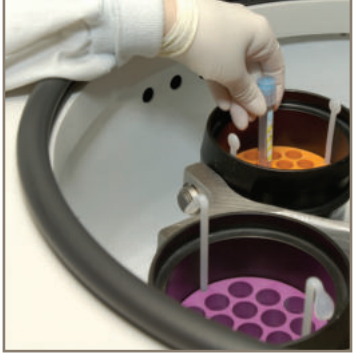

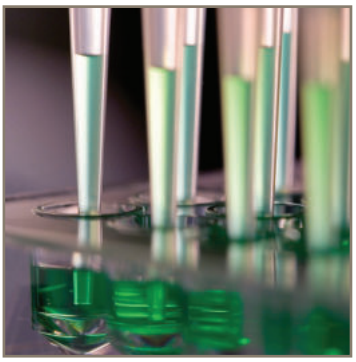

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Miniature Solenoid Valves

Precision Fluidics

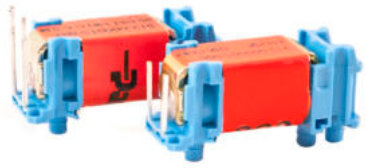
Parker

ENGINEERING YOUR SUCCESS.

X-Valve®

Miniature Pneumatic Solenoid Valve

8mm Solenoid Valve



The X-Valve® is a miniature pneumatic solenoid valve measuring only 8 mm in width. The compact size, light weight and low power consumption of the X-Valve® is the ideal solution for portable applications and those applications with limited space and available power. The body construction of the X-Valve® is suited for manifold or barbed-tube pneumatic connections and is available in 2-way normally closed and 3-way universal configurations.

Typical Applications

- Portable Equipment
- Blood Pressure Monitoring
- Wound Therapy
- Air and Oxygen Delivery
- Sensor Zeroing

Features

- Direct PC and side-to-side mounting enables compact and efficient system design
- Large range of pressure options (6, 30 and 100 psi) to meet various application requirements
- Light weight valve construction is ideal for portable applications
- Available low power model (0.5 Watt) for continuous duty applications
- RoHS compliant

Product Specifications

Mechanical

Valve Type:
3-Way, Solenoid-actuated poppet style
- Universal (6 psig & 30 psig models)
- Normally Closed (100 psig model)

2-Way Solenoid-actuated poppet style
- Normally Closed, Bi-Directional Flow (6 & 30 psig models)
- Normally Closed, Directional Flow (100 psig model)

Media: Non-Reactive gases

Operating Environment:
32 to 122°F (0 to 50°C)

Storage Temperature:
-40 to 158°F (-40 to 70°C)

Dimensions:
- Length: 0.92 in (23.4 mm)
- Width: 0.31 in (7.9 mm)
- Height: 0.48 in (12.2 mm) to Barb End / 0.35 in (8.9 mm) to Manifold Face

Spacing:
0.315 in (8 mm) center

Porting:
- Barbs for 1/16 in (1.5 mm) I. D. Tubing, (1/32 in Wall Max.)
- Manifold Mount (Gasket accessory required, see ordering info)

Weight: 0.16 oz (4.5 g)

Internal Volume:
0.0056 in^3 (0.092 cm^3)

Electrical

Power Options:
0.5 Watt (6 psig model)
1.0 Watt (30, 100 psig model)

Voltage Options:
3, 5, 12 or 24 VDC
Further power reduction may be achieved through the use of spike and hold or PWM electrical control.

Electrical Connections:
PC Pins, 4 mm centers (all models)
Lead Wire/Connector Assembly (Accessory, see ordering info)

Wetted Materials

Bobbin/Body:
PBT (Polybutylene terephthalate)

Pole & Plunger:
430 FR Series Stainless Steel

Seal (Options):
FKM, EPDM, Silicone

Other:
302 Series Stainless Steel

Performance Characteristics

Leak Rate: Tested with Air
<0.016 sccm (6 psig Silicone)
<0.016 sccm (30 psig FKM)
<0.16 sccm (6 psig EPDM & FKM)
<0.2 sccm (100 psig only)

Response:
< 20 ms maximum cycling (FKM, Silicone)
< 50 ms maximum cycling (EPDM)

Pressure/Vacuum:
0 to 6 psid (0.4 bar differential)
0 to 30 psid (2.0 bar differential)
0 to 100 psid (6.9 bar differential)

Proof Pressure:
200 psig (13.7 bar)

Minimum Flow:
4 slpm @ 6 psid (0.4 bar differential)
6 slpm @ 30 psid (2.0 bar differential)
9 slpm @ 100 psid (6.9 bar differential)

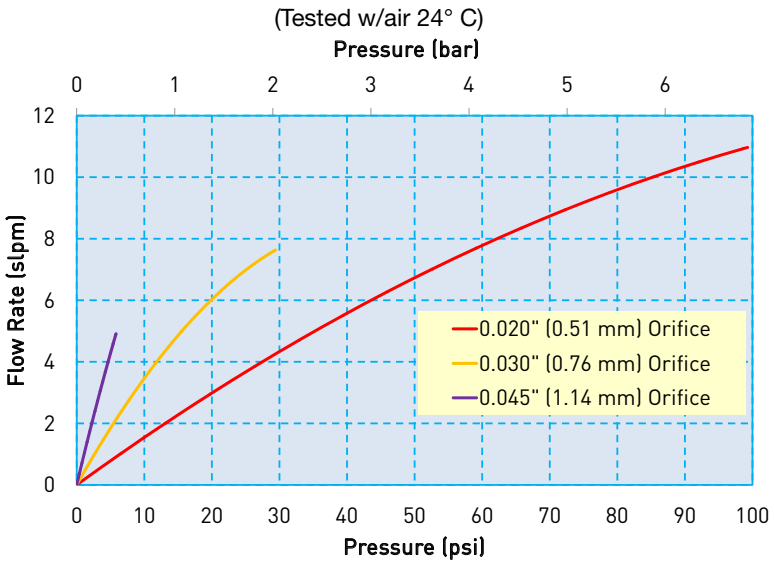
Orifice Sizes/Equivalent Cv:
0.045" (1.14 mm) / 0.018
0.030" (0.75 mm) / 0.010
0.020" (0.5 mm) / 0.005

Reliability:
Life Cycle rating of 25 million (worst case tested, no performance degradation)

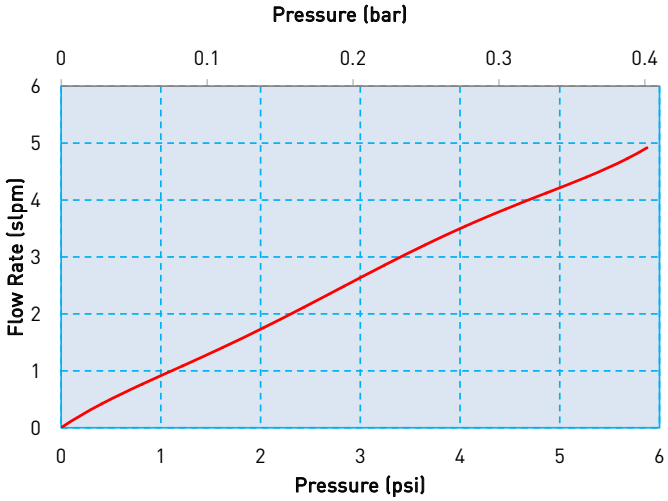
X-Valve® Miniature Pneumatic Solenoid Valve

Typical Flow Curve

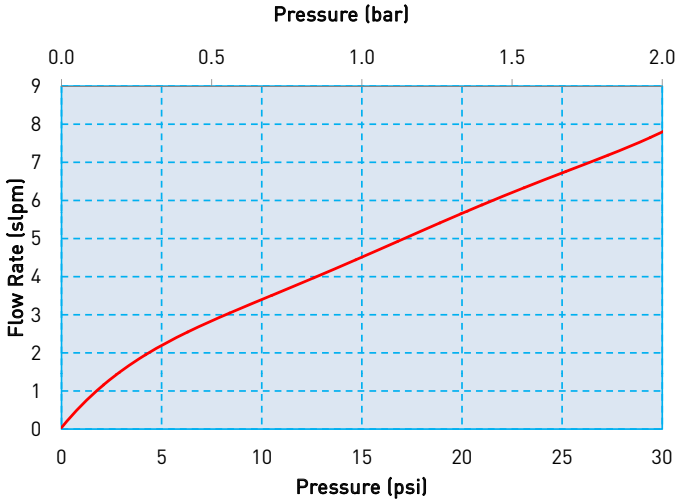
All Models



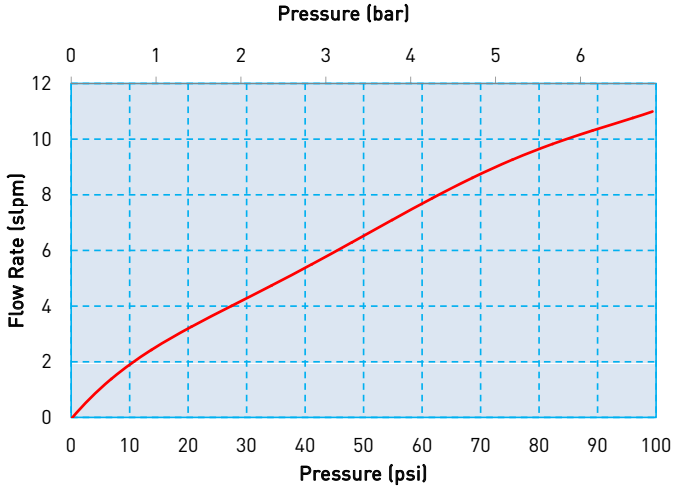
Models 1 and 6 – 0.045" (1.14 mm) Orifice



Models 2 and 7 – 0.030" (0.76 mm) Orifice



Models 5 and 8 – 0.020" (0.51 mm) Orifice



X-Valve® Miniature Pneumatic Solenoid Valve

Pressure and Flow Capabilities/Power

Model No.	Orifice Size	Nominal Cv	Maximum Operating Pressure Differential	Power Consumption Nominal
1 and 6	0.045 in (1.14 mm)	0.018	6 psi (0.4 bar differential)	0.5 Watt
2 and 7	0.030 in (0.76 mm)	0.010	30 psi (2.0 bar differential)	1 Watt
5 and 8	0.020 in (0.51 mm)	0.005	100 psi (6.9 bar differential)	1 Watt

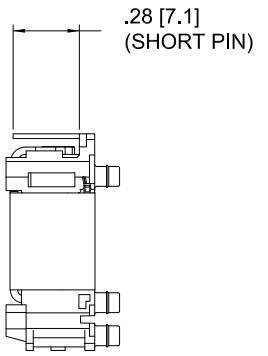
* Proof pressure is 200 psig (13.7 bar)

Pneumatic Interface / Electrical Interface

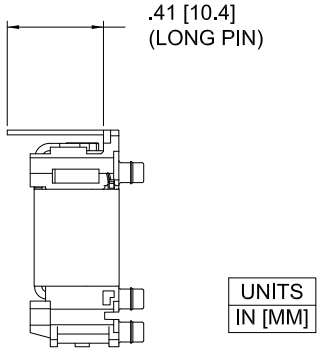
Short Pin
(For Pin/Wire Lead or PCB Terminal Housing Connection)
[Reference Accessories section]

Long Pin
(For Pin/PCB solder mount connection)

Coil Connections



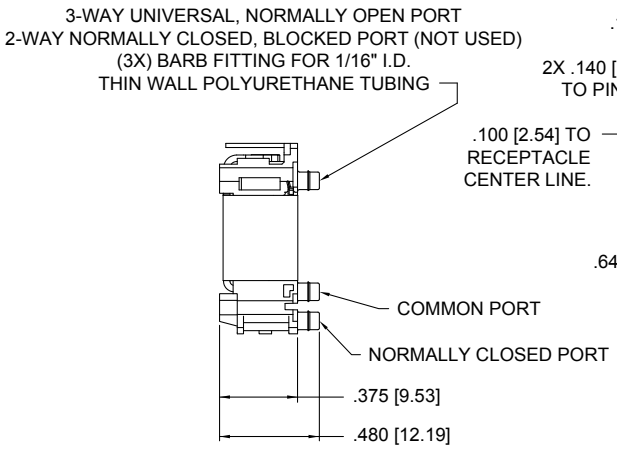
Electrical Connection Options:
Electrical terminals compatible with Molex 51065 series connector or equivalent.



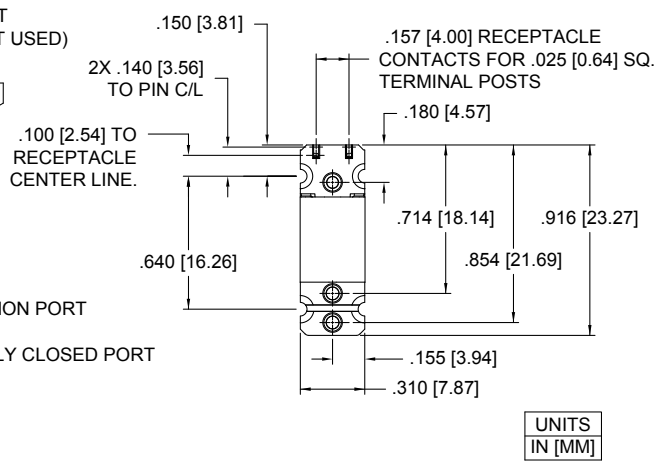
Mechanical Integration

Dimensions

SIDE VIEW



BOTTOM VIEW

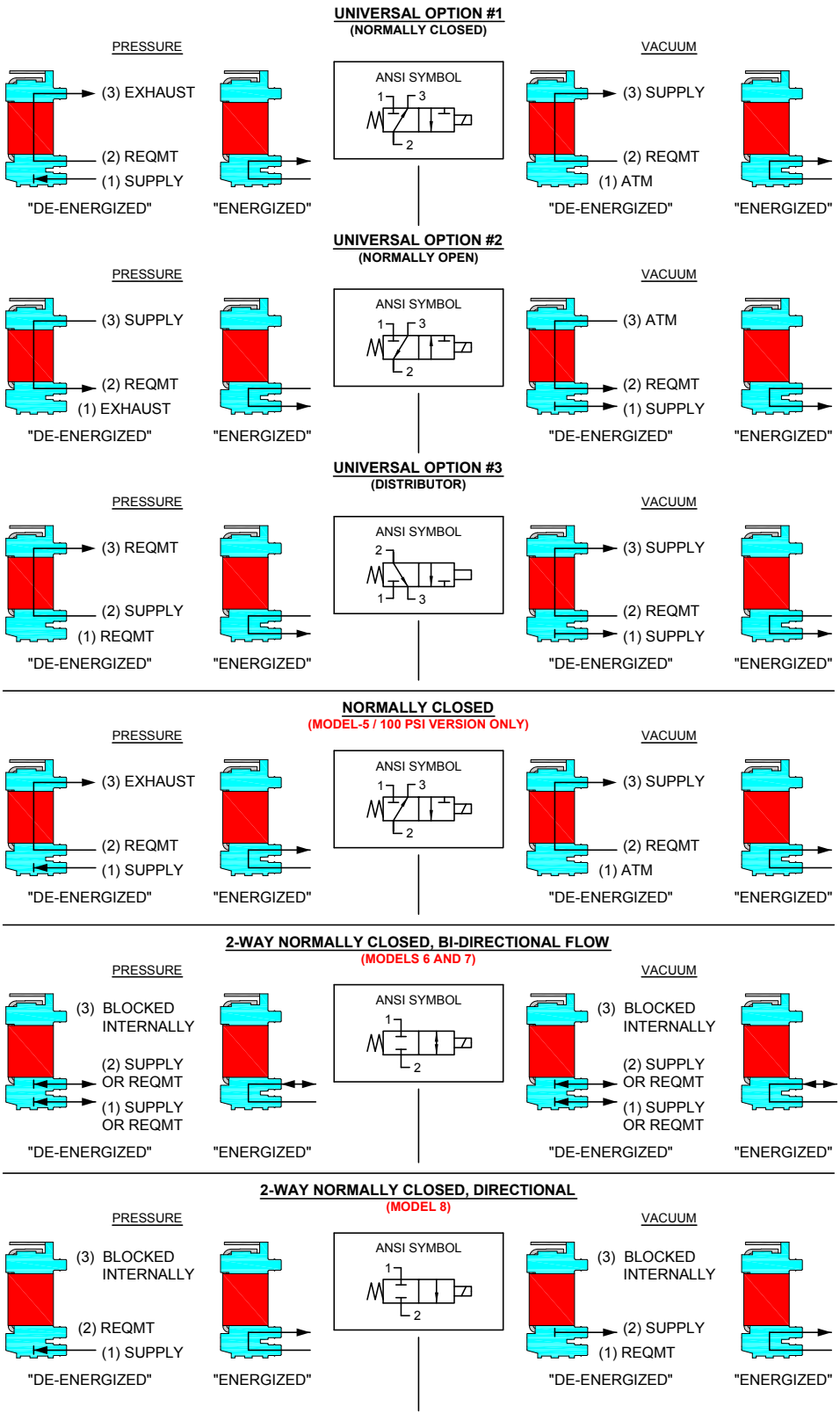


X-Valve® Miniature Pneumatic Solenoid Valve

LEGEND:	
SUPPLY:	Pneumatic Source or Supply Pressure
EXHAUST:	Exhaust to Atmospheric Pressure
REQMT:	Customer Requirement or Application
ATM:	Atmospheric Pressure

ANSI Symbols

Pneumatic Schematics by Valve Types

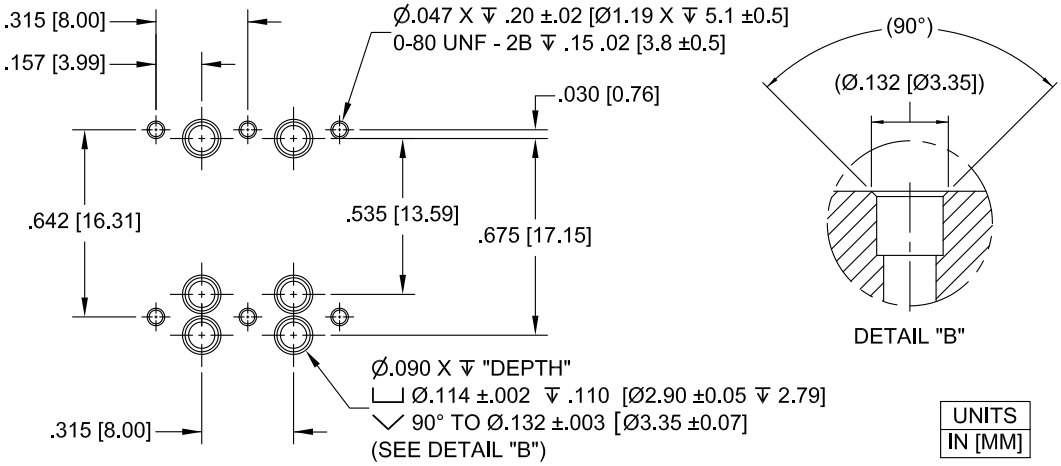


X-Valve® Miniature Pneumatic Solenoid Valve

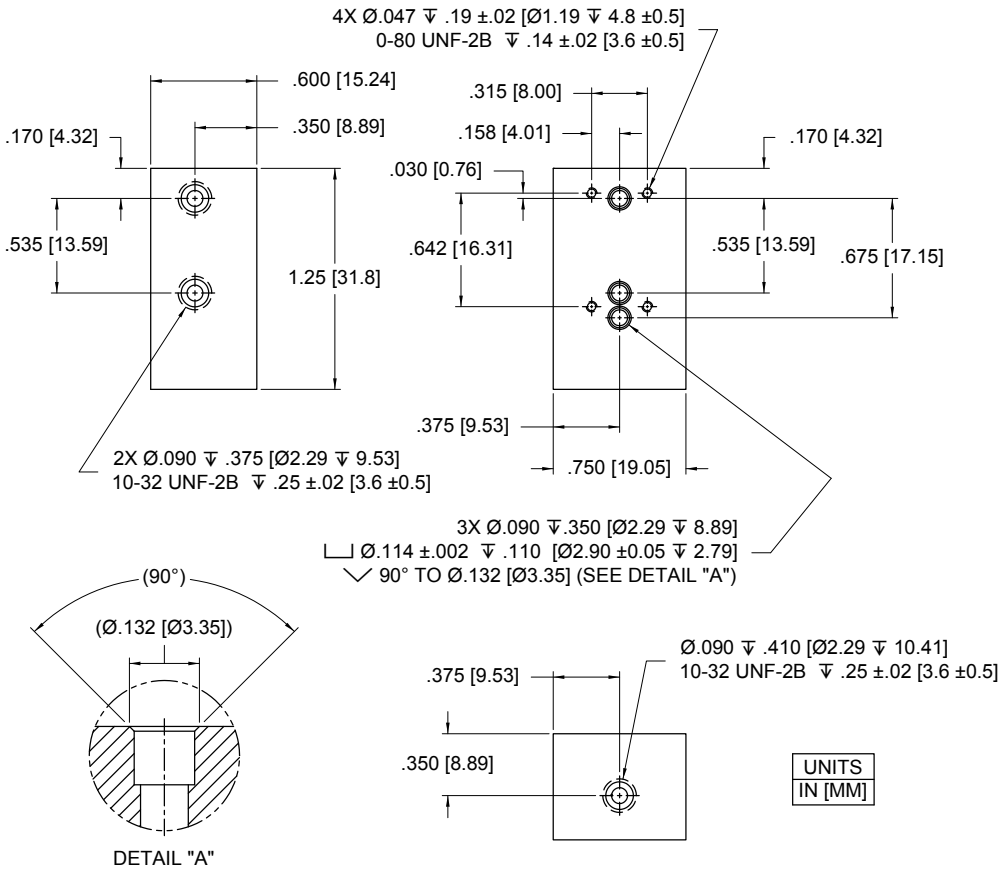
Installation and Use

X-Valve Manifold Mount Diagram

Parker Precision Fluidics recommends 3-5 in-oz of torque for the screws



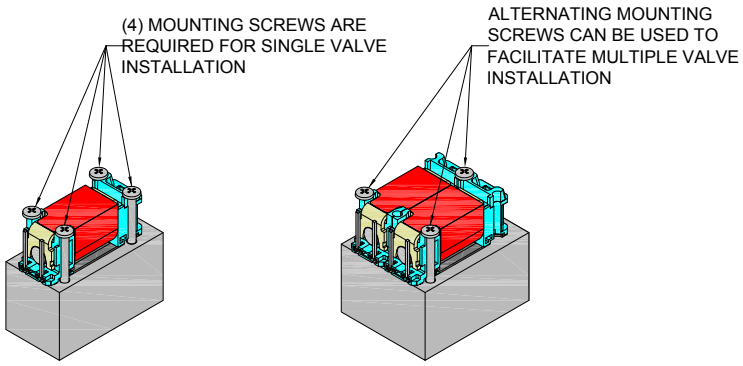
Recommended X-Valve Manifold Dimensions



X-Valve® Miniature Pneumatic Solenoid Valve

Installation and Use

Recommended X-Valve Mounting



Single Station Manifold Mounting

Multiple Station Manifold Mounting

Accessories

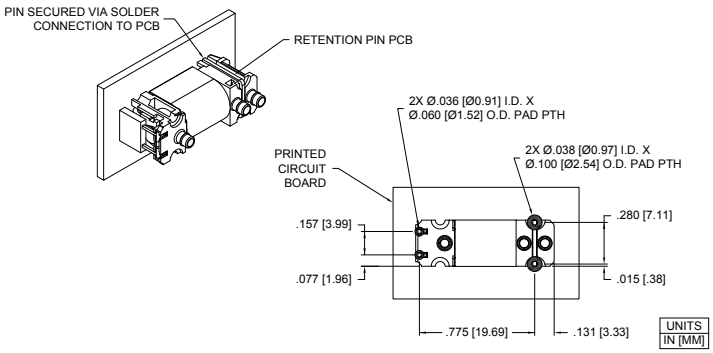
Mounting Options

Manifold Rubber Gasket (FKM)
195-000159-001
(required for manifold mounting)

12" Wire Leads
290-006061-001
(for use with Short Pin valve configuration)

Screw 0-80 x 1/2" Binding Head, Phillips
191-000100-208
(see valve mounting recommendations above)

Retention Pin PCB
190-006020-001



X-Valve® Miniature Pneumatic Solenoid Valve

Ordering Information

Sample Product ID	X	1	05	L	F
Description	**Series**	**Model Number: Pressure / Orifice / Power / Type**	**Voltage**	**Electrical Coil Connection**	**Elastomer**
Options	X	1: 6 psig / 0.045"/ 0.5 Watt / 3-Way Universal 2: 30 psig / 0.030" / 1 Watt / 3-Way Universal 5: 100 psig / 0.020" / 1 Watt / 3-Way NC only 6: 6 psig / 0.045"/ 0.5 Watt / 2-Way NC, Bi-Directional Flow (1) 7: 30 psig / 0.030" / 1 Watt / 2-Way NC, Bi-Directional Flow (1) 8: 100 psig / 0.020" / 1 Watt / 2-Way NC, Directional Flow (1) (1) 2-Way NC configurations only available in FKM	03: 3 VDC 05: 5 VDC 12: 12 VDC 24: 24 VDC	S: Short Pins (2) L: Long Pins (3) (2) For Pin/Wire Lead or PCB Terminal Housing Connection (3) For Pin/PCB solder mount connection	F: FKM E: EPDM (6 psig only) S: Silicone (6 psig only)

Product ID Reference	Order Part Number	Product ID Reference	Order Part Number	Product ID Reference	Order Part Number
X-1-03-L-F	912-000001-001	X-1-05-S-F	912-000001-009	X-5-12-S-F	912-000001-019
X-1-12-L-F	912-000001-002	X-1-05-L-F	912-000001-010	X-5-24-S-F	912-000001-020
X-2-12-L-F	912-000001-003	X-2-03-S-F	912-000001-011	X-5-12-L-F	912-000001-021
X-2-24-L-F	912-000001-004	X-2-03-L-F	912-000001-012	X-5-24-L-F	912-000001-022
X-1-03-S-F	912-000001-005	X-5-03-S-F	912-000001-013	X-5-05-L-F	912-000001-031
X-1-12-S-F	912-000001-006	X-5-03-L-F	912-000001-014	X-5-05-S-F	912-000001-032
X-2-12-S-F	912-000001-007	X-1-24-S-F	912-000001-017	X-2-05-L-F	912-000001-033
X-2-24-S-F	912-000001-008	X-1-24-L-F	912-000001-018	X-2-05-S-F	912-000001-034

Product ID Reference	Order Part Number	Product ID Reference	Order Part Number	Product ID Reference	Order Part Number
X-6-03-L-F	912-000007-001	X-6-05-S-F	912-000007-009	X-8-12-S-F	912-000007-019
X-6-12-L-F	912-000007-002	X-6-05-L-F	912-000007-010	X-8-24-S-F	912-000007-020
X-7-12-L-F	912-000007-003	X-7-03-S-F	912-000007-011	X-8-12-L-F	912-000007-021
X-7-24-L-F	912-000007-004	X-7-03-L-F	912-000007-012	X-8-24-L-F	912-000007-022
X-6-03-S-F	912-000007-005	X-8-03-S-F	912-000007-013	X-8-05-L-F	912-000007-031
X-6-12-S-F	912-000007-006	X-8-03-L-F	912-000007-014	X-8-05-S-F	912-000007-032
X-7-12-S-F	912-000007-007	X-6-24-S-F	912-000007-017	X-7-05-L-F	912-000007-033
X-7-24-S-F	912-000007-008	X-6-24-L-F	912-000007-018	X-7-05-S-F	912-000007-034

Accessories	
195-000159-001: Rubber (FKM) Gasket (1)	(1) Not supplied with the valve. Used as a seal between the valve ports and manifold.
290-006061-001: 12" (30.5 cm) Wire Leads (2)	(2) Not supplied with the valve. Used to electrically interface with the valve.
190-006020-001: Retention Pin, PCB (3)	(3) Not supplied with the valve. Used to secure the valve for printed circuit board solder mounting.
191-000100-208: Screw, 0-80 x 1/2", Binding Head, Phillips (4)	(4) Not supplied with the valve. Four (4) screws are required for single station manifold valve mounting. See Recommended X-Valve Mounting for multiple station mounting screw requirements.

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/xvalve) to configure your X-Valve Miniature Pneumatic Solenoid Valve. For more detailed information, visit us on the Web, or call and refer to Specification #790-002166-001 (3-Way, 6 and 30 psig), #790-002241-001 (3-Way, 100 psig),

#790-002383-001 (2-Way, 6 psig), #790-002384-001 (2-Way, 30 psig), #790-002385-001 (2-Way, 100 psig)

and drawing #890-003090-003 (Standard Pins) and #890-003090-004 (Long Pins).

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

Series LX-Valve **Miniature Latching Pneumatic Solenoid Valve**

8 mm Latching Solenoid Valve

The Series LX-Valve is a miniature latching pneumatic solenoid valve measuring only 8 mm in width. The compact size, light weight, and power saving latching feature of the Series LX-Valve is the ideal solution for portable/battery powered applications. The body construction of the Series LX-Valve is suited for manifold or barbed-tube pneumatic connections and is available in a 2 way configuration.

Typical Markets

- Portable Medical Equipment
- Environmental Monitoring

Typical Applications

- Air & Oxygen Delivery

Features

- Internal latching mechanism enables continuous, power free, operation with minimal/momentary actuation power to change states
- High flow output capability, (11 slpm Minimum @ 15 psid)
- Direct PC mounting and 11.2 mm valve mounting centers enables compact and lightweight system design
- RoHS and Reach compliant

Product Specifications

Mechanical

Valve Type:
- 2-Way, 2-Position, Directional Flow , Latching

Media: Non-Reactive gases

Operating Environment:
32 to 122°F (0 to 50°C)

Storage Temperature:
-40 to 158°F (-40 to 70°C)

Dimensions:
- Length: 0.92 in (23.4 mm)
- Width: 0.31 in (7.9 mm)
- Height: 0.48 in (12.2 mm) to Barb End / 0.35 in (8.9 mm) to Manifold Face

Spacing: 0.440 in (11.2 mm) center
(Minimum required to ensure proper latching operation)

Porting:
- Barbs for 1/16 in (1.5 mm) I. D. Tubing, (1/32 in Wall Max.)
- Manifold Mount (Gasket accessory required, see ordering info)

Weight: 0.16 oz (4.6 g)

Internal Volume:
0.0036 in^3 (0.060 cm^3)

Electrical

Power Options (Momentary):
0.52 Watt (6 psid model)
0.82 Watt (15 psid model)

Voltage Options:
3, 5, 12 or 24 VDC*
*minimum 20 millisecond pulse

Electrical Connections:
PC Pins, 4 mm centers (all models)
Lead Wire/Connector Assembly
(Accessory, see ordering info)

Wetted Materials

Bobbin/Body:
PBT (Polybutylene terephthalate)

Pole & Plunger:
430 FR Series Stainless Steel

Seal:
FKM

Other:
302 Series Stainless Steel

Performance Characteristics

Leak Rate: Tested with Air
< 0.20 sccm Internal
< 0.016 sccm External

Response:
< 20 ms

Pressure/Vacuum:
0 to 6 psid (0.4 bar differential)
0 to 15 psid (1.03 bar differential)

Proof Pressure:
200 psig (13.79 bar)

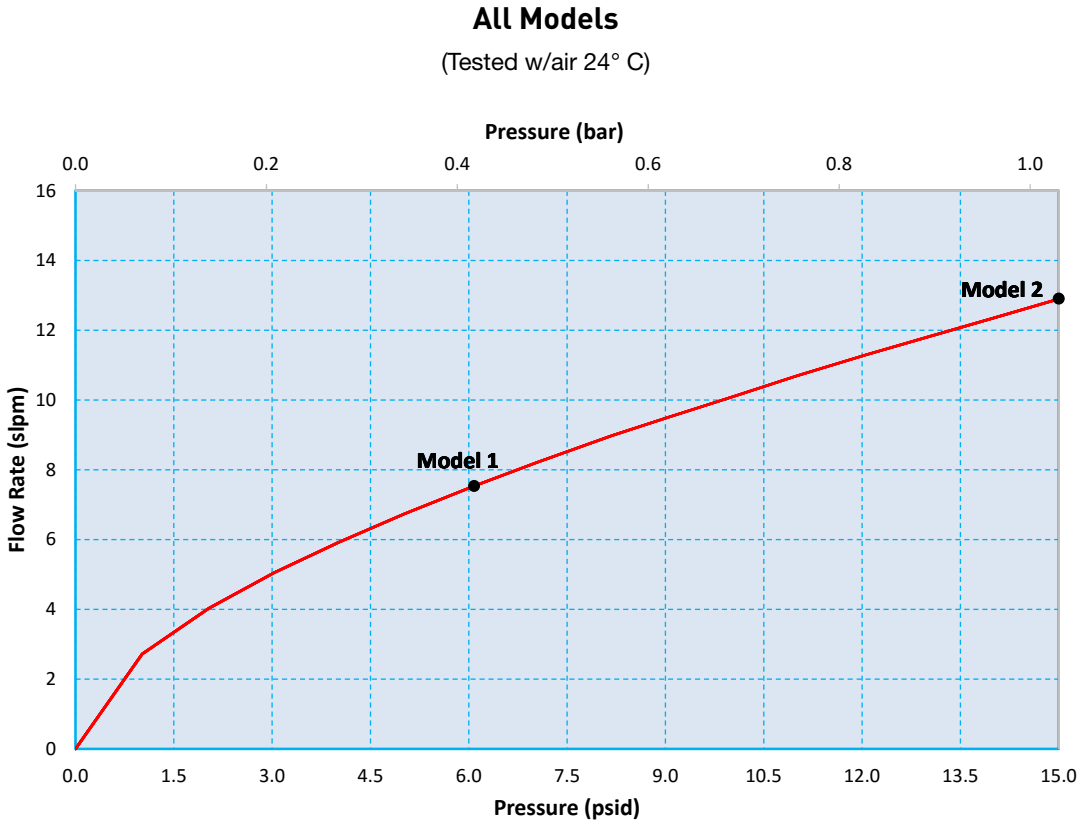
Minimum Flow:
6.0 slpm @ 6 psid
(0.4 bar differential)
11.0 slpm @ 15 psid
(1.03 bar differential)

Orifice Size/Nominal Cv:
0.045" (1.14 mm) / 0.028

Reliability:
Life Cycle rating of 10 million
Reliability .95 at 95% CI

Series LX-Valve Miniature Latching Pneumatic Solenoid Valve

Typical Flow Curve



Series LX-Valve Miniature Latching Pneumatic Solenoid Valve

Pressure and Flow Capabilities

Model No.	Orifice Size	Nominal Cv	Maximum Operating Pressure Differential	Momentary Power (50 milliseconds)
1	0.045 in (1.14 mm)	0.028	6 psid (0.4 bar differential)	0.52 Watt
2	0.045 in (1.14 mm)	0.028	15 psid (1.03 bar differential)	0.82 Watt

* Proof pressure is 200 psig (13.79 bar)

Safety: Proof Pressure: 200 PSIG (13.79 bar). Tests conducted at this pressure demonstrate that no loss of function or permanent damage occurs when returned within the specified operating pressure range.

