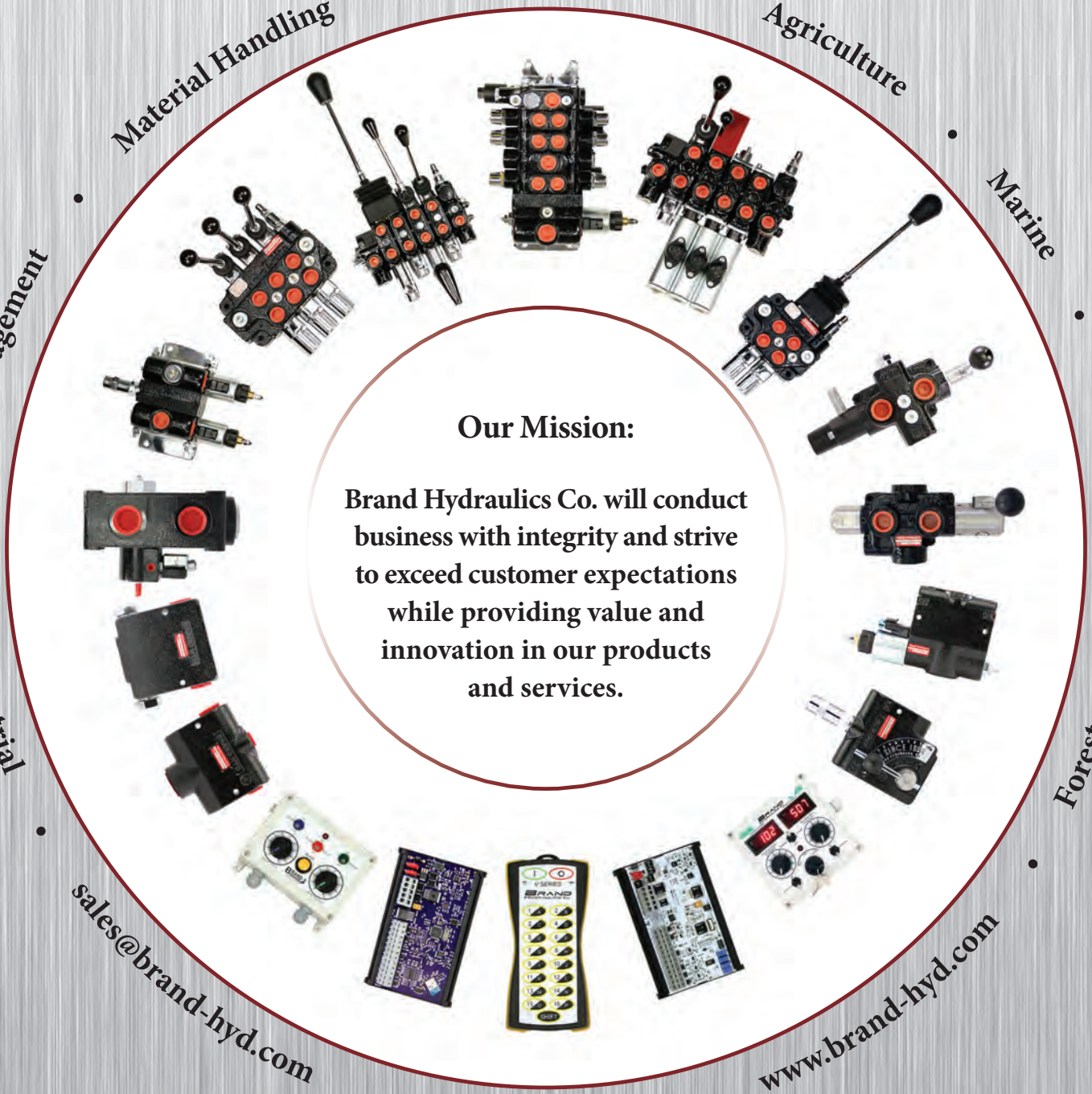
PRODUCT OVERVIEW

Construction • Agriculture • Marine • Transportation • Forestry • www.brand-hyd.com • 402.344.4434 • sales@brand-hyd.com • Industrial • Waste Management • Material Handling •



Our Mission:

Brand Hydraulics Co. will conduct business with integrity and strive to exceed customer expectations while providing value and innovation in our products and services.

BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

REV012018

www.mfcp.com

Wireless Handheld Controllers

V-Series

Handheld wireless control family that includes 5 different sized ergonomic enclosures. These controls are efficient and rugged. The transmitters are rated at IP65 and each unit includes a highly visibility boot for rugged weatherproof applications. Each unit has diagnostic LEDs and push button counts ranging from 8 to 16.

Electronic Controllers

EC20100

Spreader control with dual control knobs, dual outputs and a blast button. Both outputs and the blast button can be fully trimmed to suit your application. It is all housed in a waterproof enclosure for use inside or outside.

EC20200

Control Box has a single knob to control the output current and a switch to turn the power off. Electronic circuitry, power switch, fuse holder, potentiometer and wire bushing are sealed in a rugged waterproof box. The outputs can be trimmed for minimum and maximum output current and ramping can be trimmed in both directions.

EC20201

Control Box has a single knob to control the output current. The maintained switch is used to turn the power on/off and control 2 directional solenoids. Electronic circuitry, power switch, fuse holder, potentiometer and wire bushing are sealed in a rugged waterproof box. The outputs can be trimmed for minimum and maximum output current and ramping can be trimmed in both directions.

EC20202

Control Box has a single knob to control the output current. The momentary switch is used to turn the power on/off and control 2 directional solenoids. Electronic circuitry, power switch, fuse holder, potentiometer and wire bushing are sealed in a rugged waterproof box. The outputs can be trimmed for minimum and maximum output current and ramping can be trimmed in both directions.

Electronic Controllers

EC20300

Control Box has a single LED to indicate the power is on. This unit is designed to accept analog signals remotely from a Potentiometer, 0-10 V, 0-5 V, or 4-20 mA. It is housed in a waterproof enclosure for use inside or outside. The outputs can be trimmed for minimum and maximum output current and ramping can be trimmed in both directions.

EC20400

Joystick control box with a mini proportional single axis joystick. The control also has solid state switched output for each side of neutral. It is housed in a waterproof enclosure for use inside or outside. The outputs can be trimmed for minimum and maximum output current and ramping can be trimmed in both directions.

DEC005000

Digital Interface Control was designed for DIN rail mount applications. A single control can accept any of the following input types: a Potentiometer, 0-10 V, 0-5 V, or 4-20 mA. The 3.0 amp constant current card comes with features like: micro-controller based current control provides rock solid current output, wide operating voltage range 9-30V, factory customizable PWM frequency 30-500Hz, enable inputs, span adjustments, output ramping, diagnostic LEDS and much more.

ECM0001

Current steering module for the Series 36/38 valve. The module is designed to steer the current for the unloaded inlet coil. This module will allow you to use SPDT (Single Pole Double Throw) switches to minimize the amount of wire required for a system.

DEC006000

Digital Electronic Control has a knob to control the output current and a switch to turn the power off. Electronic circuitry, power switch, fuse holder, potentiometer and wire bushing are sealed in a rugged weather proof box. The 3.0 amp constant current control comes with features like: microcontroller based current control provides rock solid current output, wide operating voltage range 9-30V, factory customizable output currents, ramping and PWM frequency 30-500Hz, active short circuit monitoring with lockout, diagnostic LED and much more.

Electronic Controllers

EC-12-01

Control Box has a knob to control the output current and a switch to turn the power off. Electronic circuitry, power switch, fuse holder, potentiometer and wire bushing are sealed in a rugged weather proof box.

DEC007000

Digital Electronic Control functions electronically like the DEC006000, but allows dash or panel mounting. It comes with four position terminal block for easy wiring and short circuit protection. Circuit board is coated with a conformal coating to help protect against moisture, dust and other contaminates. The 3.0 amp constant current control comes with features like: microcontroller based current control provides rock solid current output, wide operating voltage range 9-30V, factory customizable output currents, ramping and PWM frequency 30-500Hz, active short circuit monitoring with lockout, diagnostic LED and much more.

EC-12-02

Panel Mount functions like the EC-12-01, but allows dash or panel mounting. It comes with four coil and power terminals for easy wiring and short circuit protection. Circuit board is coated with a special conformal coating to help protect against moisture, dust and other contaminates.

Custom Electronics

Brand Hydraulics offers a single source for custom electronic packages, circuits and wire harnesses. We build custom electronics to exacting specifications while our engineering department is available to assist with customer design. Brand is equipped for large and small scale production quantities for products ranging from simple on/off switch boxes to fully integrated digital control systems. Our professional staff is committed to delivering a robust, high-quality and cost-competitive solution to any application need.

Brand Hydraulics welcomes inquiries on custom electronics or variations of products from the standard product line. For assistance with any application, contact Brand Hydraulics directly by phone or by e-mail at custom@brand-hyd.com and include your specifications.

Capabilities

- Wireless control systems for mobile & static applications
- Handheld pendants or mounted control packages for most environments
- Complete service from concept through manufacturing including circuits, software, enclosures & cabling
- Custom electronics and circuit boards to meet customer requirements
- Analog and digital systems
- Open loop & closed loop controller designs
- Wiring harnesses
- Complete custom packages for out of the box OEM installation
- Private label of products available
- Custom machining of enclosures
- Small, medium and large quantities

Flow Controls

Small Manual Flow Controls (FC51, FCR51, FCB51, & FC55)

- Rated at 3000 PSI [206.8 Bar]
- Pressure compensating, variable flow control valves
- Rotary side lever to easily set controlled flow (CF)
- Controlled flow varies from zero to rated flow
- Compensator spool designed to reduce instability & hunting issues
- Standard flow settings: 0-8, 16, 30 GPM [0-30.2, 60.5, 114 l/min]
- Port sizes: 3/8", 1/2", 3/4" NPT & #6, 8, 10, 12 SAE
- Rotary lever spool can be drilled to custom max flow rates
- Relief option available only in FCR51 or FCB51 series flow controls
- Free reverse flow checks available in FC55 series flow controls

Large Manual Flow Controls (FC51)

- Rated at 3000 PSI [206.8 Bar]
- Pressure compensating, variable flow control
- Rotary side lever to easily set controlled flow (CF)
- Controlled flow varies from zero to rated flow
- Standard flow settings: 0-50, 90 GPM [0-189, 341 l/min]
- Port sizes: 1", 1 1/4", 1 1/2" NPT & #16, 24 SAE
- Rotary lever spool can be drilled to custom max flow rates

Electric Flow Controls (EFC, EFCC, EFCR, & LEFC)

- Rated at 3000 PSI [206.8 Bar]
- Pressure compensating, variable flow control valves
- Electrically adjustable orifice varies controlled flow (CF)
- Controlled flow varies from zero to rated flow
- Compensator spool designed to reduce instability & hunting issues (EFC only)
- Free reverse flow option is available only in the EFCC electric flow control
- Relief option is available only in the EFCR electric flow control
- Available in both 3-port (standard) & 2-port
- EFC series valves offer flow ranges of 0-30 GPM [0- 114 l/min]
- EFC series valves are only available with #12 SAE ports
- LEFC valves offer flow ranges of 0-45, 55 GPM [170, 208 l/min] with #16 SAE ports
- See “Electronic Controllers” section for controller options

Non-Adjustable Flow Controls (83AFF & 84AFF)

- Rated at 3000 PSI [206.8 Bar]
- Pressure compensation available only in Series 83 non-adjustable flow controls
- Series 83 is available up to 10 GPM [37.8 l/min] max flow rate
- Fixed orifice available with Series 84 non-adjustable flow controls
- Series 84 orifice diameters are available up to .250” [6.35 mm]
- Free Reverse flow built into both Series 83 & 84

Dividers & Combiners

Non-Adjustable Constant Volume Priority Divider (BG5, BGR5, BGC5 & BG4)

- Rated at 3000 PSI [206.8 Bar]
- Constant volume priority divider maintains priority port flow
- Divides flow to one constant output (priority) & one excess flow stream
- Priority flow is preset at factory to specified flow
- Flow changes at the inlet will be seen on the excess flow port, after priority is met
- Both outlets are pressure compensated & can be used for work functions
- BG5, BGR5, BGC5 are rated up to 30 GPM [114 l/min] flow
- BG5 port size: 3/8”, 1/2”, 3/4” NPT & #8, 10, 12 SAE
- Relief option available only in BGR5 priority divider
- Free reverse flow option available only in BGC5 priority divider
- BG4 priority divider allows inlet flows up to 45 GPM [170 l/min]
- BG4 available with 1” NPT or #16 SAE ports

Adjustable Constant Volume Priority Divider (FG52 & FG54)

- Rated at 3000 PSI [206.8 Bar] & up to 30 GPM [114 l/min] inlet flow
- Constant volume priority divider maintains priority port flow
- Divides flow to one constant output (priority) & one excess flow stream
- Priority flow is adjustable by turning side setscrew
- Flow changes at the inlet will be seen on the excess flow port, after priority is met
- Both outlets are pressure compensated & can be used for work functions
- Priority flow is adjustable from 0-12 GPM [0-45.4 l/min]
- FG series available with 3/4" inlet & excess ports & 3/8" NPT priority
- FG series also available with #12 SAE porting
- Relief option available only in FG52 priority divider
- Free reverse flow option available only in FG54 priority divider

Non-Adjustable Proportional Flow Divider (B50, BX50, B100 & B100AB)

- Rated at 3000 PSI [206.8 Bar]
- Both outlets are pressure compensated
- Proportional flow divider maintains output port ratios independent of inlet flow
- Output ratios can vary from 50:50 up to 95:5
- Free reverse flow option available only in B100 & B100AB dividers
- Auto-bypass for re-synchronizing cylinders available only in B100AB dividers
- B50, B100, & B100AB port sizes: 3/8", 1/2", 3/4" NPT & #10, #12 SAE
- BX50 available with 1" NPT or #16 SAE ports for flows up to 45 GPM [170 l/min]
- B100 also available with #24 SAE ports for flows up to 120 GPM [454 l/min]

Adjustable Proportional Flow Divider (FP53, FP55 & FP56)

- Rated at 3000 PSI [206.8 Bar]
- Both outlets are pressure compensated
- Proportional flow divider maintains output port ratios independent of inlet flow
- Adjustable orifice to change outlet ratios
- Rated up to 30 GPM [114 l/min] inlet flow with 3/4" NPT ports
- Relief option available only in FP53 divider with 3/8" tank port
- Free reverse flow option available in FP55 & FP56 divider
- Dual adjustable orifice option available only in FP56 divider

4-Way Directional Controls

Loader Directional Control Valve (LV & TS2)

- Rated at 4000 PSI [275.8 Bar] & 10 GPM [37.8 l/min] maximum flow
- Two spool monoblock valve designed for tractor-loader applications
- Port sizes: #8 SAE & #6 SAE
- Bucket regen (rapid tip) & float features available for standard loader functions
- Load checks are standard to prevent load drop when shifting spools
- Joystick or lever actuators allow for simple valve operation
- Power beyond & closed center options also available

4-Way Directional Control (HPV4, AO, LS & DC)

- Rated at 3000 PSI [206.8 Bar]
- Relief available in AO, LS & DC 4-way directional control valves
- AO rated up to 18 GPM [68.1 l/min] with 3/4"NPT in/outlet & 1/2" workports OR #12 SAE in/outlet & #10 SAE workports. Actuators: lever & rotary
- LS rated up to 18 GPM [68.1 l/min] with 3/4"NPT in/outlet & 1/2" workports OR #12 SAE in/outlet & #10 SAE workports. Log Splitter valve w/ hydraulic kickout
- DC rated up to 45 GPM [170 l/min] with 3/4"NPT in/outlet & 3/4" workports OR #16 SAE in/outlet & #16 SAE workports. Actuators: lever, rotary, & pilot
- HPV4 rated up to 6000 PSI [413.7 Bar], 5 GPM [18.9 l/min], rotary actuated, 1/4" NPT OR #4 SAE ports

4-Way Directional Control w/ Pressure Compensation (SDCF & DCF)

- Rated at 3000 PSI [206.8 Bar]
- Built in full-range pressure compensated bypass type flow control
- Standard adjustable pilot operated relief
- SDCF rated up to 18 GPM [68.1 l/min] with 3/4"NPT in/outlet & 1/2" workports OR #12 SAE in/outlet & #10 SAE workports
- DCF rated up to 45 GPM [170 l/min] with 3/4"NPT in/outlet & 3/4" workports OR #16 SAE in/outlet & #16 SAE workports
- Available with lever & rotary actuators

Monoblock Directional Control Valve (MB & TS)

- Available in one, two or three spool monoblock configurations
- Available with power beyond or closed center features
- Float option available with both MB & TS valves
- MB series rated up to 4000 PSI [275.8 Bar] & 10 GPM [37.8 l/min], three spool MB rated up to 8 GPM [30.3 l/min]
- MB series offered with #8 SAE porting & lever and/or joystick actuators
- TS series rated up to 3000 PSI [206.8 Bar] & 18 GPM [68.1 l/min]
- TS series offered with #12 SAE in/outlet ports & #10 SAE workports
- TS spool actuators include lever or rotary

Selector Valves (MS & DS)

- MS series switches one port between two separate circuits
  - -MS75 rated up to 3000 PSI [206.8 Bar] & 30 GPM [114 l/min] with 3/4" NPT ports
  - -MS16SAE rated up to 3000 PSI [206.8 Bar] & 45 GPM [170 l/min] with #16 SAE ports
- DS double selector switches two ports between two separate circuits
  - -Also allows for switching a circuit from series to parallel
  - -Available with knob, lever, pilot or electrical operators
  - -Port sizes & Ratings (for knob, lever & pilot operators):
    - #8 SAE (4500 PSI [310.2 Bar] & 10 GPM [37.8 l/min])
    - #10 SAE (4500 PSI [310.2 Bar] & 18 GPM [68.1 l/min])
    - #12 SAE (4500 PSI [310.2 Bar] & 30 GPM [114 l/min])
- See Catalog for electrically operated DS ratings

Stackable 4-Way Directional Control

Series 20 - Manually Operated

- Rated at 4500 PSI [310.2 Bar] & up to 6 GPM [22.7 l/min] flow rate
- Combines up to six sections into one valve assembly (Consult factory for more)
- Parallel configuration is standard, series configurations are available
- Port size: #6 SAE all ports
- Built-in load checks for each work-section
- Available with lever or joystick actuators
- Inlet relief, power beyond & closed center outlet options available

Series 21 - Electrically Operated

- Rated at 4000 PSI [275.8 Bar] in parallel, 3000 PSI [206.8 Bar] in series & up to 6 GPM [22.7 l/- min] flow rate
- Combines up to six sections into one valve assembly
- Port size: #6 SAE all ports
- Inlet relief, power beyond & closed center outlet options available
- Enclosed solenoid spool operators
- Manual override available in push-button or lever styles
- Combinable with Series 20 Manual sections

Series 34 - Manually Operated

- Rated at 3500 PSI [241.3 Bar] & up to 12 GPM [45.4 l/min]
- Combines up to twelve sections into one valve assembly (Consult factory for more)
- Port size: #10 SAE in/outlet, #8 SAE workports
- Parallel configuration is standard, series configurations are available
- Inlet relief, power beyond & closed center outlet options available
- Fourth-position float option available on the last spool section only
- Available with lever (straight or adjustable-angle) or joystick actuators
- Available with built in port-reliefs or load-checks

Series 36 & 38 - Electrically Operated

- Rated at 3500 PSI [241.3 Bar]
- Combines up to twelve sections into one valve assembly (Consult factory for more)
- Series 36: #10 SAE in/outlet, #8 SAE workports & rated up to 12 GPM [45.4 l/min]
- Series 38: #10 SAE all ports & rated up to 24 GPM [90.8 l/min]
- Inlet relief, power beyond & closed center options available
- Available with built in port-reliefs or load-checks
- Solenoid actuation standard, manual handle options available

Series 36/38 EFC - Electrically Operated, Built in Electronic Flow Control

- Rated at 3000 PSI [206.8 Bar]
- Combines standard EFC & Series 36/38 features into one valve assembly
- EFC inlet port size: #12 SAE
- Series 36: #8 SAE work-ports & rated up to 12 GPM [45.4 l/min]
- Series 38: #10 SAE work-ports & rated up to 24 GPM [90.8 l/min]

SEFC - Electronic Flow Control Stack Valve

- Rated at 3000 PSI [206.8 Bar] & up to 30 GPM [114 l/min]
- Combines up to five EFC valves into one valve assembly
- Parallel or series options available
- EFC port sizes: #12 SAE
- See SEFC Catalog for section details

Additional Products

Adjustable Hydraulic Relief Valves (RL & RLC)

- Rated up to 3000 PSI [206.8 Bar]
- Adjustable pressure setting range from 150 PSI [10.3 Bar] to 3000 PSI [206.8 Bar]
- RL series: Simple ball-spring relief
- RLC series: High lift ball spring relief - reduces noise, heat & chatter
- NPT & SAE porting available (see catalog or contact factory for available sizes)

Adjustable Pilot Operated Relief Valves (POR)

- Rated up to 3000 PSI [206.8 Bar] & 30 GPM [114 l/min]
- Adjustable pressure setting range from 500 PSI to 3000 PSI
- Maintains consistent cracking pressure at high & low pressures
- Port size: 3/4” NPT only

Additional Products

Pilot Operated Check Valve (PC)

- Rated up to 3000 PSI [206.8 Bar]
- Steel ball with Delrin check seat for zero leakage (steel seat optional)
- PC37C port sizes: 3/8” NPT in/outlet & 1/4” NPT pilot port, rated up to 8 GPM [30.2 l/min]
- PC50C port sizes: 1/2” NPT in/outlet & 1/4” NPT pilot port, rated up to 16 GPM [60.6 l/min]
- PC6C port sizes: #6 SAE in/outlet & pilot port, rated up to 8 GPM [30.2 l/min]
- PC8C port sizes: #8 SAE in/outlet & #6 SAE pilot port, rated up to 16 GPM [60.6 l/min]
- POC76 - Port sizes: 3/4” NPT in/outlet & 3/8” NPT pilot port, rated up to 30 GPM [114 l/min]
    - Minimum pilot pressure: 50 PSI [3.45 Bar]
    - Metering is accomplished by varying pilot pressure

Shuttle Valve (SHV)

- Rated up to 3000 PSI [206.8 Bar]
- SHV25C port sizes: 1/4” NPT all ports, 50 PSI [3.45 Bar] pressure drop at 5 GPM [18.9 l/min]
- SHV50C port sizes: 1/2” NPT all ports, 15 PSI [1.03 Bar] pressure drop at 15 GPM [56.8 l/min]

Hand Operated Hydraulic Pump (HP)

- Vertical or horizontal options available
- Port sizes: #6 SAE outlet & 1/4” NPT tank fill-port
- HP22SA: single acting pump .20 in3 [3.27 cm3] per cycle, 6000 PSI [413.7 Bar] max
- HP61DA: double acting pump .60 in3 [9.83 cm3] per cycle, 3000 PSI [206.8 Bar] max
- HP121DA: double acting pump 1.20 in3 [19.66 cm3] per cycle, 2000 PSI [137.9 Bar] max
- Standard adjustable relief & release valve (not included with “No Tank” option)
- Four standard tank sizes or two options to use in conjunction with an external reservoir

BRAND HYDRAULICS CO.
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Shipping: 2332 S 25th St (Zip 68105)
Mailing: P.O. Box #6069 (Zip 68106)
Omaha NE
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www.BRAND-HYD.COM

ISO 9001:2008 WITH DESIGN
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BRAND HYDRAULICS CO.

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Engineering & Manufacturing Solutions

V Series

Radio Remote Control Transmitter
Model: V100 / V0100020000 / 2 Functions

2.4GHZ
Extended Range

Sealed To
IP65

32-bit
Microprocessor

RoHS COMPLIANT

FEDERAL COMMUNICATIONS COMMISSION · USA · FC

CE

ISO 9001:2008 WITH DESIGN
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V Series

Radio Remote Control Transmitter / V100 / V0100020000 / 2 Functions

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited laboratory
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to use control
- Conformal coated circuit board
- 500 ft. range line of sight
- LED diagnostic indicators
- Wireless pairing function
- Powered by a single lithium coin cell battery
- Long battery life
- Ergonomically shaped to fit the hand
- Yellow impact protective boot seal
- No perceivable delay between transmitter and receiver
- Detachable neck lanyard
- Factory configurable for custom applications*
- Custom membrane keypads*
- Other impact protective boot seal colors available*

APPLICATON:

The V Series radio remote control is used to control the ON/OFF functions of hydraulic valves for motors and cylinders from a remote location. This unit can also control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

The conformal coated V Series are ergonomic, durable, sealed and easy to use radio remote transmitters. All exposed components on the transmitter are made from non corrosive materials. This transmitter is designed with Direct Sequence Spread Spectrum (DSSS) modulation for superior performance. It is a perfect complement to the Brand Series 21, Series 36 and Series 38 stackable directional control valves. Other control valves or solenoids meeting the appropriate specifications may be controlled as well.

SAFETY:

Our V Series radio remote transmitters are built with high quality long life components that are designed for use in harsh environments. We use the latest wireless and microprocessor technology including a 32-bit ARM-Core microprocessor to give these small controls some serious digital muscle. Our unique network design allows for operation of multiple units in the same location without interfering with each other. The transmitter includes a built in automatic timeout monitor to prevent unnecessary battery drain.

RELIABILITY:

All Brand Hydraulics Co. products are backed by lifetime technical support from the engineers at the Brand Hydraulics Co. manufacturing facility. Our electrical engineers are ready to assist you before and after the sale with technical support. Brand Hydraulics Co. products are backed by a 2 year Limited Warranty Policy. Please visit our website at **www.brand-hyd.com** for more information.

COMMON MODEL CODES:

V0100020000 .....V100 Series, 2 – Function Radio Remote
V0100020001.....V100 Series, 2 – Function Radio Remote w/ Lanyard Loop & Lanyard

MATING BRAND HYDRAULICS RECEIVERS:

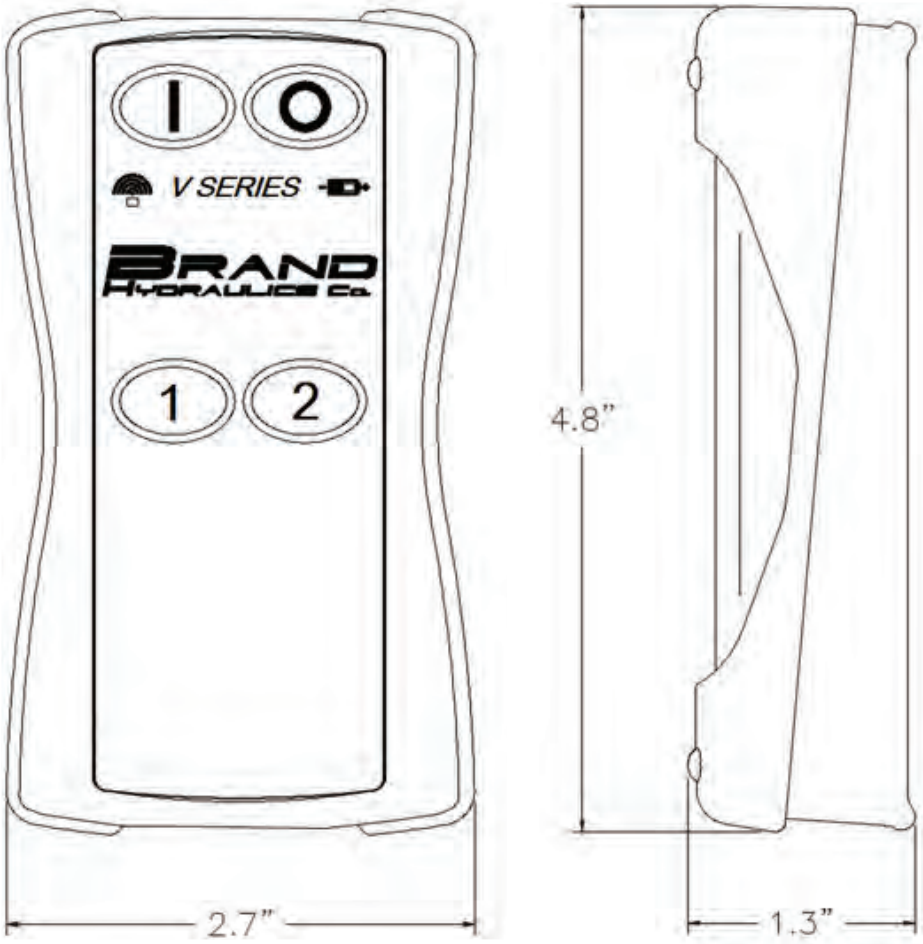
- RP01000001 (4 Digital Outputs)
- RP01000004 (3 Digital Outputs + 1 Master Digital Output)

V Series

SPECIFICATIONS:

Function Keys	2
Function Key Style	Momentary (one button at a time)
Power Keys	(2) – ON and OFF
Button Life	5,000,000 operations, typical
Response Time	50 ms
Power Source	(1) – 3V CR2450 Lithium Coil Cell, User replaceable
Battery Life	2.0 Years (estimate based on 20, 10 second operations each day. Actual life may vary based on battery, use and temperature)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-30°C - 60°C (-22°F - 140°F)
Storage Temperature	-30°C - 60°C (-22°F - 140°F)
Ingress Protection	IP65
Frequency	2.4 – 2.483 GHz
Modulation	DSSS
Weight, Approximate	4.13 oz with battery installed
Enclosure Material	ABS, Acrylonitrile butadiene styrene
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

V100 DIMENSIONS:



OPTIONAL REPLACEMENT PARTS AND ACCESSORIES:

E2304 – Replacement Enclosure screws (4 per transmitter)
E2360 – Seal Skirt, Yellow for V100
E2832 – Replacement Lanyard

Contact your local Brand Hydraulics distributor for pricing

*Some options and custom changes may require minimum quantities.

It is the purchaser's responsibility to determine the suitability of any Brand Hydraulics product for an intended application, and to insure that it is installed in accordance with all federal, state, local, private safety, health regulations, and codes and standards. Due to the unlimited variety of machines, vehicles, and equipment on which our products can be used, it is impossible for Brand Hydraulics to offer expert advice on the suitability of a product for a specific application. We believe that it is our customer's responsibility to undertake the appropriate testing and evaluation to prevent injury to the end user.

All product, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.

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V Series

Radio Remote Control Transmitter / V100 / V0100040000 / 4 Functions

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited laboratory
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to use control
- Conformal coated circuit board
- 500 ft. range line of sight
- LED diagnostic indicators
- Wireless pairing function
- Powered by a single lithium coin cell battery
- Long battery life
- Ergonomically shaped to fit the hand
- Yellow impact protective boot seal
- No perceivable delay between transmitter and receiver
- Detachable neck lanyard
- Factory configurable for custom applications*
- Custom membrane keypads*
- Other impact protective boot seal colors available*

APPLICATON:

The V Series radio remote control is used to control the ON/OFF functions of hydraulic valves for motors and cylinders from a remote location. This unit can also control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

The conformal coated V Series are ergonomic, durable, sealed and easy to use radio remote transmitters. All exposed components on the transmitter are made from non corrosive materials. This transmitter is designed with Direct Sequence Spread Spectrum (DSSS) modulation for superior performance. It is a perfect complement to the Brand Series 21, Series 36 and Series 38 stackable directional control valves. Other control valves or solenoids meeting the appropriate specifications may be controlled as well.

SAFETY:

Our V Series radio remote transmitters are built with high quality long life components that are designed for use in harsh environments. We use the latest wireless and microprocessor technology including a 32-bit ARM-Core microprocessor to give these small controls some serious digital muscle. Our unique network design allows for operation of multiple units in the same location without interfering with each other. The transmitter includes a built in automatic timeout monitor to prevent unnecessary battery drain.

RELIABILITY:

All Brand Hydraulics Co. products are backed by lifetime technical support from the engineers at the Brand Hydraulics Co. manufacturing facility. Our electrical engineers are ready to assist you before and after the sale with technical support. Brand Hydraulics Co. products are backed by a 2 year Limited Warranty Policy. Please visit our website at **www.brand-hyd.com** for more information.

COMMON MODEL CODES:

V0100040000 .....V100 Series, 4 – Function Radio Remote
V0100040001.....V100 Series, 4 – Function Radio Remote w/ Lanyard Loop & Lanyard

MATING BRAND HYDRAULICS RECEIVERS:

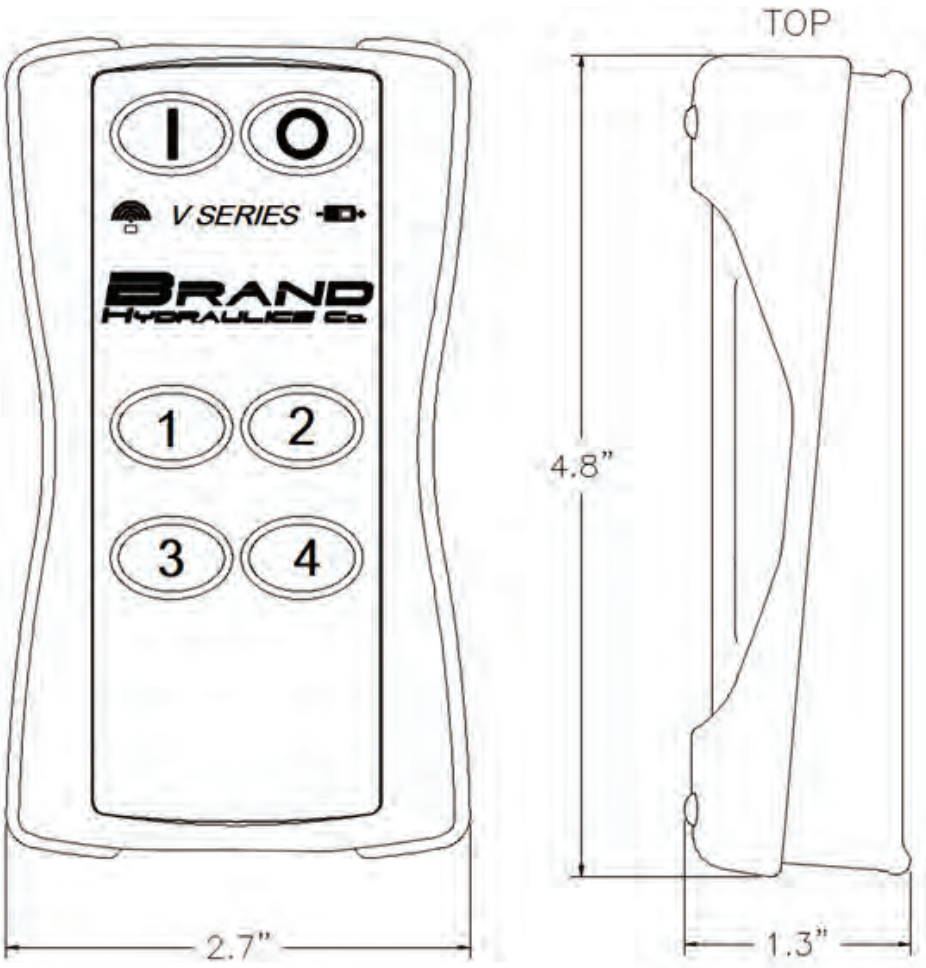
- RP01000001 (4 Digital Outputs)
- RP01000004 (3 Digital Outputs + 1 Master Digital Output)

V Series

SPECIFICATIONS:

Function Keys	4
Function Key Style	Momentary (one button at a time)
Power Keys	(2) – ON and OFF
Button Life	5,000,000 operations, typical
Response Time	50 ms
Power Source	(1) – 3V CR2450 Lithium Coil Cell, User replaceable
Battery Life	2.0 Years (estimate based on 20, 10 second operations each day. Actual life may vary based on battery, use and temperature)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-30°C - 60°C (-22°F - 140°F)
Storage Temperature	-30°C - 60°C (-22°F - 140°F)
Ingress Protection	IP65
Frequency	2.4 – 2.483 GHz
Modulation	DSSS
Weight, Approximate	4.13 oz with battery installed
Enclosure Material	ABS, Acrylonitrile butadiene styrene
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

V100 DIMENSIONS:



OPTIONAL REPLACEMENT PARTS AND ACCESSORIES:

E2304 – Replacement Enclosure screws (4 per transmitter)
E2360 – Seal Skirt, Yellow for V100
E2832 – Replacement Lanyard

Contact your local Brand Hydraulics distributor for pricing

*Some options and custom changes may require minimum quantities.

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BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

V Series

Radio Remote Control Transmitter
Model: V100 / V0100060000 / 6 Functions

2.4GHZ
Extended Range

Sealed To
IP65

32-bit
Microprocessor

RoHS COMPLIANT

FEDERAL COMMUNICATIONS COMMISSION · USA · FC

CE

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

V Series

Radio Remote Control Transmitter / V100 / V0100060000 / 6 Functions

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited laboratory
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to use control
- Conformal coated circuit board
- 500 ft. range line of sight
- LED diagnostic indicators
- Wireless pairing function
- Powered by a single lithium coin cell battery
- Long battery life
- Ergonomically shaped to fit the hand
- Yellow impact protective boot seal
- No perceivable delay between transmitter and receiver
- Detachable neck lanyard
- Factory configurable for custom applications*
- Custom membrane keypads*
- Other impact protective boot seal colors available*

APPLICATON:

The V Series radio remote control is used to control the ON/OFF functions of hydraulic valves for motors and cylinders from a remote location. This unit can also control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

The conformal coated V Series are ergonomic, durable, sealed and easy to use radio remote transmitters. All exposed components on the transmitter are made from non corrosive materials. This transmitter is designed with Direct Sequence Spread Spectrum (DSSS) modulation for superior performance. It is a perfect complement to the Brand Series 21, Series 36 and Series 38 stackable directional control valves. Other control valves or solenoids meeting the appropriate specifications may be controlled as well.

SAFETY:

Our V Series radio remote transmitters are built with high quality long life components that are designed for use in harsh environments. We use the latest wireless and microprocessor technology including a 32-bit ARM-Core microprocessor to give these small controls some serious digital muscle. Our unique network design allows for operation of multiple units in the same location without interfering with each other. The transmitter includes a built in automatic timeout monitor to prevent unnecessary battery drain.

RELIABILITY:

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COMMON MODEL CODES:

V0100060000 .....V100 Series, 6 – Function Radio Remote
V0100060001.....V100 Series, 6 – Function Radio Remote w/ Lanyard Loop & Lanyard

MATING BRAND HYDRAULICS RECEIVERS:

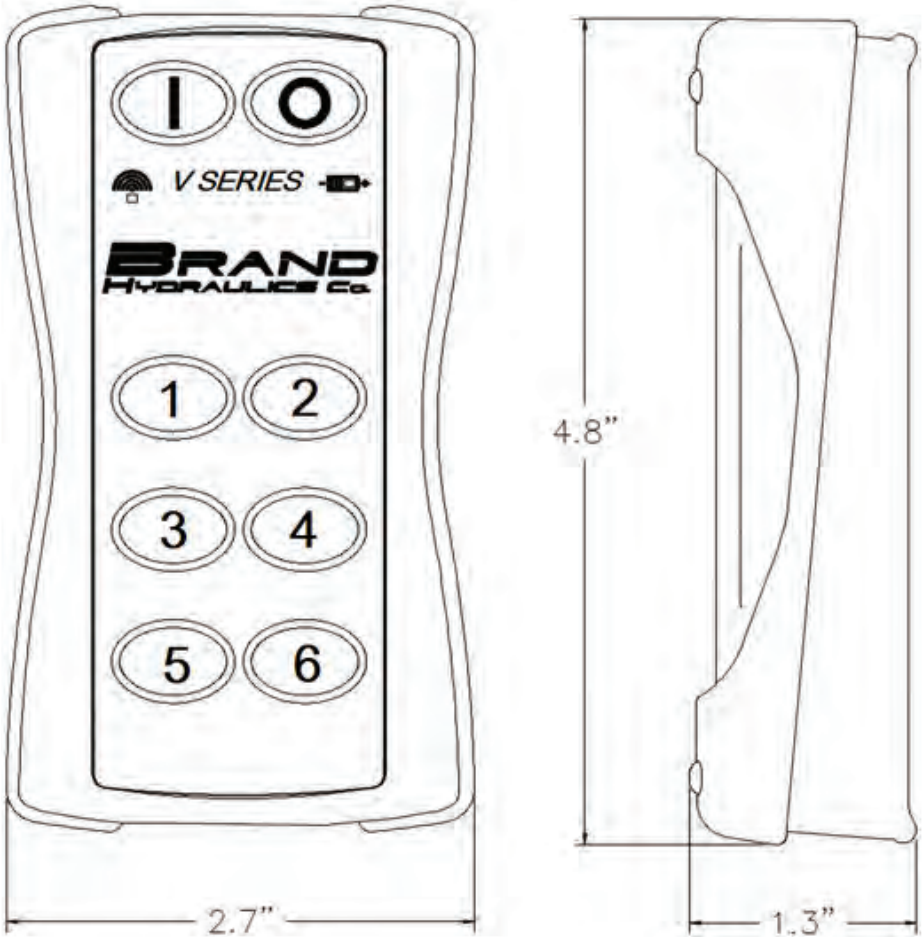
- RP01000002 (10 Digital Outputs)
- RP01000005 (9 Digital Outputs + 1 Master Digital Output)

V Series

SPECIFICATIONS:

Function Keys	6
Function Key Style	Momentary (one button at a time)
Power Keys	(2) – ON and OFF
Button Life	5,000,000 operations, typical
Response Time	50 ms
Power Source	(1) – 3V CR2450 Lithium Coil Cell, User replaceable
Battery Life	2.0 Years (estimate based on 20, 10 second operations each day. Actual life may vary based on battery, use and temperature)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-30°C - 60°C (-22°F - 140°F)
Storage Temperature	-30°C - 60°C (-22°F - 140°F)
Ingress Protection	IP65
Frequency	2.4 – 2.483 GHz
Modulation	DSSS
Weight, Approximate	4.13 oz with battery installed
Enclosure Material	ABS, Acrylonitrile butadiene styrene
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

V100 DIMENSIONS:



OPTIONAL REPLACEMENT PARTS AND ACCESSORIES:

E2304 – Replacement Enclosure screws (4 per transmitter)
E2360 – Seal Skirt, Yellow for V100
E2832 – Replacement Lanyard

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BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

V Series

Radio Remote Control Transmitter
Model: V100 / V0100080000 / 8 Functions

2.4GHZ
Extended Range

Sealed To
IP65

32-bit
Microprocessor

RoHS COMPLIANT

FEDERAL COMMUNICATIONS COMMISSION · USA ·

CE

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

V Series

Radio Remote Control Transmitter / V100 / V0100080000 / 8 Functions

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited laboratory
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to use control
- Conformal coated circuit board
- 500 ft. range line of sight
- LED diagnostic indicators
- Wireless pairing function
- Powered by a single lithium coin cell battery
- Long battery life
- Ergonomically shaped to fit the hand
- Yellow impact protective boot seal
- No perceivable delay between transmitter and receiver
- Detachable neck lanyard
- Factory configurable for custom applications*
- Custom membrane keypads*
- Other impact protective boot seal colors available*

APPLICATON:

The V Series radio remote control is used to control the ON/OFF functions of hydraulic valves for motors and cylinders from a remote location. This unit can also control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

The conformal coated V Series are ergonomic, durable, sealed and easy to use radio remote transmitters. All exposed components on the transmitter are made from non corrosive materials. This transmitter is designed with Direct Sequence Spread Spectrum (DSSS) modulation for superior performance. It is a perfect complement to the Brand Series 21, Series 36 and Series 38 stackable directional control valves. Other control valves or solenoids meeting the appropriate specifications may be controlled as well.

SAFETY:

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RELIABILITY:

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COMMON MODEL CODES:

V0100080000 ……...V100 Series, 8 – Function Radio Remote
V0100080001……V100 Series, 8 – Function Radio Remote w/ Lanyard Loop & Lanyard

MATING BRAND HYDRAULICS RECEIVERS:

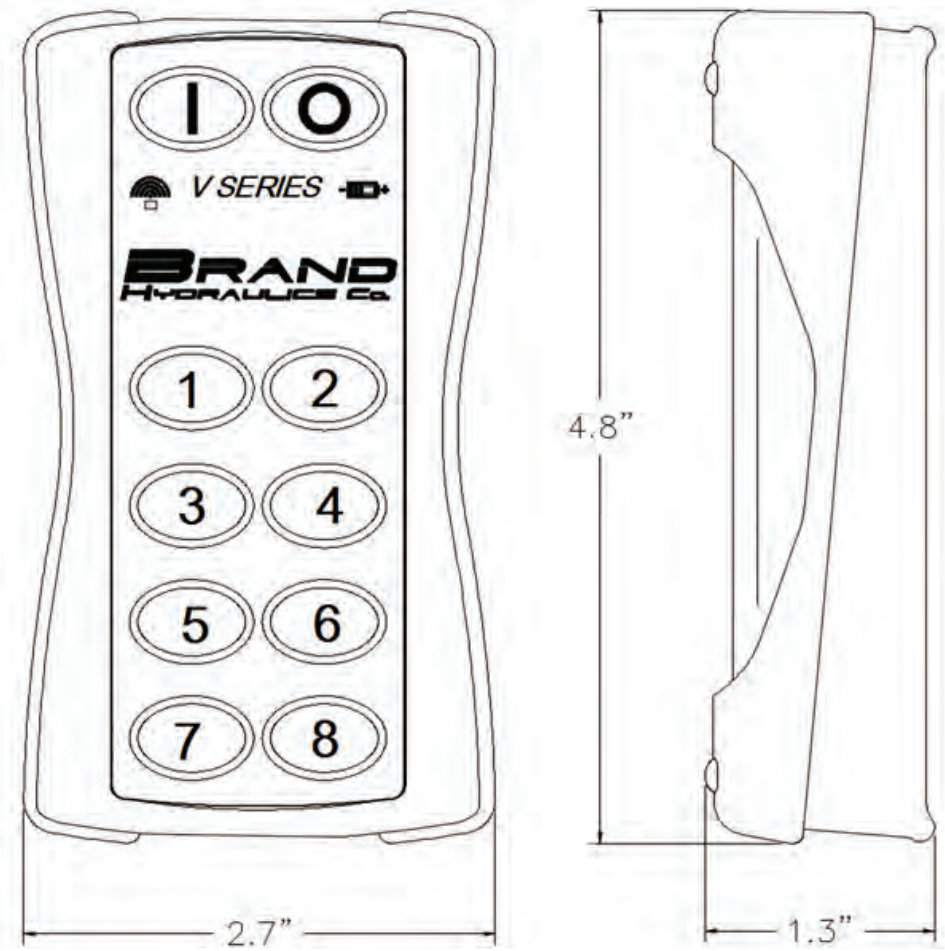
- RP01000002 (10 Digital Outputs)
- RP01000005 (9 Digital Outputs + 1 Master Digital Output)

V Series

SPECIFICATIONS:

Function Keys	8
Function Key Style	Momentary (one button at a time)
Power Keys	(2) – ON and OFF
Button Life	5,000,000 operations, typical
Response Time	50 ms
Power Source	(1) – 3V CR2450 Lithium Coil Cell, User replaceable
Battery Life	2.0 Years (estimate based on 20, 10 second operations each day. Actual life may vary based on battery, use and temperature)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-30°C - 60°C (-22°F - 140°F)
Storage Temperature	-30°C - 60°C (-22°F - 140°F)
Ingress Protection	IP65
Frequency	2.4 – 2.483 GHz
Modulation	DSSS
Weight, Approximate	4.13 oz with battery installed
Enclosure Material	ABS, Acrylonitrile butadiene styrene
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

V100 DIMENSIONS:



OPTIONAL REPLACEMENT PARTS AND ACCESSORIES:

E2304 – Replacement Enclosure screws (4 per transmitter)
E2360 – Seal Skirt, Yellow for V100
E2832 – Replacement Lanyard

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BRAND HYDRAULICS Co.

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Engineering & Manufacturing Solutions

V Series

Radio Remote Control Transmitter
Model: V200 / V0200100000 / 10 Functions

2.4GHZ
Extended Range

Sealed To
IP65

32-bit
Microprocessor

RoHS COMPLIANT

FEDERAL COMMUNICATIONS COMMISSION · USA ·

CE

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

V Series

Radio Remote Control Transmitter / V200 / V0100100000 / 10 Functions

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited laboratory
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to use control
- Conformal coated circuit board
- 500 ft. range line of sight
- LED diagnostic indicators
- Wireless pairing function
- Powered by a single lithium coin cell battery
- Long battery life
- Ergonomically shaped to fit the hand
- Yellow impact protective boot seal
- No perceivable delay between transmitter and receiver
- Detachable neck lanyard
- Factory configurable for custom applications*
- Custom membrane keypads*
- Other impact protective boot seal colors available*

APPLICATON:

The V Series radio remote control is used to control the ON/OFF functions of hydraulic valves for motors and cylinders from a remote location. This unit can also control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

The conformal coated V Series are ergonomic, durable, sealed and easy to use radio remote transmitters. All exposed components on the transmitter are made from non corrosive materials. This transmitter is designed with Direct Sequence Spread Spectrum (DSSS) modulation for superior performance. It is a perfect complement to the Brand Series 21, Series 36 and Series 38 stackable directional control valves. Other control valves or solenoids meeting the appropriate specifications may be controlled as well.

SAFETY:

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RELIABILITY:

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COMMON MODEL CODES:

V0200100000 .....V200 Series, 10 – Function Radio Remote
V0200100001.....V200 Series, 10 – Function Radio Remote w/ Lanyard Loop & Lanyard

MATING BRAND HYDRAULICS RECEIVERS:

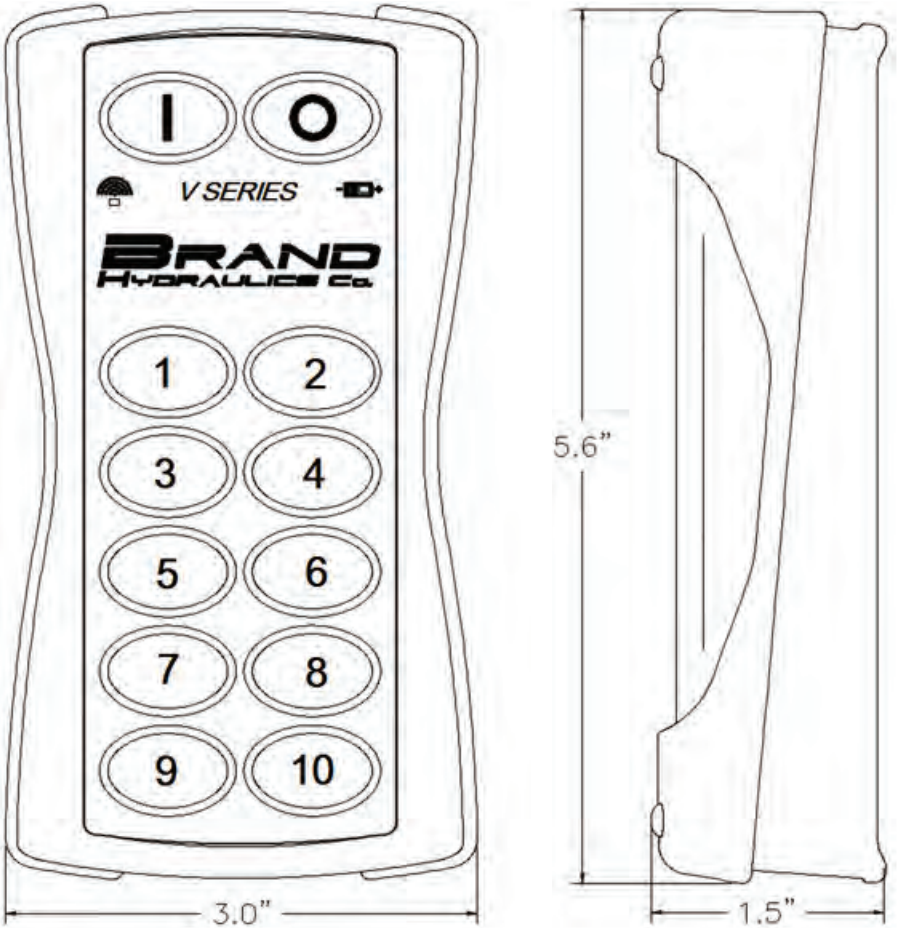
- RP01000002 (10 Digital Outputs)
- RP01000005 (9 Digital Outputs + 1 Master Digital Output)

V Series

SPECIFICATIONS:

Function Keys	10
Function Key Style	Momentary (one button at a time)
Power Keys	(2) – ON and OFF
Button Life	5,000,000 operations, typical
Response Time	50 ms
Power Source	(1) – 3V CR2450 Lithium Coil Cell, User replaceable
Battery Life	2.0 Years (estimate based on 20, 10 second operations each day. Actual life may vary based on battery, use and temperature)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-30°C - 60°C (-22°F - 140°F)
Storage Temperature	-30°C - 60°C (-22°F - 140°F)
Ingress Protection	IP65
Frequency	2.4 – 2.483 GHz
Modulation	DSSS
Weight, Approximate	5.67 oz with battery installed
Enclosure Material	ABS, Acrylonitrile butadiene styrene
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

V200 DIMENSIONS:



OPTIONAL REPLACEMENT PARTS AND ACCESSORIES:

E2304 – Replacement Enclosure screws (4 per transmitter)
E2360 – Seal Skirt, Yellow for V200
E2832 – Replacement Lanyard

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BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

V Series

Radio Remote Control Transmitter
Model: V300 / V0300120000 / 12 Functions

2.4GHZ
Extended Range

Sealed To
IP65

32-bit
Microprocessor

RoHS COMPLIANT

FEDERAL COMMUNICATIONS COMMISSION · USA ·

CE

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

V Series

Radio Remote Control Transmitter / V300 / V0300120000 / 12 Functions

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited laboratory
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to use control
- Conformal coated circuit board
- 500 ft. range line of sight
- LED diagnostic indicators
- Wireless pairing function
- Powered by a single lithium coin cell battery
- Long battery life
- Ergonomically shaped to fit the hand
- Yellow impact protective boot seal
- No perceivable delay between transmitter and receiver
- Detachable neck lanyard
- Factory configurable for custom applications*
- Custom membrane keypads*
- Other impact protective boot seal colors available*

APPLICATON:

The V Series radio remote control is used to control the ON/OFF functions of hydraulic valves for motors and cylinders from a remote location. This unit can also control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

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SAFETY:

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COMMON MODEL CODES:

V0300120000 .....V300 Series, 12 – Function Radio Remote
V0300120001.....V300 Series, 12 – Function Radio Remote w/ Lanyard Loop & Lanyard

MATING BRAND HYDRAULICS RECEIVERS:

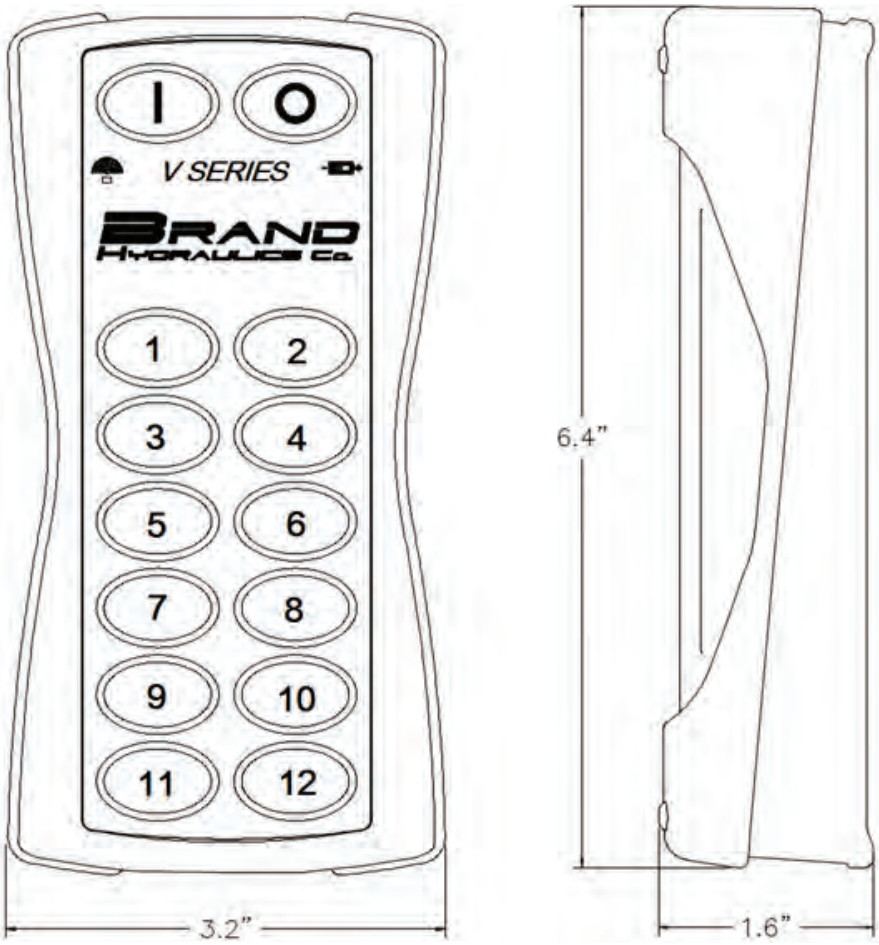
- RP01000003 (16 Digital Outputs)
- RP01000006 (15 Digital Outputs + 1 Master Digital Output)

V Series

SPECIFICATIONS:

Function Keys	12
Function Key Style	Momentary (one button at a time)
Power Keys	(2) – ON and OFF
Button Life	5,000,000 operations, typical
Response Time	50 ms
Power Source	(1) – 3V CR2450 Lithium Coil Cell, User replaceable
Battery Life	2.0 Years (estimate based on 20, 10 second operations each day. Actual life may vary based on battery, use and temperature)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-30°C - 60°C (-22°F - 140°F)
Storage Temperature	-30°C - 60°C (-22°F - 140°F)
Ingress Protection	IP65
Frequency	2.4 – 2.483 GHz
Modulation	DSSS
Weight, Approximate	6.50 oz with battery installed
Enclosure Material	ABS, Acrylonitrile butadiene styrene
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

V300 DIMENSIONS:



OPTIONAL REPLACEMENT PARTS AND ACCESSORIES:

E2304 – Replacement Enclosure screws (4 per transmitter)
E2360 – Seal Skirt, Yellow for V300
E2832 – Replacement Lanyard

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BRAND HYDRAULICS CO.

Made in the Heartland of America Serving the World

Engineering & Manufacturing Solutions

V Series

Radio Remote Control Transmitter
Model: V400 / V0400140000 / 14 Functions

2.4GHZ
Extended Range

Sealed To
IP65

32-bit
Microprocessor

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

V Series

Radio Remote Control Transmitter / V400 / V0400140000 / 14 Functions

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited laboratory
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to use control
- Conformal coated circuit board
- 500 ft. range line of sight
- LED diagnostic indicators
- Wireless pairing function
- Powered by a single lithium coin cell battery
- Long battery life
- Ergonomically shaped to fit the hand
- Yellow impact protective boot seal
- No perceivable delay between transmitter and receiver
- Detachable neck lanyard
- Factory configurable for custom applications*
- Custom membrane keypads*
- Other impact protective boot seal colors available*

APPLICATON:

The V Series radio remote control is used to control the ON/OFF functions of hydraulic valves for motors and cylinders from a remote location. This unit can also control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

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Our V Series radio remote transmitters are built with high quality long life components that are designed for use in harsh environments. We use the latest wireless and microprocessor technology including a 32-bit ARM-Core microprocessor to give these small controls some serious digital muscle. Our unique network design allows for operation of multiple units in the same location without interfering with each other. The transmitter includes a built in automatic timeout monitor to prevent unnecessary battery drain.

RELIABILITY:

All Brand Hydraulics Co. products are backed by lifetime technical support from the engineers at the Brand Hydraulics Co. manufacturing facility. Our electrical engineers are ready to assist you before and after the sale with technical support. Brand Hydraulics Co. products are backed by a 2 year Limited Warranty Policy. Please visit our website at **www.brand-hyd.com** for more information.

COMMON MODEL CODES:

V0400140000 ……...V400 Series, 14 – Function Radio Remote
V0400140001……V400 Series, 14 – Function Radio Remote w/ Lanyard Loop & Lanyard

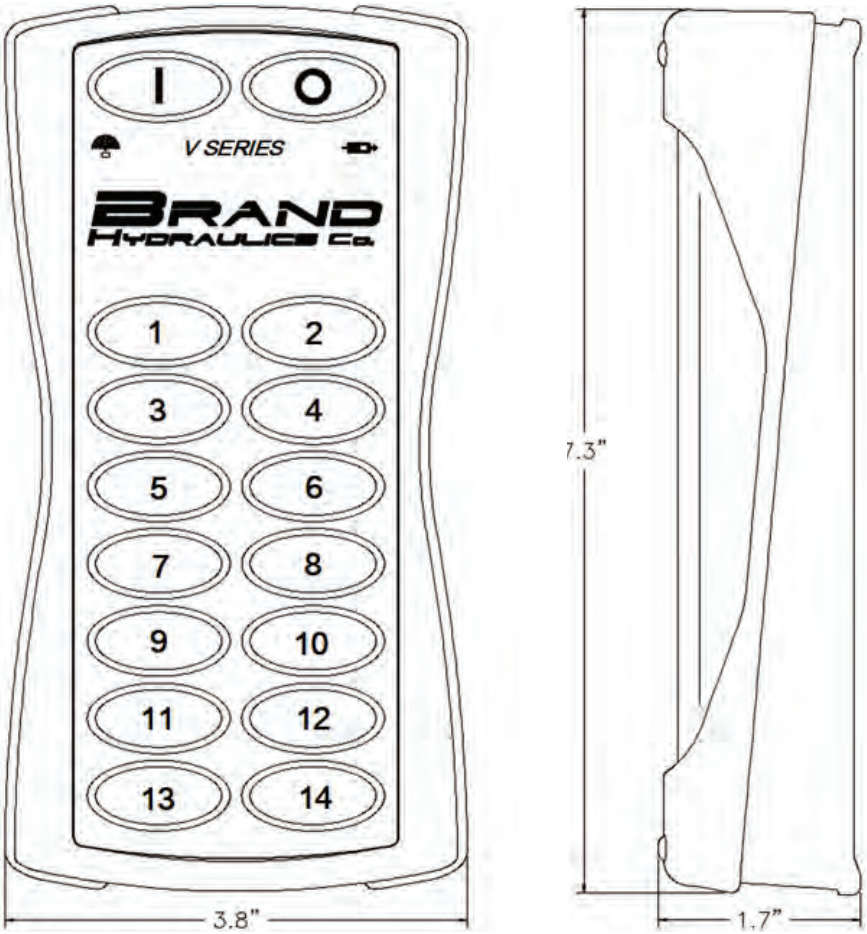
MATING BRAND HYDRAULICS RECEIVERS:

- RP01000003 (16 Digital Outputs)
- RP01000006 (15 Digital Outputs + 1 Master Digital Output)

SPECIFICATIONS:

Function Keys	14
Function Key Style	Momentary (one button at a time)
Power Keys	(2) – ON and OFF
Button Life	5,000,000 operations, typical
Response Time	50 ms
Power Source	(1) – 3V CR2450 Lithium Coil Cell, User replaceable
Battery Life	2.0 Years (estimate based on 20, 10 second operations each day. Actual life may vary based on battery, use and temperature)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-30°C - 60°C (-22°F - 140°F)
Storage Temperature	-30°C - 60°C (-22°F - 140°F)
Ingress Protection	IP65
Frequency	2.4 – 2.483 GHz
Modulation	DSSS
Weight, Approximate	9.02 oz with battery installed
Enclosure Material	ABS, Acrylonitrile butadiene styrene
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

V400 DIMENSIONS:



OPTIONAL REPLACEMENT PARTS AND ACCESSORIES:

E2304 – Replacement Enclosure screws (4 per transmitter)
E2360 – Seal Skirt, Yellow for V400
E2832 – Replacement Lanyard

Contact your local Brand Hydraulics distributor for pricing

*Some options and custom changes may require minimum quantities.

It is the purchaser's responsibility to determine the suitability of any Brand Hydraulics product for an intended application, and to insure that it is installed in accordance with all federal, state, local, private safety, health regulations, and codes and standards. Due to the unlimited variety of machines, vehicles, and equipment on which our products can be used, it is impossible for Brand Hydraulics to offer expert advice on the suitability of a product for a specific application. We believe that it is our customer's responsibility to undertake the appropriate testing and evaluation to prevent injury to the end user.

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BRAND HYDRAULICS Co.

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Serving the World

Engineering & Manufacturing Solutions

V Series

Radio Remote Control Transmitter
Model: V500 / V0500160000 / 16 Functions

2.4GHZ
Extended Range

Sealed To
IP65

32-bit
Microprocessor

RoHS COMPLIANT

FEDERAL COMMUNICATIONS COMMISSION · USA ·

CE

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

V Series

Radio Remote Control Transmitter / V500 / V0500160000 / 16 Functions

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited laboratory
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to use control
- Conformal coated circuit board
- 500 ft. range line of sight
- LED diagnostic indicators
- Wireless pairing function
- Powered by a single lithium coin cell battery
- Long battery life
- Ergonomically shaped to fit the hand
- Yellow impact protective boot seal
- No perceivable delay between transmitter and receiver
- Detachable neck lanyard
- Factory configurable for custom applications*
- Custom membrane keypads*
- Other impact protective boot seal colors available*

APPLICATON:

The V Series radio remote control is used to control the ON/OFF functions of hydraulic valves for motors and cylinders from a remote location. This unit can also control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

The conformal coated V Series are ergonomic, durable, sealed and easy to use radio remote transmitters. All exposed components on the transmitter are made from non corrosive materials. This transmitter is designed with Direct Sequence Spread Spectrum (DSSS) modulation for superior performance. It is a perfect complement to the Brand Series 21, Series 36 and Series 38 stackable directional control valves. Other control valves or solenoids meeting the appropriate specifications may be controlled as well.

SAFETY:

Our V Series radio remote transmitters are built with high quality long life components that are designed for use in harsh environments. We use the latest wireless and microprocessor technology including a 32-bit ARM-Core microprocessor to give these small controls some serious digital muscle. Our unique network design allows for operation of multiple units in the same location without interfering with each other. The transmitter includes a built in automatic timeout monitor to prevent unnecessary battery drain.

RELIABILITY:

All Brand Hydraulics Co. products are backed by lifetime technical support from the engineers at the Brand Hydraulics Co. manufacturing facility. Our electrical engineers are ready to assist you before and after the sale with technical support. Brand Hydraulics Co. products are backed by a 2 year Limited Warranty Policy. Please visit our website at **www.brand-hyd.com** for more information.

COMMON MODEL CODES:

V0500160000 .....V500 Series, 16 – Function Radio Remote
V0500160001.....V500 Series, 16 – Function Radio Remote w/ Lanyard Loop & Lanyard

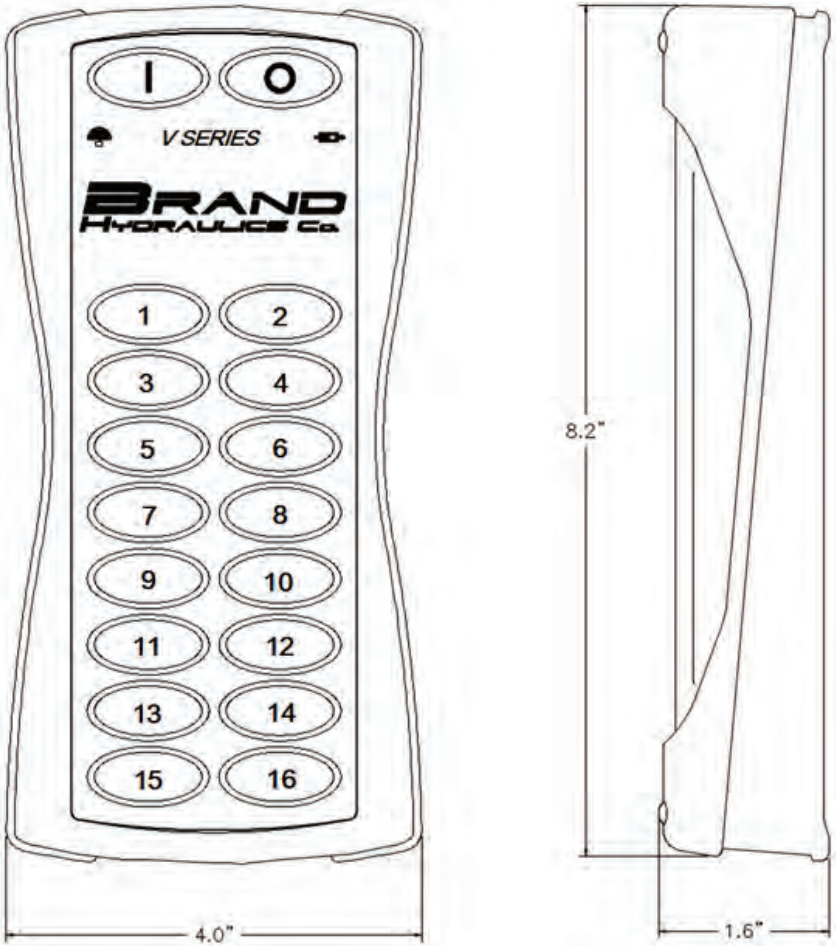
MATING BRAND HYDRAULICS RECEIVERS:

- RP01000003 (16 Digital Outputs)
- RP01000006 (15 Digital Outputs + 1 Master Digital Output)

SPECIFICATIONS:

Function Keys	16
Function Key Style	Momentary (one button at a time)
Power Keys	(2) – ON and OFF
Button Life	5,000,000 operations, typical
Response Time	50 ms
Power Source	(1) – 3V CR2450 Lithium Coil Cell, User replaceable
Battery Life	2.0 Years (estimate based on 20, 10 second operations each day. Actual life may vary based on battery, use and temperature)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-30°C - 60°C (-22°F - 140°F)
Storage Temperature	-30°C - 60°C (-22°F - 140°F)
Ingress Protection	IP65
Frequency	2.4 – 2.483 GHz
Modulation	DSSS
Weight, Approximate	10.02 oz with battery installed
Enclosure Material	ABS, Acrylonitrile butadiene styrene
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

V500 DIMENSIONS:



OPTIONAL REPLACEMENT PARTS AND ACCESSORIES:

E2304 – Replacement Enclosure screws (4 per transmitter)
E2360 – Seal Skirt, Yellow for V500
E2832 – Replacement Lanyard

Contact your local Brand Hydraulics distributor for pricing

*Some options and custom changes may require minimum quantities.

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BRAND HYDRAULICS Co.

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Engineering & Manufacturing Solutions

RP100 Series

Radio Receiver

Model: RP100 / RP01000001 / 4 Digital Output

2.4GHZ
Extended Range

Sealed To
IP67

32-bit
Microprocessor

FEDERAL COMMUNICATIONS COMMISSION · USA · FC

CE

RoHS COMPLIANT

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

RP Series

Radio Receiver / RP100 / RP0100001 / 4 Digital Outputs

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited independent laboratory
- RoHS Complaint
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to install
- Encapsulated waterproof control package
- 500 ft. range line of sight
- LED diagnostic indicators
- Reverse polarity protection
- Wireless pairing function
- Loss of signal timeout
- Universal for 12VDC or 24VDC systems
- No perceivable delay between transmitter and receiver
- Multiple system may operate within the same area in close proximity without interfering with each other
- Optional factory master output configuration
- Factory configurable for custom applications*
- Factory custom wire/cable harnesses available*

APPLICATON:

The RP Series radio receiver is used to control the ON/OFF functions of hydraulic valves for cylinders and motors from a remote location. This series can also be used to control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

The fully encapsulated RP Series are compact, durable, sealed and easy to install radio receivers. All exposed components on the receiver are made from non corrosive materials. This receiver is designed with Direct Sequence Spread Spectrum (DSSS) modulation for superior performance. It is a perfect complement to the Brand Series 21, Series 36 and Series 38 stackable directional control valves. Other control valves or solenoids meeting the appropriate specifications may be controlled as well.

SAFETY:

Our RP Series radio receivers are built with high quality long life components that are designed for use in harsh environments. We use the latest wireless and microprocessor technology including a 32-bit ARM-Core microprocessor to give these small controls some serious digital muscle. Our unique network design allows for operation of multiple units in the same location without interfering with each other. Safety and protection features:

- Watchdog monitor
- Over-current protection
- Short circuit protection
- Loss of signal timeout
- Reverse polarity protection
- Load dump protection
- Back EMF protection on all outputs
- Back-feed protected outputs

RELIABILITY:

All Brand Hydraulics Co. products are backed by lifetime technical support from the engineers at the Brand Hydraulics Co. manufacturing facility. Our electrical engineers are ready to assist you before and after the sale with technical support. Brand Hydraulics Co. products are backed by a 2 year Limited Warranty Policy. Please visit our website at **www.brand-hyd.com** for more information.

MASTER OUTPUT OPERATION:

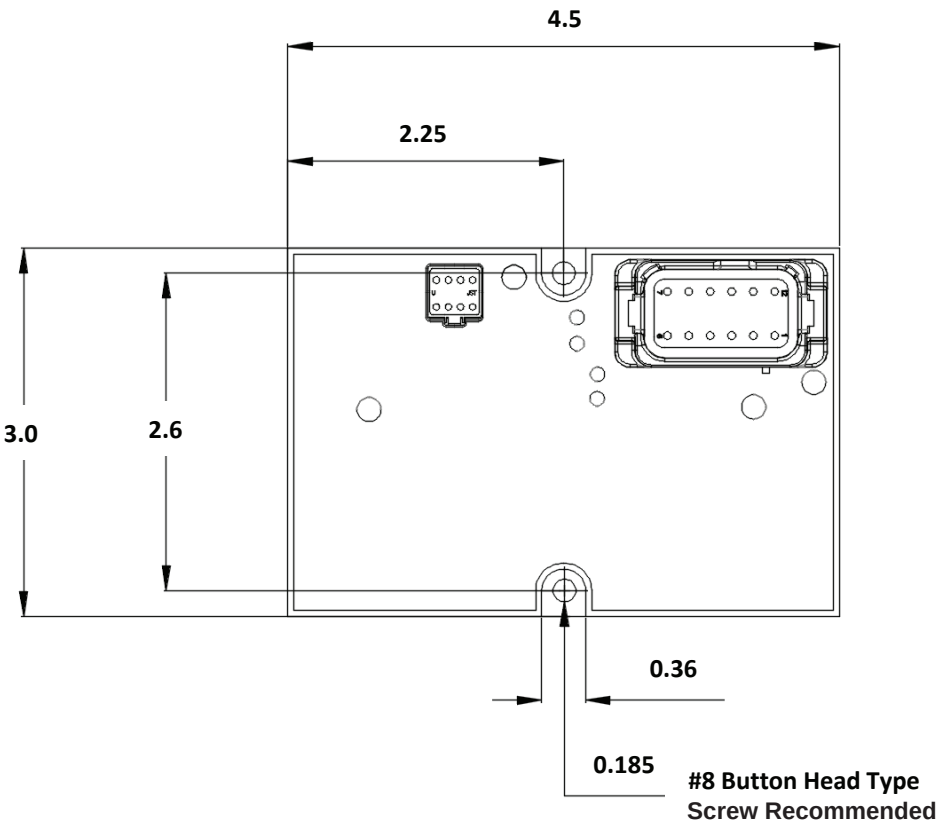
Part number RP01000004 (3 Digital Outputs + 1 Master Digital Output) is factory programmed for master output on OUTPUT #1. With this setup OUTPUT #1 will always go active when any transmitter function button is pressed. The #1 function button on the transmitter will control output #2 on the RP100 receiver. Ex. button #1 controls output #2, button #2 controls output #3 and so on. If you have a 4 function button transmitter being used with a 4 output RP01000004 the last function button, #4, will not have an associated output.

RP Series

SPECIFICATIONS:

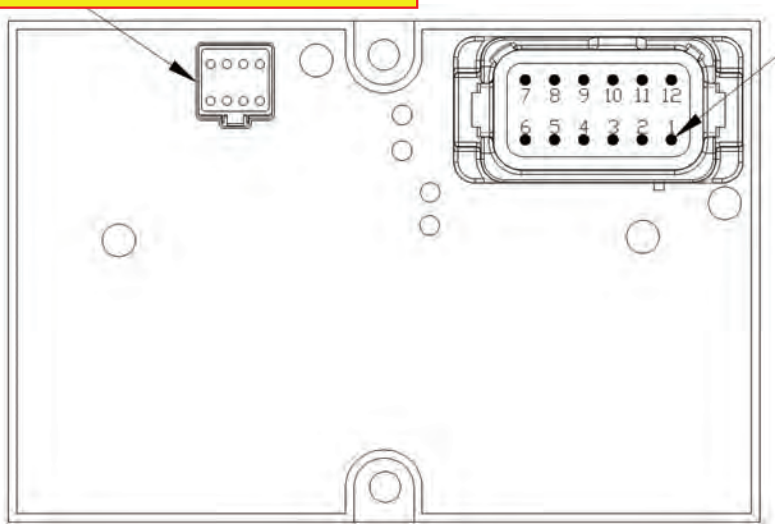
Digital Outputs	4 – (1 ON at a time) Consult factory for other options
Back EMF Protection	Yes
Output Switching Type	Automotive Grade, High side switch
Output current per output	3 Amps
Total Maximum current	6 Amps
Short Circuit Protection Shutdown	10A
Supply Voltage, DC Only	8-30VDC
LED Indicators	Transmit, Reset, Power Good, Reverse Polarity, Output Active (one for each output)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-40°C - 85°C (-40°F - 185°F)
Storage Temperature	-40°C - 85°C (-40°F - 185°F)
Ingress Protection	IP67
Frequency	2.4 – 2.483 GHz
Modulation	DSSS (Direct Sequence Spread Spectrum)
Weight	9.5 oz, less any connector plug assemblies
Enclosure Material	Glass filled plastic
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

RP100 DIMENSIONS DETAILS:



RP100 CONNECTOR DETAILS:

For factory use only. Do NOT remove this plug or make connections at this location.

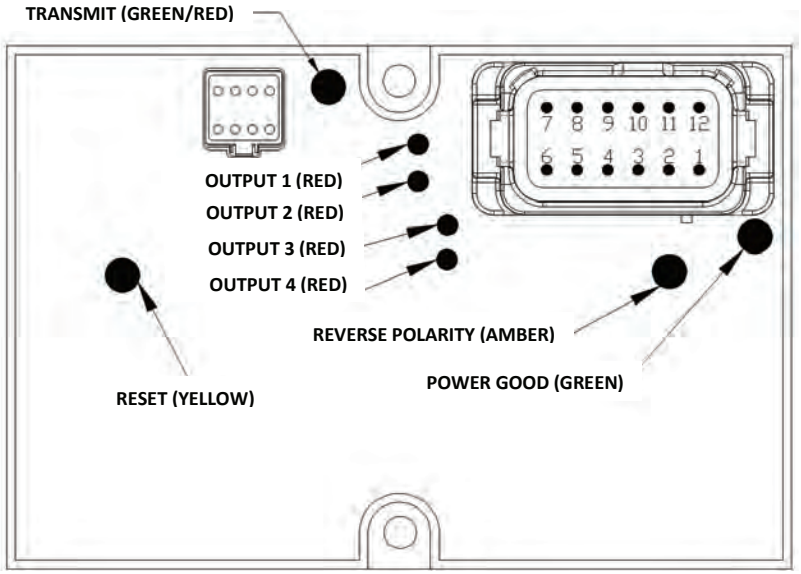


Receptacle - A
Deautsch DT Series
Keyed - A, Gray
P/N: DTF15-12PA

PIN 1 - Power Input
PIN 2 - NC
PIN 3 - Output 4
PIN 4 - Output 3
PIN 5 - Output 2
PIN 6 - Output 1
PIN 7 - Ground
PIN 8 - Ground
PIN 9 - Ground
PIN 10 - Ground
PIN 11 - Spare Ground
PIN 12 - System Ground

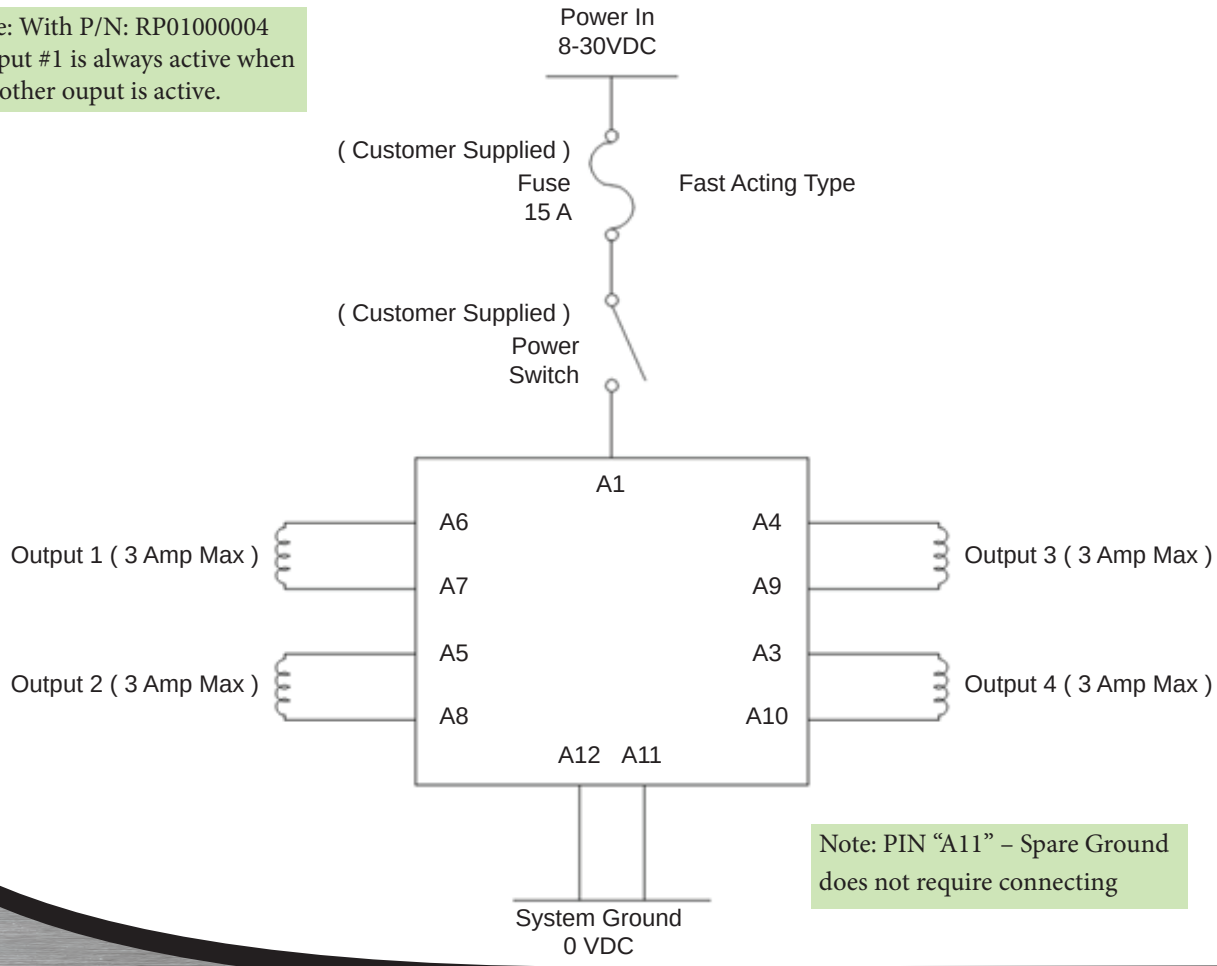
RP Series

RP100 DIAGNOSTIC INDICATORS:



TYPICAL SYSTEM CONFIGURATION:

Note: With P/N: RP01000004 Output #1 is always active when any other ouput is active.



Note: PIN "A11" – Spare Ground does not require connecting

COMMON MODEL CODES:

RP01000001 .....(4 Digital Outputs Digital Outputs)
RP01000004.....(3 Digital Outputs + 1 Master Digital Output)

MATING BRAND HYDRAULICS TRANSMITTER MODELS:

- **V100**
- **V200**
- **V300**
- **V400**
- **V500**

OPTIONAL PARTS:

E2368 – Deutsch 12-contact plug body, A-Key, Gray – Deutsch P/N: DT06-12SA
E2371 – Wedge lock for 12-contact plug, Orange – Deutsch P/N: W12S
E1827 – Terminal, socket, size 16 – Deutsch P/N: 0462-201-16141
E2024 – Sealing Plug, Locking, Size 16, White – Deutsch P/N: 0413-217-1605
E2401 – 8-Contact plug (For sealing receptacle on RP100 only)

OPTIONAL ACCESSORIES:

E2365 – Deutsch 12-contact flying lead connector assembly, A-Key, 12 – 12" leads

Brand Hydraulics can produce custom wire and cable harnesses
Contact your local Brand Hydraulics distributor for pricing

What is Included:

Quantity	Description
1	RP100 Series, 4 – Digital Output Radio Receiver

*Some options and custom changes may require minimum quantities.

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BRAND HYDRAULICS Co.

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Serving the World

Engineering & Manufacturing Solutions

RP100 Series

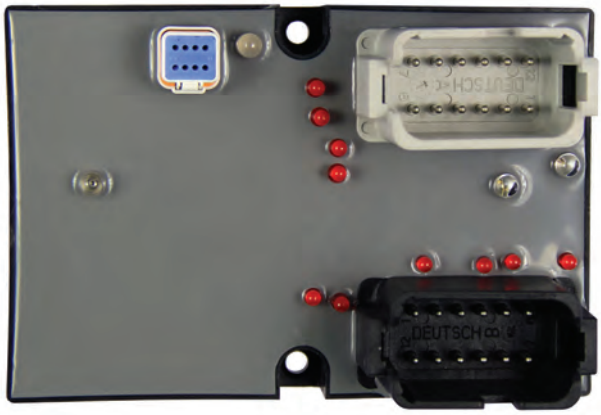
Radio Receiver

Model: RP100 / RP01000002 / 10 Digital Output

2.4GHZ
Extended Range

Sealed To
IP67

32-bit
Microprocessor



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CE

RoHS COMPLIANT

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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RP Series

Radio Receiver / RP100 / RP0100002 / 10 Digital Outputs

FEATURES:

- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited independent laboratory
- RoHS Complaint
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to install
- Encapsulated waterproof control package
- 500 ft. range line of sight
- LED diagnostic indicators
- Reverse polarity protection
- Wireless pairing function
- Loss of signal timeout
- Universal for 12VDC or 24VDC systems
- No perceivable delay between transmitter and receiver
- Multiple system may operate within the same area in close proximity without interfering with each other
- Optional factory master output configuration
- Factory configurable for custom applications*
- Factory custom wire/cable harnesses available*

APPLICATON:

The RP Series radio receiver is used to control the ON/OFF functions of hydraulic valves for cylinders and motors from a remote location. This series can also be used to control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

The fully encapsulated RP Series are compact, durable, sealed and easy to install radio receivers. All exposed components on the receiver are made from non corrosive materials. This receiver is designed with Direct Sequence Spread Spectrum (DSSS) modulation for superior performance. It is a perfect complement to the Brand Series 21, Series 36 and Series 38 stackable directional control valves. Other control valves or solenoids meeting the appropriate specifications may be controlled as well.

SAFETY:

Our RP Series radio receivers are built with high quality long life components that are designed for use in harsh environments. We use the latest wireless and microprocessor technology including a 32-bit ARM-Core microprocessor to give these small controls some serious digital muscle. Our unique network design allows for operation of multiple units in the same location without interfering with each other. Safety and protection features:

- Watchdog monitor
- Over-current protection
- Short circuit protection
- Loss of signal timeout
- Reverse polarity protection
- Load dump protection
- Back EMF protection on all outputs
- Back-feed protected outputs

RELIABILITY:

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MASTER OUTPUT OPERATION:

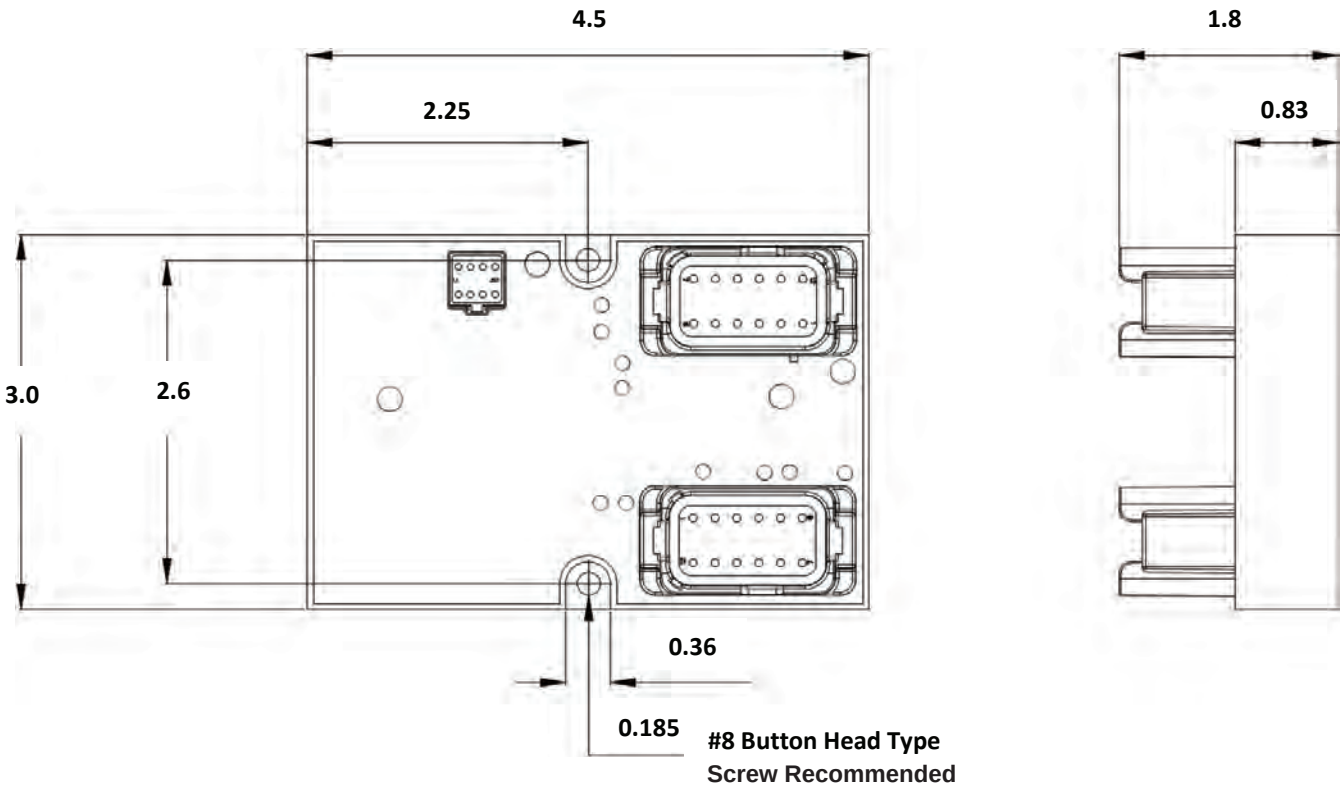
Part number RP01000005 (9 Digital Outputs + 1 Master Digital Output) is factory programmed for master output on OUTPUT #1. With this setup OUTPUT #1 will always go active when any transmitter function button is pressed. The #1 function button on the transmitter will control output #2 on the RP100 receiver. Ex. button #1 controls output #2, button #2 controls output #3 and so on. If you have a 10 function button transmitter being used with a 10 output RP01000005 the last function button, #10, will not have an associated output.

RP Series

SPECIFICATIONS:

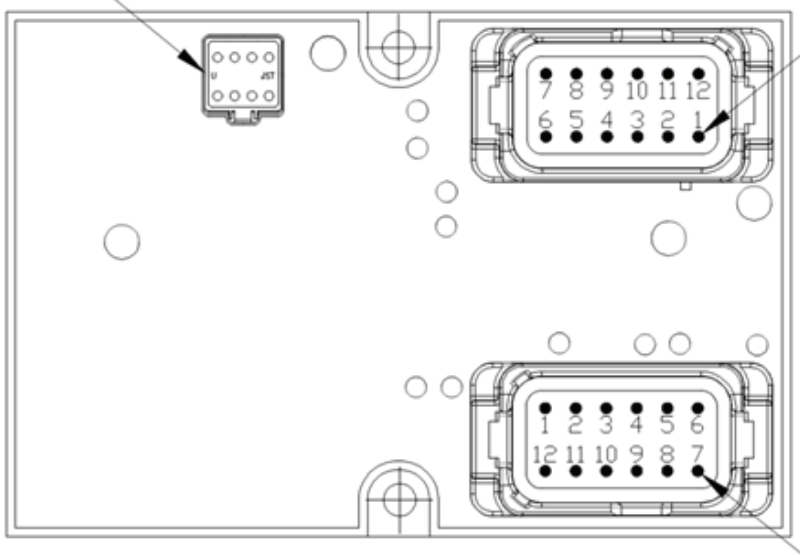
Digital Outputs	10 – (1 ON at a time) Consult factory for other options
Back EMF Protection	Yes
Output Switching Type	Automotive Grade, High side switch
Output current per output	3 Amps
Total Maximum current	6 Amps
Short Circuit Protection Shutdown	10A
Supply Voltage, DC Only	8-30VDC
LED Indicators	Transmit, Reset, Power Good, Reverse Polarity, Output Active (one for each output)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-40°C - 85°C (-40°F - 185°F)
Storage Temperature	-40°C - 85°C (-40°F - 185°F)
Ingress Protection	IP67
Frequency	2.4 – 2.483 GHz
Modulation	DSSS (Direct Sequence Spread Spectrum)
Weight	10 oz, less any connector plug assemblies
Enclosure Material	Glass filled plastic
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

RP100 DIMENSIONS DETAILS:



RP100 CONNECTOR DETAILS:

For factory use only. Do NOT remove this plug or make connections at this location.



Receptacle - A
Deautsch DT Series
Keyed - A, Gray
P/N: DTF15-12PA

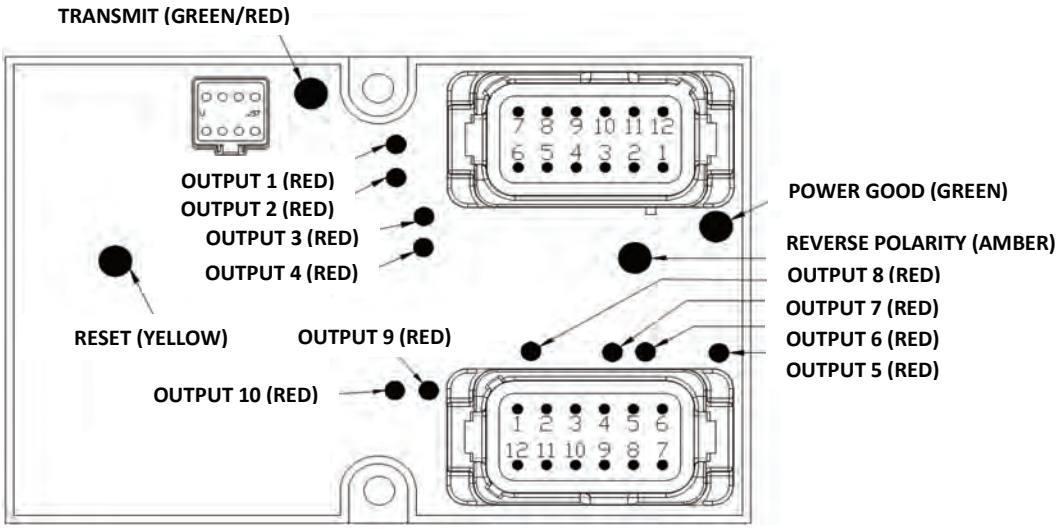
PIN 1 - Power Input
PIN 2 - NC
PIN 3 - Output 4
PIN 4 - Output 3
PIN 5 - Output 2
PIN 6 - Output 1
PIN 7 - Ground
PIN 8 - Ground
PIN 9 - Ground
PIN 10 - Ground
PIN 11 - Spare Ground
PIN 12 - System Ground

Receptacle - B
Deautsch DT Series
Keyed - B, Black
P/N: DTF15-12PB

PIN 1 - Output 10
PIN 2 - Output 9
PIN 3 - Output 8
PIN 4 - Output 7
PIN 5 - Output 6
PIN 6 - Output 5
PIN 7 - Ground
PIN 8 - Ground
PIN 9 - Ground
PIN 10 - Ground
PIN 11 - Ground
PIN 12 - Ground

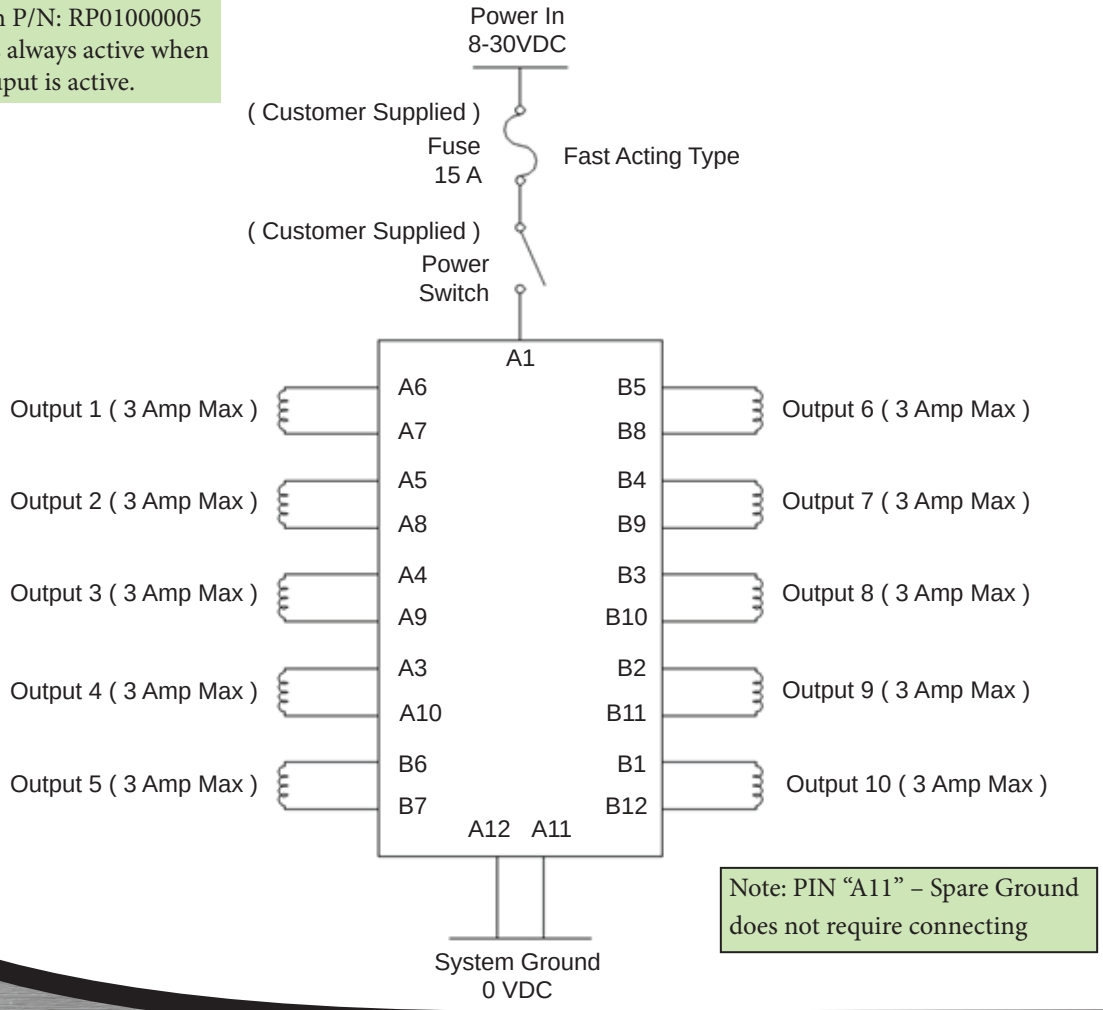
RP Series

RP100 DIAGNOSTIC INDICATORS:



TYPICAL SYSTEM CONFIGURATION:

NOTE: With P/N: RP01000005 Output #1 is always active when any other ouput is active.



Note: PIN "A11" – Spare Ground does not require connecting

COMMON MODEL CODES:

RP01000002 .....(10 Digital Outputs Digital Outputs)
RP01000005.....(9 Digital Outputs + 1 Master Digital Output)

MATING BRAND HYDRAULICS TRANSMITTER MODELS:

- **V100**
- **V200**
- **V300**
- **V400**
- **V500**

OPTIONAL PARTS:

E2368 – Deutsch 12-contact plug body, A-Key, Gray – Deutsch P/N: DT06-12SA
E2369 – Deutsch 12-contact plug body, B-Key, Black – Deutsch P/N: DT06-12SB
E2371 – Wedge lock for 12-contact plug, Orange – Deutsch P/N: W12S
E1827 – Terminal, socket, size 16 – Deutsch P/N: 0462-201-16141
E2024 – Sealing Plug, Locking, Size 16, White – Deutsch P/N: 0413-217-1605
E2401 – 8-Contact plug (For sealing receptacle on RP100 only)

OPTIONAL ACCESSORIES:

E2365 – Deutsch 12-contact flying lead connector assembly, A-Key, 12 – 12" leads
E2366 – Deutsch 12-contact flying lead connector assembly, B-Key, 12 – 12" leads

Brand Hydraulics can produce custom wire and cable harnesses
Contact your local Brand Hydraulics distributor for pricing

What is Included:

Quantity	Description
1	RP100 Series, 10 – Digital Output Radio Receiver

*Some options and custom changes may require minimum quantities.

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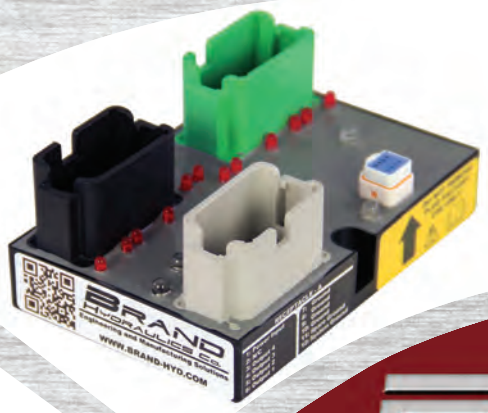

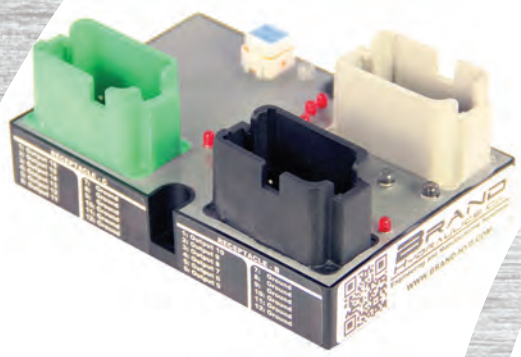

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Serving the World

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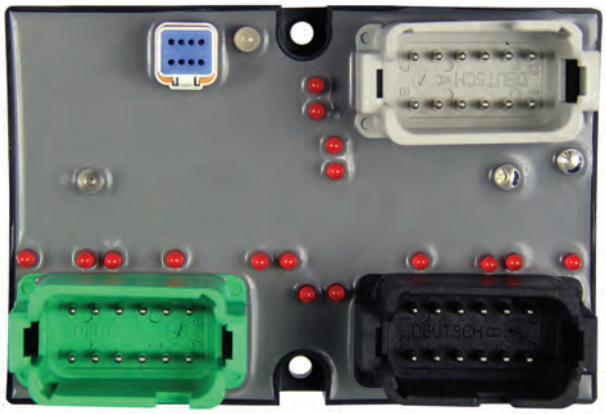
RP100 Series

Radio Receiver

Model: RP100 / RP01000003 / 16 Digital Output



2.4GHZ
Extended Range

Sealed To
IP67

32-bit
Microprocessor

FEDERAL COMMUNICATIONS COMMISSION · USA ·

CE

RoHS COMPLIANT

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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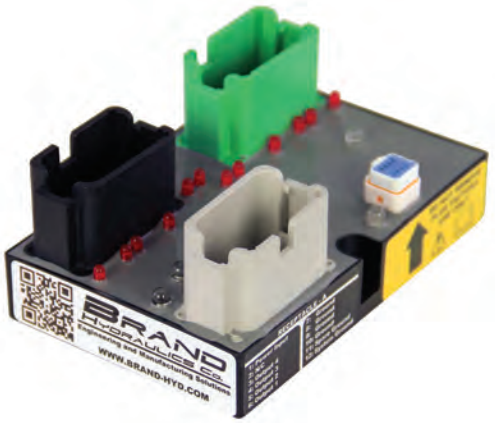
RP Series

Radio Receiver / RP100 / RP0100003 / 16 Digital Outputs

FEATURES:



- Engineered and manufactured in the USA
- FCC, IC, CE certified by accredited independent laboratory
- RoHS Complaint
- 2.4 GHz with Extended Range and DSSS (Direct Sequence Spread Spectrum)
- Worldwide license free operation
- 32-bit ARM-Core Digital Microprocessor
- Simple, straight forward, easy to install
- Encapsulated waterproof control package
- 500 ft. range line of sight
- LED diagnostic indicators
- Reverse polarity protection
- Wireless pairing function
- Loss of signal timeout
- Universal for 12VDC or 24VDC systems
- No perceivable delay between transmitter and receiver
- Multiple system may operate within the same area in close proximity without interfering with each other
- Optional factory master output configuration
- Factory configurable for custom applications*
- Factory custom wire/cable harnesses available*

APPLICATON:

The RP Series radio receiver is used to control the ON/OFF functions of hydraulic valves for cylinders and motors from a remote location. This series can also be used to control other devices that meet the electrical requirements. Ex. lights, horns, contactors, relays.

APPLICATON EXAMPLES:

- Tow Trucks
- Winches
- Boat Lifts
- Gates
- Conveyor Systems
- Service Truck Crane
- Stump Grinders
- AG Equipment
- Power units
- Automobile Carriers
- Grain Carts
- Turf Equipment
- Paving Equipment
- Door Lifts
- Lighting/Horns

DESCRIPTION:

The fully encapsulated RP Series are compact, durable, sealed and easy to install radio receivers. All exposed components on the receiver are made from non corrosive materials. This receiver is designed with Direct Sequence Spread Spectrum (DSSS) modulation for superior performance. It is a perfect complement to the Brand Series 21, Series 36 and Series 38 stackable directional control valves. Other control valves or solenoids meeting the appropriate specifications may be controlled as well.

SAFETY:

Our RP Series radio receivers are built with high quality long life components that are designed for use in harsh environments. We use the latest wireless and microprocessor technology including a 32-bit ARM-Core microprocessor to give these small controls some serious digital muscle. Our unique network design allows for operation of multiple units in the same location without interfering with each other. Safety and protection features:

- Watchdog monitor
- Over-current protection
- Short circuit protection
- Loss of signal timeout
- Reverse polarity protection
- Load dump protection
- Back EMF protection on all outputs
- Back-feed protected outputs

RELIABILITY:

All Brand Hydraulics Co. products are backed by lifetime technical support from the engineers at the Brand Hydraulics Co. manufacturing facility. Our electrical engineers are ready to assist you before and after the sale with technical support. Brand Hydraulics Co. products are backed by a 2 year Limited Warranty Policy. Please visit our website at **www.brand-hyd.com** for more information.

MASTER OUTPUT OPERATION:

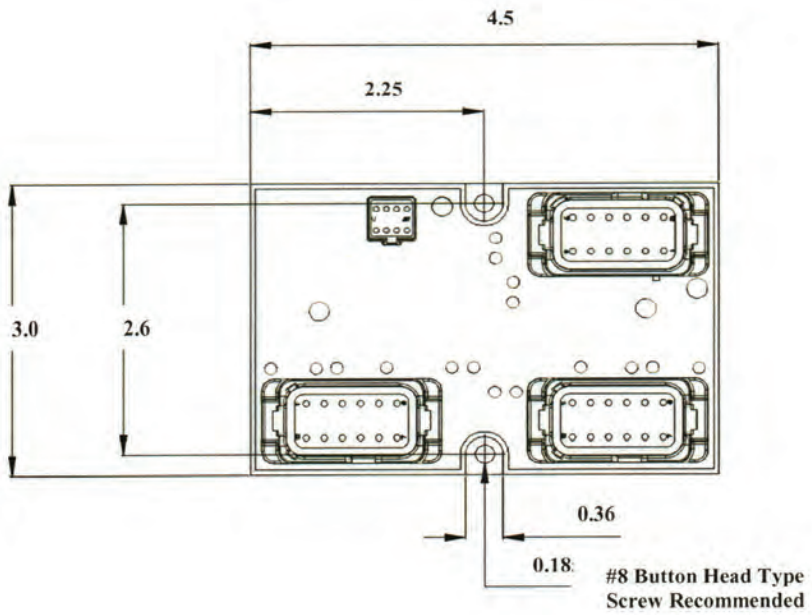
Part number RP01000006 (15 Digital Outputs + 1 Master Digital Output) is factory programmed for master output on OUTPUT #1. With this setup OUTPUT #1 will always go active when any transmitter function button is pressed. The #1 function button on the transmitter will control output #2 on the RP100 receiver. Ex. button #1 controls output #2, button #2 controls output #3 and so on. If you have a 16 function button transmitter being used with a 16 output RP01000006 the last function button, #16, will not have an associated output.

RP Series

SPECIFICATIONS:

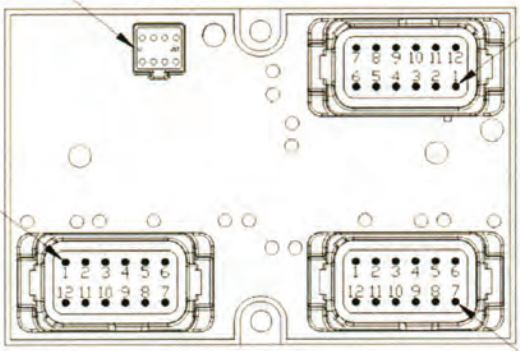
Digital Outputs	16 – (1 ON at a time) Consult factory for other options
Back EMF Protection	Yes
Output Switching Type	Automotive Grade, High side switch
Output current per output	3 Amps
Total Maximum current	6 Amps
Short Circuit Protection Shutdown	10A
Supply Voltage, DC Only	8-30VDC
LED Indicators	Transmit, Reset, Power Good, Reverse Polarity , Output Active (one for each output)
Antenna	Internal
Range	500 ft. line of site. Depends on environment
Operating Temperature	-40°C - 85°C (-40°F - 185°F)
Storage Temperature	-40°C - 85°C (-40°F - 185°F)
Ingress Protection	IP67
Frequency	2.4 – 2.483 GHz
Modulation	DSSS (Direct Sequence Spread Spectrum)
Weight	11 oz, less any connector plug assemblies
Enclosure Material	Glass filled plastic
Approvals	USA – FCC Part 15.109 European Union – CE (EN ETSI 301 489-1, V1.9.2) Canada – ICES-003

RP100 DIMENSIONS DETAILS:



RP100 CONNECTOR DETAILS:

For factory use only. Do NOT remove this plug or make connections at this location.



Receptacle – C
Deutsch DT Series
Keyed – C, Green
P/N: DTF15-12PC

PIN 1 –	Output 16
PIN 2 –	Output 15
PIN 3 –	Output 14
PIN 4 –	Output 13
PIN 5 –	Output 12
PIN 6 –	Output 11
PIN 7 –	Ground
PIN 8 –	Ground
PIN 9 –	Ground
PIN 10 –	Ground
PIN 11 –	Ground
PIN 12 –	Ground

Receptacle – A
Deutsch DT Series
Keyed – A, Gray
P/N: DTF15-12PA

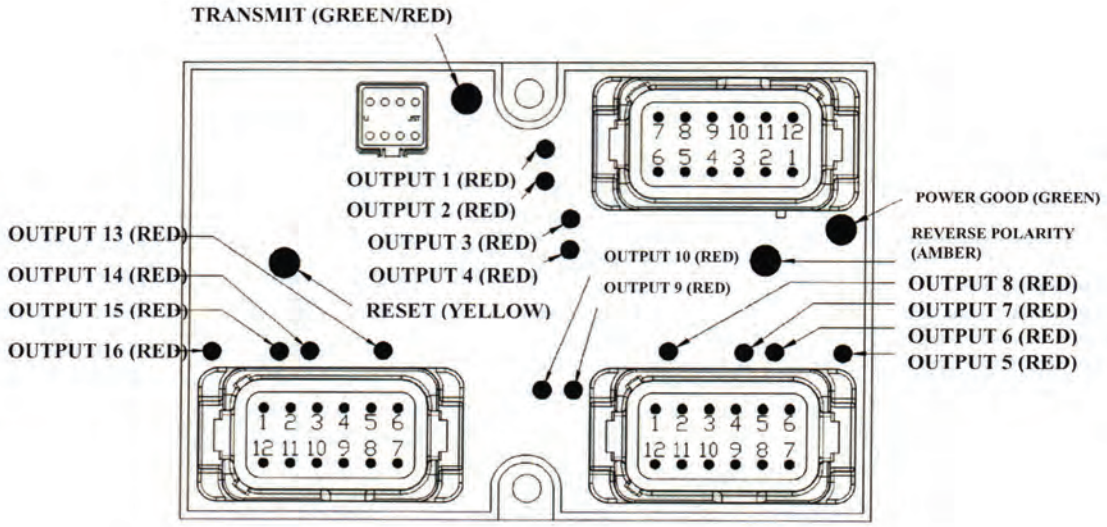
PIN 1 –	Power Input
PIN 2 –	N/C
PIN 3 –	Output 4
PIN 4 –	Output 3
PIN 5 –	Output 2
PIN 6 –	Output 1
PIN 7 –	Ground
PIN 8 –	Ground
PIN 9 –	Ground
PIN 10 –	Ground
PIN 11 –	Spare Ground
PIN 12 –	System Ground

Receptacle – B
Deutsch DT Series
Keyed – B, Black
P/N: DTF15-12PB

PIN 1 –	Output 10
PIN 2 –	Output 9
PIN 3 –	Output 8
PIN 4 –	Output 7
PIN 5 –	Output 6
PIN 6 –	Output 5
PIN 7 –	Ground
PIN 8 –	Ground
PIN 9 –	Ground
PIN 10 –	Ground
PIN 11 –	Ground
PIN 12 –	Ground

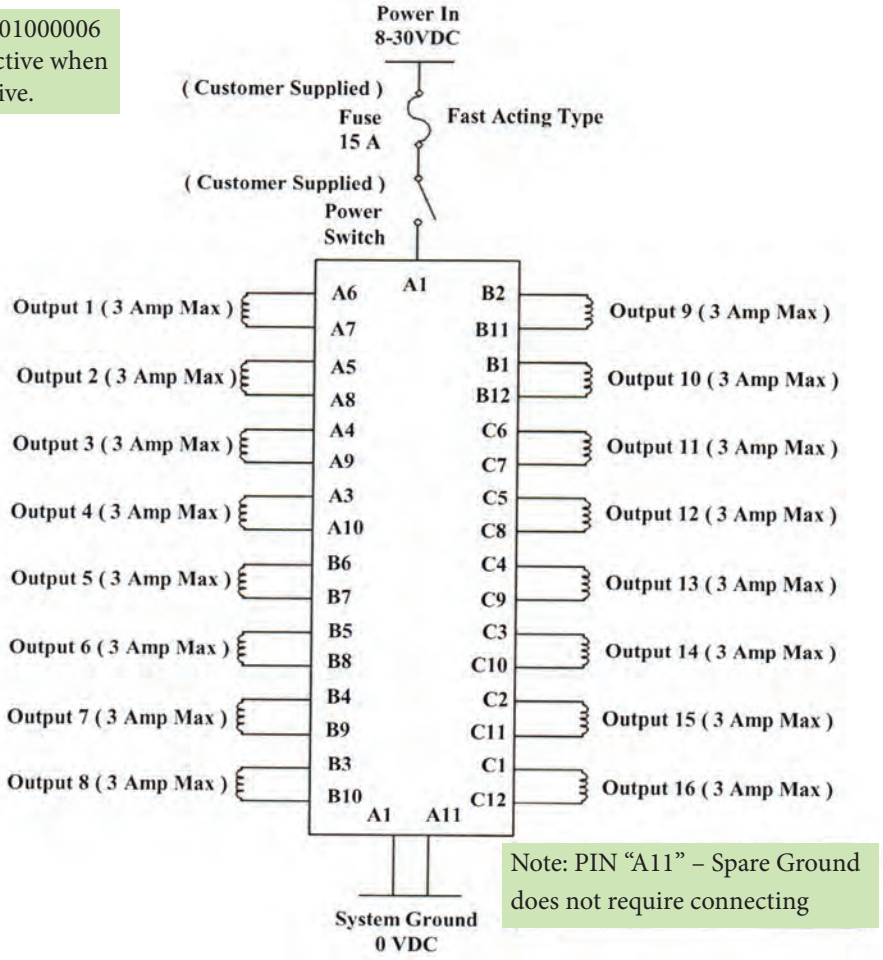
RP Series

RP100 DIAGNOSTIC INDICATORS:



TYPICAL SYSTEM CONFIGURATION:

NOTE: With P/N: RP01000006 Output #1 is always active when any other ouput is active.



Note: PIN "A11" – Spare Ground does not require connecting

COMMON MODEL CODES:

RP01000003 .....(16 Digital Outputs Digital Outputs)
RP01000006.....(15 Digital Outputs + 1 Master Digital Output)

MATING BRAND HYDRAULICS TRANSMITTER MODELS:

- **V100**
- **V200**
- **V300**
- **V400**
- **V500**

OPTIONAL PARTS AND ACCESSORIES:

E2368 – Deutsch 12-contact plug body, A-Key, Gray – Deutsch P/N: DT06-12SA
E2369 – Deutsch 12-contact plug body, B-Key, Black – Deutsch P/N: DT06-12SB
E2370 – Deutsch 12-contact plug body, C-Key, Green – Deutsch P/N: DT06-12SC
E2371 – Wedge lock for 12-contact plug, Orange – Deutsch P/N: W12S
E1827 – Terminal, socket, size 16 – Deutsch P/N: 0462-201-16141
E2024 – Sealing Plug, Locking, Size 16, White – Deutsch P/N: 0413-217-1605
E2401 – 8-Contact plug (For sealing receptacle on RP100 only)

OPTIONAL ACCESSORIES:

E2365 – Deutsch 12-contact flying lead connector assembly, A-Key, 12 – 12" leads
E2366 – Deutsch 12-contact flying lead connector assembly, B-Key, 12 – 12" leads
E2367 – Deutsch 12-contact flying lead connector assembly, C-Key, 12 – 12" leads

Brand Hydraulics can produce custom wire and cable harnesses
Contact your local Brand Hydraulics distributor for pricing

What is Included:

Quantity	Description
1	RP100 Series, 16 – Digital Output Radio Receiver

*Some options and custom changes may require minimum quantities.

It is the purchaser's responsibility to determine the suitability of any Brand Hydraulics product for an intended application, and to insure that it is installed in accordance with all federal, state, local, private safety, health regulations, and codes and standards. Due to the unlimited variety of machines, vehicles, and equipment on which our products can be used, it is impossible for Brand Hydraulics to offer expert advice on the suitability of a product for a specific application. We believe that it is our customer's responsibility to undertake the appropriate testing and evaluation to prevent injury to the end user.

All product, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.

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Serving the World

Engineering & Manufacturing Solutions

Spreader Control

EC20100

APPLICATION:

The EC20100 was designed for material spreading equipment and applications requiring a dual PWM output weatherproof control.

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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EC20100 Spreader Control

FEATURES:

- Weather tight control package.
- Two Pulse Width Modulated outputs
- Protected against reverse polarity, short circuit, and over voltage conditions.
- Current controlled output, maintains output current regardless of supply voltage and coil resistance variations.
- Blast button is user adjustable anywhere from 0- 100% of Auger output.
- Waterproof altitude pressure and vapor release vent
- Independent ramp adjustments up and down, 0.1 -12 seconds.
- Minimum and Maximum current adjustments for fine tuning each outputs span.
- Wide voltage supply range 12-26 VDC, one control for 12 or 24VDC systems.

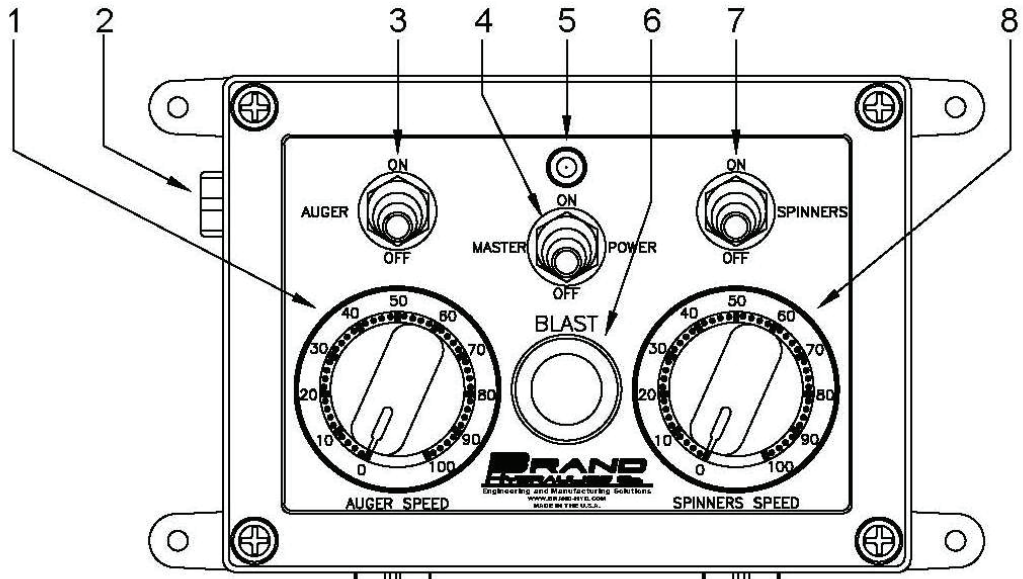
DESCRIPTION:

The EC20100 is a compact, durable, and easy to operate control, built with high quality long life components that are designed for use in harsh environments. The EC20100 is a perfect compliment to the Brand EFC, LEFC, and SEFC flow controls. Other flow controls meeting the appropriate specifications may be used as well.

SPECIFICATIONS:

Voltage Supply	12-26 VDC
Maximum Auger Output	2.0 Amps Continuous
Maximum Spinner Output	2.0 Amps Continuous
Output Type	PWM , Pulse Width Modulation, 0-100% Duty cycle
Frequency	107Hz +/- 5 Hertz
Minimum Load Resistance	Min. load = Voltage Supply ÷ 2 , Example: 6 Ohm minimum load for a system with a 12 VDC supply
Maximum Operating Current	4.076 Amps
Total Operating Current No Load	76 mA
Current Draw W/Power Switch Off	450 uA
Environmental Ratings	IP66 / NEMA 4
Operating Temperature	-40°C - 85°C (-40°F - 185°F)
Storage Temperature	-40°C - 85°C (-40°F - 185°F)
Weight, Fully Assembled	0.839 kg (1.850 lb.)

CONTROL LAYOUT:



Brand P/N: E1863
Deutsch Connector P/Ns:
Receptacle Body: DT04-2P-E004
Secondary Wedge: W2P
Terminals, Male: 0460-202-16141

Brand P/N: E1864
Deutsch Connector P/Ns:
Plug Body: DT06-2S-P012
Secondary Wedge: W2S-P012
Terminals, Female: 0462-201-16141
Wire: GXL Cross-Link, 16-AWG

RED, Positive 12-26VDC
BLACK, Negative Supply

Brand P/N: E1861
Deutsch Connector P/Ns:
Plug Body: DT06-4S-P012
Secondary Wedge: W4S-P012
Terminals, Female: 0462-201-16141

Brand P/N: E1862
Deutsch Connector P/Ns:
Receptacle Body: DT04-4P-E004
Secondary Wedge: W4P
Terminals, Male: 0460-202-16141
Wire: GXL Cross-Link, 16-AWG

BLACK, EFC Ground
BLUE, Positive Auger Output
ORANGE, Positive Spinners Output
BLACK, EFC Ground

Functions
1. Auger speed adjustment dial.
2. Waterproof altitude pressure and vapor realese vent.
3. Auger output ON/OFF switch.
4. Master power ON/OFF switch.
5. Master power indicator.
6. Blast push button temporarily overides the Auger speed adjustment dial. Blast output level is adjustble via an onboard trimmpot. Output comes from factory adjusted for 1 Amp.
7. Spinners output ON/OFF switch.
8. Spinners speed adjustment dial.

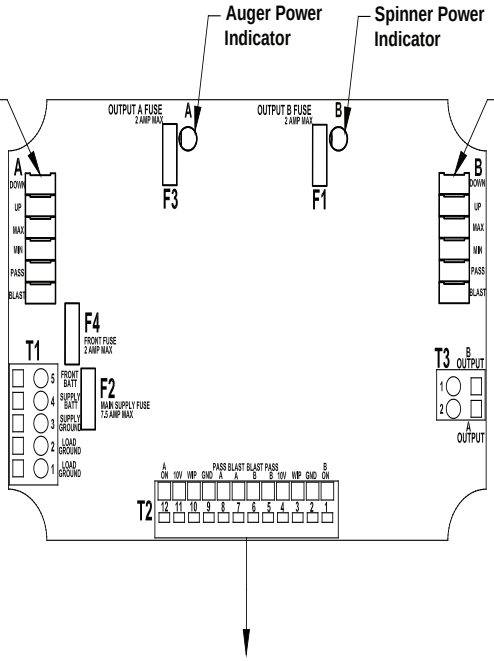
E1863 Power Cable
Pin 1, Wire #one, Positive supply
Pin 2, Wire #two, Negative supply

E1864 Mating Power Cable
Pin 1, Red wire, Positive supply
Pin 2, Black wire, Negative supply

E1861 Output Cable
Pin 1, Wire #one, out A (Auger)
Pin 2, Wire #two, out B (Spinners)
Pin 3, Wire #three, Ground
Pin 4, Wire green/yellow, Ground

E1862 Mating Output Cable
Pin 1, Blue wire, Auger Output
Pin 2, Orange wire, Spinners Output
Pin 3, Black wire, load Ground
Pin 4, Black wire, load Ground

INTERNAL LAYOUT:



Auger Adjustments

Ramping Down
Clockwise: Increases the Outputs Ramp off time.

Ramping Up
Clockwise: Increases the Outputs Ramp on time.

Maximum Output Adjustment
Clockwise: Increases Output

Minimum Output Adjustment
Clockwise: Increases Output

Pass Output Adjustment
Clockwise: Increases Output

Blast Output Adjustment
Clockwise: Increases Output

Spinners Adjustments

Ramping Down
Clockwise: Increases the Outputs Ramp off time.

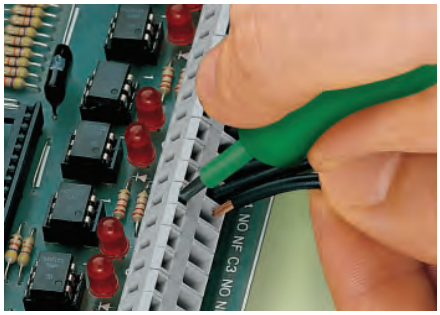
Ramping Up
Clockwise: Increases the Outputs Ramp on time.

Maximum Output Adjustment
Clockwise: Increases Output

Minimum Output Adjustment
Clockwise: Increases Output

Pass Output Adjustment
Clockwise: Increases Output

Blast Output Adjustment
Clockwise: Increases Output



Terminal Block Wiring

T1
1. Ground for EFC Coil A
2. Ground for EFC Coil B
3. System Ground Input
4. Positive 12-26 VDC Input
5. Front Lid power.

T2
1. Spinner on/off input. Apply 12-26VDC to make Spinner output active.
2. Ground for Spinners potentiometer.
3. Spinners potentiometer wiper Input.
4. 10V Reference for Spinner potentiometer as well as Auger Blast switch power.
5. Spinners pass input. Active with a 12-26VDC input. Adjustable 0-2A.
6. Spinners Blast input. Active with a 12-26VDC input. Adjustable 0-2A.
7. Auger Blast input. Active with a 12-26VDC input. Adjustable 0-2A.
8. Auger pass input. Active with a 12-26VDC input. Adjustable 0-2A.
9. Ground for Auger potentiometer and power LED.
10. Auger potentiometer wiper Input.
11. 10V Reference for Auger potentiometer.
12. Auger on/off input. Apply 12-26V to make Auger output active.

T3
1. Positive output for EFC Coil B (Spinners).
2. Positive output for EFC Coil A (Auger).

Factory Settings

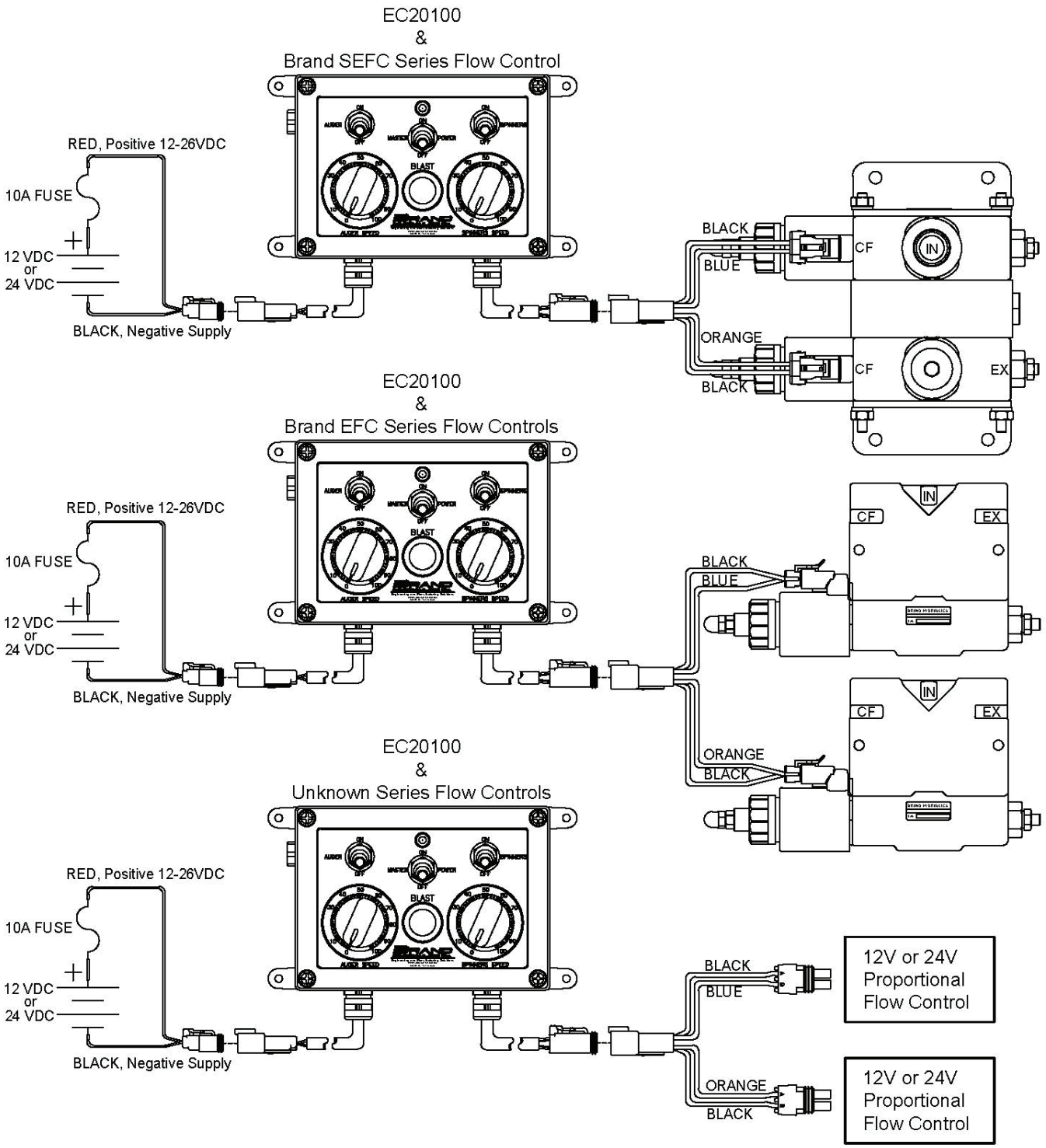
Auger
Ramping Down, set for minimum delay.
Ramping Up, set for minimum delay.
Maximum Ouput, Set for 1.00 Amp.
Minimum Output, Set for 0.2 Amp.
Pass Output, Set for minimum output.
Blast Output, Set for 1.00 Amp.

Spinners
Ramping Down, set for minimum delay.
Ramping Up, set for minimum delay.
Maximum Ouput, Set for 1.00 Amp.
Minimum Output, Set for 0.2 Amp.
Pass Output, Set for minimum output.
Blast Output, Set for 1.00 Amp.

Fuses

F1. Spinners output fuse, 2A max, ATM-2.
F2. Main fuse, 7.5A max, ATM-7-1/2.
F3. Auger output fuse, 2A max, ATM-2.
F4. Front lid power fuse, 2A max, ATM-2.

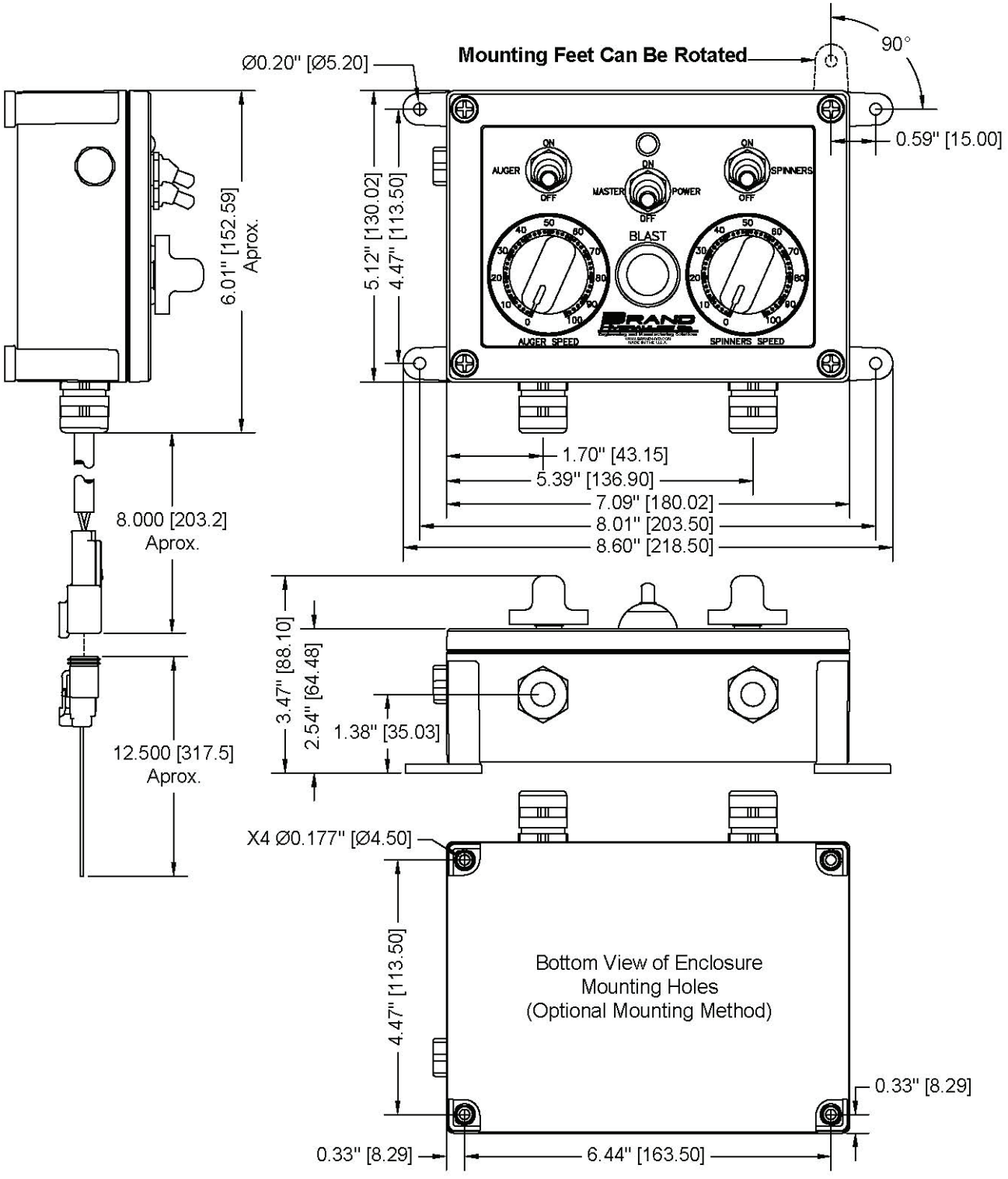
TYPICAL SYSTEM CONFIGURATION:



NOTE: Brand Hydraulics recommends a 10 amp fuse be placed within 18 inches of this controls power source. The fuse and power source are customer supplied parts.

EC20100 Spreader Control

DIMENSIONAL DATA: inches & [millimeters]



ADJUSTMENTS:

Minimum output or zero setting	Clockwise rotation increases minimum output 0 - 1.1 Amps
Maximum output	Clockwise rotation increases maximum output 0.05 - 2 Amps Maximum output will be 50 mA greater than the minimum output
Ramping Down, or Fall Time	Clockwise rotation increases ramp time 0.1 - 12 Seconds,
Ramping Up, or Rise Time	Clockwise rotation increases ramp time 0.1 - 12 Seconds
Pass Output	Clockwise rotation increases pass output 0 – 2 Amps
Blast Output	Clockwise rotation increases blast output 0 – 2 Amps

ADJUSTMENT PROCEDURE:

Adjustments are made by turning a trim pot screw. The trimmers are 25 turn, end to end devices. The trimmers have a built in slip clutches so over rotations do not damage them. It may be necessary to turn the adjustment screw several turns to observe a change in output. Start by adjusting the min output, and then adjust the max output to the desired level. The best way to fine tune adjustments is to observe the function response or speed. It is important to make adjustments in the following order.

1. Minimum output: Start by setting the master Potentiometer or input signal to zero. Turn the trimmer clockwise until the function begins to move. Now turn the trimmer back counter clockwise, one full rotation past the point of any visible movement.

2. Maximum output: Start by setting the master Potentiometer to the 100 position on the dial. Turn the trim pot counter clockwise to decrease function speed. Turn the trim pot clockwise to increase function speed. Function maximum speed will be limited to the max flow capabilities of your hydraulic system. Do not rotate the trim pot past the point of an observable increase in function speed.

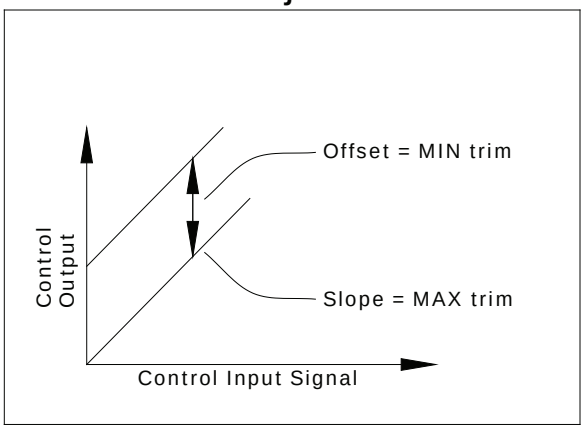
3. Ramp up: This feature changes how quickly the valve can open. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay.

4. Ramp down: This Feature changes how quickly the valve can close. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay. Use discretion when making this adjustment, this will affect how quickly your function stops.

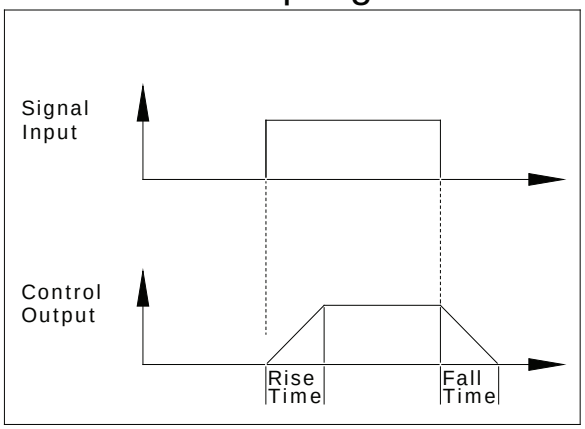
ADJUSTMENT PROCEDURE:

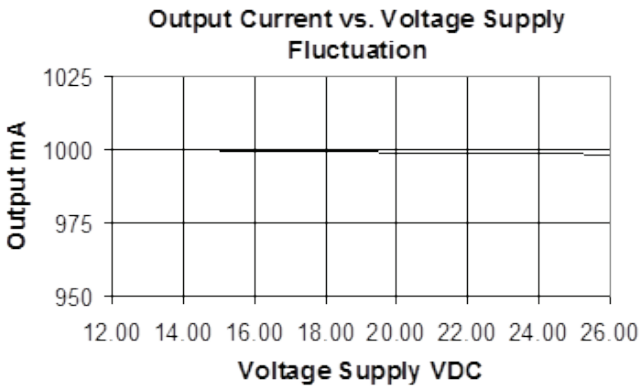
5. Blast output: Push the Blast button to observe whether or not adjustment is necessary. Turn the trim pot counter clockwise to decrease function speed. Turn the trim pot clockwise to increase function speed. Blast output will be limited to the span set by the Min and Max trimmers. Do not rotate the trim pot past the point of desired function speed.

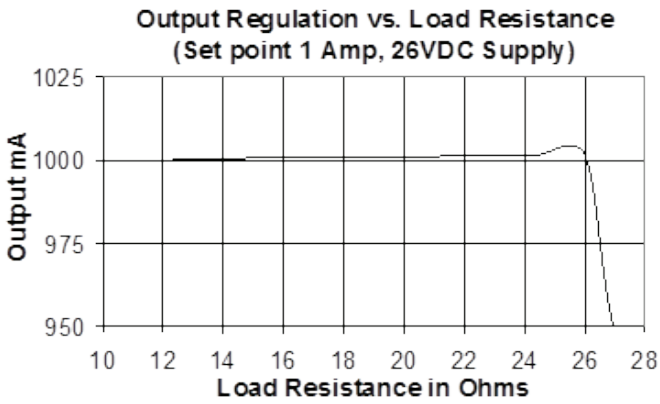
MIN/MAX Adjustments

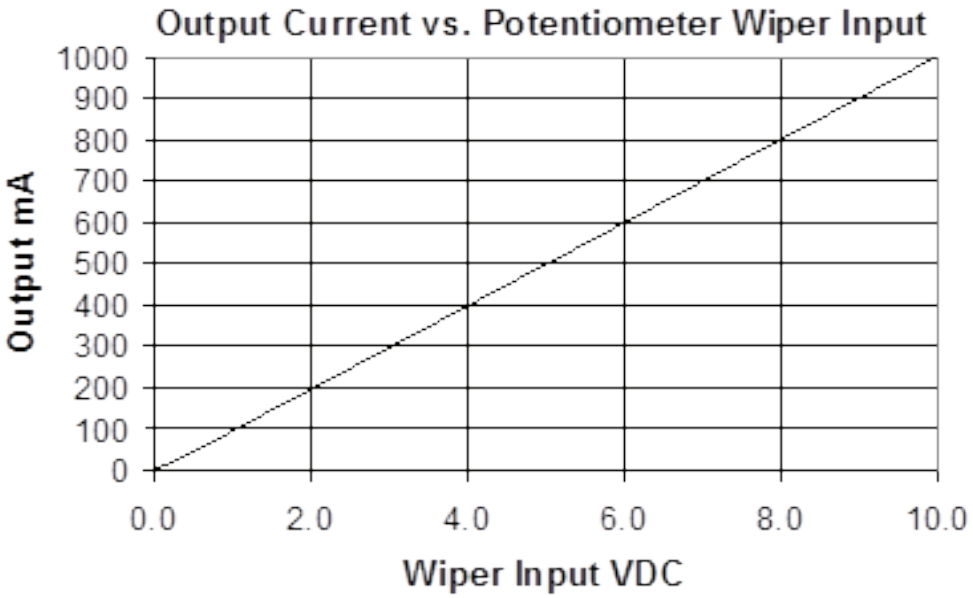


Ramping









NOTE: Unless stated otherwise the above readings were taken at 25°C, with control connected to a 14.6V supply, and the output was set for 1 amp. Both Auger and Spinner outputs share these curve characteristics.

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BRAND HYDRAULICS Co.

Made in the Heartland of America
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Engineering & Manufacturing Solutions

Potentiometer Control

EC20200

APPLICATION:

Proportionally control the speed of hydraulic motors and cylinders.

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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EC20200 Potentiometer Control

FEATURES:

- Weather tight control package
- Pulse Width Modulated output
- Different power switch configurations
- Waterproof altitude pressure and vapor release vent
- Protected against reverse polarity, short circuit, and over voltage conditions.
- Current controlled output, maintains output current regardless of supply voltage and coil resistance variations.
- On board proportional indicators for input signal and output signal. Also includes an on/off power and potentiometer status indicator.
- Two Enable lines are provided, one with adjustable soft stop, both with adjustable soft start.
- Independent ramp adjustments up and down, 0.1 -12 seconds.
- Minimum and Maximum current adjustment for fine tuning the outputs span.
- Wide voltage supply range 12-30 VDC, one control for 12 or 24VDC systems.

