/4	W369PLPX-4-4
1/4	3/8	W369PLPX-4-6
5/16	1/8	W369PLPX-5-2
5/16	1/4	W369PLPX-5-4
3/8	1/8	W369PLPX-6-2
3/8	1/4	W369PLPX-6-4
3/8	3/8	W369PLPX-6-6

Most popular.

W379PLP Male Elbow 45°



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	379PLP-2-0
1/8	1/8	W379PLP-2-2
1/4	1/8	W379PLP-4-2
1/4	1/4	W379PLP-4-4
1/4	M7	W379PLP-4-M7
3/8	1/4	W379PLP-6-4
3/8	3/8	W379PLP-6-6

W372PLP Male Branch Tee Swivel



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	372PLP-2-0
1/8	1/16	W372PLP-2-1
1/8	1/8	W372PLP-2-2
1/8	1/4	W372PLP-2-4
5/32	10-32	372PLP-5/32-0
5/32	1/8	W372PLP-5/32-2
5/32	1/4	W372PLP-5/32-4
3/16	1/8	W372PLP-3-2
1/4	1/8	W372PLP-4-2
1/4	1/4	W372PLP-4-4
1/4	3/8	W372PLP-4-6
5/16	1/8	W372PLP-5-2
5/16	1/4	W372PLP-5-4
5/16	3/8	W372PLP-5-6
3/8	1/8	W372PLP-6-2
3/8	1/4	W372PLP-6-4
3/8	3/8	W372PLP-6-6
3/8	1/2	W372PLP-6-8
1/2	1/4	W372PLP-8-4
1/2	3/8	W372PLP-8-6
1/2	1/2	W372PLP-8-8

G

Accessories

Ball / Plug Valves

Hose & Fittings

Integrated Fittings

Misc. Accessories

Quick Couplings

Tubing & Fittings



W371PLP Male Run Tee Swivel

Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	371PLP-2-0
1/8	1/16	W371PLP-2-1
1/8	1/8	W371PLP-2-2
5/32	10-32	371PLP-5/32-0
5/32	1/8	W371PLP-5/32-2
5/32	1/4	W371PLP-5/32-4
3/16	1/8	W371PLP-3-2
1/4	1/8	W371PLP-4-2
1/4	1/4	W371PLP-4-4
1/4	3/8	W371PLP-4-6
5/16	1/8	W371PLP-5-2
5/16	1/4	W371PLP-5-4
5/16	3/8	W371PLP-5-6
3/8	1/8	W371PLP-6-2
3/8	1/4	W371PLP-6-4
3/8	3/8	W371PLP-6-6
3/8	1/2	W371PLP-6-8
1/2	1/4	W371PLP-8-4
1/2	3/8	W371PLP-8-6
1/2	1/2	W371PLP-8-8



W68PLPSP Male Standpipe

Tube size (in.)	Thread NPT / UNF	Part number
5/32	10-32	68PLPSP-5/32-0
5/32	1/8	W68PLPSP-5/32-2
5/32	1/4	W68PLPSP-5/32-4
1/4	1/8	W68PLPSP-4-2
1/4	1/4	W68PLPSP-4-4
5/16	1/8	W68PLPSP-5-2
5/16	1/4	W68PLPSP-5-4
3/8	1/8	W68PLPSP-6-2
3/8	1/4	W68PLPSP-6-4
3/8	3/8	W68PLPSP-6-6
1/2	3/8	W68PLPSP-8-6
1/2	1/2	W68PLPSP-8-8



W368PLP Male Y Connector

Tube size (in.)	Thread NPT / UNF	Part number
5/32	1/8	W368PLP-5/32-2
5/32	1/4	W368PLP-5/32-4
1/4	1/8	W368PLP-4-2
1/4	1/4	W368PLP-4-4
3/8	1/4	W368PLP-6-4
3/8	3/8	W368PLP-6-6



Most popular.

32PLP Equal Union

Tube Size (in.)	Part number
1/8	32PLP-2
5/32	32PLP-5/32
3/16	32PLP-3
1/4	32PLP-4
5/16	32PLP-5
3/8	32PLP-6
1/2	32PLP-8



365PLP Union Elbow

Tube Size (in.)	Part number
1/8	365PLP-2
5/32	365PLP-5/32
3/16	365PLP-3
1/4	365PLP-4
5/16	365PLP-5
3/8	365PLP-6
1/2	365PLP-8



364PLP Union Tee

Tube Size (in.)	Part number
1/8	364PLP-2
5/32	364PLP-5/32
3/16	364PLP-3
1/4	364PLP-4
5/16	364PLP-5
3/8	364PLP-6
1/2	364PLP-8



362PLP Union Y Connector

1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	362PLP-2
1/8	1/4	362PLP-2-4
5/32	5/32	362PLP-5/32
5/32	1/4	362PLP-5/32-4
1/4	1/4	362PLP-4
1/4	3/8	362PLP-4-6
5/16	5/16	362PLP-5
3/8	3/8	362PLP-6



362PLPD Double Y Connector

1 Tube size (in.)	2 Tube size (in.)	Part number
5/32	5/32	362PLPD-5/32
5/32	1/4	362PLPD-5/32-4



24PLP Multiple Tee



1 Tube size (in.)	2 Tube size (in.)	Part number
1/4	5/32	24PLP-4-5/32
1/4	1/4	24PLP-4-4
5/16	5/32	24PLP-5-5/32
3/8	1/4	24PLP-6-4

24PLPD Double Multiple Tee



1 Tube size (in.)	2 Tube size (in.)	Part number
1/4	5/32	24PLPD-4-5/32
1/4	1/4	24PLPD-4-4
5/16	5/32	24PLPD-5-5/32
3/8	1/4	24PLPD-6-4

347PLP Equal Cross



Tube Size (in.)	Part number
5/32	347PLP-5/32
1/4	347PLP-4
5/16	347PLP-5

32PLPRC Connector for 2 Tubes



Tube Size (in.)	Part number
5/32	32PLPRC-5/32
1/4	32PLPRC-4
5/16	32PLPRC-5

32PLPDRC Connector for 3 Tubes



Tube Size (in.)	Part number
5/32	32PLPDRC-5/32
5/16	32PLPDRC-5

377PLP Female Branch Tee Swivel



Tube size (in.)	Thread NPT / UNF	Part number
1/8	1/8	377PLP-2-2
5/32	1/8	377PLP-5/32-2
5/32	1/4	377PLP-5/32-4
1/4	1/8	377PLP-4-2
1/4	1/4	377PLP-4-4
5/16	1/8	377PLP-5-2
5/16	1/4	377PLP-5-4
3/8	1/4	377PLP-6-4
1/2	3/8	377PLP-8-6

Most popular.

370PLP Female Elbow Swivel



Tube size (in.)	Thread NPT	Part number
1/8	1/8	370PLP-2-2
5/32	1/8	370PLP-5/32-2
5/32	1/4	370PLP-5/32-4
1/4	1/8	370PLP-4-2
1/4	1/4	370PLP-4-4
5/16	1/8	370PLP-5-2
5/16	1/4	370PLP-5-4
3/8	1/4	370PLP-6-4
1/2	3/8	370PLP-8-6

32PLPBH Bulkhead Union



Tube Size (in.)	Part number
1/8	32PLPBH-2
5/32	32PLPBH-5/32
1/4	32PLPBH-4
5/16	32PLPBH-5
3/8	32PLPBH-6
1/2	32PLPBH-8

365PLPBH Equal Bulkhead Elbow



Tube size (in.)	Thread NPT / UNF	Part number
1/8	13	365PLPBH-2
5/32		365PLPBH-5/32
1/4	18	365PLPBH-4
5/16		365PLPBH-5
3/8	22	365PLPBH-6
1/2	29	365PLPBH-8

369PLPSP Plug-In Elbow



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	369PLPSP-2
5/32	5/32	369PLPSP-5/32
5/32	1/4	369PLPSP-5/32-4
1/4	1/4	369PLPSP-4
1/4	3/8	369PLPSP-4-6
5/16	5/16	369PLPSP-5
3/8	3/8	369PLPSP-6
1/2	1/2	369PLPSP-8

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369PLPSPX Extended Plug-In Elbow



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	369PLPSPX-2
5/32	5/32	369PLPSPX-5/32
1/4	1/4	369PLPSPX-4
5/16	5/16	369PLPSPX-5
3/8	3/8	369PLPSPX-6

379PLPSP 45° Plug-In Elbow



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	379PLPSP-2
5/32	5/32	379PLPSP-5/32
1/4	1/4	379PLPSP-4
5/16	5/16	379PLPSP-5
3/8	3/8	379PLPSP-6

372PLPSP Plug-In Branch Tee



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	372PLPSP-2
5/32	5/32	372PLPSP-5/32
1/4	1/4	372PLPSP-4
5/16	5/16	372PLPSP-5
3/8	3/8	372PLPSP-6
1/2	1/2	372PLPSP-8

371PLPSP Plug-In Run Tee



1 Tube size (in.)	2 Tube size (in.)	Part number
5/32	5/32	371PLPSP-5/32
1/4	1/4	371PLPSP-4
5/16	5/16	371PLPSP-5
3/8	3/8	371PLPSP-6
1/2	1/2	371PLPSP-8

362PLPSP Plug-In Y



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	362PLPSP-2
5/32	5/32	362PLPSP-5/32
1/4	1/4	362PLPSP-4
5/16	5/16	362PLPSP-5
3/8	3/8	362PLPSP-6

67PLP Tube End Reducer



1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	5/32	67PLP-2-5/32
1/8	3/16	67PLP-2-3
1/8	1/4	67PLP-2-4
5/32	3/16	67PLP-5/32-3
5/32	1/4	67PLP-5/32-4
5/32	5/16	67PLP-5/32-5
5/32	3/8	67PLP-5/32-6
3/16	5/16	67PLP-3-5
3/16	1/4	67PLP-3-4
1/4	5/16	67PLP-4-5
1/4	3/8	67PLP-4-6
1/4	1/2	67PLP-4-8
5/16	3/8	67PLP-5-6
5/16	1/2	67PLP-5-8
3/8	1/2	67PLP-6-8

32PLPSP Tube Expander



1 Tube size (in.)	2 Tube size (in.)	Part number
1/4	1/8	32PLPSP-4-2
1/4	6M	32PLPSP-4-6M
1/4	5/32	32PLPSP-4-5/32
1/4	3/16	32PLPSP-4-3
3/8	1/4	32PLPSP-6-4

322PLPSP Barbed Connector



OD 1	OD 2	OD 3	Part number
5/32	0.12	0.20	322PLPSP-2-5/32
5/32	0.20	0.28	322PLPSP-5M-5/32
1/4	3/16		322PLPSP-3-4
5/16	0.25	0.34	322PLPSP-4-5
3/8	0.32	0.39	322PLPSP-5-5
3/8	0.32	0.39	322PLPSP-5-6

63PLP Double Male Union



Tube size (in.)	Part number
5/32	63PLP-5/32
1/4	63PLP-4
5/16	63PLP-5
3/8	63PLP-6
1/2	63PLP-8

Most popular.



639PLP Plug



Tube size (in.)	Part number
1/8	639PLP-2
5/32	639PLP-5/32
3/16	639PLP-3
1/4	639PLP-4
5/16	639PLP-5
3/8	639PLP-6
1/2	639PLP-8

W369PLP Male Elbow



Tube size (mm)	Thread NPT	Part number
4	1/8	W369PLP-4M-2
4	1/4	W369PLP-4M-4
6	1/8	W369PLP-6M-2
6	1/4	W369PLP-6M-4
8	1/8	W369PLP-8M-2
8	1/4	W369PLP-8M-4
8	3/8	W369PLP-8M-6
10	1/4	W369PLP-10M-4
10	3/8	W369PLP-10M-6
10	1/2	W369PLP-10M-8
12	3/8	W369PLP-12M-6
12	1/2	W369PLP-12M-8

W372PLP Male Branch Tee Swivel



Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	372PLP-2-0
1/8	1/16	W372PLP-2-1
1/8	1/8	W372PLP-2-2
1/8	1/4	W372PLP-2-4
5/32	10-32	372PLP-5/32-0
5/32	1/8	W372PLP-5/32-2
5/32	1/4	W372PLP-5/32-4
3/16	1/8	W372PLP-3-2
1/4	1/8	W372PLP-4-2
1/4	1/4	W372PLP-4-4
1/4	3/8	W372PLP-4-6
5/16	1/8	W372PLP-5-2
5/16	1/4	W372PLP-5-4
5/16	3/8	W372PLP-5-6
3/8	1/8	W372PLP-6-2
3/8	1/4	W372PLP-6-4
3/8	3/8	W372PLP-6-6
3/8	1/2	W372PLP-6-8
1/2	1/4	W372PLP-8-4
1/2	3/8	W372PLP-8-6
1/2	1/2	W372PLP-8-8

Most popular.

32PLP Union



Tube size (mm)	Part number
3	32PLP-3M
4	32PLP-4M
6	32PLP-6M
8	32PLP-8M
10	32PLP-10M
12	32PLP-12M
14	32PLP-14M

365PLP Union Elbow



Tube size (mm)	Part number
4	365PLP-4M
6	365PLP-6M
8	365PLP-8M
10	365PLP-10M
12	365PLP-12M
14	365PLP-14M

364PLP Union Tee



Tube size (mm)	Part number
3	364PLP-3M
4	364PLP-4M
6	364PLP-6M
8	364PLP-8M
10	364PLP-10M
12	364PLP-12M
14	364PLP-14M

362PLP Union Y Connector



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	362PLP-4M
6	6	362PLP-6M
8	8	362PLP-8M
10	10	362PLP-10M
12	12	362PLP-12M
4	6	362PLP-4M-6M
6	8	362PLP-6M-8M
8	10	362PLP-8M-10M
10	12	362PLP-10M-12M


362PLPD Double Y Connector



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	362PLPD-4M
6	6	362PLPD-6M
4	6	362PLPD-4M-6M
6	8	362PLPD-6M-8M


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24PLP Multiple Tee




1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	24PLP-6M-4M
8	4	24PLP-8M-4M
8	6	24PLP-8M-6M
10	6	24PLP-10M-6M
10	8	24PLP-10M-8M

24PLPD Double Multiple Tee




1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	24PLPD-6M-4M
8	4	24PLPD-8M-4M
8	6	24PLPD-8M-6M
10	6	24PLPD-10M-6M
10	8	24PLPD-10M-8M

347PLP Equal Cross




Tube size (mm)	Part number
4	347PLP-4M
6	347PLP-6M
8	347PLP-8M

32PLPRC Connector for 2 Tubes




Tube size (mm)	Part number
4	32PLPRC-4M
6	32PLPRC-6M
8	32PLPRC-8M

32PLPDRC Connector for 3 Tubes




Tube size (mm)	Part number
4	32PLPDRC-4M
6	32PLPDRC-6M
8	32PLPDRC-8M


32PLPBH Bulkhead Union



Tube size (mm)	Part number
4	32PLPBH-4M
6	32PLPBH-6M
8	32PLPBH-8M
10	32PLPBH-10M
12	32PLPBH-12M
14	32PLPBH-14M


 Most popular.

365PLPBH Equal Bulkhead Elbow



Tube size (mm)	Part number
4	365PLPBH-4M
6	365PLPBH-6M
8	365PLPBH-8M
10	365PLPBH-10M
12	365PLPBH-12M

370PLP Female Elbow - BSPP



Tube size (mm)	BSPP	Part number
4	1/8	370PLP-4M-2G
4	1/4	370PLP-4M-4G
6	1/8	370PLP-6M-2G
6	1/4	370PLP-6M-4G
8	1/8	370PLP-8M-2G
8	1/4	370PLP-8M-4G
8	3/8	370PLP-8M-6G
10	1/4	370PLP-10M-4G
10	3/8	370PLP-10M-6G
10	1/2	370PLP-10M-8G
12	1/4	370PLP-12M-4G
12	3/8	370PLP-12M-6G
12	1/2	370PLP-12M-8G

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369PLP Male Elbow - BSPP

Tube size (mm)	BSPP	Part number
3	M3x0.5	369PLP-3M-M3
3	M5x0.8	369PLP-3M-M5
4	M3x0.5	369PLP-4M-M3
4	M5x0.8	369PLP-4M-M5
4	M7x1	369PLP-4M-M7
4	1/8	369PLP-4M-2G
4	1/4	369PLP-4M-4G
6	M5x0.8	369PLP-6M-M5
6	M7x1	369PLP-6M-M7
6	M10x1	369PLP-6M-M10
6	M12x1.5	369PLP-6M-M12
6	1/8	369PLP-6M-2G
6	1/4	369PLP-6M-4G
6	3/8	369PLP-6M-6G
6	1/2	369PLP-6M-8G
8	M10x1	369PLP-8M-M10
8	M12x1.5	369PLP-8M-M12
8	1/8	369PLP-8M-2G
8	1/4	369PLP-8M-4G
8	3/8	369PLP-8M-6G
8	1/2	369PLP-8M-8G
10	1/4	369PLP-10M-4G
10	3/8	369PLP-10M-6G
10	1/2	369PLP-10M-8G
12	1/4	369PLP-12M-4G
12	3/8	369PLP-12M-6G
12	1/2	369PLP-12M-8G
14	3/8	369PLP-14M-6G
14	1/2	369PLP-14M-8G



369PLPX Male Elbow - BSPP

Tube size (mm)	BSPP	Part number
4	M5x0.8	369PLPX-4M-M5
4	M7x1	369PLPX-4M-M7
4	1/8	369PLPX-4M-2G
4	1/4	369PLPX-4M-4G
6	M5x0.8	369PLPX-6M-M5
6	M7x1	369PLPX-6M-M7
6	1/8	369PLPX-6M-2G
6	1/4	369PLPX-6M-4G
8	1/8	369PLPX-8M-2G
8	1/4	369PLPX-8M-4G
8	3/8	369PLPX-8M-6G
10	1/4	369PLPX-10M-4G
10	3/8	369PLPX-10M-6G
10	1/2	369PLPX-10M-8G
12	1/4	369PLPX-12M-4G
12	3/8	369PLPX-12M-6G
12	1/2	369PLPX-12M-8G
14	3/8	369PLPX-14M-6G
14	1/2	369PLPX-14M-8G



372PLP Male Branch Tee - BSPP

Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	372PLP-4M-M5
4	1/8	372PLP-4M-2G
4	1/4	372PLP-4M-4G
6	M5x0.8	372PLP-6M-M5
6	1/8	372PLP-6M-2G
6	1/4	372PLP-6M-4G
8	1/8	372PLP-8M-2G
8	1/4	372PLP-8M-4G
8	3/8	372PLP-8M-6G
10	1/4	372PLP-10M-4G
10	3/8	372PLP-10M-6G
10	1/2	372PLP-10M-8G
12	1/4	372PLP-12M-4G
12	3/8	372PLP-12M-6G
12	1/2	372PLP-12M-8G
14	3/8	372PLP-14M-6G
14	1/2	372PLP-14M-8G



379PLP 45° Male Elbow - BSPP

Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	379PLP-4M-M5
4	1/8	379PLP-4M-2G
6	M5x0.8	379PLP-6M-M5
6	1/8	379PLP-6M-2G
6	1/4	379PLP-6M-4G
8	1/8	379PLP-8M-2G
8	1/4	379PLP-8M-4G
8	3/8	379PLP-8M-6G
10	1/4	379PLP-10M-4G
10	3/8	379PLP-10M-6G
10	1/2	379PLP-10M-8G
12	1/4	379PLP-12M-4G
12	3/8	379PLP-12M-6G
12	1/2	379PLP-12M-8G



Most popular.

