

VSO[®]-EP Miniature Electronic Pressure Controllers

Pressure Controllers




Typical Applications

- Volumetric Flow Control
- Carrier Gas Pressure Control
- Air over Liquid Flow Control
- Electronic Pressure Regulation
- Vacuum Generator Control

The VSO[®]-EP Miniature Electronic Pressure Control Unit converts a variable electrical control signal into a variable pneumatic output. Used to control critical pressure, the VSO[®]-EP replaces manual regulators, needle valves, flow controllers, and vent orifices; providing integral closed loop proportional control. This product uses Parker Hannifin's patented VSO[®] proportional valve and offers significant improvements over dual valve controllers. VSO[®]-EP is used for carrier gas flow control, microfluidic flow control, vacuum pump control, and for aspirate/dispense applications.

Features

- Offers silent operation to reduce system noise levels
- Ensures high accuracy and unparalleled resolution for improved results
- Tested for long life to improve system availability
- Offers internal closed loop control to minimize system development time
- OEM application-specific configurations available
- Analog control for added design flexibility
- RoHS compliant 

Product Specifications

Physical Properties

Valve Technology:
Thermally compensated VSO [®] proportional valves.
Media:
Non-corrosive gases
Operating Environment:
32 to 131°F (0 to 55°C)
Storage Temperature:
-40 to 149°F (-40 to 65°C)
Length:
1.27 in (32.3 mm)
Width:
2.32 in (59.0 mm)
Height:
2.20 in (55.9 mm)
Weight:
5.6 oz (158.8 g)
Porting:
10-32 female ports Metric adaptor available

Electrical

Main Voltage:
24 VDC ± 10%
Input Control Signal:
0-5 VDC standard
Monitor Output Voltage:
0-5 VDC
Maximum Current Requirement:
< 400 mA
Electrical Connection:
RJ-45

Wetted Materials

Manifold:
AL 6061-T6, FKM, 302 Series SS
Valve:
FKM, 300 Series SS Brass 36000HT
Tubing:
Ester Based Polyurethane
Sensor:
Glass, Silicon, Silicone, Polyphenylene Sulfide

Performance Characteristics

Pressure Ranges:
0-5 psig (0-0.35 bar)
0-15 psig (0-1.03 bar)
0-30 psig (0-2.07 bar)
0-50 psig (0-3.45 bar)
0-100 psig (0-6.89 bar)
<i>(Effective control range is 10%-100% of full scale)</i>
Pressure Accuracy:
± 1.5% Full Scale maximum
Response:
< 15 ms
<i>(Response time to target pressure is output volume dependent)</i>
Linearity:
≤ +1.5% Full Scale

VSO is a registered trademark of Parker Hannifin Corporation.



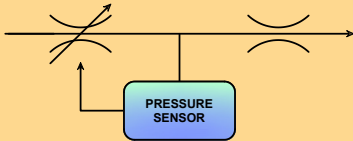
VSO®-EP Miniature Electronic Pressure Controllers

VSO®-EP Flow Capability Sizing Charts

How Flow Effects Pressure Control

The flow curves illustrate the flow capabilities of the three models of pressure controllers.

Pressure control using a constant flow approach requires the system to manage pressure drops across a variable orifice and a fixed orifice (see below).



Choosing the Right Model

In many cases, the fixed orifice is the cumulative restriction of the application system consuming gas. That fixed restriction and the inlet supply pressure level are key factors when selecting the correct model number for the VSO®-EP.