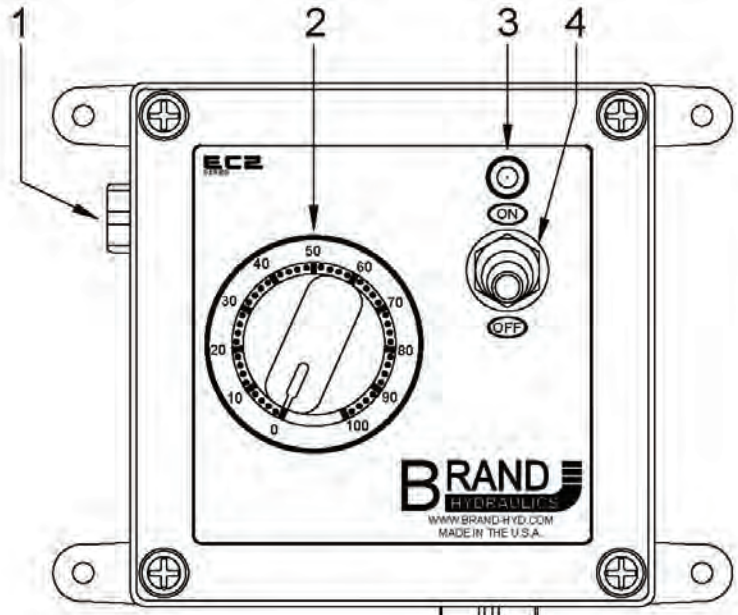
DESCRIPTION:

Easy to use and versatile the EC20200 simplifies valve control and system design. It is built with high quality long life components that are designed for use in harsh environments. The EC20200 is a perfect compliment to the Brand EFC and LEFC flow controls. Other flow controls meeting the appropriate specifications may be used as well.

SPECIFICATIONS:

Voltage Supply	12-30 VDC
PWM Output Current	2.0 Amps Max Continuous
PWM Output Description	PWM , Pulse Width Modulation, 0-100% Duty cycle
PWM Output Frequency	107Hz +/- 5 Hertz
Switched DC Output Current	2.5 Amps Max Continuous Each Output (A and B)
Switched DC Output Voltage	Voltage Out = Voltage Supply – 0.7 Volts
Environmental Ratings	IP66 / NEMA 4
Operating Temperature	-40°C - 85°C (-40°F - 185°F)
Storage Temperature	-40°C - 85°C (-40°F - 185° F)

CONTROL LAYOUT: EC20200



Functions

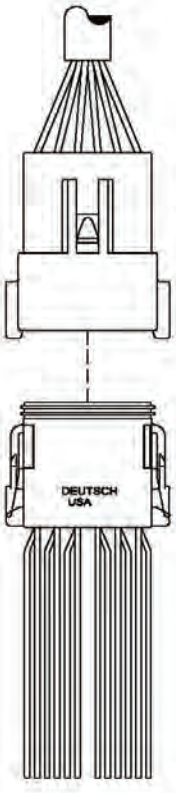
1. Waterproof altitude pressure and vapor realese vent.
2. Output level adjustment dial
3. Master power indicator.
4. Master power ON/OFF switch.

E1912 Output Cable

Pin 1, Wire #1, Positive 12-30 VDC Supply Input
Pin 2, Wire #2, "A" Output Switch Input
Pin 3, Wire #3, "B" Output Switch Input
Pin 4, Wire #4, Enable Input
Pin 5, Wire #5, Ramping Enable Input
Pin 6, Wire #6, "A" Coil Output
Pin 7, Wire #7, Ground
Pin 8, Wire #8, "B" Coil Output
Pin 9, Wire #9, Ground
Pin 10, Wire #10, Positive EFC Output
Pin 11, Wire #11, Ground
Pin 12, Wire Green/Yellow, System Ground

E1913 Mating Output Cable

Pin 1, Red Wire, Positive 12-30 VDC Supply Input
Pin 2, Yellow Wire, "A" Output Switch Input
Pin 3, Violet Wire, "B" Output Switch Input
Pin 4, Gray Wire, Enable Input
Pin 5, White Wire, Ramping Enable Input
Pin 6, Orange Wire, "A" Coil Output
Pin 7, Black Wire, Ground
Pin 8, Brown Wire, "B" Coil Output
Pin 9, Black Wire, Ground
Pin 10, Blue Wire, Positive EFC Output
Pin 11, Black Wire, Ground
Pin 12, Green Wire, System Ground



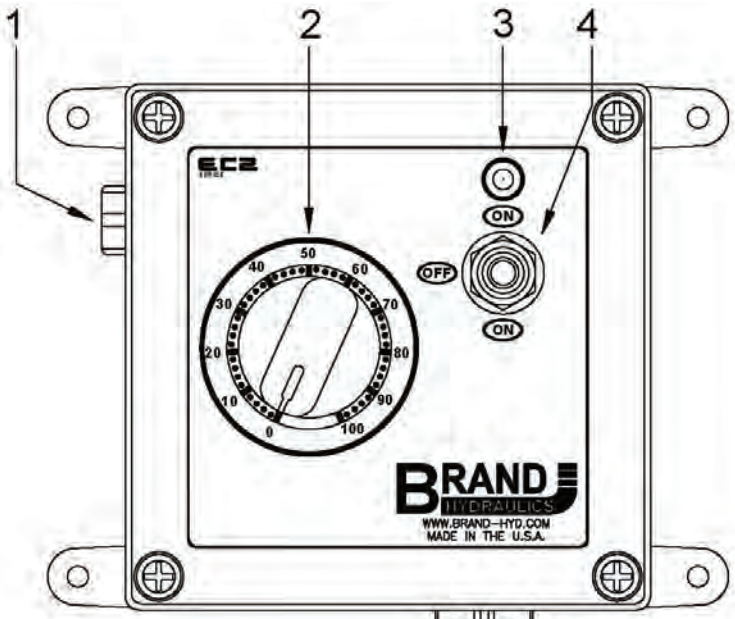
Brand P/N: E1946
Deutsch Connector P/Ns:
Receptacle Body: DT04-12PA-E004
Secondary Wedge: W12P
Terminals, Male: 0460-202-16141

Brand P/N: E1913
Deutsch Connector P/Ns:
Plug Body: DT06-12SB-P012
Secondary Wedge: W12S-P012
Terminals, Female: 0462-201-16141
Wire: GXL Cross-Link, 16-AWG

Note: Harnesses E1946 & E1913 are factory installed and included with EC20200.

EC20200 Potentiometer Control

CONTROL LAYOUT: EC20201



Functions

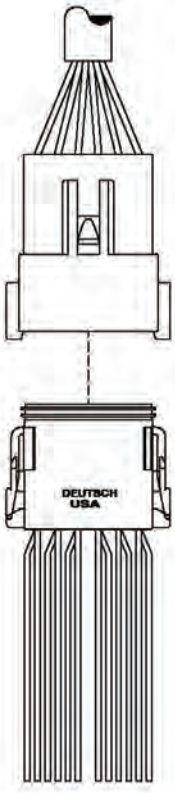
1. Waterproof altitude pressure and vapor realese vent.
2. Output level adjustment dial
3. Master power indicator.
4. ON-OFF-ON switch.

E1946 Output Cable

Pin 1, Wire #1, Positive 12-30 VDC Supply Input
Pin 2, Wire #2, Not Used
Pin 3, Wire #3, Not Used
Pin 4, Wire #4, Enable Input
Pin 5, Wire #5, Ramping Enable Input
Pin 6, Wire #6, "A" Coil Output
Pin 7, Wire #7, Ground
Pin 8, Wire #8, "B" Coil Output
Pin 9, Wire #9, Ground
Pin 10, Wire #10, Positive EFC Output
Pin 11, Wire #11, Ground
Pin 12, Wire Green/Yellow, System Ground

E1913 Mating Output Cable

Pin 1, Red Wire, Positive 12-30 VDC Supply Input
Pin 2, Yellow Wire, Not Used
Pin 3, Violet Wire, Not Used
Pin 4, Gray Wire, Enable Input
Pin 5, White Wire, Ramping Enable Input
Pin 6, Orange Wire, Switch Up "A" Coil Output
Pin 7, Black Wire, Ground
Pin 8, Brown Wire, Switch Down "B" Coil Output
Pin 9, Black Wire, Ground
Pin 10, Blue Wire, Positive EFC Output
Pin 11, Black Wire, Ground
Pin 12, Green Wire, System Ground

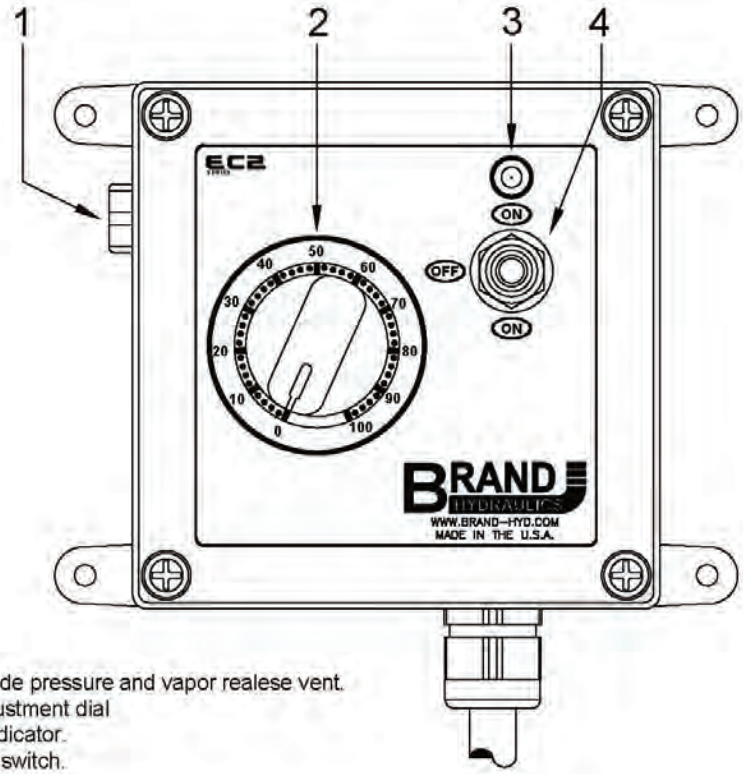


Brand P/N: E2527
Deutsch Connector P/Ns:
Receptacle Body: DT04-12PB-E004
Secondary Wedge: W12P
Terminals, Male: 0460-202-16141

Brand P/N: E1913
Deutsch Connector P/Ns:
Plug Body: DT06-12SB-P012
Secondary Wedge: W12S-P012
Terminals, Female: 0462-201-16141
Wire: GXL Cross-Link, 16-AWG

Note: Harnesses E2527 & E1913 are factory installed and included with EC20201

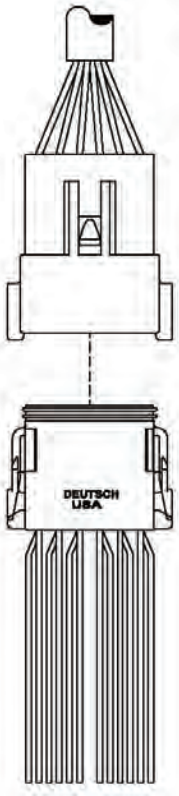
CONTROL LAYOUT: EC20202



Functions
1. Waterproof altitude pressure and vapor realese vent.
2. Output level adjustment dial
3. Master power indicator.
4. (ON)-OFF-(ON) switch.

E1946 Output Cable
Pin 1, Wire #1, Positive 12-30 VDC Supply Input
Pin 2, Wire #2, Not Used
Pin 3, Wire #3, Not Used
Pin 4, Wire #4, Enable Input
Pin 5, Wire #5, Ramping Enable Input
Pin 6, Wire #6, "A" Coil Output
Pin 7, Wire #7, Ground
Pin 8, Wire #8, "B" Coil Output
Pin 9, Wire #9, Ground
Pin 10, Wire #10, Positive EFC Output
Pin 11, Wire #11, Ground
Pin 12, Wire Green/Yellow, System Ground

E1913 Mating Output Cable
Pin 1, Red Wire, Positive 12-30 VDC Supply Input
Pin 2, Yellow Wire, Not Used
Pin 3, Violet Wire, Not Used
Pin 4, Gray Wire, Enable Input
Pin 5, White Wire, Ramping Enable Input
Pin 6, Orange Wire, Switch Up "A" Coil Output
Pin 7, Black Wire, Ground
Pin 8, Brown Wire, Switch Down "B" Coil Output
Pin 9, Black Wire, Ground
Pin 10, Blue Wire, Positive EFC Output
Pin 11, Black Wire, Ground
Pin 12, Green Wire, System Ground



Brand P/N: E2527
Deutsch Connector P/Ns:
Receptacle Body: DT04-12PB-E004
Secondary Wedge: W12P
Terminals, Male: 0460-202-16141

Brand P/N: E1913
Deutsch Connector P/Ns:
Plug Body: DT06-12SB-P012
Secondary Wedge: W12S-P012
Terminals, Female: 0462-201-16141
Wire: GXL Cross-Link, 16-AWG

Note: Harnesses E2527 & E1913 are factory installed and included with EC20202

EC20200 Potentiometer Control

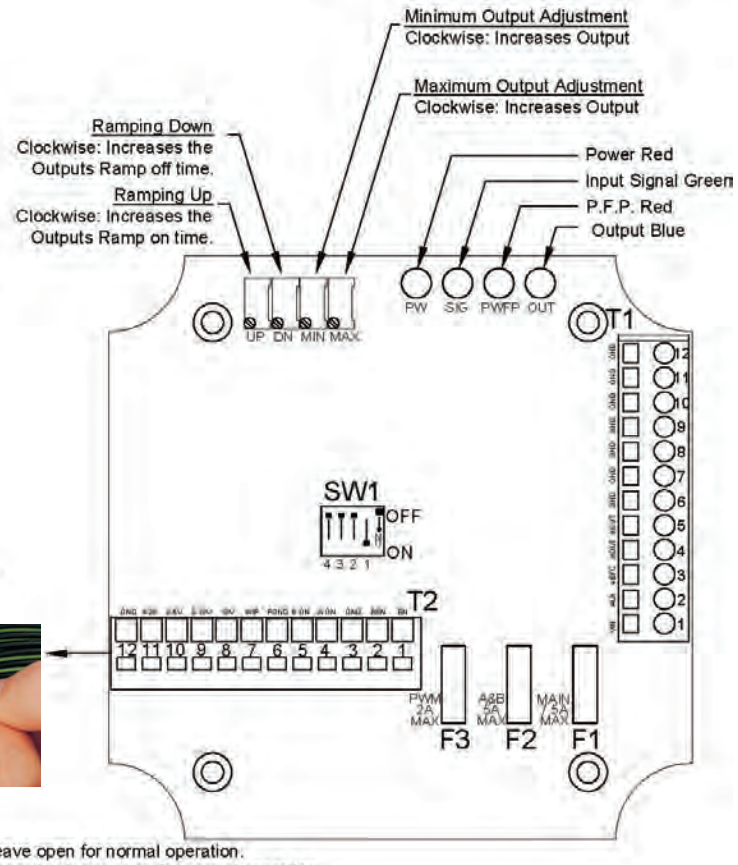
INTERNAL LAYOUT: EC20200

Power LED
LED indicates when board has DC power present. LED turns off when the enable input becomes active (switched low).

Input Signal LED
Proportional to the level of input signal.

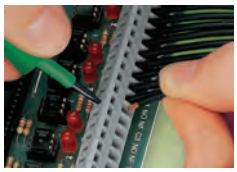
Output Signal LED
Proportional to the level of output current.

P.F.P. Potentiometer Fault Protection
A saftey feature: P.F.P will shutdown the boards wiper input if the potentiometers ground becomes open or disconnected.



Terminal Block Wiring

T1
1. Positive 12-30 VDC Input
2. Auxillary Supply Voltage output, Not to Exceed 2.5A.
3. Positive output for EFC
4. Output A positive output
5. Output B positive output
6. System Ground input
7. Ground
8. Ground
9. Ground
10. Ground
11. Ground
12. Ground



T2
1. Enable input, apply a ground to disable the board or leave open for normal operation.
2. Ramping Enable input, apply a ground to disable the board or leave open for normal operation.
3. Ground
4. Output A activation pin. Sending 6-30VDC to this pin will activate the A output (T1/pin4).
5. Output B activation pin. Sending 6-30VDC to this pin will activate the B output (T1/pin5).
6. Ground for Potentiometer. (Note: Wiper input will not function without the potentiometer being grounded at this pin.)
7. Potentiometer wiper Input, Not to Exceed 10V. Input Impedance is 10K Ohms.
8. 10V Reference for potentiometer.
9. Positive 0-10V signal input, Not to Exceed 10V. Input Impedance is 10K Ohms.
10. Positive 0-5V signal input, Not to Exceed 5V. Input Impedance is 10K Ohms.
11. Positive 4-20mA input. Current input only do not apply voltage to this pin. Input Impedance is 250 Ohms.
12. Signal Ground, Negative loop return.

Dip Switches

1. ON: EFC output will be active when power is applied to the PCB.
1. OFF: EFC output will be active when power is applied to the A ON or B ON input.

2. ON: Applying power to the A ON input activates the EFC output and turns the Coil A output on.
2. OFF: Applying power to the A ON input only turns the Coil A output on.

3. ON: Applying power to the B ON input activates the EFC output and turns the Coil B output on.
3. OFF: Applying power to the B ON input only turns the Coil B output on.

4. Not Used

Factory Settings

Ramping Up, set for minimum delay.
Ramping Down, set for minimum delay.
Minimum Output, Set for 0.2 Amp.
Maximum Ouput, Set for 1.00 Amp.

Factory Switch Settings

1. On
2. Off
3. Off
4. Not used

Fuses

F1. Main fuse, 7.5A max, ATM-7-1/2.
F2. Coil A and B Output fuse, 5A max, ATM-5
F3. EFC output fuse, 2A max, ATM-2.

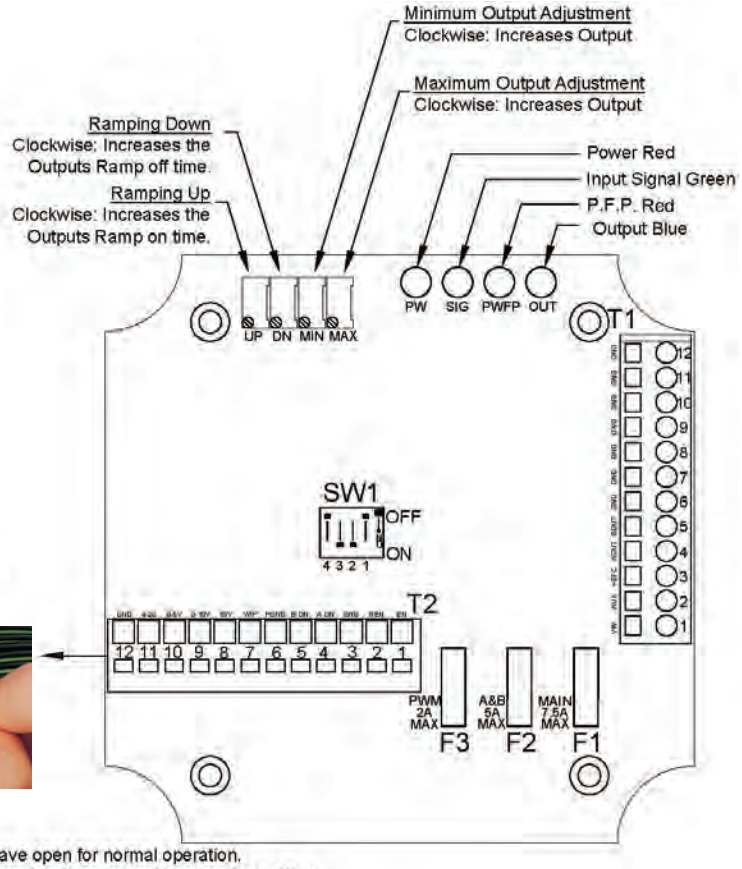
INTERNAL LAYOUT: EC20201

Power LED
LED indicates when board has DC power present. LED turns off when the enable input becomes active (switched low).

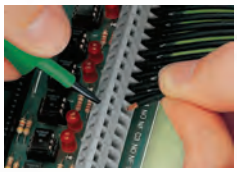
Input Signal LED
Proportional to the level of input signal.

Output Signal LED
Proportional to the level of output current.

P.F.P. Potentiometer Fault Protection
A saftey feature: P.F.P will shutdown the boards wiper input if the potentiometers ground becomes open or disconnected.



Terminal Block Wiring



T1
1. Positive 12-30 VDC Input
2. Auxillary Supply Voltage output, Not to Exceed 2.5A.
3. Positive output for EFC
4. Output A positive output
5. Output B positive output
6. System Ground input
7. Ground
8. Ground
9. Ground
10. Ground
11. Ground
12. Ground

T2
1. Enable input, apply a ground to disable the board or leave open for normal operation.
2. Ramping Enable input, apply a ground to disable the board or leave open for normal operation.
3. Ground
4. Output A activation pin. Sending 6-30VDC to this pin will activate the A output (T1/pin4).
5. Output B activation pin. Sending 6-30VDC to this pin will activate the B output (T1/pin5).
6. Ground for Potentiometer. (Note: Wiper input will not function without the potentiometer being grounded at this pin.)
7. Potentiometer wiper Input, Not to Exceed 10V. Input Impedance is 10K Ohms.
8. 10V Reference for potentiometer.
9. Positive 0-10V signal input, Not to Exceed 10V. Input Impedance is 10K Ohms.
10. Positive 0-5V signal input, Not to Exceed 5V. Input Impedance is 10K Ohms.
11. Positive 4-20mA input. Current input only do not apply voltage to this pin. Input Impedance is 250 Ohms.
12. Signal Ground, Negative loop return.

Dip Switches

1. ON: EFC output will be active when power is applied to the PCB.
1. OFF: EFC output will be active when power is applied to the A ON or B ON input.

2. ON: Applying power to the A ON input activates the EFC output and turns the Coil A output on.
2. OFF: Applying power to the A ON input only turns the Coil A output on.

3. ON: Applying power to the B ON input activates the EFC output and turns the Coil B output on.
3. OFF: Applying power to the B ON input only turns the Coil B output on.

4. Not Used

Factory Settings

Ramping Up, set for minimum delay.
Ramping Down, set for minimum delay.
Minimum Output, Set for 0.2 Amp.
Maximum Ouput, Set for 1.00 Amp.

Factory Switch Settings

1. Off
2. On
3. On
4. Not used

Fuses

F1. Main fuse, 7.5A max, ATM-7-1/2.
F2. Coil A and B Output fuse, 5A max, ATM-5
F3. EFC output fuse, 2A max, ATM-2.

EC20200 Potentiometer Control

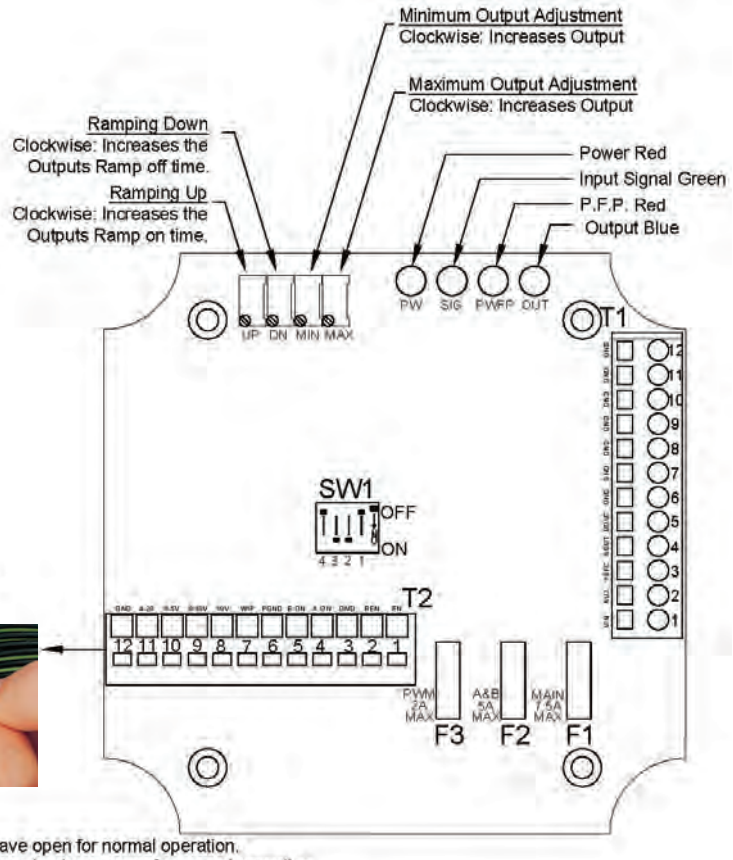
INTERNAL LAYOUT: EC20202

Power LED
LED indicates when board has DC power present. LED turns off when the enable input becomes active (switched low).

Input Signal LED
Proportional to the level of input signal.

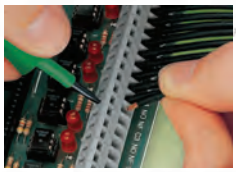
Output Signal LED
Proportional to the level of output current.

P.F.P. Potentiometer Fault Protection
A saftey feature: P.F.P will shutdown the boards wiper input if the potentiometers ground becomes open or disconnected.



Terminal Block Wiring

T1
1. Positive 12-30 VDC Input
2. Auxillary Supply Voltage output, Not to Exceed 2.5A.
3. Positive output for EFC
4. Output A positive output
5. Output B positive output
6. System Ground input
7. Ground
8. Ground
9. Ground
10. Ground
11. Ground
12. Ground



T2
1. Enable input, apply a ground to disable the board or leave open for normal operation.
2. Ramping Enable input, apply a ground to disable the board or leave open for normal operation.
3. Ground
4. Output A activation pin. Sending 6-30VDC to this pin will activate the A output (T1/pin4).
5. Output B activation pin. Sending 6-30VDC to this pin will activate the B output (T1/pin5).
6. Ground for Potentiometer. (Note: Wiper input will not function without the potentiometer being grounded at this pin.)
7. Potentiometer wiper Input, Not to Exceed 10V. Input Impedance is 10K Ohms.
8. 10V Reference for potentiometer.
9. Positive 0-10V signal input, Not to Exceed 10V. Input Impedance is 10K Ohms.
10. Positive 0-5V signal input, Not to Exceed 5V. Input Impedance is 10K Ohms.
11. Positive 4-20mA input. Current input only do not apply voltage to this pin. Input Impedance is 250 Ohms.
12. Signal Ground, Negative loop return.

Dip Switches

1. ON: EFC output will be active when power is applied to the PCB.
1. OFF: EFC output will be active when power is applied to the A ON or B ON input.

2. ON: Applying power to the A ON input activates the EFC output and turns the Coil A output on.
2. OFF: Applying power to the A ON input only turns the Coil A output on.

3. ON: Applying power to the B ON input activates the EFC output and turns the Coil B output on.
3. OFF: Applying power to the B ON input only turns the Coil B output on.

4. Not Used

Factory Settings

Ramping Up, set for minimum delay.
Ramping Down, set for minimum delay.
Minimum Output, Set for 0.2 Amp.
Maximum Ouput, Set for 1.00 Amp.

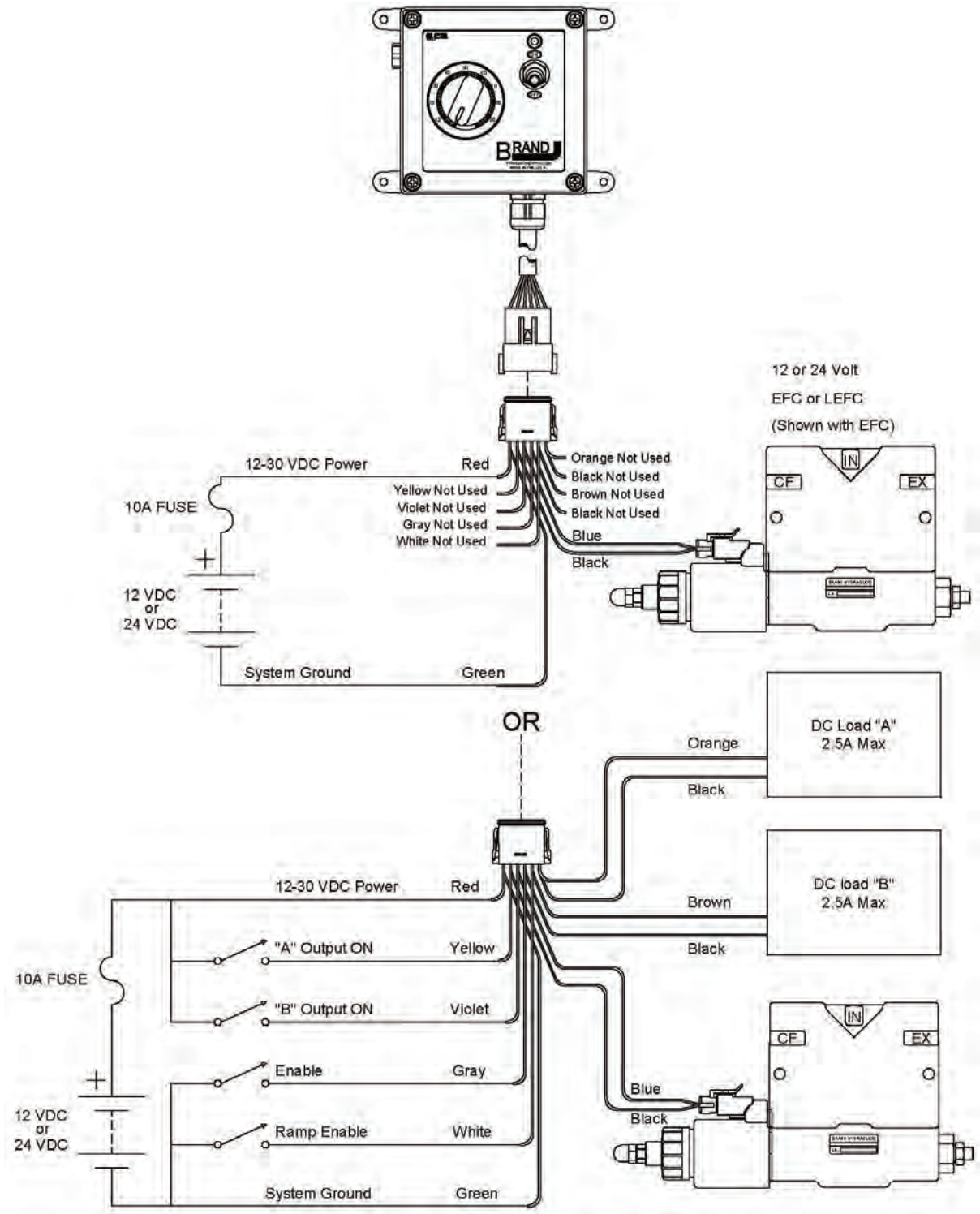
Factory Switch Settings

1. Off
2. On
3. On
4. Not used

Fuses

F1. Main fuse, 7.5A max, ATM-7-1/2.
F2. Coil A and B Output fuse. 5A max, ATM-5
F3. EFC output fuse, 2A max, ATM-2.

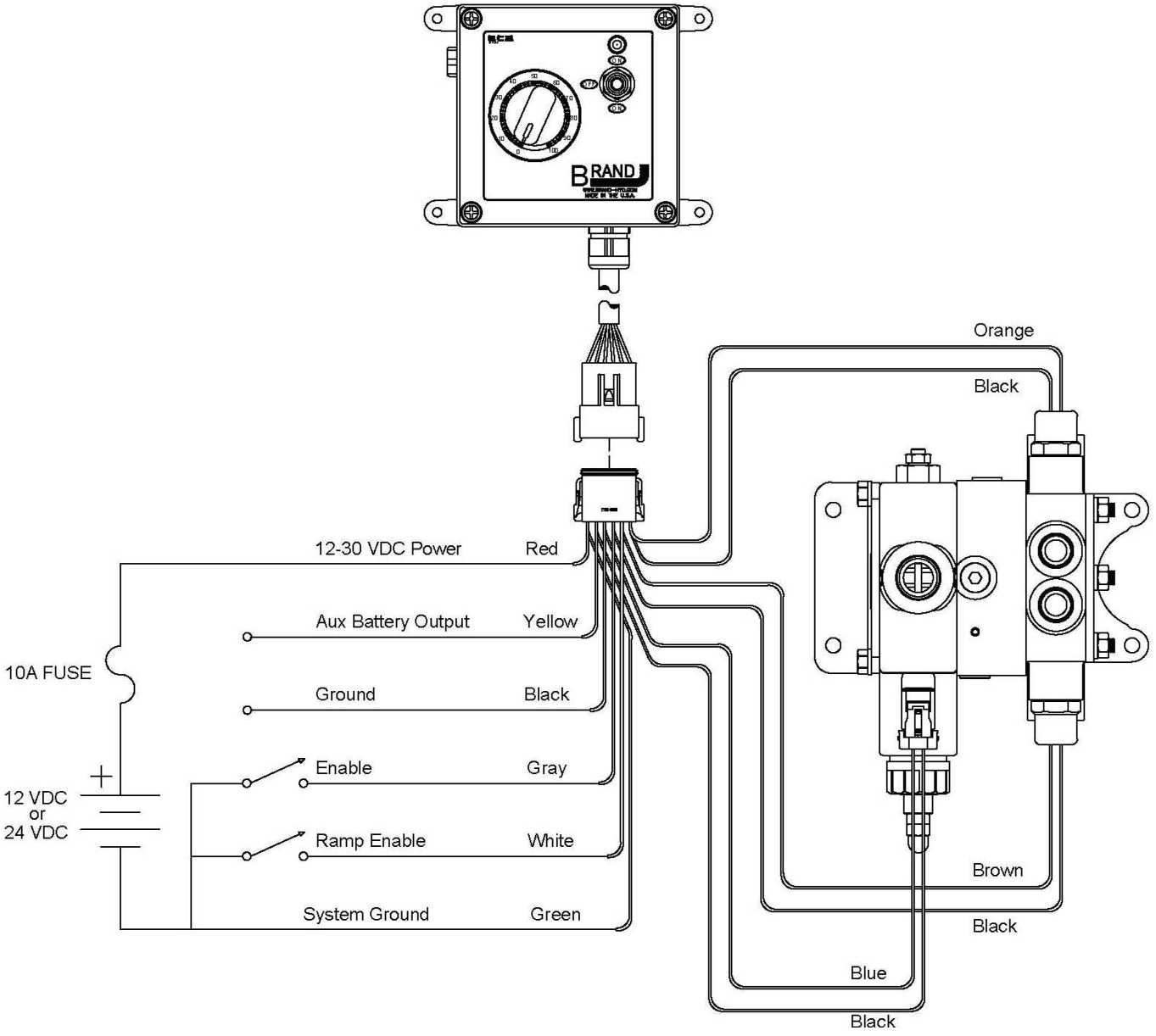
TYPICAL SYSTEM CONFIGURATION: EC20200



NOTE: Brand Hydraulics recommends a 10 amp fuse be placed within 18 inches of this controls power source. The fuse and power source are customer supplied parts. Also, ensure that all unused wires are capped, and electrically isolated from each other and ground.

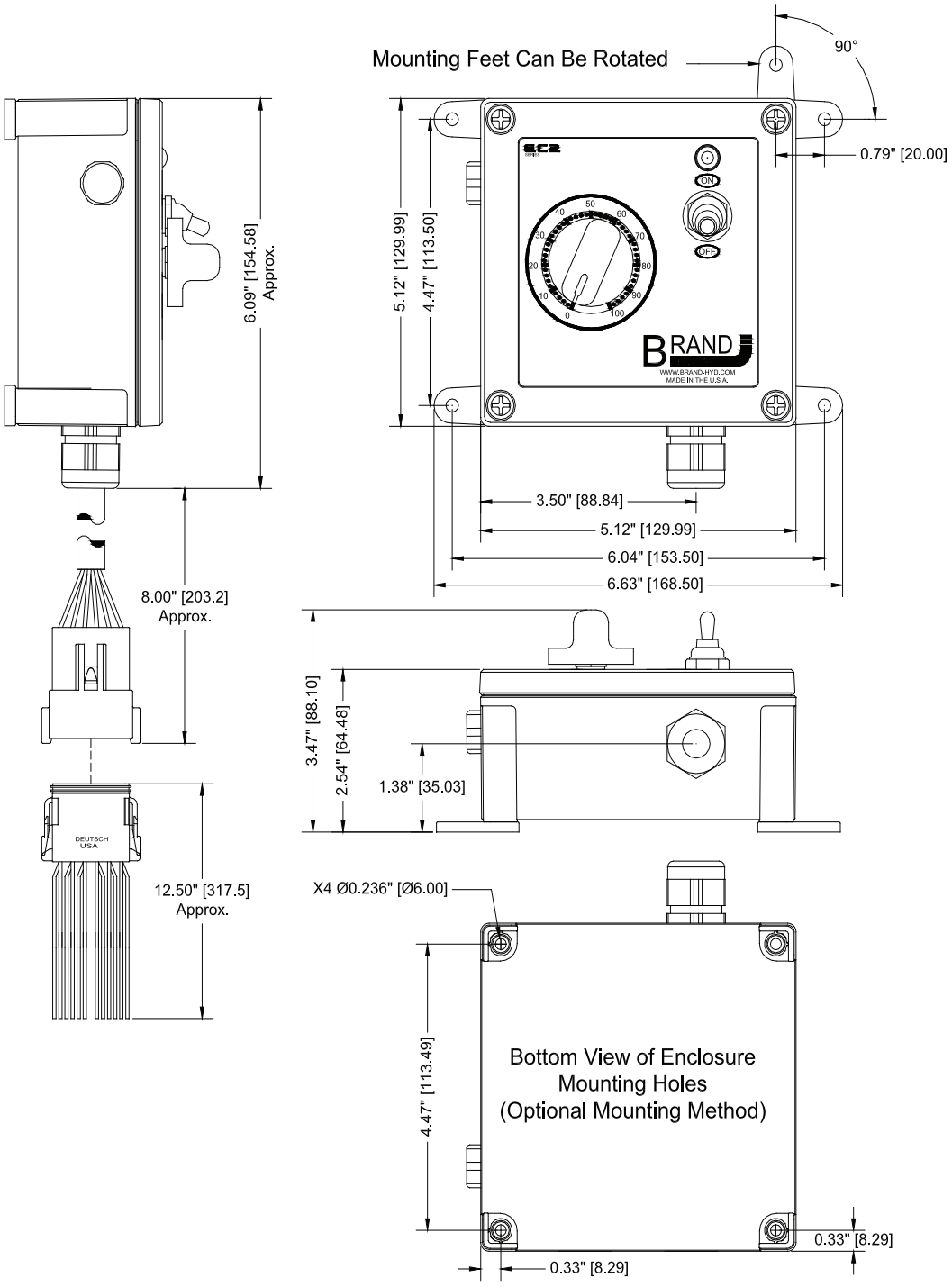
EC20200 Potentiometer Control

TYPICAL SYSTEM CONFIGURATION: EC20201 or EC20202



NOTE: Brand Hydraulics recommends a 10 amp fuse be placed within 18 inches of this controls power source. The fuse and power source are customer supplied parts. Also, ensure that all unused wires are capped, and electrically isolated from each other and ground.

DIMENSIONAL DATA: inches & [millimeters] EC20200, EC20201, EC20202



EC20200 Potentiometer Control

ADJUSTMENTS:

Minimum output or zero setting	Clockwise rotation increases minimum output 0 - 1.5 Amps
Maximum output	Clockwise rotation increases maximum output 0.05 - 2 Amps Maximum output will always be 50 mA greater then the minimum output
Ramping Down, or Fall Time	Clockwise rotation increases ramp time 0.1 - 12 Seconds
Ramping Up, or Rise Time	Clockwise rotation increases ramp time 0.1 - 12 Seconds

ADJUSTMENT PROCEDURE:

Adjustments are made by turning a trim pot screw. The trimmers are 25 turn, end to end devices. The trimmers have a built in slip clutches so over rotations do not damage them. It may be necessary to turn the adjustment screw several turns to observe a change in output. Start by adjusting the min output, and then adjust the max output to the desired level. The best way to fine tune adjustments is to observe the function response or speed. It is important to make adjustments in the following order.

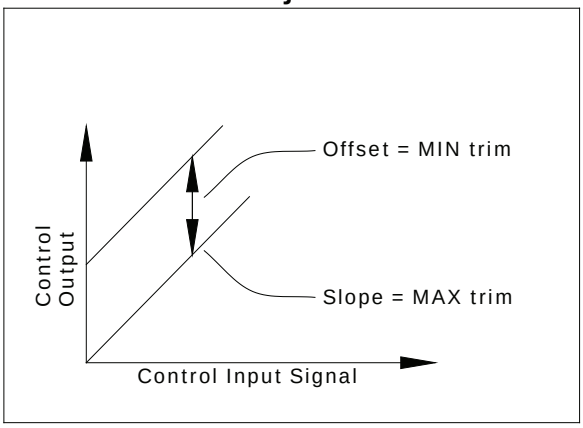
1. Minimum output: Start by setting the master Potentiometer or input signal to zero. Turn the trimmer clockwise until the function begins to move. Now turn the trimmer back counter clockwise, one full rotation past the point of any visible movement.

2. Maximum output: Start by setting the master Potentiometer to the 100 position on the dial. Turn the trim pot counter clockwise to decrease function speed. Turn the trim pot clockwise to increase function speed. Function maximum speed will be limited to the max flow capabilities of your hydraulic system. Do not rotate the trim pot past the point of an observable increase in function speed.

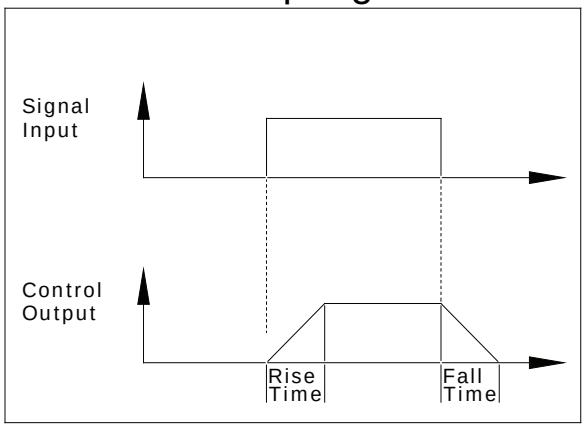
3. Ramp up: This feature changes how quickly the valve can open. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay.

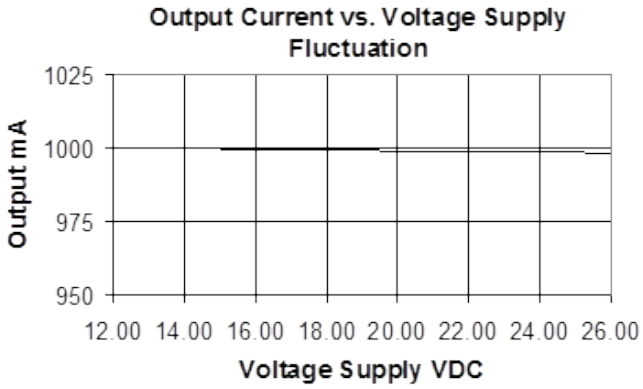
4. Ramp down: This Feature changes how quickly the valve can close. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay. Use discretion when making this adjustment, this will affect how quickly your function stops.

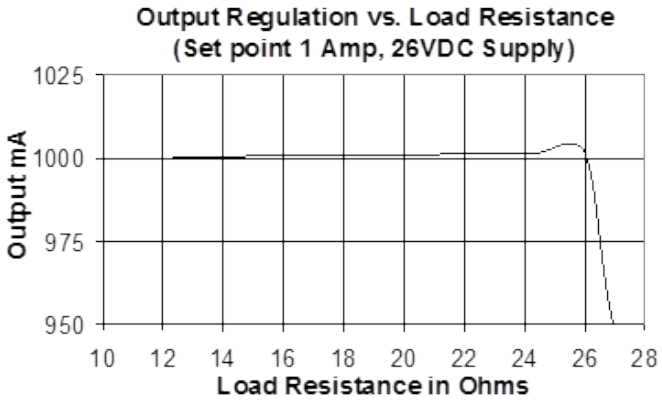
MIN/MAX Adjustments

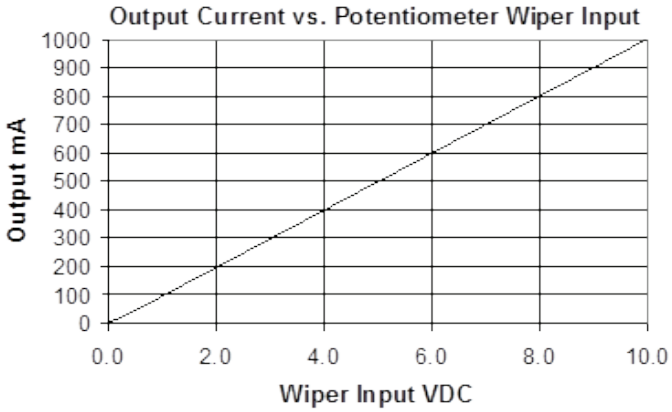


Ramping









NOTE: Unless stated otherwise the above readings were taken at 25°C, with control connected to a 14.6V supply, and the output was set for 1 amp.

EC20200 Potentiometer Control

PARTS AND ACCESSORIES:

E1071……...Potentiometer seal nut
E1466……...Toggle switch, DPDT, ON-OFF-ON, #6 screw terminals
E1467……...Toggle switch, DPDT, (ON)-OFF-(ON), #6 screw terminals
E1747……...Toggle switch, SPST, ON-NONE-OFF, #6 screw terminals
E1844……...Switch boot seal, red
E1848……...Knob, black w/ blue pointer
E1902……...Mounting feet kit, includes 4 feet and 4 screws
E1907……...Water proof pressure and vapor release vent
E1908……...Vent lock nut
E1913……...Output Cable, 12-contact flying lead connector assembly, B-Key, 12 – 12” leads
E1922……...Potentiometer assembly 10K Ohm, 2 Watt, w/ 5-1/2” leads

Contact your local Brand Hydraulics distributor for pricing.

WARNING:

- All used and unused wires should be secured and electrically isolated from each other and any other possible connections. Not doing so could result in personnel injury, fire, or even death. If you have questions regarding installation consult with your distributor, the factory or an electronic technician.

CAUTION:

- Only mount the EC20200 on flat surfaces. Mounting to uneven surfaces can cause mounting feet to break.
- Not designed for use in AC voltage systems. Use an AC to DC power supply consult factory for appropriate sizing.
- Values and ranges stated in the General Specifications and other areas of this data sheet are Absolute Maximum Ratings. Absolute Maximum Ratings indicate limits beyond which this device should not be used or damage to the device may occur. Operating Ratings and Ranges indicate conditions for which the device is functional. Devices operated beyond the Absolute Maximum Ratings and Ranges may void the devices warranty.
- Terminal block 2 pin 6 is to be used for the potentiometers ground only. Never use a potentiometer with a resistance lower than 2K Ohms. The resulting damages caused by excessive currents will not be repaired under warranty.
- Never apply voltage to the 4-20 mA signal input terminal. Never apply more than 5 V to the 0-5V signal input terminal. Never apply more than 10V to the 0-10V and potentiometer wiper input terminals. Doing so will void the controls warranty.

BRAND HYDRAULICS Co.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

Sealed Interface Control

EC20300

APPLICATION:

The EC20300 conveniently interfaces a industry standard signals 4-20mA, 0-5V or 0-10V with proportional solenoid valve.

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

EC20300 Sealed Interface Control

FEATURES:

- Weather tight control package.
- Pulse Width Modulated output.
- Waterproof altitude pressure and vapor release vent.
- Protected against reverse polarity, short circuit, and over voltage conditions.
- Current controlled output, maintains output current regardless of supply voltage and coil resistance variations.
- On board proportional indicators for input signal and output signal. Also includes an on/off power and potentiometer status indicator.
- Two Enable lines are provided, one with adjustable soft stop, both with adjustable soft start.
- Independent ramp adjustments up and down, 0.1 -12 seconds.
- Minimum and Maximum current adjustment for fine tuning the outputs span.
- Wide voltage supply range 12-30 VDC, one control for 12 or 24VDC systems.

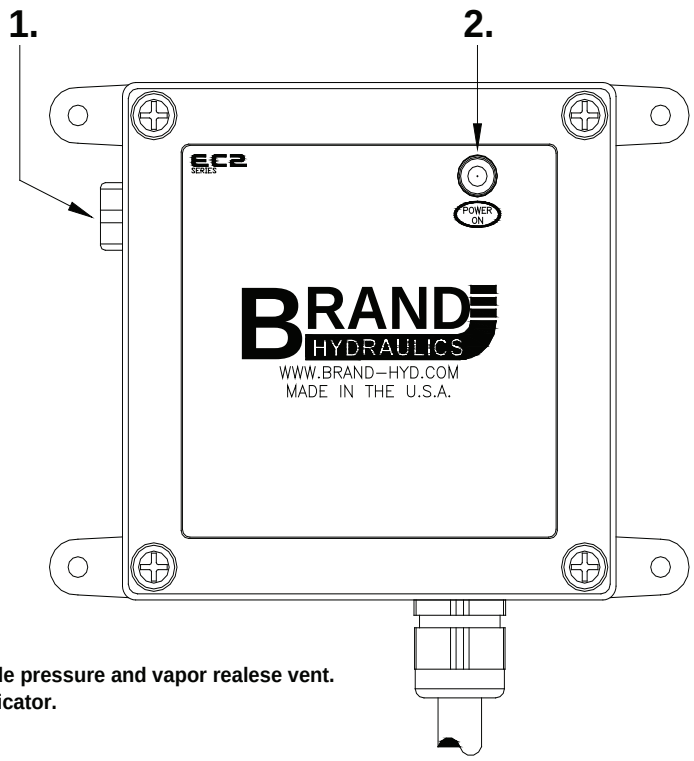
DESCRIPTION:

The EC20300 has been designed to meet the various requirements of mobile and industrial hydraulic control applications. EC20300 controls are versatile, cost effective and easily integrated into new or pre-existing designs. Much of this is a result of the unique ability each card has to accept 4 different signals. The EC20300 can accept any of the following input types: Potentiometer, 0-10V, 0-5V, or 4-20mA. The control takes these signals and converts them into a PWM output suitable for a Brand EFC-Series valve or other proportional valves that meet the proper specifications.

SPECIFICATIONS:

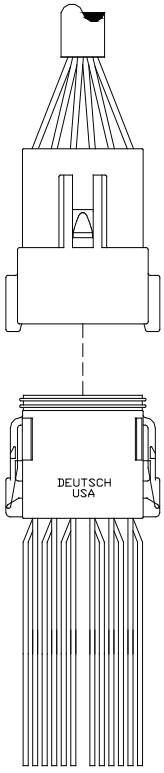
Voltage Supply	12-30 VDC
PWM Output Current	2.0 Amps Max Continuous
PWM Output Description	PWM , Pulse Width Modulation, 0-100% Duty cycle
PWM Output Frequency	107Hz +/- 5 Hertz
Environmental Ratings	IP66 / NEMA 4
Operating Temperature	-40°C - 85°C (-40°F - 185°F)
Storage Temperature	-40°C - 85°C (-40°F - 185°F)

CONTROL LAYOUT:



Functions

1. Waterproof altitude pressure and vapor realese vent.
2. Master power indicator.



E1947 Output Cable

Pin 1, Wire #1, Positive 12-30 VDC Supply Input
Pin 2, Wire #2, 4-20 mA Input
Pin 3, Wire #3, 0-5 Volt Input
Pin 4, Wire #4, 0-10 Volt Input
Pin 5, Wire #5, Signal Ground
Pin 6, Wire #6, 10 Volt Reference
Pin 7, Wire #7, Potentiometer Wiper Input
Pin 8, Wire #8, Potentiometer Ground
Pin 9, Wire #9, Enable Input
Pin 10, Wire #10, Positive EFC Output
Pin 11, Wire #11, Ground
Pin 12, Wire Green/Yellow, System Ground

E1914 Mating Output Cable

Pin 1, Red Wire, Positive 12-30 VDC Supply Input
Pin 2, Yellow Wire, 4-20 mA Input
Pin 3, Violet Wire, 0-5 Volt Input
Pin 4, Gray Wire, 0-10 Volt Input
Pin 5, Black Wire, Signal Ground
Pin 6, Orange Wire, 10 Volt Reference
Pin 7, White Wire, Potentiometer Wiper Input
Pin 8, Brown Wire, Potentiometer Ground
Pin 9, Pink Wire, Enable Input
Pin 10, Blue Wire, Positive EFC Output
Pin 11, Black Wire, EFC Ground
Pin 12, Green Wire, System Ground

Brand P/N: E1947

Deutsch Connector P/Ns:
Receptacle Body: DT04-12PB-E004
Secondary Wedge: W12P
Terminals, Male: 0460-202-16141

Brand P/N: E1914

Deutsch Connector P/Ns:
Plug Body: DT06-12SB-P012
Secondary Wedge: W12S-P012
Terminals, Female: 0462-201-16141
Wire: GXL Cross-Link, 16-AWG

EC20300 Sealed Interface Control

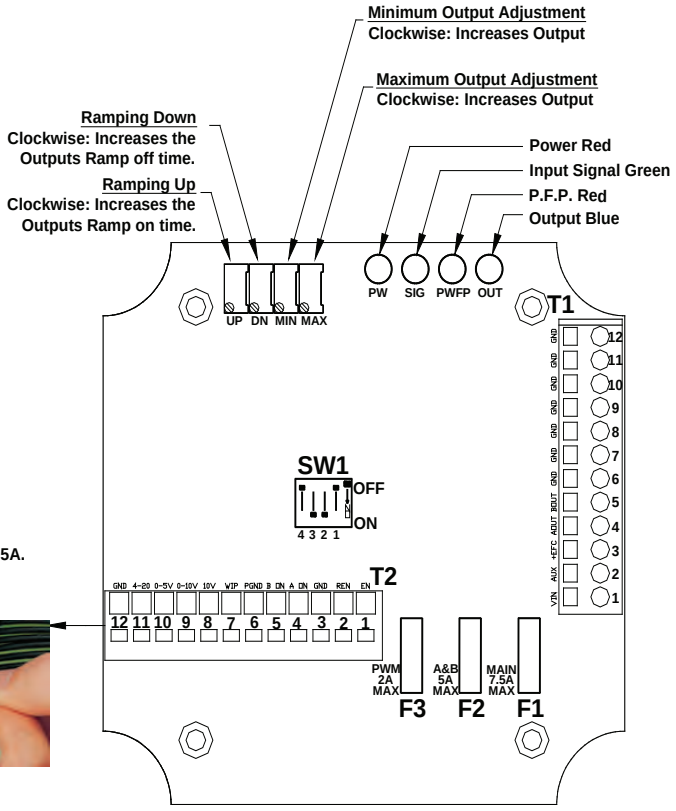
INTERNAL LAYOUT:

Power LED
LED indicates when board has DC power present. LED turns off when the enable input becomes active (switched low).

Input Signal LED
Proportional to the level of input signal.

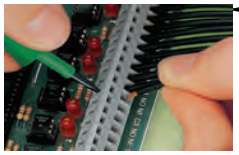
Output Signal LED
Proportional to the level of output current.

P.F.P. Potentiometer Fault Protection
A saftey feature: P.F.P will shutdown the boards wiper input if the potentiometers ground becomes open or disconnected.



Terminal Block Wiring

T1
1. Positive 12-30 VDC Input
2. Auxiliary Supply Voltage output, Not to Exceed 2.5A.
3. Positive output for EFC
4. Output A positive output
5. Output B positive output
6. System Ground input
7. Ground
8. Ground
9. Ground
10. Ground
11. Ground
12. Ground



T2
1. Enable input, apply a ground to disable the board or leave open for normal operation.
2. Ramping Enable input, apply a ground to disable the board or leave open for normal operation.
3. Ground
4. Output A activation pin. Sending 6-30VDC to this pin will activate the A output (T1/pin4).
5. Output B activation pin. Sending 6-30VDC to this pin will activate the B output (T1/pin5).
6. Ground for Potentiometer. (Note: Wiper input will not function without the potentiometer being grounded at this pin.)
7. Potentiometer wiper Input, Not to Exceed 10V. Input Impedance is 10K Ohms.
8. 10V Reference for potentiometer.
9. Positive 0-10V signal input, Not to Exceed 10V. Input Impedance is 10K Ohms.
10. Positive 0-5V signal input, Not to Exceed 5V. Input Impedance is 10K Ohms.
11. Positive 4-20mA input. Current input only do not apply voltage to this pin. Input Impedance is 250 Ohms.
12. Signal Ground, Negative loop return.

Dip Switches

1. ON: EFC output will be active when power is applied to the PCB.
1. OFF: EFC output will be active when power is applied to the A ON or B ON input.

2. ON: Applying power to the A ON input activates the EFC output and turns the Coil A output on.
2. OFF: Applying power to the A ON input only turns the Coil A output on.

3. ON: Applying power to the B ON input activates the EFC output and turns the Coil B output on.
3. OFF: Applying power to the B ON input only turns the Coil B output on.

4. Not Used

Factory Settings

Ramping Up, set for minimum delay.
Ramping Down, set for minimum delay.
Minimum Output, Set for 0.2 Amp.
Maximum Ouput, Set for 1.00 Amp.

Factory Switch Settings

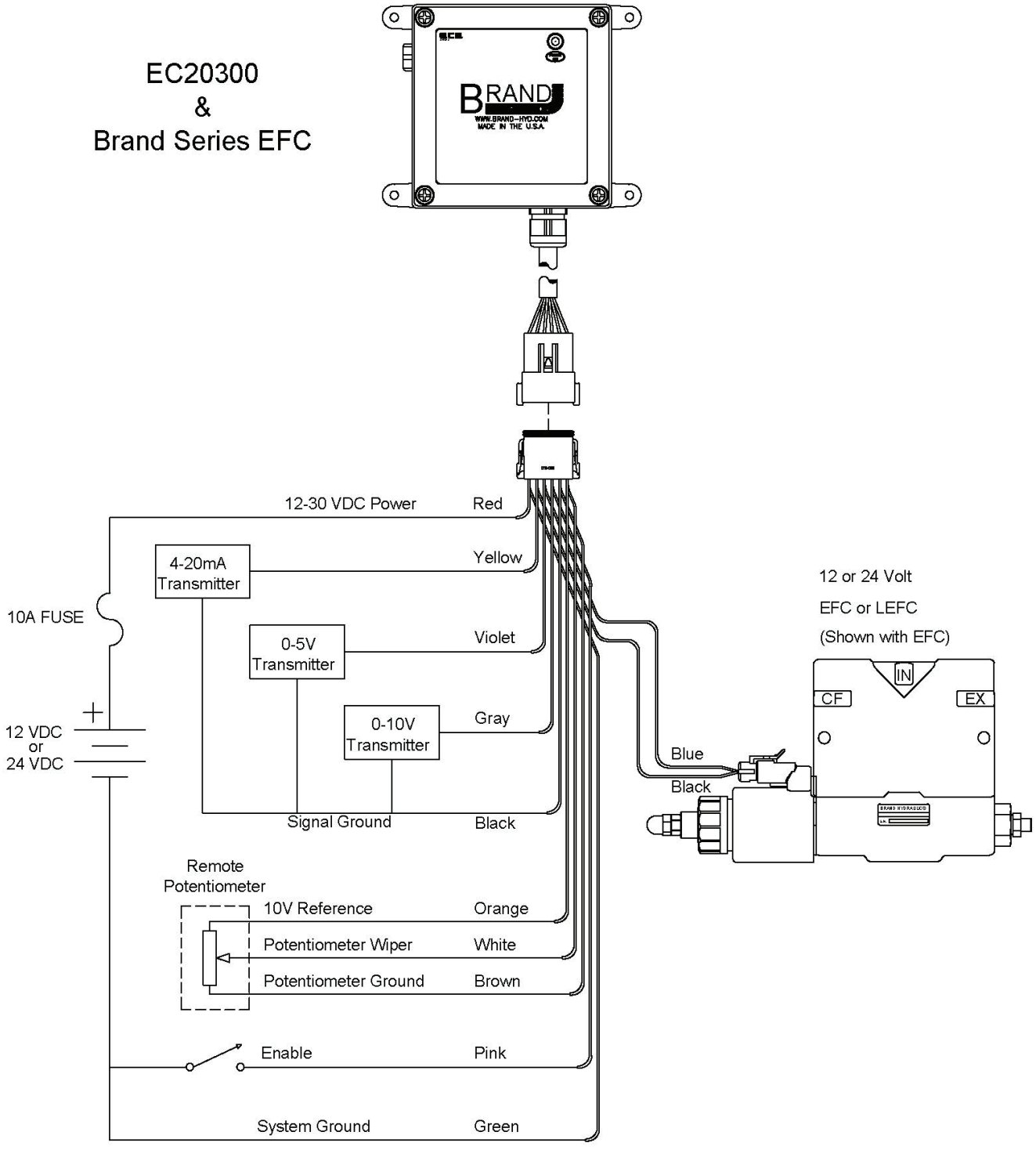
1. Off
2. On
3. On
4. Not used

Fuses

F1. Main fuse, 7.5A max, ATM-7-1/2.
F2. Coil A and B Output fuse, 5A max, ATM-5
F3. EFC output fuse, 2A max, ATM-2.

TYPICAL SYSTEM CONFIGURATION:

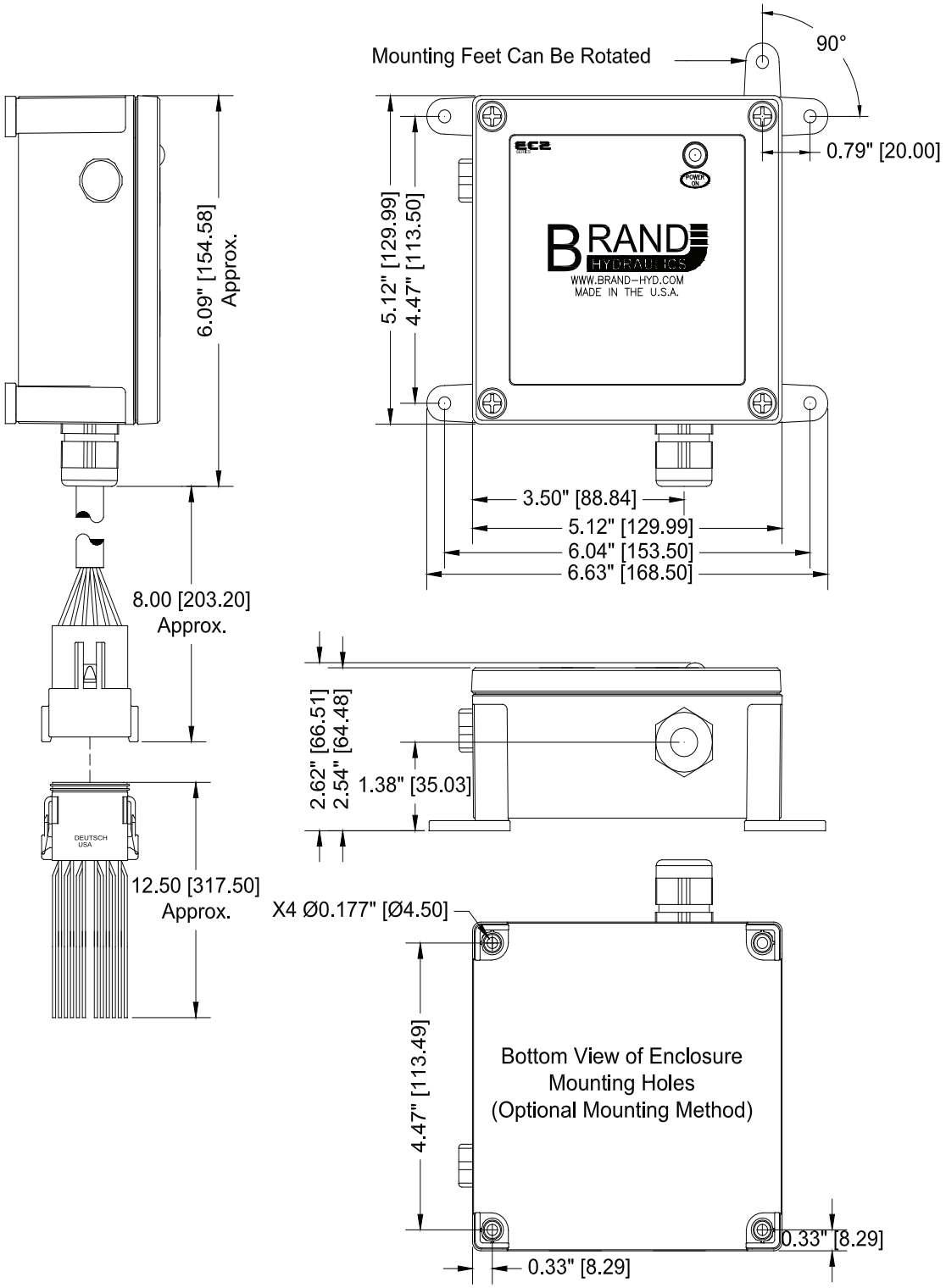
EC20300
&
Brand Series EFC



NOTE: Brand Hydraulics recommends a 10 amp fuse be placed within 18 inches of this controls power source. The fuse and power source are customer supplied parts. Also, ensure that all unused wires are capped, and electrically isolated from each other and ground.

EC20300 Sealed Interface Control

DIMENSIONAL DATA: inches & [millimeters]



INPUT SPECIFICATIONS:

Potentiometer	
Wiper Input Impedance	10K Ohms
Wiper Input range	0-10V
Potentiometer guidelines	
Resistance	2K-10K Ohms
Minimum Power rating	1/8th Watt
0-10 Volt Input	Terminal block 2, Pin 9
Input Impedance	10K Ohms
Step response	Output current will equal: ((Input voltage x 0.1) (max current - min current)) + (min current) For every volt of input, output will change 1/10 its full range.
0-5 Volt Input	Terminal block 2, Pin 10
Input Impedance	10K Ohms
Step response	Output current will equal: ((Input voltage x 0.2) (max current - min current)) + (min current) For every volt of input, output will change 1/5 its full range.
4-20mA Input	Terminal block 2, Pin 11
Input Impedance	250 Ohms
Step response	Output current will equal: ((Input current - 4mA) (0.0625) (max current - min current)) + (min current) For every milliamp of input, output will change 1/16 its full range.
Enable Input	When Enable is left open (high) the unit is operational. When the enable line is connected to ground (low) the board output immediately goes to 0 Amps.
Input Impedance	Greater than 1M Ohms
High state EN pin voltage	1.04V +/- 0.1V, Reading taken with a 40M Ohm Load
Source current while pulled low	5.11uA
Ramping Enable Input	When Enable is left open (high) the unit is operational. When the enable line is connected to ground (low) the board output ramps down to the minimum output setting at the rate set by ramp adjustments.
Input Impedance	5.444K Ohms
High state REN pin voltage	5.98V +/- 0.15V Reading taken with a 40M Ohm Load

EC20300 Sealed Interface Control

INPUT SPECIFICATIONS:

Source current while pulled low	5.11uA
Solid State Outputs (A & B) Input Specifications	A and B outputs are activated by applying power to the A on or the B on inputs located on Terminal Block 2, Pins 4 and 5.
Input Impedance	Greater than 20K Ohms
Output Off Input Voltage Range	0.0 – 1.1V
Output Undetermined (Unstable)	1.1 – 6.0V Caution, avoid input voltages that fall within this range.
Output On Input Voltage Range	6.0 – 30V
Solid State Outputs (A & B) Output Specifications	Terminal block 1, Pin 4 and Pin 5
Switched DC Output Current	2.5 Amps Max Continuous Each Output (A and B)
Switched DC Output Voltage	Voltage Out = Voltage Supply – 0.7 Volts

ADJUSTMENTS:

Minimum output or zero setting	Clockwise rotation increases minimum output 0 - 1.5 Amps
Maximum output	Clockwise rotation increases maximum output 0.05 - 2 Amps Maximum output will always be 50 mA greater then the minimum output
Ramping Down, or Fall Time	Clockwise rotation increases ramp time 0.1 - 12 Seconds
Ramping Up, or Rise Time	Clockwise rotation increases ramp time 0.1 - 12 Seconds

ADJUSTMENT PROCEDURE:

Adjustments are made by turning a trim pot screw. The trimmers are 25 turn, end to end devices. The trimmers have a built in slip clutches so over rotations do not damage them. It may be necessary to turn the adjustment screw several turns to observe a change in output. Start by adjusting the min output, and then adjust the max output to the desired level. The best way to fine tune adjustments is to observe the function response or speed. It is important to make adjustments in the following order.

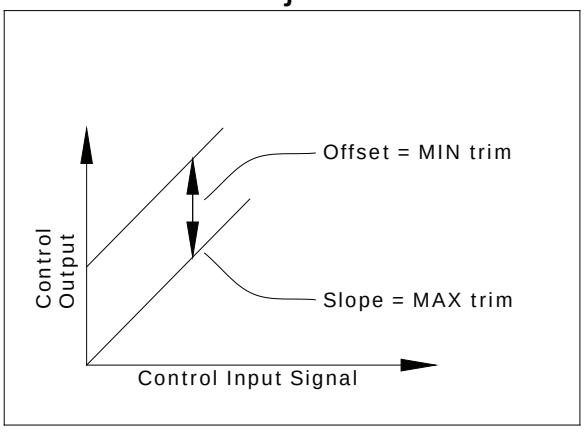
1. Minimum output: Start by setting the master Potentiometer or input signal to zero. Turn the trimmer clockwise until the function begins to move. Now turn the trimmer back counter clockwise, one full rotation past the point of any visible movement.

2. Maximum output: Start by setting the master Potentiometer to the 100 position on the dial. Turn the trim pot counter clockwise to decrease function speed. Turn the trim pot clockwise to increase function speed. Function maximum speed will be limited to the max flow capabilities of your hydraulic system. Do not rotate the trim pot past the point of an observable increase in function speed.

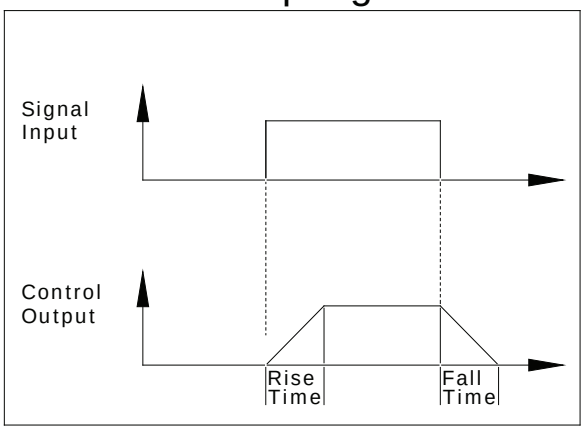
3. Ramp up: This feature changes how quickly the valve can open. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay.

4. Ramp down: This Feature changes how quickly the valve can close. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay. Use discretion when making this adjustment, this will affect how quickly your function stops.

MIN/MAX Adjustments



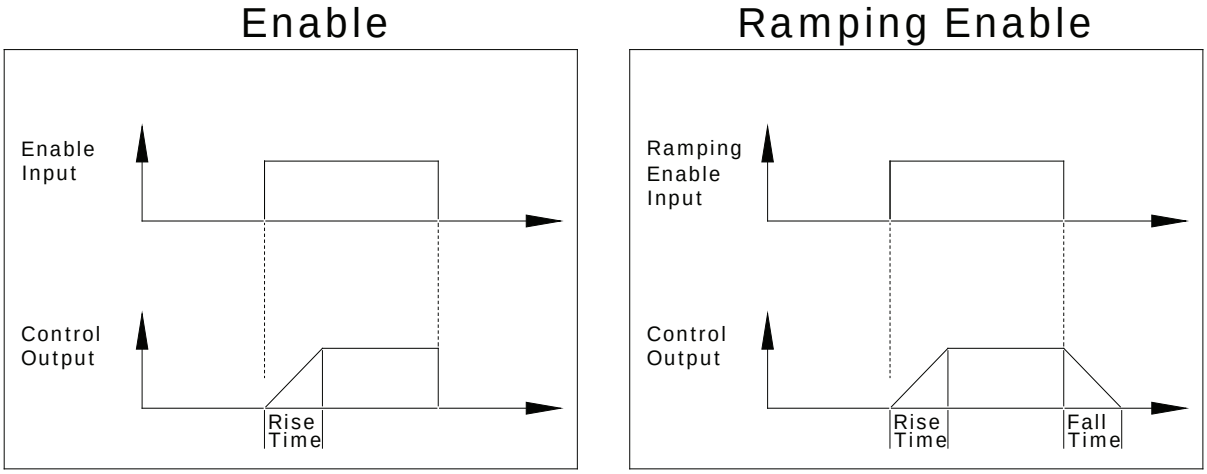
Ramping



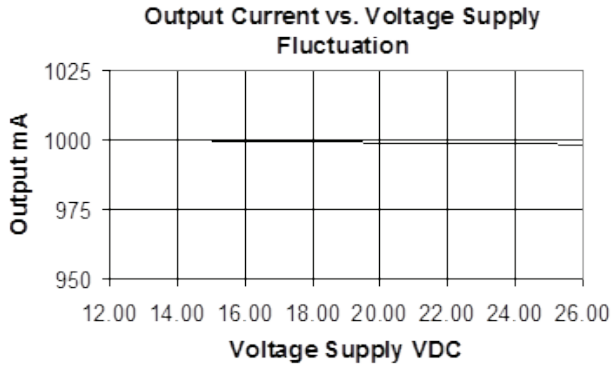
ENABLE INPUTS:

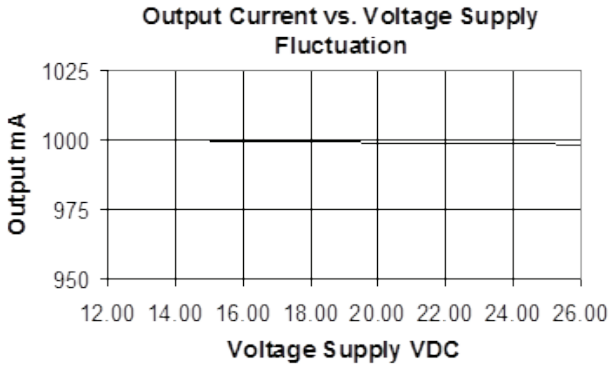
The Enable Inputs can be used to turn the controllers output on and off, without having to switch on/off the main power source. The EC20300 cards are supplied with two unique types of Enable inputs, EN and REN. When the EN line is switched to ground the control will go into sleep mode. It will be as if the controls power source has been turned off. When the EN line is switched back to its normal state, open to ground, the control output will again respond to user input. A soft start can be achieved using the controllers Ramp Up adjustment.

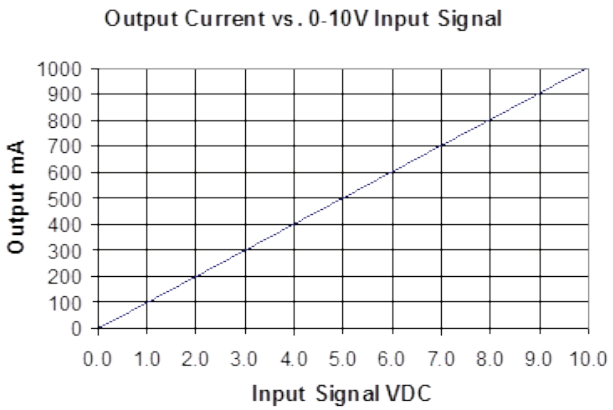
The Ramping enable input, REN, allows for soft start and soft stop enabling. The REN input is also activated by being switched to ground. When the REN is activated the control will respond as if the user input signal has been turned off and the controls output will ramp down to the set minimum output value. When the REN input is returned to its normal state the control output will ramp up to the output level that corresponds with the user input signal. Soft start ramp and Soft stop ramp times are set using the onboard trim pots that are labeled UP and DOWN.

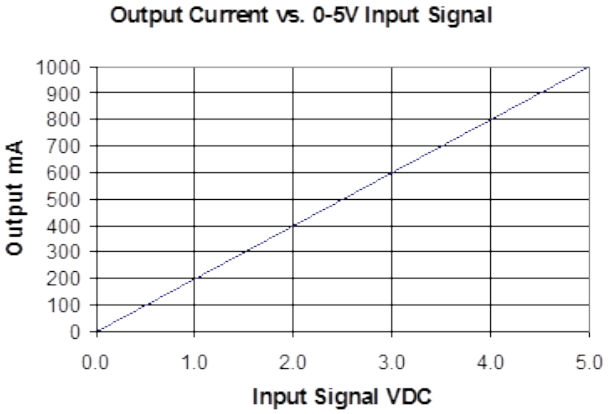


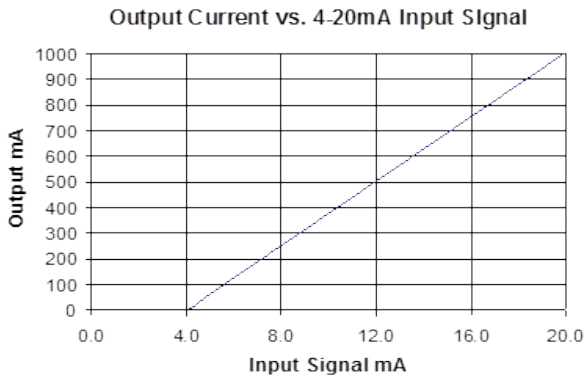
OUTPUTS:

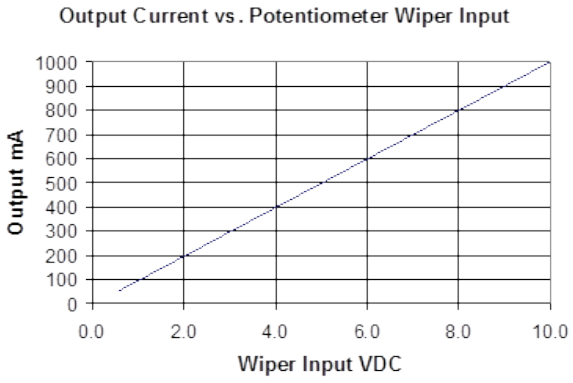












Note: Unless stated otherwise the above readings were taken at 25°C, with control connected to a 14.6V supply, and the output was set for 1 amp.

EC20300 Sealed Interface Control

PARTS AND ACCESSORIES:

E1803.....Potentiometer assembly 10K Ohm, 2 Watt, comes with 6" leads
E1048.....Potentiometer dial plate, 2.125" diameter
E1071.....Potentiometer seal nut
E1050.....Potentiometer knob, black with a light grey pointer
E1907.....Water proof pressure and vapor release vent
E1908.....Vent lock nut
E1902.....Mounting feet kit, includes 4 feet and 4 screws

Contact your local Brand Hydraulics distributor for pricing.

ATTENTION:

WARNING:

- All used and unused wires should be secured and electrically isolated from each other and any other possible connections. Not doing so could result in personnel injury, fire, or even death. If you have questions regarding installation consult with your distributor, the factory or an electronic technician.

CAUTION:

- Only mount the EC20300 on flat surfaces. Mounting to uneven surfaces can cause mounting feet to break.
- Not designed for use in AC voltage systems. Use an AC to DC power supply consult factory for appropriate sizing.
- Values and ranges stated in the General Specifications and other areas of this data sheet are Absolute Maximum Ratings. Absolute Maximum Ratings indicate limits beyond which this device should not be used or damage to the device may occur. Operating Ratings and Ranges indicate conditions for which the device is functional. Devices operated beyond the Absolute Maximum Ratings and Ranges may void the devices warranty.
- Terminal block 2 pin 6 is to be used for the potentiometers ground only. Never use a potentiometer with a resistance lower than 2K Ohms. The resulting damages caused by excessive currents will not be repaired under warranty.
- Never apply voltage to the 4-20 mA signal input terminal. Never apply more than 5 V to the 0-5V signal input terminal. Never apply more than 10V to the 0-10V and potentiometer wiper input terminals. Doing so will void the controls warranty.

BRAND HYDRAULICS Co.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

Joystick Control

EC20400

APPLICATION:

Proportionally control the speed and direction of hydraulic motors and cylinders. The EC20400 was designed primarily to be paired with a single section Brand Series 36 EFC, but other flow controls meeting the appropriate specifications may be used as well

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

EC20400 Joystick Control

FEATURES:

- Pulse Width Modulated output proportional to joystick deflection.
- Plug and Play stack valve control, includes a switched output for each side of the levers center position.
- Precise control in a low profile ergonomic design.
- Weather tight control package.
- Protected against reverse polarity, short circuit, and over voltage conditions.
- Current controlled output, maintains output current regardless of supply voltage and coil resistance variations.
- On board proportional indicators for input signal and output signal. Also includes an on/off power and joystick status indicator.
- Two Enable lines are provided, one with adjustable soft stop, both with adjustable soft start.
- Independent ramp adjustments up and down, 0.1 -12 seconds.
- Minimum and Maximum current adjustment for fine tuning the outputs span.
- Wide voltage supply range 12-30 VDC, one control for 12 or 24VDC systems.

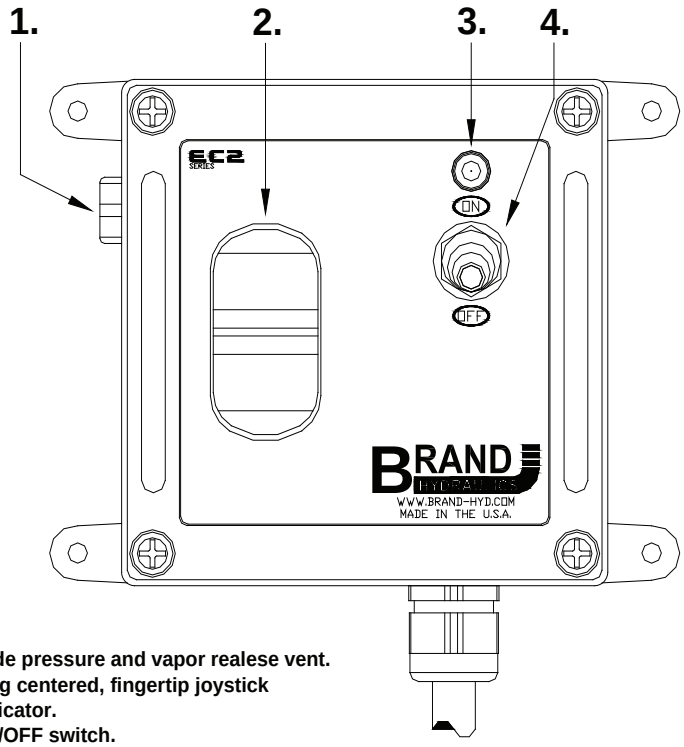
DESCRIPTION:

The EC20400 is a compact weatherproof joystick control built with high quality long life components that are designed for use in harsh environments. The control comes loaded with user friendly features that provide versatility without sacrificing ease of use.

SPECIFICATIONS:

Voltage Supply	12-30 VDC
PWM Output Current	2.0 Amps Max Continuous
PWM Output Description	PWM , Pulse Width Modulation, 0-100% Duty cycle
PWM Output Frequency	107Hz +/- 5 Hertz
Switched DC Output Current	2.5 Amps Max Continuous Each Output (A and B)
Switched DC Output Voltage	Voltage Out = Voltage Supply – 0.7 Volts
Environmental Ratings	IP66 / NEMA 4
Operating Temperature	-40°C - 85°C (-40°F - 185°F)
Storage Temperature	-40°C - 85°C (-40°F - 185° F)

CONTROL LAYOUT:



Functions

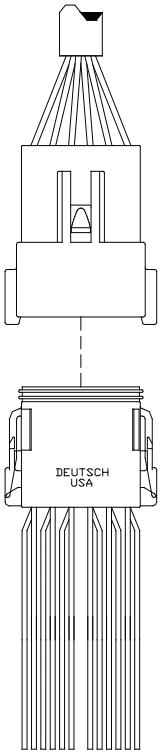
1. Waterproof altitude pressure and vapor realese vent.
2. Single-axis, spring centered, fingertip joystick
3. Master power indicator.
4. Master power ON/OFF switch.

E1948 Output Cable

Pin 1, Wire #1, Positive 12-30 VDC Supply Input
Pin 2, Wire #2, Auxiliary battery output
Pin 3, Wire #3, Ground
Pin 4, Wire #4, Enable Input
Pin 5, Wire #5, Ramping Enable Input
Pin 6, Wire #6, "A" Coil Output
Pin 7, Wire #7, Ground
Pin 8, Wire #8, "B" Coil Output
Pin 9, Wire #9, Ground
Pin 10, Wire #10, Positive EFC Output
Pin 11, Wire #11, Ground
Pin 12, Wire Green/Yellow, System Ground

E1915 Mating Output Cable

Pin 1, Red Wire, Positive 12-30 VDC Supply Input
Pin 2, Yellow Wire, Auxiliary battery output
Pin 3, Black, Ground
Pin 4, Gray Wire, Enable Input
Pin 5, White Wire, Ramping Enable Input
Pin 6, Orange Wire, "A" Coil Output
Pin 7, Black Wire, Ground
Pin 8, Brown Wire, "B" Coil Output
Pin 9, Black Wire, Ground
Pin 10, Blue Wire, Positive EFC Output
Pin 11, Black Wire, Ground
Pin 12, Green Wire, System Ground



Brand P/N: E1948
Deutsch Connector P/Ns:
Receptacle Body: DT04-12PB-E004
Secondary Wedge: W12P
Terminals, Male: 0460-202-16141

Brand P/N: E1915
Deutsch Connector P/Ns:
Plug Body: DT06-12SB-P012
Secondary Wedge: W12S-P012
Terminals, Female: 0462-201-16141
Wire: GXL Cross-Link, 16-AWG

EC20400 Joystick Control

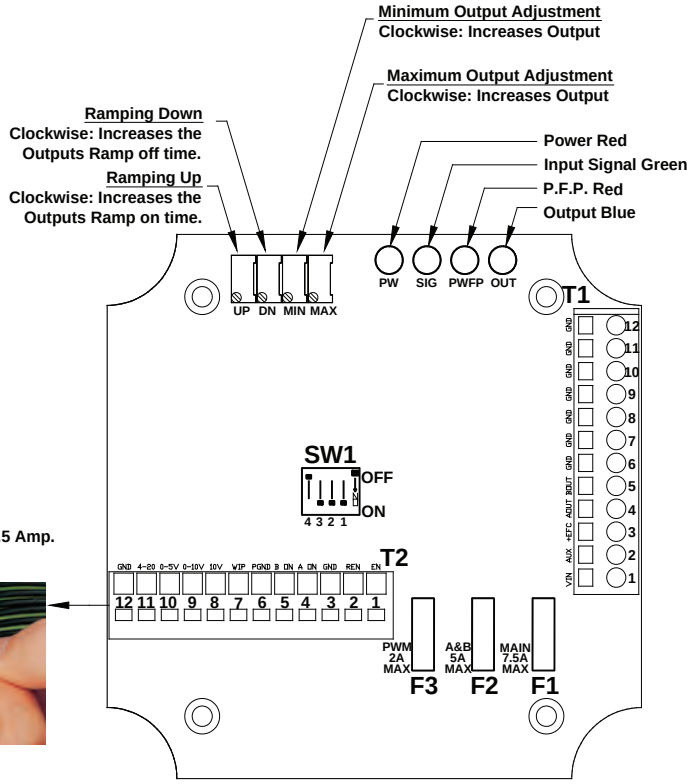
INTERNAL LAYOUT:

Power LED
LED indicates when board has DC power present. LED turns off when the enable input becomes active (switched low).

Input Signal LED
Proportional to the level of input signal.

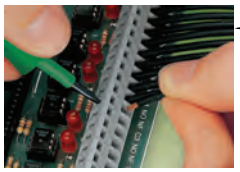
Output Signal LED
Proportional to the level of output current.

P.F.P. Potentiometer Fault Protection
A saftey feature: P.F.P will shutdown the boards wiper input if the potentiometers ground becomes open or disconnected.



Terminal Block Wiring

T1
1. Positive 12-30 VDC Input
2. Auxiliary Supply Voltage output, Not to Exceed 2.5 Amp.
3. Positive output for EFC
4. Output A positive output
5. Output B positive output
6. System Ground input
7. Ground
8. Ground
9. Ground
10. Ground
11. Ground
12. Ground



T2
1. Enable input, apply a ground to disable the board or leave open for normal operation.
2. Ramping Enable input, apply a ground to disable the board or leave open for normal operation.
3. Ground
4. Output A activation pin. Sending 6-30VDC to this pin will activate the A output (T1/pin4).
5. Output B activation pin. Sending 6-30VDC to this pin will activate the B output (T1/pin5).
6. Ground for Potentiometer. (Note: Wiper input will not function without the potentiometer being grounded at this pin.)
7. Potentiometer wiper Input, Not to Exceed 10V. Input Impedance is 10K Ohms.
8. 10V Reference for potentiometer.
9. Positive 0-10V signal input, Not to Exceed 10V. Input Impedance is 10K Ohms.
10. Positive 0-5V signal input, Not to Exceed 5V. Input Impedance is 10K Ohms.
11. Positive 4-20mA input. Current input only do not apply voltage to this pin. Input Impedance is 250 Ohms.
12. Signal Ground, Negative loop return.

Dip Switches

1. ON: EFC output will be active when power is applied to the PCB.
1. OFF: EFC output will be active when power is applied to the A ON or B ON input.

2. ON: Applying power to the A ON input activates the EFC output and turns the Coil A output on.
2. OFF: Applying power to the A ON input only turns the Coil A output on.

3. ON: Applying power to the B ON input activates the EFC output and turns the Coil B output on.
3. OFF: Applying power to the B ON input only turns the Coil B output on.

4. Not Used

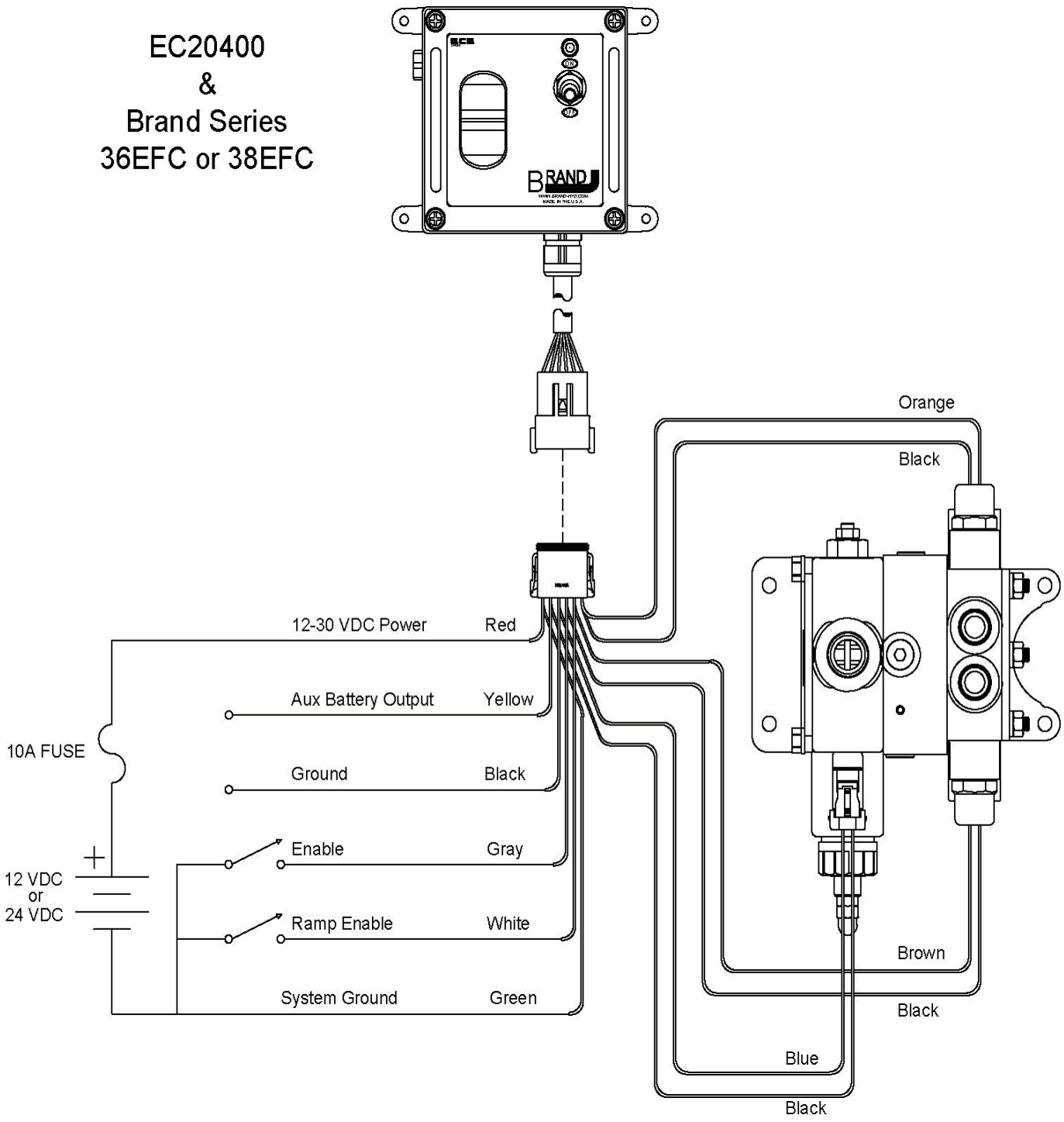
Factory Settings
Ramping Up, set for minimum delay.
Ramping Down, set for minimum delay.
Minimum Output, Set for 0.2 Amp.
Maximum Ouput, Set for 1.00 Amp.

Factory Switch Settings
1. On
2. On
3. On
4. Not used

Fuses
F1. Main fuse, 7.5A max, ATM-7-1/2.
F2. Coil A and B Output fuse, 5A max, ATM-5
F3. EFC output fuse, 2A max, ATM-2.

TYPICAL SYSTEM CONFIGURATION:

EC20400
&
Brand Series
36EFC or 38EFC

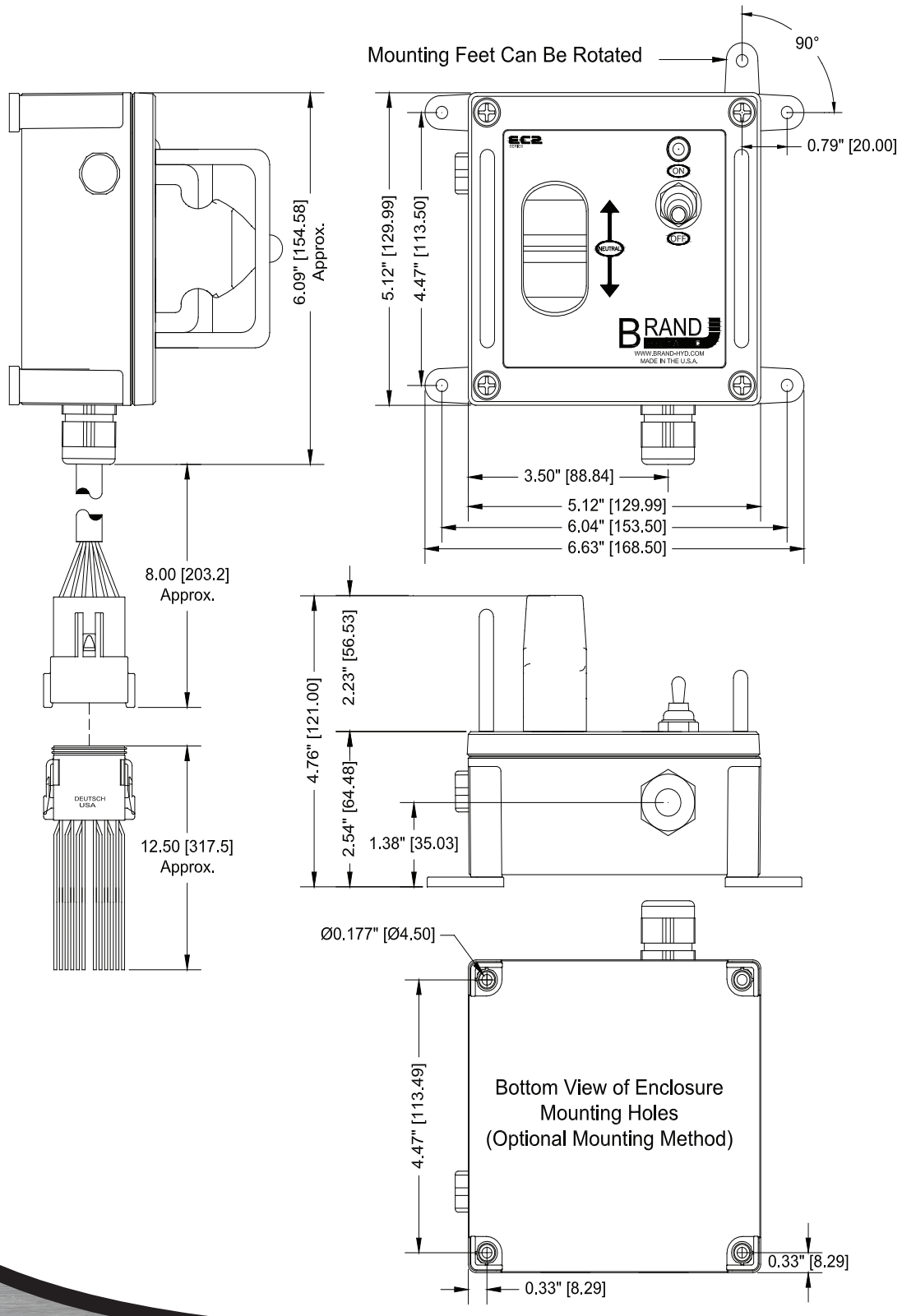


NOTE: Brand Hydraulics recommends a 10 amp fuse be placed within 18 inches of this controls power source. The fuse and power source are customer supplied parts. Valve is sold separately.

NOTE: Ensure that all unused wires are capped, and electrically isolated from each other and ground.

EC20400 Joystick Control

DIMENSIONAL DATA: inches & [millimeters]



ADJUSTMENTS:

Minimum output or zero setting	Clockwise rotation increases minimum output 0 - 1.5 Amps
Maximum output	Clockwise rotation increases maximum output 0.05 - 2 Amps Maximum output will always be 50 mA greater then the minimum output
Ramping Down, or Fall Time	Clockwise rotation increases ramp time 0.1 - 12 Seconds
Ramping Up, or Rise Time	Clockwise rotation increases ramp time 0.1 - 12 Seconds

ADJUSTMENT PROCEDURE:

Adjustments are made by turning a trim pot screw. The trimmers are 25 turn, end to end devices. The trimmers have a built in slip clutches so over rotations do not damage them. It may be necessary to turn the adjustment screw several turns to observe a change in output. Start by adjusting the min output, and then adjust the max output to the desired level. The best way to fine tune adjustments is to observe the function response or speed. It is important to make adjustments in the following order.

1. Minimum output: Start by setting the master Potentiometer or input signal to zero. Turn the trimmer clockwise until the function begins to move. Now turn the trimmer back counter clockwise, one full rotation past the point of any visible movement.

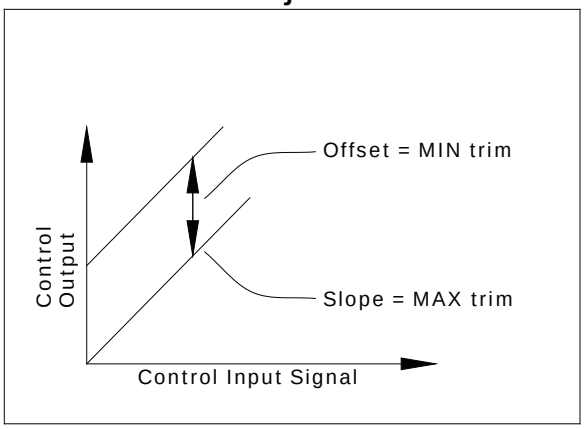
2. Maximum output: Start by setting the master Potentiometer to the 100 position on the dial. Turn the trim pot counter clockwise to decrease function speed. Turn the trim pot clockwise to increase function speed. Function maximum speed will be limited to the max flow capabilities of your hydraulic system. Do not rotate the trim pot past the point of an observable increase in function speed.

3. Ramp up: This feature changes how quickly the valve can open. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay.

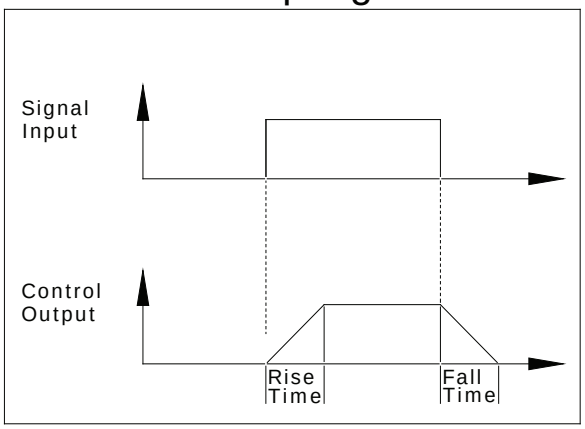
4. Ramp down: This Feature changes how quickly the valve can close. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay. Use discretion when making this adjustment, this will affect how quickly your function stops.

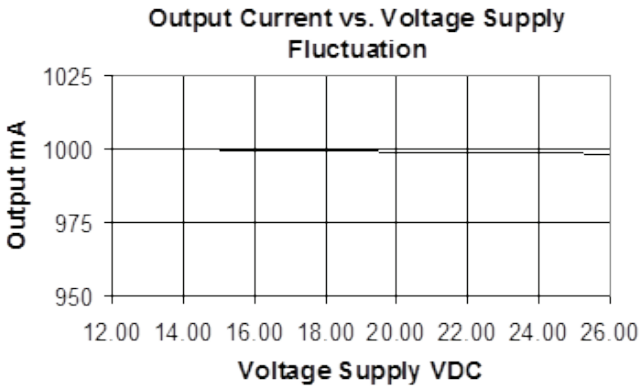
EC20400 Joystick Control

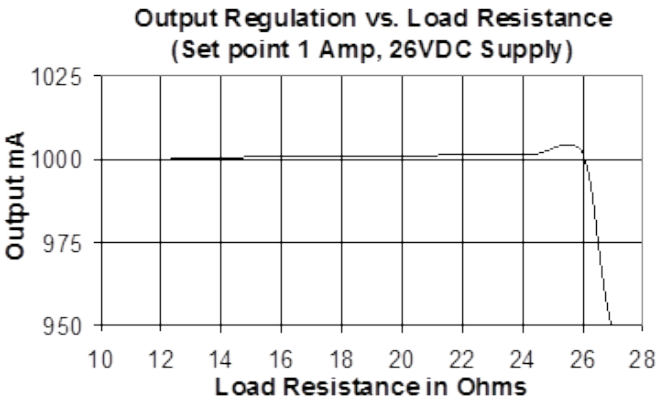
MIN/MAX Adjustments

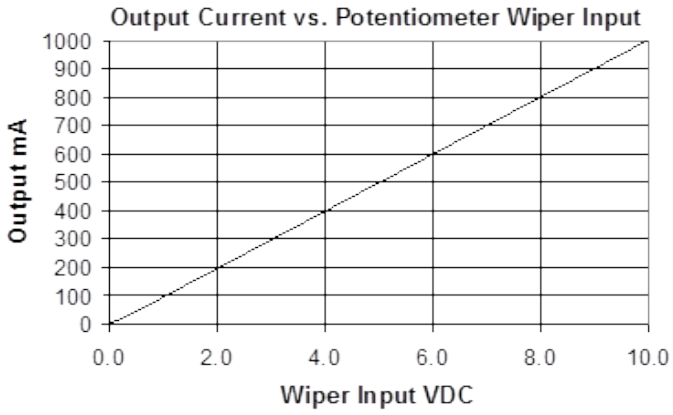


Ramping









NOTE: Unless stated otherwise the above readings were taken at 25°C, with control connected to a 14.6V supply, and the output was set for 1 amp.

PARTS AND ACCESSORIES:

E1907……..Water proof pressure and vapor release vent
E1908……...Vent lock nut
E1747……...Toggle switch, SPST, ON-NONE-OFF, #6 screw terminals
E1844……..…Switch boot seal, red
E1902……...……Mounting feet kit, includes 4 feet and 4 screws

Contact your local Brand Hydraulics distributor for pricing.

ATTENTION:

WARNING:

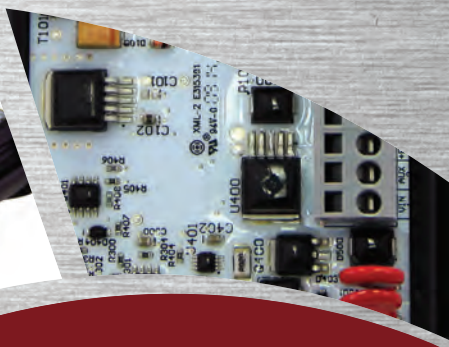
- All used and unused wires should be secured and electrically isolated from each other and any other possible connections. Not doing so could result in personnel injury, fire, or even death. If you have questions regarding installation consult with your distributor, the factory or an electronic technician.

CAUTION:

- Only mount the EC20400 on flat surfaces. Mounting to uneven surfaces can cause mounting feet to break.
- Not designed for use in AC voltage systems. Use an AC to DC power supply consult factory for appropriate sizing.
- Values and ranges stated in the General Specifications and other areas of this data sheet are Absolute Maximum Ratings. Absolute Maximum Ratings indicate limits beyond which this device should not be used or damage to the device may occur. Operating Ratings and Ranges indicate conditions for which the device is functional. Devices operated beyond the Absolute Maximum Ratings and Ranges may void the devices warranty.
- Terminal block 2 pin 6 is to be used for the potentiometers ground only. Never use a potentiometer with a resistance lower than 2K Ohms. The resulting damages caused by excessive currents will not be repaired under warranty.
- Never apply voltage to the 4-20 mA signal input terminal. Never apply more than 5 V to the 0-5V signal input terminal. Never apply more than 10V to the 0-10V and potentiometer wiper input terminals. Doing so will void the controls warranty.

It is the purchaser's responsibility to determine the suitability of any Brand Hydraulics product for an intended application, and to insure that it is installed in accordance with all federal, state, local, private safety, health regulations, and codes and standards. Due to the unlimited variety of machines, vehicles, and equipment on which our products can be used, it is impossible for Brand Hydraulics to offer expert advice on the suitability of a product for a specific application. We believe that it is our customer's responsibility to undertake the appropriate testing and evaluation to prevent injury to the end user.

All product, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.



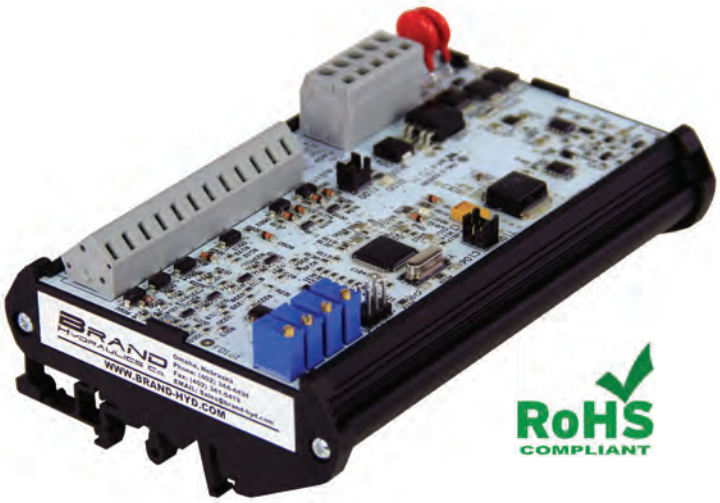
BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

Digital Interface Card

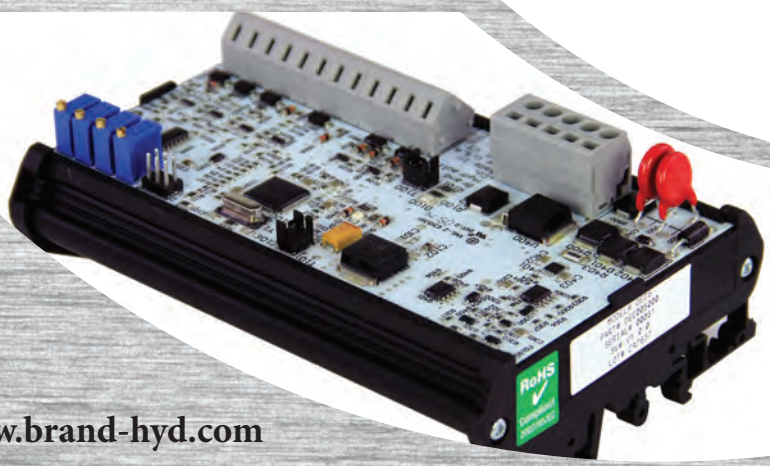
DEC005000

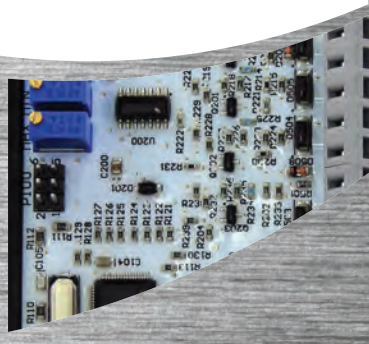


RoHS COMPLIANT

APPLICATION:

The DEC005000 conveniently interfaces industry standard signals 4-20mA, 0-5V or 0-10V with a proportional solenoid valve





ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

DEC005000 Digital Interface Card

FEATURES:

- Din rail mount, Din35 and Din 32.
- Reverse polarity protection.
- Active, short circuit monitoring and lockout.
- Open load detection.
- Diagnostic indicator.
- Pulse Width Modulated Output.
- Current controlled output, maintains output current regardless of supply voltage and coil resistance variations.
- Capable of accepting four industry standard signal types: Potentiometer, 0-10V, 0-5V, or 4-20mA.
- Reference voltage provided for control via an external potentiometer.
- Two Enable lines are provided, one with adjustable soft stop, both with adjustable soft start. (See details on page 4)
- Independent ramp adjustments up and down (0.1 -30s).
- Maximum and minimum current adjustments completely independent of one another.
- Wide voltage supply range (9-30V) for 12V or 24V systems.
- Full, industrial temp spec (-40°C - 85°C) operation.

DESCRIPTION:

The DEC005000 has been designed to meet the various requirements of mobile and industrial hydraulic control applications. DEC005000 cards are versatile, cost effective and easily integrated into new or pre-existing designs. Much of this is a result of the unique ability each card has to accept 4 different signals. The DEC005000 can accept any of the following input types: Potentiometer, 0-10V, 0-5V, or 4-20mA. The card takes these signals and converts them into a PWM output suitable for a Brand EFC-Series valve or other proportional valves that meet the proper specifications.

SPECIFICATIONS:

Voltage Supply	9-30 VDC
Operating Temperature	-40°C - 85°C (-40°F - 176°F)
Storage Temperature	-40°C - 85°C (-40°F - 176°F)
Max Continuous Output Current	3.0 Amps
Overcurrent Lockout Current	4.5 Amps
Short Circuit Lockout Current	5.0 Amps

Output Type	PWM , Pulse Width Modulation, 0-100% Duty cycle
PWM Output Frequency	30Hz - 500Hz +/- 5 Hertz (Factory Set)
Weight, fully assembled	0.151kg (0.332lb.)
INPUT SPECIFICATIONS:	
Potentiometer	Terminal block 2, Pin 7
Wiper Input Impedance	10K Ohms
Wiper Input range	.6V - 4.4V
Resistance	10K Ohms
Minimum Power rating	1/8th Watt
Maximum Operating Input Voltage	7.2V +/- .5V (Higher voltages will lock out input)
Maximum Protected Input Voltage	30V
0-10 Volt Input	Terminal block 2, Pin 9
Input Impedance	10K Ohms
Step response	Output current will equal: ((Input voltage x 0.1) (max current - min current)) + (min current) For every volt of input, output will change 1/10 its full range.
Maximum Operating Input Voltage	12.3V +/- .5V (Higher voltages will lock out input)
Maximum Protected Input Voltage	30V
0-5 Volt Input	Terminal block 2, Pin 10
Input Impedance	10K Ohms
Step response	Output current will equal: ((Input voltage x 0.2) (max current - min current)) + (min current) For every volt of input, output will change 1/5 its full range.
Maximum Operating Input Voltage	7.8V +/- .5V (Higher voltages will lock out input)
Maximum Protected Input Voltage	30V
4-20mA Input	Terminal block 2, Pin 11
Input Impedance	250 Ohms
Step response	Output current will equal: ((Input current - 4mA) (0.0625) (max current - min current)) + (min current) For every milliamp of input, output will change 1/16 its full range.
Maximum Operating Input Voltage	8.0V +/- .5V (Higher voltages will lock out input)
Maximum Protected Input Voltage	30V
Enable Input	When Enable is left open (high) the unit is operational. When the enable line is connected to ground (low) the board output immediately goes to 0 Amps.
Impedance	560K Ohms
High state REN pin voltage	4.61V +/- 0.1V

Source current while pulled low	3.67mA
Ramping Enable Input	When Enable is left open (high) the unit is operational. When the enable line is connected to ground (low) the board output ramps down to the minimum output setting at the rate set by ramp adjustments.
Impedance	560K Ohms
High state REN pin voltage	4.61V +/- 0.1V
Source current while pulled low	3.67mA
Auxiliary Output	Terminal block 1, Pin 2
Maximum Current	2.5A

ADJUSTMENTS:

Minimum output or zero setting	Clockwise rotation increases minimum output 0.1 - 3 Amps Maximum output will always be 50mA greater than the minimum output
Maximum output	Clockwise rotation increases maximum output 0.1 - 3 Amps Maximum output will always be 50mA greater than the minimum output
Ramping Down or Fall Time	Clockwise rotation increases ramp time 0.1 - 30 Seconds,
Ramping Up, or Rise Time	Clockwise rotation increases ramp time 0.1 - 30 Seconds

ADJUSTMENT PROCEDURE:

Adjustments are made by turning a trim pot screw. The trimmers are 25 turn, end to end devices. The trimmers have a built in slip clutches so over rotations do not damage them. It may be necessary to turn the adjustment screw several turns to observe a change in output. Start by adjusting the min output, and then adjust the max output to the desired level. The best way to fine tune adjustments is to observe the function response or speed. It is important to make adjustments in the following order.

1. Minimum output: Start by setting the master Potentiometer or input signal to zero. Turn the trimmer clockwise until the function begins to move. Now turn the trimmer back counter clockwise, one full rotation past the point of any visible movement.

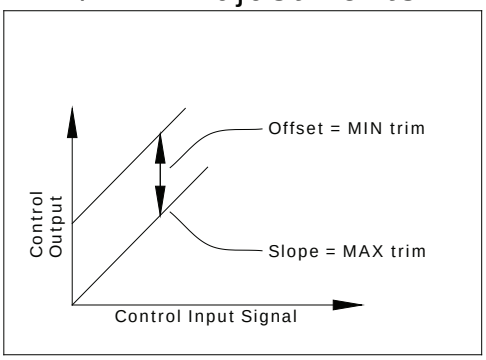
2. Maximum output: Start by setting the master Potentiometer to the 100 position on the dial. Turn the trim pot counter clockwise to decrease function speed. Turn the trim pot clockwise to increase function speed. Function maximum speed will be limited to the max flow capabilities of your hydraulic system.

Do not rotate the trim pot past the point of an observable increase in function speed.

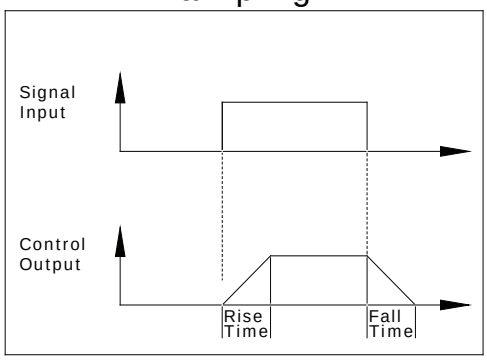
3. Ramp up: This feature changes how quickly the valve can open. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay.

4. Ramp down: This Feature changes how quickly the valve can close. Clockwise turns increase the amount of delay. Counterclockwise turns decrease the amount of delay. Use discretion when making this adjustment, this will affect how quickly your function stops.

MIN/MAX Adjustments



Ramping

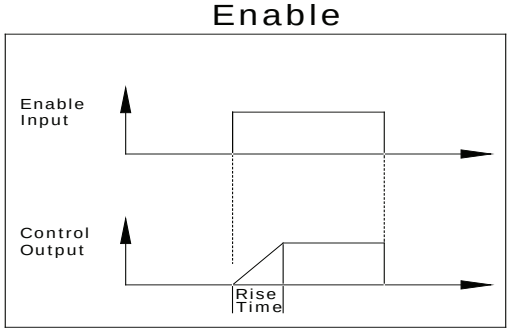


ENABLE INPUTS:

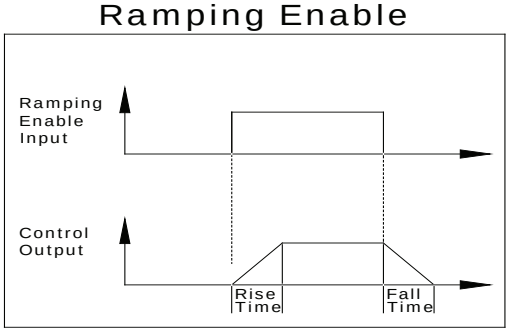
The Enable Inputs can be used to turn the controllers output on and off, without having to switch on/off the main power source. The DEC005000 cards are supplied with two unique types of Enable inputs, EN and REN. When the EN line is switched to ground the control will go into sleep mode. It will be as if the controls power source has been turned off. When the EN line is switched back to its normal state, open to ground, the control output will again respond to user input. A soft start can be achieved using the controllers Ramp Up adjustment.

The Ramping enable input, REN, allows for soft start and soft stop enabling. The REN input is also activated by being switched to ground. When the REN is activated the control will respond as if the user input signal has been turned off and the controls output will ramp down to the set minimum output value. When the REN input is returned to its normal state the control output will ramp up to the output level that corresponds with the user input signal. Soft start ramp and Soft stop ramp times are set using the onboard trim pots that are labeled UP and DOWN.

Enable

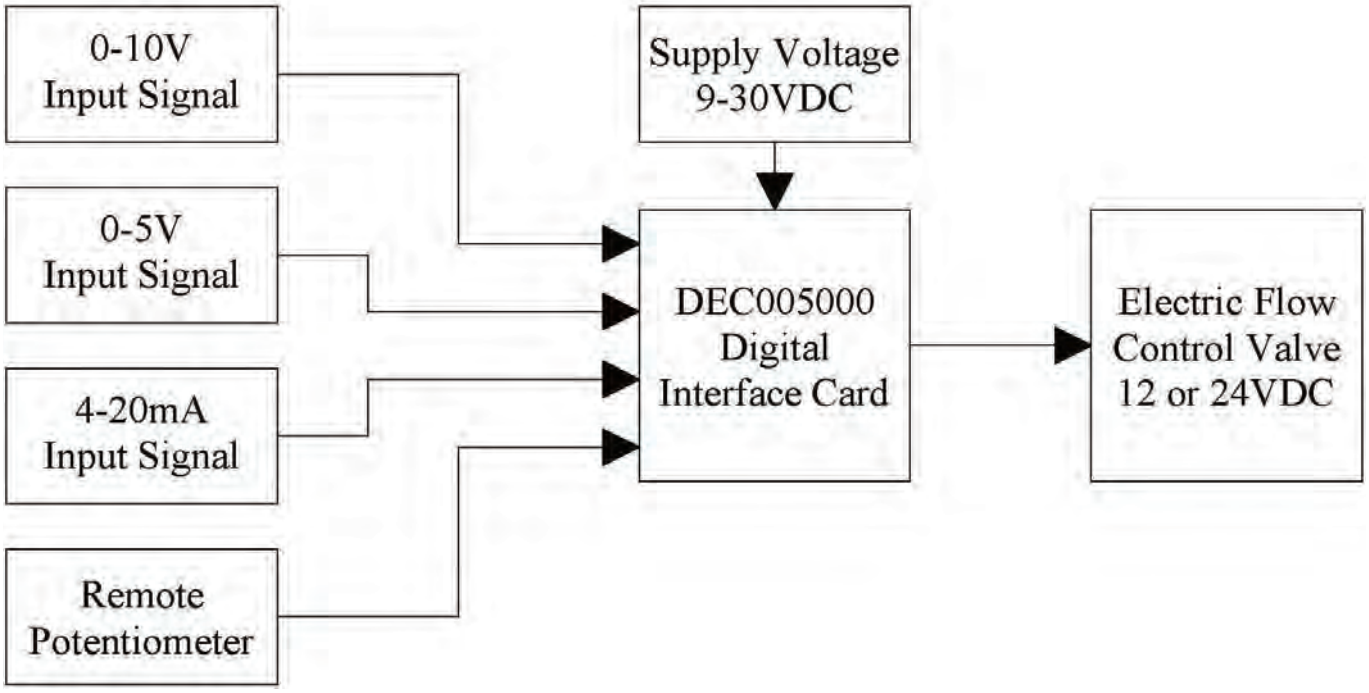


Ramping Enable



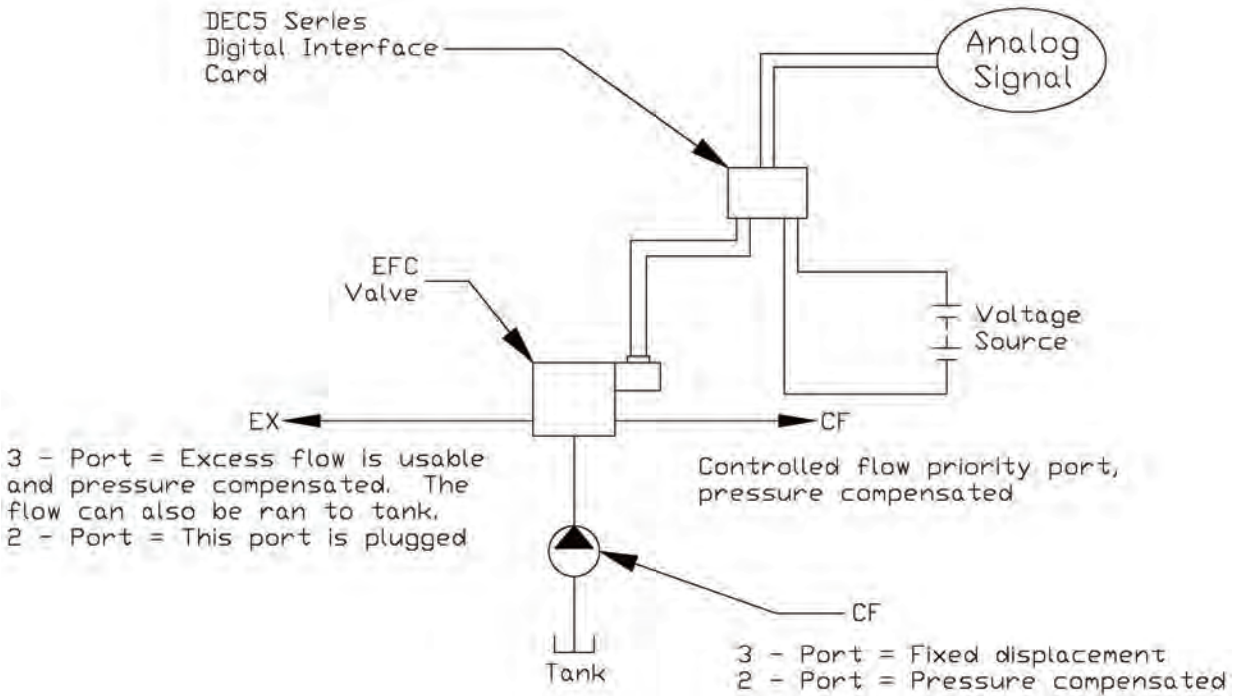
DEC005000 Digital Interface Card

TYPICAL SYSTEM CONFIGURATIONS:

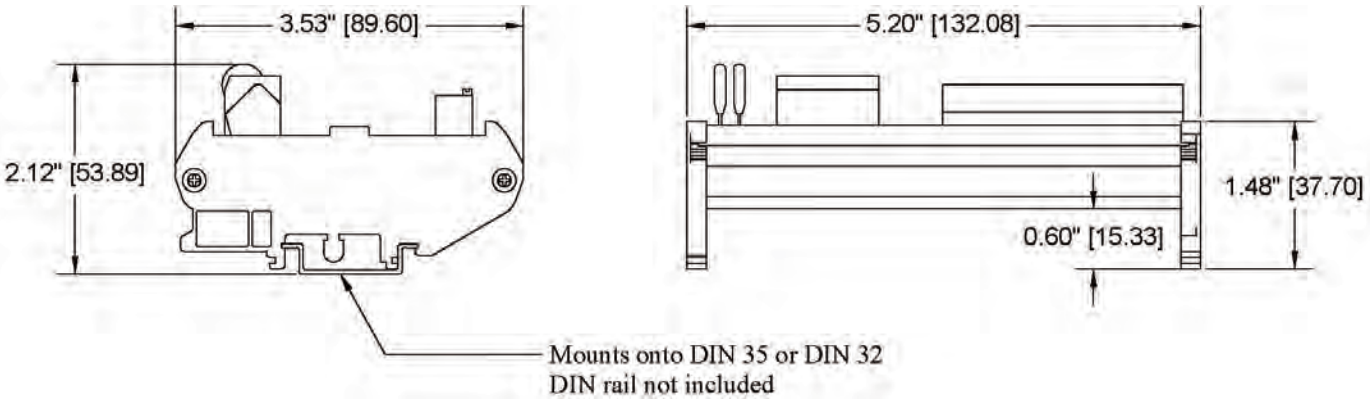


Note: Inputs are additive when two or more are used simultaneously. Other configurations are possible, contact factory for more information.

DEC/EFC - SERIES SCHEMATIC DRAWING:



DIMENSIONAL DATA: inches & [millimeters]



DEC005000 Digital Interface Card

INTERNAL LAYOUT:

Diagnostic LED (D106)
LED will flash when an error mode has taken place. The following table lists the possible error modes and the corresponding LED flash sequence.

OPEN LOAD:
ON - 0.25 seconds
OFF - 0.25 seconds
Blinks 10 times and pauses

OVER CURRENT LOAD:
ON - 0.10 seconds
OFF - 0.10 seconds
Continuously blinks

SHORT CIRCUIT LOAD:
ON - 0.10 seconds
OFF - 0.10 seconds
Continuously blinks

OUTPUT DISABLED - ONLY FOR ENABLE:
ON - 0.25 seconds
OFF - 2.00 seconds
Continuously blinks

POWER POLARITY REVERSED:
ON - Continuously, no blink

Power LED (D100)
LED indicates when board has appropriate DC supply in the correct polarity

Terminal Block Termination Details

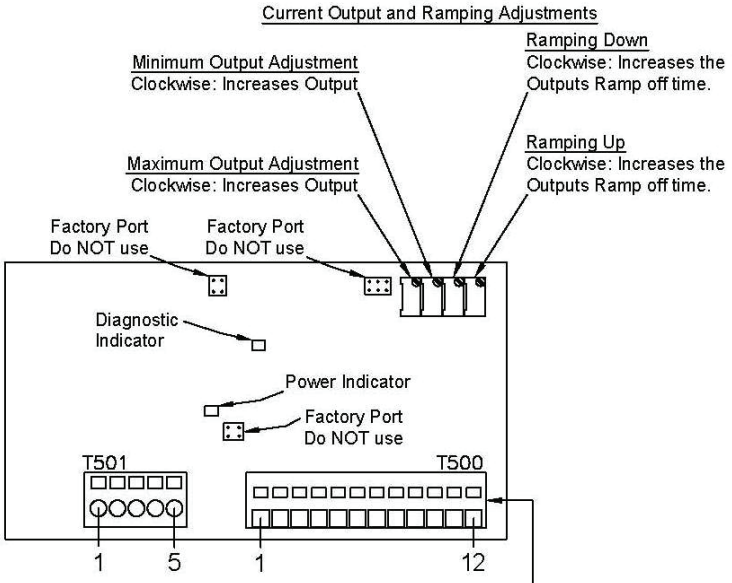
T501
18-12 AWG wires go to circular holes. Strip wires 0.333" Screwdriver inserts into square holes. See Terminal Block callouts.

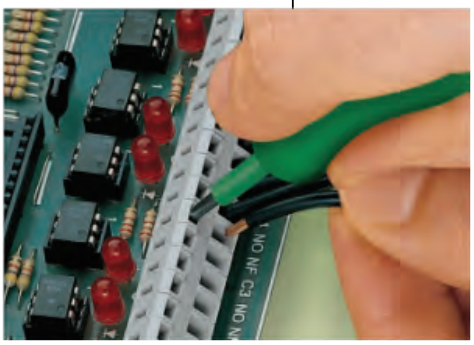
T502
28-12 AWG wires go to square holes. Strip wires 0.22". Screwdriver inserts into rectangular holes. See Terminal Block callouts.

Terminal Block Pin Outs

T501
1. Positive Supply Voltage, 9-30VDC
2. Auxillary Supply Voltage output, Not to Exceed 2.5A, unfused
3. Output to EFC Valve, 3A Maximum
4. Ground for EFC Valve
5. Negative Supply Voltage

T500
1. Enable input, Apply a ground to disable the board or leave Open for normal operation.
2. Ramping Enable input, Apply a ground to disable the board or leave Open for normal operation.
3. Ground
4. Ground
5. 5V Reference for potentiometer.
6. 5V Reference for potentiometer.
7. Potentiometer wiper Input
8. Ground for Potentiometer. (Note: Wiper input will not function without the potentiometer being grounded at this pin.)
9. Positive 0-10V signal input
10. Positive 0-5V signal input
11. Positive 4-20mA input
12. Signal Ground, Negative loop return





FACTORY SETTINGS
Ramp up time 0 seconds

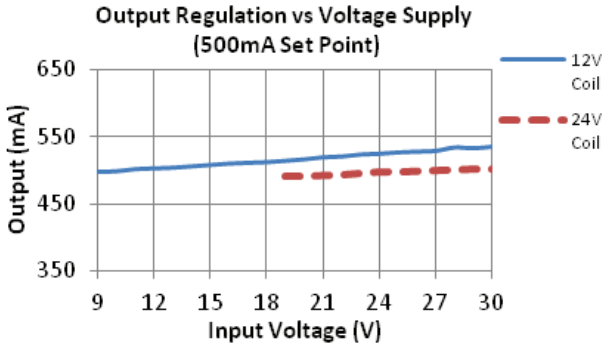
Ramp down time 0 seconds

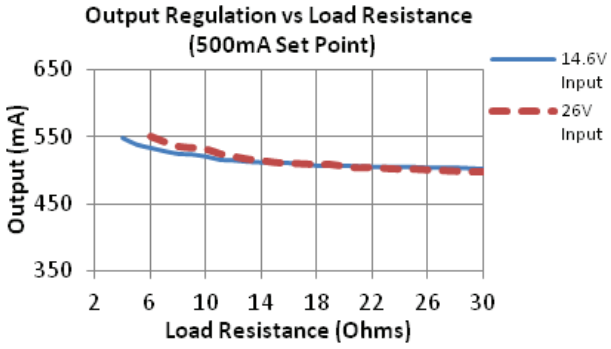
Min. output set at 0.0 Amps

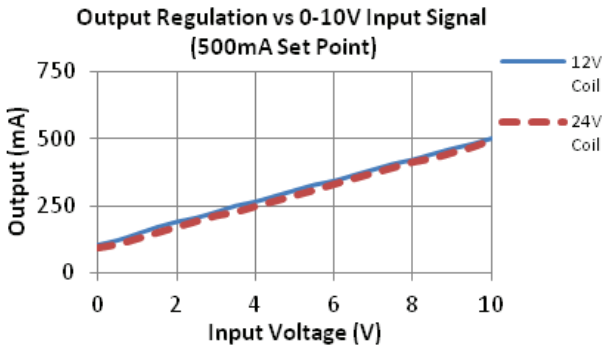
Max output adjusted for 1 Amp at full

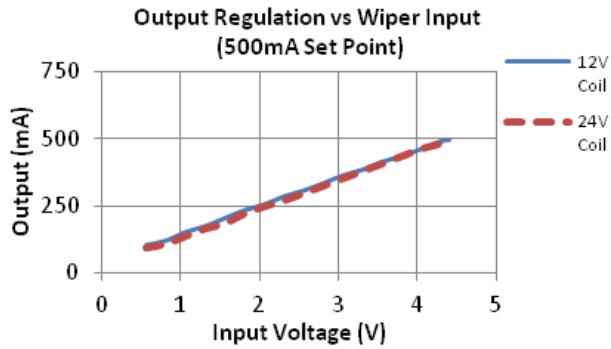
Frequency set at 100 Hz

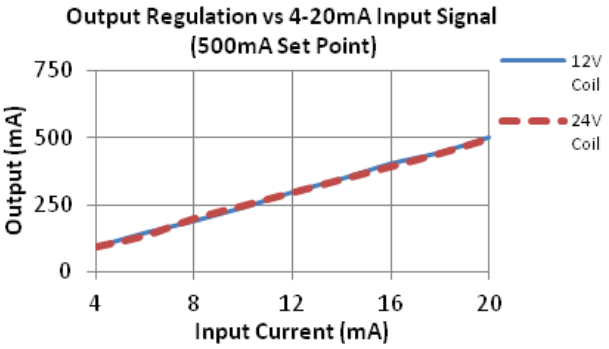
OUTPUT:

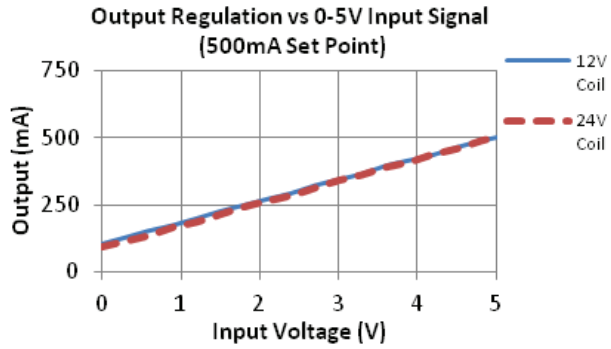












Note: All the above readings were taken with the DEC005000 adjusted for a .5 Amp maximum output at 100 Hz. A 14.6V supply was used for 12V coil tests and a 26V supply was used for 24V coil tests.

EC - ACCESSORIES:

E1049.....Panel mount fuse holder
E1050.....Knob, Black
E1071.....Potentiometer shaft seal
E1747.....Power switch, SPST, screw terminals
E1758.....Switch boot seal
E1803.....Long Life Potentiometer, 10K w/ 6" Leads

BRAND HYDRAULICS Co.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

EC - Series
Electronic Control Box

APPLICATION:
Proportionally control the speed and direction of hydraulic motors and cylinders. This low cost unit can be configured in multiple ways to cover many applications.

RoHS COMPLIANT

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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EC Electronic Control Box

FEATURES:

- Rugged aluminum box construction.
- Heavy-duty foot brackets for quick and secure mounting.
- Color keyed SAE automotive grade wire leads for easy wiring and identification.
- Different potentiometers, power switches, LEDs and connector configurations.
- Single Pulse width modulated (PWM) output.
- Weatherproof seals on power switch, potentiometer, fuse holder, wire bushing and box lid.
- Externally mounted fuse holder for quick and easy fuse change to protect against over current conditions.
- Input protection from voltage transients, load dumps, 2-battery jumps and reverse polarityhook-ups.
- Power switches are separate from main control knob for turning valve on and off without loss of flow setting.
- Circuit board is coated with a conformal coating to protect against moisture.
- Customization for OEM customers is available. Consult factory.

RoHS COMPLIANT

SPECIFICATIONS:

Voltage Supply	12.7-18 VDC
PWM Output Current	1.0 Amps Max Continuous
PWM Output Frequency	100Hz +/- 10 Hertz
Environmental Ratings	IP65 / NEMA 4
Operating Temperature	-40°C - 80°C (-40°F - 176°F)
Storage Temperature	-40°C - 80°C (-40°F - 176°F)
Approximate Weight	1.4 lbs. (0.64 kg).

GENERAL INFORMATION:

The Brand, electronic control box is designed to proportionally adjust the Brand EFC-Series valves and other proportional valves that meet the appropriate specifications. The controller's design makes it suitable for use outdoors or indoor environments. The box has weather proofing features to help it function in the elements.

The main control knob is used to linearly adjust the current going through the solenoid on the valve. A large knob and a single turn potentiometer with a large degree of rotation gives smooth and precise adjustments. The controller is Pulse Width Modulated (PWM), which helps reduce the effects of hysteresis.

100% of all controls are tested prior to leaving the factory. All tests are performed with up to date, state of the art test equipment that is calibrated to NIST standards by an independent laboratory on a yearly basis.