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371PLP Male Run Tee - BSPP

Tube size (mm)	BSPP	Part number
4	M5x0.8	371PLP-4M-M5
4	1/8	371PLP-4M-2G
4	1/4	371PLP-4M-4G
6	M5x0.8	371PLP-6M-M5
6	1/8	371PLP-6M-2G
6	1/4	371PLP-6M-4G
8	1/8	371PLP-8M-2G
8	1/4	371PLP-8M-4G
8	3/8	371PLP-8M-6G
10	1/4	371PLP-10M-4G
10	3/8	371PLP-10M-6G
10	1/2	371PLP-10M-8G
12	1/4	371PLP-12M-4G
12	3/8	371PLP-12M-6G
12	1/2	371PLP-12M-8G
14	3/8	371PLP-14M-6G
14	1/2	371PLP-14M-8G



368PLP Male Y Connector - BSPP

Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	368PLP-4M-M5
4	1/8	368PLP-4M-2G
4	1/4	368PLP-4M-4G
6	M5x0.8	368PLP-6M-M5
6	1/8	368PLP-6M-2G
6	1/4	368PLP-6M-4G
8	1/8	368PLP-8M-2G
8	1/4	368PLP-8M-4G
8	3/8	368PLP-8M-6G
10	1/4	368PLP-10M-4G
10	3/8	368PLP-10M-6G
10	1/2	368PLP-10M-8G
12	3/8	368PLP-12M-6G
12	1/2	368PLP-12M-8G



68PLPSP Male Standpipe - BSPP

Tube size (mm)	BSPP	Part number
4	M5x0.8	68PLPSP-4M-M5
4	1/8	68PLPSP-4M-2G
4	1/4	68PLPSP-4M-4G
6	1/8	68PLPSP-6M-2G
6	1/4	68PLPSP-6M-4G
8	1/8	68PLPSP-8M-2G
8	1/4	68PLPSP-8M-4G
8	3/8	68PLPSP-8M-6G
10	1/4	68PLPSP-10M-4G
10	3/8	68PLPSP-10M-6G
10	1/2	68PLPSP-10M-8G
12	3/8	68PLPSP-12M-6G
12	1/2	68PLPSP-12M-8G
14	3/8	68PLPSP-14M-6G
14	1/2	68PLPSP-14M-8G



368PLPD Double Y Male Connector - BSPP

Tube size (mm)	BSPP	Part number
4	1/8	368PLPD-4M-2G
4	1/4	368PLPD-4M-4G
6	1/8	368PLPD-6M-2G
6	1/4	368PLPD-6M-4G



369PLPSP Plug-In Elbow

1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	369PLPSP-4M
6	6	369PLPSP-6M
8	8	369PLPSP-8M
10	10	369PLPSP-10M
12	12	369PLPSP-12M
4	6	369PLPSP-4M-6M
6	4	369PLPSP-6M-4M
6	8	369PLPSP-6M-8M
8	10	369PLPSP-8M-10M
10	12	369PLPSP-10M-12M



Most popular.



369PLXSP Extended Plug-In Elbow



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	369PLXSP-4M
6	6	369PLXSP-6M
8	8	369PLXSP-8M
10	10	369PLXSP-10M
12	12	369PLXSP-12M
4	6	369PLXSP-4M-6M
6	8	369PLXSP-6M-8M
8	10	369PLXSP-8M-10M
10	12	369PLXSP-10M-12M

362PLPSP Plug-In Y



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	362PLPSP-4M
6	6	362PLPSP-6M
8	8	362PLPSP-8M
10	10	362PLPSP-10M
12	12	362PLPSP-12M
4	6	362PLPSP-4M-6M
6	8	362PLPSP-6M-8M
8	10	362PLPSP-8M-10M
10	12	362PLPSP-10M-12M

379PLPSP 45° Plug-In Elbow



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	379PLPSP-4M
6	6	379PLPSP-6M
8	8	379PLPSP-8M
10	10	379PLPSP-10M
12	12	379PLPSP-12M

362PLPDSP Plug-In Multiple Y



1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	362PLPDSP-6M-4M
8	4	362PLPDSP-8M-4M
8	6	362PLPDSP-8M-6M

372PLPSP Plug-In Branch Tee



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	372PLPSP-4M
6	6	372PLPSP-6M
8	8	372PLPSP-8M
10	10	372PLPSP-10M
12	12	372PLPSP-12M
4	6	372PLPSP-4M-6M
6	8	372PLPSP-6M-8M
8	10	372PLPSP-8M-10M
10	12	372PLPSP-10M-12M

67PLP Tube Reducer



1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	67PLP-6M-4M
8	4	67PLP-8M-4M
8	6	67PLP-8M-6M
10	4	67PLP-10M-4M
10	6	67PLP-10M-6M
10	8	67PLP-10M-8M
12	10	67PLP-12M-10M
12	6	67PLP-12M-6M
12	8	67PLP-12M-8M
14	10	67PLP-14M-10M
14	12	67PLP-14M-12M
14	6	67PLP-14M-6M
14	8	67PLP-14M-8M

371PLPSP Plug-In Run Tee



1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	371PLPSP-4M
6	6	371PLPSP-6M
8	8	371PLPSP-8M
10	10	371PLPSP-10M
12	12	371PLPSP-12M
4	6	371PLPSP-4M-6M
6	8	371PLPSP-6M-8M
8	10	371PLPSP-8M-10M
10	12	371PLPSP-10M-12M

32PLPSP Tube Expander



1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	32PLPSP-6M-4M
8	6	32PLPSP-8M-6M
10	8	32PLPSP-10M-8M
12	10	32PLPSP-12M-10M

Most popular.

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322PLPSP Barbed Connector



OD 1	OD 2	OD 3	Part number
4	3.2	5.0	322PLPSP-3M-4M
4	5.0	7.0	322PLPSP-5M-4M
6	5.0	7.0	322PLPSP-5M-6M
8	6.3	8.5	322PLPSP-6M-8M
8	8.0	10.0	322PLPSP-8M-8M
10	6.3	8.0	322PLPSP-6M-10M
10	8.0	10.0	322PLPSP-8M-10M
12	8.0	10.0	322PLPSP-8M-12M
12	10.0	12.0	322PLPSP-1012M
12	12.5	14.5	322PLPSP-1212M
14	12.5	14.5	322PLPSP-1214M
14	14.0	16.0	322PLPSP-1414M

Push-to-Connect, Prestolok Metal

W68PLP Male Connector



Tube size (in.)	Pipe thd (NPTF)	Part number
1/8	1/16	W68PLP-2-1
1/8	1/8	W68PLP-2-2
1/8	1/4	W68PLP-2-4
3/16	1/8	W68PLP-3-2
3/16	1/4	W68PLP-3-4
5/32	1/16	W68PLP-5/32-1
5/32	1/8	W68PLP-5/32-2
5/32	1/4	W68PLP-5/32-4
1/4	1/16	W68PLP-4-1
1/4	1/8	W68PLP-4-2
1/4	1/4	W68PLP-4-4
1/4	3/8	W68PLP-4-6
5/16	1/8	W68PLP-5-2
5/16	1/4	W68PLP-5-4
5/16	3/8	W68PLP-5-6
3/8	1/8	W68PLP-6-2
3/8	1/4	W68PLP-6-4
3/8	3/8	W68PLP-6-6
3/8	1/2	W68PLP-6-8
1/2	1/4	W68PLP-8-4
1/2	3/8	W68PLP-8-6
1/2	1/2	W68PLP-8-8
5/32	1/4-28	68PLP-5/32-4LT*

*SAE-LT Threads

Most popular.

W68PLPR Round Body Male Connector



Tube size (in.)	Thread size NPTF	Part number
5/32	1/16	W68PLPR-5/32-1
5/32	1/8	W68PLPR-5/32-2
1/4	1/16	W68PLPR-4-1
1/4	1/8	W68PLPR-4-2
1/4	1/4	W68PLPR-4-4

*10-32 seal is neoprene

W68PW Male Connector (Nickel Plated)



Tube size (in.)	Thread size NPTF	Part number
1/4	1/8	W68PW-4-2
1/4	1/4	W68PW-4-4
1/4	3/8	W68PW-4-6
5/16	1/8	W68PW-5-2
5/16	1/4	W68PW-5-4
5/16	3/8	W68PW-5-6
3/8	1/8	W68PW-6-2
3/8	1/4	W68PW-6-4
3/8	3/8	W68PW-6-6
3/8	1/2	W68PW-6-8
1/2	1/4	W68PW-8-4
1/2	3/8	W68PW-8-6
1/2	1/2	W68PW-8-8

G

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Integrated Fittings

Misc. Accessories

Quick Couplings

Tubing & Fittings

W169PLP Male Elbow Swivel 90°

Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/16	W169PLP-2-1
1/8	1/8	W169PLP-2-2
1/8	10-32	169PLP-2-0*
1/8	1/4	W169PLP-2-4
3/16	1/8	W169PLP-3-2
5/32	1/16	W169PLP-5/32-1
5/32	1/8	W169PLP-5/32-2
5/32	1/4	W169PLP-5/32-4
5/32	10-32	169PLP-5/32-0*
1/4	1/16	W169PLP-4-1
1/4	1/8	W169PLP-4-2
1/4	1/4	W169PLP-4-4
1/4	3/8	W169PLP-4-6
1/4	10-32	169PLP-4-0*
5/16	1/8	W169PLP-5-2
5/16	1/4	W169PLP-5-4
3/8	1/8	W169PLP-6-2
3/8	1/4	W169PLP-6-4
3/8	3/8	W169PLP-6-6
3/8	1/2	W169PLP-6-8
1/2	1/4	W169PLP-8-4
1/2	3/8	W169PLP-8-6
1/2	1/2	W169PLP-8-8



*10-32 seal is neoprene

W169PLPNS Male Elbow 90°

Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	W169PLPNS-2-2
5/32	1/8	W169PLPNS5/32-2
5/32	1/4	W169PLPNS5/32-4
1/4	1/8	W169PLPNS-4-2
1/4	1/4	W169PLPNS-4-4
5/16	1/8	W169PLPNS-5-2
5/16	1/4	W169PLPNS-5-4
3/8	1/4	W169PLPNS-6-4
3/8	3/8	W169PLPNS-6-6
3/8	1/2	W169PLPNS-6-8
1/2	3/8	W169PLPNS-8-6
1/2	1/2	W169PLPNS-8-8
5/32	1/4-28	169PLPNS532-4LT*



* SAE-LT Threads

Most popular.

W169PW Male Elbow Swivel 90° (Nickel Plated)

Tube size (in.)	Thread (NPTF)	Part number
1/4	1/8	W169PW-4-2
1/4	1/4	W169PW-4-4
1/4	3/8	W169PW-4-6
5/16	1/8	W169PW-5-2
5/16	1/4	W169PW-5-4
3/8	1/8	W169PW-6-2
3/8	1/4	W169PW-6-4
3/8	3/8	W169PW-6-6
3/8	1/2	W169PW-6-8
1/2	1/4	W169PW-8-4
1/2	3/8	W169PW-8-6
1/2	1/2	W169PW-8-8



W171PLP Male Run Tee Swivel

Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	W171PLP-2-2
5/32	1/8	W171PLP-5/32-2
1/4	1/8	W171PLP-4-2
1/4	1/4	W171PLP-4-4
1/4	3/8	W171PLP-4-6
5/16	1/8	W171PLP-5-2
5/16	1/4	W171PLP-5-4
3/8	1/4	W171PLP-6-4
3/8	3/8	W171PLP-6-6
1/2	3/8	W171PLP-8-6
1/2	1/2	W171PLP-8-8



W171PW Male Run Tee Swivel (Nickel Plated)

Tube size (in.)	Pipe thread (NPTF)	Part number
1/4	1/8	W171PW-4-2
1/4	1/4	W171PW-4-4
1/4	3/8	W171PW-4-6
5/16	1/8	W171PW-5-2
5/16	1/4	W171PW-5-4
3/8	1/4	W171PW-6-4
3/8	3/8	W171PW-6-6
1/2	3/8	W171PW-8-6
1/2	1/2	W171PW-8-8



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W172PLP Male Branch Tee Swivel



Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	W172PLP-2-2
3/16	1/8	W172PLP-3-2
5/32	1/8	W172PLP-5/32-2
1/4	1/8	W172PLP-4-2
1/4	1/4	W172PLP-4-4
1/4	3/8	W172PLP-4-6
5/16	1/8	W172PLP-5-2
5/16	1/4	W172PLP-5-4
3/8	1/4	W172PLP-6-4
3/8	3/8	W172PLP-6-6
1/2	1/4	W172PLP-8-4
1/2	3/8	W172PLP-8-6
1/2	1/2	W172PLP-8-8

W172PW Male Branch Tee Swivel (Nickel Plated)



Tube size (in.)	Thread (NPTF)	Part number
1/4	1/8	W172PW-4-2
1/4	1/4	W172PW-4-4
1/4	3/8	W172PW-4-6
5/16	1/8	W172PW-5-2
5/16	1/4	W172PW-5-4
3/8	1/4	W172PW-6-4
3/8	3/8	W172PW-6-6
1/2	1/4	W172PW-8-4
1/2	3/8	W172PW-8-6
1/2	1/2	W172PW-8-8

62PLP Union



Tube size (in.)	Part number
1/8	62PLP-2
3/16	62PLP-3
5/32	62PLP-5/32
1/4	62PLP-4
5/16	62PLP-5
3/8	62PLP-6
1/2	62PLP-8

62PW Union (Nickel Plated)



Tube size (in.)	Part number
1/4	62PW-4
5/16	62PW-5
3/8	62PW-6
1/2	62PW-8

Most popular.

164PLP Union Tee



Tube size (in.)	Part number
1/8	164PLP-2
3/16	164PLP-3
5/32	164PLP-5/32
1/4	164PLP-4
5/16	164PLP-5
3/8	164PLP-6
1/2	164PLP-8

164PW Union Tee (Nickel Plated)



Tube size (in.)	Part number
1/4	164PW-4
5/16	164PW-5
3/8	164PW-6
1/2	164PW-8

165PLP Union Elbow



Tube size (in.)	Part number
1/8	165PLP-2
5/32	165PLP-5/32
3/16	165PLP-3
1/4	165PLP-4
5/16	165PLP-5
3/8	165PLP-6
1/2	165PLP-8

165PW Union Elbow (Nickel Plated)



Tube size (in.)	Part number
1/4	165PW-4
5/16	165PW-5
3/8	165PW-6
1/2	165PW-8

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66PLP Female Connector



Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	66PLP-2-2
1/8	1/4	66PLP-2-4
3/16	1/8	66PLP-3-2
5/32	1/8	66PLP-5/32-2
5/32	1/4	66PLP-5/32-4
1/4	1/8	66PLP-4-2
1/4	1/4	66PLP-4-4
5/16	1/8	66PLP-5-2
5/16	1/4	66PLP-5-4
3/8	1/4	66PLP-6-4
3/8	3/8	66PLP-6-6

66PW Female Connector (Nickel Plated)



Tube size (in.)	Pipe thread (NPTF)	Part number
1/4	1/8	66PW-4-2
1/4	1/4	66PW-4-4
5/16	1/8	66PW-5-2
5/16	1/4	66PW-5-4
3/8	1/4	66PW-6-4
3/8	3/8	66PW-6-6

62PLPBH Bulkhead Union



Tube size (in.)	Part number
1/8	62PLPBH-2
5/32	62PLPBH-5/32
1/4	62PLPBH-4
5/16	62PLPBH-5
3/8	62PLPBH-6
1/2	62PLPBH-8

66PLPBH Female Bulkhead



Tube size (in.)	Pipe thd (NPTF)	Part number
5/32	1/4	66PLPBH-5/32-4
1/4	1/4	66PLPBH-4-4
3/8	3/8	66PLPBH-6-6
1/2	3/8	66PLPBH-8-6

Most popular.

62PWBH Bulkhead Union (Nickel Plated)



Tube Size (in.)	Bulkhead Hole Dia. B	Part number
1/4	9/16	62PWBH-4
5/16	5/8	62PWBH-5
3/8	3/4	62PWBH-6
1/2	7/8	62PWBH-8

66PWBH Female Bulkhead (Nickel Plated)



Tube size (in.)	Thread (NPTF)	Bulkhead hole dia.	Part number
1/4	1/4	9/16	66PWBH-4-4
3/8	3/8	7/8	66PWBH-6-6
1/2	3/8	1	66PWBH-8-6

PLPHBF4-B Male Connector BSPP



Tube size (in.)	Pipe thd BSPP	Part number
3/16	1/8-28	3-1/8PLPHBF4-B
3/16	1/4-19	3-1/4PLPHBF4-B
1/4	1/8-28	4-1/8PLPHBF4-B
1/4	1/4-19	4-1/4PLPHBF4-B
1/4	3/8-19	4-3/8PLPHBF4-B
3/8	1/4-19	6-1/4PLPHBF4-B
3/8	3/8-19	6-3/8PLPHBF4-B
3/8	1/2-14	6-1/2PLPHBF4-B
1/2	3/8-19	8-3/8PLPHBF4-B
1/2	1/2-14	8-1/2PLPHBF4-B

DB Dust / Weld Spatter Boot



Tube size (in.)	Part number
1/4	DB-4
3/8	DB-6
1/2	DB-8

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FPB Male Connector NPT



Tube size (mm)	NPT	Part number
4	1/8-27	W68PLP-5/32-2
4	1/4-18	W68PLP-5/32-4
6	1/8-27	FPB6-1/8
6	1/4-18	FPB6-1/4
10	1/4-18	FPB10-1/4
10	3/8-18	FPB10-3/8
12	3/8-18	FPB12-3/8

C6PB Adjustable Male Elbow NPT



Tube size (mm)	NPT	Part number
6	1/4-18	C6PB6-1/4
6	3/8-18	C6PB6-3/8
10	1/4-18	C6PB10-1/4
10	3/8-18	C6PB10-3/8
12	1/2-14	C6PB12-1/2

HPB Equal Union



Tube size (mm)	Part number
4	HPB4
5	HPB5
6	HPB6
8	HPB8
10	HPB10
12	HPB12
14	HPB14

JPB Union Tee



Tube size (mm)	Part number
4	JPB4
5	JPB5
6	JPB6
8	JPB8
10	JPB10
12	JPB12
14	JPB14

EPB 90° Union Elbow



Tube size (mm)	Part number
4	EPB4
5	EPB5
6	EPB6
8	EPB8
10	EPB10
12	EPB12
14	EPB14

Most popular.