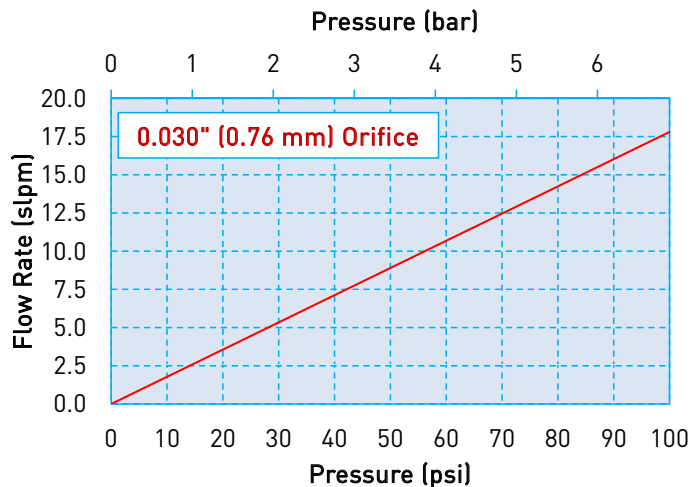
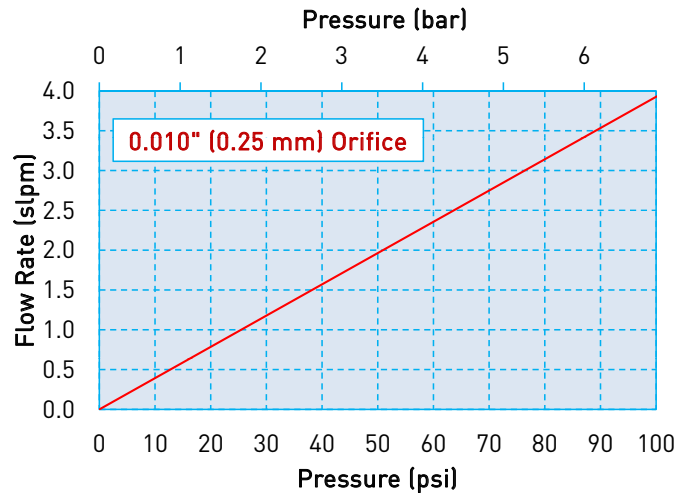
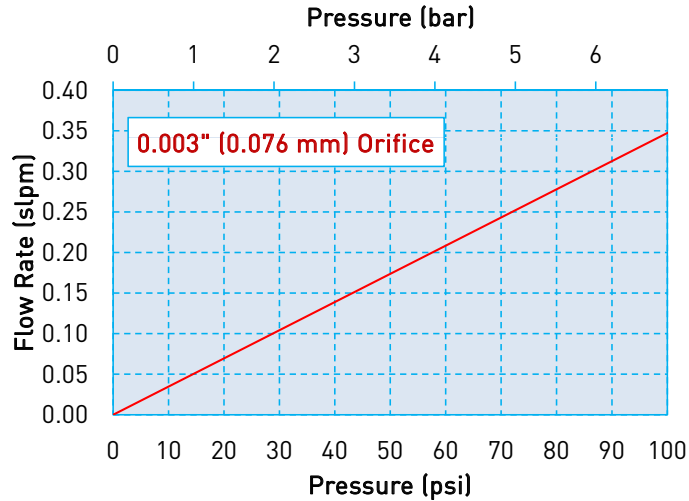
If the orifice is too small, it may fail to generate enough flow to drop the required pressure across the fixed orifice. If the orifice is too large, the Pressure Controller can become unstable. When considering orifice size please remember that the effective control range is 10%-100% of full scale.

EXAMPLE:

Please refer to flow chart labeled 0.010" (0.25mm) orifice. If your application requires 40 PSIG of pressure at 1 SLPM of flow, you would need a 0.010" orifice pressure controller.

This graph shows that a 0.010" orifice will flow up to 1.5 SLPM at 40 PSIG making it the right choice for your application.

