VSO[®] LowPro GC Miniature Proportional Valve

Low Profile Proportional Valve



Markets

Analytical Chemistry

Applications

Gas Chromatography

Product Specifications

Physical Properties

Valve Type:

2-Way Normally Closed

Media:

Air, Argon, Helium, Hydrogen, Nitrogen (Others, consult factory)

Operating Environment: -4 to 185°F (-20°C to 85°C)

Storage Temperature: -40 to 185°F (-40 to 85°C)

Length:

0.80 in (20 mm)

Width: 0.63 in (16 mm)

Height:

0.53 in (13.5 mm)

Porting: Face Seal to Manifold

with integrated FKM seal Weight:

0.56 oz (16 g)

The VSO[®] LowPro GC is a robust miniature proportional valve that controls the flow rate of common carrier gases from less than 1 SCCM up to 6.5 SLPM. At less than half the size and weight of competitor valves, the LowPro GC isolates the carrier gas from the valve coil with excellent leak rate performance, very high resolution and best in class flow control stability while operating in extreme environmental conditions.

Features

Electrical Power:

Voltage:

See Table 2

- Lower power to minimize oxygen permeation into the system
- Media isolated from the coil to prevent chemical outgassing into the system
 - Small size, less weight with simplified mounting enables smaller system volume

0.7 Watt (Nominal) @ 20 °C

(See Electrical Table 2)

Electrical Termination:

Wetted Materials

Armature & Spring:

Body & Cover:

Stainless Steel

FKM static seals)

Regulatory:

All Others:

4.5" (114 mm) Wire leads [26 AWG]

C36000 Brass, 400 Stainless Steel

Carbon Steel (Nickel Plated)

FFKM* or FKM (plunger seal),

Loctite 648 and bonding agent.

Compliant with RoHS directive

(2011/65/EU), REACH EC

1907/2006, ISO 15001, IP65(IEC/EN 60529), and CE

(EN 61010-1:2010)

(*FFKM plunger seal option uses

with Molex 50-57-9402 connector

3. 9 and 16 VDC

- Cleaned for Analytical Service use
- Reach, RoHS, ISO 15001, IP65, and CE compliant



Performance Characteristics

Leak Rate: *

Internal: 0.030 SCCM of Helium at pressure of 150 psid (10.3 bar) [consult factory for details] External: 0.020 SCCM of Helium at pressure of 150 psid (10.3 bar)

*The leakage shall not exceed the above values.

Operating Pressure: See Table 1

0 - 150 psi (0 - 10.3 bar)

Vacuum:

0-27 in Hg (0-686 mm Hg)

Proof Pressure:

300 psi (20.7 bar)

Orifice Sizes: 0.007 in (0.18 mm) Model 07 0.011 in (0.28 mm) Model 10

Hysteresis:

6% of full scale current (Typical) 15% of full scale current (Maximum)

Recommended Filtration: 17 µm (Included)

Response Time: 10 msec Typical

Reliability: 100 Million Cycles 0.95 Reliability Factor 97% Confidence



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VSO[®] LowPro GC Low Profile Proportional Valve

Typical Flow Curve



All Models Typical Air Flow with 9 VDC Coil @ 150 psid (10.3 bar) @ 22C



The curve below shows the maximum output flow for each orifice size as a function of inlet pressure up to the maximum rated pressure for the valve.