WBMPB Mixed Bulkhead Union



Tube 1 size (mm)	Tube 2 size (mm)	Bulkhead hole dia.	Part number
4	4	8mm	WBMPB4
6	6	10mm	WBMPB6
8	8	12mm	WBMPB8
10	10	14mm	WBMPB10
12	12	16mm	WBMPB12
14	14	18mm	WBMPB14

WPB Bulkhead Union



Tube Size (mm)	Bulkhead hole dia.	Part number
4	11mm	WPB4
6	13mm	WPB6
8	16mm	WPB8
10	18mm	WPB10
12	23mm	WPB12
14	24mm	WPB14

Jam nut is supplied loose in box

WE6PB Adjustable Bulkhead Union Elbow



Tube Size (mm)	Bulkhead hole dia.	Part number
4	11mm	WE6PB4
6	13mm	WE6PB6
8	15mm	WE6PB8
10	18mm	WE6PB10
12	23mm	WE6PB12

G4PB Female Connector BSPP



Tube size (mm)	BSPP	Part number
4	1/8	G4PB4-1/8
6	1/8	G4PB6-1/8
6	1/4	G4PB6-1/4
8	1/8	G4PB8-1/8
8	1/4	G4PB8-1/4

G

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Hose & Fittings

Integrated Fittings

Misc. Accessories

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WG4PB Bulkhead Union Female BSPP



Tube size (mm)	BSPP	Part number
4	G1/8	WG4PB4-1/8
6	G1/8	WG4PB6-1/8
6	G1/4	WG4PB6-1/4
8	G1/8	WG4PB8-1/8
8	G1/4	WG4PB8-1/4
10	G3/8	WG4PB10-3/8
12	G3/8	WG4PB12-3/8
12	G1/2	WG4PB12-1/2

F4PB Compact Male Connector BSPP



Tube size (mm)	BSPP	Part number
4	1/8	F4PB4-1/8
4	1/4	F4PB4-1/4
6	1/8	F4PB6-1/8
6	1/4	F4PB6-1/4
8	1/4	F4PB8-1/4
8	1/8	F4PB8-1/8
8	3/8	F4PB8-3/8
10	1/4	F4PB10-1/4
10	3/8	F4PB10-3/8
10	1/2	F4PB10-1/2
12	1/4	F4PB12-1/4
12	3/8	F4PB12-3/8
12	1/2	F4PB12-1/2
14	3/8	F4PB14-3/8
14	1/2	F4PB14-1/2

C64PB Adjustable Male Elbow BSPP



Tube size (mm)	BSPP	Part number
4	1/8	C64PB4-1/8
4	1/4	C64PB4-1/4
6	1/8	C64PB6-1/8
6	1/4	C64PB6-1/4
8	1/8	C64PB8-1/8
8	1/4	C64PB8-1/4
8	3/8	C64PB8-3/8
10	1/4	C64PB10-1/4
10	3/8	C64PB10-3/8
12	1/4	C64PB12-1/4
12	3/8	C64PB12-3/8
12	1/2	C64PB12-1/2
14	3/8	C64PB14-3/8
14	1/2	C64PB14-1/2

R64PB Swivel Male Branch Run Tee BSPP



Tube size (mm)	BSPP	Part number
4	1/8	R64PB4-1/8
4	1/4	R64PB4-1/4
6	1/8	R64PB6-1/8
6	1/4	R64PB6-1/4
8	1/8	R64PB8-1/8
8	1/4	R64PB8-1/4
8	3/8	R64PB8-3/8
10	1/4	R64PB10-1/4
10	3/8	R64PB10-3/8
12	1/4	R64PB12-1/4
12	3/8	R64PB12-3/8
14	3/8	R64PB14-3/8
14	1/2	R64PB14-1/2

C64SPB Compact Adjustable Male Elbow BSPP



Tube size (mm)	BSPP	Part number
4	1/8	C64SPB4-1/8
6	1/8	C64SPB6-1/8
6	1/4	C64SPB6-1/4
8	1/8	C64SPB8-1/8
8	1/4	C64SPB8-1/4
8	3/8	C64SPB8-3/8
10	1/4	C64SPB10-1/4
10	3/8	C64SPB10-3/8
12	1/8	C64SPB12-1/4
12	3/8	C64SPB12-3/8
12	1/2	C64SPB12-1/2

Most popular.

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S64PB Swivel Male Branch Tee BSPP



Tube size (mm)	BSPP	Part number
4	1/8	S64PB4-1/8
4	1/4	S64PB4-1/4
6	1/8	S64PB6-1/8
6	1/4	S64PB6-1/4
8	1/8	S64PB8-1/8
8	1/4	S64PB8-1/4
8	3/8	S64PB8-3/8
10	1/4	S64PB10-1/4
10	3/8	S64PB10-3/8
12	1/4	S64PB12-1/4
12	3/8	S64PB12-3/8
14	3/8	S64PB14-3/8
14	1/2	S64PB14-1/2

C68PB Adjustable Male Elbow Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M5x0.8	C68PB4M5
6	M5x0.8	C68PB6M5

C68SPB Compact Adjustable Male Elbow Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M5x0.8	C68SPB4M5
6	M5x0.8	C68SPB6M5

F28PB Male Connector Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M3x0.5	F28PB4M3
4	M5x0.8	F28PB4M5
6	M5x0.8	F28PB6M5

This fitting has been designed for use where space is at a premium. It is assembled using the internal hexagon and an allen key.

F8PB Male Connector Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M5x0.8	F8PB4M5
4	M10x1	F8PB4M10
6	M5x0.8	F8PB6M5
6	M10x1	F8PB6M10
6	M12x1.5	F8PB6M12
8	M12x1.5	F8PB8M12
8	M16x1.5	F8PB8M16
8	M22x1.5	F8PB8M22

Most popular.

R68PB Adjustable Male Run Tee Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M3x0.5	R68PB4M3
4	M5x0.8	R68PB4M5
6	M5x0.8	R68PB6M5

S68PB Adjustable Male Branch Tee Metric Straight Thread



Tube size (mm)	Thread (mm)	Part number
4	M3x0.5	S68PB4M3
4	M5x0.8	S68PB4M5
6	M5x0.8	S68PB6M5

FNPB Plug



Tube size (mm)	Part number
4	FNPB4
6	FNPB6
8	FNPB8
10	FNPB10
12	FNPB12
14	FNPB14

TEPB Tube End Expander



Tube 1 Size (mm)	Tube 2 Size (mm)	Part number
4	6	TEPB4-6

TRPB Tube End Reducer



Tube 1 size (mm)	Tube 2 size (mm)	Part number
6	4	TRPB6-4
8	4	TRPB8-4
8	6	TRPB8-6
10	4	TRPB10-4
10	6	TRPB10-6
10	8	TRPB10-8
12	6	TRPB12-6
12	8	TRPB12-8
12	10	TRPB12-10
14	8	TRPB14-8
14	10	TRPB14-10
14	12	TRPB14-12

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Integrated Fittings

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Quick Couplings

Tubing & Fittings

207ACBH Anchor Coupling



Female pipe thread	Straight thread	Max. bulkhead	Part number
1/8	5/8-18	.89	207ACBH-2
1/8	5/8-18	.35	207ACBHS-2
1/4	3/4-16	.81	207ACBH-4
1/4	3/4-16	.26	207ACBHS-4
3/8	1-14	.62	207ACBH-6
1/2	1-1/8-14	.75	207ACBH-8
3/4	1-5/16-12	.65	207ACBH-12
1	1-5/8-14	1.00	207ACBH-16*

*Lock washer not available

207P Coupling



Pipe thread	C Hex	Part number
1/8	9/16	207P-2
1/4	3/4	207P-4
3/8	7/8	207P-6
1/2	1-1/16	207P-8
3/4	1-3/8	207P-12

208P Reducer Coupling



1 Pipe thread	2 Pipe thread	C Hex	Part number
1/4	1/8	3/4	208P-4-2
3/8	1/4	7/8	208P-6-4
1/2	1/4	1-1/16	208P-8-4
1/2	3/8	1-1/16	208P-8-6
3/4	3/8	1-3/8	208P-12-6
3/4	1/2	1-3/8	208P-12-8

209P Bushing



1 Pipe thread	2 Pipe thread	C Hex	Part number
1/8	1/4	9/16	209P-4-2
1/8	3/8	11/16	209P-6-2
1/4	3/8	3/4	209P-6-4
1/8	1/2	7/8	209P-8-2
1/4	1/2	7/8	209P-8-4
3/8	1/2	7/8	209P-8-6
1/8	3/4	1-1/8	209P-12-2
1/4	3/4	1-1/8	209P-12-4
3/8	3/4	1-1/8	209P-12-6
1/2	3/4	1-1/8	209P-12-8
1/2	1	1-3/8	209P-16-8
3/4	1	1-3/8	209P-16-12

Most popular.

210P Lock Nut



Pipe thread	C Hex	Part number
1/8 NPSL	11/16	210P-2
1/4 NPSL	7/8	210P-4
3/8 NPSL	1	210P-6
1/2 NPSL	1-1/8	210P-8

211P Square-Head Plug



Pipe thread	Part number
1/8	211P-2
1/4	211P-4
3/8	211P-6
1/2	211P-8
3/4	211P-12

212P Union



Pipe thread	C Hex	Part number
1/4	1-3/16	212P-4
3/8	1-1/4	212P-6

213P Cap



Pipe thread	C Hex	Part number
1/8	9/16	213P-2
1/4	11/16	213P-4
3/8	13/16	213P-6
1/2	1-1/16	213P-8
3/4	1-1/4	213P-12

215PN Close Nipple



Pipe thread	Part number
1/8	215PN-2
1/4	215PN-4
3/8	215PN-6
1/2	215PN-8
3/4	215PN-12

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215PNL Long Nipple

Pipe thread	Part number
1/8	215PNL-2-15
1/4	215PNL-4-15
3/8	215PNL-6-15
1/2	215PNL-8-15
1/8	215PNL-2-20
1/4	215PNL-4-20
3/8	215PNL-6-20
1/2	215PNL-8-20
1/8	215PNL-2-25
1/4	215PNL-4-25
3/8	215PNL-6-25
1/2	215PNL-8-25
1/8	215PNL-2-30
1/4	215PNL-4-30
3/8	215PNL-6-30
1/2	215PNL-8-30
1/8	215PNL-2-35
1/4	215PNL-4-35
3/8	215PNL-6-35
1/2	215PNL-8-35



216P Hex Nipple

Pipe thread	C Hex	Part number
1/8	7/16	216P-2
1/4	9/16	216P-4
3/8	11/16	216P-6
1/2	7/8	216P-8
3/4	1-1/16	216P-12



218P Hex-Head Plug

Pipe thread	C Hex	Part number
1/8	7/16	218P-2
1/4	9/16	218P-4
3/8	11/16	218P-6
1/2	7/8	218P-8
3/4	1-1/16	218P-12



219P Countersunk Hex-Head Plug

Pipe thread	C Hex	Part number
1/8	3/16	219P-2
1/4	1/4	219P-4
3/8	5/16	219P-6
1/2	3/8	219P-8
3/4	9/16	219P-12



Most popular.

Accessories Pipe Fittings

220P Slotted-Head Plug

Pipe thread	Part number
1/8	220P-2
1/4	220P-4
3/8	220P-6



222P Adapter

1 Pipe thread	2 Pipe thread	C Hex	Part number
1/8	1/8	9/16	222P-2-2
1/4	1/8	3/4	222P-4-2
1/4	1/4	3/4	222P-4-4
3/8	1/8	7/8	222P-6-2
3/8	1/4	7/8	222P-6-4
3/8	3/8	7/8	222P-6-6
1/2	1/4	1	222P-8-4
1/2	3/8	1-1/16	222P-8-6
1/2	1/2	1-1/16	222P-8-8
3/4	3/8	1-3/8	222P-12-6
3/4	1/2	1-3/8	222P-12-8
3/4	3/4	1-3/8	222P-12-12



1200P-2200P 90° Union Elbow

Pipe thread	Part number
1/8	1200P-2-2
1/8	2200P-2-2
1/4	1200P-4-4
1/4	2200P-4-4
3/8	1200P-6-6
3/8	2200P-6-6
1/2	2200P-8-8



1202P-2202P 90° Street Elbow

1 Pipe thread	2 Pipe thread	Part number
1/8	1/8	1202P-2-2
1/8	1/8	2202P-2-2
1/8	1/8	2202PA-2-2*
1/4	1/8	2202P-4-2
1/4	1/4	1202P-4-4
1/4	1/4	2202P-4-4
1/4	1/4	2202PA-4-4*
1/4	3/8	2202P-4-6
3/8	1/4	1202P-6-4
3/8	3/8	1202P-6-6
3/8	3/8	2202P-6-6
3/8	3/8	2202PA-6-6*



*Meets SAE Dimensions

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1203P-2203P Union Tee



Pipe thread	Part number
1/8	1203P-2
1/8	2203P-2
1/4	1203P-4
1/4	2203P-4
3/8	2203P-6
1/2	1203P-8
1/2	2203P-8
3/4	2203P-12

1204P Male Elbow



Pipe thread	Part number
1/8	1204P-2
1/4	1204P-4
3/8	1204P-6
1/2	1204P-8

2224P Male Branch Tee



Pipe thread	Part number
1/8	2224P-2
1/4	2224P-4
3/8	2224P-6
1/2	2224P-8
3/4	2224P-12

2225P Street Tee



Pipe thread	Part number
1/8	2225P-2
1/4	2225P-4
3/8	2225P-6
1/2	2225P-8
3/4	2225P-12

1201P-2201P 45° Female Elbow



1201P



2201P

Pipe thread	Part number
1/8	2201P-2-2
1/2	1201P-8-8

2205P Cross



Pipe thread	Part number
1/8	2205P-2
1/4	2205P-4
3/8	2205P-6
1/2	2205P-8
3/4	2205P-12

2214P 45° Street Elbow



Pipe thread	Part number
1/8	2214P-2-2
1/4	2214P-4-4
3/8	2214P-6-6
1/2	2214P-8-8

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DD44 Pipe 90° Elbow BSPP



BSPP	C Hex	Part number
1/8	14	1/8DD44B
1/4	17	1/4DD44B
3/8	22	3/8DD44B
1/2	27	1/2DD44B

KMMOO4 Pipe Cross BSPP



BSPP	C Hex	Part number
1/8	14	1/8KMMOO4B
1/4	17	1/4KMMOO4B
3/8	22	3/8KMMOO4B
1/2	27	1/2KMMOO4B

FF44 Pipe Nipples BSPP



BSPP	C Hex	Part number
1/8	14	1/8FF44B
1/4	17	1/4FF44B
3/8	22	3/8FF44B
1/2	27	1/2FF44B

MMO444 Pipe Tee BSPP



BSPP	C Hex	Part number
1/8	14	1/8MMO444B
1/4	17	1/4MMO444B
3/8	22	3/8MMO444B
1/2	27	1/2MMO444B
3/4	32	3/4MMO444B
1	40	1MMO444B

FHG4 Adapter Male NPTF BSPP



BSPP 1	NPTF 2	C Hex	Part number
1/8	1/8	0.562	1/8FHG4-B
1/4	1/4	0.750	1/4FHG4-B
3/8	3/8	0.875	3/8FHG4-B
1/2	1/2	1.062	1/2FHG4-B

WGG44 Bulkhead Female Union BSPP



BSPP	Straight thread	C Hex	Part number
1/8	M16x1.5	19	1/8WGG44B
1/4	M20x1.5	24	1/4WGG44B
3/8	M23x1.5	27	3/8WGG44B
1/2	M27x1.5	32	1/2WGG44B
3/4	M34x1.5	41	3/4WGG44B
1	M45x2	55	1WGG44B

GG44 Pipe Connector BSPP



BSPP	C Hex	Part number
1/8	14	1/8GG44B
1/4	17	1/4GG44B
3/8	22	3/8GG44B
1/2	27	1/2GG44B
3/4	32	3/4GG44B
1	41	1GG44B

Most popular.



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Accessories

Air Preparation Units

Symbol	Description
	Filter / Separator with manual drain
	Filter / Separator with automatic drain
	Oil Removal Filter
	Automatic Drain
	Lubricator less drain
	Lubricator with manual drain
	Lubricator with automatic filling
	Air Line Pressure Regulator adjustable, relieving
	Air Line Pressure Regulator pilot controlled, relieving
	Filter / Regulator (piggyback) manual drain relieving (with gauge)
	Filter / Regulator (piggyback) auto drain relieving
	Air Line Combo F-R-L simplified

Pneumatic Valves

Symbol	Description
	Check
	Flow Control
	Relief Valve
	2-Position, 2-Way
	2-Position, 3-Way
	2-Position, 4-Way
	2-Position, 4-Way 5-Ported

Pneumatic Valves

Symbol	Description
	3-Position, 4-Way, APB ports closed, center pos.
	3-Position, 4-Way, CE 5-Ported cylinder ports open to exhaust in center position
	3-Position, 4-Way, PC 5-Ported pressure ports open to exhaust in center position
	Quick Exhaust
	Shuttle

Valve Actuators

Symbol	Description
	Manual general symbol
	Push Button
	Lever
	Pedal or Treadle
	Mechanical cam, toggle, etc.
	Spring
	Detent line indicates which detent is in use
	Piezo
	Solenoid
	Internal Pilot Supply
	Remote Pilot Supply complete
	Remote Pilot Supply simplified
	And / Or Composite solenoid and pilot or manual override
	And / Or Composite solenoid and pilot or manual override and pilot

Cylinders

Symbol	Description
	Standard double acting
	Single Acting
	Double Rod
	Spring Return
	Ram Type
	Telescope
	Tandem
	Duplex

Lines and Functions

Symbol	Description
	Solid Line - Main Line
	Dashed Line - Pilot Line
	Dotted Line - Exhaust or Drain Line
	Center Line - Enclosure Outline
	Lines Crossing (90° intersection not necessary)
	Lines Joining (90° intersection not necessary)
	Lines Joining
	Flow Direction hydraulic medium
	Flow Direction gaseous medium
	Energy Source
	Line with Fixed Restriction
	Line with Adjustable Restriction
	Flexible Line
	Plugged Port, Test Station, Power Take-off
	Quick Disconnect Without Checks
	Quick Disconnect With Checks
	Quick Disconnect With One Check

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Design Torque

Design torque represents the maximum torque that an actuator must supply in an application. This maximum is the greater of the Demand Torque or the Cushion Torque. If the demand torque exceeds what the actuator can supply, the actuator will either move too slowly or stall. If the cushion torque is too high, the actuator may be damaged by excessive pressure. Demand torque and cushion torque are defined below in terms of load, friction, and acceleration torque.

