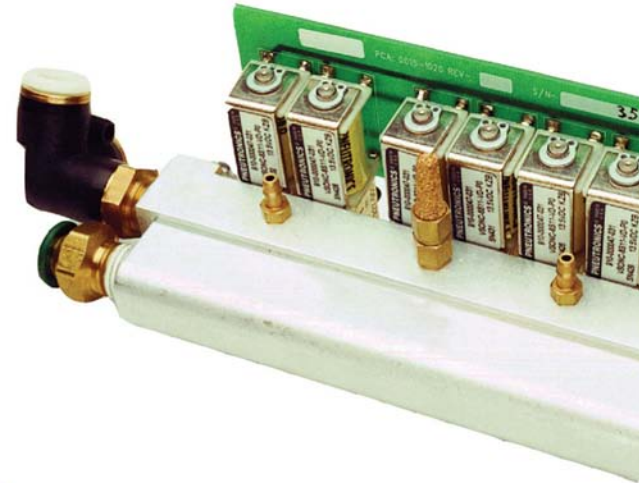




aerospace  
climate control  
electromechanical  
filtration  
**fluid & gas handling**  
hydraulics  
pneumatics  
process control  
sealing & shielding



# Miniature Proportional Valves

## Precision Fluidics



ENGINEERING YOUR SUCCESS.




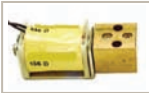



## ENGINEERING **YOUR** SUCCESS.

When you partner with the global leader in motion and control technologies, expect to move your business and the world forward. From miniature solenoid valves to highly integrated automation systems, our innovations are critical to life-saving medical devices and scientific instruments used for drug discovery and pathogen detection. Not to mention, critical to decreasing time to market and lowering your overall cost of ownership. So partner with Parker, and get ready to move, well, anything.



[www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics) 1 800 525-2857

# Table of Contents

	product	page
	<b>VSO®</b> Thermally Compensated Proportional Valve	4
	<b>VSO® Low Flow</b> Thermally Compensated Proportional Valve	6
	<b>Lone Wolf</b> Thermally Compensated Proportional Valve	8
	<b>MD PRO</b> Non-Thermally Compensated Proportional Valve	10
	<b>HF PRO</b> Non-Thermally Compensated Proportional Valve	12
	<b>Offer of Sale</b>	14



# VSO® Miniature Proportional Valve

## Thermally Compensated Proportional Valve



The VSO®, Voltage Sensitive Orifice, is a miniature solenoid valve that controls the flow of gas in proportion to input current. You can drive the valve with either DC current or pulse width modulation and use closed loop feed-back to deliver optimal system performance. Medical and analytical OEMs worldwide choose VSO as their preferred miniature proportional valve.

### Features

- Offers operating pressure up to 150 psig and a range of orifice sizes.
- Satisfies a 0.2 sccm leakage specification of He for 100 million life cycles and offers high repeatability.
- Provides computer-automated calibrations and full calibration traceability.
- Uses either DC current or pulse width modulation with closed loop feedback to deliver optimal system performance.
- Maintains ideal flow through thermal compensation.
- ROHS compliant

### Physical Properties

<b>Valve Type:</b>
2-Way Normally Closed
<b>Media:</b>
Air, argon, helium, hydrogen, methane, nitrogen, oxygen, & others
<b>Operating Environment:</b>
32 to 131°F (0 to 55°C)
<b>Storage Temperature:</b>
-40 to 158°F (-40 to 70°C)
<b>Length:</b>
1.785 in (45.34 mm)
<b>Width:</b>
0.625 in (16.51 mm)
<b>Height:</b>
0.67 in (17.02 mm)
<b>Porting:</b>
Barbs or 10-32 female; manifold mount with screens
<b>Weight:</b>
2.2 oz (62.86 grams)
<b>Internal Volume:</b>
0.031 in³ (.508 cm³)
<b>Filtration:</b> (Suggested and Available)
Models 1 & 2: 17 micron Models 3, 4, 5, & 6: 40 micron
<b>Oxygen and Analytically Clean:</b>
Standard

### Electrical

<b>Power:</b>
2.0 Watts maximum
<b>Voltage:</b>
See Ordering Information
<b>Electrical Termination:</b>
18" Wire Leads PC Mount, Spade Lugs

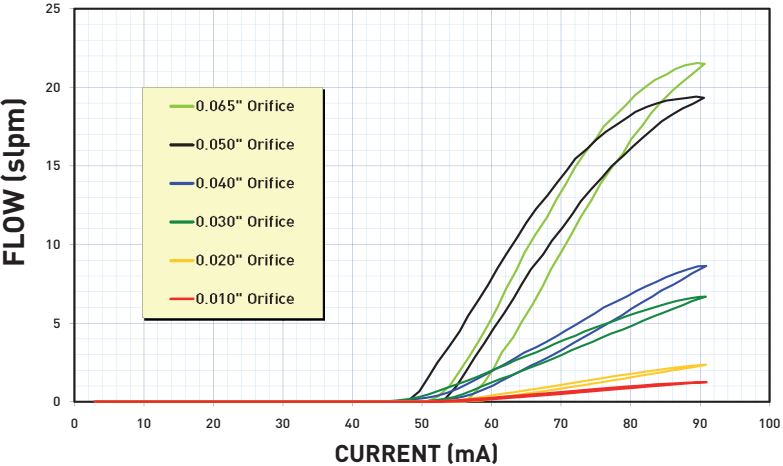
### Wetted Materials

<b>Body:</b>
360 HO2 Brass
<b>Stem Base:</b>
430 FR Stainless Steel and Brass 360 HT
<b>All Others:</b>
FKM; FFKM; 430 FR Stainless Steel; 300 Series Stainless Steel

### Performance Characteristics

<b>Leak Rate:</b>
<0.2 sccm of helium (bubble tight)
<b>Pressure:</b>
0 to 50 psi (0.34 MPa) 0 to 75 psi (0.52 MPa) 0 to 100 psi (0.69 MPa) 0 to 150 psi (1.03 MPa)
<b>Vacuum:</b>
0-27 in Hg (0.09 MPa)
<b>Orifice Sizes:</b>
0.010" (0.245 mm) 0.020" (0.510 mm) 0.030" (0.762 mm) 0.040" (1.016 mm) 0.050" (1.270 mm) 0.065" (1.651 mm)