COMMON MODEL CODES:

EC1201.....Electronic control box
EC1201L.....Electronic control box with LED

CREATING A MODEL CODE:

SERIES:
EC

OPERATING VOLTAGE:
12 - 12VDC

POTENTIOMETER:
01 - Single Turn - 312° roation (See Figure 1)
03 - 3 Turn - 1080° roation (See Figure 2)
05 - 5 Turn - 1800° roation (See Figure 3)
07 - 10 Turn - 3600° roation (See Figure 4)

LED INDICATOR (See Figure 5) **:**
L - Red LED (Single, when SPST switch is selected)
M - Green LED (Single, when SPST switch is selected)
N - Red LED (Top & Bottom, when DPDT switch is selected)
P - Green LED (Top & Bottom, when DPDT switch is selected)
Q - Red LED (Top) / Green LED (Bottom), when DPDT switch is selected)
R - Green LED (Top) / Red LED (Bottom), when DPDT switch is selected)

POWER SWITCH: () indicate momentary function
Omit – ON-NONE-OFF (SPST)
1 - (ON)-NONE-OFF (SPST)
2 - ON-OFF-ON (DPDT)
3 - (ON)-OFF-(ON) (DPDT)
4 - (ON)-OFF-ON (DPDT)
5 - ON-OFF-(ON) (DPDT)

Wire/Cable Bushing Location #1 Mandatory Selection (See Figure 6 & 8)**:**
1A - 2 Wires - Flying leads 2-Way Weather Pack, Plug, Female Terminals
1C - 2 Wires - Flying leads 2-Way Metri-Pack 150 Series, Plug, Female Terminals
1E - 2 Wires - Flying leads 2-Way Deutsch DT Series, Plug, Female Terminals
1G - 2 Wires - Flying leads 2-Way Molex ML-XT Series, Plug, Female Terminals
2A - 2 Wires - Multi Conductor Cable 2-Way Weather Pack, Plug, Female Terminals
2C - 2 Wires - Multi Conductor Cable 2-Way Metri-Pack 150 Series, Plug, Female Terminals

Wire/Cable Bushing Location #1 Mandatory Selection (See Figure 6 & 8) *continued***:**
2E - 2 Wires - Multi Conductor Cable 2-Way Deutsch DT Series, Plug, Female Terminals
2G - 2 Wires - Multi Conductor Cable 2-Way Molex ML-XT Series, Plug, Female Terminals
3M - 4 Wires - Flying leads 4-Way Weather Pack, Plug, Female Terminals
3N - 4 Wires - Flying leads 4-Way Metri-Pack 150 Series, Plug, Female Terminals
3P - 4 Wires - Flying leads 4-Way Deutsch DT Series, Plug, Female Terminals
3Q - 4 Wires - Flying leads 4-Way Molex ML-XT Series, Plug, Female Terminals
4M - 4 Wires - Multi Conductor Cable 4-Way Weather Pack, Plug, Female Terminals
4N - 4 Wires - Multi Conductor Cable 4-Way Metri-Pack 150 Series, Plug, Female Terminals
4P - 4 Wires - Multi Conductor Cable 4-Way Deutsch DT Series, Plug, Female Terminals
4Q - 4 Wires - Multi Conductor Cable 4-Way Molex ML-XT Series, Plug, Female Terminals
5R - 6 Wires - Flying leads 6-Way Weather Pack, Plug, Female Terminals
5S - 6 Wires - Flying leads 6-Way Metri-Pack 150 Series, Plug, Female Terminals
5T - 6 Wires - Flying leads 6-Way Deutsch DT Series, Plug, Female Terminals
5U - 6 Wires - Flying leads 6-Way Molex ML-XT Series, Plug, Female Terminals
6R - 6 Wires - Multi Conductor Cable 6-Way Weather Pack, Plug, Female Terminals
6S - 6 Wires - Multi Conductor 6-Way Metri-Pack 150 Series, Plug, Female Terminals
6T - 6 Wires - Multi Conductor Cable 6-Way Deutsch DT Series, Plug, Female Terminals
6U - 6 Wires - Multi Conductor Cable 6-Way Molex ML-XT Series, Plug, Female Terminals

Optional Power Bushing Location #2
(See Figure 7)**:**
Omit - No Bushing
1 - Flying leads
2 - Multiconductor cable

Connector for Optional Power Bushing If Power Bushing is selected an option code must be selected Location #2
(See Figure 8) **:**
OMIT - No Connector or Optional Power Bushing was not selected
B - 2-Way Weather Pack, Receptacle, Male Terminals
D - 2-Way Metri-Pack 150 Series, Receptacle, Male Terminals
F - 2-Way Deutsch DT Series, Receptacle, Male Terminals
H - 2-Way Molex ML-XT Series, Receptacle, Male Terminals
J - 3-Way John Deere Power Connector Must use bushing location #1 Multiconductor (Option 2)
K - 3-Way AMP CPC Circular Power Connector Must use bushing location #1 Multiconductor (Option 2)
L - Fused Power/Cigarette Lighter Plug Must use bushing location #1 flying leads (Option 1)

CREATING A MODEL CODE INFORMATION:

LED INDICATOR:

- If 2 LEDs are selected you must select a DPDT power switch

WIRE/CABLE BUSHINGS:

- Wire/Cable bushing location #1 is a mandatory selection
- Wire/Cable power bushing location #2 is optional
- Flying leads and multi conductor cables are 18" long

PARTS LIST: Note: ( ) indicate momentary function

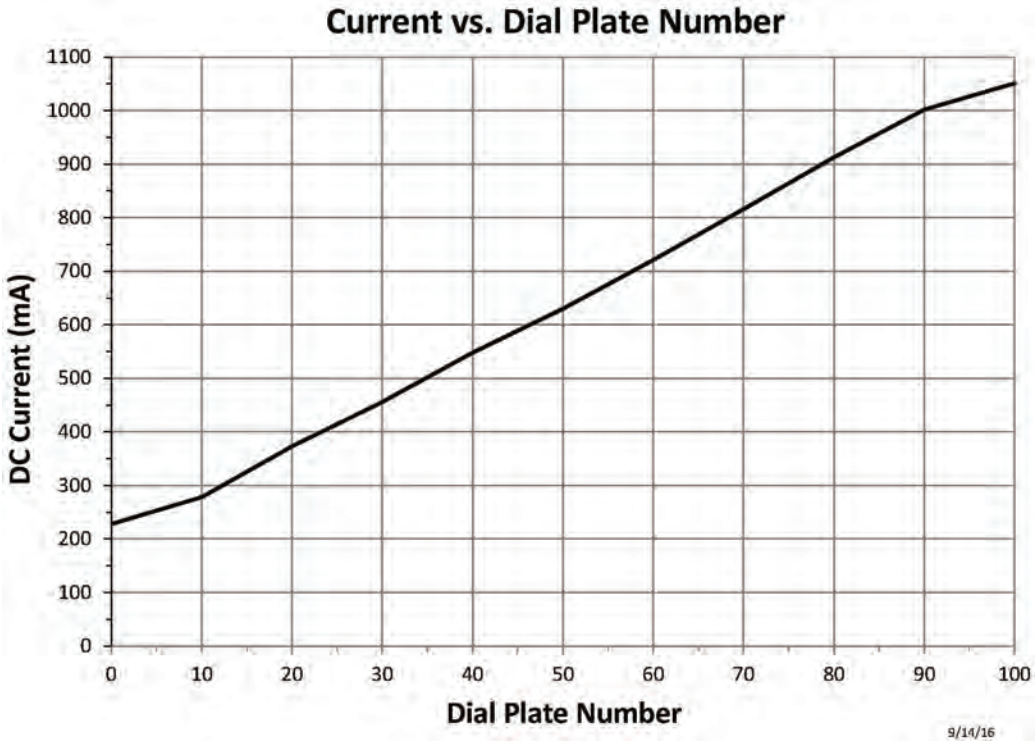
E1028.....Surface mount PCB standoff
E1034.....Mounting foot hex nut
E1049.....Panel mount fuse holder
E1050.....Knob, Black
E1071.....Potentiometer shaft seal
E1466..... Power switch, DPDT, ON-OFF-ON, screw terminals
E1467..... Power switch, DPDT, (ON)-OFF-(ON), screw terminals
E1726.....Fuse 1.5 amp
E1747..... Power switch, SPST, ON-NONE-OFF, screw terminals
E1758.....Switch boot seal
E1803.....Single Turn Long Life Potentiometer, 10K w/6" Leads
E1953.....Mounting foot lock washer
E2170.....LED, Panel Mount, Red
E2563.....3 Long Life Potentiometer, 10K w/6" Leads
E2833.....Power switch, SPST, (ON)-NONE-OFF, screw terminals
E2834.....Power switch, DPDT, ON-OFF-(ON), screw terminals
E2835.....LED, Panel Mount, Green
E2836.....5 Long Life Potentiometer, 10K w/6" Leads
E2837.....10 Long Life Potentiometer, 10K w/6" Leads
P1158.....Mounting foot bracket

ACCESSORIES LIST:

E2815.....120VAC Wall-mount power supply with 6 ft. c rd. Flying leads w/loose Quick Disconnect Terminals
E2816.....120VAC Wall-mount power supply with 6 ft. c rd. Weather Pack, 2-Way, Plug, Female Terminals
E2817.....120VAC Wall-mount power supply with 6 ft. c rd. Metri-Pack 150 Series, 2-Way, Plug, Female Terminals
E2818.....120VAC Wall-mount power supply with 6 ft. c rd. Deutsch DT Series, 2-Way, Plug, Female Terminals
E2819.....120VAC Wall-mount power supply with 6 ft. c rd. Molex ML-XT Series, 2-Way, Plug, Female Terminals

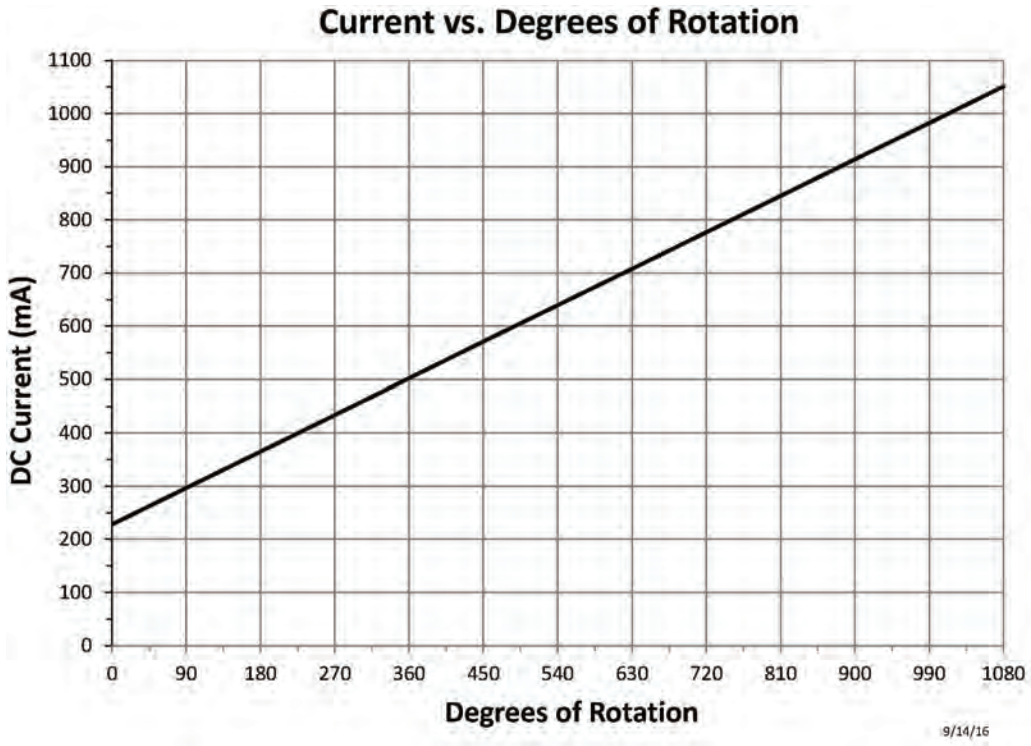
EC1201 SERIES CURRENT VS. DIAL PLATE:

Figure 1



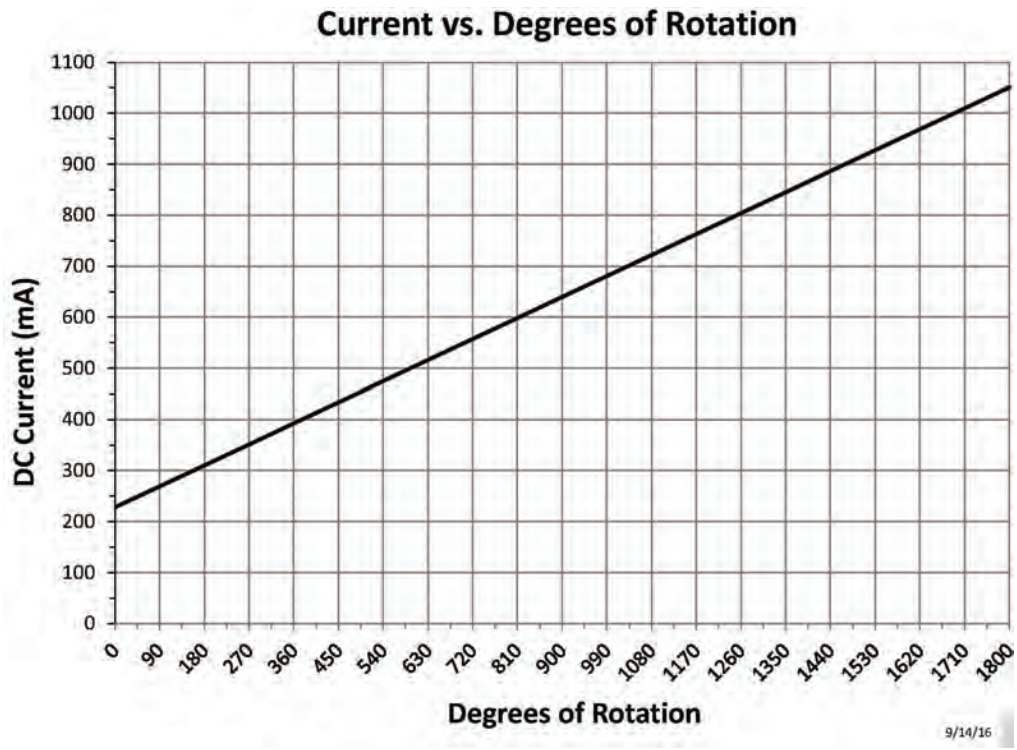
EC1203 SERIES CURRENT VS. DEGREES OF ROTATION:

Figure 2



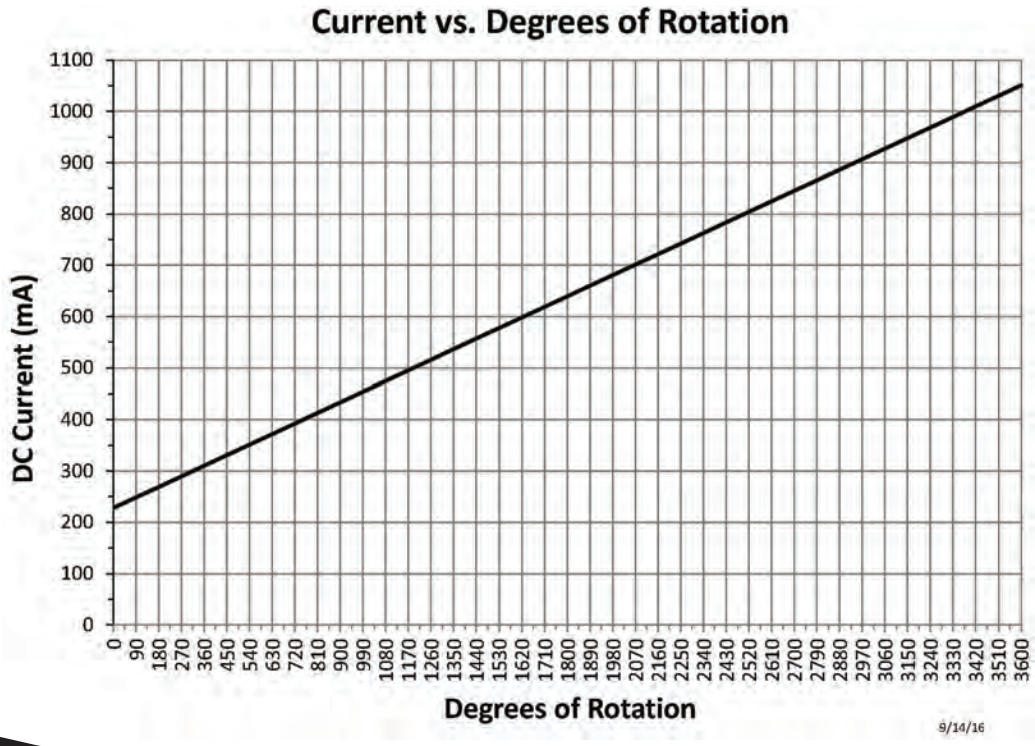
EC1205 SERIES CURRENT VS. DEGREES OF ROTATION:

Figure 3



EC1207 SERIES CURRENT VS. DEGREES OF ROTATION:

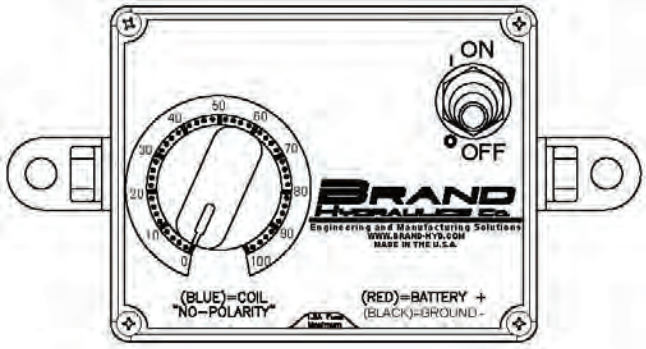
Figure 4



KNOB, SWITCH AND LED LAYOUTS:

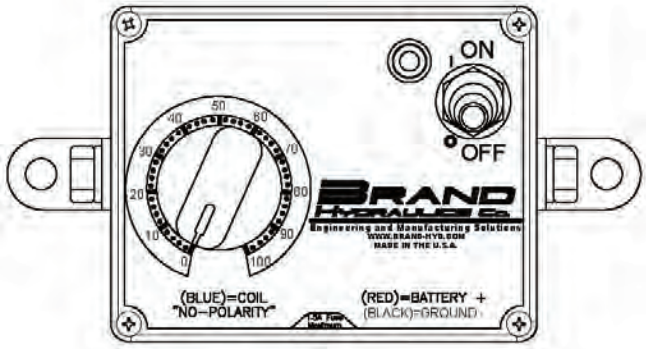
Figure 5

EC1201



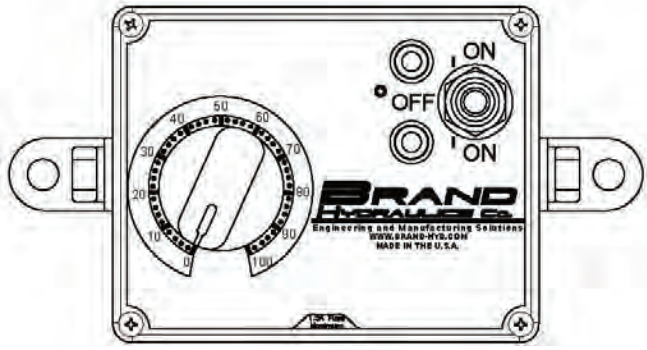
EC1203
EC1205
EC1207

EC1201L

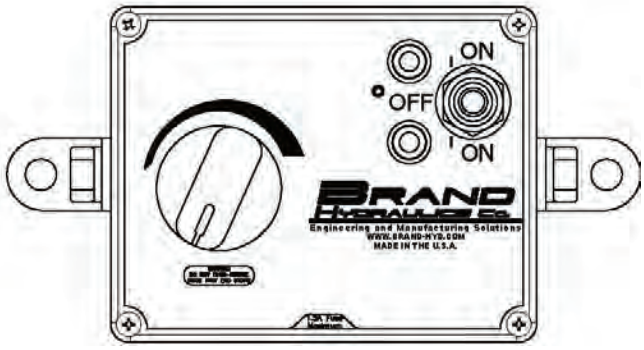


EC1203L
EC1205L
EC1207L

EC1201N2

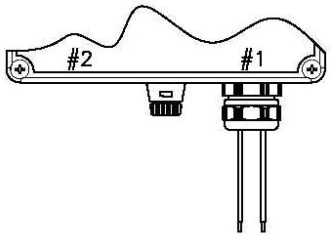


EC1203N2
EC1205N2
EC1207N2



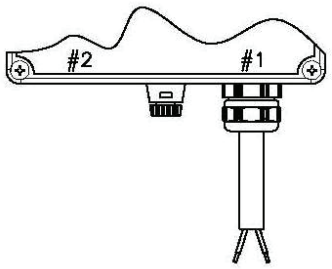
WIRE/CABLE BUSHING LOCATION #1:

Figure 6



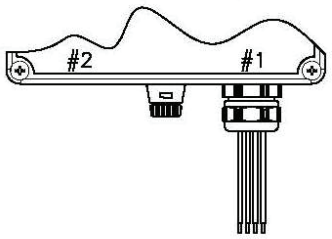
Option Code
1*

Wire/Cable Bushings	
Bushing Location	Bushing Type
Bushing #1	2 Wires – Flying Leads Wire



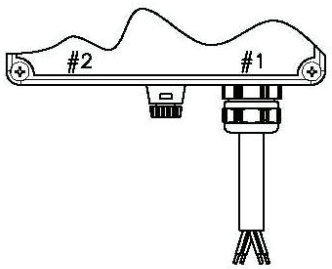
Option Code
2*

Wire/Cable Bushings	
Bushing Location	Bushing Type
Bushing #1	2 Wires – Multi Conductor Cable



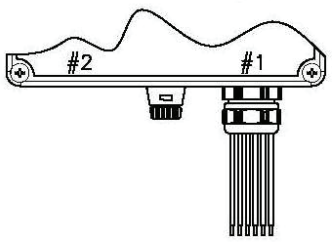
Option Code
3*

Wire/Cable Bushings	
Bushing Location	Bushing Type
Bushing #1	4 Wires – Flying Leads Wire



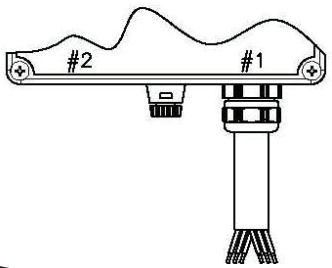
Option Code
4*

Wire/Cable Bushings	
Bushing Location	Bushing Type
Bushing #1	4 Wires – Multi Conductor Cable



Option Code
5*

Wire/Cable Bushings	
Bushing Location	Bushing Type
Bushing #1	6 Wires – Flying Leads Wire

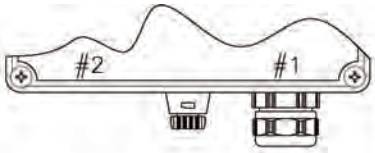


Option Code
6*

Wire/Cable Bushings	
Bushing Location	Bushing Type
Bushing #1	6 Wires – Multi Conductor Cable

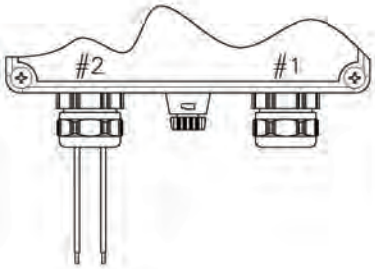
WIRE/CABLE BUSHING LOCATION #2:

Figure 7



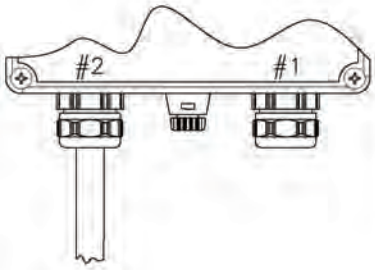
Option Code
OMIT

Wire/Cable Bushings	
Bushing Location	Bushing Type
Bushing #1	Option Code **
Bushing #2	NONE



Option Code
1

Wire/Cable Bushings	
Bushing Location	Bushing Type
Bushing #1	Option Code **
Bushing #2	2 Wires – Flying Leads Wire



Option Code
2

Wire/Cable Bushings	
Bushing Location	Bushing Type
Bushing #1	Option Code **
Bushing #2	Multi Conductor Cable

CONNECTORS:

Figure 8

Option Code **A**

Delphi Weather Pack, 2–Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E1059	12015792
Seal	2	E1063	12015323
Terminal	2	E1061	12089188

Option Code **B**

Delphi Weather Pack, 2–Way Receptacle, Male Terminals			
Description	Quantity	Brand P/N	MFG P/N
Receptacle	1	E1064	12010973
Seal	2	E1063	12015323
Terminal	2	E1065	12089040

Option Code **C**

Delphi Metri–Pack 150, 2–Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E1357	12052641
TPA	1	E1360	12052634
Seal	2	E1358	12052924
Terminal	2	E1359	12048074

Option Code **D**

Delphi Metri–Pack 150, 2–Way Receptacle, Male Terminals			
Description	Quantity	Brand P/N	MFG P/N
Receptacle	1	E1648	12162000
TPA	1	E1360	12052634
Seal	2	E1358	12052924
Terminal	2	E1649	12045773

Option Code **E**

Deutsch DT Series, 2–Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2534	DT06–2S
Wedge Lock	1	E2540	W2S
Terminal	2	E1827	0462–201–16141

Option Code **F**

Deutsch DT Series, 2–Way Receptacle, Male Terminals			
Description	Quantity	Brand P/N	MFG P/N
Receptacle	1	E2824	DT04–2P
Wedge Lock	1	E2015	W2P
Terminal	2	E2016	0460–202–16141

CONNECTORS:

Option Code
G

Molex ML-XT Series, 2-Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2825	93445-1102
Wedge Lock	1	E2827	93448-1003
Terminal	2	E2828	84525-0009

Option Code
H

Molex ML-XT Series, 2-Way Receptacle, Male Terminals			
Description	Quantity	Brand P/N	MFG P/N
Receptacle	1	E2826	93444-1102
Wedge Lock	1	E2829	93447-1003
Terminal	2	E2830	84524-0004

Option Code
J

John Deere Molded Power Cable, 3-Way			
Description	Quantity	Brand P/N	MFG P/N
Cable	1	E2809	RE67013

Terminal Letter	Wire Color	Connection
A	Red	+ VDC Input
B	Black	System Ground
C	Orange	Keyed + VDC

Option Code
K

TE Circular Connector, 3-Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2247	206037-2
Clamp	1	E2248	206070-8
Terminal	2	E2249	66740-2

Terminal Letter	Wire Color	Connection
1	Red	+ VDC Input
2	N/C	N/C
3	Black	System Ground

Option Code
L

Fused Power/Cigarette Lighter Plug		
Description	Quantity	Brand P/N
Cable/Plug	1	E2831

Terminal Letter	Wire Color	Connection
Pin	Red	+ VDC Input
Springs	Black	System Ground

Option Code
M

Delphi Weather Pack, 4-Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2838	12015798
Seal	4	E1063	12015323
Terminal	4	E1061	12089188

EC Electronic Control Box

CONNECTORS

Option Code
N

Delphi Metri–Pack 150, 4–Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2840	12162144
TPA	1	E2842	12047948
Seal	4	E1358	12052924
Terminal	4	E1359	12048074

Option Code
P

Deutsch DT Series, 4–Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2843	DT06–4S
Wedge Lock	1	E2759	W4S
Terminal	4	E1827	0462–201–16141

Option Code
Q

Molex ML–XT Series, 4–Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2845	93445–3102
Wedge Lock	1	E2847	93448–3003
Terminal	4	E2828	84525–0009

Option Code
R

Delphi Weather Pack, 6–Way Plug, Male Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E1084	12015799
Seal	6	E1063	12015323
Terminal	6	E1061	12089188

Option Code
S

Delphi Metri–Pack 150, 6–Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2849	12052848
TPA	1	E2851	12052850
Seal	6	E1358	12052924
Terminal	6	E1359	12048074

Option Code
T

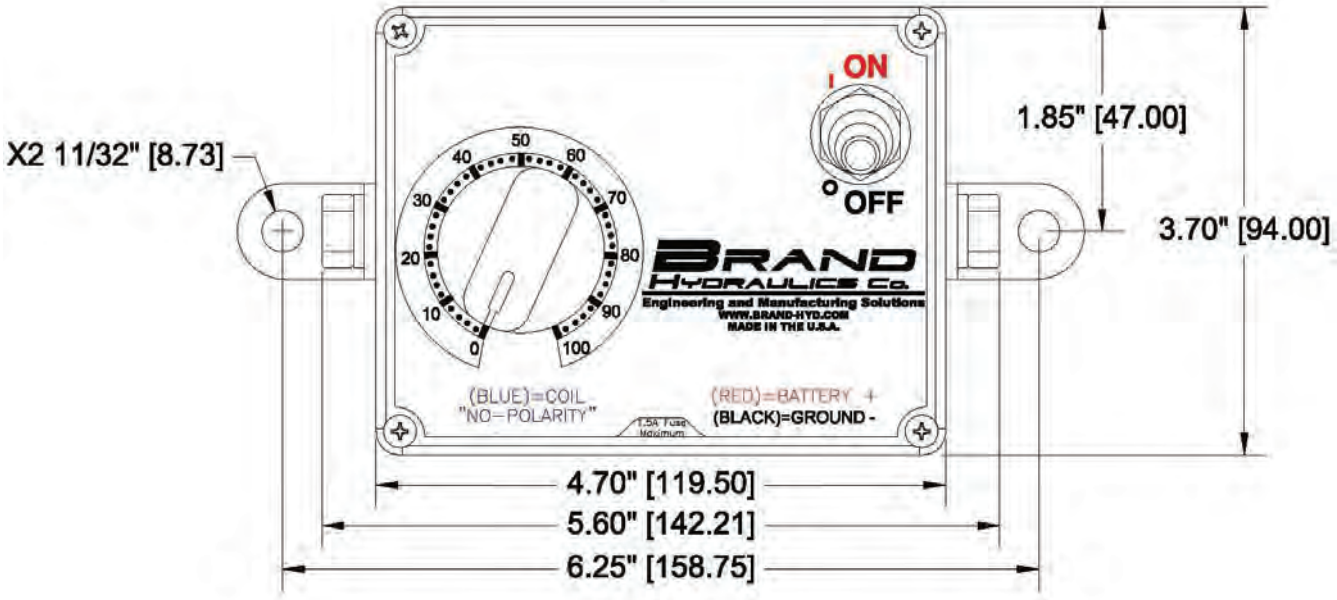
Deutsch DT Series, 6–Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2852	DT06–6S
Wedge Lock	1	E2548	W6S
Terminal	6	E1827	0462–201–16141

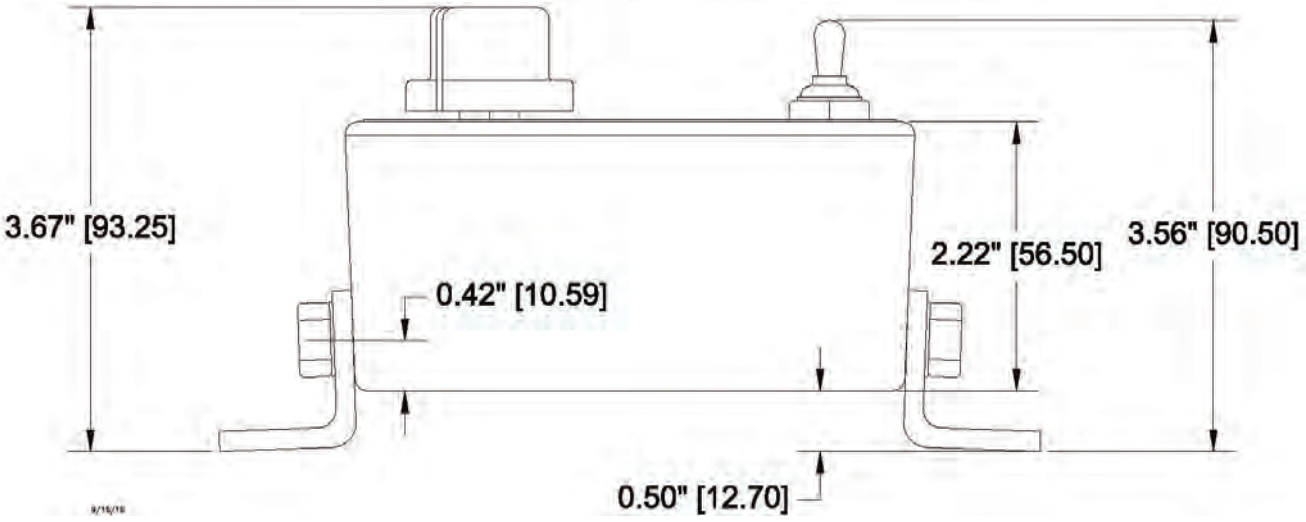
Option Code
U

Molex ML–XT Series, 6–Way Plug, Female Terminals			
Description	Quantity	Brand P/N	MFG P/N
Plug	1	E2854	93445–4102
Wedge Lock	1	E2856	93448–4003
Terminal	6	E2828	84525–0009

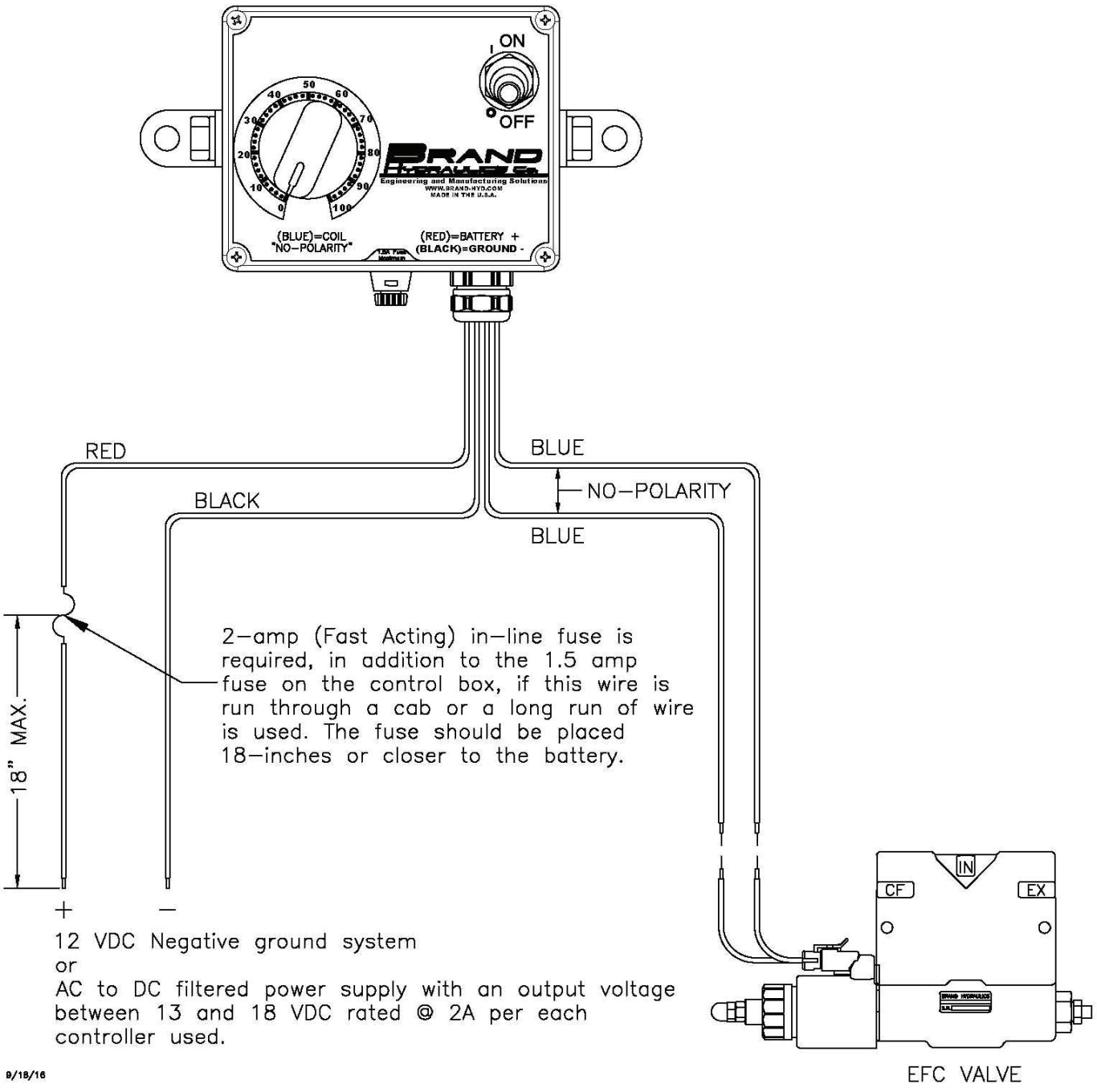
DIMENSIONAL DATA: inches & [millimeters]

EC1201, EC1203, EC1205, EC1207 SERIES **EC1201 SERIES SHOWN**

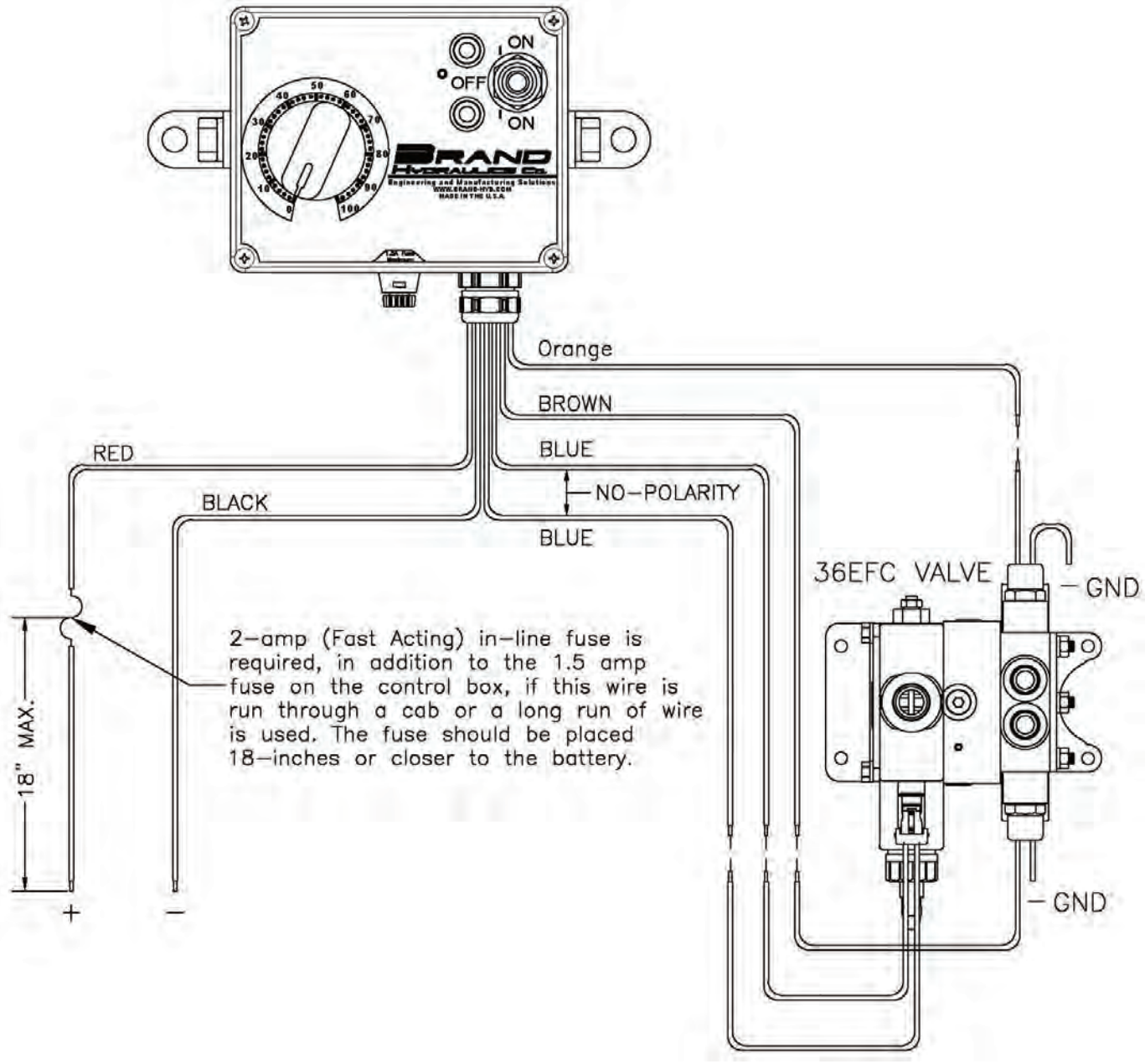




EC1201 SERIES WIRING DIAGRAM:

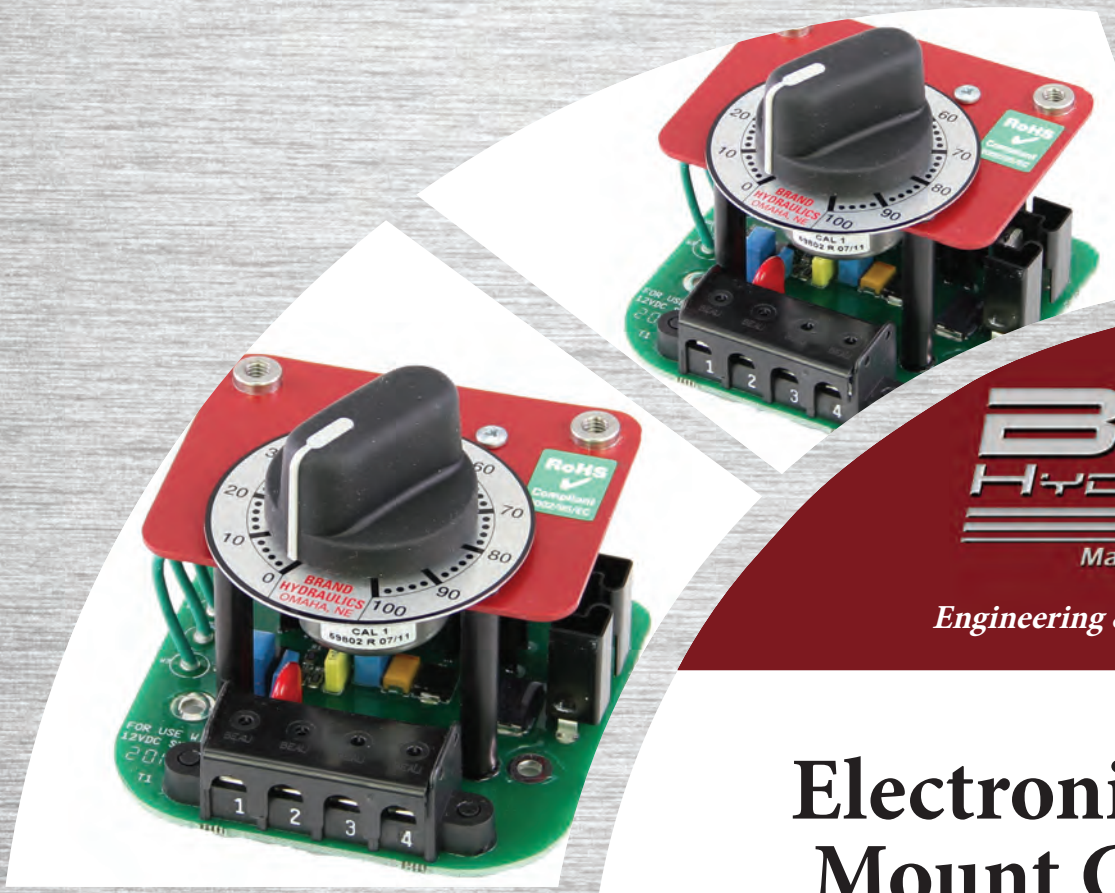


EC1201N2 SERIES WIRING DIAGRAM:



It is the purchaser's responsibility to determine the suitability of any Brand Hydraulics product for an intended application, and to insure that it is installed in accordance with all federal, state, local, private safety, health regulations, and codes and standards. Due to the unlimited variety of machines, vehicles, and equipment on which our products can be used, it is impossible for Brand Hydraulics to offer expert advice on the suitability of a product for a specific application. We believe that it is our customer's responsibility to undertake the appropriate testing and evaluation to prevent injury to the end user.

All product, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.



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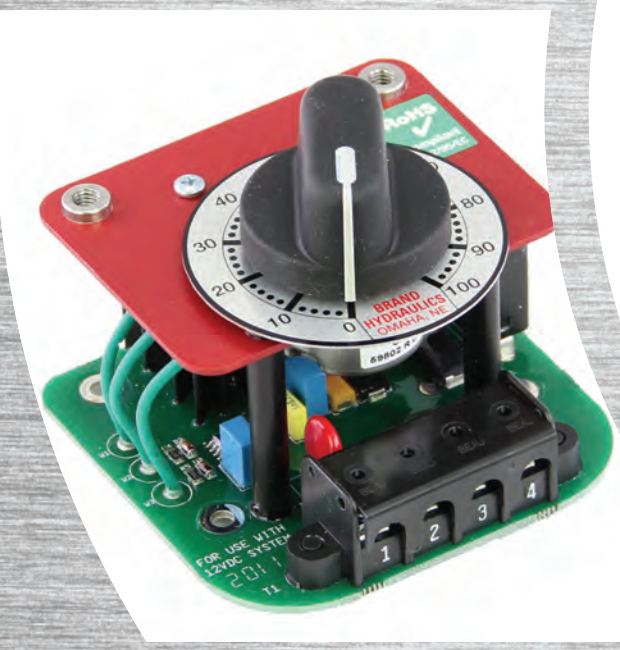
Engineering & Manufacturing Solutions

Electronic Panel Mount Control

EC-12-02



RoHS COMPLIANT

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

402.344.4434 • www.brand-hyd.com

EC-12-02 Electronic Panel Mount Control

FEATURES:

- Lightweight in design to minimize panel fatigue.
- Small in size to minimize space requirements.
- Pulse width modulation output to reduce the effects of hysteresis.
- Short circuit protection to guard against over current conditions. (when wired to factory instructions)
- Input protection for transients, load dumps, 2-battery jumps, and reverse polarity hook-ups.
- Terminal block has printed numbers and a hinge cover for easy wiring and accidental short circuit prevention.
- Optional power switch and fuse can be installed separate from the control.
- The circuit board is coated with a special conformal coating to guard against moisture, dust and other contaminates.
- Only three small holes are required for mounting to panel.
- Four predrilled holes may be used to surface mount to panel.

SPECIFICATIONS:

Voltage Supply	12.7-18 VDC
PWM Output Current	1.0 Amps Max Continuous
PWM Output Frequency	100Hz +/- 10 Hertz
Environmental Ratings	IP67 (Model: EC-12-02S)
Operating Temperature	-40°C - 80°C (-40°F - 176°F)
Storage Temperature	-40°C - 80°C (-40°F - 176°F)
Approximate Weight	6.25 oz (178 g).

TERMINAL BLOCK CONNECTIONS:

Terminal #1	Positive 12.7-18 VDC Supply Input
Terminal #2	Ground
Terminal #3	Output to proportional coil
Terminal #4	Output to proportional coil

Note: No polarity between terminals #3 & #4

GENERAL INFORMATION CONTINUED:

The Brand, electronic panel mount control is designed to proportionally adjust the Brand EFC-Series valves and other proportional valves that meet the appropriate solenoid specifications. The panel mount control is designed to mount behind a control panel in an industrial setting, behind the dash panel of mobile equipment, or in any other mounting location.

The main control knob is used to linearly adjust the current going through the solenoid on the valve. A large knob and a single turn potentiometer with a large degree of rotation gives smooth and precise adjustments. The controller is Pulse Width Modulated (PWM), which helps reduce the effects of hysteresis.

Each controller produced is burned-in for 24 hours to assure the controller is operating properly and meets all specifications. There are also many other quality assurance procedures that our controllers go through before they are shipped. All tests are performed with up to date, state of the art test equipment that is calibrated to NIST standards by an independent laboratory on a yearly basis.

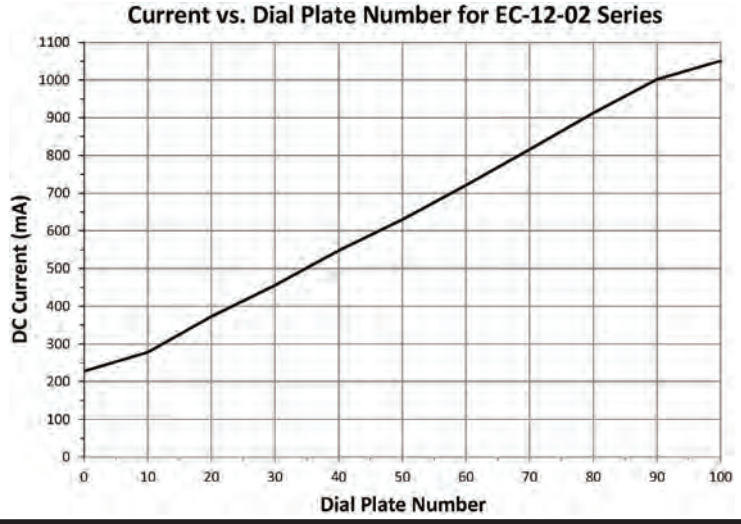
COMMON MODEL CODES:

EC-12-02……Electronic panel mount.
EC-12-02S……..Electronic panel mount control with E1071 and E1130 installed

PARTS LIST:

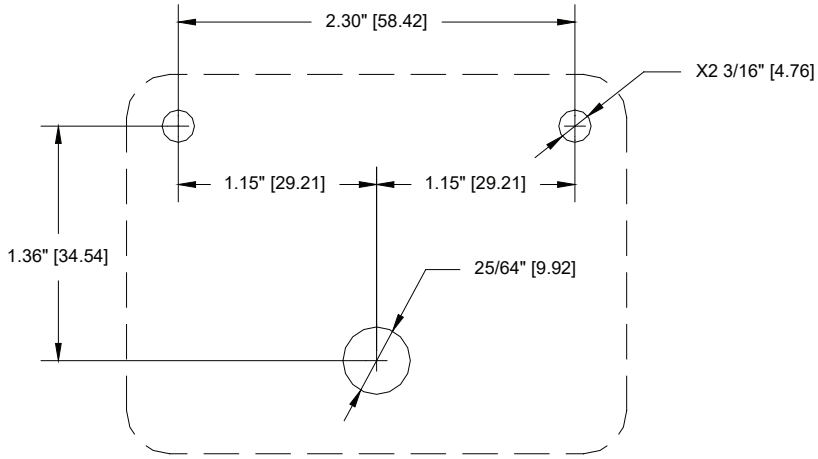
E1049……..Panel mount fuse holder
E1050……..Knob, Black
E1071……..Potentiometer shaft seal
E1130……..Seal screw, 10-32 threads
E1726……..Fuse 1.5 amp
E1747……..Power switch, SPST, screw terminals
E1758……..Switch boot seal
E2820……..Wall-mount power supply with 6 ft. cord, w/ loose Spade Terminals

CURRENT VS. DIAL PLATE:

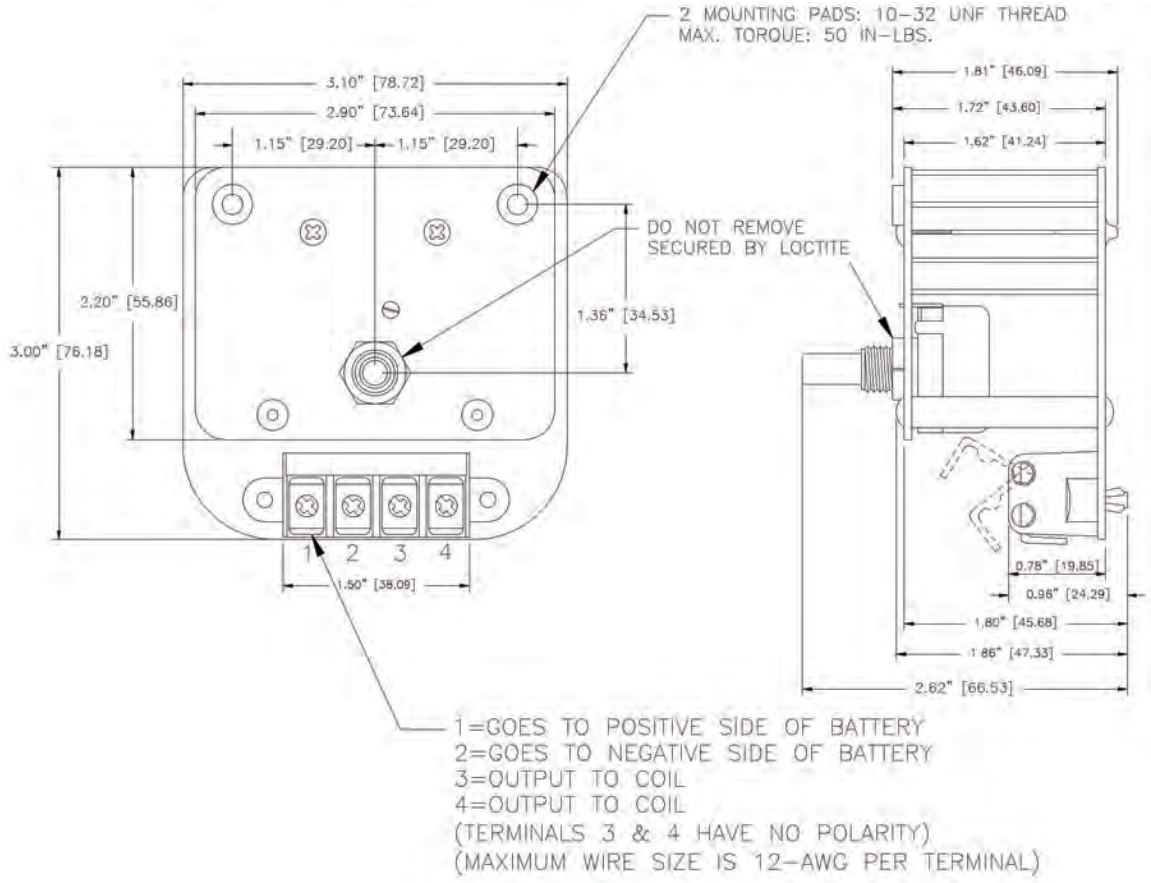


EC-12-02 Electronic Panel Mount Control

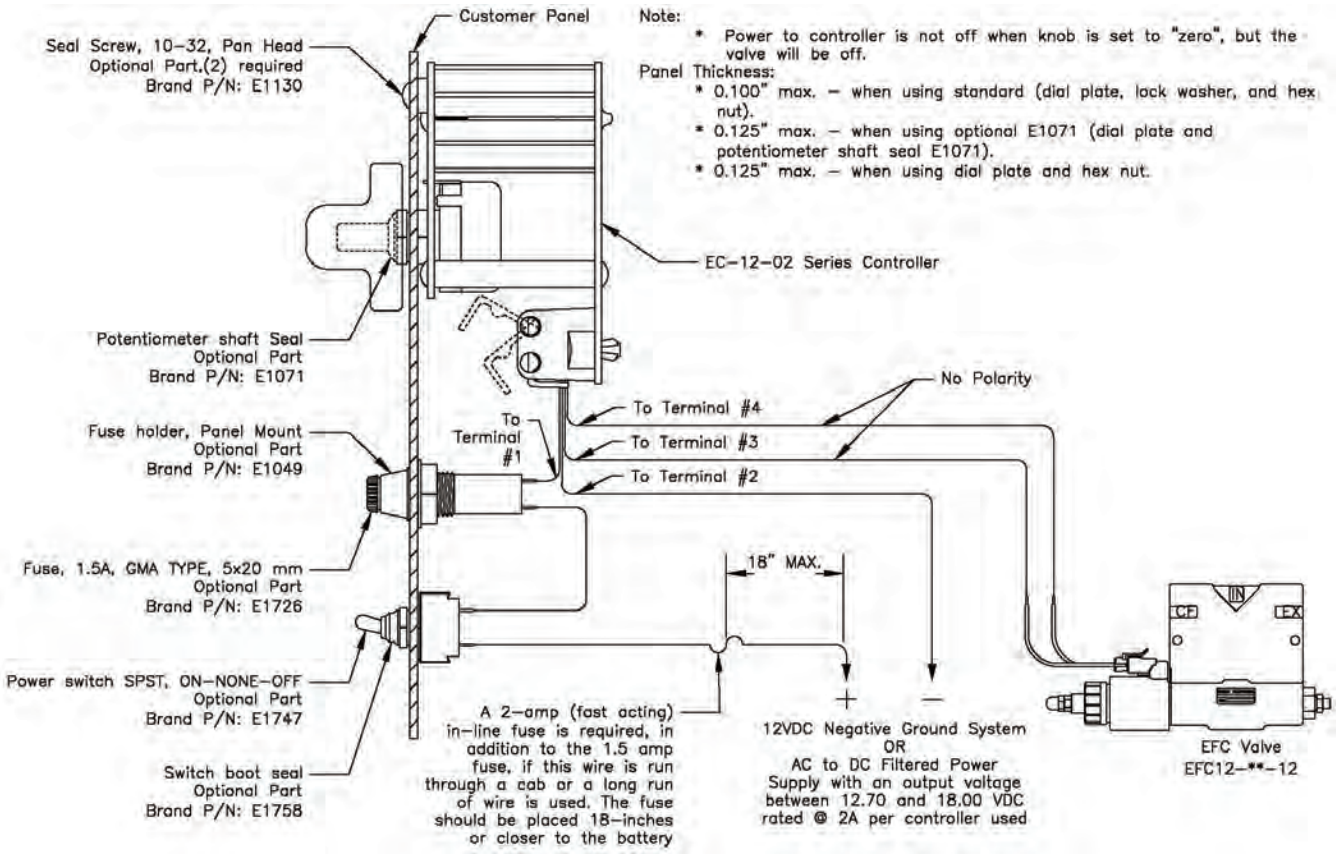
MOUNTING HOLES: inches & [millimeters]

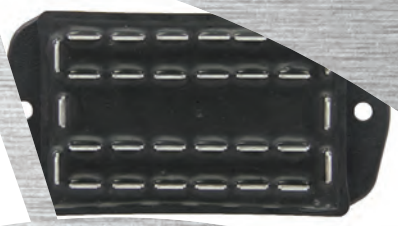


DIMENSIONAL DATA: inches & [millimeters]



WIRING DIAGRAM:





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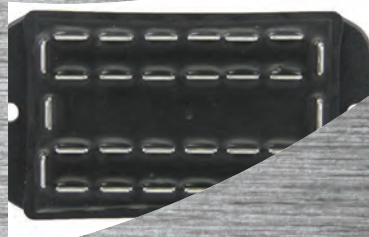
Current Steering Module

ECM0001



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Certificate #02.002.1

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ECM0001 Current Steering Module

FEATURES:

- Eliminates the need for double pole double throw switches (Bussed Cathode Design) to control a Brand Series 36 or Series 38 stack valve.
- Compatible with 12 or 24 VDC systems.
- Easy installation with 0.250"quick tab terminals.
- Potted enclosure helps protects the internal circuitry from mechanical and environmental stress.
- Uses 10% less wire than equivalent DPDT systems.*
- Simplifies the replacement of stack valves that do not use an unloaded inlet.
- Extends switch contact life; each output terminal has inductive kickback suppression.

DESCRIPTION:

The ECM0001 was designed to simplify the wiring of Brand Series 36 and Series 38 stack valves. When a switch input is activated a corresponding work section coil terminal and the inlet coil output terminals become energized. The module is set up to run up to a 6-spool stack valve. Two ECM0001 modules can be daisy chained for control of up to 12 sections.

SPECIFICATIONS:

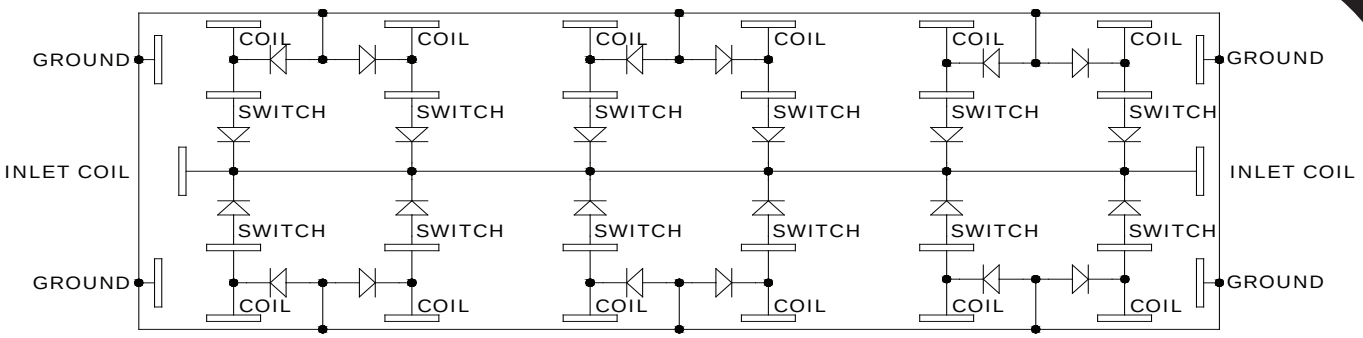
Voltage Supply	10-35 VDC
Max Continuous Output Current / Terminal	2.5 Amps / Coil Terminal / Inlet Coil Terminal**
Inputs	12 Switch Input Terminals 4 Common Ground Terminals
Outputs	12 Coil Output Terminals 2 Common Inlet Coil Output Terminals
Operating Temperature	-20°C - 70°C (-4°F - 158°F)
Storage Temperature	-40°C - 70°C (-40°F - 158°F)
Environmental Rating	IP67
Weight, Fully Assembled	0.148 kg (0.326 lb.)
Fuse	Customer supplied,
Type	5A, Fast Acting ***
Series	AGC, GMA, ATM, ATC, ATO are all acceptable

*10% savings based on wiring for a 6-section stack valve. Switches are less then 3 inches apart, and located 10 feet from the power source and stack valve.

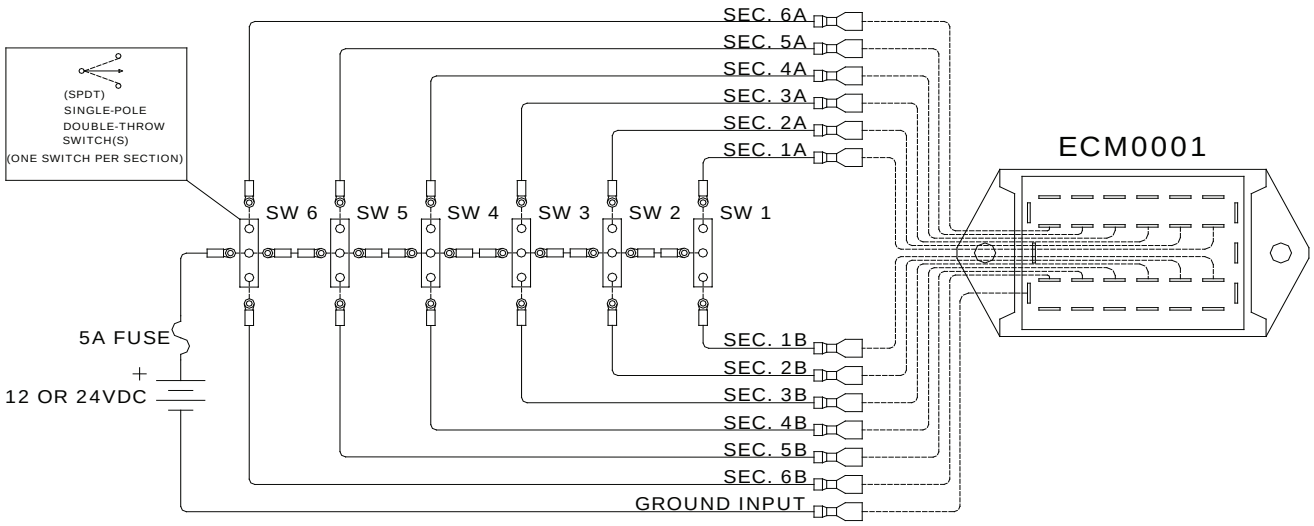
**Inlet coil output terminals must be limited to a combined 2.5A load. The inlet coil output buss current must not exceed 2.5A.

*** 5A fuse based on controlling a 1-12 spool Brand Series 36 or Brand Series 38 stack valve.

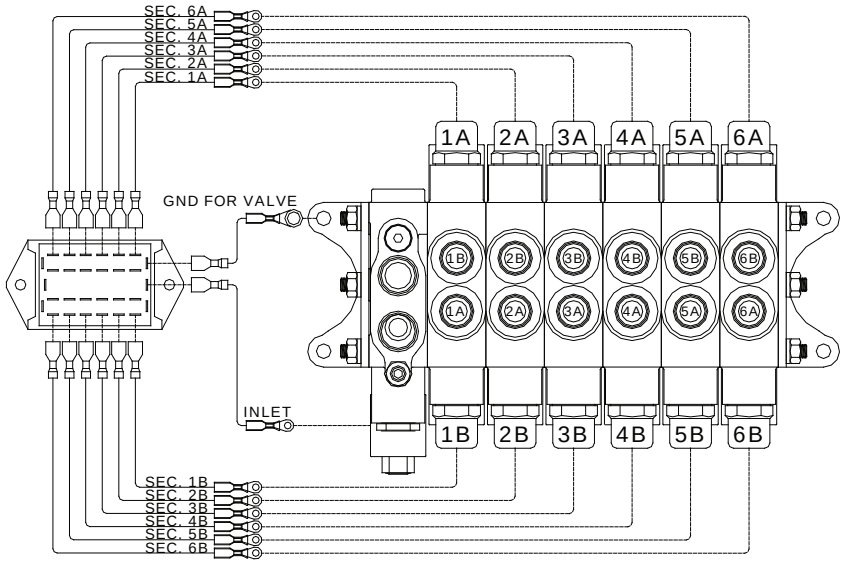
SCHEMATIC:



SWITCHES TO MODULE WIRING:

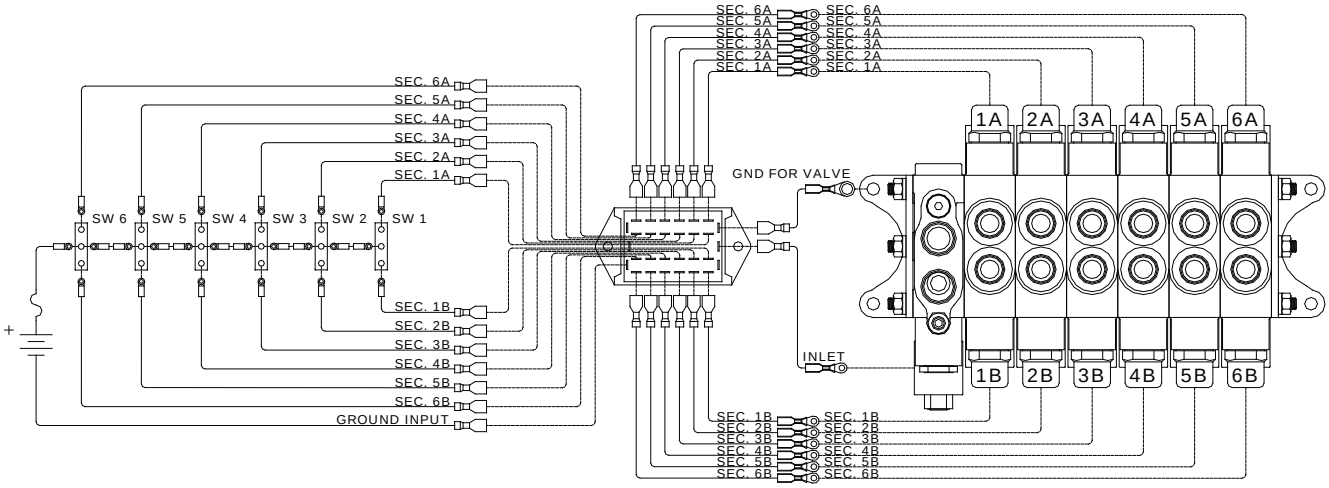


MODULE TO VALVE WIRING:



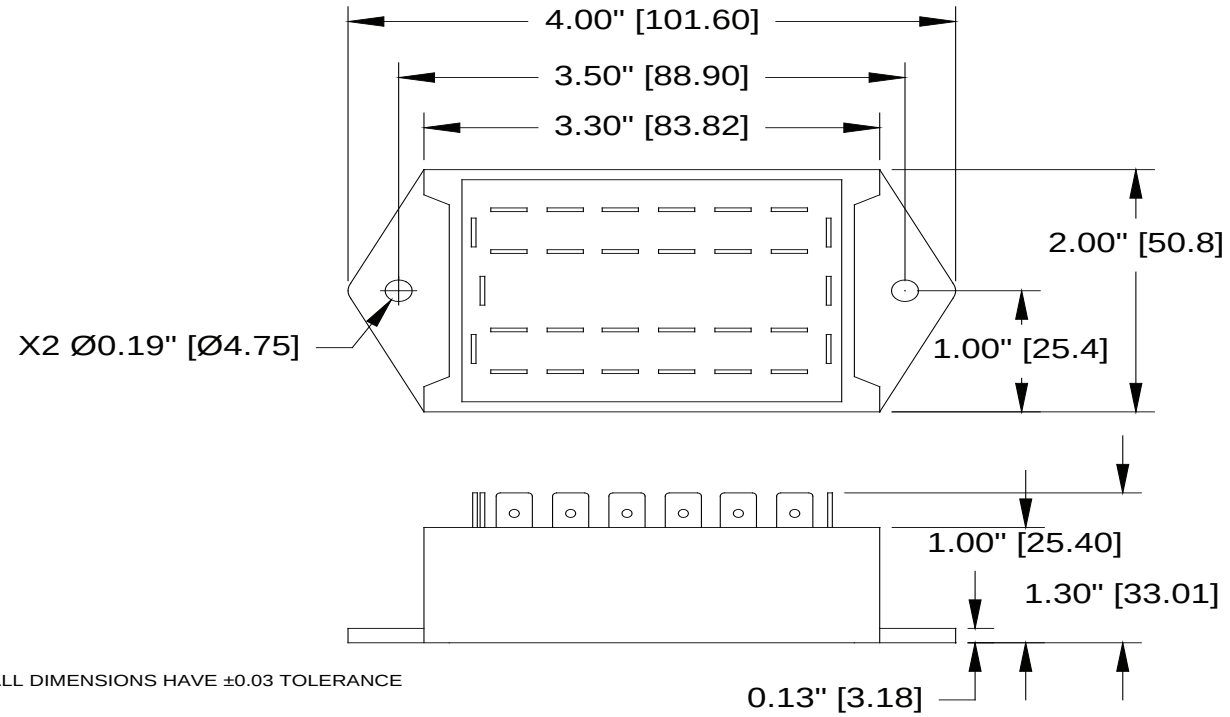
ECM0001 Current Steering Module

COMPLETE SYSTEM WIRING:



Note: Valve shown with optional C503-00000 coil

DIMENSIONAL DATA (ECM0001): inches & [millimeters]



NOTE: ALL DIMENSIONS HAVE ±0.03 TOLERANCE

PARTS AND ACCESSORIES:

SWITCHES

E1252.....Toggle switch, SPDT, (ON)-OFF-(ON), #6 screw terminals
E1253.....Toggle switch, SPDT, ON-OFF-ON, #6 screw terminals
E1758.....Switch boot seal, black, use with E1252 and E1253

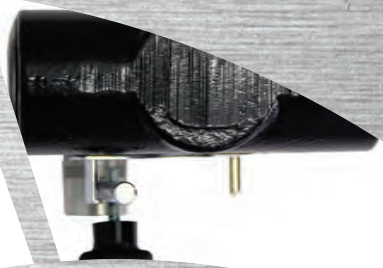
ATTENTION:

NOTES:

- Brand Hydraulics recommends the use of dielectric grease on all terminals.
- Switches, wiring, fuses, and terminals are not included, but are available.

CAUTION:

- Only mount module on flat surfaces. Mounting to uneven surfaces can cause mounting ears to break.
- Not designed for use in AC voltage systems.



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FC

PFC51-12SAE

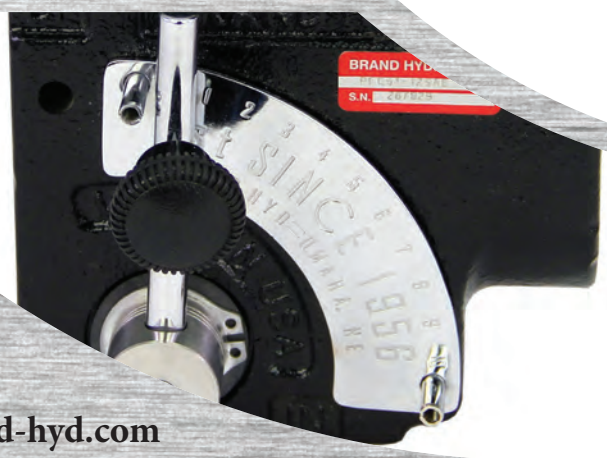
Full Range Pressure Compensating Variable Flow Control

PFCR51-3/4

PFCB51-12SAE

Specifications:

- See flow chart for capacity.
- Rated for 3000 psi (207 bar).
- Weighs 7- ¾ lbs. (3.52 kg).
- 30-Micron Filtration Recommended.
- Torque to turn side lever spool.
  - 35 in*lbs with 3000 psi (207 bar) on EX Port.



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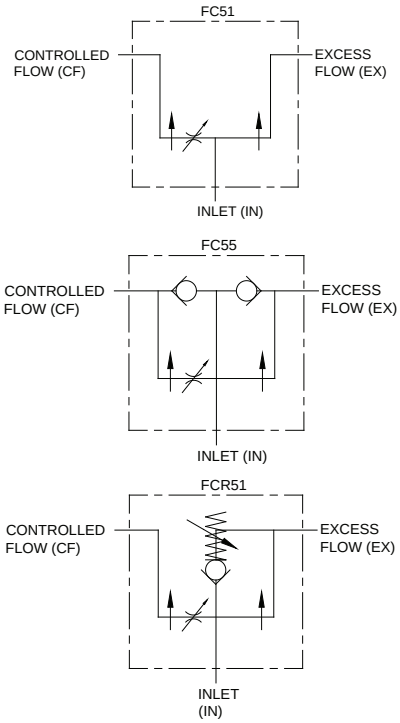
FC Full Range Pressure Compensating Variable Flow Control



PFC51-12SAE

PFCR51-3/4

PFCB51-12SAE

MATERIALS:

- Cast Iron Body.
- Heat Treated Compensator Spool.
- Stainless Steel Rotary Spool.
- Buna N O'Rings (Standard)
- Heat Treated Free Reverse Check Seat.

FEATURES:

- DIAMOND HONED SPOOL BORE provides consistent spool fit with low leakage.
- EVERY FC IS TESTED for shutoff, max. flow, and pressure compensation.
- STANDARD 3-PORT allows for pressure compensated flow out of two ports.
- STANDARD 416 STAINLESS STEEL rotary lever spool to prevent the spool from locking up.
- STANDARD SAE ORB COMPENSATOR PLUGS to eliminate external leakage from the compensator bore.
- EXTERNAL SEALS ON ROTARY SPOOL prevents contamination from locking up spool.
- OPTIONAL TOP PORT allows the customer to plumb their pipe directly in line with the inlet.
- OPTIONAL 2-PORT allows for pressure compensated flow out of one port.
- OPTIONAL 316 STAINLESS STEEL rotary spool provides highest corrosion resistance.
- OPTIONAL FREE REVERSE FLOW allows fluid to move from the CF (control flow) and EX (excess flow) port to the inlet. (Single reverse flow is also available)
- OPTIONAL ADJUSTABLE BALL SPRING RELIEF AND HIGH LIFT BALL SPRING RELIEF CF (control flow) port.

FC – GENERAL INFORMATION

The Brand, full range pressure compensating variable flow control is designed so that the orifice area varies as the lever is rotated. Fluid travels past the variable orifice, through the compensator spool and then out the controlled flow port. Therefore the flow out of the CF port is proportional to the orifice area which can vary from closed to open. The sum of the controlled flow and the excess flow equals the inlet flow and as the controlled flow increases the excess flow decreases. Both outlet flows are pressure compensated with a spool that maintains a constant flow by adjusting for pressure. Hunting between the compensated pump and our valve is dampened with a dashpot on the compensator spool. Thus, the outlet flow is smooth and constant regardless of the pressure on the CF and EX port. External seals on the rotary spool prevent contamination from getting between the spool and the casting, thus preventing the spool from locking in one position. All FC's are built with stainless steel (416) rotary spools to help prevent the rotary spools from locking up when they are in a corrosive environment. We also offer the FC with outlet ports coming from the top of the casting.

ADJUSTABLE BALL SPRING RELIEFS – The adjustable ball spring relief (R) and the adjustable high lift ball spring relief (B) allow the customer pressure compensated flow up to the pressure setting on the relief. Once the pressure on the CF port increases above the relief setting the relief valve opens and diverts flow to the EX port while maintaining the pressure on the CF port. The EX port must be plumbed back to tank for both of these reliefs. Both relief options are preset to 1500 psi (103 bar), standard, and field adjustable from 750 to 3000 psi. (52 to 207 bar). Pressure settings between 250 and 750 psi (17 and 52 bar) can be achieved by using a different spring. The B option's advantage over the R option is that the cracking pressure at low and high flow is virtually the same. The B option is also more stable when flow is traveling past the ball and spring. (See relief flow charts on next page)

FREE REVERSE FLOW – The free reverse flow (55) option is designed primarily where cylinders and motors are needed to go in reverse. Flow can go in reverse from either the EX or the CF port to the inlet. Flow is not metered when it goes in reverse. The non-metered flow travels past the poppet, down the center of the valve, past the compensator spool and through the inlet. The steel poppet seat inside the free reverse flow check is heat treated to assure a long life.

FC Full Range Pressure Compensating Variable Flow Control

FC – EXAMPLES OF COMMON MODEL CODES:

FC51-3/4.....3/4" ports and a max flow of 30 gpm (114 lpm).

FCR51-3/8.....Ball spring relief (1500 psi (103 bar) setting), adjustable from 750 to 3000 psi (52 to 207 bar), 3/8" ports, and a max flow of 8 gpm (30 lpm).

FC55-1/2.....Free reverse flow, 1/2" ports, and a max flow of 16 gpm (61 lpm).

FC – CREATING A MODEL CODE FOR FC'S:

F C - _ _ _ _ _

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

RELIEF TYPE:
Omit – No relief
R – Adj. ball spring relief (Standard 1500psi (103bar) setting)
B – Adj. high-lift ball spring relief (Standard 1500psi (103bar) setting)

FLOW PATH:
51 – Standard flow control
55 – Free reverse flow (Cannot be used in conjunction with ball spring relief).

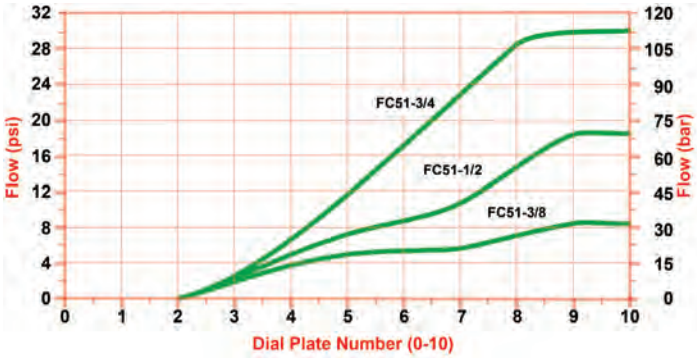
PORT SIZE:
3/8 – 3/8" NPT (0-8 gpm (0-30 lpm), standard)
1/2 – 1/2" NPT (0-16 gpm (0-61 lpm), standard)
3/4 – 3/4" NPT (0-30 gpm (0-114 lpm), standard)
6 - #6SAE (9/16 – 18) (0-8 gpm (0-30 lpm), standard)
8 - #8SAE (3/4 – 16) (0-8 gpm (0-61 lpm), standard)
10 - #10SAE (7/8 – 14) (0-16 gpm (0-61 lpm), standard)
12 - #12SAE (1-1/16 – 12) (0-30 gpm (0-114 lpm), standard)

2 OR 3 PORT:
2P – 2 port
Omit – 3 port (Standard)
TP – Top ported

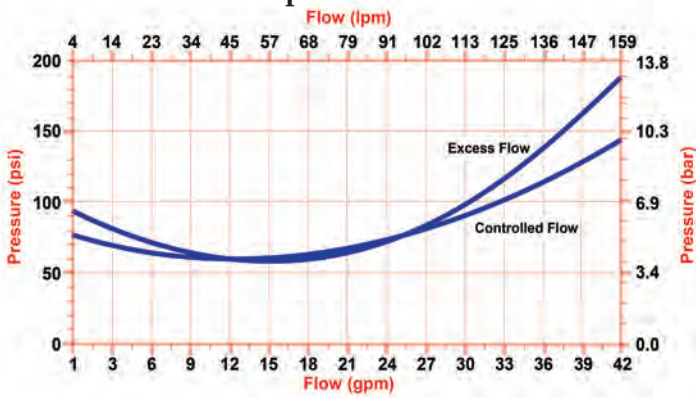
FLOW SETTING & SPOOL TYPE:
SS - 316 Stainless Steel (416 S.S. is standard)
X – Increased Compensation Stability
***37** – 0-8 gpm (0-30.3 lpm)
***50** – 0-16 gpm (0-60.6 lpm)
***75** – 0-30 gpm (0-113.6 lpm)
** - Consult factory for others
** - Need not specify for standard flow settings noted under " PORT SIZE"

FC - FLOW AND PRESSURE INFO:

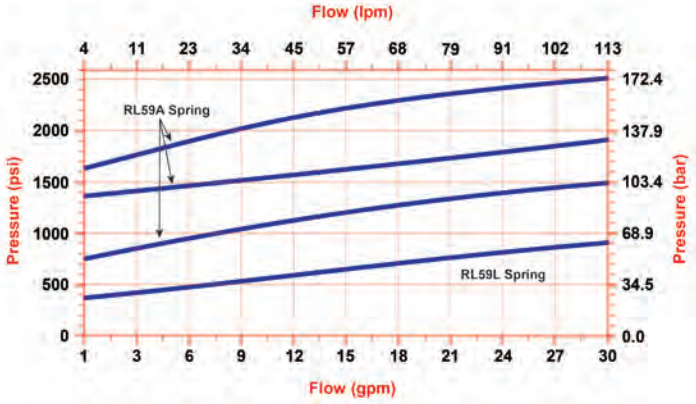
Controlled Flow vs. Dial Plate for FC Series



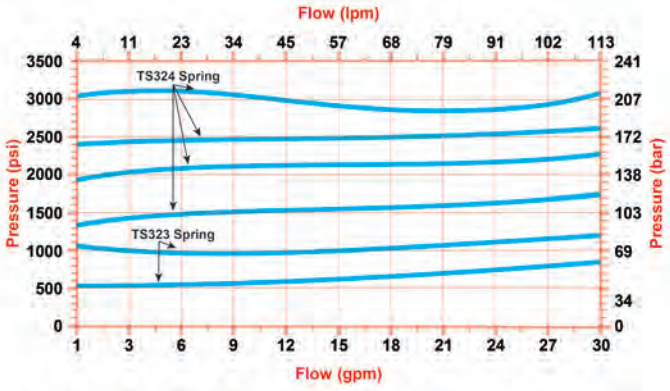
Pressure Drop vs. Flow for FC Series



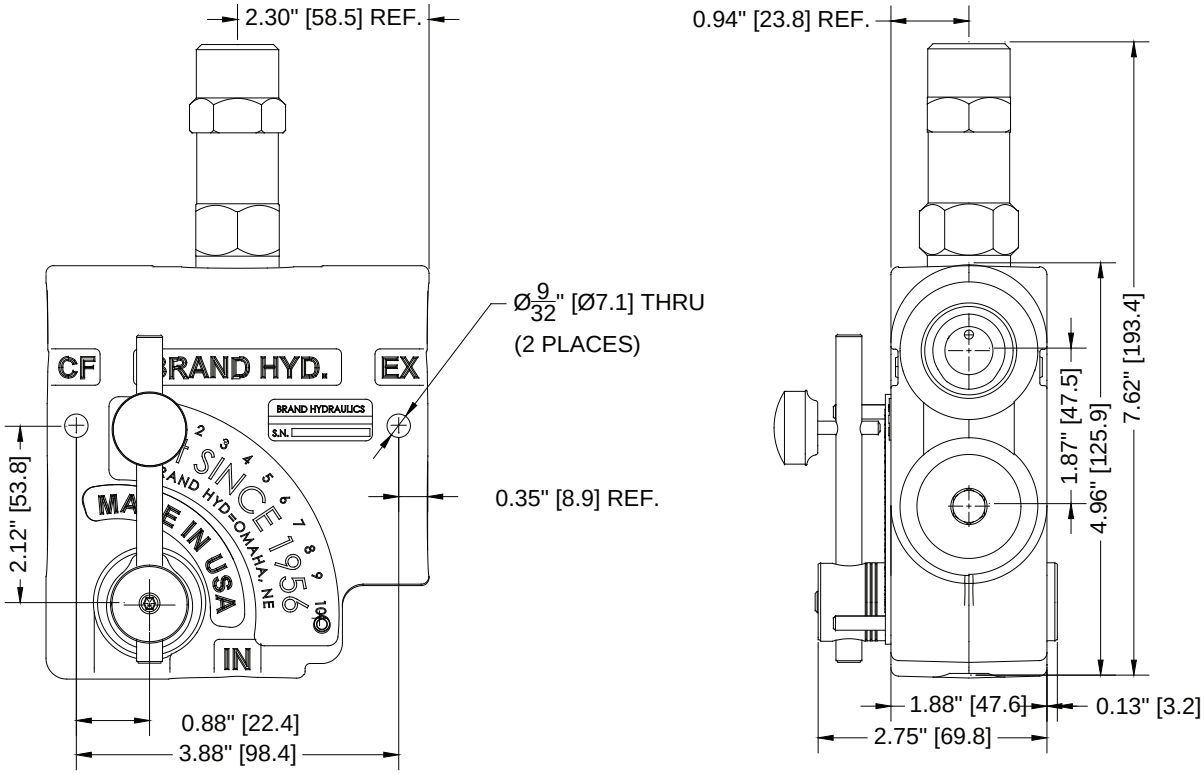
Pressure vs. Flow for FCR51

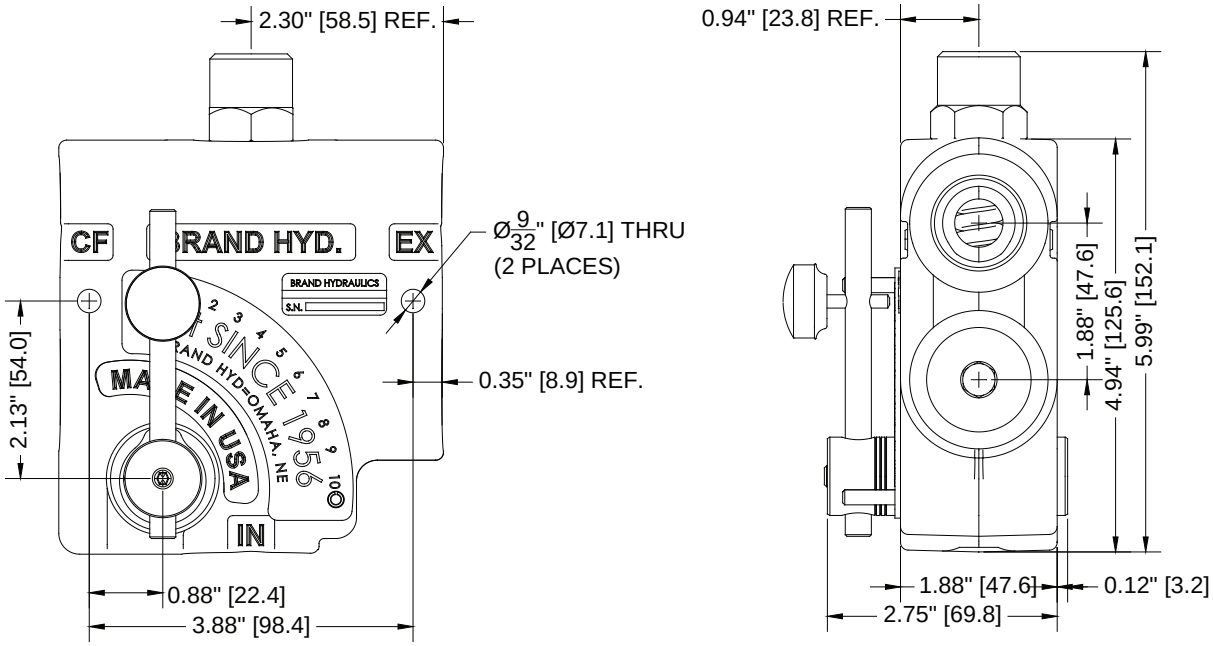


Pressure VS. Flow for FCB51



DIMENSIONAL DATA:
FCB51 AND FC51 DIMENSIONAL DATA (inches & [millimeters]):
(FCB51 SHOWN):





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FC

High Volume Full Range Pressure Compensating Variable Flow Control

Specifications:

- See flow chart for capacity.
- Rated for 3000 psi (207 bar).
- Weighs 28 – 3/4 lbs. (13.0 kg).
- 30-Micron Filtration Recommended.
- Torque to turn side lever spool. -40 in*lbs (4.5Nm) with 3000 (207 bar) psi on CF port or the EX port.

PFC51-16SAE

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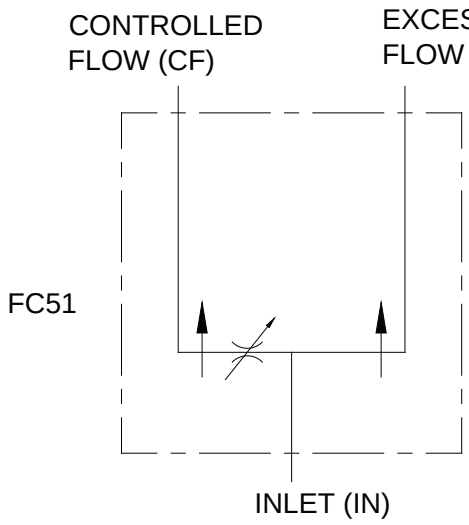
FC High Volume Full Range Pressure Compensating Variable Flow Control



PFC51-16SAE

MATERIALS:

- Ductile Cast Iron Body.
- Heat Treated Steel Spools.
- Buna N O'Rings.
- Consult factory for stainless steel rotary spool.

FEATURES:

- PRECISION GROUND PLATED SPOOL that assures long life.
- DIAMOND HONED SPOOL BORE provides consistent spool fit with low leakage.
- EVERY FC IS TESTED for shutoff, linearity, and pressure compensation.
- STANDARD 3-PORT allows for pressure compensated flow out of two ports.

FC – GENERAL INFORMATION

The Brand, full range pressure compensating variable flow control is designed so that the orifice area varies as the lever is rotated. Fluid travels past the variable orifice, by the compensator spool and then out the controlled flow port. Therefore the flow out of the CF port is proportional to the orifice area which can vary from closed to wide open. The sum of the controlled flow and the excess flow equals the inlet flow and as the controlled flow increases the excess flow decreases. Both outlet flows are pressure compensated with a spool that maintains a constant flow while adjusting for pressure. Hunting between the compensated pump and our valve is dampened with a cross hole in the casting. Thus, the outlet flow is smooth and constant regardless of the pressure on the CF and EX port.

FC – EXAMPLES OF COMMON MODEL CODES:

FC51-1.....1" ports and standard 50 gpm (189.3 lpm) rotary spool.
FC51-1 1/2.....1 1/2" ports and 90 gpm (340.7 lpm) rotary spool.
FC51-24*100.....Number 24SAE ports and 50 gpm (189.3 lpm) rotary spool.

FC – CREATING A MODEL CODE FOR FC'S:

F C 51 ___ ___ ___

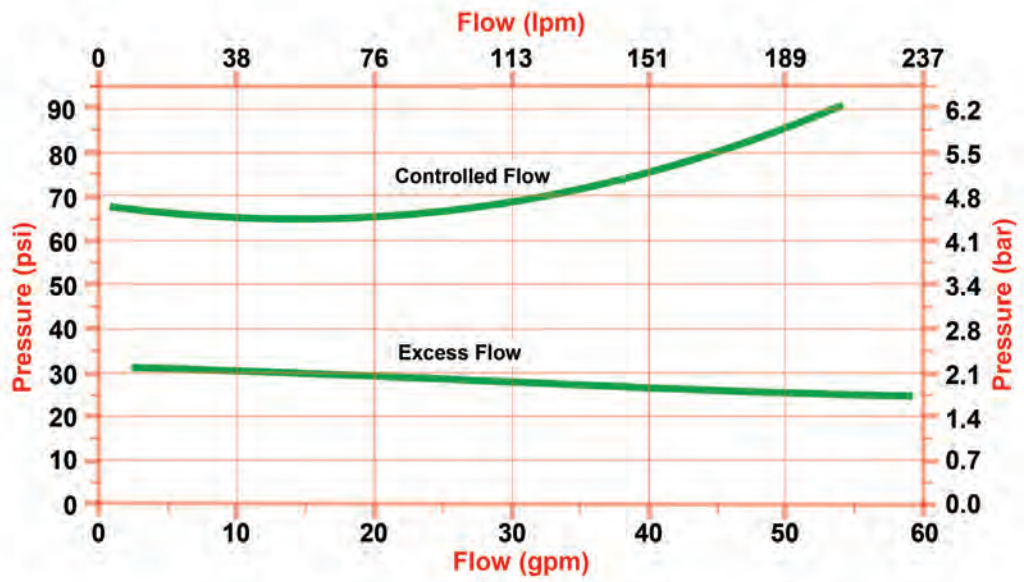
PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

PORT SIZE:
1 – 1" NPT (0-50 gpm (0-189.3 lpm) standard)
1 1/4 – 1 1/4" NPT (0-90 gpm (0-340.7 lpm) standard)
1 1/2 – 1 1/2" NPT (0-90 gpm (0-340.7 lpm) standard)
16 - #16SAE (1 5/16 – 12) (0-50 gpm (0-189.3 lpm) standard)
24 - #24SAE (1 7/8 – 12) (0-90 gpm (340.7 lpm) standard)

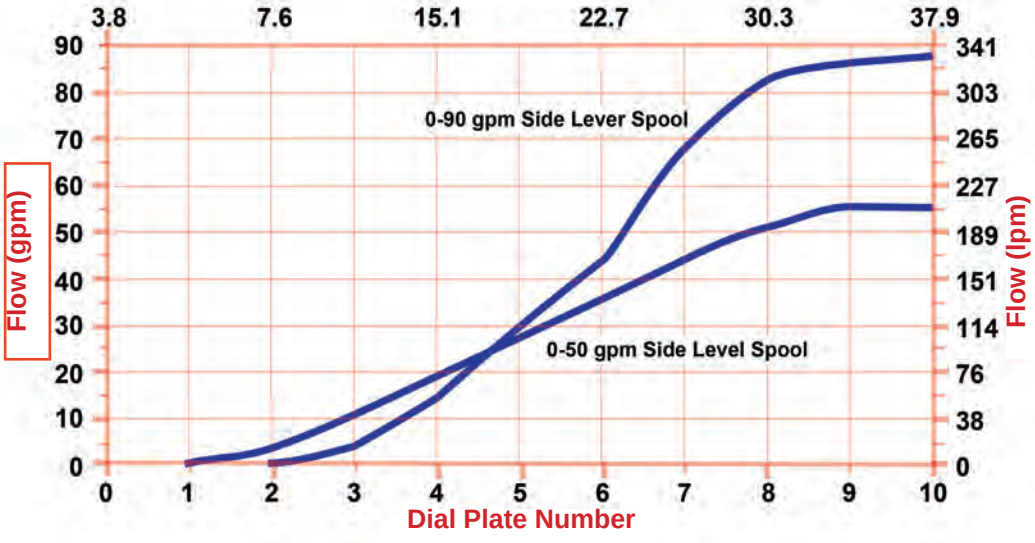
FLOW SETTING:
***100** – 0-50 gpm (0-189.3 lpm)
** - Need not specify for standard flow setting noted under "PORT SIZE"

FC - FLOW AND PRESSURE INFO:

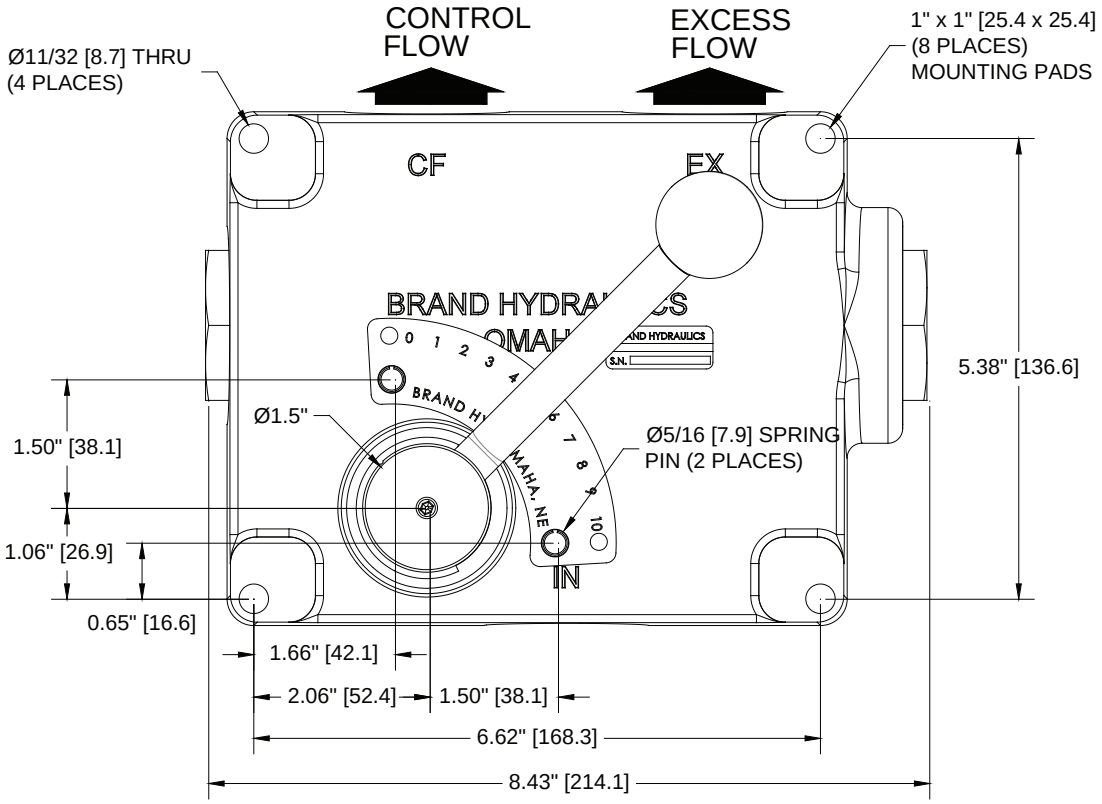
Pressure Drop vs. Flow

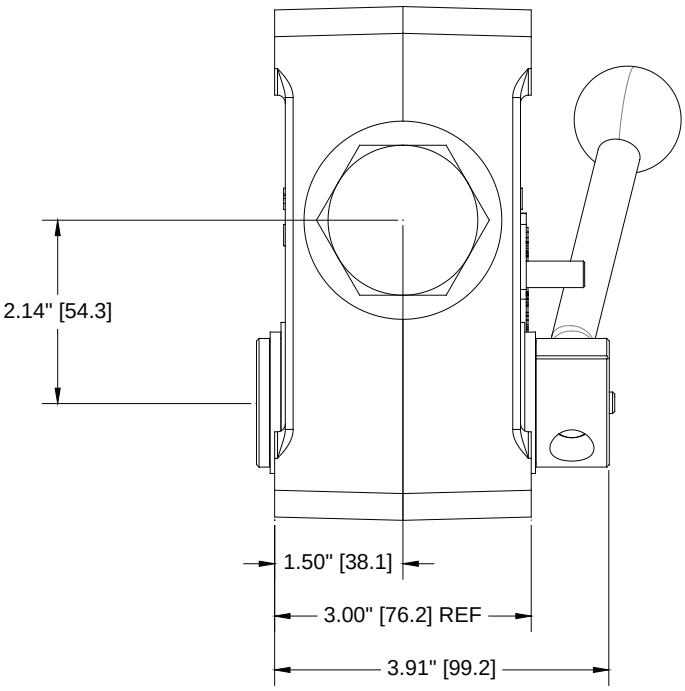


Flow vs. Dial Plate



DIMENSIONAL DATA:
DIMENSIONAL DATA (inches & [millimeters]):





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Series 83

Non-Adjustable Flow Control

Specifications:

- Rated for 0-10 gpm (0-37.9 lpm).
- Rated for 3000 psi (207 bar).
- Weighs 1/4 lb. (0.11 kg).
- 30-Micron Filtration Recommended.
- Port size #8 SAE (3/4-16).

P83AFF01

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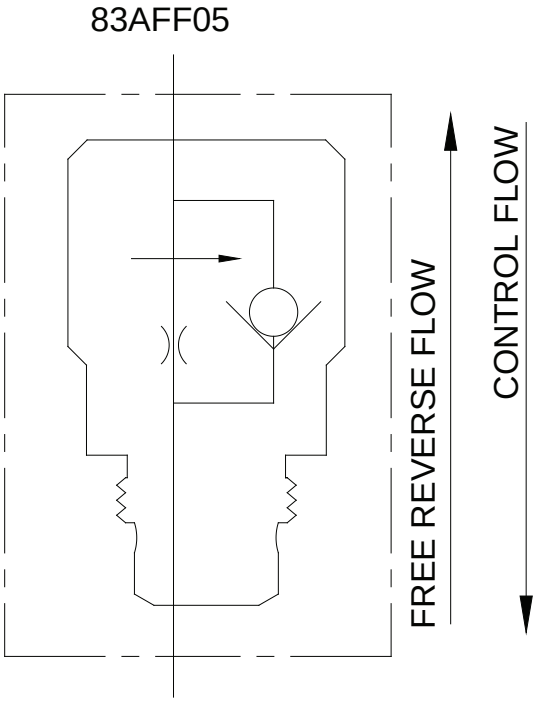
Series 83 Non-Adjustable Flow Control



P83AFF01

MATERIALS:

- Black Oxide Steel Body.
- Heat Treated Steel Spool.
- Buna N O'Rings (Standard).

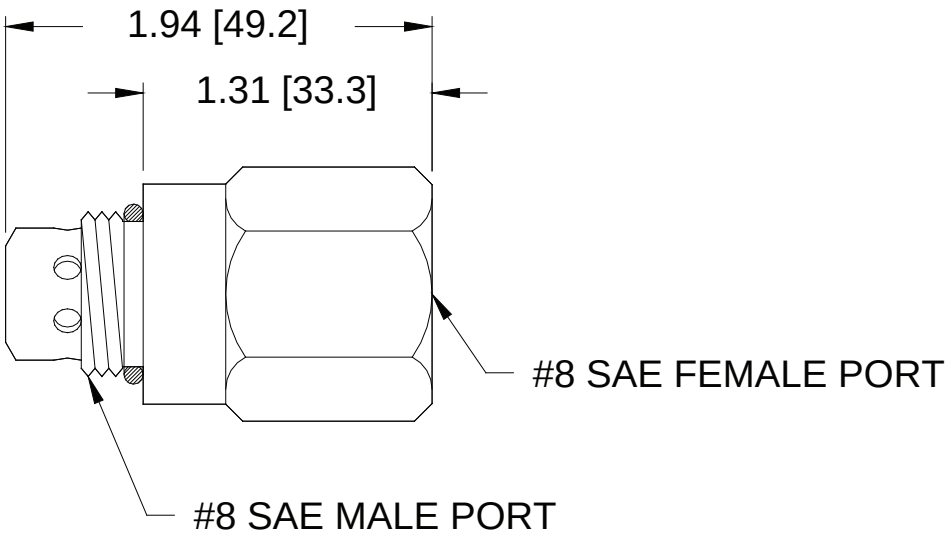
FEATURES:

- EVERY SERIES 83 IS TESTED for max. flow, and pressure compensation.
- FREE REVERSE FLOW allows fluid to move freely in one direction and controlled in the other direction.

SERIES 83 – GENERAL INFORMATION:
The Brand, Series 83 is a two port, non–adjustable, pressure compensated, inline flow control, with free reverse flow. The amount of flow is determined by the diameter of the orifice in the compensator piston. The spring and piston are held in place when it is connected to a #8 SAE male fitting. This flow control is inexpensive and gives the customer the ability to change the flow rate by swapping the piston with another that has a different orifice size.

SERIES 83 – EXAMPLES OF COMMON MODEL CODES:
83AFF05.....#8 SAE ports and a max flow of 5 gpm (18.9 lpm).
83AFF10A.....#8 SAE ports, a max flow of 10 gpm (37.9 lpm) and a #8 SAE adapter.
83AFF__.....#8 SAE ports, indicate flow in gpm, as per example: 83AFF03=3 gpm (11.4 lpm).
Paint (Optional).....(P) painted black (other colors available, consult factory), (MP) epoxy coating.

DIMENSIONAL DATA:
DIMENSIONAL DATA (inches & [millimeters]):



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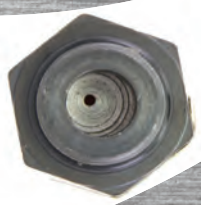
Series 84

Non-Adjustable Fixed Orifice

Specifications:

- Orifice DIA. 0 – 0.250” (0 – 0.635 cm).
- Rated for 3000 psi (207 bar).
- Weighs 1/4 lb. (0.11 kg).
- 30-Micron Filtration Recommended.
- Port size #8 SAE (3/4-16).

P84AFF-062



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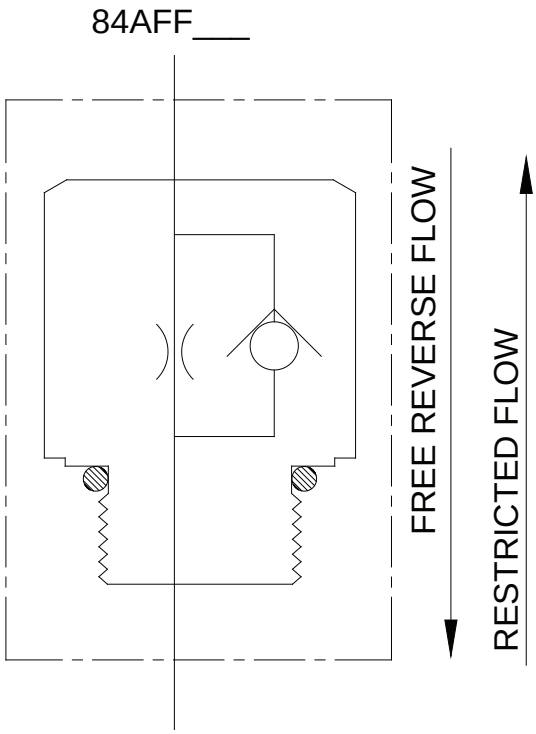
Series 84 Non-Adjustable Fixed Orifice



P84AFF-062

MATERIALS:

- Black Oxide Steel Body.
- Buna N O'Rings (Standard).

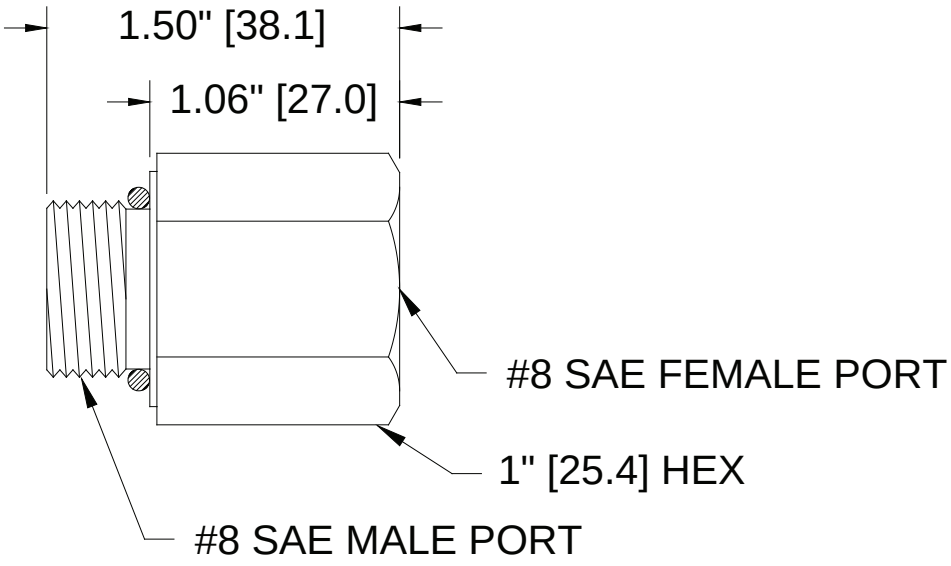
FEATURES:

- RESTRICTED FLOW allows flow to be metered through a specified orifice.
- FREE REVERSE FLOW allows fluid to move freely.

SERIES 84 – GENERAL INFORMATION:
The Brand, Series 84 is a two port, non–adjustable, inline, fixed orifice with free reverse flow. The flow is determined by the orifice diameter and fluid pressure. The orifice diameter must be specified by the customer when ordering (up to a diameter of 0.250" (6.35mm)). The orifice plate is held in place when it is connected to a #8 SAE male fitting. This restricted flow assembly is inexpensive and gives the customer the ability to change the orifice diameter by swapping the orifice plate with another that has a different orifice size.

SERIES 84 – EXAMPLES OF COMMON MODEL CODES:
84AFF.125…….. #8 SAE ports and an orifice diameter of 0.125 (3.18mm).
84AFF.063…….. #8 SAE ports and an orifice diameter of 0.063 (1.6mm).
84AFF__……#8 SAE ports, indicate orifice diameter, as per example:
84AFF.063 = .063" (1.6mm) orifice.
Paint (Optional).....(P) painted black (other colors available, consult factory), (MP) epoxy coating.

DIMENSIONAL DATA:
DIMENSIONAL DATA (inches & [millimeters]):



BRAND HYDRAULICS CO.

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EFC

Electronically Adjustable Proportional Pressure Compensated Flow Control

Specifications:

- See flow chart for capacity.
- 3000 psi (207 bar) rating.
- Weighs 8-1/2 lbs. (3.9 kg).
- Standard Port size #12SAE (1-1/16 – 12).
- 10-Micron Filtration Recommended.
- Pulse Frequency (90 to 115 hz).
- Coil

-12 VDC standard	(24 VDC).
-9.6 ohms	(48 ohms).
-15 watts	(15 watts).
-1.0 amp max	(0.5 amp max.).

PEFC12-10-12

PEFC12-15-12R22

- Response Time
  - -0.035” Standard dash pot (375 ms).
  - -0.020” Dash pot (900 ms).
  - -0.093 Dash pot (175 ms to 350 ms depending on flow).
- Spool leakage (3.05 in^3/min. @ 1000 psi ((50 ml/min. @ 68.9 bar) on EX port).

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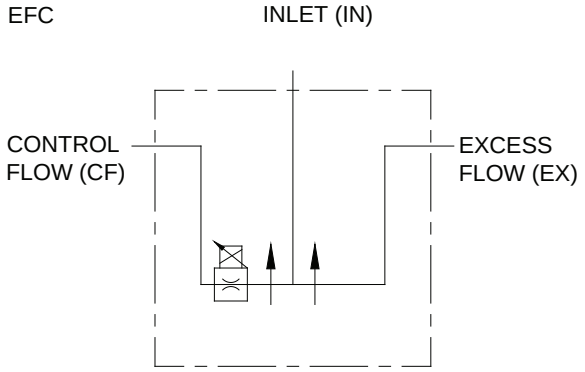
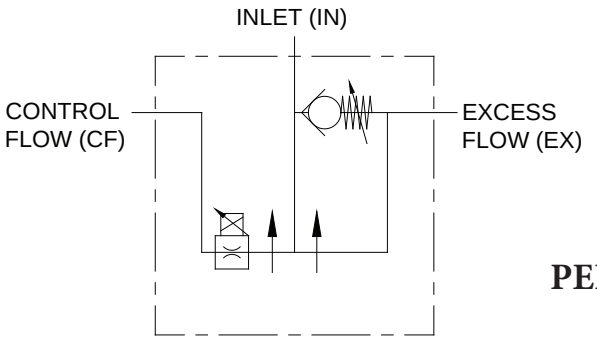
EFC

Electronically Adjustable Proportional Pressure Compensated Flow Control

EFC



EFC WITH RELIEF



PEFC12-10-12

PEFC12-15-12R22

MATERIALS:

- Ductile Cast Iron Body
- Heat Treated Steel Spools
- Buna N O'Rings
- Heat Treated Free Reverse Check Seat

FEATURES:

- DIAMOND HONED SPOOL BORE provides consistent spool fit with low leakage.
- O'RING PORTS to eliminate leakage.
- EVERY EFC IS TESTED for shutoff, linearity, max. flow, crack open and pressure compensation.
- STANDARD 3-PORT allows for pressure compensated flow out of the CF and EX ports.
- MANUAL OVERRIDE when electrical power is lost.
- OPTIONAL 2-PORT allows for pressure compensated flow out of CF port.
- OPTIONAL FREE REVERSE FLOW allows fluid to move from the CF port to the inlet.
- OPTIONAL HIGH LIFT RELIEF.

EFC – GENERAL INFORMATION

The Brand, electronically adjustable proportional pressure compensated flow control is an electronically controlled version of the original FC51 style flow control valve. The EFC performance as a flow control is very similar to the FC51 because they both use the same spring and compensator spool. Thus, the control flow port (CF) and the excess flow port (EX) remain usable and pressure compensated.

The main advantage of the EFC over the FC51 is that the flow can be adjusted proportionally with a solenoid instead of manually. As the current to the solenoid increases the variable orifice moves proportionally similar to positioning the rotary side lever on the manual FC's. The solenoid is connected to our EC – series controls which can be sold with the EFC. We also give the choice of a dashpot size, which allows the customer to select a valve that responds to the control box at different rates. Other options are 2-port, free reverse flow and high lift ball spring relief.

2-PORT- The 2-port (2P) option is a modified version of the standard 3-port EFC. This option lets the customer use the control flow port while the excess port is plugged. A special compensator spool was designed to eliminate hunting that can occur between pressure compensated valves and pumps. To use the EFC 2-port a pressure compensated pump is required. The 2-port can be converted to a 3-port (by removing the EX plug), but it will not have the same characteristics as the standard 3-port. (See chart on next page for 2-port EFC)

FREE REVERSE FLOW- The free reverse flow option was designed to be used primarily where cylinders and motors are needed to go in reverse. The flow can only go in reverse from controlled flow (CF) to the inlet (IN). Flow is not metered when it goes in reverse. The steel ball seat inside the compensator spool is heat treated to assure a long life.

HIGH LIFT BALL SPRING RELIEF – The high lift ball spring relief (R) reduces plumbing and provides relief protection. Once the pressure on the inlet port increases above the relief setting the relief valve opens and diverts flow to the EX port while maintaining pressure on the IN port. The EX port must be plumbed back to tank for this relief to work. This relief does not chatter and the cracking pressure from low to high flow is virtually the same. The relief is easily adjustable by simply loosening the lock nut and turning the adjusting fitting. (See relief chart on next page)

EFC

Electronically Adjustable Proportional Pressure Compensated Flow Control

EFC – EXAMPLES OF COMMON MODEL CODES:

EFC12-10-12.....10 gpm (37.9 lpm) 3-port with 12 volt coil

EFC12-15-12R15.....15 gpm (56.8 lpm) 3-port, 12 volt coil with 1500 psi (103.4 bar) relief

EFC12-10-122P.....10 gpm (37.9 lpm) 2-port with 12 volt coil

CEP1000.....10 gpm (37.9 lpm) 3-port with EC-12-01 control

EFC – CREATING A MODEL CODE FOR EFC'S:

EF C - -

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

REVERSE FLOW:
C – Free reverse flow
Omit – No reverse flow

PORT SIZE:
12 - #12SAE (1-1/16 – 12)
****** - Contact factory for others

FLOW SETTING:
05 – 0-5 gpm (18.9 lpm)
10 – 0-10 gpm (37.8 lpm)
15 – 0-15 gpm (56.8 lpm)
20 – 0-20 gpm (75.7 lpm)
25 – 0-25 gpm (94.6 lpm)*
30 – 0-30 gpm (113.6 lpm)*

OPTIONS:
2P – 2 port
R15 – Relief set at 1500 psi (103.4 bar) (specify pressure in 100 psi increments)*
.093 – 0.093 dashpot orifice
.020 – 0.020 dashpot orifice

COIL VOLTAGE & TERMINAL:
12 – 12 volt DC
24 – 24 volt DC
PF – Weather pack, female shroud with male pin
PM – Weather pack, male tower with female pin

* - 3 port only

EFC – WITH ELECTRONIC CONTROL:

CEP _ _ _ 00

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

REVERSE FLOW:
C – Free reverse flow
Omit – No reverse flow

CONTROLS:
D – EC-12-02 (Dashmount)
Omit – EC -12-01 (Weather proof box)

OPTIONS:
2P – 2 port
R15 – Relief set at 1500 psi (103.4 bar) (specify pressure in 100 psi increments)*
.093 – 0.093 dashpot orifice
.020 – 0.020 dashpot orifice
Omit – No options

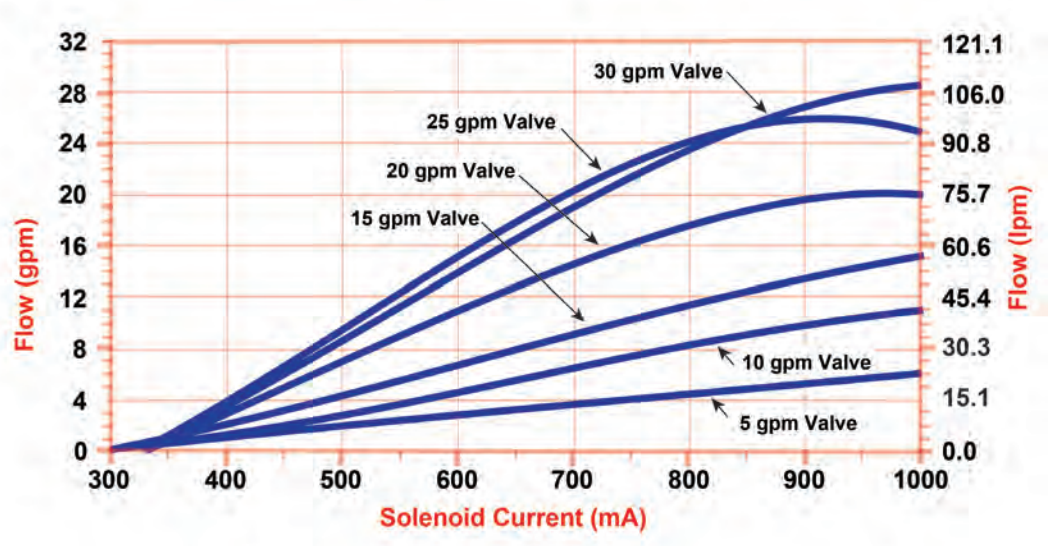
* - 3 port only

FLOW SETTING:
05 – 0-5 gpm (18.9 lpm)
10 – 0-10 gpm (37.8 lpm)
15 – 0-15 gpm (56.8 lpm)
20 – 0-20 gpm (75.7 lpm)
25 – 0-25 gpm (94.6 lpm)*
30 – 0-30 gpm (113.6 lpm)*

EFC FLOW & SOLENOID CURRENT INFO FOR 2-PORT AND 3-PORT:

Flow vs. Solenoid for EFC 3-Port

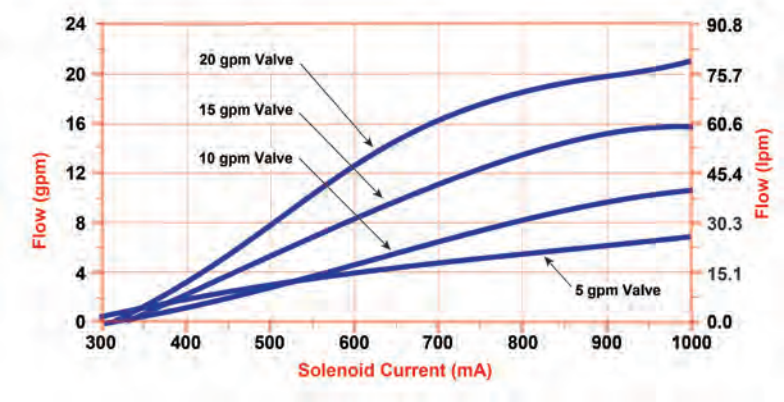
Oil Temp = 100 deg. F w/140-147 SUS Oil



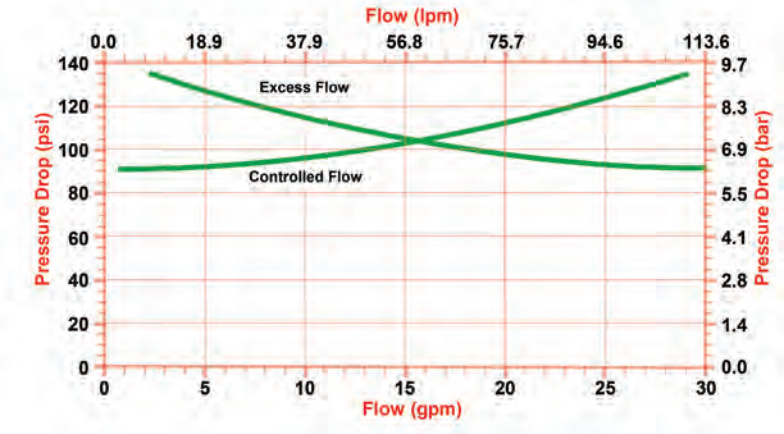
EFC FLOW & SOLENOID CURRENT INFO FOR 2-PORT AND 3-PORT:

Flow vs. Solenoid Current for EFC 2-Port

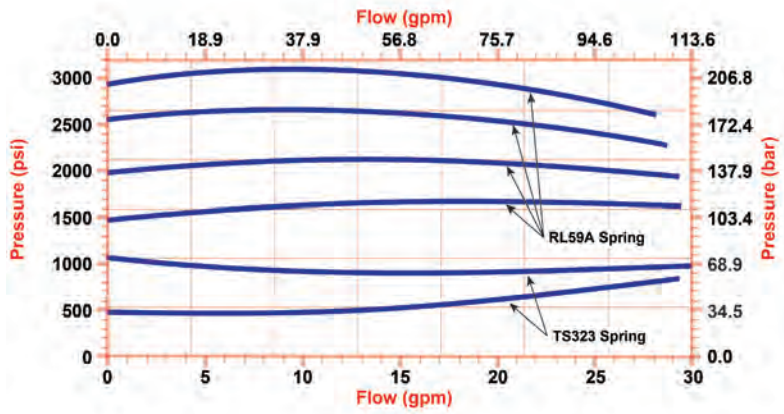
Oil Temp = 100 deg. F w/140-147 SUS Oil



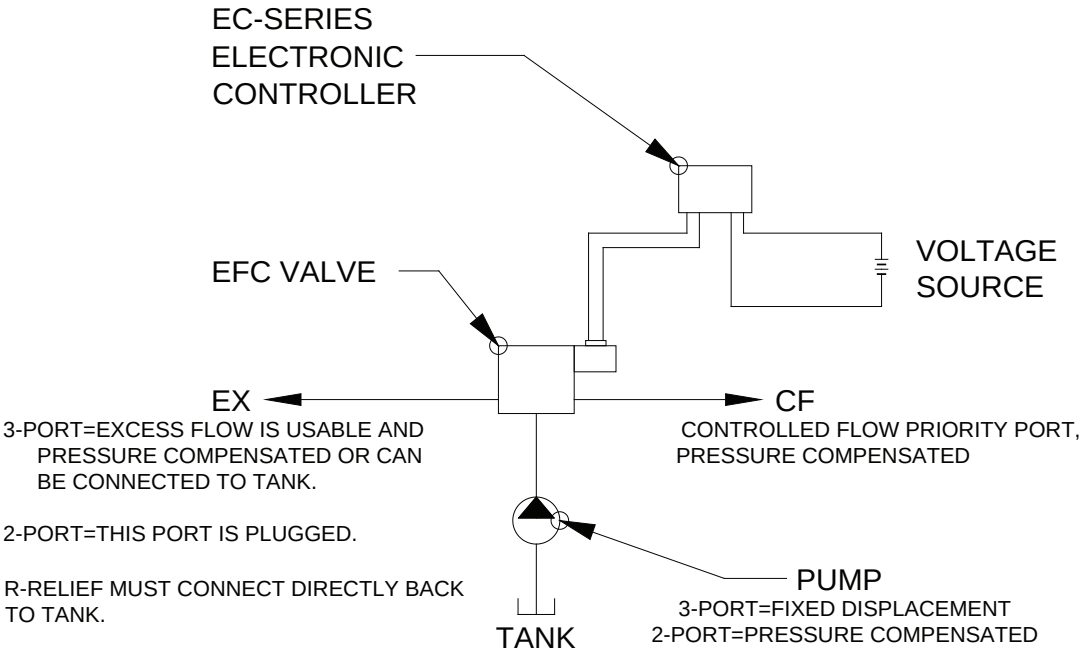
Pressure Drop vs. Flow for EFC Series



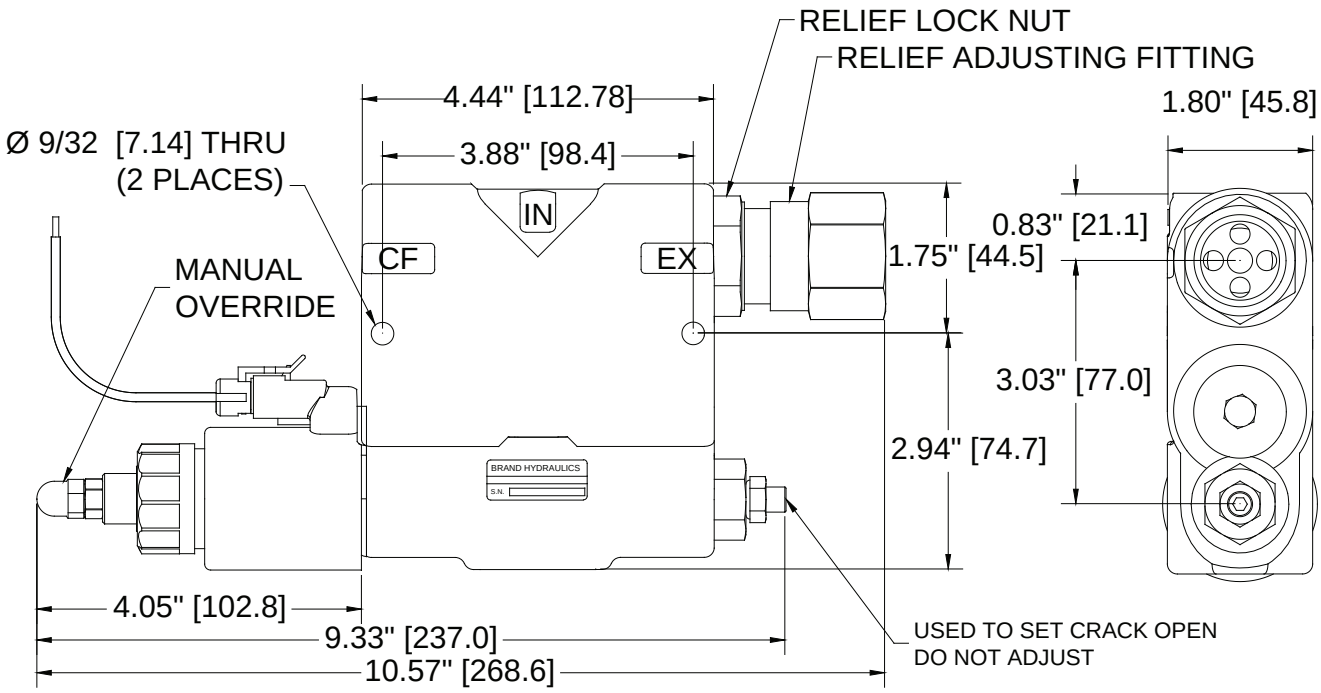
Pressure vs. Flow for EFC with Relief



2 & 3 PORT SCHEMATIC DRAWING:



DIMENSIONAL DATA (EFC WITH RELIEF SHOWN):



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LEFC

Large Electronically Adjustable Proportional Pressure Compensated Flow Control

PLEFC165512LH

Specifications:

- See flow chart for capacity.
- Max. 3000 psi cartridge input pressure.
- Nominally Rated for 3000 psi (207 bar).
- Tank Port - #4 SAE (10 psi (0.69 bar) MAX. back pressure)
- Weight 32–3/4 lbs. (14.9 kg).
- 25-Micron Filtration or Better.
- Coil 12 VDC standard.
  10.4 Ohms.
  14 Watts.
  1.15 Amp max.

Rated 100% continuous duty cycle

- Pulse Frequency (90 to 110 Hz)
- Operating Temperature: -20° to 210°F (-30° to 100°C)

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Certificate #02.002.1

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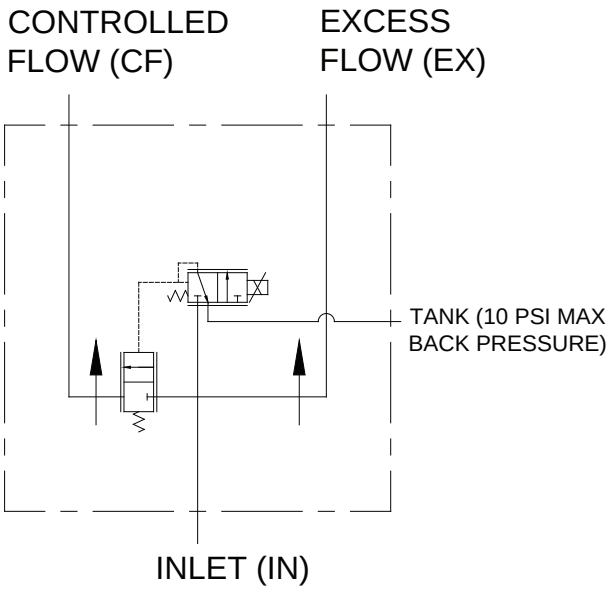
LEFC

Large Electronically Adjustable Proportional Pressure Compensated Flow Control



PLEFC165512LH

MATERIALS:

- Cast Iron Body.
- Heat Treated Steel Spools.
- Buna N O'Rings.

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- DIAMOND HONED SPOOL BORE provides consistent spool fit with low leakage.
- EVERY LEFC IS TESTED for linearity and pressure compensation.
- STANDARD 3-PORT allows for pressure compensated flow out of two ports.
- OPTIONAL MANUAL OVERRIDE when electrical power is lost.

LEFC – GENERAL INFORMATION

The Brand, LEFC (large electronically adjustable proportional pressure compensated flow control) is an electronically controlled version of the original large FC51 style flow control valve. The LEFC performance as a flow control is very similar to the large FC51 because they both use the same spring and compensator spool. Thus, the control flow port (CF) and the excess flow port (EX) remain usable and pressure compensated.

The main advantage of the LEFC over the large FC51 is that the flow can be adjusted proportionally with a solenoid instead of manually. The orifice spool proportionally opens as the current through the solenoid increases, thus increasing the flow out of the CF port (similar to positioning the rotary side lever on the manual FC). The solenoid is connected to our optional EC – series controls which can be sold with the LEFC. Please see the Electronic Controllers section for your control needs. We also give the choice of coil voltage, coil terminal and maximum flow setting.

2-PORT- The 2-port (2P) option is a modified version of the standard 3-port EFC. This option lets the customer use the control flow port while the excess port is plugged. To use the EFC 2-port a pressure compensated pump is required. The 2-port can be converted to a 3-port by removing the EX plug.

LEFC – EXAMPLES OF COMMON MODEL CODES:

LEFC164512LM……# 16 SAE ports, 45 gpm (170.3 lpm), 12 VDC coil, 18" 44.7 cm) double lead coil terminal and manual override.

LEFC165512LM……...# 16 SAE ports, 55 gpm (208.2 lpm), 12 VDC coil, 18" (44.7 cm) double lead coil terminal and manual override.

LEFC – CREATING A MODEL CODE FOR LEFC'S:

L E F C _ _ _ _ M

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

PORT SIZE:
16 - #16SAE (1 5/16 – 12) standard
** - Consult factory for others

FLOW SETTING:
45 – 0-45 gpm (0-170.3 lpm)
55 – 0-55 gpm (0-208.2 lpm)
** - Consult factory for others

COIL VOLTAGE:
12 – 12 volt DC
24 – 24 volt DC

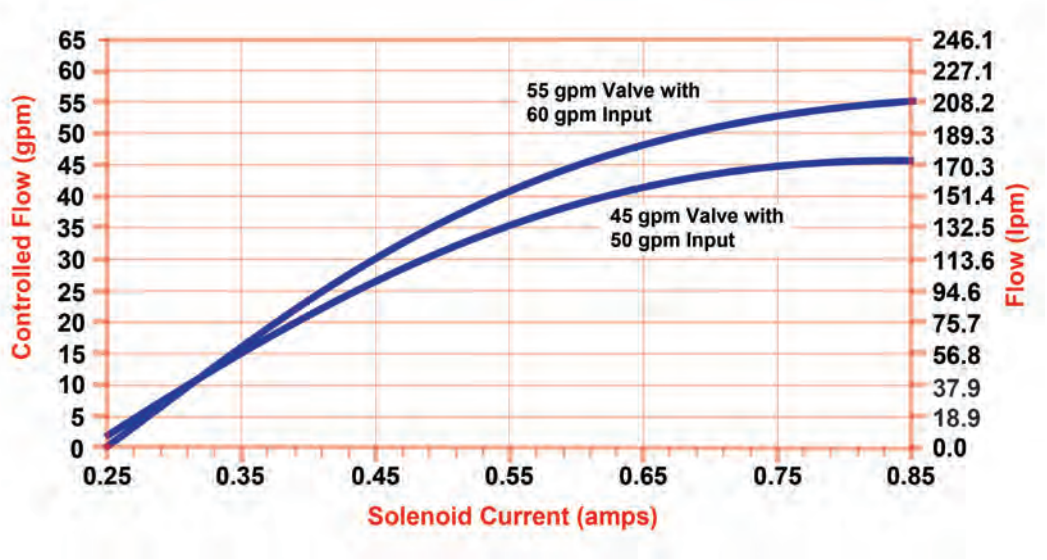
OPTIONS:
Omit – 3 port (standard)
2P – 2 port

COIL VOLTAGE & TERMINAL:
L – 18" (44.7 cm) double lead (standard)
S – Double spade
D – Din 43650 (without Din connector)
PF – Female shroud with male pin
PM – Male tower with female pin

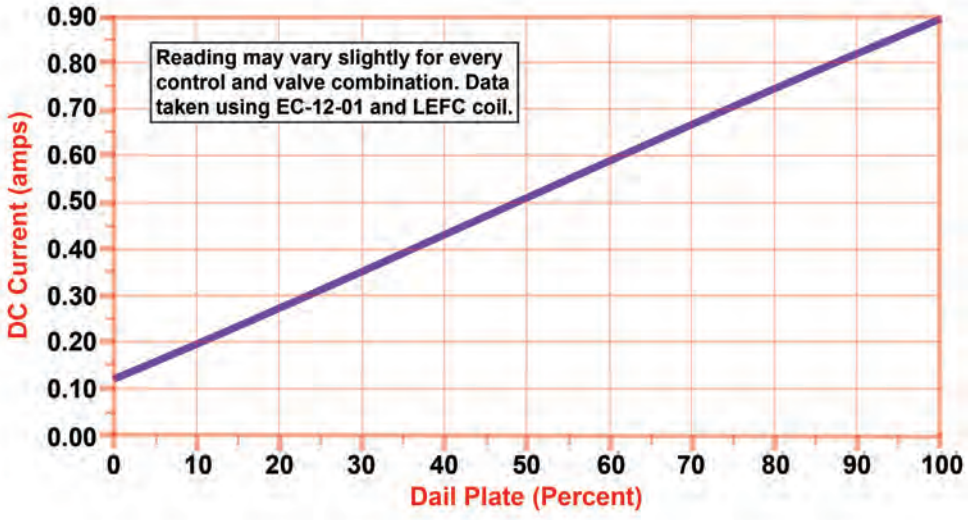
LEFC FLOW & PRESSURE INFO:

Controlled Flow vs. Solenoid Current

Oil Temp = 100 deg. F w/140-147 SUS Oil

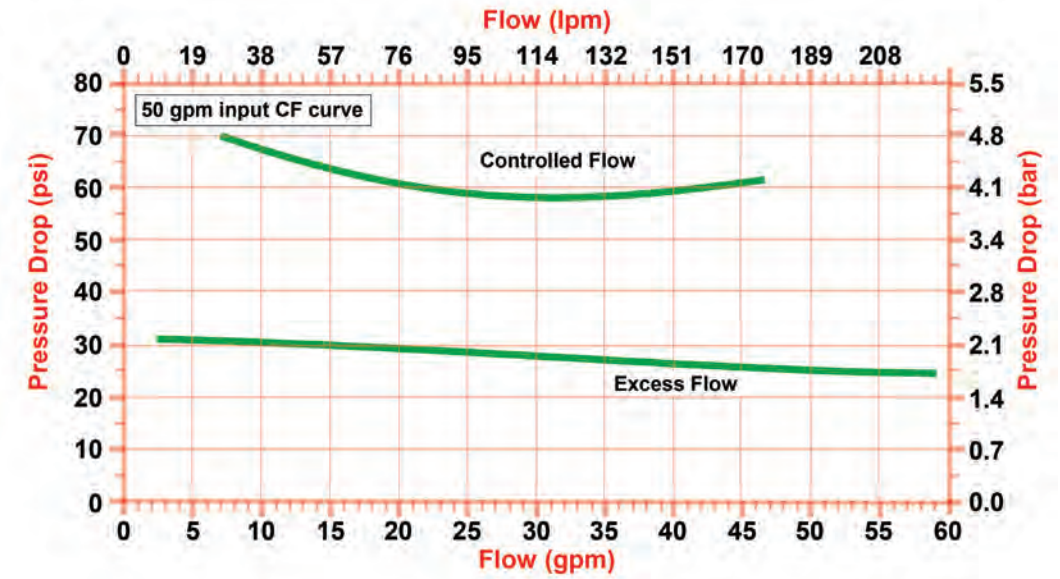


Current vs. Dial Plate for EC-12-01, EC-12-01L and EC-12-02

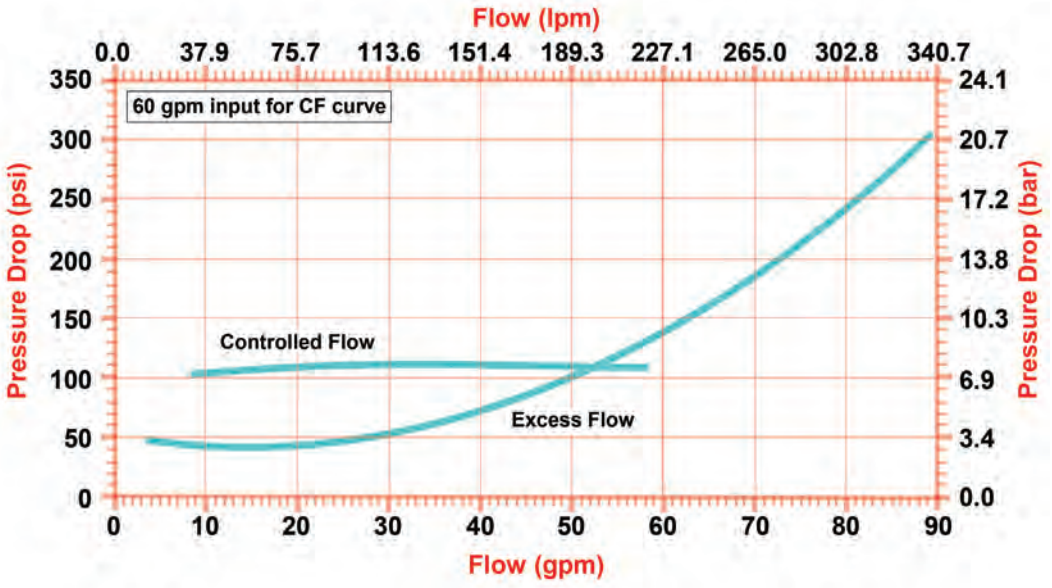


LEFC FLOW & PRESSURE INFO:

Pressure Drop vs. Flow for 45 gpm Valve



Pressure Drop vs. Flow for 55 gpm Valve

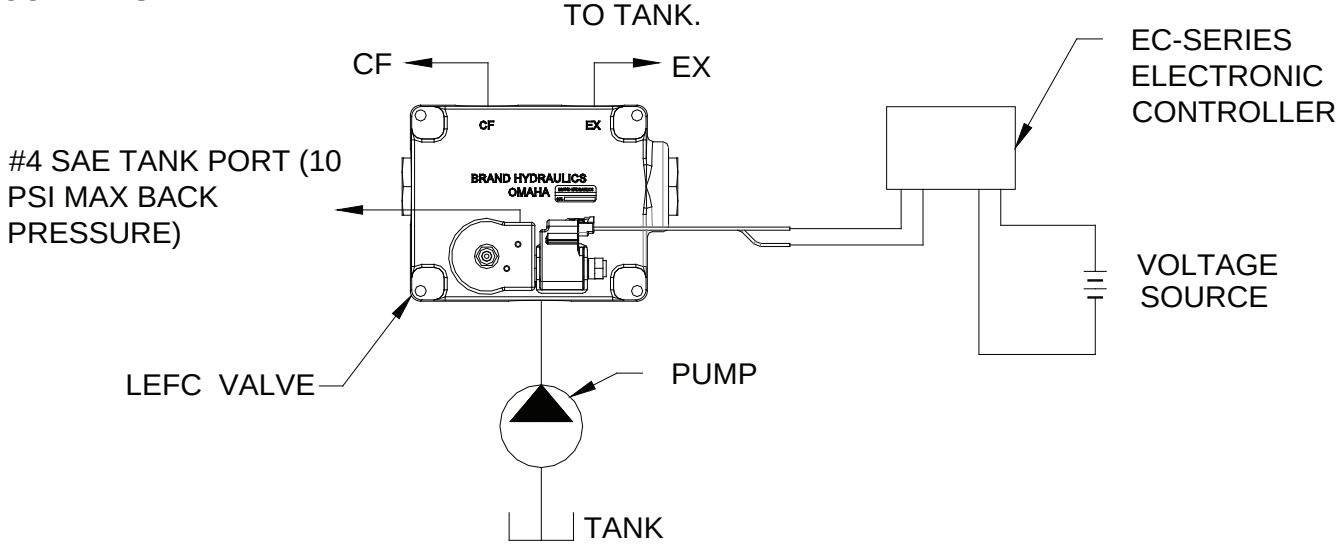


LEFC
Large Electronically Adjustable Proportional Pressure Compensated Flow Control

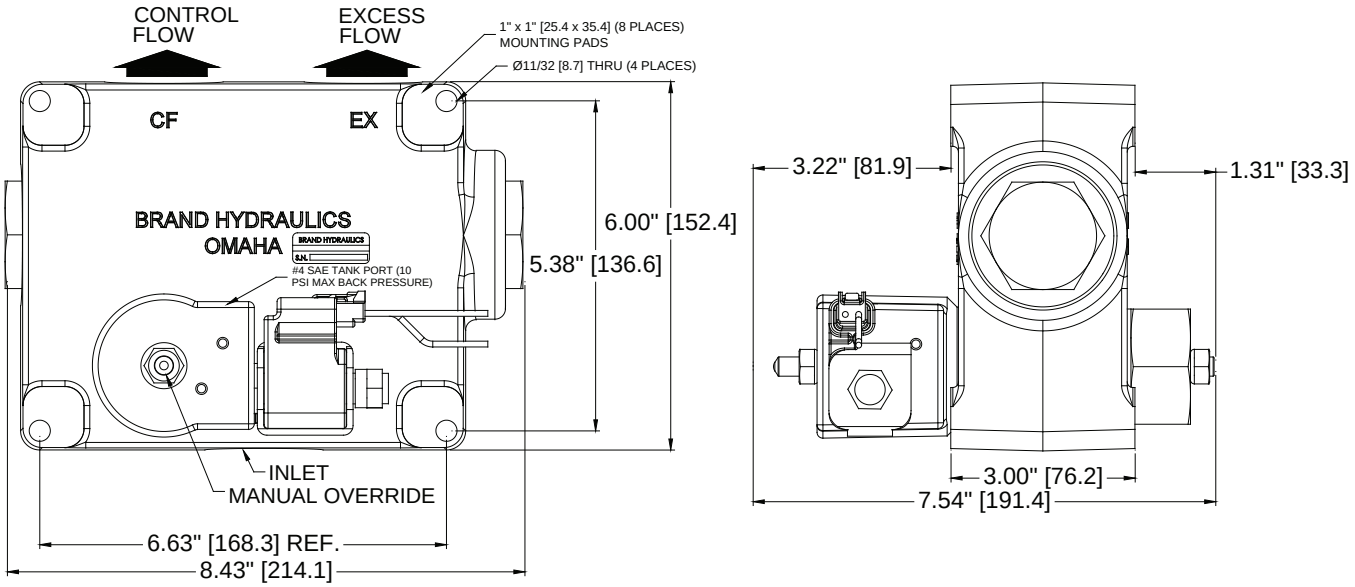
SCHEMATIC DRAWING:

CF-CONTROLLED FLOW PRIORITY PORT, PRESSURE COMPENSATED

EX-EXCESS FLOW IS PRESSURE COMPENSATED. THE FLOW CAN BE USED TO DO WORK OR RAN BACK TO TANK.



DIMENSIONAL DATA (LEFC SHOWN):



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BG

Non-Adjustable Constant Volume Priority Divider

Specifications:

- Rated for 3000 psi (207 bar).
- Rated for 0-30 gpm (0-113.6 lpm) max. priority flow.
- 30-Micron filtration recommended.
- Weight -BG, BGR & BGC = 5 lbs. (2.3 kg).

PBGR501-3/4

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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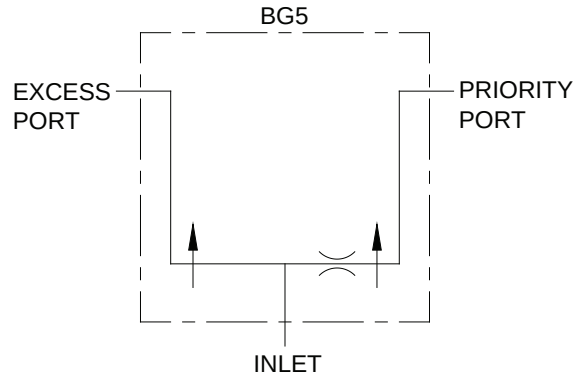
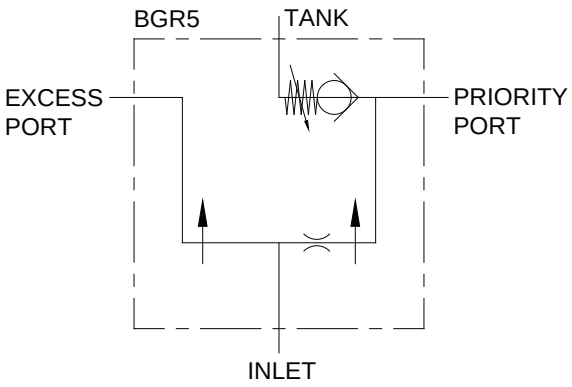
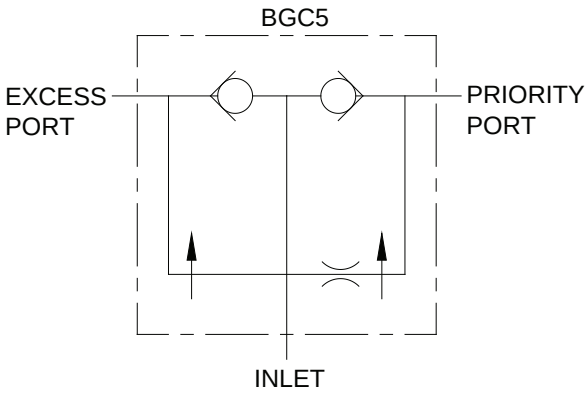
BG Non-Adjustable Constant Volume Priority Divider







PBGR501-3/4

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- Heat Treated Steel Spools
- Heat Treated Free Reverse Check Seat
- Heat Treated Relief Seat

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- PRESSURE COMPENSATION for both outlet ports.
- PRIORITY FLOW IS PRESET at factory to customer requirements.
- EVERY BG IS TESTED for priority flow and pressure compensation.
- LARGE METERING SPOOL provides a greater area for the pressure differential to act upon.
- OPTIONAL FREE REVERSE FLOW allows fluid to move from the outlet port to the inlet port.
- OPTIONAL BALL SPRING RELIEF VALVE for priority flow relief.

BG – GENERAL INFORMATION:
The Brand, non-adjustable priority flow divider comes in three basic models BG5, BGR5 and BGC5. The BG series receive a single stream of fluid and divides it into two separate output streams. The priority port will maintain the same flow even with an increase or decrease in the input flow. The priority port size is 3/8" NPT for 0-8 gpm (0-30.2 lpm), 1/2" NPT for 8-16 gpm (30.2-60.5 lpm) and 3/4" NPT for 16-30 gpm (60.5-113.4 lpm).

BG5 – is a non-adjustable priority divider that receives a single stream and divides it into a priority stream and an excess stream. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow. The priority flow setting must be specified when ordering.

BGR5 – is very similar to the BG5 in that it is a non-adjustable priority divider, but in addition to the BG5's features it also provides a ball spring relief valve for the priority port. Adjustable relief is set to 1500 psi (103 bar) at the factory (standard setting). The relief flow dumps to its own drain port. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow. The priority flow setting must be specified when ordering.

BGC5 – is very similar to the BG5 in that it is a non-adjustable priority divider, but in addition to the BG5's features it also provides free reverse flow for both outlet ports. Flow can travel in reverse through both outlet ports and is not metered as it travels in reverse. The non-metered flow travels past the poppet, down the center of the valve, past the orifice spool and then through the inlet. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow. The priority flow setting must be specified when ordering.

BG Non-Adjustable Constant Volume Priority Divider

BG – CREATING A MODEL CODE FOR BG'S:

B G -

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

FLOW OPTIONS:
5 – Non-adjustable priority divider
R5 – Non-adjustable priority divider with relief
C5 – Non-adjustable priority divider with free reverse flow

PORT SIZE & (INLET FLOW):
3/4 – 3/4" NPT (0-8 gpm)
* Contact factory for avail. ORB ports

FLOW SETTING:
01 – 1 gpm priority flow
05 – 5 gpm priority flow
ETC.

BG – EXAMPLES OF COMMON MODEL CODES:

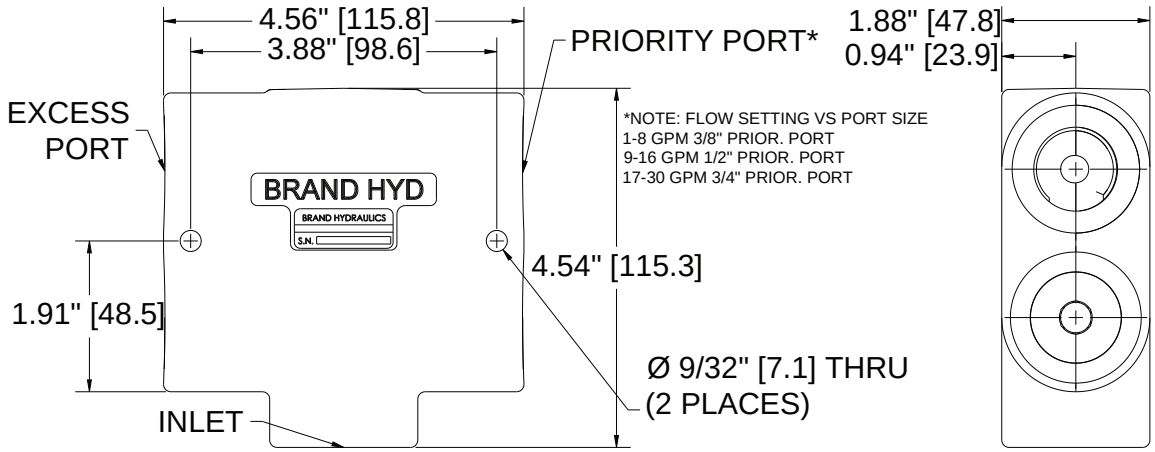
BG503-3/4.....Three gpm (11.3 lpm) priority setting, 3/4" inlet/excess ports and 3/8" priority port.

BGR506-3/4.....1500 psi (103 bar) relief setting, 6 gpm (22.7 lpm) priority setting, 3/4" inlet/excess ports, 3/8" priority port and 3/8" tank port.

BGC504-3/4.....Free reverse flow, 4 gpm (15.1 lpm) priority setting, 3/4" inlet/excess ports and 3/8" priority port.