Caution: Shock Resistance: This valve may change states when subjected to high shock conditions. (Contact application for more details). Validation testing should be conducted to ensure proper operation in the application.

Electrical Interface

Short Pin

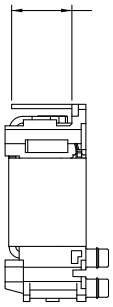
(For Pin/Wire Lead or PCB Terminal Housing Connection)

[Reference Accessories section]

Long Pin

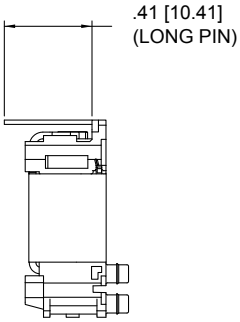
(For Pin/PCB solder mount connection)

Latching X-Valve Coil Connection

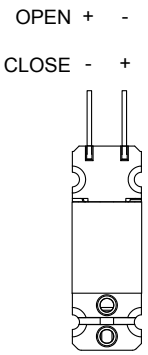


Electrical Connection Options:

Electrical terminals compatible with Molex 51065 series connector or equivalent.



Latching X-Valve Polarity View



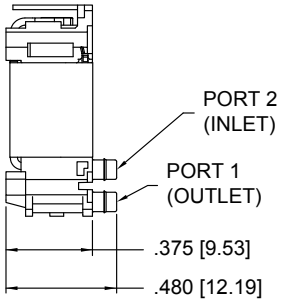
UNITS
IN [MM]

Series LX-Valve Miniature Latching Pneumatic Solenoid Valve

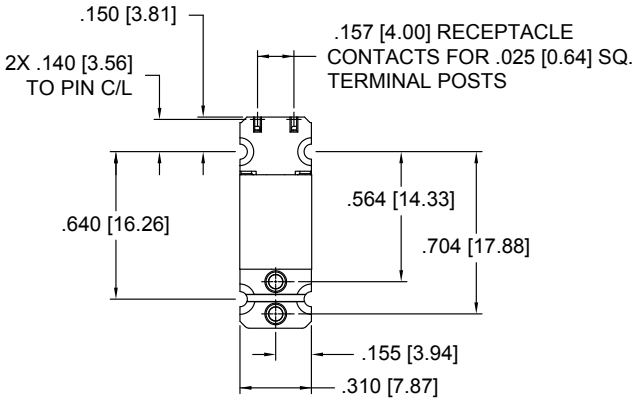
Pneumatic Interface/Mechanical Integration

Dimensions

SIDE VIEW



BOTTOM VIEW

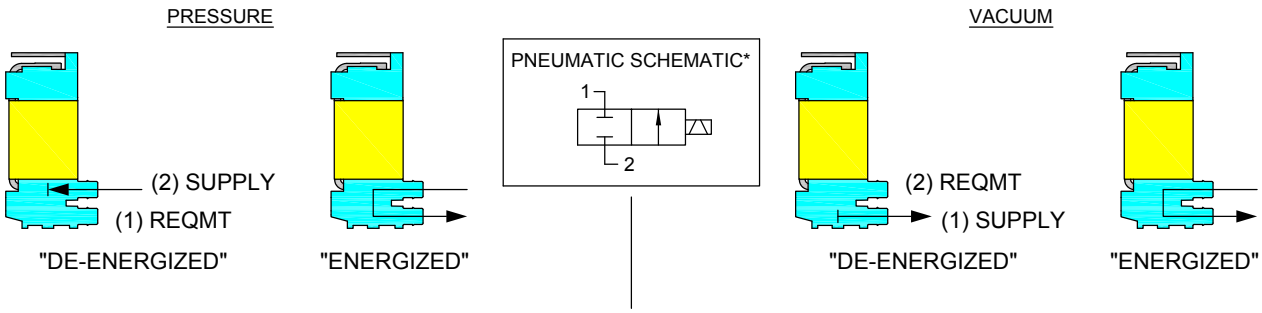


UNITS
IN [MM]

ANSI Symbols

Pneumatic Schematics by Valve Types

2-WAY NORMALLY CLOSED, DIRECTIONAL



* THE COIL SYMBOL, ⏢, REPRESENTS A SINGLE VALVE COIL WITH (2) POLARITY OPTIONS. REFERENCE THE "LATCHING X-VALVE POLARITY VIEW" SECTION, OF THIS DOCUMENT, FOR INFORMATION ON POLARITY ORIENTATION RELATIVE TO VALVE STATE.

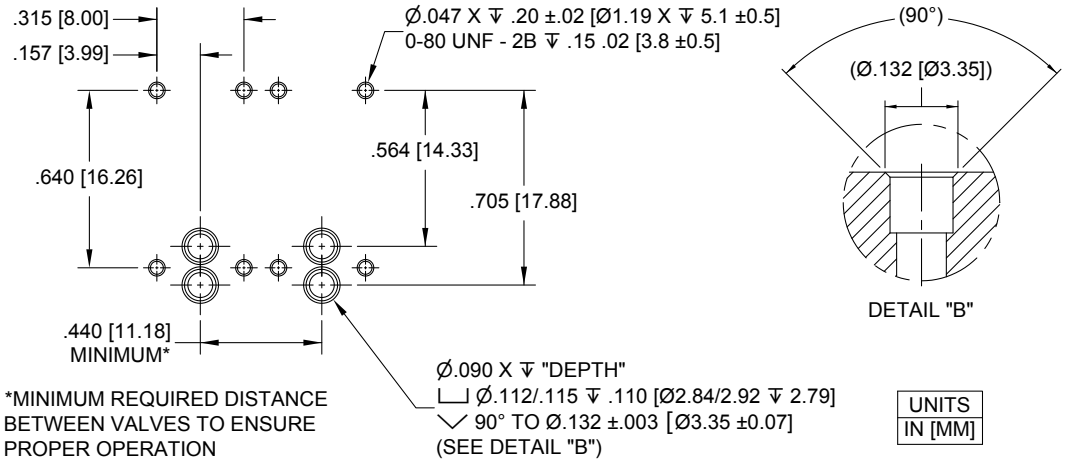
LEGEND:	
SUPPLY:	Pneumatic Source or Supply Pressure
REQMT:	Customer Requirement or Application

Series LX-Valve Miniature Latching Pneumatic Solenoid Valve

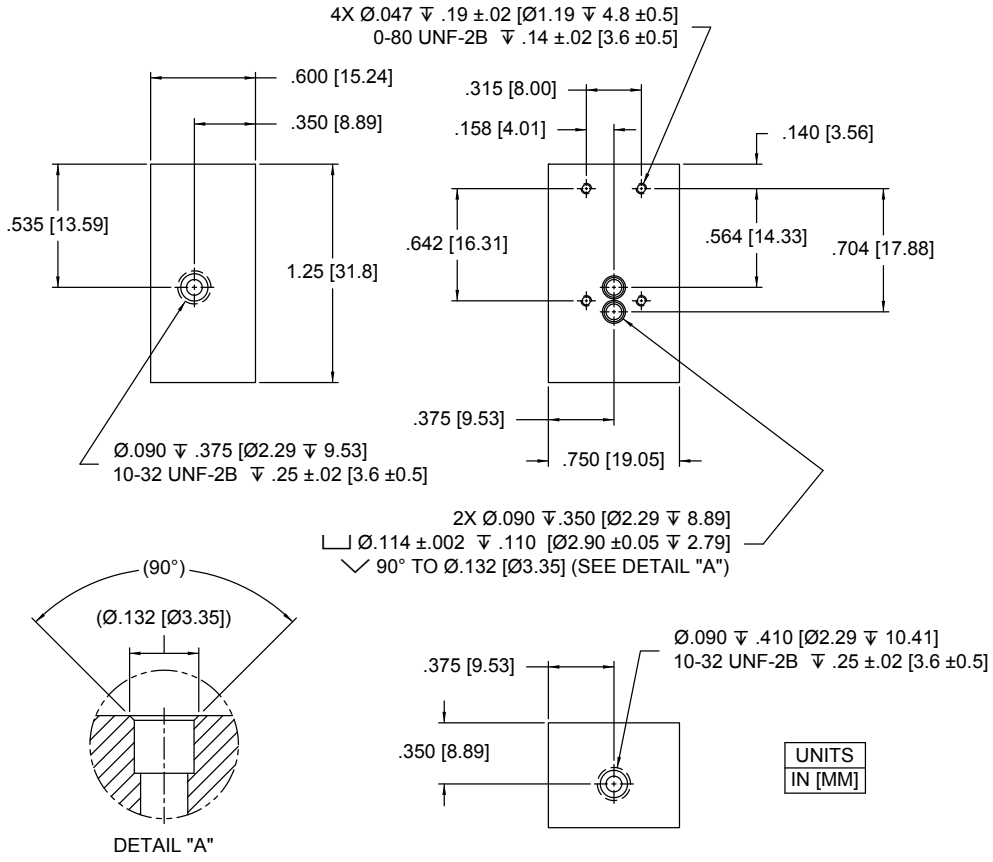
Installation and Use

LX-Valve Manifold Mount Diagram

Parker Precision Fluidics recommends 3-5 in-oz of torque for the screws



Recommended LX-Valve Manifold Dimensions

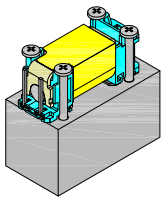


Series LX-Valve Miniature Latching Pneumatic Solenoid Valve

Installation and Use

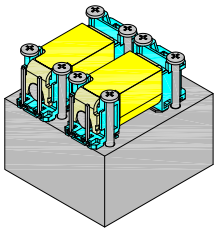
Recommended LX-Valve Mounting

(4) MOUNTING SCREWS REQUIRED FOR VALVE INSTALLATION



Single Station Manifold Mounting

.440 [11.18] MINIMUM VALVE SPACING REQUIREMENT.



Multiple Station Manifold Mounting

Accessories

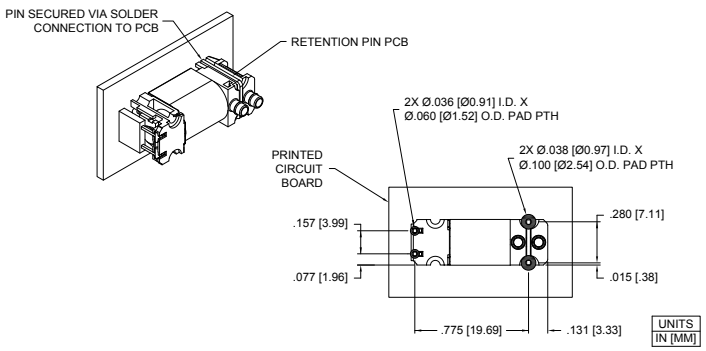
Mounting Options

Gasket, Manifold Mount (FKM)
195-000277-001
(required for manifold mounting)

12" Wire Leads
290-006061-001
(for use with Short Pin valve configuration)

Screw 0-80 x 1/2" Binding Head, Phillips
191-000100-208

Retention Pin PCB
190-006020-001



Series LX-Valve Miniature Latching Pneumatic Solenoid Valve

Ordering Information

Sample Product ID	LX	1	05	L	F
Description	**Series**	**Model Number: Pressure / Orifice / Type**	**Voltage[1]**	**Electrical Coil Connection**	**Elastomer**
Options	LX	1: 6 psid / 0.045"/ 2-Way Directional 2: 15 psid / 0.045" / 2-Way Directional	03: 3 VDC 05: 5 VDC 12: 12 VDC 24: 24 VDC [1] Warning: The valve may change states when subjected to high shock conditions. Validation testing shouldbe conducted to ensure proper operation in the application Contact applications for more details.	S: Short Pins [2] L: Long Pins [3] [2] For Pin/Wire Lead or PCB Terminal Housing Connection [3] For Pin/PCB solder mount connection	F: FKM

Product ID Reference	Order Part Number	Product ID Reference	Order Part Number	Product ID Reference	Order Part Number
LX-1-03-L-F	915-000001-001	LX-1-12-S-F	915-000001-007	LX-2-03-S-F	915-000001-013
LX-1-05-L-F	915-000001-002	LX-1-24-S-F	915-000001-008	LX-2-05-S-F	915-000001-014
LX-1-12-L-F	915-000001-003	LX-2-03-L-F	915-000001-009	LX-2-12-S-F	915-000001-015
LX-1-24-L-F	915-000001-004	LX-2-05-L-F	915-000001-010	LX-2-24-S-F	915-000001-016
LX-1-03-S-F	915-000001-005	LX-2-12-L-F	915-000001-011		
LX-1-05-S-F	915-000001-006	LX-2-24-L-F	915-000001-012		

Accessories	
195-000277-001: Gasket, Manifold Mount (FKM)[1]	[1] Not supplied with the valve. Used as a seal between the valve ports and manifold.
290-006061-001: 12" (30.5 cm) Wire Leads [2]	[2] Not supplied with the valve. Used to electrically interface with the valve.
190-006020-001: Retention Pin, PCB [3]	[3] Not supplied with the valve. Used to secure the valve for printed circuit board solder mounting.
191-000100-208: Screw, 0-80 x 1/2", Binding Head, Phillips [4]	[4] Not supplied with the valve. Four (4) screws are required for single station manifold valve mounting. See Recommended LX-Valve Mounting for multiple station mounting screw requirements.

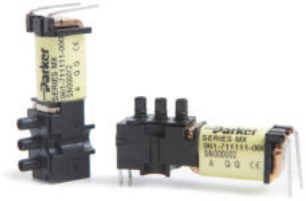
NOTE: In order to provide the best possible solution for your application, please provide the following requirements when contacting Applications Engineering:

- 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/lxvalve) to configure your LX-Valve Miniature Latching Pneumatic Solenoid Valve. For more detailed information, visit us on the Web, or call and refer to Performance Specification #790-002454-001, Outline Drawing #890-003377-001 (Short Pin), Outline Drawing #890-003377-002 (Long Pin).

Series MX Miniature Pneumatic Solenoid Valve

10 mm Solenoid-Actuated Poppet Valve



Typical Markets

- Respiratory
- Patient Therapy

Typical Applications

- Oxygen Concentrators
  - Sieve bed switching/equalization
  - Oxygen delivery
- Deep Vein Thrombosis
  - Cuff Inflation/Deflation Control
- Negative Pressure Wound Therapy
  - High Volume Vacuum/Pressure Control

The Series MX is a miniature solenoid valve that delivers high flow at low pressure in a compact, 10 mm wide size. Using hit and hold control, the Series MX miniature solenoid consumes very little power helping medical device manufacturers increase battery life and reduce system weight without sacrificing performance. The universal design supports manifold or barbed-tube mounting and is available in 2-way and 3-way configurations. The Series MX solenoid valve is an ideal solution for portable medical devices with limited space and power.

Features

- Small, 10 mm size enables compact integration and reduces device size
- Highest flow to power consumption ratio increases device battery life
- Lightweight 0.3 oz (8.5 g) design helps reduce portable device weight
- Universal barbed-tube or manifold mount eases valve integration
- CE and RoHS compliant

Product Specifications

Mechanical

Valve Type:
Solenoid-Actuated Poppet Style
- 2 and 3-Way Normally Closed (NC)
- 2 and 3-Way Normally Open (NO)
- 3-Way Distributor

Media: Non-Reactive gases

Operating Environment:
41 to 122°F (5 to 50°C)

Storage Temperature:
-40 to 158°F (-40 to 70°C)

Dimensions:
- Length: 1.50 in (38.1 mm)
- Width: 0.40 in (10.1 mm)
- Height: 0.62 in (15.7 mm) to Barb End / 0.44 in (11.1 mm) to Manifold Face

Valve to Valve Spacing:
0.400 in (10 mm) center

Porting:
- Barbs for 3/32 in (2 mm) I. D. Tubing
- Manifold Mount

Weight: 0.3 oz (8.5 g)

Internal Volume:
0.01247 in^3 (0.2043 cm^3)

Filtration:
40 micron recommended

Electrical

Power Options (Hit/Hold):
6 psid model (1.0/0.25 Watt)
15 psid model (2.0/0.5 Watts)
30 psid model (3.0/0.75 Watts)

Voltage Options:
5, 12 or 24 VDC
Series MX Model 7 is not rated for continuous duty and must employ hit and hold control.

Electrical Connections:
2-Pin PCB (for PCB solder connection)
2-Pin Up (for connector interface)
0.30 in (7.6 mm) pin centers
(Lead Wire/Connector Assembly available, see ordering information)

Wetted Materials

Body/Plunger:
PPE/PA
(Polyphenylene Ether/Polyamide)

Armature:
430 FR Series Stainless Steel

Seal (Options):
Silicone (6 PSI Only), FKM

Other:
302/304 Series Stainless Steel
EPDM (Manifold Gasket)

Performance Characteristics

Leak Rate: Tested with Air
<0.2 sccm

Response:
< 20 ms maximum cycling

Pressure/Vacuum:
0 to 6 psid (0.4 bar differential)
0 to 15 psid (1.0 bar differential
0 to 30 psid (2.0 bar differential)

Proof Pressure:
100 psig (6.9 bar)

Typical Flow:
17.5 slpm @ 6 psid
(0.4 bar differential)
30 slpm @ 15 psid
(1.0 bar differential)
48 slpm @ 30 psid
(2.0 bar differential)

Orifice Sizes/Equivalent Cv:
0.075 in (1.91 mm) / 0.072

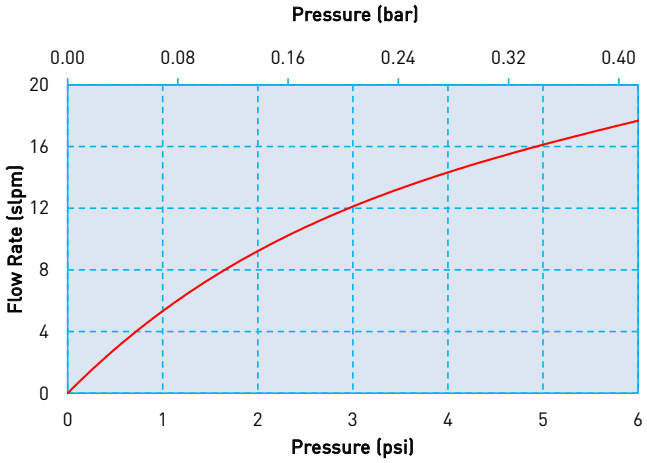
Reliability:
Life Cycle rating of 25 million
(worst case tested)

Series MX Miniature Pneumatic Solenoid Valve

Typical Flow Curve

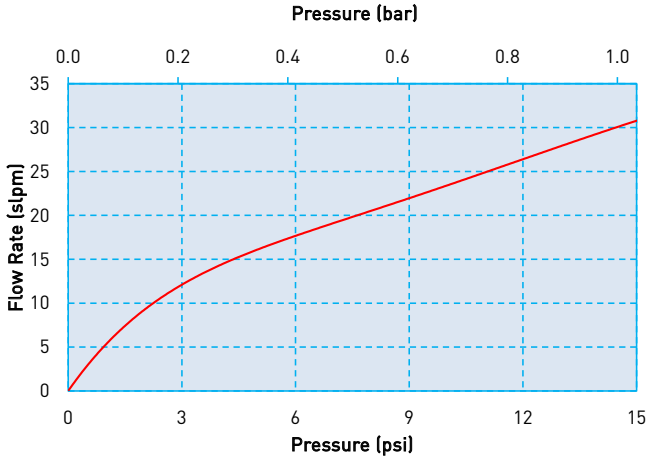
6 PSID Model

(Tested w/air 20° C)



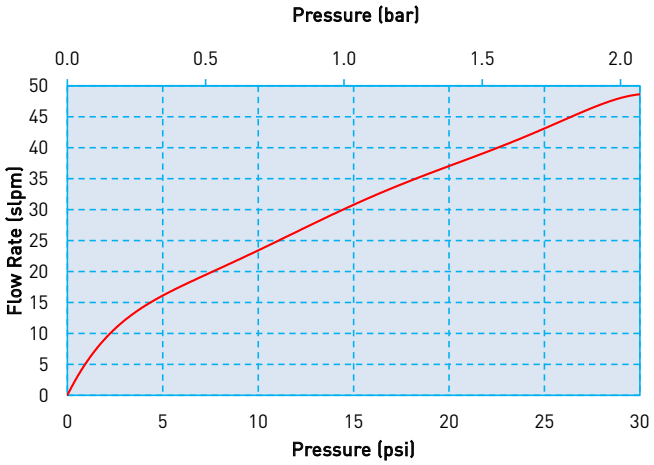
15 PSID Model

(Tested w/air 20° C)



30 PSID Model

(Tested w/air 20° C)



Series MX Miniature Pneumatic Solenoid Valve

Pressure and Flow Capabilities

Model No.	Orifice Size	Maximum Operating Pressure Differential	Typical Flow at Rated Pressure	Nominal Cv
7	0.075 in (1.9 mm)	6 psid (0.4 bar)	17.5 slpm	0.062
		15 psid (1.0 bar)	30 slpm	0.068
		30 psid (2.0 bar)	48 slpm	0.072

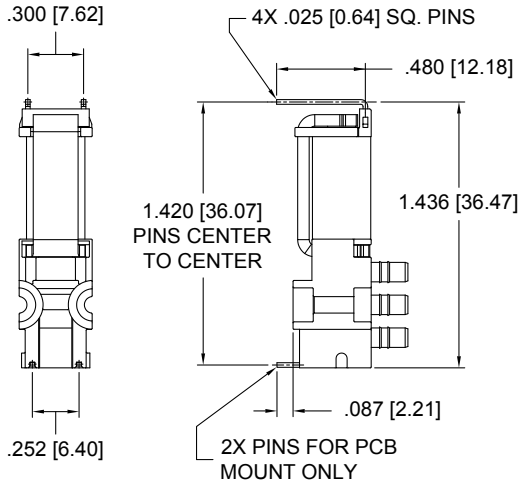
Electrical Interface

2 Pin-PCB
(For Pin/PCB solder mount connection)

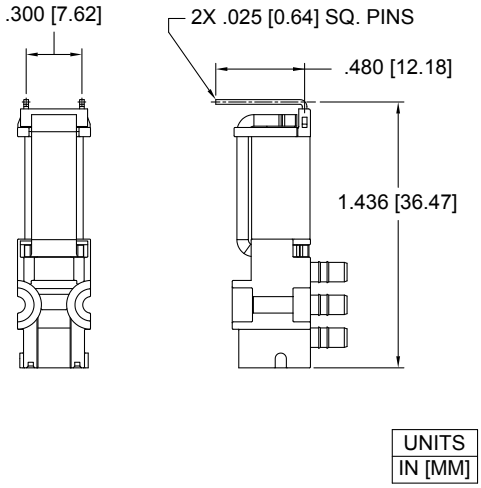
2 Pin-Up
(For Pin/Wire Lead or PCB Terminal Housing Connection)
[Reference Accessories section]

Coil Connections

2 PIN-PCB



2 PIN-UP



Electrical Connection Options:
Electrical terminals compatible with Molex 0511910400 (4 Position) Connector and Molex 0508029101 Crimp Terminal or equivalent.

Series MX Miniature Pneumatic Solenoid Valve

Electrical Requirements

6 PSI Version

Actuation Voltage Minimum of 50 msec* (VDC ±5%)	Minimum Hold Voltage (VDC)	Hold Power, Typical @ 20°C (Watts)	Resistance @ 20°C (Ohms ±5%)
5	2.5	0.25	24.5
12	6	0.25	145
24	12	0.25	567

* Valve is not rated for continuous duty at rated in-rush voltage. Recommended minimum actuation time is 50 milliseconds. Actuation voltage time must not exceed 20 seconds.

15 PSI Version

Actuation Voltage Minimum of 50 msec* (VDC ±5%)	Minimum Hold Voltage (VDC)	Hold Power, Typical @ 20°C (Watts)	Resistance @ 20°C (Ohms ±5%)
5	2.5	0.50	12.5
12	6	0.50	71
24	12	0.50	285

* Valve is not rated for continuous duty at rated in-rush voltage. Recommended minimum actuation time is 50 milliseconds. Actuation voltage time must not exceed 20 seconds.

30 PSI Version

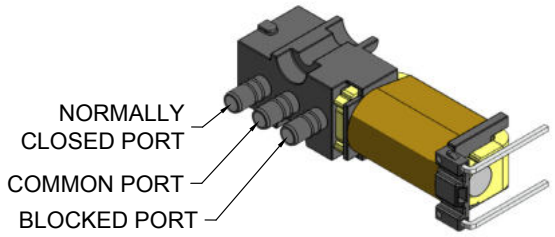
Actuation Voltage Minimum of 50 msec* (VDC ±5%)	Minimum Hold Voltage (VDC)	Hold Power, Typical @ 20°C (Watts)	Resistance @ 20°C (Ohms ±5%)
5	2.5	0.75	8
12	6	0.75	50
24	12	0.75	180

* Valve is not rated for continuous duty at rated in-rush voltage. Recommended minimum actuation time is 50 milliseconds. Actuation voltage time must not exceed 20 seconds.

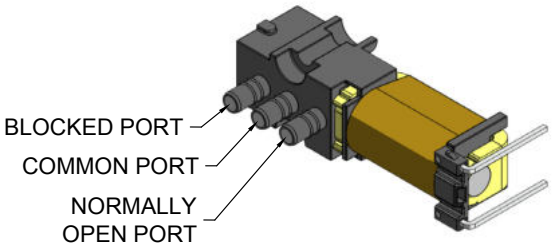
Series MX Miniature Pneumatic Solenoid Valve

Pneumatic Integration

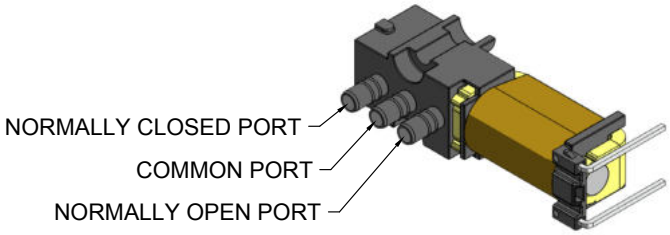
2-WAY NORMALLY CLOSED



2-WAY NORMALLY OPEN

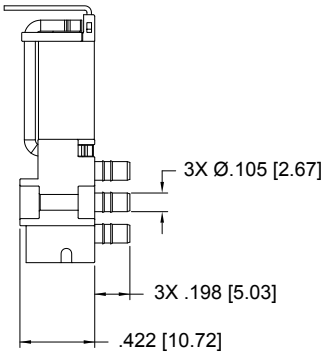


3-WAY NC, NO AND DISTRIBUTOR

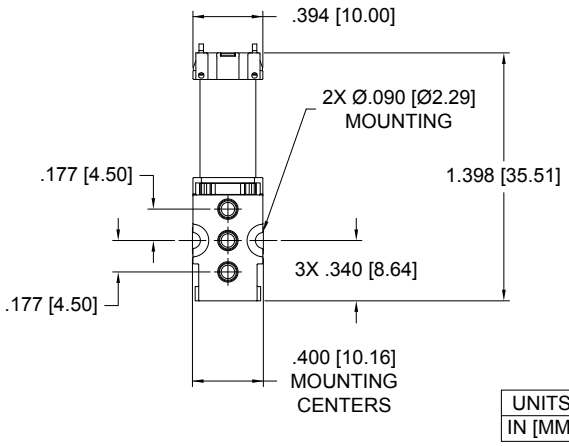


Mechanical Integration

SIDE VIEW



BOTTOM VIEW



Mounting Requirements

Mounting Screw Sizes (Pan Head Machine Screw)*	Mounting Screw Torque
2-56 x 1/2"	10 to 12 in-oz
M2 x 14 mm	0.07 to 0.08 N-m

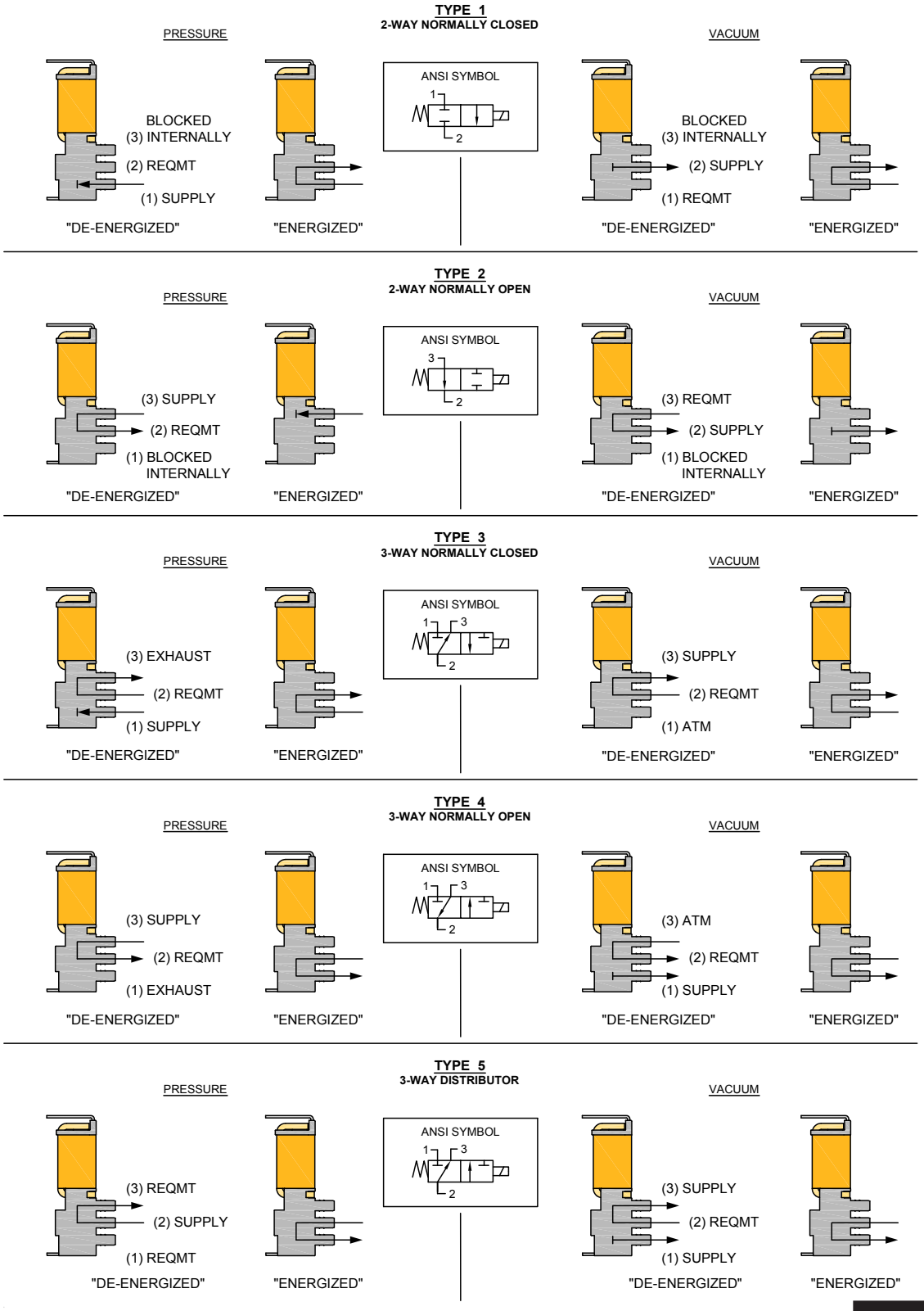
*Mounting screws are not provided with the valve. See Accessories

Series MX Miniature Pneumatic Solenoid Valve

LEGEND:	
SUPPLY:	Pneumatic Source or Supply Pressure
EXHAUST:	Exhaust to Atmospheric Pressure
REQMT:	Customer Requirement or Application
ATM:	Atmospheric Pressure

ANSI Symbols

Pneumatic Schematics by Valve Types



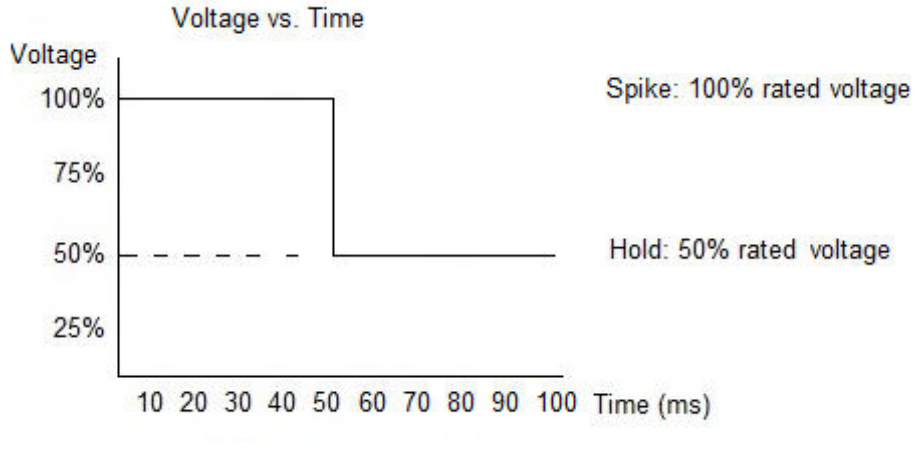
Installation and Use

Hit and Hold Specifications

The Series MX valve is designed for use with "Hit and Hold" control.

Hit and Hold is a common control method used to reduce component power consumption without sacrificing performance. The "Hit" or "Spike" state refers to the rated voltage required to actuate the valve. The "Hold" state is a substantial reduction in the rated voltage (normally 50% of the rated voltage) that maintains the valve in an actuated state.

Hit and Hold control can be incorporated using several different approaches, including discrete component circuits or programmable logic. The graph below illustrates the typical "Hit" and "Hold" control method.



This method greatly reduces power consumption because the valve only draws full current for a short period of time (in this case, a minimum of 50 msec), making it ideal for applications with sensitive power budgets.