Typical Air Flow with 20VDC coil (25 psig)



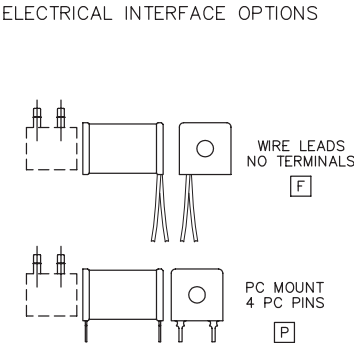
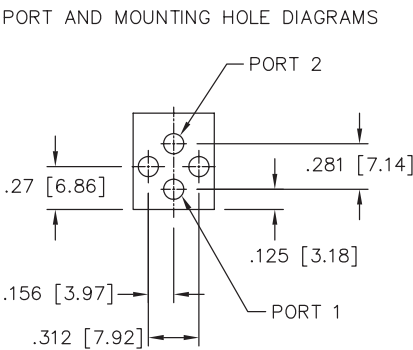
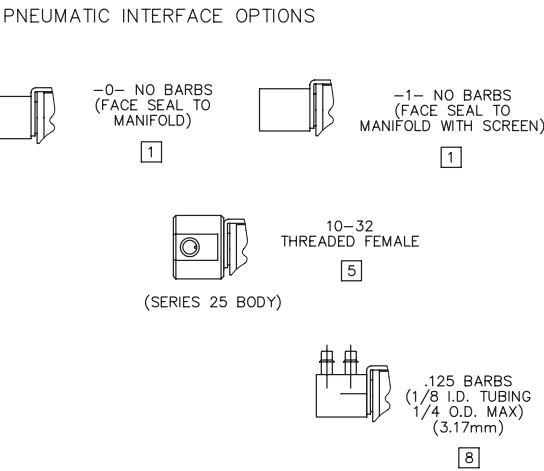
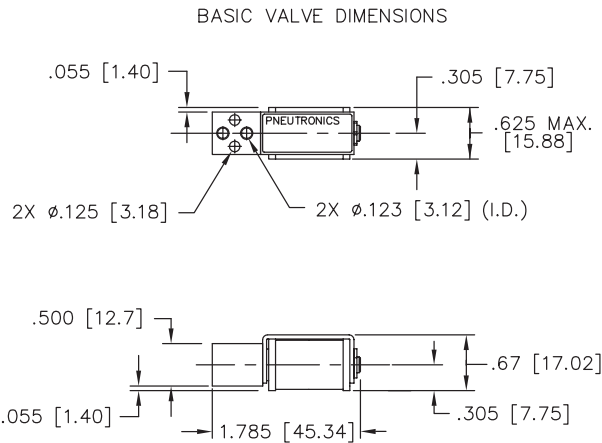
VSO is a registered trademark of Parker Hannifin Corporation.





VSO® Thermally Compensated Proportional Valve

Dimensions



NOTES:  
1. DIMENSIONS IN [ ] ARE IN MM.

Ordering Information

Sample Part ID	VSONC	1	S	11	V	A	F	8
Description	Standard	Model Number	Series	Body Series	Elastomer	Coil Selection	Electrical Interface	Pneumatic Interface (Series 11 only except with Option 5)
Options		#: Max. Operating Pressure/Orifice Size 1: 150 psid/0.010" 2: 150 psid/0.020" 3: 150 psid/0.030" 4: 75 psid/0.040" 5: 100 psid/0.050" 6: 50 psid/0.065"		11: Series 11 25: Series 25 (available in nickel-plated brass only)	V: FKM/Brass C: FFKM/Brass I: FKM/Stainless Steel H: FKM*/Stainless Steel	X: Max Voltage* A 5.5 VDC B 8 VDC C 11.5 VDC D 13.5 VDC E 20 VDC F 29 VDC  * Max Voltage for continuous full flow, ambient temperature 55°C	F: Wire Leads, 18" P: PC Board Mount, 4 PC Pins Q: Quick Connect Spade	0: Manifold Mount 1: Manifold Mount with Screens  5: 10-32 Threaded Female (Series 25) 8: 1/8" Barbs



NOTE: Please consult Parker Precision Fluidics for other considerations. For more detailed information, visit us on the Web, or call and refer to Performance Spec. #790-002115-001 and Drawing #890-003022-001.

PPF-MPV-002/US Sept 2009

For more information call 1.800.525.2857 or email [ppfinfo@parker.com](mailto:ppfinfo@parker.com)  
Visit [www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)



# VSO® Low Flow Low Flow Miniature Proportional Valve

## Thermally Compensated Proportional Valve



The VSO® LF (Low Flow) offers the same benefits as the VSO® valve with enhanced flow control for applications where control is critical or flow is required below 600 sccm. This miniature solenoid-operated valve automates the flow of gas in proportion to the input current.

### Features

- Uses either DC current or pulse width modulation; closed loop feedback delivers optimal system performance.
- Offers computer automated calibrations and full calibration traceability.
- Rated for 10 million life cycles.
- Maintains ideal flow through thermal compensation.
- Highly repeatable.
- ROHS compliant

### Physical Properties

<b>Valve Type:</b>
2-Way Normally Closed
<b>Media:</b>
Air, argon, helium, hydrogen, methane, nitrogen, oxygen, & others
<b>Operating Environment:</b>
32 to 131°F (0 to 55°C)
<b>Storage Temperature:</b>
-40 to 158°F (-40 to 70°C)
<b>Length:</b>
1.785 in (45.34 mm)
<b>Width:</b>
0.625 in (16.51 mm)
<b>Height:</b>
0.67 in (17.02 mm)
<b>Porting:</b>
Manifold mount
<b>Weight:</b>
2.2 oz (62.86 grams)
<b>Internal Volume:</b>
0.031 in³ (.508 cm³)
<b>Filtration:</b> (Suggested and Available)
17 micron
<b>Oxygen and Analytically Clean:</b>
Standard