Equations for calculating demand torque and cushion torque for some general applications are provided on the following pages.

T - Torque

The amount of turning effort exerted by a rotary actuator.

TD - Demand Torque

This is the torque required from the actuator to do the job and is the sum of the load torque, friction torque, and acceleration torque, multiplied by an appropriate design factor. Design factors vary with the applications and the designers' knowledge.

$$\text{Equation 4-3) } TD = Ta + Tf + TL$$

TL - Load torque

This is the torque required to equal the weight or force of the load. For example, in Fig. 4-8a, the load torque is 563 Nm (5000 lb-in.); in Fig. 4-8b the load torque is zero; in Fig. 4-8c the load torque is 563 Nm (5000 lb-in.). The load torque term is intended to encompass all torque components that aren't included in the friction or acceleration terms.

Tf - Friction torque

This is the torque required to overcome friction between any moving parts, especially bearing surfaces. In Fig. 4-8a, the friction torque is zero for the hanging load; in Fig. 4-8b the friction torque is 775 Nm (6880 lb-in) for the sliding load; in Fig. 4-8c the friction torque is zero for the clamp.

$$\text{Equation 4-4) } Tf = mWr$$

Ta - Acceleration Torque

This is the torque required to overcome the inertia of the load in order to provide a required acceleration or deceleration. In Fig. 4-8a the load is suspended motionless so there is no acceleration. In Fig. 4-8b, the load is accelerated from 0 to some specified angular velocity. If the mass moment of inertia about the axis of rotation is I and the angular acceleration is a, the acceleration torque is equal to Ia. In Fig. 4-8c there is no acceleration.

Some values for mass moment of inertia are given in Table 4. Some useful equations for determining a are listed in Table 5. Equation 5 below shows the general equation for acceleration torque.

$$\text{Equation 4-5) } Ta = Ia$$

TC - Cushion Torque

This is the torque that the actuator must apply to provide a required deceleration. This torque is generated by restricting the flow out of the actuator (meter-out) so as to create a back pressure which decelerates the load. This back pressure (deceleration) often must overcome both the inertia of the load and the driving pressure (system pressure) from the pump. See applications.

$$\text{Equation 4-6) } Tc = Ta + \frac{PrV}{\theta} - Tf \pm TL$$

The friction torque Tf reduces the torque the actuator must apply to stop the load. The load torque TL may add to, or subtract from the torque required from the actuator, depending upon the orientation of the load torque. For example, a weight being swung upward would result in a load torque that is subtracted.

Warning: Rapid deceleration can cause high pressure intensification at the outlet of the actuator. Always insure that cushion pressure does not exceed the manufacturer's pressure rating for the actuator.

KE - Kinetic Energy (1/2 Jmω²)

This is the amount of energy that a rotating load has. The rotator must be able to stop the load. All products have kinetic energy rating tables. Choose the appropriate deceleration option (i.e., bumper, cushions, shock absorbers, etc.) that meets or exceeds the kinetic energy of the load.

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Rotary Actuator Torque Requirements
Demand Torque Examples

A) Example of load torque

The load is held motionless as shown.

$$T_D = T_\alpha + T_f + T_L$$

$$T_\alpha = 0$$

$$T_f = 0$$

$$T_L = (500 \text{ lb})(10 \text{ in}) = 5,000 \text{ lb-in}$$

$$T_D = 5,000 \text{ lb-in}$$

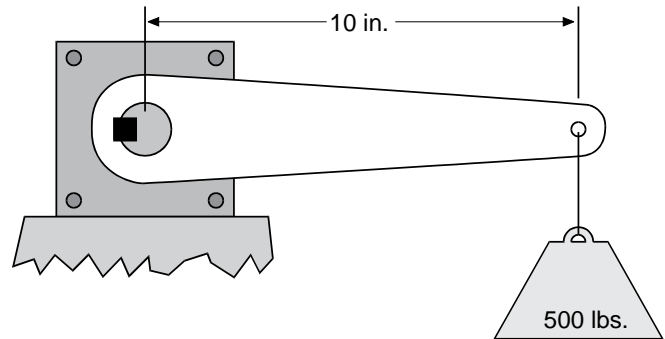


Figure 4-8a

B) Due to friction and acceleration

The 500 lb rotating index table is supported by bearings with a coefficient of friction of 0.25. The table's acceleration a is 2 rad/sec². The table's mass moment of inertia I is 2,330 lb-in-sec².

$$T_D = T_\alpha + T_f + T_L$$

$$T_\alpha = I\alpha = (2,330 \text{ lb-in-sec}^2)(2/\text{sec}^2) = 4,660 \text{ lb-in}$$

$$T_f = \mu W r_b = 0.25 (500 \text{ lb})(55 \text{ in}) = 6,880 \text{ lb-in}$$

$$T_L = 0$$

$$T_D = 4,660 \text{ lb-in} + 6,880 \text{ lb-in} = 11,540 \text{ lb-in}$$

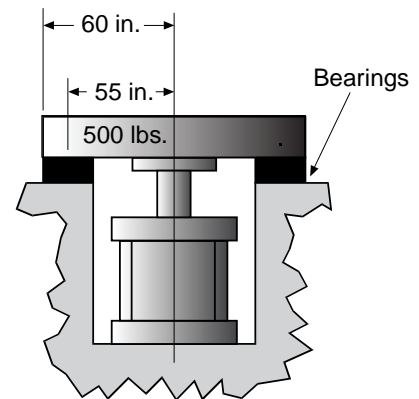


Figure 4-8b

C) Load torque example

$$T_D = T_\alpha + T_f + T_L$$

$$T_\alpha = 0$$

$$T_f = 0$$

$$T_L = (500 \text{ lb})(10 \text{ in}) = 5,000 \text{ lb-in}$$

$$T_D = 5,000 \text{ lb-in}$$

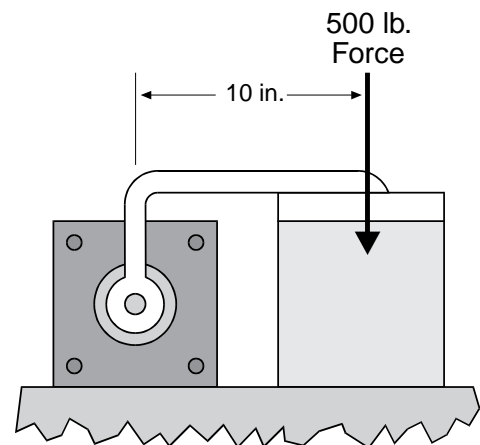


Figure 4-8c

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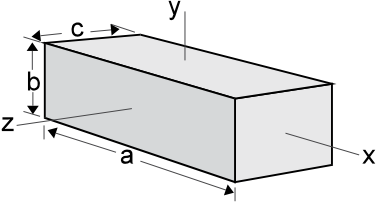
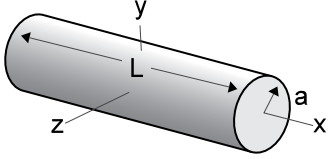
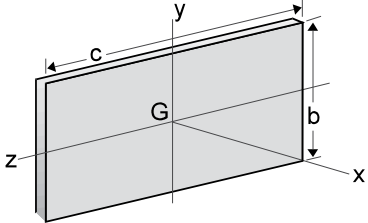
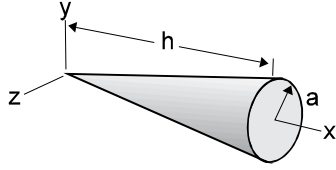
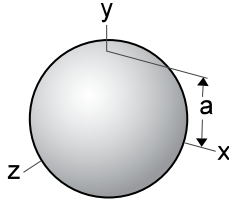
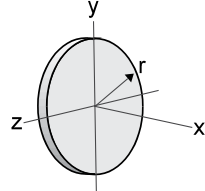
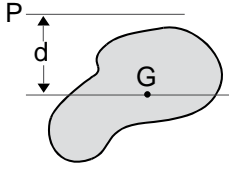
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Rotary Actuator Moments of Inertia
Table 4: Mass Moments of Inertia

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<p>Rectangular prism</p> $I_x = \frac{1}{12}m(b^2 + c^2)$ $I_y = \frac{1}{12}m(c^2 + a^2)$ $I_z = \frac{1}{12}m(a^2 + b^2)$ 	<p>Circular cylinder</p> $I_x = \frac{1}{2}ma^2$ $I_y = I_z = \frac{1}{12}m(3a^2 + L^2)$ 
<p>Thin rectangular plate</p> $I_x = \frac{1}{12}m(b^2 + c^2)$ $I_y = \frac{1}{12}mc^2$ $I_z = \frac{1}{12}mb^2$ 	<p>Circular cone</p> $I_x = \frac{3}{10}ma^2$ $I_y = I_z = \frac{3}{5}m\left(\frac{1}{4}a^2 + h^2\right)$ 
<p>Sphere</p> $I_x = I_y = I_z = \frac{2}{5}ma^2$ 	<p>Thin disk</p> $I_x = \frac{1}{2}mr^2$ $I_y = I_z = \frac{1}{4}mr^2$ 
<p>Parallel Axis Theorem:</p> $I_p = I + md^2$ 	<p>I_p = Mass moment of inertia about an axis parallel to a centroidal axis I = Mass moment of inertia about a centroidal axis m = Mass d = Distance between axes</p>
<p>When acceleration is constant:</p> $\theta = \omega_0 t + \frac{1}{2} \alpha t^2$ $\alpha = \frac{2\theta}{t^2}$ $\theta = \omega_0 t + \frac{1}{2} \omega_t t$ $\alpha = \frac{(\omega_t - \omega_0)^2}{2\theta}$ $\omega = \omega_0 + \alpha t$ $\alpha = \frac{(\omega_t - \omega_0)}{t}$ $\omega = (\omega_0^2 + 2\alpha\theta)^{1/2}$	<p>When velocity is constant:</p> $\theta = \omega t$ <p>t = time θ = angular position ω_t = angular velocity at time = t ω_0 = angular velocity at time = 0 α = angular acceleration</p>

Rotary Actuator Basic Equations
Basic Velocity, Acceleration, Kinetic Energy And Torque Equations

Equations below are based on triangular velocity profile.

$$\omega_{\max} = .035 \times \frac{\Theta}{t}$$

$$\alpha = \frac{\omega_{\max}^2}{\left(\frac{\Theta}{57.3}\right)^2}$$

$$\alpha = \frac{\omega_{\max}}{(t/2)}$$

$$K.E. = 1/2 J_m \omega^2$$

$$T_a = \alpha \times J_m$$

$$T_f = W \times U_s \times \left(\text{Distance from pivot point to center of external bearings} \right)$$

$$T_L = \left(\text{Torque arm length to C.G. of load} \right) \times WL \times \cos(\phi)$$

Where ϕ = Angle between torque arm and horizontal plane

Where:

Θ = Angle of Rotation (Degrees)

t = Time to rotate through Θ (sec)

ω = Angular velocity, radians/sec

α = Angular accelerations (radians/sec²)

WL = Weight of load (lbf)

T_a = Torque to accelerate load (lb-in)

U_s = Coefficient of static friction

J_m* = Rotational mass moment of inertia (lb-in-sec²)

T_f = Torque to overcome friction (lb-in)

T_L = Torque to overcome effects of gravity

*Use "I" values from Table 4.

Coefficients of Friction

Material*	μ_s	μ_k
Steel on Steel	0.80	0.40
Steel on Steel (lubricated)	0.16	0.03
Aluminum on Steel	0.45	0.30
Copper on Steel	0.22	0.22
Brass on Steel	0.35	0.19
Teflon on Steel	0.04	0.04

*dry contact unless noted

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Selecting the proper vacuum cup

CAUTION:
 Selecting the type of vacuum cup, material, and size suitable for an application is important to the overall vacuum system. Calculating the forces involved for each application is recommended to determine the vacuum cup size. It should be noted that these calculations are basic theoretical guidelines and each application must be tested for actual results. With all vacuum applications, certain practical assumptions concerning cup materials, environmental conditions, and product characteristics to name a few, may not be consistent with the performance. Again, the user should determine the efficiency, performance, and safety factor of the cup selection.

Calculating pad diameter and forces

Mass

The term mass is a quantity of matter and its ability to resist motion when acted on by an external force. The magnitude of an object is represented as a certain number of kilograms (kg) and is symbolized as “m”. The easiest way to determine the mass of an object is to measure the weight with a scale within the earth’s gravitational field ($a_g = 9.81\text{m/sec}^2$). Likewise, outside of any gravitational field, a mass could potentially be weightless.

Forces

For vacuum applications, force is a vector quantity in a defined direction either horizontal or vertical. The standard international unit of force is measured in Newtons (N) which is the equivalent of (kgm/sec^2). The force can be calculated by measuring the effect of a change in acceleration on a mass.

Newton's Law: $F(N) = \text{mass}(\text{kg}) \times a_g(\text{m/sec}^2)$

Consider an object with a mass of 10kg. The gravitational force on this object would be:

$$F(N) = 10\text{kg} \times 9.81\text{m/sec}^2 = 98.1 \text{ N}$$

Acceleration

Acceleration is the change in velocity of a moving object. Acceleration is a vector, a directional quantity expressed in units of meters per second squared (m/sec^2) and symbolized as “a”. To explain the magnitude of acceleration consider an object with a change in velocity of 2 meters per second (m/sec) over a 4 second time frame. The acceleration can be calculated with:

$$a = \frac{\Delta \text{ velocity}}{\text{time}} \quad a = \frac{6\text{m/sec}}{2 \text{ sec}} \quad a = 3\text{m/sec}^2$$

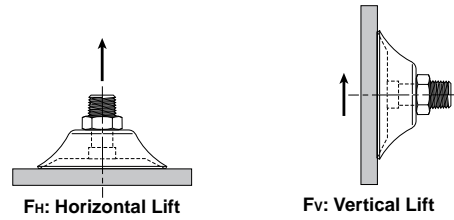
This is considered an average acceleration.

Coefficient of friction

Certain values for coefficient of friction should be taken into consideration when calculating the combined forces in motion. Actual values between suction cups and surfaces are difficult to determine. Therefore, coefficient of friction values from published charts, should be used as a reference to adjust the safety factors accordingly.

Lifting forces

When calculating lifting forces, safety factors of 2 for horizontal lifts and 4 for vertical lifts are minimum values. Applications with irregular shapes, difficult surfaces, and backward motions will require increased safety factors.



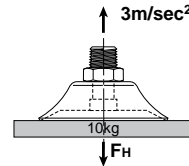
Horizontal lifting force

Apply Newton's Law to calculate the force on a 10kg mass with a change in acceleration of 3m/sec^2 and a safety factor of 2.

$$F_H(N) = \text{mass}(\text{kg}) \times (a_g + a) \times \text{SF}$$

$$F_H(N) = 10\text{kg} \times (9.81\text{m/sec}^2 + 3\text{m/sec}^2) \times 2$$

$$F_H = 256.2 \text{ N}$$



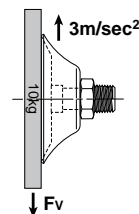
Vertical lifting force

Apply Newton's Law to calculate the force on a 10kg mass with a dry surface, a change in acceleration of 3m/sec^2 and a safety factor of 4.

$$F_V(N) = \text{mass}(\text{kg}) \times (a_g + a) \times \text{SF}$$

$$F_V(N) = 10\text{kg} \times (9.81\text{m/sec}^2 + 3\text{m/sec}^2) \times 4$$

$$F_V = 512.4 \text{ N}$$



Combined vertical lift and horizontal motion

Calculate the force on a 10kg mass with a dry surface, a change in acceleration of 3m/sec^2 , and a change in travel acceleration of 2m/sec^2 .

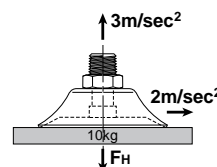
$$F_M(N) = \sqrt{F_V^2 + F_H^2}$$

$$F_M(N) = \sqrt{[(10\text{kg} \times 2\text{m/sec}^2) \times 4]^2 + [10\text{kg} \times (9.81\text{m/sec}^2 + 3\text{m/sec}^2) \times 2]^2}$$

$$F_M(N) = \sqrt{(80\text{kgm/sec}^2)^2 + [256\text{kgm/sec}^2]^2}$$

$$F_M(N) = \sqrt{6400\text{kgm/sec}^2 + 65,536\text{kgm/sec}^2}$$

$$F_M = 268.2 \text{ N}$$



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Analyze the forces

Using the previous examples, consider an application where 4 cups have been selected to transfer the product.

Take the Horizontal Lifting Force (FH) of 256.2 N and divide by the number of cups (4) to obtain the individual force for each cup.

$$\frac{256.2 \text{ (N)}}{4} = 64.05 \text{ N / Cup}$$

Referring to the chart below, at 60% vacuum, select a force greater than 64.05 N. The appropriate selection is a 40mm diameter cup which has a theoretical lifting force of 76.9 N.

The same calculation can be applied to the Vertical Lifting Force and the Forces in Motion examples to determine the cup diameter.

To convert Pounds (lbf) to Newton (N), multiply lbf x 4.4.