DIMENSIONAL DATA: Inches & [millimeters]

BG



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BG4

Non-Adjustable Constant Volume Priority Divider

Specifications:

- Rated for 3000 psi (207 bar).
- Rated for 30-45 gpm (114-170 lpm).
- 30-Micron filtration recommended.
- Weight 8.5 lbs. (3.9 kg).
- Standard port size.
  -#16SAE (1-5/16-12) all ports.

PBG405-16SAE

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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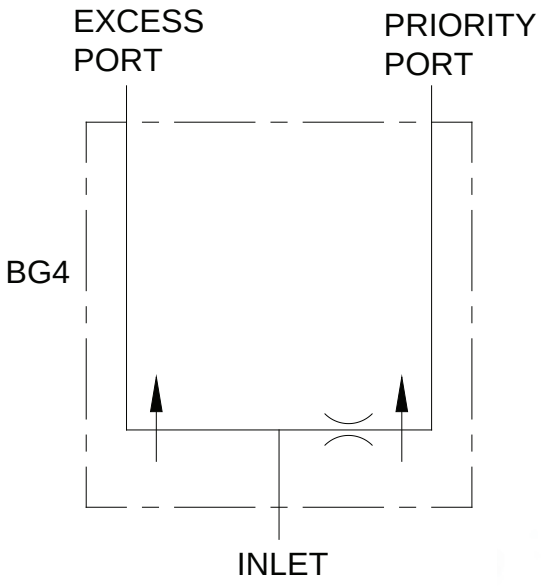
BG4 Non-Adjustable Constant Volume Priority Divider



PBG405-16SAE

MATERIALS:

- Ductile Cast Iron Body
- Buna N O'Rings
- Heat Treated Steel Spools

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- PRESSURE COMPENSATION for both outlet ports.
- PRIORITY FLOW IS PRESET at factory to customer requirements.
- EVERY BG4 IS TESTED for priority flow and pressure compensation.
- LARGE METERING SPOOL provides a greater area for the pressure differential to act upon.

BG4 – GENERAL INFORMATION:

The Brand, BG4 non-adjustable priority flow divider receives a single stream of fluid and divides it into a priority stream and an excess stream. The priority flow port maintains the same flow even with an increase or decrease in the input flow. Both outlet flows are pressure compensating and the sum of said flows equals the inlet flow. Flow can only pass through the valve in one direction, inlet to outlet. Accuracy is normally better than ± 5%. The priority flow setting must be specified when ordering. Pressure drop through the valve will range from 33 to 50 psi (2.3 to 3.4 bar) depending on the flow and pressure in the system.

BG – CREATING A MODEL CODE FOR BG4'S:

B G 4 _ - _

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

FLOW SETTING:
01 – 1 gpm (3.8 lpm) priority flow
05 – 5 gpm (18.9 lpm) priority flow
ETC.

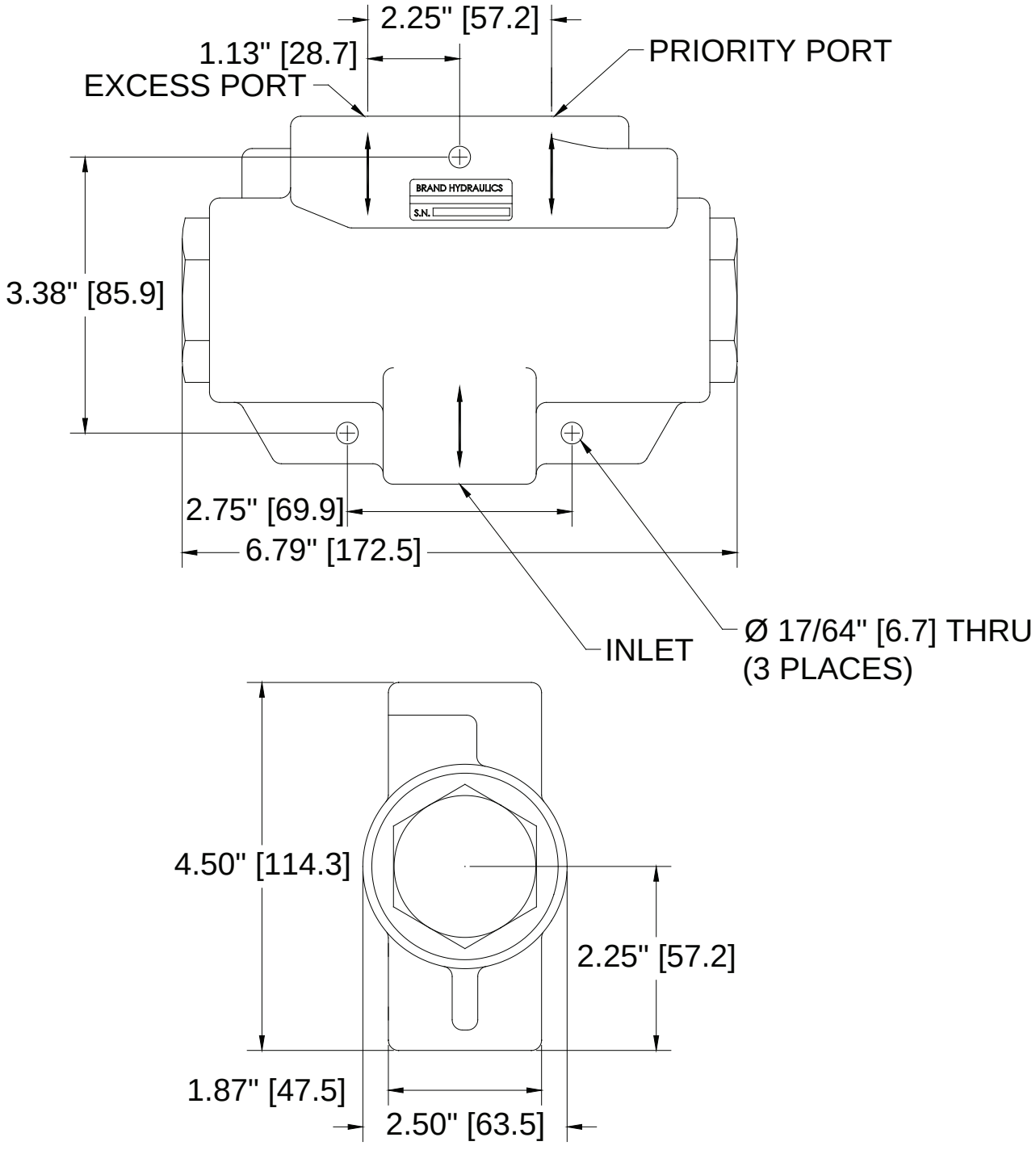
PORT SIZE & (INLET FLOW):
16SAE - #16SAE (1-5/16-12) all ports.

BG4 – EXAMPLES OF COMMON MODEL CODES:

BG410-16SAE……Ten gpm priority (37.8 lpm) setting and #16SAE all ports.

BG4 Non-Adjustable Constant Volume Priority Divider

DIMENSIONAL DATA (BG4 SHOWN): inches & [millimeters]



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FG

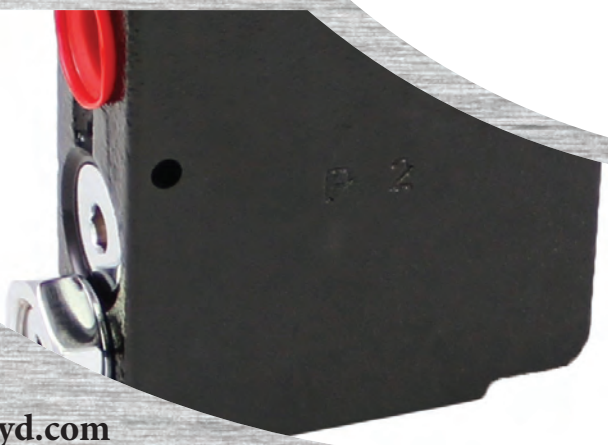
Adjustable Constant Volume Priority Divider

Specifications:

- Rated for 3000 psi (207 bar).
- Rated for 0-30 gpm (0-113.6 lpm) inlet flow.
- Rated for 0-12 gpm (0-56.8 lpm) priority flow.
- 30-Micron filtration recommended.
- Weight -FG52, & FG54 = 8 lbs. (3.6 kg).

PFG52-3/4

PFG54-3/4



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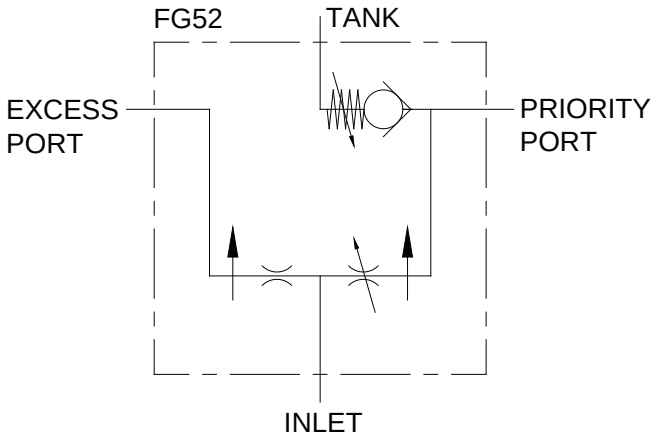
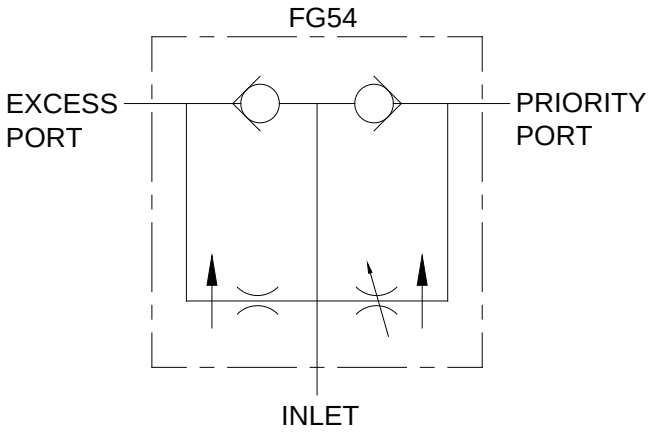
FG Adjustable Constant Volume Priority Divider



PFG52-3/4



PFG54-3/4

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- Heat Treated Steel Spools
- Heat Treated Free Reverse Check Seat
- Heat Treated Relief Seat

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- PRESSURE COMPENSATION for both outlet ports.
- EVERY FG IS TESTED for adjustable flow and pressure compensation.
- LARGE METERING SPOOL provides a greater area for the pressure differential to act upon.
- FREE REVERSE FLOW (FG54) allows fluid to move from the outlet port to the inlet port.
- BALL SPRING RELIEF VALVE (FG52) for priority flow relief.
- PAINT (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

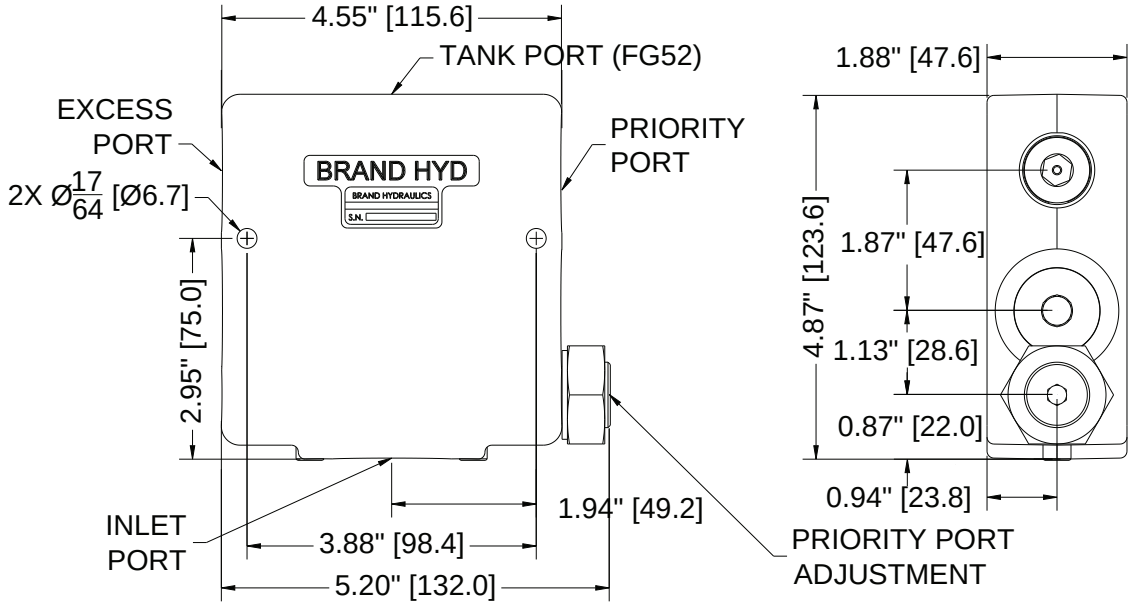
FG – GENERAL INFORMATION:
The Brand, adjustable priority flow divider comes in two basic models FG52 and FG54. The FG series receives a single stream of fluid and divides it into two separate output streams. The priority flow is adjustable from 0.2 to 12 gpm (.8 to 45.4 lpm) with minimal pressure drop. The priority port will maintain the same flow setting even with an increase or decrease in the input flow.

FG52 – is an adjustable priority divider with a ball spring relief for the priority port. The adjustable relief is set to 1500 psi (103 bar) at the factory (standard setting). The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow.

FG54 – is an adjustable priority divider with free reverse flow for both outlet ports. Flow can travel in reverse through both outlet ports and is not metered when it travels in reverse. The non-metered flow travels past the poppet, down the center of the valve, past the orifice spool and then through the inlet. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow

FG – COMPLETE LIST OF MODEL CODES:
FG52-3/4……Adjustable priority port, 1500 psi (103 bar) relief setting, 3/4" NPT all ports, and 3/8" NPT tank port.
FG54-3/4……Adjustable priority port, free reverse flow and 3/4" NPT all ports.

DIMENSIONAL DATA (FG SHOWN): inches & [millimeters]



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B

Non-Adjustable Proportional Flow Dividers

PB50 or PB100

PB100AB

Specifications:

- Rated for 3000 psi (207 bar).
- See "Port Size & Inlet Flow" on next page for flow capacity.
- 30-Micron filtration recommended.
- Weight -B50 & B100 = 5 lbs. (2.3 kg).
  -B100AB = 7-1/2 lbs. (3.4 kg).

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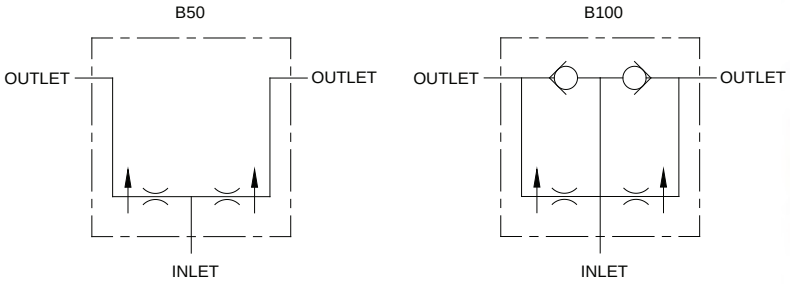
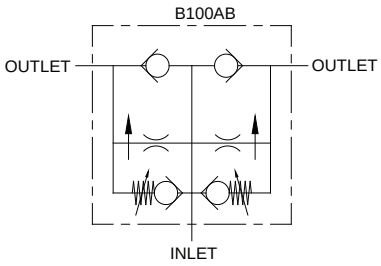
B Non-Adjustable Proportional Flow Dividers





PB50 or PB100

PB100AB

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- Heat Treated Steel Spool
- Heat Treated Free Reverse Check Seat

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- PRESSURE COMPENSATION for both outlet ports.
- EVERY B IS TESTED for flow ratio and pressure compensation.
- DIVIDES INLET FLOW INTO TWO FLOWS of equal flow or a ratio up to 95:5.
- OPTIONAL FREE REVERSE FLOW (B100 & B100AB) allows fluid to move from the outlet ports to the inlet port.
- OPTIONAL ADJUSTABLE BYPASS (B100AB) allows a cylinder to finish its stroke.

B – GENERAL INFORMATION

The Brand, non-adjustable, proportional flow divider comes in three basic models B50, B100 and B100AB. The B series receives a single stream of fluid and divides it into two output streams. The ratio of division to the two outlets will remain constant even though the work being done by one of the streams is much greater than the work being done by the other. The ratio of the outlet flows, remains constant even when the input flow increases or decreases. The ratio of the outlet flows may be varied from equal flow (50:50) all the way up to a 95:5 ratio.

B50 – is a non-adjustable divider that receives a single stream and divides into two streams. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow. The ratio of the outlet flows must be specified when ordering.

B100 – is very similar to the B50 in that it is a non-adjustable proportional divider, but in addition to the B50 it also offers free reverse flow for both outlet ports. Flow can travel in reverse through both outlet ports and is not metered when it goes in reverse. The non-metered flow travels past the poppet, down the center of the valve, past the orificed spool and through the inlet. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow. The ratio of the outlet flows must be specified when ordering.

B100AB – is very similar to the B100 in that it is a non-adjustable proportional divider and has free reverse flow for both outlets, in addition it offers automatic adjustable bypass for each outlet. If one cylinder ends its stroke ahead of the other, the bypass to the lagging cylinder will automatically open and allow the lagging cylinder to finish its stroke. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow. The ratio of the outlet flows must be specified when ordering.

BG – CREATING A MODEL CODE FOR BG'S:

B _ - _ _

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

FLOW OPTIONS:
50 – Flow from inlet to outlet
100 – Free reverse flow
100AB – Auto. adj. bypass and free rev. flow

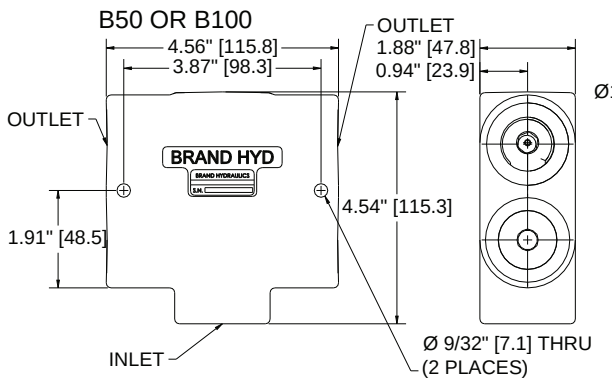
OUTLET FLOW RATIO:
Omit – Standard 50:50 ratio
(60:40) – 60:40 ratio
(66:33) – 66:33 ratio
(70:30) – 70:30 ratio
(80:20) – 80:20 ratio
**** - Consult factory for others**

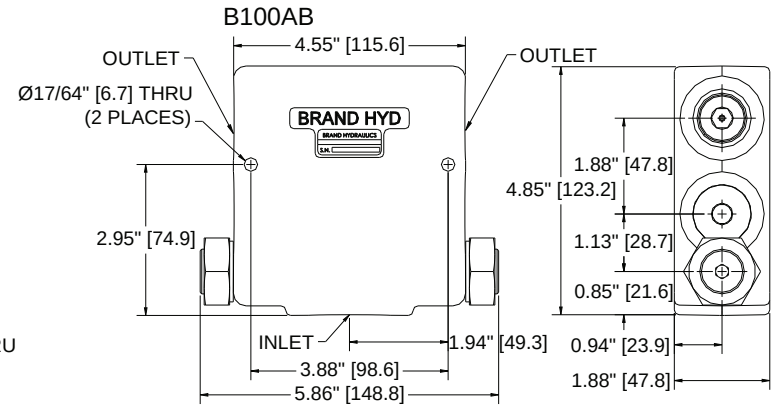
PORT SIZE & (INLET FLOW):
3/8 – 3/8" NPT (2-8 gpm (7.6 to 30.2 lpm))
1/2 – 1/2" NPT (8-16 gpm (30.2 to 60.5 lpm))
3/4 – 3/4" NPT (16-30 gpm (60.5 to 113.4 lpm))
10 – #10 SAE (8-16 gpm (30.2 to 60.5 lpm))
12 – #12 SAE (16-30 gpm (60.5 to 113.4 lpm)

B – EXAMPLES OF COMMON MODEL CODES:

B50-1/2.....1/2" NPT ports, and divides at 50:50 ratio.
B100-1/2.....1/2" NPT ports, free reverse flow for both outlets and divides at 50:50 ratio.
B100AB-3/8.....3/8" NPT ports, free reverse flow for both outlets, automatic adjustable bypass for both outlets and divides at 50:50 ratio.

DIMENSIONAL DATA : inches & [millimeters]





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B

High Volume Non-Adjustable Proportional Flow Dividers

Specifications:

- Rated for 3000 psi (207 bar).
- BX50 is rated for 25-45 gpm (94-170 lpm).
- B100 is rated for 30-120 gpm (113-454 lpm).
- 30-Micron filtration recommended.
- Weight - BX50 = 9 lbs. (4.1 kg).
  - B100 = 26 lbs. (11.8 kg).
- Standard port sizes.
  -#24SAE (1-7/8-12) all ports (B100).
  -#16SAE (1-5/16-12) all ports (BX50).

PBX50-16SAE

PB100-24SAE

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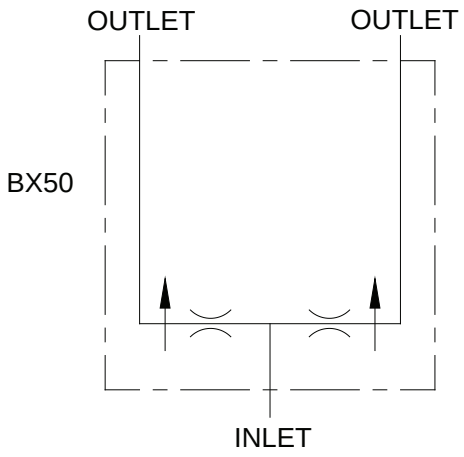
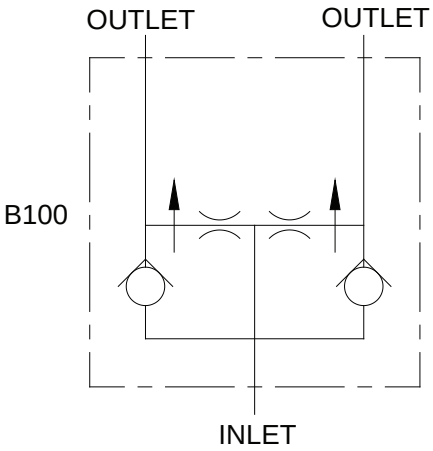


PBX50-16SAE



PB100-24SAE

MATERIALS:

- Ductile Cast Iron Body (BX50)
- Cast Iron Body (B100)
- Buna N O'Rings
- Heat Treated Steel Spool
- Delrin Free Reverse Check Seat

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- PRESSURE COMPENSATION for both outlets.
- EVERY B IS TESTED for flow ratio and pressure compensation.
- DIVIDES INLET FLOW INTO TWO FLOWS of equal flow or a ratio up to 85:15.
- OPTIONAL FREE REVERSE FLOW (B100) allows fluid to move from the outlet ports to the inlet port.

B – GENERAL INFORMATION:

The Brand, non-adjustable, proportional flow divider comes in two basic models BX50, and B100. The B series receives a single stream of fluid and divides it into two output streams. The ratio of division to the two outlets will remain constant even though the work being done by one of the streams is much greater than the work being done by the other. The ratio of the outlet flows, remains constant even when the input flow increases or decreases. The ratio of the outlet flows may be varied from equal flow (50:50) all the way up to an 85:15 ratio.

BX50-16SAE – is a non-adjustable divider that receives a single stream and divides into two streams. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow. The ratio of the outlet flows must be specified when ordering.

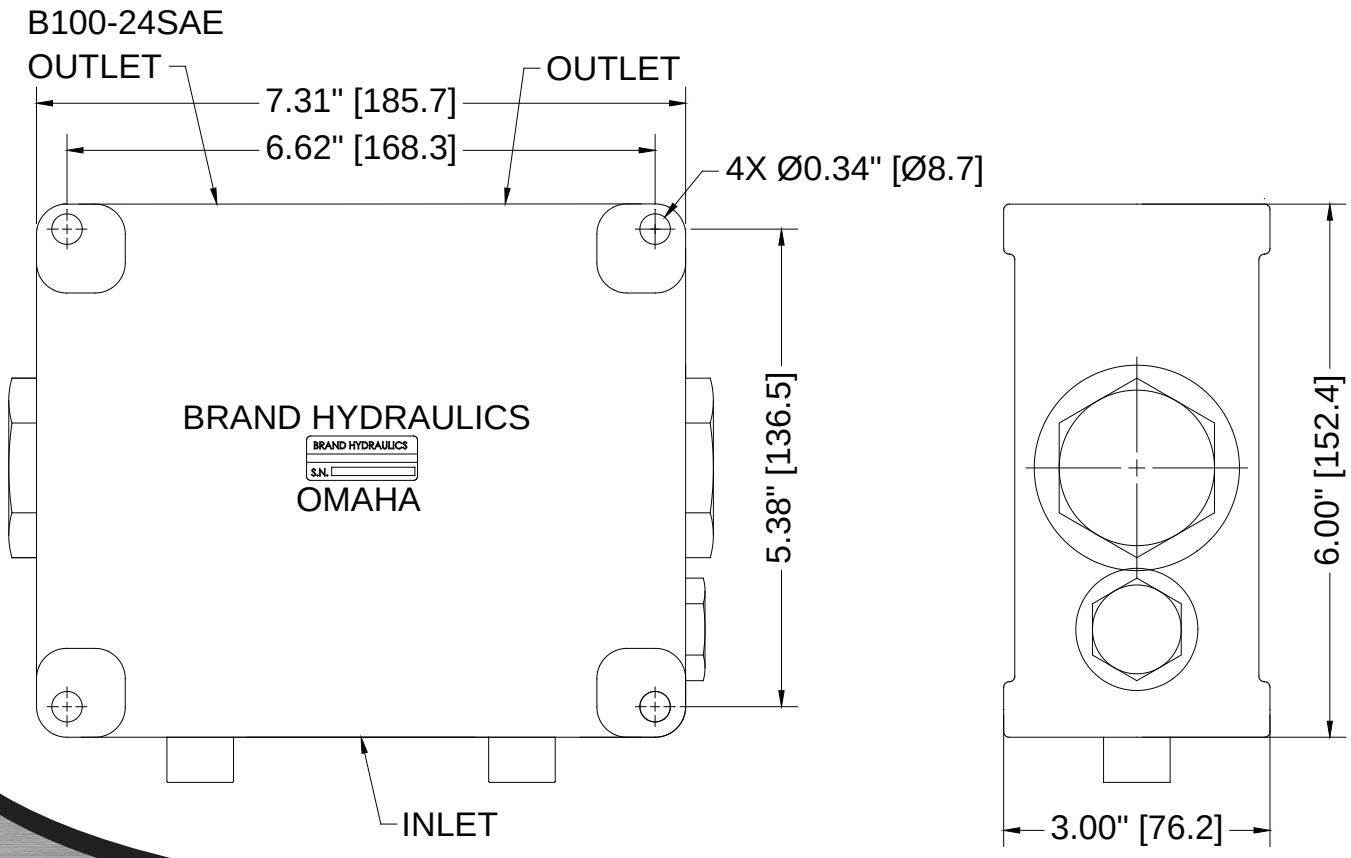
B100-24SAE – is very similar to the BX50 in that it is a non-adjustable proportional divider, but in addition to the BX50 it also offers free reverse flow for both outlet ports. Flow can travel in reverse through both outlet ports and is not metered when it goes in reverse. The non-metered flow travels past the orificed spool, through the delrin checks, and through the inlet. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow. The ratio of the outlet flows must be specified when ordering.

B – EXAMPLES OF COMMON MODEL CODES:

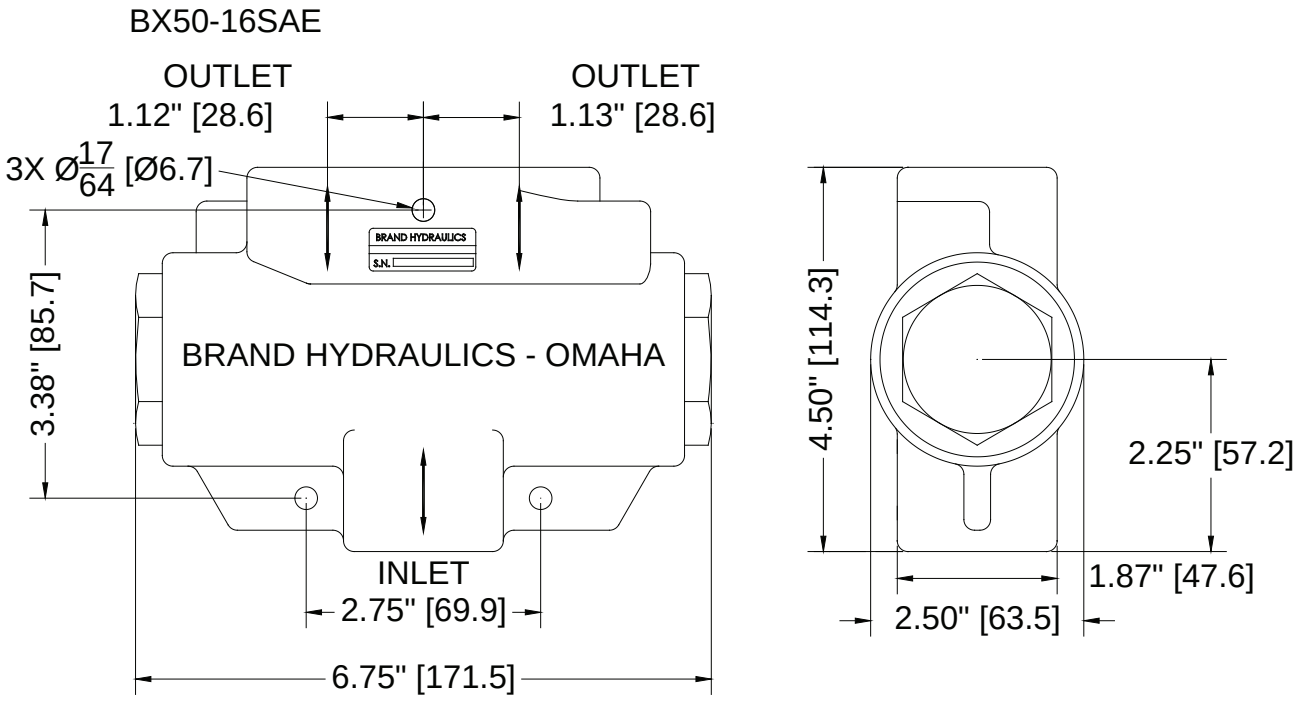
BX50-16SAE……#16SAE all ports, and divides at 50:50 ratio.
BX50-16SAE(60:40)…...#16SAE all ports, and divides at 60:40 ratio.
BX50-16SAE(__:__)…...#16SAE all ports, and specify division ratio in parenthesis.
B100-24SAE……#24SAE all ports, 75 to 120 gpm (284 to 454 lpm) flow rating, free reverse flow, and divides at 50:50 ratio.
B100-24SAE-.380……#24SAE all ports, 45 to 75 gpm (170 to 284 lpm) flow rating, free reverse flow, and divides at 50:50 ratio.
B100-24SAE-.316……#24SAE all ports, 30 to 55 gpm (113 to 208 lpm) flow rating, free reverse flow, and divides at 50:50 ratio .
B100-24SAE(60:40)……#24SAE all port, free reverse flow, and divides at 60:40 ratio.
Paint (Optional). . . . . . (P) painted black (other colors available, consult factory), (MP) epoxy coating.

B – FLOW AND PRESSURE INFO:

DIMENSIONAL DATA: inches & [millimeters]



DIMENSIONAL DATA: inches & [millimeters]



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FP

Adjustable Proportional Flow Dividers

Specifications:

- Rated for 3000 psi (207 bar).
- Rated for 0-30 gpm (0-114 lpm).
- 30-Micron filtration recommended.
- Weights 7-1/2 lbs. (3.4 kg).

PFP55-3/4

PFP53-3/4

PFP56-3/4

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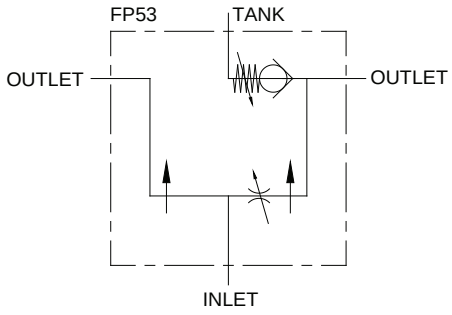
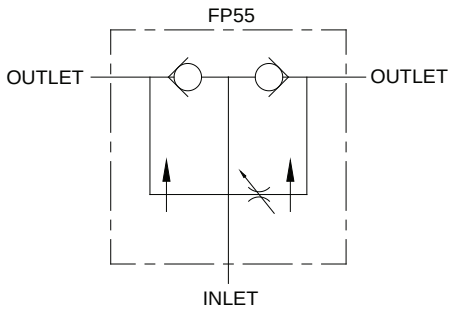
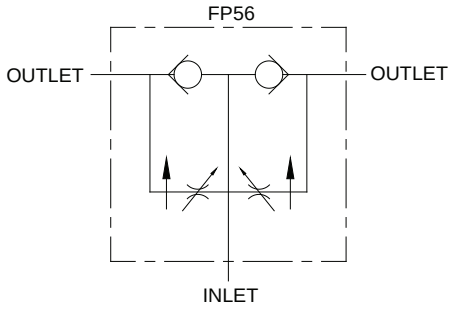
FP

Adjustable Proportional Flow Dividers







PFP55-3/4

PFP53-3/4

PFP56-3/4

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- Heat Treated Steel Spool
- Heat Treated Free Reverse Check Seat

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- PRESSURE COMPENSATION for both outlets.
- EVERY FP IS TESTED for adjustable flow and pressure compensation.
- DIVIDES INLET FLOW INTO TWO FLOWS of equal flow or a ratio up to 95:5.
- OPTIONAL FREE REVERSE FLOW allows fluid to move from the outlet ports to the inlet port.
- OPTIONAL ONE OR TWO ADJUSTABLE ORIFICES allows the customer to control the flow.
- PAINT (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

FP – GENERAL INFORMATION

The Brand, adjustable proportional flow divider comes in three basic models FP53, FP55 and FP56. The FP series receives a single stream of fluid and divides it into two streams. The customer has the ability to adjust one (FP53 or FP55) or both (FP56) outlet flows. The initial flow settings will not fluctuate even though the work being done by one of the streams is much greater than the work being done by the other. The ratio of the outlet streams remains constant even when the inlet flow increases or decreases.

FP53 – has one fixed orifice, one adjustable orifice and a relief for the outlet port on the side of the valve with the adjustment screw. The FP53 receives a single stream and divides into two steams. With the FP53 it is possible to control the flow out one outlet up to 60% of input. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow.

FP55 – has one fixed orifice, one adjustable orifice and free reverse flow for both outlets. The FP55 receives a single stream and divides into two steams. With the FP55 it is possible to control the flow out one outlet up to 60% of input. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow.

FP56 – has two adjustable orifices and free reverse flow for both outlets. The FP56 receives a single stream and divides into two steams. With the FP56 it is possible to control the flow out two outlets up to 95% of input, and to vary the pressure drop through the valve. The two outlet flows are pressure compensating and the sum of said flows equals the inlet flow.

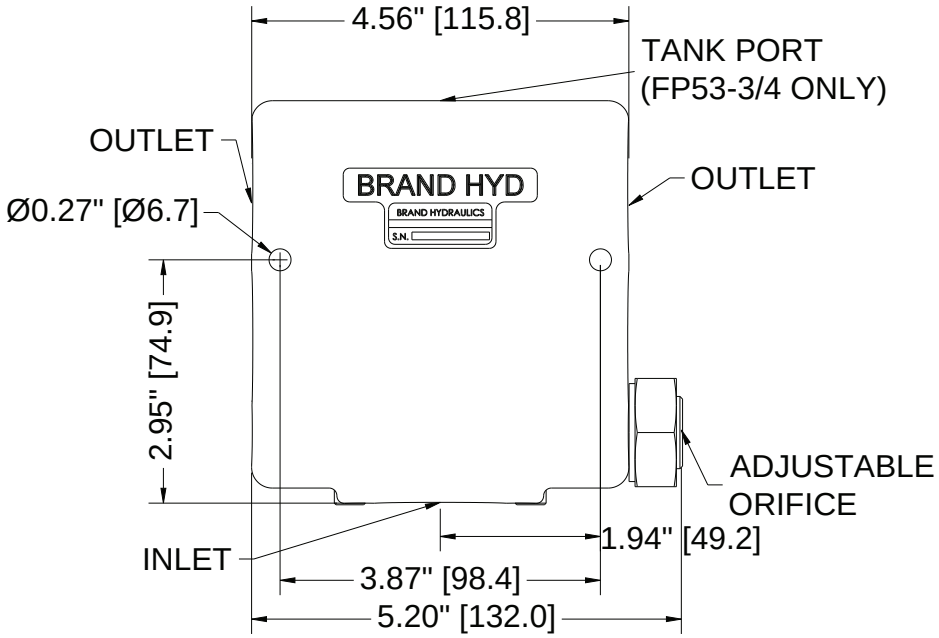
FP – COMPLETE LIST OF MODEL CODES:

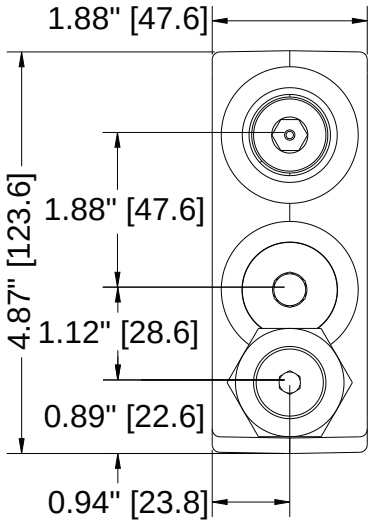
FP53-3/4…….3/4” NPT ports, 3/8” NPT tank port, inlet flow 0-30 gpm (0-114 lpm), one adjustable orifice and an adjustable relief.

FP55-3/4…….3/4” NPT ports, inlet flow 0-30 gpm (0-114 lpm), one adjustable orifice and free reverse flow.

FP56-3/4…….3/4” NPT ports, inlet flow 0-30 gpm (0-114 lpm), two adjustable orifices and free reverse flow.

DIMENSIONAL DATA (FP53-3/4 or FP55-3/4 SHOWN): inches & [millimeters]





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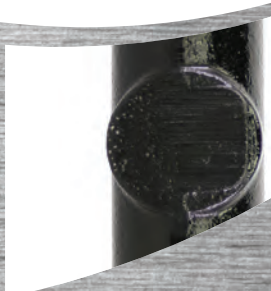
B300

Non-Adjustable Proportional Combiner

Specifications:

- Rated for 3000 psi (207 bar).
- Rated for 1-16 gpm (3.8-60.6 lpm).
- 20-Micron filtration recommended.
- Weight 4.8 lbs. (2.2 kg).
- Standard port sizes.
  -1/2" NPT all ports.
  - Consult factory for other sizes
    (Avail. in production qnty. only).

PB300-1/2



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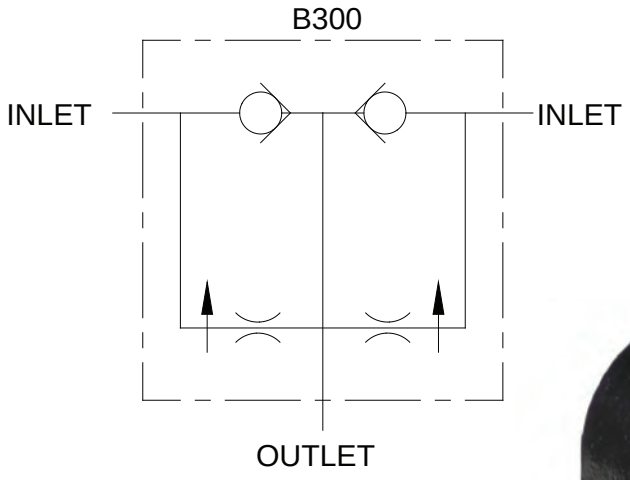
B300 Non-Adjustable Proportional Combiner



PB300-1/2

MATERIALS:

- Cast Iron Body
- Heat Treated Steel Spool

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- COMBINES TWO STREAMS INTO ONE at a fixed ratio.
- NON-METERED FREE REVERSE FLOW allows fluid to travel from the outlet to the inlet ports.
- PAINT (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

FB300 – GENERAL INFORMATION

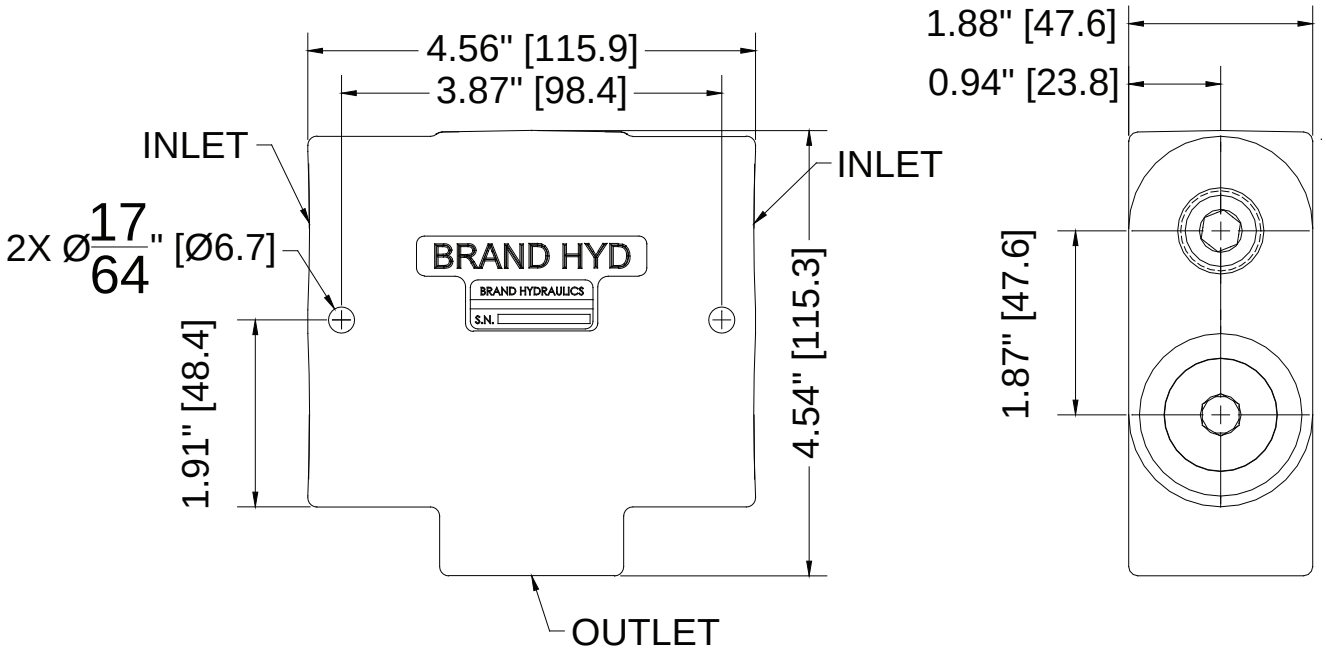
The Brand, B300 non-adjustable proportional combiner takes two streams of flow and combines them into one stream and it also offers free reverse flow from each outlet port. Flow can travel in reverse through the outlet port and is non-metered when it goes in reverse. The non-metered flow travels through the outlet, up the center of the valve, past both ball checks and then out the inlet port. This valve gives the customer the ability to synchronize two single acting cylinders when lowering two different gravity loads. It also gives the customer the ability to synchronize two double acting cylinders by plumbing a B300 at the inlet of both cylinders and another B300 at the outlet of both cylinders. The ratio of combination is dependent on pre-drilled orifices in the valves spool. It can combine two streams into one stream of unequal size up to 85:15 ratio. The B300's advantage over the divider is that it combines the flows instead of separating the flows. By combining the flows, the integrator spool provides back pressure that prevents cavitation and lunging.

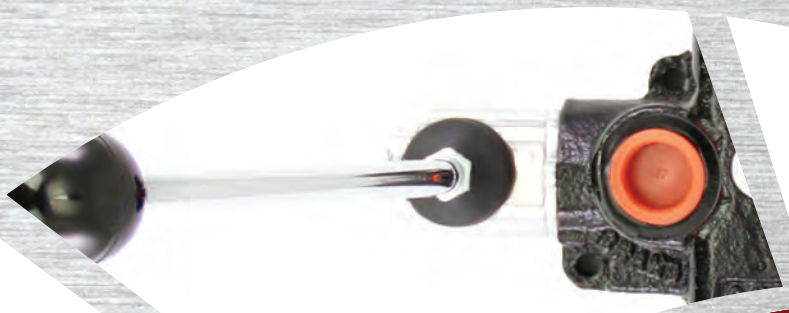
B300 – COMPLETE LIST OF MODEL CODES:

B300-1/2.....Non-adjustable proportional combiner, free reverse flow, 1 to 16 gpm (3.8 to 60.6 lpm) combiner, 50:50 ratio and 1/2" NPT all ports

Note: Other ratios available upon request, please consult factory (50:50 ratio is standard).

DIMENSIONAL DATA (B300-1/2 SHOWN): inches & [millimeters]





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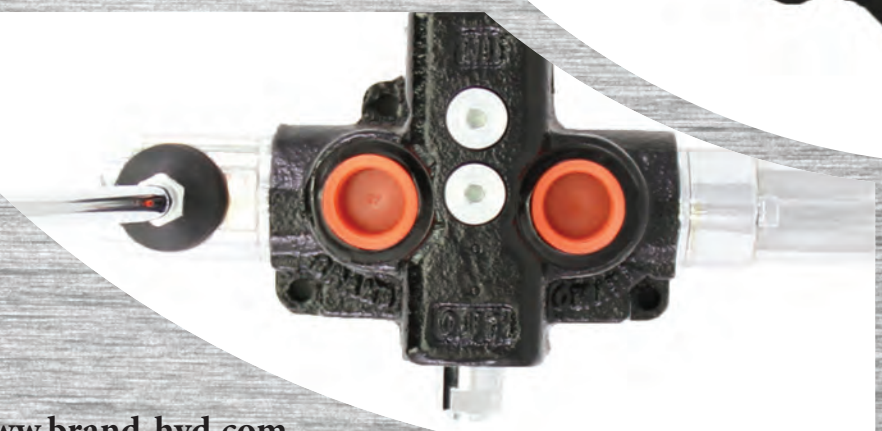
SDCF

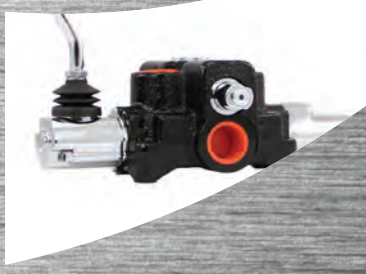
4-Way Directional Control With Pressure Compensated Flow Control

PSDCF120M64LF1

Specifications:

- Rated for 0-18 gpm (0-68.1 lpm)
- Rated for 3000 psi (207 bar)
- Weighs 6-1/2 lbs. (2.9 kg)
- 30 – Micron filtration recommended





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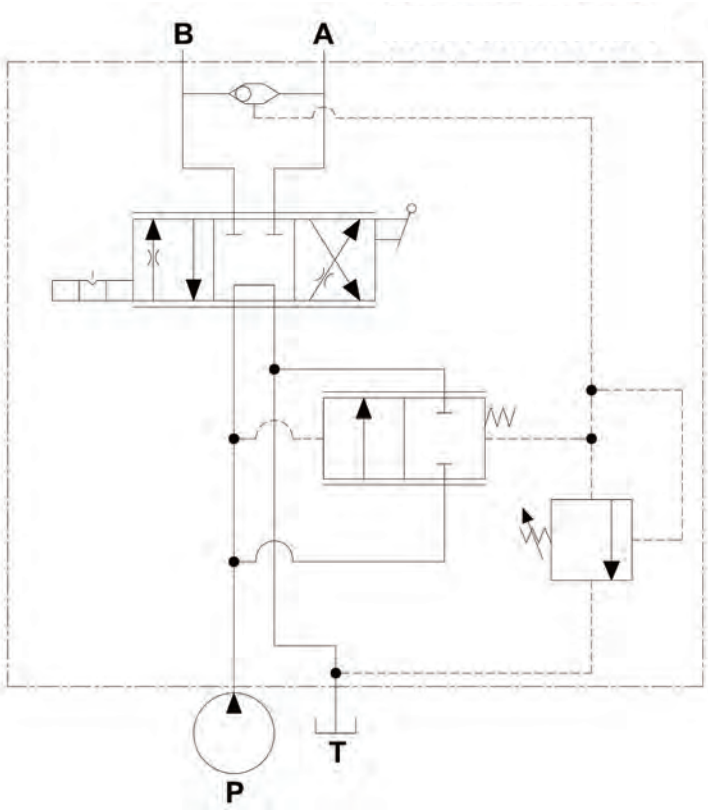
SDCF

4-Way Directional Control
With Pressure Compensated Flow Control



PSDCF120M64LF1

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- IOSSO Plated Steel Spool
- Consult Factory for Stainless Steel Spools

FEATURES:

- ADJUSTABLE PILOT OPERATED RELIEF VALVE is standard on every SDCF.
- FULL RANGE PRESSURE COMPENSATED by-pass type flow control valve built in.
- SDCF REDUCES the number of fittings, plumbing and potential leaks in hydraulic circuits.
- FINE POSITIVE METERING in either direction with the manual handle.
- PRECISION GROUND IOSSO PLATED SPOOL that assures long life.
- OPTIONAL O'RING PORTS to eliminate leakage.

SDCF – GENERAL INFORMATION:

The Brand, SDCF combines the features of a four-way directional control valve, a full range pressure compensated by-pass type flow control valve, and an adjustable pilot operated pressure relief valve all in one compact package. This valve reduces the number of fittings, plumbing and potential leakage points in hydraulic circuits. The manual handle allows the customer to meter the flow out of either port. Flow to the work port is directly proportional to the movement of the lever. Flow out of each work port is constant regardless of load changes, this allows the customer to maintain smooth and constant movement of a cylinder or motor. Every SDCF comes standard with a pilot operated relief (1500 psi (102 bar) standard setting). The tank port must be plumbed directly back to tank.

SPOOL TYPE – The spool types we offer are:

- **Tandem center (T)**
- **Open center (O)**
- **Open meter center (OM)**
- **Fine metering (M)**
- **Tandem metering (TM)**

HANDLE OPTIONS –

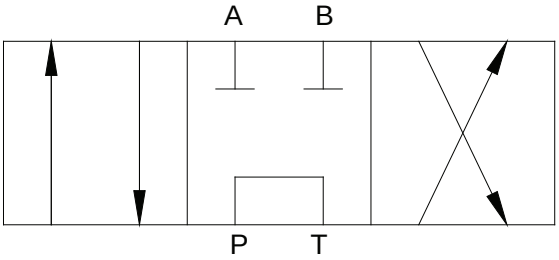
- **Standard enclosed lever handle (G)** pressurizes the B port when the handle is pushed towards the valve body (vertical mount).
- **Enclosed lever handle (C)** is similar to **(G)** except horizontal mount.
- **Lever handle (L)** pressurizes the B port when the handle is pushed towards the valve body.
- **Lever handle (J)** pressurizes A port when the handle is pushed towards the valve body.
- **Rotary handle (H)** is used to rotate spool in or out of valve body.
- **No actuator (N) G** type spool.
- **No actuator (M) J** type spool.

SPOOL ACTION –

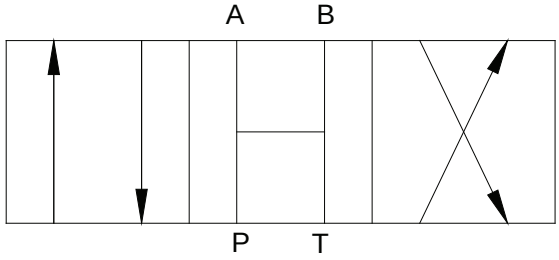
- **Three-position detent (D)** holds the spool in neutral and both active positions.
- **Friction detent (F1)** applies friction to the spool so that the spool does not move when the handle is released either side of neutral, a detent groove clearly indicates neutral position.
- **Spring center (S)** returns the handle to neutral when the handle is released.
- **Spring center detent (SD)** springs back to neutral from one position and is mechanically detented in the other position (flow out port A in detent).
- **Detent spring center (DS)** springs back to neutral from one position and is mechanically detented in the other position (flow out port B in detent).
- **Spring center friction detent (SF1)** springs back to neutral from one direction and functions similar to standard F1 in other direction (flow out port B in friction detent).
- **Spring offset (SO)** spring holds spool in one active position (flow out port B).
- **Spring offset (SO2)** spring holds spool in one active position (P to B in offset position, neutral and P toA).
- **Rotary friction detent (E)** applies friction to the spool as it is rotated so that the spool does not rotate when the handle is released either side of neutral, a detent groove clearly indicates neutral position.
- **Two-position detent (2D)** P to B and neutral only.
- **Two-position detent (D2)** P to A and neutral only.
- **Two-position friction (F2)** P to A and neutral only.
- **Normally closed electric switch (WC)** used with (S), (F1) and (D) options only.
- **Normally open electric switch (WO)** used with (S), (F1) and (D) options only.

SDCF 4-Way Directional Control With Pressure Compensated Flow Control

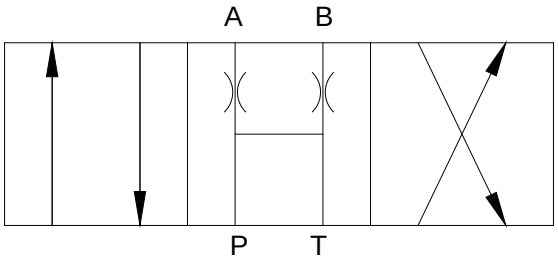
SPOOL SCHEMATICS:



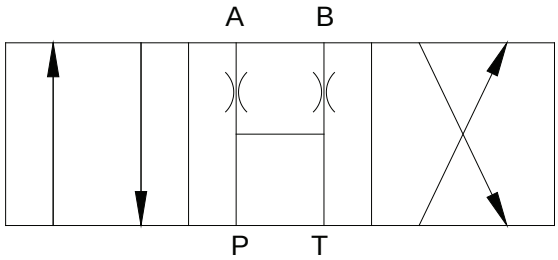
Tandem Center (T) - Powers cylinder or motor in both directions (metering capability is very limited). Pump unloads to tank when spool is in neutral. Cylinder or motor blocked when spool in neutral.



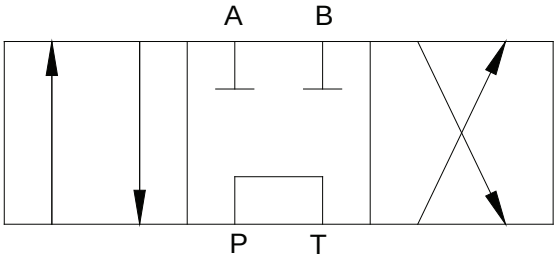
Open Center (O) - All of the ports are connected to tank when the spool is in neutral. Allows cylinder to move or motor to rotate when spool is in neutral.



Fine Metering Spool (M) - The pressure drop in neutral is higher than the (OM) and (TM) spools. P to T is blocked by the main spool but the valve remains open center due to the compensating spool passage way. Requires external locking valves to hold cylinder, because ports A and B are open (orificed) in the neutral position. Extremely fine metering control.



Open Metering Spool (OM) - The neutral pressure drop is much lower than the (M) spool. Extremely fine metering control. Ports A and B are open (orificed) in the neutral position.



Tandem Metering Spool (TM) - Similar to (T) spool except much finer metering control. The pressure drop in neutral is lower than the (M) spool. Cylinder or motor blocked in neutral and pump unloads to tank.

SDCF – CREATING A MODEL CODE FOR SDCF'S:

S D C F _ _ _ _ 4 _ _ _

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

PORT SIZE:
755 – 3/4" inlet/outlet and 1/2" work ports
120 - #12SAE inlet/outlet and #10SAE work ports

SPOOL TYPE:
T – Tandem Center
O – Open Center
OM – Open metering
M – Fine metering
TM – Tandem metering

FLOW SETTING:
Omit – When using T and O spool
6 – 0-6 gpm (0-22.7 lpm) OM, M and TM only
12 – 0-12 gpm (0-45.4 lpm) OM, M and TM only
18 – 0-18 gpm (0-68.0 lpm) OM, M and TM only

HANDLE OPTION:
G – Enclosed handle (B port is active when handle is pushed, recommended)
C – Enclosed handle (horizontal mount)
L – Lever handle (B port is active when handle is pushed
J – Lever handle (A port is active when handle is pushed)
N – No actuator (G type spool)
M – No actuator (J type spool)
H – Rotary handle (Used only in conjunction with rotary friction detent)

RELIEF OPTION:
Omit – Standard relief
N – No relief

SPOOL ACTION:
S – Spring center
D – Three-position detent
F1 – Friction detent
WC –Norm. close elec. switch (used with S, D and F1)
WO –Norm. open elec. switch (used with S, D and F1)
SO – Spring offset (P to B and neutral)
SO2 –Spring offset (P to B in offset position, neutral and P to A)
DS – Detent (P to B in detent) / Spring center
SD – Spring center / detent (P to A in detent)
SF1 – Spring center / friction detent (P to B in friction detent)
2D – Two-position detent P to B
D2 – Two-position detent P to A
F2 – Two-position friction P to A
F2M–Two-position friction P to A with stroke limiter
E – Rotary friction detent
M – Stroke limiter

SDCF – EXAMPLES OF COMMON MODEL CODES:

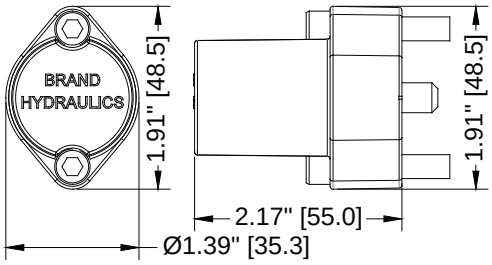
SDCF755TM64GF1…….....3/4" inlet and outlet ports, 1/2" work ports, 0-6 gpm (0-22.7 lpm) tandem metering spool, G style handle and neutral position friction detent.

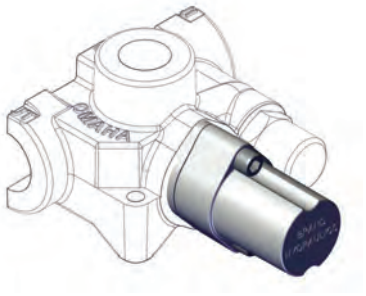
SDCF120TM184GF1…….....#12SAE inlet and outlet ports, #10SAE work ports, 0-18 gpm (0-68.0 lpm) tandem metering spool, G style handle and neutral position friction detent.

SDCF 4-Way Directional Control With Pressure Compensated Flow Control

SDCF – COMPLETE LIST OF KITS:

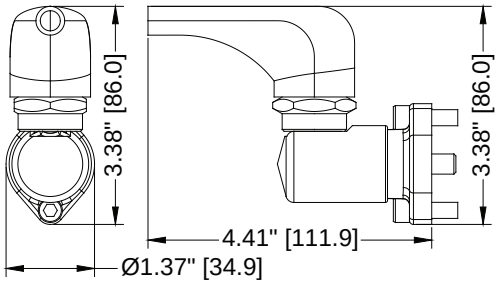
SDC-D……..Three-position detent kit.
SDC-F1…….Ball friction detent.
SDC-S……....Spring centering kit.
SDC-SD……Spring centering detent kit (P to A in detent).
SDC-DS……Detent spring center kit (P to B in detent).
SDC-SF1……...Spring center / friction detent (P to B in friction detent).
SDC-SO……Spring offset kit (P to B in offset position and neutral).
SDC-SO2……..Spring offset kit (P to B in offset position, neutral and P to A)

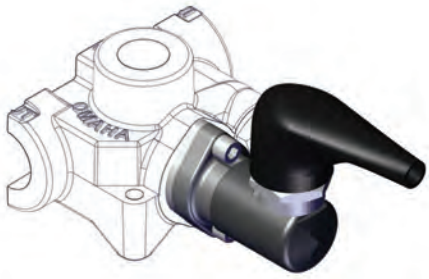




External dimensions are the same for all kits listed above.

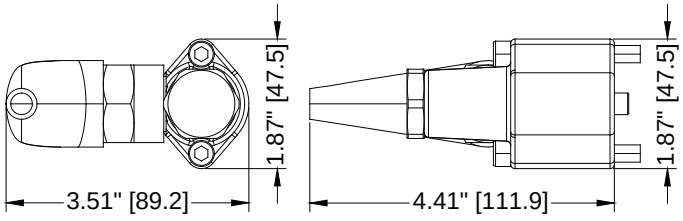
SDC-SWC……..…..Spring centering kit with normally closed electric switch.
SDC-SWO……....Spring centering kit with normally open electric switch.





External dimensions are the same for all kits listed above.

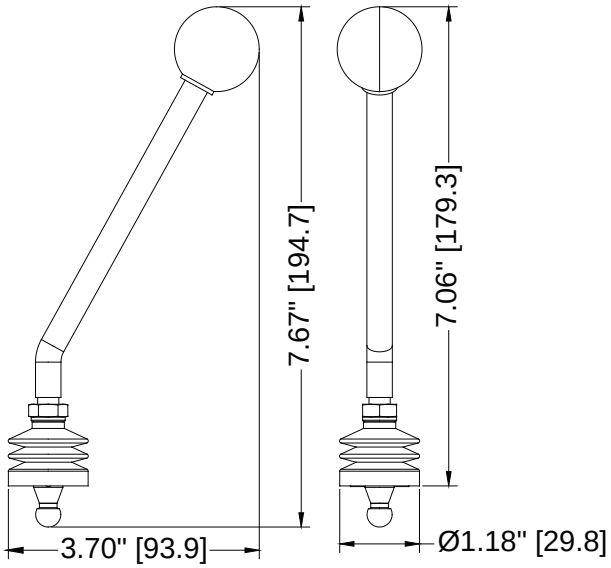
SDC-WC……...Three-position detent kit with normally closed electric switch.
SDC-WO……...Three-position detent kit with normally open electric switch.
SDC-F1WC……..Ball friction detent with normally closed electric switch.
SDC-F1WO……..Ball friction detent with normally open electric switch.

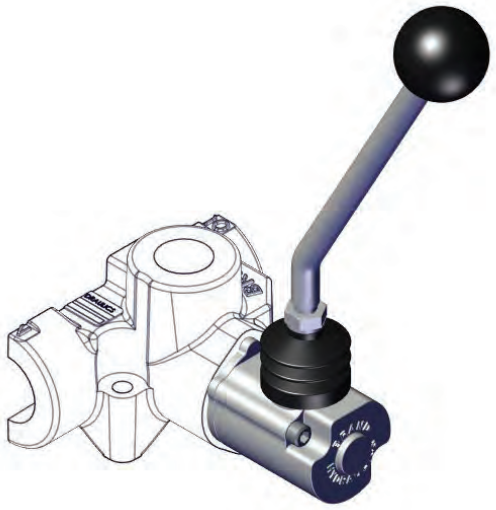


External dimensions are the same for all kits listed above.

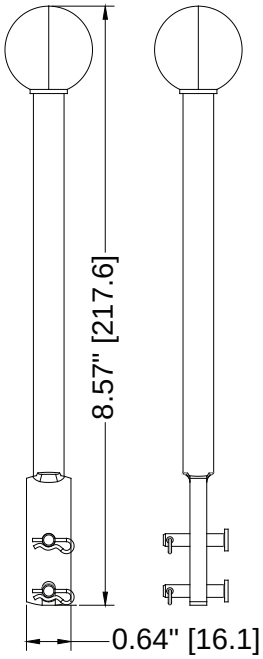
SDCF – COMPLETE LIST OF KITS: *(continued)*

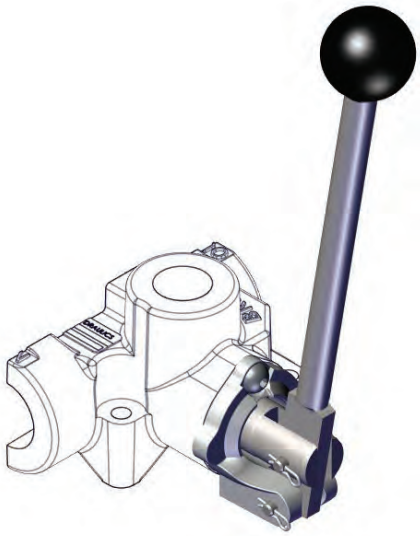
SDC-HG…….....G style handle kit (recommended). Enclosed lever handle pressurizes the B port when the handle is pushed towards the valve body.





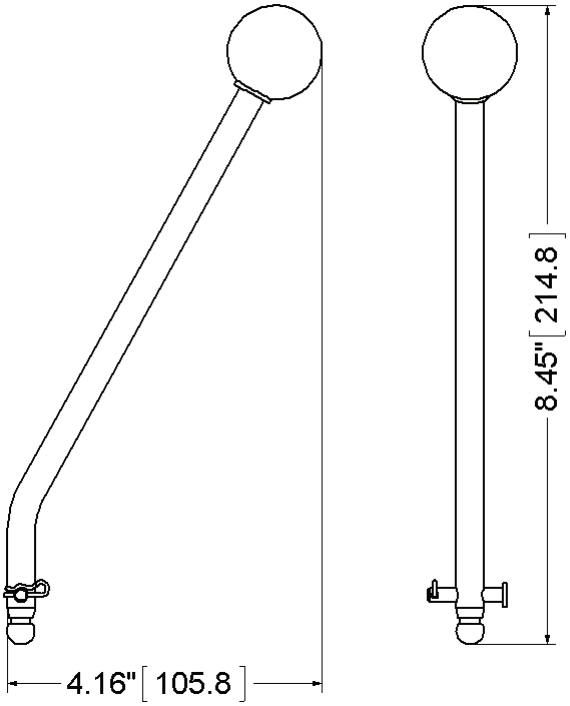
SDC-HJ……...J style handle kit. Lever handle pressurizes the A port when the handle is pushed towards the valve body.





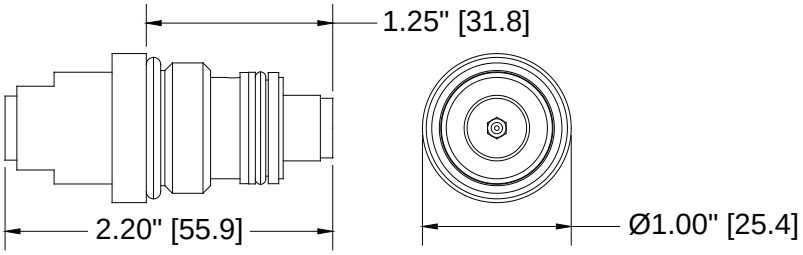
SDCF – COMPLETE LIST OF KITS: *(continued)*

SDC-HL…….....L style handle kit. Lever handle pressurizes the B port when the handle is pushed towards the valve body.



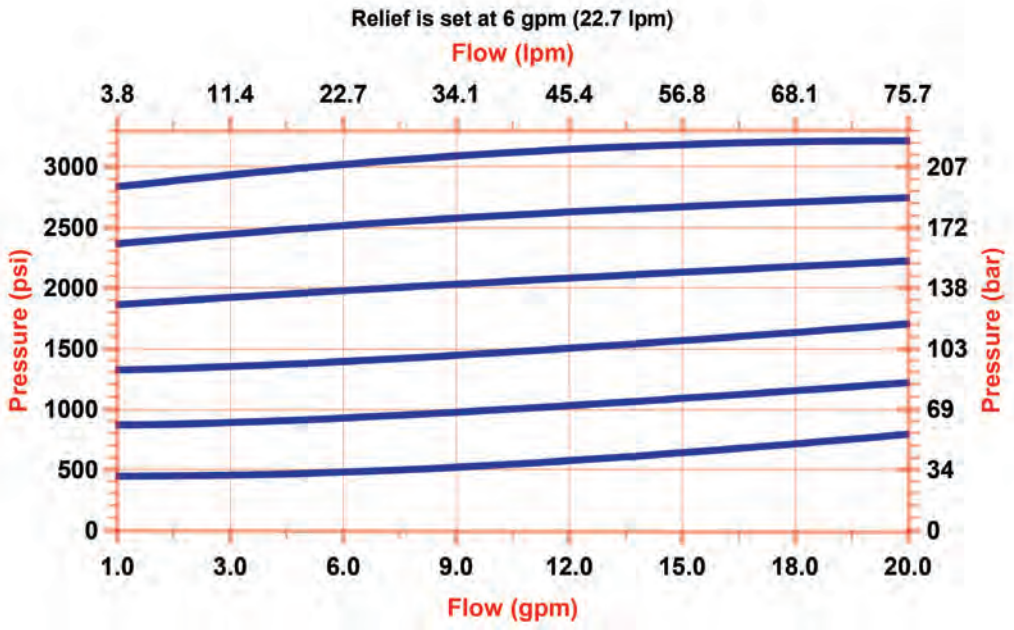
SDCF-K…….....Seal kit for SDCF.

SDCF-CART……...Pilot operated pressure relief cartridge for SDCF.

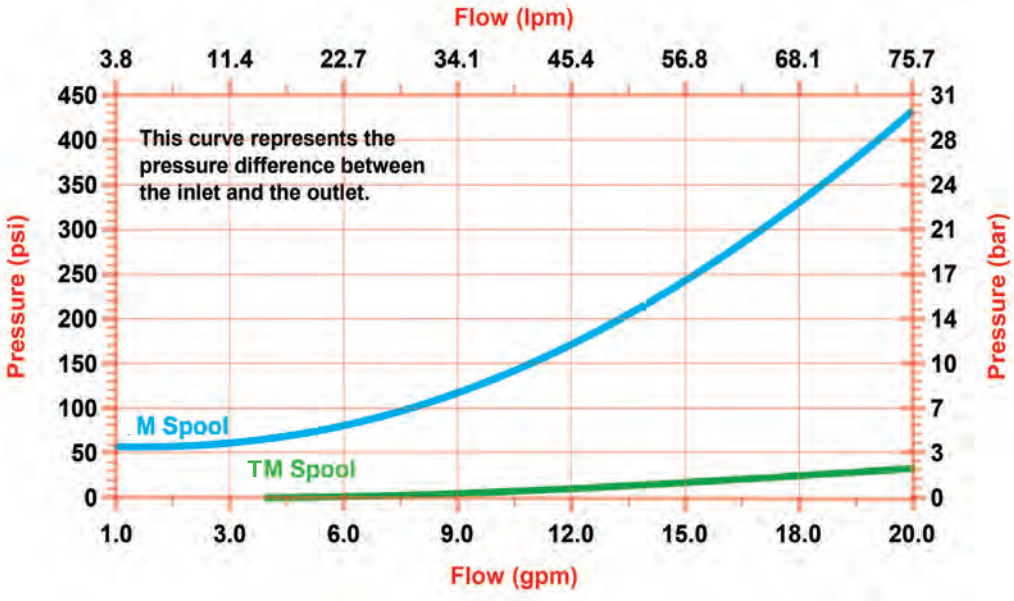


SDCF – FLOW AND PRESSURE INFO:

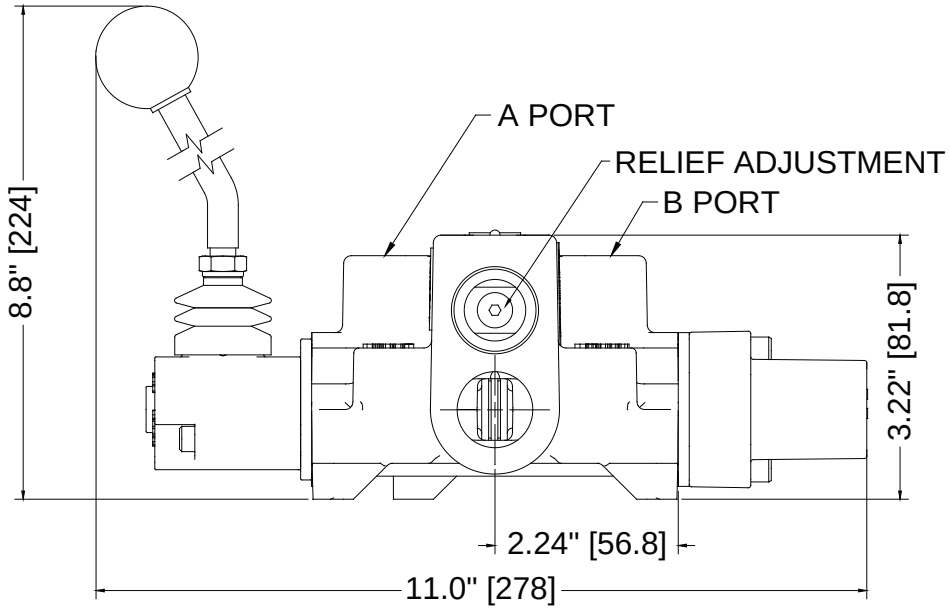
Pressure VS. Flow for Pilot Relief

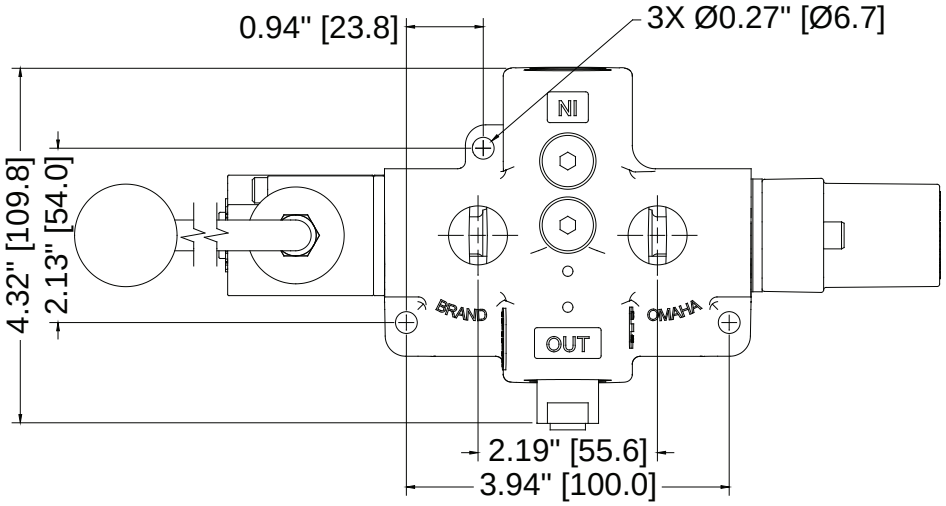


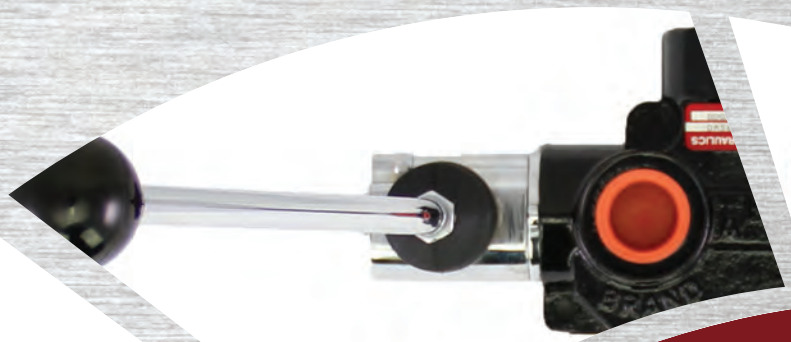
Neutral Flow Pressure Drop

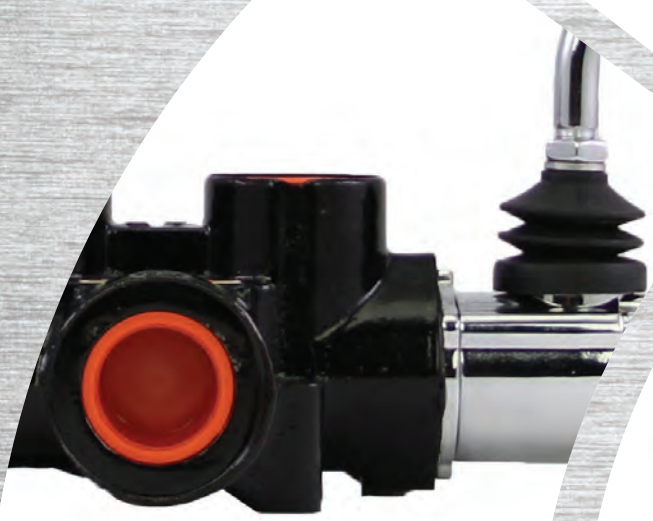


DIMENSIONAL DATA (SDCF755TM124GF1 SHOWN): inches & [millimeters)









BRAND HYDRAULICS Co.

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Serving the World

Engineering & Manufacturing Solutions

AO

4-Way Directional Control Valve

PAO120T4GRSWO

Specifications:

- Rated for 0-18 gpm (0-68.1 lpm)
- Rated for 3000 psi (207 bar)
- Weighs 5-1/2 lbs. (2.5 kg)
- 30 – Micron filtration recommended

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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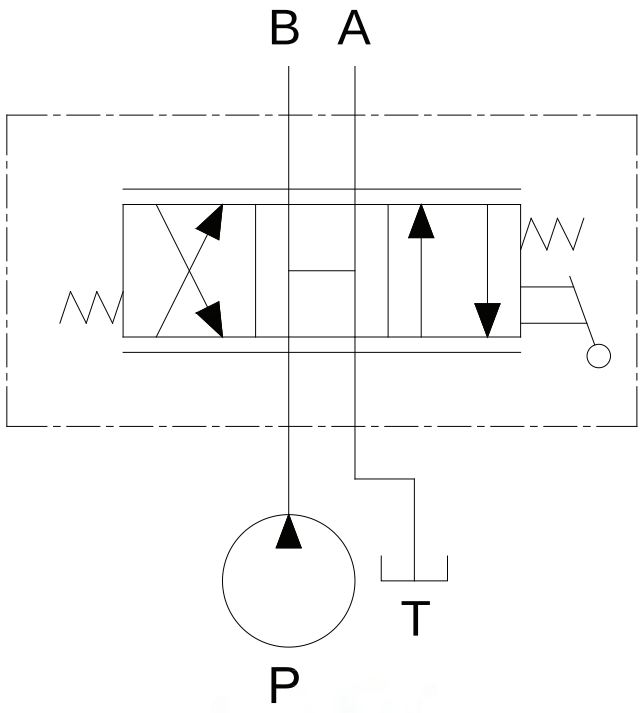
AO 4-Way Directional Control Valve

AO120O4GS



PAO120T4GRSWO

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- IOSSO Plated Steel Spool
- Consult Factory for Stainless Steel Spools
- Black Nylon Ball Knob

FEATURES:

- SMALL AND COMPACT to fit your design requirements.
- POSITIVE METERING in either direction with the manually shifting handle.
- PRECISION GROUND IOSSO PLATED SPOOL that assures long life.
- OPTIONAL O'RING PORTS to eliminate leakage.

AO – GENERAL INFORMATION:

The Brand, 4-way directional control valve is designed to be durable and dependable. The manually shifted handle provides metered flow to either port. Port flow is directly proportional to the movement of the lever. The tank port must go directly back to tank.

SPOOL TYPE – The spool types offered are tandem center 4-way (**T**), open center 4-way (**O**), fine metering (**M**), tandem metering (**TM**), closed center 4-way (**C**), and tandem 3-way (**T3**). (See schematics page for information on spool types)

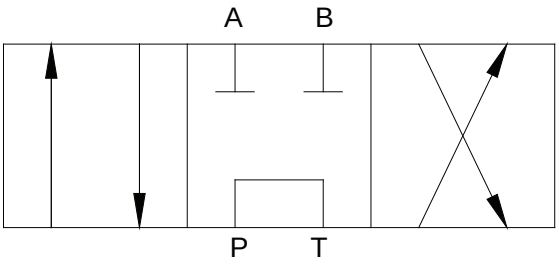
HANDLE OPTIONS –

- **Standard enclosed lever handle (G)** pressurizes the B port when the handle is pushed towards the valve body (vertical mount).
- **Enclosed lever handle (C)** is similar to **(G)** except horizontal mount.
- **Lever handle (L)** pressurizes the B port when the handle is pushed towards the valve body.
- **Lever handle (J)** pressurizes A port when the handle is pushed towards the valve body.
- **Pilot operated (P)** is used to shift the valve from a remote location.
- **Rotary handle (H)** is used to rotate spool in or out of valve body.
- **No actuator (N) G** type spool.
- **No actuator (M) J** type spool.

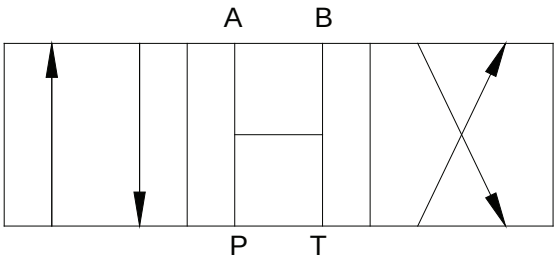
SPOOL ACTION –

- **Three-position detent (D)** holds the spool in neutral and both active positions.
- **Friction detent (F1)** applies friction to the spool so that the spool does not move when the handle is released either side of neutral, a detent groove clearly indicates neutral position.
- **Spring center (S)** returns the handle to neutral when the handle is released.
- **Spring center detent (SD)** springs back to neutral from one position and is mechanically detented in the other position (flow out port A in detent).
- **Spring center friction detent (SF1)** springs back to neutral from one direction and functions similar to standard F1 in other direction (flow out port B in friction detent).
- **Spring offset (SO)** spring holds spool in one active position (P to B in offset position and neutral).
- **Spring offset (SO2)** spring holds spool in one active position (P to B in offset position, neutral and P to A).
- **Rotary friction detent (E)** applies friction to the spool as it is rotated so that the spool does not rotate when the handle is released either side of neutral, a detent groove clearly indicates neutral position.
- **Two-position detent (2D)** P to B and neutral.
- **Two-position detent (D2)** P to A and neutral.
- **Adjustable relief (R)** set to 1500 psi (103 bar) at factory.
- **Normally closed electric switch (WC)** used with (S), (F1) and (D) options only.
- **Normally open electric switch (WO)** used with (S), (F1) and (D) options only.

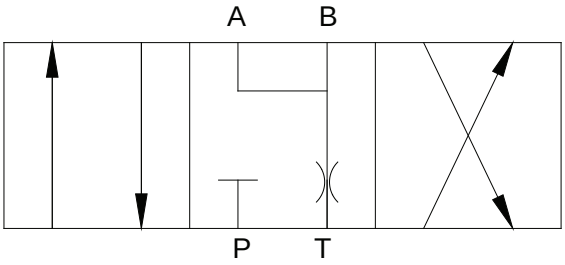
SPOOL SCHEMATICS:



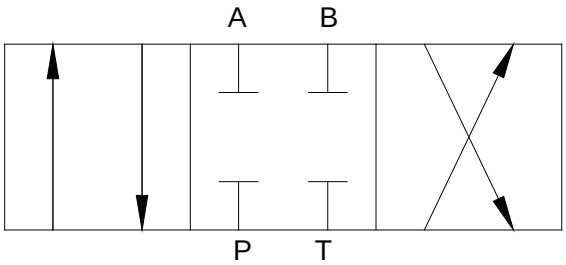
Tandem Center (T) - Powers cylinder or motor in both directions. Pump unloads to tank when spool is in neutral. Cylinder or motor blocked when spool in neutral.



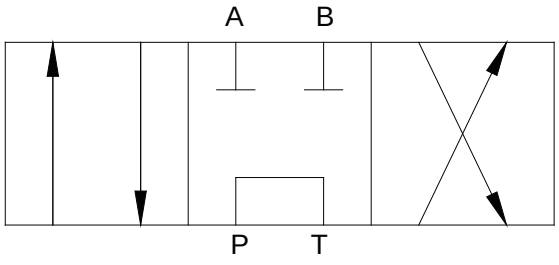
Open Center (O) - All of the ports are connected to tank when the spool is in neutral. Allows cylinder to move or motor to rotate when spool is in neutral.



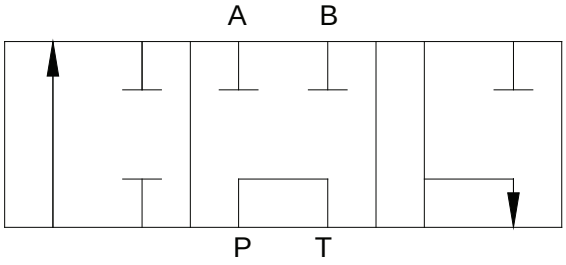
Fine Metering Spool (M) - Requires external locking valves to hold cylinder when spool is in neutral position. Extremely fine metering control. This spool requires a pressure compensated pump.



Closed Center (C) - All ports are blocked in neutral. Blocks cylinder or motor in neutral. Required for use with pressure compensated pump.



Tandem Metering Spool (TM) - Similar to (T) spool except much finer metering control. Cylinder or motor blocked in neutral and pump unloads to tank.



Tandem Three Way (T3) - Powers the cylinder in one direction. Pump unloads to tank when spool is in neutral, or when spool is being reversed. Cylinder is blocked when spool is in neutral. Port "B" is plugged.

AO – CREATING A MODEL CODE FOR AO'S:

AO

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

PORT SIZE:
755 – 3/4" inlet/outlet and 1/2" work ports
120 - #12SAE inlet/outlet and #10SAE work ports

SPOOL TYPE:
T – Tandem Center
O – Open Center
C – Closed Center
M – Fine metering
TM – Tandem metering

FLOW SETTING:
Omit – When using T, C, T3 and O spool
6 – 6 gpm (0-22.7 lpm) M and TM only
12 – 12 gpm (0-45.4 lpm) M and TM only
18 – 18 gpm (0-68.0 lpm) M and TM only

3-Way Or 4-Way:
3 – 3-Way (Tandem spool only)
4 - 4-Way

SPOOL ACTION:
S – Spring center
D – Three-position detent
F1 – Ball Friction detent
WC –Norm. close elec. switch (used with S, D and F1)
WO –Norm. open elec. switch (used with S, D and F1)
SO – Spring offset (P to B and neutral)
SO2 –Spring offset (P to B, neutral and P to A)
SD – Spring center / detent (P to A in detent)
SF1 – Spring center / friction detent (P to B in friction detent)
2D – Two-position detent P to B
D2 – Two-position detent P to A
F2 – Two-position friction P to A
E – Rotary ball friction detent
M – Stroke limiter
R – Adjustable relief

HANDLE OPTION:
G – Enclosed handle (B port is active when handle is pushed, recommended)
C – Enclosed handle (horizontal mount)
L – Lever handle (B port is active when handle is pushed
J – Lever handle (A port is active when handle is pushed)
P – Pilot operated
N – No actuator (G type spool)
M – No actuator (J type spool)
H – Rotary handle (Used only in conjunction with rotary friction detent)

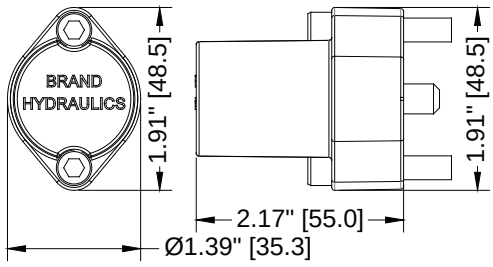
AO – EXAMPLES OF COMMON MODEL CODES:

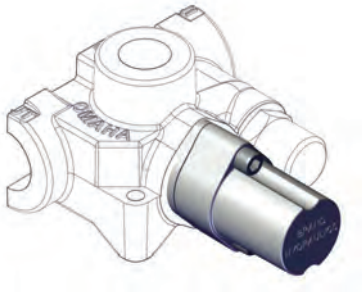
AO755T4GRS…….3/4" inlet and outlet ports, 1/2" work ports, tandem center 4-way spool, G style handle, adjustable relief set at 1500 psi (103 bar) and spring centering.

AO755O4GD…….3/4" inlet and outlet ports, 1/2" work ports, open center 4-way spool, G style handle, and three position detent.

AO – COMPLETE LIST OF KITS:

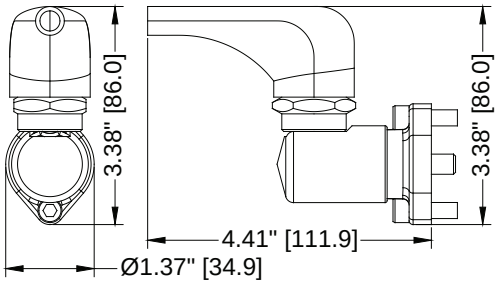
SDC-D……..Three-position detent kit.
SDC-F1…….Ball friction detent.
SDC-S……....Spring centering kit.
SDC-SD……Spring centering detent kit (P to A in detent).
SDC-SF1……...Spring center / friction detent (P to B in friction detent).
SDC-SO……Spring offset kit (P to B in offset position and neutral).
SDC-SO2……..Spring offset kit (P to B in offset position, neutral and P to A)

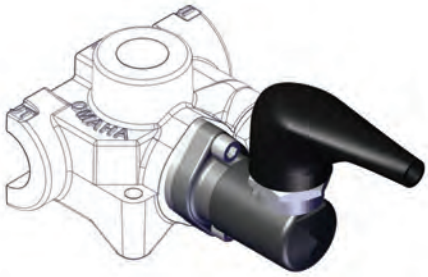




External dimensions are the same for all kits listed above.

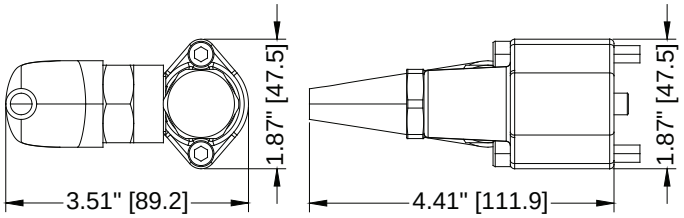
SDC-SWC……..…..Spring centering kit with normally closed electric switch.
SDC-SWO……....Spring centering kit with normally open electric switch.





External dimensions are the same for all kits listed above.

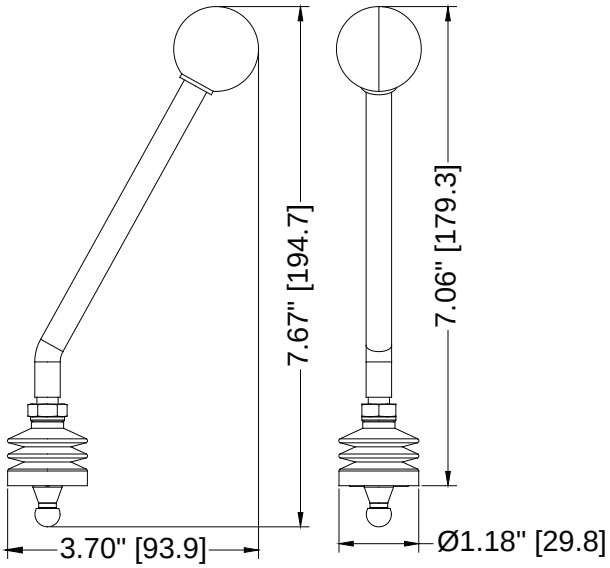
SDC-WC……...Three-position detent kit with normally closed electric switch.
SDC-WO……...Three-position detent kit with normally open electric switch.
SDC-F1WC……..Ball friction detent with normally closed electric switch.
SDC-F1WO……..Ball friction detent with normally open electric switch.



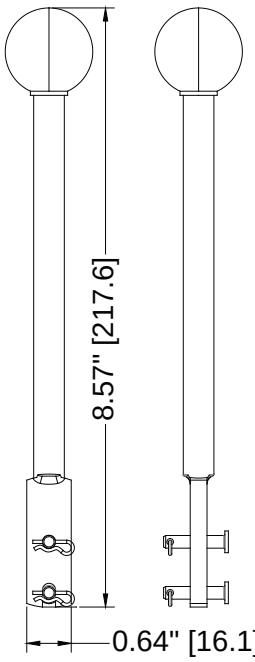
External dimensions are the same for all kits listed above.

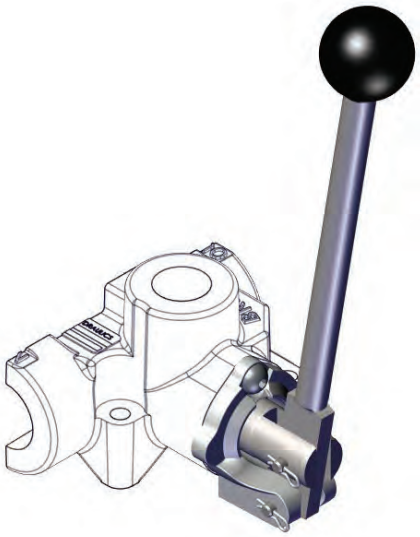
AO – COMPLETE LIST OF KITS: *(continued)*

SDC-HG…….....G style handle kit.



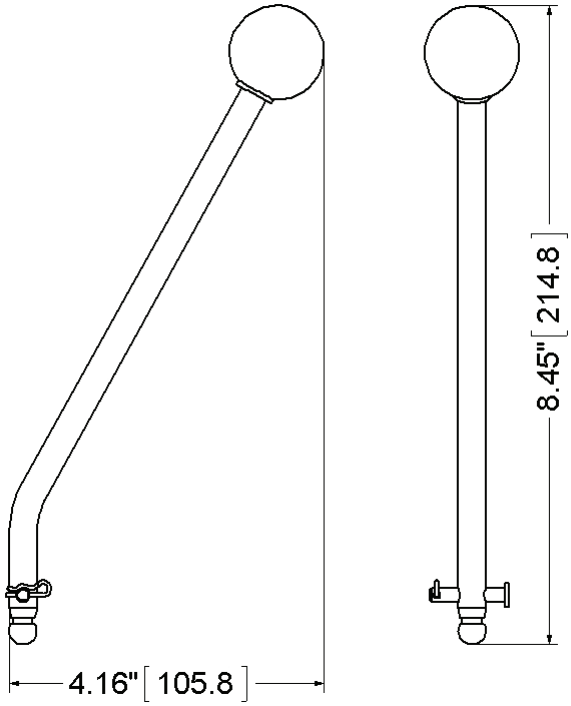
SDC-HJ……...J style handle kit.





AO – COMPLETE LIST OF KITS: *(continued)*

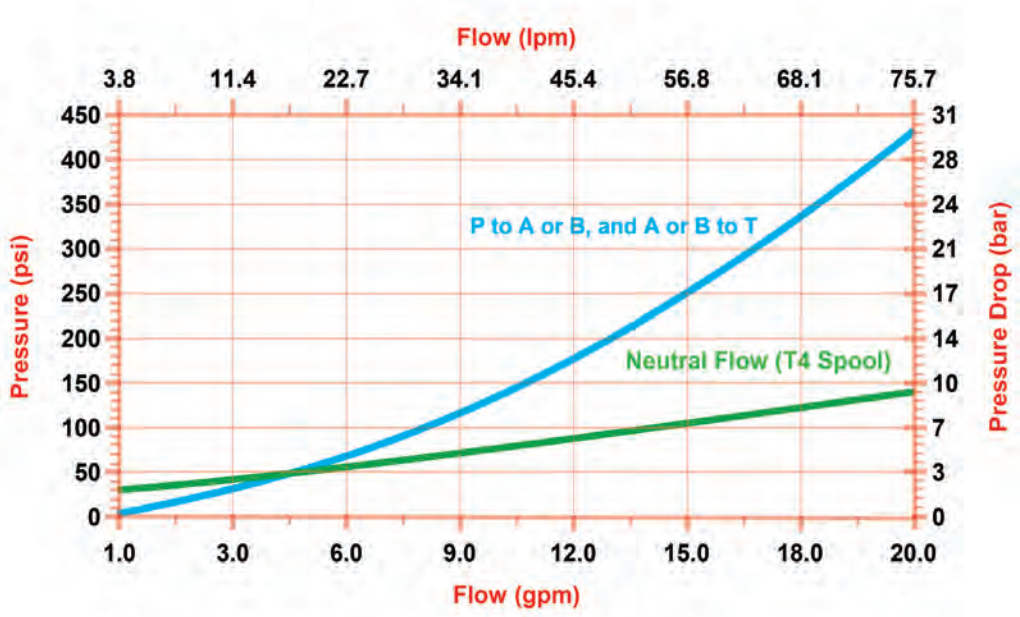
SDC-HL…….....L style handle kit.



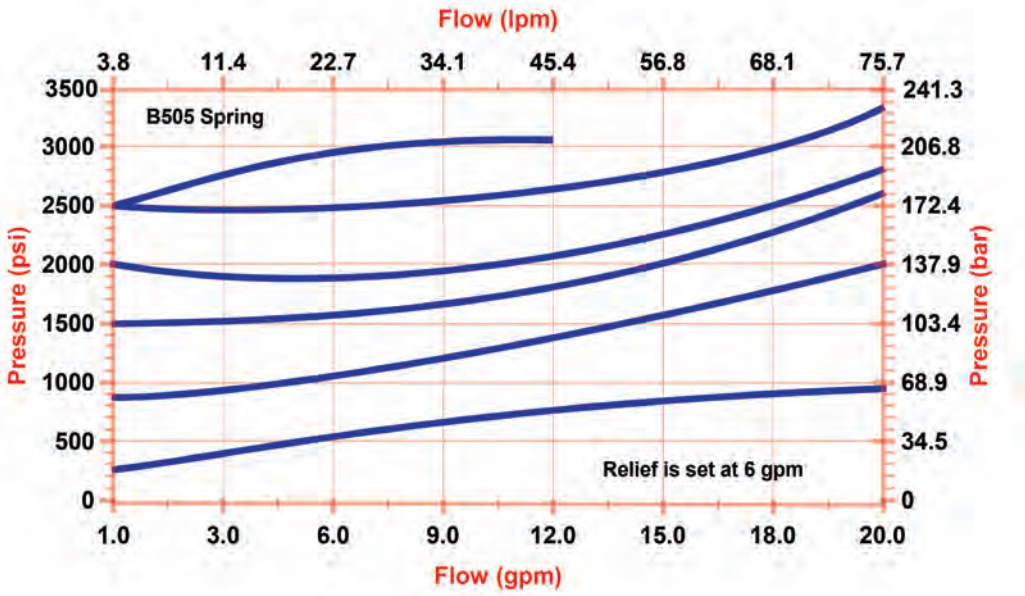
SDC-K…….....Seal kit for SDC-K.

AO – FLOW AND PRESSURE INFO:

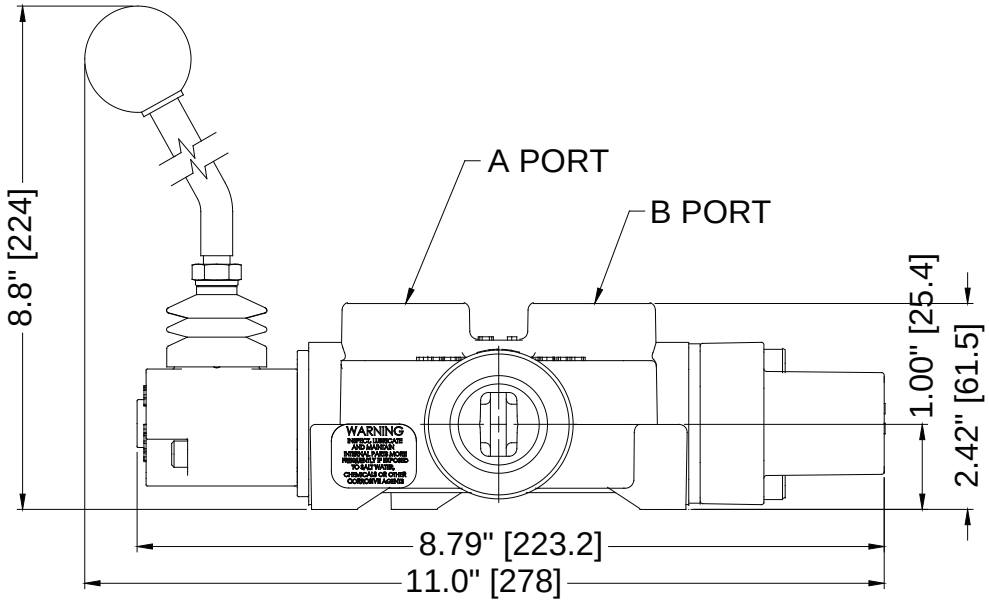
Pressure Drop VS. Flow

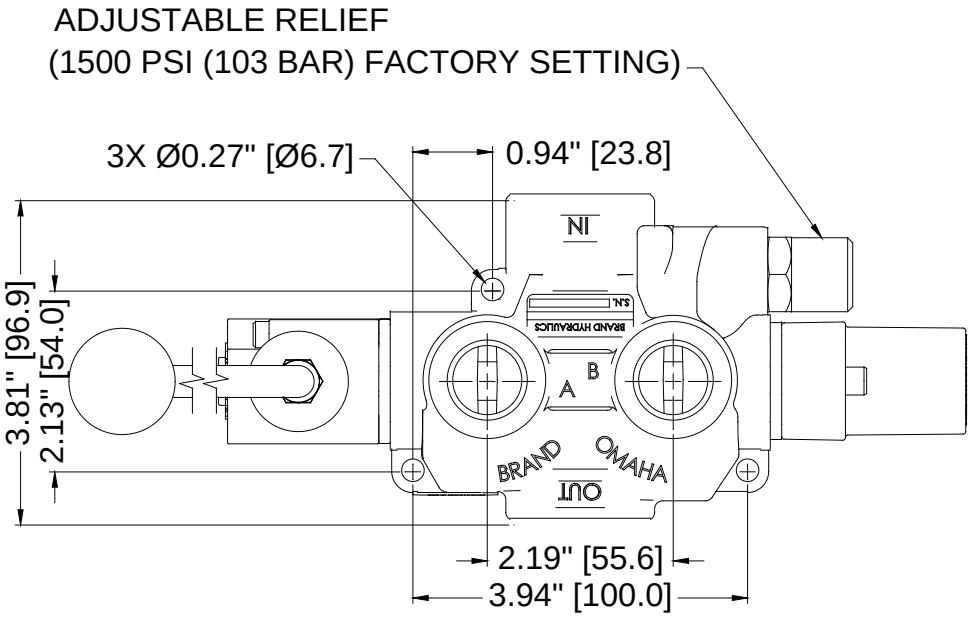


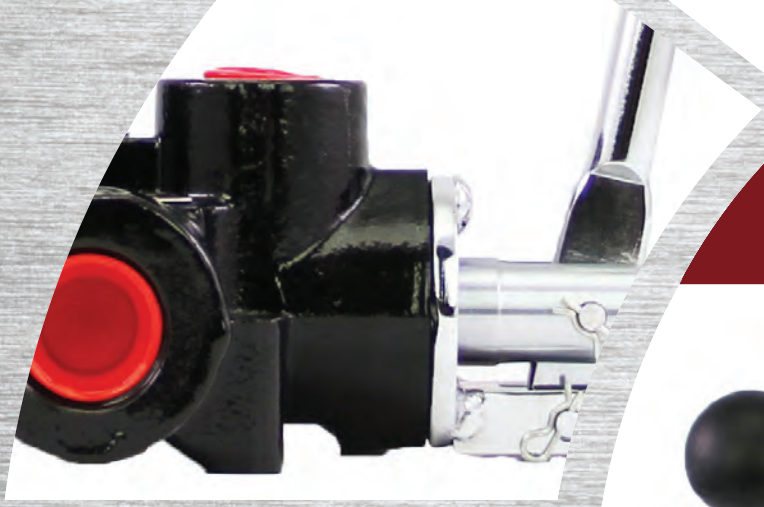
Pressure VS. Flow for AO Relief (R)



DIMENSIONAL DATA (AO120T4GRS SHOWN): inches & [millimeters]







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LS

4-Way Directional Control Valve With Hydraulic Kick Out

PLS755T4JRSH

Specifications:

- Rated for 0-18 gpm (0-68.1 lpm)
- Rated for 3000 psi (207 bar)
- Weighs 5-1/2 lbs. (2.5 kg)
- 30 – Micron filtration recommended

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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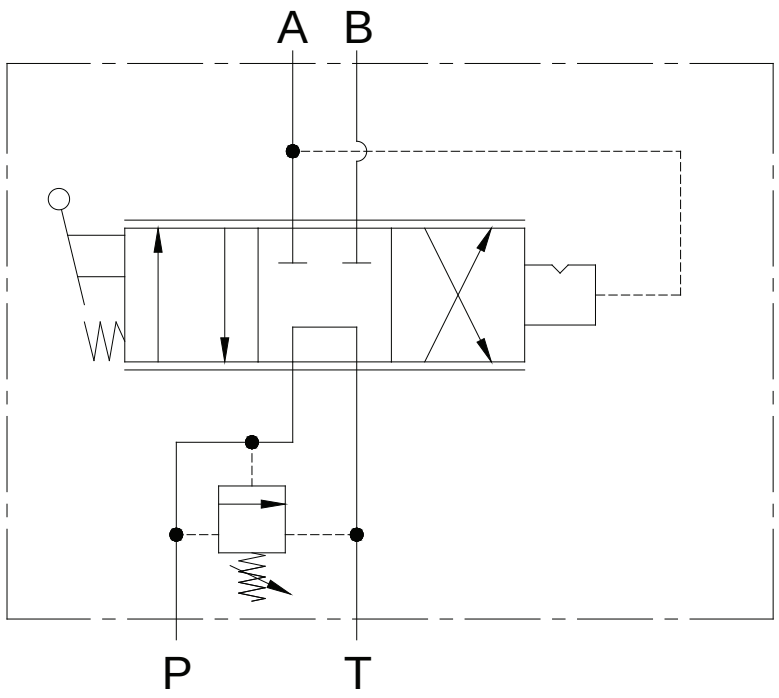
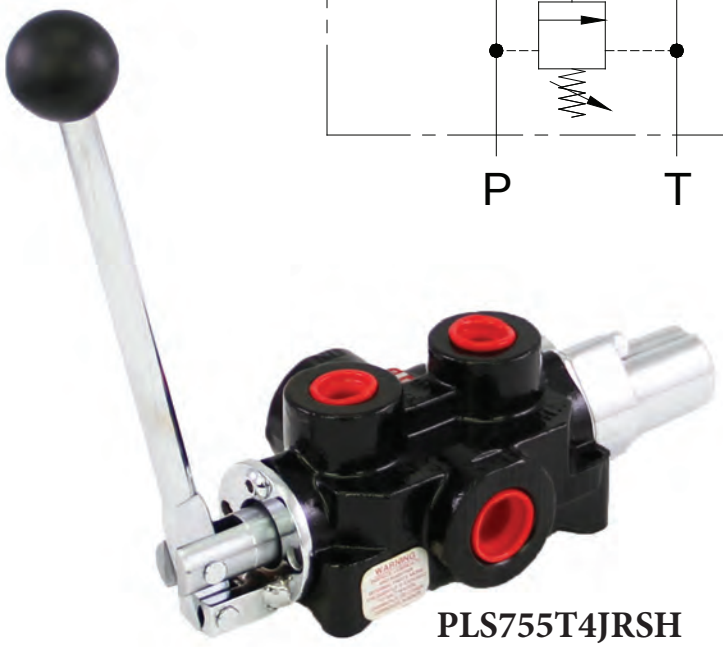
LS

4-Way Directional Control Valve With Hydraulic Kick Out

LS755T4JRSH





PLS755T4JRSH

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- IOSSO Plated Steel Spool
- Black Nylon Ball Knob

FEATURES:

- SINGLE ADJUSTABLE HYDRAULIC KICK OUT.
- OPTIONAL DOUBLE HYDRAULIC KICK OUT is not recommended for log splitters.
- SMALL AND COMPACT to fit your design requirements.
- FINE POSITIVE METERING in either direction with the manually adjustable handle.
- PRECISION GROUND IOSSO PLATED SPOOL that assures long life.

LS – GENERAL INFORMATION:

The Brand, LS 4-way directional control valve is designed primarily for log splitters. The manual adjustable handle provides fine metering to either port. Port flow is directly proportional to the movement of the lever. The tank port must be plumbed directly back to tank.

SPOOL TYPE – The spool types offered are tandem center 4-way (**T4**), open center 4-way (**O4**), closed center 4-way (**C4**). (See chart and schematics for information on spool types).

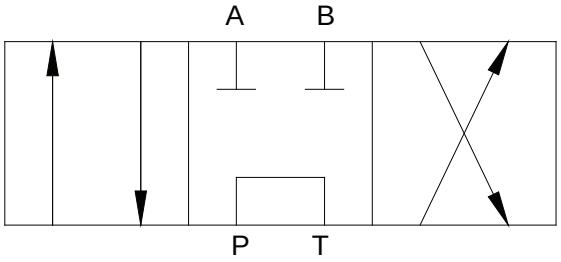
HANDLE OPTIONS –

- **Lever handle (J)** pressurizes A port when the handle is pushed towards the valve body (clevis below spool).
- **Lever handle (L)** pressurizes A port when the handle is pulled away from valve body (clevis above spool).
- **No actuator (M) J** type spool.

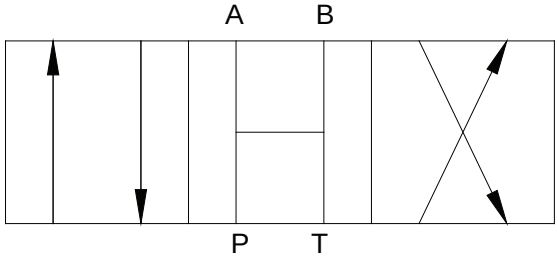
SPOOL ACTION –

- **Spring center hydraulic detent** (**SH**) springs back to neutral from one position and pressure release detent in the other direction when the cylinder completes its return stroke (P to A in detent and 800-1000 psi (55 to 69 bar) kick-out setting).
- **Single hydraulic kick-out** (**SH**) preset at 800 PSI. Adjustable from 800 to 2200 PSI.
- **Hydraulic detent in both directions** (**HHA**) pressure release detent in both directions and springs to center when out of detent (Not recommended for log splitters).
- **Adjustable relief (R)** set to 2000 psi (138 bar) at factory.

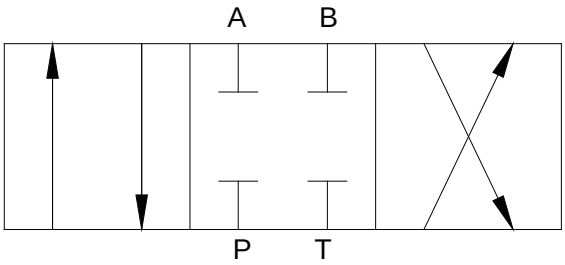
SPOOL SCHEMATICS:



Tandem Center 4-Way (T4) - Powers cylinder or motor in both directions. Pump unloads to tank when spool is in neutral. Cylinder or motor blocked when spool in neutral.



Open Center 4-Way (O4) - All of the ports are connected to tank when the spool is in neutral. Allows cylinder to move or motor to rotate when spool is in neutral.



Closed Center 4-Way (C4) - All ports are blocked in neutral. Blocks cylinder or motor in neutral. Required for use with pressure compensated pump.

LS – CREATING A MODEL CODE FOR LS'S:

LS

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

PORT SIZE:
755 – 3/4" inlet/outlet and 1/2" work ports
120 - #12SAE inlet/outlet and #10SAE work ports

SPOOL TYPE:
T4 – Tandem Center 4-way
O4 – Open Center 4-way
C4 – Closed Center 4-way

HANDLE OPTION:
J – J-style lever handle (clevis below spool)
L – J-style lever handle (clevis above spool)
M – No actuator (J type spool)

SPOOL ACTION:
SH – Spring center / hydraulic detent (Adjustable)
HHA – Hydraulic detent in both directions

RELIEF:
Omit – 3No relief
R - Adjustable relief (2000 psi (138 bar) factory setting)

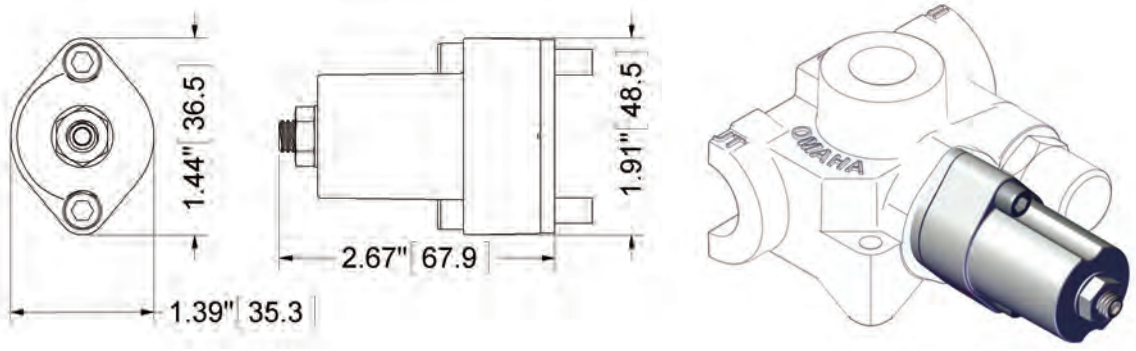
LS – EXAMPLES OF COMMON MODEL CODES:

LS755C4JRSH.....3/4" NPT inlet/outlet, 1/2" NPT work ports, closed center 4-way spool, J-style actuator, adjustable relief set at 2000 psi (138 bar), and spring center one direction hydraulic detent in other direction with non-adjustable kick-out.

LS755T4JRHHA.....3/4" NPT inlet/outlet, 1/2" NPT work ports, tandem center 4-way spool, J-style actuator, adjustable relief set at 2000 psi (138 bar), and hydraulic detent in both directions.

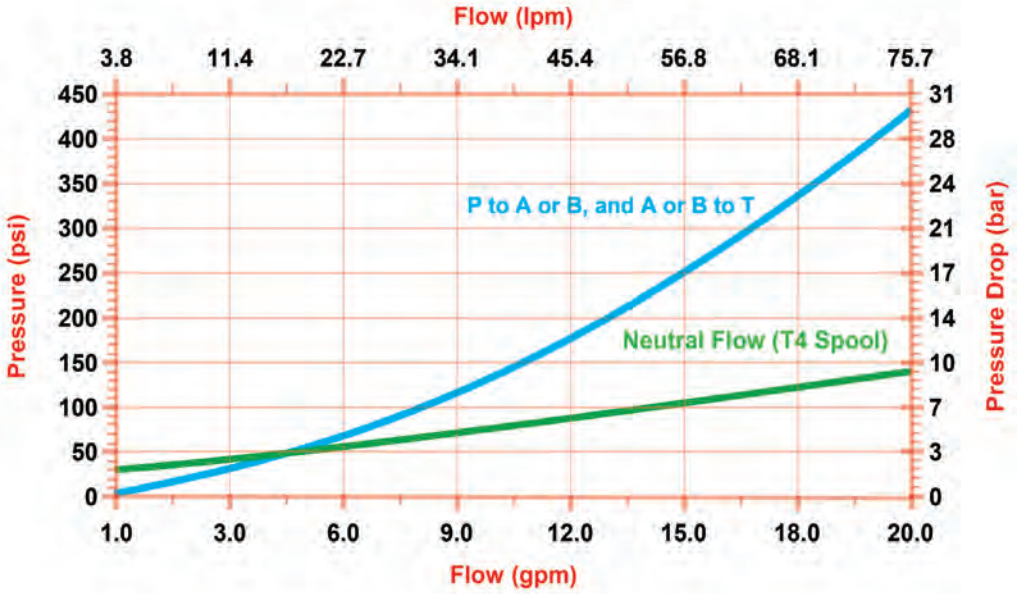
LS – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

LSJRHH-K..... Seal kit for LS with HHA spool action.
LSJRS-K..... Seal kit for LS with SH spool action.
LS-RK..... Kick-out assembly with spool for SH spool action.

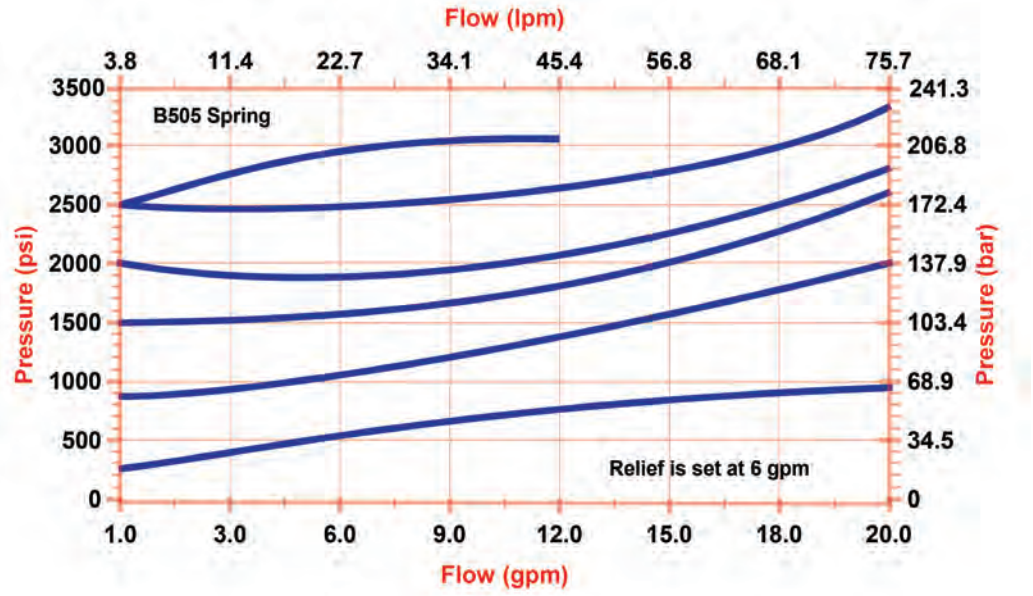


LS – FLOW AND PRESSURE INFO:

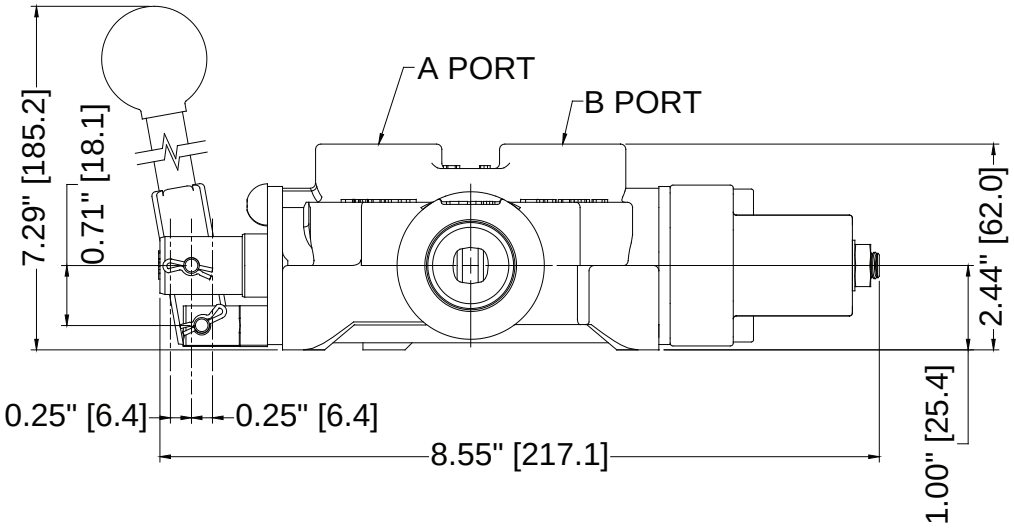
Pressure Drop VS. Flow

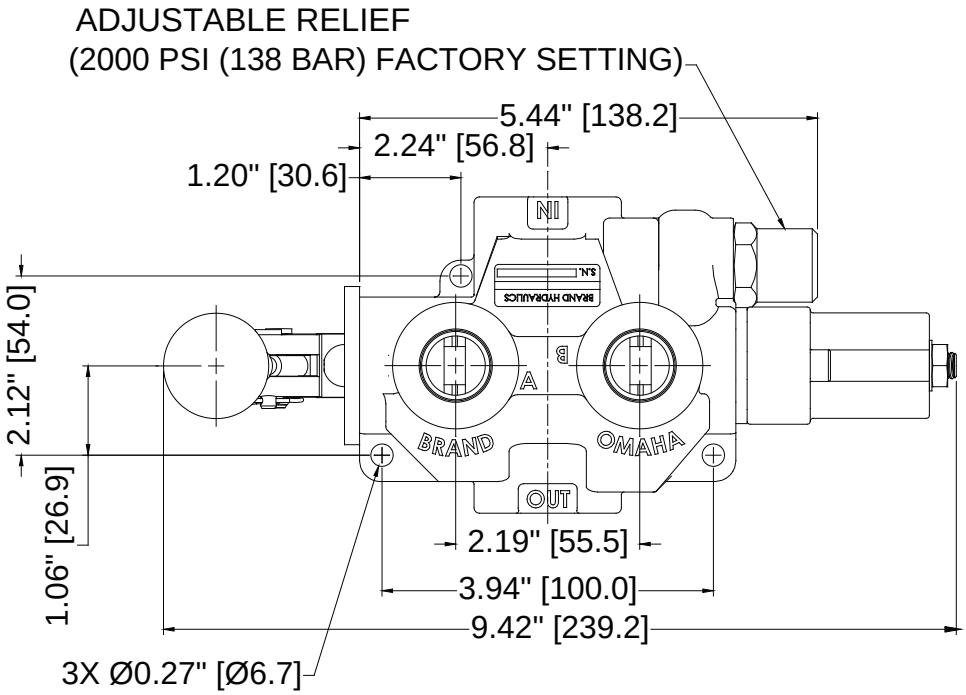


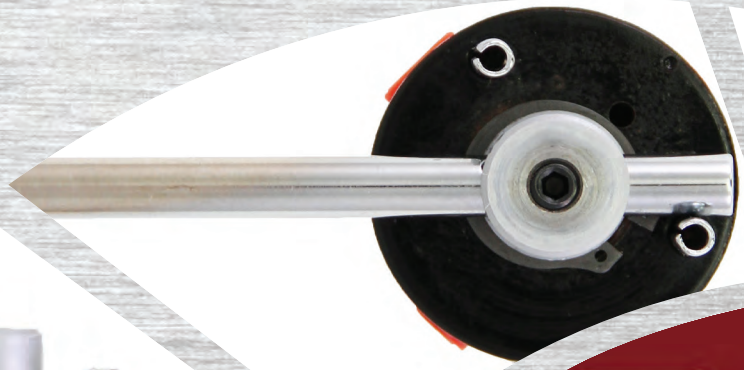
Pressure VS. Flow for LS Relief (R)



DIMENSIONAL DATA (LS755T4JRSH SHOWN): inches & [millimeters]







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HPV4

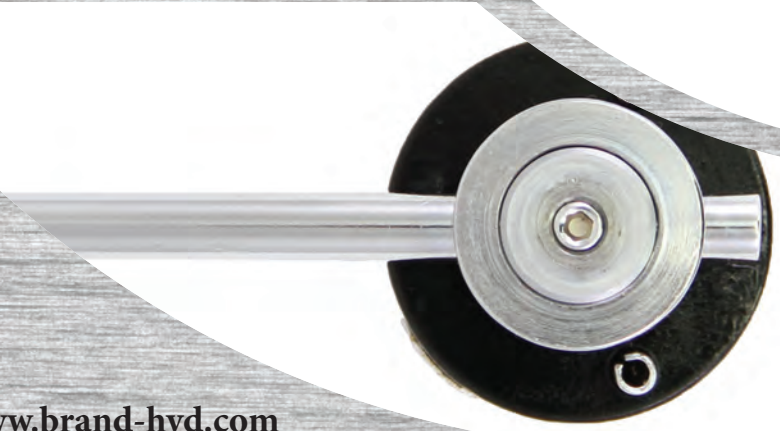
4-Way Directional Control Valve

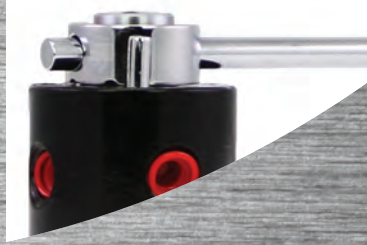
Specifications:

- Rated for 0-5 gpm (0-19 lpm)
- Rated for 6000 psi (414 bar)
- Weighs 1.25 lbs. (0.6 kg)
- Porting: 1/4" NPT or #4 SAE
- 30 in lbs (3.4 Nm) to turn HPV4 spool @ 3000 psi (207 bar)
- 15 degree of rotation before work ports open to pressure or tank
- 30 – Micron filtration recommended

PHPV4

PHPV4D





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Certificate #02.002.1

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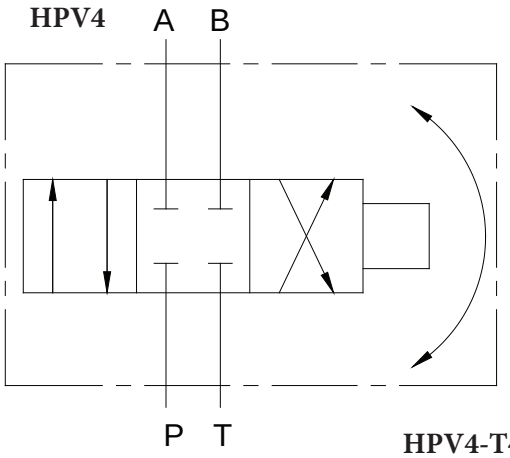
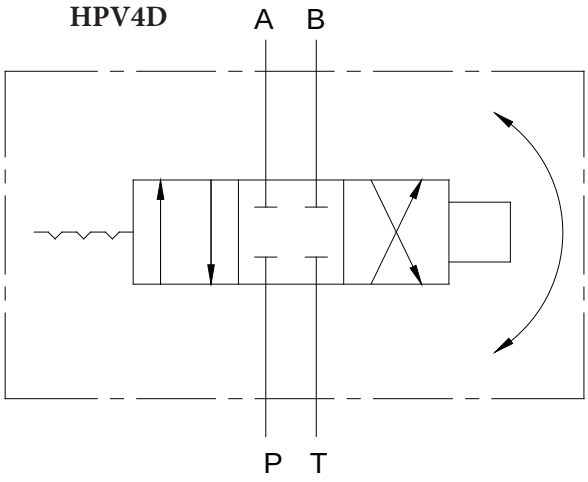
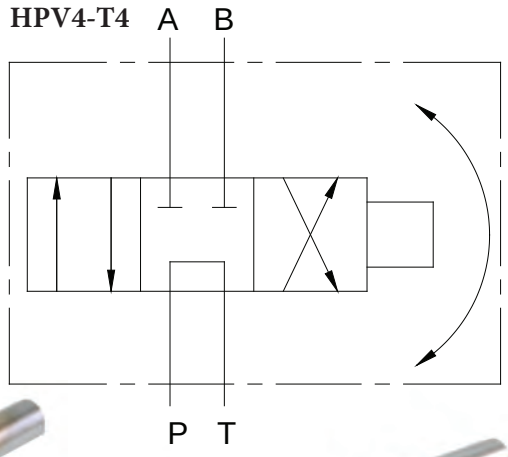
HPV4 4-Way Directional Control Valve







PHPV4

PHPV4D

MATERIALS:

- Durabar Gray Cast Iron Body
- Buna N O'Rings
- IOSSO Plated Steel Spool

FEATURES:

- SMALL AND COMPACT to fit your design requirements.
- CROSS HOLES IN SPOOL reduce torque required to rotate the spool.
- PRECISION GROUND IOSSO PLATED SPOOL that assures long life.
- OPTIONAL #4 SAE PORTING for a better seal between the body and the fitting.
- OPTIONAL T4 SPOOL allows customer to send oil from P to T in the neutral position.
- OPTIONAL THREE-POSITION DETENT to hold the spool in either active position or neutral.

HPV4 – GENERAL INFORMATION:

The Brand, HPV4 directional control valves are small and compact. The HPV4's were designed primarily for use with hand pumps and other low flow applications where size weight and appearance are important. Three-position detent (D) holds the spool in neutral or either active position. Closed center (standard) blocks all ports when in neutral. Tandem center (T4) sends oil from P to T when in the neutral position. The T4 spool should not be used for flows of 4 gpm and greater because the pressure drop increases significantly.

HPV4 – CREATING A MODEL CODE FOR HPV4'S:

HPV4 - ____ ____ ____ ____

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

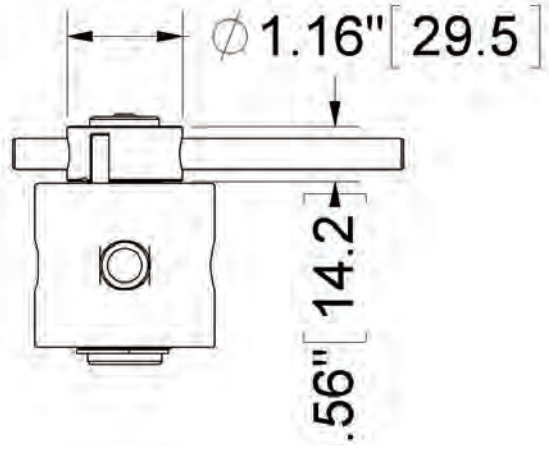
SPOOL ACTION:
Omit – Standard o-ring friction
D – Three position detent

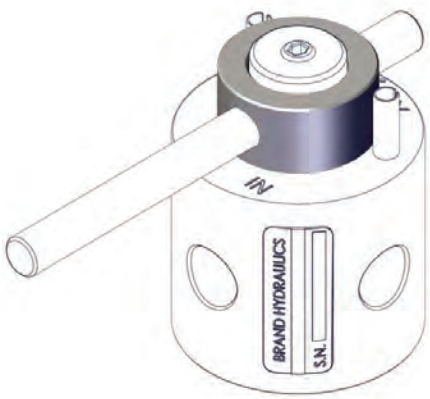
SPOOL TYPE:
Omit – Closed center 4-way spool
T4 – Tandem center 4-way spool

PORT SIZE:
Omit – 1/4" NPT all ports
4SAE - #4 SAE (7/16-20) all ports

HPV4 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

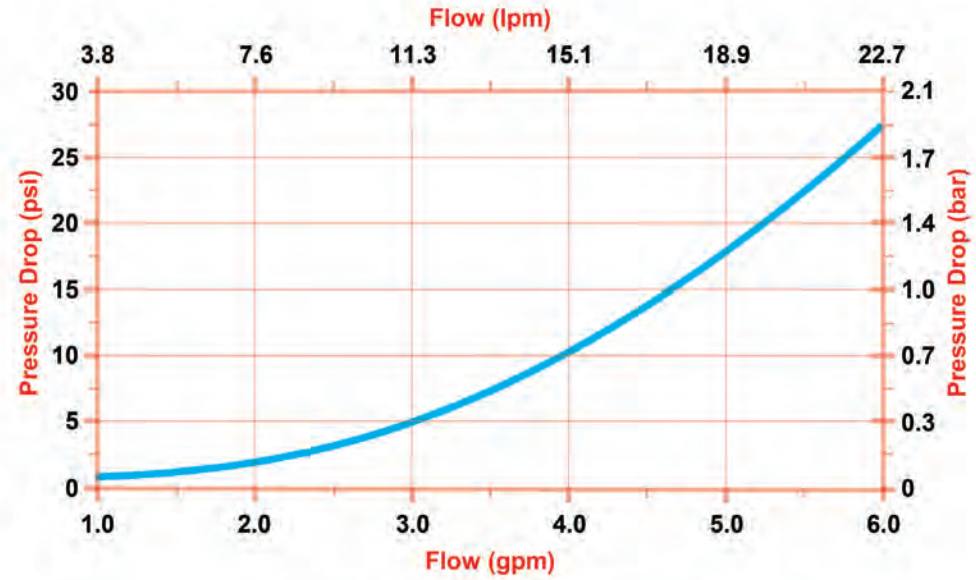
HPV-3D…… Three-position friction detent kit.
HPV4-K…… Seal kit for HPV4.



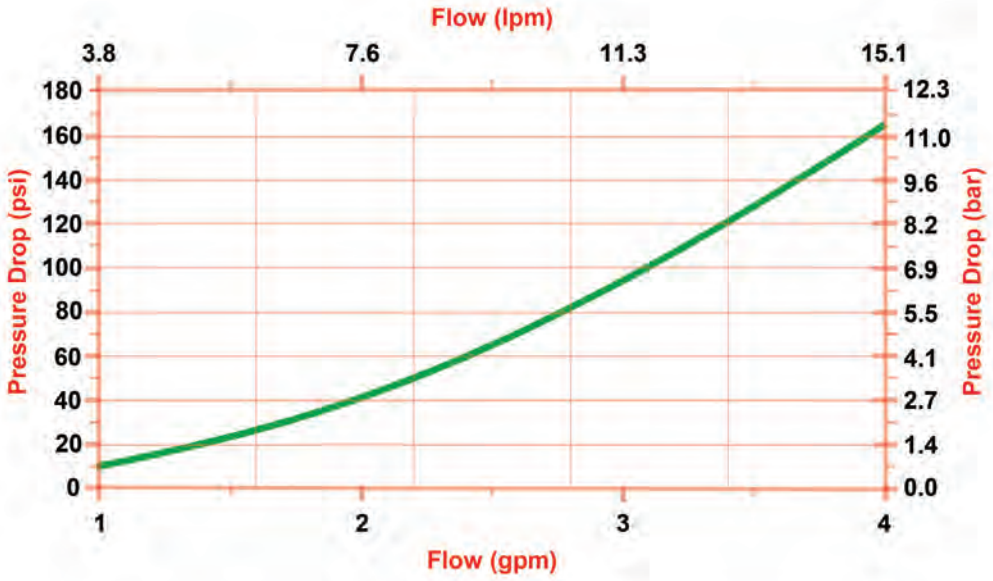


HPV4 – FLOW AND PRESSURE INFO:

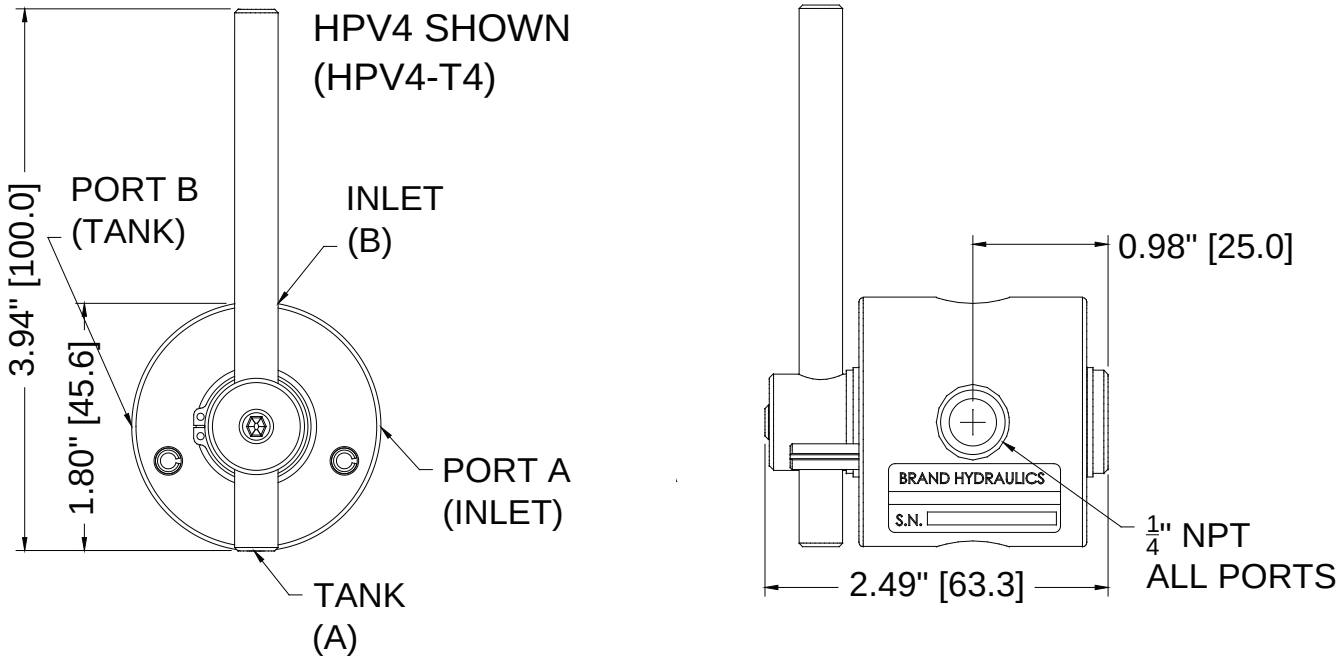
Pressure Drop VS. Flow for P to A or B

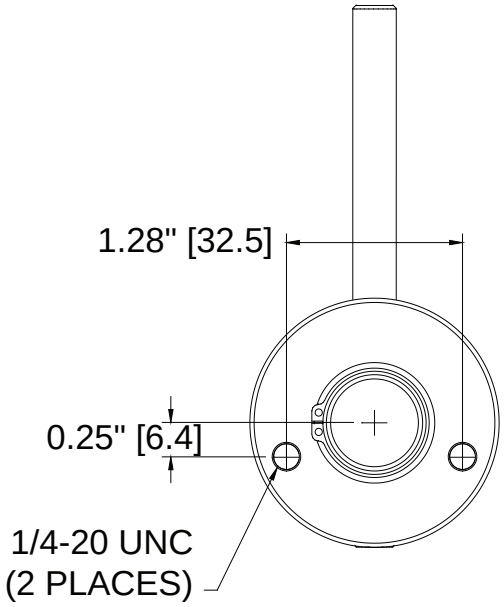


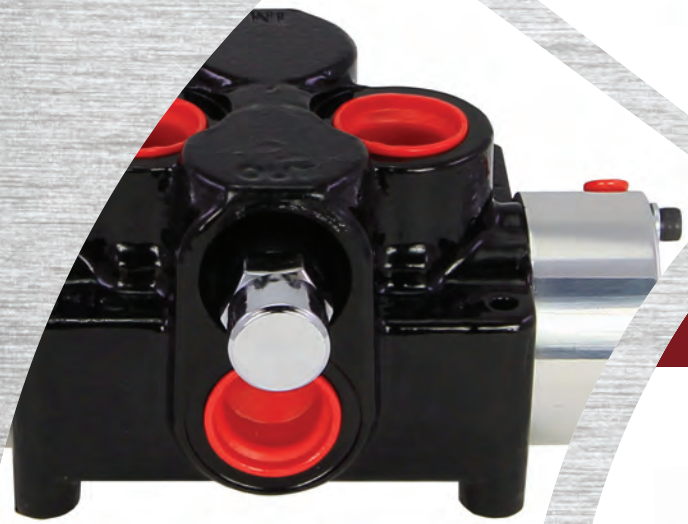
Pressure Drop VS. Flow for T4 Spool



DIMENSIONAL DATA: inches & [millimeters]







BRAND HYDRAULICS CO.

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Engineering & Manufacturing Solutions

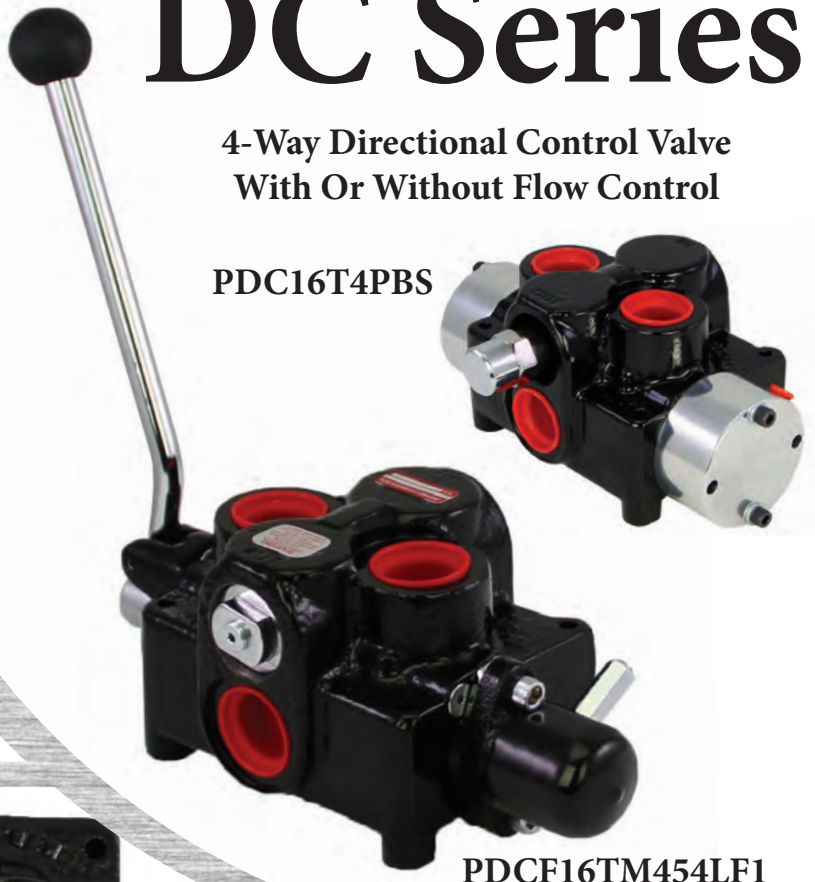
DC Series

4-Way Directional Control Valve
With Or Without Flow Control

Specifications:

- Rated for 0-45 gpm (0-170 lpm)
- Rated for 3000 psi (207 bar)
- Std. port sizes (Consult factory for others)
  - 3/4" NPT all ports
  - #16 SAE (1-5/16-12) all ports
- Weighs 16 lbs. (7.3 kg)
- 20 – Micron filtration recommended

PDC16T4PBS



PDCF16TM454LF1

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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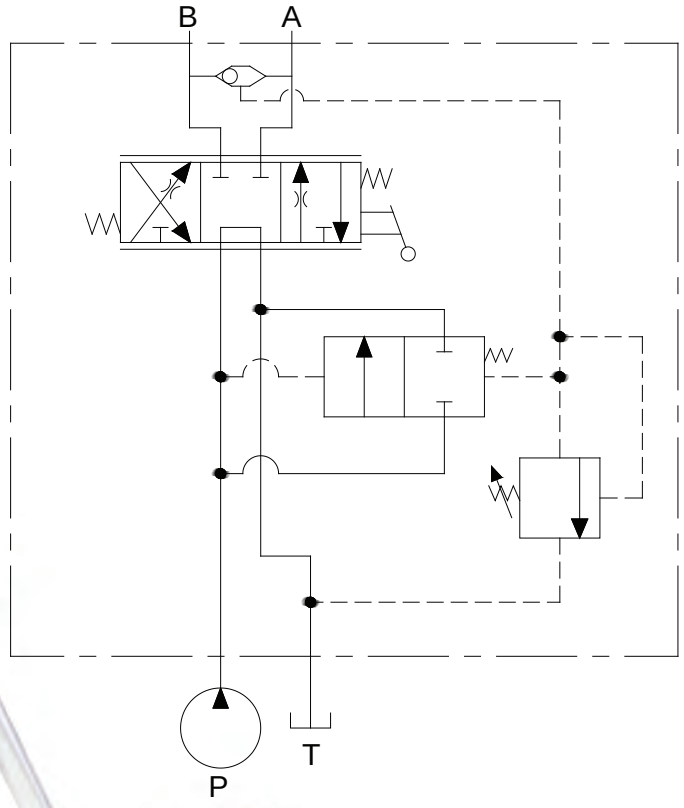
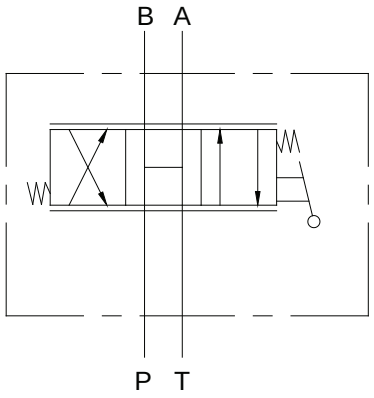
DC Series

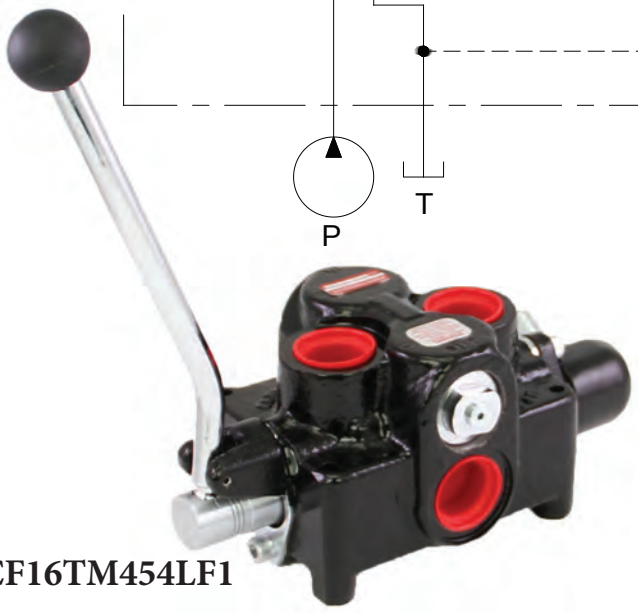
4-Way Directional Control Valve With Or Without Flow Control

DCF16TM304LS



DC7504LS





PDCF16TM454LF1

MATERIALS:

- Ductile Cast Iron Body
- Buna N O'Rings
- IOSSO Plated Steel Spool
- Consult Factory for Stainless Steel Spools

FEATURES:

- PILOT OPERATED RELIEF VALVE is standard on every DCF valve.
- FULL RANGE PRESSURE COMPENSATED by-pass type flow control valve (DCF valve).
- DCF REDUCES the number of fittings, plumbing and potential leaks in hydraulic circuits.
- FINE POSITIVE METERING in either direction with the manual handle (DCF valve).
- PRECISION GROUND IOSSO PLATED SPOOL that assures long life (DC & DCF valves).
- OPTIONAL VENT PORT to unload relief (DCF only).
- OPTIONAL PILOT OPERATED ACTUATOR for remote operation (DC & DCF valves).
- NPT & SAE porting available.