### Electrical

<b>Power:</b>
2.0 Watts maximum
<b>Voltage:</b>
See Ordering Information
<b>Electrical Termination:</b>
18" Wire Leads

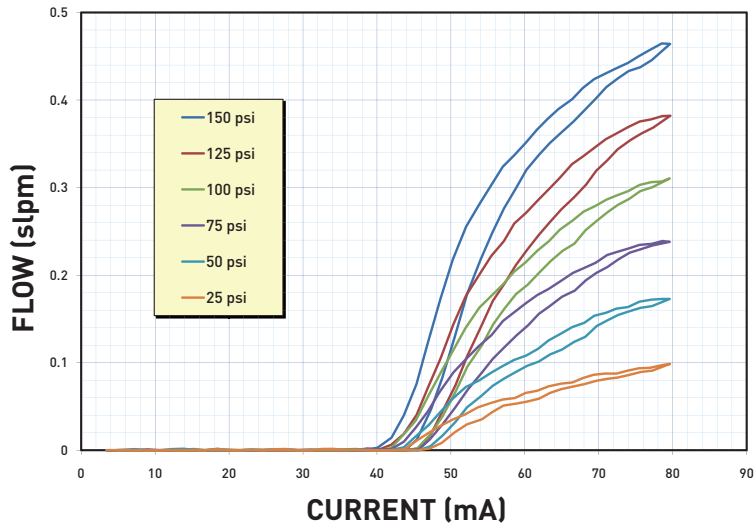
### Wetted Materials

<b>Body:</b> 360 HO2 Brass
<b>Stem Base:</b>
430 FR Stainless Steel and Brass 360 HT
<b>All Others:</b>
FKM; 430 FR Stainless Steel; 300 Series Stainless Steel

### Performance Characteristics

<b>Leak Rate:</b>
<0.2 sccm of helium
<b>Pressure</b>
0 - 150 psi (1.03 MPa)
<b>Orifice Size:</b>
0.003" (0.076 mm)

Typical Air Flow with 12 VDC coil

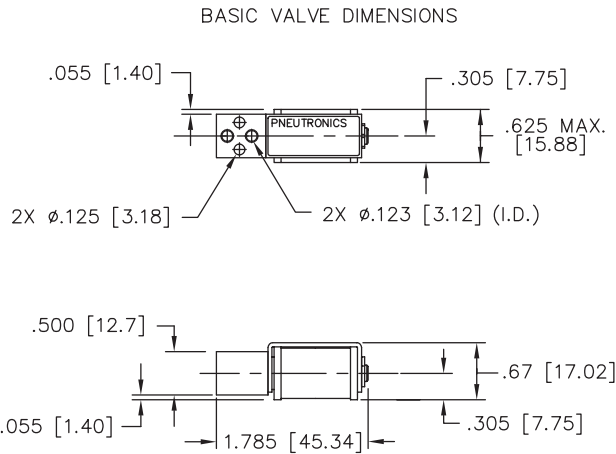


VSO is a registered trademark of Parker Hannifin Corporation.

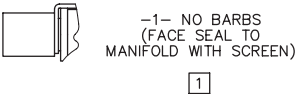


VSO® Low Flow Thermally Compensated Proportional Valve

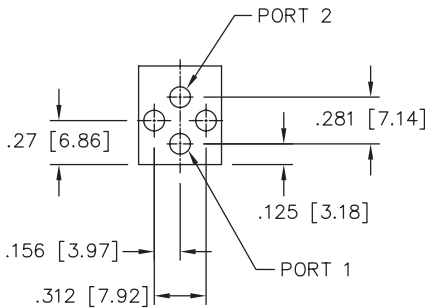
Dimensions



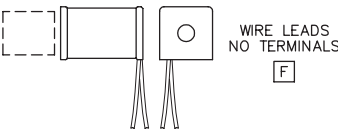
PNEUMATIC INTERFACE OPTIONS



PORT AND MOUNTING HOLE DIAGRAMS



ELECTRICAL INTERFACE OPTIONS



NOTES:  
1. DIMENSIONS IN [ ] ARE IN MM.

Ordering Information

Sample Part ID	910	-	000200	-	001
Description	Series	-	Model Number	-	Coil Selection
Options			VSO, Low Flow, 0.003" Orifice Size		X: Max Voltage* 001: 6.5 VDC 002: 8 VDC 003: 12 VDC 004: 18 VDC * Max Voltage for continuous full flow, ambient Temp 55°C,

NOTE: Please consult Parker Precision Fluidics for other considerations. For more detailed information, visit us on the Web, or call and refer to Performance Spec. #790-002160-002 and Drawing #890-003022-022.

PPF-MPV-002/US Sept 2009

For more information call 1.800.525.2857 or email [ppfinfo@parker.com](mailto:ppfinfo@parker.com)  
Visit [www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)



# Lone Wolf

## Normally Open Miniature Proportional Valve

### Thermally Compensated Proportional Valve



With its patented technology, the Lone Wolf valve has the highest performance characteristics of any Normally Open proportional valve available on the market. This VSO® valve offers silent operation, provides repeatable high-speed performance, and ensures maximum accuracy.