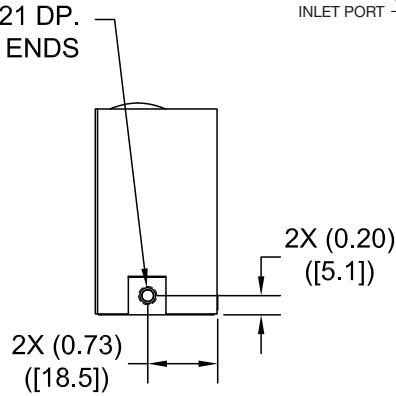
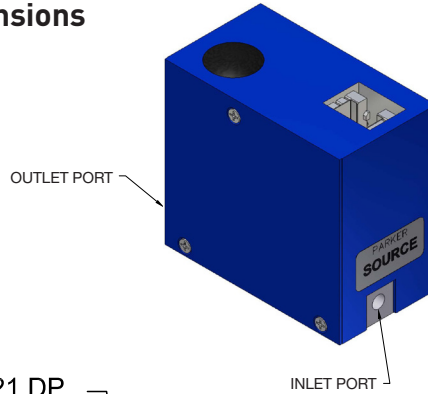
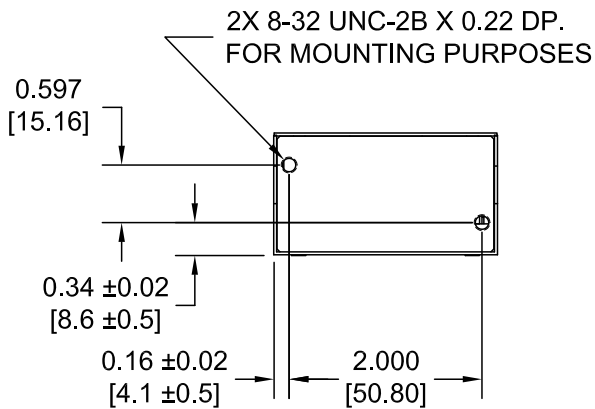
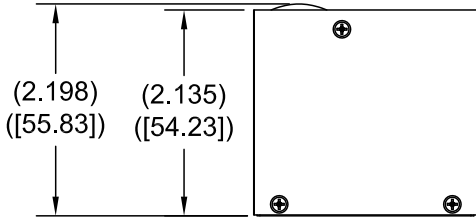
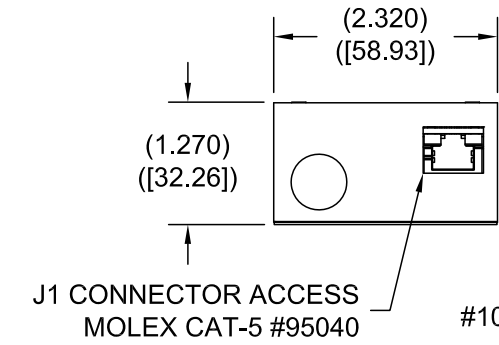
Typical Flow vs Pressure @ 25°C



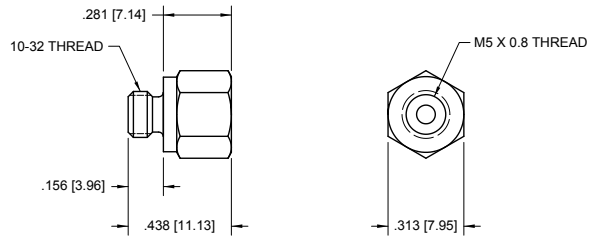
VSO®-EP Miniature Electronic Pressure Controllers

Mechanical Integration Dimensions

VSO-EP Basic Dimensions



Metric Adaptor (available option)

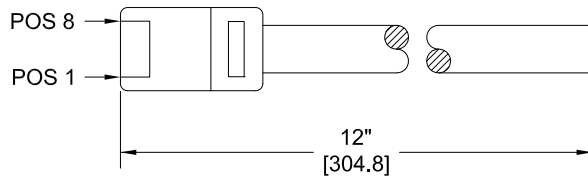


UNITS
IN. [mm.]