DC Series – GENERAL INFORMATION:

The Brand, DCF directional flow control valve combines the features of a four-way directional control valve, a full range pressure compensated by-pass type flow control valve, and a pilot operated pressure relief valve, all in one compact package. This valve reduces the number of fittings, plumbing and potential leakage points in hydraulic circuits. The manual handle provides fine metering to either port. Flow to the work port is directly proportional to the movement of the lever. Flow out of each work port is constant regardless of load changes, this allows the customer to maintain smooth and constant movement of a cylinder or motor. Every DCF comes standard with a pilot operated relief. The tank port must be plumbed directly back to tank.

The Brand, DC directional control valve does not have the flow control feature of the DCF. The DC can be used in series but the spool is difficult to shift when there is tank pressure. The DC offers an optional high lift ball spring relief to take the place of the standard pilot operated relief on the DCF. The manual handle provides metering to either port.

SPOOL TYPE – The spool types offered are tandem center 4-way (**T**), open center 4-way (**O**), closed center 4-way(**C**), fine metering 4-way (**M**), tandem metering 4-way (**TM**), and tandem center 3-way (**T3**).

HANDLE OPTIONS –

- **Lever handle (L)** pressurizes the B port when the handle is pushed towards the valve body.
- **Pilot operated (P)** is used when it is necessary to remotely operate the valve.
- **Rotary handle (H)** is used to rotate spool in or out of valve body.
- **No actuator (N)** L type spool.

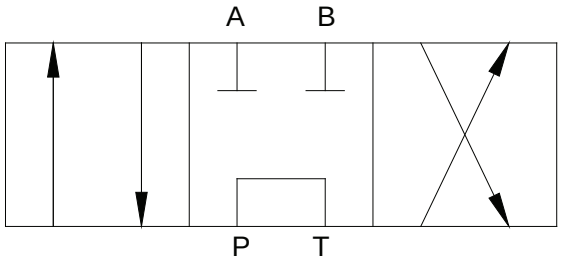
SPOOL ACTION –

- **Three-position detent (D)** holds the spool in neutral and both active positions.
- **Friction detent** (**F1**) applies friction to the spool so that the spool does not move when the handle is released from either side of neutral, a detent groove clearly indicates neutral position.
- **Spring center** (**S**) returns the handle to neutral when the handle is released.
- **Two-position detent** (**2D**) P to B only.
- **Two-position detent** (**D2**) P to A only.
- **Spring center detent** (**SD**) springs back to neutral from one position and is mechanically detented in the other position (flow out port A in detent).
- **Detent spring center** (**DS**) springs back to neutral from one position and is mechanically detented in the other position (flow out port B in detent).
- **Rotary friction detent** (**E**) applies friction to the spool as it is rotated so that the spool does not rotate when the handle is released either side of neutral, a detent groove clearly indicates neutral position.
- **High lift ball spring relief** (**B**) provides relief for DC only.
- **Vent port** (**C**) allows relief to unload (DCF only).
- **Top port** (**TP**) allows the customer to plumb the inlet, outlet on the same surface as the work ports (DC only).

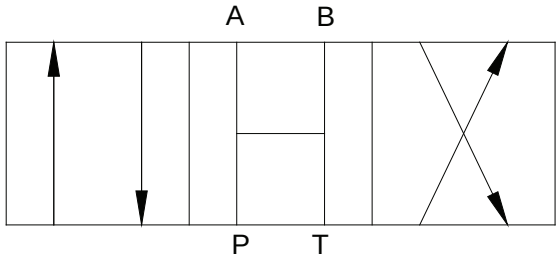
DC Series

4-Way Directional Control Valve
With Or Without Flow Control

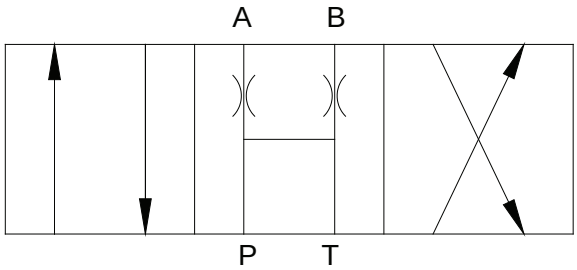
SPOOL SCHEMATICS:



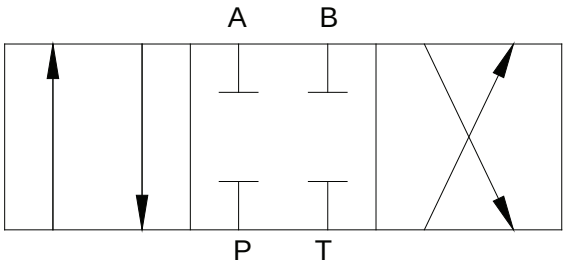
Tandem Center (T) - Powers cylinder or motor in both directions (metering capability is very limited). Pump unloads to tank when spool is in neutral. Cylinder or motor blocked when spool in neutral. This spool is not designed for DCF valve.



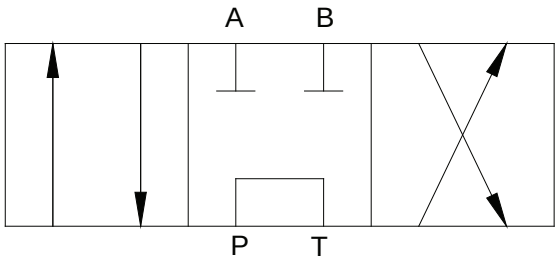
Open Center (O) - All of the ports are connected to tank when the spool is in neutral. Allows cylinder to move or motor to rotate when spool is in neutral. This spool is not designed for DCF valve.



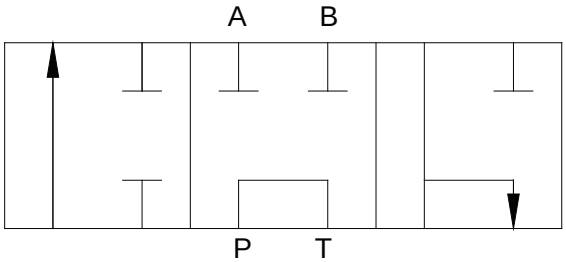
Fine Metering Spool (M) - The pressure drop in neutral is higher then the (TM) spool. Requires external locking valves to hold cylinder, because ports A and B are open (orificed) in neutral position. Extremely fine metering control. This spool is designed for the DCF valve and acts as closed center in DC valve.



Closed Center (C) - All ports are blocked in neutral. Blocks cylinder or motor in neutral. Required for use with pressure compensated pump. This is not available for DCF valve.



Tandem Metering Spool (TM) - Similar to (T) spool except much finer metering control. The pressure drop in neutral is lower then the (M) spool. Cylinder or motor blocked in neutral and pump unloads to tank. This spool is designed for DCF valve.



Tandem Three Way (T3) - Powers the cylinder in one direction. Pump unloads to tank when spool is in neutral, or when spool is being reversed. Cylinder is blocked when spool is in neutral. Port "B" is plugged. This spool is designed for the DCF valve.

DC Series – CREATING A MODEL CODE FOR DC'S:

4

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

SERIES:
DC – 4-way directional control valve
DCF – 4-way directional control valve with flow control

PORT SIZE:
75 – 3/4" inlet/outlet and work ports
16 - #16SAE inlet/outlet and work ports

SPOOL TYPE:
T3 – Tandem center 3-way (DC only) (Omit 4)
C – Closed center (DC only)
T – Tandem center (DC only)
O – Open center (DC only)
M – Fine metering
TM – Tandem metering

FLOW SETTING:
Omit – When using T, C, and O spool
15 – 0-15 gpm (0-57 lpm) M and TM only
30 – 0-30 gpm (0-113 lpm) M and TM only
45 – 0-45 gpm (0-170 lpm) M and TM only

SPOOL ACTION:
S – Spring center
D – Three-position detent
F1 –Ball friction detent
B – High lift ball spring relief for DC (TS-B)
R – Pilot relief (Std. on DCF)
V – Vent port on relief (DCF only)
TP –Top ported (DC only)
2D– Two-position detent (P to B only)
D2 –Two position detent (P to A only)
E– Rotary ball friction detent
SD – Spring center/Detent (P to A)
DS – Detent (P to B)/Spring center

HANDLE OPTION:
L – Lever handle (B port is active when handle is pushed)
P – Pilot operated (500 psi (34.5 bar) max. pilot pressure)
N – No actuator (L type spool)
H – Rotary handle (Used in conjunction with rotary ball friction detent (E))

DC SERIES – EXAMPLES OF COMMON MODEL CODES:

DC16T4LBS.....Four-way directional valve, #16 SAE port size, tandem center 4-way spool, L style actuator, high lift ball spring relief and spring center.

DC75O4LBD.....4-way directional valve, 3/4" NPT port size, open center 4-way spool, L style actuator, high lift ball spring relief and three-position detent.

DCF16TM304LF1.....4-way directional flow control, #16 SAE port size, tandem metering spool, 0-30 gpm (0-113 lpm) metering capability, 4-way, L style actuator and friction detent.

DCF75M154LS.....4-way directional flow control, 3/4" NPT port size, fine metering spool, 0-15 gpm (0-57 lpm) metering capability, 4-way, L style actuator and spring center.

DC Series

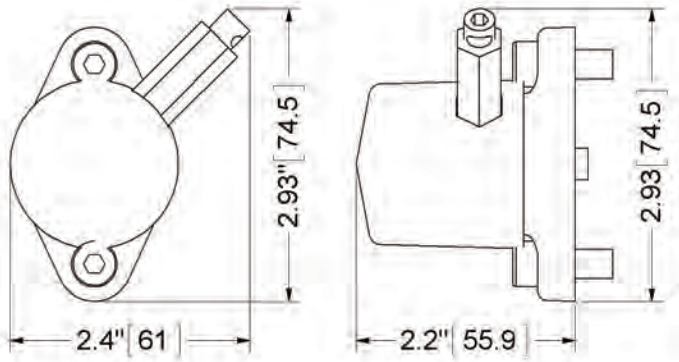
4-Way Directional Control Valve
With Or Without Flow Control

DC Series – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

DC-D.....Three-position detent kit for DC and DCF.

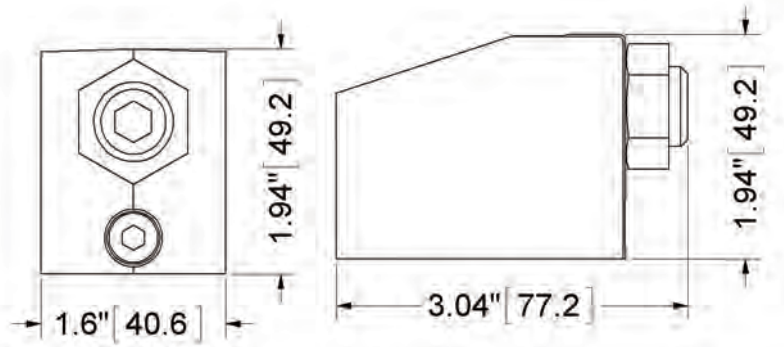
DC-D2.....Two-position detent kit for DC and DCF. (Neutral & P to A)

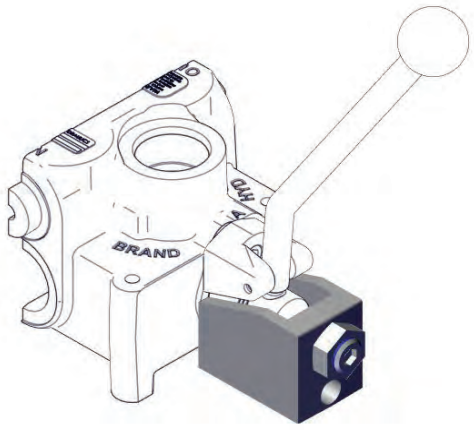
DCF-F1.....Neutral position friction detent for DC and DCF.



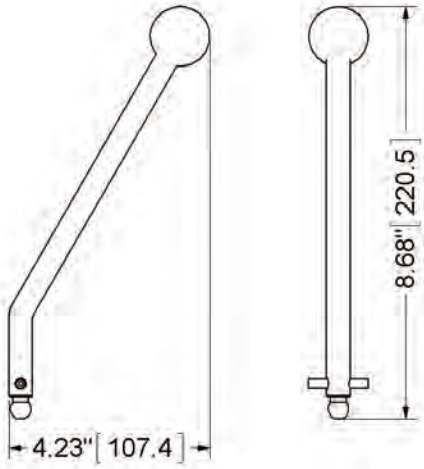
External dimensions are the same for all kits listed above.

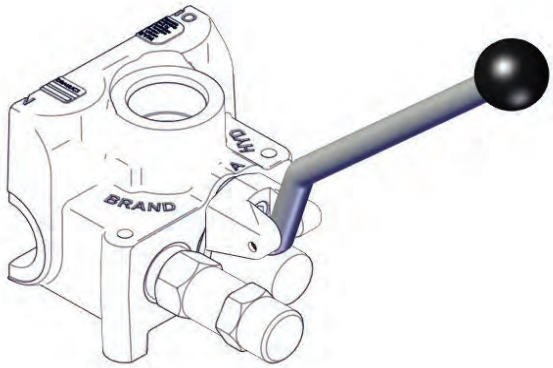
DC-AH.....Spool stop for front of valve.





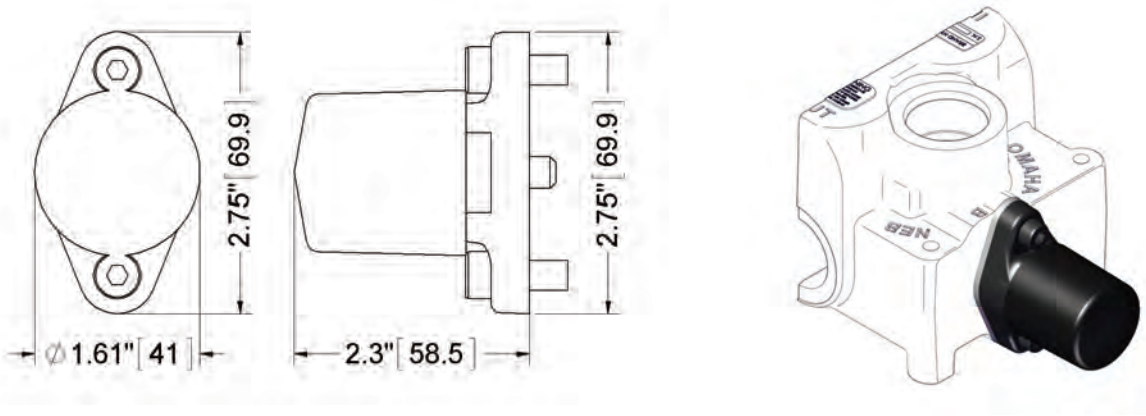
DC-HL.....Handle kit for DC and DCF.



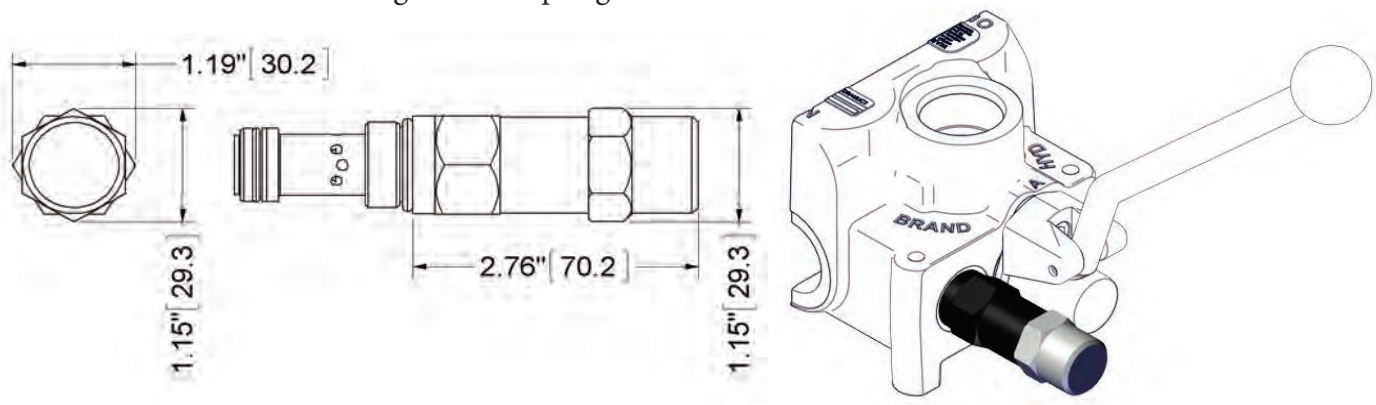


DC Series – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

DC-S.....Spring centering kit for DC and DCF.



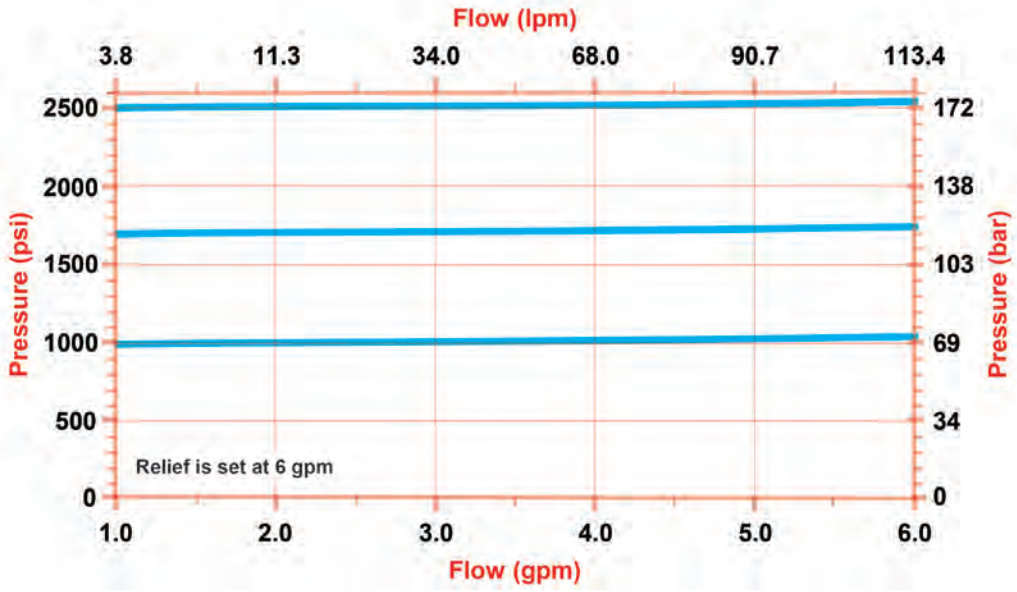
TS-B.....High lift ball spring relief for DC.



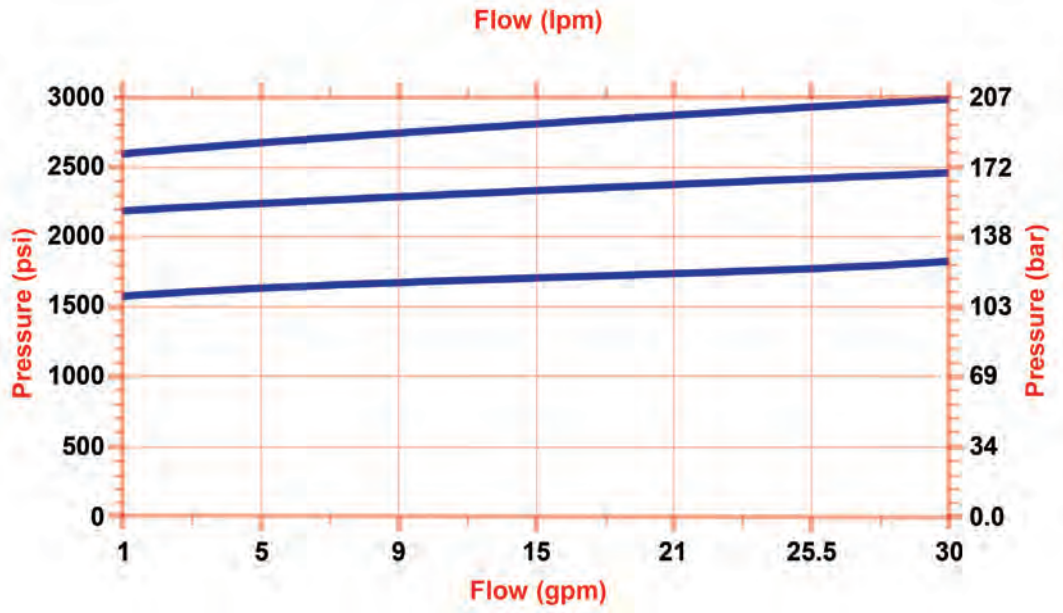
DC-K.....Seal kit for DC.
DC-KU.....Seal kit for DC with urethane polypac seal.
DCF-K.....Seal kit for DCF.
DCP-K.....Seal kit for pilot operated DC.
DCF-CART-N.....Pilot operated pressure relief valve for DCF.
DC7588BL-K.....Relief cavity plug for DCF.
TS-B-K.....Seal kit for TS-B cartridge relief.

DC Series – FLOW AND PRESSURE INFO:

Pressure VS. Flow for Pilot Relief (DCF)

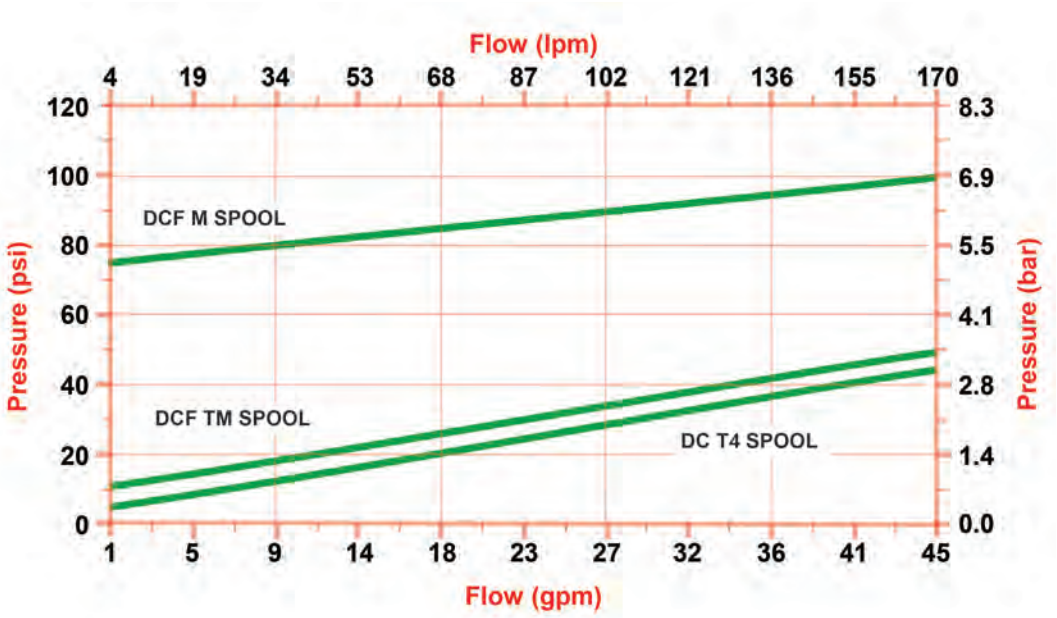


Pressure VS. Flow for B Relief (DC)



DC Series – FLOW AND PRESSURE INFO:

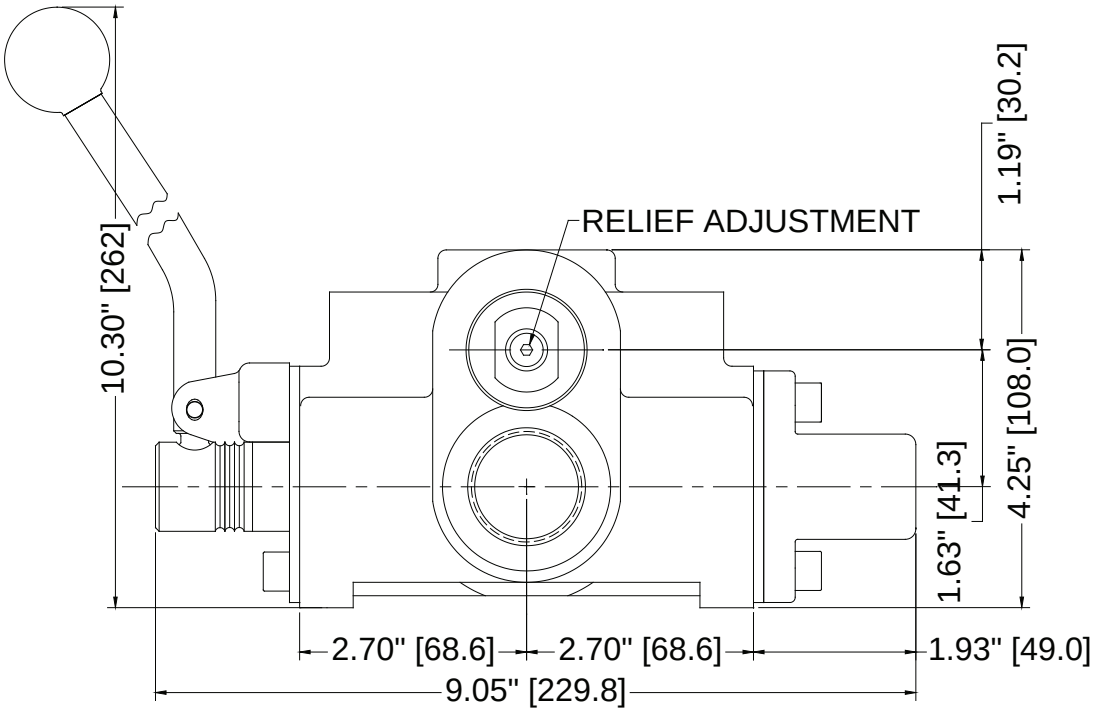
Neutral Flow Pressure Drop

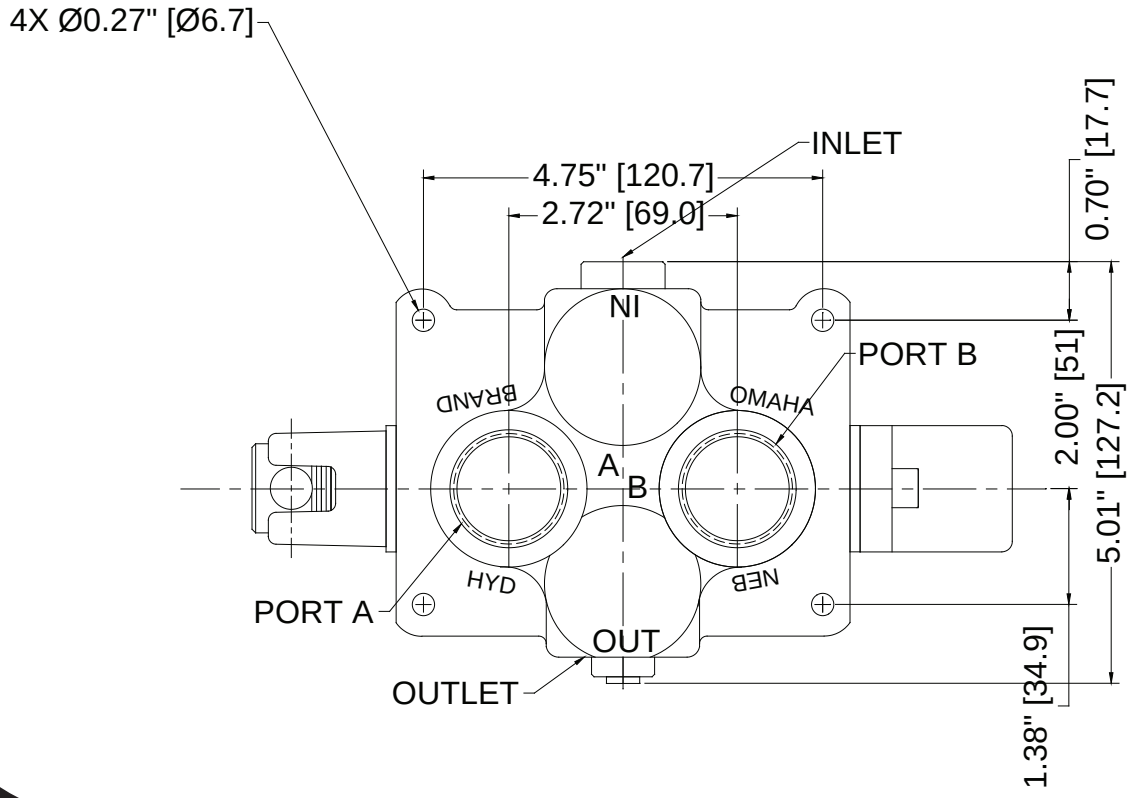


DC Series

4-Way Directional Control Valve
With Or Without Flow Control

DIMENSIONAL DATA (DCF16TM454LS SHOWN): inches & [millimeters]





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Engineering & Manufacturing Solutions

MDC Series

Marine Grade
4-Way Directional Control Valve
With Or Without Flow Control

Specifications:

- MDC rated for 0-40 gpm (0-151 lpm)
- MDCF rated for 0-30 gpm (0-114 lpm)
- Rate for 3000 PSI (207 bar)
- Port Sizes #16 SAE (1-5/16-12) all ports
- Weighs 16 lbs. (7.3 kg)
- 20 – Micron filtration recommended

MDCF16TH304H

MDC16TH404HB

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Certificate #02.002.1

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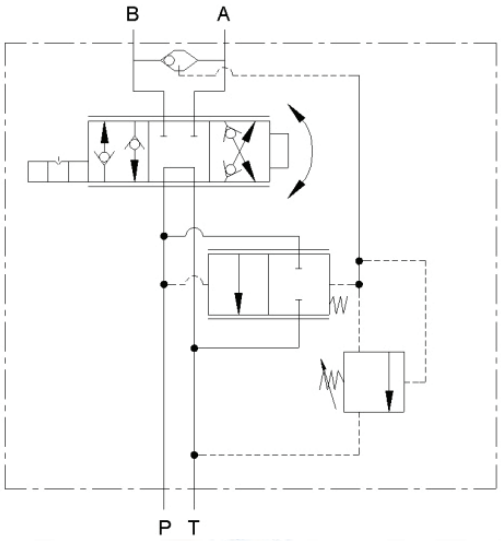
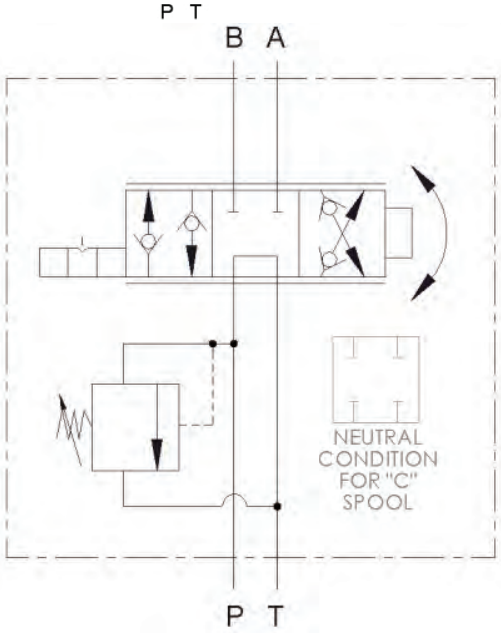
MDC Series

Marine Grade / 4-Way Directional Control Valve With Or Without Flow Control





MDCF16TH304H

MDC16TH404HB

MATERIALS:

- Cast Iron Body and End-Caps
- Buna N O'Rings
- 416 Stainless Steel Heat-Treated Spool Components and Handle Adapter
- 316 Stainless steel Handle
- Amerlock® 2 epoxy paint (2 coats)

FEATURES:

- PRECISION GROUND STAINLESS STEEL SPOOL to assure long life (MDC & MDCF valves).
- SEALED ENDCAPS protects internal components from corrosive environments.
- BUILT-IN SPOOL DROP-CHECKS prevents loads from dropping through the transient position.
- O'RING PORTS STANDARD to eliminate leakage.
- PAINTED after assembly to seal completed valve to minimize corrosion on exposed non stainless-steel components (salt spray tested per ASTM B-117).
- PILOT OPERATED RELIEF VALVE is standard on MDCF valves.
- FULL RANGE PRESSURE COMPENSATED by-pass type flow control valve (MDCF ONLY).
- MDCF REDUCES the number of fittings, plumbing and potential leaks in hydraulic circuits.
- FINE POSITIVE METERING in either direction with the manual handle (MDCF valve).

MDC & MDCF SERIES – GENERAL INFORMATION:

The Brand MDCF directional flow control valve combines the features of a four-way directional control valve, load-checks, a full range pressure compensated by-pass type flow control valve, and a pilot operated pressure relief valve all in one compact package. This valve reduces the number of fittings, plumbing and potential leakage points in hydraulic circuits. The manual rotary handle provides fine metering to either port. Flow to the work port is directly proportional to the movement of the lever. Flow out of each work port is constant regardless of load changes which allows the customer to maintain smooth and constant movement of a cylinder or motor. Every MDCF comes standard with a pilot operated relief. The tank port must be plumbed directly back to tank.

The Brand MDC directional control valve does not have the flow control feature of the MDCF. The MDC can be used in series but the spool is difficult to shift when there is tank pressure. The MDC offers an optional high lift ball spring relief. The manual rotary handle provides metering to either port.

SPOOL TYPE –

Two spool types are available: closed center 4-way (DC only) and tandem metering 4-way (**TM**).

HANDLE OPTIONS –

Rotary handle (**H**) is used to rotate spool in or out of valve body. Rotate clockwise to open P-A and B-T, and counter clockwise to open P-B and A-T (Note: "**A**" port is closest to the handle). The adjustable handle allows the center neutral position to be adjusted in 30 degree increments.

SPOOL ATTACHMENTS –

Rotary friction detent (**E**) applies friction to the spool as it is rotated so that the spool does not rotate when the handle is released either side of neutral, a detent groove clearly indicates neutral position.

MDC SERIES – MODEL CODES AVAILABLE:

MDC16TM404H.....Four-way directional valve, #16 SAE port size, 40gpm (0-151 lpm), tandem metering spool, rotary actuator, and work-port load checks.

MDC16TM404HB.....Four-way directional valve, #16 SAE port size, 40gpm (0-151 lpm), tandem metering spool, rotary actuator, 1500psi high lift ball spring relief and work-port load checks.

MDC16C404H.....Four-way directional valve, #16 SAE port size, 40gpm (0-151 lpm), closed center spool, rotary actuator, and work-port load checks.

MDCF SERIES – MODEL CODES AVAILABLE:

MDCF16TM304H.....Four-way directional flow control, #16 SAE port size, tandem metering spool, 0-30 gpm (0-113 lpm) metering capability, four-way, rotary actuator, 1500 psi adjustable relief.

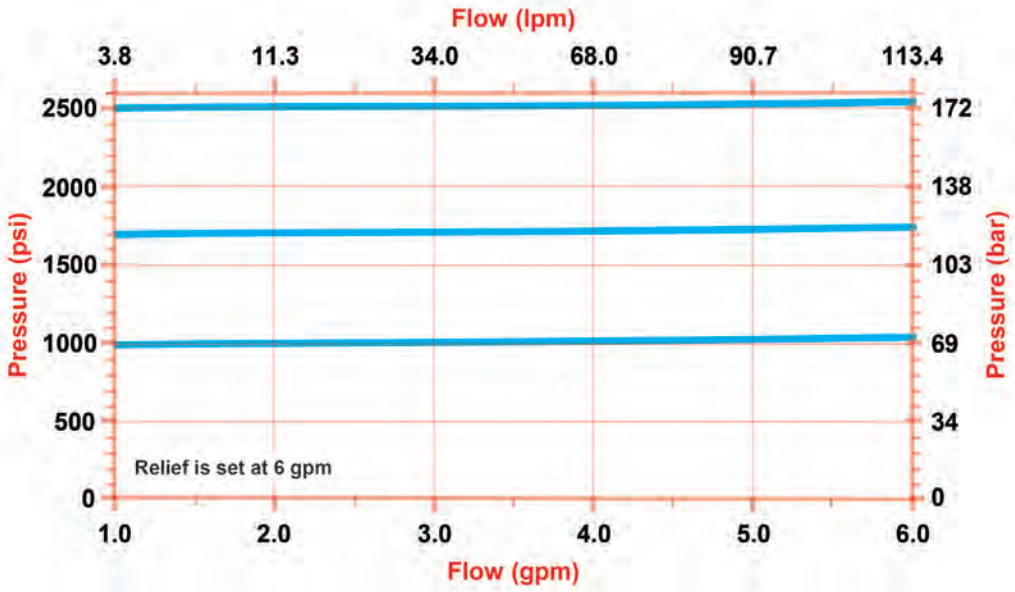
MDC & MDCF SERIES – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

DC-K……..…. Seal kit for MDC.
DC-KU……..Seal kit for MDC with urethane polypac seal.
DCF-K…….. Seal kit for MDCF.
DCF-KU…….. Seal kit for MDCF w/ Urethane POLYPAC Seal.
DCF-CART-N……..….Pilot operated pressure relief valve for MDCF.
TS-B……..High lift ball spring relief for MDC.
MDC-HA……..Handle kit for MDC & MDCF.
MDC-R…….Rotary friction detent kit for MDC & MDCF.

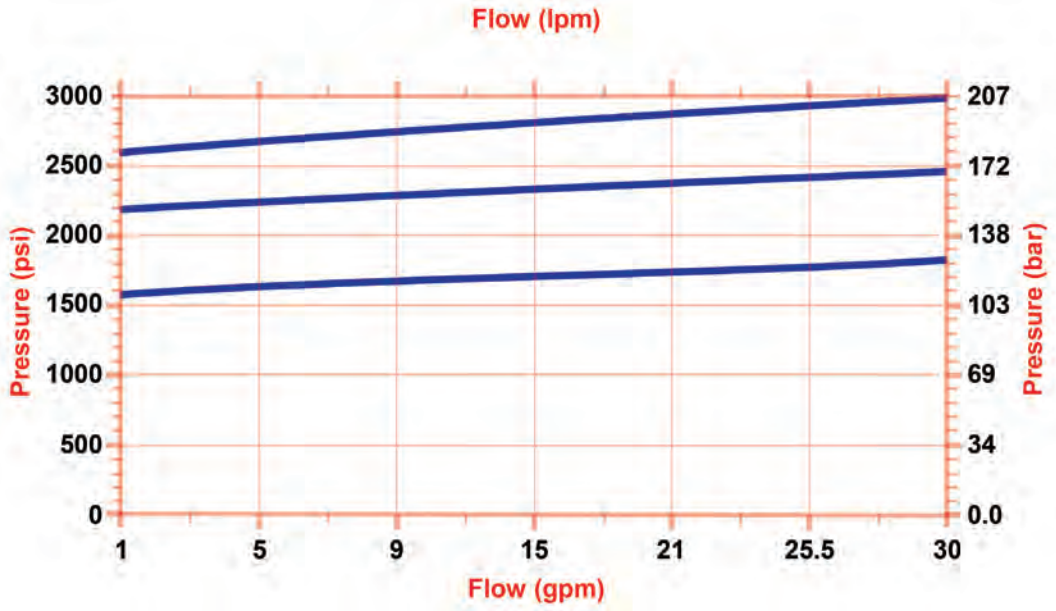
NOTE: Corrosion may occur in corrosive environments if the paint seal is broken while servicing the valve. Consider cleaning and repainting the affected areas to reduce further corrosion.

DC SERIES – FLOW AND PRESSURE INFO:

Pressure VS. Flow for Pilot Relief (MDCF)

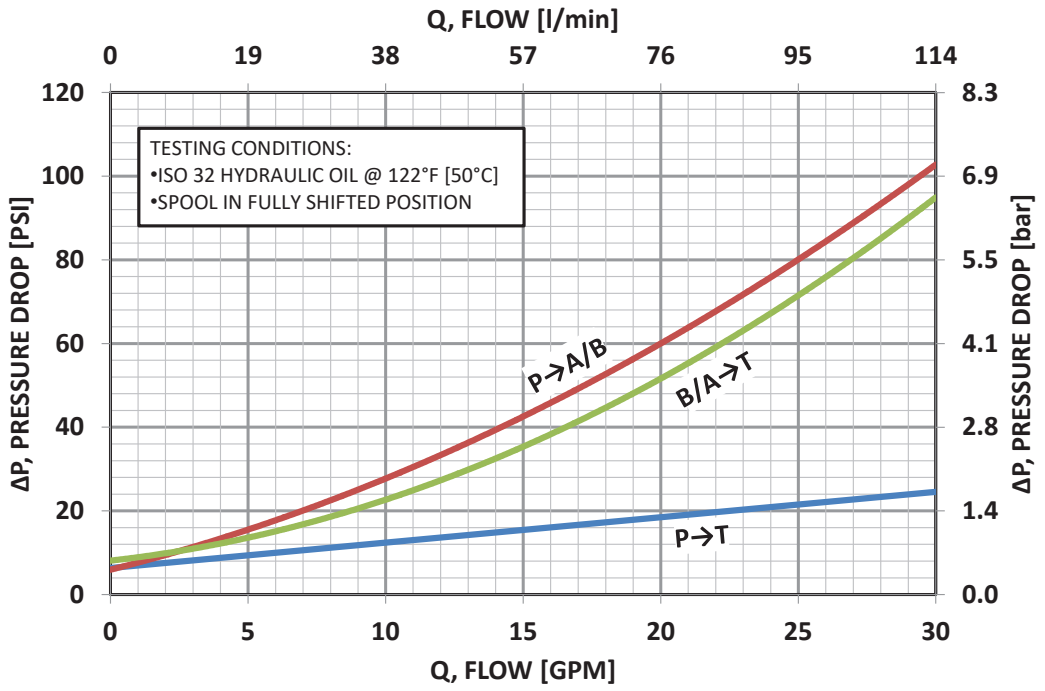


Pressure VS. Flow for B Relief (MDC)

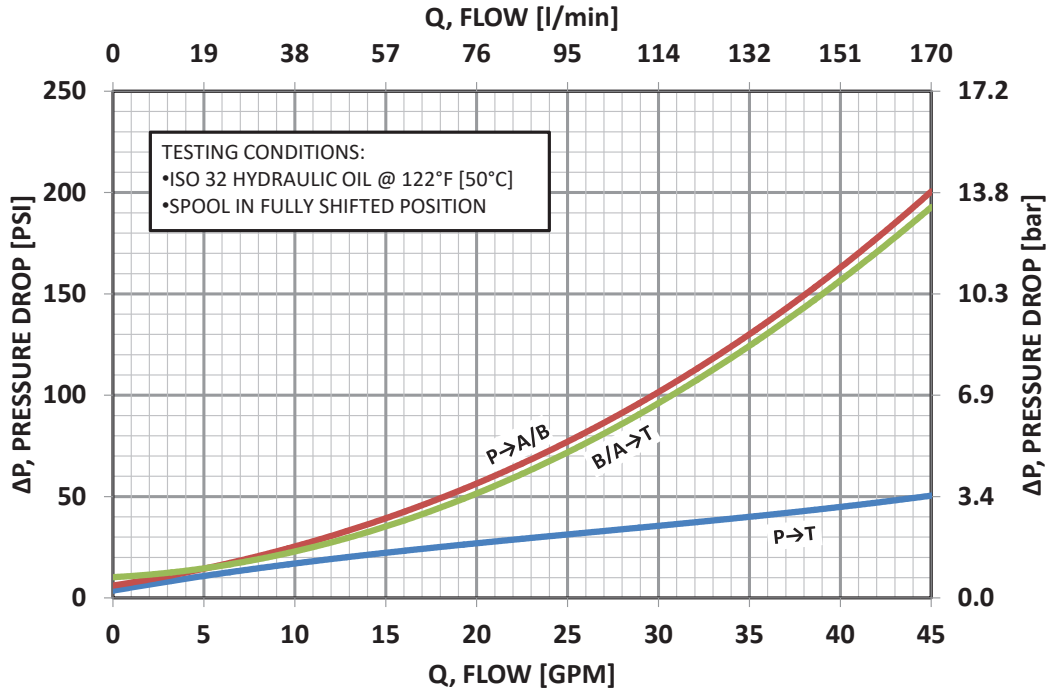


DC SERIES – FLOW AND PRESSURE INFO:

MDCF Flow VS. Pressure Drop

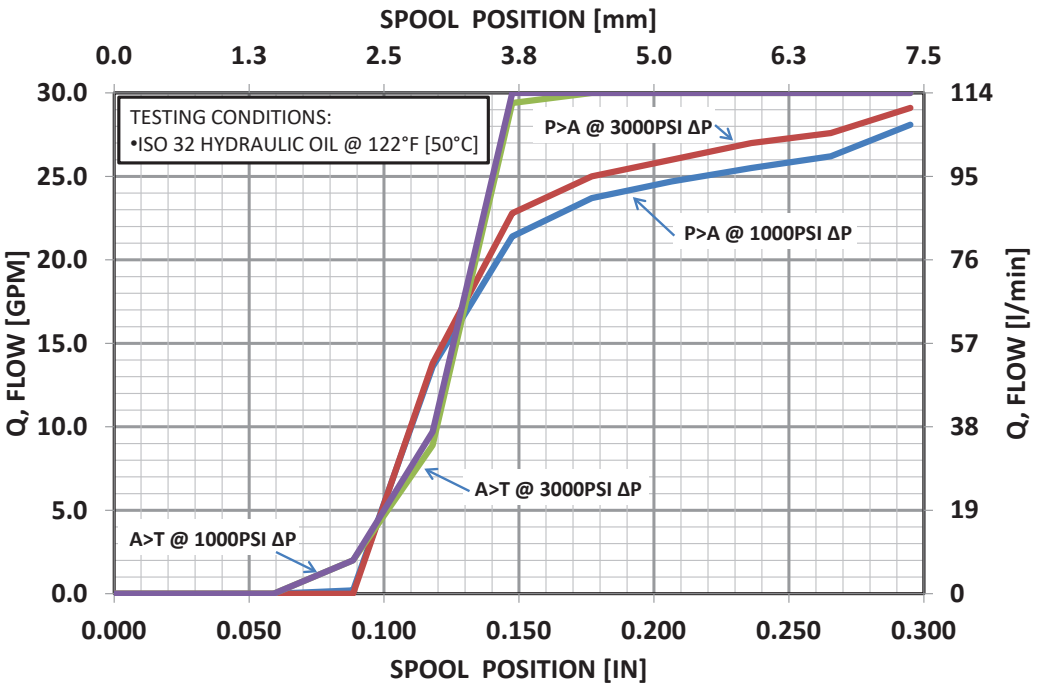


MDC Flow VS. Pressure Drop

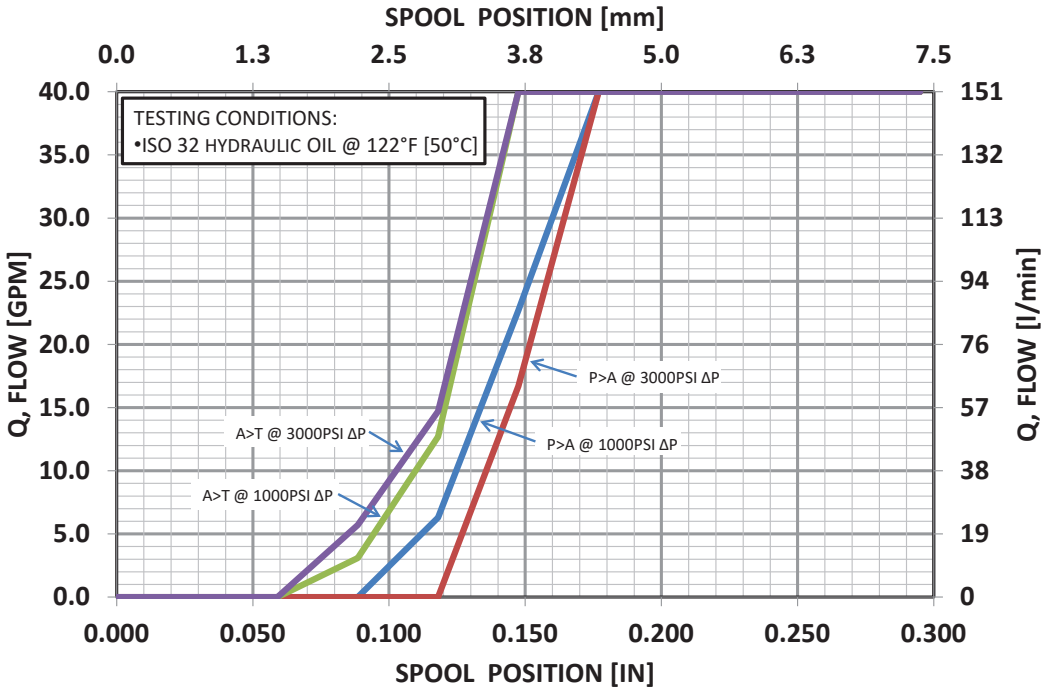


DC SERIES – FLOW AND PRESSURE INFO:

MDCF Spool Position VS. Flow



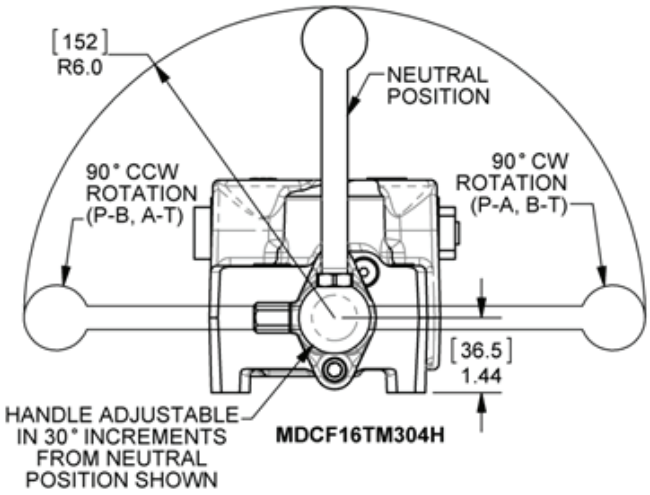
MDC Spool Position VS. Flow



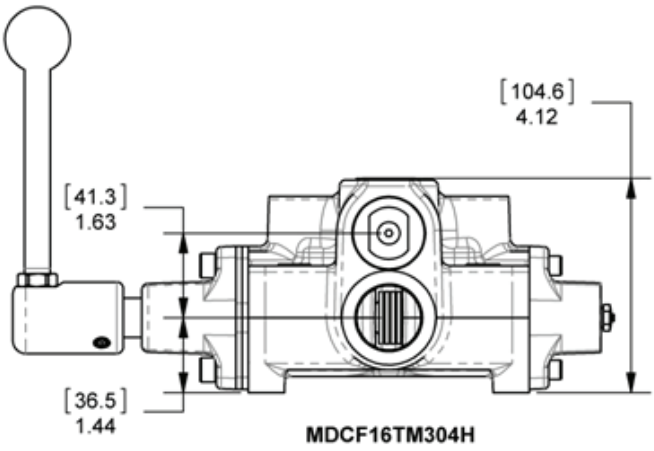
MDC Series

Marine Grade / 4-Way Directional Control Valve
With Or Without Flow Control

DIMENSIONAL DATA: inches & [millimeters]



MDCF16TM304H



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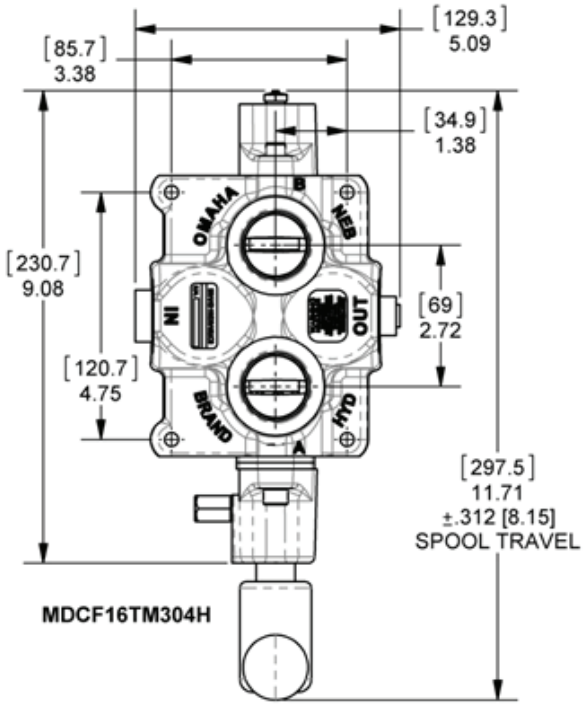
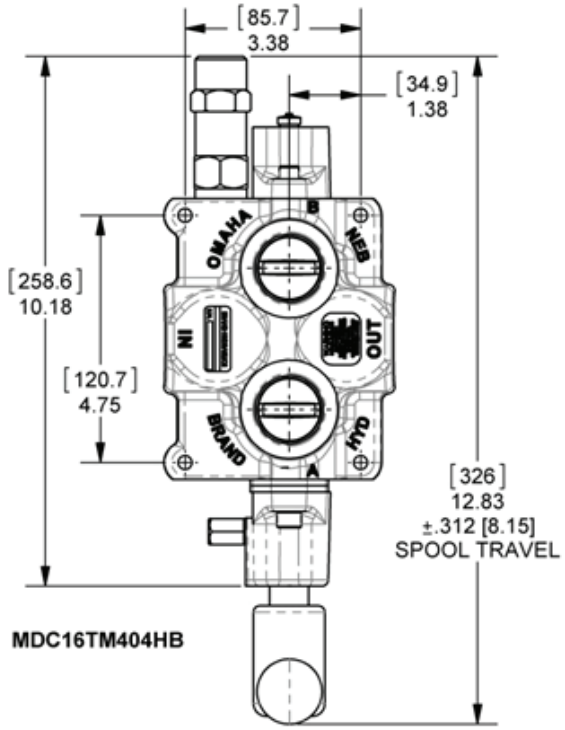


MDCF16TM304H



MDC16TM404HB

BRAND HYDRAULICS Co.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

LV

Loader Directional Control Valve

Specifications:

- 10 gpm (38 lpm) Nominal Capacity
- Rated up to 4000 psi (275 bar)
- Port Sizes:
  - Inlet/Outlet #8 SAE
  - Work Ports #6 or #8 SAE
- Weighs 10.9 lbs. (4.9 kg)
- 25 – Micron Filtration Recommended

PLV22RFSTKAB

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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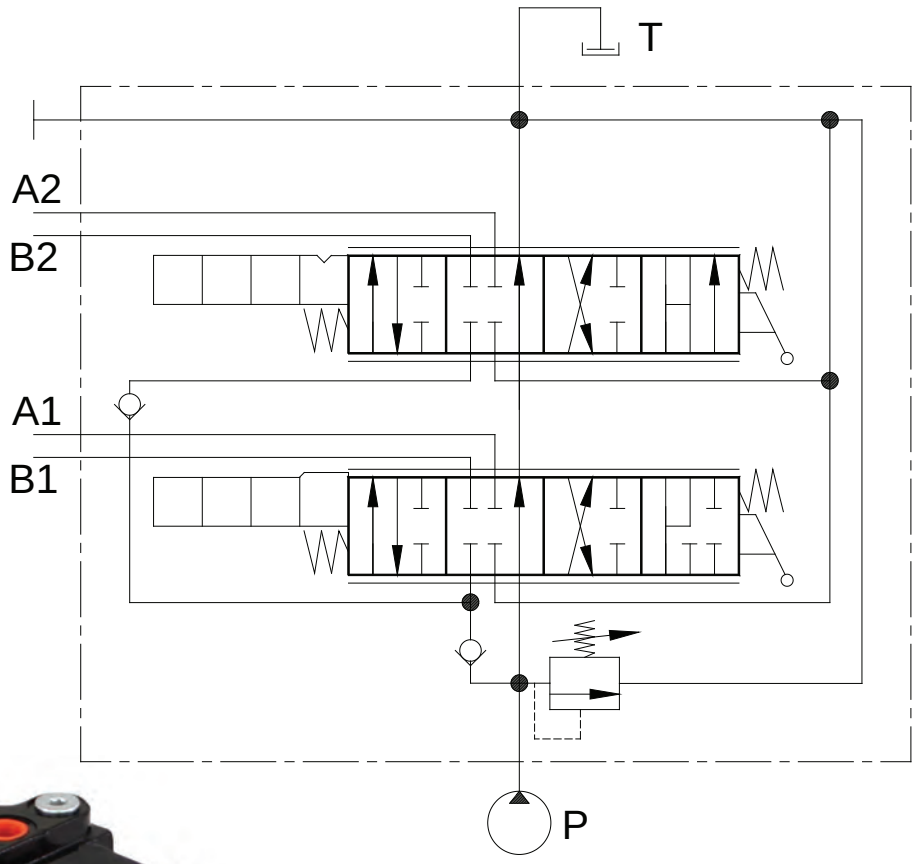
LV Loader Directional Control Valve

LV22RFSTKLB



PLV22RFSTKAB

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- IOSSO Plated Steel Spools
- Black Nylon Ball Knob

FEATURES:

- O'RING PORTS to eliminate leakage.
- FOURTH POSITION REGEN allows cylinder to rapidly extend.
- POWER BEYOND CAPABILITY to fit your multi valve circuits.
- PRECISION GROUND IOSSO PLATED SPOOLS that assure long life.
- INDIVIDUAL DROP LOAD CHECKS prevent the load from dropping when the spool is shifted.
- FOURTH POSITION FLOAT allows spool movement to a fourth position and makes all ports common to each other (last spool only).

LV – GENERAL INFORMATION:

The Brand LV22, loader directional control valve, is a superbly designed two spool mono-block valve suitable for Front End Loaders. The LV22 offers two parallel, tandem center 4-way work sections available with two of the following spool actions: float, regenerative or spring-to-center. The valve is also field convertible to closed center or power beyond with the appropriate cartridge.

SPOOL TYPE – The Tandem center 4-way (**T**, in model code) powers a cylinder or a motor in both directions. Regen 4-way (**R**, in model code) acts just like a Tandem center spool in the standard three positions, but also has a fourth position that allows for rapid extension of a cylinder (uses **FS** spool action). For more information, see the Spool Schematics on next page.

HANDLE OPTIONS –

- **Standard joystick handle** (**A**, in model code) is used to actuate two adjacent spools with one handle.
- **Optional joystick handles** (**A1**, **A2** & **A3**, in model code) also actuate two adjacent spools with one handle, but have different actuation patterns (See joystick diagrams on further pages).
- **Enclosed lever handle** (**L**, in model code) pressurizes the "B" port when the handle is pushed towards the valve body and is convertible from the vertical to the horizontal position.
- **No actuator** (**N**, in model code) is used when it is necessary to connect the spool to an external actuator.

SPOOL ACTION –

- **Spring-to-center** (**S**, in model code) returns the handle to neutral when the handle is released.
- **Fourth position spring centering** (**FS**, in model code) is similar to spring-to-center except it has a fourth position that allows a cylinder to rapidly extend (must use Regen spool).
- **Fourth position float** (**K**, in model code) is similar to spring-to-center except it has a fourth position detent that makes all ports common to each other (used with tandem center spool only).

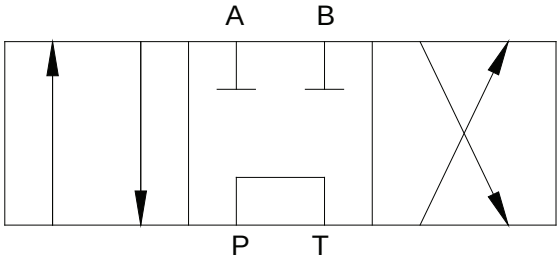
OPTIONS -

Power beyond (W, in model code) offers high pressure carryover for valves downstream. The LV22 valve is also field convertible to power beyond with the LV2-W power beyond cartridge kit. Closed center (C, in model code) blocks the neutral flow path and is required in pressure compensating, i.e. closed center systems. The LV22 valve is also field convertible to closed center with the LV2-C closed center cartridge kit. Adjustable relief (B, in model code) is factory preset at 2000psi, but is adjustable from 1200 to 3100 psi.

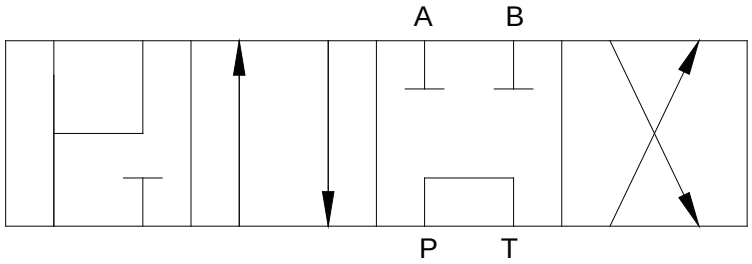
For additional pressure setting ranges:

- 500-1200 PSI use spring P/N "S065"
- 3100-4000 PSI use spring P/N "S064"

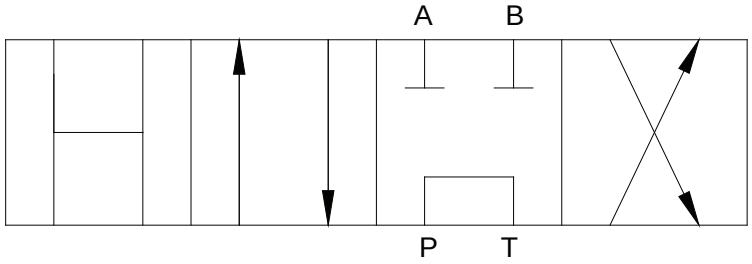
SPOOL SCHEMATICS:



Tandem Center (T) - Powers cylinder or motor in both directions. Pump unloads to tank when spool is in neutral. Cylinder or motor blocked when spool in neutral.



Regen (R) - Same as Tendem spool in standard three positions. Fourth position allows for rapid extension of cylinder.



Float (K) - Same as Tendem spool in standard three positions. Detented fourth position allows cylinder to move or motor to rotate when spool is detented.

LV – CREATING A MODEL CODE FOR LV'S:

LV 2

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

PORT SIZE:
1 – #6 SAE Work Ports & #8SAE Inlet/Outlet Ports
2 – #8 SAE All Ports

SPOOL TYPE:
R – Tandem center and fourth position regen (FS spool action only)
T – Tandem center 4-way

SPOOL ACTION:
S – Spring center
FS – Fourth position spring centering (Regen spool only)
K – Fourth position float (T spool only)

REPEAT SPOOL TYPE AND SPOOL ACTION FOR SECOND SPOOL:

OPTIONS:
W – Power beyond sleeve installed (#8 SAE Port)
C – Closed center plug installed
B – Adjustable relief
Omit – No relief, power beyond or Closed center

HANDLE OPTION:
L – Enclosed lever handle (B port is active when handle is pushed)
A – Standard joystick
A1 – Optional joystick 1
A2 – Optional joystick 2
A3 – Optional joystick 3
N – No actuator (L type spool)

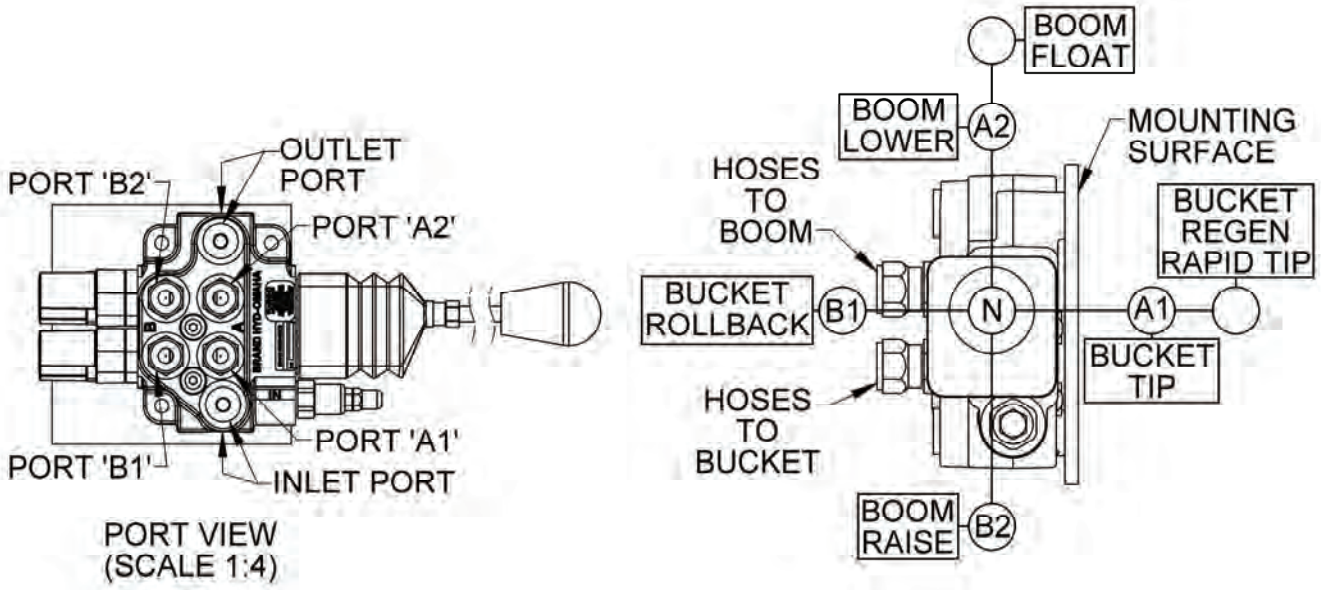
LV – EXAMPLES OF COMMON MODEL CODES:

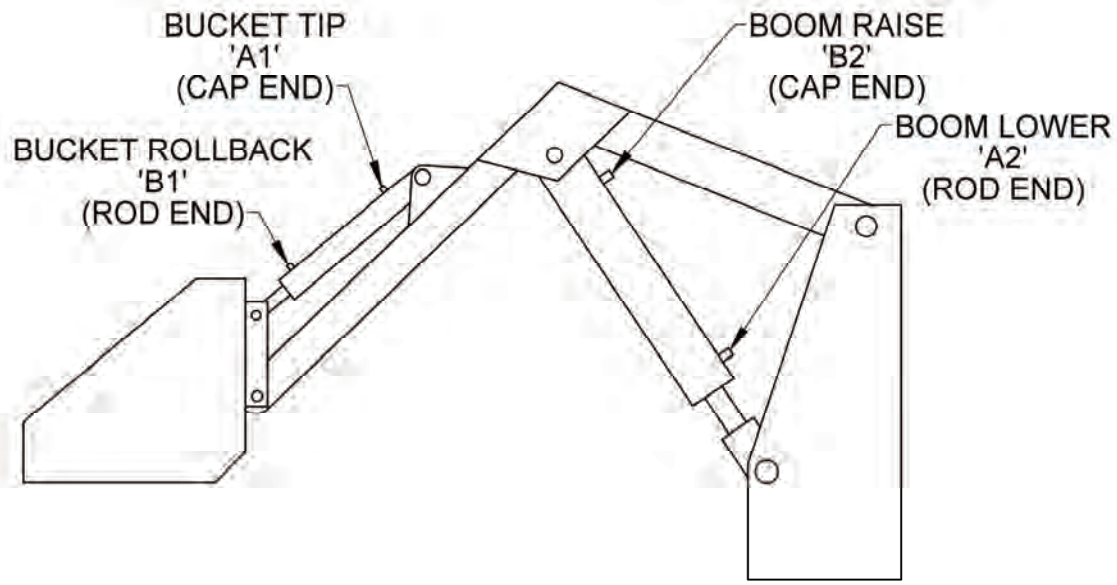
LV22RFSTKABW…… Two spool valve, tandem center fourth position regen spool (R), fourth position spring center (FS), tandem center (T), fourth position float (K), joy stick assembly (A), adjustable relief (B) 2000 psi (138 bar) setting and power beyond (W).

LV22TSTKLB…….. Two spool valve, tandem center (T), spring centering (S), tandem center (T), fourth position float (K), enclosed handle assembly (L) and adjustable relief (B) 2000 psi (138 bar) setting.

LV - JOYSTICK MOVEMENT SCHEMES:

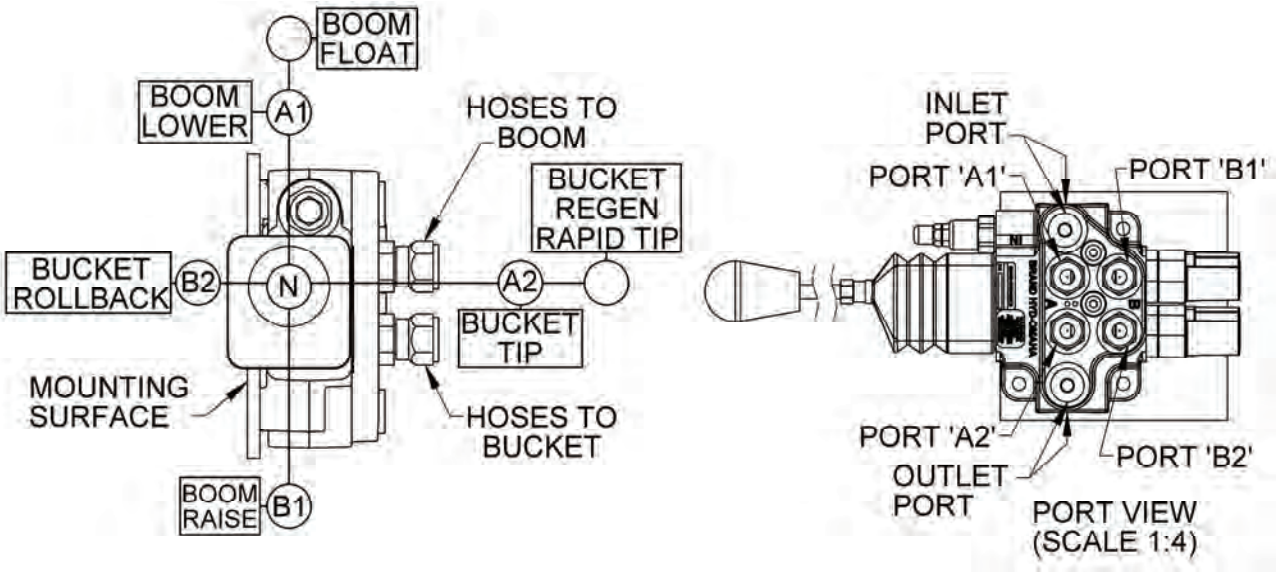
LV22**RFSTKA**B (SHOWN) & LV22**TSTKA**B

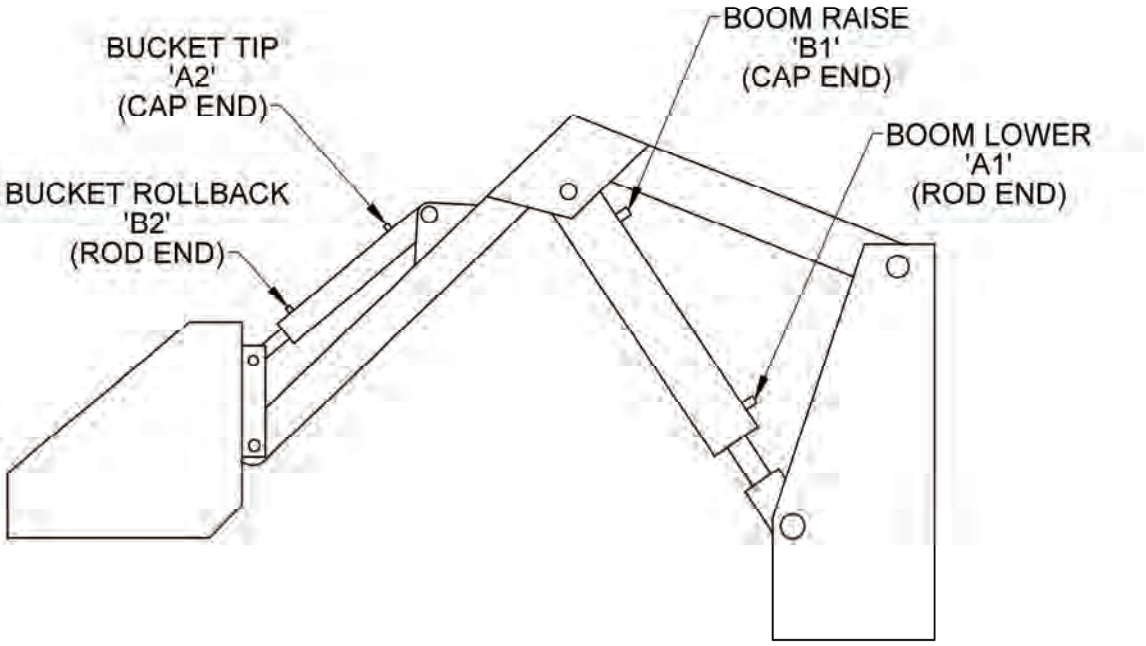




LV - JOYSTICK MOVEMENT SCHEMES: - Continued:

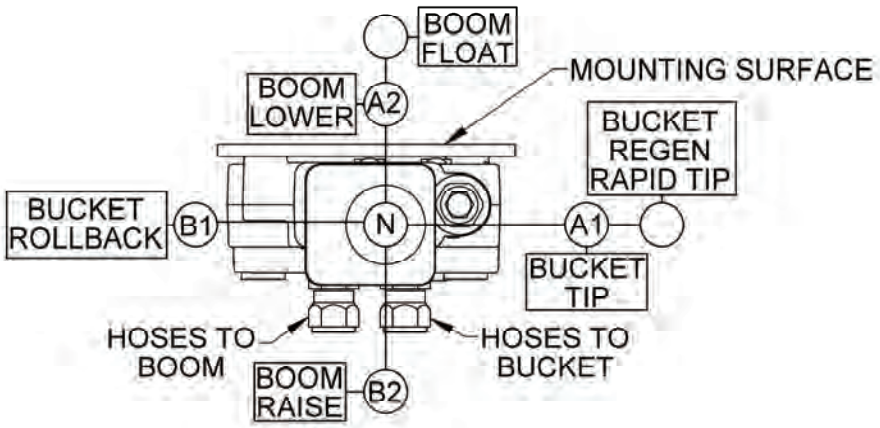
LV22**TKRFSA1**B (SHOWN) & LV22**TKTSA1**B

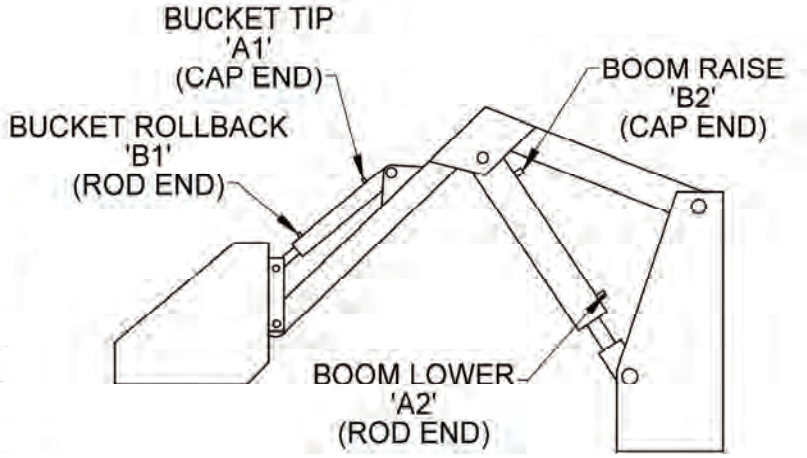


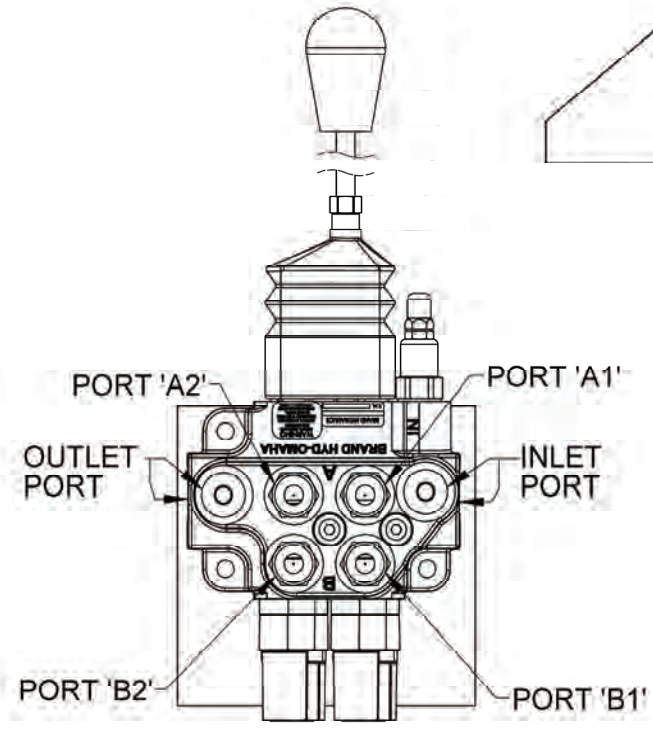


LV - JOYSTICK MOVEMENT SCHEMES: - Continued:

LV22**RFSTKA2**B (SHOWN) & LV22**TSTKA2**B

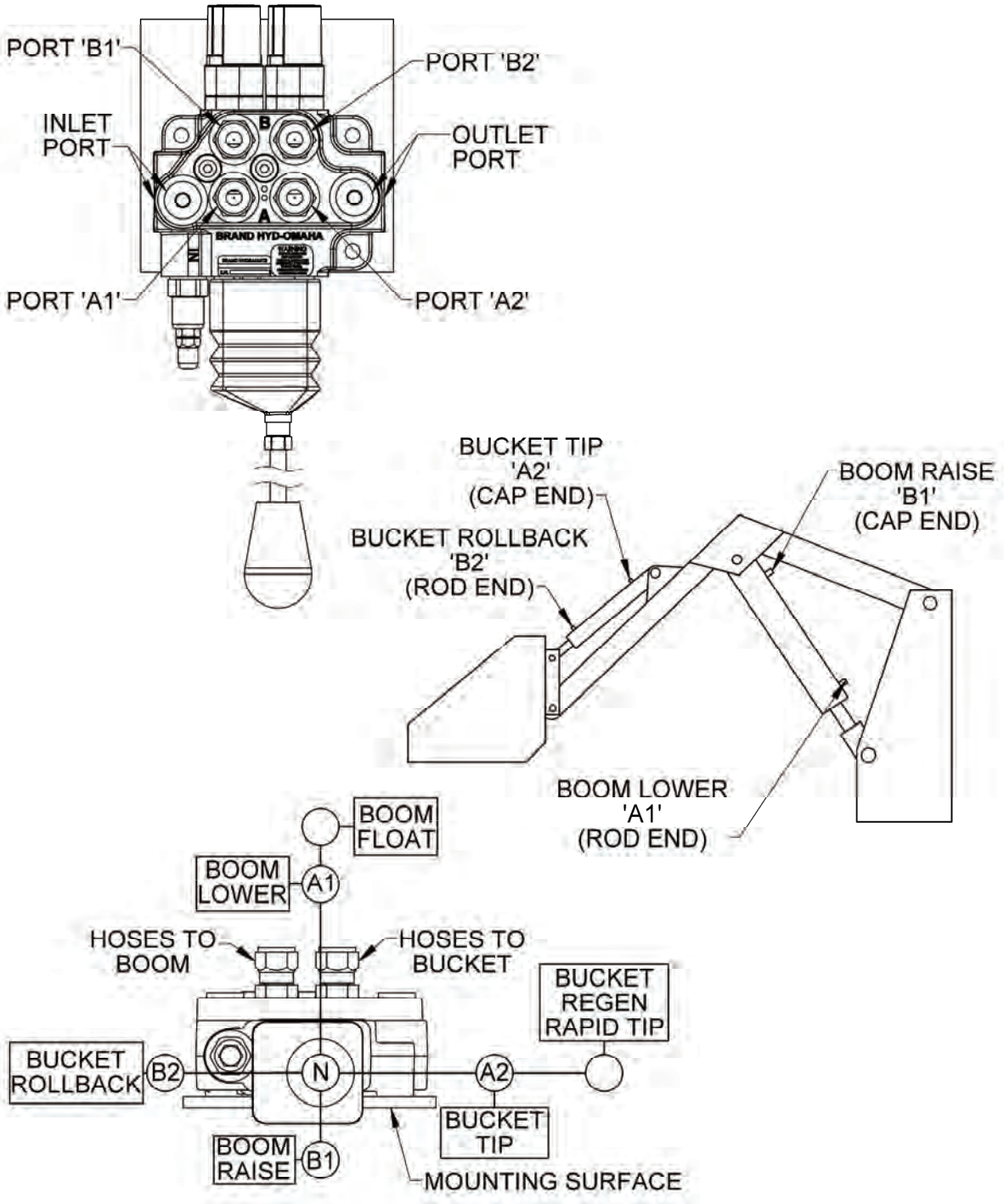






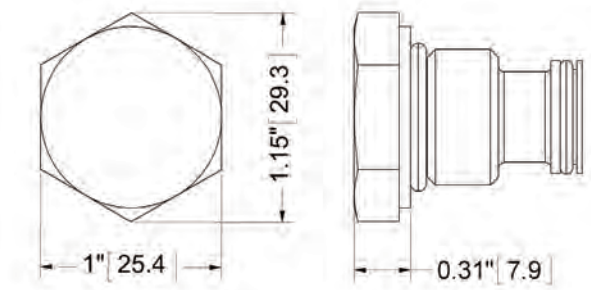
LV - JOYSTICK MOVEMENT SCHEMES: - Continued:

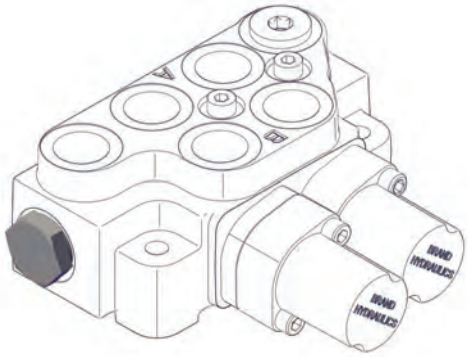
LV22**TKRFSA3**B (SHOWN) &LV22**TKTSA3**B



LV – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

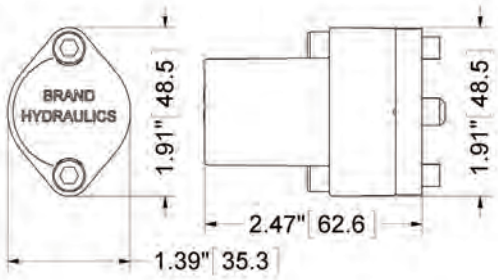
LV2-C.....Closed center cartridge kit.

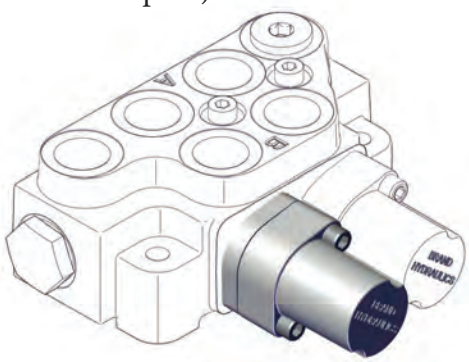




LV2-FS.....Fourth position spring centering (Use with Regen spool)

LV2-K..... Fourth position float (Use with Tandem spool).

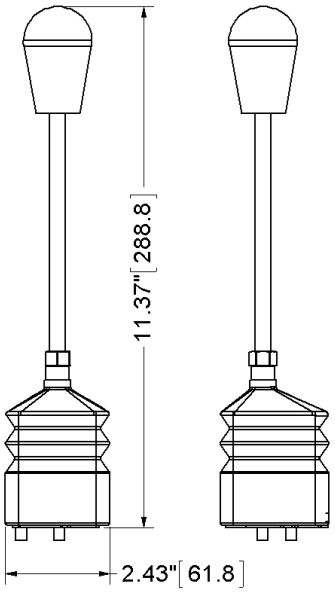


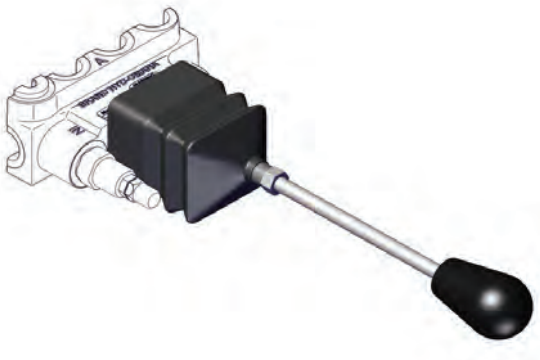


External dimensions are the same for all kits listed above.

LV2-HA.....A and A1-style joystick kit (Operates two spools simultaneously)

LV2-HA2.....A2 and A3-style joystick kit (Operates two spools simultaneously)

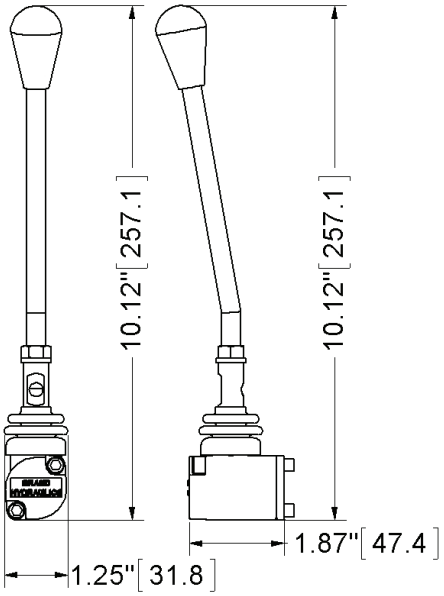




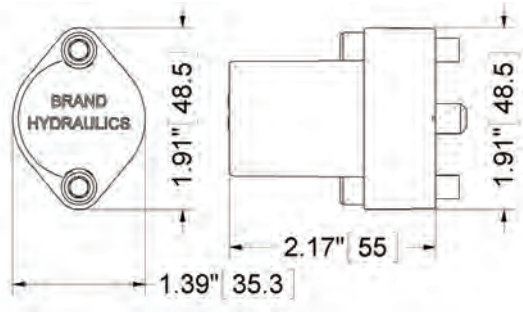
External dimensions are the same for all kits listed above.

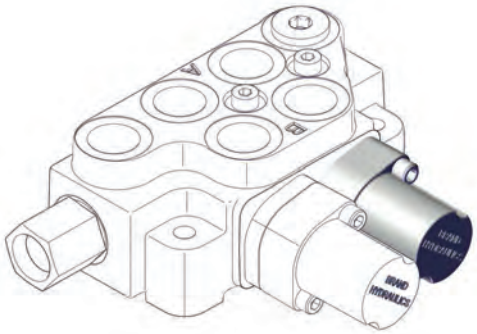
LV – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

LV2-HL.....L-style enclosed handle kit (Operates one spool only).

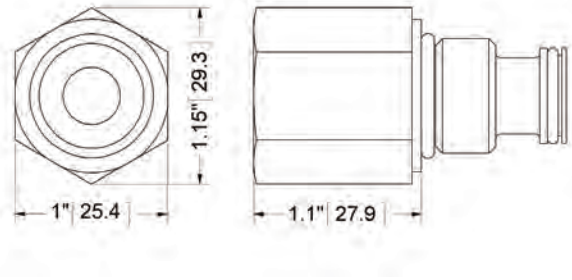


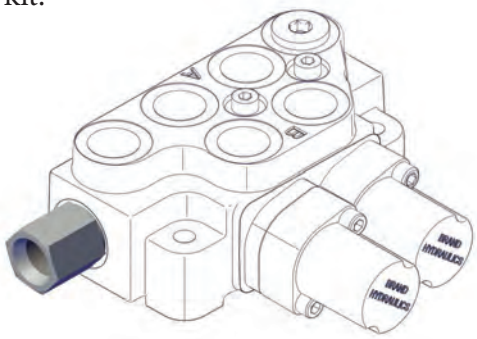
LV2-S.....Spring centering kit.





LV2-W.....Power beyond cartridge kit.



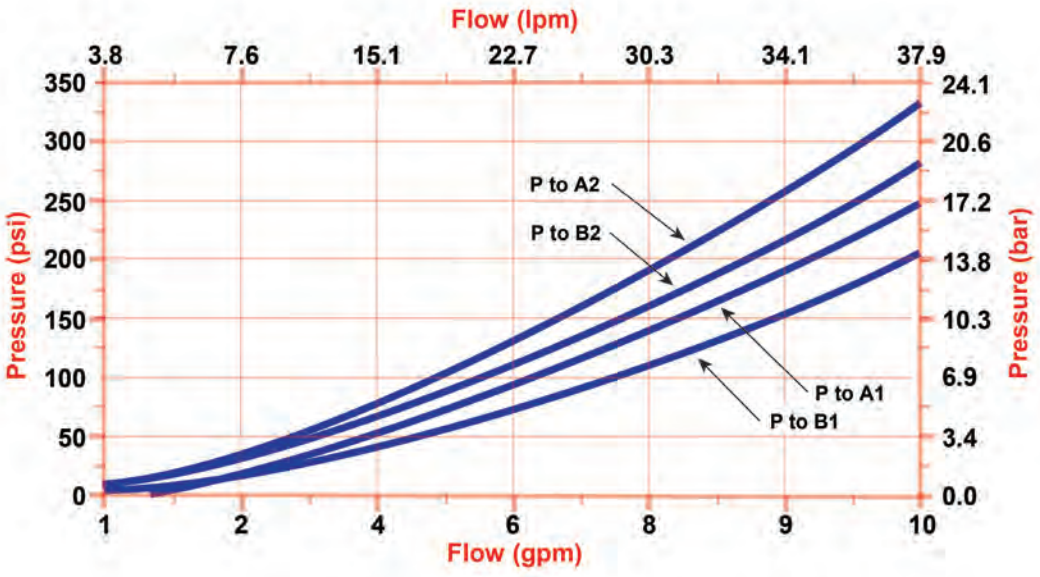


LV2-SK.....Seal kit for spool, relief, load checks and cartridge.

LV – FLOW AND PRESSURE INFO:

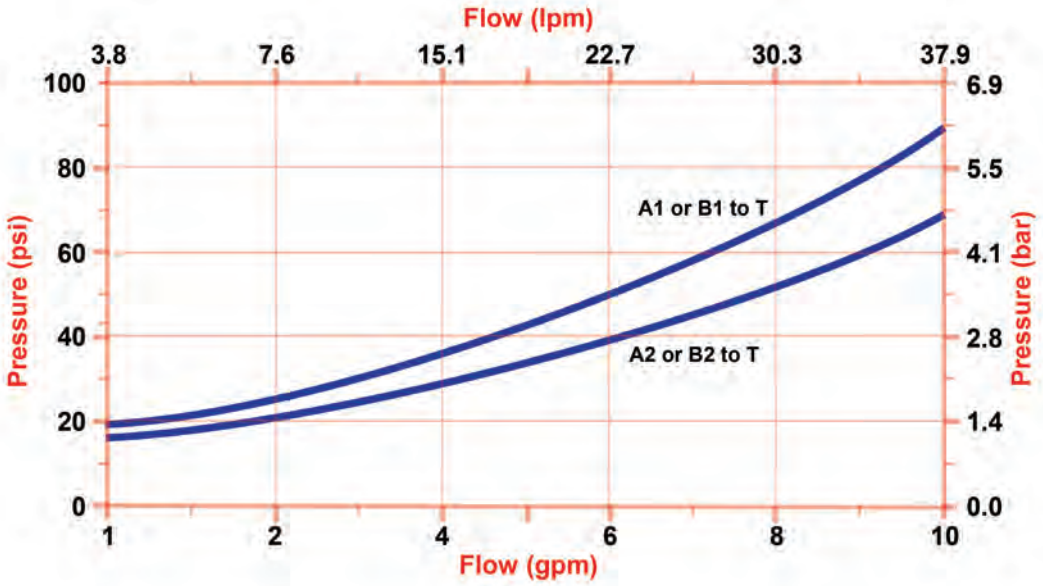
Neutral Flow And Pressure Drop

Pressure Drop VS. Flow for P to A or B

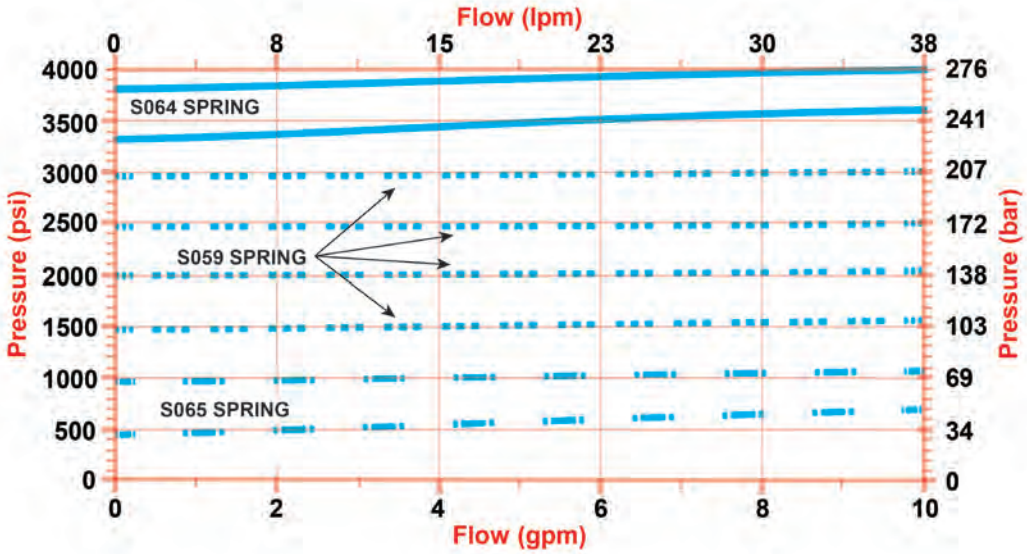


LV – FLOW AND PRESSURE INFO:

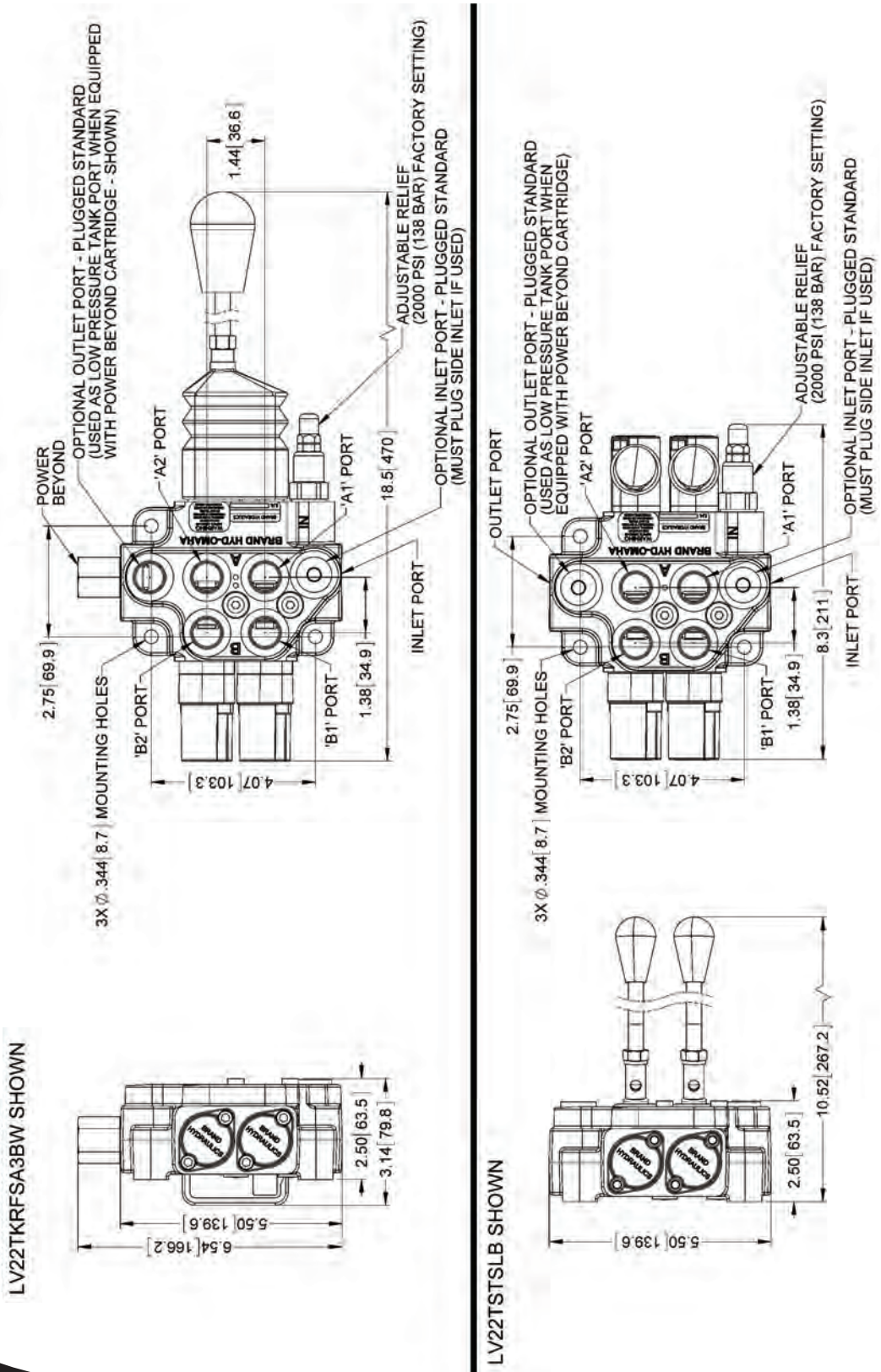
Pressure Drop VS. Flow for A to B-T

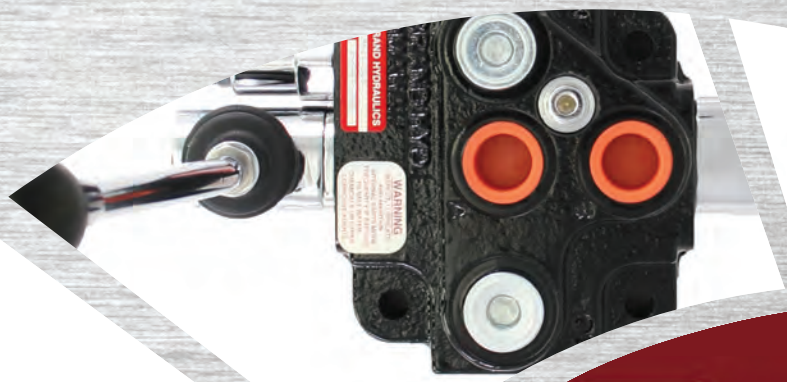


Pressure VS. Flow for LV Relief



DIMENSIONAL DATA: inches & [millimeters]





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Engineering & Manufacturing Solutions

MB

Monoblock Directional Control Valve

PMB22TSTSAB

PMB23TSTSTSLB

PMB21TDLB

Specifications:

- FLOW RATINGS:
  - MB21 & MB22 – 10 gpm (38 lpm)
  - MB23 – 8 gpm (30 lpm)
- Rated up to 4000 psi (275 bar).
- Port Sizes:
  - Inlet/Outlet #8 SAE.
  - Work Ports #8 SAE.
- 25 Micron Filtration Recommended.
- Weight
  - MB21 = 8.1 lbs (3.7 kg)
  - MB22 = 10.9 lbs. (4.9 kg)
  - MB23 = 14.2 lbs (6.4 kg)

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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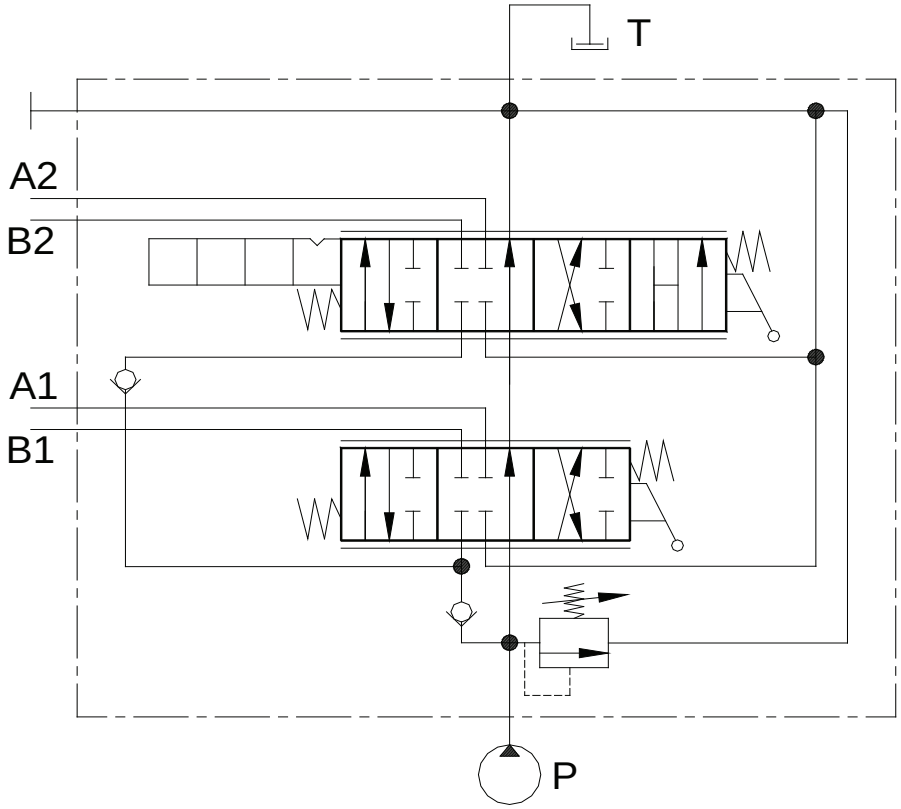
MB Monoblock Directional Control Valve

MB22TSTKLB



PMB21TDLB

PMB22TSTSAB

PMB23TSTSTSLB

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- IOSSO Plated Steel Spools
- Black Nylon Ball Knob

FEATURES:

- O'RING PORTS to eliminate leakage.
- POWER BEYOND CAPABILITY to fit your multi valve circuits.
- PRECISION GROUND IOSSO PLATED SPOOLS that assure long life.
- INDIVIDUAL DROP LOAD CHECKS prevent the load from dropping when the spool is shifted.
- FOURTH POSITION FLOAT allows spool movement to a fourth position and makes all ports common to each other

MB – GENERAL INFORMATION:

The Brand MB, monoblock directional control valve, is a superbly designed mono-block spool valve suitable for applications requiring one valve to perform up to three separate functions. The MB valve is available in one (MB21), two (MB22) or three (MB23) spool configurations. The valve is also field convertible to closed center or power beyond with the appropriate cartridge.

SPOOL TYPE –

Tandem center 4-way **T**, in model code) powers a cylinder or a motor in both directions. Open center 4-way (**O**, in model code) connects all ports to tank in neutral. Tandem center 3-way (**T3**, in model code) powers a cylinder in one direction. For more information, see the Spool Schematics.

HANDLE OPTIONS –

- **Standard joystick handle** (**A,** in model code) is used to actuate two adjacent spools with one handle.
- **Optional joystick handles** (**A1**, **A2** & **A3**, in model code) also actuate two adjacent spools with one handle, but have different actuation patterns (See Joystick Diagram).
- **Enclosed lever handle** (**L**, in model code) pressurizes the "B" port when the handle is pushed towards the valve body and is convertible from the vertical to the horizontal position.
- **No actuator** (**N**, in model code) is used when it is necessary to connect the spool to an external actuator.

SPOOL ACTION –

- **Three-position detent (D**, in model code) holds the spool in neutral and both active positions.
- **Friction detent** (**F1**, in model code) applies friction to the spool so the spool does not move when the handle is released; a detent groove clearly indicates neutral position.
- **Spring-to-center** (**S**, in model code) returns the handle to neutral when the handle is released.
- **Spring detent** (**SD**, in model code) springs back to neutral from P→B (pushing the handle) and is held in detent while P→A (pulling the handle) is engaged.
- **Fourth position float** (**K**, in model code) is similar to spring-to-center except it has a fourth position detent that makes all ports common to each other (used with tandem center spool only).

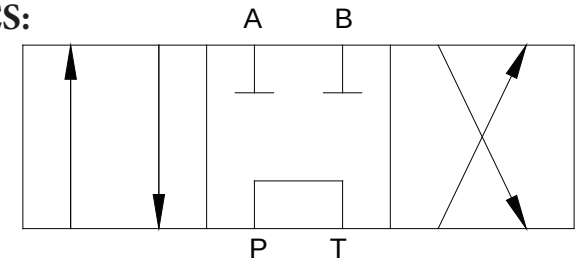
OPTIONS -

Power beyond (W, in model code) offers high pressure carryover for valves downstream. The MB valve is also field convertible to power beyond with the LV2-W power beyond cartridge kit. Closed center (C, in model code) blocks the neutral flow path and is required in pressure compensating, i.e. closed center systems. The MB valve is also field convertible to closed center with the LV2-C closed center cartridge kit. Adjustable relief (B, in model code) is factory preset at 2000psi (137 bar), but is adjustable from 1200 to 3100 psi (83 to 214 bar).

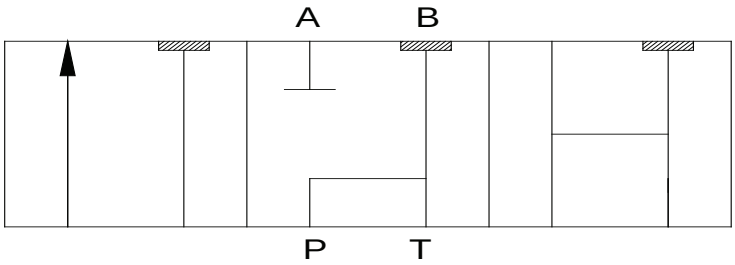
For additional pressure setting ranges:

- 500-1200 PSI use spring P/N "S065"
- 3100-400 PSI use spring P/N "S064"

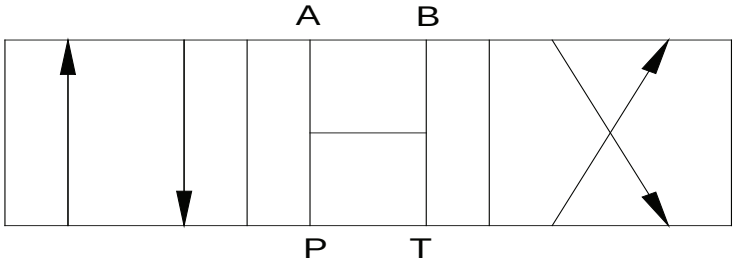
SPOOL SCHEMATICS:



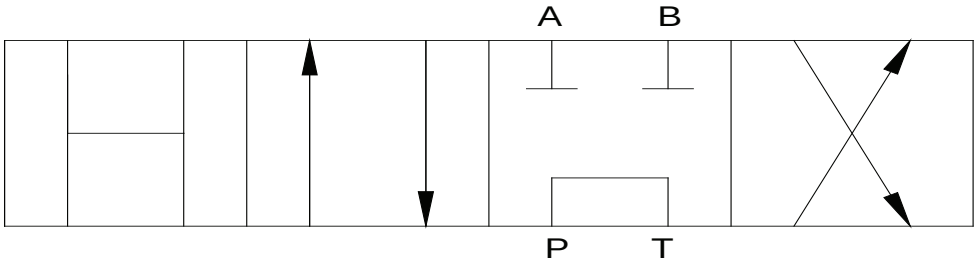
Tandem Center (T) - Powers cylinder or motor in both directions. Pump unloads to tank when spool is in neutral. Cylinder or motor blocked when spool in neutral.



Tandem Three Way (T3) - Powers the cylinder in one direction. Pump unloads to tank when spool is in neutral, or when spool is being reversed. Cylinder is blocked when spool is in neutral. Port "B" is plugged. Second spool only.



Open Center (O) - All of the ports are connected to tank when the spool is in neutral. Allows cylinder to move or motor to rotate when spool is in neutral.



Float (K) - Same as Tandem spool in standard three positions. Detented Fourth position allows cylinder to move or motor to rotate when spool is detented.

MB – CREATING A MODEL CODE FOR MB'S:

MB 2

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

VALVE TYPE:
1 – One spool
2 – Two spool
3 – Three spool

SPOOL TYPE:
T – Tandem center 4-way
O – Open center 4-way
T3 – Tandem center 3-way

SPOOL ACTION:
D – Three position detent
F1 – Friction detent
S – Spring center
SD – Spring center detent (Detents P→A)
K – Fourth position float (T spool only)

REPEAT SPOOL TYPE AND SPOOL ACTION FOR SECOND SPOOL:

REPEAT SPOOL TYPE AND SPOOL ACTION FOR THIRD SPOOL:

OPTIONS:
W – Power beyond sleeve installed
C – Closed center plug installed
B – Adjustable relief (2,000psi[137 bar] standard setting
Omit – No relief, power beyond or Closed center

HANDLE OPTION:
L – Enclosed lever handle (B port is active when handle is pushed)
J – Enclosed lever handle (Similar to L except handle is rotated 180° from standard)
A – Standard joystick
A1 – Optional joystick 1
A2 – Optional joystick 2
A3 – Optional joystick 3
N – No actuator (L type spool)

MB – EXAMPLES OF COMMON MODEL CODES:

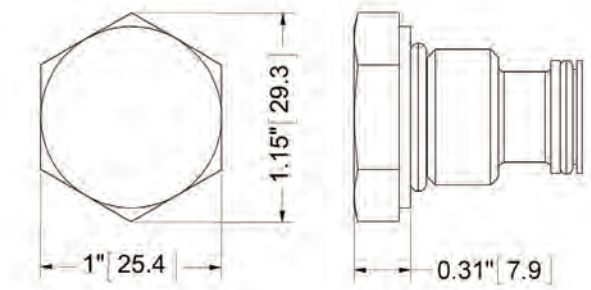
MB21TKLBW..... One spool valve, tandem center spool (T), fourth position float (K), enclosed handle assembly (L), adjustable relief (B) 2000 psi (138 bar) setting and power beyond (W).

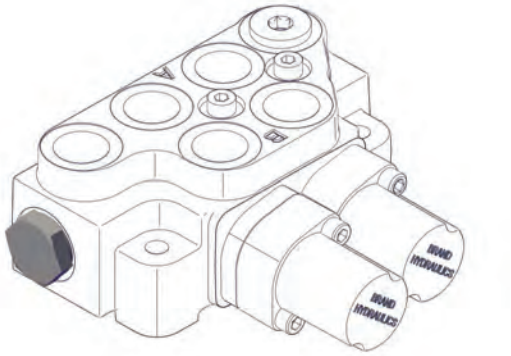
MB22TSTSLBC..... Two spool valve, tandem center (T), spring centering (S), tandem center (T), spring centering (S), enclosed handle assembly (L), adjustable relief (B) 2000 psi (138 bar) setting and closed center (C).

MB23OF1TSDTKLA..... Three spool valve, open center spool (O), friction detent (F1), tandem center spool (T), spring detent (SD), tandem spool, fourth position float (K), en closed handle on first work section (L), joystick assembly on work sections two and three (A)

MB – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

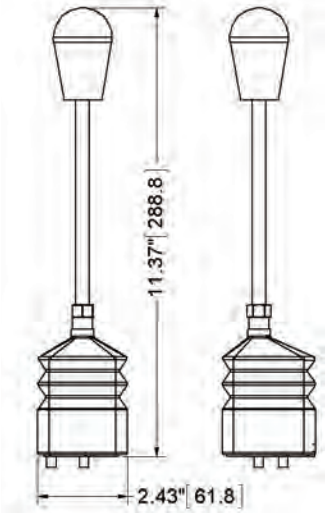
LV2-C.....Closed center cartridge kit.

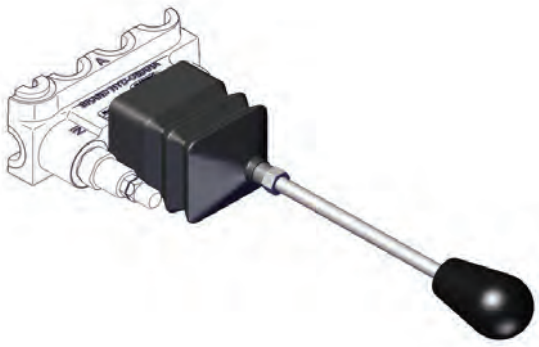




LV2-HA.....A and A1-style joystick kit (Operates two spools simultaneously)

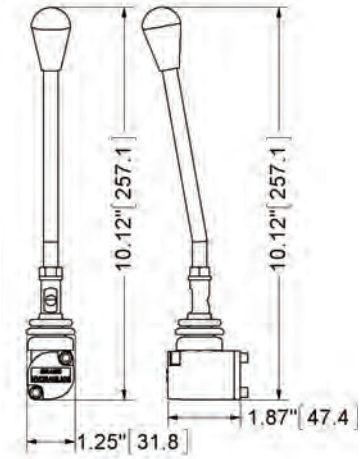
LV2-HA2..... A2 and A3-style joystick kit (Operates two spools simultaneously)





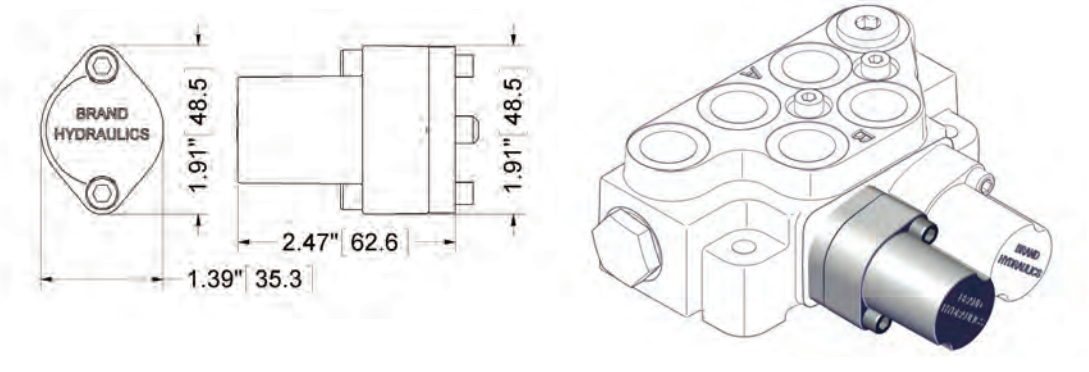
External dimensions are the same for all kits listed above.

LV2-HL.....L-style enclosed handle kit (Operates one spool only).

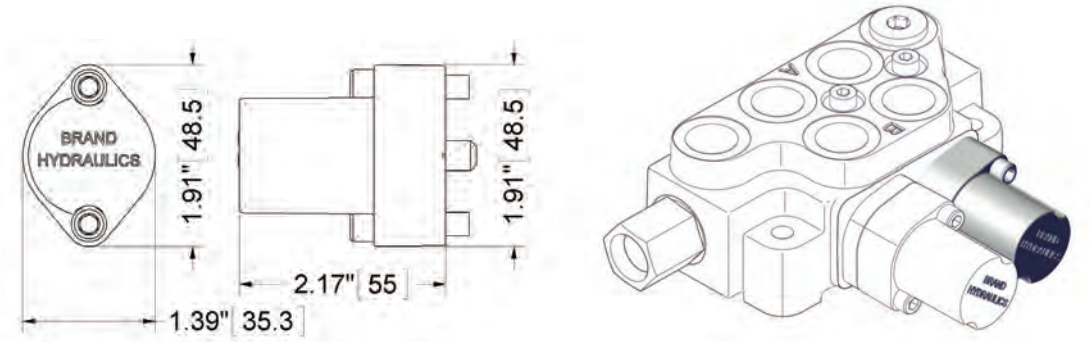


LV – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

LV2-K…….. Fourth position float (Use with Tandem spool).

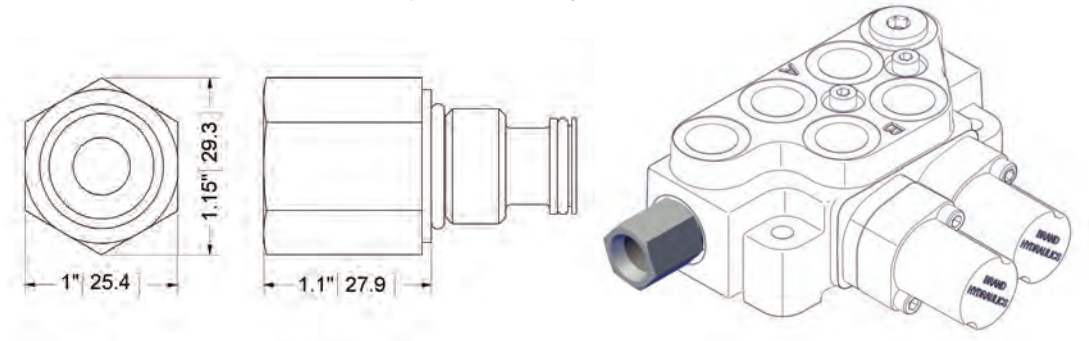


LV2-SD..... Spring center detent kit (P to A in detent)
LV2-S……Spring centering kit.
LV2-D..... Three-position detent kit.
LV2-F1..... Ball friction detent kit.



External dimensions are the same for all kits listed above.

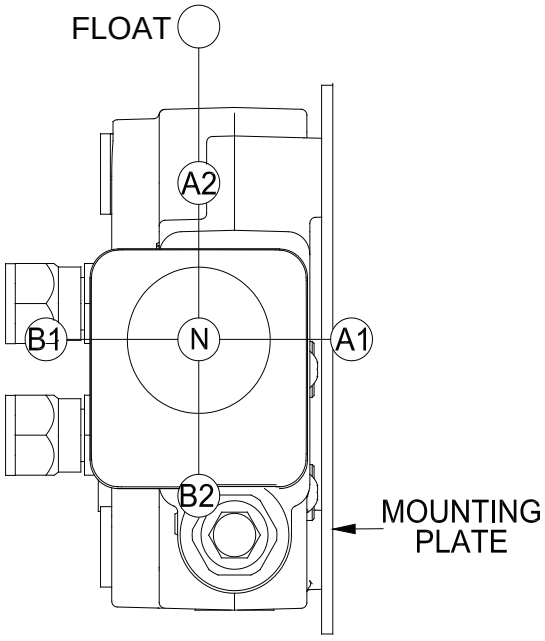
LV2-W…….. Power beyond cartridge kit.



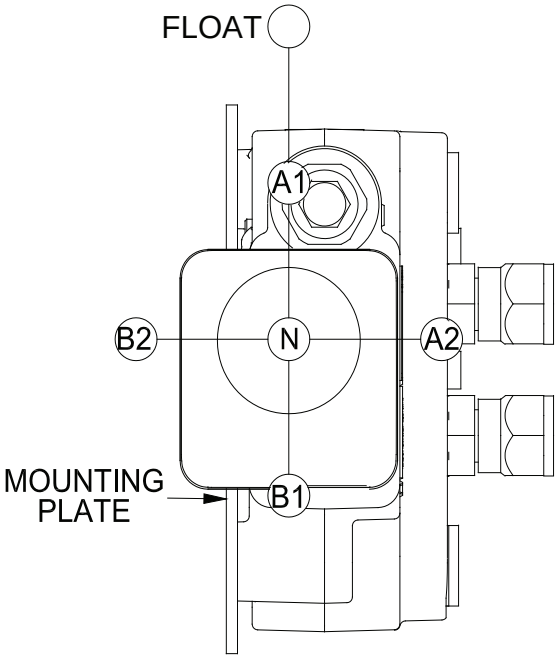
MB2-SK……..……Seal kit for MB series (One, Two, or Three spool valves).

MB – JOYSTICK MOVEMENTS SCHEMES:

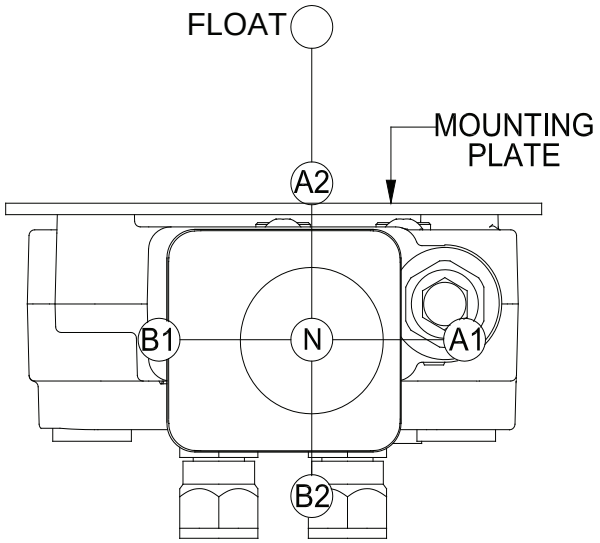
MB22TSTKAB



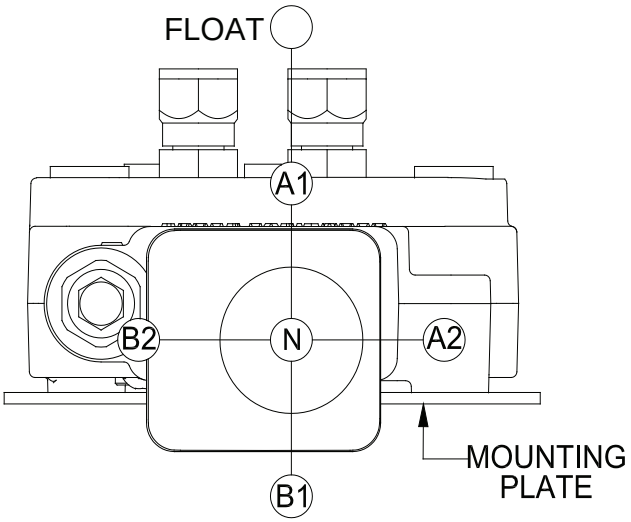
MB22TKTSA1B



MB22TSTKA2B

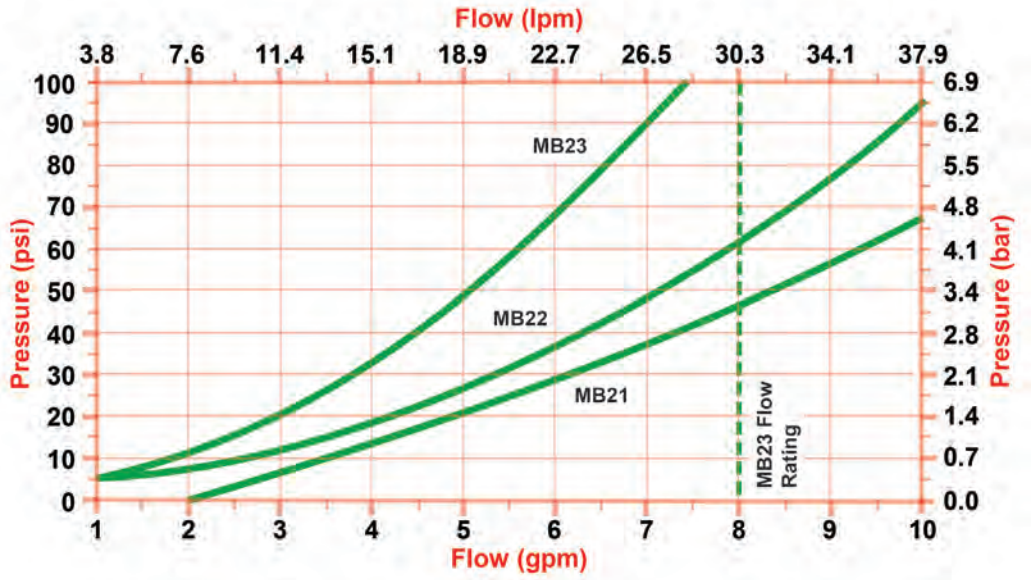


MB22TKTSA3B

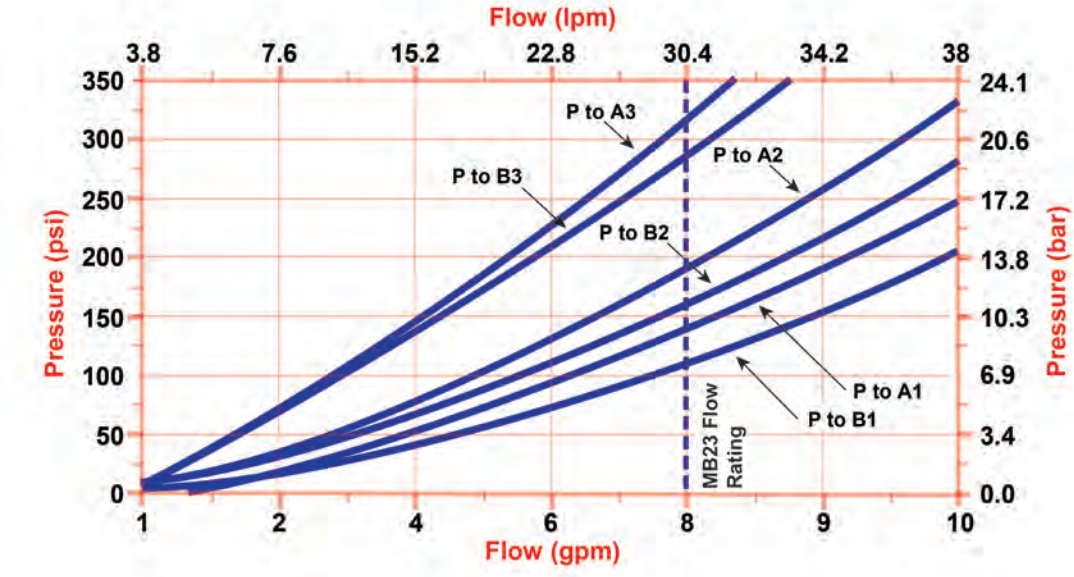


MB – FLOW AND PRESSURE INFO:

Neutral Flow Pressure Drop

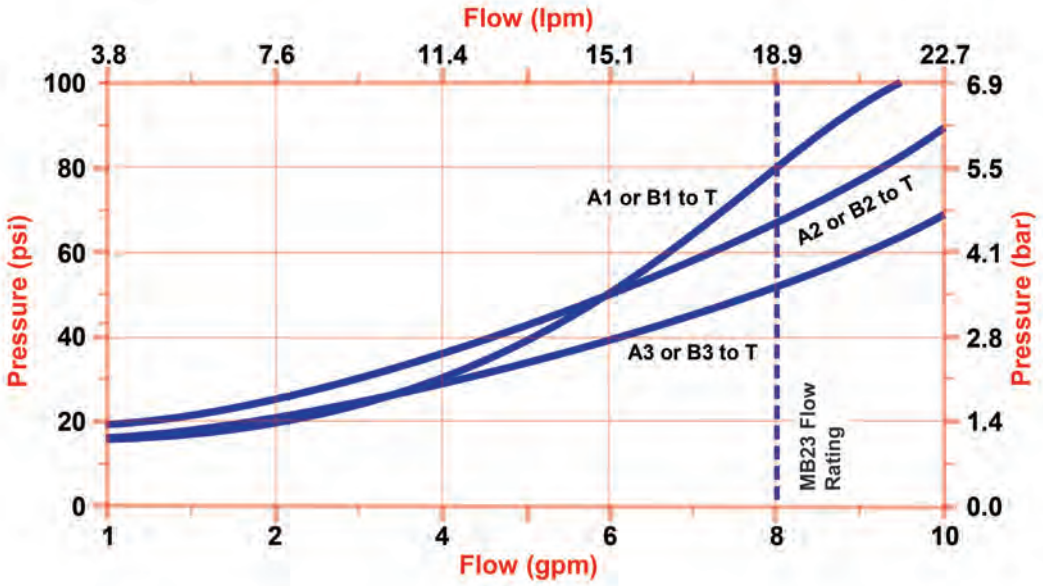


Pressure Drop VS. Flow for P to A or B

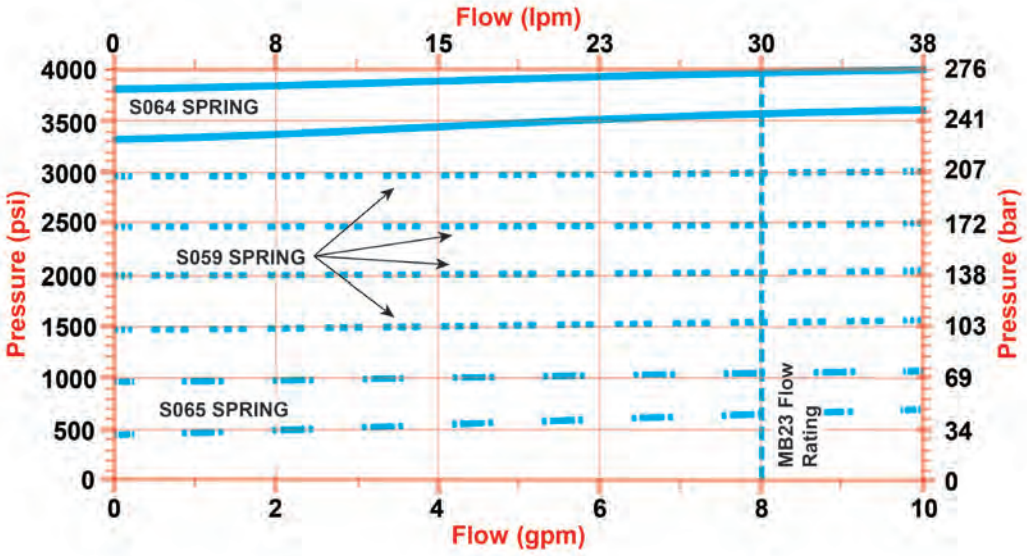


LV – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for A or B to T

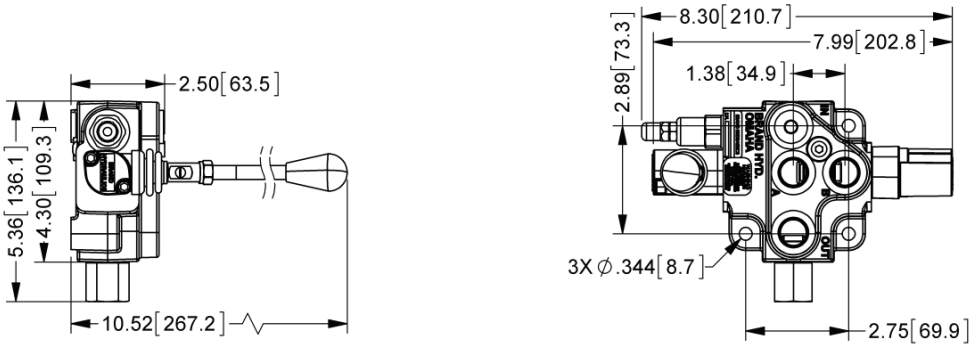


Pressure VS. Flow for LV Relief

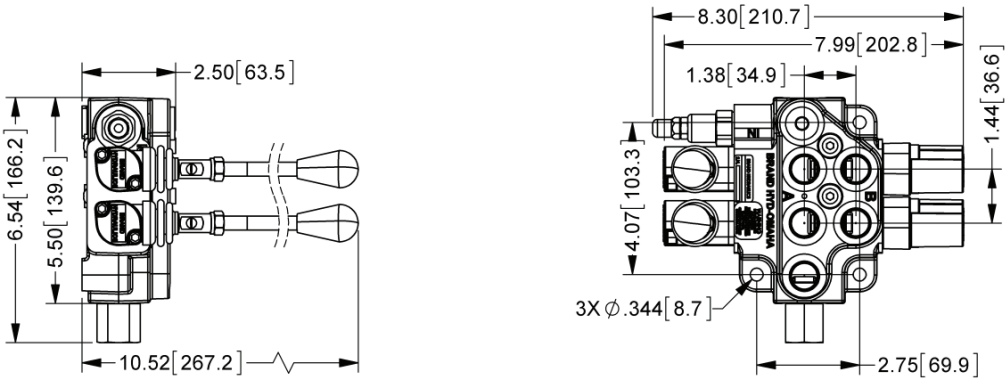


DIMENSIONAL DATA: inches & [millimeters]

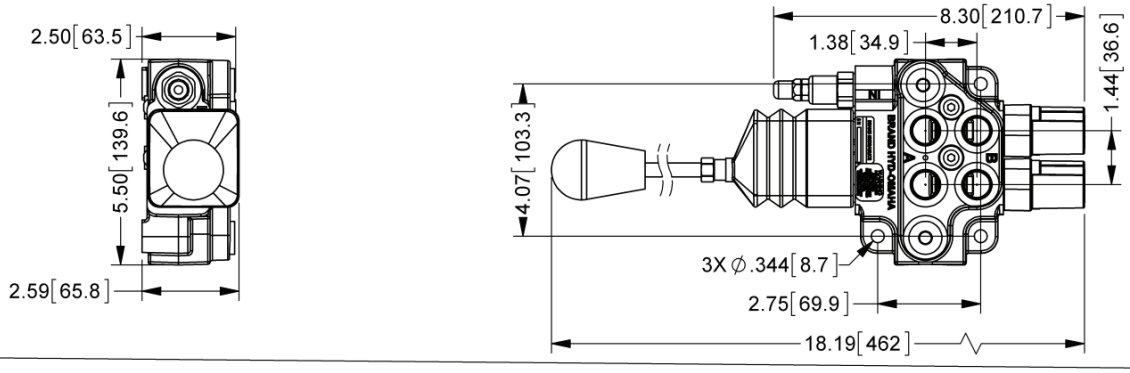
MB21TSLBW



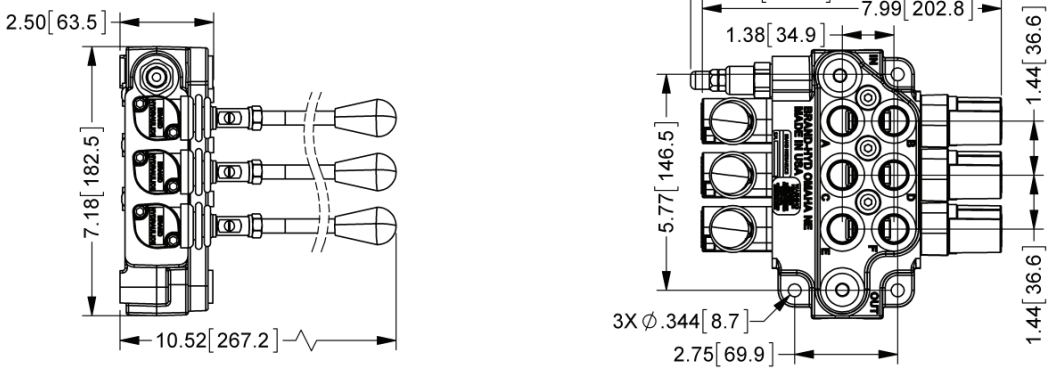
MB22TSTSLBW

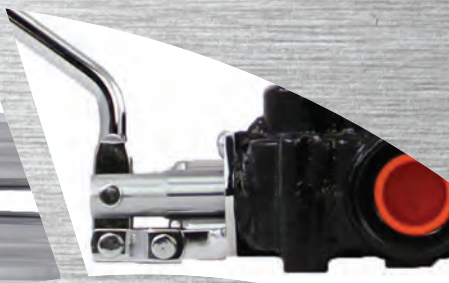


MB22TSTSAB



MB23TSTSTSLB





BRAND HYDRAULICS CO.

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Engineering & Manufacturing Solutions

TS

Monoblock Directional Control Valve

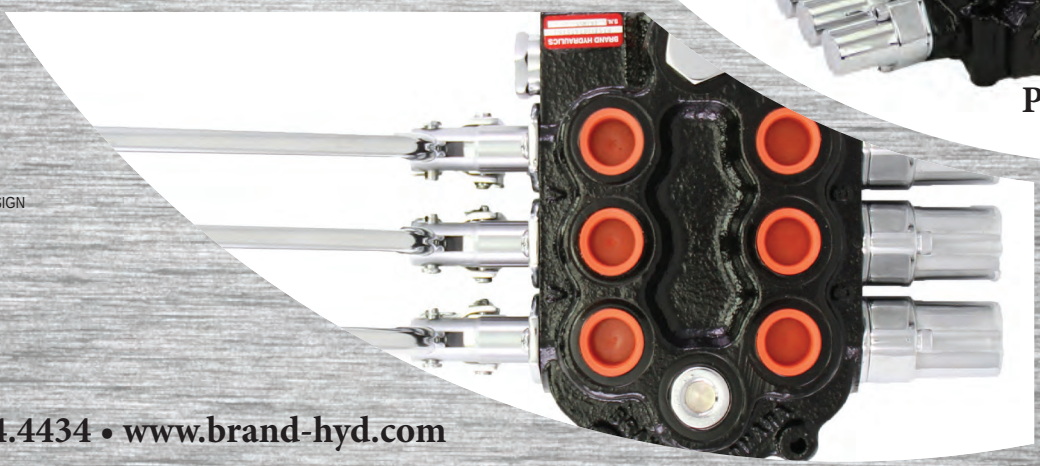
PTS1120TSJB

PTS2120TSTSJB

PTS3120TSDTSTKJ

Specifications:

- 18 gpm (68.0 lpm) Nominal Capacity.
- Rated up to 3000 psi (207 bar).
- Port Sizes:
  - -Inlet/Outlet #12 SAE.
  - -Work Ports #10 SAE.
- 10 Micron Filtration Recommended.
- Weight:
  - -TS1 = 9 lbs. (4.1 kg).
  - -TS2 = 14 lbs. (6.4 kg).
  - -TS3 = 20 lbs. (9.1 kg).



ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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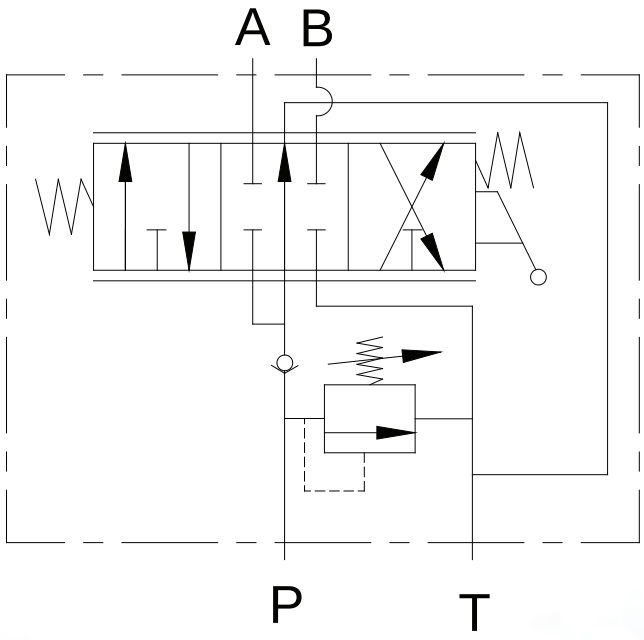
TS Monoblock Directional Control Valve

TS1120TSLB



PTS1120TSJB

PTS3120TSDTSTKJ

PTS2120TSTSJB

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- IOSSO Plated Steel Spools
- Black Nylon Ball Knob

FEATURES:

- O'RING PORTS to eliminate leakage.
- POWER BEYOND CAPABILITY to fit your multi valve circuits.
- BUILT IN ANTI-DROP CHECK prevents the load from dropping when the spool is shifted.
- FOURTH POSITION FLOAT allows spool movement to a fourth position and makes all ports common to each other (last spool only).
- PRECISION GROUND IOSSO PLATED SPOOL that assures long life.

TS – GENERAL INFORMATION:

The Brand mono block directional control valve is available in one (TS1), two (TS2) and three (TS3) spool configurations. This valve was designed for applications in which one valve is required to operate separate circuits independently. The TS offers parallel, tandem center 4-way, open center 4-way(motor spool), and tandem 3-way spools. The valve is also field convertible to closed center or power beyond.

SPOOL TYPE –

The tandem three-way (**T3**) powers a cylinder in one direction. Tandem center 4-way (**T**) powers a cylinder or a motor in both directions. Closed center 4-way (**C**) blocks all ports in neutral and must be used with a pressure compensated pump. Open center 4-way (**O**) connects all ports to tank when in neutral.

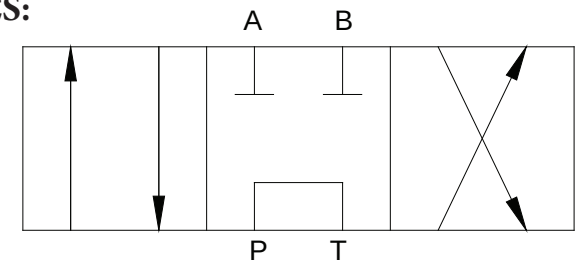
HANDLE OPTIONS –

- **Lever handle (L)** pressurizes the B port when the handle is pushed towards the valve body.
- **Lever handle** (**J**) pressurizes the A port when the handle is pushed towards the valve body.
- **Rotary handle** (**H**) is used to rotate spool in or out.
- **No actuator** (**N**) is used when it is necessary to connect the spool to an external actuator (L type spool).
- **No actuator** (**M**) is used when it is necessary to connect the spool to an external actuator (J type spool).

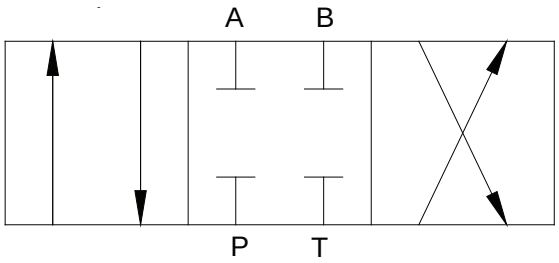
SPOOL ACTION –

- **Three position detent** (**D**) holds the spool in neutral and both active positions.
- **Rotary friction detent** (**E**) applies friction to the spool as it is rotated so that the handle does not rotate when the handle is released, a detent groove clearly indicates neutral position (only available on TS1).
- **Friction detent** (**F1**) applies friction to the spool so that the spool does not move when the handle is released, a detent groove clearly indicates neutral position.
- **Spring center** (**S**) returns the handle to neutral when the handle is released.
- **Spring center detent** (**SD**) springs back to neutral from one position and is mechanically detented P to A.
- **Spring center hydraulic detent** (**SH**) springs back to neutral from P to B position and pressure release detent in the other direction when the cylinder completes its return stroke (P to A in detent and 800-1000 psi (55 to 69 bar) kick-out setting).
- **Fourth position float** (**K**) is similar to spring center except it has a fourth position that makes all ports common to each other (last spool section only).
- **Normally open electric switch** (**WO**) is used with (S), (F1) and (D) options.
- **Normally closed electric switch** (**WC**) is used with (S), (F1) and (D) options. The electric switches can be used on the TS1, TS2 and TS3 (first and third spool only).

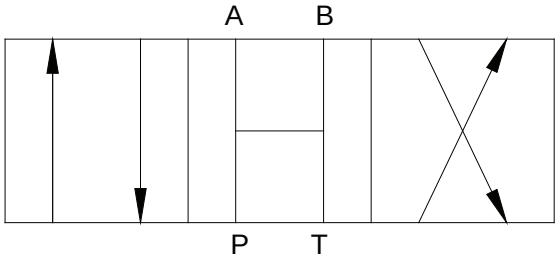
SPOOL SCHEMATICS:



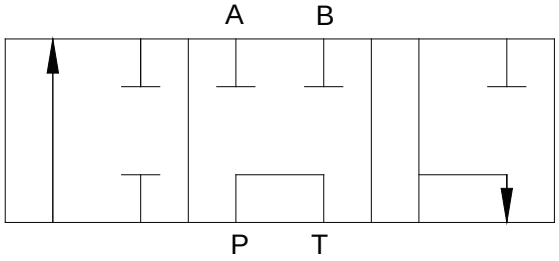
Tandem Center (T) - Powers cylinder or motor in both directions. Pump unloads to tank when spool is in neutral. Cylinder or motor blocked when spool in neutral.



Closed Center (C) - All ports are blocked in neutral. Blocks cylinder or motor in neutral. Required for use with pressure compensated pump.



Open Center (O) - All of the ports are connected to tank when the spool is in neutral. Allows cylinder to move or motor to rotate when spool is in neutral.



Tandem Three Way (T3) - Powers the cylinder in one direction. Pump unloads to tank when spool is in neutral, or when spool is being reversed. Cylinder is blocked when spool is in neutral. Port “B” is plugged.

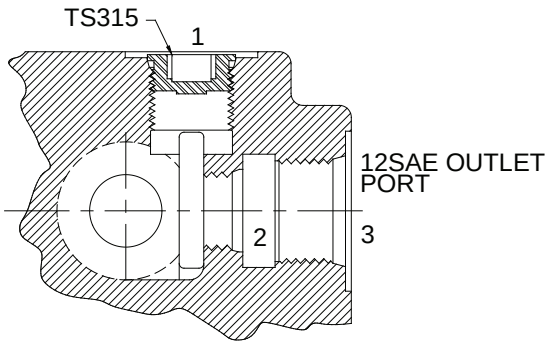
OPTIONS -

Power beyond (W) offers high pressure carryover for valves down stream. The TS series is field convertible to power beyond. Area differential relief cartridge (B) is preset at factory at 1500 PSI. Other pressure can be achieved using different springs.