#### Features

- Achieves rapid, stable performance.
- Enhances system control and patient comfort.
- Maintains ideal flow through Normally Open valve with thermal compensation.
- Extremely reliable.
- ROHS compliant

#### Physical Properties

<b>Valve Type:</b>
2-Way Normally Open
<b>Media:</b>
Air, argon, helium, hydrogen, methane, nitrogen, oxygen, & others
<b>Operating Environment:</b>
32 to 122°F (0 to 50°C)
<b>Storage Temperature:</b>
-40 to 158°F (-40 to 70°C)
<b>Length:</b>
1.785 in (45.34 mm)
<b>Width:</b>
0.625 in (16.51 mm)
<b>Height:</b>
0.67 in (17.02 mm)
<b>Porting:</b>
Manifold mount; 1/8" Barbs, 5/64" Barbs
<b>Weight:</b>
2.2 oz (62.86 grams)
<b>Internal Volume:</b>
0.031 in³ (.508 cm³)
<b>Filtration:</b> (Suggested and Available)
40 micron
<b>Oxygen and Analytically Clean:</b>
Available

#### Electrical

<b>Power:</b>
2.0 Watts maximum
<b>Voltage:</b>
3-60 VDC
<b>Electrical Termination:</b>
18" Wire Leads; PC Mount; Spade Lugs

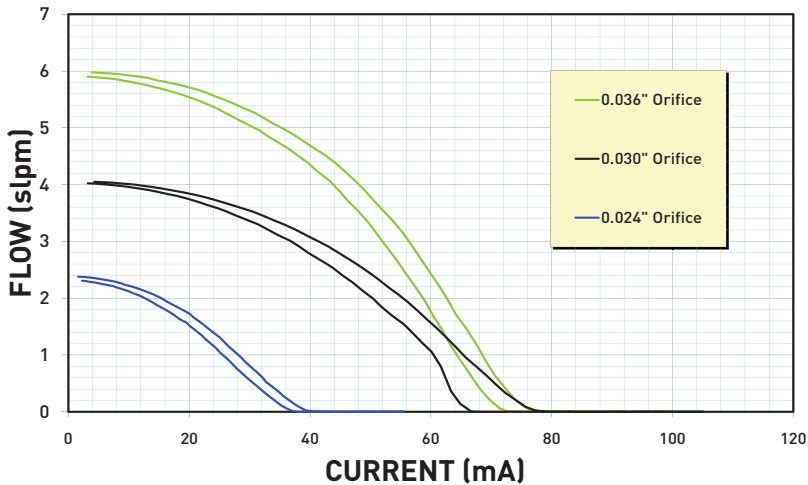
#### Wetted Materials

<b>Body:</b>
360 HO2 Brass
<b>Stem Base:</b>
430 FR Stainless Steel and Brass 360 HT
<b>All Others:</b>
Fluorocarbon; 430 FR Stainless Steel; 300 Series Stainless Steel

#### Performance Characteristics

<b>Leak Rate:</b>
Internal: 0.2 sccm
External: 0.016 sccm
<b>Pressure:</b>
0-10 psi (0.06 MPa)
0-20 psi (0.13 MPa)
0-25 psi (0.17 MPa)
<b>Vacuum:</b>
0-20 in Hg (0.06 MPa)
<b>Orifice Sizes:</b>
0.024" (0.609 mm)
0.030" (0.762 mm)
0.036" (0.914 mm)

Typical Air Flow with 13.5 VDC coil (25 psig)



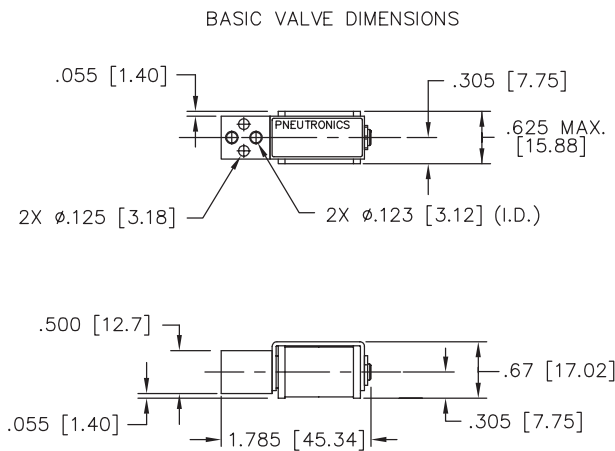
VSO is a registered trademark of Parker Hannifin Corporation.



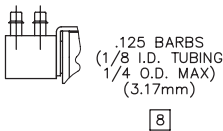
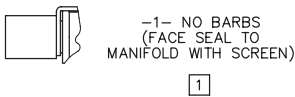


# Lone Wolf Thermally Compensated Proportional Valve

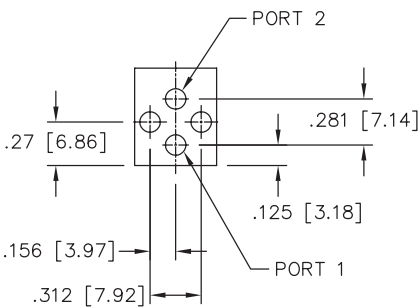
## Dimensions



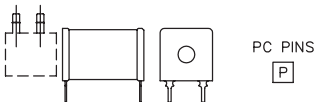
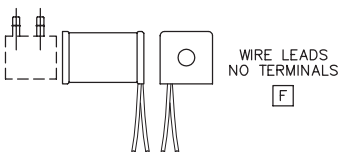
### PNEUMATIC INTERFACE OPTIONS



### PORT AND MOUNTING HOLE DIAGRAMS



### ELECTRICAL INTERFACE OPTIONS



NOTES:  
1. DIMENSIONS IN [ ] ARE IN MM.

## Ordering Information

Sample Part ID	LW	1	B	V	A	F	8
Description	Series	Model Number	Material	Elastomer	Coil Selection	Electrical Interface	Pneumatic Interface
		#: Max Operating Pressure/Orifice Size 1: 0-10 psi/0.024" 2: 0-20 psi/0.030" 3: 0-25 psi/0.036"	B: Brass	V: FKM	X: Max Voltage* A: 5 VDC B: 8 VDC C: 11.5 VDC D: 13.5 VDC F: 29 VDC *Max Voltage for continuous full flow, ambient temperature 55°C	F: Wire Leads, 18"-19" P: PC Board Mount, 4 PC Pins	0: Manifold Mount 1: Manifold Mount with Screens 8: 1/8" Barbs

NOTE: Please consult Parker Precision Fluidics for other considerations. For more detailed information, visit us on the Web, or call and refer to Performance Spec. #790-002130-001 and Drawing #890-003079-001.

PPF-MPV-002/US Sept 2009

For more information call 1.800.525.2857 or email [ppfinfo@parker.com](mailto:ppfinfo@parker.com)  
Visit [www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)



# MD PRO Miniature Proportional Valve

## Non-Thermally Compensated Proportional Valve



The MD Pro is a miniature solenoid-operated valve that controls gas flow proportionally to input current. This non-thermally compensated VSO® valve is the economical solution for precise flow control.