Theoretical lifting force per cup lbf (N)

Cup		Vacuum level								
Diameter mm	Area cm ²	3 inHg	6 inHg	9 inHg	12 inHg	15 inHg	18 inHg	21 inHg	24 inHg	27 inHg
		-1.5 PSIG	-3 PSIG	-4.5 PSIG	-6 PSIG	-7.5 PSIG	-9 PSIG	-10.5 PSIG	-12 PSIG	-13.5 PSIG
		10.2 kPa	20.3 kPa	30.5 kPa	40.6 kPa	50.8 kPa	61 kPa	71.1 kPa	81.3 kPa	91.4 kPa
		10%	20%	30%	40%	50%	60%	70%	80%	90%
1.5	0.01	0.004 (0.02)	0.008 (0.04)	0.008 (0.04)	0.014 (0.06)	0.018 (0.08)	0.022 (0.10)	0.026 (0.12)	0.032 (0.14)	0.032 (0.14)
2	0.03	0.007 (0.03)	0.013 (0.06)	0.022 (0.10)	0.029 (0.13)	0.036 (0.16)	0.043 (0.19)	0.049 (0.22)	0.056 (0.25)	0.063 (0.28)
3.5	0.10	0.022 (0.10)	0.045 (0.20)	0.065 (0.29)	0.088 (0.39)	0.110 (0.49)	0.133 (0.59)	0.155 (0.69)	0.175 (0.78)	0.198 (0.88)
5	0.20	0.045 (0.20)	0.090 (0.40)	0.135 (0.60)	0.180 (0.80)	0.225 (1.00)	0.270 (1.20)	0.315 (1.40)	0.360 (1.60)	0.405 (1.80)
6	0.28	0.065 (0.29)	0.130 (0.58)	0.196 (0.87)	0.270 (1.20)	0.315 (1.40)	0.382 (1.70)	0.450 (2.00)	0.517 (2.30)	0.585 (2.60)
7	0.39	0.088 (0.39)	0.175 (0.78)	0.265 (1.18)	0.360 (1.60)	0.450 (2.00)	0.540 (2.40)	0.607 (2.70)	0.697 (3.10)	0.787 (3.50)
8	0.50	0.117 (0.52)	0.229 (1.02)	0.346 (1.54)	0.450 (2.00)	0.585 (2.60)	0.697 (3.10)	0.809 (3.60)	0.922 (4.10)	1.034 (4.60)
10	0.79	0.180 (0.80)	0.360 (1.60)	0.540 (2.40)	0.719 (3.20)	0.899 (4.00)	1.079 (4.80)	1.259 (5.60)	1.439 (6.40)	1.619 (7.20)
15	1.77	0.404 (1.80)	0.809 (3.60)	1.216 (5.41)	1.619 (7.20)	2.023 (9.00)	2.428 (10.8)	2.833 (12.6)	2.237 (14.4)	3.642 (16.2)
18	2.55	0.585 (2.60)	1.169 (5.20)	1.751 (7.79)	2.338 (10.4)	2.923 (13.0)	3.507 (15.6)	4.069 (18.1)	4.676 (20.8)	5.238 (23.3)
20	3.14	0.719 (3.20)	1.439 (6.40)	2.158 (9.60)	2.878 (12.8)	3.597 (16.0)	4.316 (19.2)	5.036 (22.4)	5.755 (25.6)	6.474 (28.8)
25	4.91	1.124 (5.00)	2.248 (10.0)	3.372 (15.0)	4.496 (20.0)	5.620 (25.0)	6.744 (30.0)	7.868 (35.0)	8.992 (40.0)	10.116 (45.0)
30	7.07	1.619 (7.20)	3.237 (14.4)	4.856 (21.6)	6.474 (28.8)	8.093 (36.0)	9.712 (43.2)	11.330 (50.4)	12.949 (57.6)	14.568 (64.8)
35	9.62	2.203 (9.80)	4.406 (19.6)	5.598 (29.4)	8.813 (39.2)	11.016 (49.0)	13.241 (58.9)	15.422 (68.6)	17.648 (78.5)	19.828 (88.2)
40	12.6	2.900 (12.9)	5.755 (25.6)	8.655 (38.5)	11.510 (51.2)	14.388 (64.0)	17.288 (76.9)	20.143 (89.6)	23.155 (103)	25.853 (115)
50	19.6	4.519 (20.1)	8.992 (40.0)	13.511 (60.1)	17.985 (80.0)	22.481 (100)	26.977 (120)	31.473 (140)	35.969 (160)	40.466 (180)
60	28.3	6.497 (28.9)	12.949 (57.6)	19.446 (86.5)	25.853 (115)	32.372 (144)	38.892 (173)	45.411 (202)	51.931 (231)	58.226 (259)
75	44.2	10.161 (45.2)	20.233 (90.0)	30.349 (135)	40.466 (180)	50.582 (225)	60.698 (270)	70.815 (315)	80.931 (360)	91.048 (405)
80	50.3	11.555 (51.4)	22.931 (102)	34.621 (154)	46.086 (205)	57.551 (256)	69.241 (308)	80.706 (359)	92.172 (410)	103.637 (461)
90	63.6	14.635 (65.1)	29.225 (130)	43.838 (195)	58.226 (259)	72.838 (324)	87.451 (389)	102.063 (454)	116.676 (519)	131.064 (583)
95	70.9	16.299 (72.5)	32.372 (144)	48.784 (217)	64.970 (289)	81.156 (361)	97.567 (434)	113.753 (506)	129.940 (578)	146.126 (650)
110	95.0	21.851 (97.2)	43.613 (194)	65.419 (291)	87.001 (387)	108.808 (484)	130.614 (581)	152.421 (678)	174.227 (775)	195.809 (871)
120	113.1	26.078 (116)	51.706 (230)	77.784 (346)	103.637 (461)	129.490 (576)	155.568 (692)	181.421 (807)	207.274 (922)	233.127 (1037)
150	176.7	40.690 (181)	80.931 (360)	121.622 (541)	161.862 (720)	202.328 (900)	243.019 (1081)	283.259 (1260)	323.950 (1441)	364.191 (1620)
200	314.2	72.164 (321)	143.878 (640)	216.041 (961)	287.531 (1279)	359.919 (1601)	432.083 (1922)	503.797 (2241)	575.961 (2562)	647.449 (2880)

Calculate the diameter of the cup

Calculate the cup diameter for horizontal lift at 60% of full vacuum using the information from the previous page.

$$D = 35.7 \sqrt{\frac{m (a_g + a) \times S}{P_v \times n}}$$

D (mm) = Diameter of Cup
 m (kg) = Mass
 $a_g = 9.81 \text{ m/sec}^2$
 a = Motion Acceleration
 S = Safety Factor
 P_v (kPa) = Operating Vacuum Pressure
 n = number of Cups

$$D = 35.7 \sqrt{\frac{10 (9.81 + 3) \times 2}{61 \times 4}}$$

D = 36.58 mm

Referring to the chart below, at 60% vacuum, select a cup diameter equal to or greater than 37mm. The appropriate selection is a 40mm diameter cup which has a theoretical lifting force of 76.9 N.

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Selecting a generator size

The choice of Generator Series depends on the system requirements for components and overall performance for the application. Inline Generators offer the basic function for creating vacuum flow. Adding integrated components such as automatic blow off Controls, Vacuum and Blow-off Solenoids, Pressure Sensors, Check Valves and Filters are options that can reduce overall mounting space, reduce cycle time and can offer air conservation functions as well as emergency stop modes. For guidelines on selecting Vacuum Generators by features, consult the highlight features in the Generator Index section for each Series Section.

A vacuum source can only achieve and hold a degree of vacuum that sustains the amount of leakage into the vacuum system. In most cases, it is the leakage through the product and by of the cup seal that limits the system degree of vacuum. Products with high product leakage are Porous Applications. The degree of vacuum that can be obtained with this type of product can vary and tends to be below 10 inHg. Products with low or no leakage are called Non-Porous Applications. It can be assumed that the maximum degree of vacuum of the system is the maximum degree of the vacuum generator. Due to design cycle time and safety requirements, a lower degree of vacuum is generally chosen other than the maximum obtainable degree of vacuum. Chart 1 lists different units of measure for vacuum with typical application levels. The system degree of vacuum must be determined by product testing.

Evacuation time

The size of the generator generally refers to either the Evacuation Time or the Vacuum Flow Rates of the generator and varies by the size of the nozzle / diffuser.

Evacuation Time is the time required to evacuate the air out of a vacuum system to specific degree of vacuum. Typically, this degree of vacuum is a value where it is safe to move a product in a pick and place application and is determined by the design engineer. Evacuation Time can also be considered response time of the system.

A typical Evacuation Time chart for a generator series is shown in Chart 2. The time to achieve a given degree of vacuum in a 1 cubic foot volume is listed in seconds for each Generator.

Chart 2: evacuation time

Series / nozzle diameter	Air supply pressure	Air consumption	Evacuation time in sec / ft ³ * to reach different vacuum levels (inHg)								
	PSI	SCFM	3	6	9	12	15	18	21	24	27
CV-05HS	70	0.46	24.3	57.3	101.0	160.5	231.1	305.1	433.1	597.7	—
CV-05LS	70	0.46	11.0	23.4	40.0	64.4	110.2	—	—	—	—
CV-10HS	70	1.55	4.8	9.9	16.0	24.9	35.9	51.4	77.4	117.5	226.0
CV-10LS	70	1.55	3.7	7.6	13.0	20.3	33.1	—	—	—	—
CV-15HS	70	3.53	2.5	4.8	7.0	11.0	15.5	22.0	31.9	46.6	112.1
CV-15LS	70	3.53	2.0	3.1	5.0	7.6	12.1	—	—	—	—
CV-20HS	70	6.36	1.7	2.8	5.0	6.5	9.0	13.0	18.9	27.4	60.7
CV-20LS	70	6.36	1.3	2.5	4.0	5.9	11.3	—	—	—	—

* 1 ft³ = 28.31 liters

Chart 1: Basic vacuum pressure measurements units

Negative gauge pressure PSIG	Absolute pressure PSIA	Inches of mercury inHg
0	14.7	0
Atmospheric pressure at sea level		
-1.5	13.2	3
-3.0	11.7	6
-4.5	10.2	9
Typical porous vacuum level		
-6.0	8.7	12
-7.5	7.2	15
-9.0	5.7	18
-10.5	4.2	21
Typical non-porous vacuum level		
-12.0	2.7	24
-13.5	1.2	27
-14.7	0	29.92
Perfect vacuum (zero reference pressure)		

Example: A pick and place application requires a 0.25 secs for creation of 18 inHg of vacuum in the vacuum system. The vacuum system volume, which includes tubing and cups, is 0.002 ft³.

The evacuation time charts are given for a 1 cubic foot (ft³) volume. To use these charts, convert the time requirement of the system to an equivalent time for a 1 cubic foot (ft³) volume. In this example, 1 cubic foot (ft³) is 500 times the system volume of 0.002 ft³. Multiply the system time requirement by 500 (500 x 0.25 secs = 125 seconds). Any generator with a evacuation time of less than 125 seconds to attain 18 inHg can be chosen for this application. A CV-15-HS will meet the requirements for this application. A (-) listed means the generator will not obtain a higher degree of vacuum than the level of the first (-).

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Vacuum flow

A typical Vacuum Flow chart for a generator series is listed in Chart 3. The vacuum flow rate at given degree of vacuum is listed in SCFM for each Generator. This chart is generally used to determine the change of degree of vacuum given a change in vacuum flow rate of a generator.

Example. A CV-15HS can only obtain 9 inHg. The vacuum flow rate at 9 inHg is 1.50 SCFM. This means that the cup

seal and product leaks 1.50 SCFM of air. This generator can maintain the leak rate of 1.50 SCFM. Choosing a generator with more flow at 9 inHg will increase the degree of vacuum in the system because the generator can overcome more leakage. In this case, the vacuum flow rates are linear since this CV generator is a single stage venturi generator. Replacing a CV-15HS with CV-20HS will increase the degree of vacuum in the system to approximately 16.2 inHg. The CV-20HS now maintains 16.2 inHg at a flow rate of 1.50 SCFM.

Chart 3: Vacuum flow (SCFM)

Nozzle diameter	inHg										
	0	3	6	9	12	15	18	21	24	27	30
CV-05HS	.21	.19	.17	.15	.13	.11	.09	.07	.05	.03	—
CV-05LS	.32	.27	.22	.17	.12	.06	—	—	—	—	—
CV-10HS	.95	.85	.75	.65	.55	.45	.35	.25	.15	.05	—
CV-10LS	1.27	1.05	.83	.59	.38	.17	—	—	—	—	—
CV-15HS	2.22	1.98	1.74	1.5	1.26	1.01	.76	.51	.25	.10	—
CV-15LS	3.35	2.79	2.23	1.67	1.10	.53	—	—	—	—	—
CV-20HS	3.88	3.45	3.02	2.59	2.16	1.73	1.30	.87	.44	.25	—
CV-20LS	5.85	5.09	4.03	2.97	1.91	.85	—	—	—	—	—

Tubing reference

Tubing ID		Tubing length (L)	
SAE	mm	In.	M
5/64	2	18	.457
3/32	2.38	24	.610
1/8	3.17	30	.762
5/32	4	36	.914
3/16	4.76	42	1.07
1/4	6.35	48	1.22
5/16	8	54	1.37
3/8	9.52	60	1.52
7/16	11.1	66	1.67
SAE x 25.4 = mm		In. x 25.4 = M	

Pad volume reference (pv)

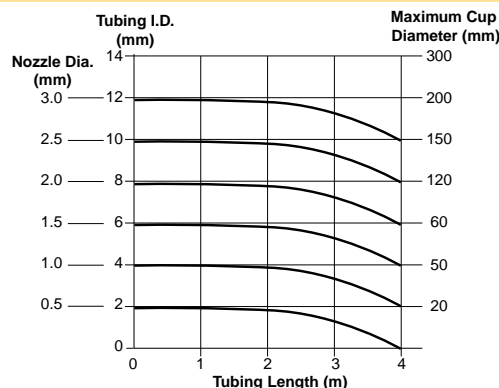
PFG			PBG			PCG		
Ø	Cu in.	L	Ø	Cu in.	L	Ø	Cu in.	L
2	.00004	.0000006	10	.013	.0002	5	.002	.00003
3.5	.0001	.000002	15	.045	.0007	7	.003	.00004
5	.0003	.000005	20	.070	.001	10	.010	.0001
6	.00048	.000008	30	.28	.004	15	.060	.0009
8	.002	.00003	40	.56	.009	18	.082	.001
10	.004	.00007	50	1.60	.026	20	.123	.002
15	.012	.0002	75	4.63	.076	30	.595	.009
20	.03	.0005	110	6.77	.111	40	1.15	.018
25	.067	.0011	150	15.86	.26	60	4.40	.072
30	.067	.0011				90	10.00	.1639
35	.14	.0023						
40	.18	.003						
50	.25	.0042						
60	.57	.0094						
80	1.28	.021						
95	1.95	.032						
110	5.00	.082						
150	10.80	.177						
200	23.24	.381						

1 ft³ = 28.31 liters
 1 ft³ = 1728 in³

Nozzle diameter to tubing diameter to cup diameter reference

For each application, the size of the nozzle diameter, vacuum tubing I.D., and maximum cup diameter must be practical in relationship to each other. The chart to the right is a quick reference to aid in selecting the vacuum tubing I.D. and nozzle diameter given the maximum cup diameter.

As an example, one 60mm cup with 2 meters in tubing length would require a minimum 6mm I.D. vacuum tube and a 1.5mm nozzle. The same 60mm cup with 3.5 meters in tubing length would require a minimum 8mm I.D. vacuum tube and a 2.0mm nozzle to achieve an equivalent performance.



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Saving Money and Space by Sizing Your Valves Properly

This catalog gives you a flow rating (Cv) for each valve in the Parker Hannifin line. You can “plug” your requirements into the following simple formula, and determine the Cv needed to do the job. By not oversizing, you’ll save space and money, and you’ll ensure the valve you select will do the job.

Converting the Job Requirements Into Cv

(Capacity Co-efficient).

$$Cv = \frac{\text{Cylinder Area (Sq. In.)} \times \text{Cylinder Stroke (In.)} \times \text{Compression Factor (Table 2)} \times \text{“A” Constant (Table 2)}}{\text{Stroke Time (sec.)} \times 28.8}$$

Let’s work through an example:

We want to extend a 3-1/4" bore cylinder which has a 12" stroke in one second, and we have a supply pressure of 80 PSI to do the work. Here’s what we know:

- Cylinder Area for a 3-1/4" Bore, from Table 18.30 sq. in.
- Cylinder Stroke 12 in.
- Stroke Time Required in Seconds..... 1 sec.
- Compression Factor at 80 PSI, from Table 2..... 6.4
- “A” Constant for 80 PSI, from Table 2..... .048

Substituting in the formula, we have:

$$Cv = \frac{8.30 \times 12 \times 6.4 \times .048}{1 \times 28.8} = 1.06$$

Any valve, therefore, which has a Cv of at least 1.06, will extend our cylinder the specified distance in the required time.

Choosing the Valve “Series”

Your next step is to choose a basic valve design to do the job. For a quick guide to valve designs, see Table 3.

Having selected the basic valve design, consult the Capacity Co-efficient (Cv) tables which describe the individual valve capacities.

Selecting the Valve Model, Options and Accessories

Having determined Cv, series, port size, flow-path configuration (pre-determined by circuit design), and actuation method, you’re ready to choose the exact valve model number.

Read the pertinent catalog pages; note the exact model numbers, options and accessories you want. Then phone or write your Parker Hannifin air valve distributor. They will give you prompt, accurate service.

Note: Need circuit design help? Contact your local Parker Hannifin distributor. They are backed up by our regional Sales Engineers and offices. Between them, you’ll find answers to all of your questions.

Table 1

Effective Square-Inch Areas for Standard-Bore-Size Cylinders

Bore Size	Cylinder Area (Sq. In.)	Bore Size	Cylinder Area (Sq. In.)
3/4"	.44	4"	12.57
1"	.79	4-1/2"	15.90
1-1/8"	.99	5"	19.64
1-1/4"	1.23	6"	28.27
1-1/2"	1.77	7"	38.48
1-3/4"	2.41	8"	50.27
2"	3.14	10"	78.54
2-1/2"	4.91	12"	113.10
3-1/4"	8.30	14"	153.94
3-5/8"	10.32		

Table 2

Compression Factors and “A” Constants

Inlet Pressure (PSIG)	Compression Factor	“A” Constants for Various Pressure Drop*		
		2 PSI ΔP	5 PSI ΔP	10 PSI ΔP
10	1.6	.152	.103	
20	2.3	.126	.084	.065
30	3.0	.111	.073	.055
40	3.7	.100	.065	.048
50	4.4	.091	.059	.044
60	5.1	.085	.055	.040
70	5.7	.079	.051	.037
80	6.4	.075	.048	.035
90	7.1	.071	.046	.033
100	7.8	.068	.044	.032
110	8.5	.065	.042	.030
120	9.2	.063	.040	.029
130	9.9	.061	.039	.028
140	10.6	.058	.037	.027
150	11.2	.057	.036	.026
160	11.9	.055	.035	.025
170	12.6	.053	.034	.024
180	13.3	.052	.033	.024
190	14.0	.051	.032	.023
200	14.7	.050	.032	.023

Note: Use “A” constant at 5 PSI rP for most applications. On very critical applications, use “A” at 2 PSI rP. You will find in many cases, a 10 PSI rP is not detrimental, and can save money and mounting space.