Pressure Range	Spring P/N
300 - 700	DC7594
700 - 1400	P1270-360
1400 - 2400	P1270 (standard)
2400 - 3000	P1279

GENERAL CONVERSION INFORMATION-

NOTE: The standard 1, 2 and 3 spool castings with (O) or (T) spools are assembled at the factory with the TS315 plug in the 10SAE (1) top port.



CLOSED CENTER CONVERSION - To have the casting in closed center operation, both the top port (1) and internal port (2) must be plugged. Take the TS315 plug from the top port (1) and insert it into the internal port (2). Then plug the top port (1) with any standard #10 SAE plug or purchase a TS315 plug from the factory. Closed center blocks "Pump" only, the condition of ports A and B depend on the spool type. (See illustration above)

POWER BEYOND CONVERSION - To convert the valve to power beyond operation, take the TS315 plug from the top port (1) and insert it into the internal port (2). Next, plumb a #10 SAE fitting from the top port (1) to the adjoining valve. Lastly, run a line from the #12 SAE outlet port (3) to the reservoir. (See illustration above)

TS Monoblock Directional Control Valve

TS – CREATING A MODEL CODE FOR TS'S:

TS 120

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

VALVE TYPE:
1 – One spool
2 – Two spool
3 – Three spool

SPOOL TYPE (First Section):
T – Tandem center 4-way
O – Open center 4-way
T3 – Tandem center 3-way
C – Close center 4-way
CO – Motor center 4-way

SPOOL ACTION:
D – Three position detent
E – Rotary friction detent (TS1 only)
F1 – Friction detent
S – Spring center
SD – Spring center detent (P to A)
SH – Spring center / hydraulic detent
K – Fourth position float
WO – Norm. open elec. switch
WC – Norm. closed elec. switch

REPEAT SPOOL TYPE AND SPOOL ACTION FOR SECOND SPOOL:

REPEAT SPOOL TYPE AND SPOOL ACTION FOR THIRD SPOOL:

HANDLE OPTION:
L – Lever handle (B port is active when handle is pushed)
J – Lever handle (A port is active when handle is pushed)
H – Rotary handle (used in conjunction with rotary friction detent)
N – No actuator (L type spool)
M – No actuator (J type spool)

OPTIONS:
W – Power beyond
B – Area-differential relief cartridge
Omit – No relief, power beyond

TS – EXAMPLES OF COMMON MODEL CODES:

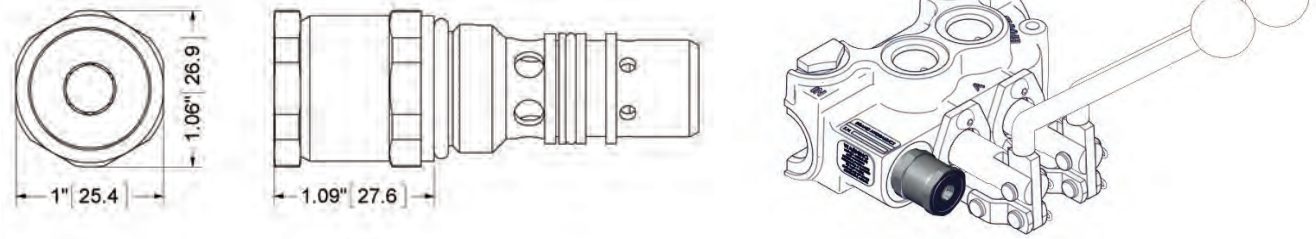
TS1120TSJBW.....Single spool valve, tandem center 4-way spool (T), spring center (S), lever handle (J), area-diff. relief cartridge (B) and power beyond (W).

TS2120TDTSJB.....Two spool valve, the first section has a tandem center 4-way spool (T) with three position detent (D), the second section has a tandem center 4-way spool (T) with spring center (S), lever handles (J), and area-diff. relief cartridge (B).

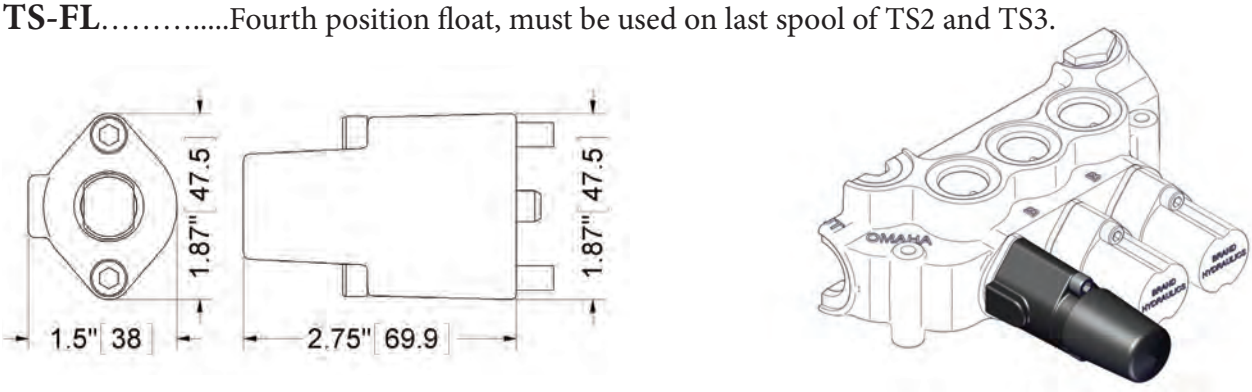
TS3120TSTSTKJ.....Three spool valve, the first and second sections have a tandem center 4-way spools (T) with spring center (S), the third section has a tandem center 4-way spool (T) with fourth position float (K) and lever handles (J).

TS – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

34R10……Area differential relief cartridge set at 1000 psi (69.0 bar). (Available in pressure setting increments of 100 psi (6.9 bar), standard pressure setting is 1500 PSI).



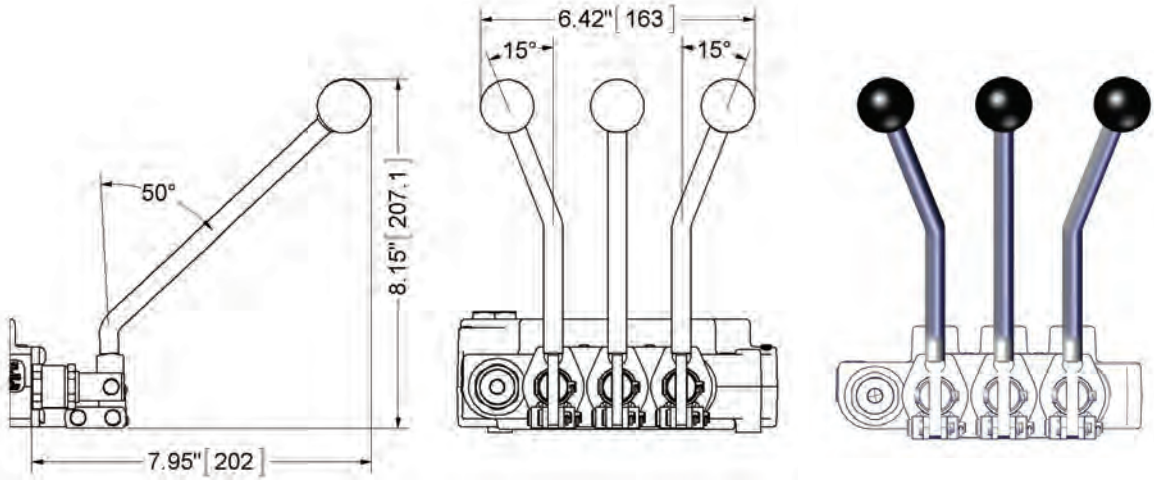
TS-FL……....Fourth position float, must be used on last spool of TS2 and TS3.



TS-HJ……TS handle kit with ball knob. (One per spool)

TS-HJBL……...TS handle kit double bend, away, offset left with ball knob. (One per spool)

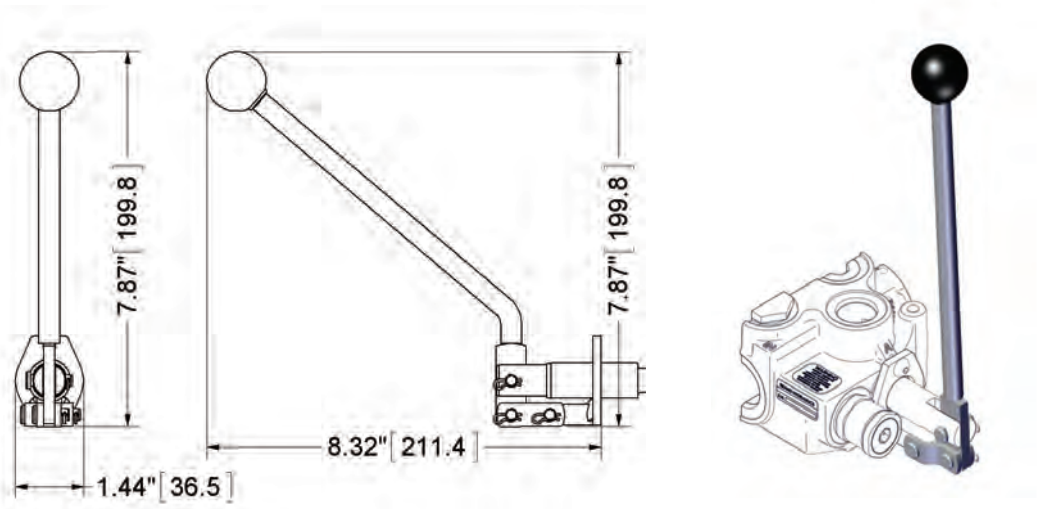
TS-HJBR……...TS handle kit double bend, away, offset right with ball knob. (One per spool)



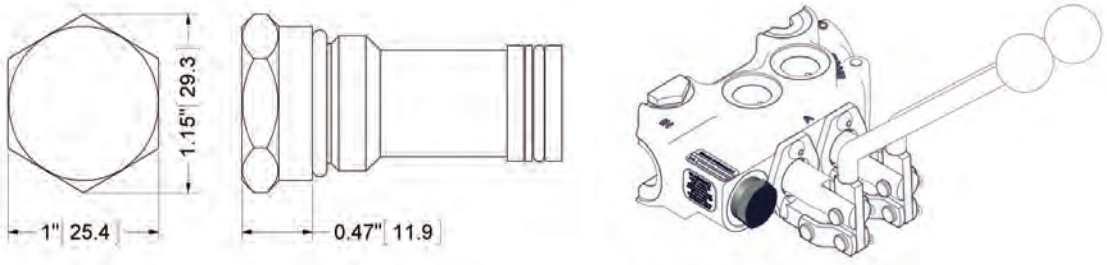
External dimensions are the same for all kits listed above.

TS – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

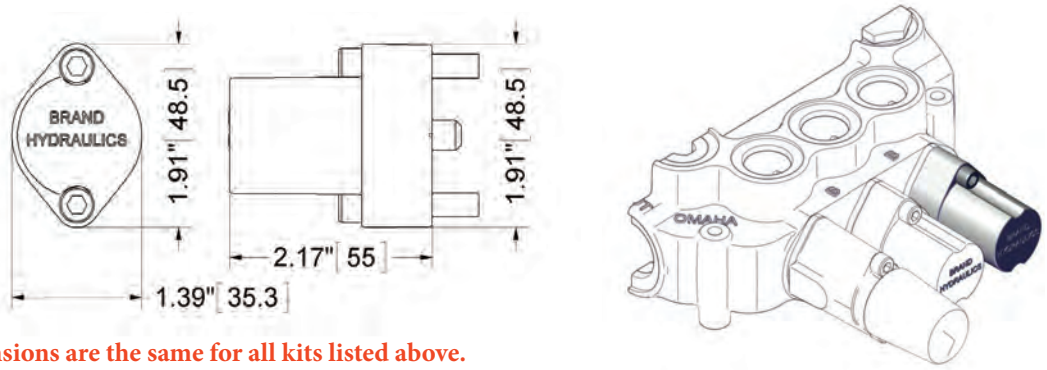
TS-HJS……...TS straight handle kit with ball knob. (One per spool).



TS-NB……Plug for relief cavity.



SDC-D……....Three-position detent kit.
SDC-F1……..Ball friction detent.
SDC-S……..Spring centering kit.

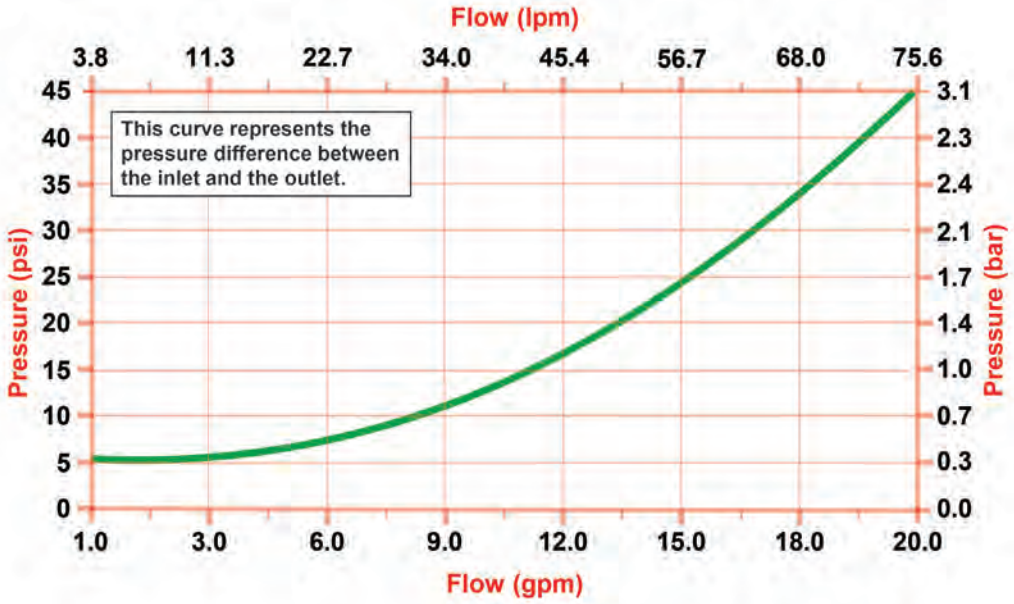


External dimensions are the same for all kits listed above.

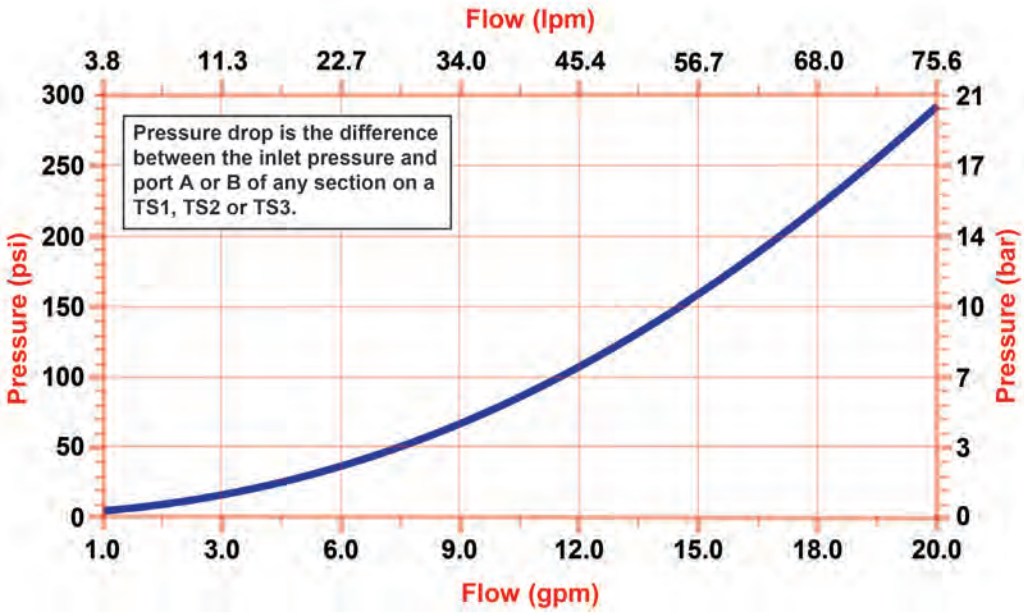
TS-K……....Seal kit for TS series. (One, two or three spools)
TS3HL-K……...Handle linkage kit for TS3. (Three linkages per kit)

TS – FLOW AND PRESSURE INFO:

Neutral Flow Pressure Drop

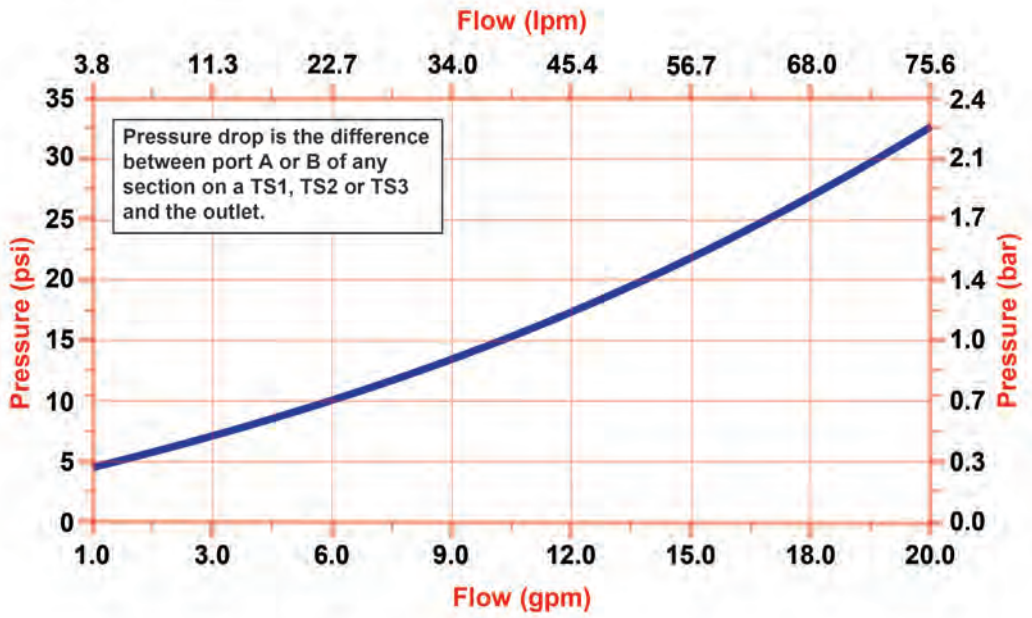


Pressure Drop VS. Flow for P to A or B

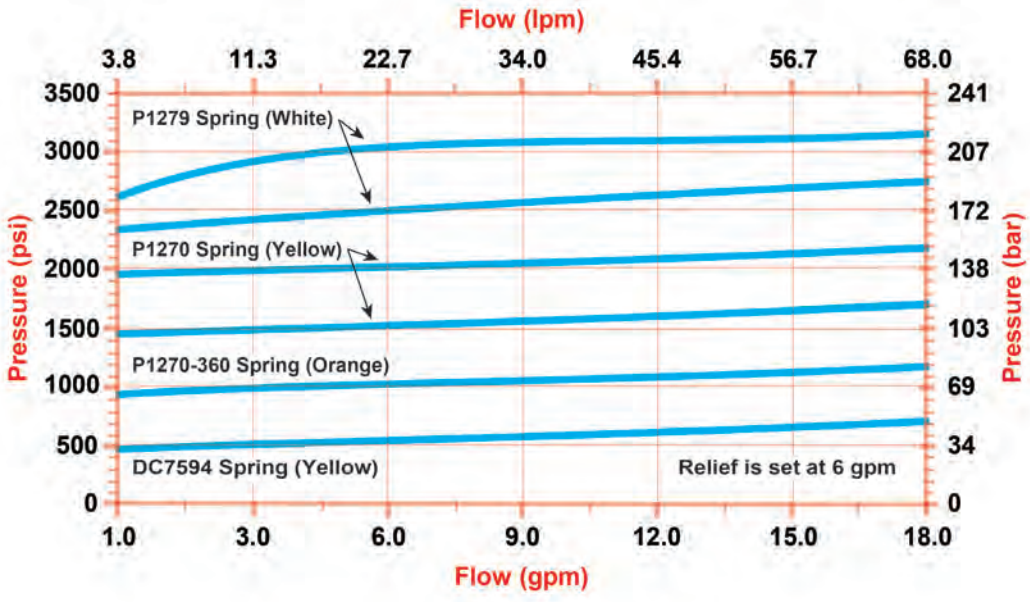


TS – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for A or B to T

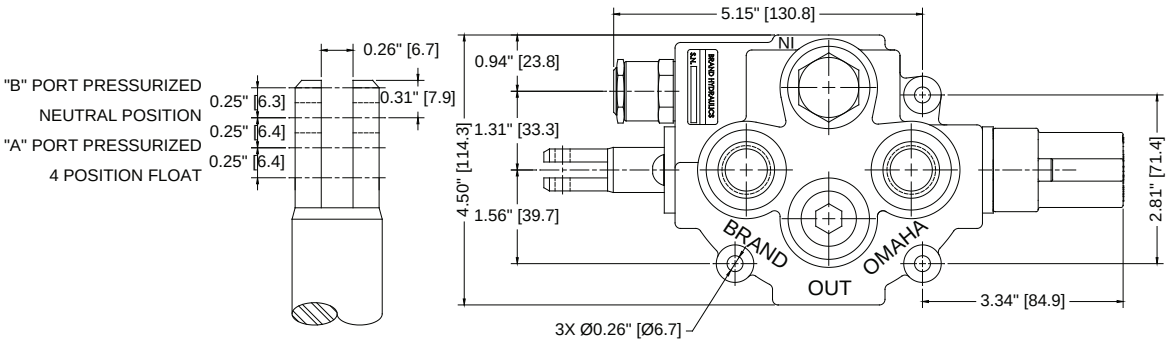


Pressure VS. Flow for Area-Differ. Port Relief (B)

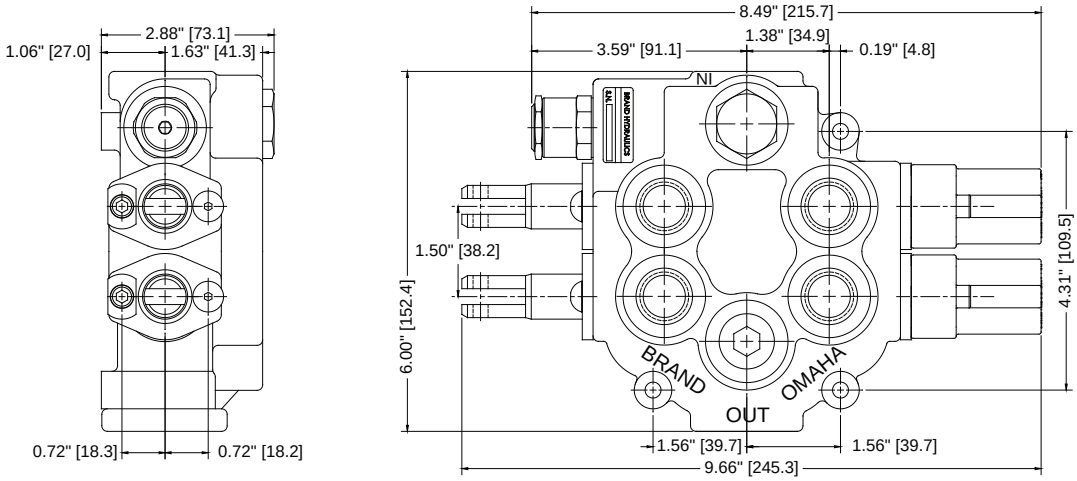


DIMENSIONAL DATA: inches & [millimeters]

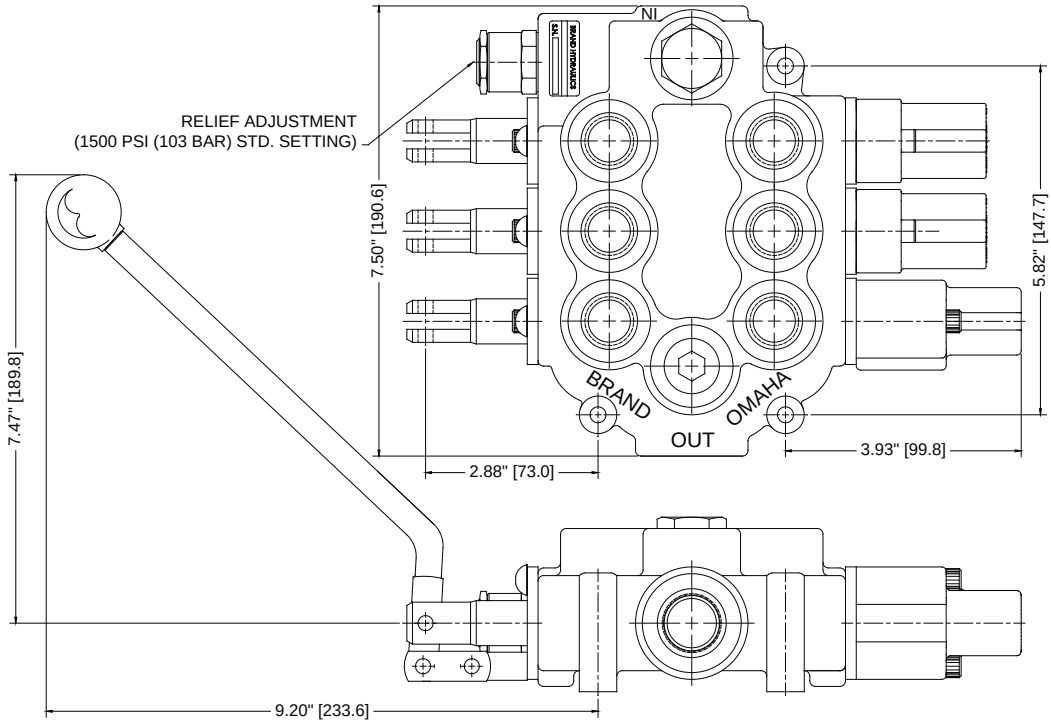
TS1120TF1JB



TS2120TF1TSJB



TS3120TSDTSTKJB



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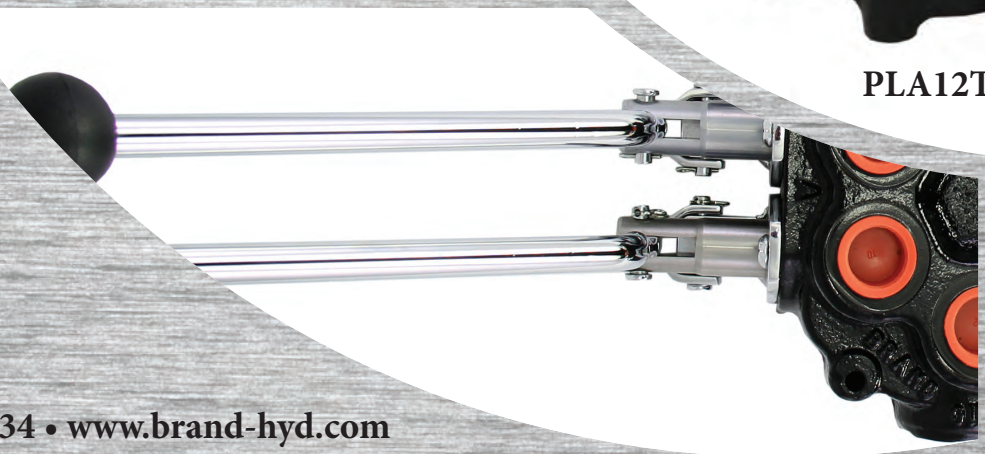
LA

Monoblock Directional Auto-Cycle Valve

PLA12TGTHJB

Specifications:

- 18 gpm (68.0 lpm) Nominal Capacity.
- Rated up to 2000 psi (138 bar).
- Port Sizes:
  - Inlet/Outlet #12 SAE.
  - Work Ports #10SAE.
- 10 Micron Filtration Recommended.
- Weight
  - 14 lbs. (6.4 kg).



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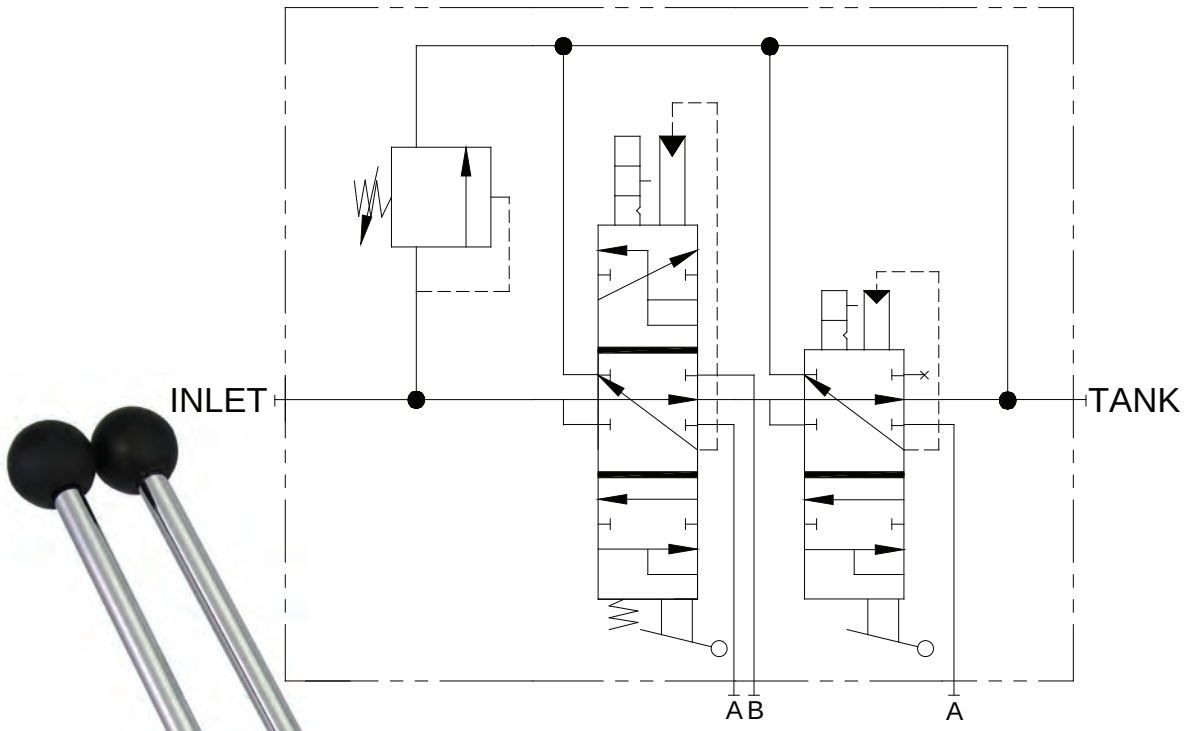
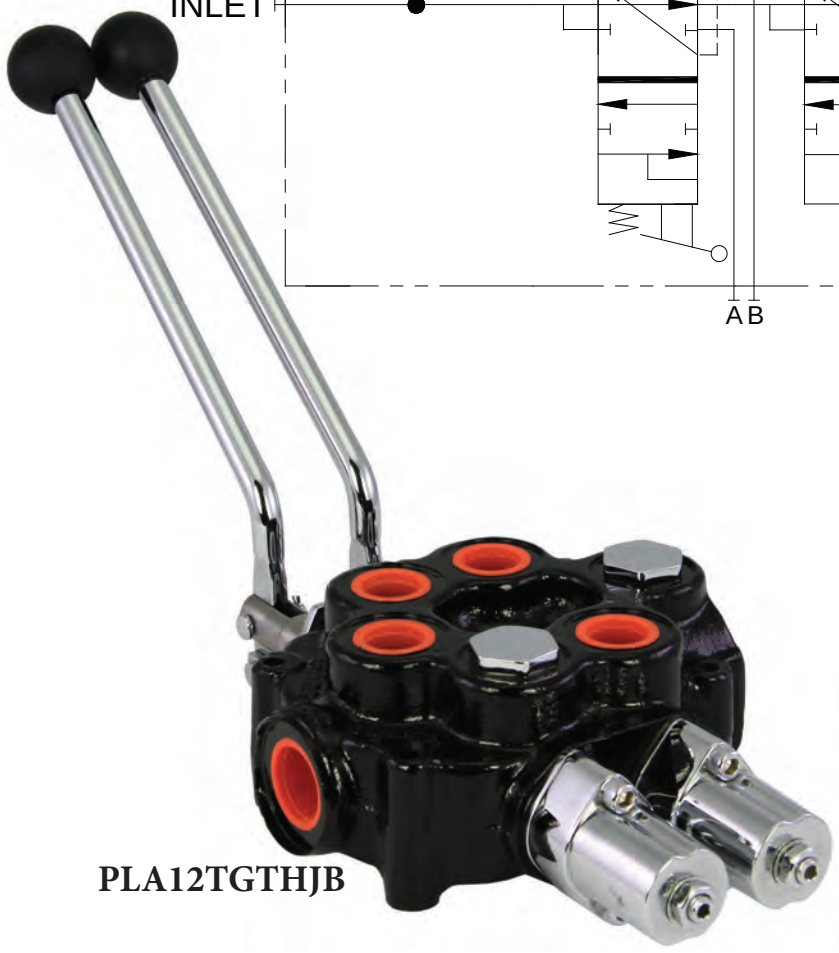
LA Monoblock Directional Auto-Cylce Valve





PLA12TGTHJB

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- IOSSO Plated Steel Spools
- Black Nylon Ball Knob

FEATURES:

- AUTOCYCLE A DOUBLE ACTING CYLINDER with one input from the user.
- ADJUSTABLE HYDRAULIC KICKOUT on both spools.
- O'RING PORTS to eliminate leakage.
- POWER BEYOND CAPABILITY to fit your multi valve circuits.
- PRECISION GROUND IOSSO PLATED SPOOL that assures long life.

LA – GENERAL INFORMATION:

The Brand auto-cycle valve will cycle a double acting cylinder from retracted to fully extended and then back to fully retracted using two spools. The first spool can be used to manually extend and retract cylinder while the second spool only retracts the cylinder. Pushing both levers forward starts the autocycle process. The first hydraulic detent can be adjusted up to 2000 PSI (103 bar) and the second detent should always be set 500 PSI (34 bar) above the first detent setting. The valve is also field convertible to closed center and power beyond.

SPOOL ACTION –

The first spool uses a spring center hydraulic detent. This will hold the spool in detent until the cylinder is fully extended or until the pressure reaches the detent pressure setting causing it to return to neutral. The first spool is spring centering in the other direction. The second spool uses a hydraulic detent. This spool can only be shifted in the one direction. The cylinder will retract until it is fully retracted or until the detent pressure setting is reached causing it to return to neutral.

HANDLE OPTIONS –

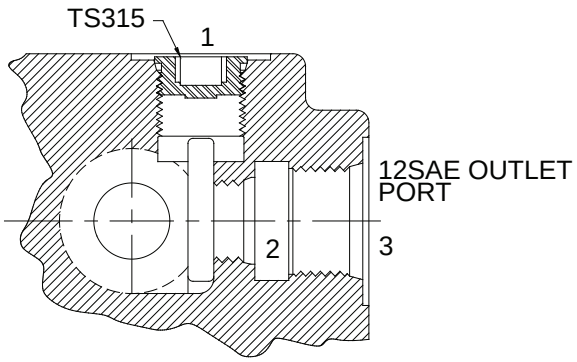
- **Lever handle (J)** pressurizes the "A" port when the handle is pushed towards the valve body.
- **No actuator** (M) is used when it is necessary to connect the spool to an external actuator (J type spool).

OPTIONS -

Power beyond (W) offers high pressure carryover for valves downstream. The LA series is field convertible to power beyond. Area differential relief cartridge (B) is preset at factory at 1500 PSI. Other pressure can be achieved using different springs.

Pressure Range	Spring P/N
300 - 700	DC7594
700 - 1400	P1270-360
1400 - 2400	P1270 (standard)
2400 - 3000	P1279

CLOSED CENTER CONVERSION - To have the casting in closed center operation, both the top port (1) and internal port (2) must be plugged. Take the TS315 plug from the top port (1) and insert it into the internal port (2). Then plug the top port (1) with any standard #10 SAE plug or purchase a TS315 plug from the factory. Closed center blocks "Pump" only, the condition of ports A and B depend on the spool type. (See illustration)



POWER BEYOND CONVERSION - To convert the valve to power beyond operation, take the TS315 plug from the top port (1) and insert it into the internal port (2). Next, plumb a #10 SAE fitting from the top port (1) to the adjoining valve. Lastly, run a line from the #12 SAE outlet port (3) to the reservoir. (See illustration)

LA Monoblock Directional Auto-Cycle Valve

LA – CREATING A MODEL CODE FOR LA'S:

LA12TGTH

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

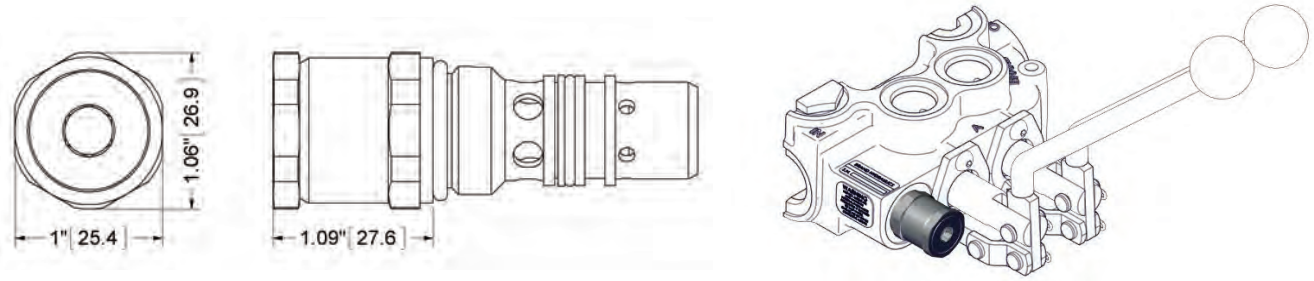
HANDLE OPTION:
J – Lever handle
M – No actuator

RELIEF OPTION:
B – Adjustable relief (2300 psi (159 bar) standard setting)
N – No relief

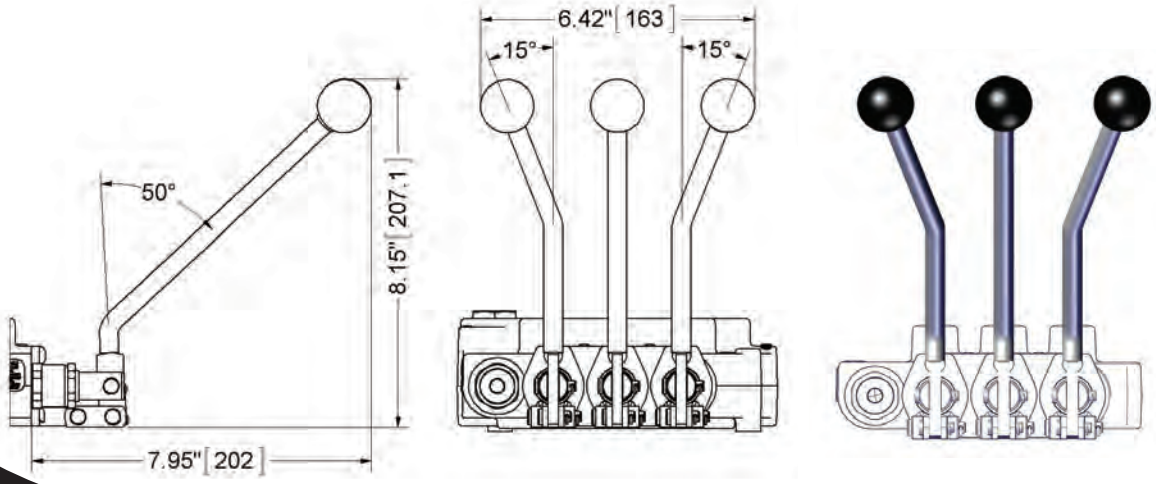
OPTIONS:
W – Power beyond
C – Closed center
Omit – Open center

LA – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

34R10.....Area differential relief cartridge set at 1000 psi (69.0 bar). (Available in pressure setting increments of 100 psi (6.9 bar), standard pressure setting is 1500 PSI).



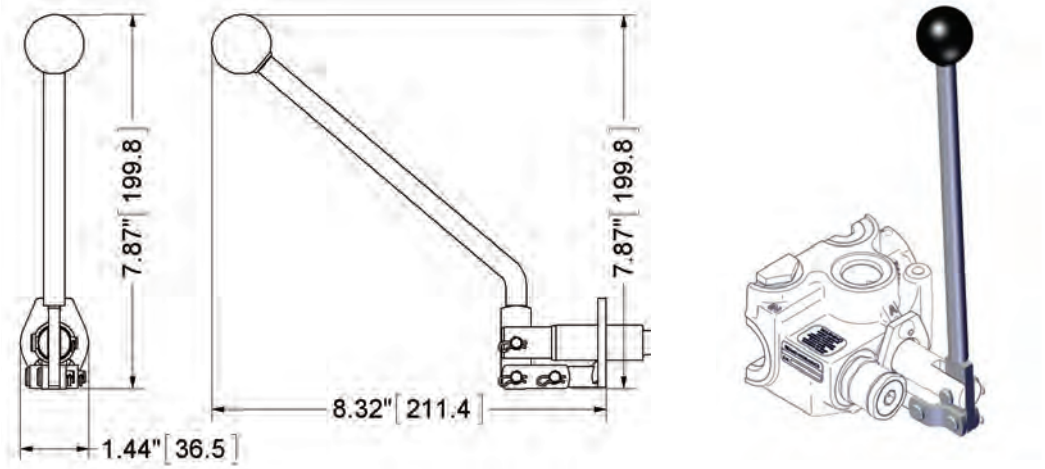
TS-HJ.....TS handle kit with ball knob. (One per spool)
TS-HJBL.....TS handle kit double bend, away, offset left with ball knob. (One per spool)
TS-HJBR.....TS handle kit double bend, away, offset right with ball knob. (One per spool)



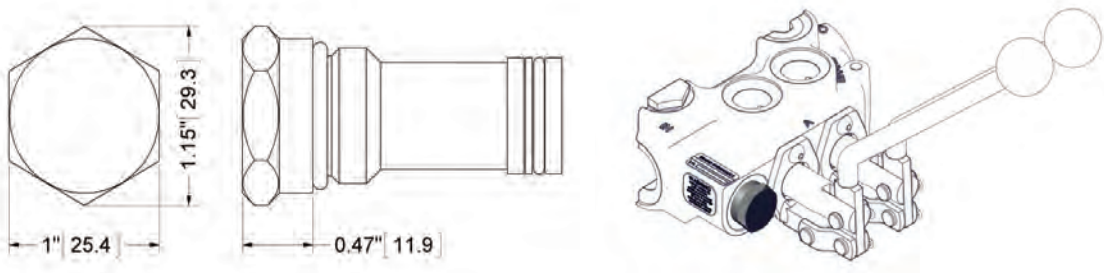
External dimensions are the same for all kits listed above.

LA – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

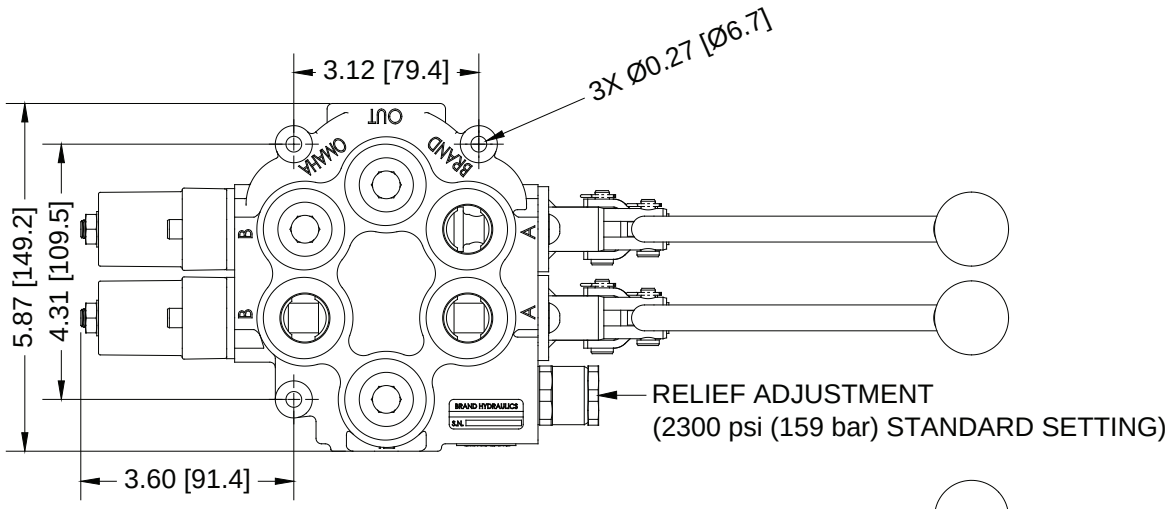
TS-HJS……...TS straight handle kit with ball knob. (One per spool).

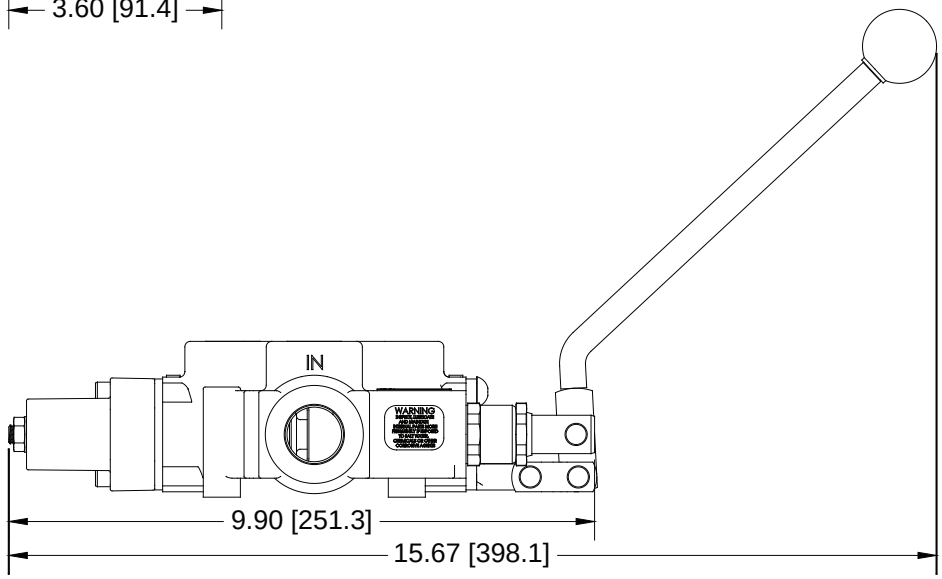


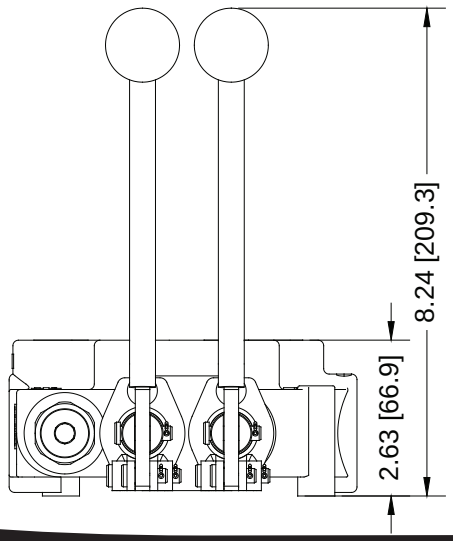
TS-NB……Plug for relief cavity.



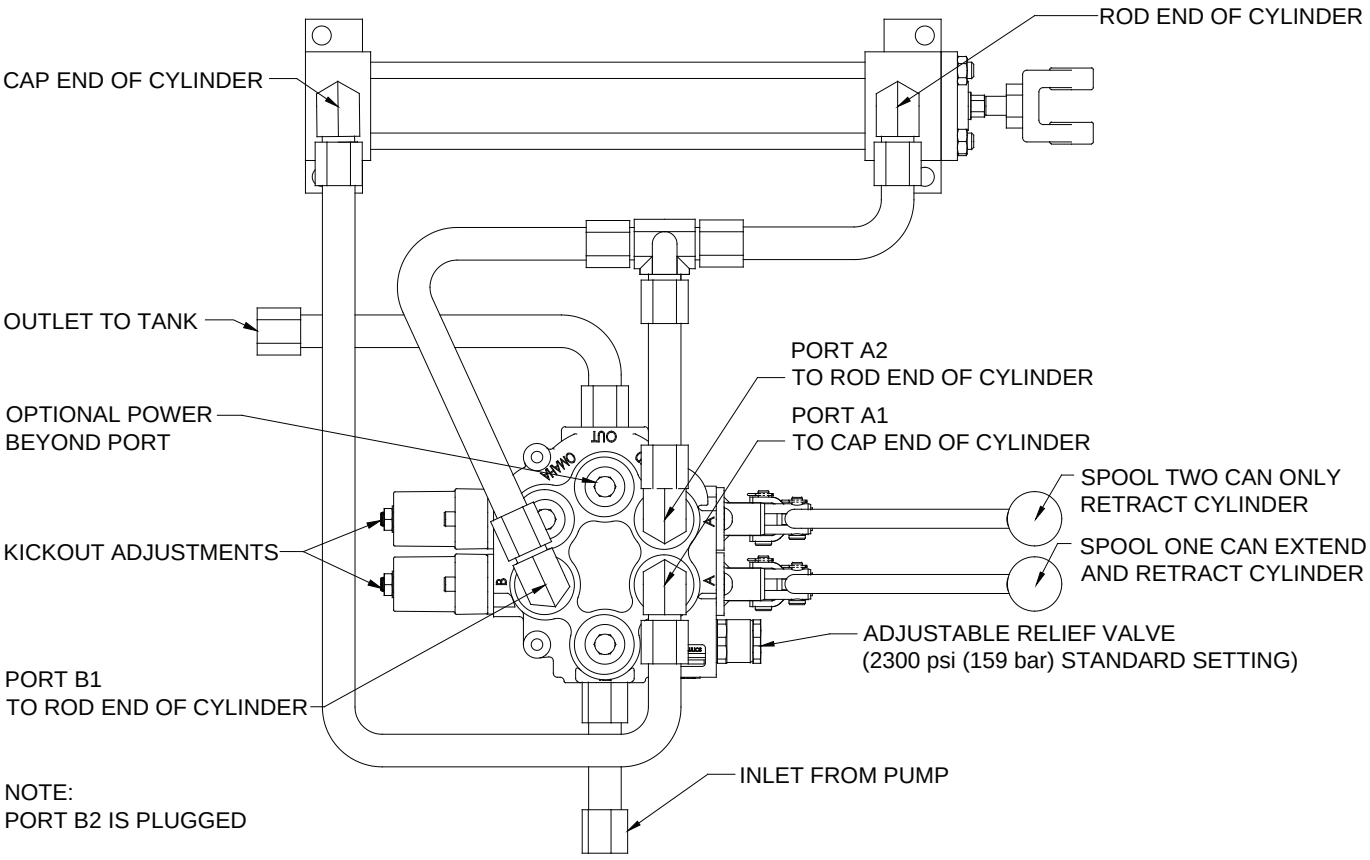
DIMENSIONAL DATA: inches & [millimeters]







AUTO-CYCLE HYDRAULIC CIRCUIT:



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MS

Manual Selector Valve

PMSC12-SO

PMS16-SAE

Specifications:

- Rated for 3000 psi (207 bar).
- Flow rating
  - 3/4" NPT 0-30 gpm (0-113 lpm).
  - #16 SAE 0-45 gpm (0-170 lpm).
- 30-Micron filtration recommended.
- Weight
  - MS75 / MS12 5.5 lbs. (2.5 kg).
  - MS16-SAE 9 lbs. (4.1 kg).
- Standard port sizes.
  - 3/4" NPT / #12 SAE.
  - #16 SAE (1 5/16-12) all ports.
- Free reverse flow option (MS75 / MS12 only).

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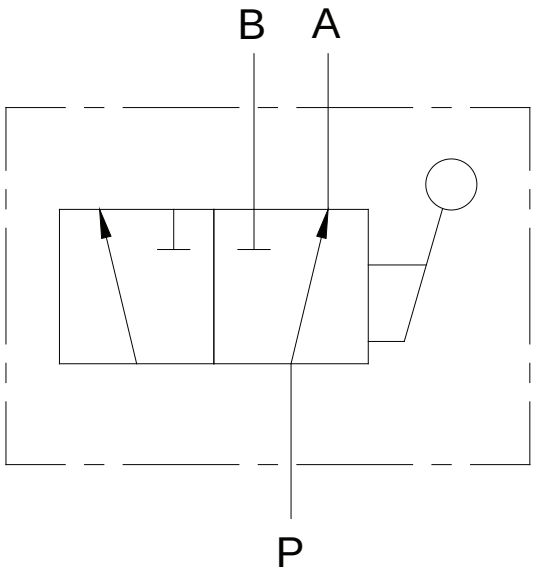
MS Manual Selector Valve

MS16-SAE OR MS75-3/4 / MS12-SAE



PMS16-SAE

PMSC12-SO

MATERIALS:

- High Strength Cast Iron Body (MS16-SAE)
- Cast Iron Body (MS75)
- Buna N O'Rings
- IOSSO Plated Steel Spools

FEATURES:

- PRECISION GROUND IOSSO PLATED SPOOL that assures long life.
- O'RING PORTS to eliminate leakage (MS16-SAE & MS12-SAE).
- RIGID HANDLE allows customer to shift spool smoothly.
- OPTIONAL SPRING OFFSET holds spool in one active position (P to A in offset position and 3/4" NPT & #12-SAE).

MS – GENERAL INFORMATION:

The Brand, MS two-position manual selector valves are available in two different sizes MS75 /MS12 and MS16-SAE. The MS16-SAE allows up to 45 gpm (170 lpm) out of either port and has a manual handle for effortless shifting of the spool. The MS75/ MS12 allows up to 30 gpm (113 lpm) out of either port and has a "T" grip handle for effortless push/pull shifting of the spool. The inlet is orificed to ports A and B when the spool is being shifted from port A to port B or vise versa.

MS – COMPLETE LIST OF MODEL CODES:

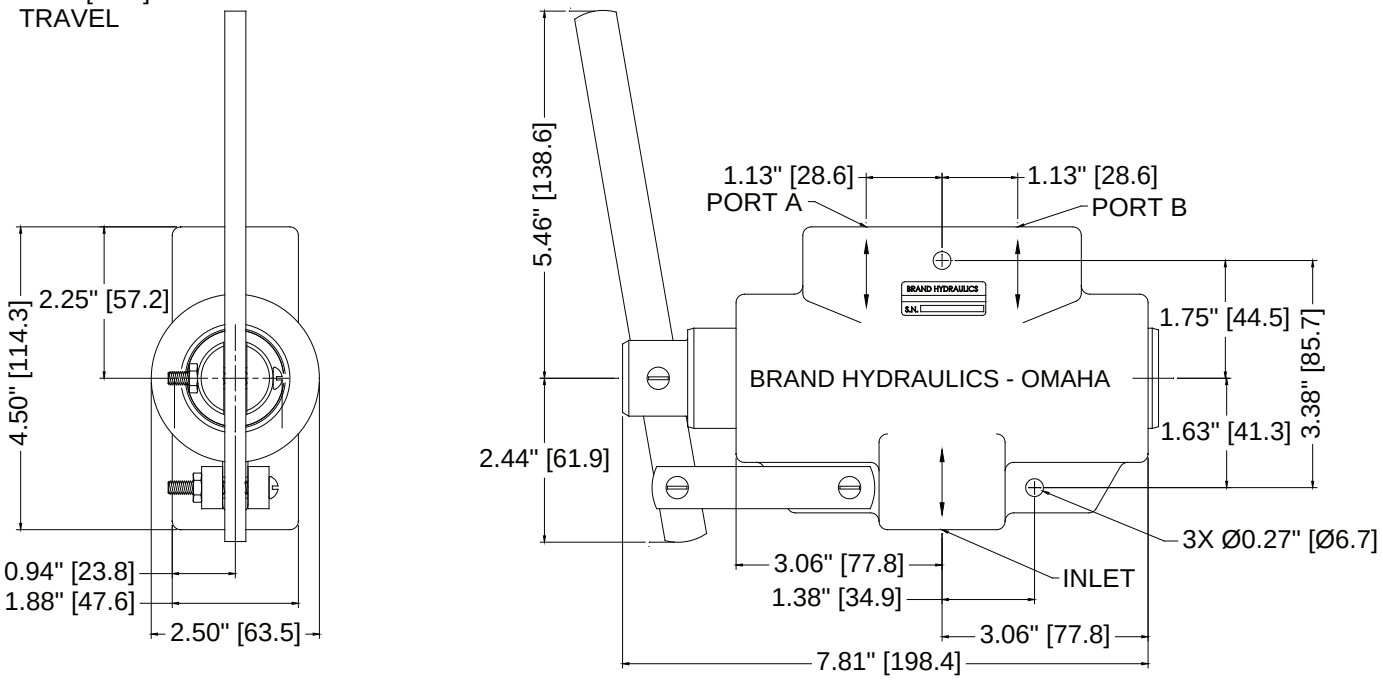
MS12-SAE.....12 SAE all ports and rated for 0-30 gpm (0-113 lpm).
MS75-3/4.....3/4" NPT all ports and rated for 0-30 gpm (0-113 lpm).
MS12-SO.....12 SAE all ports, rated for 0-30 gpm (0-113 lpm) and spring offset (P to A in offset position).
MSC12-SO.....12 SAE all ports, rated for 0-30 gpm (0-113 lpm) and spring offset, with free reverse flow.
MSC75-SO.....3/4" NPT all ports and rated for 0-30 gpm (0-113 lpm), spring offset, with free reverse flow.
Paint (Optional).....(P) painted black (other colors available, consult factory), (MP) epoxy coating.

MS – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

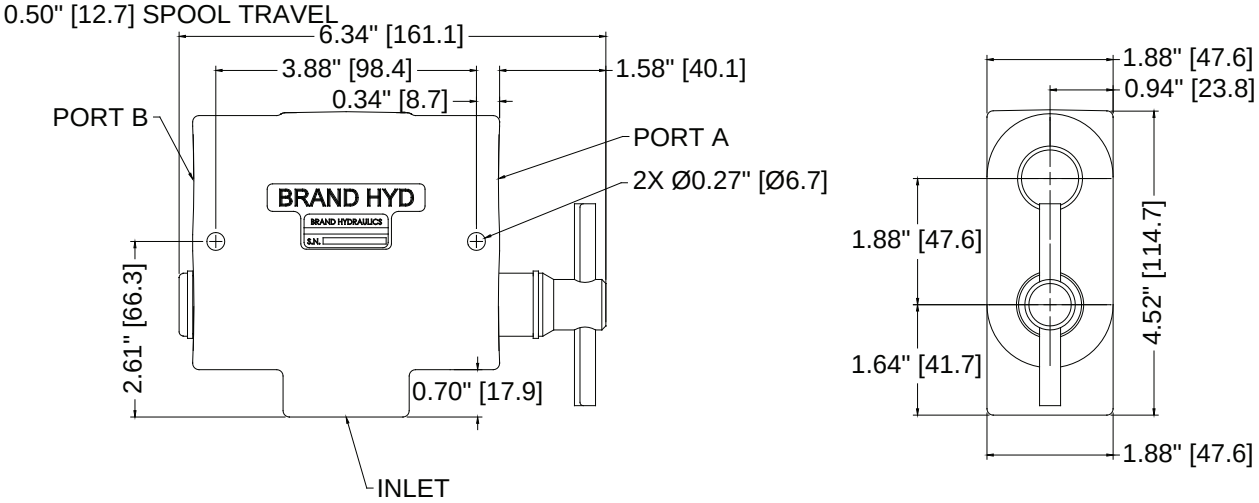
LMS-K.....Seal kit for MS16-SAE valve.
MS-K.....Seal kit for MS75 & MS12 valves.

DIMENSIONAL DATA: inches & [millimeters]

MS16-SAE
0.63" [16.0] SPOOL TRAVEL



MS75-3/4 or MS12-SAE
0.50" [12.7] SPOOL TRAVEL



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DS

Electric, Pilot or Manual Double Selector Valve

PDS10BE1SN

PDS12BK

PDS12BPS

PDS12BLS

Specifications:

- Coils: - 12 VDC, 3.5 ohms, 40 watts, and 3.5 amps
  - 24 VDC, 14 ohms, 40 watts, and 1.75 amps
  - 120 VAC, 300 ohms, 40 watts, and 0.40 amps
- Port Sizes: - #8 SAE (3/4-16) all ports
  - #10 SAE (7/8-14) all ports
  - #12 SAE (1-1/16-12) all ports
  - #4 SAE (7/16-20) drain port
- Weight: 10.0 lbs (4.55 kg)
- 10 Micron Filtration Recommended.
- Flow and pressure ratings for Pilot, Lever and Knob actuated valves
  - #8 SAE – 10 gpm (38 lpm) and 4500 psi (310 bar)
  - #10 SAE – 18 gpm (68 lpm) and 4500 psi (310 bar)
  - #12 SAE – 30 gpm (114 lpm) and 4500 psi (310 bar)
- Pressure and flow specifications for electric actuated found on page B-89

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DS Electric, Pilot or Manual Double Selector Valve

PDS10BE1SN

PDS12BK

PDS12BPS

PDS12BLS

MATERIALS:

- Ductile cast iron body
- Heat treated steel spool
- Buna N O-rings (standard)

FEATURES:

- O-RING PORTS to eliminate leakage.
- PRECISION GROUND heat treated spool assures long life.
- IP69 COIL RATING provides protection against dust and long periods of immersion.
- SELECTOR SPOOL allows flow to two separate hydraulic circuits.
- SERIES/PARALLEL SPOOL allows for selection of either series or parallel motor operation.
- DIAMOND HONED spool bore provides consistent spool fit with low leakage.
- OIL GROOVES on spool (electric valve only) provide smooth spool motion.
- OPTIONAL DRAIN PORT for increased pressure rating.

DS – GENERAL INFORMATION:

The Brand DS Series is a 6-way two position double selector valve. We offer this valve with four different operators: electric, pilot, manual lever and manual knob. This valve is typically used to divert flow between two separate circuits. The standard selector spool (open cross-over) allows operation of two double acting cylinders or two reversible motors with one 4-way directional control valve. It also allows operation of four single acting cylinders with one 4-way directional control valve. When the coil is de-energized top ports C and D are connected to B and F respectively. When the coil is energized top ports C and D are connected to A and E respectively. We also have a series/parallel spool available that is used to operate two motors in series when the coil is energized and in parallel when the coil is de-energized.

SPOOL TYPE –

The spool types offered are series/parallel (**A**, in model code), selector (**B**, in model code) open cross-over, selector (**C**, in model code) closed cross-over, selector (**F**, in model code) open cross-over with unused ports open, and selector (**G**, in model code) closed cross-over with unused ports open. A closed cross-over spool should be used when isolating the work ports (**E** and **A** from **B** and **F**) is required in the transient position. This would be advantageous if the work ports are connected to cylinders holding a load. Unused ports open allows the non active ports to be common, this would allow a motor to free spin when it is connected to the non active ports. Please note that spool types (**A**, **B**, and **C** in model code) can be used with all four spool operators and spool types, (**F** and **G** in model code) can only be used with spool operators (**E**, in model code).

HANDLE OPTIONS –

- **Electric operator** (**E**, in model code) shifts spool using electromagnetic force and does not require any extra pilot or tank lines.
- **Enclosed lever handle** (**L**, in model code) provides smooth shifting of spool while protecting spool from contaminants.
- **Pilot** (**P**, in model code) allows the spool to be shifted from a remote location, 150 psi pilot pressure (air or hydraulic) required to shift spool.
- **Knob** (**K**, in model code) is an inexpensive way to easily push and pull the spool to each position.

SPOOL ACTION –

- **Spring offset** (**S**, in model code) can be used with all spool operators.
- **Two position detent** (**D**, in model code) can only be used with spool operator (**L** and **K**, in model code).

COIL VOLTAGE -

We offer 12 volt DC (1, in model code), 24 volt DC (2, in model code) or 120 volt AC (3, in model code) for spool operator (E, in model code).

DRAIN-

Drain type is only specified when spool operator (E, in model code) is used. Internal drain (N, in model code) drains any spool leakage to the lower pressure port via spool leakage. External drain (X, in model code) drains spool leakage externally to tank from a #4SAE port. An externally drained valve is rated to a higher pressure than the internally drained valve.

TERMINAL -

Terminal is only specified when spool operator (E, in model code) is used. Both coils come standard with a Deutsch connector (DT04-2P). Wire leads (T, in model code) is a mating Deutsch connector with flying leads. Deutsch to female weather pack (V, in model code) is a mating Deutsch connector to female shroud with male pin. Deutsch to male weather pack (W, in model code) is a mating Deutsch connector to male tower with female pin. Do not specify terminal when using spool operator (L, P and K, in model code).

DS ELECTRIC PRESSURE AND FLOW RATINGS FOR INTERNAL DRAIN:

	A series/parallel	B Selector open cross-over	C Selector closed cross-over	F Selector open cross-over unused ports open	G Selector closed cross-over unused ports open
8 SAE Ports	3600 PSI (248 bar)	3600 PSI (248 bar)	See Chart Page B-94	3600 PSI (248 bar)	See Chart Page B-94
	10 gpm (38 lpm)	10 gpm (38 lpm)	10 gpm (38 lpm)	10 gpm (38 lpm)	10 gpm (38 lpm)
10 SAE Ports	3600 PSI (248 bar)	3600 PSI (248 bar)	See Chart Page B-94	3600 PSI (248 bar)	See Chart Page B-94
	18 gpm (68 lpm)	18 gpm (68 lpm)	18 gpm (68 lpm)	18 gpm (68 lpm)	18 gpm (68 lpm)
12 SAE Ports	3600 PSI (248 bar)	3600 PSI (248 bar)	See Chart Page B-94	3600 PSI (248 bar)	See Chart Page B-94
	26 gpm (98 lpm)	26 gpm (98 lpm)	20 gpm (76 lpm)	26 gpm (98 lpm)	20 gpm (76 lpm)

*For External Drain, pressure rating increases to 4500 psi (310 bar) and flow ratings are same as above

DS – CREATING A MODEL CODE FOR DS'S:

DS

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coating

PORTING SIZE:
8 – SAE all ports
10 – SAE all ports
12 – SAE all ports

SPOOL TYPE:
A – Series/parallel
B – Selector, open cross-over
C – Selector, closed cross-over
F – Selector, open cross-over, unused ports open
G – Selector, closed cross-over, unused ports open

HANDLE OPTION:
E – Electric
L – Enclosed lever handle
P – Pilot
K – Knob (push/pull)

COIL VOLTAGE:
Omit – When using "**L**", "**P**", or "**K**" spool operator
1 – 12 volt DC
2 – 24 volt DC
3 – 120 volt AC

SPOOL ACTION:
Omit – No spring offset or detent
S – Spring offset (Can be used for all spool operators, required for "**E**" and "**P**" spool operators)
D – Two position detent (Can be used for "**L**" and "**K**" spool operators only)

DRAIN:
Omit – When using "**L**", "**P**", or "**K**" spool operator
N – Internal drain
X – External drain

TERMINAL:
Omit – When using "**L**", "**P**", or "**K**" spool operator
T – Wire leads
V – Deutsch to female weather pack
W – Deutsch to male weather pack

DS – EXAMPLES OF COMMON MODEL CODES:

DS10BE1SN…..#10 SAE all ports, standard selector spool, electric operator, 12 VDC, spring offset and internal drain.

DS12BPS…….#12 SAE all ports, standard selector spool, pilot operator, and spring offset.

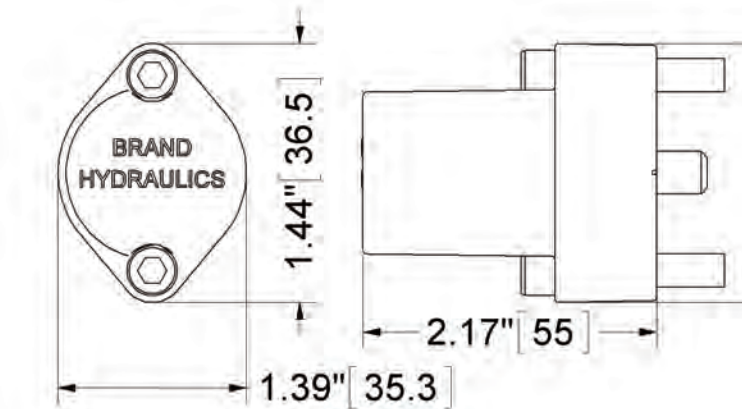
DS08BK……..#8 SAE all ports, standard selector spool, and manual knob.

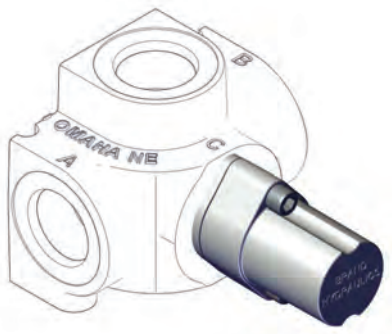
DS12ALD……..#12 SAE all ports, series/parallel spool, manual lever handle, and two position detent.

DS – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

DS-S……...Spring offset kit for "L", "P" and "K" spool operator.

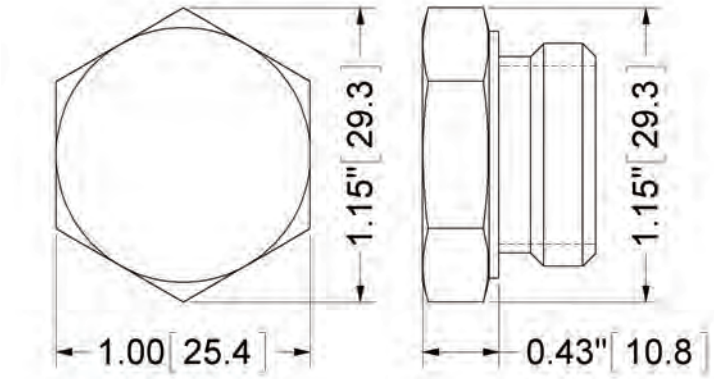
DS-D……..Two position detent kit for "L" and "K" spool operator.

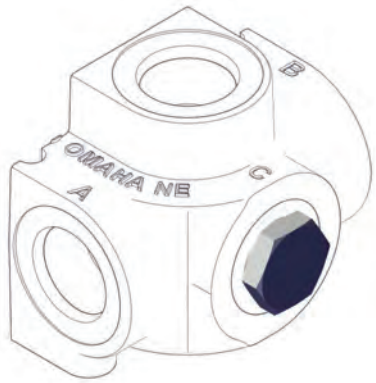




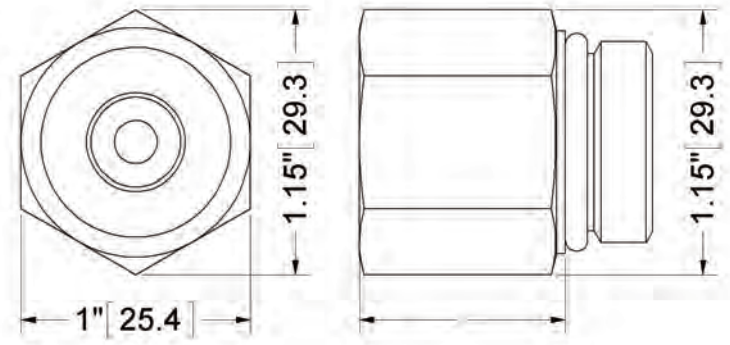
External dimensions are the same for all kits listed above.

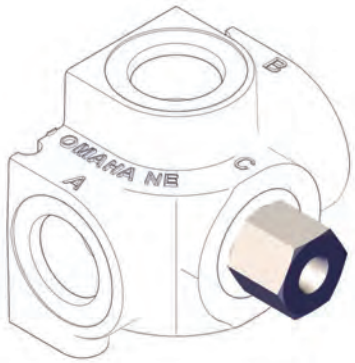
DS-SN……... Spring offset kit for "E" spool operator (includes internal drain plug, o-ring and spring).





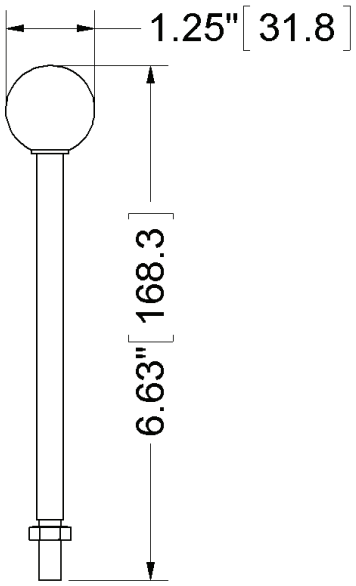
DS-SX……....Spring offset kit for "E" spool operator (includes external drain plug, o-ring and spring).

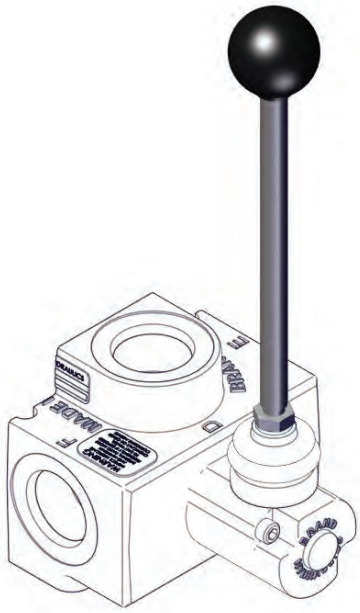




DS – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

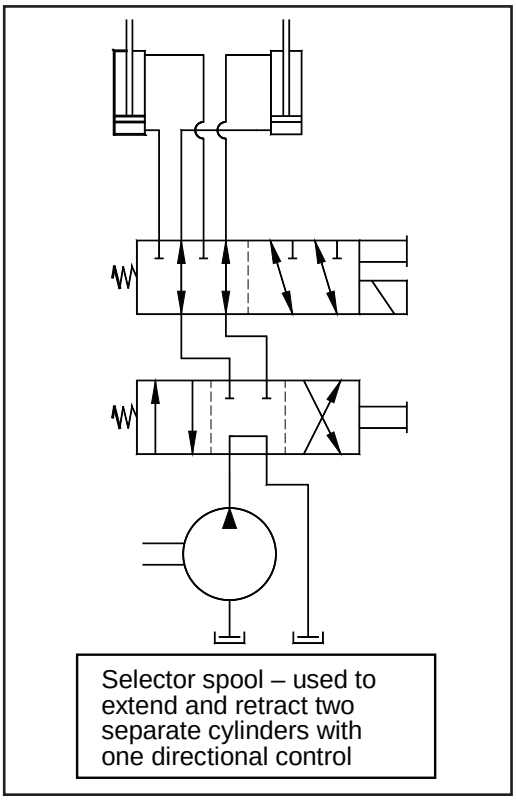
DS-HL……..….Manual lever handle kit.



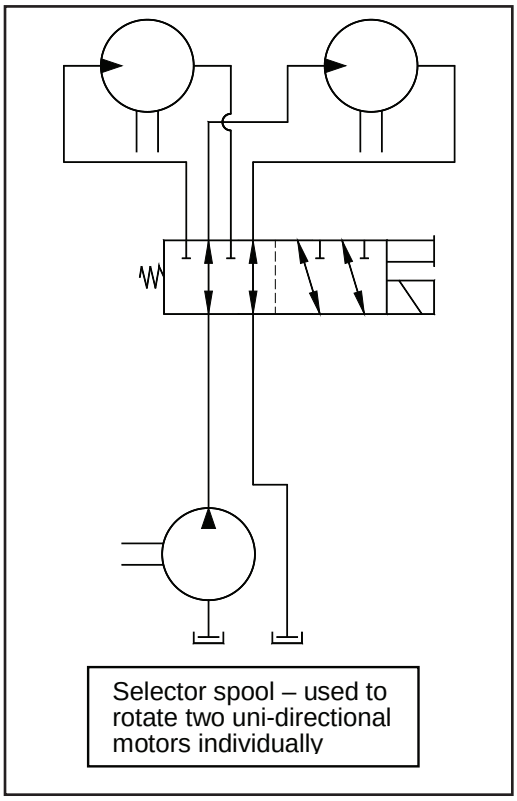


DS-EK……Seal kit for electric double selector valve.
DS-PK……Seal kit for pilot double selector valve.
DS-K……..….Seal kit for all manually operated double selector valves (“L” and “K” spool operator).
E1767……..Deutsch D.T. series with 12” (305 mm) flying leads.
E1767PF…….....Deutsch to female weather pack (female shroud with male pin).
E1767MF…...…Deutsch to male weather pack (male tower with female pin).

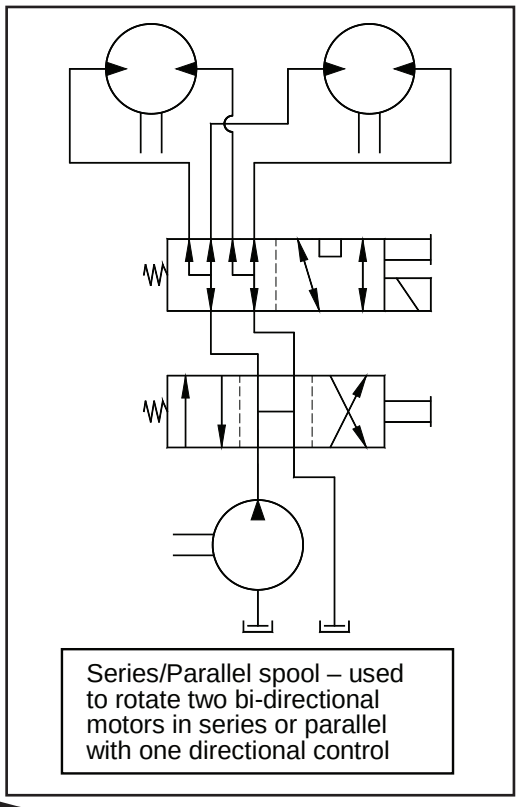
DS – COMMON DOUBLE SELECTOR APPLICATIONS:



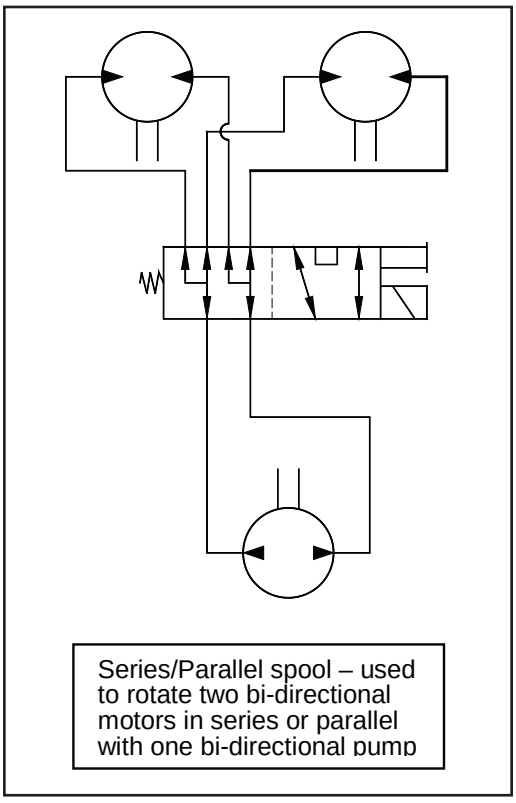
Selector spool – used to extend and retract two separate cylinders with one directional control



Selector spool – used to rotate two uni-directional motors individually



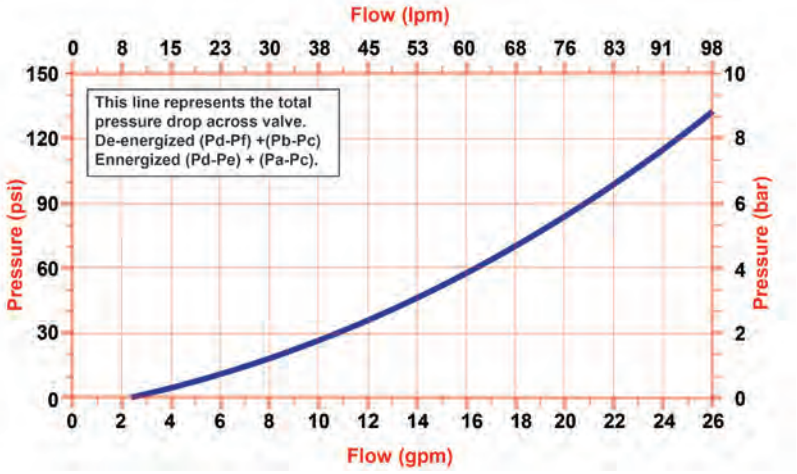
Series/Parallel spool – used to rotate two bi-directional motors in series or parallel with one directional control



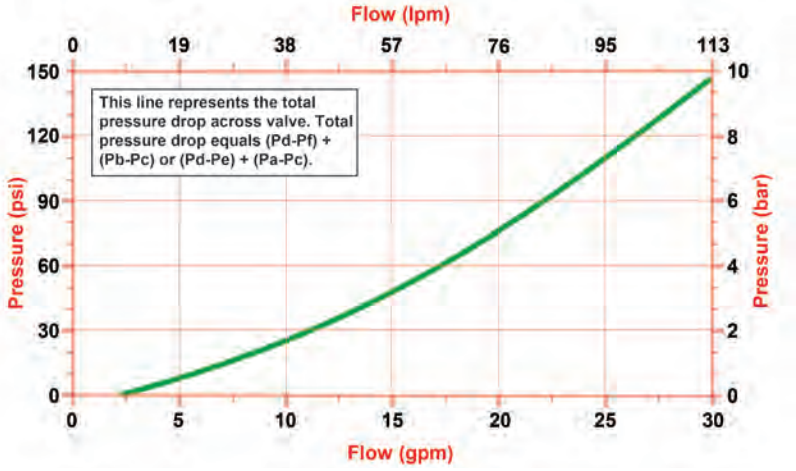
Series/Parallel spool – used to rotate two bi-directional motors in series or parallel with one bi-directional pump

DS – FLOW AND PRESSURE INFO:

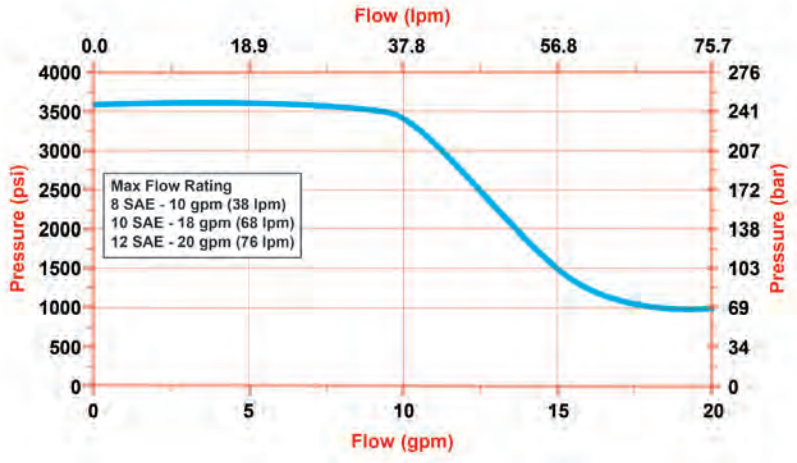
Pressure VS. Flow for Electric DS



Pressure VS. Flow for Manual/Pilot DS

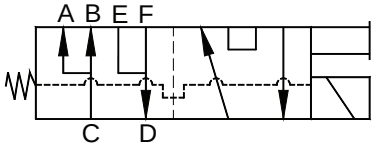


Closed Cross-over Maximum Performance for Electric DS

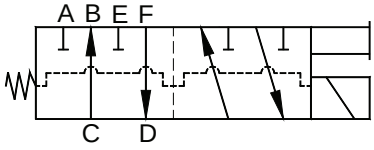


DS – SPOOL SCHEMATICS:

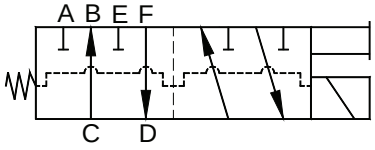
Spool schematics for "E" electric spool operator (transient position not shown)



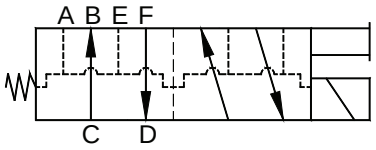
A - Series/Parallel



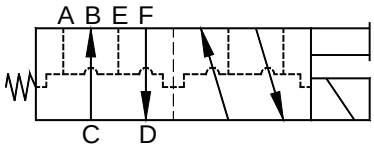
B - Selector spool with open cross-over transient position



C - Selector spool with closed cross-over transient position

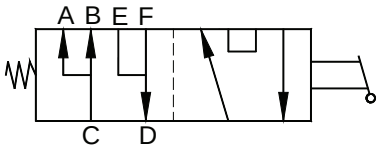


F - Selector spool with open cross-over transient position and unused ports open

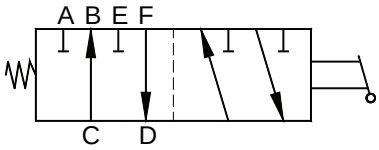


G - Selector spool with closed cross-over transient position and unused ports open

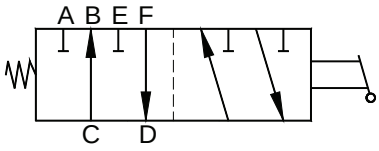
Spool schematics for "L" lever spool operator (transient position not shown)



A - Series/Parallel

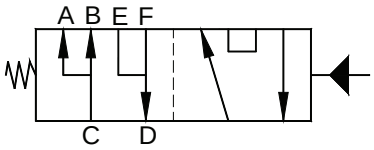


B - Selector spool with open cross-over transient position

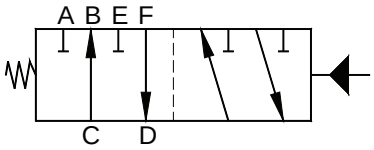


C - Selector spool with closed cross-over transient position

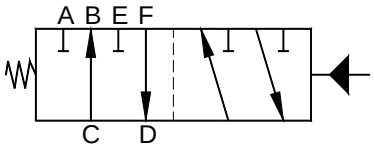
Spool schematics for "P" pilot spool operator (transient position not shown)



A - Series/Parallel

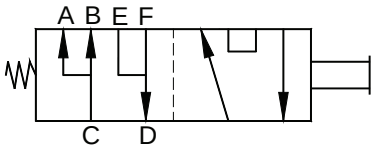


B - Selector spool with open cross-over transient position

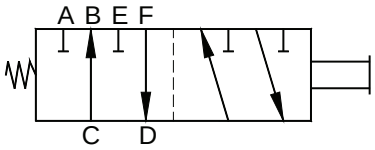


C - Selector spool with closed cross-over transient position

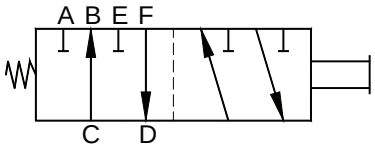
Spool schematics for "K" knob spool operator (transient position not shown)



A - Series/Parallel



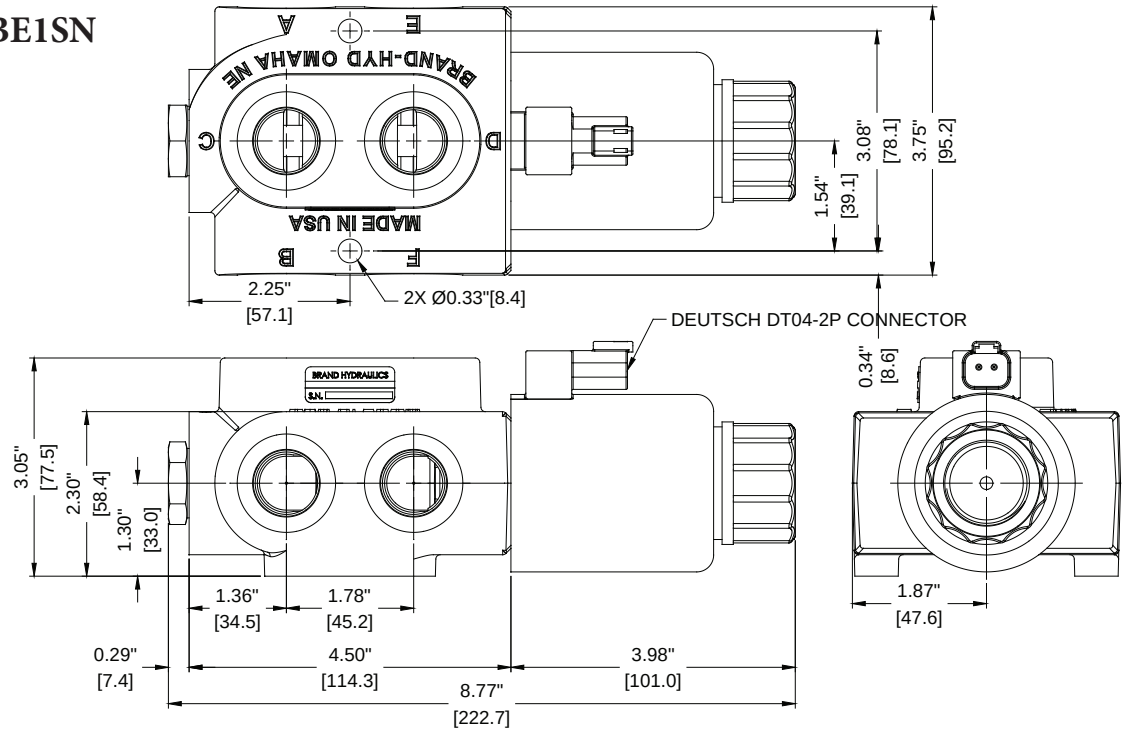
B - Selector spool with open cross-over transient position



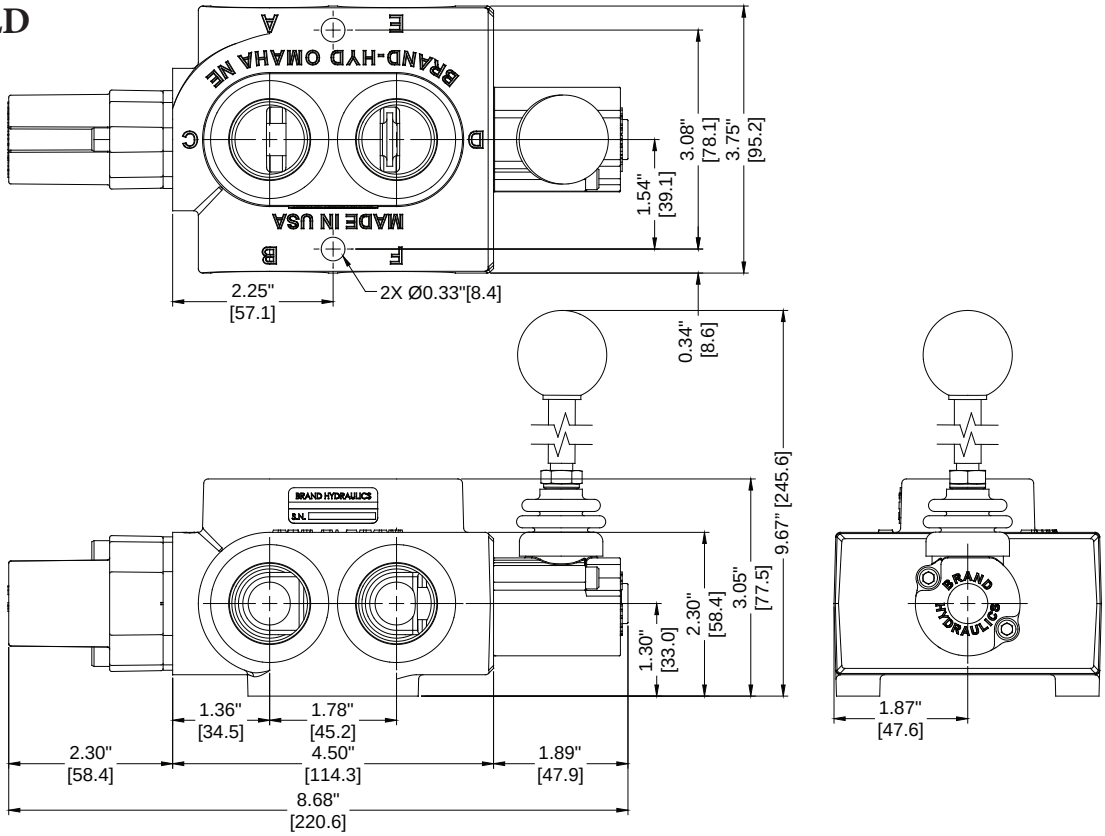
C - Selector spool with closed cross-over transient position

DS – DIMENSIONAL DATA (inches & [millimeters]):

DS10BE1SN



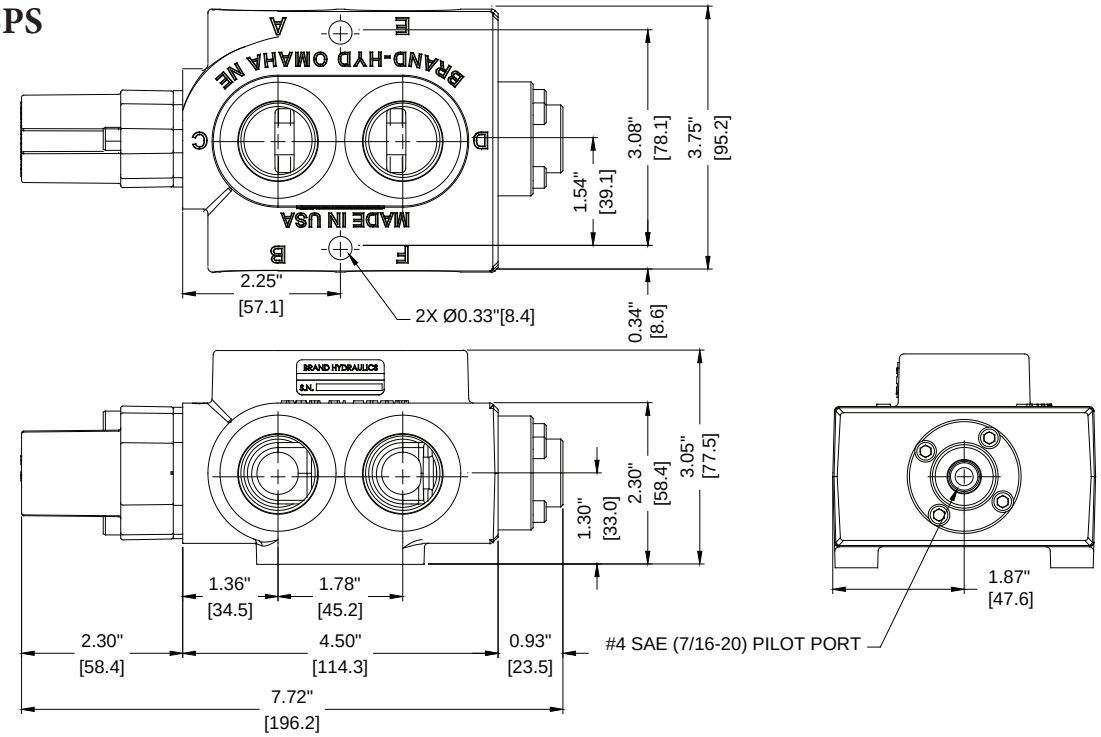
DS12BLD



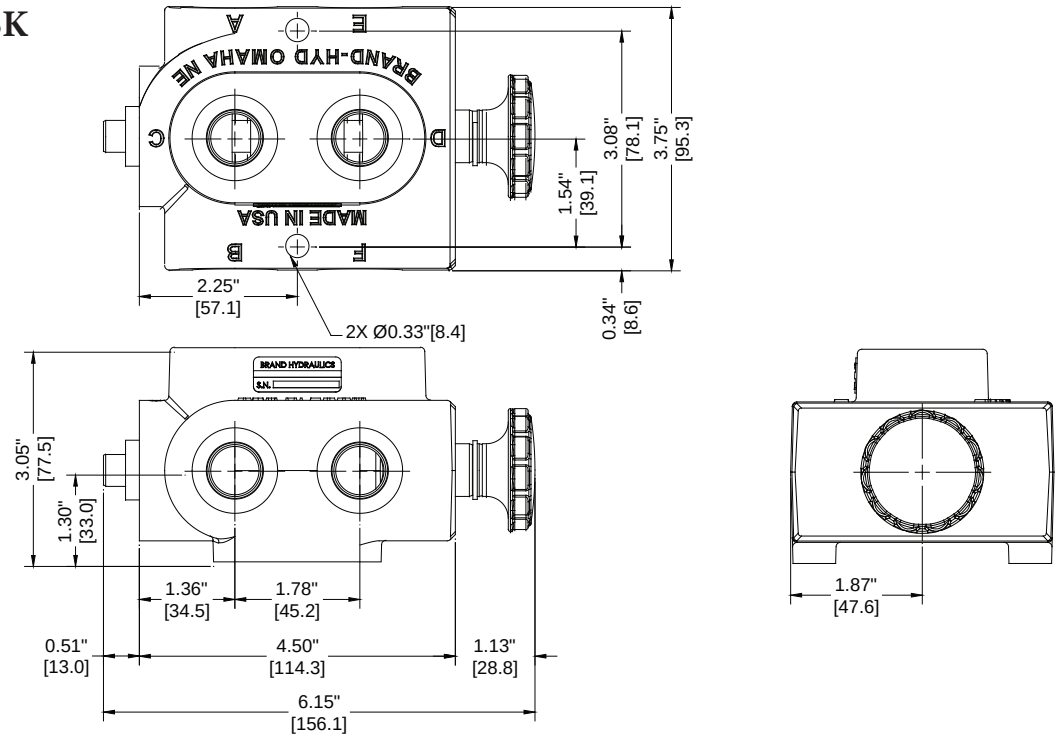
DS Electric, Pilot or Manual Double Selector Valve

DS – DIMENSIONAL DATA (inches & [millimeters]):

DS12BPS



DS08BK



BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

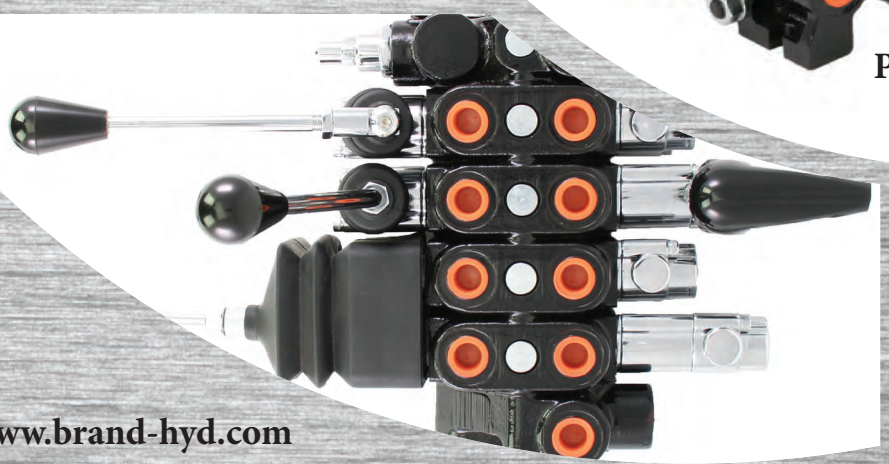
Series 20

Sectional Directional Control Valve

Specifications:

- 6 gpm Nominal Capacity.
- Pressure Ratings:
- 4500psi (301 bar), Parallel
- 3000psi (207 bar), Series
- 400 psi (27 bar) max tank pressure.
- 6 sections max (consult factory for more).
- 10-Micron Filtration Recommended.
- Assembly Torque = 85 inch-lbs.
- Weights: Inlet = 2.6 lbs. (1.2 kg).
- Work = 3.1 lbs. (1.4 kg).
  Outlet = 2.2 lbs. (1.0 kg).
- Port Size: #6SAE (9/16-18), All Ports

P20A000620



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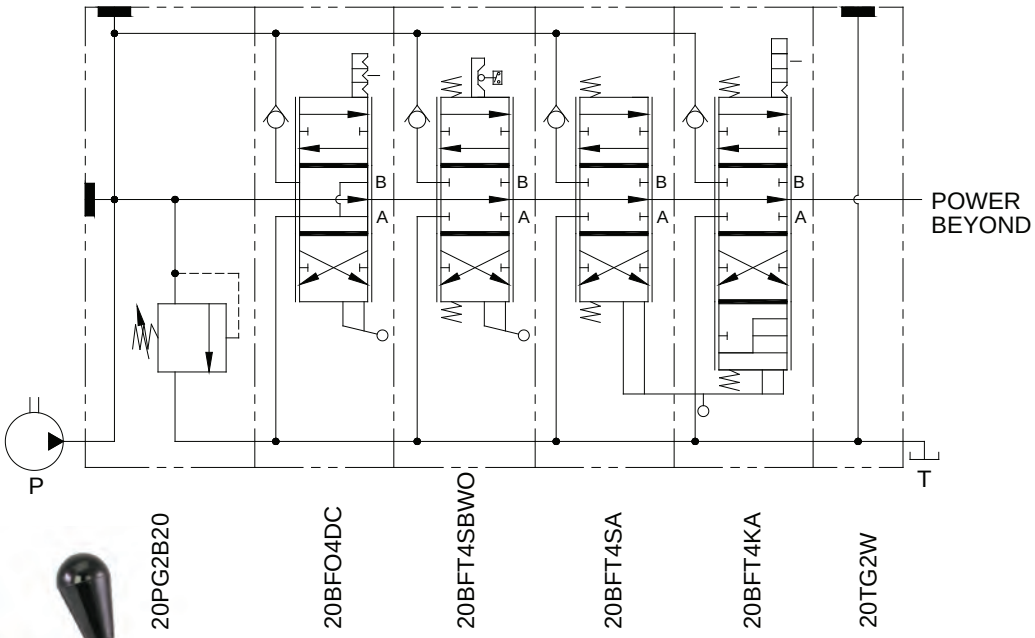
Series 20

Sectional Directional Control Valve



P20A000620

MATERIALS:

- Cast Iron Body.
- Iosso Chrome Plated Steel Spools
- Buna N O'Rings (standard).
- Stress Proof Tie Rods

FEATURES:

- O'RING PORTS to eliminate leakage.
- METERING SPOOLS provide smooth control of load.
- POWER BEYOND CAPABILITY to fit your multi-valve circuits.
- PRECISION GROUND IOSSO PLATED SPOOL that assure long life.
- DIAMOND HONED SPOOL BORES provide consistent spool fit with low leakage.
- ENCLOSED HANDLES increase handle rigidity and eliminate exposure to the elements.
- INDIVIDUAL LOAD CHECK built into each section to prevent the load from dropping when the spool is shifted.
- ALL SECTIONS & ASSEMBLIES ARE 100% TESTED including both internal & external leakage & flow tests.

SERIES 20 – GENERAL INFORMATION:

The Brand, Series 20 Sectional Directional Control Valves are assembled to meet our customer's requirements for up to six individual applications per assembly (consult factory for more sections). Brand Hydraulics does not charge anything extra for this process and assembly is priced solely on the overall sum of the prices of its components.

When assembled in their normal manner the series 20 spool sections are in parallel. When the spools are in neutral position, the flow passes by each spool and then onto the tank (outlet) port. If two or more spools are shifted simultaneously their work ports are in parallel. The oil flow will take the path of least resistance allowing lighter loads to move first. All spools are machined with metering chamfers, and have a high "handle vs. spool" movement ratio, resulting in good metering capability. Input flow can be divided among several circuits (spool sections) by feathering the spools.

INLETS –

Can be provided with no relief, or an adjustable high lift relief (B). Standard inlets are end ported (1) which is not field convertible. The other optional inlets are machined with end, top (2) and side (3) ports, these two options are field convertible to all three ports. Option (4) is similar to option (2) except it also has a relief drain port.

OUTLETS –

Are available end ported (1) which is not convertible to top or side porting. The other optional outlets are top (2) and side (3) porting; these two options are field convertible to all three ports. Options (2) and (3) are machined for power beyond and closed center cartridge. Specify (W) to receive the outlet assembled with power beyond cartridge. Specify (C) to receive the outlet assembled with closed center cartridge.

SPOOL TYPE –

Open Center four-way (**O**) connects ports A and B to tank in neutral. Tandem Center four-way (**T**) blocks port A and B in neutral. Tandem Center, three-way (**T3**) powers a cylinder in one direction. Please note that closed center four-way operation can be obtained by using a tandem center four-way spool and a closed center plug in the assembly's outlet section.

HANDLE OPTIONS –

- **Joystick handle** (**A**) is used to actuate two adjacent spool sections with one handle (use on any spool section).
- **B-style handle** (**B**) is assembled to the valve vertically.
- **C-style handle** (**C**) is assembled to the valve horizontally.

SPOOL ACTION –

- **Standard spring center** (**S**) returns the handle to neutral when the handle is released.
- **Standard three-position detent** (**D**) holds the spool in neutral and both active positions.
- **Spring center detent** (**SD** or **DS**) springs back to neutral from one position and is mechanically detented in the other direction.
- **Fourth-position float** (**K**) is similar to spring center except it has a fourth position that makes all ports common to each other (last spool section only).
- **Two-position detent** (**D2**) P to A only.
- **Two-position detent** (**2D**) P to B only.

OPTIONS -

Normally open electric switch (WO) used with spring center option only. Normally closed electric switch (WC) is used with spring center option only.

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

ACCESSORY ITEMS –

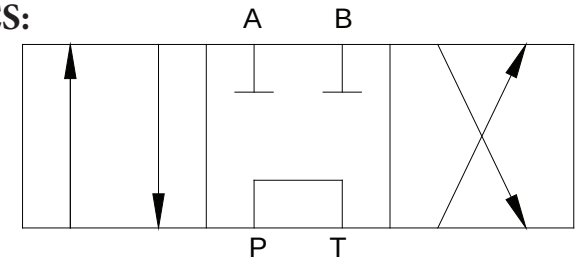
All standard tie rod kits contain rods, lock washers and hex nuts. Please be sure to note correct tie rod torque spec of 85 inch pounds.

Seal kits, power beyond kit, closed center kit and many other accessory items are available, please see the "SERIES 20 COMPLETE LIST OF OPTIONS AND ACCESSORIES" section of this catalog, for model codes and descriptions of these items.

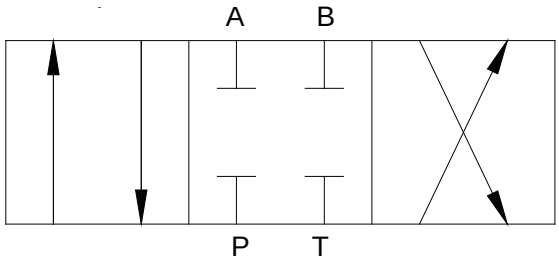
ASSEMBLY –

Model codes and list prices for complete assemblies will be issued by the factory, upon request of an authorized Brand Distributor. All model codes so issued become proprietary to the requesting distributor. Model codes so issued will not be descriptive in nature, but shall be of sequential numerical type. Individual sections and accessories can be purchased so that custom valve stacks may be assembled or modified outside the factory.

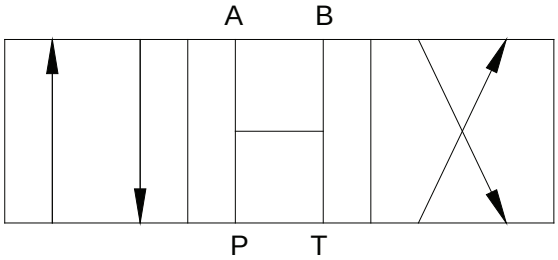
SPOOL SCHEMATICS:



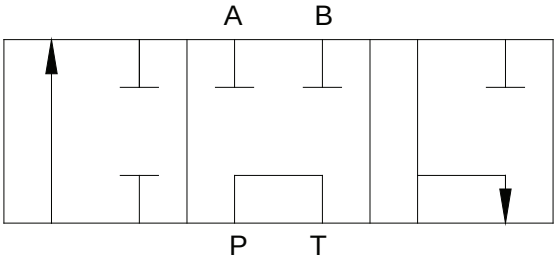
Tandem Center (T) - Powers cylinder or motor in both directions. Pump unloads to tank when spool is in neutral. Cylinder or motor blocked when spool in neutral.



Closed Center (C) - All ports are blocked in neutral. Blocks cylinder or motor in neutral. Required for use with pressure compensated pump.



Open Center (O) - All of the ports are connected to tank when the spool is in neutral. Allows cylinder to move or motor to rotate when spool is in neutral.



Tandem Three Way (T3) - Powers the cylinder in one direction. Pump unloads to tank when spool is in neutral, or when spool is being reversed. Cylinder is blocked when spool is in neutral. Port "B" is plugged.

Series 20 Sectional Directional Control Valve

SERIES 20 – CREATING A MODEL CODE FOR SERIES 20:
INLET SECTION: 20PG

PORTING:
1 – End port (not convertible)
2 – Top port (convertible to end or side port)
3 – Side port (convertible to top or end port)
4 – Top port with relief drain port (convertible to side or end port)

RELIEF SETTING:
15 - 1500 psi
20 - 2000 psi
ETC...

RELIEF:
OMIT – Not machined for relief
B – Adjustable high lift relief

SERIES 20 – CREATING A MODEL CODE FOR SERIES 20:
OUTLET SECTION: 20TG

PORTING:
1 – End port (not convertible)
2 – Top port (convertible to end or side port)
3 – Side port (convertible to top or end port)

OPTION:
OMIT – No options
W – Power beyond cartridge used with top port (2) call out
C – Closed center cartridge used with top port (2) call out

SERIES 20 – CREATING A MODEL CODE FOR SERIES 20 CONT…
WORK SECTION: 20 B F

PARALLEL/SERIES:
OMIT – Parallel
S – Series

SPOOL TYPE:
T – Tandem center
O – Open center

TYPE:
3 – Three-way (T spool only)
4 – Four-way

HANDLE OPTION:
A – Joystick assembly for adjacent spool sections
B – Vertical handle assembly
C – Horizontal handle assembly

SPOOL ACTION:
S – Spring center
D – Three-position detent
SD – Spring center (P to A) detent
DS – Detent / spring center (P to B)
K – Fourth position float / spring center (Last spool only)
D2 – Two-position detent P to A
2D – Two-position detent P to B

SERIES 20 – EXAMPLES OF COMMON MODEL CODES:

INLET SECTIONS

20PG1.....Inlet section plain, no relief, end ported.

20PG1B20.....Inlet section, end ported, and adjustable high lift relief set at 2000 psi.

OUTLET SECTIONS

20TG1.....Plain, end ported.

20TG2W.....Top ported outlet with power beyond cartridge, convertible to end ported.

WORK SECTIONS

20BFO4DC.....Open center, four-way, three-position detent, horizontal handle.

20BFT4SB.....Tandem center, four-way, spring to center, vertical handle.

HANDLE KITS

20HA.....Joystick handle, used to shift two adjacent spools.

20HB.....Standard enclosed handle kit, handle is in vertical position.

20HC.....Optional enclosed handle kit, handle is in horizontal position.

TIE ROD KITS

20TR1.....Tie rod kit for valve stack containing a standard inlet, outlet and one spool section.

20TR2.....Tie rod kit for valve stack containing a standard inlet, outlet and two spool sections.

STANDARD ASSEMBLY MODEL CODES:

20A1.....Single spool assembly, tandem center four-way, spring to center action, no relief and with B style handle assembly. End ported inlet and outlet.

20AB1.....Same as above but with an adjustable high lift relief added and set at 2000 psi.

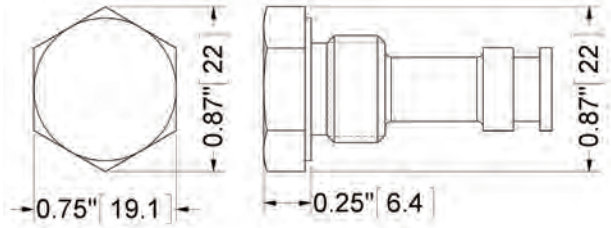
20A2.....Two spool assembly, tandem center four-way, spring to center action, no relief, and with B-style handle assemblies. End ported inlet and outlet.

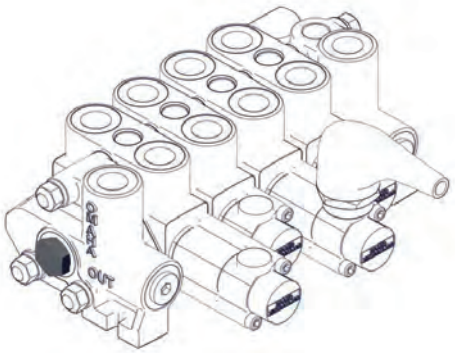
20AB2.....Same as above but with an adjustable high lift relief added and set at 2000 psi

Standard assemblies are available with up to 6 spool sections using the model code format outlined above for the one and two spool assemblies.

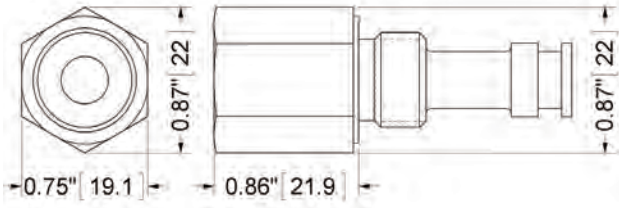
SERIES 20 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

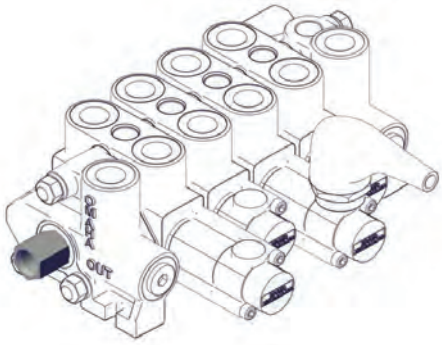
20-AGCC……..…..Closed center plug kit, for outlet sections with porting 2 in their model code.
(Cannot be used with power beyon



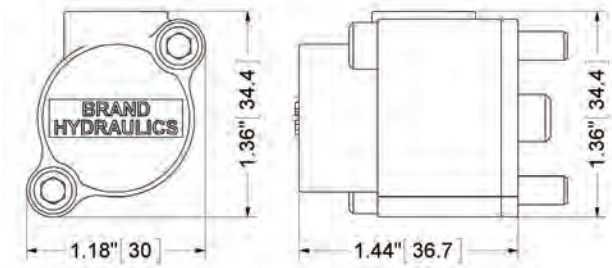


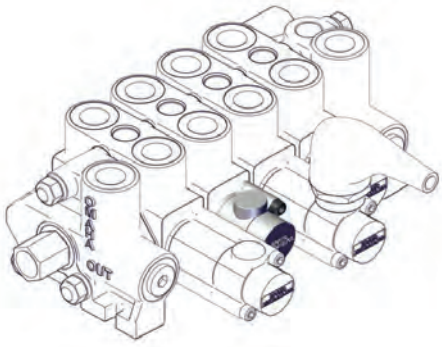
20-AGPB……...…..Power beyond cartridge kit, for outlet sections with porting 2 in their model code.





20-D……...…....Three-position detent kit.
20-D2……...…….....Two-position detent kit, P to A and neutral.
20-2D……...….....Two-position detent kit, P to B and neutral.
20-S……....Spring to center kit.



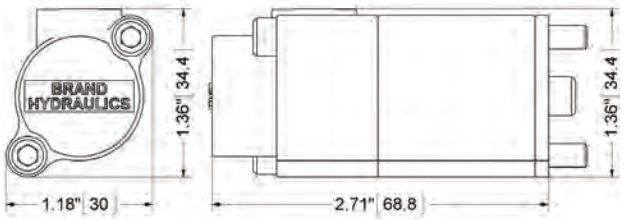


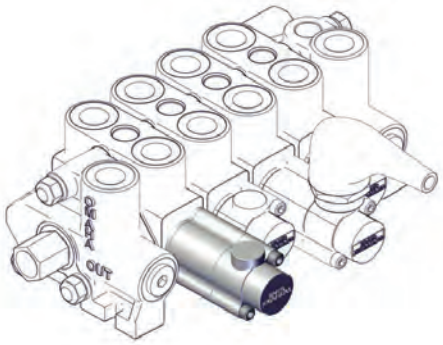
External dimensions are the same for all kits listed above.

20-DS……..…...Spool is detented in one work position (P to A), and springs to center (P to B) from the other.

20-SD……..……...Spool springs to center in one work position (P to A), and detented (P to B) in other position.

20-K……...…....Fourth position float kit, use on last spool section in assembly only.

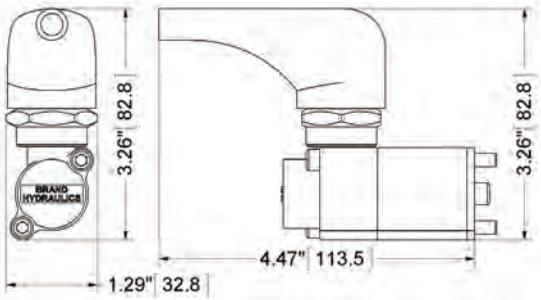


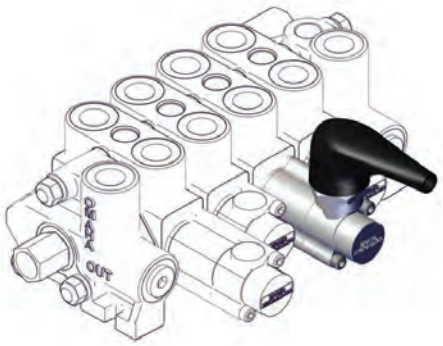


External dimensions are the same for all kits listed above.

20-SWC……..……Spring to center kit with normally closed electric switch.

20-SWO……..Spring to center kit with normally open electric switch.



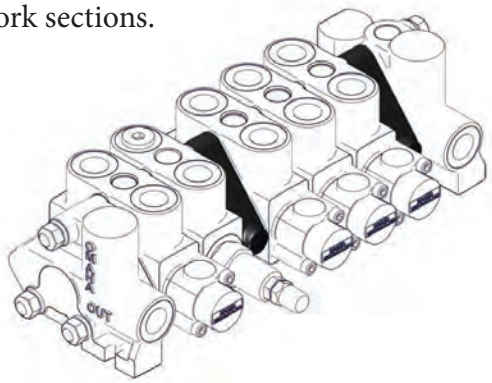


External dimensions are the same for all kits listed above.

20ASB…….....Series block allows the customer to meter multiple work sections independently without losing fluid to tank core. The down side to this section is that pressures are additive and pressure rating of valve is reduced to 3000 psi (207 bar) because the tank core is seeing system pressure. This section must be installed between two spool sections to put them in series. (0.656" [16.7mm] casting width) Note: Adjacent work section towards Inlet must have Series call out in model code. Joystick ("A" option) cannot be used when 20ASB is used between two adjacent work sections. Inlet section with relief ("B"option) must have porting option"4"

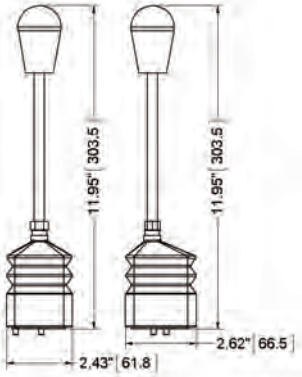
SERIES 20 – COMPLETE LIST OF OPTIONS AND ACCESSORIES: *(continued)*

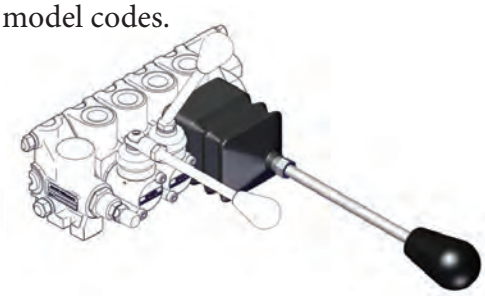
20ASP.....Series/Parallel block (also referred to as a tandem flow or priority valve) allows the customer to meter multiple work sections independently. The neutral flow path is in parallel but the pressure core is in series. Tank fluid is not combined to neutral flow passage. Upstream section has priority when shifting multiple sections. Pressures are not additive. The pressure rating remains at 4500 psi (301 bar) since the tank cores are not pressurized. This spool section must be installed between two spool sections to put them in series/parallel. (0.656" [16.7mm] casting width) Note: Joystick ("A" option) cannot be used when 20ASP is used between two adjacent work sections.



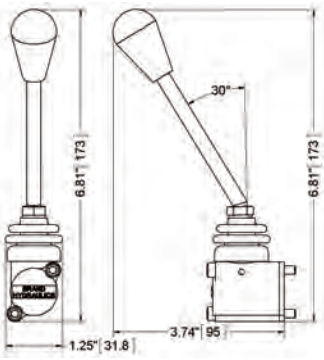
External dimensions are the same for all kits listed above.

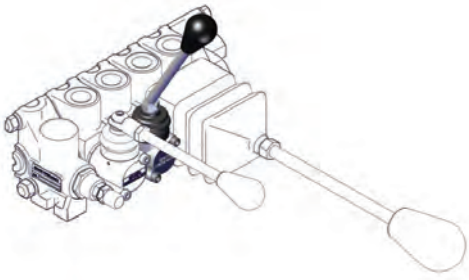
20HA.....Joystick handle kit for series 20, note, this kit may only be used on two adjacent spool sections in a valve assembly, and both of these two sections must have the (A) actuator call out in their model codes.



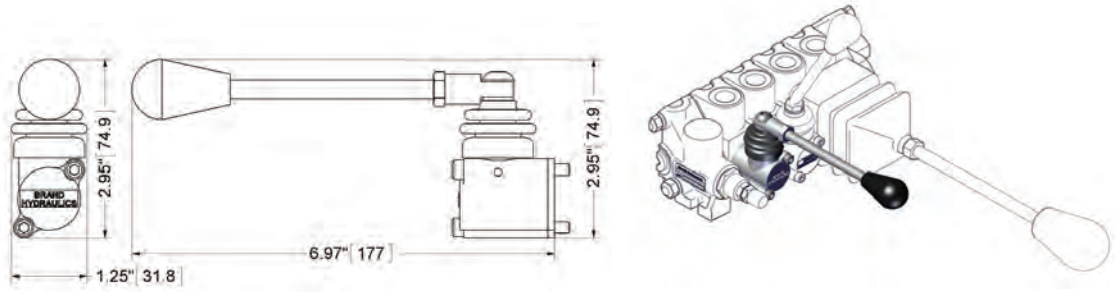


20HB.....B-style handle kit, with bent handle, use on spool sections with (B) handle call out.





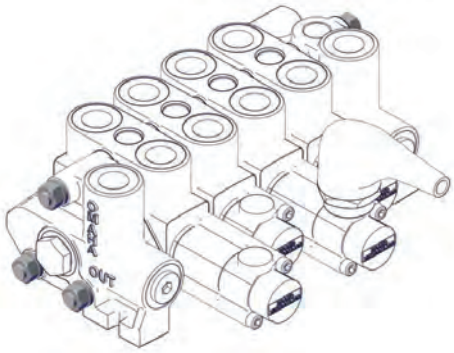
20HC……..…….....C-style handle kit, with straight handle, use on spool sections with (C) handle call out.



20HB-K……..…..Replacement handle kit which includes ball knob, bent handle and jam nut.

20HC-K……..…..Replacement handle kit which includes ball knob, straight handle, jam nut, link age and cap screw.

20TR……..…....Tie rod kits, specify number of spool sections in valve assembly, i.e. 3 spool sections in valve assembly, requires using 20TR3 tie rod kit. Please note that when using extra items in the assembly, such as series blocks, drain blocks etc., the tie rod kit must have its length extended.



External dimensions are the same for all kits listed above.

Seal Kits:

20AK……..Replacement seal kit for work section.

20BK……..Seal kit, contains seals for use in between work sections.

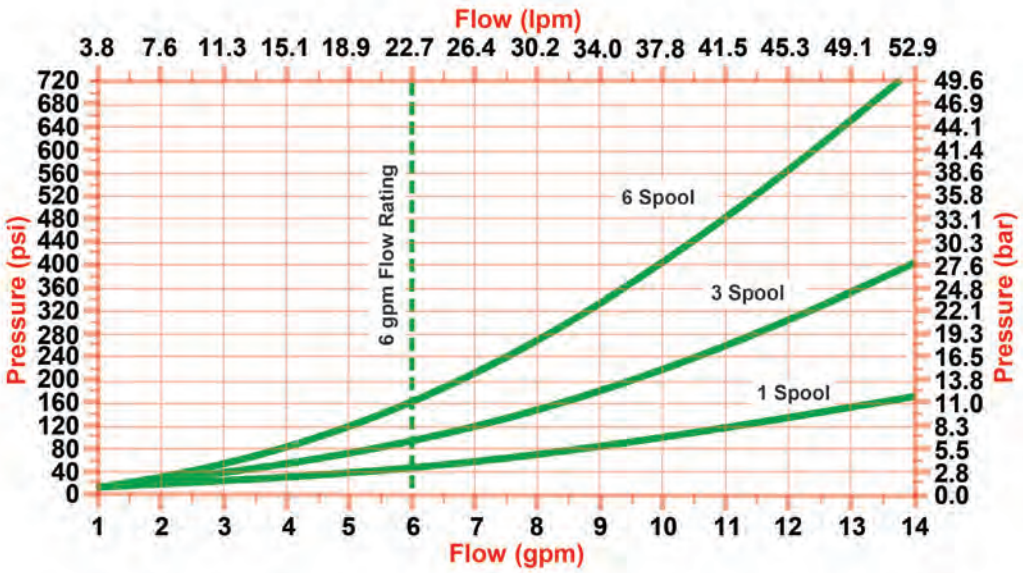
20CK……..…....Replacement seal kit for inlet section.

20DK……...…...Replacement seal kit for outlet sections.

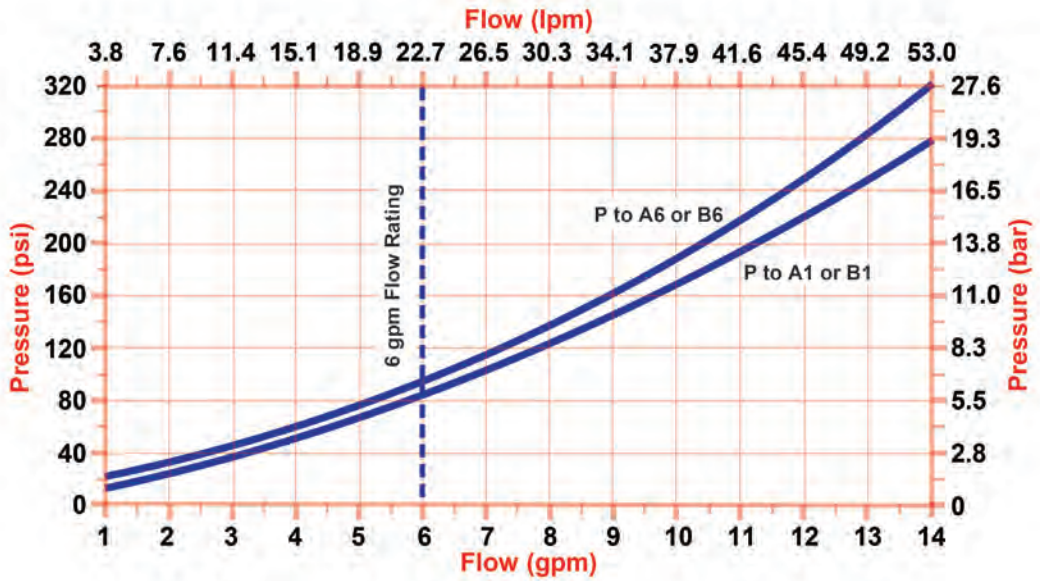
Please feel free to contact the factory with your ideas regarding custom options or accessories, we will be happy to review them to see if they can be put into production for your assemblies.

SERIES 20 – FLOW AND PRESSURE INFO:

Neutral Flow Pressure Drop

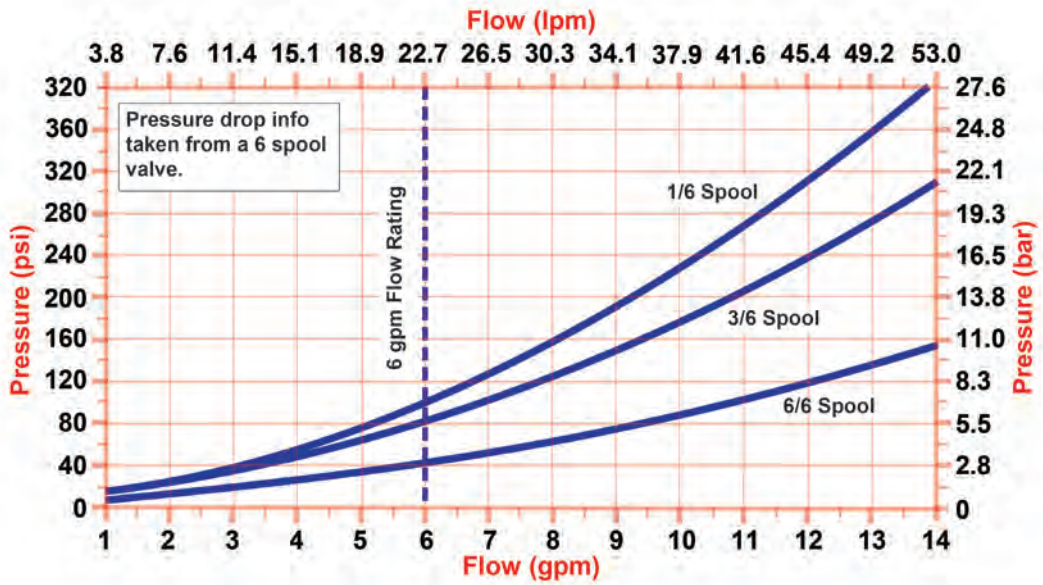


Pressure Drop VS. Flow for P to A or B

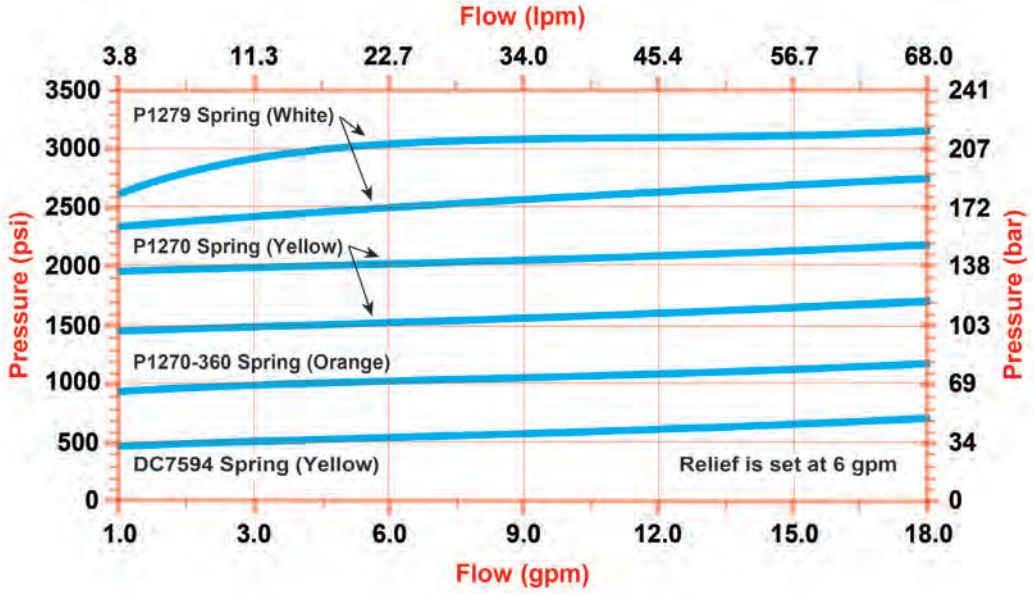


SERIES 20 – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for A or B to T

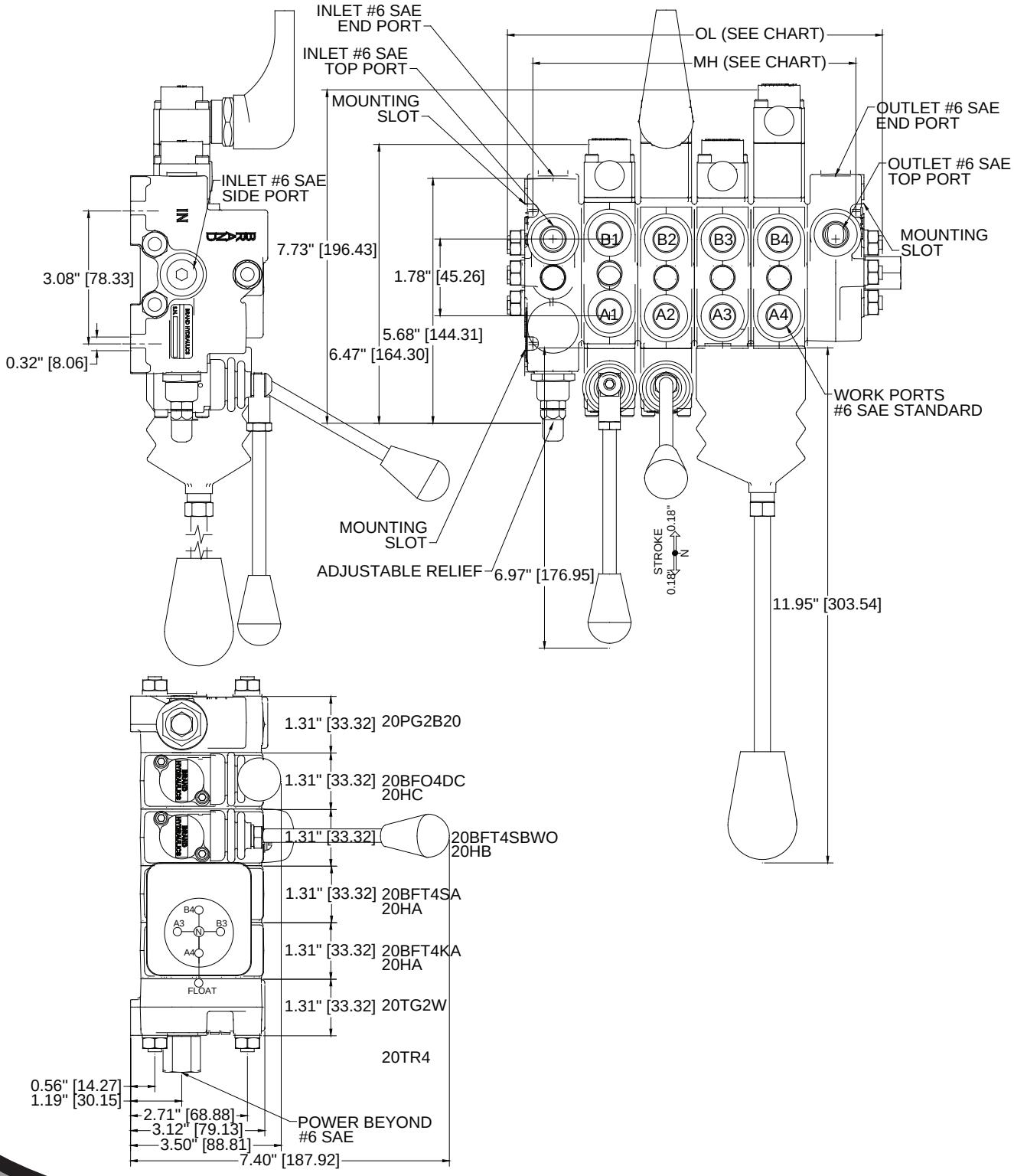


Pressure VS. Flow for S20 Inlet Relief



Series 20 Sectional Directional Control Valve

DIMENSIONAL DATA: inches & [millimeters]



VALVE ASSEMBLY ARRANGEMENT:		PRICE
(P)	P20A (Painted black)	
(MP)	MP20A (Epoxy coating)	
	20A	
INLET	20PG	
SPOOL #1	20BF	
SPOOL #2	20BF	
SPOOL #3	20BF	
SPOOL #4	20BF	
SPOOL #5	20BF	
SPOOL #6	20BF	
SPOOL #7	20BF	
SPOOL #8	20BF	
SPOOL #9	20BF	
SPOOL #10	20BF	
SPOOL #11	20BF	
SPOOL #12	20BF	
OUTLET	20TG	
MISC.		
TIE ROD	20TR	
(Torque to 85 inch lbs)		
HANDLES	20H_____QNTY._____PRICE_____ =	$_____
ASSEMBLY	20A_____LIST	$_____

DISTRIBUTOR:_____

NAME:_____

EMAIL:_____ **PHONE:**_____

ADDRESS:_____

CITY:_____ **STATE:**_____ **ZIP:**_____ **DATE:**_____

BRAND HYDRAULICS Co.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

Series 21

Direct Acting Solenoid Operated
Stackable Directional
Control Valve

P21A00020

Specifications:

- 6 gpm Nominal Capacity.
- Pressure Ratings:
- 4000psi (272 bar), Parallel
- 3000psi (204 bar), Series
- 400 psi (27 bar) max tank pressure.
- 6 sections max.
- 10 Micron Filtration Recommended.
- Assembly Torque = 85 inch-lbs. (9.6 N m)
- Spool Leakage = Less than 1.5 - 2.0 in3 (25 - 33 cc) at 1000 psi. (69 bar) per minute.
- Weight -Inlet = 2.6 lbs. (1.2 kg).
  -Work section = 4.4 lbs. (2.0 kg).
  -Outlet = 2.2 lbs. (1.0 kg).
- Port Sizes -Inlet/outlet #6SAE (9/16-18).
  -Work Ports #6SAE (9/16-18).
  -Power Beyond #6SAE (9/16-18).

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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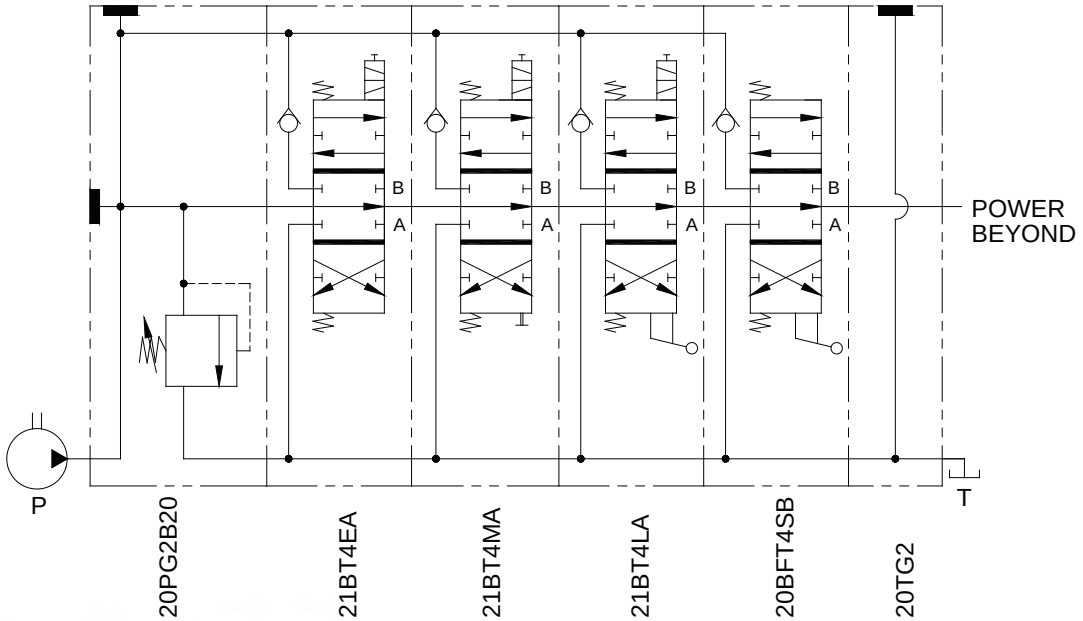
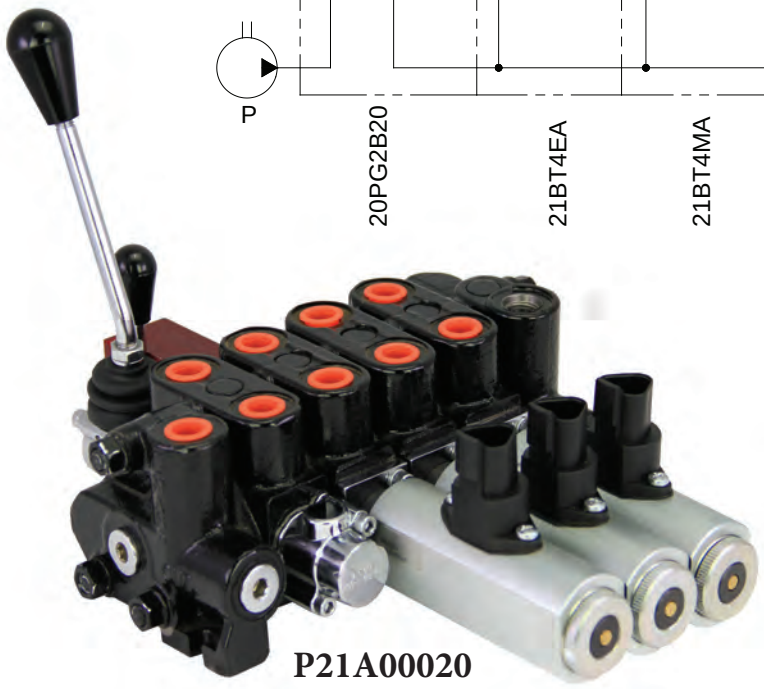
Series 21

Direct Acting Solenoid Operated
Stackable Directional Control Valve





P21A00020

MATERIALS:

- Cast Iron Body.
- Buna N O'Rings (standard).
- Stress Proof Tie Rods

FEATURES:

- O'RING PORTS to eliminate leakage.
- POWER BEYOND CAPABILITY to fit your multi-valve circuits.
- PRECISION HONED SPOOL BORE provides consistent spool fit with low leakage.
- ENCLOSED SOLENOIDS & CONNECTIONS eliminate exposure to the elements.
- INDIVIDUAL LOAD CHECK built into each section to prevent the load from dropping when the spool is shifted.
- ALL SECTIONS & ASSEMBLIES ARE 100% TESTED including both internal & external leakage & flow tests.
- OPTIONAL LEVER HANDLES for manual control when power is lost.
- COMBINABLE WITH SERIES 20 MANUAL VALVE for increased versatility.

SERIES 21 – GENERAL INFORMATION:

The Brand, Series 21 Direct Acting Solenoid Operated Stackable Directional Control Valves are assembled to meet our customer's requirements for up to six individual applications per assembly. Brand Hydraulics does not charge anything extra for this process, an assembly is priced solely on the overall sum of the prices of its components.

When assembled in their normal manner the Series 21 spool sections are in parallel. When the spools are in the neutral position flow passes by each spool and then onto the tank (outlet) port. If two or more spools are shifted simultaneously their work ports are in parallel. The oil flow will take the path of least resistance allowing lighter loads to move first.

INLETS –

Can be provided with no relief, or an adjustable high lift relief (B). Standard inlets are end ported (1) which is not field convertible. The other optional inlets are machined with end, top (2) and side (3) ports, these two options are field convertible to all three ports. Option (4) is similar to option (2) except it also has a relief drain port.

OUTLETS –

Are available end ported (1) which is not convertible to top or side porting. The other optional outlets are top (2) and side (3) ported, these two options are field convertible to all three ports. Options (2) and (3) are machined for power beyond and closed center cartridge. Specify (W) to receive the outlet assembled with power beyond cartridge. Specify (C) to receive the outlet assembled with closed center cartridge.

WORK SECTIONS:

Note: Series 21 work sections can be combined with series 20 work sections on the same stack. (See series 20 literature for ordering information)

SPOOL TYPE –

Open Center four-way (**O4**) connects ports A and B to tank in neutral. Tandem Center four-way (**T4**) blocks port A and B in neutral. Tandem Center, three-way (**T3**) powers a cylinder in one direction. Please note that closed center four-way operation can be obtained by using a tandem center four-way spool and a closed center plug in the assembly's outlet section.

HANDLE OPTIONS –

- **Option** (**E**) specifies electric control only.
- **Option** (**L**) specifies electric control with manual lever override for use when power is unavailable. Please note the lever does not shift when valve's spool is shifted electrically.
- **Option** (**M**) specifies electric control and push pin style manual override. This option also allows the customer to shift the spool when power is unavailable.

Series 21

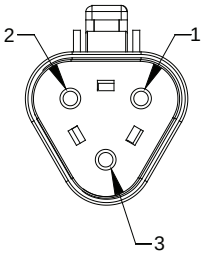
Direct Acting Solenoid Operated
Stackable Directional Control Valve

VOLTAGE & COIL TERMINAL –

Option (A) is 12 Volt DC with DEUTSCH DT04-3P connector. Option (AF) is 12 volt DC with mating DEUTSCH connector and flying leads. Option (B) is 24 Volt DC with DIN 43650 connector. Option (BF) is 24 Volt DC with mating DIN connector and flying leads.