### Features

- Provides repeatability across its operating range.
- Offers a superior combination of value and performance.
- Rated for 10 million life cycles.
- ROHS compliant.

### Physical Properties

<b>Valve Type:</b>
2-Way Normally Closed
<b>Media:</b>
Air, argon, helium, hydrogen, methane, nitrogen, oxygen, & others
<b>Operating Environment:</b>
32 to 140°F (0 to 60°C)
<b>Storage Temperature:</b>
-40 to 158°F (-40 to 70°C)
<b>Length:</b>
1.785 in (45.34 mm)
<b>Width:</b>
0.625 in (16.51 mm)
<b>Height:</b>
0.67 in (17.02 mm)
<b>Porting:</b>
1/8" barbs; manifold mount
<b>Weight:</b>
2.2 oz (62.86 grams)
<b>Internal Volume:</b>
0.031 in³ (.508 cm³)
<b>Filtration</b> (Suggested and Available):
43 micron
<b>Oxygen Clean:</b>
Available

### Electrical

<b>Power:</b>
2.0 Watts maximum
<b>Voltage:</b>
See ordering information
<b>Electrical Termination:</b>
18" Wire Leads

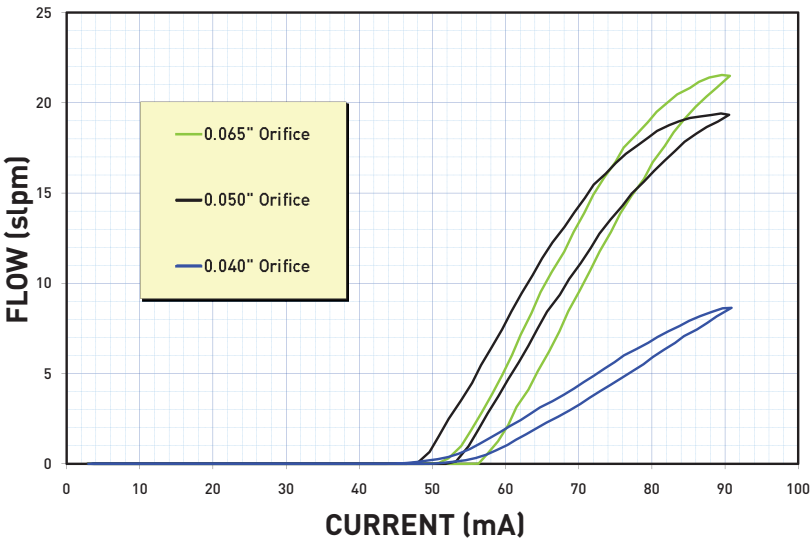
### Wetted Materials

<b>Body:</b>
360 HO2 Brass
<b>Stem Base:</b>
430 FR Stainless Steel and Brass 360 HT
<b>All Others:</b>
Fluorocarbon; 430 FR Stainless Steel; 300 Series Stainless Steel

### Performance Characteristics

<b>Leak Rate:</b>
<0.2 sccm of air
<b>Pressure:</b>
0 to 50 psi (0.34 MPa) 0 to 75 psi (0.52 MPa) 0 to 100 psi (0.69 MPa)
<b>Vacuum:</b>
0-27 in Hg (0.09 MPa)
<b>Orifice Sizes:</b>
0.040" (1.02 mm) 0.050" (1.27 mm) 0.065" (1.65 mm)

Typical Air Flow with 20VDC coil (25 psig)

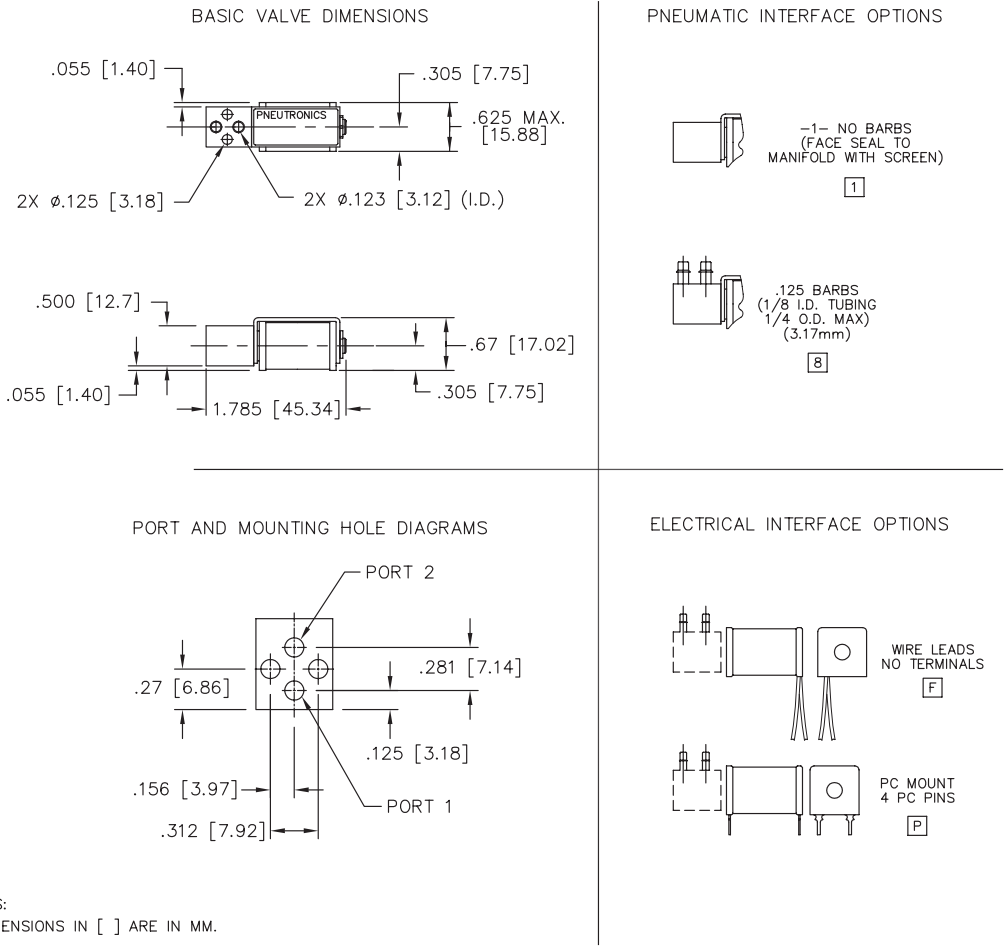


VSO is a registered trademark of Parker Hannifin Corporation.