* Tabulated values are the solution of $\frac{1}{22.48} \sqrt{\frac{GT}{(P_1 - P_2) P_2}}$ where T is for 68°F and G = 1 for Air.

Table 3

Characteristics of the Major Valve Designs

<p>A. Poppet 3-Way and 4-Way</p>	<ol style="list-style-type: none"> High flow capacities Minimum lubrication requirements Fast response Self-cleaning poppet seats Pressures of 15 to 150 PSIG (modifications for vacuum to 250 PSIG)
<p>B. Spool Valves (WCS) 3-Way and 4-Way</p>	<ol style="list-style-type: none"> Low friction Lower operating pressures Fast response Less wear Long Cycle Life - Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore Non-Lube Service - No lubrication required for continuous valve shifting Bi-Directional Spool Seals - Common spool used for any pressure, including vacuum
<p>C. Packed Bore 4-Way</p>	<ol style="list-style-type: none"> Wide range of flow capacities Wide range of flow-path configurations Pilot-operated models available Pressures of vacuum to 150 PSIG
<p>D. Rotary Or Reciprocating Disc 4-Way, manually operated</p>	<ol style="list-style-type: none"> Inexpensive Versatility in manual actuation

Cv – Capacity Co-efficients (sometimes called Flow Factors). Each flow path through the valve has its own Cv value. All Cv ratings for each valve cataloged on this page are listed on the front side of this sheet.

$$Cv = \frac{Q}{22.48} \sqrt{\frac{GT}{(P_1 - P_2) P_2}}$$

Q = Flow in Standard Cubic Feet per minute (14.7 PSIA at 60°F)
P₁ = Inlet Absolute Pressure (gauge pressure + 14.7)
P₂ = Outlet Absolute Pressure (gauge pressure + 14.7)
Note: P₂ must be greater than .53 x P₁
G = Specific Gravity of flowing medium (Air, G = 1)
T = Absolute Temperature of Air (460 + °F)

Cv = Q x “A” (Table 2)

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00337 1000.....	G7	04716 0016.....	G11	07E32A11AC.....	E54	0R37B.....	G12	11111x.....	B233
00337 1001.....	G7	04720 0020.....	G11	07E32A13AC.....	E54	0R37FB.....	G12	11112x.....	B233
00337 1002.....	G7	04724 0024.....	G11	07E34A11AC.....	E54	0R37TB.....	G12	11113x.....	B233
00337 1003.....	G7	04L00GB.....	E72	07E34A13AC.....	E54	0R37VB.....	G12	11114x.....	B233
00337 1004.....	G7	04L03GB.....	E72	07E36A11AC.....	E54	0R50B.....	G12	11115x.....	B233
00337G1000.....	G7	04L10GB.....	E72	07E36A13AC.....	E54	0R50VB.....	G12	11118x.....	B233
00337G1001.....	G7	04L13GB.....	E72	07E38A11AC.....	E54	0R75B.....	G12	11121x.....	B233
00338 1100.....	G7	05499 0000.....	G10	07E38A13AC.....	E54	0R75FB.....	G12	11122x.....	B233
00338 1101.....	G7	06739 0000.....	G10	07E42A11AC.....	E54	0R75VB.....	G12	11123x.....	B233
00338 1102.....	G7	06A12A13A2BC.....	E60	07E42A13AC.....	E54	1/2DD44B.....	G39	11124x.....	B233
00338 1103.....	G7	06A22A13A2BC.....	E60	07E44A11AC.....	E54	1/2FF44B.....	G39	11125x.....	B233
00338 1104.....	G7	06A32A13A2BC.....	E60	07E44A13AC.....	E54	1/2FHG4-B.....	G39	11126x.....	B233
00338G1100.....	G7	06B12A13A2BC.....	E61	07E46A11AC.....	E54	1/2GG44B.....	G39	11128x.....	B233
00338G1101.....	G7	06B22A13A2BC.....	E61	07E46A13AC.....	E54	1/2KMM004B.....	G39	11131x.....	B233
00339 3000.....	G9	06B32A13A2BCG.....	E61	07E48A11AC.....	E54	1/2MM0444B.....	G39	11132x.....	B233
00339 3001.....	G9	06D1NA.....	G13	07E48A13AC.....	E54	1/2WGG44B.....	G39	11133x.....	B233
00339 3002.....	G9	06D3NA.....	G13	07F32AC.....	E44	1/4DD44B.....	G39	11134x.....	B233
00339 3003.....	G9	06E12A11AC.....	E52	07F34AC.....	E44	1/4FF44B.....	G39	11135x.....	B233
00339 3004.....	G9	06E12A13AC.....	E52	07F36AC.....	E44	1/4FHG4-B.....	G39	11136x.....	B233
00339G3000.....	G9	06E14A11AC.....	E52	07F38AC.....	E44	1/4GG44B.....	G39	11138x.....	B233
00339G3001.....	G9	06E14A13AC.....	E52	07F42AC.....	E44	1/4KMM004B.....	G39	11141x.....	B233
00470 0010.....	G13	06E16A11AC.....	E52	07F44AC.....	E44	1/4MM0444B.....	G39	11142x.....	B233
00470 0900.....	G13	06E16A13AC.....	E52	07F46AC.....	E44	1/4WGG44B.....	G39	11143x.....	B233
00470 7020.....	G13	06E18A11AC.....	E52	07F48AC.....	E44	1/8DD44B.....	G39	11144x.....	B233
00475 0010.....	G13	06E18A13AC.....	E52	07G32A13A2BD.....	E60	1/8FF44B.....	G39	11145x.....	B233
00475 0900.....	G13	06E22A11AC.....	E52	07G42A13A2BD.....	E60	1/8FHG4-B.....	G39	11146x.....	B233
00475 2900.....	G13	06E22A13AC.....	E52	07H32A13A2BD.....	E61	1/8GG44B.....	G39	11148x.....	B233
00645 0060.....	G10	06E24A11AC.....	E52	07H42A13A2BD.....	E61	1/8KMM004B.....	G39	11822FIL.....	B233
008230109.....	D235	06E24A13AC.....	E52	07L32BE.....	E58	1/8MM0444B.....	G39	11823FIL.....	B233
008230299.....	D235	06E26A11AC.....	E52	07L34BE.....	E58	1/8WGG44B.....	G39	11824FIL.....	B233
008240109.....	D235	06E26A13AC.....	E52	07L42BE.....	E58	1-1/2x2.....	B370	11825FIL.....	B233
01468 0060.....	G10	06E28A11AC.....	E52	07L44BE.....	E58	1-1/2x3-1/2.....	B370	11826FIL.....	B233
0240.....	B229	06E28A13AC.....	E52	07R313AC.....	E48	1-1/2x5.....	B370	11827FIL.....	B233
0261109910.....	B81	06E32A11AC.....	E52	07R318AC.....	E48	1-1/2x6-1/2.....	E64	11F12EC.....	E46
0261109911.....	B81	06E32A13AC.....	E52	07R413AC.....	E48	10F01ED.....	E64	11F14EC.....	E46
0261109912.....	B81	06E34A11AC.....	E52	07R418AC.....	E48	10F01HD.....	E64	11F16EC.....	E46
0261109916.....	B81	06E34A13AC.....	E52	0831830000.....	B141	10F03ED.....	E64	11F18EC.....	E46
0261109917.....	B81	06E36A11AC.....	E52	0833010048.....	B141	10F03HD.....	E64	11F22EC.....	E46
0261109918.....	B81	06E36A13AC.....	E52	0833010100.....	B141	10F05ED.....	E64	11F24EC.....	E46
0261109919.....	B81	06E38A11AC.....	E52	0833010124.....	B141	10F05HD.....	E64	11F26EC.....	E46
0261109920.....	B81	06E38A13AC.....	E52	0853550003.....	B359	10F07ED.....	E64	11F28EC.....	E46
0261109921.....	B81	06F12AC.....	E44	0853550006.....	B356, B359	10F07HD.....	E64	11F32EC.....	E46
0261109922.....	B81	06F14AC.....	E44	0853550012.....	B356, B359	10F11ED.....	E64	11F34EC.....	E46
0261110600.....	B135	06F16AC.....	E44	0853560003.....	B359	10F11HD.....	E64	11F36EC.....	E46
0261210800.....	B135	06F18AC.....	E44	0853560006.....	B359	10F13ED.....	E64	11F38EC.....	E46
0261211000.....	B135	06F22AC.....	E44	0853560009.....	B359	10F13HD.....	E64	11R115PC.....	E50
03047 0099.....	G9	06F24AC.....	E44	0853560012.....	B359	10F15ED.....	E64	11R121PC.....	E50
032130599.....	D235	06F26AC.....	E44	0856640050.....	B38	10F15HD.....	E64	11R215PC.....	E50
032130899.....	D235	06F28AC.....	E44	0856640075.....	B38	10F17ED.....	E64	11R221PC.....	E50
032140299.....	D235	06F32AC.....	E44	0856640100.....	B38	10F17HD.....	E64	11R315PC.....	E50
03250 0119.....	G7	06F34AC.....	E44	0856640138.....	B38	11052.....	B233	11R321PC.....	E50
03250 0219.....	G7	06F36AC.....	E44	0856640175.....	B38	11053.....	B233	1200P-2-2.....	G37
03250 0319.....	G7	06F38AC.....	E44	0859170003.....	B359	11054.....	B233	1200P-4-4.....	G37
03250 0419.....	G7	06G12A13A2BC.....	E60	0859170006.....	B356, B359	11055.....	B233	1200P-6-6.....	G37
03250 0519.....	G7	06G22A13A2BC.....	E60	0859170012.....	B356, B359	11056.....	B233	1201P-8-8.....	G38
03251 0125.....	G8	06G32A13A2BC.....	E60	0875470006.....	B356	11057.....	B233	1202P-2-2.....	G37
03251 0250.....	G8	06H12A13A2BC.....	E61	0886620000.....	B354	11058.....	B233	1202P-4-4.....	G37
03251 0375.....	G8	06H22A13A2BC.....	E61	0886620000.....	B354	11059.....	B233	1202P-6-4.....	G37
03251 0500.....	G8	06H32A13A2BCG.....	E61	086620S002.....	B355	11060.....	B233	1202P-6-6.....	G37
03251 1215.....	G8	06L12BE.....	E58	086620S005.....	B355	11061.....	B233	1203P-2.....	G38
03251 1225.....	G8	06L14BE.....	E58	086620T002.....	B355	11062.....	B233	1203P-4.....	G38
03251 2525.....	G8	06L22BE.....	E58	086620T005.....	B355	11063.....	B233	1203P-8.....	G38
03251 2538.....	G8	06L24BE.....	E58	09166 0060.....	G10	11064.....	B233	1204P-2.....	G38
03251 3838.....	G8	06L32BE.....	E58	09L8PBA.....	E102	11065.....	B233	1204P-4.....	G38
04502 0002.....	G11	06L34BE.....	E58	09L84BA.....	E102	11066.....	B233	1204P-6.....	G38
04504 0004.....	G11	06R113AC.....	E48	09R813BA.....	E95	11067.....	B233	1204P-8.....	G38
04506 0060.....	G11	06R118AC.....	E48	0R12B.....	G12	11068.....	B233	1227A30-001.....	E29
04508 0080.....	G11	06R213AC.....	E48	0R12NB.....	G12	11069.....	B233	1232H30-001.....	E29
04512 0012.....	G11	06R218AC.....	E48	0R12NVB.....	G12	11070.....	B233	12F32EC.....	E46
04516 0016.....	G11	06R313AC.....	E48	0R12VB.....	G12	11116.....	B233	12F34EC.....	E46
04702 0002.....	G11	06R318AC.....	E48	0R25B.....	G12	11089FIL.....	B233	12F36EC.....	E46
04704 0004.....	G11	07A32A13A2BD.....	E60	0R25NB.....	G12	11090FIL.....	B233	12F38EC.....	E46
04706 0006.....	G11	07A42A13A2BD.....	E60	0R25NFB.....	G12	11091FIL.....	B233	12F42EC.....	E46
04708 0008.....	G11	07B32A13A2BD.....	E61	0R25PB.....	G12	11092FIL.....	B233	12F44EC.....	E46
04712 0012.....	G11	07B42A13A2BD.....	E61	0R25VB.....	G12	11093FIL.....	B233	12F46EC.....	E46

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12F48EC	E46	14E11B11FC	E70	169PLP-2-0	G30	20186FIL	B231	20R111FC	E68
12PRL	B337	14E11B13FC	E70	169PLP-4-0	G30	20187FIL	B231	20R111GC	E68
12R315PB	E50	14E13B10FC	E70	169PLP-5/32-0	G30	20267FIL	B231	20R113FC	E68
12R321PB	E50	14E13B11FC	E70	169PLPNS532-4LT	G30	20268FIL	B231	20R113GC	E68
12R415PB	E50	14E13B13FC	E70	16A12A13A2BC	E60	20290-	B227	20R161FC	E68
12R421PB	E50	14E15B10FC	E70	16A22A13A2BC	E60	20292-	B227	20R161GC	E68
130-02AAP	G12	14E15B11FC	E70	16A32A13A2BC	E60	20311FIL	B229	210P-2	G36
130-02AP	G12	14E15B13FC	E70	16B12A13A2BC	E61	20313FIL	B229	210P-4	G36
130-02BP	G12	14E17B10FC	E70	16B22A13A2BC	E61	20408FIL	B229	210P-6	G36
130-02CP	G12	14E17B11FC	E70	16B32A13A2BCG	E61	20432FIL	B231	210P-8	G36
1337390125	B335	14E17B13FC	E70	16E	G16	20433FIL	B231	211P-12	G36
1337390150	B335	14F01BB	E63	16G	G16	20434FIL	B229	211P-2	G36
1337390175	B335	14F03BB	E63	16G12A13A2BC	E60	20435FIL	B229	211P-4	G36
1337390188	B335	14F05BB	E63	16G22A13A2BC	E60	20438FIL	B231	211P-6	G36
134-02AAP	G12	14F07BB	E63	16G32A13A2BC	E60	20439FIL	B231	211P-8	G36
134-02AP	G12	14F11BB	E63	16H12A13A2BC	E61	20446	B227	212P-4	G36
134-02BP	G12	14F13BB	E63	16H22A13A2BC	E61	20451FIL	B229	212P-6	G36
134-02CP	G12	14F15BB	E63	16H32A13A2BCG	E61	20452FIL	B229	213P-12	G36
1347570031	B335	14F17BB	E63	16L12BE	E56	20459	B227	213P-2	G36
1347570038	B335	14G01B13FOGD	E73	16L14BE	E56	20462	B227	213P-4	G36
1347570044	B335	14G11B13FOGD	E73	16L22BE	E56	20463	B227	213P-6	G36
1347570050	B335	14R010FC	E65	16L24BE	E56	20466	B227	213P-8	G36
1347570063	B335	14R011FC	E65	16L32BE	E56	20467	B227	215PN-12	G36
1347570075	B335	14R013FC	E65	16L34BE	E56	20477	B227	215PN-2	G36
1347570088	B335	14R015FC	E65	16PRL	B337	20478	B227	215PN-4	G36
1347570100	B335	14R016FC	E65	17	G16	20480FIL	B229	215PN-6	G36
1347570125	B335	14R018FC	E65	17A32A13A2BD	E60	20482FIL	B229	215PN-8	G36
1458030044	B38	14R110FC	E65	17A42A13A2BD	E60	20490	B227	215PNL-2-15	G37
1458030050	B38	14R111FC	E65	17B32A13A2BD	E61	207ACBH-2	G36	215PNL-2-20	G37
1458030075	B38	14R113FC	E65	17B42A13A2BD	E61	207ACBH-4	G36	215PNL-2-25	G37
1458030088	B38	14R115FC	E65	17E	G16	207ACBH-6	G36	215PNL-2-30	G37
1458030100	B38	14R116FC	E65	17G	G16	207ACBH-8	G36	215PNL-2-35	G37
1458030125	B38	14R118FC	E65	17G32A13A2BD	E60	207ACBH-12	G36	215PNL-4-15	G37
1458030150	B38	1527B7916-001	E29	17G42A13A2BD	E60	207ACBH-16	G36	215PNL-4-20	G37
1458040044	B38	15R110FB	E65	17H32A13A2BD	E61	207ACBHS-2	G36	215PNL-4-25	G37
1458040050	B38	15R111FB	E65	17H42A13A2BD	E61	207ACBHS-4	G36	215PNL-4-30	G37
1458040075	B38	15R113FB	E65	17L32BE	E56	207P-2	G36	215PNL-4-35	G37
1458040088	B38	15R115FB	E65	17L34BE	E56	207P-4	G36	215PNL-6-15	G37
1458040100	B38	15R116FB	E65	17L42BE	E56	207P-6	G36	215PNL-6-20	G37
1458040125	B38	15R118FB	E65	17L44BE	E56	207P-8	G36	215PNL-6-25	G37
1458040150	B38	15R210FB	E65	1834C05-001	E29	207P-12	G36	215PNL-6-30	G37
1458050050	B38	15R211FB	E65	18A57	E93	20806	B228	215PNL-6-35	G37
1458050075	B38	15R213FB	E65	18B57	E94	20807	B228	215PNL-8-15	G37
1458050100	B38	15R215FB	E65	1GG44B	G39	20808	B228	215PNL-8-20	G37
1458050138	B38	15R216FB	E65	1MMO444B	G39	20809	B228	215PNL-8-25	G37
1458050175	B38	15R218FB	E65	1WGG44B	G39	20810	B228	215PNL-8-30	G37
1458060050	B38	16	G16	20005	B227	20811	B228	215PNL-8-35	G37
1458060075	B38	16-5B	G16	20006FIL	B231	20849FIL	B231	216P-2	G37
1458060100	B38	16-5BP	G16	20007FIL	B231	20850FIL	B231	216P-4	G37
1458060138	B38	16-6B	G16	20008FIL	B229	20851FIL	B231	216P-6	G37
1458060175	B38	16-6BP	G16	20009FIL	B229	208P-4-2	G36	216P-8	G37
146617****	B356	16-7B	G16	20024-	B227	208P-6-4	G36	216P-12	G37
148275****	B356	161X57-SS	E106, E108	20025FIL	B231	208P-8-4	G36	218P-2	G37
148896****	B356	164PLP-2	G31	20026FIL	B231	208P-8-6	G36	218P-4	G37
148897****	B356	164PLP-3	G31	20035-	B227	208P-12-6	G36	218P-6	G37
149109****	B356	164PLP-4	G31	20036-	B227	208P-12-8	G36	218P-8	G37
1493440002	B110	164PLP-5	G31	20037-	B227	209P-12-2	G36	218P-12	G37
1493440003	B110	164PLP-5/32	G31	20039	B227	209P-12-4	G36	219P-2	G37
1493440004	B110	164PLP-6	G31	20092	B227	209P-12-6	G36	219P-4	G37
1493440005	B110	164PLP-8	G31	20093	B227	209P-12-8	G36	219P-6	G37
14A01B13FOGF	E73	164PW-4	G31	20094	B227	209P-16-8	G36	219P-8	G37
14A11B13FOGF	E73	164PW-5	G31	20095	B227	209P-16-12	G36	219P-12	G37
14E01B10FC	E70	164PW-6	G31	20096	B227	209P-4-2	G36	2200P-2-2	G37
14E01B11FC	E70	164PW-8	G31	20097	B227	209P-6-2	G36	2200P-4-4	G37
14E01B13FC	E70	165PLP-2	G31	2010	B229	209P-6-4	G36	2200P-6-6	G37
14E03B10FC	E70	165PLP-3	G31	20153-	B227	209P-8-2	G36	2200P-8-8	G37
14E03B11FC	E70	165PLP-4	G31	20156-	B227	209P-8-4	G36	2201P-2-2	G38
14E03B13FC	E70	165PLP-5	G31	20157FIL	B229	209P-8-6	G36	2202P-2-2	G37
14E05B10FC	E70	165PLP-5/32	G31	20158FIL	B229	20PRL	B337	2202P-4-2	G37
14E05B11FC	E70	165PLP-6	G31	20161	B227	20R011FC	E68	2202P-4-4	G37
14E05B13FC	E70	165PLP-8	G31	20162FIL	B229	20R011GC	E68	2202P-4-6	G37
14E07B10FC	E70	165PW-4	G31	20163FIL	B229	20R013FC	E68	2202P-6-6	G37
14E07B11FC	E70	165PW-5	G31	20166-	B227	20R013GC	E68	2202PA-2-2	G37
14E07B13FC	E70	165PW-6	G31	20167-	B227	20R061FC	E68	2202PA-4-4	G37
14E11B10FC	E70	165PW-8	G31	20168-	B227	20R061GC	E68	2202PA-6-6	G37