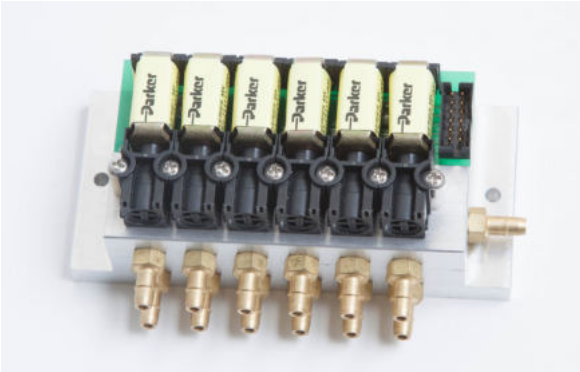
Rated voltage must be applied to the Series MX valve for a minimum of 50 msec to ensure full valve actuation in all operating conditions.

Important Note:
The Series MX valve is not designed for continuous use at rated voltage. Therefore, rated voltage should not be applied for greater than 20 seconds. Exceeding rated voltage for longer than 20 seconds may adversely affect valve performance. **Contact factory for more details.**

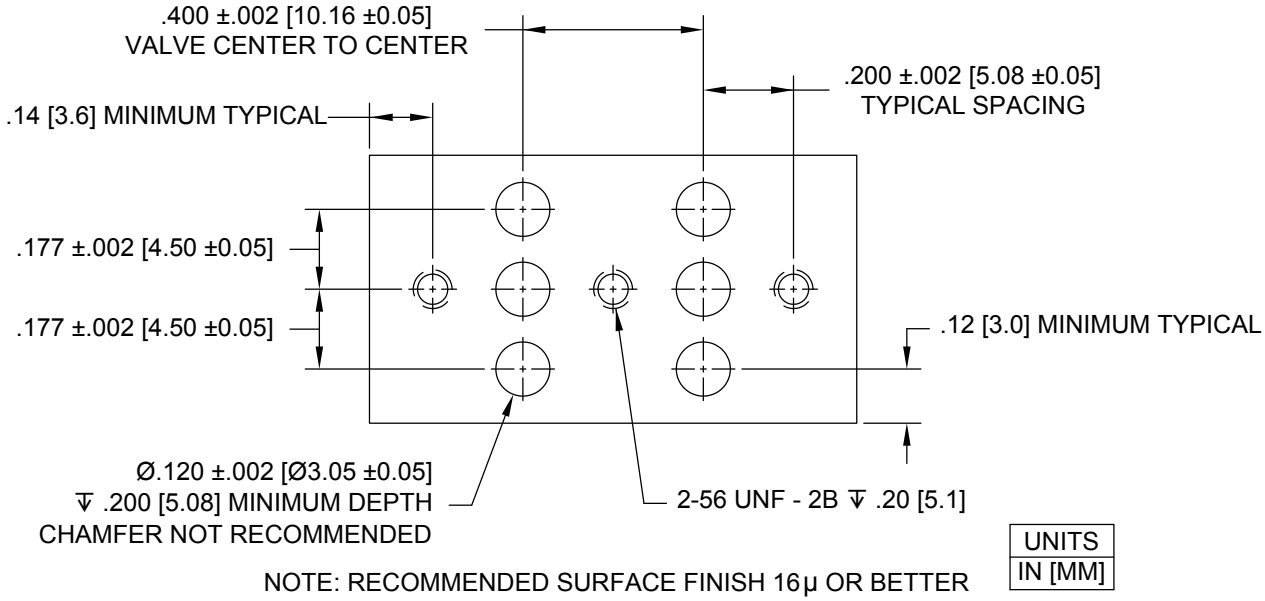
Series MX Miniature Pneumatic Solenoid Valve

Installation and Use

Recommended Series MX Mounting



Series MX Manifold Mount Diagram

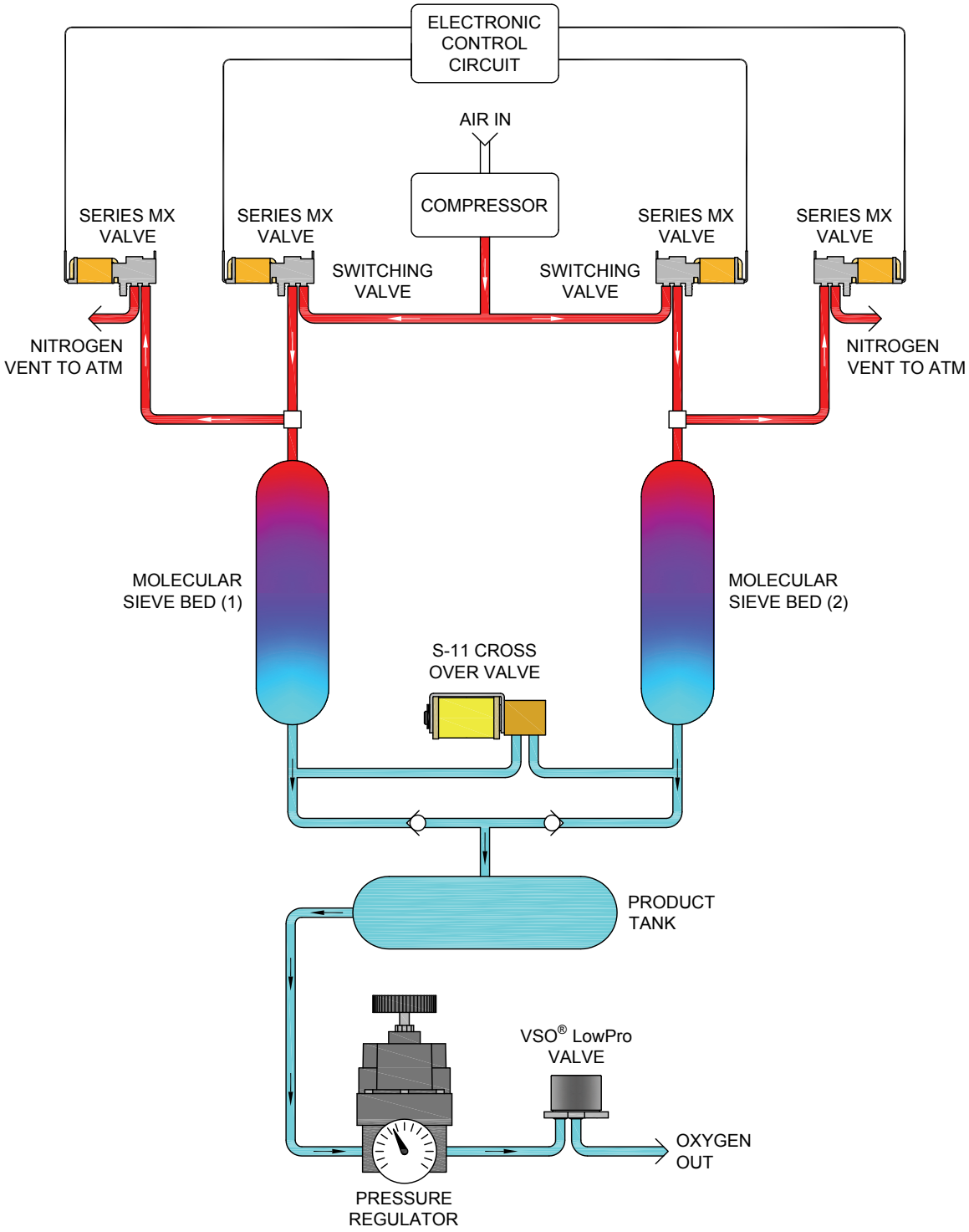


NOTE: RECOMMENDED SURFACE FINISH 16µ OR BETTER

Series MX Miniature Pneumatic Solenoid Valve

Typical Flow Diagram

Oxygen Concentrator Application



Series MX Miniature Pneumatic Solenoid Valve

Accessories

Manifold Rubber Gasket (EPDM)
00444-05-E099
(required for manifold mounting and supplied with each valve)

12" (30 cm) Wire Leads
290-006061-002
(for use with 2-Pin Up valve configuration)
Note: Not Included with valve

Ordering Information

Sample Product ID	961	7	1	1	1	1	1	000
Description	**Series**	**Model Number: Orifice Size**	**Voltage**	**Electrical Interface**	**Type**	**Pressure/ Power (Hold)**	**Elastomer**	
Options	961	7: 0.075 " (1.9 mm) Orifice	1: 5 VDC 2: 12 VDC 3: 24 VDC	1: 2 Pin-Up 2: 2 Pin-PCB	1: 2-Way NC 2: 2-Way NO 3: 3-Way NC 4: 3-Way NO 5: 3-Way Dist	1: 6 psig / 0.25 Watt 2: 15 psig / 0.5 Watt 3: 30 psig / 0.75 Watt	1: FKM 2: Silicone (6 PSI Only)	

Accessories		
Part Number	**Description**	**Comments**
0044-05-E099	Manifold Rubber Gasket, EPDM	Manifold gasket is supplied with each valve. Used as a seal between the valve and manifold.
290-006061-002	Cable, 4 Position, 18" Lead	Not supplied with the valve. Used to electrically interface with the 2 Pin-Up configurated valve.
191-000112-008	Screw 2-56 x 1/2" Pan Head	Not supplied with the valve. Two (2) required for each valve.

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/mxvalve) to configure your Series MX-Model 7 Pneumatic Solenoid Valve. For more detailed information, visit us on the Web, or call and refer to the following documents:

Document:	Document Number
• Series MX-Model 7 Performance Specification	790-002435-001
• 3-Way, 2 Pin-Up Line Drawing	890-003360-001
• 2-Way NO, 2 Pin-Up Line Drawing	890-003360-002
• 2-Way NC, 2 Pin-Up Line Drawing	890-003360-003
• 3-Way, 2 Pin-PCB Line Drawing	890-003361-001
• 2-Way NO, 2 Pin-PCB Line Drawing	890-003361-002
• 2-Way NC, 2 Pin-PCB Line Drawing	890-003361-003

C7 Valve **Miniature Cartridge Solenoid Valve**

7 mm Miniature Cartridge Valve

The Series C7 is a miniature cartridge style solenoid valve with a compact 7 mm diameter. This unique design combines small size, light weight and low power consumption with high flow repeatability and fast response time over an exceptionally long life, up to 130 million cycles. Available in 2-way and 3-way configurations, the valve is manifold mounted utilizing a simple securing system reducing assembly time.

Typical Markets

- Respiratory and Anesthesia
- Patient Therapy
- Patient Monitoring
- Analytical Chemistry
- Clinical Diagnostics

Typical Applications

- Portable/Transport Ventilators Gas Control
- Negative Pressure Wound Therapy
- Air Over Liquid Dispense
- Sidestream CO_2 measurement
- Portable/Hand held environmental monitoring

Features

- Variety of orifice sizes with pressures up to 145 PSI (10 bar).
- Floating frictionless plunger enables reliable and repeatable operation up to 130 Million cycles.
- Low power design reduces heat and energy consumption.
- Cartridge configuration enables compact integration saving space and weight.
- Simple mechanical fastening prevents valve being dislodged due to vibration or pressure spikes.
- RoHS & REACH compliant

Product Specifications

Mechanical

Valve Type:
Solenoid Cartridge Valve
2-Way Normally Closed (NC)
3-Way Normally Closed (NC)

Media: Gases and Liquids*
(see details in liquid datasheet)

Operating Environment:
32°F to 122°F (0°C to 50°C)

Storage Environment:
-40°F to 158°F (-40°C to 70°C)

Dimensions:
- Diameter: 0.28 in (7 mm)
- Length: 0.79 in (20 mm)

Porting:
- Cartridge Seal

Weight: 0.11 oz (3.1 g)

Internal Volume:
2-Way 81µL
3-Way 90µL

Orifice		0.012 in (0.3 mm)		0.020 in (0.5 mm)		0.031 in (0.8 mm)		0.039 in (1.0 mm)	
Type		2-Way	3-Way	2 Way	3 Way	2 Way	3 Way	2 Way	3 Way
Max Vacuum & Pressure	PSI	145	145	116	87	73	36.3	43.5	21.8
	Bar	10	10	8	6	5	2.5	3	1.5
	Cv	0.003	0.004	0.007	0.01	0.009	0.014	0.015	0.015
	SLPM (air)	7	7	14	11	12	10	13	7

Electrical

Voltage (VDC):
12 and 24 VDC ± 5%
(Other voltages available on request.)

Electrical Connections:
3.2 in (80 mm) Flying Leads

Power:
Typical 0.5W - 1.2W
(Please see Table 1 for more details)

Wetted Materials

Body:
Stainless Steel Series 300 and 400

Seals: (Internal and External)
FKM, EPDM

Performance Characteristics

Response:
10 ms maximum cycling

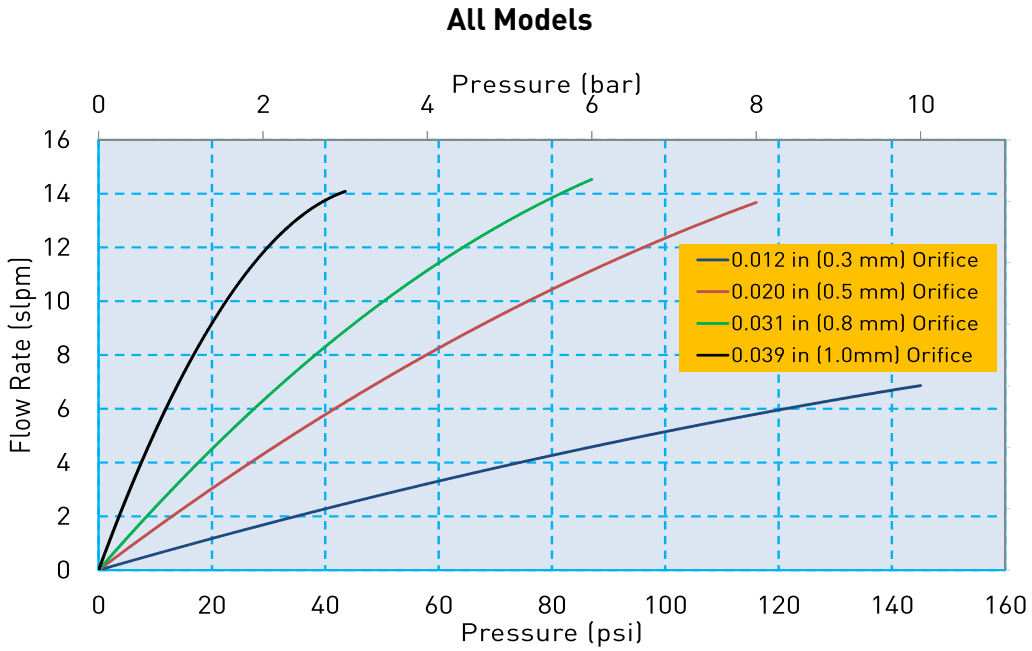
Recommended Filtration:
0.3 mm Orifice
5 Micron
0.5 mm, 0.8 mm, & 1.0 mm Orifice
10 Micron

Reliability:
2-Way 130 Million
3-Way 55 Million
0.90 Reliability Factor
95% Confidence

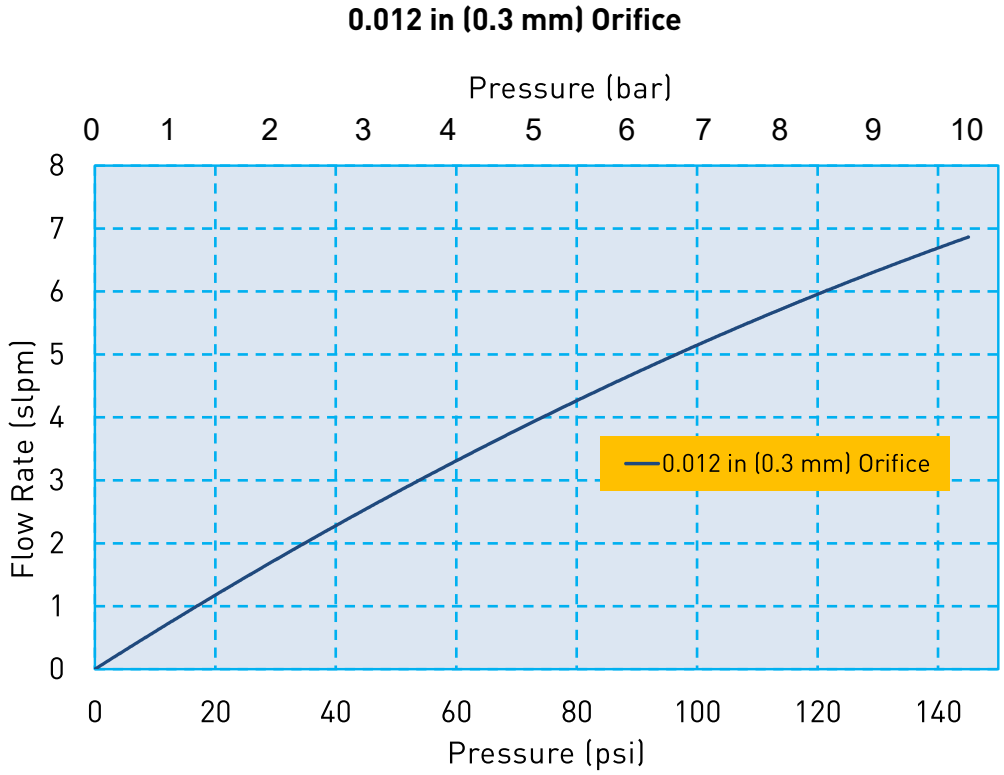
*Please contact factory for additional details on liquid compatibility.

C7 Miniature Cartridge Valve

Flow Curve



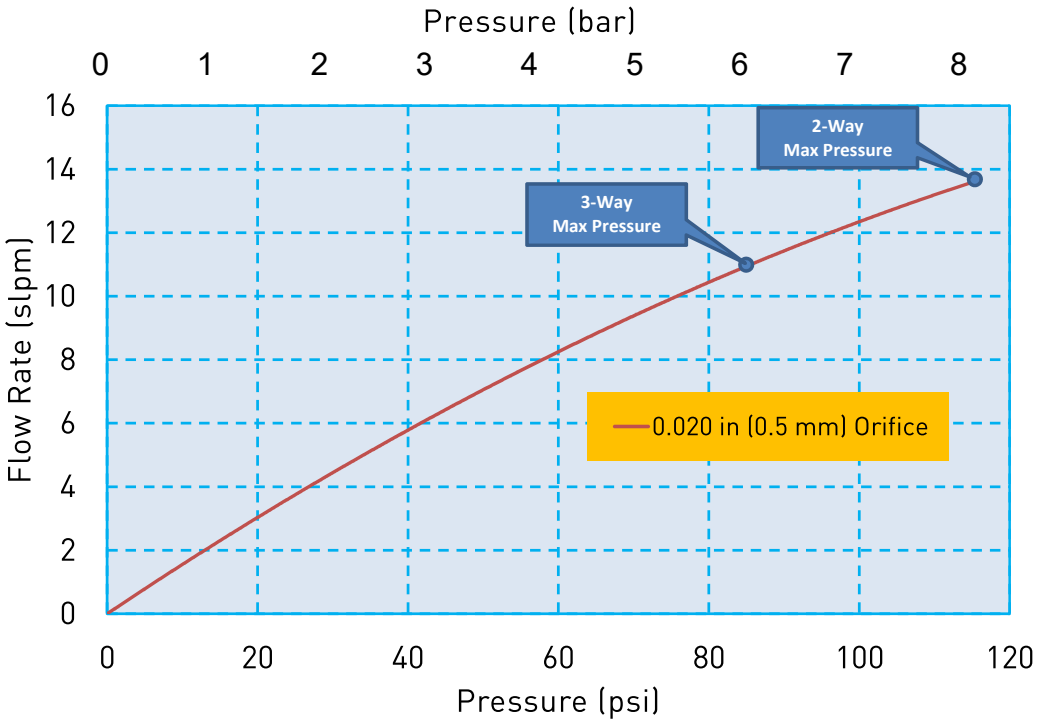
Flow Curve



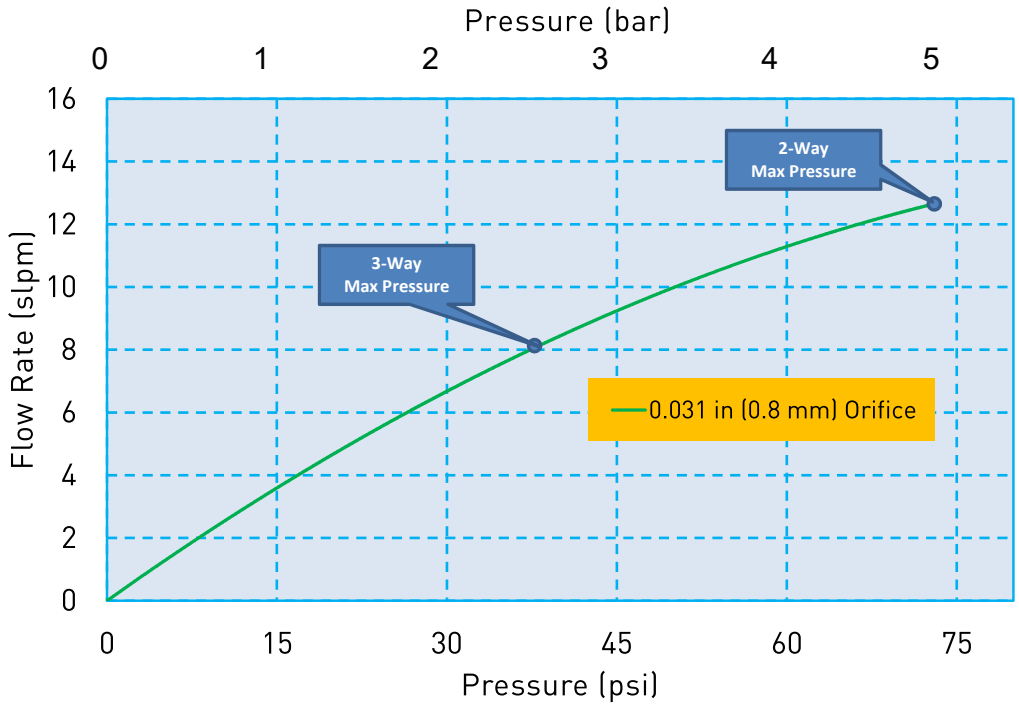
C7 Miniature Cartridge Valve

Flow Curve

0.020 in (0.5 mm) Orifice

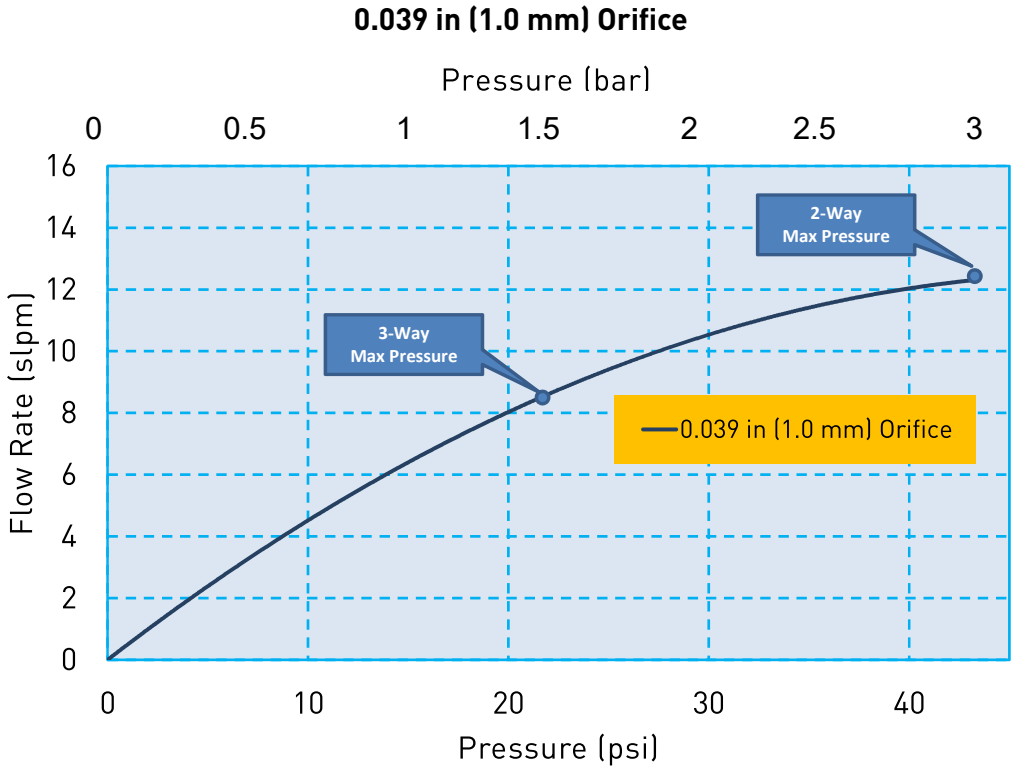


0.031 in (0.8 mm) Orifice



C7 Miniature Cartridge Valve

Flow Curve



Electrical Interface

Wire Leads

Standard: 3.2 in (80 mm) Wire Leads, stripped at end

C7 Miniature Cartridge Valve

Electrical Requirements

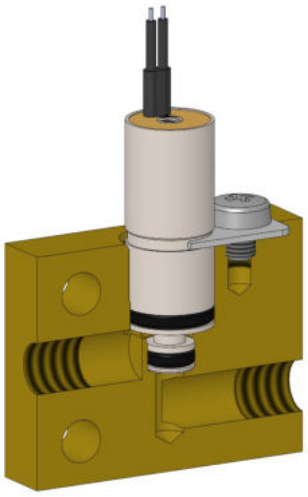
Table 1

Orifice	0.012 in (0.3 mm)				0.020 in (0.5 mm)				0.031 in (0.8 mm)				0.039 in (1.0 mm)			
Valve Type	2-Way		3-Way		2-Way		3-Way		2-Way		3-Way		2-Way		3-Way	
Voltage (VDC)*	12V	24V	12V	24V	12V	24V	12V	24V	12V	24V	12V	24V	12V	24V	12V	24V
Power (Watts)	0.5	0.6	1	1.2	1	0.85	1	1.2	1	1.2	1	1.2	1	1.2	1	1.2
Resistance (Ohm)**	288	995	140	495	140	700	140	495	140	495	140	495	140	495	140	495

* ± 5%, other voltages available on request

** ±5% @ 68°F, 20°C

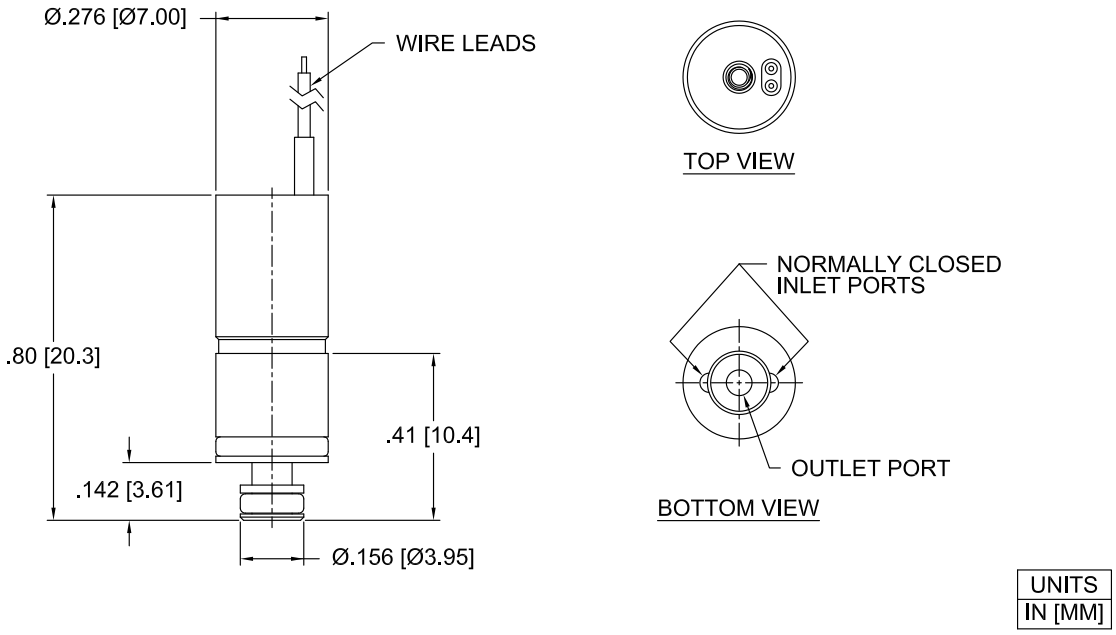
Pneumatic Interface/Mechanical Integration



C7 Miniature Cartridge Valve

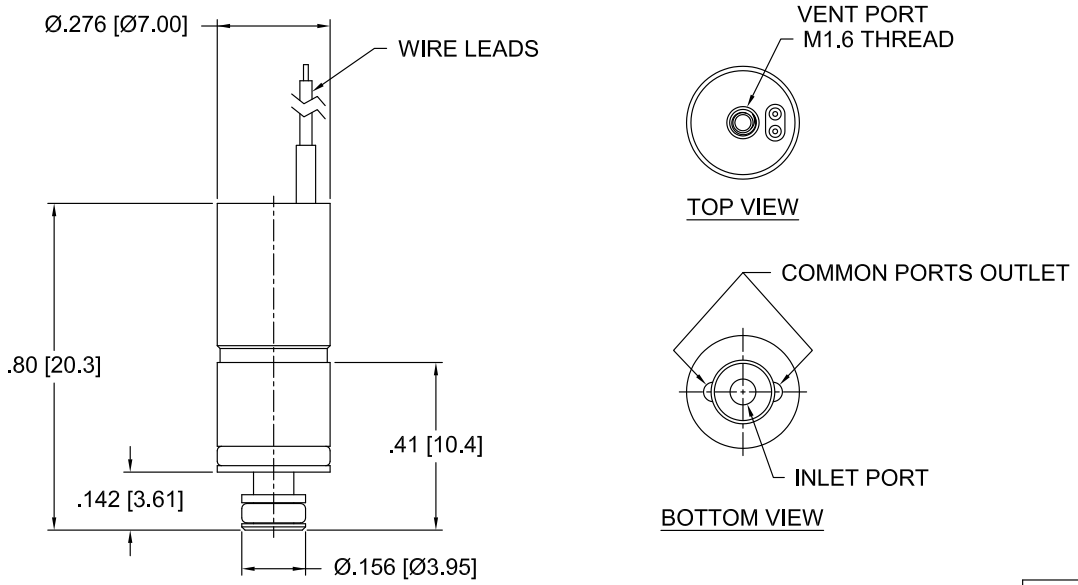
Dimensions

2-Way



UNITS
IN [MM]

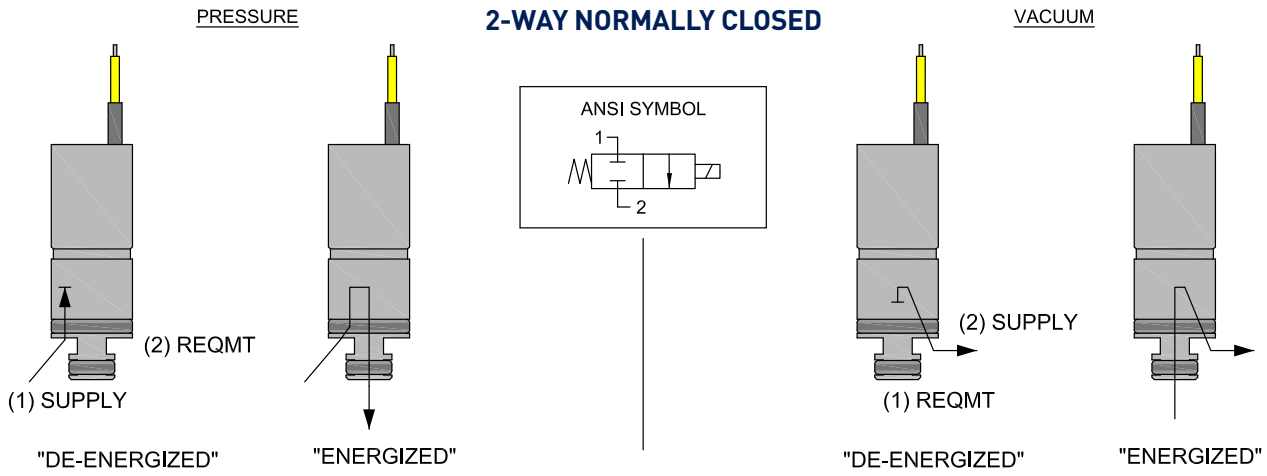
3-Way

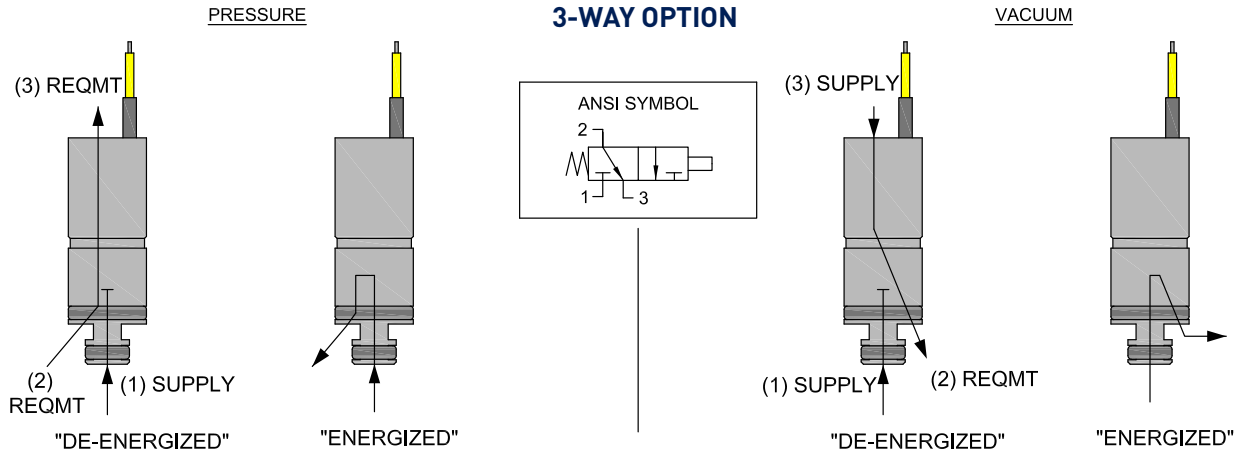


UNITS
IN [MM]

C7 Miniature Cartridge Valve

ANSI Symbols

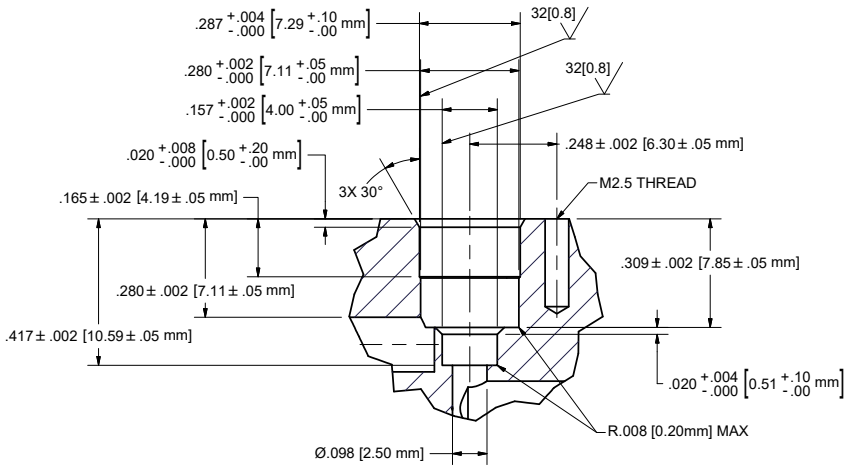




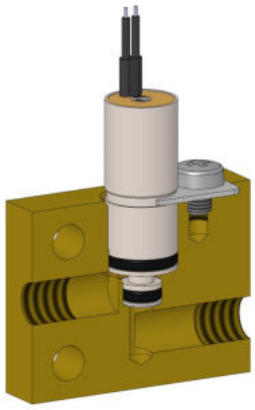
C7 Miniature Cartridge Valve

Installation and Use

Recommended Valve Manifold Dimensions



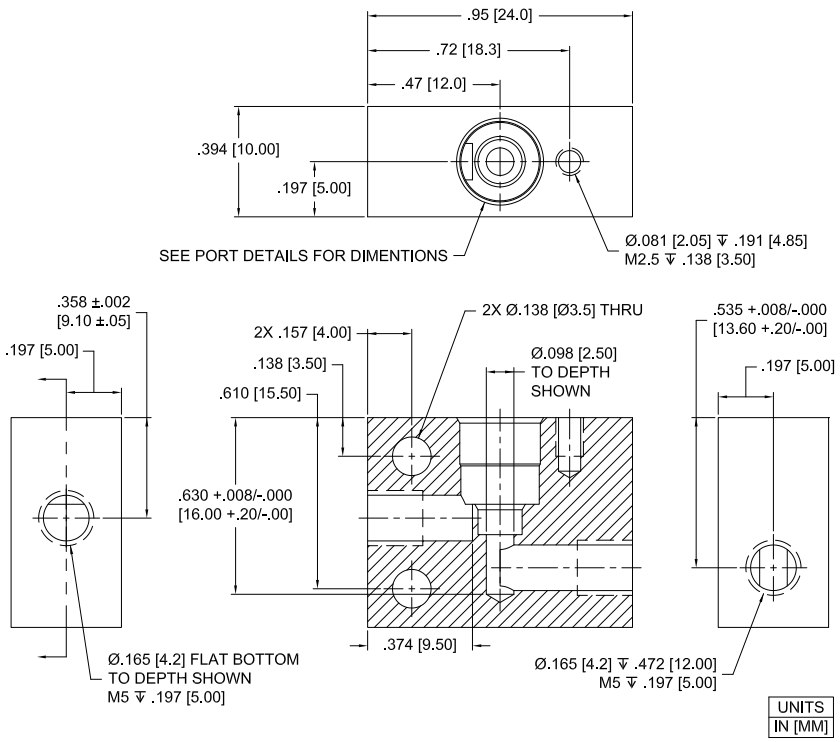
Recommended Valve Mounting



Installation and Use

C7 Evaluation Manifold Dimensions and Design

C07-MCS



C7 Miniature Cartridge Valve

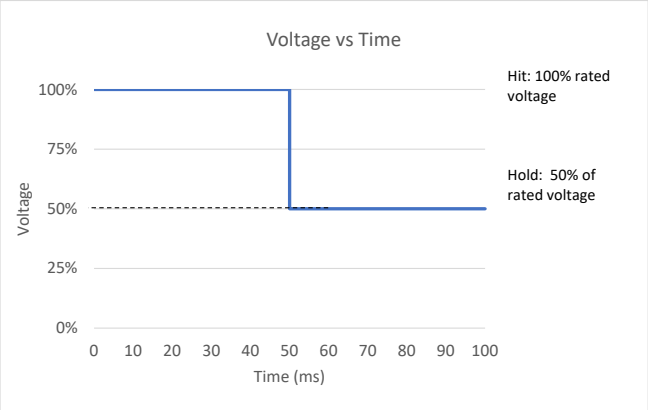
Installation and Use

Optional Reduced Power Control Method

"Hit and Hold" is an optional control method to increase power efficiency for the C7 series valves.