Pressure and Flow Capabilities

Table 1

Model No.	Orifice Diameter	Cv at Maximum Pressure	Maximum Inlet Pressure	Maximum Differential Pressure
10	0.011 in (0.28 mm)	0.0026	150 psi (10.3 bar)	150 psi (10.3 bar)
07	0.007 in (0.18 mm)	0.0012	150 psi (10.3 bar)	150 psi (10.3 bar)



VS0[®] LowPro GC Low Profile Proportional Valve VS0[®] LowPro Sizing Charts



Model 07 - 0.007" (0.18 mm)







VSO[®] LowPro GC Low Profile Proportional Valve Pneumatic Interface

VS0[®] LowPro Manifold Mount



Mechanical Integration Dimensions



VS0® LowPro Basic Valve Dimensions



VSO[®] LowPro GC Low Profile Proportional Valve **Electrical Interface**



Electrical Requirements

Table 2

Rated Voltage*	Nominal Coil Resistance (Ohms)	Control Current at Maximum Flow						
Fondago	@ 20°C *	Model 07	Model 10					
3 VDC	10	263 mA	263 mA					
9 VDC	61	107 mA	107 mA					
16 VDC	179	63 mA	63 mA					

IOLERENCE +/- 10%

Installation and Use

Typical Valve Set-up



Valve Electrical Control

Basic Control:

The VSO® LowPro GC valve can be controlled by either voltage or current; however, it is highly recommended that current control be employed to ensure the most repeatable valve flow performance.

PWM Control:

For PWM control, the signal applied to the valve should have a frequency of 10 kHz or greater. Optimum frequency will be application dependent.



VSO[®] LowPro GC Low Profile Proportional Valve Installation and Use



Suggested VSO® LowPro GC Current Driver Schematic

This simple current driver circuit draws only 1 mA at the input control (0-5VDC) and provides control for any VSO® LowPro GC valve configuration regardless of valve voltage or resistance.

Table 3 (below) describes the recommended R1 and R2 resistor values based upon the full shut-off current.

Table 3: Selectable Resistor Values for a Low Current (1 mA)LM358-Based Current Driver (All Models)

Valve Drive Voltage, Input (VDC)	Valve Coil Voltage, Resulting (VDC)	Nominal Coil Resistance @ 20°C (Ohms)	ninal Coil Ince @ 20°C Input Current for Full Dhms) Flow (mA)		R2 (Ohms)
5	3	10	266	8660	487
9	7	61	108	8660	191
13	12	180	63	8660	110



VSO[®] LowPro GC Low Profile Proportional Valve Installation and Use

Manifold Dimensions & Design

Not shipped with valves.





VSO[®] LowPro GC Low Profile Proportional Valve Typical Flow Diagram



Typical Gas Chromatograph Schematic





VS0[®] LowPro GC Low Profile Proportional Valve Ordering Information

Sample Part ID	93	6	-	07	0	03	1	-	01	0
Description	Family	Isolation		Model Number: Orifice Size	Elastomer	Coil Voltage	Body Material		Pneumatic Interface	Electrical Interface
Options	93	6: Isolated		07: 0.007 in (0.18 mm)	0: FKM	03: 3 VDC	1: Brass		01: Manifold Mount w/ Filter	0: Wire Leads, w/Connector
				10: 0.011 in (0.28 mm)	1: FFKM	09: 09 VDC				
						16: 16 VDC				
Accessories										
290-006061-003: 12.5 in (318 mm) Adapter Wire Leads					**Not supplied with the valve.					
890-009042-001: Manifold, Single Station, 1/8 in NPT					**Not supplied with the valve.					
890-009042-002: Manifold, Single Station, M5					**Not supplied with the valve.					
190-007059-001: Manifold O-Ring (FKM)					**Supplied with the valve.					
191-000112-404 Screw#2-56 x 2/16 in Socket Head Cap Screw					**Not supplied with the valve. See Valve Mounting					

NOTE: In order to provide the best possible solution for your application, please provide the following requirements when contacting Applications Engineering:

- Media, Inlet & Outlet Pressures
- Minimum Required Flow Rate
- System Supply Voltage
- Media & Ambient Temperature Range

Please click on the Order On-line button to configure your VSO® LowPro GCProportional Valve (or go to www.parker.com/precisionfluidics/vso-lowpro-miniature-analytical-proportional-valve). For more detailed information, visit us on the Web, or call and refer to VSO® LowPro Performance Spec. 790-002490-001.

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