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2203P-4	G38	3/8GG44B	G39	32PLCK-6M	G8	362PLP-6M-8M	G24	368PLP-8M-2G	G27
2203P-6	G38	3/8KMM004B	G39	32PLCK-8M	G8	362PLP-8M	G24	368PLP-8M-4G	G27
2203P-8	G38	3/8MM0444B	G39	32PLP-10M	G24	362PLP-8M-10M	G24	368PLP-8M-6G	G27
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220P-6	G37	30182-6-8B	G4	32PLP-5/32	G21	362PLPDSP-8M-6M	G28	369PLP-10M-8G	B334
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MC72S15HS01C4BPN	C62	MMFU**A**F	D70	N35441091	D79	NN-6-093	G18	P1C-4KME	B76
MC72S15HS06C4BPG	C62	MPS-ACCH8	C73	N35451091	D79	NN-8-062	G18	P1C-4KMF	B74
MC72S15HS06C4BPN	C62	MPS-ACCH9	C75	N35461091	D79	NN-8-124	G18	P1C-4KMSA	B75
MC72S15HS41C4APG	C62	MPS-ACCK10	C75	N35471091	D79	NNR-2-017	G19	P1C-4KMT	B76
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MC72S15HS41C4BPG	C62	MPS-P33G-NGAT	C73	N3553904553	D79	NNR-3-024	G19	P1C-4KRF	B81
MC72S15HS41C4BPN	C62	MPS-P33G-PGAT	C73	N3554904549	D79	NNR-3-039	G19	P1C-4KRS	B80
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MC72S15HS42C4APN	C62	MPS-P33N-PGAT	C73	N3555904549	D79	NNR-4-050	G19	P1C-4LMB	B74
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P32KA00BSM.....	E4, E7, E15, E36	P33CA96GEANGLNW.....	E20	P3BA20823.....	E114	P3NKB96CL.....	E82	P5GB-025MSG014B.....	B284
P32KA00BSN.....	E36	P33CA96GEMNGLNW.....	E20	P3BA4514A.....	E115	P3NKB96CP.....	E82	P5GB-032MSG016B.....	B284
P32KA00CB.....	E4, E7, E10, E13, E15, E18, E29, E35	P33CB94GEANGLNW.....	E20	P3BA4516A.....	E115	P3NKB98CL.....	E82	P5GM-010MSG005B.....	B297
P32KA00CY.....	E37	P33CB94GEMNGLNW.....	E20	P3BA4524A.....	E115	P3NKB98CP.....	E82	P5GM-010MSG006B.....	B297
P32KA00DA.....	E4, E7, E15, E36, E86, E90	P33CB96GEANGLNW.....	E20	P3BA4526A.....	E115	P3NKB9BCL.....	E82	P5GM-010MSG010B.....	B297
P32KA00ES9.....	E7, E36, F8	P33CB96GEMNGLNW.....	E20	P3BA4534A.....	E115	P3NKB9BCP.....	E82	P5GM-014MSG006B.....	B297
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P32KA00ESC.....	E7, E3, F8	P33EA94EGMBNGP.....	E15	P3EA63242NS.....	E113	P3NLA96LSN.....	E80	P5GM-014MSG013B.....	B297
P32KA00ESE.....	E4, E15, E36, F8	P33EA94ESABNGP.....	E15	P3EA63252NS.....	E113	P3NLA98LSN.....	E80	P5GM-022MSG010B.....	B297
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P32KA00ML.....	E4, E7, E18, E35	P33EA96EGABNGP.....	E15	P3HKA00ML.....	E23, E26, E120	P3NRA9PBNN.....	E76	P5GM-022MSG019B.....	B297
P32KA00MM.....	E10, E13, E15, E36	P33EA96EGMBNGP.....	E15	P3KKA00MC.....	E23, E120	P3NRA9PBPG.....	E77	P5GM-032MSG013B.....	B297
P32KA00MP.....	E10, E13, E15, E36	P33EA96ESABNGP.....	E15	P3KKA00ML.....	E23, E120	P3NRA9PBPP.....	E77	P5GM-032MSG019B.....	B297
P32KA00MQ.....	E10, E13, E15	P33EA96ESMBNGP.....	E15	P3KNA00ES9.....	F8	P3NRA96BNG.....	E76	P5GM-032MSG032B.....	B297
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P32KA00OPR.....	E37	P33FA94DSMN.....	E7	P3NCB9PSGMMNLLNA.....	E81	P3NRA98BNG.....	E76	P5GN-014MSG002B.....	B294
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P32KA00OPT.....	E37	P33FA94EGMN.....	E4	P3NCB98SGMMNLLNA.....	E81	P3NRA98BPG.....	E77	P5GN-014MSG005B.....	B294
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P32KA00RQ.....	E4, E7, E36	P33FA94QSAN.....	F7	P3NEA96GSMBNN.....	E78	P3RA10242.....	E117	P5GN-032MSG005B.....	B294
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P32KB00MR.....	E35	P33KA00BSA.....	E36	P3NFA98GSA.....	E74	P3TFA9CWHAN.....	E122, F3	P5GR-014MSG016B.....	B288
P32KB00RB.....	E15	P33KA00BSM.....	E4, E7, E15, E36	P3NFA98GSM.....	E74	P3TFA9EWKAN.....	E122, F3	P5GR-021MSG025B.....	B288
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P32LA92LSNN.....	E18	P33KA00ESA.....	E7, E36, F8	P3NFA99PDSA.....	E75, F3	P3TFAFFW2AN.....	E124, F3	P5GR-021MSG025B.....	B288
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P32LA93LSNN.....	E18	P33KA00ESE.....	E4, E15, E36, F8	P3NFA9PESA.....	F3	P3TFAFGQ3AN.....	E91, F3	P5GS-016MSG019B.....	B300
P32LA94LGNN.....	E18	P33KA00ML.....	E4, E7, E18, E35	P3NFA9PGSA.....	E74	P3TFAFGW3AN.....	E124, F3	P5GS-016MSG032B.....	B300
P32LA94LSNN.....	E18	P33KA00MM.....	E10, E36	P3NFA9PGSM.....	E74	P3TJA93A1JN.....	F6	P5GS-024MSG025B.....	B300
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P32RA92BNGP.....	E10	P33KA00MR.....	E10, E15, E35	P3NFA9PQSM.....	E75	P3TJA93A3JN.....	F6	P5GS-032MSG038B.....	B300
P32RA92BNNP.....	E10	P33KA00MT.....	E4	P3NKA00BSA.....	E74, E75, E79	P3TJA93A4JN.....	F6	P5GS-032MSG074B.....	B300
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P32RA94BNGP.....	E10	P33KA00OPT.....	E37	P3NKA00BSP.....	E74, E75, E79	P3TJA93A7JN.....	F6	P5GT-025MSG006B.....	B303
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P32SA94SCNA3GN.....	E26	P33LA94LSNN.....	E18	P3NKA00ESE.....	E74, E79, F8	P3TKA00JA5.....	F6	P5GT-046MSG019B.....	B303
P32TA94PPN.....	E26	P33LA96LGNN.....	E18	P3NKA00ESG.....	E74, E79	P3TKA00JA6.....	F6	P5GT-064MFG032B.....	B303
P32TA94SCNA2CN.....	E26	P33LA96LSNN.....	E18	P3NKA00MW.....	E74, E75, E76, E77, E79, E80, E82	P3TKA00JA7.....	F6	P5GT-064MSG032B.....	B303
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P5GV-010MFG003B	B286	P5SS-020-EA-25	B324	P8S-FRFXS	B330, B331	PBG-20B-SI	C18, C19, C22	PBTM-15A-SI-G1	C18
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P5GV-010MFG006B	B286	P5SS-020-RA-05	B324	P8S-FRSUS (M8)	B331	PBG-20-SI	C20, C21	PBTM-20B-NBR-G1	C18
P5GV-010MSG003B	B286	P5SS-020-RA-15	B324	P8S-GNFLX	B341, B343	PBG-30-NBR	C18, C19, C20, C21, C22	PBTM-20B-NBR-G2	C18
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P5GW-043MFG006B	B310	P5SS-025-ESK	B325	P8S-GPFLX/EX	B343	PBG-40-SI	C18, C19, C20, C21, C22	PBTM-30-NBR-G1	C18
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P5GW-072MFG010B	B310	P5V-CFS05011N	C29	P8S-GPSHX	B340, B343	PBG-75-NBR	C18, C19, C20, C21, C22	PBTM-30-SI-M10	C18
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P5GW-120DSG016B	B310	P6G-PR11040	E13	P8S-GRSHX	B342, B344	PBTM-40-NBR-N1	C19	PBTM-40-SI-G1	C18
P5GW-120MFG016B	B310	P6G-PR11100	E13	P8S-HHSN-017	B330, B332	PBTM-40-SI-G2	C19	PBTM-40-SI-M10	C18
P5GW-120MSG016B	B310	P6G-PR11P06	E13	P8S-HHSP-011	B330, B332	PBTM-40-SI-N1	C19	PBTM-50-NBR-G1	C18
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P5GW-156MFG025B	B310	P6M-PAB1	D117	P8S-HISN-011	B330, B332	PBTM-50-NBR-G2	C19	PBTM-50-SI-G1	C18
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P5GW-225DSG035B	B310	P6M-PAB2	G11	P8S-HISN-017	B330, B333	PBTM-50-SI-N1	C19	PBTM-75-NBR-G1	C18
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P5RS-016DSG190B	B326	P8BPA00MA	D96, D167, D179	P8S-HSMK-117	B330	PBTYS15A15NBRM5	C22	PBTYS15A15SIM5	C22
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P5SS-008-EA-15	B324	P8S-CABL-013	B330	P8S-TMAOY	B340, B341, B342	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-008-EA-25	B324	P8S-CABL-014	B330	P8S-TMC01	B340, B341, B342, B345	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-008-ESK	B325	P8S-CABL-018	B330	P8S-TMC02	B340, B341, B342, B345	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-008-RA-05	B324	P8S-ENFXS	B330, B331	P8S-TMC03	B340, B341, B342, B345	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-008-RA-15	B324	P8S-ENFXS	B341	PB11-04WJCRSS	E108	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-008-RA-25	B324	P8S-ENSUS	B330	PB11-04WJCSS	E108	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-008-RSK	B325	P8S-ENSUS (M8)	B331	PB12-04WJCRSS	E108	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-012-EA-05	B324	P8S-EPFXS	B330, B331	PB12-04WJCSS	E108	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-012-EA-15	B324	P8S-EPFXS	B340	PB548-02DHCSS	E108	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-012-EA-25	B324	P8S-EPFXS	B340	PB558-02DHCSS	E108	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-012-ESK	B325	P8S-EPFXS	B340	PBG-10A-NBR	C18, C19, C20, C21, C22	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-012-RA-05	B324	P8S-EPFXS	B340	PBG-10A-SI	C18, C19, C20, C21, C22	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-012-RA-15	B324	P8S-EPFXS	B340	PBG-110-NBR	C19, C21, C22	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-012-RA-25	B324	P8S-EPFXS	B340	PBG-110-SI	C19, C21, C22	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
P5SS-012-RSK	B325	P8S-EPFXS	B340	PBG-150-NBR	C19, C21, C22	PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
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P5SS-016-ESK	B325	P8S-ERSUS	B330			PBTYS5030SIM5	C22	PBTYS5030SIM5	C22
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PBTYS7530SIN1	C22	PCTK-20-NBR	C45	PF504-02HRSS	E104	PFTF-60-NBR-N2	C6	PFTM-40-NBR-M10	C5
PBTYS7550NBRN1	C22	PCTK-20-SI	C45	PF504-02DHSS	E104	PFTF-60-SI-G2	C6	PFTM-40-NBR-N1	C5
PBTYS7550SIN1	C22	PCTK-30-NBR	C45	PF6-10A-NBR	C5, C6, C7, C8, C9	PFTF-60-SI-N2	C6	PFTM-40-SI-G1	C5
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PBYK-10A-SI	C21	PCTK-40-NBR	C45	PF6-120-NBR	C6, C8, C9	PFTF-6A-NBR-M5	C6	PFTM-40-SI-M10	C5
PBYK-110-NBR-G1	C21	PCTK-40-SI	C45	PF6-120-SI	C6, C8, C9	PFTF-6A-SI-G1	C6	PFTM-40-SI-N1	C5
PBYK-110-NBR-N1	C21	PCTK-5-NBR	C45	PF6-150-NBR	C6, C8, C9	PFTF-6A-SI-M5	C6	PFTM-50-NBR-G1	C5
PBYK-110-SI-G1	C21	PCTK-5-SI	C45	PF6-150-SI	C6, C8, C9	PFTF-80-NBR-G2	C6	PFTM-50-NBR-G2	C5
PBYK-110-SI-N1	C21	PCTK-60-NBR	C45	PF6-15A-NBR	C5, C6, C9	PFTF-80-NBR-N2	C6	PFTM-50-NBR-N1	C5
PBYK-150-NBR-G1	C21	PCTK-60-SI	C45	PF6-15A-SI	C5, C6, C9	PFTF-80-SI-G2	C6	PFTM-50-SI-G1	C5
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PBYK-150-SI-G1	C21	PCTK-7-SI	C45	PF6-15-SI	C7, C8	PFTF-8A-NBR-G1	C6	PFTM-50-SI-N1	C5
PBYK-150-SI-N1	C21	PCTK-90-NBR-G1	C45	PF6-200-NBR	C6, C8, C9	PFTF-8A-NBR-M5	C6	PFTM-5A-NBR-G1	C5
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PBYK-30-NBR	C21	PCTM-10-NBR-M5	C43	PF6-20-SI	C7, C8	PFTF-95-SI-G2	C6	PFTM-60-NBR-M10	C5
PBYK-30-SI	C21	PCTM-10-SI-G1	C43	PF6-30-NBR	C5, C6, C7, C8, C9	PFTF-95-SI-N2	C6	PFTM-60-NBR-N2	C5
PBYK-40-NBR	C21	PCTM-10-SI-M5	C43	PF6-30-SI	C5, C6, C7, C8, C9	PFTK-10A-NBR	C7	PFTM-60-SI-G2	C5
PBYK-40-SI	C21	PCTM-15-NBR-G1	C43	PF6-40-NBR	C5, C6, C7, C8, C9	PFTK-15-NBR	C7	PFTM-60-SI-M10	C5
PBYK-50-NBR	C21	PCTM-15-NBR-M5	C43	PF6-40-SI	C5, C6, C7, C8, C9	PFTK-15-SI	C7	PFTM-60-SI-N2	C5
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PCTF-20-NBR-G1	C44	PCTM-90-SI-N2	C43	PFTF-15A-SI-M5	C6	PFTM-10A-SI-G1	C5	PFTYS15020SIN2	C9
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SCP01-9000P-25-07	C77	SKS20LP751	B168	U-21-xxx-0500	G18	W169PLP-8-4	G30	W368PLP-6-6	G21
SCPSD-016-04-17	C78	SKS20LP755	B168	U-42-xxx-0250	G18	W169PLP-8-6	G30	W369PLP-10M-4	G24
SCPSD-016-14-15	C78	SKS25LP751	B168	U-42-xxx-0500	G18	W169PLP-8-8	G30	W369PLP-10M-6	G24
SCPSD-0250P-0727	C78	SKS25LP755	B168	U-64-xxx-0100	G18	W169PLPNS-2-2	G30	W369PLP-10M-8	G24
SCPSD-0250P-1727	C78	SKS30LP871	B168	U-64-xxx-0250	G18	W169PLPNS-4-2	G30	W369PLP-12M-6	G24
SCPSD-1000P-1725	C78	SKS30LP875	B168	U-86-xxx-0100	G18	W169PLPNS-4-4	G30	W369PLP-12M-8	G24
SCPSD-1000P-1727	C78	SKS40LP101	B168	U-86-xxx-0250	G18	W169PLPNS5/32-2	G30	W369PLP-2-1	G20
SCPSD-250-04-17	C78	SKS40LP105	B168	UTK-60-15	C51	W169PLPNS5/32-4	G30	W369PLP-2-2	G20
SCPSD-250-14-15	C78	SMC-1N	B341, B352	UTYS-60-30	C51	W169PLPNS-5-2	G30	W369PLP-2-4	G20
SCPSD-3000P-0727	C78	SMC-1NC	B341, B352	UTYS-60-50	C51	W169PLPNS-5-4	G30	W369PLP-3-2	G20
SCPSD-3000P-1725	C78	SMC-1P	B340, B352	VF-2E	C83	W169PLPNS-6-4	G30	W369PLP-4-2	G20
SCPSD-3000P-1727	C78	SMC-1PC	B340, B352	VF-2G	C83	W169PLPNS-6-6	G30	W369PLP-4-4	G20
SCPSD-5000P-1725	C78	SMD-1L	B342, B352	VF-3E	C83	W169PLPNS-6-8	G30	W369PLP-4-6	G20
SCPSD-5000P-1727	C78	SMD-1LC	B342	VF-3G	C83	W169PLPNS-8-6	G30	W369PLP-4M-2	G24
SCPSD-600-04-17	C78	SMD-1LD	B352	VF-3K	C83	W169PLPNS-8-8	G30	W369PLP-4M-4	G24
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SK050P1D01	B82	SPR-375-1	E69	VFL-88	C83	W169PW-6-8	G30	W369PLP-6-8	G20
SK063P1D01	B82	SPR-375-2-SS	E106, E108	VFL-88E	C83	W169PW-8-4	G30	W369PLP-6M-2	G24
SK080P1D01	B82	SPR-376	E69	VFL-88K	C83	W169PW-8-6	G30	W369PLP-6M-4	G24
SK100P1D01	B82	SPR-376-1-SS	E106, E108	VFL-E	C83	W169PW-8-8	G30	W369PLP-8-4	G20
SK125P1D01	B82	SPR-377	E69	VFPOCFC01	C84	W171PLP-2-2	G30	W369PLP-8-6	G20
SK15003MA1	B15	SPR-377-1-SS	E106, E108	VFPOCFC03	C84	W171PLP-4-2	G30	W369PLP-8-8	G20
SK15104MA1	B39	SPR-388-1-SS	E106, E108	VFPOCFC11	C84	W171PLP-4-4	G30	W369PLP-8M-2	G24
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SK20003MA1	B15	SPR-47	E69, E76	VFP1CFC11	C84	W171PLP-5-4	G30	W369PLPX-2-4	G20
SK20104MA1	B39	SPR-48	E69, E76	VFP1CFC13	C84	W171PLP-6-4	G30	W369PLPX-4-2	G20
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SK25304MA1	B39	SWH-2N	B341, B353	VFP3CFC11	C84	W171PW-5-2	G30	W369PLPX-6-2	G20
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SK32003MA1	B15	SWH-2P	B340, B353	VFP4CFC01	C84	W171PW-6-4	G30	W369PLPX-6-6	G20
SK32104MA1	B39	SWH-2PC	B340, B353	VFP4CFC03	C84	W171PW-6-6	G30	W371PLP-2-1	G21
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Safety Guide for Selecting and Using Hydraulic, Pneumatic Cylinders and Their Accessories