Hit and Hold is a common control method used to reduce component power consumption and heat generation without sacrificing performance. The "Hit" or "Spike" state refers to the rated voltage required to actuate the valve. The "Hold" state is a substantial reduction in the rated voltage (normally 50% of the rated voltage) that maintains the valve in an actuated state.

Hit and Hold control can be incorporated using several different approaches, including discrete component circuits or programmable logic. The graph below illustrates a voltage "Hit" and "Hold" control method, however pulse width modulation (PWM) is also an acceptable control method.



C7 Hit and Hold Specification	
Hit Voltage Level	Rated Voltage
Hold Voltage Level	50% of Rated Voltage
Minimum Hit Time	50 ms
Maximum Hit Time	N/A
PWM Frequency (Minimum)	min. 1 kHz
Hold Nominal Duty Cycle	50%

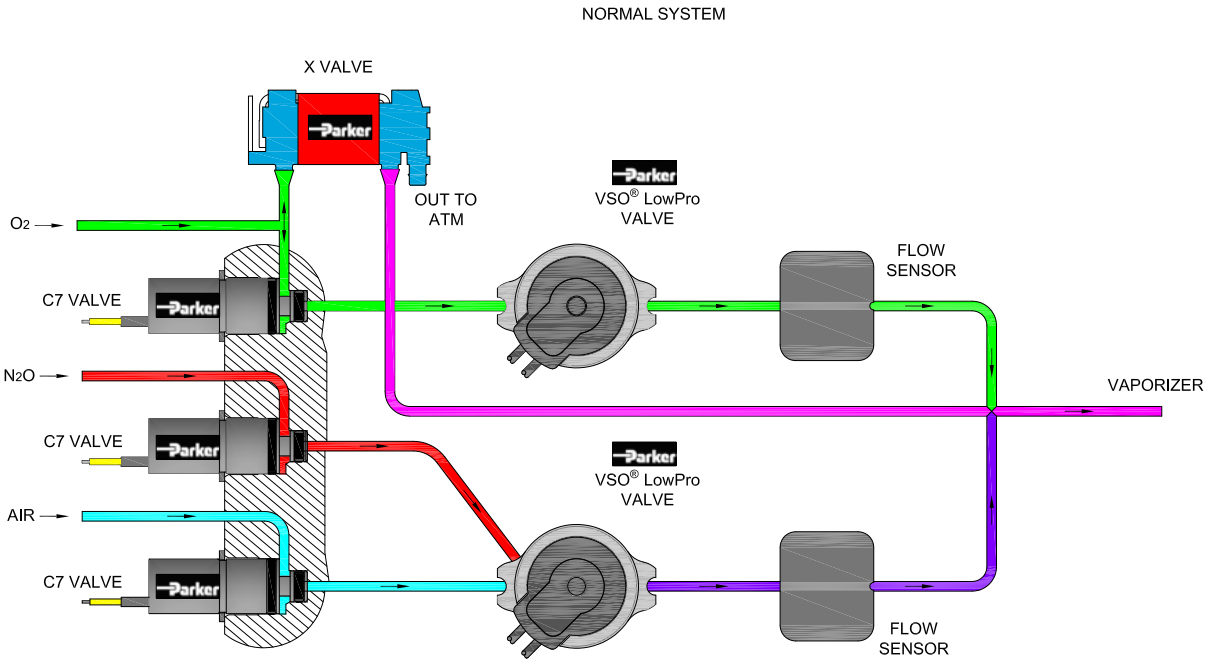
This method greatly reduces power consumption because the valve only draws full current for a short period of time making it ideal for applications with sensitive power budgets.

Note: 50% duty cycle is a general recommendation; therefore, it is recommended that specific application testing is completed to verify the proper "hold" requirement. Factors that could impact hit and hold voltage levels include vibration, shock, pressure variation and pressure locations that are driven from specific usage. The hit and hold circuit design, combined with Parker's valve, need to be validated for each specific application to ensure the valve will actuate under all usage conditions. **Contact Factory for more details**.

C7 Miniature Cartridge Valve

Typical Flow Diagram

Anesthesia Gas Blending Circuit



Accessories

C7 Evaluation Manifold with clip and screw (Valve not included)
C07-MCS

Replacement Clip for C07-MCS
C07-C

Replacement Screw for C07-MCS
C07-S

Replacement FKM O-Ring for C7 Valve, Large
C07-LG

Replacement FKM O-Ring for C7 Valve, Small
C07-SM

C7 Miniature Cartridge Valve

Ordering Information

Sample Part ID	C07	-	2	24	FK	03	F	F	-	000
Description	**Series**		**Configuration**	**Coil Voltage**	**Elastomer**	**Orifice**	**Mounting Style**	**Electrical Interface**		**Custom**
Options	C07: 7 mm Cartridge Valve		2: 2-Way 3: 3-Way	12: 12 VDC 24: 24 VDC	EP: EPDM FK: FKM	03: 0.012 in (0.3 mm) 05: 0.020 in (0.5 mm) 08: 0.031 in (0.8 mm) 10: 0.039 in (1.0 mm)	F: Face Seal	F: 3.2 in (80 mm) flying lead		000: Standard

Accessories

C07-MCS: C07 Evaluation Manifold with Clip and Screw, Not supplied with the valve.

C07-C: Replacement Clip used on C07-MCS*

C07-S: Replacement Screw used on C07-MCS*

C07-LG: Spare O-Ring for C07 Valve, FKM, Large**

C07-LGE: Spare O-Ring for C07 Valve, EPDM, Large**

C07-SM: Spare O-Ring for C07 Valve, FKM, Small**

C07-SME: Spare O-Ring for C07 Valve, EPDM, Small**

* Not Supplied with Valve, Replacement Part for C07-MCS ** Supplied with Valve

NOTE: For Evaluation - Please Add C07-MCS To Your Sample Order. All Valves Ship With O-Rings Installed

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 C7 valve. For CAD models and more detailed information, please visit us on the Web (www.parker.com/precisionfluidics/C7_GasCartridgeValve), call (603.595.1500) or email at ppfinfo@parker.com.

Parker Hannifin Precision Fluidics Division reserves the right to make changes. Drawings are for reference only.

C15 Valve **Miniature Cartridge Solenoid Valve**

15 mm Miniature Cartridge Valve

The Series C15 is a miniature cartridge style solenoid valve with a unique design that combines small size, light weight and low power consumption with high flow repeatability and fast response time over an exceptionally long life, up to 500 million cycles. Available in 2-way and 3-way configurations, the valve is manifold mounted utilizing a simple securing system reducing assembly time.

Typical Markets

- Medical and Analytical Gas Control
- Respiratory & Anesthesia

Typical Applications

- Portable/Transport Ventilators
- Negative Pressure Wound Therapy
- Air Over Liquid Dispense
- Sidestream CO2 measurement
- Portable/Hand held environmental monitoring

Features

- Variety of orifice sizes with pressures up to 145 PSI (10 bar).
- Floating frictionless plunger enables reliable and repeatable operation up to 500 Million cycles.
- Low power design reduces heat and energy consumption.
- Cartridge configuration enables compact integration saving space and weight.
- Simple mechanical fastening prevents valve being dislodged due to vibration or pressure spikes.
- RoHS & REACH compliant.

Product Specifications

Mechanical

Valve Type:
Solenoid Cartridge Valve
2-Way Normally Closed (NC)
3-Way Normally Closed (NC)

Media: Gases and Liquids*
(See details in liquid datasheet)

Operating Environment:
32°F to 122°F (0°C to 50°C)

Storage Environment:
-40°F to 158°F (-40°C to 70°C)

Dimensions:
- Diameter: 0.59 in (15 mm)
- Length: 1.14 in (29 mm)

Porting:
- Cartridge Seal

Weight: 0.78 oz (22 g)

Internal Volume:
2-Way: 391 µL
3-Way: 461 µL

Orifice		0.020 in (0.5 mm)		0.040 in (1.0 mm)		0.060 in (1.5 mm)		0.080 in (2.0 mm)	
Type		2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way
Max Vacuum & Pressure	PSI	145	145	116	102	58	50.8	21.8	14.5
	Bar	10	10	8	7	4	3.5	1.5	1
	Cv	0.01	0.01	0.032	0.028	0.058	0.048	0.093	0.076
	SLPM (air)	18	18	55	43	55	41	44	29

Electrical

Voltage (VDC):
12 and 24 VDC ± 5%
(Other voltages available on request.)

Electrical Connections:
3.2 in (80 mm) Flying Leads

Power:
Typical 1.1W - 1.7W
(Please see Table 1 for more details)

Wetted Materials

Body:
Stainless Steel Series 300 and 400

Seals: (Internal and External)
FKM, EPDM

Performance Characteristics

Response:
10 ms Maximum, Cycling

Proof Pressure:
120% of Rated Maximum Pressure

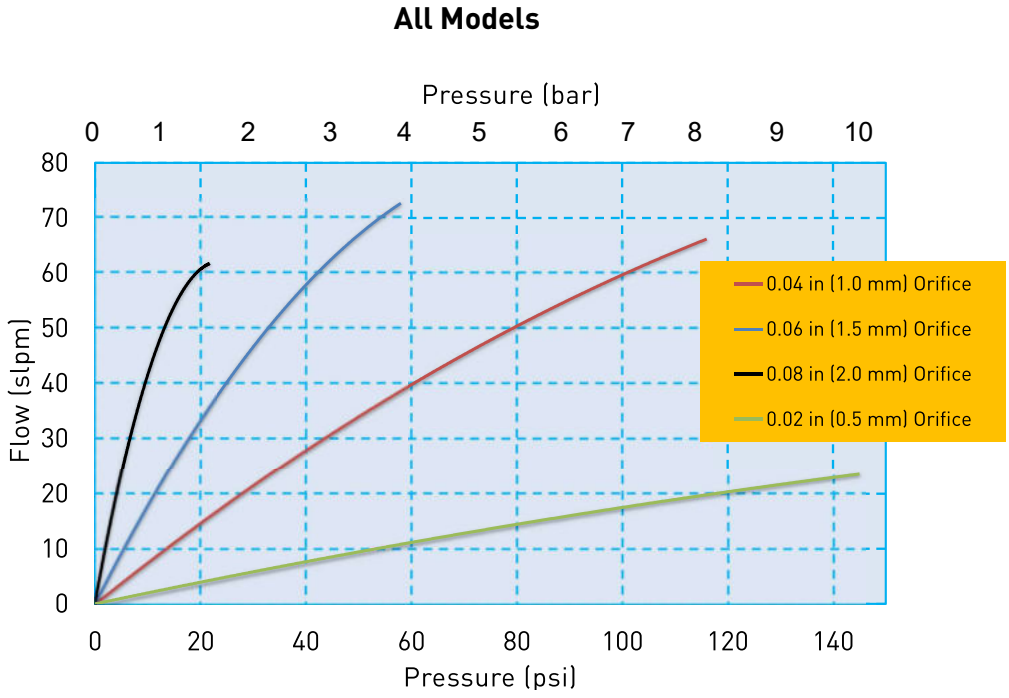
Recommended Filtration:
10 µm

Reliability:
2-Way: 500 Million Cycles
3-Way: 200 Million Cycles
0.90 Reliability Factor
95% Confidence

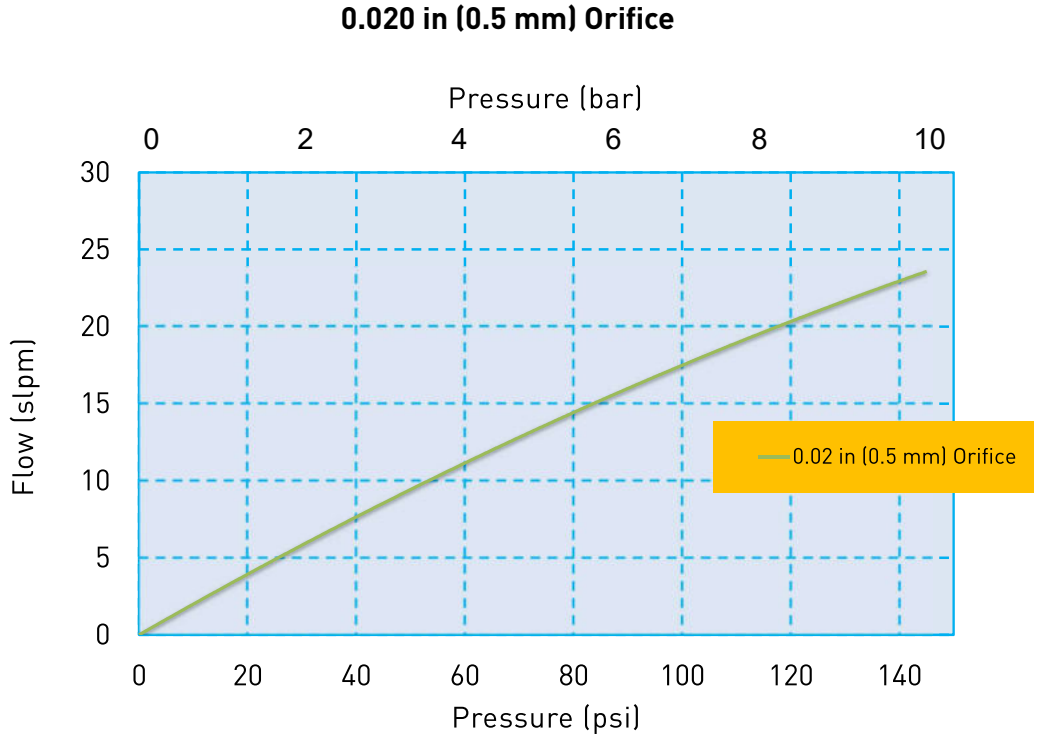
*Please contact factory for additional details on liquid compatibility.

C15 Miniature Cartridge Valve

Flow Curve



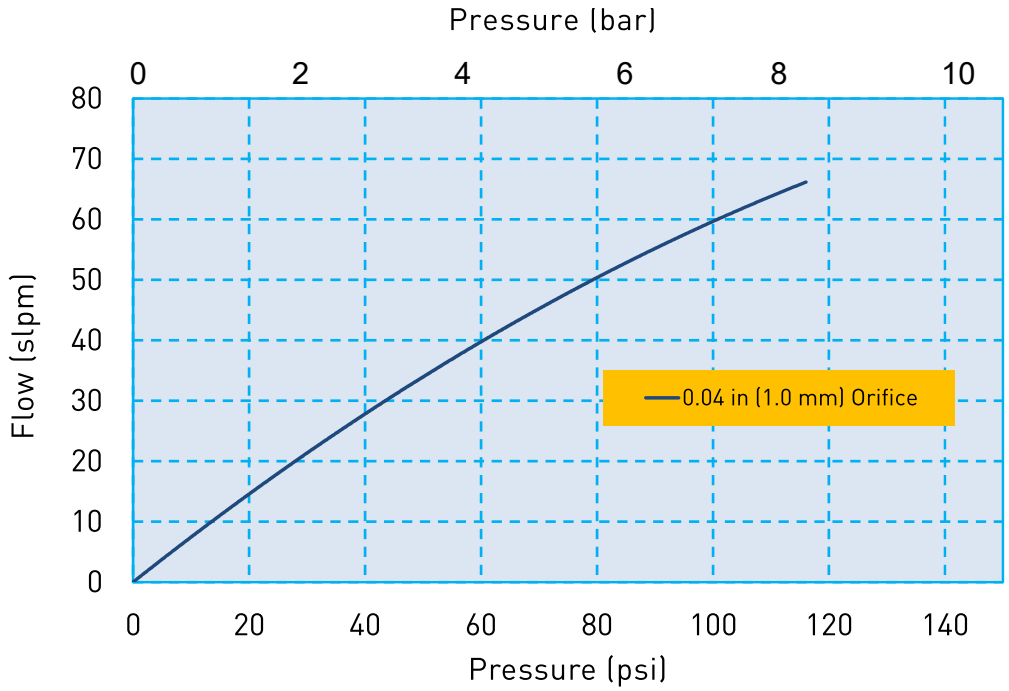
Flow Curve



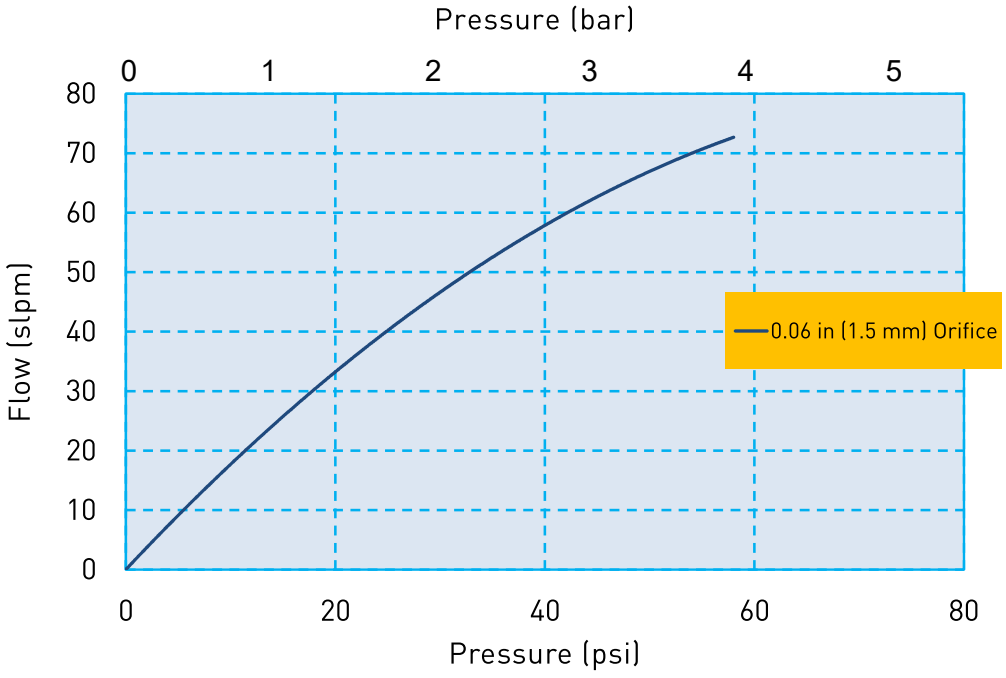
C15 Miniature Cartridge Valve

Flow Curve

0.040 in (1.0 mm) Orifice

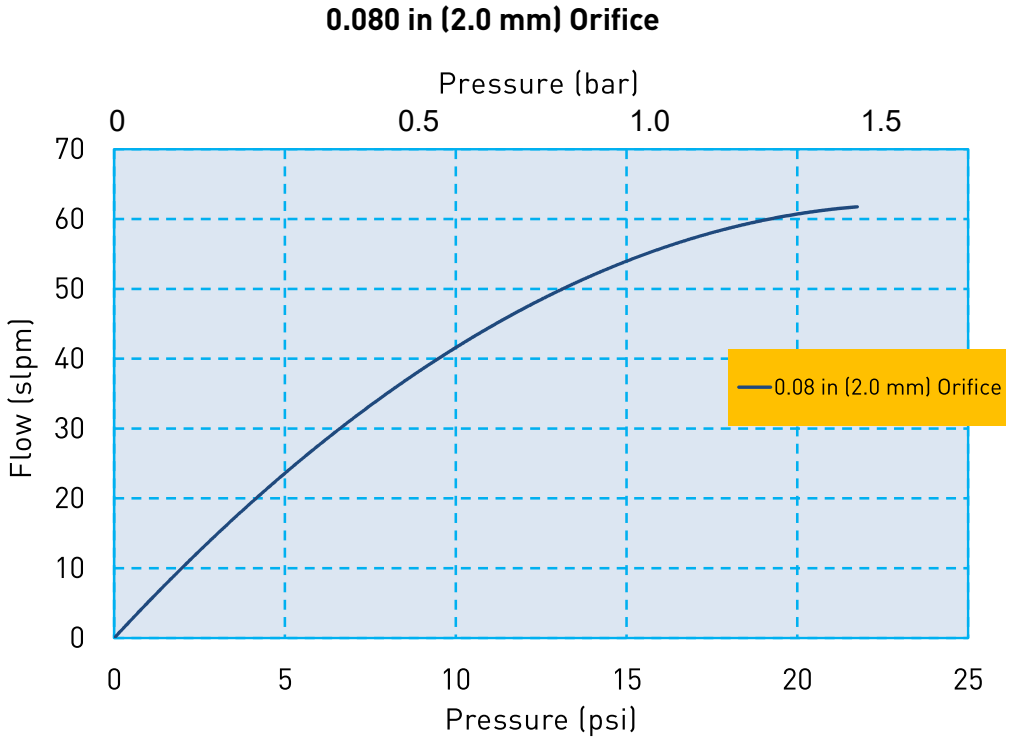


0.060 in (1.5 mm) Orifice



C15 Miniature Cartridge Valve

Flow Curve



Electrical Interface

Wire Leads

Standard: 3.2 in (80 mm) Wire Leads, stripped at end

C15 Miniature Cartridge Valve

Electrical Requirements

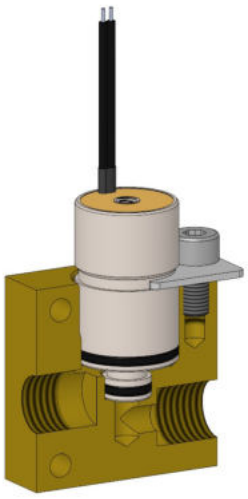
Table 1

Orifice	0.020 in (0.5 mm)				0.040 in (1.0 mm)				0.060 in (1.5 mm)				0.080 in (2.0 mm)			
Valve Type	2-Way		3-Way		2-Way		3-Way		2-Way		3-Way		2-Way		3-Way	
Voltage (VDC)*	12	24	12	24	12	24	12	24	12	24	12	24	12	24	12	24
Power (Watts)	1.1	1.1	1.7	1.6	1.7	1.6	1.7	1.6	1.7	1.6	1.7	1.6	1.7	1.6	1.7	1.6
Resistance (Ohm)**	132	525	85	361	85	361	85	361	85	361	85	361	85	361	85	361

* ± 5%, other voltages available on request

** ±5% @ 68°F, 20°C

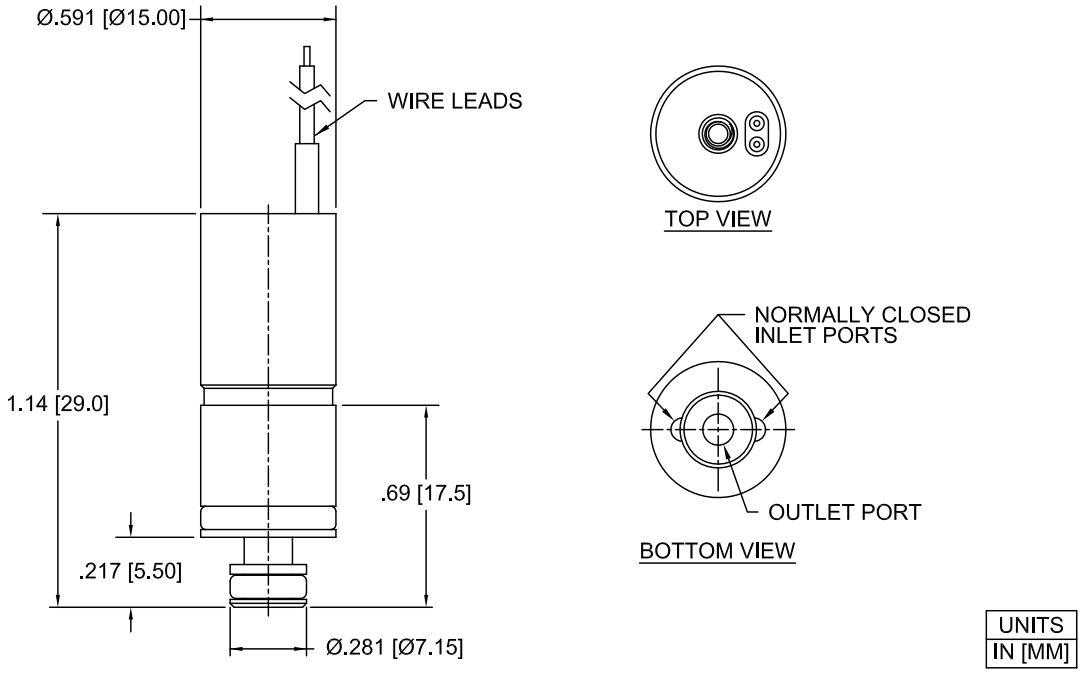
Pneumatic Interface/Mechanical Integration