Electrical Interface

CAT 5e Plug-in (RJ-45) Connector (included)	
Signal	RJ-45 Pin No. Color
Main Power, 24 VDC	1 White w/ Orange
Input Control Signal, 0-5 VDC	2 Solid Orange
Monitor Signal Output, 0-5 VDC	3 White w/ Green
System Ground	4 Solid Blue

CAT 5e to flying lead Plug-in Cable (included)



VSO®-EP Miniature Electronic Pressure Controllers

Installation Guide

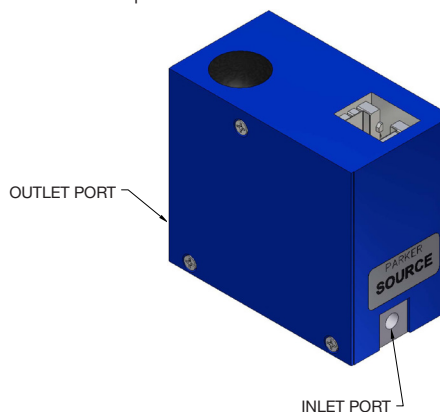
The VSO®-EP is a dynamic pressure controller that uses proportional valve technology to supply an accurate and stable pressure source for a variety of application requirements. Installation of this device requires the completion of a few easy steps.

They are as follows:

- Ensure that the gas is non corrosive, clean and dry.
- Connect the gas supply to the Inlet Port on the VSO®-EP.
- Connect a line requiring the controlled pressure to the Outlet Port on the VSO®-EP.
- Pneumatic ports are 10-32 UNF-2B Female. Metric Adaptor option is available.
- The EPC effective control range is 10%-100% of full scale.
- Electrical connections are made through the connector at the top of the unit.

They are as follows:

CAT 5e Plug-in (RJ-45) Connector (included)	
Signal	RJ-45 Pin No. Color
Main Power, 24 VDC	1 White w/ Orange
Input Control Signal, 0-5 VDC	2 Solid Orange
Monitor Signal Output, 0-5 VDC	3 White w/ Green
System Ground	4 Solid Blue



Key Things to Remember:

The pressure controller requires downstream restriction to build pressure. There are two ways to accomplish this:

- Use a venting controller. The venting controller is configured with an internal vent orifice that is roughly 40% of the controller orifice size. This configuration of controller can supply pressure to an application with a effective downstream restriction that represents 30% of the controller orifice size down to a completely restricted application.
- Use of a non-venting controller. The non-venting controller does not incorporate an internal vent orifice and will require a downstream restriction of roughly 20% to 60% of the controller's orifice size.

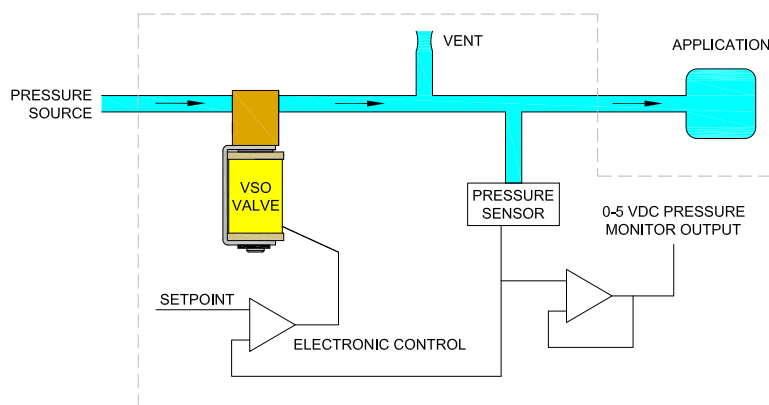
For example:

A non-vented controller with an orifice size of 0.010" should have 0.002" to 0.006" effective downstream restriction.

VSO®-EP Miniature Electronic Pressure Controllers

Configurations

Pressure Controller with Internal Vent



With Internal Vent.

A vent is required when the application does not consume any gas. For example, pressurizing a piloted regulator.