MD PRO Non-Thermally Compensated Proportional Valve

Dimensions



Ordering Information

Sample Part ID	MDPRO	4	V	A	F	8	S
Description	Series	Model Number	Elastomer	Coil Selection	Electrical Interface	Pneumatic Interface	Cleaning
Options		#: Max. Operating Pressure/Orifice Size	V: FKM	X: Max Voltage*	F: Wire Leads, 18"	1: Manifold Mount with Screen*	S: Standard Cleaning
		4: 75 psid/0.040" 5: 100 psid/0.050" 6: 50 psid/0.065"		A: 5.5 VDC B: 8 VDC C: 11.5 VDC D: 13.5 VDC E: 20 VDC F: 29 VDC  * Max Voltage for continuous full flow, ambient temperature 55°C	P: PC Board Mount 4 PC Pins Q: Quick Connect Spade	8: 1/8" Barbs  * 43 Micron Screen [Port 2]	O: Oxygen Service

NOTE: Please consult Parker Precision fluidics Division for other considerations. For more detailed info, visit us on the Web, or call and refer to Performance Spec. #790-002206-001 and Drawing #890-003022-001.

PPF-MPV-002/US Sept 2009

For more information call 1.800.525.2857 or email [ppfinfo@parker.com](mailto:ppfinfo@parker.com)  
Visit [www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)



# HF PRO High Flow Proportional Valve

## Non-Thermally Compensated Proportional Valve



The HF Pro controls the flow of gas proportionally to input current. The valve may be driven with DC current or Pulse Width Modulation. HF Pro achieves optimal system performance when it uses closed loop feedback.

### Features

- Capable of 60 lpm flow and pressures up to 50 psig.
- Face seal manifold mount or 5mm barbed body options.
- Proven performance to 35 million life cycles.
- Non-thermally compensated proportional valve.
- ROHS compliant

### Physical Properties

<b>Valve Type:</b>
2-Way Normally Closed
<b>Media:</b>
Air, argon, helium, hydrogen, methane, nitrogen, oxygen, & others
<b>Operating Environment:</b>
32 to 122°F (0 to 50°C)
<b>Storage Temperature:</b>
-40 to 158°F (-40 to 70°C)
<b>Length:</b>
1.785 in (45.34 mm)
<b>Width:</b>
0.625 in (16.51 mm)
<b>Height:</b>
0.67 in (17.02 mm)
<b>Porting:</b>
1/8" barbs; manifold mount
<b>Weight:</b>
2.2 oz (62.86 grams)
<b>Internal Volume:</b>
0.031 in³ (.508 cm³)
<b>Filtration:</b>
43 micron
<b>Oxygen and Analytically Clean:</b>
Available

### Electrical

<b>Power:</b>
3.0 Watts maximum
<b>Voltage:</b>
See Ordering Information
<b>Electrical Termination:</b>
18" Wire Leads

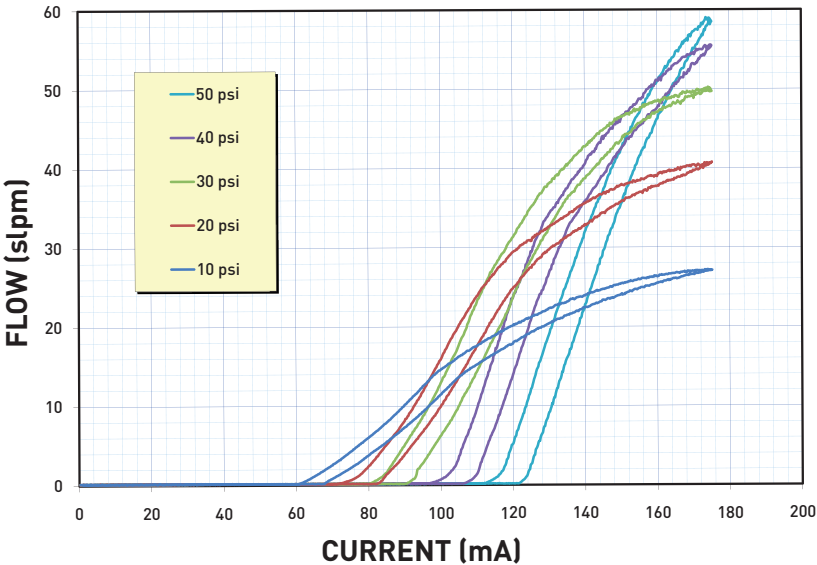
### Wetted Materials

<b>Body:</b> 360 HO2 Brass
<b>Stem Base:</b>
430 FR Stainless Steel and Brass 360 HT
<b>All Others:</b>
FKM; 430 FR Stainless Steel; 300 Series Stainless Steel

### Performance Characteristics

<b>Leak Rate:</b>
<0.5 sccm Max. N2
<b>Pressure:</b>
0 to 50 psi (0.34 MPa)
<b>Vacuum:</b>
0-27 in Hg (0.09 MPa)
<b>Orifice Sizes:</b>
0.070" (1.8 mm)

Typical Air Flow with 13.5 VDC coil



# Miniature Proportional Valves

Rometec srl - [www.rometec.it](http://www.rometec.it) - Rometec srl - [www.rometec.it](http://www.rometec.it) - Rometec srl - [www.rometec.it](http://www.rometec.it)



PARKER-HANNIFIN CORP., PRECISION FLUIDICS TERMS AND CONDITIONS OF SALE, ORDER POLICIES & PRODUCT WARRANTY INFORMATION

**1. APPLICABLE LAW:** This order shall be only subject to the terms and conditions set forth herein, notwithstanding any terms and conditions that may be contained in any order acknowledgement or other form of Buyer. Such terms and conditions of Buyer shall not bind the Seller unless accepted by it in writing whether or not they materially alter this order. This order shall be governed in all respects by the laws of the State of New Hampshire.