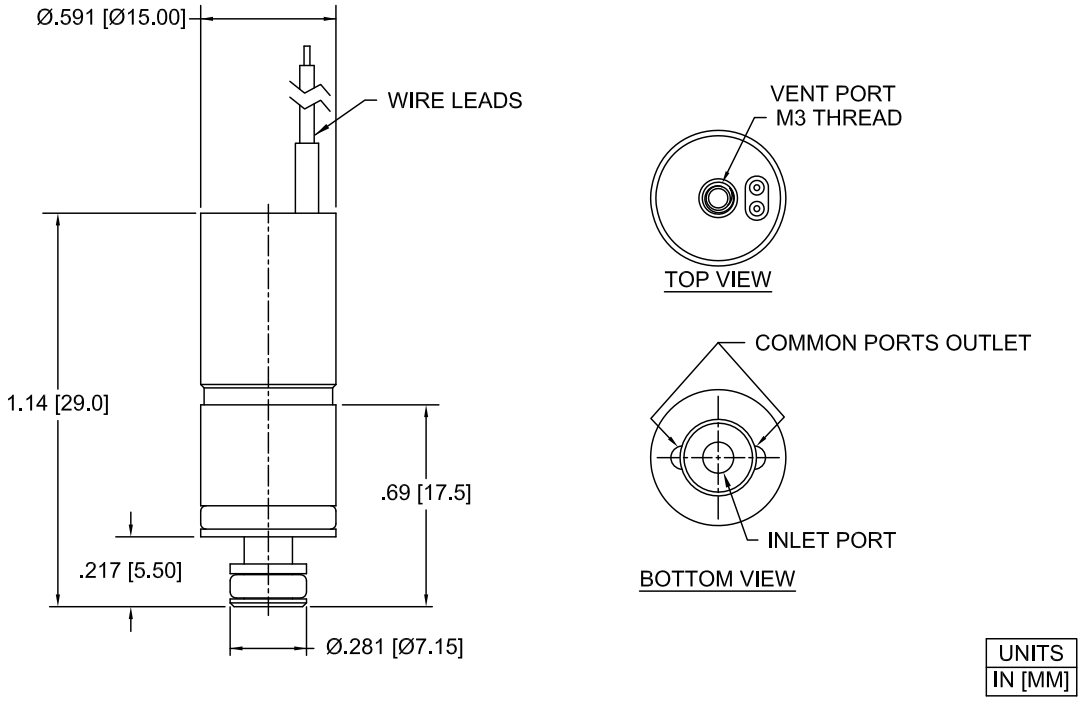
C15 Miniature Cartridge Valve

Dimensions

2-Way Valve Configuration



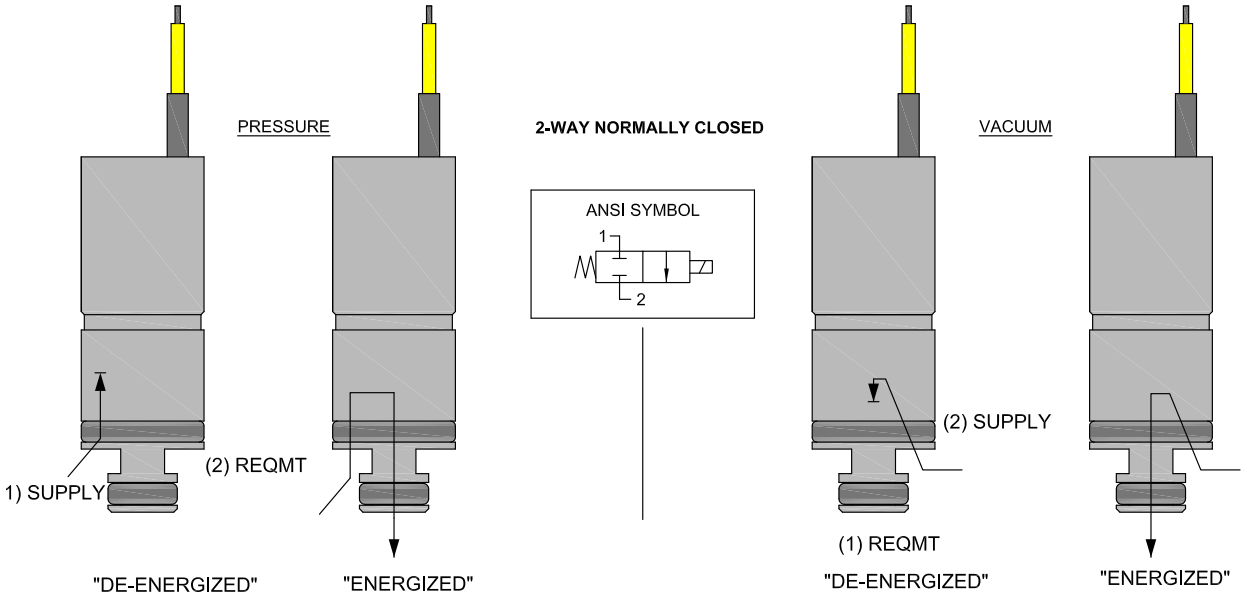
3-Way Valve Configuration



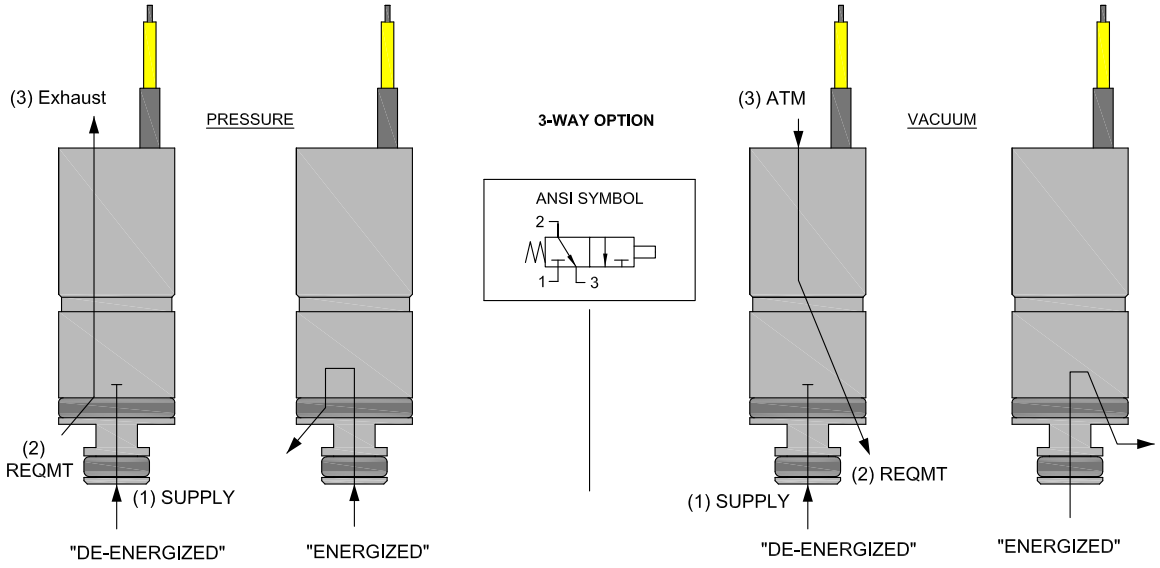
C15 Miniature Cartridge Valve

ANSI Symbols

2-Way Normally Closed



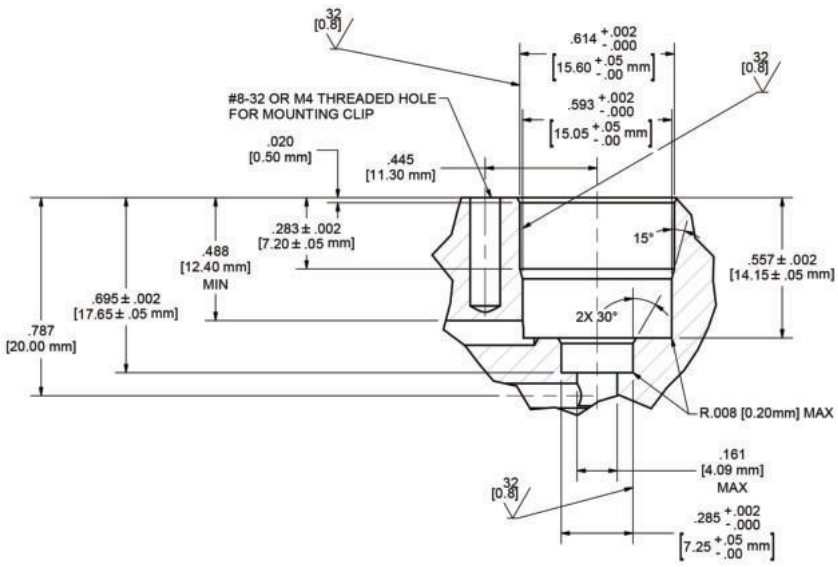
3-Way Normally Closed



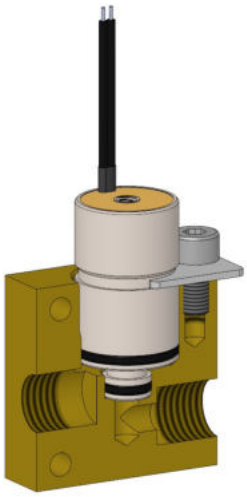
C15 Miniature Cartridge Valve

Installation and Use

Recommended Valve Manifold Dimensions



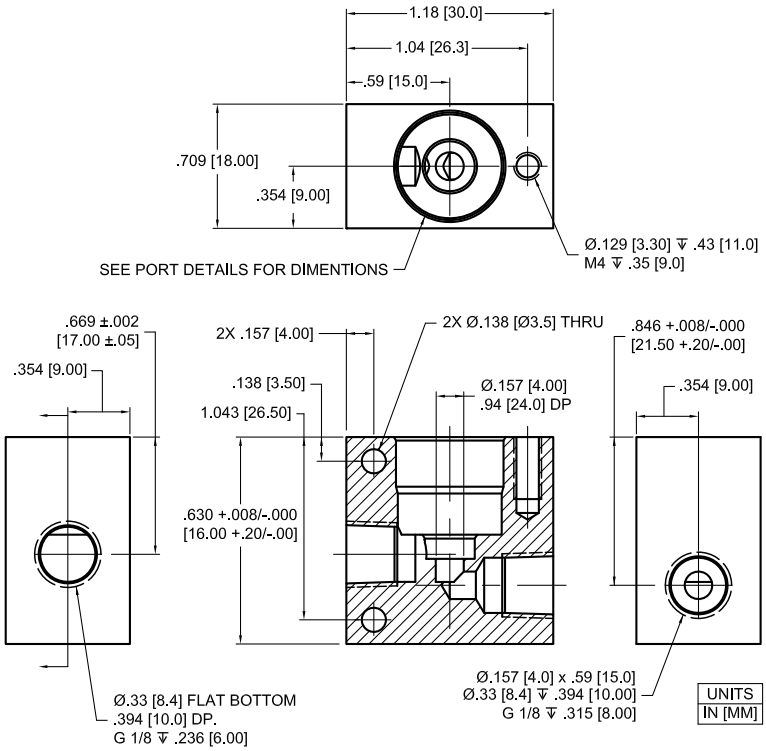
Recommended Valve Mounting



Installation and Use

C15 Evaluation Manifold Dimensions and Design

C15-MCS



C15 Miniature Cartridge Valve

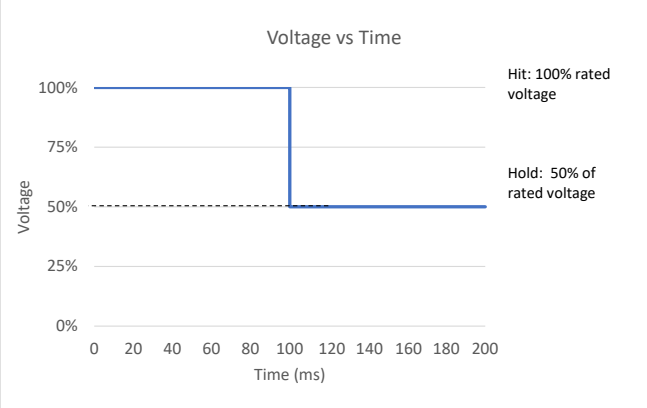
Installation and Use

Optional Reduced Power Control Method

"Hit and Hold" is an optional control method to increase power efficiency for the C15 series valves.

Hit and Hold is a common control method used to reduce component power consumption and heat generation without sacrificing performance. The "Hit" or "Spike" state refers to the rated voltage required to actuate the valve. The "Hold" state is a substantial reduction in the rated voltage (normally 50% of the rated voltage) that maintains the valve in an actuated state.

Hit and Hold control can be incorporated using several different approaches, including discrete component circuits or programmable logic. The graph below illustrates a voltage "Hit" and "Hold" control method, however pulse width modulation (PWM) is also an acceptable control method.



C15 Hit and Hold Specification	
Hit Voltage Level	Rated Voltage
Hold Voltage Level	50% of Rated Voltage
Minimum Hit Time	100 ms
Maximum Hit Time	N/A
PWM Frequency (Minimum)	1 kHz
Hold Nominal Duty Cycle	50%

This method greatly reduces power consumption because the valve only draws full current for a short period of time making it ideal for applications with sensitive power budgets.

Note: 50% duty cycle is a general recommendation; therefore, it is recommended that specific application testing is completed to verify the proper "hold" requirement. Factors that could impact hit and hold voltage levels include vibration, shock, pressure variation and pressure locations that are driven from specific usage. The hit and hold circuit design, combined with Parker's valve, need to be validated for each specific application to ensure the valve will actuate under all usage conditions. **Contact Factory for more details**.

C15 Miniature Cartridge Valve

Accessories

C15 Evaluation Manifold with clip and screw (Valve not included)
C15-MCS

Replacement Clip for C15-MCS
C15-C

Replacement Screw for C15-MCS
C15-S

Replacement O-Ring for C15 Valve, Large
C15-LG

Replacement FKM O-Ring for C15 Valve, Small
C15-SM

C15 Miniature Cartridge Valve

Ordering Information

Sample Part ID	C15	-	2	24	FK	05	F	F	-	000
Description	**Series**		**Configuration**	**Coil Voltage**	**Elastomer**	**Orifice**	**Mounting Style**	**Electrical Interface**		**Custom**
Options	C15: 15 mm Cartridge Valve		2: 2-Way 3: 3-Way	12: 12 VDC 24: 24 VDC	EP: EPDM FK: FKM	05: 0.020 in (0.5 mm) 10: 0.040 in (1.0 mm) 15: 0.060 in (1.5 mm) 20: 0.080 in (2.0 mm)	F: Face Seal	F: 3.2 in (80 mm) flying lead		000: Standard

Accessories
C15-MCS: C15 Evaluation Manifold with Clip and Screw, Not supplied with the valve.
C15-C: Replacement Clip used on C15-MCS*
C15-S: Replacement Screw used on C15-MCS*
C15-LG: Spare O-Ring for C15 Valve, Large**
C15-SM: Spare O-Ring for C15 Valve, Small**
* Not Supplied with Valve, Replacement Part for C15-MCS ** Supplied with Valve

NOTE: For Evaluation - Please Add C15-MCS To Your Sample Order. All Valves Ship With O-Rings Installed

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 C15 valve. For CAD models and more detailed information, please visit us on the Web (www.parker.com/precisionfluidics/C15_GasCartridgeValve), call (+1.603.595.1500) or email at ppfinfo@parker.com.

Parker Hannifin Precision Fluidics Division reserves the right to make changes. Drawings are for reference only.

C21 Valve Miniature Cartridge Solenoid Valve

21 mm Miniature Cartridge Valve

The Series C21 is a miniature cartridge style solenoid valve with a unique design that combines small size, light weight and low power consumption with high flow repeatability and fast response time over an exceptionally long life, of up to 20 million cycles. Available in 2-way and 3-way configurations, the valve is manifold mounted utilizing a simple securing system reducing assembly time.

Typical Markets

- Medical and Analytical Gas Control
- Respiratory & Anesthesia
- Patient Therapy

Typical Applications

- Compression Therapy
- Oxygen Concentrators & Conservers
- Negative Pressure Wound Therapy

Features

- Variety of orifice sizes with pressures up to 145 PSI (10 bar).
- Floating frictionless plunger enables reliable and repeatable operation of up to 20 Million cycles.
- Low power design reduces heat and energy consumption.
- Cartridge configuration enables compact integration saving space and weight.
- Simple mechanical fastening prevents valve being dislodged due to vibration or pressure spikes.
- RoHS & REACH compliant.

Product Specifications

Mechanical

Valve Type:
Solenoid Cartridge Valve
3-Way
2-Way Normally Closed (NC)

Media: Gases and Liquids*
(See more Information in Liquid Datasheet)

Operating Environment:
32°F to 122°F (0°C to 50°C)

Storage Environment:
-40°F to 158°F (-40°C to 70°C)

Dimensions:
- Diameter: 0.28 in (7 mm)
- Length: 0.79 in (20 mm)

Porting:
- Cartridge Seal
Weight: 2.17 oz (60 g)

Internal Volume:
2-Way: 1173µL
3-Way: 1376µL

Orifice		0.040 in (1.0 mm)		0.080 in (2.0 mm)		0.12 in (3.0 mm)		0.16 in (4.0 mm)	
Type		2-Way	3-Way	2-Way	3-Way	2-Way	3-Way	2-Way	3-Way
Max Vacuum & Pressure	PSI	145	145	116	87	58	36	29	15
	Bar	10	10	8	6	4	2.5	2	1
	Cv	0.03	0.03	0.08	0.07	0.13	0.11	0.18	0.14
	SLPM (air)	67.5	60	140	90	124	70	101	55

Electrical

Voltage (VDC):
12 and 24 VDC ± 5%
(Other voltages available on request.)

Electrical Connections:
3.2 in (80 mm) Flying Leads

Power:
Typical 2.5W - 2.6W
(Please see Table 1 for more details)

Wetted Materials

Body:
Stainless Steel

Seals: (Internal and External)
FKM, EPDM

Performance Characteristics

Response:
10 ms Maximum, Cycling

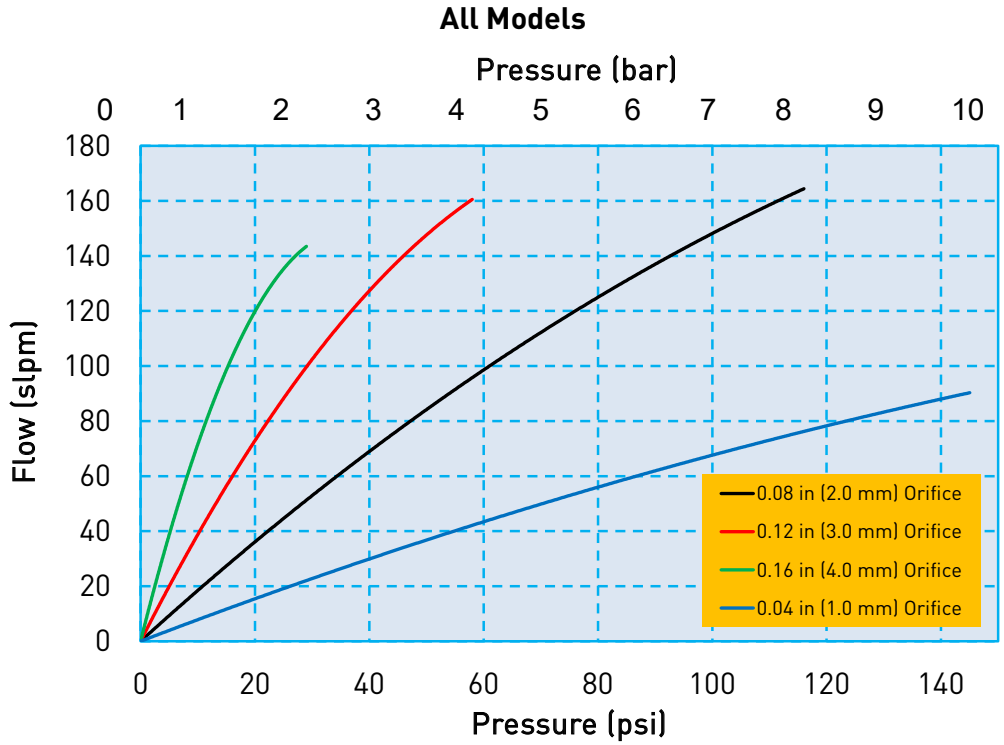
Recommended Filtration:
10 µm

Reliability:
2-Way: 20 Million Cycles
3-Way: 20 Million Cycles
0.90 Reliability Factor
95% Confidence

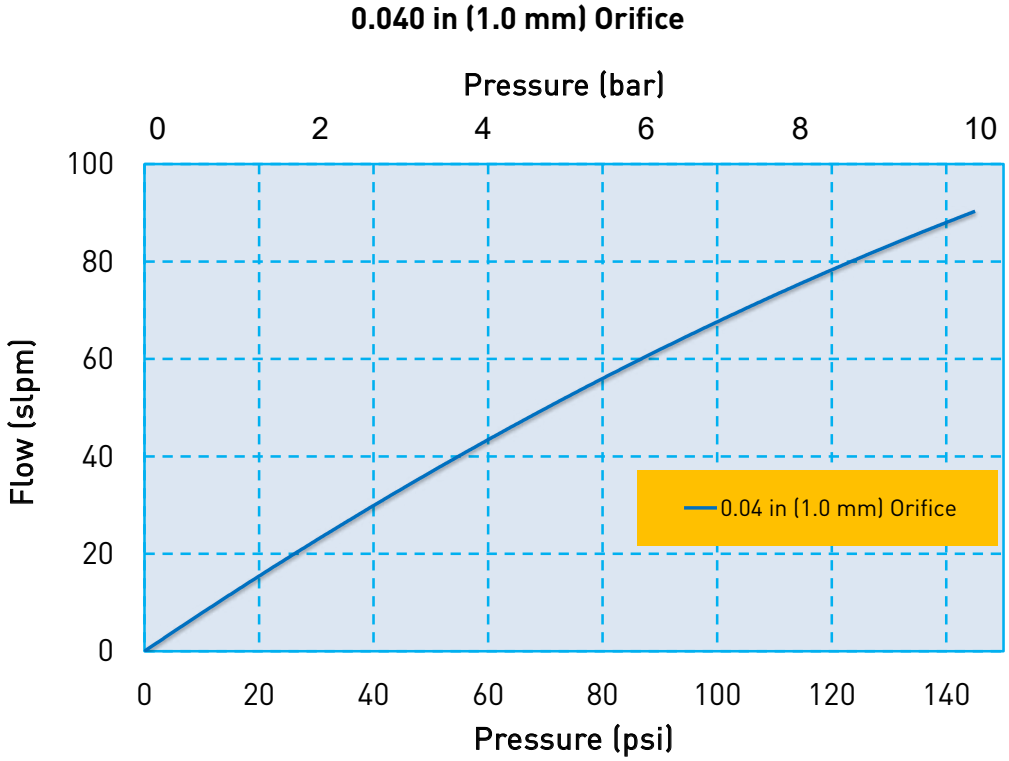
*Please contact factory for additional details on liquid compatibility.

C21 Miniature Cartridge Valve

Flow Curve

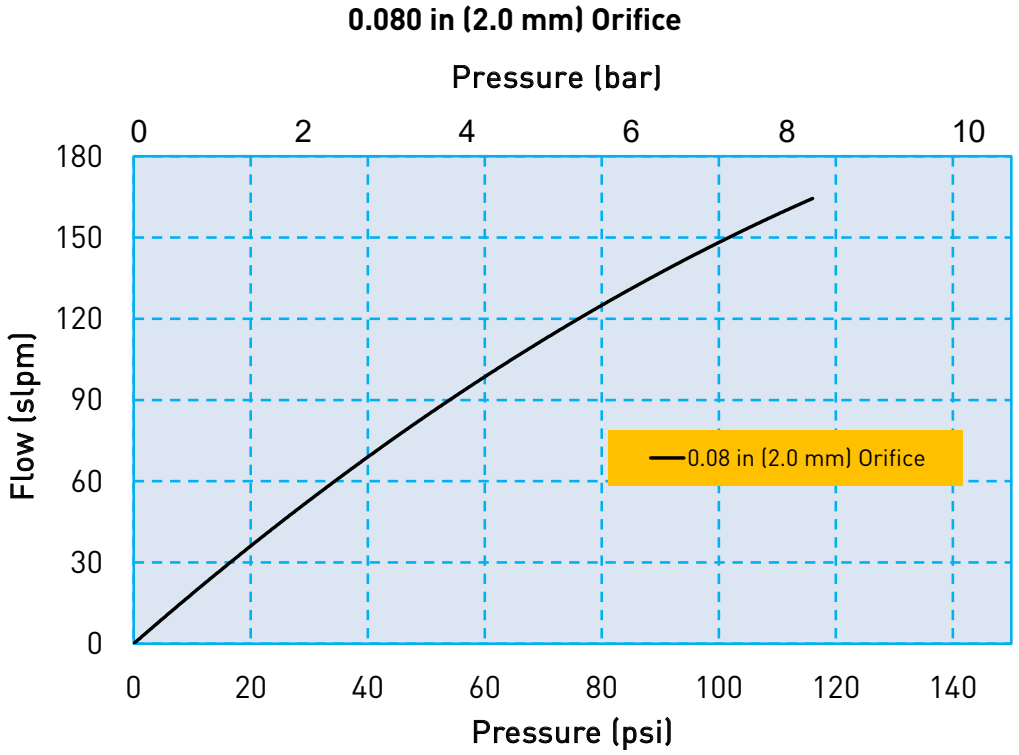


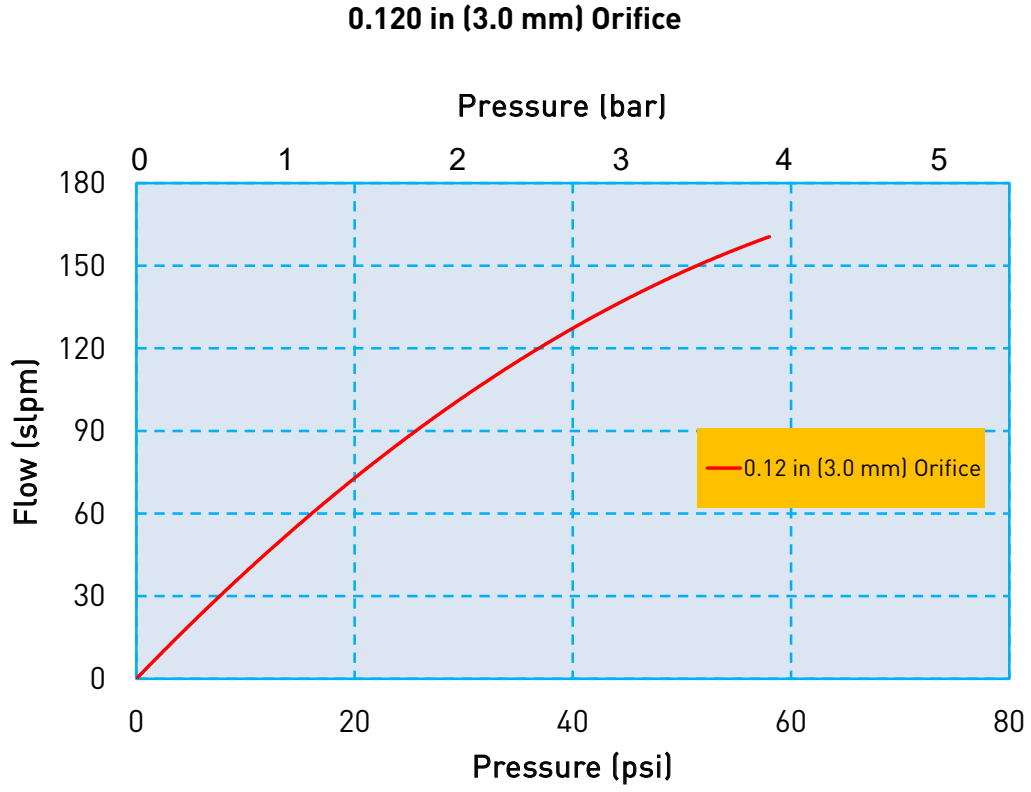
Flow Curve



C21 Miniature Cartridge Valve

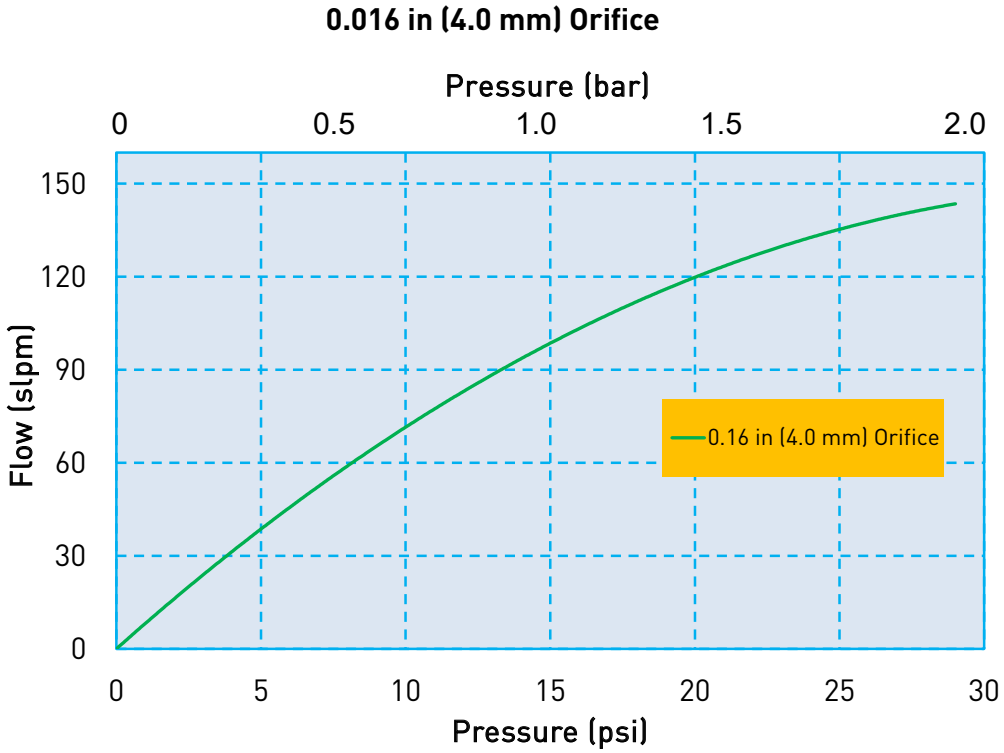
Flow Curve





C21 Miniature Cartridge Valve

Flow Curve



Electrical Interface

Wire Leads

Standard: 3.2 in (80 mm) Wire Leads, stripped at end

C21 Miniature Cartridge Valve

Electrical Requirements

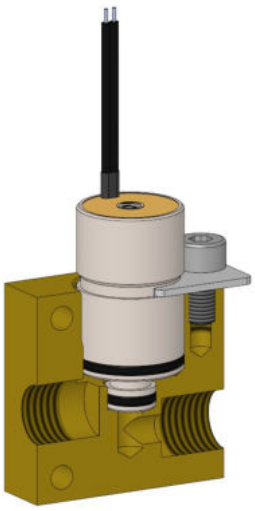
Table 1

Orifice	0.040 in (1.0 mm)				0.080 in (2.0 mm)				0.12 in (3.0 mm)				0.16 in (4.0 mm)			
Valve Type	2-Way		3-Way		2-Way		3-Way		2-Way		3-Way		2-Way		3-Way	
Voltage (VDC)*	12	24	12	24	12	24	12	24	12	24	12	24	12	24	12	24
Power (Watts)	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5
Resistance (Ohm)**	56	235	56	235	56	235	56	235	56	235	56	235	56	235	56	235

* ± 5%, other voltages available on request

** ±5% @ 68°F, 20°C

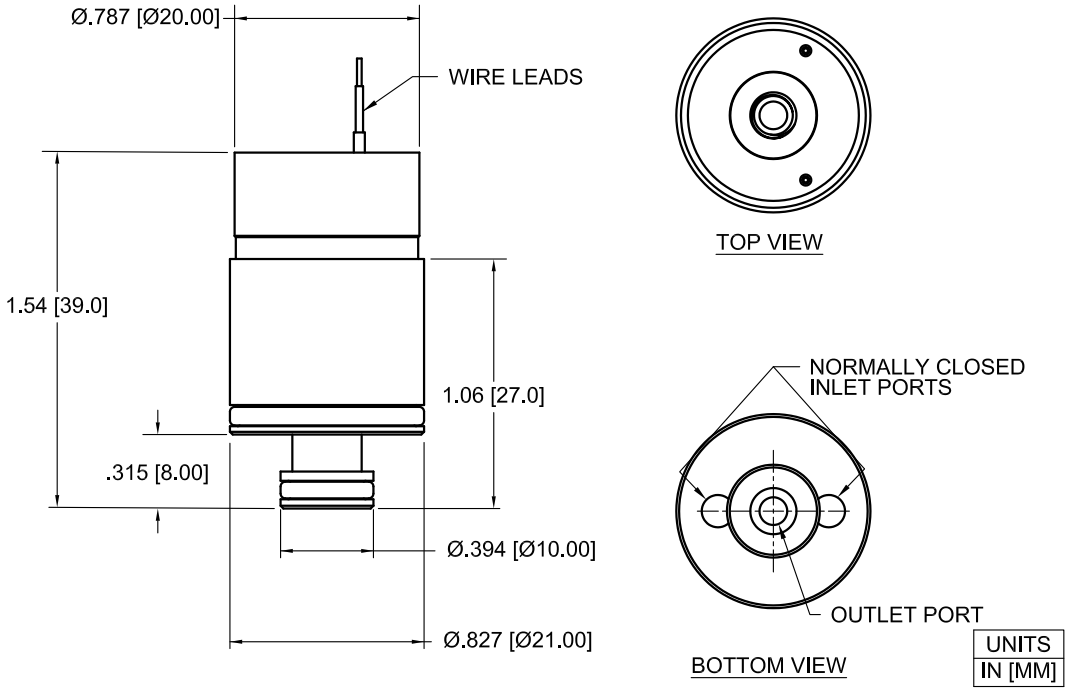
Pneumatic Interface/Mechanical Integration



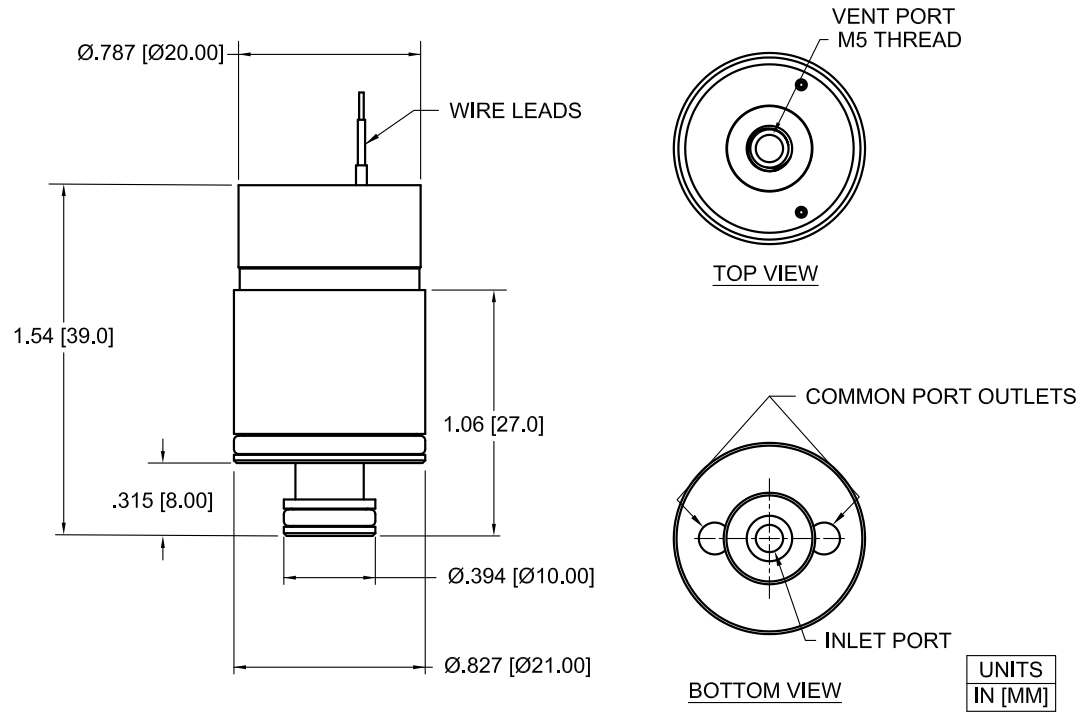
C21 Miniature Cartridge Valve

Dimensions

2-Way Valve Configuration



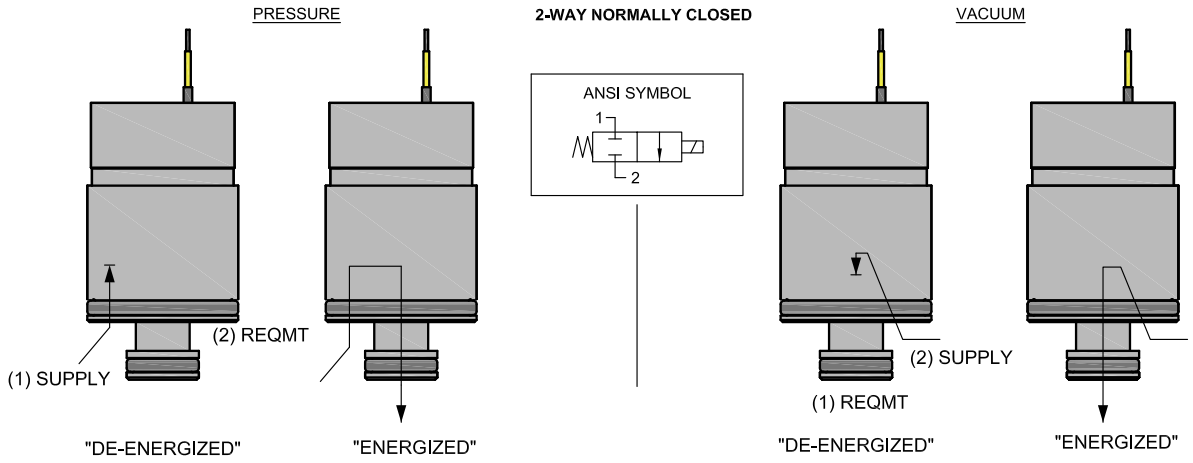
3-Way Valve Configuration



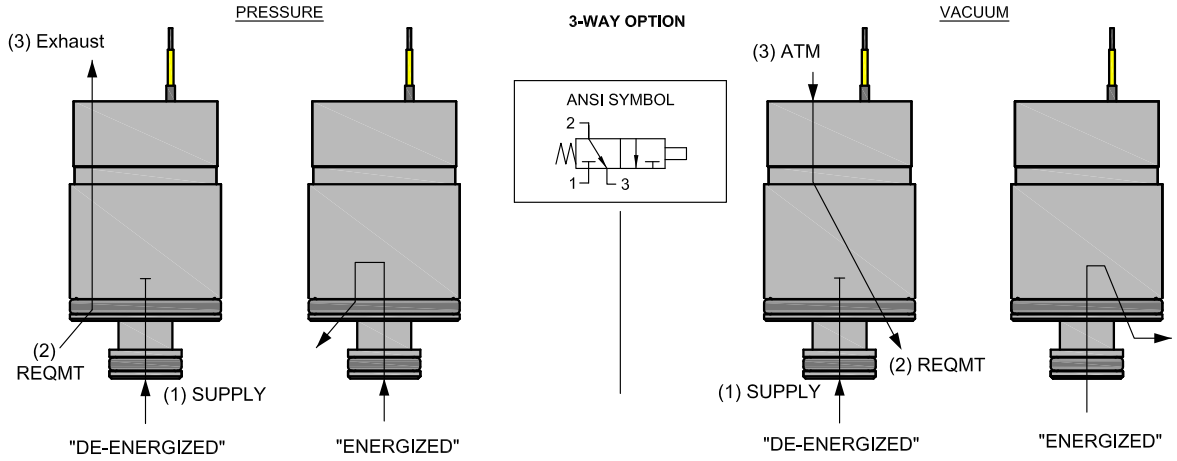
C21 Miniature Cartridge Valve

ANSI Symbols

2-Way Normally Closed



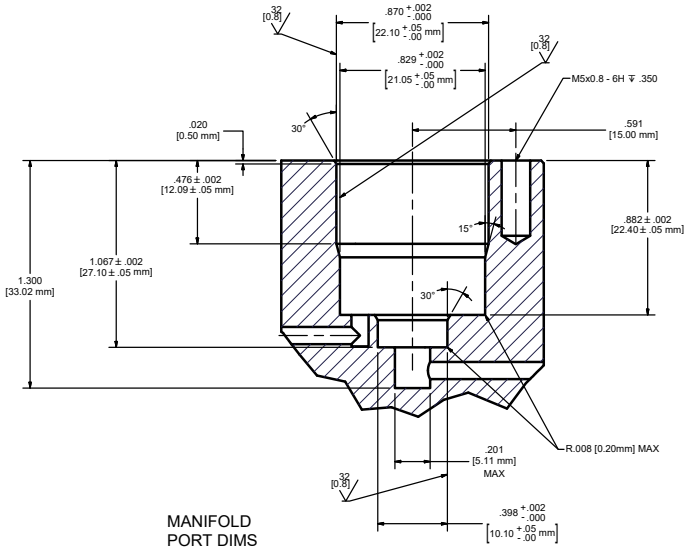
3-Way Normally Closed



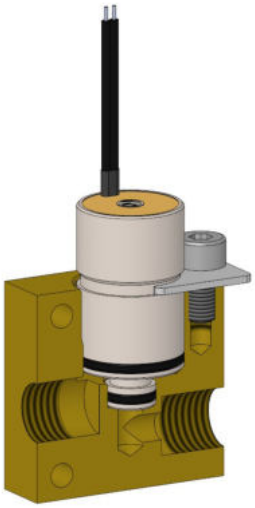
C21 Miniature Cartridge Valve

Installation and Use

Recommended Valve Manifold Dimensions



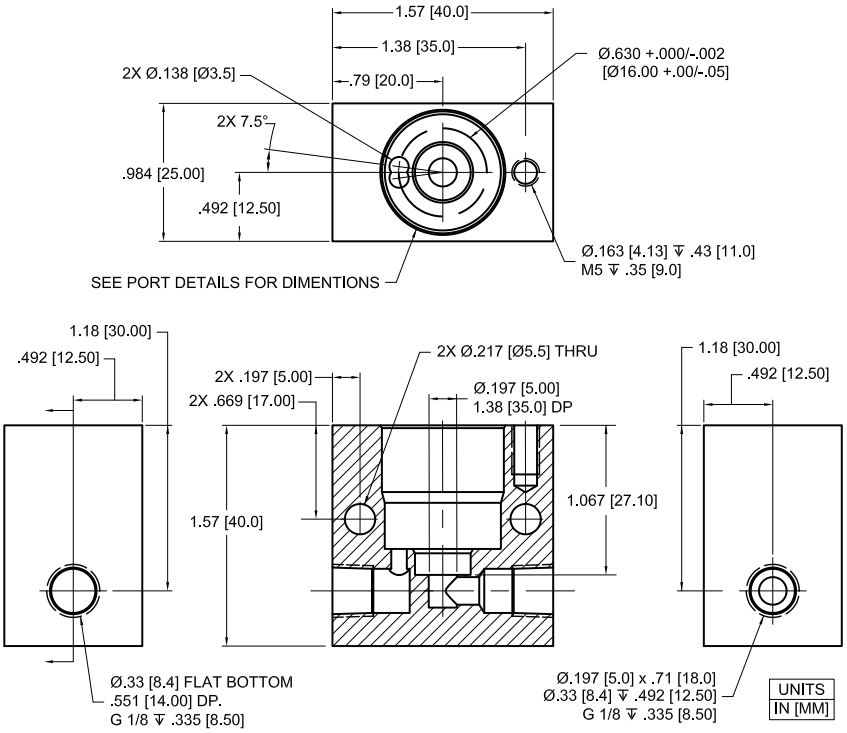
Recommended Valve Mounting



Installation and Use

C21 Evaluation Manifold Dimensions and Design

C21-MCS



C21 Miniature Cartridge Valve

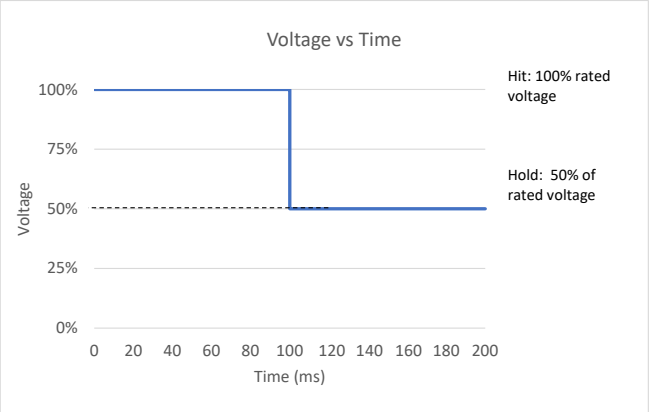
Installation and Use

Optional Reduced Power Control Method

"Hit and Hold" is an optional control method to increase power efficiency for the C21 series valves.