Ordering Information

Part Number	990-005001-015	990-005001-050	990-005001-100	990-005003-005
Series	VSO-EP	VSO-EP	VSO-EP	VSO-EP
Configuration	Internal Vent	Internal Vent	Internal Vent	Internal Vent
Effective Orifice	0.010" (0.25 mm)	0.010" (0.25 mm)	0.010" (0.25 mm)	0.030" (0.76 mm)
Main Voltage	24 VDC	24 VDC	24 VDC	24 VDC
Control Voltage	0-5 VDC	0-5 VDC	0-5 VDC	0-5 VDC
Pressure Range	0-15 psig	0-50 psig	0-100 psig	0-5 psig

Part Number	990-005003-015	990-005003-050	990-005003-100
Series	VSO-EP	VSO-EP	VSO-EP
Configuration	Internal Vent	Internal Vent	Internal Vent
Effective Orifice	0.030" (0.76 mm)	0.030" (0.76 mm)	0.030" (0.76 mm)
Main Voltage	24 VDC	24 VDC	24 VDC
Control Voltage	0-5 VDC	0-5 VDC	0-5 VDC
Pressure Range	0-15 psig	0-50 psig	0-100 psig

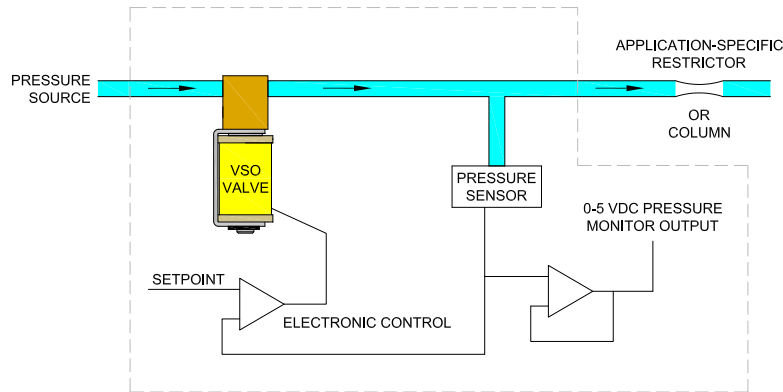
Accessories	
Part Number	190-008246-001
Configuration	10-32 Male to M5 x 0.8 mm Female Adaptor w/O-ring
Wetted Materials	FKM & Brass



VSO®-EP Miniature Electronic Pressure Controllers

Configurations

Pressure Controller with No Internal Vent



With No Internal Vent.

An internal vent may not be required when the application consumes a high rate of gas or the gas is coming from a limited source and/or is flammable.

Ordering Information

Part Number	990-005010-100	990-005011-015	990-005011-050	990-005011-100	990-005013-030
Series	VSO-EP	VSO-EP	VSO-EP	VSO-EP	VSO-EP
Configuration	No Internal Vent	No Internal Vent	No Internal Vent	No Internal Vent	No Internal Vent
Effective Orifice	0.003" (0.076 mm)	0.010" (0.25 mm)	0.010" (0.25 mm)	0.010" (0.25 mm)	0.030" (0.76 mm)
Main Voltage	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
Control Voltage	0-5 VDC	0-5 VDC	0-5 VDC	0-5 VDC	0-5 VDC
Pressure Range	0-100 psig	0-15 psig	0-50 psig	0-100 psig	0-30 psig

Accessories	
Part Number	190-008246-001
Configuration	10-32 Male to M5 x 0.8 mm Female Adaptor w/O-ring
Wetted Materials	FKM & Brass



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 (or go to www.parker.com/precisionfluidics/vsoep) to configure your VSO-EP Miniature Electronic Pressure Controller. For more detailed information, visit us on the Web, or call and refer to Performance Spec. #790-002202-001 and Drawing #890-003146-001.

PPF-EPC-002/US July 2016

For more information call +1 603 595 1500 or email ppfinfo@parker.com
Visit www.parker.com/precisionfluidics