**2. TAXES:** Prices do not include Federal, State or local taxes, including without limitation, which taxes may at Seller's discretion be added to sales price or may be billed separately and which taxes will, in any event, be paid by Buyer unless Buyer provides Seller with a proper tax exemption certificate.

**3. TERMS OF PAYMENT:** Unless otherwise stated on Seller's invoices, terms of payment shall be Net 30 days from date of invoice. If at any time Seller in its sole discretion determines an alternative payment arrangement would be prudent, Seller may require Letter of Credit, Cash on Delivery, advance or other acceptable means of payment. If requirements of Seller are not met, Seller may cancel the order or any part thereof and receive reasonable cancellation fees.

**4. DELIVERY:** Seller shall not be liable for any delays in or failure of delivery due to acts of God or public authority, labor disturbances, accidents, fires, floods, extreme weather conditions, failure of any delays by carriers, shortages of material, delays of a supplier or any other cause beyond Seller's control. In no event shall the Seller be liable for consequential or special damages arising out of a delay in or failure of delivery. Buyer's requested delivery date or schedule shall be approximate and subject to Seller's acceptance.

**5. TERMINATION OF CONTRACT:** Orders accepted by the Seller may be cancelled by Buyer only with the consent of Seller and upon payment of reasonable cancellation charges, determined by Seller in its sole discretion. Seller shall have the right without penalty or payment to cancel any order accepted or to refuse or delay the shipment thereof if (1) Buyer fails to make promptly any payment due, or to meet any other reasonable requirements established by Seller, (2) Buyer's act or omission to act delays Seller's performance, or (3) Buyer's credit becomes impaired, in the Seller's sole judgement. In such event, Seller shall be entitled to receive reimbursement for reasonable and proper cancellation charges.

**6. CHANGES IN SPECIFICATIONS OR DESIGN:** If Buyer requests changes in specifications or designs relating to any goods, delivery schedules shall be revised if necessary, and an equitable adjustment upward or downward shall be made in price if warranted.

**7. FREIGHT:** Carriers will be selected by the Seller unless the Buyer instructs otherwise in writing. All shipments will be F. O. B. Seller's plant. Standard freight charges for equipment repaired under warranty will be paid by Parker Precision Fluidics. Buyers request for alternatives means will be charged additional freight as required.

**8. CONSEQUENTIAL DAMAGES:** In no event shall Seller be liable for consequential or special damages arising out of delay in or failure of delivery, defects in material, or workmanship or arising out of a breach by Seller of any other term or obligation of the Seller under this contract.

**9. GOVERNMENT COBONTRACTS:** If the products to be furnished under this contract are to be used in the performance of a United States Government Contract or sub-contract, the government contract number, priority rating and a statement to that effect shall appear on the Buyer's purchase order. If the Buyer's purchase order includes all of said information and if said order is accepted in writing by an authorized officer of Seller with knowledge of said information, then those clauses of the applicable government procurement regulations which are mandatorily required by Federal Statute or regulation to be included in this contract shall be incorporated herein by reference; in all other events said clauses shall not be incorporated herein by reference.

**10. PROPRIETARY INFORMATION:** Buyer represents that it has adopted reasonable procedures to protect proprietary information as defined hereafter including binding agreements with employees and consultants to prevent unauthorized publication, disclosure, or use of such information during or after the term of their employment by or services for Buyer. Buyer shall not use proprietary information except as expressly permitted hereunder, shall not disclose proprietary information of Seller to any third party and shall not transmit any documents or copies thereof containing proprietary information to any third party except as may be authorized in writing by Seller.

**11. PATENT INDEMNITY:** Seller shall have no liability for patent infringement unless the goods furnished hereunder, in an of themselves, constitute the infringement. If they do, and Seller is notified of the class of infringement within ten days after such claim is received by the Buyer and is permitted to settle or defend such claim, Seller will indemnify the Buyer against reasonable expense of defending suit and against any judgement or settlement to which Seller agrees. However, such indemnity will be limited to an amount not exceeding the price paid by Buyer to Seller for the infringing goods. If an injunction is issued against the further use of the goods, Seller will have the option of either procuring for the Buyer the right to use the goods, replacing them with non-infringing goods, modify them so that they become non-infringing, or refunding the purchase price. The foregoing constitutes Seller's entire warranty and liability as to patents. If the goods furnished hereunder are in accordance with a design furnished by the Buyer, the Buyer will defend and hold harmless Seller from all cost, expenses and judgements on accounts of any claim of infringement of any patent.

**12. WARRANTIES:** A. Equipment: Seller warrants that all equipment manufactured by it shall be free from defects in material or workmanship under normal use for a period of one (1) year from date of shipment to Buyer and upon examination of Seller determines to its satisfaction that such equipment is defective in material or workmanship and such defect was not caused by accident, misuse, neglect, alteration, improper adjustment, improper repair, improper application, or improper testing. Seller shall at its option repair or replace the equipment, shipment to Buyer prepaid. Seller does not recommend it's products for use in life support systems.

B. The foregoing are in lieu of all representations, warranties and covenants, express or implied, with respect to the products and any defects therein of any nature whatever, including without limitation, warranties of merchantability and fitness for a particular purpose. Seller's sole and exclusive liability, and Buyer's sole and exclusive remedy, for any nonconformity or defect in the products in tort (including negligence), contract, or otherwise, shall be as set forth in Section 12A.

Pricing and Lead Time

- Standard Prices and lead times are as indicated on the current published Standard Price List and Discount Schedule.
- Non-standard pricing [other than that contained in the published Price List] must be approved by Parker Precision Fluidics and a formal quotation must be submitted to the customer.
- Quantity discounts for similar product are as noted on the Standard Price List and Discount Schedule.
- All shipments are FCA factory [payable in US dollars].
- The Standard Price List and Discount Schedule are subject to change.
- All price quotations are valid for a period of 90 days.