Hit and Hold is a common control method used to reduce component power consumption and heat generation without sacrificing performance. The "Hit" or "Spike" state refers to the rated voltage required to actuate the valve. The "Hold" state is a substantial reduction in the rated voltage (normally 50% of the rated voltage) that maintains the valve in an actuated state.

Hit and Hold control can be incorporated using several different approaches, including discrete component circuits or programmable logic. The graph below illustrates a voltage "Hit" and "Hold" control method, however pulse width modulation (PWM) is also an acceptable control method.



C21 Hit and Hold Specification	
Hit Voltage Level	Rated Voltage
Hold Voltage Level	50% of Rated Voltage
Minimum Hit Time	100 ms
Maximum Hit Time	N/A
PWM Frequency (Minimum)	1 kHz
Hold Nominal Duty Cycle	50%

This method greatly reduces power consumption because the valve only draws full current for a short period of time making it ideal for applications with sensitive power budgets.

Note: 50% duty cycle is a general recommendation; therefore, it is recommended that specific application testing is completed to verify the proper "hold" requirement. Factors that could impact hit and hold voltage levels include vibration, shock, pressure variation and pressure locations that are driven from specific usage. The hit and hold circuit design, combined with Parker's valve, need to be validated for each specific application to ensure the valve will actuate under all usage conditions. **Contact Factory for more details**.

C21 Miniature Cartridge Valve

Accessories

C21 Evaluation Manifold with clip and screw (Valve not included)
C21-MCS

Replacement Clip for C21-MCS
C21-C

Replacement Screw for C21-MCS
C21-S

Replacement O-Ring for C21 Valve, Large
C21-LG

Replacement FKM O-Ring for C21 Valve, Small
C21-SM

C21 Miniature Cartridge Valve

Ordering Information

Sample Part ID	C21	-	2	24	FK	10	F	F	-	000
Description	**Series**		**Configuration**	**Coil Voltage**	**Elastomer**	**Orifice**	**Mounting Style**	**Electrical Interface**		**Custom**
Options	C21: 15 mm Cartridge Valve		2: 2-Way 3: 3-Way	12: 12 VDC 24: 24 VDC	EP: EPDM FK: FKM	10: 0.040 in (1.0 mm) 20: 0.080 in (2.0 mm) 30: 0.12 in (3.0 mm) 40: 0.16 in (4.0 mm)	F: Face Seal	F: 3.2 in (80 mm) flying lead		000: Standard

Accessories
C21-MCS: C21 Evaluation Manifold with Clip and Screw, Not supplied with the valve.
C21-C: Replacement Clip used on C21-MCS*
C21-S: Replacement Screw used on C21-MCS*
C21-LG: Spare O-Ring for C21 Valve, Large**
C21-SM: Spare O-Ring for C21 Valve, Small**
* Not Supplied with Valve, Replacement Part for C21-MCS ** Supplied with Valve

NOTE: For Evaluation - Please Add C21-MCS To Your Sample Order. All Valves Ship With O-Rings Installed

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

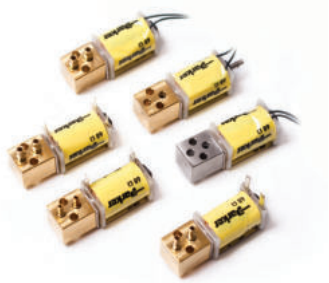
- Media, Inlet & Outlet Pressures
- Minimum Required Flow Rate
- System Supply Voltage
- Media & Ambient Temperature Range

Please click on the Order On-line button to configure your C21 valve. For CAD models and more detailed information, please visit us on the Web (www.parker.com/precisionfluidics/C21_GasCartridgeValve), call (+1.603.595.1500) or email at ppfinfo@parker.com.

Parker Hannifin Precision Fluidics Division reserves the right to make changes. Drawings are for reference only.

Series 11 Miniature Pneumatic Solenoid Valve

15 mm Solenoid Valve



The Series 11 miniature pneumatic solenoid valve is a robust and proven product with a reputation for reliable and consistent performance. The Series 11 miniature solenoid valve is the preferred choice of major OEM's in the medical and analytical market. With valve bodies made from brass or stainless steel, the Series 11 miniature solenoid valve is an ideal solution for general purpose applications and those applications requiring low out-gassing and a bubble-tight seal.

Typical Applications

- Oxygen Conservers
- Oxygen Concentrators
- Compression Therapy
- Gas Chromatography
- Insufflators
- Medical & Analytical Gas Control

Features

- Proven performance tested to 260 million life cycles
- Wide range of available electrical connections to simplify valve integration and control
- Manifold mount or barbed tube pneumatic configurations available for added system design flexibility
- Available Analytical and Oxygen Service Clean to minimize contamination
- RoHS compliant

Product Specifications

Mechanical

Valve Type:
Solenoid-actuated poppet style
- 2/3 Port, Normally Closed (NC)
- 2/3 Port, Normally Open (NO)
- 3 Port, Distributor
- 2 Port, Normally Closed (NC) - Universal

Media:
Air, argon, helium, hydrogen, methane, nitrogen, oxygen, & other non-reacting gasses

Operating Environment:
32 to 158°F (0 to 70°C)

Storage Temperature:
-40 to 158°F (-40 to 70°C)

Dimensions:
- Length: 1.73 in (43.9 mm)
- Width: 0.63 in (15.8 mm)
- Height: 0.67 in (17.0 mm)

Weight:
2.1 oz (60 g)

Internal Volume:
0.026 in^3 (0.426 cm^3)

Filtration:
40 micron (recommended)

Oxygen Clean:
Call For Details

Electrical

Power Options:
0.5, 1.0, or 2.0 Watts

Voltage Options:
5, 12 or 24 VDC
Further power reduction may be achieved through the use of spike and hold or PWM electrical control.

Electrical Connections:
Wire Leads, PC Pins, Solder Tabs, Quick Disconnect Spade

Wetted Materials

Body:
36000 HO2 Brass;
303 Series Stainless Steel

Stem Base:
36000 HO2 Brass;
303 Series Stainless Steel

Poppet Options:
FKM or EPDM

All Others:
430 FR Series Stainless Steel
302 Series Stainless Steel

Performance Characteristics

Leak Rate:
<0.016 sccm of air
<0.1 sccm of air (Model 20 only)

Response:
<30 ms cycling

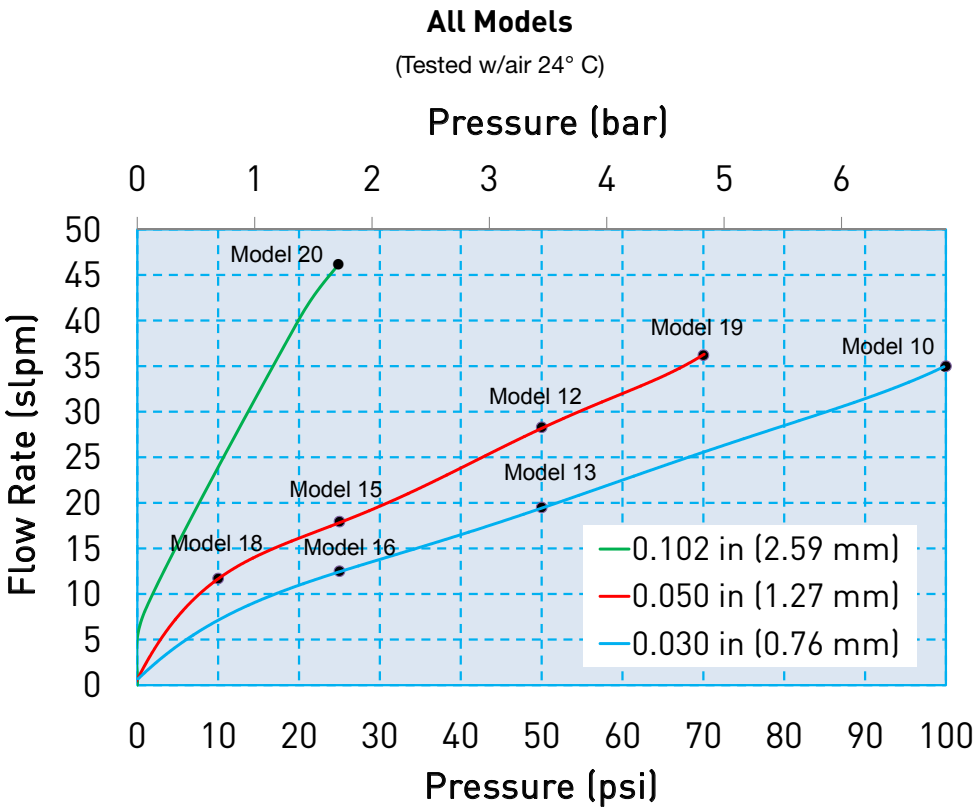
Pressure:
0 to 100 psig (6.9 bar)

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

Orifice Sizes:
0.030" (0.76 mm)
0.050" (1.27 mm)
0.102" (2.59 mm)

Series 11 Miniature Pneumatic Solenoid Valve

Typical Flow Curve



All models reflect typical flow output capability based on rated pressure

Pressure and Flow Capabilities/Life Requirements

Model No.	Orifice Size	Nominal Cv	Maximum Supply Pressure	Leak Rate (Air)	Power Consumption	Elastomer	Life Requirements (millions of cycles)*
10	0.030 in (0.76 mm)	0.017	100 psi (6.89 bar)	<0.016 sccm	2 Watts	FKM	100
						EPDM	20
12	0.050 in (1.27 mm)	0.031	50 psi (3.45 bar)	<0.016 sccm	2 Watts	FKM	100
						EPDM	20
13	0.030 in (0.76 mm)	0.017	50 psi (3.45 bar)	<0.016 sccm	1 Watt	FKM	200
						EPDM	40
15	0.050 in (1.27 mm)	0.025	25 psi (1.72 bar)	<0.016 sccm	1 Watt	FKM	200
						EPDM	40
16	0.030 in (0.76 mm)	0.017	25 psi (1.72 bar)	<0.016 sccm	0.5 Watt	FKM	260
						EPDM	60
18	0.050 in (1.27 mm)	0.021	10 psi (0.69 bar)	<0.016 sccm	0.5 Watt	FKM	260
						EPDM	60
19	0.050 in (1.27 mm)	0.025	70 psi (4.83 bar)	<0.016 sccm	2 Watts	FKM	20
						EPDM	16
20	0.102 in (2.59 mm)	0.069	25 psi (1.72 bar)	<0.1 sccm	1 Watt	FKM	25

*Life is dependent upon elastomeric material, duty cycle and pressures

For custom requirements please contact Applications Engineering at 603-595-1500 or ppfinfo@parker.com

Series 11 Miniature Pneumatic Solenoid Valve

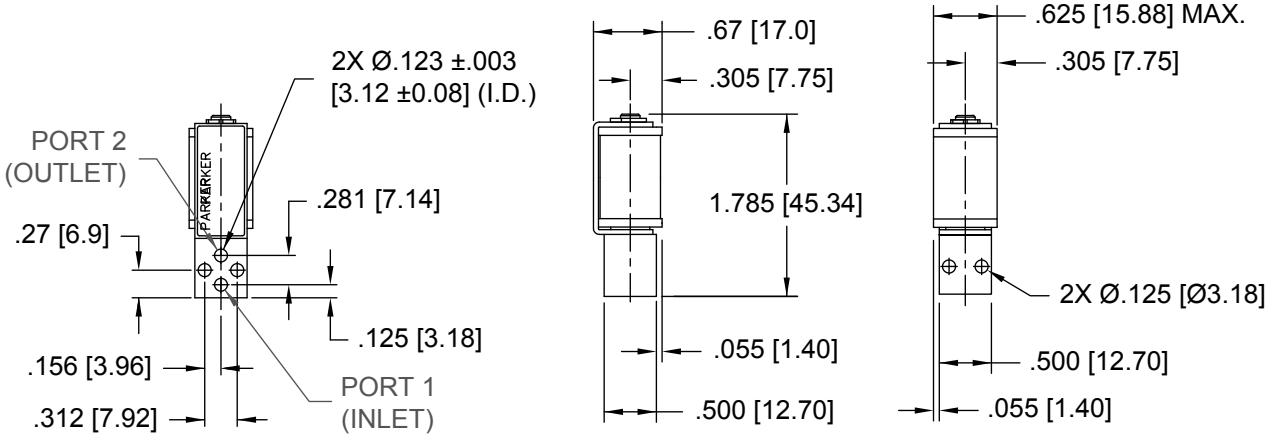
Pneumatic Interface

Manifold Mount

Mechanical Integration

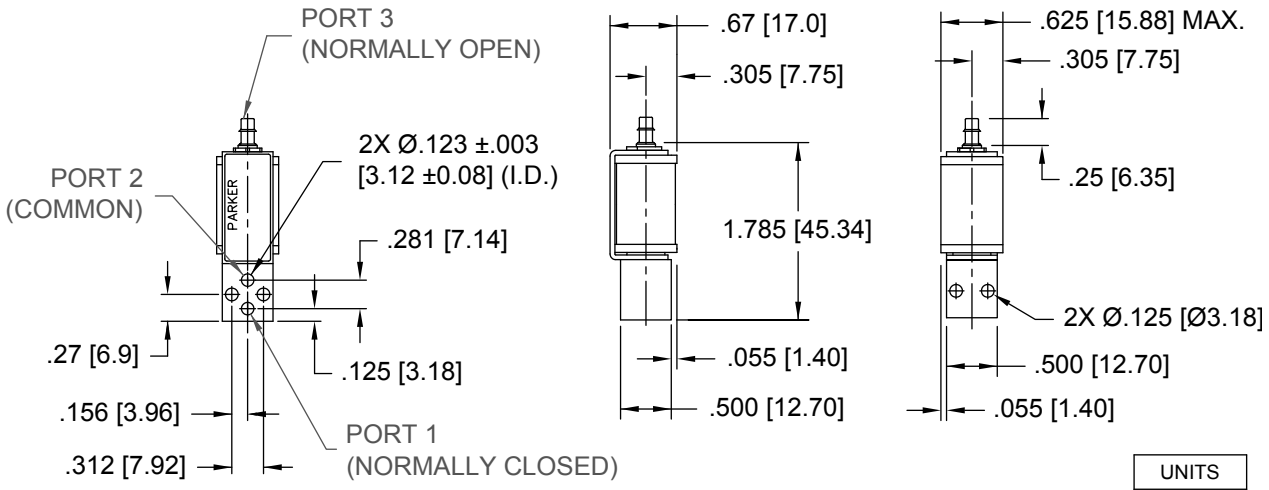
Dimensions

Basic Dimensions, 2-Way Valve Configuration



UNITS
IN. [mm.]

Basic Dimensions, 3-Way Valve Configuration



UNITS
IN. [mm.]

Series 11 Miniature Pneumatic Solenoid Valve

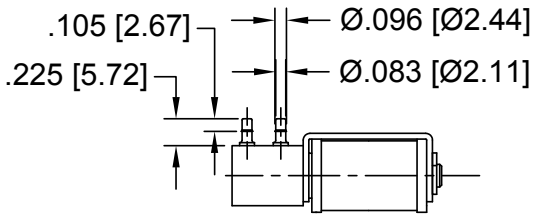
Pneumatic Interface

Barbed

Barb Options

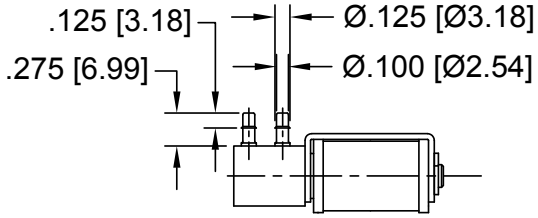
1/16" (1.5 mm) Barbs

(For 1/16" (1.5 mm) I.D. Tubing)



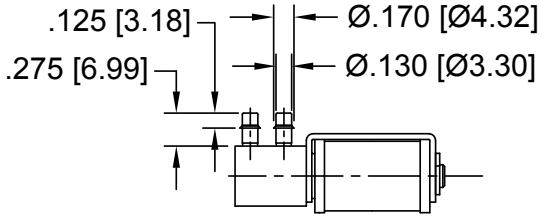
5/64" (2 mm) Barbs

(For 5/64" (2 mm) I.D. Tubing)



1/8" (3 mm) Barbs

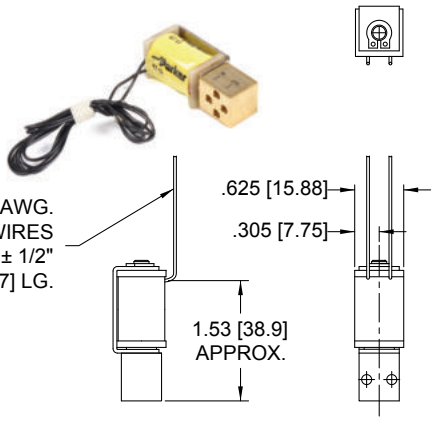
(For 1/8" (3 mm) I.D. Tubing)



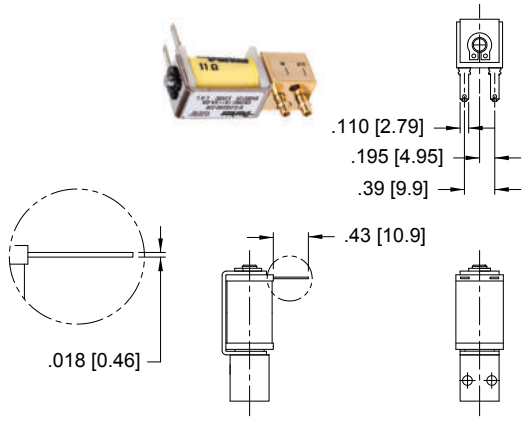
Series 11 Miniature Pneumatic Solenoid Valve

Electrical Interface

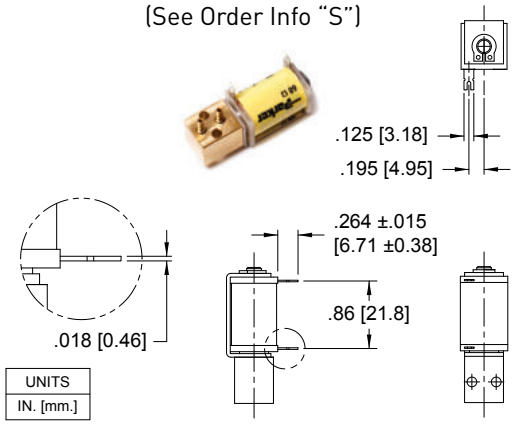
Coil Type: Wire Leads
(See Order Info "F")



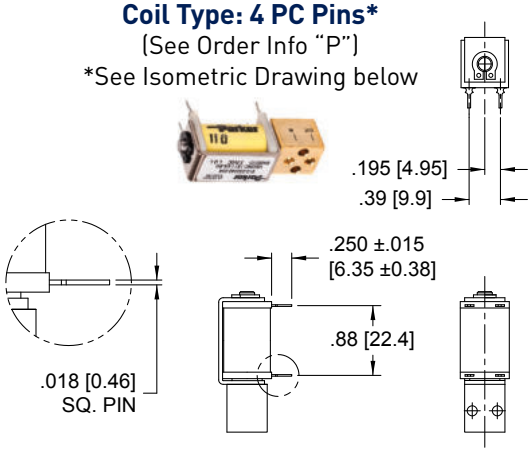
Coil Type: Quick Connect Spade
(See Order Info "Q")



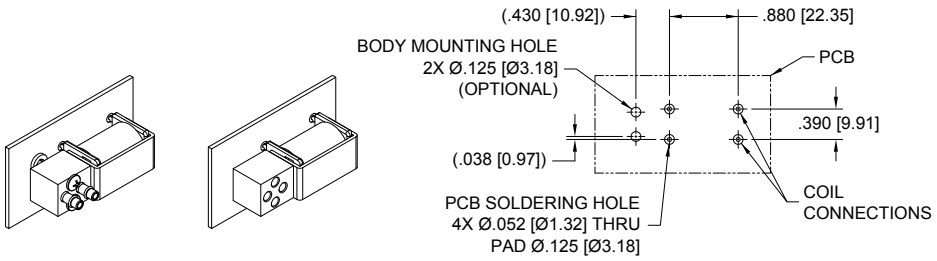
Coil Type: Solder Tab
(See Order Info "S")



Coil Type: 4 PC Pins*
(See Order Info "P")
*See Isometric Drawing below



*4 PC PIN PCB Interface

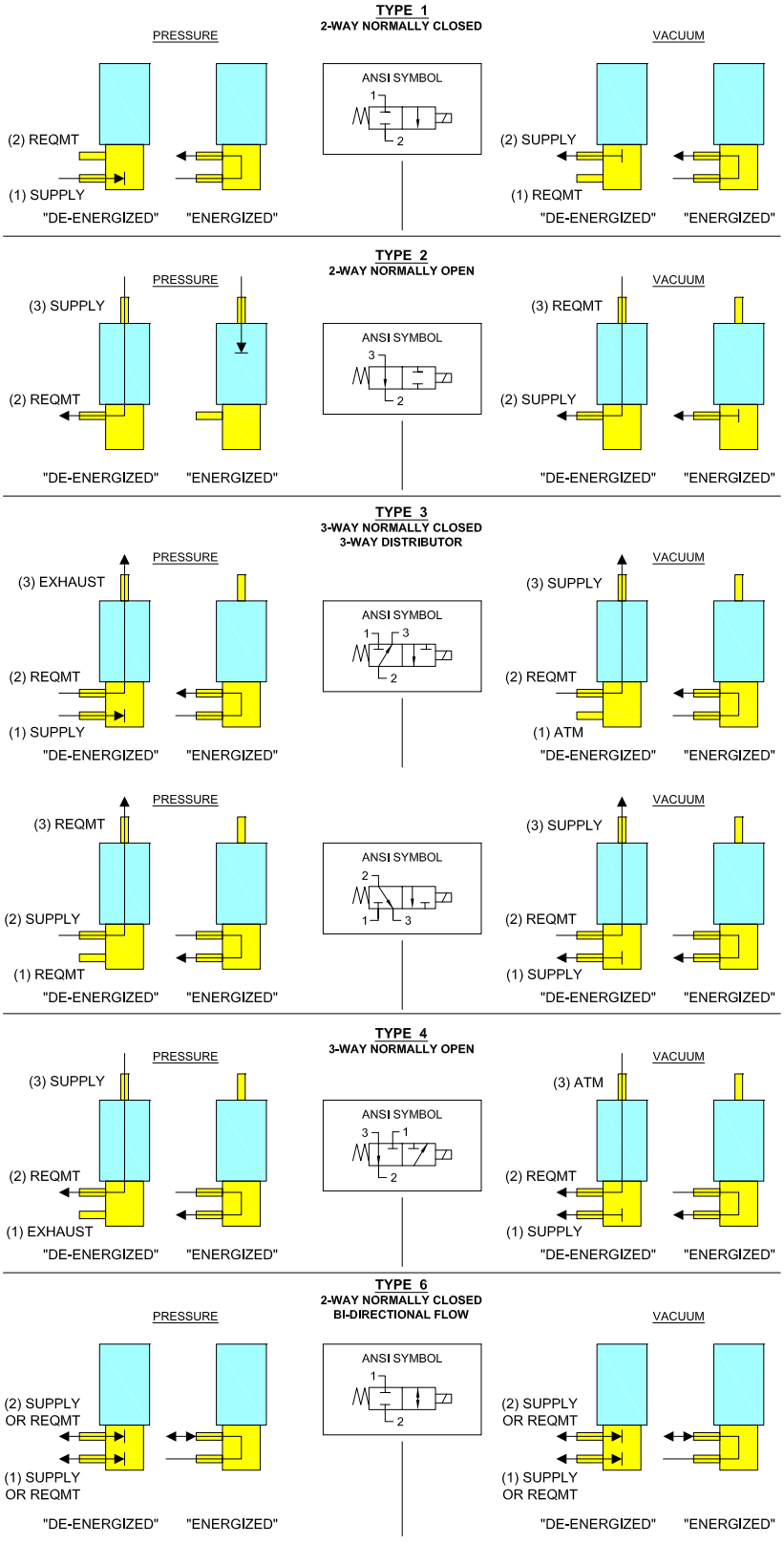


Series 11 Miniature Pneumatic Solenoid Valve

LEGEND:	
SUPPLY:	Pneumatic Source or Supply Pressure
EXHAUST:	Exhaust to Atmospheric Pressure
REQMT:	Customer Requirement or Application
ATM:	Atmospheric Pressure

ANSI Symbols

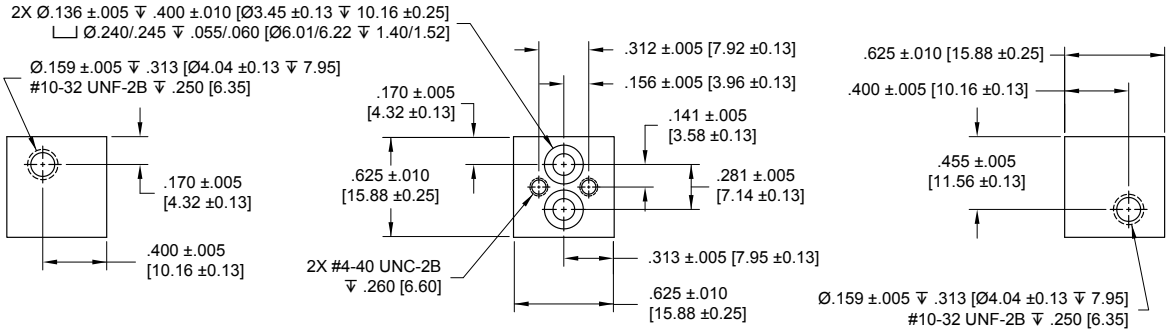
Pneumatic Schematics by Valve Types



Series 11 Miniature Pneumatic Solenoid Valve

Installation and Use

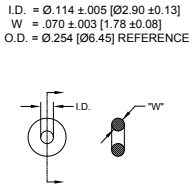
Manifold & O-Ring Dimensions & Design



Accessories

O-Ring (Manifold Seal) Dimensions

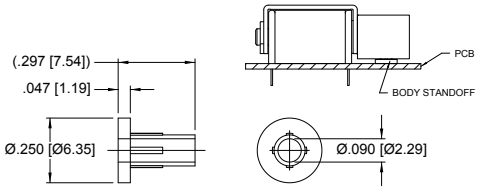
(see Accessories table below for part numbers)



Body Standoff

890-000027-001

(2 required for each valve)



Screw 4-40 x 1/2" Pan Head

191-000100-208

(2 required for each valve)

Ordering Information

Sample Part ID	11	10	3	BV	12	P	7	7
Description	**Series**	**Model Number Pressure / Orifice / Power**	**Type**	**Material XX: Body / Poppet & Seal**	**Voltage**	**Electrical Coil Connection**	**Pneumatic Connection Body**	**Pneumatic Connection Stem**
Options	11	10: 0-100 psi / 0.030" / 2 Watts	1: 2-Way NC	BV: Brass / FKM [2]	5: 5 VDC	F: Wire Leads, 18", No Termination	0: Manifold Mount [3]	0: Manifold Mount [4]
		12: 0-50 psi / 0.050" / 2 Watts	2: 2-Way NO	SV: Stainless Steel / FKM	12: 12 VDC	P: PC Mount, 4 PC Pins	6: 1/16" (1.5 mm) Barbs	6: 1/16" (1.5 mm) Barbs [5]
		13: 0-50 psi / 0.030" / 1 Watt	3: 3-Way NC or Distributor	BE: Brass / EPDM	24: 24 VDC	S: PC Mount, 2 Solder Tabs	7: 5/64" (2 mm) Barbs	7: 5/64" (2 mm) Barbs
		15: 0-25 psi / 0.050" / 1 Watt	4: 3-Way NO			Q: Quick Connect Spade	8: 1/8" (3 mm) Barbs	8: 1/8" (3 mm) Barbs
		16: 0-25 psi / 0.030" / 0.5 Watt	6: 2-Way NC Universal [1]					
		18: 0-10 psi / 0.050" / 0.5 Watt						
		19: 0-70 psi / 0.050" / 2 Watts						
		20: 0-25 psi / 0.102" / 1 Watt						
			[1] Model 20 (0.102" orifice) only available in 2-Way NC Universal configuration	[2] Model 20 (0.102" orifice) only available in Brass/FKM configuration			[3] Model 20 (0.102" orifice) only available in manifold mount body	[4] Type 1 and 6 configurations only [5] Not available on Models 12, 15, 18 and 19 (0.050" orifice)

Accessories	
190-007024-001: O-ring, Buna-N*	* Used as a seal between the manifold and valve body
190-007024-002: O-ring, FKM *	** Used to create a flush mount between the coil and valve body
890-000027-001: Body Standoff **	
191-000115-010: Screw, 4-40 x 5/8" Pan Head, Phillips	

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/s11) to configure your Series 11 Miniature Pneumatic Solenoid Valve. For more detailed information, visit us on the Web, or call and refer to Performance Spec. #790-002075-001 and #790-002407-001 (Model 20 only) and Drawing #890-003016-001.

Series 25 Miniature Pneumatic Solenoid Valve

15 mm Solenoid Valve

The Series 25 miniature pneumatic solenoid valve is a robust and proven product with a reputation for reliable and consistent performance. The Series 25 miniature solenoid valve is the preferred choice of major OEM's in the medical and analytical market. With valve bodies made from nickel-plated brass and multiple pneumatic and electrical interface options, the Series 25 miniature solenoid valve is the ideal solution for general purpose applications and those applications requiring low out-gassing and a bubble-tight seal.