WARNING: ⚠ FAILURE OF THE CYLINDER, ITS PARTS, ITS MOUNTING, ITS CONNECTIONS TO OTHER OBJECTS, OR ITS CONTROLS CAN RESULT IN:

- Unanticipated or uncontrolled movement of the cylinder or objects connected to it.
- Falling of the cylinder or objects held up by it.
- Fluid escaping from the cylinder, potentially at high velocity.

THESE EVENTS COULD CAUSE DEATH OR PERSONAL INJURY BY, FOR EXAMPLE, PERSONS FALLING FROM HIGH LOCATIONS, BEING CRUSHED OR STRUCK BY HEAVY OR FAST MOVING OBJECTS, BEING PUSHED INTO DANGEROUS EQUIPMENT OR SITUATIONS, OR SLIPPING ON ESCAPED FLUID.

Before selecting or using Parker (The Company) cylinders or related accessories, it is important that you read, understand and follow the following safety information. Training is advised before selecting and using The Company's products.

1.0 General Instructions

1.1 Scope – This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) cylinder products. This safety guide is a supplement to and is to be used with the specific Company publications for the specific cylinder products that are being considered for use.

1.2 Fail Safe – Cylinder products can and do fail without warning for many reasons. All systems and equipment should be designed in a fail-safe mode so that if the failure of a cylinder product occurs people and property won't be endangered.

1.3 Distribution – Provide a free copy of this safety guide to each person responsible for selecting or using cylinder products. Do not select or use The Company's cylinders without thoroughly reading and understanding this safety guide as well as the specific Company publications for the products considered or selected.

1.4 User Responsibility – Due to very wide variety of cylinder applications and cylinder operating conditions, The Company does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to The Company's design guidelines and do not necessarily meet the design guideline of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

1.5 Additional Questions – Call the appropriate Company technical service department if you have any questions or require any additional information. See the Company publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 Cylinder and Accessories Selection

2.1 Seals – Part of the process of selecting a cylinder is the selection of seal compounds. Before making this selection, consult the "seal information page(s)" of the publication for the series of cylinders of interest. The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

2.2 Piston Rods – Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Follow the recommendations of the "Piston Rod Selection Chart and Data" in the publication for the series of cylinders of interest. The suggested piston rod diameter in these charts must be followed in order to avoid piston rod buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

On occasion cylinders are ordered with double rods (a piston rod extended from both ends of the cylinder). In some cases a stop is threaded on to one of the piston rods and used as an external stroke adjuster. On occasions spacers are attached to the machine member connected to the piston rod and also used as a stroke adjuster. In both cases the stops will create a pinch point and the user should consider appropriate use of guards. If these external stops are not perpendicular to the mating contact surface, or if debris is trapped between the contact surfaces, a bending moment will be placed on the piston rod, which can lead to piston rod failure. An external stop will also negate the effect of cushioning and will subject the piston rod to impact loading. Those two (2) conditions can cause piston rod failure. Internal stroke adjusters are available with and without cushions. The use of external stroke adjusters should be reviewed with our engineering department.

The piston rod to piston and the stud to piston rod threaded connections are secured with an anaerobic adhesive. The strength of the adhesive decreases with increasing temperature. Cylinders which can be exposed to temperatures above +250°F (+121°C) are to be ordered with a non studded piston rod and a pinned piston to rod joint.

2.3 Cushions – Cushions should be considered for cylinder applications when the piston velocity is expected to be over 4 inches/second.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be reviewed by our engineering department.

2.4 Cylinder Mountings – Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

2.5 Port Fittings – Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure} \times \text{effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

3.0 Cylinder and Accessories Installation and Mounting

3.1 Installation

3.1.1 – Cleanliness is an important consideration, and cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations.

3.1.2 – Cylinders operating in an environment where air drying materials are present such as fast-drying chemicals, paint, or weld splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

3.1.3 – Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear. On fixed mounting cylinders attaching the piston rod while the rod is retracted will help in achieving proper alignment.

3.1.4 – Sometimes it may be necessary to rotate the piston rod in order to thread the piston rod into the machine member. This operation must always be done with zero pressure being applied to either side of the piston. Failure to follow this procedure may result in loosening the piston to rod-threaded connection. In some rare cases the turning of the piston rod may rotate a threaded piston rod gland and loosen it from the cylinder head. Confirm that this condition is not occurring. If it does, re-tighten the piston rod gland firmly against the cylinder head.

For double rod cylinders it is also important that when attaching or detaching the piston rod from the machine member that the torque be applied to the piston rod end of the cylinder that is directly attaching to the machine member with the opposite end unrestrained. If the design of the machine is such that only the rod end of the cylinder opposite to where the rod attaches to the machine member can be rotated, consult the factory for further instructions.

3.2 Mounting Recommendations

3.2.1 – Always mount cylinders using the largest possible high tensile alloy steel socket head screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

3.2.2 – Side-Mounted Cylinders – In addition to the mounting bolts, cylinders of this type should be equipped with thrust keys or dowel pins located so as to resist the major load.

3.2.3 – Tie Rod Mounting – Cylinders with tie rod mountings are recommended for applications where mounting space is limited. The standard tie rod extension is shown as BB in dimension tables. Longer or shorter extensions can be supplied. Nuts used for this mounting style should be torqued to the same value as the tie rods for that bore size.

3.2.4 – Flange Mount Cylinders – The controlled diameter of the rod gland extension on head end flange mount cylinders can be used as a pilot to locate the cylinders in relation to the machine. After alignment has been obtained, the flanges may be drilled for pins or dowels to prevent shifting.

3.2.5 – Trunnion Mountings – Cylinders require lubricated bearing blocks with minimum bearing clearances. Bearing blocks should be carefully aligned and rigidly mounted so the trunnions will not be subjected to bending moments. The rod end should also be pivoted with the pivot pin in line and parallel to axis of the trunnion pins.

3.2.6 – Clevis Mountings – Cylinders should be pivoted at both ends with centerline of pins parallel to each other. After cylinder is mounted, be sure to check to assure that the cylinder is free to swing through its working arc without interference from other machine parts.

4.0 Cylinder and Accessories Maintenance, Troubleshooting and Replacement

4.1 Storage – At times cylinders are delivered before a customer is ready to install them and must be stored for a period of time. When storage is required the following procedures are recommended.

4.1.1 – Store the cylinders in an indoor area which has a dry, clean and noncorrosive atmosphere. Take care to protect the cylinder from both internal corrosion and external damage.

4.1.2 – Whenever possible cylinders should be stored in a vertical position (piston rod up). This will minimize corrosion due to possible condensation which could occur inside the cylinder. This will also minimize seal damage.

4.1.3 – Port protector plugs should be left in the cylinder until the time of installation.

4.1.4 – If a cylinder is stored full of hydraulic fluid, expansion of the fluid due to temperature changes must be considered. Installing a check valve with free flow out of the cylinder is one method.

4.1.5 – When cylinders are mounted on equipment that is stored outside for extended periods, exposed unpainted surfaces, e.g. piston rod, must be coated with a rust-inhibiting compound to prevent corrosion.

4.2 Cylinder Trouble Shooting

4.2.1 – External Leakage

4.2.1.1 – Rod seal leakage can generally be traced to worn or damaged seals. Examine the piston rod for dents, gouges or score marks, and replace piston rod if surface is rough.

Rod seal leakage could also be traced to gland wear. If clearance is excessive, replace rod bushing and seal. Rod seal leakage can also be traced to seal deterioration. If seals are soft or gummy or brittle, check compatibility of seal material with lubricant used if air cylinder, or operating fluid if hydraulic cylinder. Replace with seal material, which is compatible with these fluids. If the seals are hard or have lost elasticity, it is usually due to exposure to temperatures in excess of 165°F. (+74°C). Shield the cylinder from the heat source to limit temperature to 350°F. (+177°C.) and replace with fluorocarbon seals.

4.2.1.2 – Cylinder body seal leak can generally be traced to loose tie rods. Torque the tie rods to manufacturer's recommendation for that bore size.

Excessive pressure can also result in cylinder body seal leak. Determine maximum pressure to rated limits. Replace seals and retorque tie rods as in paragraph above. Excessive pressure can also result in cylinder body seal leak. Determine if the pressure rating of the cylinder has been exceeded. If so, bring the operating pressure down to the rating of the cylinder and have the tie rods replaced.

Pinched or extruded cylinder body seal will also result in a leak. Replace cylinder body seal and retorque as in paragraph above.

Cylinder body seal leakage due to loss of radial squeeze which shows up in the form of flat spots or due to wear on the O.D. or I.D. – Either of these are symptoms of normal wear due to high cycle rate or length of service. Replace seals as per paragraph above.

4.2.2 – Internal Leakage

4.2.2.1 – Piston seal leak (by-pass) 1 to 3 cubic inches per minute leakage is considered normal for piston ring construction. Virtually no static leak with lipseal type seals on piston should be expected. Piston seal wear is a usual cause of piston seal leakage. Replace seals as required.

4.2.2.2 – With lipseal type piston seals excessive back pressure due to over-adjustment of speed control valves could be a direct cause of rapid seal wear. Contamination in a hydraulic system can result in a scored cylinder bore, resulting in rapid seal wear. In either case, replace piston seals as required.

4.2.2.3 – What appears to be piston seal leak, evidenced by the fact that the cylinder drifts, is not always traceable to the piston. To make sure, it is suggested that one side of the cylinder piston be pressurized and the fluid line at the opposite port be disconnected. Observe leakage. If none is evident, seek the cause of cylinder drift in other component parts in the circuit.

4.2.3 – Cylinder Fails to Move the Load

4.2.3.1 – Pneumatic or hydraulic pressure is too low. Check the pressure at the cylinder to make sure it is to circuit requirements.

4.2.3.2 – Piston Seal Leak – Operate the valve to cycle the cylinder and observe fluid flow at valve exhaust ports at end of cylinder stroke. Replace piston seals if flow is excessive.

4.2.3.3 – Cylinder is undersized for the load – Replace cylinder with one of a larger bore size.

4.3 Erratic or Chatter Operation

4.3.1 – Excessive friction at rod gland or piston bearing due to load misalignment – Correct cylinder-to-load alignment.

4.3.2 – Cylinder sized too close to load requirements – Reduce load or install larger cylinder.

4.3.3 – Erratic operation could be traced to the difference between static and kinetic friction. Install speed control valves to provide a back pressure to control the stroke.

4.4 Cylinder Modifications, Repairs, or Failed Component

– Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at company locations or by The Company's certified facilities. The Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, tie rod, mounting accessory or any other cylinder component. The notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure.

It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies. However, this work must be done by strictly following all the instructions provided with the seal kits.

Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

WARNING:

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS ("PRODUCTS") CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

1. GENERAL INSTRUCTIONS

- 1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.
- 1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.
- 1.3. Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See www.iso.org for ordering information.
- 1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
 - Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
 - Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
 - Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
 - Assuring compliance with all applicable government and industry standards.
- 1.6. Safety Devices:** Safety devices should not be removed, or defeated.
- 1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.

1.8. Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

- 2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.
- 2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.
- 2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.
- 2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.
- 2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.
- 2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:
 - Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
 - Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, ketones, esters or certain alcohols.
 - Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

- 2.7. Chemical Compatibility:** For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5
- 2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
 - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
 - Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 3.1. Component Inspection:** Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.
- 3.2. Installation Instructions:** Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.
- 3.3. Air Supply:** The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.
- 4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.
- 4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)
- 4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
 - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
 - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
 - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
 - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

Caution: Leak detection solutions should be rinsed off after use.

4.5. Routine Maintenance Issues:

- Remove excessive dirt, grime and clutter from work areas.
- Make sure all required guards and shields are in place.

4.6. Functional Test:

Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.

4.7. Service or Replacement Intervals:

It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:

- Previous performance experiences.
- Government and / or industrial standards.
- When failures could result in unacceptable down time, equipment damage or personal injury risk.

4.8. Servicing or Replacing of any Worn or Damaged Parts:

To avoid unpredictable system behavior that can cause death, personal injury and property damage:

- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
- Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
- Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

4.9. Putting Serviced System Back into Operation:

Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

- 1. Terms and Conditions.** Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is subject to these Terms and Conditions or any newer version of the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document issued by Buyer.
- 2. Price Adjustments; Payments.** Prices stated on Seller's quote or other documentation offered by Seller are valid for 30 days, and do not include any sales, use, or other taxes unless specifically stated, Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and is due 30 days from the date of invoice or such other term as required by Seller's Credit Department, after which Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.
- 3. Delivery Dates; Title and Risk; Shipment.** All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon placement of the products with the shipment carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.
- 4. Warranty.** Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
- 5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 30 days after delivery. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for an amount due on any invoice) must be commenced within 12 months from the date of the breach without regard to the date breach is discovered.
- 6. LIMITATION OF LIABILITY.** UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. **IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.**
- 7. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
- 8. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
- 9. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.
- 10. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.
- 11. Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright

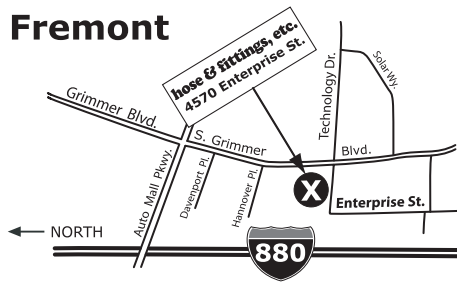
- infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
- 12. Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
 - 13. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
 - 14. Force Majeure.** Seller does not assume the risk and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure") Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.
 - 15. Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
 - 16. Termination.** Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of any provision of this agreement (b) appointments a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or by a third party (d) makes an assignment for the benefit of creditors, or (e) the dissolves or liquidates all or a majority of its assets.
 - 17. Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.
 - 18. Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
 - 19. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
 - 20. Compliance with Law, U. K. Bribery Act and U.S. Foreign Corrupt Practices Act.** Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which the Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.

02/12



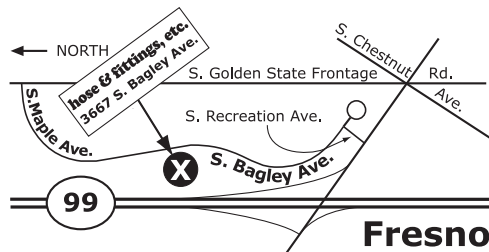
Five convenient locations - same great service

Fremont



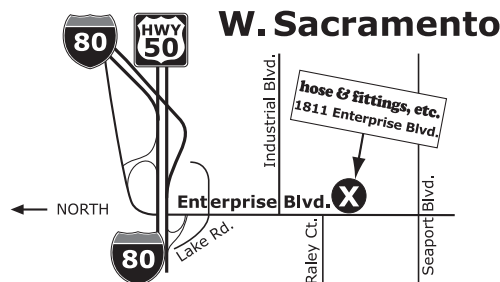
4570 Enterprise St.
Fremont, CA 94538
Phone: 510.661.0151
Hours: 7 a.m. - 5 p.m. (M-F)

Fremont



3667 South Bagley Ave., #102
Fresno, CA 93725
Phone: 559.495.1220
Hours: 7 a.m. - 5 p.m. (M-F)

Fresno

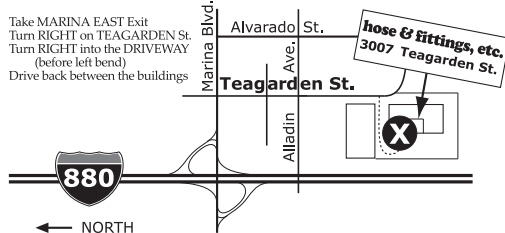


1811 Enterprise Blvd.
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W. Sacramento

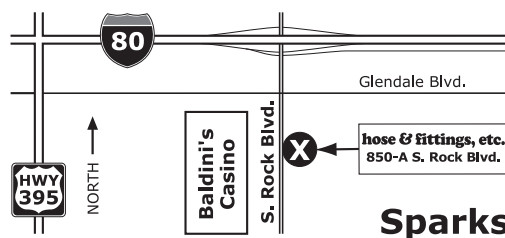


San Leandro



3007 Teagarden St.
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San Leandro



850-A South Rock Blvd.
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