ELECTRICAL SPECIFICATIONS

- Coil voltage: 12 or 24 VDC
- Duty cycle: 100%
- Coil power: 31 W at 68 ˚F [20 ˚C]
- Elect. connection: -IP 67 with connector
  -IP 50 without connector



CONNECTOR SCHEME FOR
BRAND PART NUMBER - E2287
(DEUTSCH DT06-3S)

1. P TO B (B+)(BLUE)
2. P TO A (A+)(RED)
3. GROUND (C-)(BLACK)

Connector includes wire leads.

ACCESSORY ITEMS – All standard tie rod kits contain rods, lock washers and hex nuts. Please be sure to note correct tie rod torque spec of 85 inch pounds (9.6 N m).

Seal kits, power beyond kit, closed center kit and other accessory items are available; please see the "SERIES 21 COMPLETE LIST OF OPTIONS AND ACCESSORIES" section of this catalog, for model codes and descriptions of these items.

SERIES 21 – GENERAL INFORMATION CONT…

ASSEMBLY – Model codes and list prices for complete assemblies will be issued by the factory, upon request of an authorized Brand Distributor. All model codes so issued become proprietary to the requesting distributor. Model codes so issued will not be descriptive in nature, but shall be of sequential numerical type. Individual sections and accessories can be purchased so that custom valve stacks may be assembled or modified outside the factory.

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

SERIES 21 – CREATING A MODEL CODE FOR SERIES 21:
INLET SECTION: 20PG

PORTING:
1 – End port (not convertible)
2 – Top port (convertible to end or side port)
3 – Side port (convertible to top or end port)
4 – Top port with relief drain port (convertible to side or end port)

RELIEF SETTING:
15 - 1500 psi
20 - 2000 psi
ETC...

RELIEF:
OMIT – Not machined for relief
B – Adjustable high lift relief

SERIES 21 – CREATING A MODEL CODE FOR SERIES 21:
WORK SECTION: 20TG

PORTING:
1 – End port (not convertible)
2 – Top port (convertible to end or side port)
3 – Side port (convertible to top or end port)

OPTION:
OMIT – No options
W – Power beyond cartridge used with top port (2) call out
C – Closed center cartridge used with top port (2) call out

SERIES 21 – CREATING A MODEL CODE FOR SERIES 21:
OUTLET SECTION: 21B

SPOOL TYPE:
T4 – Tandem four-way
T3 – Tandem three-way
O4 – Open four-way

HANDLE OPTION:
E – Electric control only
L – Lever control and electric control
M – Push pin style manual override and electric control

VOLTAGE & COIL TERMINAL:
A – 12 VDC Coil with DT04-3P connector
AF – 12 VDC Coil with mating DEUTSCH connector and flying leads
B – 24 VDC Coil with DIN 43650 connector
BF –24 VDC Coil with with mating DIN connector and flying leads

Series 21

Direct Acting Solenoid Operated
Stackable Directional Control Valve

MANUAL WORK SECTION:

20 B F

PARALLEL/SERIES:
OMIT – Parallel
S – Series

SPOOL TYPE:
T – Tandem center
O – Open center

TYPE:
3 – Three-way (T spool only)
4 – Four-way

OPTIONS:
WO – Normal open electric switch (Spring center only)
WC – Normal closed electric switch (Spring center only)

HANDLE OPTION:
A – Joystick assembly for adjacent spool sections
B – Vertical handle assembly
C – Horizontal handle assembly

SPOOL ACTION:
S – Spring center
D – Three-position detent
SD – Spring center (P to A) detent
DS – Detent / spring center (P to B)
K – Fourth position float / spring center (Last spool only)
D2 – Two-position detent P to A
2D – Two-position detent P to B

**Note: Series 21 work sections can be combined with series 20 work sections on the same stack.

SERIES 20 – EXAMPLES OF COMMON MODEL CODES:

INLET SECTIONS

20PG1.....Inlet section plain, no relief, end ported.
20PG1B20.....Inlet section, end ported, and adjustable high lift relief set at 2000 psi.

OUTLET SECTIONS

20TG1.....Plain, end ported.
20TG2W.....Top ported outlet with power beyond cartridge, convertible to end ported.

WORK SECTIONS

21BO4EA.....Open center, four-way, spring to center and 12 volt DC coil.
21BT4EA.....Tandem center, four-way, spring to center and 12 volt DC coil.
21BT4LA.....Tandem center, four-way, spring to center, manual lever override and 12 volt DC coil.

SERIES 20 – EXAMPLES OF COMMON MODEL CODES:

21BT4MAF……..……Tandem center, four-way, spring to center, push pin style manual override, 12 volt DC coil and DEUTSCH DT06-3S connector with 13" wire leads.

21BO4MA……..……..Pilot operated double lock valves, open center, four-way, spring to center, push pin style manual override and 12 volt DC coil with DEUTSCH DT04-3P connector.

TIE ROD KITS

20TR1…….....Tie rod kit for valve stack containing a standard inlet, outlet and one spool section.

20TR2…….....Tie rod kit for valve stack containing a standard inlet, outlet and two spool sections.

STANDARD ASSEMBLY MODEL CODES:

21A1……..….....Single spool assembly, tandem center four-way, spring to center action, no relief 12 Volt DC Solenoid. End ported inlet and outlet.

21AB1…….....Same as above but with an adjustable spring relief added and set at 2000 psi.

21A2……...…….....Two spool assembly, tandem center four-way, spring to center action, no relief, and with 12 Volt DC Solenoid. End ported inlet and outlet.

21AB2…...…….....Same as above but with an adjustable spring relief added and set at 2000 psi

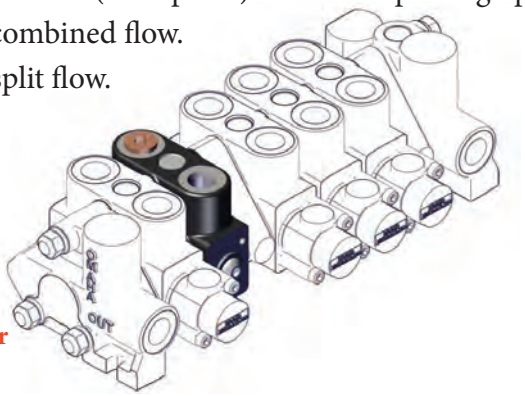
Standard assemblies are available with up to 6 spool sections using the model code format outlined above for the one and two spool assemblies.

SERIES 20 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

20ASB…….Series block allows the customer to shift multiple work sections independently without losing fluid to the tank core. The down side to this section is that pressures are additive and the pressure rating of valve is reduced to 3000 psi (207 bar) because the tank core is seeing system pressure. This section must be installed between two spool sections to put them in series. (0.656" [16.7mm] casting width) Note: Inlet section with relief ("B" option) must have porting option"4"

20BFMIC……...Mid-inlet combined flow.

20BFMIS……...Mid-inlet split flow.



External dimensions are the same for all kits listed above.

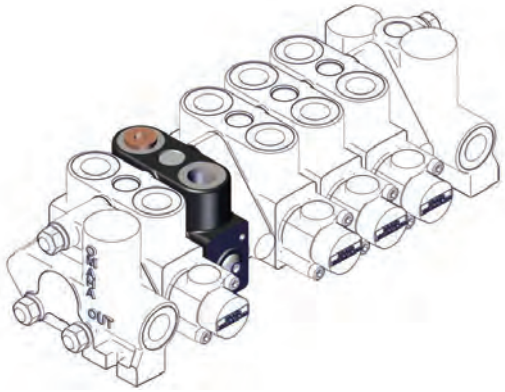
Series 21

Direct Acting Solenoid Operated
Stackable Directional Control Valve

SERIES 20 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

20BFMICB_.....Mid-inlet combined flow with relief. Order as per example: 20BFMICB25 – Mid-inlet combined flow with 2500 psi relief setting. Relief is set in 100 psi increments.

20BFMISB_.....Mid-inlet split flow with relief. Order as per example: 20BFMISB25 – Mid-inlet split flow with 2500 psi relief setting. Relief is set in 100 psi increments.



External dimensions are the same for all kits listed above.

20TR_…….....Tie rod kits, specify number of spool sections in valve assembly, i.e. 3 spool sections in valve assembly, requires using 20TR3 tie rod kit. Please note that when using extra items in the assembly, such as series blocks, drain blocks etc., the tie rod kit must have its length extended.

Seal Kits:

21AK……....Replacement seal kit for work section.

21BK……Seal kit, contains seals for use in between work sections.

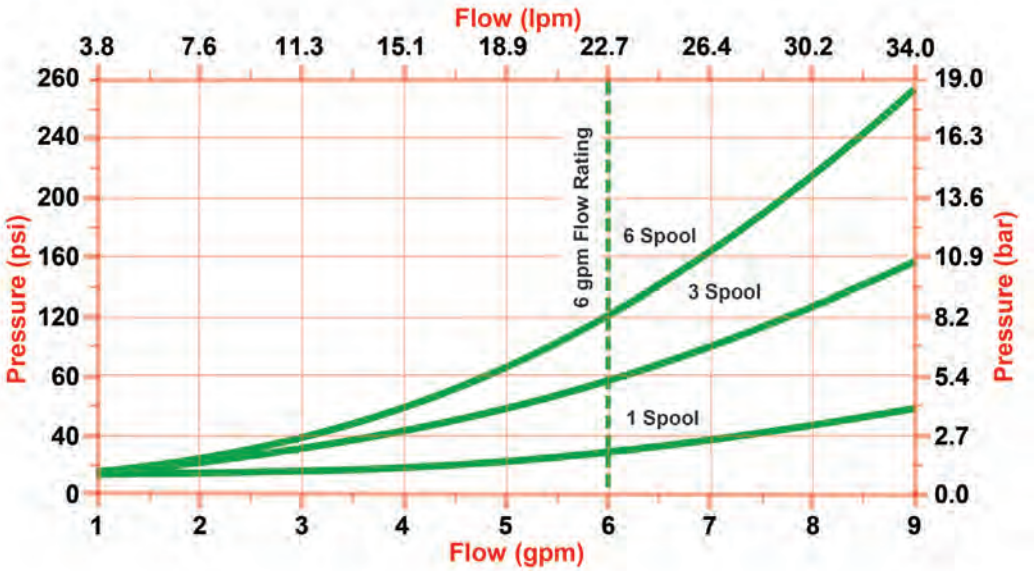
20CK……...….Replacement seal kit for inlet section.

20DK……...…….Replacement seal kit for outlet sections.

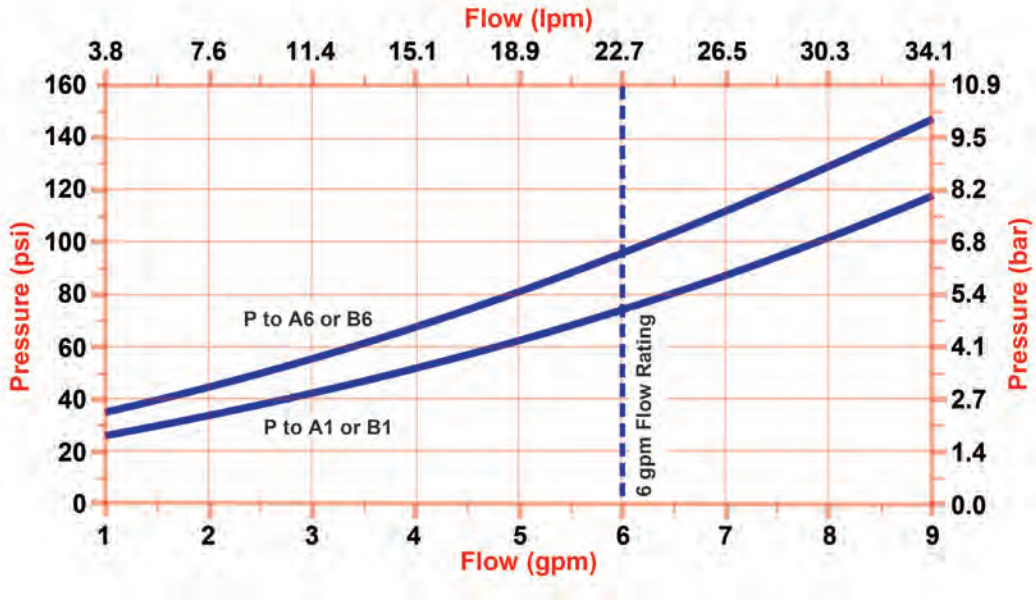
Please feel free to contact the factory with your ideas regarding custom options or accessories, we will be happy to review them to see if they can be put into production for your assemblies.

SERIES 21 – FLOW AND PRESSURE INFO:

Neutral Flow Pressure Drop

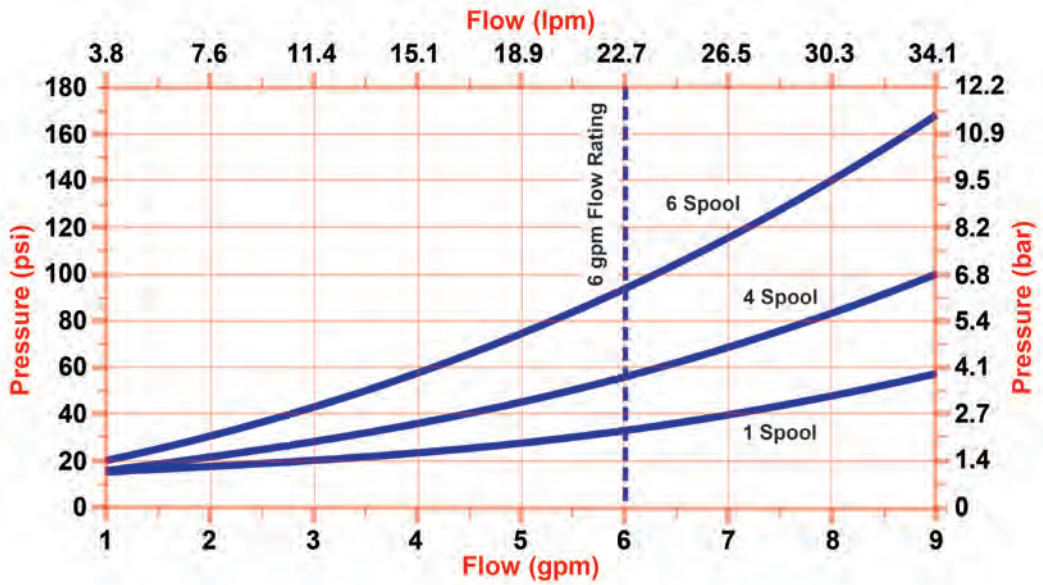


Pressure Drop VS. Flow for P to A or B

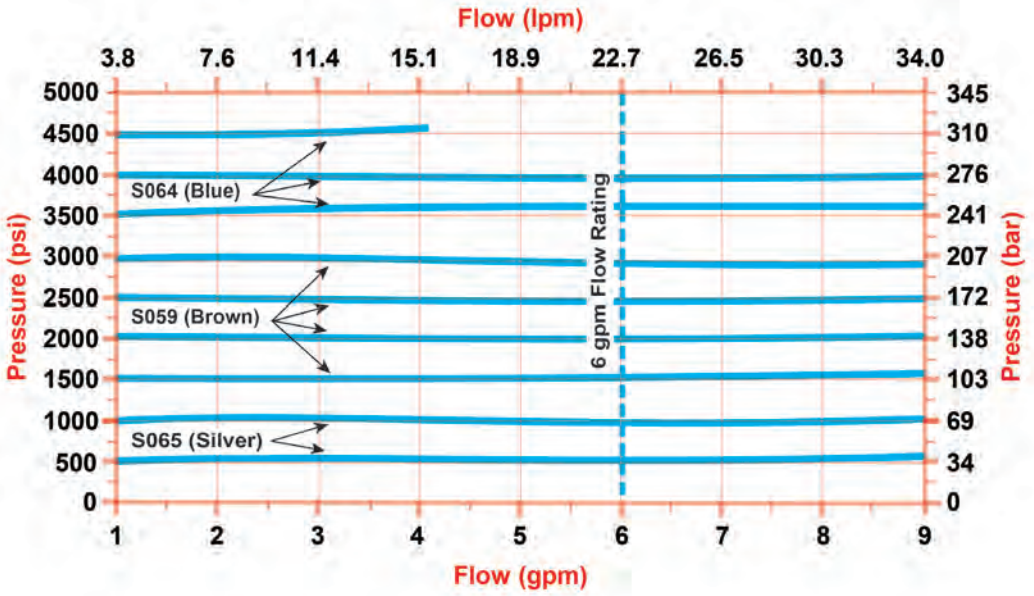


SERIES 21 – FLOW AND PRESSURE INFO:

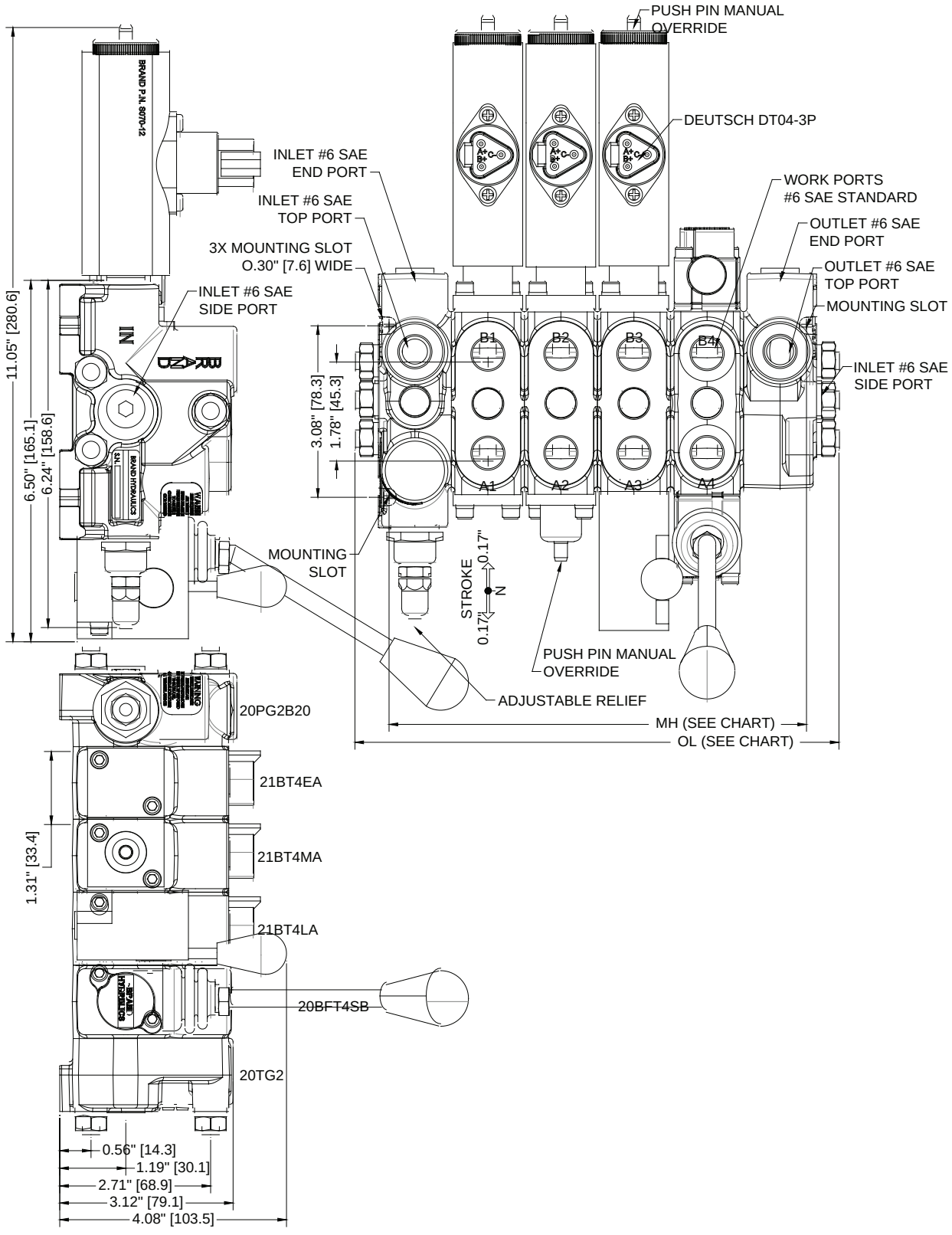
Pressure Drop VS. Flow for A or B to T



Pressure VS. Flow for S21 Inlet Relief



DIMENSIONAL DATA: inches & [millimeters]



Series 21

Direct Acting Solenoid Operated
Stackable Directional Control Valve

VALVE ASSEMBLY ARRANGEMENT: **PRICE**

(P)	P21A (Painted black) _____	
(MP)	MP21A (Epoxy coating) _____	
	21A _____	
INLET	20PG _____	
SPOOL #1	21B _____	
SPOOL #2	21B _____	
SPOOL #3	21B _____	
SPOOL #4	21B _____	
SPOOL #5	21B _____	
SPOOL #6	21B _____	
OUTLET	20TG _____	
MISC.	_____	
TIE ROD	20TR _____	
(Torque to 85 inch lbs)		
ASSEMBLY	21A _____ LIST	$_____

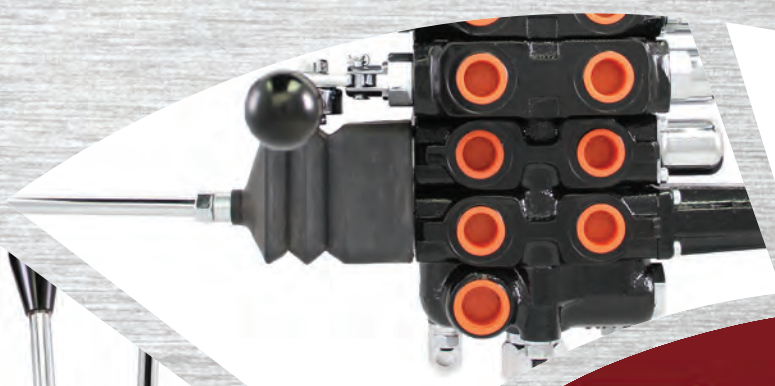
DISTRIBUTOR:_____

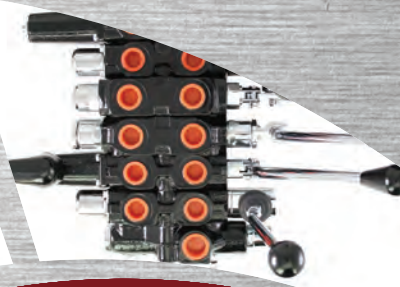
NAME:_____

EMAIL:_____ **PHONE:**_____

ADDRESS:_____

CITY:_____ **STATE:**_____ **ZIP:**_____ **DATE:**_____





BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

Series 34

Sectional Directional Control Valve

P34A161020

Specifications:

- 12 gpm (45.4 lpm) Nominal Capacity (see flow chart).
- 3500 psi (241 bar).
- 400 psi (27 bar) max tank pressure.
- 12 sections max (consult factory for more).
- 10 Micron Filtration Recommended.
- Assembly Torque = 85 inch-lbs. (9.6 N m).
- Weight -Inlet/outlet = 6 lbs. (2.7 kg).
  -Low spool section = 4 lbs. (1.8 kg).
  -High spool section = 6 lbs. (2.7 kg).
- Port Sizes -Inlet/outlet #10SAE (7/8 – 14).
  -Work Ports #8SAE (3/4 – 16).

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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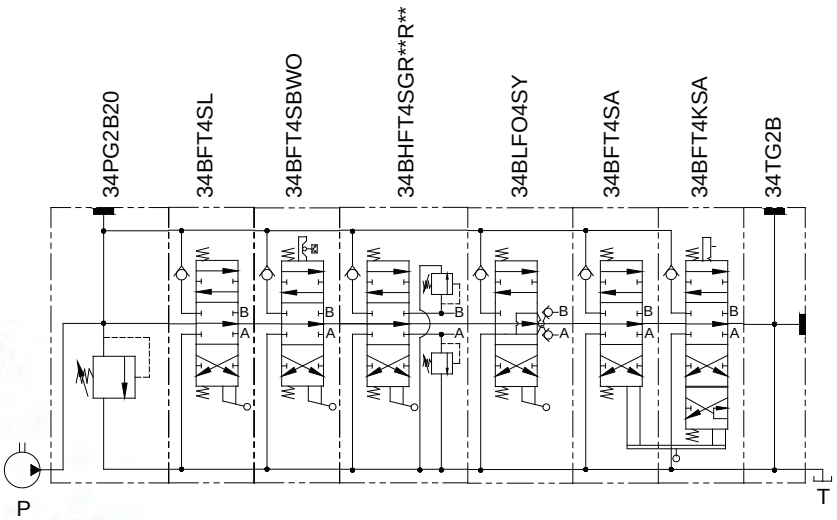
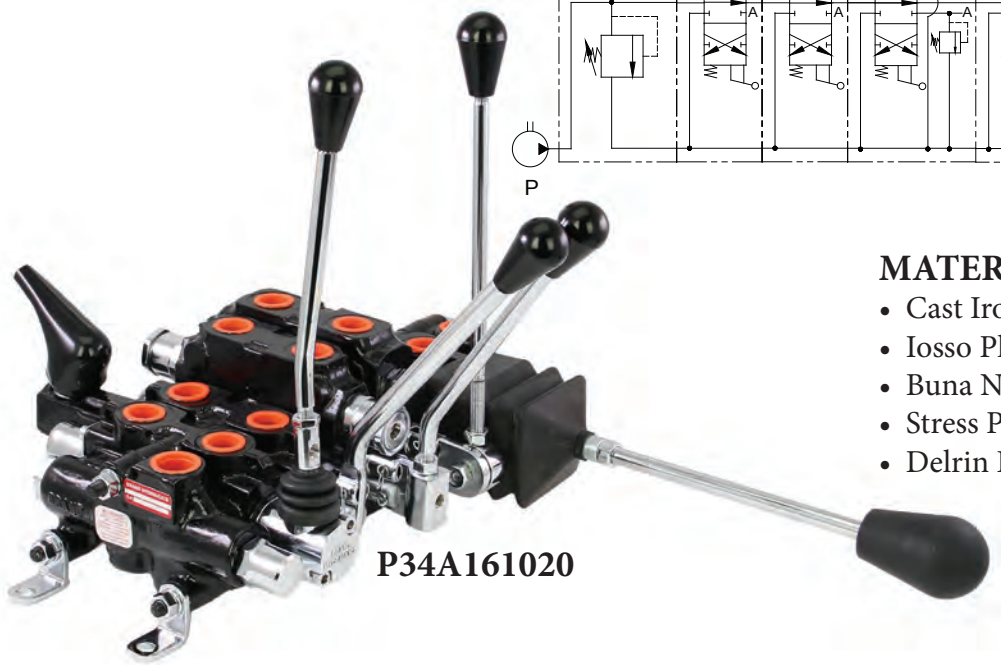
Series 34 Sectional Directional Control Valve





P34A161020

MATERIALS:

- Cast Iron Body.
- Iosso Plated Steel Spools
- Buna N O'Rings (standard).
- Stress Proof Steel Handles & Tie Rods
- Delrin Load Check Poppet

FEATURES:

- INDIVIDUAL LOAD CHECK built into each section that prevents the load from dropping when the spool is shifted.
- PRECISION GROUND IOSSO PLATED SPOOL that assures long life.
- DIAMOND HONED SPOOL BORE provides consistent spool fit with low leakage.
- METERING NOTCHES give smooth control of load.
- ADJUSTABLE HANDLES position handle in any location from 90° up to 90° down.
- O'RING PORTS to eliminate leakage.
- SPECIAL MODIFICATIONS are easily made to fit your particular application.
- PARALLEL OR SERIES flow paths are possible.
- ALL SECTIONS & ASSEMBLIES ARE 100% TESTED includes both internal & external leakage tests & flow tests.
- POWER BEYOND CAPABILITY to fit your multi-valve circuits.

SERIES 34 – GENERAL INFORMATION:

The Brand, Series 34 Sectional Directional Control Valves are assembled to meet our customer's requirements for up to twelve individual applications per assembly. Brand Hydraulics does not charge anything extra for this process and assembly is priced solely on the overall sum of the prices of its components.

When assembled in their normal manner the series 34 spool sections are in parallel. When the spools are in neutral position the flow passes by each spool and then onto the tank (outlet) port. If two or more spools are shifted simultaneously their work ports are in parallel, and the oil flow will take the path of least resistance allowing lighter loads to move first. All spool sections are cast with metering notches, and have a high "handle vs. spool" movement ratio, resulting in good metering capability. Input flow can be divided among several circuits (spool sections) by feathering the spools. Series 34 spool sections may also operate in series by installing a series block in between each spool section. Please note that when using series blocks in an assembly it is necessary to use a drain block immediately after the inlet in order for the inlet's relief to function correctly.

INLETS –
Can be provided with no relief, with an adjustable ball spring relief, or with an adjustable area-differential cartridge relief. Standard inlets are field convertible to be end ported (1), or top ported (2), by shifting a plug from one port to the other.

LOW SPOOL SECTIONS:

SPOOL TYPE –

Open center four-way (**O**) connects ports A and B to tank in neutral. Tandem center four-way (**T**) blocks port A and B in neutral. Tandem center four-way with metering (**M**) blocks port A and B in neutral and meters flow when shifted. Tandem center three-way (**T3**) powers a cylinder in one direction. Please note that closed center four-way operation can be obtained by using a tandem center four-way spool and a closed center plug in the assembly's outlet section.

SPOOL ACTION –

- **Standard spring center** (**S**) returns the handle to neutral when the handle is released.
- **Standard three-position detent** (**D**) holds the spool in neutral and both active positions.
- **Spring center detent** (**SD** or **DS**) springs back to neutral from one position and is mechanically detented in the other direction.
- **Fourth-position float** (**K**) is similar to spring center except it has a fourth position that makes all ports common to each other (last spool section only).
- **Two-position detent** (**D2**) P to A only.
- **Two position detent** (**2D**) P to B only.

Series 34 Sectional Directional Control Valve

HANDLE OPTIONS –

- **B-style handle** (B) is non-adjustable and is the most common (use on low spool sections only).
- **L-style handle** (L) is an enclosed lever handle (use on low spool section and high spool section with locks).
- **G-style handle** (G) is also non-adjustable (use on any spool section).
- **Y-style handle** (Y) allows the customer to adjust the handle from straight up to straight down (use on any spool section).
- **Joystick handle** (A) is used to actuate two adjacent spool sections with one handle (use on any spool section).

OPTION –

Normally open electric switch (WO) used with spring center option only. Normally closed electric switch (WC) used with spring center option only. Cable attachment (Z) used with spring center option only on spring center side (Cable actuators must have own integral centering mechanism). Jacketed cable adapter (C) allows the customer to move the spool from a remote location. Machined to attach handle on B port side of valve (E).

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

HIGH SPOOL SECTIONS –

Are available with the same spool type, spool action, actuator and option choices as the low spool section, but offers added features such as individual port reliefs or double lock valves. Three types of reliefs are offered for high sections machined with port relief cavities – ball spring (B), area-differential (R) or area-differential with anti-cavitation check (C). Please note that all high sections require use of adjustable (Y), or non-adjustable (G). Series block cannot follow a high spool section unless the working pressure for the previous sections is below 800 psi (55.1 bar).

OUTLET SECTION –

Is available end ported (1) which is not convertible to top port, or top ported (2) which is field convertible to end ported. Available machined for power beyond but without power beyond cartridge (A), machined for power beyond and with the power beyond cartridge (B), closed center plug (C) not available with power beyond, and field convertible open to closed center (D) without breaking open the valve stack.

ACCESSORY ITEMS –

Both mid-inlets and mid-outlets are available, both are available as either split flow or combined flow type.

All standard tie rod kits contain rods, foot brackets, lock washers and hex nuts. Please be sure to note correct tie rod torque spec of 85 inch lbs. (9.6 N m).

Flow restricting orifices which screw into the work ports of spool sections are available, either pressure compensated (83AFF) or non-compensated (84AFF).

Seal kits, replacement relief cartridges, series blocks, relief drain blocks and many other accessory items are available, please see the "SERIES 34 COMPLETE LIST OF OPTIONS AND ACCESSORIES" section of this catalog, for model codes and descriptions of these items.

ASSEMBLY –

Model codes and list prices for complete assemblies will be issued by the factory, upon request of an authorized Brand Distributor. All model codes so issued become proprietary to the requesting distributor. Model codes so issued will not be descriptive in nature, but shall be of sequential numerical type.

Individual sections and accessories can be purchased so that custom valve stacks may be assembled or modified outside the factory.

SERIES 34 – CREATING A MODEL CODE FOR SERIES 34:

INLET SECTION: 34PG

PORTING:
1 – End port
2 – Top port

RELIEF:
OMIT – No relief
B – Adjustable ball spring relief
C – Area-diff. cartridge relief

RELIEF SETTING:
10 - 1000 psi (69.0 bar)
15 - 1500 psi (103.4 bar)
20 - 2000 psi (138.0 bar)
ETC...

SERIES 34 – CREATING A MODEL CODE FOR SERIES 34:

OUTLET SECTION: 34TG

PORTING:
1 – End port (not convertible)
2 – Top port (convertible)

OPTION:
OMIT – No options
A – Machined for power beyond no cartridge
B – Machined for power beyond with cartridge
C – Closed center plug (Not available with power beyond)
D – Convertible from open to center, screw type adjustment (Not available with power beyond)

Series 34 Sectional Directional Control Valve

LOW SPOOL SECTION:

34 B F

SPOOL TYPE:
T – Tandem center
O – Open center
M – Tandem with metering (4-way only)

TYPE:
3 – Three-way (T spool only)
4 – Four-way

SPOOL ACTION:
S – Spring center
D – Three-position detent
SD – Spring center (P to A) detent
DS – Detent / spring center (P to B)
K – Fourth position float / spring center (Last spool only)
D2 – Two-position detent P to A
2D – Two-position detent P to B

HANDLE OPTION:
B – Fixed angle handle (Standard)
G – Fixed angle handle
Y – Variable angle handle
L – Enclosed handle
A – Joystick handle

OPTIONS:
WO – Normal open electric switch (Spring center only)
WC – Normal closed electric switch (Spring center only)
Z – Cable attached on spring center end of valve
C – Jacked cable adapter

SERIES 34 – CREATING A MODEL CODE FOR SERIES 34:

END SPOOL SECTION: **34TG**

HIGH SPOOL SECTION WITH LOCK(S):

34 B L __ F

LOCK TYPE:
1 – Single lock
OMIT – double lock

SPOOL TYPE:
T – Tandem center
O – Open center
M – Tandem with metering (4-way only)

TYPE:
3 – Three-way (T spool only)
4 – Four-way

SPOOL ACTION:
S – Spring center
D – Three-position detent
SD – Spring center (P to A) detent
DS – Detent / spring center (P to B)
K – Fourth position float / spring center (Last spool only)
D2 – Two-position detent P to A
2D – Two-position detent P to B

HANDLE OPTION:
G – Fixed angle handle
Y – Variable angle handle
L – Enclosed handle
A – Joystick handle (34HAB & 34HAD only)
Note: B-style handle not available on high sections

OPTIONS:
WO – Normal open electric switch (Spring center only)
WC – Normal closed electric switch (Spring center only)
Z – Cable attachment on spring center end of valve
C – Jacked cable adapter

Series 34 Sectional Directional Control Valve

HIGH SPOOL SECTION WITH PORT RELIEF(S):

34BHF

SPOOL TYPE:
T – Tandem center
O – Open center
M – Tandem with metering (4-way only)

TYPE:
3 – Three-way (T spool only)
4 – Four-way

SPOOL ACTION:
S – Spring center
D – Three-position detent
SD – Spring center (P to A) / detent
DS – Detent / spring center (P to B)
K – Fourth position float / spring center (Last spool only)
D2 – Two-position detent P to A
2D – Two-position detent P to B

HANDLE OPTION:
G – Fixed angle handle
Y – Variable angle handle
A – Joystick handle (34hab & 34HAD only)
Note: B-style & L-style handle not available on high sections

RELIEF TYPE "A" PORT:
B - High lift ball spring
C - Combination area-differential relief with anti-cavitation check
R - Area-differential
P - Cavity plugged, no relief
Q - Anti-cavitation check, no relief

RELIEF SETTING:
10 - 1000 psi (69.0 bar)
15 - 1500 psi (103.4 bar)
20 - 2000 psi (138.0 bar)
ETC...

REPEAT RELEIF TYPE AND SETTING FOR "B" PORT:

OPTIONS:
WO – Normal open electric switch (Spring center only)
WC – Normal closed electric switch (Spring center only)
Z – Cable attached on spring center end of valve
C – Jacked cable adapter

SERIES 20 – EXAMPLES OF COMMON MODEL CODES:

INLET SECTIONS

34PG1…….....Inlet section plain, no relief, end ported.

34PG1B20…..….....Inlet section, end ported, and adjustable ball spring relief set at 2000 psi (138 bar).

OUTLET SECTIONS

34TG1……....Plain, end ported.

34TG1A……Machined for power beyond, but less power beyond cartridge, end ported.

LOW SPOOL SECTIONS

34BFO4DB……..Open center, four-way, three-position detent, uses B-style handle.

34BFT4SB……Tandem center, four-way, spring to center, uses B-style handle

HIGH SPOOL SECTIONS

34BHFT4SYR10R10…Tandem center, four-way, spring to center, Y-style handle and area-differential reliefs set at 1000 psi (69.0 bar).

34BLFO4SG…….Pilot operated double lock valves, open center, four-way, spring to center and G-style handle.

HANDLE KITS:

34HB…….....Standard bent handle kit, for spool sections with B machining option in model code.

34HBS…….....Standard straight handle kit, for spool sections with B machining option in model code.

34HG…….....Bent handle kit, for spool sections with G machining option in model code.

34HGS…….....Straight handle kit, for spool sections with G machining option in model code.

34HY…….....Adjustable angle handle kit, for spool sections with Y machining option in model code.

34HL…….....Enclosed handle kit (bent), for spool sections with L machining option in model code.

34HLS…….....Enclosed handle kit (straight), for spool sections with L machining option in model code.

34HAA…….....Joystick handle kit, for spool sections with A machining option (LV22 pivot up).

34HAB…….....Joystick handle kit, for spool sections with A machining option (LV22 pivot down).

Series 34 Sectional Directional Control Valve

SERIES 34 – EXAMPLES OF COMMON MODEL CODES:

34HAC…….....Joystick handle kit, for spool sections with A machining option (LV60 pivot up).

34HAD…….....Joystick handle kit, for spool sections with A machining option (LV60 pivot down).

TIE ROD KITS:

34TR1…….....Tie rod kit for valve stack containing a standard inlet, outlet and one spool section.

34TR2…….....Tie rod kit for valve stack containing a standard inlet, outlet and two spool sections.

STANDARD ASSEMBLY MODEL CODES:

34A1B…….....Single spool assembly, tandem center four-way, spring to center action, no relief and with B style handle assembly. End ported inlet and outlet.

34AB1B…….....Same as above but with an adjustable ball spring relief added and set at 2000 psi(138 bar).

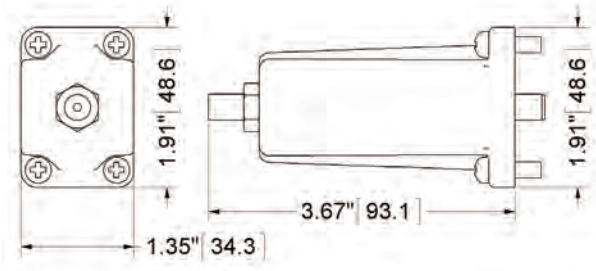
34A2B…….....Two spool assembly, tandem center four-way, spring to center action, no relief, and with B-style handle assemblies. End ported inlet and outlet.

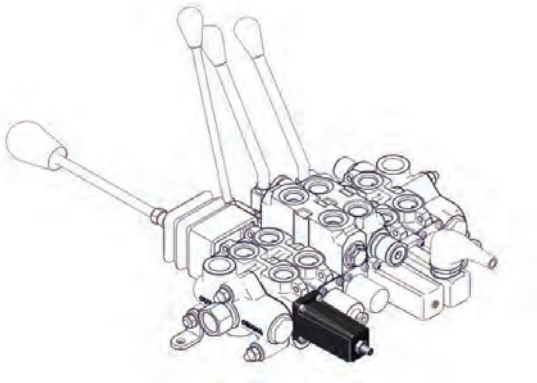
34AB2B…….....Same as above but with an adjustable ball spring relief added and set at 2000 psi (138 bar).

Standard assemblies are available with up to 12 spool sections using the model code format outlined above for the one and two spool assemblies.

SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

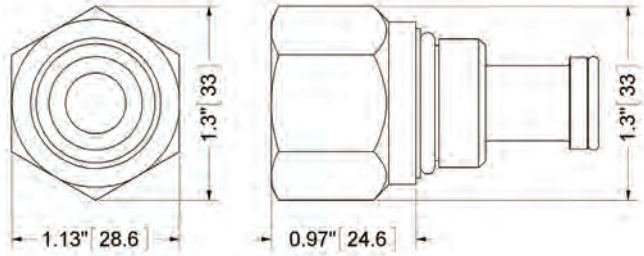
34K…….. Fourth position float kit, use on last spool section in assembly only.

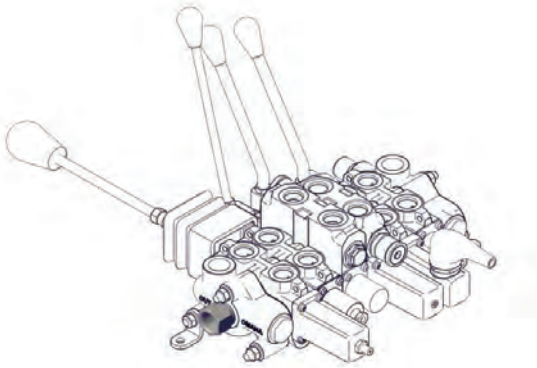




SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

34AGPB…….. Power beyond cartridge kit, for outlet sections with A or B in their model code.

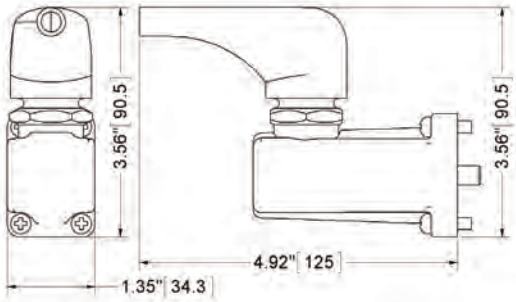


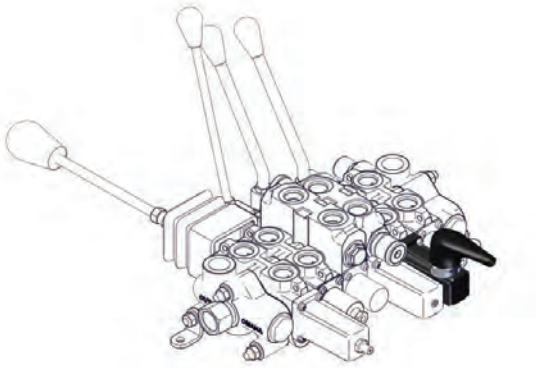


External dimensions are the same for all kits listed above.

34AWC…… Spring to center kit with normally closed electric switch.

34AWO…….... Spring to center kit with normally open electric switch.





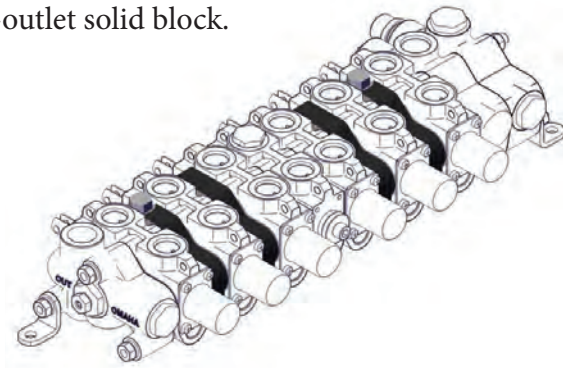
External dimensions are the same for all kits listed above.

34AS……..…... Spacer block (adds 0.75” [19.0 mm] between spool sections).

34ASB……. Series block, installed in between two spool sections puts them in series (adds 0.75” [19.0 mm] between spool sections).

34ASI…….. Isolator block.

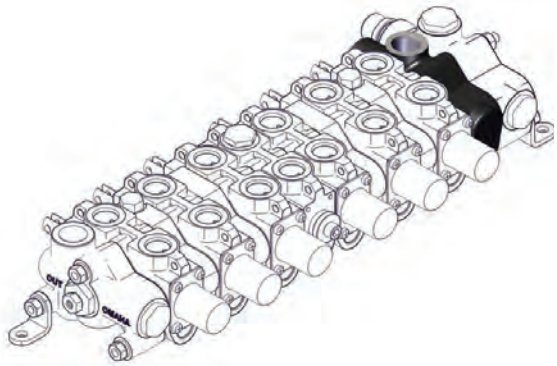
34ASOL…….. Mid-outlet solid block.



External dimensions are the same for all kits listed above.

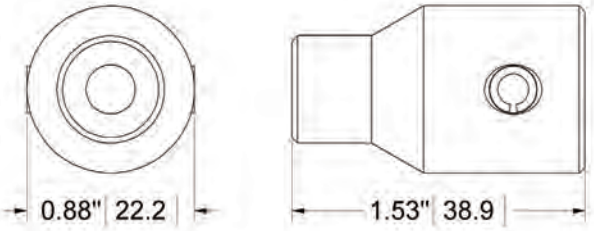
SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

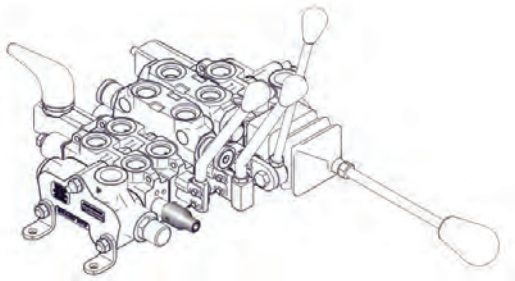
34ASD..... Series drain block, required for inlet relief to function correctly when using series block(s) in an assembly (adds 1.598" [19.0 mm] between spool sections).



34ASP..... Spool end adapter kit, converts spools machined to accept handles to spools having a tapped (5/16-18) end for attaching actuator cables or rods.

34ASPB..... Same as 34ASP, except, with blank end (customer taps to their own spec).





External dimensions are the same for all kits listed above.

34AZ..... Spring to center kit with tap (5/16-18) for cable attachment (note: spring to center mechanism is intended to shift the spool only, cable actuators must have their own integral centering mechanism).

34AZ2..... Same as 34AZ except tap is 1/4-28.

34B10..... High lift ball spring relief cartridge, set at 1000 psi (69.0 bar), for spool section codes beginning 34BH. (Available in pressure setting increments of 100 psi (6.9 bar), please specify desired setting as per this example).

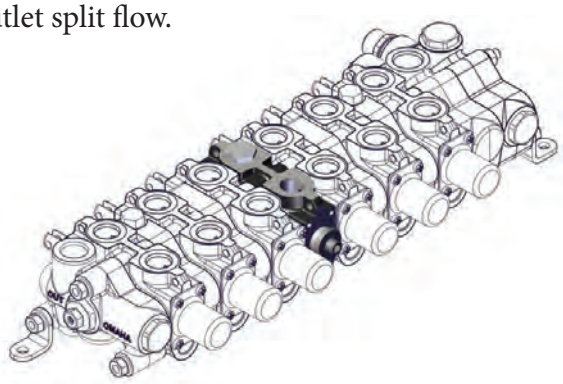
SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

34BFMIC..... Mid-inlet combined flow.

34BFMIS..... Mid-inlet split flow.

34BFMOI..... Mid- outlet/inlet (flow exits out A port, and is accepted back in at B port).

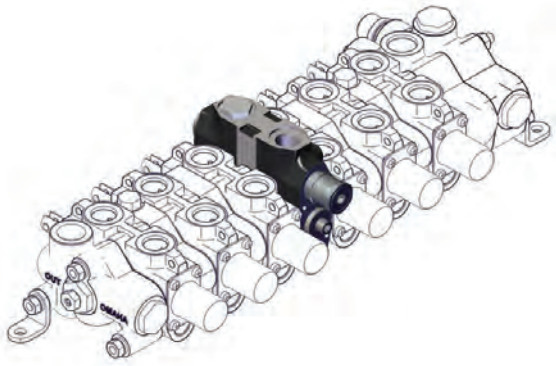
34BFMOS..... Mid-outlet split flow.



External dimensions are the same for all kits listed above.

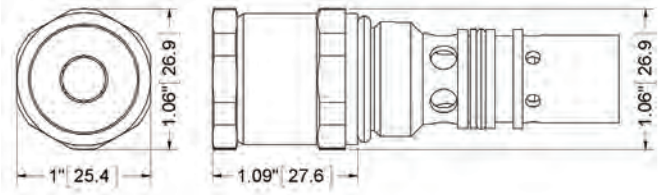
34BHFMIC..... Mid-inlet, combined flow, with cavities for port reliefs. Port relief cartridge options and call outs are the same for this unit as those for the 34BH type high spool sections.

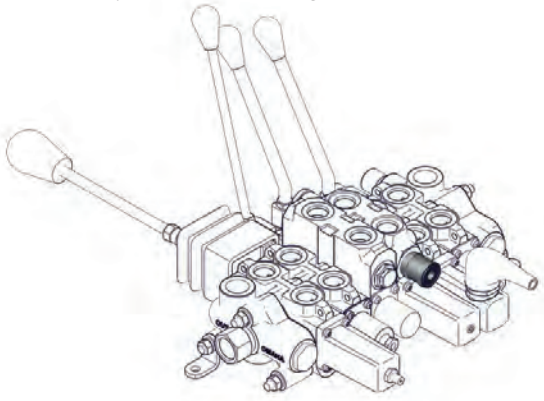
34BHFMIS..... Mid-inlet, split flow, with cavities for port reliefs. Port relief cartridge options and call outs are the same for this unit as those for the 34BH type high spool sections.



External dimensions are the same for all kits listed above.

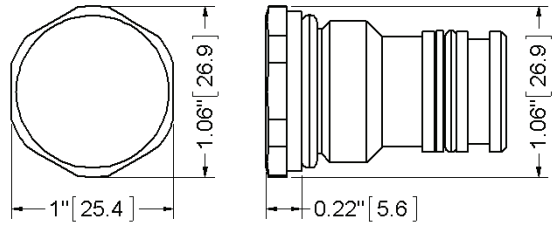
34C10..... Combination area-differential relief / anti-cavitation check cartridge, set at 1000 psi (69.0 bar), for spool section codes beginning 34BH. (Available in pressure setting increments of 100 psi (6.9 bar), please specify desired setting as per this example.)

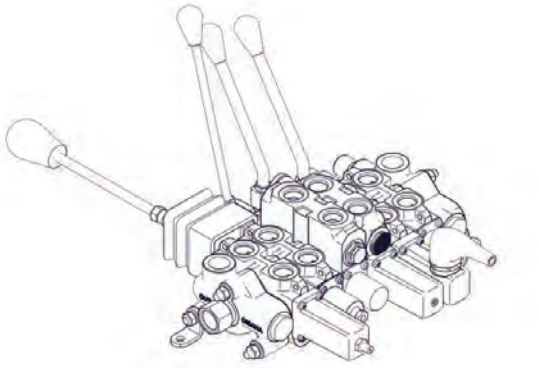




SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

34CP…….…... Relief port cavity plug, for spool section codes beginning 34BH.



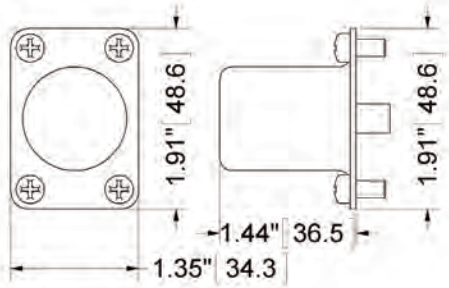


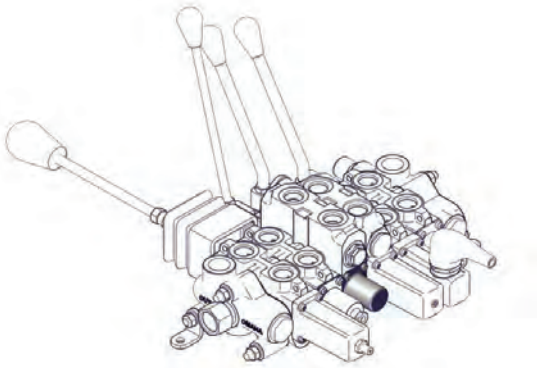
34D…….…... Three-position detent kit, for low or high spool section.

34D2…….…... Two-position detent kit, pressure to A port in the detent position.

342D…….…... Two-position detent kit, pressure to B port in the detent position.

34S…….…... Spring to center kit, for low or high spool section.

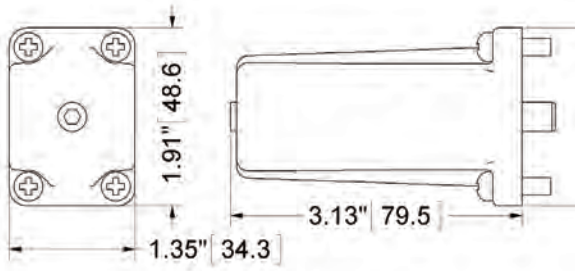


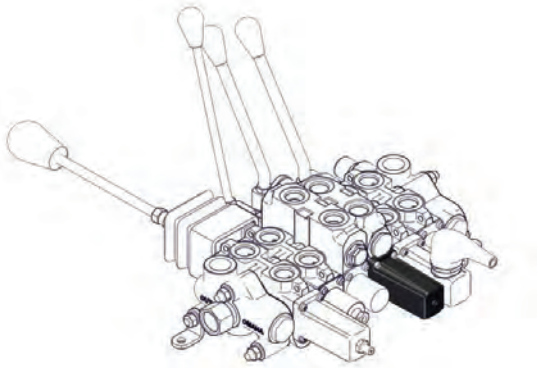


External dimensions are the same for all kits listed above.

34DS…….…... Detent kit, spool is detented in one work position (P to A), and springs to center from the other.

34SD…….…... Same as 34DS but detent and spring center directions are reversed (P to B when spool detented).

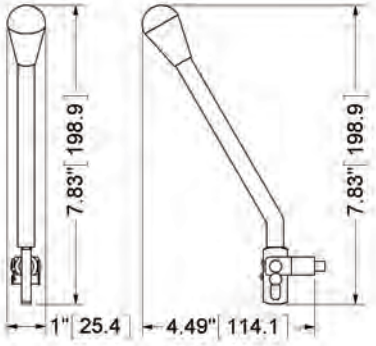


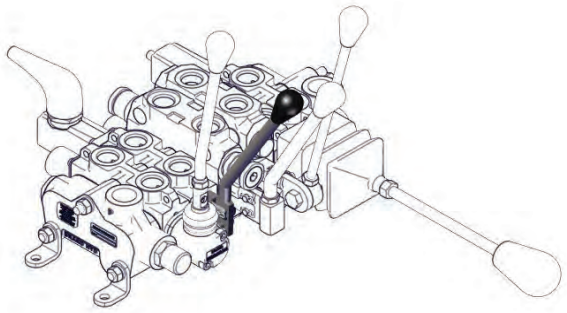


External dimensions are the same for all kits listed above.

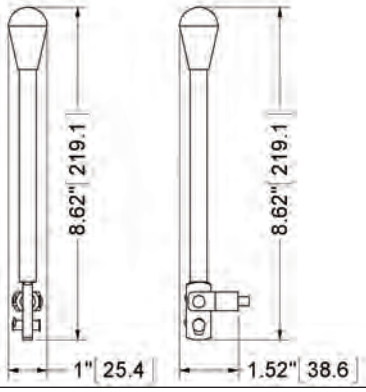
SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

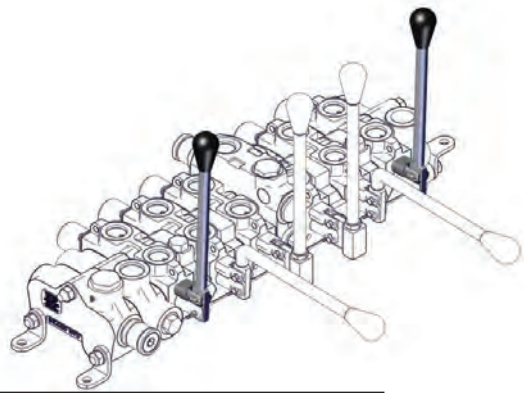
34HB…….. B-style handle kit, with bent handle, use on spool sections with (B) handle call out.



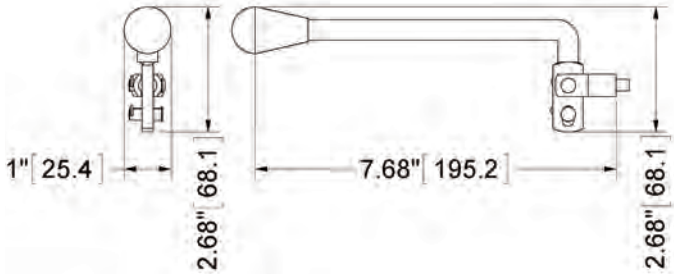


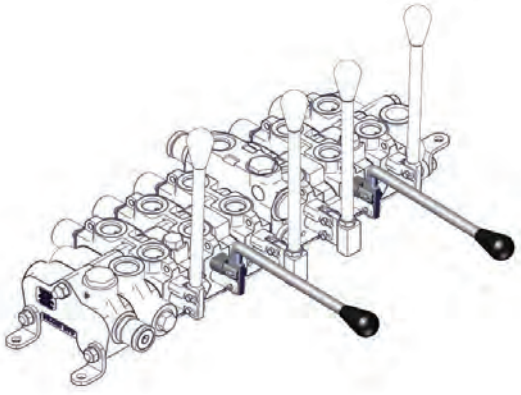
34HBS…….. B-style handle kit, with straight handle, use on spool sections with (B) handle call out.





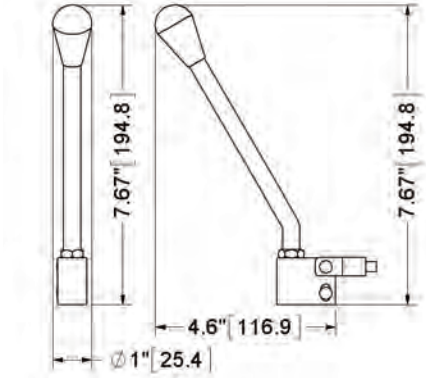
34HB-90…….. B-style handle kit, with handle bent at 90 degrees, use on spool sections with (B) handle call out.

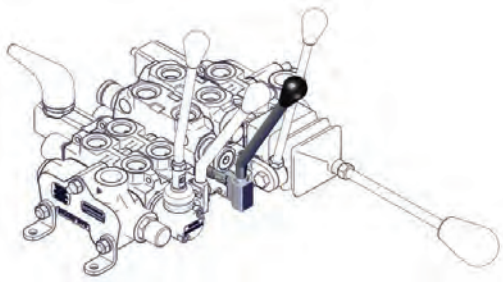




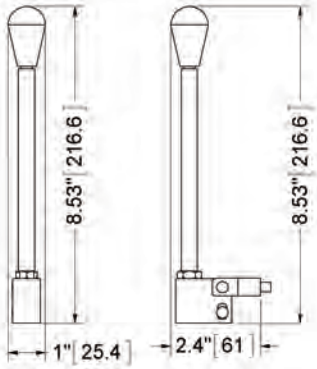
SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

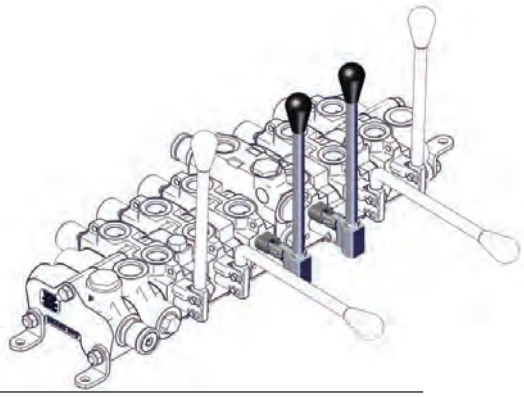
34HG…….. G-style handle kit, with bent handle, use on spool sections with (G) handle call out.



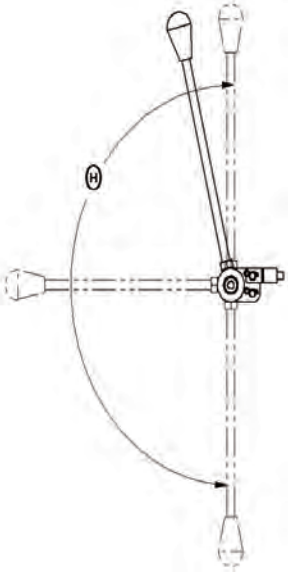


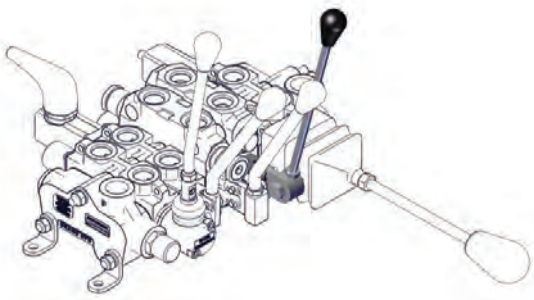
34HGS……..…... G-style handle kit, with straight handle, use on spool sections with (G) handle call out.





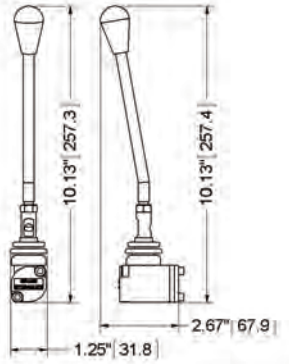
34HY…….... Y style handle kit, handle angle adjusts to clear relief and lock cartridges in high spool sections, or to facilitate "handle through panel" mounting of valve assemblies. Please note that different length handle rods can be furnished, contact factory for details. Standard rod length is 9.41".

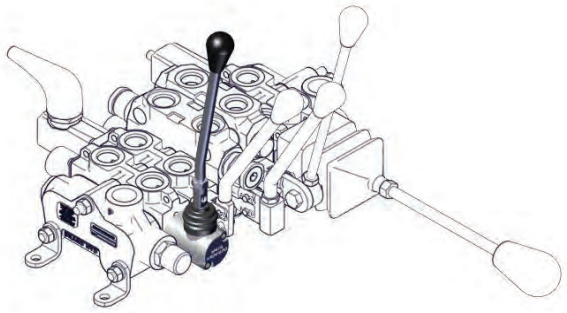




SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

34HL…….…. Enclosed handle kit (bent), for spool sections with L machining option in model code.





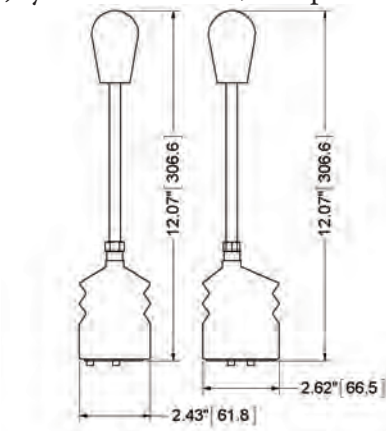
34HLS…….…. Enclosed handle kit (straight), for spool sections with L machining option in model code.

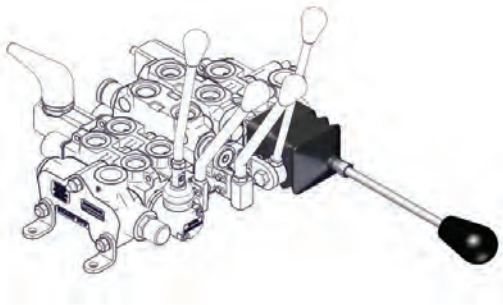
34HAA…….…. Joystick handle kit, for spool sections with A machining option (LV22 pivot up).

34HAB……. Joystick handle kit, for spool sections with A machining option (LV22 pivot down).

34HAC…….…. Joystick handle kit, for spool sections with A machining option (LV60 pivot up).

34HAD…….…. Joystick handle kit, for spool sections with A machining option (LV60 pivot down).





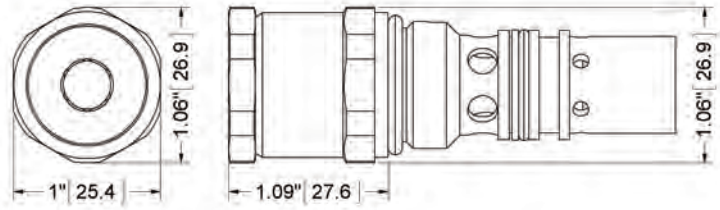
External dimensions are the same for all kits listed above.

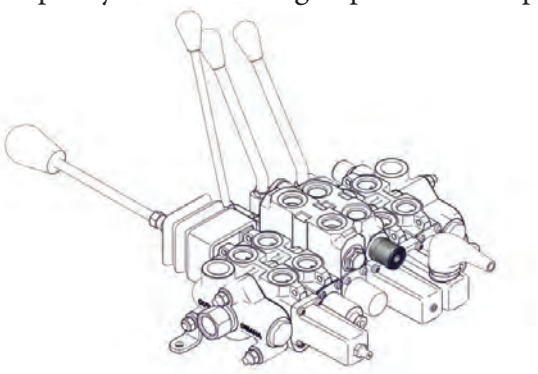
Series 34 Sectional Directional Control Valve

SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

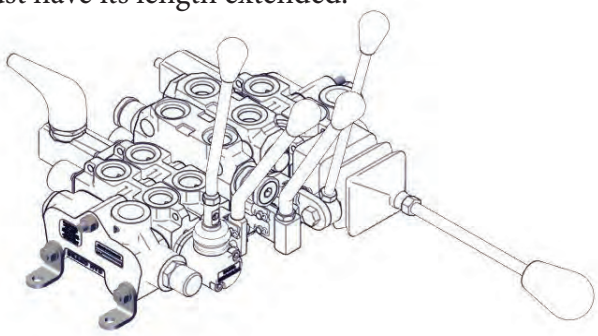
34Q…….. Anti-cavitation check cartridge, no relief included in this kit.

34R10…….. Area differential relief cartridge, set at 1000 psi (69.0 bar), for spool section codes beginning 34BH, and inlets with C in model code. (Available in pressure setting increments of 100 psi (6.9 bar), please specify desired setting as per this example)





34TR_ ……. Tie rod kits, specify number of spool sections in valve assembly, i.e. 3 spool sections in valve assembly, requires using 34TR3 tie rod kit. Please note that when using extra items in the assembly, such as series blocks, drain blocks, isolator blocks etc., the tie rod kit must have its length extended.



83AFF01……. Pressure compensated flow control, set at 1 gpm (3.8 lpm), screws into work port of any spool section, meters flow into said port. (Available in whole gallon increments to 10 gpm (37.8 lpm), please specify desired setting as per this example.)

84AFF__……. Non-pressure compensated flow control, specify orifice size required in blank (i.e. 84AFF.50).

P1156…….. Closed center plug, installs in any basic outlet except ones with D in model code. (Cannot be used with power beyond)

34DL2-K……. Series 34 double lock kit(Includes: check assemblies and piston, for valves shipped after 02/01/13)

34DL-CART…....…Series 34 lock kit. (Includes: One check assembly, for valves shipped after 02/01/13)

P14605S-K……. Pilot operated check seat. (Valves shipped before 02/01/13)

SERIES 34 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

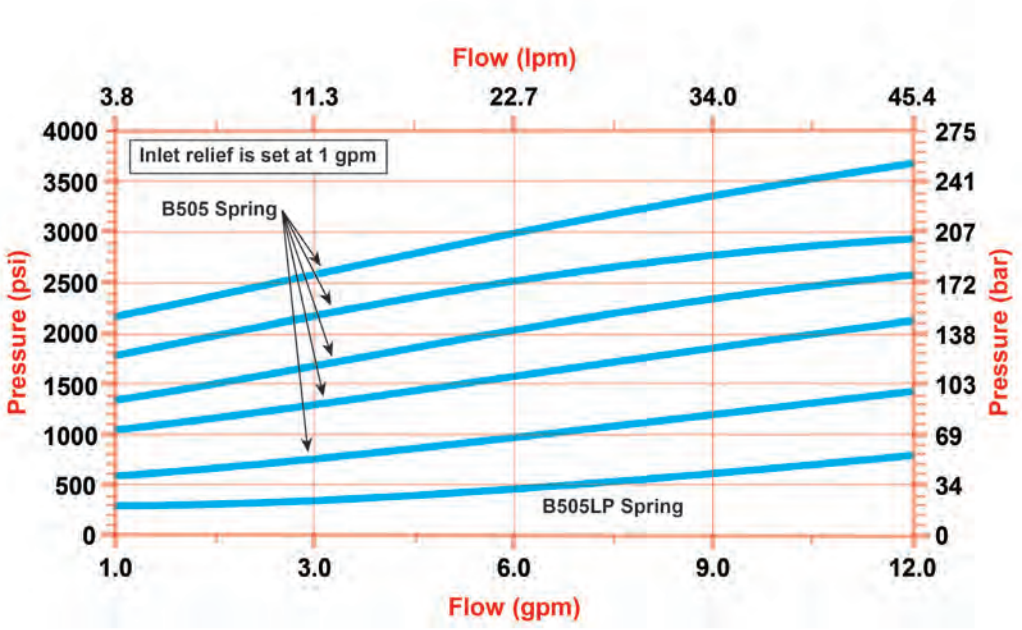
Seal Kits:

34AK……... Replacement seal kit for basic low spool section.
34BK……Seal kit, contains seals for use in between spool sections.
34BLF-K……. Seal kit , contains seals and check seat for 34BL2F work section.
34CK……... Seal kit for series 34 area-differential relief cartridges.

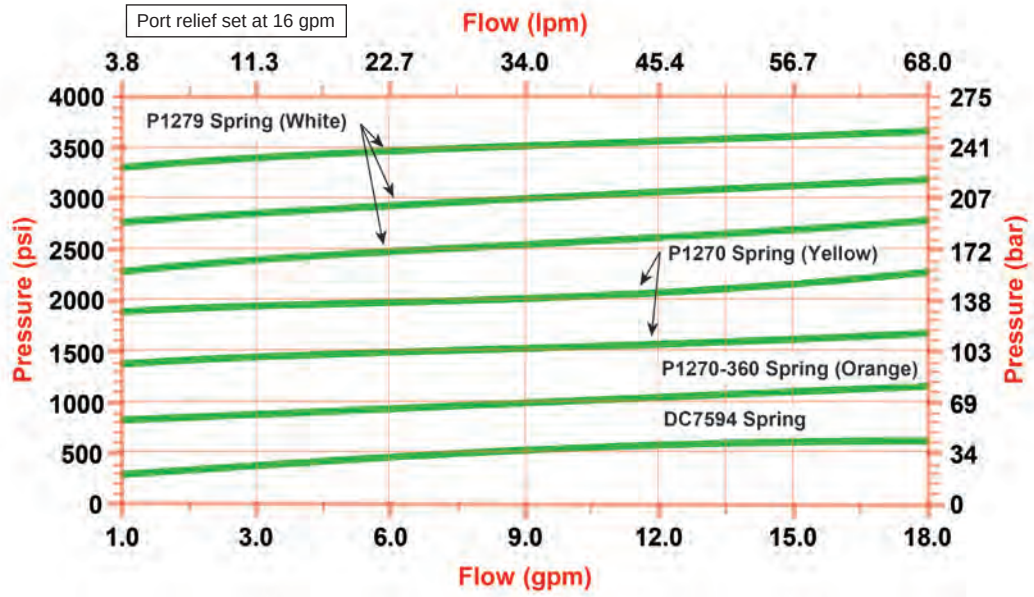
Please feel free to contact the factory with your ideas regarding custom options or accessories, we will be happy to review them to see if they can be put into production for your assemblies.

SERIES 34 – FLOW AND PRESSURE INFO:

Neutral Flow for Inlet Ball Spring Relief

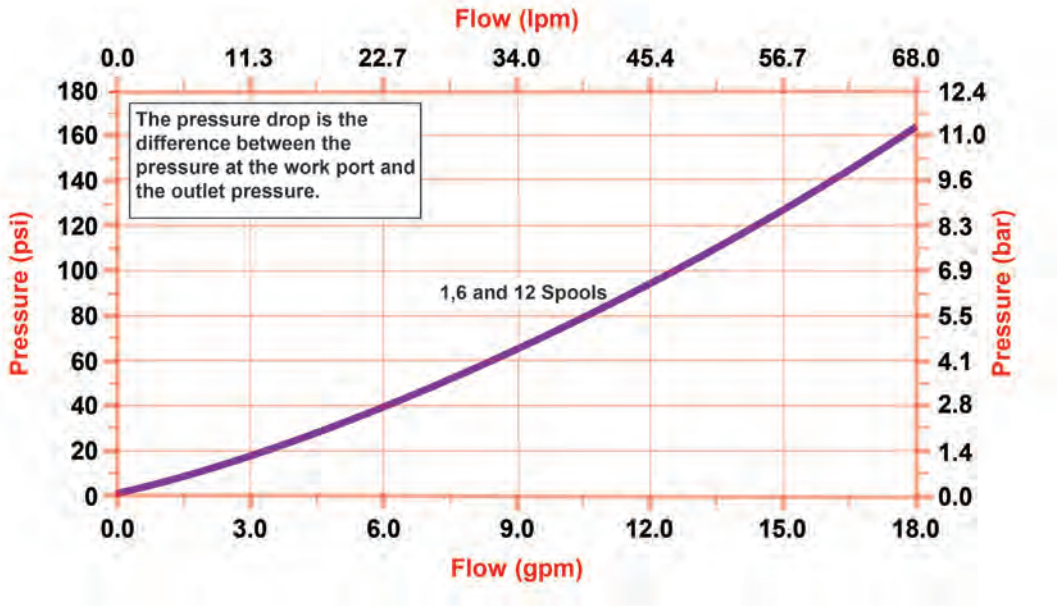


Pressure Drop VS. Flow for S34 Relief

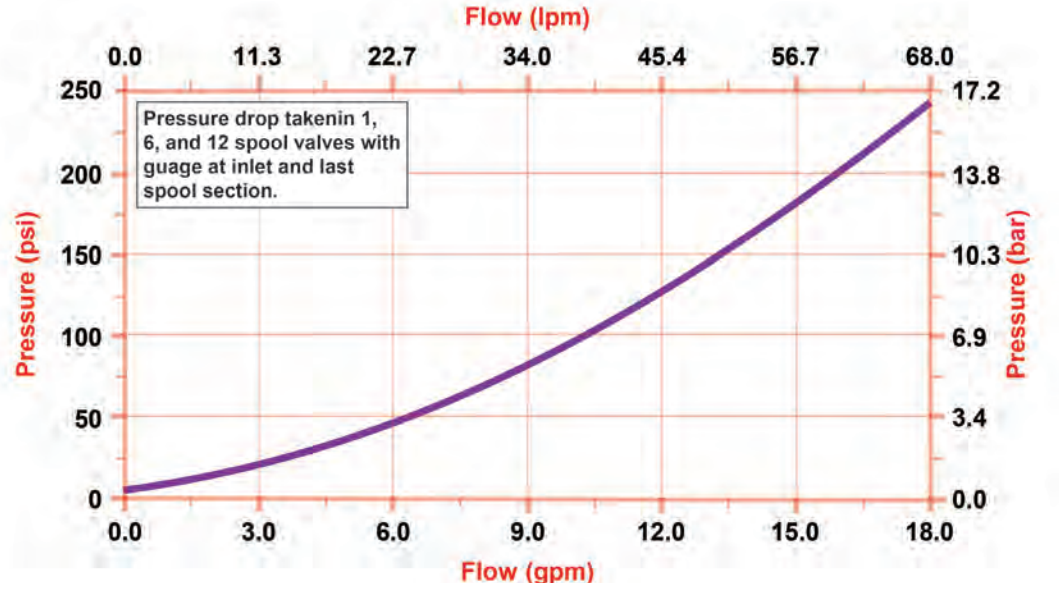


SERIES 34 – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for A or B-T

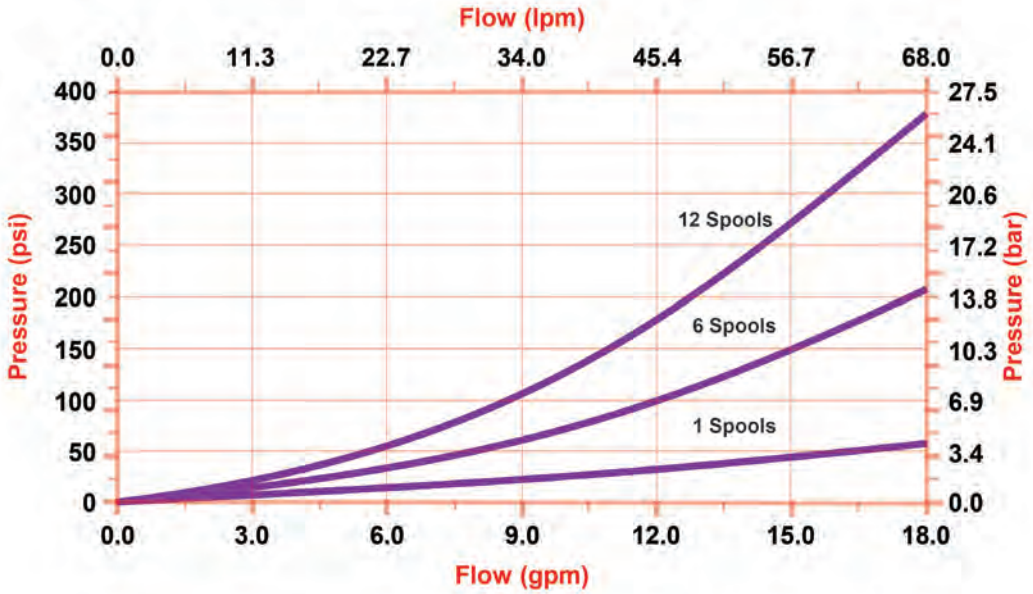


Pressure Drop VS. Flow for P-A or B

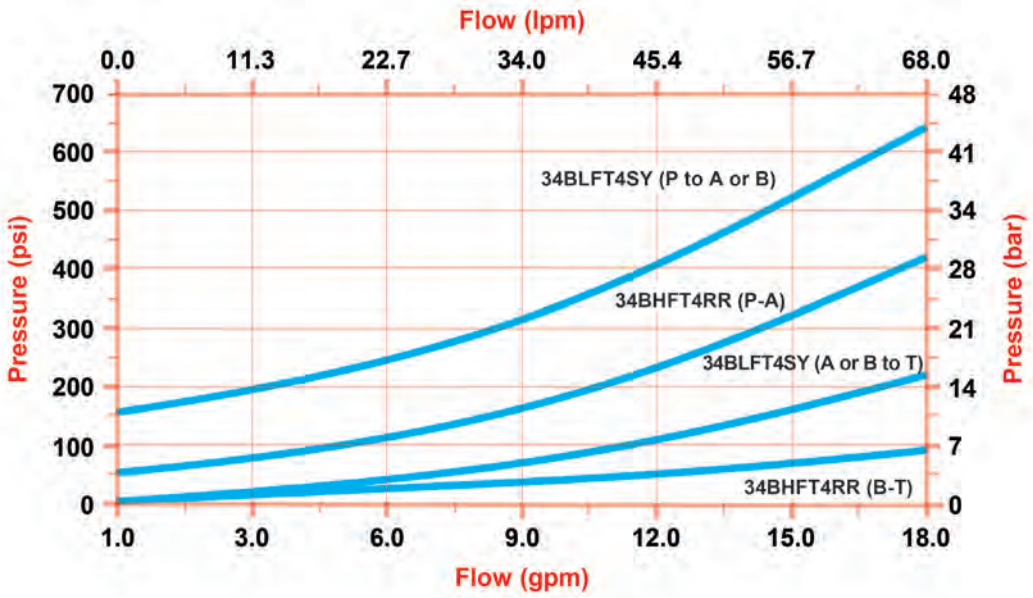


SERIES 34 – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for P-T

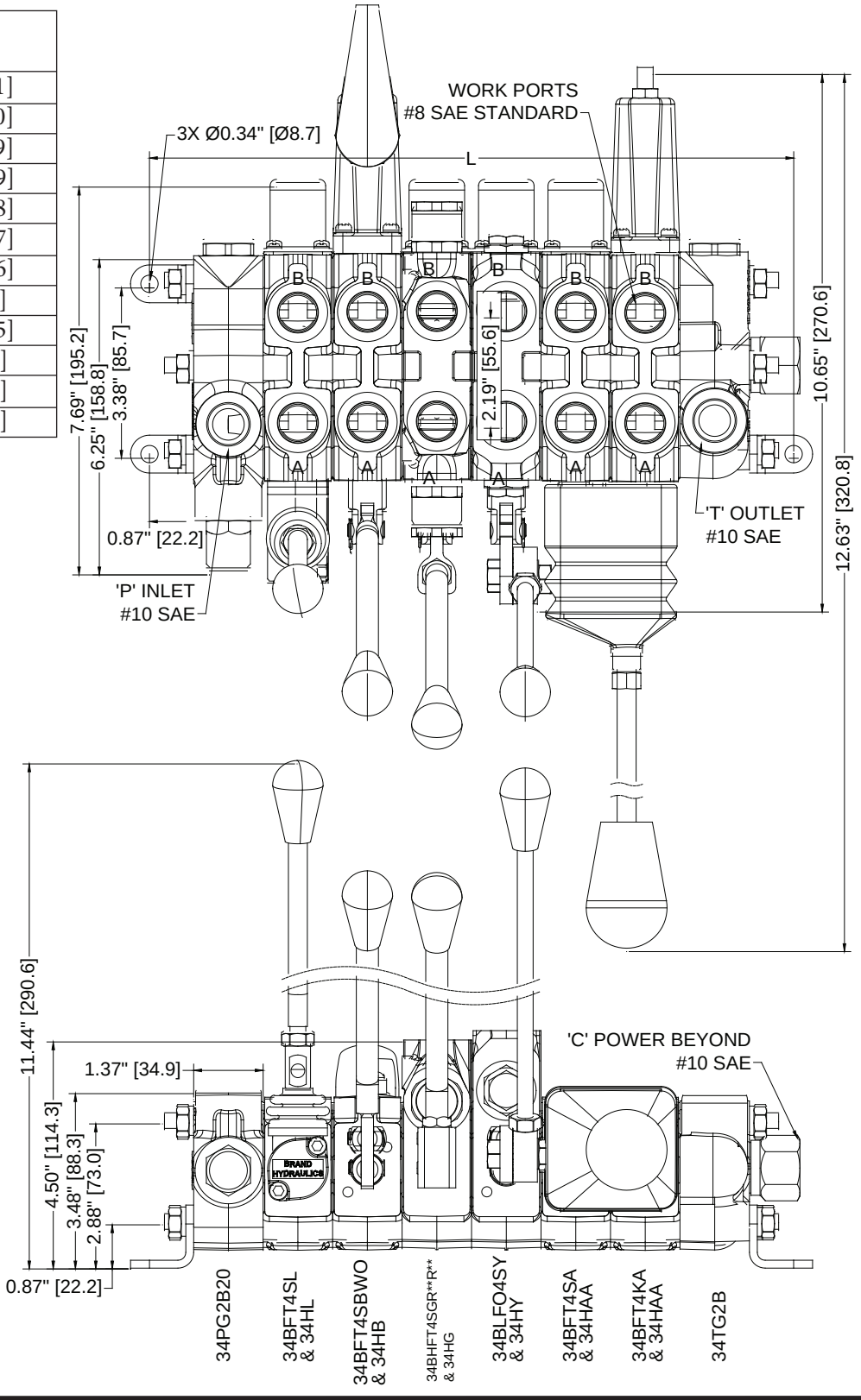


Pressure Drop for High Sections



DIMENSIONAL DATA: inches & [millimeters]

# OF SPOOLS	L
1	5.87" [149.1]
2	7.25" [184.0]
3	8.62" [218.9]
4	10.00" [253.9]
5	11.37" [288.8]
6	12.75" [323.7]
7	14.12" [358.6]
8	15.50" [393.6]
9	16.87" [428.5]
10	18.25" [463.4]
11	19.62" [498.3]
12	21.00" [533.3]



Series 34 Sectional Directional Control Valve

VALVE ASSEMBLY ARRANGEMENT:		PRICE
(P)	P34A (Painted black)	
(MP)	MP34A (Epoxy coating)	
	34A	
INLET	34PG	
SPOOL #1	34B	
SPOOL #2	34B	
SPOOL #3	34B	
SPOOL #4	34B	
SPOOL #5	34B	
SPOOL #6	34B	
SPOOL #7	34B	
SPOOL #8	34B	
SPOOL #9	34B	
SPOOL #10	34B	
SPOOL #11	34B	
SPOOL #12	34B	
OUTLET	34TG	
MISC.		
TIE ROD	34TR	
(Torque to 85 inch lbs(9.6 N m))		
HANDLES	34H_____QNTY._____PRICE_____ =	$_____
ASSEMBLY	34A_____LIST	$_____

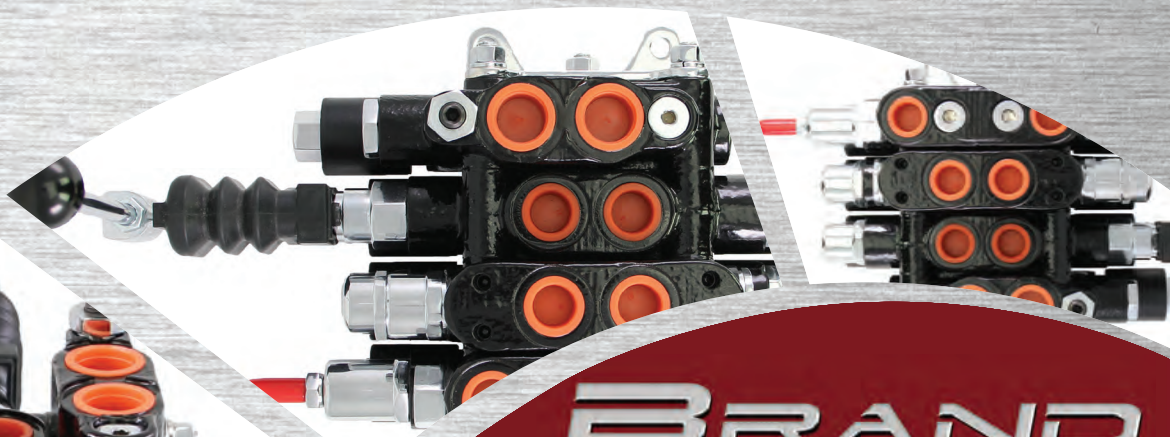
DISTRIBUTOR:_____

NAME:_____

EMAIL:_____ **PHONE:**_____

ADDRESS:_____

CITY:_____ **STATE:**_____ **ZIP:**_____ **DATE:**_____



BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

Series 36

Electric Sectional Directional Control Valve

P36A138020

Specifications:

- 12 gpm (45.4 lpm) Nominal Capacity
- 3500 psi (241 bar).
- 100 psi (6.9 bar) max tank pressure.
- 12 sections max (consult factory for more).
- 10 Micron Filtration Recommended.
- Assembly Torque = 85 inch-lbs. (9.6 N m)
- Spool Leakage = Less than 0.50 in^3 (819 cm^3) at 1000 psi. (69 bar)
- Weight -Inlet/outlet = 6 lbs. (2.7 kg).
  -Low spool section = 4 lbs. (1.8 kg).
  -High spool section = 6.5 lbs. (2.9 kg).
  -Above weights include cartridge, coil, and reliefs.
- Port Sizes -Inlet / Outlet #10SAE (7/8 – 14).
  -Work Ports #8SAE (3/4 – 16).
- Response Time (6 gpm@2000 psi (22.7 lpm@138 bar)).
  -110 mS for unloader.
  -600 mS for section.
- Coil -1.25 amp Inrush current.
  -1.00 amp Steady state current.

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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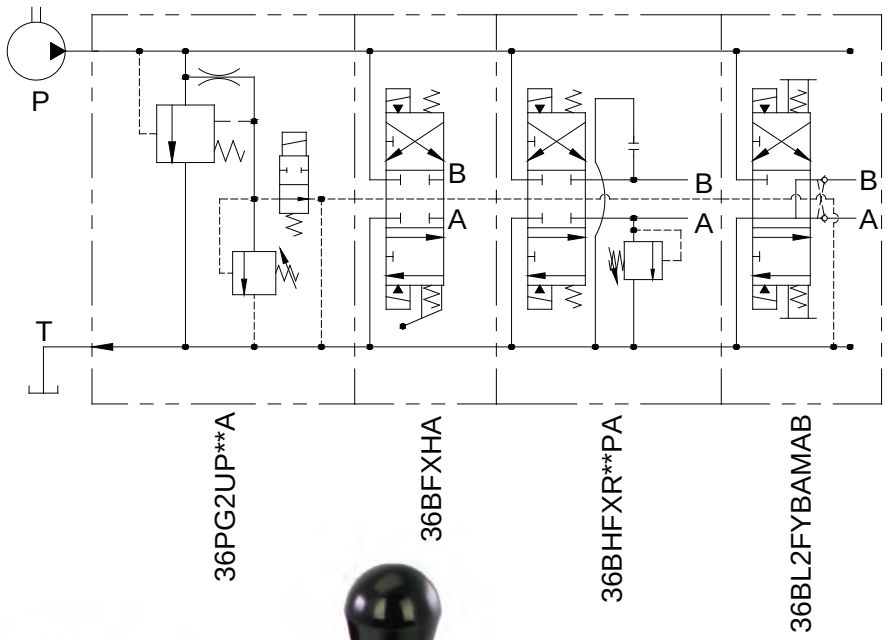
Series 36 Electric Sectional Directional Control Valve



P36A138020

MATERIALS:

- Cast Iron Body.
- Heat Treated Steel Spools.
- Buna N O'Rings (standard).
- Stress Proof Steel Tie Rods.

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL assures long life.
- DIAMOND HONED SPOOL BORE provides consistent spool fit with low leakage.
- O'RING PORTS to eliminate leakage.
- OIL GROOVES on the spool provide smooth spool motion.
- PILOT CARTRIDGE assures positive force to shift spool.

SERIES 36 – GENERAL INFORMATION:

The Brand, Series 36 Electric Sectional Directional Control Valves are assembled to meet our customer's requirements for up to twelve individual applications per assembly. Brand Hydraulics does not charge extra for this assembly process, an assembly is priced solely on the overall sum of the prices of its components.

The Series 36 is available with electric unloading in the inlet section. The flow goes directly to tank in the neutral condition. Neutral flow does not pass through the spool sections; therefore, the neutral pressure drop to tank remains low and constant regardless of the number of spool sections. This neutral path is closed whenever a section is activated. If two or more spools are shifted simultaneously, then the spool sections are in parallel. In parallel the flow will take the path of least resistance and the lightest load will move first. The spools are shifted by solenoid controlled pilot valves. This method assures positive shifting and it also minimizes the amperage draw.

It is common to have applications where high flow (above 15 gpm (56.7 lpm)) is needed out some sections and low flow (below 15 gpm (56.7 lpm)) is needed out other sections. The Series 38 can be used for high flow and the Series 36 can be used for low flow. Series 36 and Series 38 sections can be stacked together to meet both flow requirements. Any combination up to twelve sections can be assembled. (See Series 38 literature for more details)

Flow can be controlled by machining a pocket in the pressure line so that an orifice plate can fit between the spool sections. If more than one orifice is used in an assembly, then they must be arranged with the largest orifice first (closest to the inlet). We also offer individual orifice plates to restrict the flow out of a work port.

INLETS –

Can be provided with a closed center inlet (with or without relief) which can be used in a pressure compensated system. Inlets are also available with unloading for use in systems with fixed displacement pumps.

To understand the unloading feature the following explanation may be helpful. The inlet is machined with a pilot operated relief valve, and a vent line. By manipulating the vent line we can offer the following features:

ELECTRIC UNLOADING – An inlet machined for a pilot-operated relief valve can be supplied with a vent line that is open to flow through a two-way normally open solenoid cartridge. Thus, we have electric unloading when the solenoid is de-energized and loading when the solenoid is energized. By replacing the two-way normally open solenoid cartridge with a cavity plug the vent line will be blocked and the inlet will not unload. The cavity plug is used for pressure compensated systems while still providing relief valve protection.

AUTOMATIC UNLOADING – When using the handle option it is necessary to use a specially machined inlet that allows the vent line to continue on past each spool section. The vent line is interrupted automatically whenever the handle is moved.

Series 36 Electric Sectional Directional Control Valve

Inlets can be supplied with electric unloading, or automatic unloading. Our most popular combination is an inlet machined for electric and automatic unloading. This combination allows the customer to manually control the valve with handles during an electrical failure.

LOW SPOOL SECTIONS – are available with two types of spools - open (Y) and blocked (X). Spring centering is standard on every spool section. Spring offset (O), allows the customer to use a cavity plug on the side of the spring offset instead of a solenoid and cartridge. Manual override/Stroke control (M) is available for ports A & B of each section. It allows the customer to manually move the spool, which can lower a load or to limit the travel of the spool so that it acts as a speed control. Manual handles are also available for use when there is no electricity or for manual and electric control of the same section.

HIGH SPOOL SECTIONS – offer the same options as listed for the low spool sections with the addition of individual port reliefs. Three types of reliefs are offered for high sections machined with port relief cavities – ball spring (B), area-differential (R), or area-differential with anti-cavitation check (C). The high section can also be made with a pilot-operated double lock (36BL2F).

END SPOOL SECTIONS – are the last spool section of an assembly. The end section is not an outlet and it does not have cross-holes drilled all the way through the casting.

ELECTRIC/MANUAL SECTIONS – When manual handles are used it is necessary to route the relief vent line past each spool section. The vent line is routed by specially machining each section for automatic unloading. Every section (low, high, and double lock) is available with automatic unloading (A). We can assemble any combination of electric, manual handle, or electric/manual handle controlled spool sections. If any section has automatic unloading, then every spool section in the assembly must be machined for a vent line (A).

CARTRIDGES AND COILS – are used to open and close pilot flow paths when shifting the spool electrically. The cartridges and coils must be specified for each section of an assembly. The standard cartridge and coil for a 36PG2UP** inlet section is C300-00000 (Normally open cartridge) and C500-00000 (12 VDC coil). A C100-00002 (Normally closed cartridge) and C500-00000 (12 VDC coil) are required for each work port of any work section. Please refer to "SERIES 38 – LIST OF OPTIONS AND ACCESSORIES" for other types of coils and cartridges. (Please contact factory for availability of other cartridges and coils)

ACCESSORY ITEMS - All standard tie rod kits contain rods, foot brackets, lock washers and hex nuts. Please be sure to note correct tie rod torque spec of 85 inch lbs. (9.6 N m)

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

SERIES 36 – GENERAL INFORMATION: Continued

ASSEMBLY MODEL CODES – and list prices for complete assemblies will be issued by the factory upon the request of an authorized Brand Distributor. All model codes that are issued become proprietary to the requesting distributor. Model codes will not be descriptive in nature, but shall be of a sequential numerical type.

Individual sections and accessories can be purchased so that custom valve stacks can be assembled or modified outside the factory.

SERIES 36 – CREATING A MODEL CODE FOR SERIES 36:

INLET SECTION: (USE THIS INLET FOR SERIES 36 & 38):

36PG2

CONDITION OF INLET:
C – Closed inlet
U – Unloaded inlet*

RELIEF:
OMIT – No relief
P – Adjustable pilot relief

OPTIONS:
A- Automatic unloading*
T - Power beyond Man/Elec.*

RELIEF SETTING:
10 - 1000 psi (69.0 bar)
15 - 1500 psi (103.4 bar)
20 - 2000 psi (138.0 bar)
ETC...

LOW SPOOL SECTION:

36 B F

SPOOL TYPE:
Y – Open
X – Blocked

END SECTION:
OMIT – Center section
B – End section
W – End section, used with auto unloading and power beyond (36TG2WA)

OPTIONS:
A – Automatic unloading
C – Clevis use w/closed inlet
CA – Clevis use w/automatic unloading
H – Manual handle use w/ closed inlet
HA – Manual handle use w/ automatic unloading
M – Manual override stroke control. Choose (A) or (B) port or both.
O – Spring offset
NW – No wire through spool
D – Spring center (P to A) / detent (P to B)

*(U) – Controlled by electrical cartridge.
*(A) – Controlled by handle movement.
*(T) – Used with power beyond section (36TG2WA)

Series 36 Electric Sectional Directional Control Valve

SERIES 36 – CREATING A MODEL CODE FOR SERIES 36:
HIGH SPOOL SECTION WITH DOUBLE LOCKS:

36BL2F

SPOOL TYPE:
Y – Open
X – Blocked

END SECTION:
OMIT – Center section
B – End section
W – End section, used with auto unloading and power beyond (36TG2WA)

OPTIONS:
A – Automatic unloading
C – Clevis use w/closed inlet
CA – Clevis use w/automatic unloading
H – Manual handle use w/ closed inlet
HA – Manual handle use w/ automatic unloading
M – Manual override stroke control. Choose (A) or (B) port or both.
O – Spring offset
NW – No wire through spool
D – Spring center (P to A) / detent (P to B)

HIGH SPOOL SECTION WITH PORT RELIEF:

36BHF

SPOOL TYPE:
Y – Open
X – Blocked

END SECTION:
OMIT – Center section
B – End section
W – End section, used with auto unloading and power beyond (36TG2WA)

RELIEF (A) PORT:
B – High lift ball spring relief
C – Combo area-differ. port relief & anti-cavitation check
R – Area-differ. port relief
P – Cavity plug (No relief)
Q – Anti-cavitation check (No relief)

RELIEF (A) PORT:
10 – 1000 psi (69.0)
10 – 1500 psi (103.4 bar)
10 – 2000 psi (138.0 bar) **ECT...**

OPTIONS:
A – Automatic unloading
C – Clevis use w/closed inlet
CA – Clevis use w/automatic unloading
H – Manual handle use w/ closed inlet
HA – Manual handle use w/ automatic unloading
M – Manual override stroke control. Choose (A) or (B) port or both.
O – Spring offset
NW – No wire through spool
D – Spring center (P to A) / detent (P to B)

REPEAT RELIEF & SETTING FOR (B) PORT

SERIES 36 – EXAMPLES OF COMMON MODEL CODES:
INLET SECTIONS (USE THIS INLET FOR SERIES 36 & 38):

36PG2CP20…...Inlet section, closed center and a relief set at 2000 psi (138 bar). (Other pressures available)

36PG2UP20…...Inlet section, unloading, and a relief set at 2000 psi (138 bar). (Other pressures available)

36PG2UP20A....Inlet section, unloading, relief set at 2000 psi (138 bar) and automatic unloading.

LOW SPOOL SECTIONS:

36BFX……..Blocked spool, center section, and spring center.

36BFY……..Open spool, center section, and spring center.

36BFXB……...Blocked spool, end section, and spring center.

36BFYB……...Open spool, end section, and spring center.

36BFXBMAB…Blocked spool, end section, manual override for A and B port, and spring center.

36BFXA……...Blocked spool, automatic unloading, and spring center.

HIGH SPOOL SECTION WITH DOUBLE LOCKS:

36BL2FY…….Open spool, double locks, center section and spring center.

36BL2FYB……..Open spool, double locks, end section and spring center.

HIGH SPOOL SECTION WITH PORT RELIEF:

36BHFXR20R15…Blocked spool, center section, area-differential set at 2000 psi (138 bar)on port A, area-differential set at 1500 psi (103 bar)on port B, and spring center.

36BHFXB20P…….Blocked spool, center section, high lift ball spring relief set at 2000 psi (138 bar) on port A, port B has a cavity plug (no relief), and spring center.

36BHFXC20P…….Blocked spool, center section, combo area-differential and anti-cavitation relief set at 2000 psi (138 bar) on port A, port B has a cavity plug (no relief), and spring center.

TIE ROD KITS:

36TR1……Tie rod kit for valve stack containing a standard inlet and one spool section.

36TR2……Tie rod kit for valve stack containing a standard inlet and two spool sections.

36TR3……....Tie rod kit for valve stack containing a standard inlet and three spool sections.

STANDARD ASSEMBLY MODEL CODES:

36A1……..Single spool assembly, 36BFXB section, 12VDC coils, cartridges, and unloading inlet set at 2000 psi (138 bar).

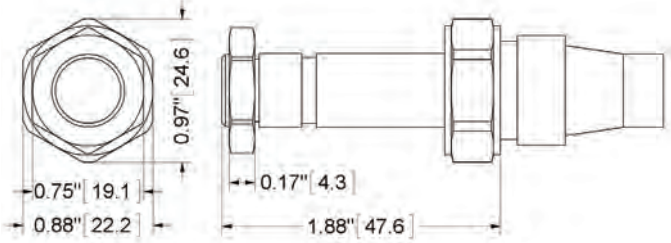
36A2L……...Two double lock spool assemblies, 36BL2FY-type sections, 12VDC coils, cartridges, and unloading inlet set at 2000 psi (138 bar).

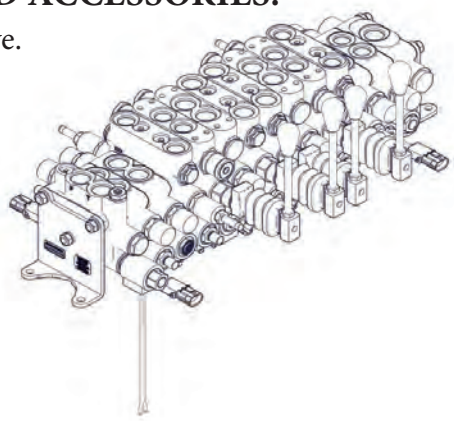
36A6……..Six spool assemblies, 36BFX-type sections, 12VDC coils, cartridges, and unloading inlet set at 2000 psi (138 bar).

Standard assemblies are available with up to twelve spool sections using the model code format outlined above for the one and two spool assemblies. (Includes 12VDC coils with 18” (457 mm) wires)

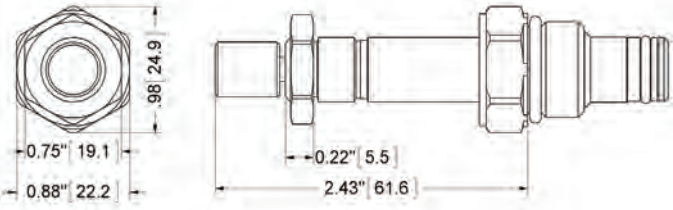
SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

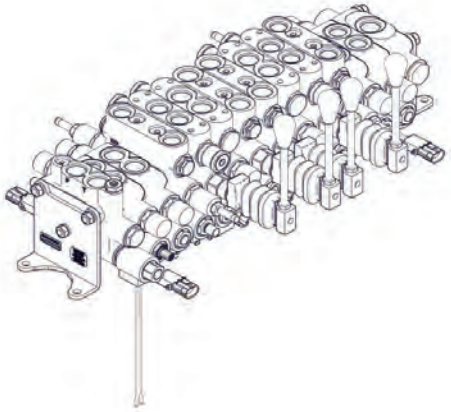
C100-00002…...…Normally closed, two way cartridge valve.



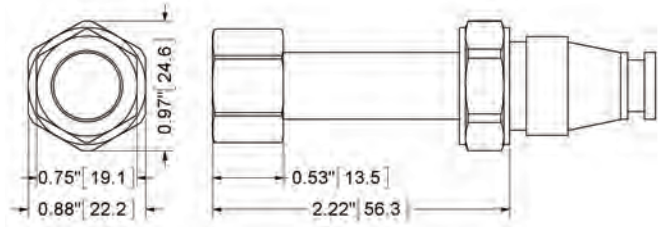


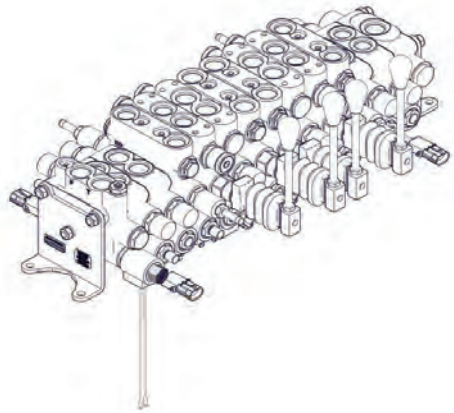
C102-00000…...….Normally closed cartridge valve, with manual override. Allows manual control of pilot oil used to shift spool. To override, push button in, twist counterclockwise 180° and release. In this position, the valve will remain open. To return to normal operation, push button in, twist clockwise 180°, and release. Override will be detented in this position. Note: on stacks with unloaded inlets, the unloader must be closed either electrically or manually, in order to provide pilot pressure at this valve.





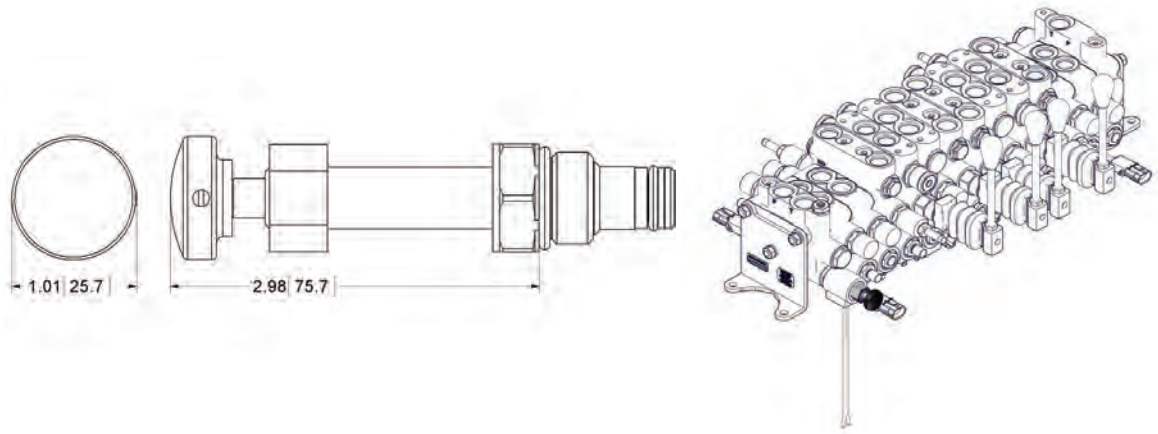
C300-00000……..Normally open, two way cartridge valv





SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

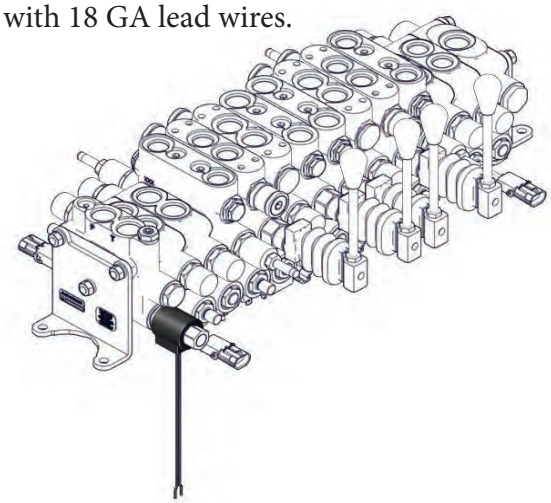
C30M-00000…....Normally open cartridge valve, with manual override. Allows manual control of unloading valve, in inlet sections so equipped. To override, push and hold override button.



C500-00000…....12 VDC coil with 18 GA lead wires.

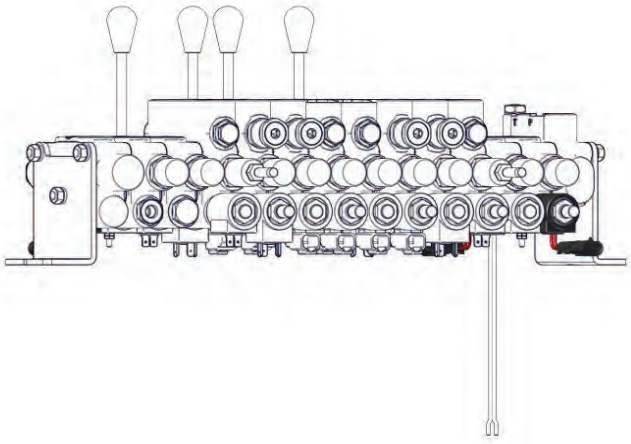
C600-00000…....24 VDC coil with 18 GA lead wires.

C800-00000…....115 VAC coil with 18 GA lead wires.



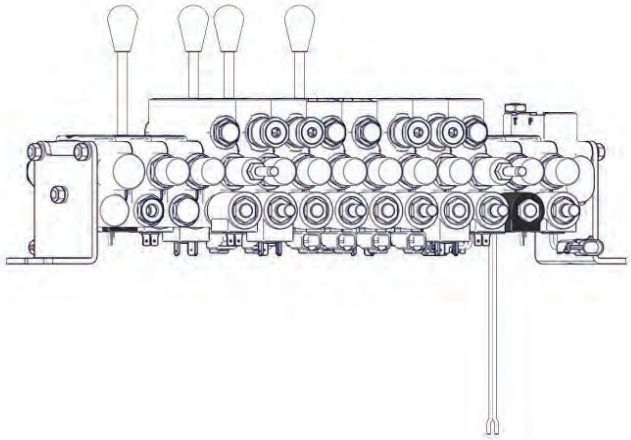
External dimensions are the same for all kits listed above.

C501-00000…....12 VDC coil, with weatherhead connection.

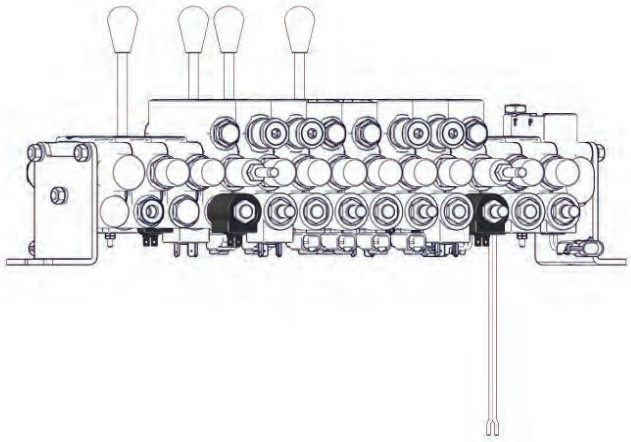


SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

C503-00000…..…12 VDC coil with single 8-32 stud internal ground.



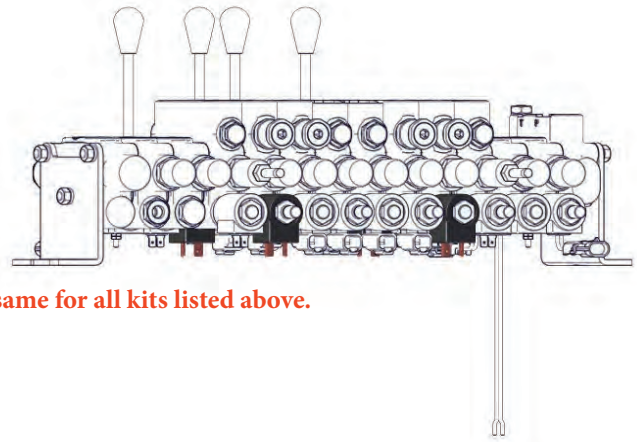
C504-00000…..…12 VDC coil with dual spade connector (SAE J858a).



C506-00000……..12 VDC coil with DIN 43650 connector.

C601-00000…..…24 VDC coil with DIN 43650 connector.

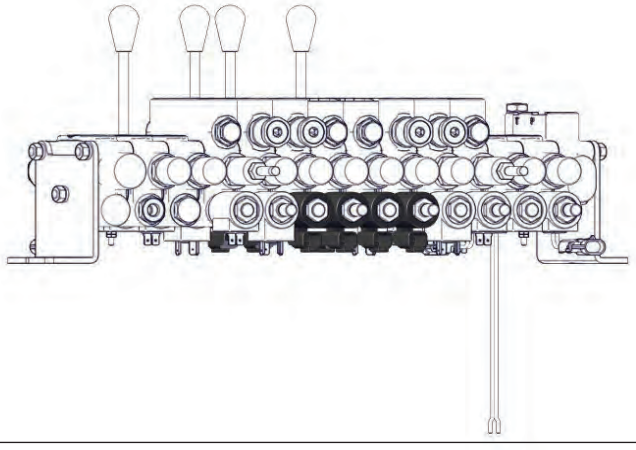
C801-00000…..…115 VAC coil with DIN 43650 connector.



External dimensions are the same for all kits listed above.

SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

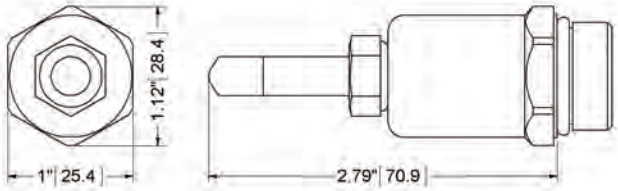
C513-00000……..12 VDC coil with Deutsch connector DT06-2S.

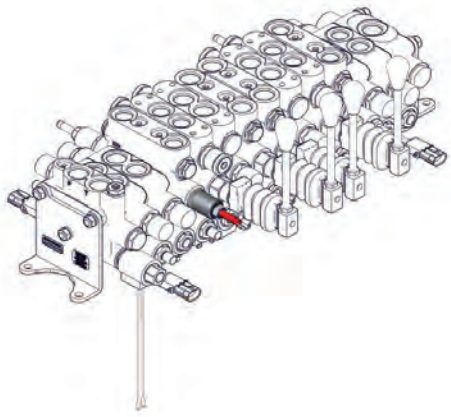


36-SCR……..…....Screens for cartridge.

36ABSP……..…....Plug with seals, used to convert a center section to an end section.

36AM……..…....Manual override kit. (One end only)





36BDB-W……....End section with #4 SAE pilot port.

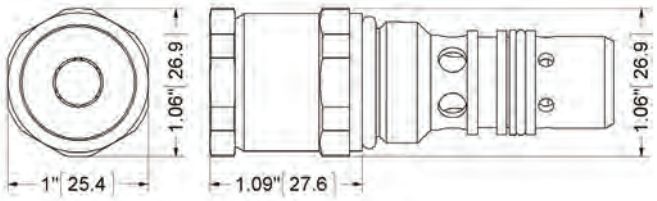
36B_-NW…….....Spool section with no wires in spool.

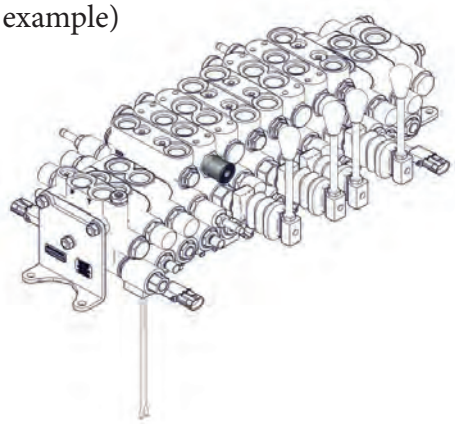
36BL1FY……...Single lock section with open spool.

SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

36C10……...…...Combination differential port relief and anti-cavitation check, set at 1000 psi (69.0 bar), for spool section codes beginning 36BHF. (Available in pressure setting increments of 100 psi (6.9 bar), please specify desired setting as per this example)

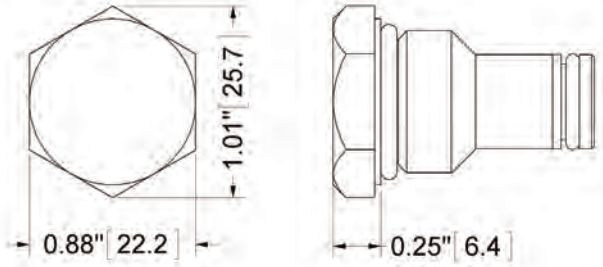
36R10……...…....Area differential port relief, set at 1000 psi (69.0 bar), for spool section codes beginning 36BHF. (Available in pressure setting increments of 100 psi (6.9 bar), please specify desired setting as per this example)

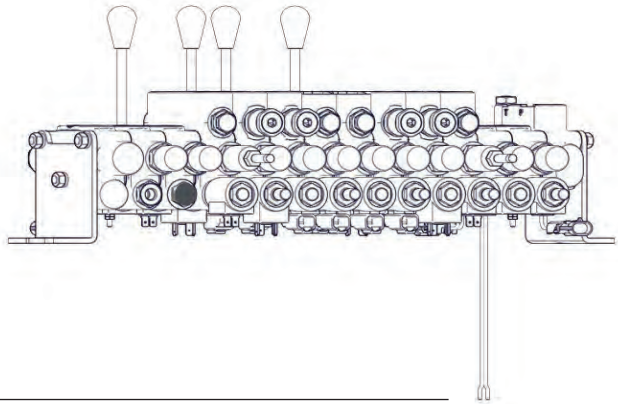




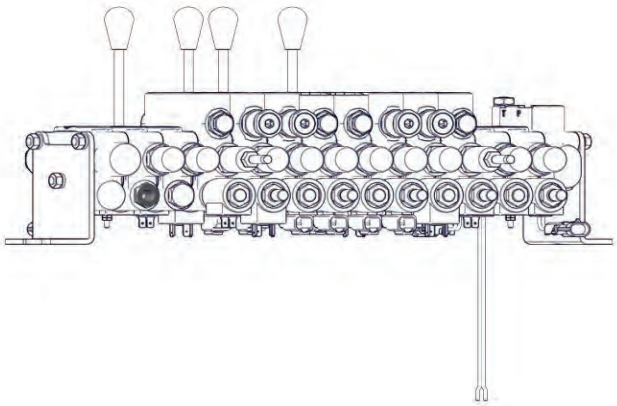
External dimensions are the same for all kits listed above.

36CP……...…....Solid plug for solenoid cartridge cavity.



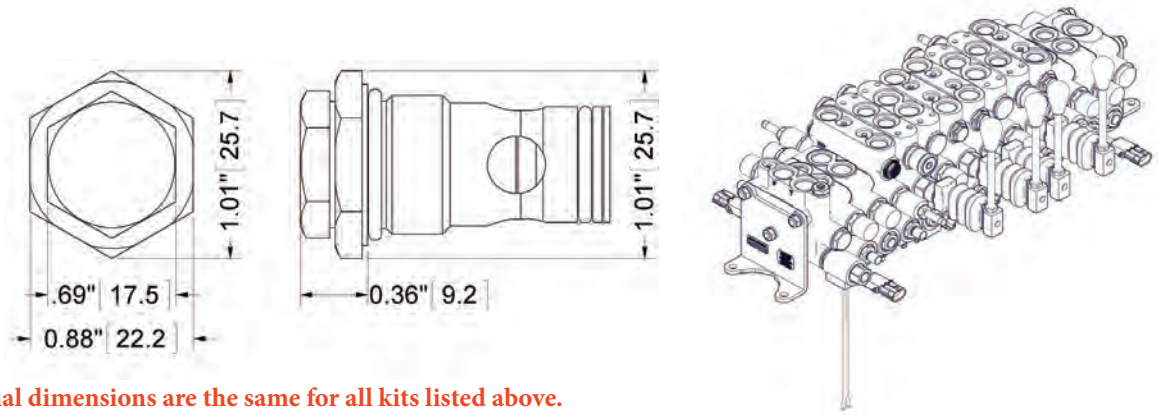


36CP-RP……...…..Pilot plug (for cartridge cavity) with drilled and tapped hole that allows the customer to shift the spool from a remote location.



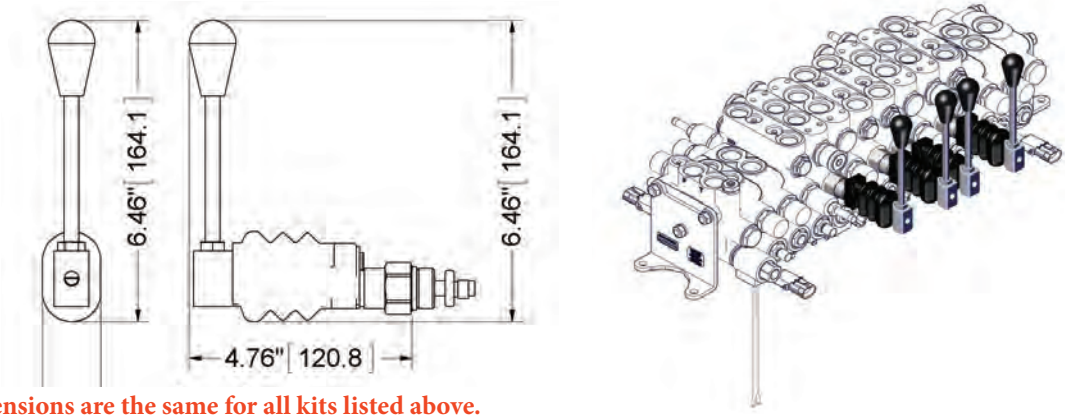
SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

36L2-K…….....Double lock kit with 4:1 ratio seat. (Valves shipped after 02/01/13)
36DL2-K……..…..Delrin double lock kit with 5:1 ratio seat. (Valves shipped before 02/01/13)
36DL2-KS…….....Steel double lock kit with 5:1 ratio seat. (Valves shipped before 02/01/13)



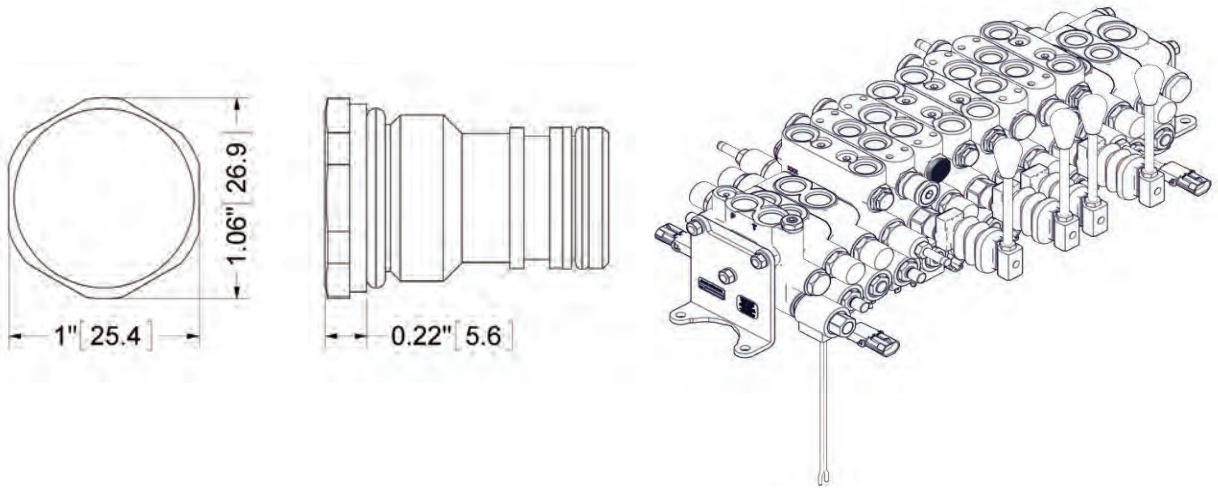
External dimensions are the same for all kits listed above.

36ME-X……..…....Handle assembly kit with (X) style spool. (Y spool also)
36ME-XL…….....Handle assembly kit with (X) style spool and light springs. (Y spool also)



External dimensions are the same for all kits listed above.

36RP……..Port relief cavity plug for high section.



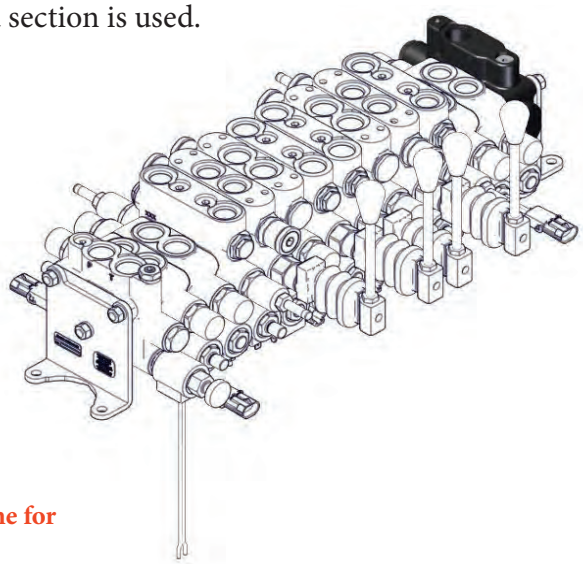
Series 36 Electric Sectional Directional Control Valve

SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

36TG1……..……...Outlet section for Series 36.

36TG2W……..…...Power beyond outlet section. This section must also have a N.O. cartridge. Inlet section does not require a N.O. cartridge when this power beyond section is used.

36TG2WA…...…..Power beyond outlet section for electric and manual control. This section must also have a N.O. cartridge. Inlet section does not require a N.O. cartridge when this power beyond section is used.



External dimensions are the same for all kits listed above.

36TR_……..…....Tie rod kits, specify number of spool sections in valve assembly, i.e. 3 spool sections in valve would read 36TR3.

ECM0001…….. ...Current Steering Module. Simplify wiring by replacing DPDT switches with SPDT switches.

Seal Kits:

36BHK…….....Seal kit for high section with relief.

36BK…….....Seal kit to rebuild between sections.

36BK-EM…….....Seal kit to rebuild between EM sections.

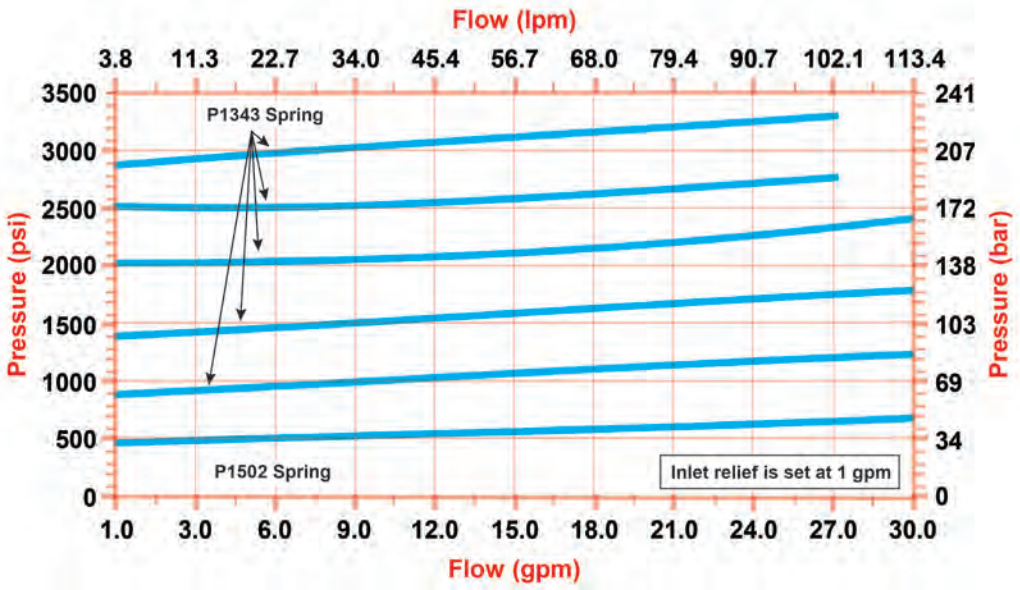
36BLK……..…..Seal kit for the body, locks and between the sections.

36PK……...…....Seal kit for inlet.

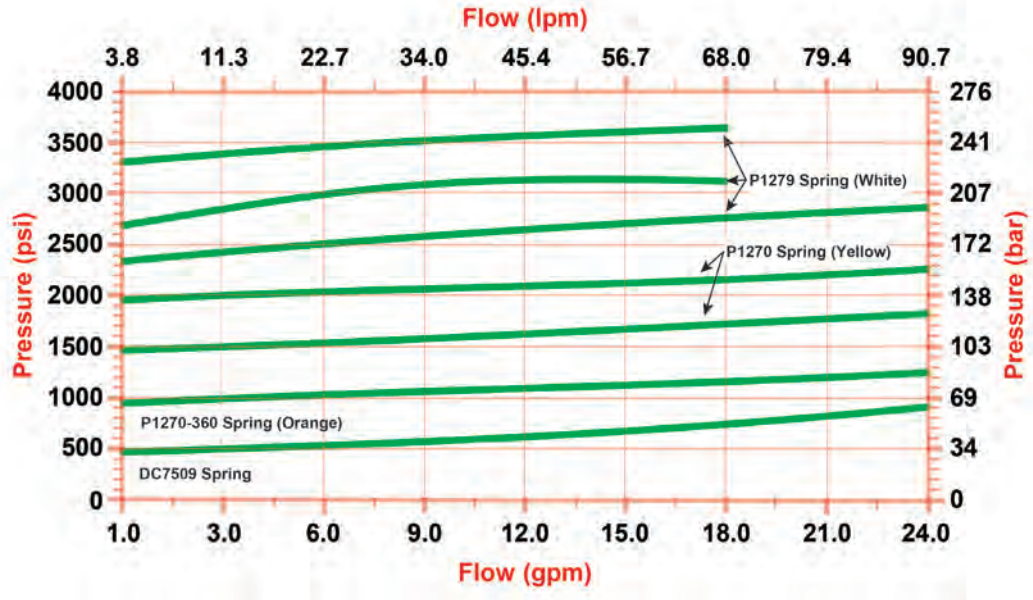
36RCB……..…….Seal kit for High lift ball spring relief (B), Combo. differ. port relief and anti cavitation check (C), and Area differ. port relief (R).

SERIES 36 – FLOW AND PRESSURE INFO:

Pressure VS. Flow for Inlet Relief

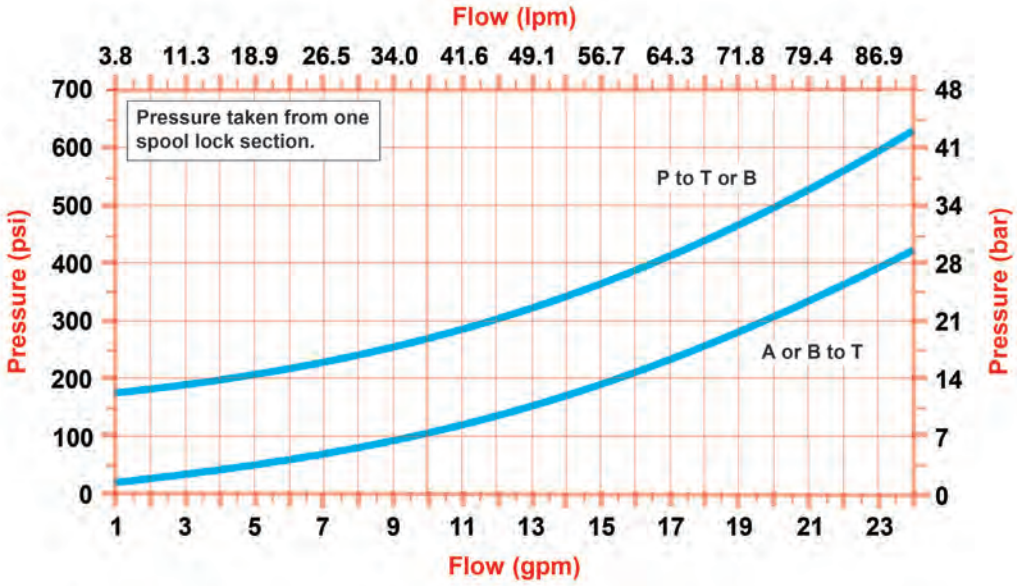


Pressure Drop VS. Flow for S36 Relief

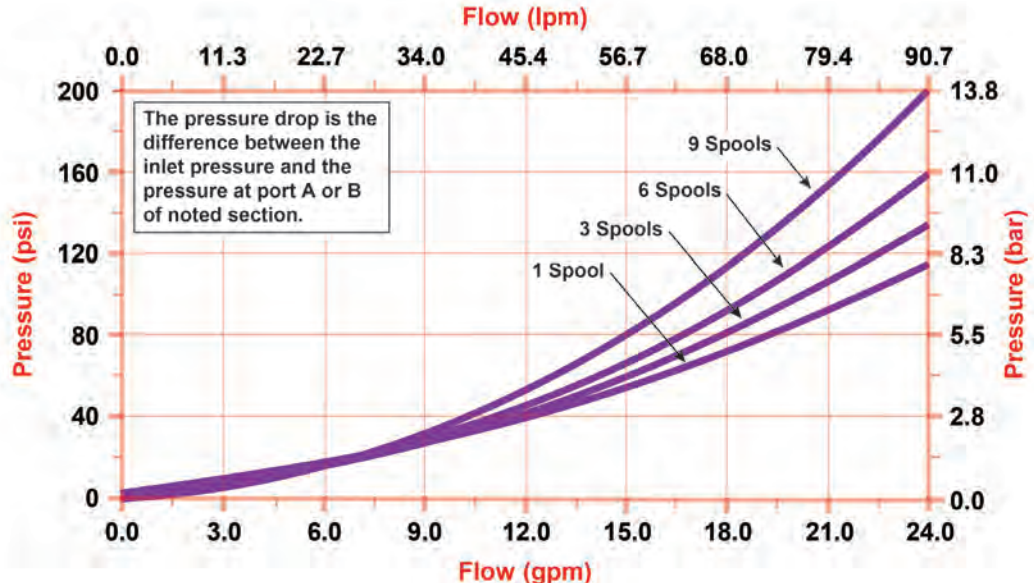


SERIES 36 – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for Double Lock Section

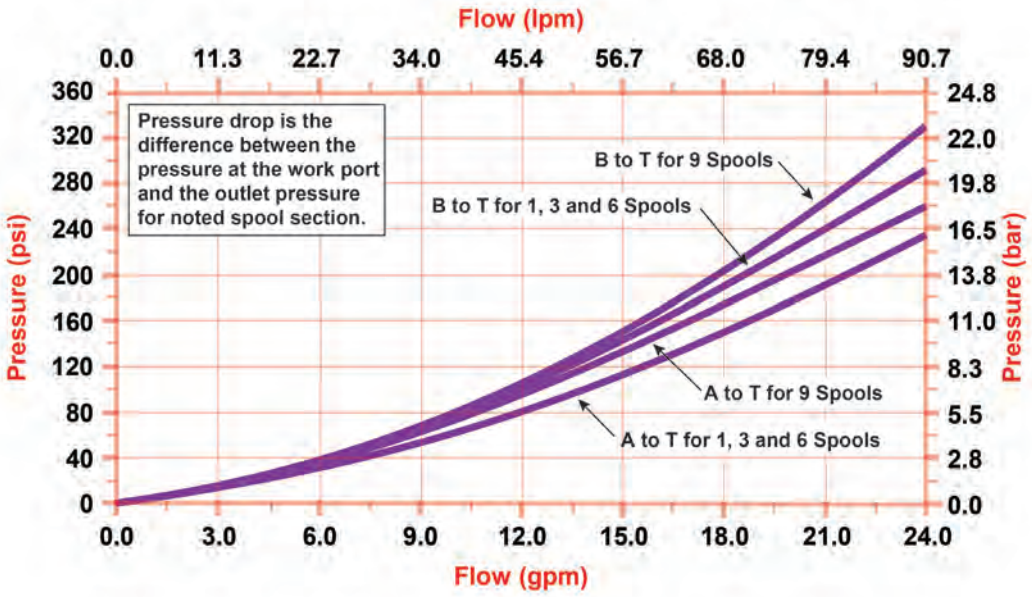


Pressure Drop VS. Flow for P to A or B



SERIES 36 – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for A or B to T

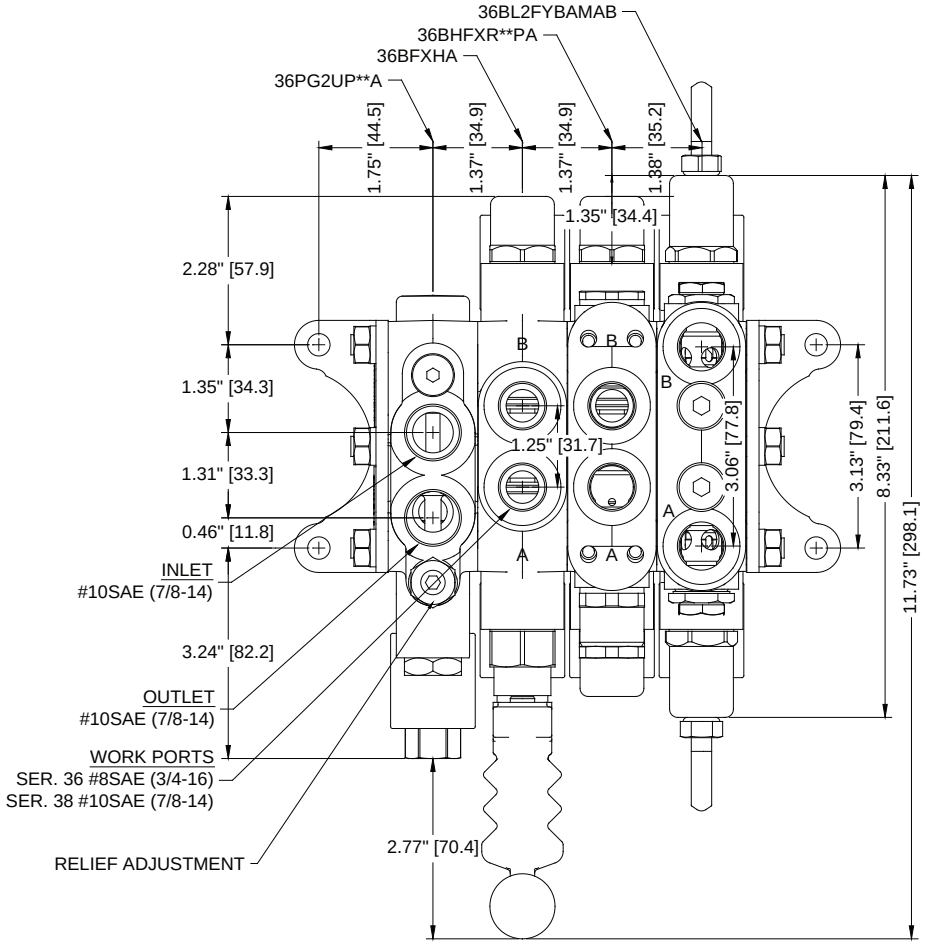


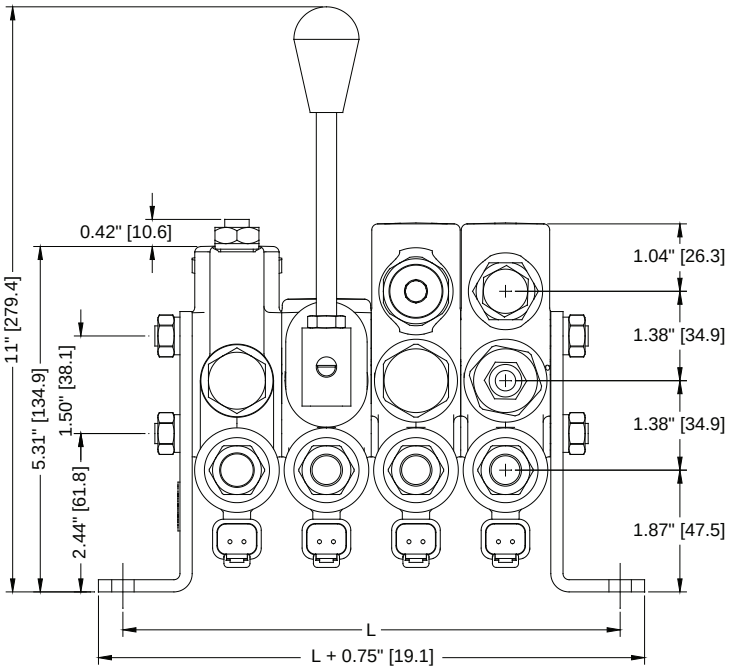
Neutral Flow Pressure Drop

Series 36 Electric Sectional Directional Control Valve

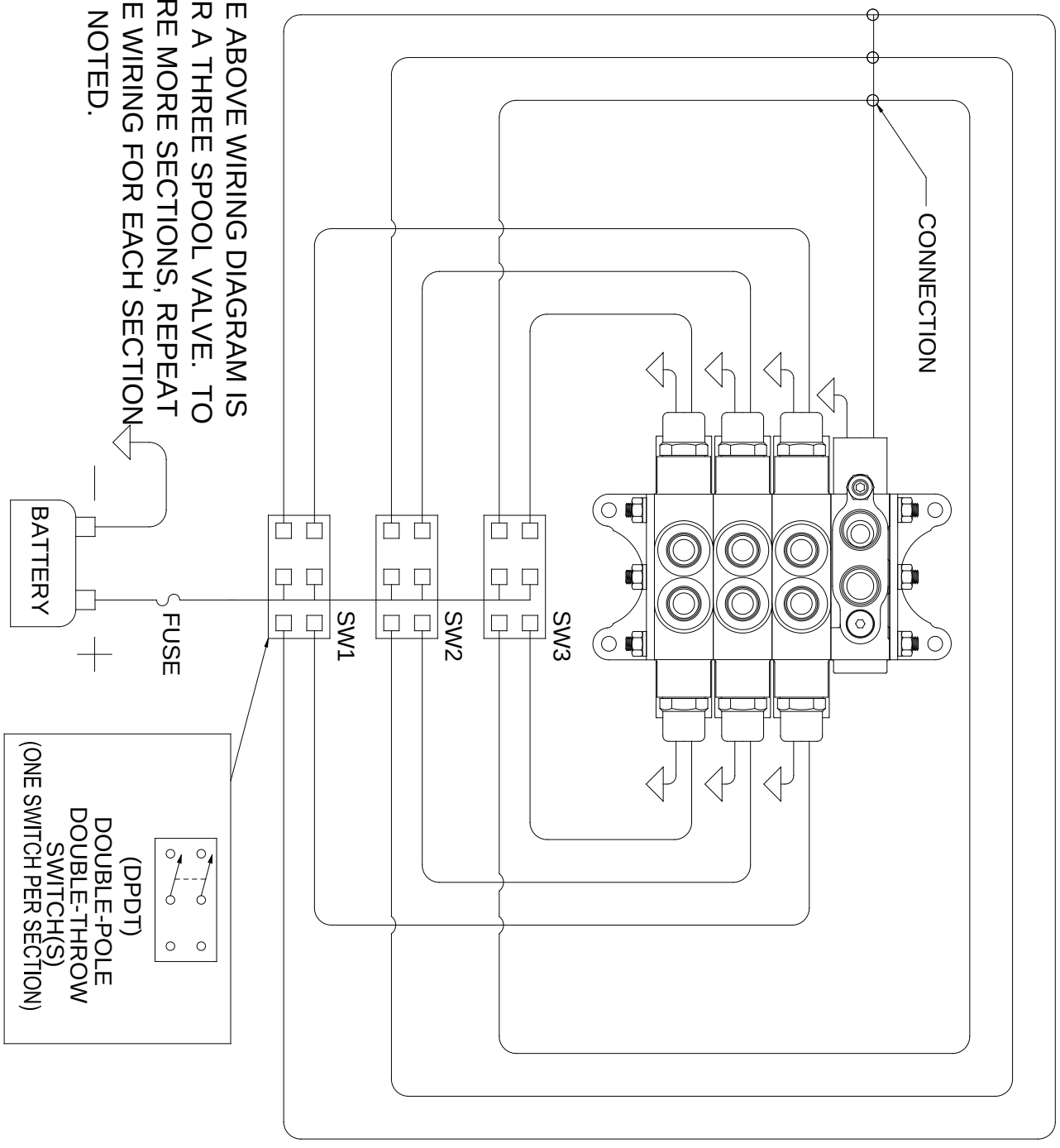
DIMENSIONAL DATA: inches & [millimeters]

# OF SPOOLS	L
1	4.89” [124.2]
2	6.27” [159.1]
3	7.64” [194.0]
4	9.02” [229.0]
5	10.39” [263.9]
6	11.77” [298.8]
7	13.14” [333.8]
8	14.52” [368.7]
9	15.89” [403.6]
10	17.27” [438.5]
11	18.64” [473.5]
12	20.02” [508.4]





SERIES 36/38 SWITCH WIRING DIAGRAM:



Series 36 Sectional Directional Control Valve

VALVE ASSEMBLY ARRANGEMENT:		PRICE
(P)	P36A (Painted black)	
(MP)	MP36A (Epoxy coating)	
	36A	
INLET/OUTLET	36PG2	
SPOOL #1	36B	
SPOOL #2	36B	
SPOOL #3	36B	
SPOOL #4	36B	
SPOOL #5	36B	
SPOOL #6	36B	
SPOOL #7	36B	
SPOOL #8	36B	
SPOOL #9	36B	
SPOOL #10	36B	
SPOOL #11	36B	
END SPOOL	36B	
N.C. CART.	C100	
N.C. CART.	C300	
COILS	C___	
TIE ROD	36TR	
(Torque to 85 inch lbs(9.6 N m))		
ASSEMBLY	36A LIST	$

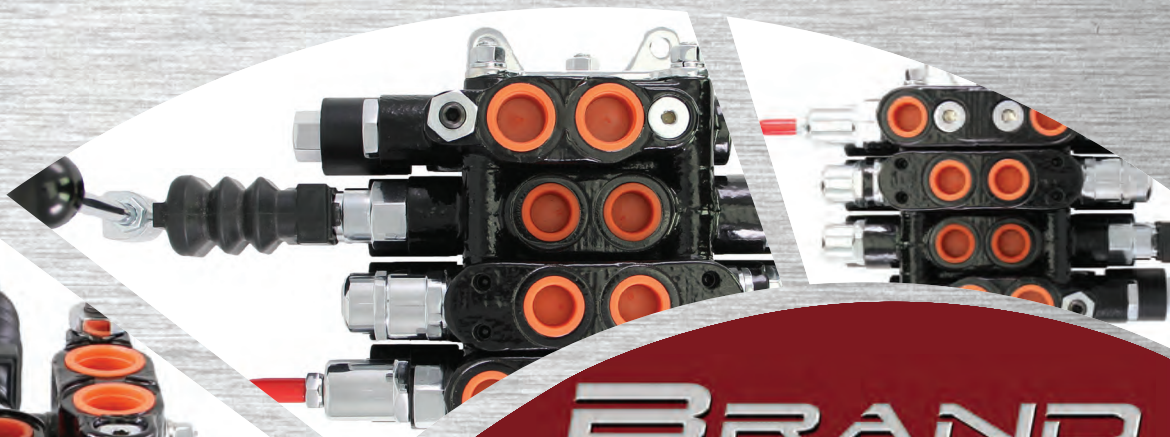
DISTRIBUTOR:_____

NAME:_____

EMAIL:_____ **PHONE:**_____

ADDRESS:_____

CITY:_____ **STATE:**_____ **ZIP:**_____ **DATE:**_____



BRAND HYDRAULICS Co.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

Series 38

Electric Sectional Directional Control Valve

P38A138020

Specifications:

- 24 gpm (90.7 lpm) Nominal Capacity
- 3500 psi (241 bar).
- 100 psi (6.9 bar) max tank pressure.
- 12 sections max (consult factory for more).
- 10 Micron Filtration Recommended.
- Assembly Torque = 85 inch-lbs. (9.6 N m)
- Spool Leakage = Less than 0.50 in^3 (819 cm^3) at 1000 psi. (69 bar)
- Weight -Inlet/outlet = 6 lbs. (2.7 kg).
  -Low spool section = 4 lbs. (1.8 kg).
  -High spool section = 6.5 lbs. (2.9 kg).
  -Above weights include cartridge, coil, and reliefs.
- Port Sizes -Inlet / Outlet #10SAE (7/8 – 14).
  -Work Ports #10SAE (7/8 – 14).
- Response Time (6 gpm@2000 psi (22.7 lpm@138 bar)).
  -110 mS for unloader.
  -600 mS for section.
- Coil -1.25 amp Inrush current.
  -1.00 amp Steady state current.