Typical Applications

- Oxygen Conservers and Concentrators
- Sieve Bed Switching
- Anesthesia Delivery
- Compression Therapy
- Gas Chromatography
- Insufflators
- Flow Control/Shut-off

Features

- Proven performance tested to 260 million life cycles
- Wide range of available electrical connections to simplify valve integration and control
- Manifold mount or barbed tube pneumatic configurations available for added system design flexibility
- Available Analytical and Oxygen Service Clean to minimize contamination
- RoHS compliant

Product Specifications

Mechanical

Valve Type:
2/3 Port, Direct-acting poppet style
- Normally Closed (NC)
- Normally Open (NO)
- Distributor

Media:
Air, argon, helium, hydrogen, methane, nitrogen, oxygen, & other non-reacting gasses

Operating Environment:
32 to 158°F (0 to 70°C)

Storage Temperature:
-40 to 158°F (-40 to 70°C)

Dimensions:
- Length: 1.73 in (43.9 mm)
- Width: 0.63 in (15.8 mm)
- Height: 0.67 in (17.0 mm)

Weight:
2.1 oz (60 g)

Internal Volume:
0.026 in^3 (0.426 cm^3)

Filtration:
40 micron (recommended)

Oxygen Clean:
Call For Details

Electrical

Power Options:
0.5, 1.0 or 2.0 Watts

Voltage Options:
5, 12 or 24 VDC
Further power reduction may be achieved through the use of spike and hold or PWM electrical control.

Electrical Connections:
Wire Leads, PC Pins, Solder Tabs, Quick Disconnect Spade

Wetted Materials

Body:
36000 HO2 Brass, Nickel Plated

Stem Base:
36000 HO2 Brass;

Poppet Options:
FKM

All Others:
430 FR Series Stainless Steel
302 Series Stainless Steel
36000 HO2 Brass, Nickel Plated

Performance Characteristics

Leak Rate:
<0.016 sccm of air (bubble tight)

Response:
<30 ms cycling

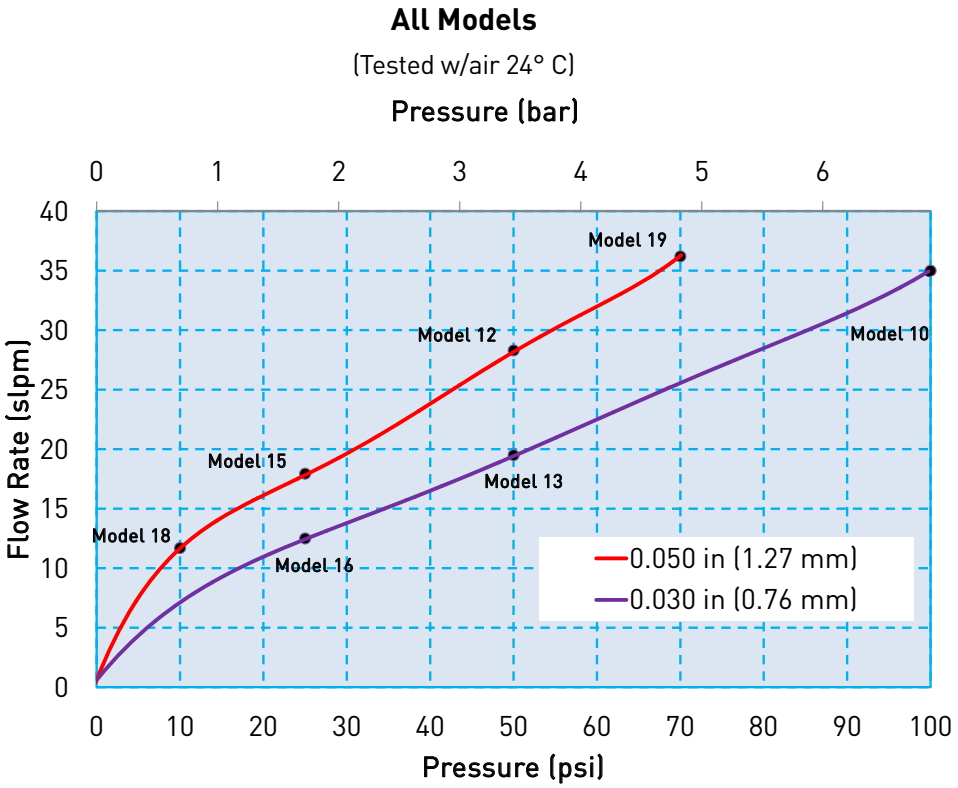
Pressure:
0 to 100 psig (6.9 bar)

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

Orifice Sizes:
0.030" (0.76 mm)
0.050" (1.27 mm)

Series 25 Miniature Pneumatic Solenoid Valve

Typical Flow Curve



All models reflect typical flow output capability based on rated pressure

Pressure and Flow Capabilities/Life Requirements

Model No.	Orifice Size	Nominal Cv	Maximum Supply Pressure	Power Consumption	Elastomer	Life Requirements (millions of cycles*)
10	0.030 in (0.76 mm)	0.017	100 psig (6.9 bar)	2 Watts	FKM	100
12	0.050 in (1.27 mm)	0.031	50 psig (3.5 bar)	2 Watts	FKM	100
13	0.030 in (0.76 mm)	0.017	50 psig (3.5 bar)	1 Watt	FKM	200
15	0.050 in (1.27 mm)	0.025	25 psig (1.7 bar)	1 Watt	FKM	200
16	0.030 in (0.76 mm)	0.017	25 psig (1.7 bar)	0.5 Watt	FKM	260
18	0.050 in (1.27 mm)	0.021	10 psig (0.7 bar)	0.5 Watt	FKM	260
19	0.050 in (1.27 mm)	0.025	70 psig (4.8 bar)	2 Watts	FKM	20

*Life is dependent upon elastomeric material, duty cycle and pressures

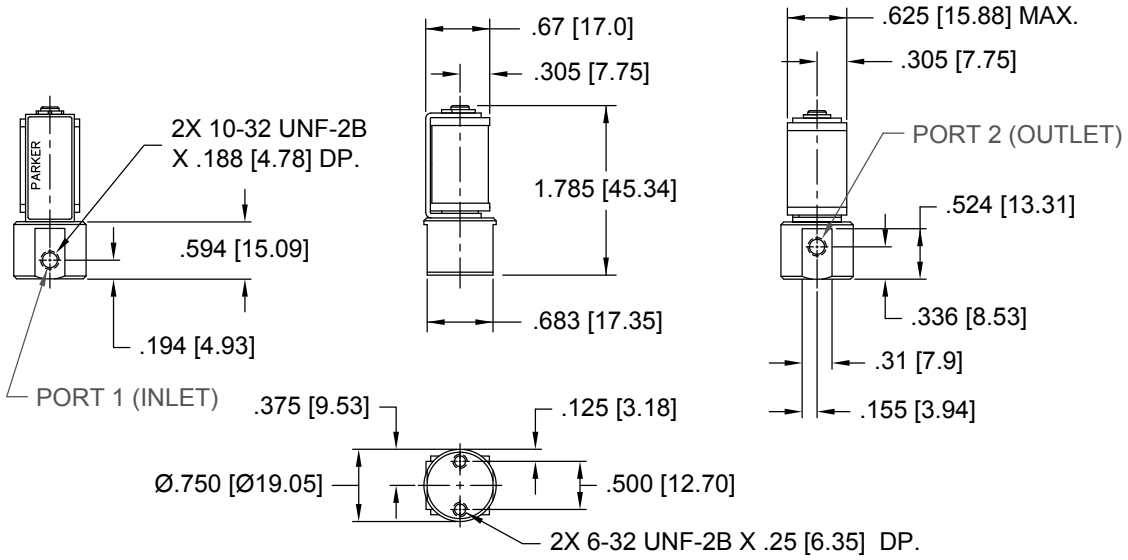
For custom requirements please contact Applications Engineering at 1-603-595-1500 or ppfinfo@parker.com

Series 25 Miniature Pneumatic Solenoid Valve

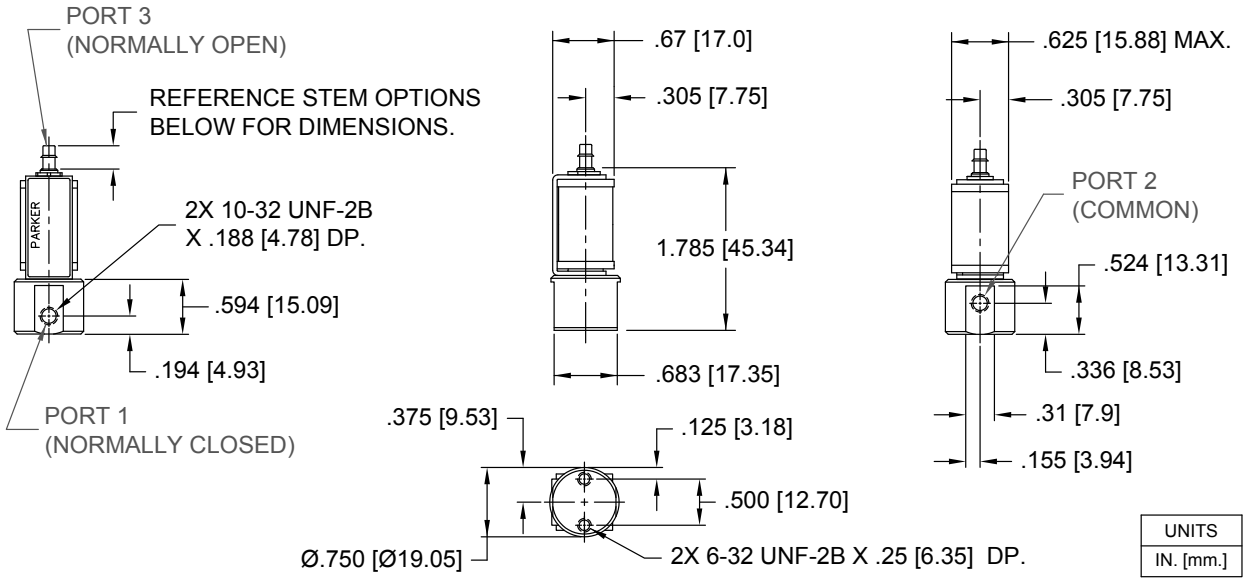
Mechanical Integration

Dimensions

Basic Dimensions, 2-Way Valve Configuration



Basic Dimensions, 3-Way Valve Configuration



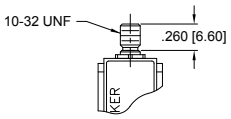
Series 25 Miniature Pneumatic Solenoid Valve

Mechanical Integration

Dimensions

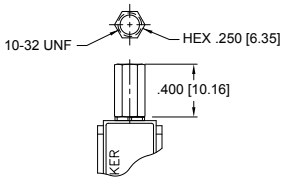
Stem Options

10-32, MALE THREAD
(OPTION #4)*



*Torque applied to #10-32 male fitting not to exceed 0.5 in-oz (3.5 mN-m). Use Loctite 290 or compatible liquid-curing fastener to secure mating fitting in place.

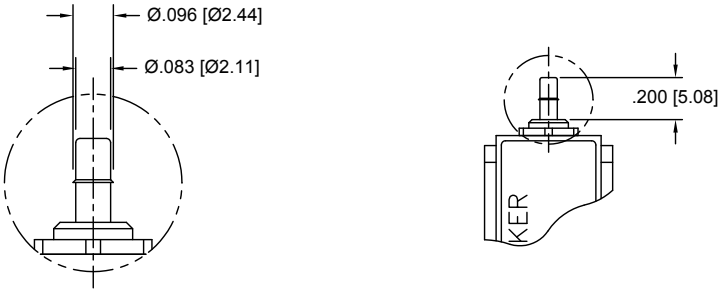
10-32, FEMALE THREAD
(OPTION #5)**



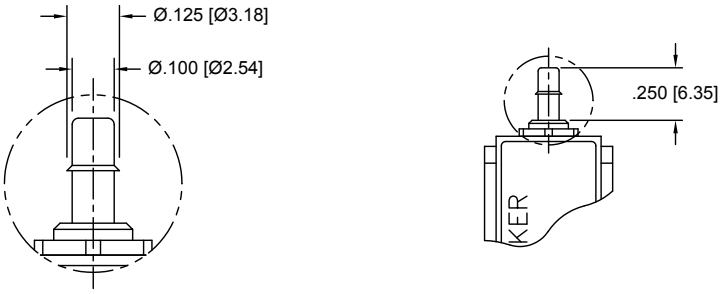
**Torque applied to #10-32 Female fitting not to exceed 0.5 in-oz (3.5 mN-m). Use 1/4 inch hex wrench to support the fitting when installing a mating, #10-32 male fitting.

Barb Options

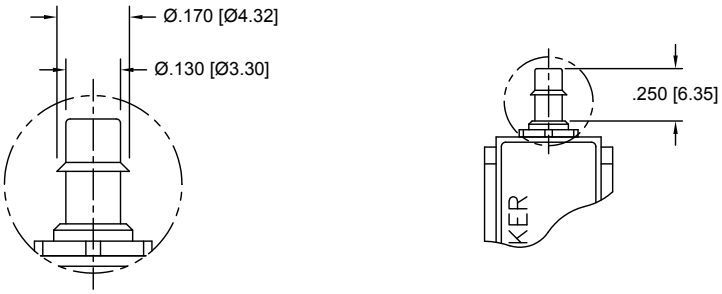
1/16" (1.5 mm) Barb
(For 1/16" (1.5 mm) I.D. Tubing)
(OPTION #6)



5/64" (2 mm) Barb
(For 5/64" (2 mm) I.D. Tubing)
(OPTION #7)



1/8" (3 mm) Barb
(For 1/8" (3 mm) I.D. Tubing)
(OPTION #8)

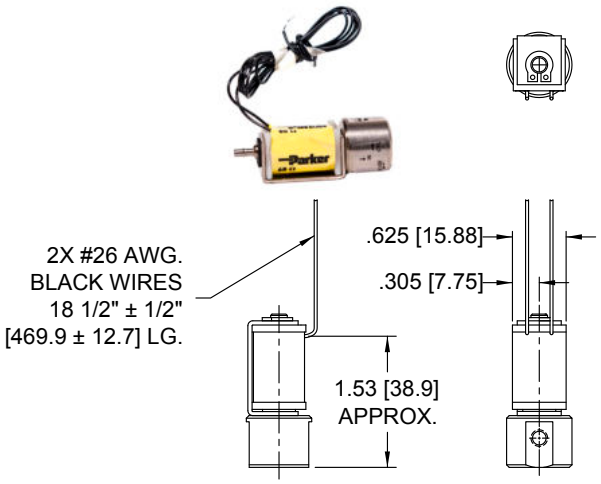


Series 25 Miniature Pneumatic Solenoid Valve

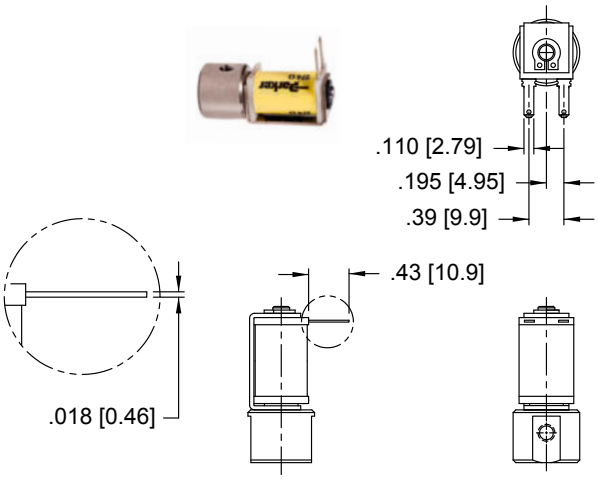
Electrical Interface

Coil Type: Wire Leads
(See Order Info "F")

COIL TYPE: WIRE LEADS

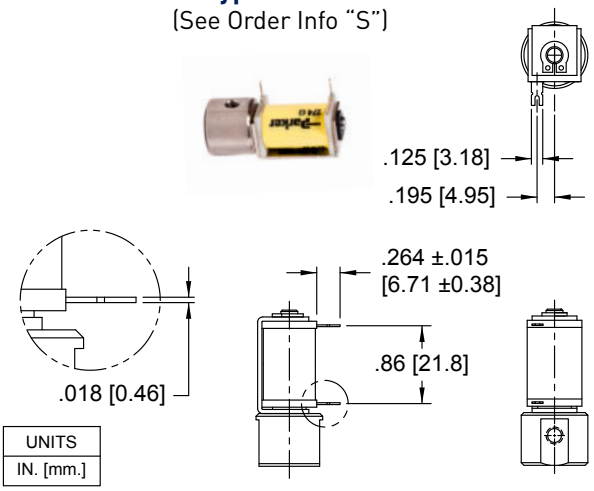


Coil Type: Quick Connect Spade
(See Order Info "Q")



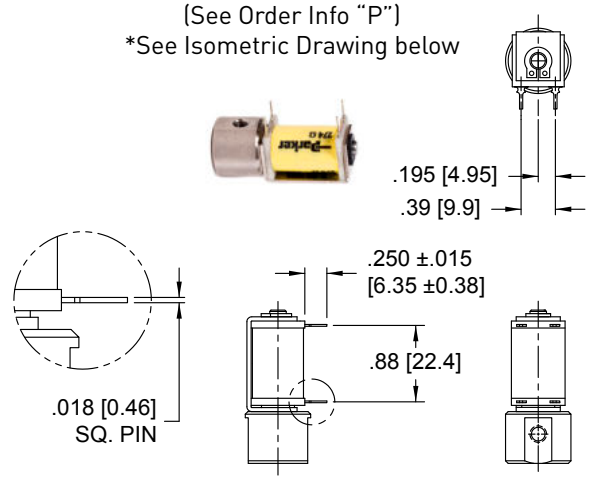
COIL TYPE: SOLDER TAB

Coil Type: Solder Tab
(See Order Info "S")

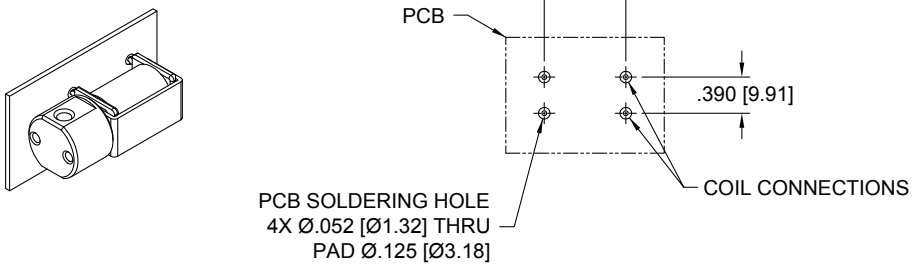


UNITS
IN. [mm.]

Coil Type: 4 PC Pins*
(See Order Info "P")
*See Isometric Drawing below



*4 PC PIN PCB Interface

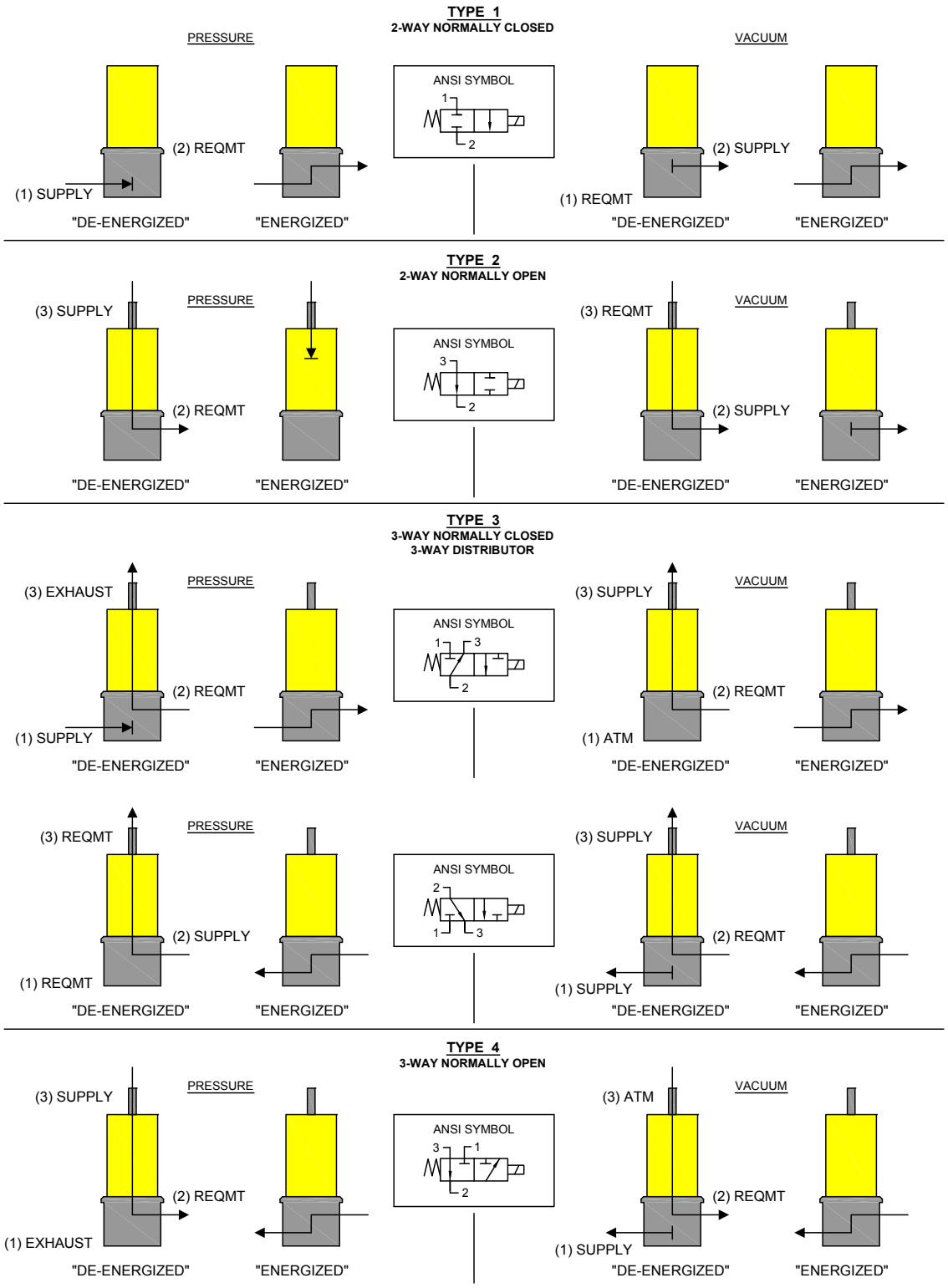


Series 25 Miniature Pneumatic Solenoid Valve

LEGEND:	
SUPPLY:	Pneumatic Source or Supply Pressure
EXHAUST:	Exhaust to Atmospheric Pressure
REQMT:	Customer Requirement or Application
ATM:	Atmospheric Pressure

ANSI Symbols

Pneumatic Schematics by Valve Types



Series 25 Miniature Pneumatic Solenoid Valve

Ordering Information

Sample Part ID	25	10	3	NV	12	P	5	7
Description	**Series**	**Model Number: Pressure / Orifice / Power**	**Type**	**Material XX: Body / Poppet & Seal**	**Voltage**	**Electrical Coil Selection**	**Pneumatic Connection Body**	**Pneumatic Connection Stem**
Options	25	10: 0-100 psi / 0.030" orifice / 2 Watts 12: 0-50 psi / 0.050" orifice / 2 Watts 13: 0-50 psi / 0.030" orifice / 1 Watt 15: 0-25 psi / 0.050" orifice / 1 Watt 16: 0-25 psi / 0.030" orifice / 0.5 Watt 18: 0-10 psi / 0.050" orifice / 0.5 Watt 19: 0-70 psi / 0.050" orifice / 2 Watts	1: 2-Way NC 2: 2-Way NO 3: 3-Way NC or Distributor 4: 3-Way NO	NV: Nickel-plated Brass / FKM	5: 5 VDC 12: 12 VDC 24: 24 VDC	F: Wire Leads, 18", No Termination P: PC Mount, 4 PC Pins S: PC Mount, 2 Solder Tabs Q: Quick Connect Spade	5: 10-32 Female	0: Manifold Mount (2-Way NC Only) 4: 10-32 Male 5: 10-32 Female 6: 1/16" (1.5mm) Barbs* 7: 5/64" (2 mm) Barbs 8: 1/8" (3 mm) Barbs *1/16" Barbs not available for 0.050" orifice valves

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/s11) to configure your Series 25 Miniature Pneumatic Solenoid Valve. For more detailed information, visit us on the Web,or call and refer to Performance Spec. #790-002075-001 and

Drawing #890-003016-001.

Series 26 Miniature Pneumatic Solenoid Valve

15 mm Solenoid Valve

The Series 26 miniature pneumatic solenoid valve is a robust and proven product with a reputation for reliable and consistent performance. The Series 26 miniature solenoid valve is the preferred choice of major OEM's in the medical and analytical market. With valve bodies made from nickel-plated brass and multiple pneumatic and electrical interface options, the Series 26 miniature solenoid valve is the ideal solution for general purpose applications and those applications requiring low out-gassing and a bubble-tight seal.

Typical Applications

- Oxygen Conservers and Concentrators
- Sieve Bed Switching
- Anesthesia Delivery
- Compression Therapy
- Gas Chromatography
- Insufflators
- Flow Control/Shut-off

Features

- Proven performance tested to 260 million life cycles
- Wide range of available electrical connections to simplify valve integration and control
- Manifold mount body interface simplifies the manifold design and eases valve installation
- Available Analytical and Oxygen Service Clean to minimize contamination
- RoHS compliant

Product Specifications

Mechanical

Valve Type:
2/3 Port, Direct-acting poppet style
- Normally Closed (NC)
- Normally Open (NO)
- Distributor

Media:
Air, argon, helium, hydrogen, methane, nitrogen, oxygen, & other non-reacting gasses

Operating Environment:
32 to 158°F (0 to 70°C)

Storage Temperature:
-40 to 158°F (-40 to 70°C)

Dimensions:
Length: 1.53 in (38.8 mm)
Diameter: 0.75 in (19.0 mm)

Weight:
2.1 oz (60 g)

Internal Volume:
0.026 in^3 (0.426 cm^3)

Filtration:
40 micron (recommended)

Oxygen Clean:
Call For Details

Electrical

Power Options:
0.5, 1.0 or 2.0 Watts

Voltage Options:
5, 12 or 24 VDC
Further power reduction may be achieved through the use of spike and hold or PWM electrical control.

Electrical Connections:
Wire Leads, PC Pins, Solder Tabs, Quick Disconnect Spade

Wetted Materials

Body:
36000 HO2 Brass, Nickel Plated

Stem Base:
36000 HO2 Brass;

Poppet Options:
FKM

All Others:
430 FR Series Stainless Steel
302 Series Stainless Steel
36000 HO2 Brass, Nickel Plated

Performance Characteristics

Leak Rate:
<0.016 sccm of air (bubble tight)

Response:
<30 ms cycling

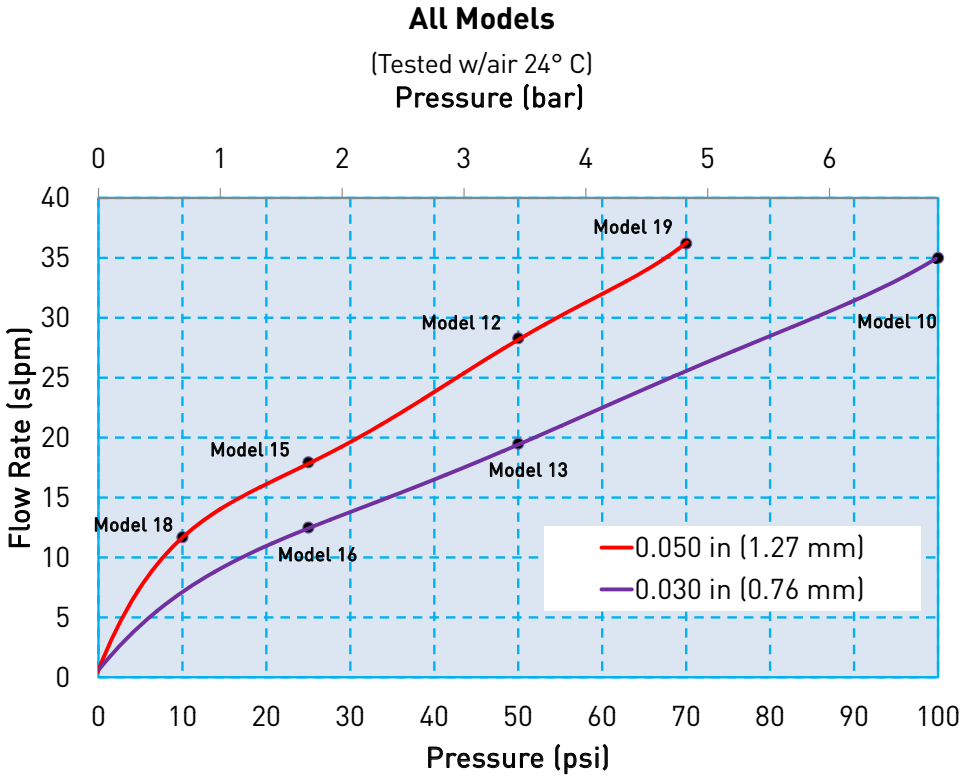
Pressure:
0 to 100 psig (6.9 bar)

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

Orifice Sizes:
0.030" (0.76 mm)
0.050" (1.27 mm)

Series 26 Miniature Pneumatic Solenoid Valve

Typical Flow Curve



All models reflect typical flow output capability based on rated pressure

Pressure and Flow Capabilities/Life Requirements

Model No.	Orifice Size	Nominal Cv	Maximum Supply Pressure	Power Consumption	Elastomer	Life Requirements (millions of cycles*)
10	0.030 in (0.76 mm)	0.017	100 psig (6.9 bar)	2 Watts	FKM	100
12	0.050 in (1.27 mm)	0.031	50 psig (3.5 bar)	2 Watts	FKM	100
13	0.030 in (0.76 mm)	0.017	50 psig (3.5 bar)	1 Watt	FKM	200
15	0.050 in (1.27 mm)	0.025	25 psig (1.7 bar)	1 Watt	FKM	200
16	0.030 in (0.76 mm)	0.017	25 psig (1.7 bar)	0.5 Watt	FKM	260
18	0.050 in (1.27 mm)	0.021	10 psig (0.7 bar)	0.5 Watt	FKM	260
19	0.050 in (1.27 mm)	0.025	70 psig (4.8 bar)	2 Watts	FKM	20

*Life is dependent upon elastomeric material, duty cycle and pressures

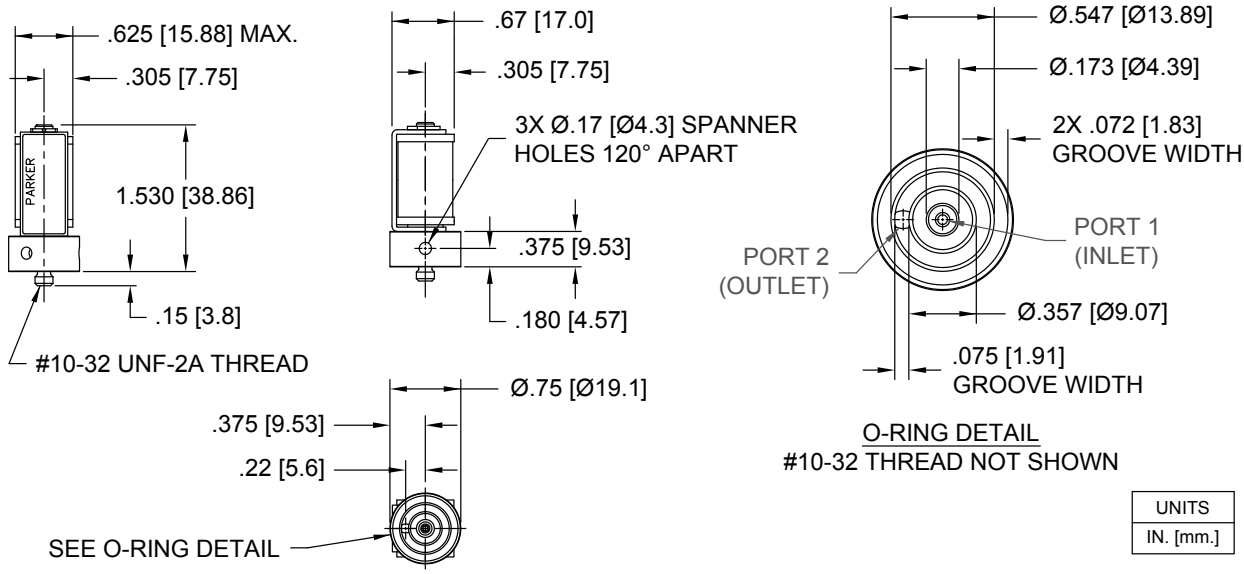
For custom requirements please contact Applications Engineering at 1-603-595-1500 or ppfinfo@parker.com

Series 26 Miniature Pneumatic Solenoid Valve

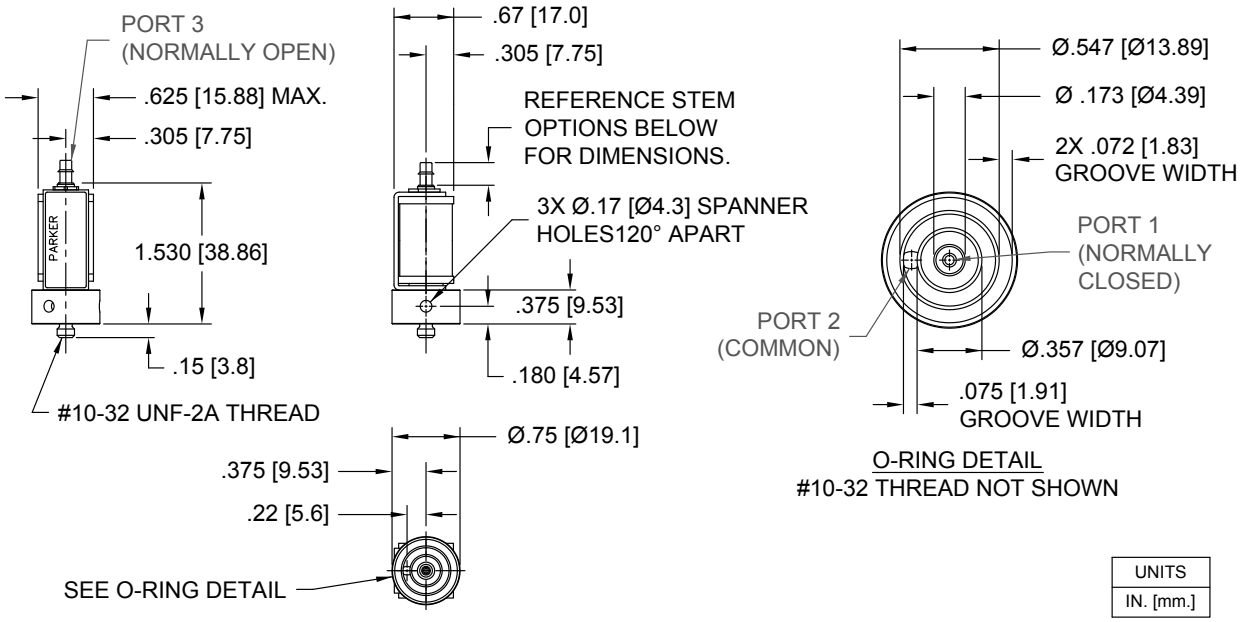
Mechanical Integration

Dimensions

Basic Dimensions, 2-Way Valve Configuration



Basic Dimensions, 3-Way Valve Configuration



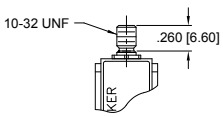
Series 26 Miniature Pneumatic Solenoid Valve

Mechanical Integration

Dimensions

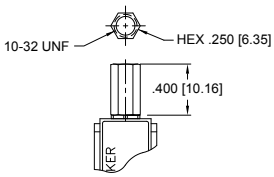
Stem Options

10-32, MALE THREAD
(OPTION #4)*



*Torque applied to #10-32 male fitting not to exceed 0.5 in-oz (3.5 mN-m). Use Loctite 290 or compatible liquid-curing fastener to secure mating fitting in place.