Payment and Credit Terms

- Payment terms are 1% 10, 25 net 30 as noted below:
  - For invoices dated between the 1st and 15th, payments must be received by the 25th of the month.
  - For invoices dated between the 16th and 31st, payments must be received by the 10th of the following month.
- The above payment terms and discount are available to all customers with established credit. Otherwise, the following special terms exist:
  - COD for non-established domestic customers for orders greater than \$1,000. Cash in Advance for non-established foreign customers for orders greater than \$1,000.
  - Standard payment terms will be established upon corporate credit approval.
  - Credit card sales will be accepted from customers with established credit.

Order Policies

- A hard copy Purchase Order confirmation must be provided for all orders. This copy may be sent via fax or Internet e-mail provided it is signed by the authorized buyer.
- Minimum order/shipment is \$250.00 Net. All sales transactions totaling \$2,500 or less will be processed via credit card only.
- Distributor/Contract Mfg. Orders: All distributors and contract manufacturers are required to report end customer information at the time of order. Orders will not be processed by Parker Precision Fluidics until such information is provided.
- Blanket Orders: Orders consisting of multiple releases must be completed within a twelve (12) month (A.R.O.) period unless other terms have been agreed upon prior to acceptance of the order.
- **Blanket Orders are subject to back billing (add billing) as indicated below:**
  - Standard Product: If at the end of the contract period the full quantity has not been released and shipped, the entire order will be re-priced at the applicable discount for quantity shipped.
  - Custom Product: If at the end of the contract period the full quantity has not been released and shipped, a charge will be assessed to cover the cost of any unique material plus an adjustment of discount on the entire order.
- **Order Reschedules:**
  - Standard Product: A 20% reschedule fee will be incurred unless a formal change order is received at least thirty (30) days prior to scheduled shipment.
  - Custom Product: A 20% reschedule fee will be incurred unless a formal change order is received at least sixty (60) days prior to scheduled shipment due to unique component lead time.
- **Order Expedites:**
  - Customers requesting an expedited delivery of two (2) weeks or less of the quoted standard lead time will be subject to a charge equal to 20% of the amount being expedited.
- **Order Cancellations:**
  - Standard Product - A 20% cancellation fee will be incurred unless a formal change order is received at least thirty (30) days prior to scheduled shipment.
  - Custom Product - Cancellations of custom product are subject to a 20% cancellation fee plus the cost of all work in process and the cost of any material unique to that order

Product Returns

- Standard Product: - All returns of standard product are subject to prior approval from Parker Precision Fluidics and will incur a restocking charge of 20%. Credit will be issued based upon original invoice value. No material will be accepted for return without prior authorization from Parker Precision Fluidics. The Return Material Authorization (RMA) number should appear on all packages and accompanying paperwork.
- Custom Product: Return of custom product cannot be accepted.

Warranties

- Parker Precision Fluidics warrants its products against defective materials and workmanship under normal use for a period of one (1) year from the date of shipment to our customer. This warranty does not apply to any product that has been subjected to misuse, accident, improper installation, improper application, or improper operation, nor does it apply to any product that has been repaired or altered by other than an authorized factory representative. There are no warranties that extend beyond those herein specifically given.
- Miniature Diaphragm Pumps - Seller warrants to buyer that the products will be free, under normal use and maintenance, from defects in material and workmanship for a period of twelve (12) months from the manufacture date as noted by date code, serial number, or rated hours of operation which ever occurs first, unless otherwise stated.
- Warranty Repair: All products will be repaired at the factory, replaced at no charge throughout the warranty period, or a credit will be issued to reconcile the account. The balance of the warranty will remain in effect and no other warranty will be issued.
- Warranty items costing less than \$75 will no longer be repaired - credit will be issued upon receipt of item.
- Non-Warranty Repair Charges: Non-warranty repairs are not available. For a fee of \$500, a standard analysis which includes visual inspection, determination of cause, and failure analysis report will be performed. Additional charges may be imposed if the use of an outside lab is necessary.
- IOTA One Solenoid Valve Controllers and Picospritzer III Pressure Injection Systems manufactured more than five (5) years prior to the request date will not be accepted for repair. For a fee of \$250.00, an evaluation will be performed on non-warranty units less than five (5) years old and a quote will be prepared detailing the cost of all the repairs.

Return Materials Authorizations

- Hazardous Material: All products returned must be free of hazardous materials. Return of any product exposed to bio hazardous material will not be accepted.
  - You must obtain a Return Material Authorization (RMA) number from Parker Precision Fluidics in order that we may process your returned equipment. Material will not be accepted unless an RMA number is assigned and is clearly marked on all incoming packages and associated paperwork. RMA numbers expire 60 days after date of issue. Items returned without authorization or after 60 days of issuance will be returned to the customer freight collect.
  - This policy has been set for our mutual protection in that it greatly reduces the possibility of misplaced returns. Please call our Customer Service Department at 1-800-525-2857 to obtain an RMA number. **Be prepared to provide the following information when calling:**
    - Customer Name, Address & Phone Number
    - Contact Name
    - Ship-To and Bill-To Address
    - Reason for Return & Failure Symptoms if Applicable
    - Part Number, Quantity & Date Code
- Purchase Order Numbers (\*Note: A Purchase Order Number is necessary for products returned under warranty. P.O. number to be used as tracking Vehicle only. Precision Fluidics Division will contact the customer with date of return shipment.

**Shipping:** Products that are shipped to the factory for Warranty repair will be shipped at the customer's expense and will be returned to the Customer at no charge via Precision Fluidics Division's standard shipping method. Products that are shipped to the factory on a freight collect basis will not be accepted. Customers may specify preferred method of shipment. Product will then be shipped back to the customer on a freight collect basis.

PARKER-HANNIFIN CORP., PRECISION FLUIDICS DIVISION 8/10/2009  
Standard terms and conditions are supplemented by this policy statement,  
which each apply to all orders from the division.





## **WARNING**

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

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

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