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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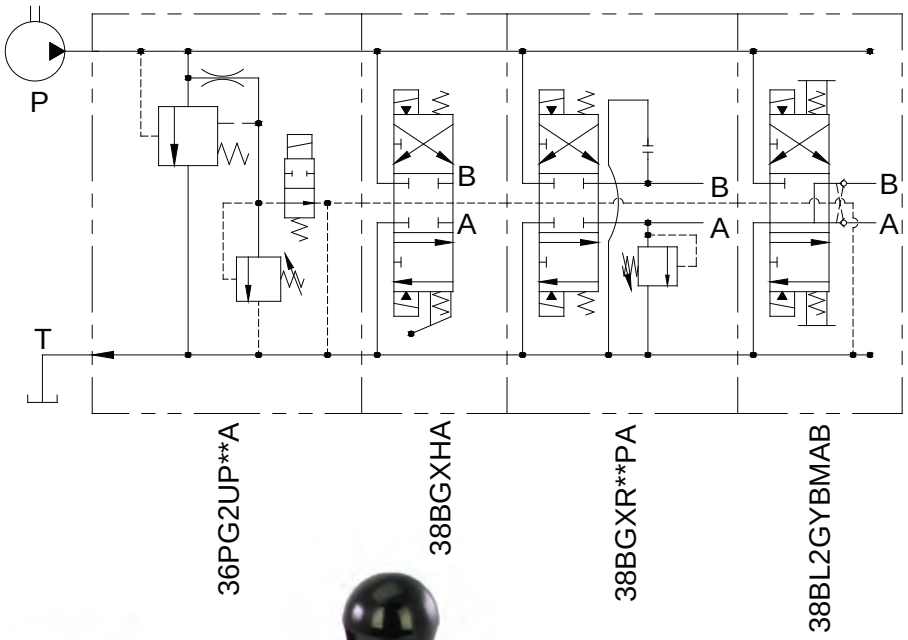
Series 38 Electric Sectional Directional Control Valve



P38A138020

MATERIALS:

- Cast Iron Body.
- Heat Treated Steel Spools.
- Buna N O'Rings (standard).
- Stress Proof Steel Tie Rods.

FEATURES:

- PRECISION GROUND HEAT TREATED SPOOL assures long life.
- DIAMOND HONED SPOOL BORE provides consistent spool fit with low leakage.
- O'RING PORTS to eliminate leakage.
- OIL GROOVES on the spool provide smooth spool motion.
- PILOT CARTRIDGE assures positive force to shift spool.

SERIES 38 – GENERAL INFORMATION:

The Brand, Series 38 Electric Sectional Directional Control Valves are assembled to meet our customer's requirements for up to twelve individual applications per assembly. Brand Hydraulics does not charge extra for this assembly process, an assembly is priced solely on the overall sum of the prices of its components.

The Series 38 is available with electric unloading in the inlet section. The flow goes directly to tank in the neutral condition. Neutral flow does not pass through the spool sections; therefore, the neutral pressure drop to tank remains low and constant regardless of the number of spool sections. This neutral path is closed whenever a section is activated. If two or more spools are shifted simultaneously, then the spool sections are in parallel. In parallel the flow will take the path of least resistance and the lightest load will move first. The spools are shifted by solenoid controlled pilot valves. This method assures positive shifting and it also minimizes the amperage draw.

It is common to have applications where high flow (above 15 gpm (56.7 lpm)) is needed out some sections and low flow (below 15 gpm (56.7 lpm)) is needed out other sections. The Series 38 can be used for high flow and the Series 36 can be used for low flow. Series 36 and Series 38 sections can be stacked together to meet both flow requirements. Any combination up to twelve sections can be assembled.

Flow can be controlled by machining a pocket in the pressure line so that an orifice plate can fit between the spool sections. If more than one orifice is used in an assembly, then they must be arranged with the largest orifice first (closest to the inlet). We also offer individual orifice plates to restrict the flow out of a work port.

INLETS –

Can be provided with a closed center inlet (with or without relief) which can be used in a pressure compensated system. Inlets are also available with unloading for use in systems with fixed displacement pumps.

To understand the unloading feature the following explanation may be helpful. The inlet is machined with a pilot operated relief valve, and a vent line. By manipulating the vent line we can offer the following features:

ELECTRIC UNLOADING – An inlet machined for a pilot-operated relief valve can be supplied with a vent line that is open to flow through a two-way normally open solenoid cartridge. Thus, we have electric unloading when the solenoid is de-energized and loading when the solenoid is energized. By replacing the two-way normally open solenoid cartridge with a cavity plug the vent line will be blocked and the inlet will not unload. The cavity plug is used for pressure compensated systems while still providing relief valve protection.

AUTOMATIC UNLOADING – When using the handle option it is necessary to use a specially machined inlet that allows the vent line to continue on past each spool section. The vent line is interrupted automatically whenever the handle is moved.

Inlets can be supplied with electric unloading, or automatic unloading. Our most popular combination is an inlet machined for electric and automatic unloading. This combination allows the customer to manually control the valve with handles during an electrical failure.

Series 38 Electric Sectional Directional Control Valve

LOW SPOOL SECTIONS – are available with two types of spools - open (Y) and blocked (X). Spring centering is standard on every spool section. Spring offset (O), allows the customer to use a cavity plug on the side of the spring offset instead of a solenoid and cartridge. Manual override/Stroke control (M) is available for ports A & B of each section. It allows the customer to manually move the spool, which can lower a load or to limit the travel of the spool so that it acts as a speed control. Manual handles are also available for use when there is no electricity or for manual and electric control of the same section.

HIGH SPOOL SECTIONS – offer the same options as listed for the low spool sections with the addition of individual port reliefs. Three types of reliefs are offered for high sections machined with port relief cavities – ball spring (B), area-differential (R), or area-differential with anti-cavitation check (C). The high section can also be made with a pilot-operated double lock (36BL2F).

END SPOOL SECTIONS – are the last spool section of an assembly. The end section is not an outlet and it does not have cross-holes drilled all the way through the casting.

ELECTRIC/MANUAL SECTIONS – When manual handles are used it is necessary to route the relief vent line past each spool section. The vent line is routed by specially machining each section for automatic unloading. Every section (low, high, and double lock) is available with automatic unloading (A). We can assemble any combination of electric, manual handle, or electric/manual handle controlled spool sections. If any section has automatic unloading, then every spool section in the assembly must be machined for a vent line (A).

CARTRIDGES AND COILS – are used to open and close pilot flow paths when shifting the spool electrically. The cartridges and coils must be specified for each section of an assembly. The standard cartridge and coil for a 36PG2UP** inlet section is C300-00000 (Normally open cartridge) and C500-00000 (12 VDC coil). A C100-00002 (Normally closed cartridge) and C500-00000 (12 VDC coil) are required for each work port of any work section. Please refer to "SERIES 38 – LIST OF OPTIONS AND ACCESSORIES" for other types of coils and cartridges. (Please contact factory for availability of other cartridges and coils)

ACCESSORY ITEMS - All standard tie rod kits contain rods, foot brackets, lock washers and hex nuts. Please be sure to note correct tie rod torque spec of 85 inch lbs. (9.6 N m)

ASSEMBLY MODEL CODES – and list prices for complete assemblies will be issued by the factory upon the request of an authorized Brand Distributor. All model codes that are issued become proprietary to the requesting distributor. Model codes will not be descriptive in nature, but shall be of a sequential numerical type.

Individual sections and accessories can be purchased so that custom valve stacks can be assembled or modified outside the factory.

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

SERIES 38 – CREATING A MODEL CODE FOR SERIES 38:
INLET SECTION: (USE THIS INLET FOR SERIES 36 & 38):

36PG2 ____ ____ ____ ____

CONDITION OF INLET:
C – Closed inlet
U – Unloaded inlet*

RELIEF:
OMIT – No relief
P – Adjustable pilot relief

OPTIONS:
A- Automatic unloading*
T - Power beyond Man/Elec.*

RELIEF SETTING:
10 - 1000 psi (69.0 bar)
15 - 1500 psi (103.4 bar)
20 - 2000 psi (138.0 bar)
ETC...

LOW SPOOL SECTION:

38 B G ____ ____ ____

SPOOL TYPE:
Y – Open
X – Blocked

END SECTION:
OMIT – Center section
B – End section
W – End section, used with auto unloading and power beyond (36TG2WA)

OPTIONS:
A – Automatic unloading
C – Clevis use w/closed inlet
CA – Clevis use w/automatic unloading
H – Manual handle use w/ closed inlet
HA – Manual handle use w/ automatic unloading
M – Manual override stroke control. Choose (A) or (B) port or both.
O – Spring offset
NW – No wire through spool
D – Spring center (P to A) / detent (P to B)

*(U) – Controlled by electrical cartridge.
*(A) – Controlled by handle movement.
*(T) – Used with power beyond section (36TG2WA)

Series 38 Electric Sectional Directional Control Valve

SERIES 38 – CREATING A MODEL CODE FOR SERIES 38:
HIGH SPOOL SECTION WITH DOUBLE LOCKS:

38BL2G

SPOOL TYPE:
Y – Open
X – Blocked

END SECTION:
OMIT – Center section
B – End section
W – End section, used with auto unloading and power beyond (36TG2WA)

OPTIONS:
A – Automatic unloading
C – Clevis use w/closed inlet
CA – Clevis use w/automatic unloading
H – Manual handle use w/ closed inlet
HA – Manual handle use w/ automatic unloading
M – Manual override stroke control. Choose (A) or (B) port or both.
O – Spring offset
NW – No wire through spool
D – Spring center (P to A) / detent (P to B)

HIGH SPOOL SECTION WITH PORT RELIEF:

38BHG

SPOOL TYPE:
Y – Open
X – Blocked

END SECTION:
OMIT – Center section
B – End section
W – End section, used with auto unloading and power beyond (36TG2WA)

RELIEF (A) PORT:
B – High lift ball spring relief
C – Combo area-differ. port relief & anti-cavitation check
R – Area-differ. port relief
P – Cavity plug (No relief)
Q – Anti-cavitation check (No relief)

RELIEF (A) PORT:
10 – 1000 psi (69.0)
10 – 1500 psi (103.4 bar)
10 – 2000 psi (138.0 bar) **ECT...**

OPTIONS:
A – Automatic unloading
C – Clevis use w/closed inlet
CA – Clevis use w/automatic unloading
H – Manual handle use w/ closed inlet
HA – Manual handle use w/ automatic unloading
M – Manual override stroke control. Choose (A) or (B) port or both.
O – Spring offset
NW – No wire through spool
D – Spring center (P to A) / detent (P to B)

REPEAT RELIEF & SETTING FOR (B) PORT

SERIES 38 – EXAMPLES OF COMMON MODEL CODES:

INLET SECTIONS (USE THIS INLET FOR SERIES 36 & 38):

36PG2CP20…...Inlet section, closed center and a relief set at 2000 psi (138 bar). (Other pressures available)

36PG2UP20…...Inlet section, unloading, and a relief set at 2000 psi (138 bar). (Other pressures available)

36PG2UP20A....Inlet section, unloading, relief set at 2000 psi (138 bar) and automatic unloading.

LOW SPOOL SECTIONS:

38BGX……..Blocked spool, center section, and spring center.

38BGY……..Open spool, center section, and spring center.

38BGXB……...Blocked spool, end section, and spring center.

38BGYB……...Open spool, end section, and spring center.

38BGXBMAB…Blocked spool, end section, manual override for A and B port, and spring center.

38BGXA……...Blocked spool, automatic unloading, and spring center.

HIGH SPOOL SECTION WITH DOUBLE LOCKS:

38BL2GY…….Open spool, double locks, center section and spring center.

38BL2GYB……..Open spool, double locks, end section and spring center.

HIGH SPOOL SECTION WITH PORT RELIEF:

38BHGXR20R15...Blocked spool, center section, area-differential set at 2000 psi (138 bar)on port A, area-differential set at 1500 psi (103 bar)on port B, and spring center.

38BHGXB20P……Blocked spool, center section, high lift ball spring relief set at 2000 psi (138 bar) on port A, port B has a cavity plug (no relief), and spring center.

38BHGXC20P……Blocked spool, center section, combo area-differential and anti-cavitation relief set at 2000 psi (138 bar) on port A, port B has a cavity plug (no relief), and spring center.

TIE ROD KITS:

36TR1……Tie rod kit for valve stack containing a standard inlet and one spool section.

36TR2……Tie rod kit for valve stack containing a standard inlet and two spool sections.

36TR3……....Tie rod kit for valve stack containing a standard inlet and three spool sections.

STANDARD ASSEMBLY MODEL CODES:

38A1……..Single spool assembly, 38BGXB section, 12VDC coils, cartridges, and unloading inlet set at 2000 psi (138 bar).

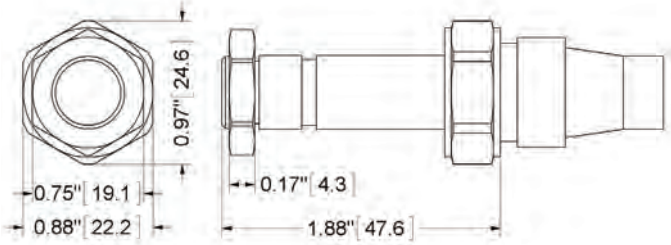
38A2L……...Two double lock spool assemblies, 38BL2GY-type sections, 12VDC coils, cartridges, and unloading inlet set at 2000 psi (138 bar).

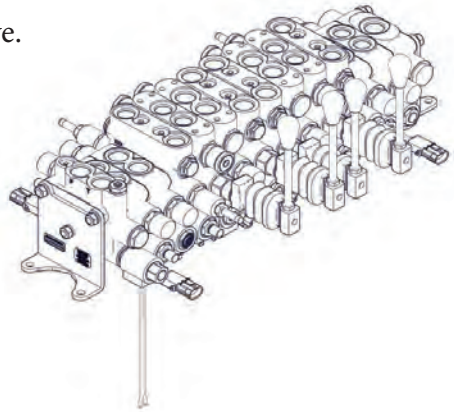
38A6……..Six spool assemblies, 38BGX-type sections, 12VDC coils, cartridges, and unloading inlet set at 2000 psi (138 bar).

Standard assemblies are available with up to twelve spool sections using the model code format outlined above for the one and two spool assemblies. (Includes 12VDC coils with 18” (457 mm) wires)

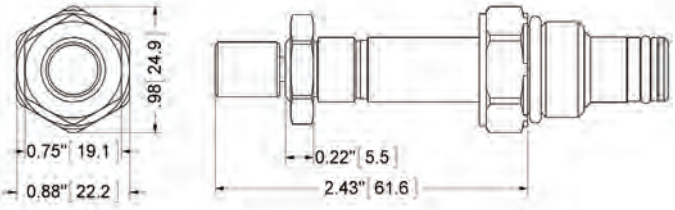
SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

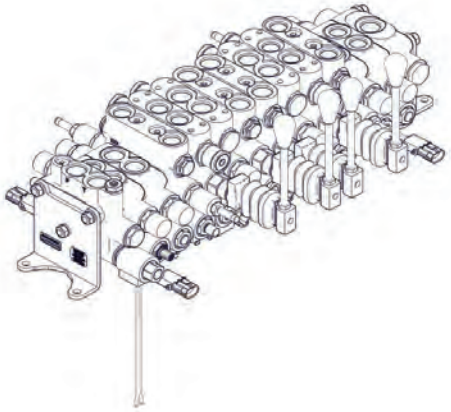
C100-00002…...…Normally closed, two way cartridge valve.



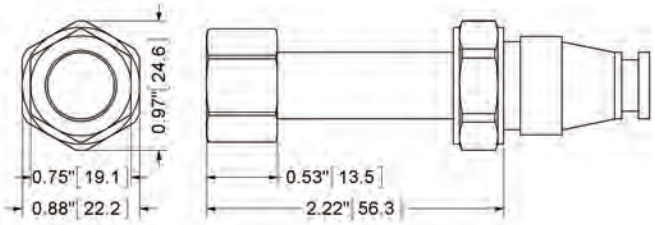


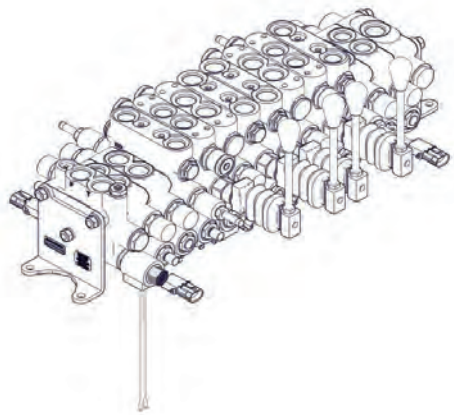
C102-00000…...….Normally closed cartridge valve, with manual override. Allows manual control of pilot oil used to shift spool. To override, push button in, twist counterclockwise 180° and release. In this position, the valve will remain open. To return to normal operation, push button in, twist clockwise 180°, and release. Override will be detented in this position. Note: on stacks with unloaded inlets, the unloader must be closed either electrically or manually, in order to provide pilot pressure at this valve.





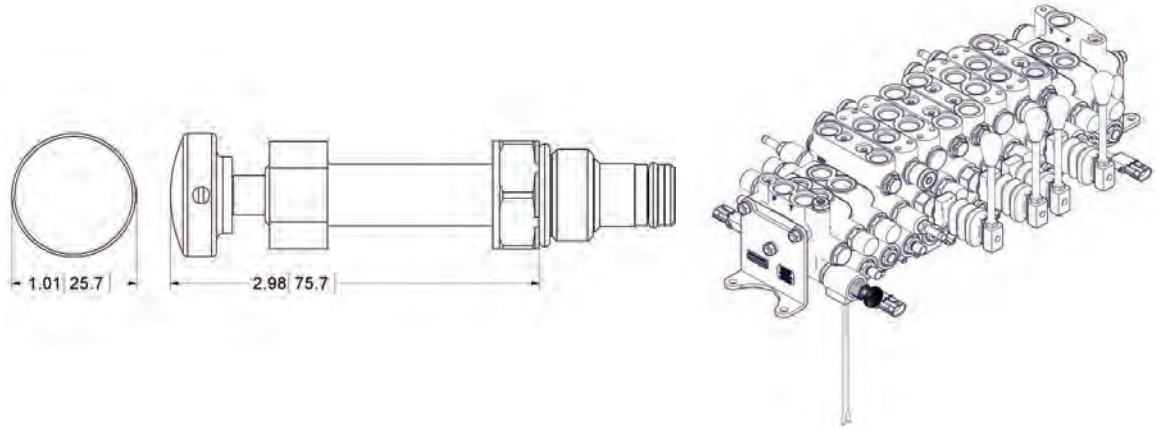
C300-00000……..Normally open, two way cartridge valv





SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

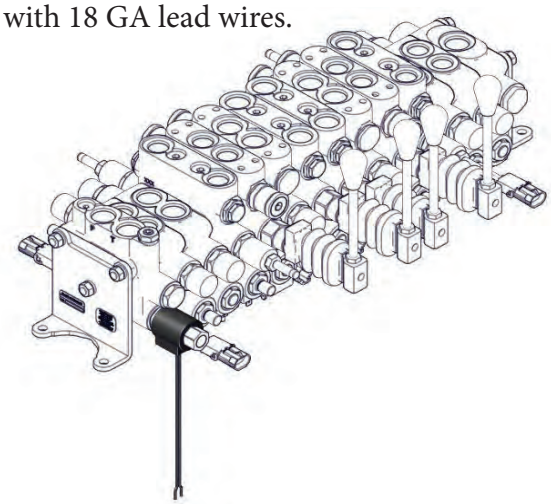
C30M-00000…....Normally open cartridge valve, with manual override. Allows manual control of unloading valve, in inlet sections so equipped. To override, push and hold override button.



C500-00000…....12 VDC coil with 18 GA lead wires.

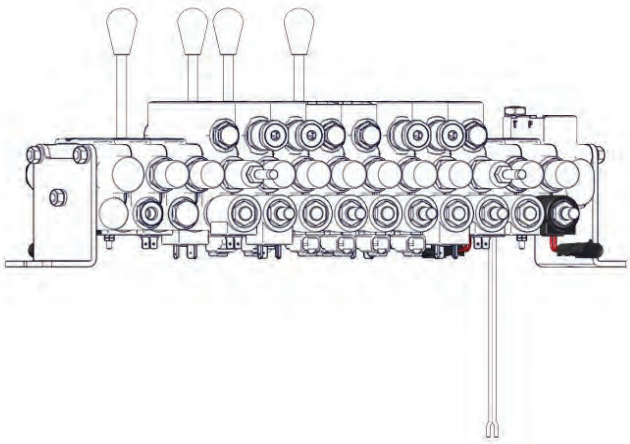
C600-00000…....24 VDC coil with 18 GA lead wires.

C800-00000…....115 VAC coil with 18 GA lead wires.



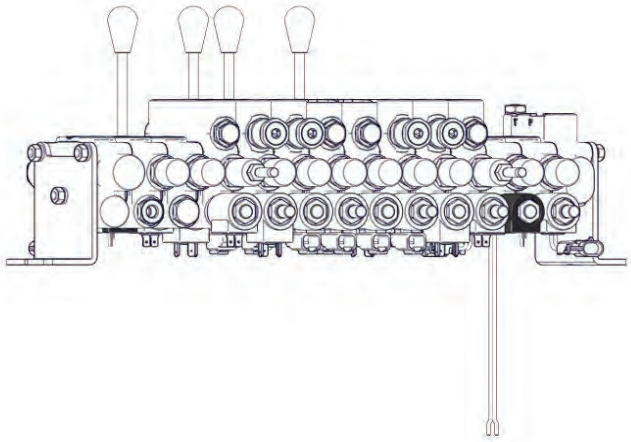
External dimensions are the same for all kits listed above.

C501-00000…....12 VDC coil, with weatherhead connection.

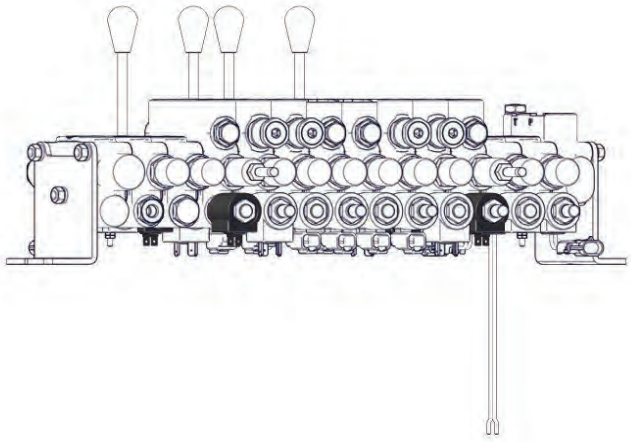


SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

C503-00000…...…12 VDC coil with single 8-32 stud internal ground.



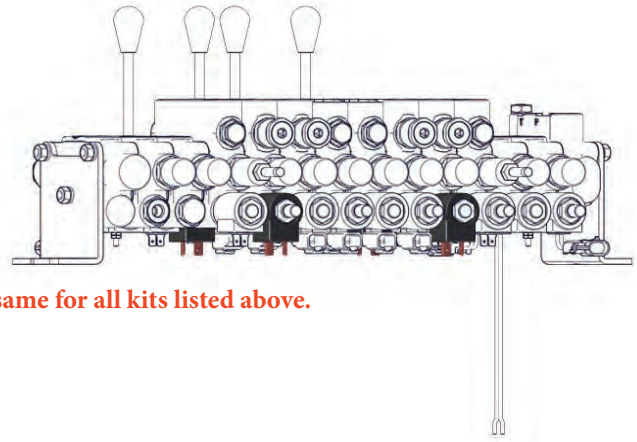
C504-00000…...…12 VDC coil with dual spade connector (SAE J858a).



C506-00000……..12 VDC coil with DIN 43650 connector.

C601-00000…...…24 VDC coil with DIN 43650 connector.

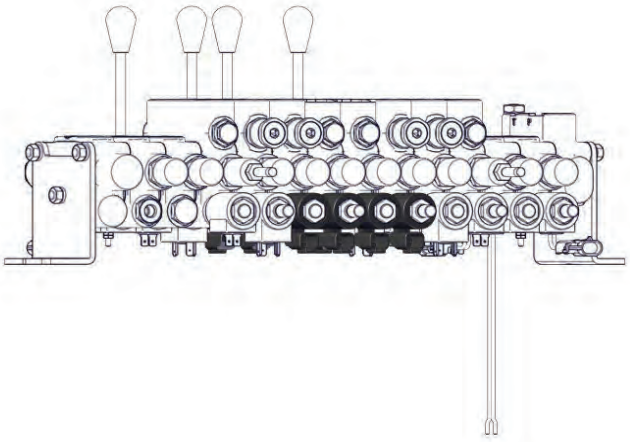
C801-00000…...…115 VAC coil with DIN 43650 connector.



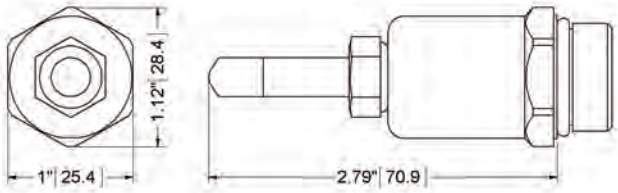
External dimensions are the same for all kits listed above.

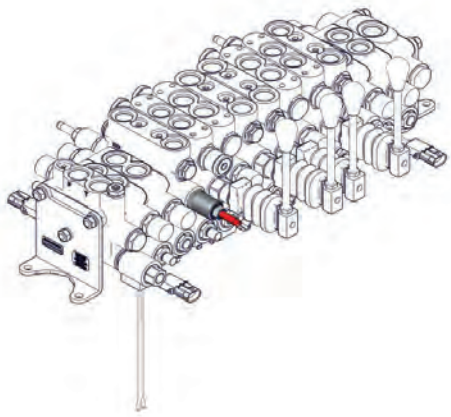
SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

C513-00000……..12 VDC coil with Deutsch connector DT06-2S.



36-SCR……..…....Screens for cartridge.
36ABSP……..…....Plug with seals, used to convert a center section to an end section.
36AM……..…....Manual override kit. (One end only)



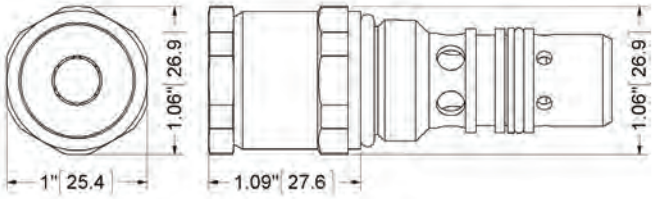


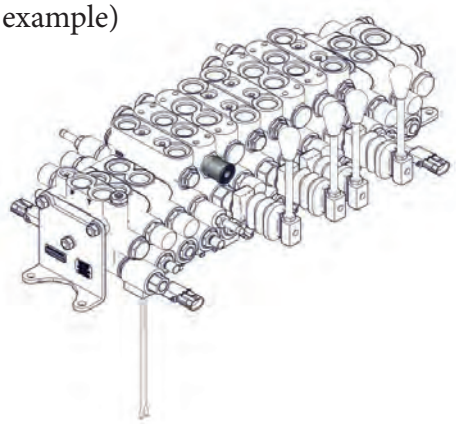
36BDB-W……....End section with #4 SAE pilot port.
36B_-NW…….....Spool section with no wires in spool.
36BL1FY……....Single lock section with open spool.

SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

36C10……..…...Combination differential port relief and anti-cavitation check, set at 1000 psi (69.0 bar), for spool section codes beginning 36BHF. (Available in pressure setting increments of 100 psi (6.9 bar), please specify desired setting as per this example)

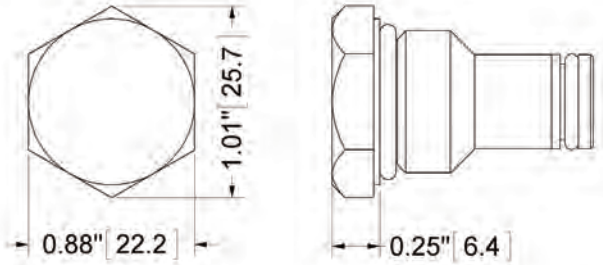
36R10……..…....Area differential port relief, set at 1000 psi (69.0 bar), for spool section codes beginning 36BHF. (Available in pressure setting increments of 100 psi (6.9 bar), please specify desired setting as per this example)

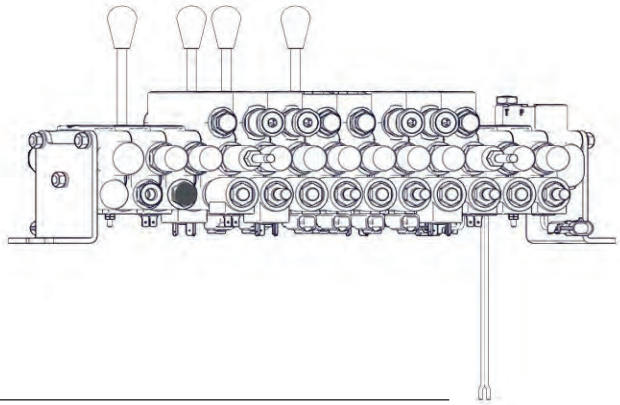




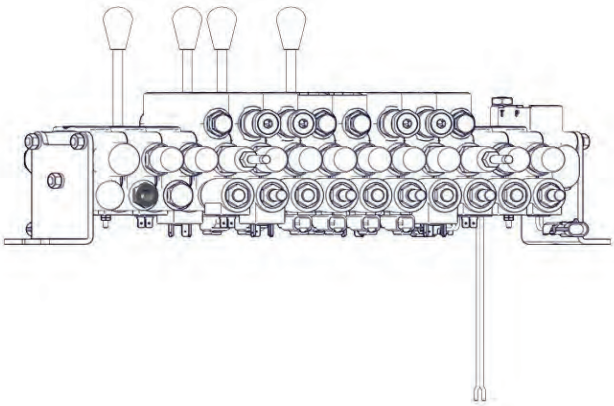
External dimensions are the same for all kits listed above.

36CP……..…....Solid plug for solenoid cartridge cavity.



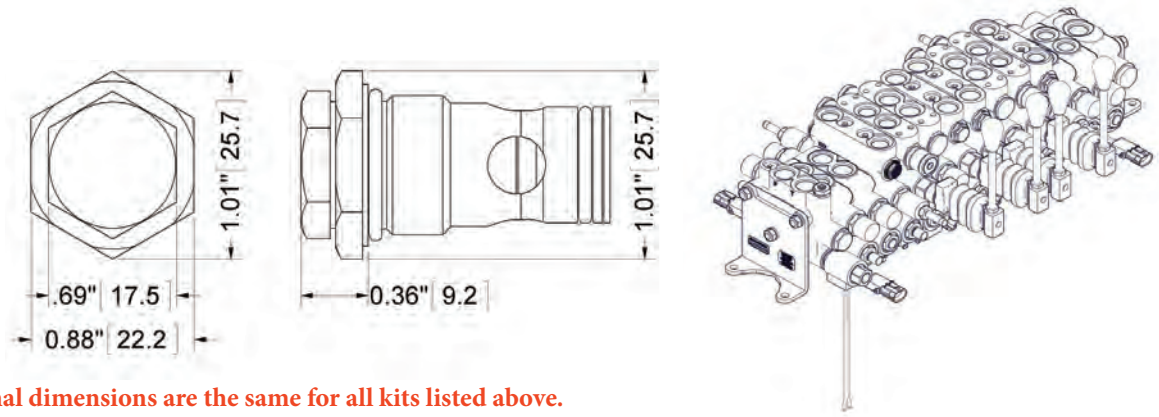


36CP-RP……..…..Pilot plug (for cartridge cavity) with drilled and tapped hole that allows the customer to shift the spool from a remote location.



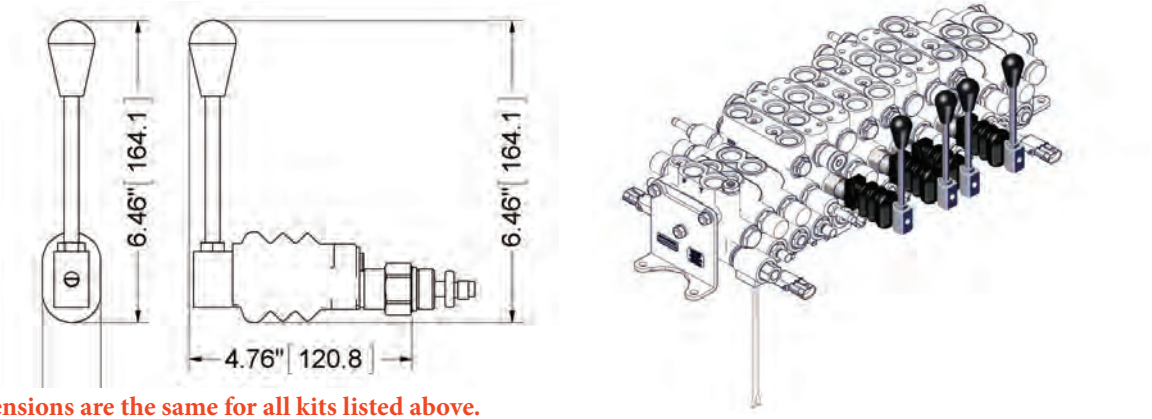
SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

36L2-K…….....Double lock kit with 4:1 ratio seat. (Valves shipped after 02/01/13)
36DL2-K……..…..Delrin double lock kit with 5:1 ratio seat. (Valves shipped before 02/01/13)
36DL2-KS…….....Steel double lock kit with 5:1 ratio seat. (Valves shipped before 02/01/13)



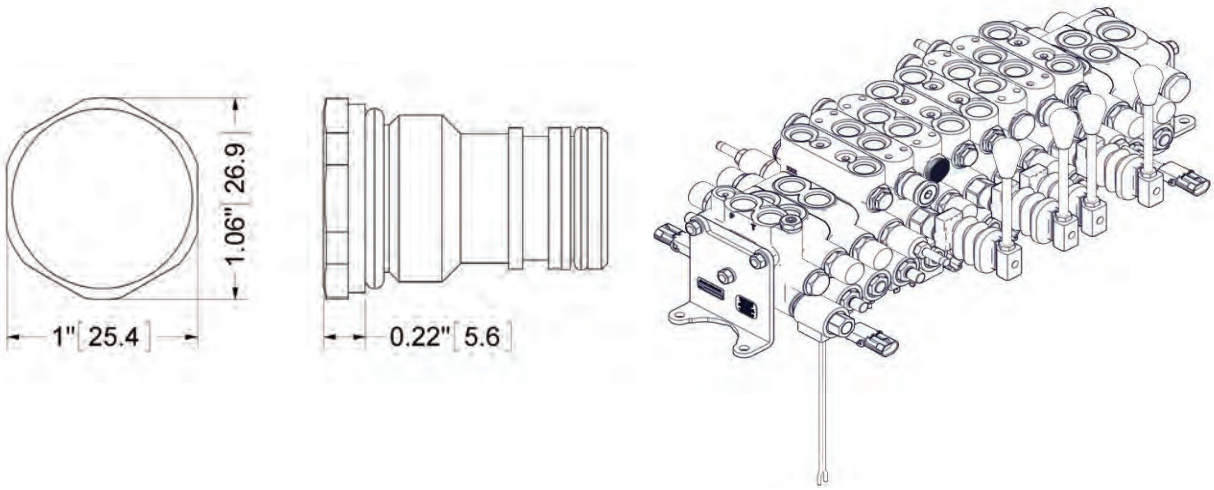
External dimensions are the same for all kits listed above.

36ME-X……..…....Handle assembly kit with (X) style spool. (Y spool also)
36ME-XL…….....Handle assembly kit with (X) style spool and light springs. (Y spool also)



External dimensions are the same for all kits listed above.

36RP……....Port relief cavity plug for high section.



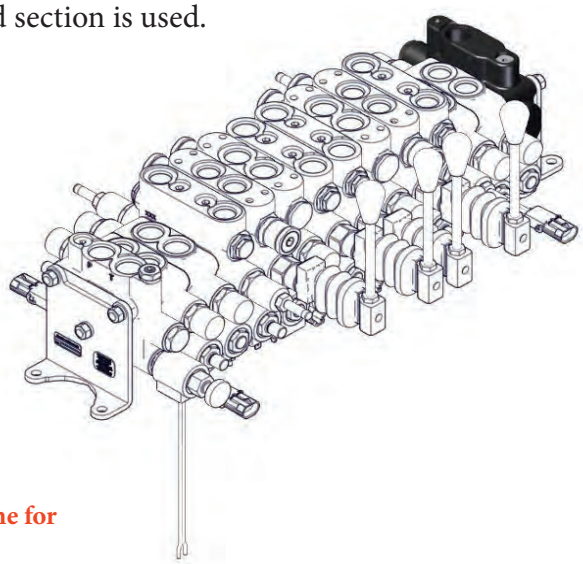
Series 38 Electric Sectional Directional Control Valve

SERIES 36 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

36TG1……..……...Outlet section for Series 36.

36TG2W……..…...Power beyond outlet section. This section must also have a N.O. cartridge. Inlet section does not require a N.O. cartridge when this power beyond section is used.

36TG2WA…...…..Power beyond outlet section for electric and manual control. This section must also have a N.O. cartridge. Inlet section does not require a N.O. cartridge when this power beyond section is used.



External dimensions are the same for all kits listed above.

36TR_……..…....Tie rod kits, specify number of spool sections in valve assembly, i.e. 3 spool sections in valve would read 36TR3.

ECM0001…….. ...Current Steering Module. Simplify wiring by replacing DPDT switches with SPDT switches.

Seal Kits:

36BHK…….....Seal kit for high section with relief.

36BK…….....Seal kit to rebuild between sections.

36BK-EM…….....Seal kit to rebuild between EM sections.

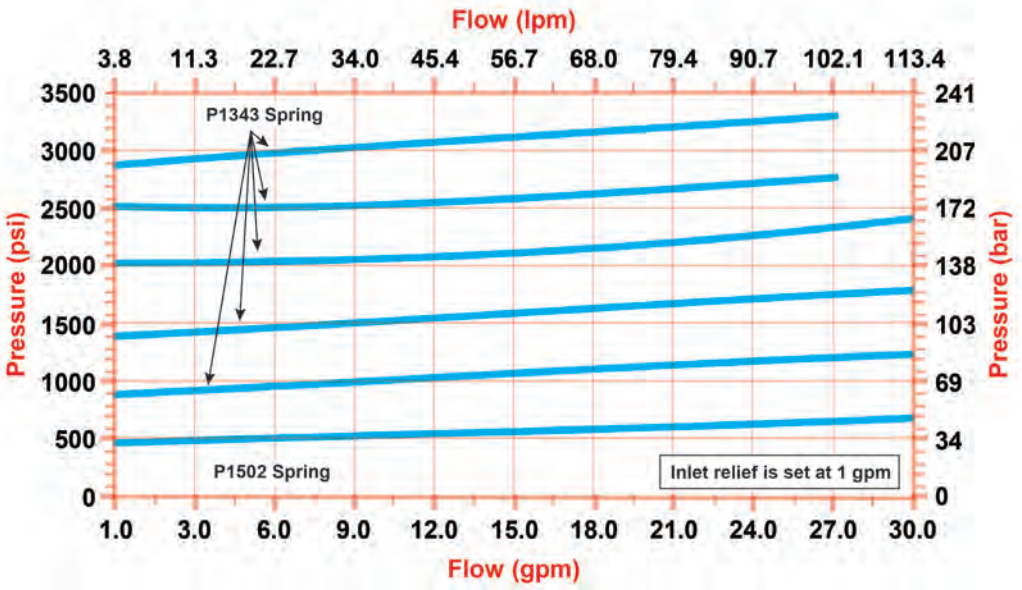
36BLK……..…..Seal kit for the body, locks and between the sections.

36PK……...…....Seal kit for inlet.

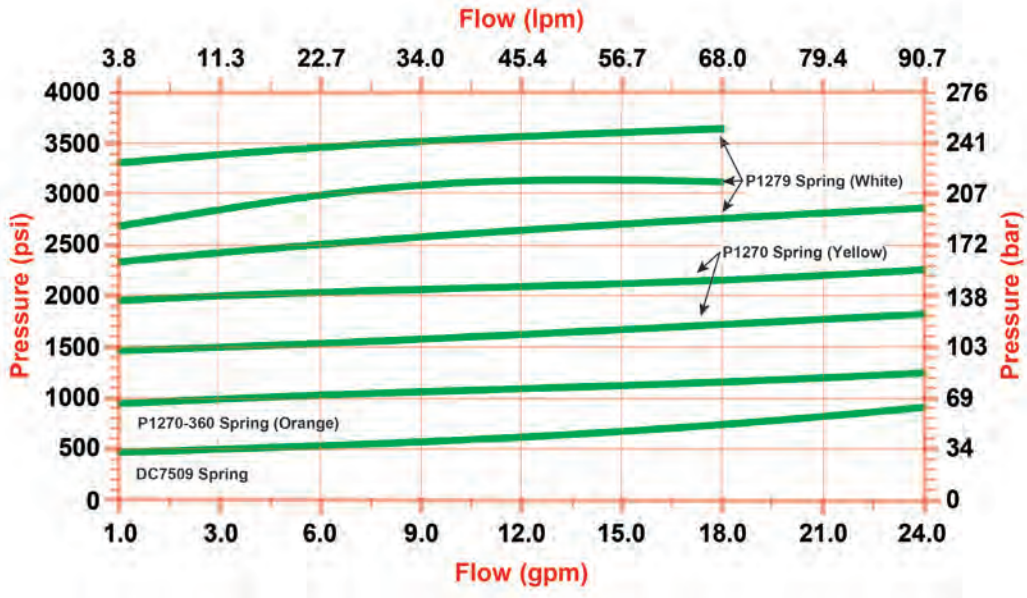
36RCB……..…….Seal kit for High lift ball spring relief (B), Combo. differ. port relief and anti cavitation check (C), and Area differ. port relief (R).

SERIES 38 – FLOW AND PRESSURE INFO:

Pressure VS. Flow for Inlet Relief

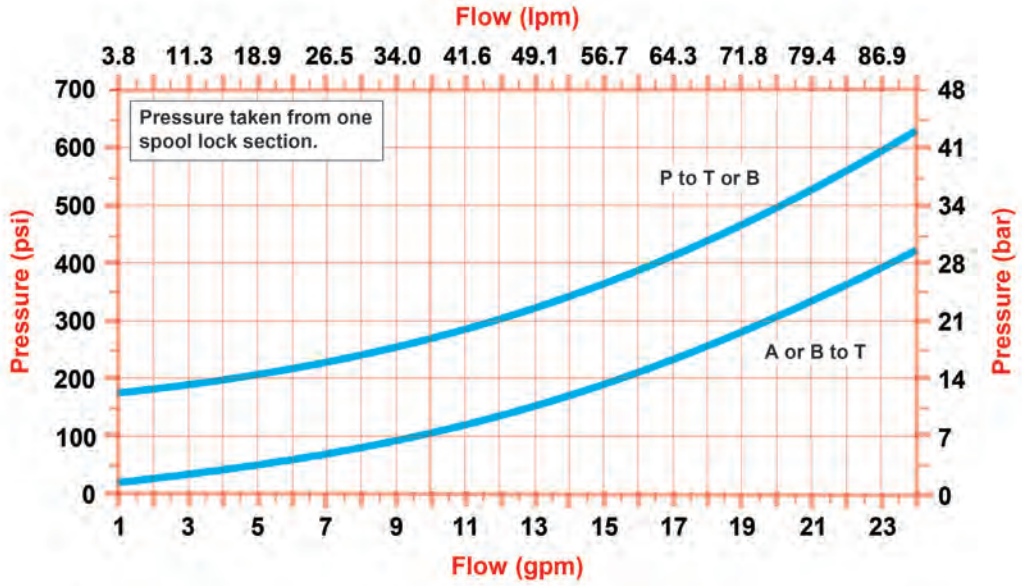


Pressure Drop VS. Flow for S36 Relief

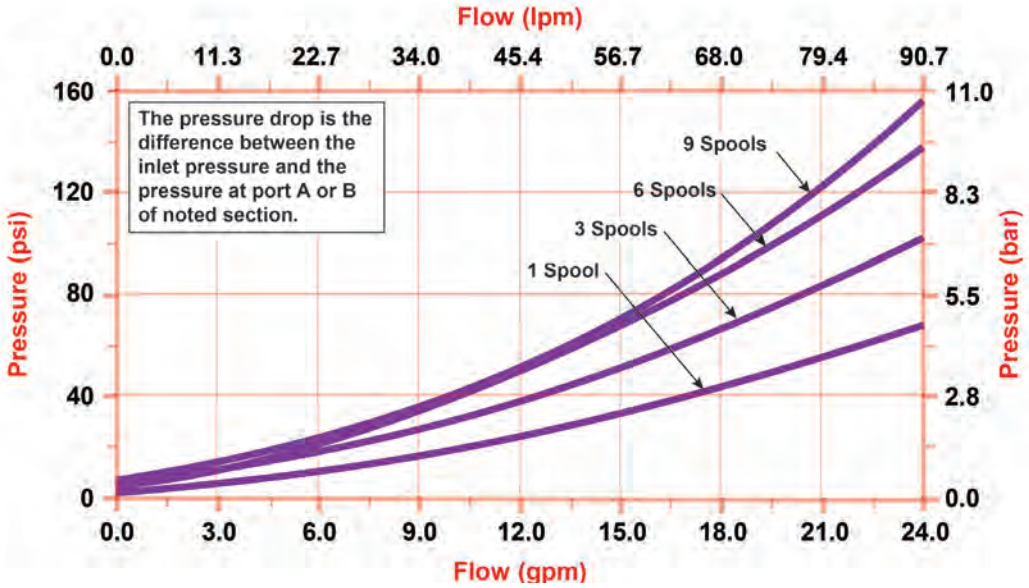


SERIES 38 – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for Double Lock Section

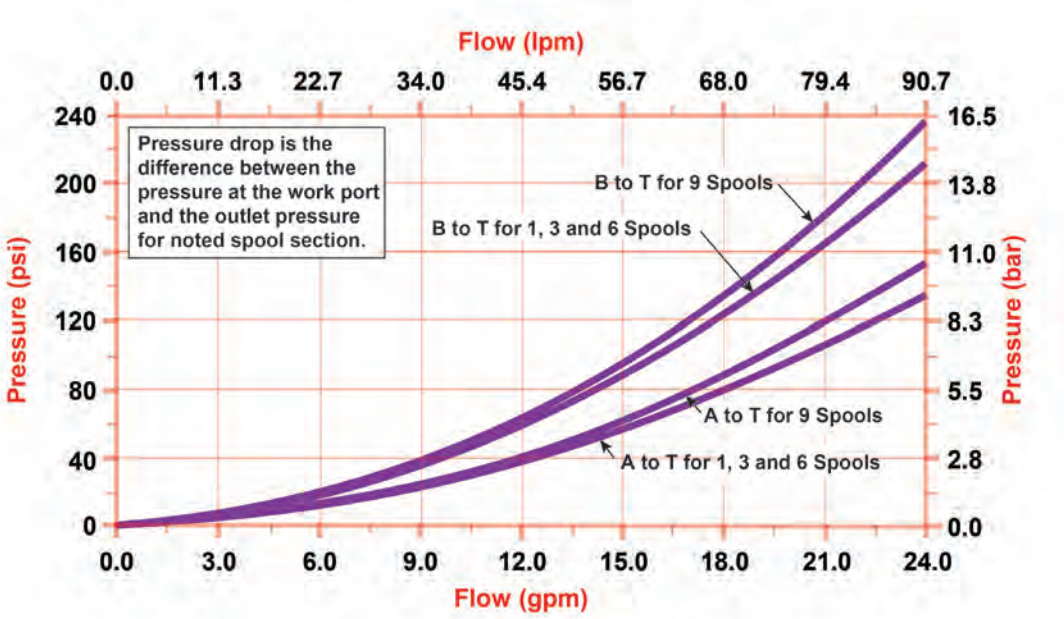


Pressure Drop VS. Flow for P to A or B

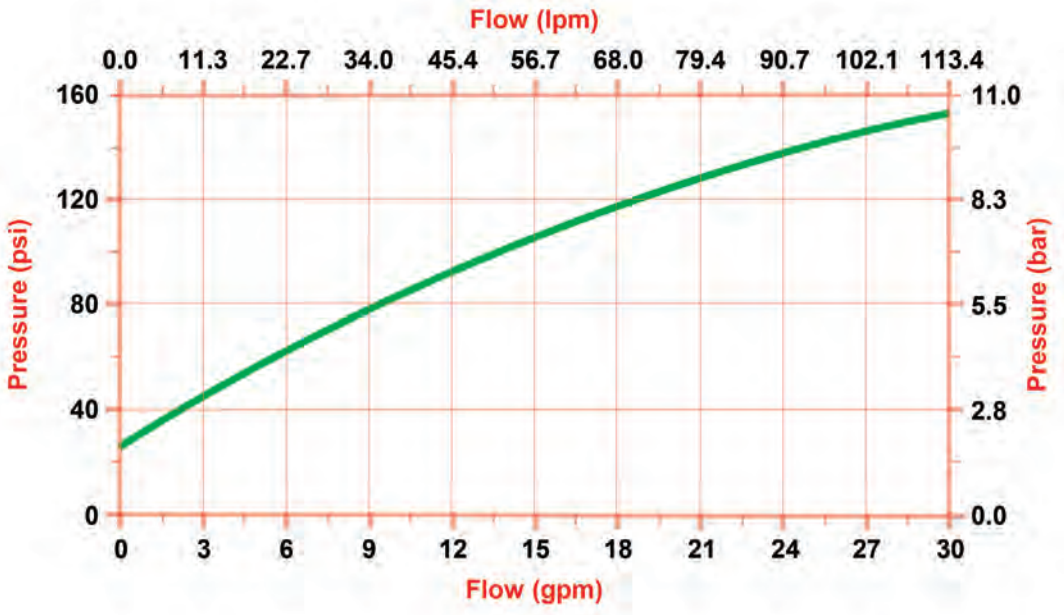


SERIES 36 – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for A or B to T



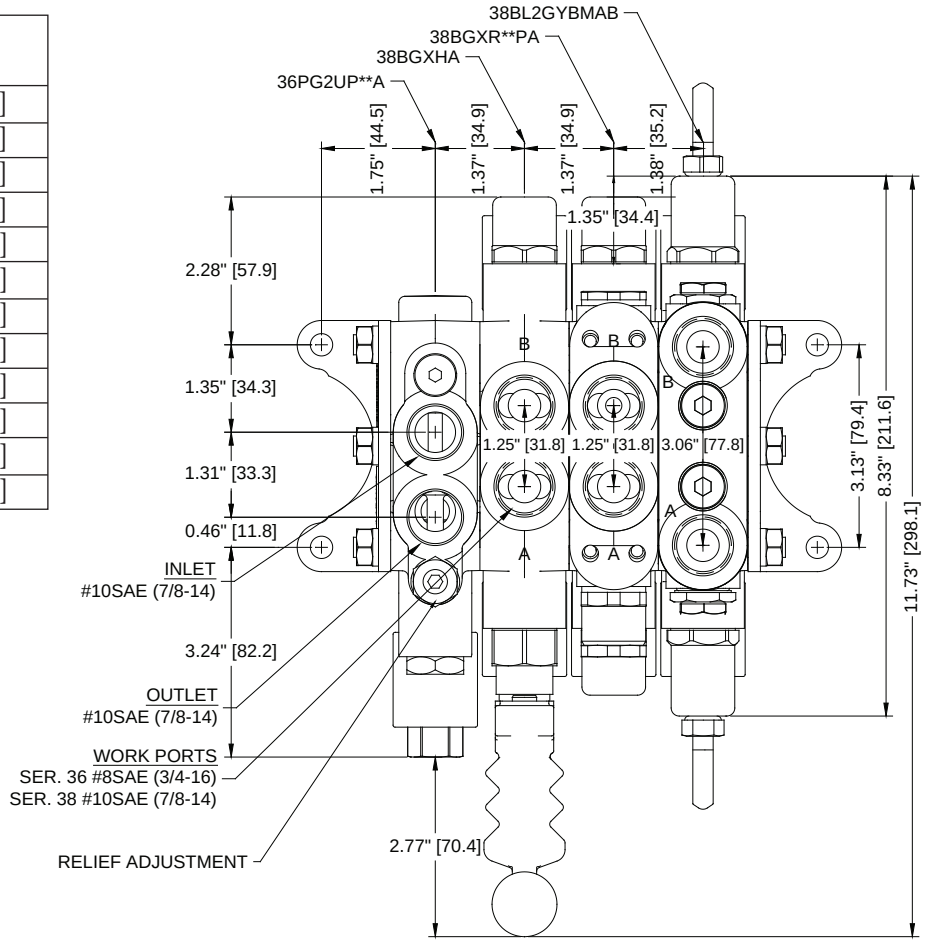
Neutral Flow Pressure Drop

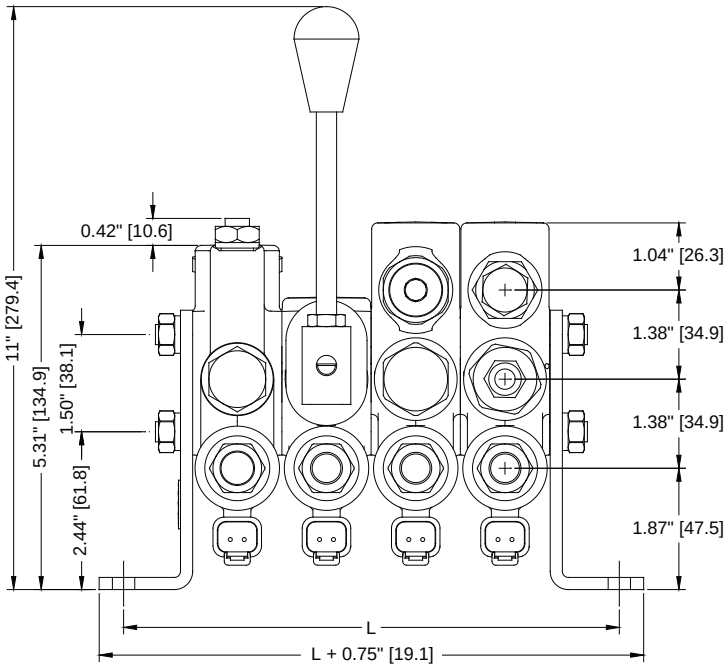


Series 38 Electric Sectional Directional Control Valve

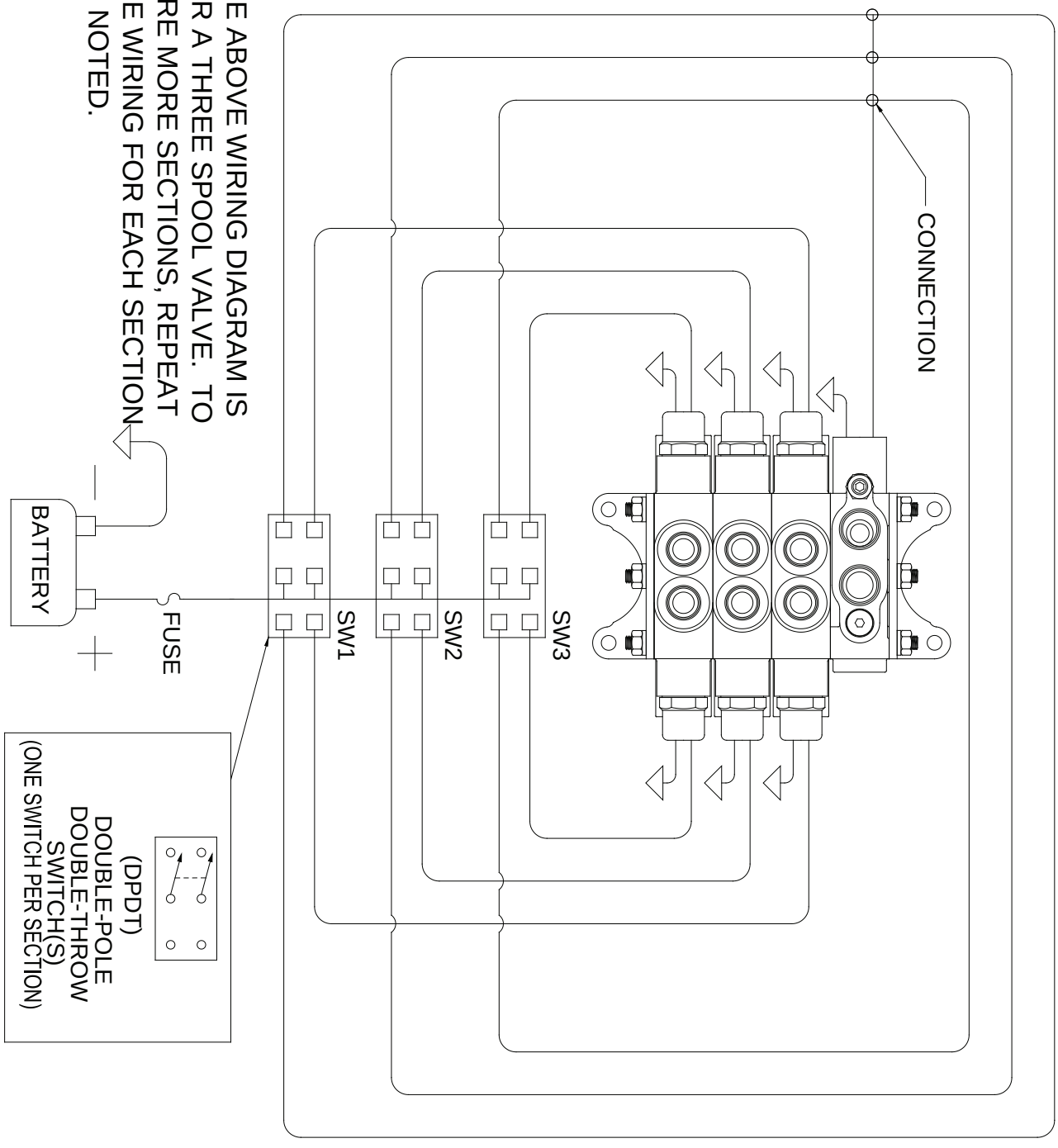
DIMENSIONAL DATA: inches & [millimeters]

# OF SPOOLS	L
1	4.89” [124.2]
2	6.27” [159.1]
3	7.64” [194.0]
4	9.02” [229.0]
5	10.39” [263.9]
6	11.77” [298.8]
7	13.14” [333.8]
8	14.52” [368.7]
9	15.89” [403.6]
10	17.27” [438.5]
11	18.64” [473.5]
12	20.02” [508.4]





SERIES 36/38 SWITCH WIRING DIAGRAM:



Series 38 Electric Sectional Directional Control Valve

VALVE ASSEMBLY ARRANGEMENT:		PRICE
(P)	P38A (Painted black)	
(MP)	MP38A (Epoxy coating)	
	38A	
INLET/OUTLET	36PG2	
SPOOL #1	38B	
SPOOL #2	38B	
SPOOL #3	38B	
SPOOL #4	38B	
SPOOL #5	38B	
SPOOL #6	38B	
SPOOL #7	38B	
SPOOL #8	38B	
SPOOL #9	38B	
SPOOL #10	38B	
SPOOL #11	38B	
END SPOOL	38B	
N.C. CART.	C100	
N.C. CART.	C300	
COILS	C___	
TIE ROD	36TR	
(Torque to 85 inch lbs(9.6 N m))		
ASSEMBLY	38A LIST	$

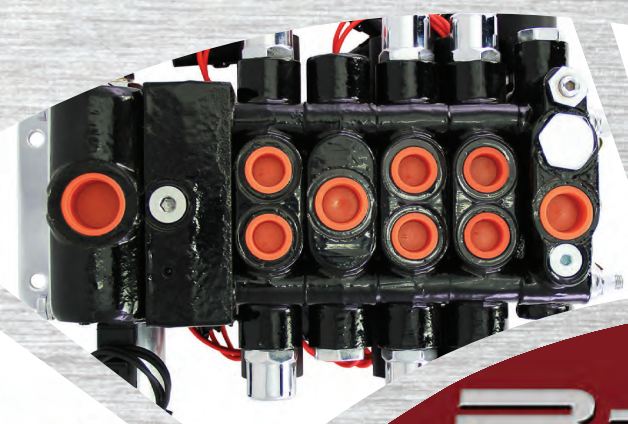
DISTRIBUTOR:_____

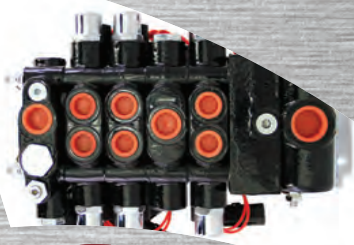
NAME:_____

EMAIL:_____ **PHONE:**_____

ADDRESS:_____

CITY:_____ **STATE:**_____ **ZIP:**_____ **DATE:**_____





BRAND HYDRAULICS CO.

Made in the Heartland of America
Serving the World

Engineering & Manufacturing Solutions

36EFC

Series 36-38 & EFC
Valve Package

P36A065800

Specifications:

- Rated for 0-24 gpm (0-91 lpm) depending on Series 36-38 work sections used.
- Pressure rating 3000 psi (207 bar).
- 10 Micron filtration recommended.
- See Series 36-38 literature for more specifications on work sections.
- See EFC literature for more specifications and information on EFC.

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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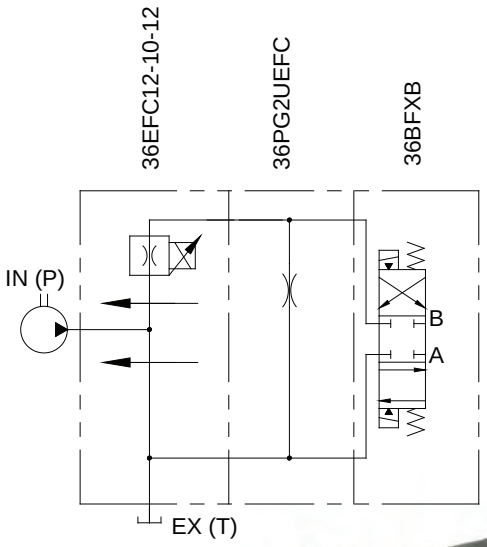
36EFC Series 36-38 & EFC Valve Package



P36A065800

MATERIALS:

- Cast Iron Body.
- Buna N O'Rings
- Heat Treaded Steel Spool

FEATURES:

- ADAPTABLE TO AUTOMATED CIRCUITS for four-way directional speed control.
- CONTROL AND WIRING HARNESS PACKAGES available to fit customer's application.
- OPEN OR CLOSED PACKAGES are available to suit the customer's needs.
- PRECISION GROUND HEAT TREATED SPOOLS assure long life.
- DIAMOND HONED SPOOL BORE provides consistent spool fit with low leakage.
- O'RING PORTS to eliminate leakage.
- PILOT CARTRIDGES assures positive force to shift spool.
- OPTIONAL HIGH LIFT RELIEF.

36EFC – GENERAL INFORMATION:

The Brand, 36EFC provides the functionality of Brand's Series 36-38 stack valve combined with the precise flow control of our EFC valve. This allows users to proportionally control the input flow to the stack valve in one complete package. For example, a motor's speed on a winch can be controlled in forward and reverse. The 36EFC may also electrically control the rate at which a cylinder extends or retracts. Please refer to EFC, series 36 and series 38 literature for information on work sections, valve capabilities and work section model codes.

WIRING PACKAGES – can be produced to meet any customer's requirements from simple to complex. Packages can consist of handheld, stationary or a combination of both. They can be for mobile or industrial applications. We can supply packages from coiled cables to special labels and nameplates to give you a true out-of-the-box ready to go package. Please call our engineering department and let us know what your specifications are so that we can design a custom package to suit your needs.

ACCESSORY ITEMS – All tie rod kits contain rods, foot brackets, lock washers and hex nuts. Please be sure to note the correct tie rod torque spec is 85 inch lbs. (9.6 N m).

ASSEMBLY MODEL CODES – and list prices for complete assemblies will be issued by the factory upon the request of an authorized Brand Distributor. All model codes that are issued become proprietary to the requesting distributor. Model codes will not be descriptive in nature, but shall be of a sequential numerical type.

36EFC – EXAMPLES OF COMMON MODEL CODES:

36EFC12-10……..…..10 gpm (37.8 lpm) flow control, 3-ported, machined to mount on series 36EFC manifold (use unloaded manifold "U").

36EFC12-152P……....15 gpm (56.7 lpm) flow control, 2-ported, machined to mount on series 36EFC manifold (use closed manifold "C").

36PG2CEFC……..….Closed manifold machined to mount adjacent to a 2-ported 36EFC.

36PG2UEFC……..….Unloaded manifold machined to mount adjacent to a 3-ported 36EFC.

36EFC Series 36-38 & EFC Valve Package

36EFC – CREATING A MODEL CODE FOR 36EFC'S:
36EFC FLOW CONTROL VALVE:

36EFC

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coding

PORT SIZE:
12 - #12SAE (1-1/16 – 12)
** - Contact factory for others

FLOW SETTING:
05 – 0-5 gpm (18.9 lpm)
10 – 0-10 gpm (37.8 lpm)
15 – 0-15 gpm (56.8 lpm)
20 – 0-20 gpm (75.7 lpm)
25 – 0-25 gpm (94.6 lpm)

OPTIONS:
W – Power beyond
2P – 2 port (Use closed inlet)
Omit – 3 port (Use unloaded inlet)
M – Manual override thumb screw
R15 – Relief set at 1500 psi (103 bar) (specify pressure in 100 psi (6.9 bar) increments, 3-port only)
.093 – 0.093" (2.4 mm) dashpot orifice
.020 – 0.020" (0.5 mm) dashpot orifice
Omit – Standard (0.031" (0.8 mm))

COIL VOLTAGE & TERMINAL:
Omit – 12 volt DC
24 – 24 volt DC
PF – Female shroud with male pin
PM – Male tower with female pin

36PG2 EFC

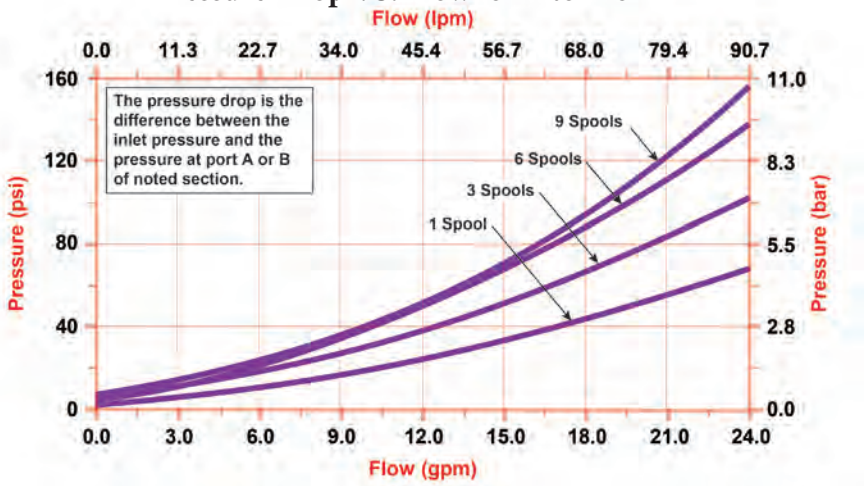
CONDITION OF MANIFOLD:
C – Closed manifold, 12 SAE tank port (Use with 2P 36EFC)
U – Unloaded manifold (Use with 3-port 36EFC)
W – Power beyond, 12 SAE tank port (Use with power beyond 36EFC)

36TR EFC

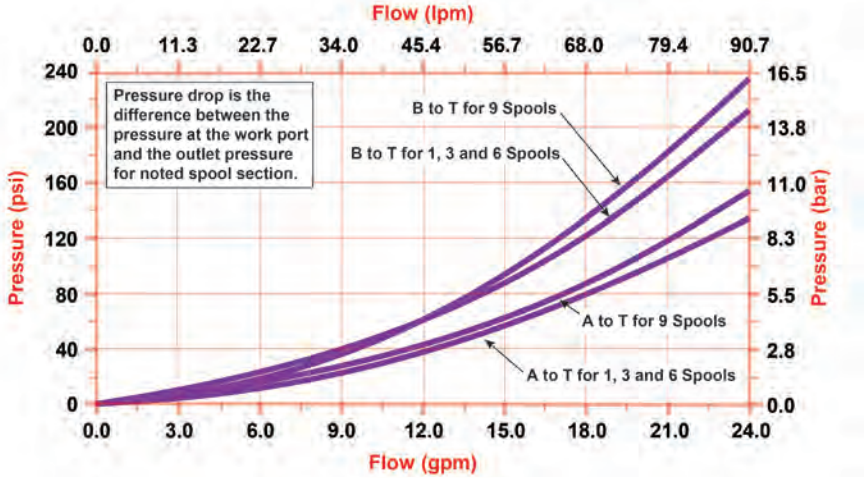
NUMBER OF WORK SECTIONS:
1 – One work section
2 – Two work sections
3 – Three work sections
ETC…

36EFC - FLOW AND PRESSURE INFO:

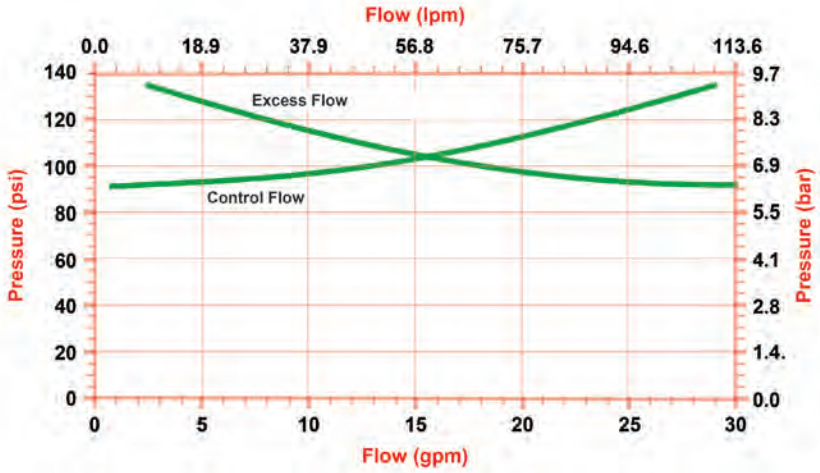
Pressure Drop VS. Flow for P to A or B



Pressure Drop VS. Flow for A to B or T

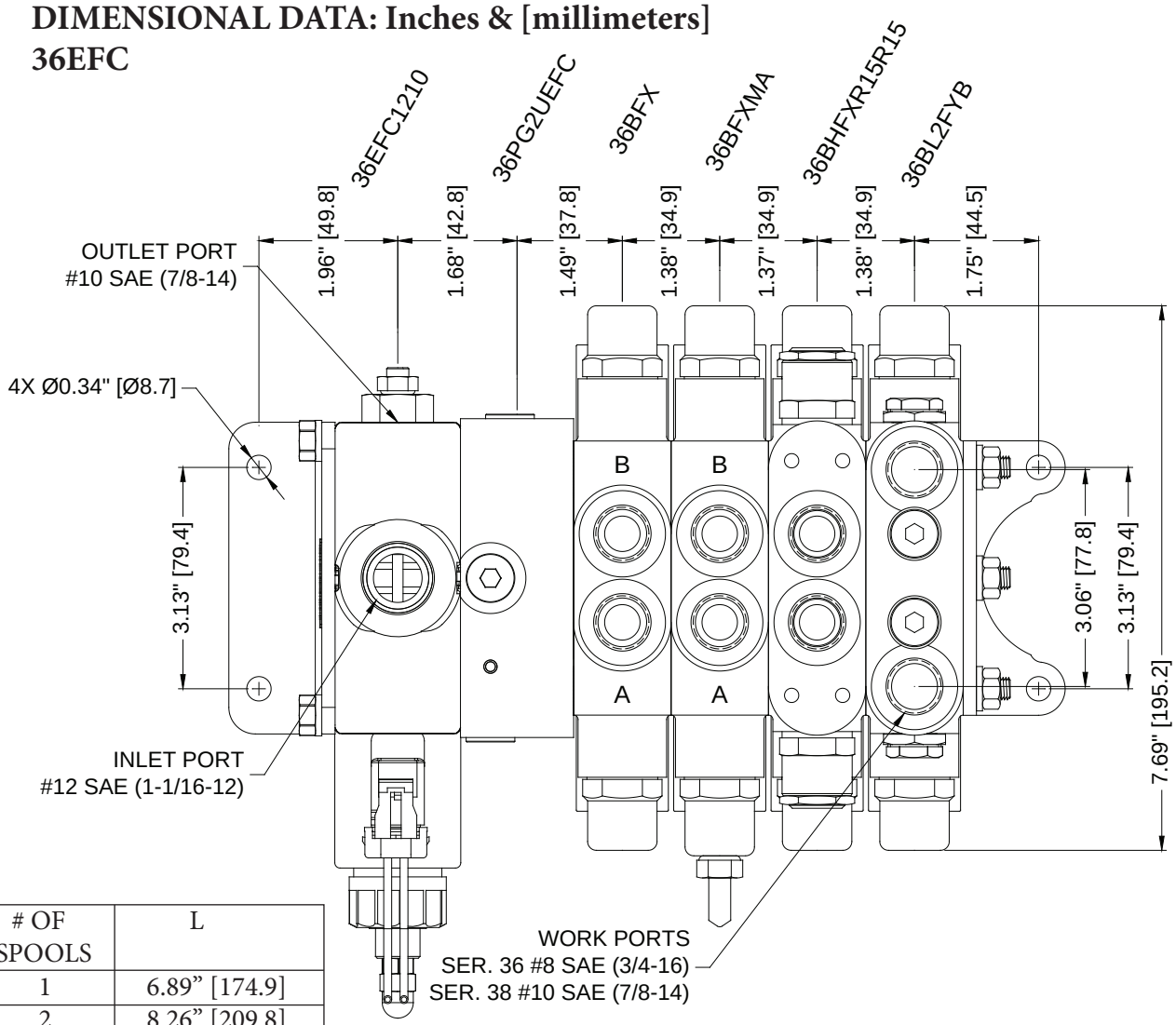


Pressure Drop VS. Flow for EFC Series

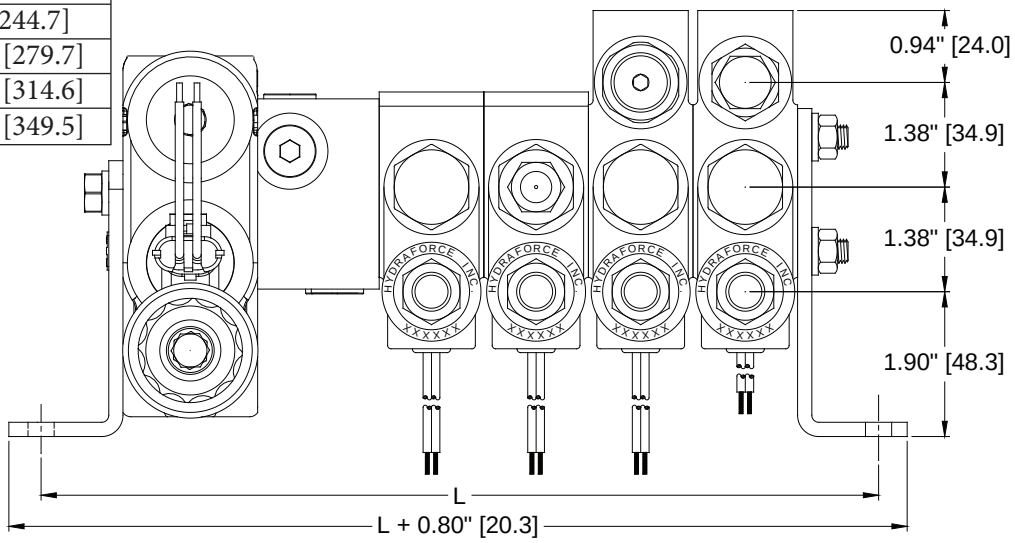


36EFC Series 36-38 & EFC Valve Package

DIMENSIONAL DATA: Inches & [millimeters]
36EFC



# OF SPOOLS	L
1	6.89" [174.9]
2	8.26" [209.8]
3	9.64" [244.7]
4	11.01" [279.7]
5	12.39" [314.6]
6	13.76" [349.5]



BRAND HYDRAULICS Co.

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Serving the World

Engineering & Manufacturing Solutions

SEFC

Stackable Electric Flow Control

Specifications:

- 3000 psi (207 bar) rating.
- Standard port size #12SAE (1-1/16-12).
- 10-Micron filtration recommended.
- Pulse frequency (90 to 115 hz).
- Coil

-12 VDC standard	(24 VDC).
-9.6 ohms	(48 ohms).
-15 watts	(15 watts).
-1.0 amp max.	(0.5 amp max.).

PEFC07426

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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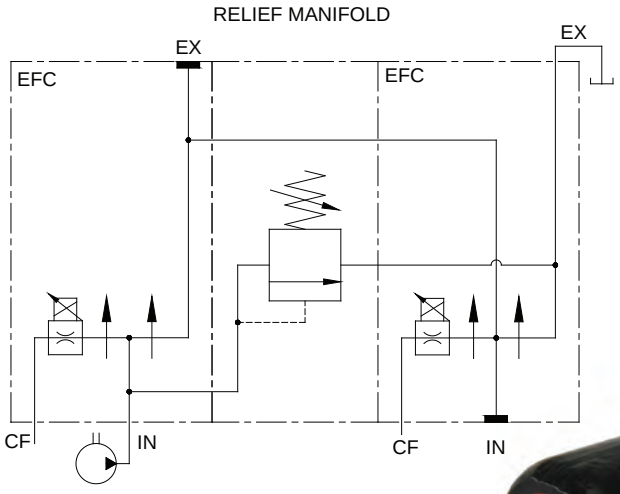
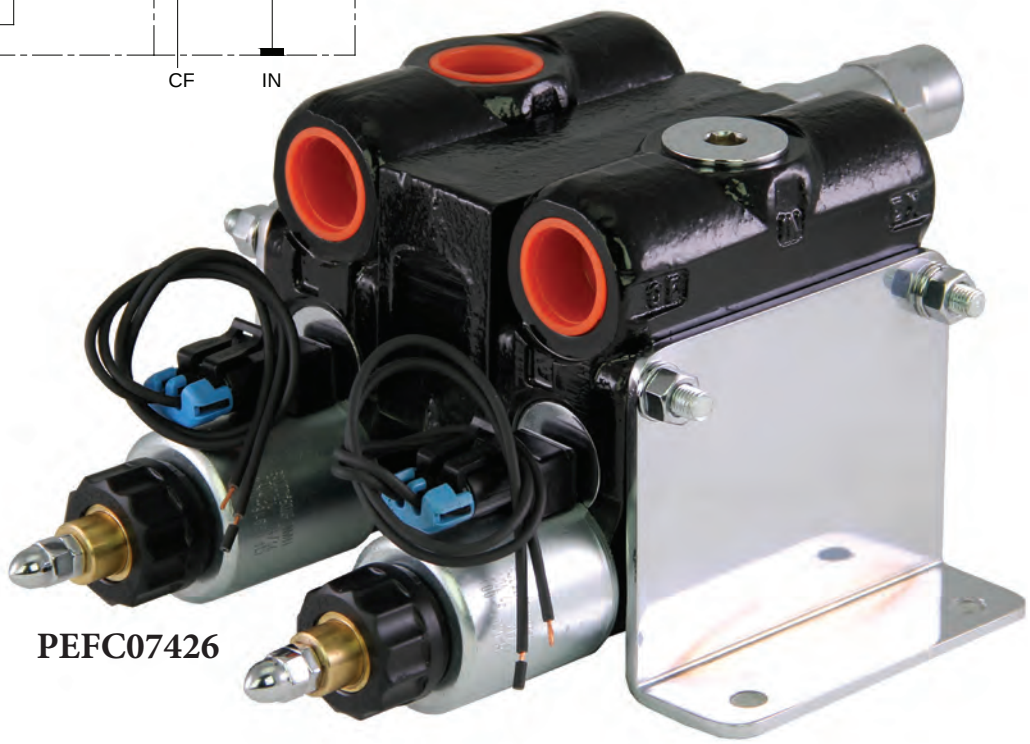
SEFC Stackable Electric Flow Control





PEFC07426

MATERIALS:

- Hardened Alloy Steel Ball
- Chrome Alloy Steel Ball
- Ductile Cast Iron Body
- Heat Treated Steel Spools
- Buna N O'Rings

FEATURES:

- PARALLEL OR SERIES flow paths are possible.
- SPECIAL MODIFICATIONS are easily made to fit your particular application.
- O'RING PORTS to eliminate leakage.
- OPTIONAL RELIEF SECTION provides protection of circuit.

SEFC – GENERAL INFORMATION:

The Brand, SEFC allows the customer to stack EFC's in series or parallel. Relief sections are also available for hydraulic circuit protection. Advantages of stacking EFC's are reducing leakage points, fewer hoses and smaller packages. Please contact the Brand Engineering Department to help define the best way to stack your electric flow controls.

One of the best applications for this valve is the salt or sand spreader. For this application, stack two EFC's and one relief section. The first EFC controls the speed of the spinner and the second controls the speed of the chain driven bed. By using this package you reduce costs, eliminate unnecessary hoses/ fittings and reduce leakage points.

WIRING PACKAGES – can be produced to meet any customer's requirements from simple to complex. Packages can consist of handheld, stationary or a combination of both. They can be for mobile or industrial applications. We can supply packages from coiled cables to special labels and nameplates to give you a true out-of-the-box ready to go package. Please call our engineering department and let us know what your specifications are so that we can design a custom package to suit your needs.

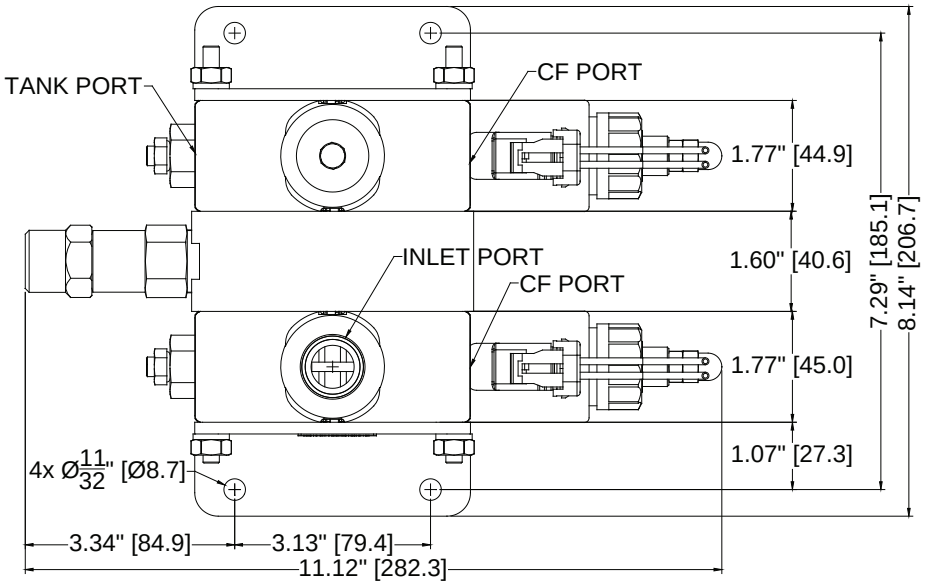
ACCESSORY ITEMS – All tie rod kits contain rods, foot brackets, lock washers and hex nuts. Please be sure to note the correct tie rod torque spec is 85 inch lbs. (9.6 N m).

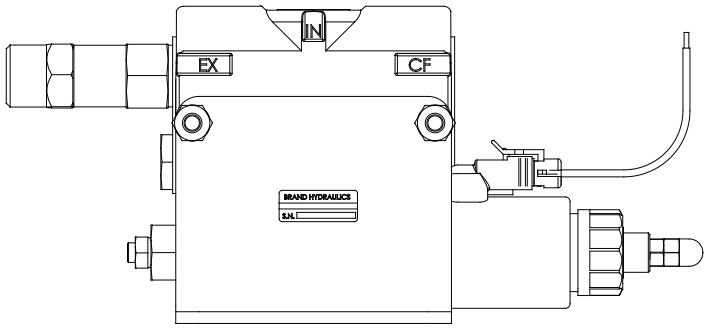
ASSEMBLY MODEL CODES – and list prices for complete assemblies will be issued by the factory upon the request of an authorized Brand Distributor. All model codes that are issued become proprietary to the requesting distributor. Model codes will not be descriptive in nature, but shall be of a sequential numerical type.

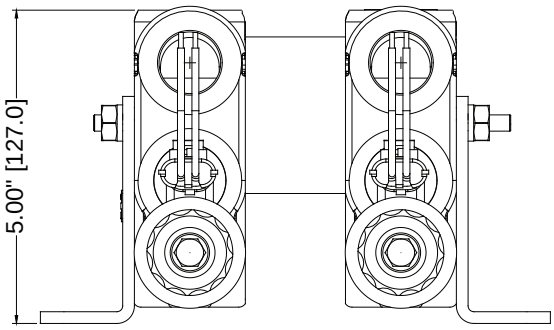
Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

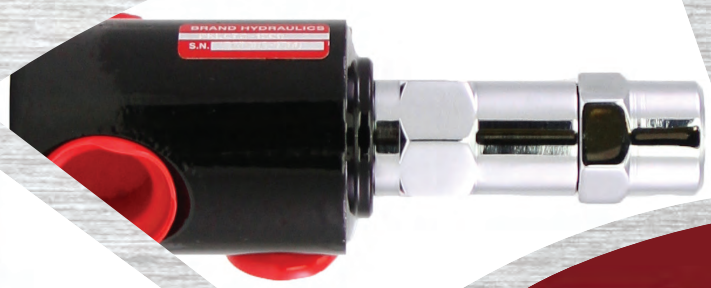
DIMENSIONAL DATA: Inches & [millimeters]
SEFC

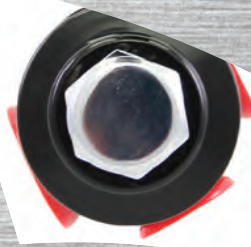
TWO EFC'S IN SERIES WITH RELIEF PROTECTION











BRAND HYDRAULICS Co.

Made in the Heartland of America
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Engineering & Manufacturing Solutions

RL

Adjustable Hydraulic Relief Valves

PRL75-1500

PRLC16-1500

PRLC75-1500

Specifications:

- Pressure rating 3000 psi (207 bar).
- Pressure setting 150-3000 psi (10-207 bar).
- See creating a model code for flow capacity.
- Weighs 2 1/4 lbs (1.0 kg).

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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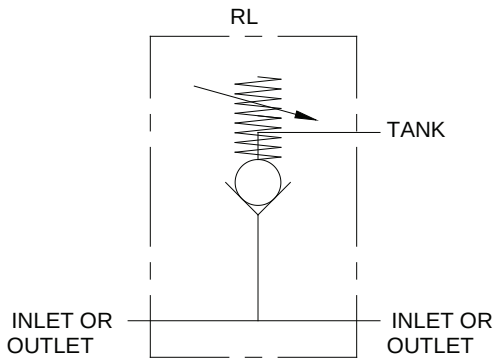
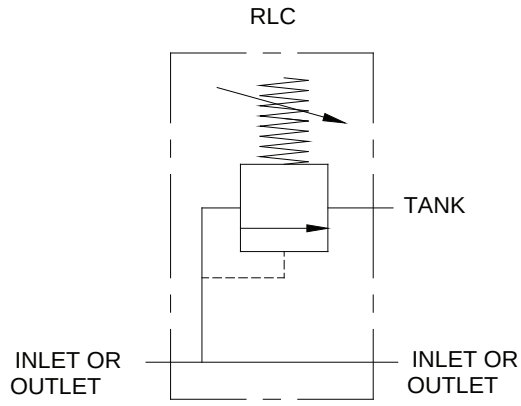
RL Adjustable Hydraulic Relief Valves





PRL75-1500

PRLC16-1500

PRLC75-1500

MATERIALS:

- Zinc Plated Steel Body
- Chrome Alloy Steel Ball
- Hardened Alloy Steel Seat
- Aluminum Alloy Bod

FEATURES:

- OPTIONAL HIGH LIFT BALL SPRING RELIEF reduces noise, heat and chatter.
- OPTIONAL O'RING PORTS to eliminate leakage.
- STEEL BALL will not jam, lock or seize and will always open.
- CHROME ALLOY STEEL BALL is a grade No. 25 ball.
- HARDENED ALLOY STEEL SEAT to reduce wear.
- SHOT PEENED STRESS RELEIVED steel spring to increase life and consistent results.

RL – GENERAL INFORMATION:

The Brand, adjustable relief valve is precision built, dependable and low priced. Both the RL and RLC are of the ball spring type, which is the most dependable type of relief valve. The ball will not jam, lock, or seize and will always open. The advantage of the RLC over the RL option is that cracking pressure at low and high flow is virtually the same. The RLC is also more stable when flow is traveling past the ball and spring. (See relief flow charts below)

RL – CREATING A MODEL CODE FOR RL'S:

RL ___ ___ - ___

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coding

RELIEF TYPE:
Omit – Adjustable ball spring relief
C – Adjustable high lift ball spring relief

RELIEF SETTING:
500 – 500 psi (34.5 bar)
1000 – 1000 psi (69.0 bar)
1500 – 1500 psi (103.4 bar)
ETC.

PORT SIZE:
37 – 3/8" NPT all ports (0-12 gpm (0-45.4 lpm)) (Production quantity only)
50 – 1/2" NPT all ports (0-20 gpm (0-75.6 lpm))
75 – 3/4" NPT pressure ports and 1/2" tank port (0-20 gpm (0-75.6 lpm))
8 – #8SAE all ports (0-12 gpm (0-45.4 lpm)) (Production quantity only)
10 – #10SAE all ports (0-20 gpm (0-75.6 lpm))
12 – #12SAE all ports (0-30 gpm (0-113.4 lpm), C relief type only and manifold body)
16 – #16SAE all ports (0-30 gpm (0-113.4 lpm), C relief type only and manifold body)

RL – EXAMPLES OF COMMON MODEL CODES:

RL10-1500..... Adjustable ball spring relief, all ports are #10SAE and the relief is set at 1500 psi (103 bar).

RL50-1500..... Adjustable ball spring relief, all ports are 1/2" NPT and the relief is set at 1500 psi (103 bar).

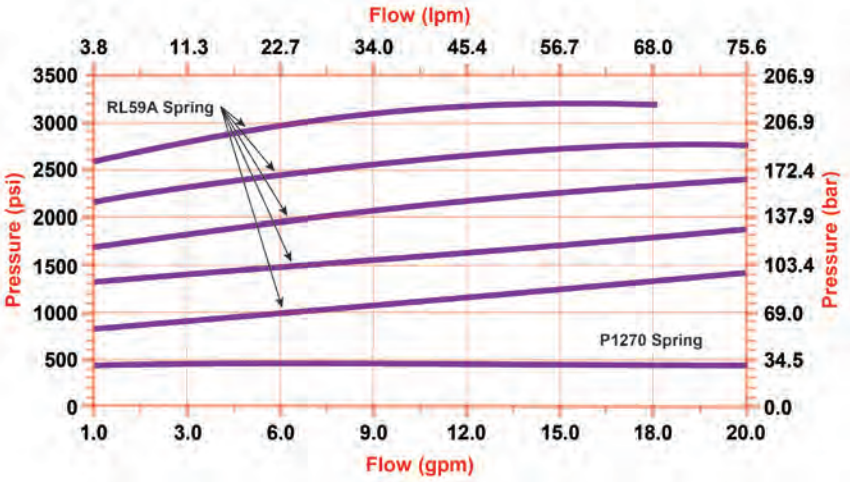
RL75-2000..... Adjustable ball spring relief, tank port is 1/2" NPT, pressure ports are 3/4" NPT and the relief is set at 2000 psi (138 bar).

RLC75-3000..... Adjustable high lift ball spring relief, tank port is 1/2" NPT, pressure ports are 3/4" NPT and the relief is set at 3000 psi (207 bar).

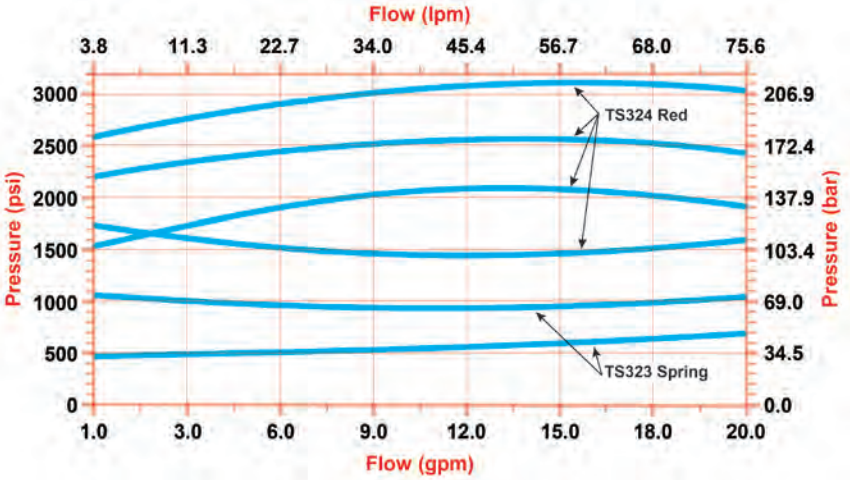
RLC16-1500..... Adjustable high lift ball spring relief, rated for 30 gpm (113 lpm), #16SAE all ports, manifold body and the relief is set at 1500 psi (103 bar).

RL - FLOW AND PRESSURE INFO:

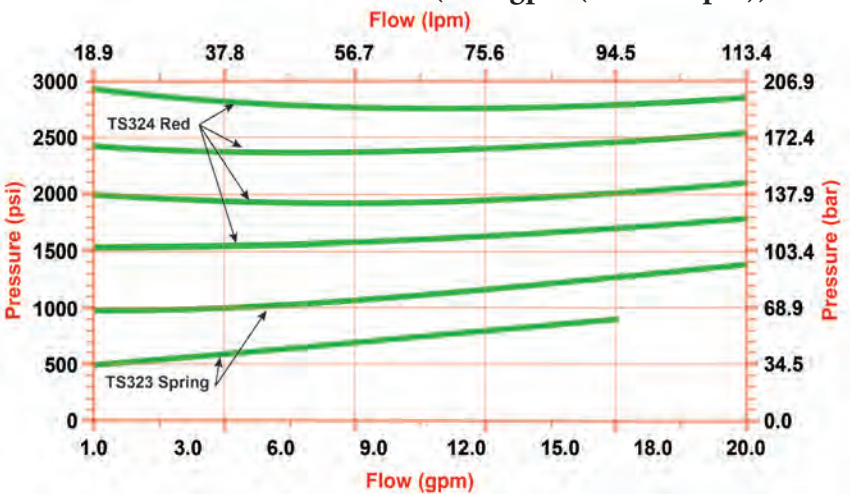
Pressure VS. Flow for RL



Pressure VS. Flow for RLC (0-20 gpm (0-75.6 lpm))

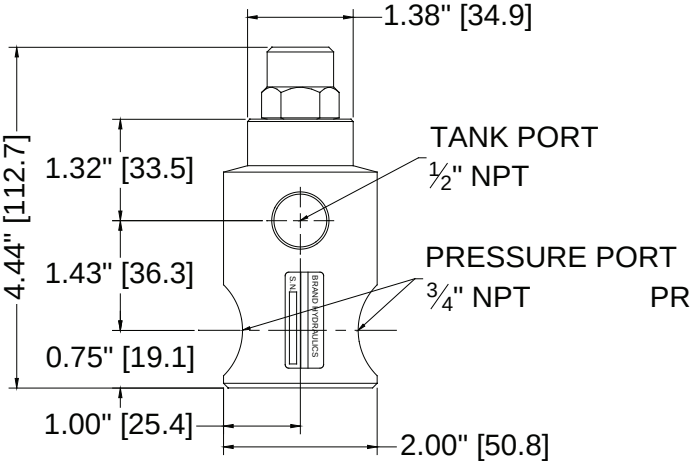


Pressure VS. Flow for RLC (0-30 gpm (0-113.4 lpm))

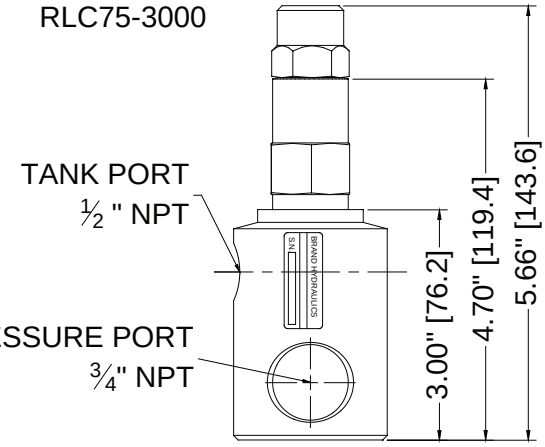


DIMENSIONAL DATA: Inches & [millimeters]
RL75-3000

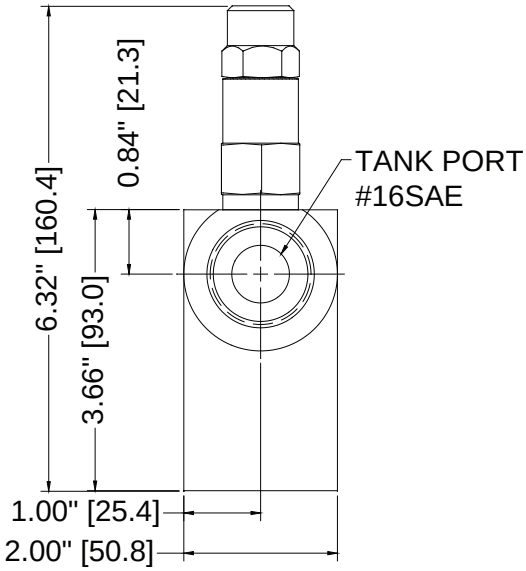
RL75-3000

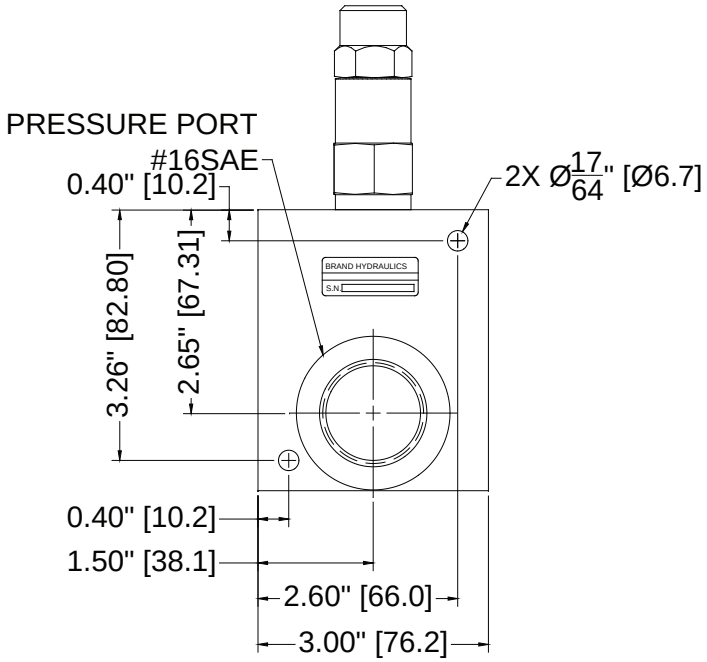


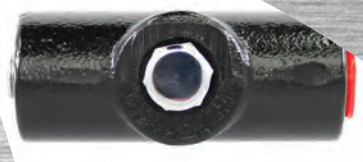
RLC75-3000



RLC16-1500







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POR75-3/4

Adjustable Pilot Operated Relief Valves

Specifications:

- Pressure rating 3000 psi (207 bar).
- Rated for 0-30 gpm (0-114 lpm)
- Weighs 5 lbs (2.3 kg).
- 30 Micron filtration recommended

PPOR75-3/4

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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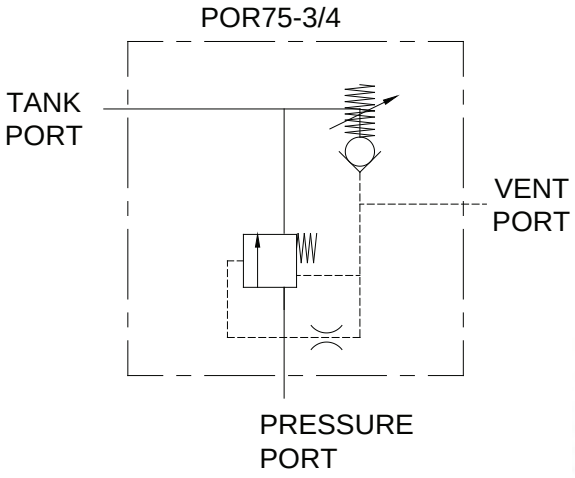
POR75-3/4 Adjustable Pilot Operated Relief Valves



PPOR75-3/4

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- Heat Treated Steel Spool

FEATURES:

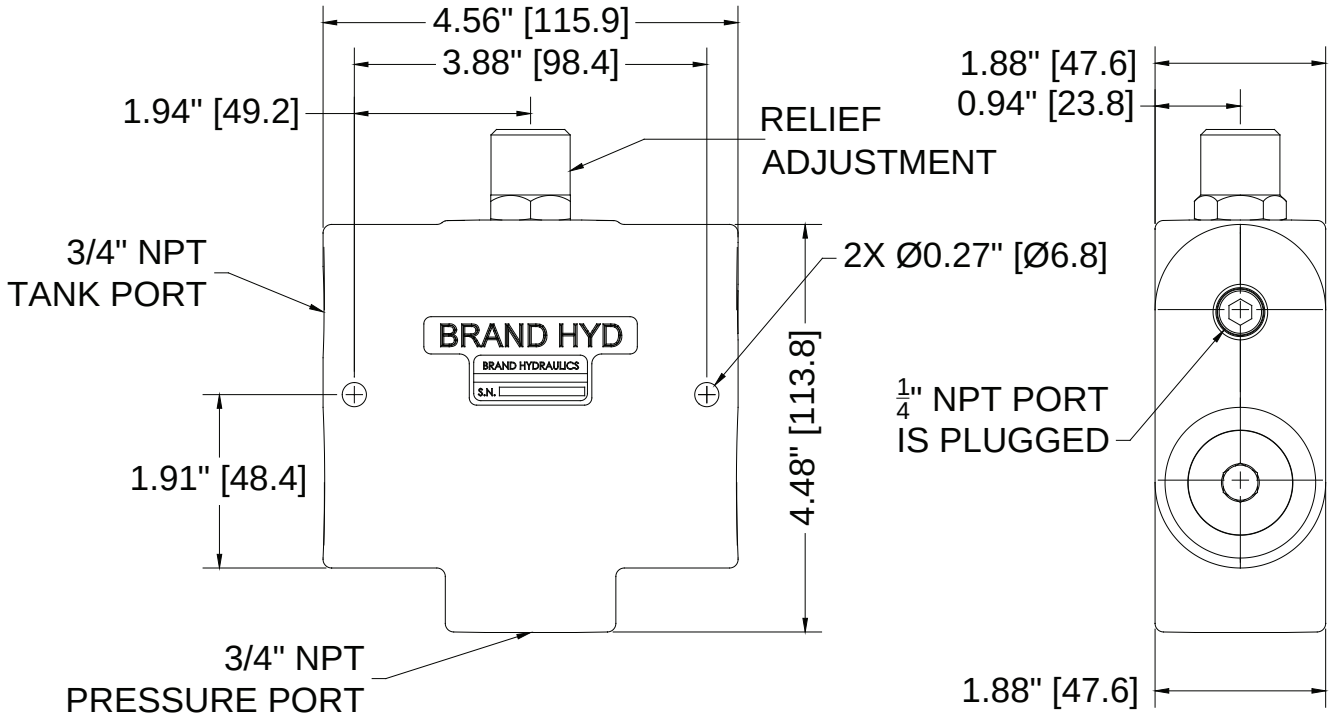
- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- STEEL BALL will not jam, lock or seize and will always open.
- OPENING AND CLOSING of this relief valve is very accurate concerning repeatability and is smooth and surgeless.
- HOLES DRILLED CROSS-WISE allow the flow to gradually increase and decrease so that the change from closed to open is stepless and smooth.
- DAMPENING ORIFICE smoothes out pulsations caused by the poppet relief

POR75-3/4 – GENERAL INFORMATION:

The Brand, adjustable pilot operated relief valve maintains the same cracking pressure at low and high flows. As the pressure setting is exceeded a poppet type relief opens and allows a small pilot supply of fluid to escape a chamber at the end of the main spool. The escape of pilot supply causes the main spool to shift and thus opens a passageway which allows the main volume of pressurized fluid to escape to tank without passing over the poppet type relief. The higher the pump output the farther the spool shifts over to enlarge the opening to tank.

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

DIMENSIONAL DATA (POR75-3/4): inches & [millimeters]



BRAND HYDRAULICS Co.

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PC

Pilot Check Valves

Specifications:

- Pressure rating 3000 psi (207 bar).
- See creating a model code for flow capacity and port sizes.
- Weighs 0.7 lbs (0.3 kg).
- 30 Micron Filtration Recommended.

PPC37C

PPC50C

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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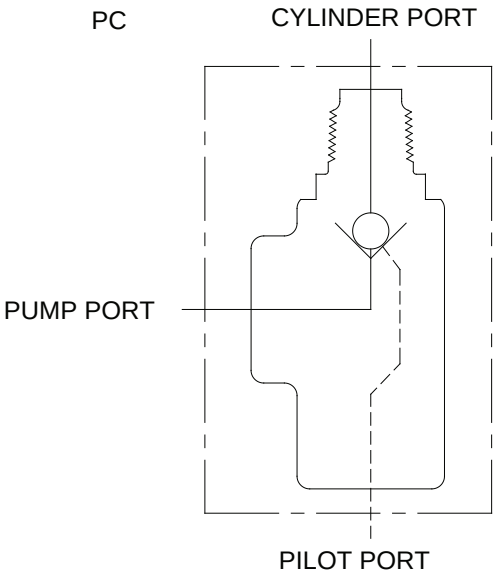
PC Pilot Check Valve



PPC37C

PPC50C

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- Chrome Alloy Steel Ball
- Delrin Check Seat

FEATURES:

- EVERY PC IS TESTED for leakage.
- OPTIONAL O'RING PORTS to eliminate leakage.
- STEEL BALL will not jam, lock or seize and will always open.
- DERLIN CHECK SEAT for zero leakage.

PC – GENERAL INFORMATION:

The Brand, pilot check valve is precision built, dependable and low priced. In one direction oil opens a check valve and passes through the valve and into a cylinder. As the check valve closes the oil is positively trapped in the cylinder with a check ball valve. Applying pilot pressure to the pilot port of this valve moves a piston stem against the ball to push the check ball off its seat thus allowing the oil to leave the cylinder. The PC is intended to be a positive safety check, it is not intended to be a metering or counter balance valve. The pilot piston ratio is 3.2 to 1 (PC37C and PC6C) and 4.0 to 1 (PC50C and PC8C), this means that it only requires 0.312 and 0.25 as much pressure on the pilot piston as is being trapped in the cylinder by the check ball.

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

PC – EXAMPLES OF COMMON MODEL CODES:

PC37C……..Pilot operated check valve, rated for 0-8 gpm (0-30.2 lpm), 3/8" NPT inlet/outlet port, and 1/4" NPT pilot port.

PC50C……..Pilot operated check valve, rated for 0-16 gpm (0-60.5 lpm), 1/2" NPT inlet/outlet port, and 1/4" NPT pilot port.

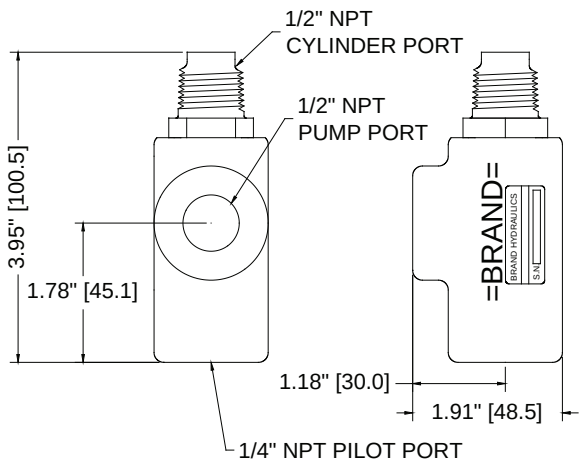
PC6C……Pilot operated check valve, rated for 0-8 gpm (0-30.2 lpm), #6 SAE all ports.

PC8C……..…..Pilot operated check valve, rated for 0-16 gpm (0-60.5 lpm), #8 SAE inlet/outlet port, and #6 SAE pilot port.

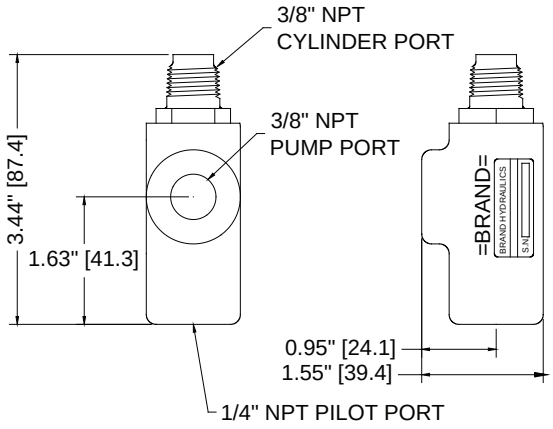
Note: Also available with steel check seat, add –S to model code, as per example: PC50C-S

DIMENSIONAL DATA: Inches & [millimeters]
PC

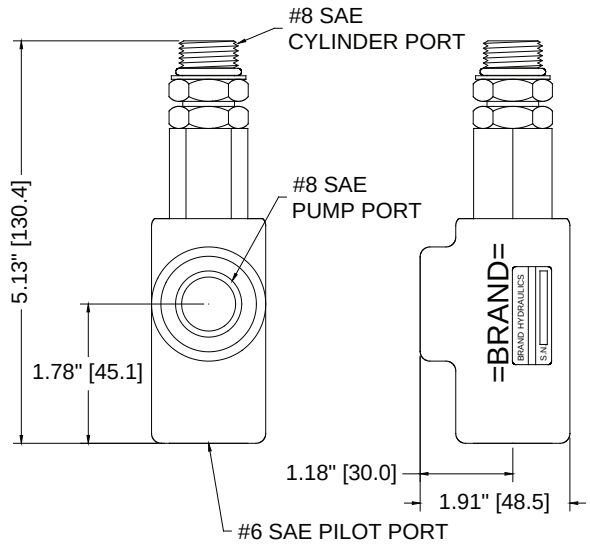
PC50C



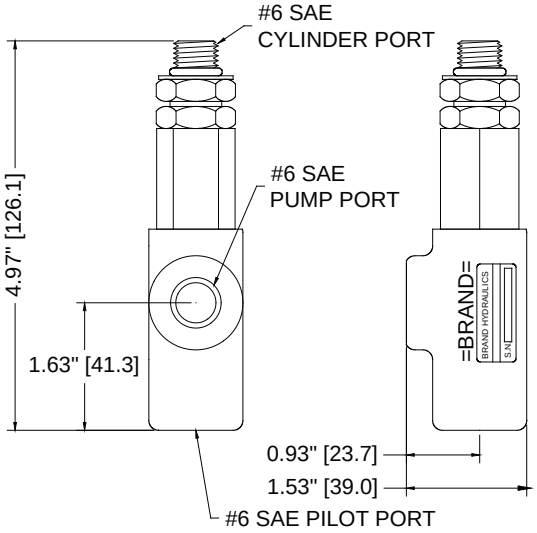
PC37C



PC8C



PC6C



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POC76-3/4

Pilot Operated Check Valve
(or Counter Balance Valve)

Specifications:

- Pressure rating 3000 psi (207 bar).
- Rated for 0-30 gpm (0-114 lpm).
- Weighs 5 lbs (2.3 kg).
- 30 Micron filtration recommended.

PPOC76-3/4

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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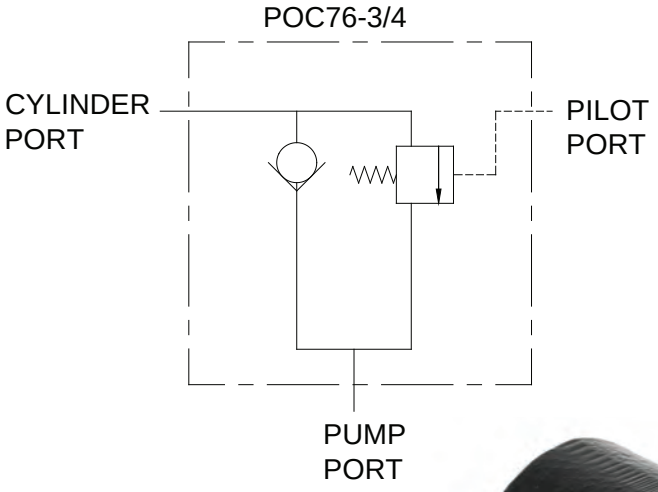
POC76-3/4

Pilot Operated Check Valve (or Counter Balance Valve)



PPOC76-3/4

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- Heat Treated Steel Spool
- Delrin Check Poppet

FEATURES:

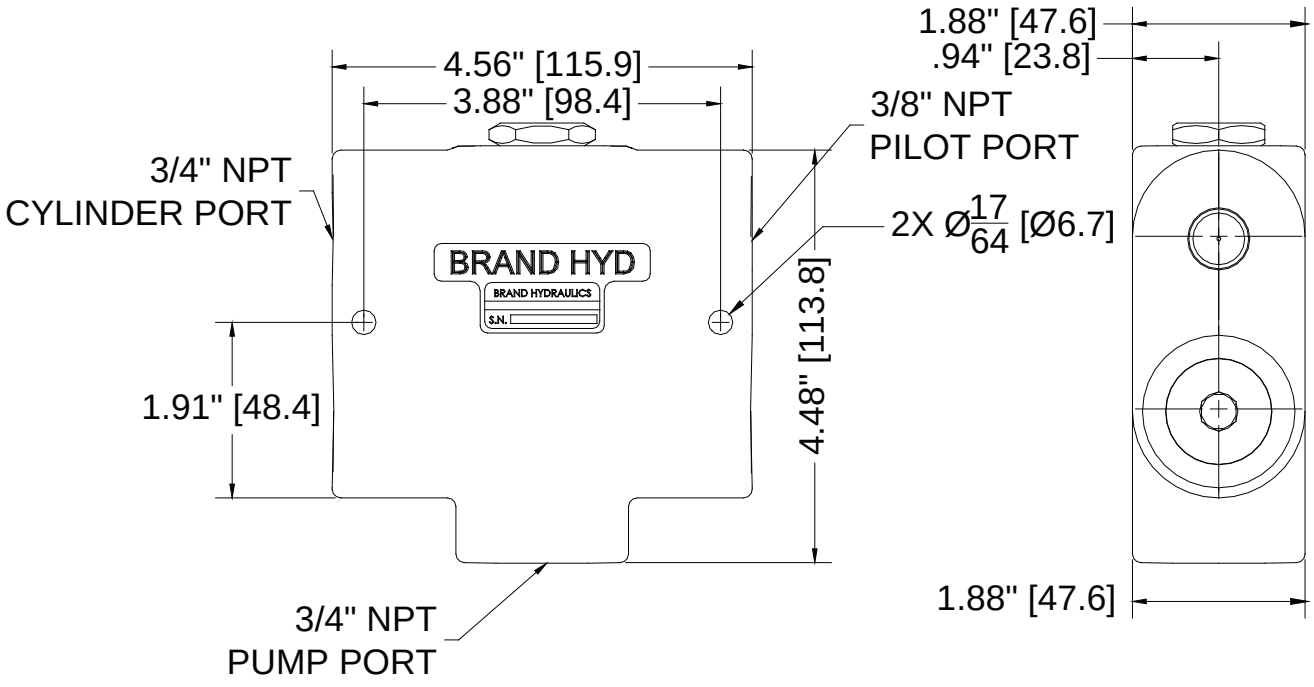
- PRECISION GROUND HEAT TREATED SPOOL that assures long life.
- FREE FLOW IN ONE DIRECTION and checked flow in the other (Not a zero leak check).
- BUILT IN DAMPENING CHAMBER provides smooth action when pilot pressure is applied.
- HOLES DRILLED CROSS-WISE allow the flow to gradually increase and decrease as it closes.

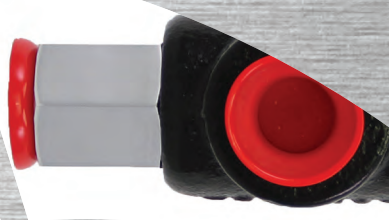
POC76-3/4 – GENERAL INFORMATION:

The Brand, pilot check valve will permit free flow in one direction and will check flow in the opposite direction. Applying pilot pressure to the pilot port of this valve moves the main spool, causing it to shift and unblock the flow. Pilot pressure must be 50 psi (3.4 bar) or greater. The POC76-3/4 is normally connected to the bottom of a cylinder holding a heavy load. This valve will prevent the load from free falling if a hose or pipe breaks. The valve meters the flow at the same rate in both directions which prevents cavitation and run-a-way. Metering the flow can be accomplished by varying the pilot pressure. The POC76-3/4 is available in production quantities of 100 and greater, unless in stock.

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

DIMENSIONAL DATA: Inches & [millimeters]
POC76-3/4





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SHV

Shuttle Valve

Specifications:

- Pressure rating 3000 psi (207 bar).
- See "GEN. INFO." for flow, pressure drop and porting.
- Weighs – SHV50C 1.25 lbs (.57 kg).
  - SHV25 0.5 lbs (.23 kg).
- 30 Micron filtration recommended.

PSHV25

PSHV50C

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

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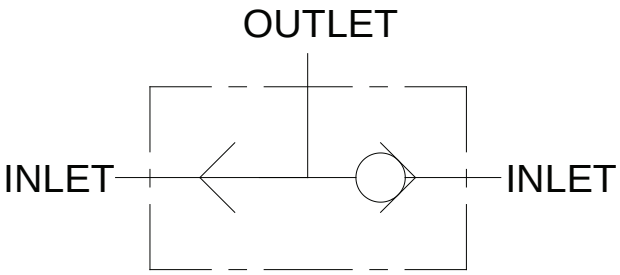
SHV Shuttle Valve



PSHV25

PSHV50C

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- Hardened Steel Ball

FEATURES:

- HARDENED STEEL BALL for wear resistance and greater durability.
- BALL TYPE CONSTRUCTION for minimal leakage.
- LOW AND HIGH FLOW CAPACITY for any type of application.

SHV – GENERAL INFORMATION:

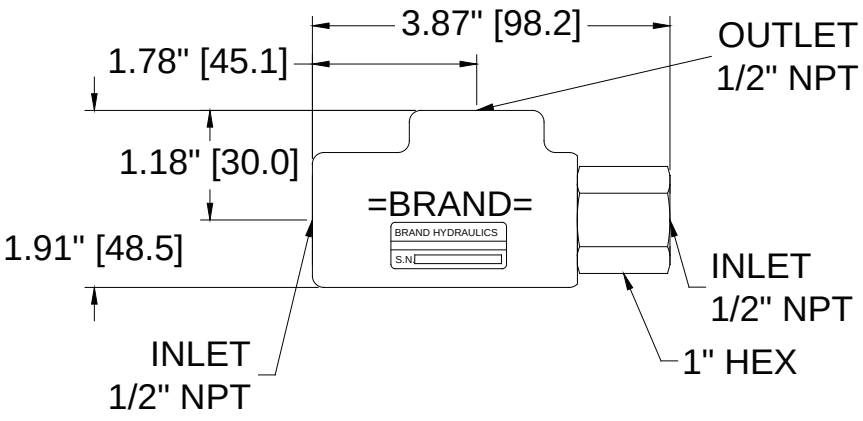
The Brand, shuttle valve has two inlet ports and one outlet port. The purpose of the shuttle valve is to accept flow from the inlet with the higher pressure and to route it to the outlet, while keeping the inlet flows isolated from one another. We manufacture shuttle valves in two sizes SHV50C and SHV25. The SHV50C has 1/2" NPT ports, capable of 0-15 gpm (0-57 lpm) and a peak pressure drop of 15 psi (1.0 bar). SHV25 has 1/4" NPT ports, capable of 0-5 gpm (0-19 lpm) and a peak pressure drop of 50 psi (3.4 bar).

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

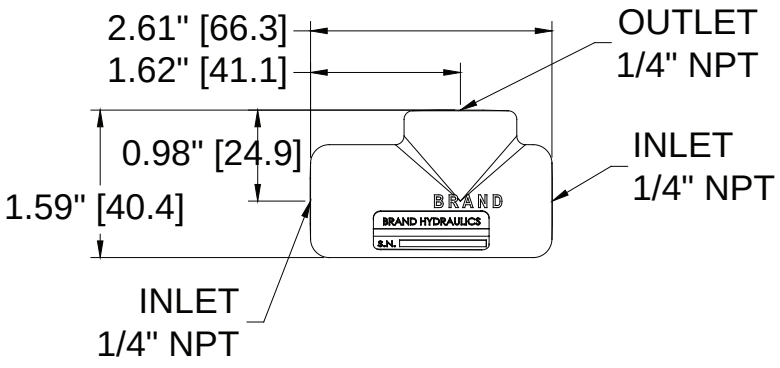
DIMENSIONAL DATA: Inches & [millimeters]

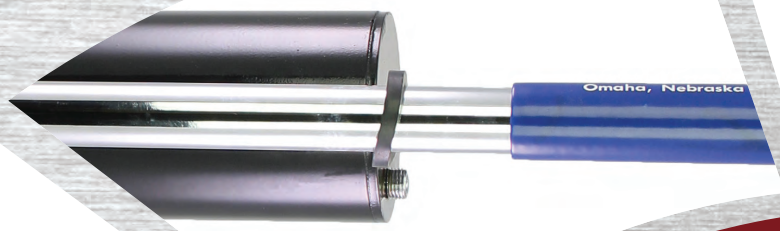
SHV

SHV50C



SHV25





BRAND HYDRAULICS Co.

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HP

Hand Operated Hydraulic Pumps

Specifications:

- Volume Displacement
  HP22SA – 0.20 in3 (3.3 cm3) (When handle is pulled).
  HP61DA – 0.60 in3 (9.8 cm3) per full cycle.
  HP121DA – 1.20 in3 (19.7 cm3) per full cycle.
- Tank sizes
  95 in3 (1557 cm3), 80 in3 (1311 cm3), 65 in3 (1065 cm3), and 50 in3. (819 cm3).
  TL – 2 in. (50.8 mm) tank used with remote reservoir.
  - Pressure rating and (Standard relief setting).
    HP22SA – 6000 psi, 414 bar (4000 psi, 276 bar).
    HP61DA – 3000 psi (3000 psi, 207 bar).
    HP121DA – 2000 psi (2000 psi, 138 bar).
    - Outlet Port Size #6 SAE (9/16-18).
      - Filler Port Size 1/4" NPT.

PHP121DAH65

PHP121DA95

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Certificate #02.002.1

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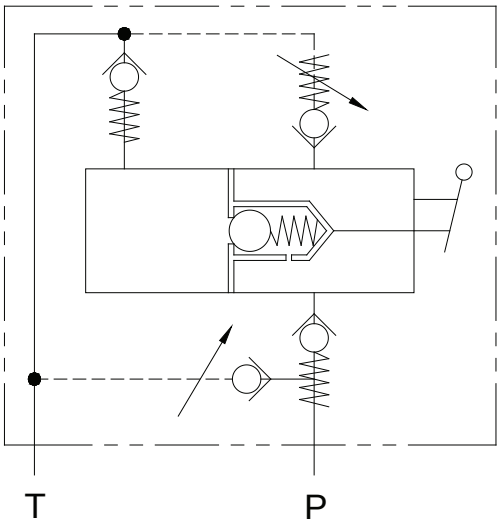
HP121 OR HP61



PHP121DA95

PHP121DAH65

MATERIALS:

- Cast Iron Body
- Buna N O'Rings
- Delrin Inlet Seat
- Stainless Steel Piston

FEATURES:

- O'RING PORT to eliminate leakage.
- DELRIN SEAT to seal between tank inlet and piston reservoir.
- O'RING OUTLET CHECK for zero leakage.
- O'RING SEAL between tank and casting.
- STEEL BALL RELEASE VALVE relieves outlet pressure.
- EVERY HP IS TESTED for outlet check leakage, double or single pump action and relief setting.
- OPTIONAL HORIZONTAL MOUNTING BRACKETS allows for horizontal handle actuation.

HP – GENERAL INFORMATION

The Brand, hand operated hydraulic pump comes in three basic models HP121DA, HP61DA and HP22SA. Each one of these models comes with a relief that can be adjusted manually to suit the customer's requirements. Brand has also redesigned the outlet check seat for zero leakage. The zero leak seat was created by utilizing an o'ring seal to replace the steel ball seal. The NT (no tank) option does not have a tank, pressure relief and release valve. To use the NT option the customer must connect the inlet of the hand pump to an external reservoir (external reservoir is not supplied by Brand). The TL (2 in. tank) option has a small tank, pressure relief and release valve. To use the TL option the customer must connect the fill port on the tank to an external reservoir (external reservoir is not supplied by Brand). When mounting the NT or TL option, the pump should be placed below the fluid level of the external reservoir.

HP22SA – has a single-acting piston that can pump 0.20 in3 (3.3 cm3) per full cycle. The term single-acting means that the piston only pumps fluid when the handle is pulled away from the pump. The piston does not displace fluid when the handle is pushed towards the pump. The pressure rating is higher then the HP121DA because it takes less force to displace the smaller surface area of the piston. This pump is typically used in applications that require low volume displacement and high pressure.

HP61DA – has a double-acting piston that can pump 0.60 in3 (9.8 cm3) per full cycle. The term double-acting means that the piston pumps fluid when the handle is pushed and pulled. The pressure rating is higher then the HP121DA because it takes less force to displace the piston. This pump is typically used in applications that require medium volume displacement and medium pressure.

HP121DA – has a large double-acting piston that can pump 1.20 in3 (19.7 cm3) per full cycle. The term double-acting means that the piston pumps fluid when the handle is pushed and pulled. The pressure rating is lower then the HP22SA and HP61DA because it takes a greater amount of force to displace a piston that has a large surface area. This pump is typically used in applications that require high volume displacement and lower pressure.

HP Hand Operated Hydraulic Pumps

HP – CREATING A COMMON MODEL CODE FOR HP'S:

HP

PAINT:
Blank – No paint
P – Painted black (other colors available, consult factory)
MP – Epoxy coding

DISPLACEMENT PER CYCLE & PUMP ACTION:
22SA – 0.20 in3 (3.3 cm3) and single acting
61DA – 0.60 in3 (9.8 cm3) and double acting
121DA – 1.20 in3 (19.7 cm3) and double acting

HAND PUMP MOUNTING:
Omit – Standard vertical mounting
H – Horizontal-mounting brackets (must use 50, 65, 80, or 95 tank option)

TANK:
95 – 95 in3 (12 in. height and 1/4" NPT filler plug)
80 – 80 in3 (10 in. height and 1/4" NPT filler plug)
65 – 65 in3 (8 in. height and 1/4" NPT filler plug)
50 – 50 in3 (6 in. height and 1/4" NPT filler plug)
TL – 2 in. tank used in conjunction with customer's external reservoir (1/4" NPT filler port).
NT – Does not come with tank, adjust able relief and release valve. (61DA and 121DA only)
RP – Return port (1/4" NPT return port, cannot be used with the NT option.).

HP – EXAMPLES OF COMMON MODEL CODES:

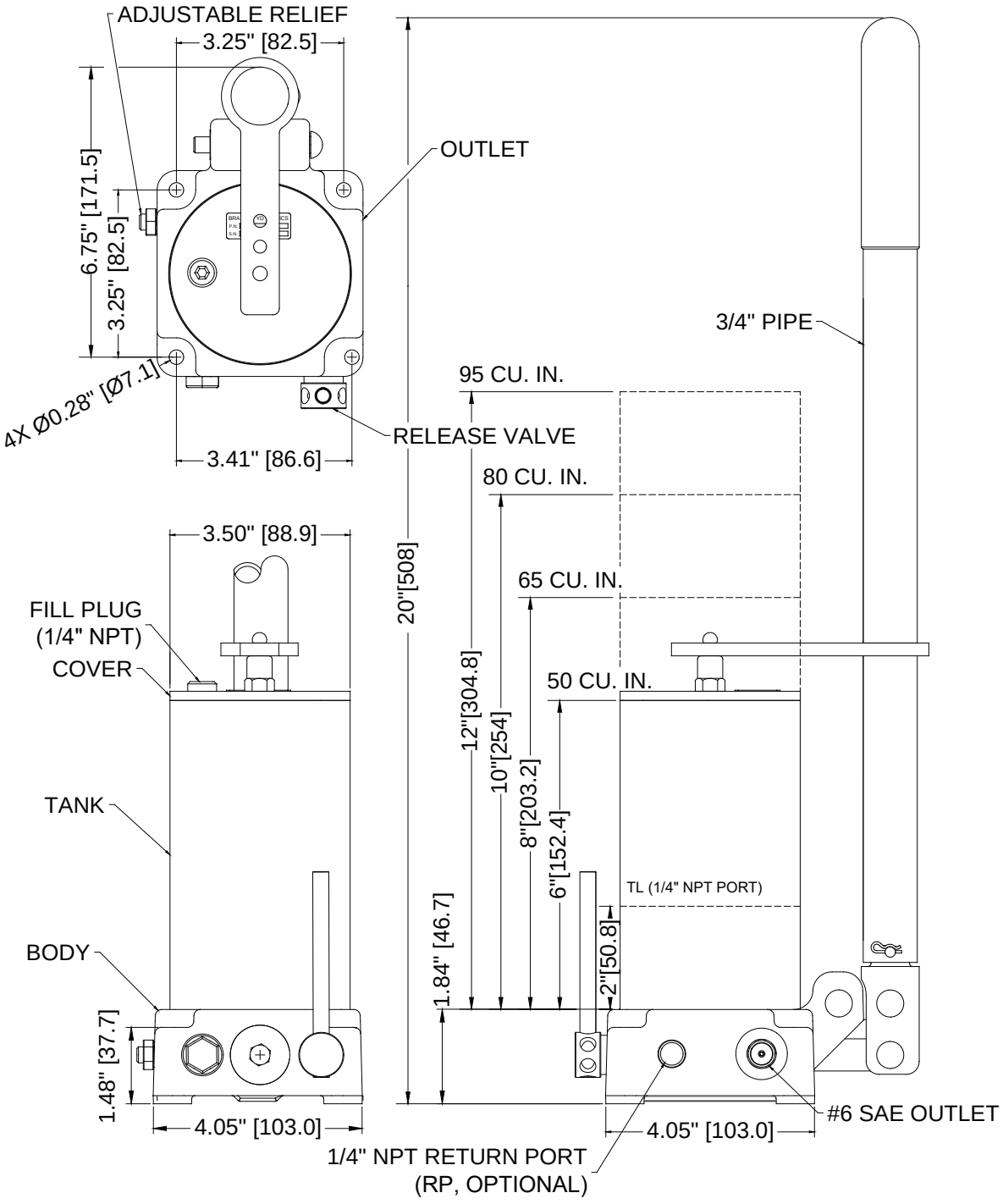
HP22SA50.....0.20 in3 (3.3 cm3) displacement, single acting and 50 in3 (819 cm3) tank.
HP61DA95.....0.60 in3 (9.8 cm3) displacement, double acting and 95 in3 (1557 cm3) tank.
HP121DA65.....1.20 in3 (19.7 cm3) displacement, double acting and 65 in3 (1065 cm3) tank.

HP – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

HP22-K.....Seal kit for HP22SA.
HP22-K-EPR.....Ethylene propylene rubber (EPR) seal kit for HP22SA.
HP61-K.....Seal kit for HP61DA.
HP121-K.....Seal kit for HP121DA.

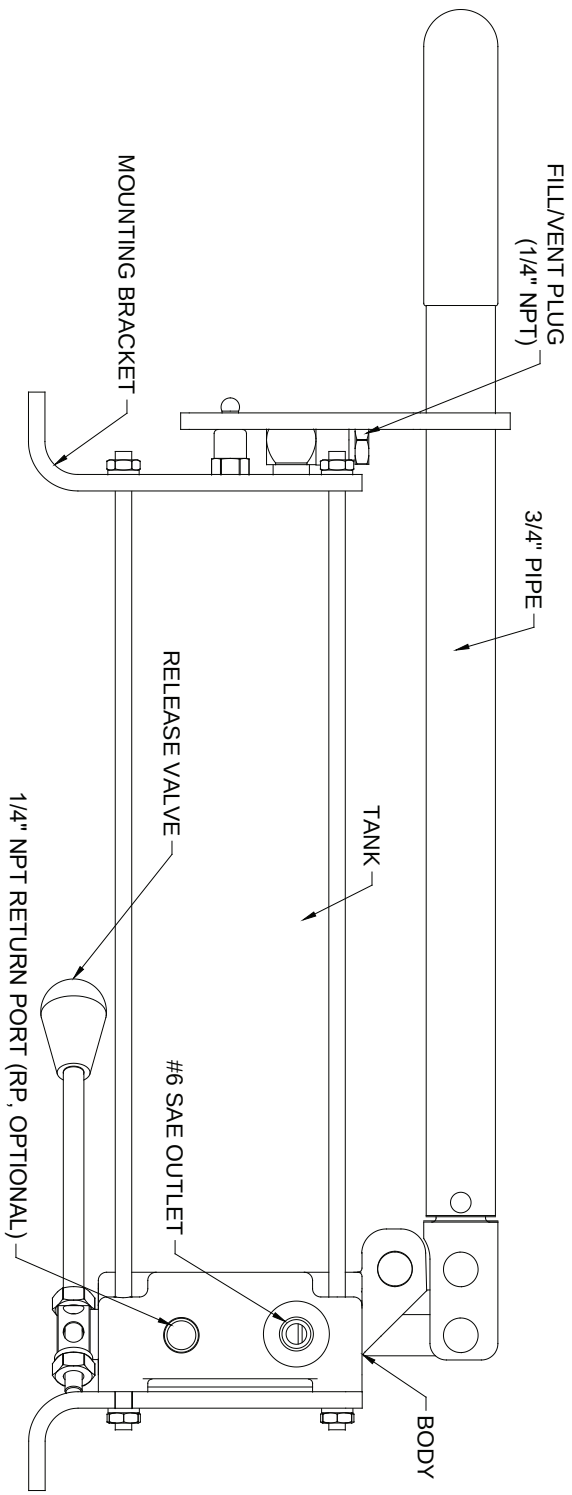
DIMENSIONAL DATA: Inches & [millimeters]

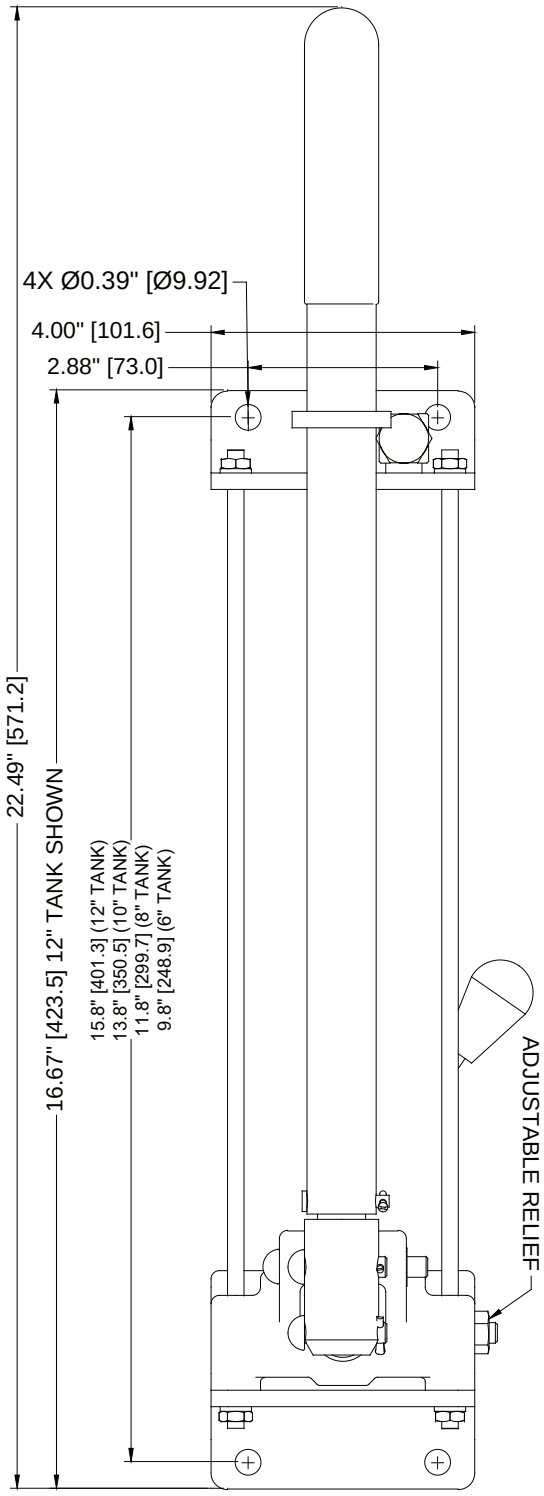
DIMENSIONS LISTED ARE THE SAME FOR ALL THREE PUMP SERIES
(HP61DA SHOWN)



DIMENSIONAL DATA: Inches & [millimeters]

DIMENSIONS LISTED ARE THE SAME FOR ALL THREE PUMP SERIES
(HP61DA AND HP121DA SHOWN)





BRAND HYDRAULICS CO.
Made in the Heartland of America
Serving the World

Shipping: 2332 S 25th St (Zip 68105)
Mailing: P.O. Box #6069 (Zip 68106)
Omaha NE
Phone: (402) 344.4434
Fax: (402) 341.5419
www.BRAND-HYD.COM

ISO 9001:2008 WITH DESIGN
Certificate #02.002.1

LIMITED TWENTY-FOUR (24) MONTH WARRANTY

Brand Hydraulics Co. warrants to the original purchaser that the products Brand manufactures will be free of defects in material and workmanship for a period of twenty-four (24) months from the date of purchase from Brand or its authorized distributor or for a period of thirty-six (36) months from the production date code, whichever period is shorter. Brand's obligation under this warranty shall be limited to repair or replacement of the product or any of its parts, which upon examination by Brand show to be defective.

The buyer shall return the product claimed to be defective to Brand with transportation charges prepaid by buyer or, at Brand's option, make the product available for inspection by Brand. Brand shall, at its option, correct any defect either by repairing or replacing the defective article or by issuing a credit or refund for the purchase price. Repaired articles, or parts thereof, shall be returned to the buyer, transportation charges prepaid by Brand and shall be warranted for the remainder of the term of the original warranty on the article or ninety (90) days, whichever is longer.

If Brand denies the warranty claim, Brand shall notify the buyer. Brand shall retain the item for thirty (30) days following such denial. During this period, the buyer may at buyer's cost take possession of the item. If buyer does not take possession of product within this period, Brand may dispose of the product as Brand deems fit.

The warranty shall not apply to any article which shall have been subject to alteration, accident, abuse, misuse, or failure to follow Brand's instructions for operation and maintenance. Brand does not warrant products damaged by the use of anti-friction sealants.

BRAND HYDRAULICS CO. EXPRESSLY DISCLAIMS ANY WARRANTY OF MERCHANTABILTY OR FITNESS FOR ANY PARTICULAR PURPOSE.

BRAND HYDRAULICS CO. SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTAL DAMAGES OF ANY KIND.

This warranty shall constitute the sole remedy of the buyer and the sole liability of Brand. Brand neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the sale of this product, and no person is authorized to amend, modify or extend this warranty in any way.

To make a claim under this warranty, please complete the RGA Form. The RGA Form is located on our "DISTRIBUTORS' COMMERCE" page.

http://www.brand-hyd.com/admin/login.asp

If you do not know your User ID and Password, contact the Sales Department at Brand Hydraulics Co. Upon receipt and verification of the RGA Form information, a RGA number will be issued by the Brand Hydraulics Co. Sales Department and faxed back to the person named in the form. Any items arriving without an RGA number marked on the package/shipping paperwork may be refused and returned. Brand will make its best effort to repair or replace the product, if found to be defective within the terms of the warranty, within thirty (30) days after the return of the product to company.

The construction and validity of this warranty shall be determined under the laws of the State of Nebraska.

W-01-99

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A Brief History of Brand Hydraulics Co.

Brand Hydraulics was founded in 1956 by Glen Brand and his wife Mary Lou Brand in Omaha, Nebraska. Having won the 1948 Olympic Gold Medal in London, England in free-style wrestling, Glen went on to study engineering at Iowa State. Since Glen's passing in 2008 the company has been and will continue to be run by Glen and Mary Lou's only child, Greg Brand.

Brand has designed, manufactured, assembled and tested hydraulic valves for over 55 years. In 1997, Brand began to design and incorporate electronic controllers and custom wiring harnesses into their product line. Brand is strongly committed to the future of hydraulics and electro-hydraulic components and plans to continue developing hydraulic valves, electronic controllers and products which incorporate both (electro-hydraulics).

Many of the products we provide are modified to specifically fit our customers' applications and needs. Feel free to give our engineering department a call to learn more about special modifications to meet your needs.

Brand believes that a company begins with and continues to succeed based on the quality of its employees, their dedication to working as a team and their ability to achieve a common goal. Our common goal is our mission statement which reads:

> "*Brand Hydraulics will conduct business with integrity and will strive to exceed customer expectations while providing value and innovation in our products and services.*"

Brand's professional, well educated and trained staff is looking forward to serving you in a timely manner.

Brand's investment in technology is impressive, relative to our size. We incorporate state of the art computers and manufacturing equipment in order to help realize our mission statement. Plus we just think they're cool!!!

Brand's commitment to quality and continuous improvement is evident in our ISO 9001 certification. We were certified to ISO9001:1994 in January of 2002 and have since upgraded to ISO9001:2008 with design. Smithers Quality Assessments, Inc. is our Registrar and our Certificate Number is #02.002.1.

Brand's website is comprehensive and incorporates all our detailed product information, as well as a host of other useful information. Our website contains another website within, called "Distributors' Commerce". This site is specifically designed, and continually growing, for our distributors. Please visit our website at www.brand-hyd.com.

Brand sells its product throughout the world and enjoys exporting product to many countries.

Give Brand Hydraulics Co. a try. We believe you will be glad you did!!!