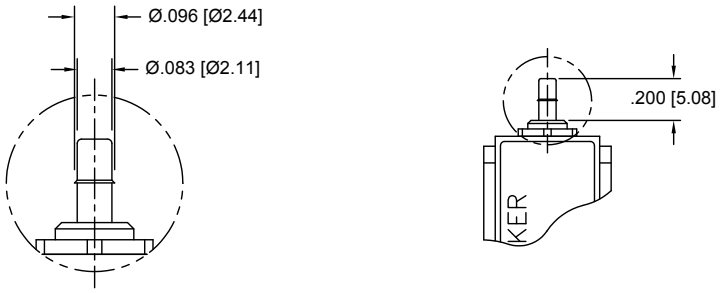
10-32, FEMALE THREAD
(OPTION #5)**



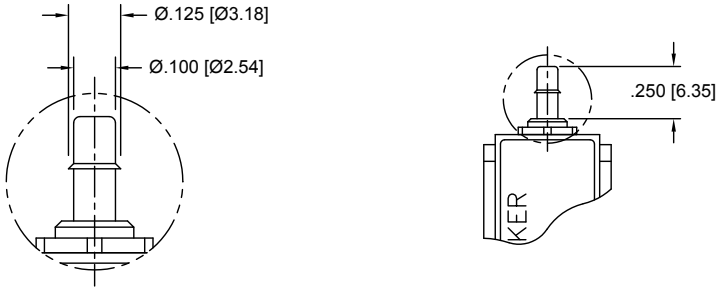
**Torque applied to #10-32 Female fitting not to exceed 0.5 in-oz (3.5 mN-m). Use 1/4 inch hex wrench to support the fitting when installing a mating, #10-32 male fitting.

Barb Options

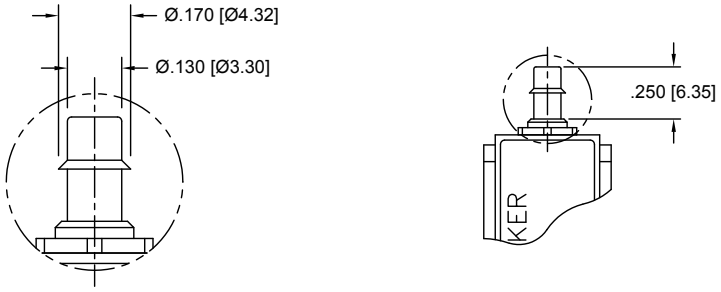
1/16" (1.5 mm) Barb
(For 1/16" (1.5 mm) I.D. Tubing)
(OPTION #6)



5/64" (2 mm) Barb
(For 5/64" (2 mm) I.D. Tubing)
(OPTION #7)



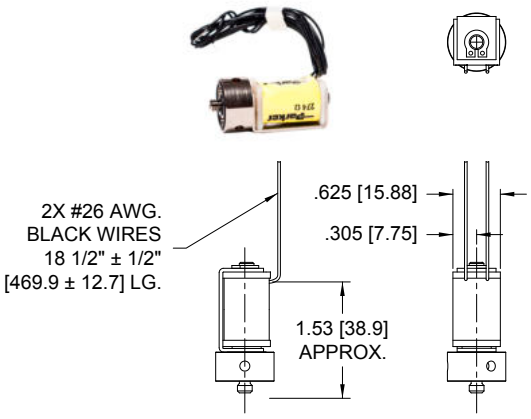
1/8" (3 mm) Barb
(For 1/8" (3 mm) I.D. Tubing)
(OPTION #8)



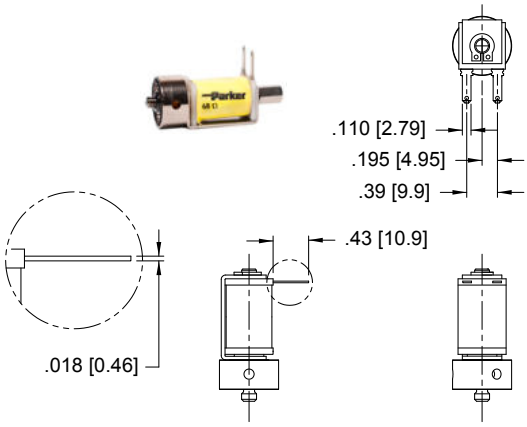
Series 26 Miniature Pneumatic Solenoid Valve

Electrical Interface

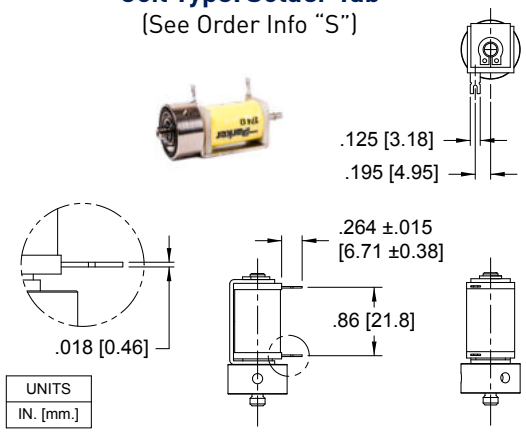
Coil Type: Wire Leads
(See Order Info "F")



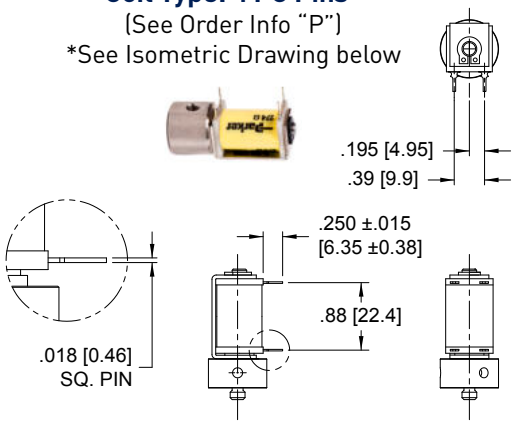
Coil Type: Quick Connect Spade
(See Order Info "Q")



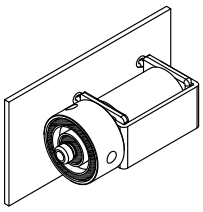
Coil Type: Solder Tab
(See Order Info "S")

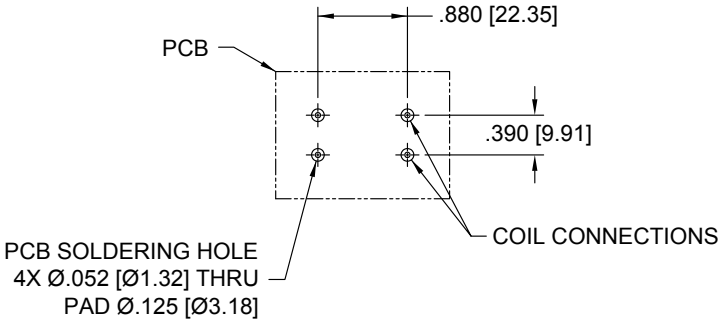


Coil Type: 4 PC Pins*
(See Order Info "P")
*See Isometric Drawing below



*4 PC PIN PCB Interface



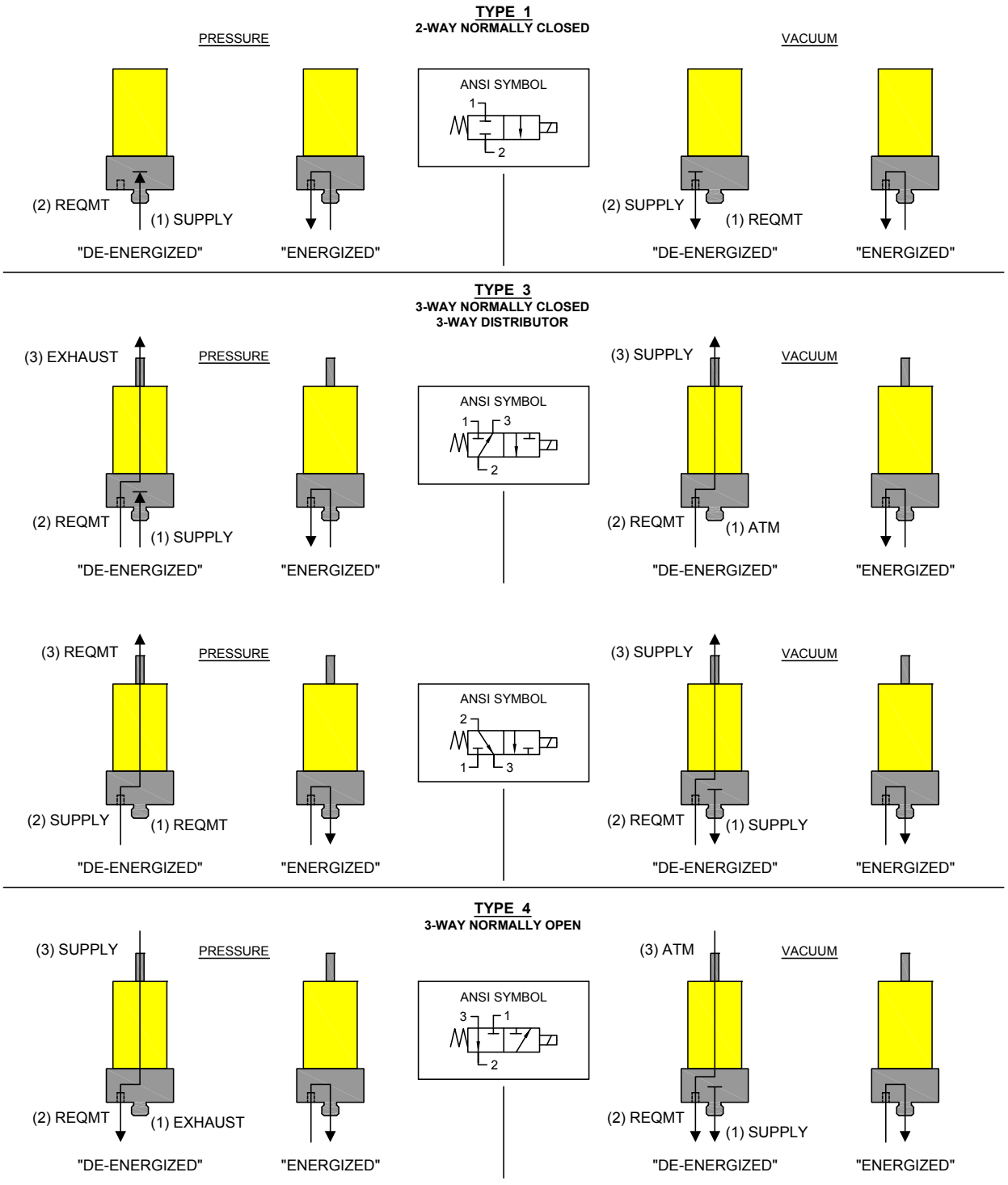


Series 26 Miniature Pneumatic Solenoid Valve

LEGEND:	
SUPPLY:	Pneumatic Source or Supply Pressure
EXHAUST:	Exhaust to Atmospheric Pressure
REQMT:	Customer Requirement or Application
ATM:	Atmospheric Pressure

ANSI Symbols

Pneumatic Schematics by Valve Types



Series 26 Miniature Pneumatic Solenoid Valve

Ordering Information

Sample Part ID	26	10	3	NV	12	P	4	7
Description	**Series**	**Model Number: Pressure / Orifice / Power**	**Type**	**Material**	**Voltage**	**Electrical Coil Selection**	**Pneumatic Connection Body**	**Pneumatic Connection Stem**
Options	26	10: 0-100 psig / 0.030" orifice / 2 Watts 12: 0-50 psig / 0.050" orifice / 2 Watts 13: 0-50 psig / 0.030" orifice / 1 Watt 15: 0-25 psig / 0.050" orifice / 1 Watt 16: 0-25 psig / 0.030" orifice / 0.5 Watt 18: 0-10 psig / 0.050" orifice / 0.5 Watt 19: 0-70 psig / 0.050" orifice / 2 Watts	1: 2-Way NC 3: 3-Way NC or Distributor 4: 3-Way NO	NV: Nickel-plated Brass/FKM	5: 5 VDC 12: 12 VDC 24: 24 VDC	F: Wire Leads, 18", No Termination P: PC Mount, 4 PC Pins S: PC Mount, 2 Solder Tabs Q: Quick Connect Spade	4: 10-32 Male	0: Manifold Mount (2-Way NC Only) 4: 10-32 Male 5: 10-32 Female 6: 1/16" (1.5 mm) Barbs* 7: 5/64" (2 mm) Barbs 8: 1/8" (3 mm) Barbs *1/16" Barbs not available for 0.050" orifice valves

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/s11) to configure your Series 26 Miniature Pneumatic Solenoid Valve. For more detailed information, visit us on the Web,or call and refer to Performance Spec. #790-002075-001 and

Drawing #890-003016-001.

V² Valve

Miniature Pneumatic Solenoid Valve

15 mm Pneumatic Solenoid Valve

The V² miniature pneumatic solenoid valve is a proven product with a reputation for reliable and consistent performance. Designed for medical device and system manufacturers, the V² miniature pneumatic solenoid valve is made from lightweight PBT plastic and provides flexible mounting and termination options. The V² miniature pneumatic solenoid valve also offers pneumatic and electrical design flexibility. It is available in manifold mount or 1/8" (3 mm) barbed tube configurations and is also available with either wire lead, quick connect spade or 4 pin printed circuit board electrical termination.

Typical Applications

- Oxygen Conservers
- Flow control/shut-off valve
- Portable Medical Devices

Features

- Lightweight PBT plastic body to reduce system weight
- Manifold mount or molded barbed fittings for added system design flexibility
- Printed circuit board mount, quick connect spade or wire lead coil termination to ease integration
- Proven performance tested to 25 million life cycles
- RoHS compliant

Product Specifications

Mechanical

Valve Type:
2/3 Port, Direct-acting poppet style - Normally Closed (NC) - Normally Open (NO) - Distributor (Dist)
Media:
Air, Oxygen, Helium, Nitrogen, Carbon Dioxide/Monoxide, & other non-reactive gases.
Operating Environment:
32 to 158°F (0 to 70°C)
Storage Temperature:
-40 to 158°F (-40 to 70°C)
Dimensions:
- Length: 1.73 in (43.9 mm) - Width: 0.63 in (15.9 mm) - Height: 0.67 in (17.0 mm)
Weight:
1.2 oz (34.3 g)
Internal Volume:
0.0009 in^3 (0.016 cm^3)
Filtration:
40 micron (recommended)

Electrical

Power Options:
0.5, 1.0, or 2.0 Watts
Voltage Options:
5, 12 or 24 VDC Further power reduction may be achieved through the use of spike and hold or PWM electrical control.

Wetted Materials

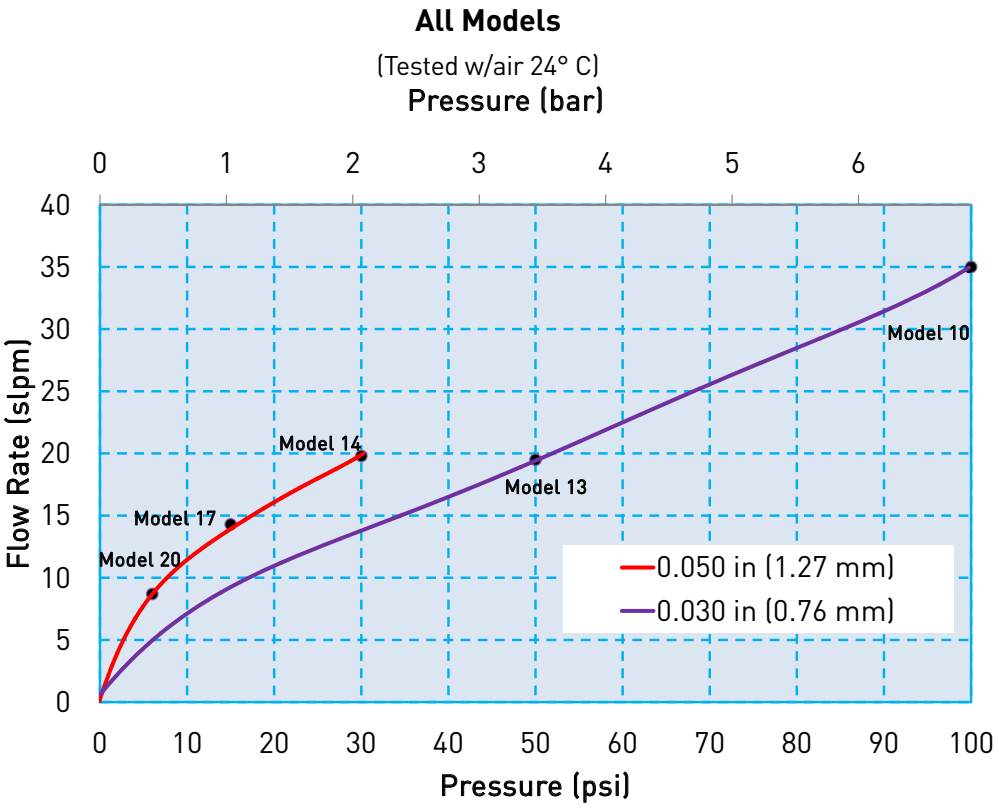
Body:
PBT
Stem Base:
36000 HO2 Brass
All Others:
FKM 430 FR Series Stainless Steel 302 Series Stainless Steel

Performance Characteristics

Leak Rate (Air):
≤0.2 sccm
Response:
<30 ms cycling
Pressure:
0 to 100 psig (6.89 bar)
Vacuum:
0-27 in Hg (686 mm Hg)
Orifice Sizes:
0.030" (0.76 mm) 0.050" (1.27 mm)
Reliability:
Life cycle rating of 25 million (worst case tested, no performance degradation)

V² Valve Miniature Pneumatic Solenoid Valve

Typical Flow Curve



All models reflect typical flow output capability based on rated pressure

Pressure and Flow Capabilities

Model No.	Orifice Size	Nominal Cv	Maximum Supply Pressure	Power Consumption
10	0.030 in (0.76 mm)	0.017	100 psig (6.89 bar)	2 Watts
13	0.030 in (0.76 mm)	0.017	50 psig (3.45 bar)	1 Watt
14	0.050 in (1.27 mm)	0.034	30 psig (2.07 bar)	2 Watts
16	0.030 in (0.76 mm)	0.017	25 psig (1.72 bar)	0.5 Watt
17	0.050 in (1.27 mm)	0.032	15 psig (1.03 bar)	1 Watt
20	0.050 in (1.27 mm)	0.030	6 psig (0.41 bar)	0.5 Watt

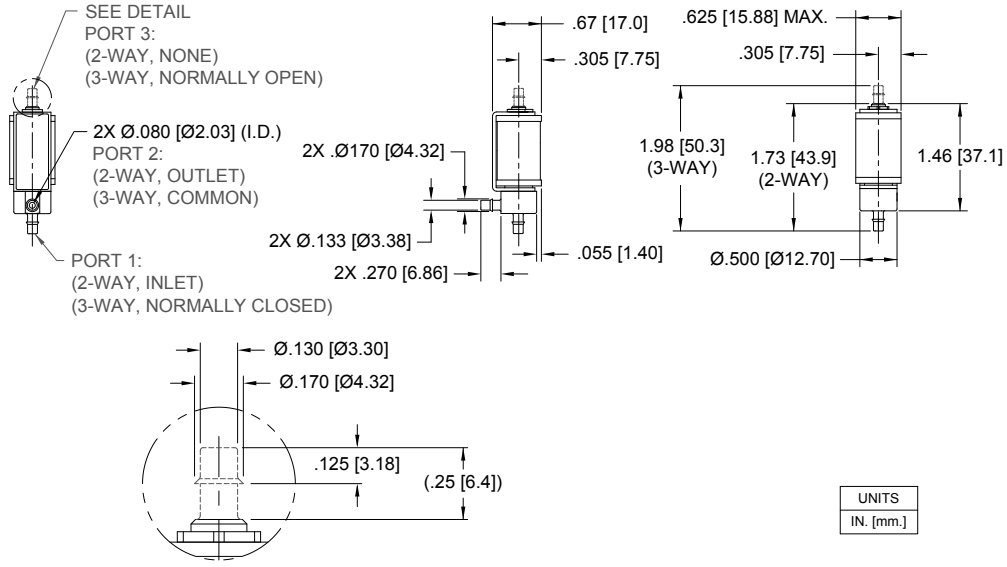
V² Valve Miniature Pneumatic Solenoid Valve

Mechanical Integration

Dimensions

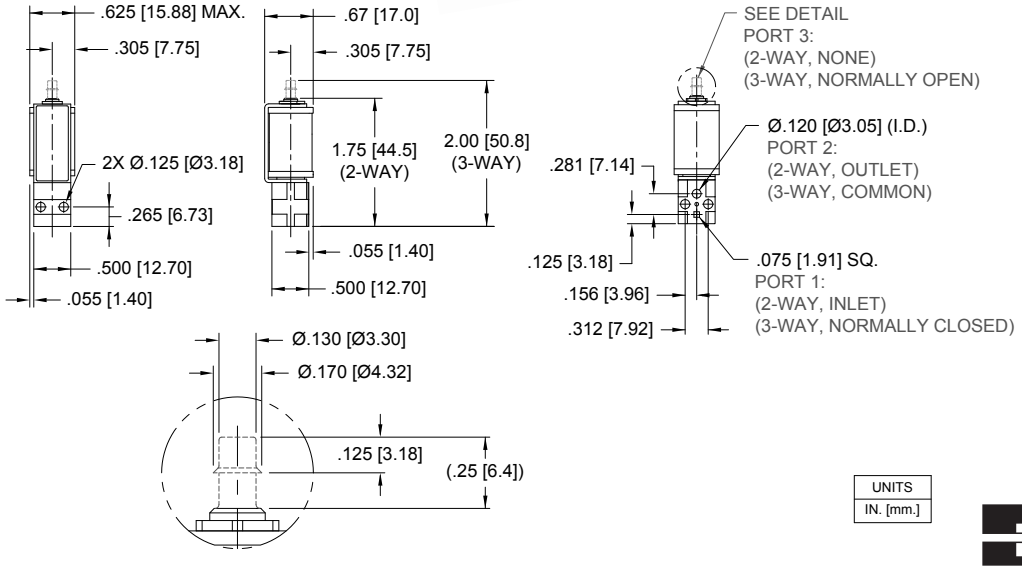
V² Basic Dimensions, Barbed Configuration

Barbed



V² Basic Dimensions, Manifold Mount Configuration

Manifold Mount

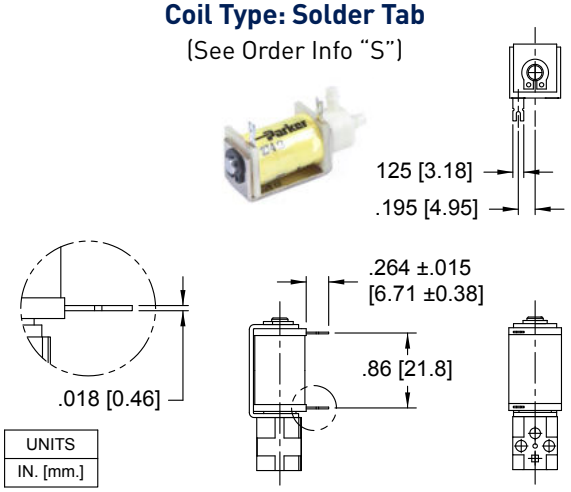


V² Valve Miniature Pneumatic Solenoid Valve

Electrical Interface

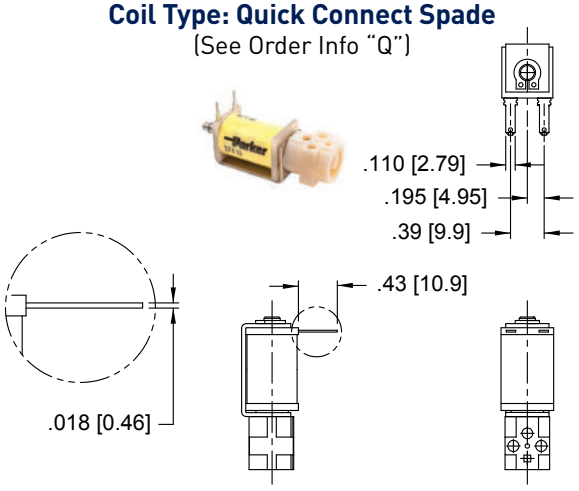
Coil Type: Solder Tab

(See Order Info "S")



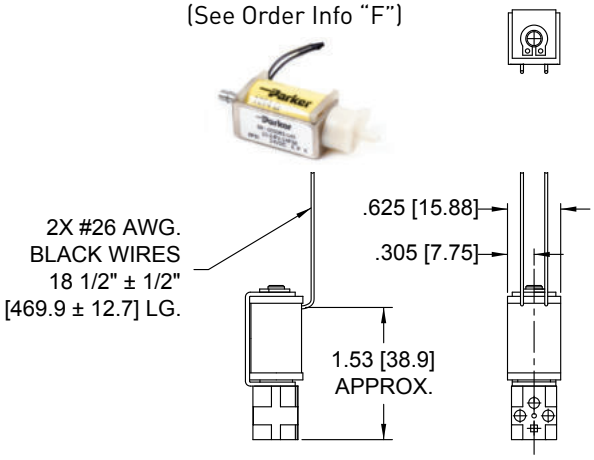
Coil Type: Quick Connect Spade

(See Order Info "Q")



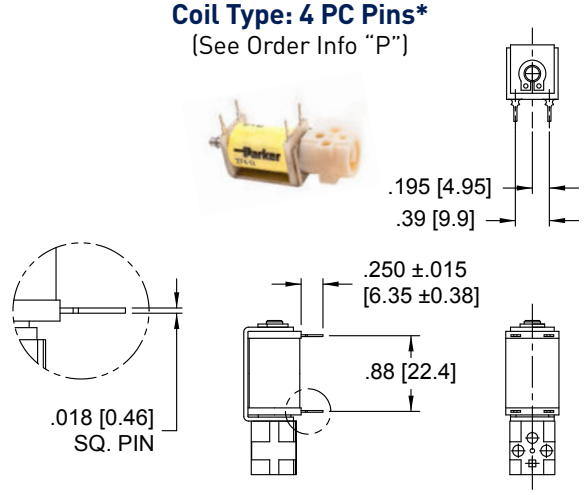
Coil Type: Wire Leads

(See Order Info "F")

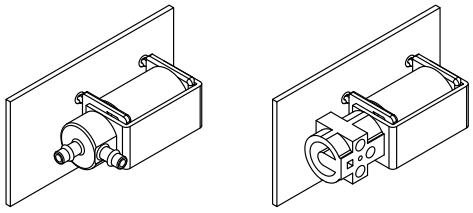


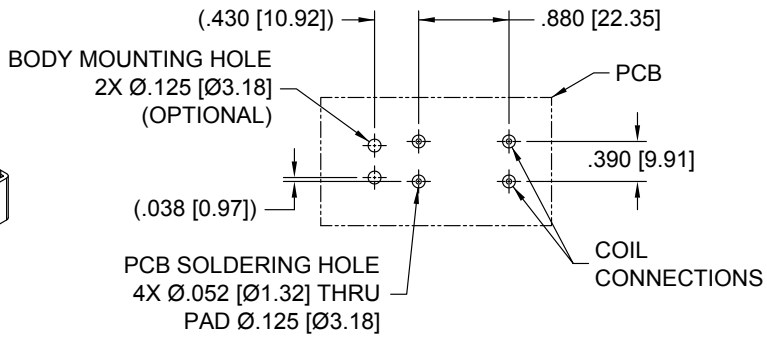
Coil Type: 4 PC Pins*

(See Order Info "P")



*PCB Pin Layout (Coil Type 4 PC Pin)



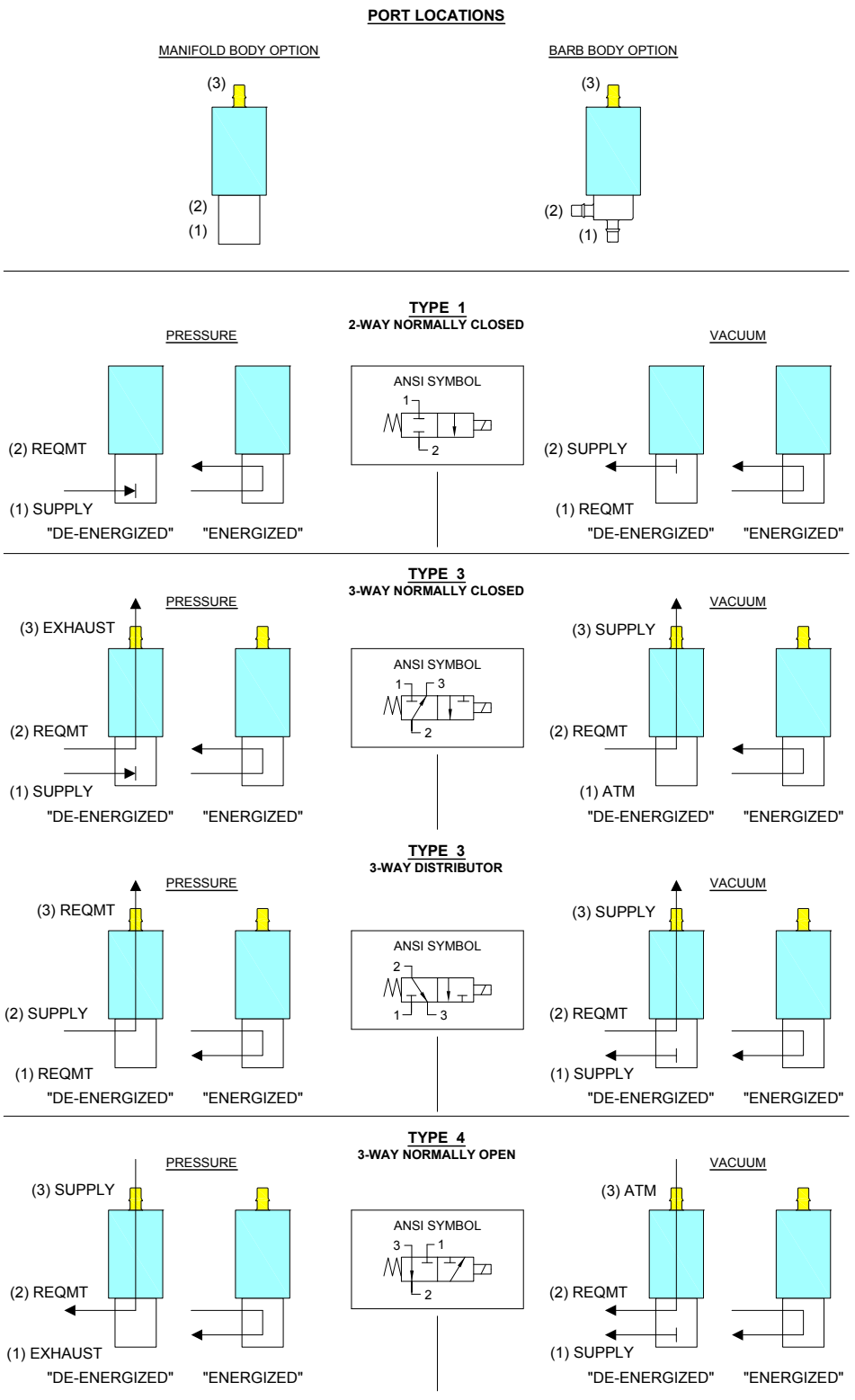


V² Valve Miniature Pneumatic Solenoid Valve

LEGEND:	
SUPPLY:	Pneumatic Source or Supply Pressure
EXHAUST:	Exhaust to Atmospheric Pressure
REQMT:	Customer Requirement or Application
ATM:	Atmospheric Pressure

ANSI Symbols

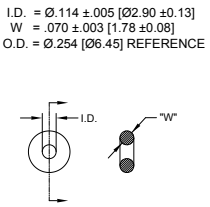
Pneumatic Schematics by Valve Types



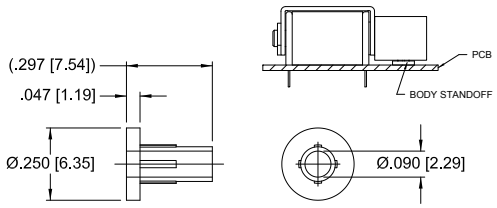
V² Valve Miniature Pneumatic Solenoid Valve

Accessories

O-Ring (Manifold Seal) Dimensions
190-007024-002
(2 required for each valve)



Body Standoff
890-000027-001
(2 required for each valve)



Screw 4-40 x 5/8" Pan Head
191-000115-010
(2 required for each valve)

Ordering Information

Sample Part ID	V2	14	3	PV	12	P	8	8
Description	**Series**	**Model Number: Pressure / Orifice / Power**	**Type**	**Material XX: Body / Poppet Seal**	**Voltage**	**Coil Type**	**Body Styles**	**Topseat Barbs**
Options	V2	10: 0-100 psi / 0.030" orifice / 2 Watts	1: 2-Way NC	PV: Plastic / FKM	5: 5 VDC	F: Wire Leads, 18", No Termination	0: Manifold Mount	0: None (2-Way NC Only)
		13: 0-50 psi / 0.030" orifice / 1 Watt	3: 3-Way NC or Distributor		12: 12 VDC	P: PC Mount, 4 PC Pins	8: 1/8" (3 mm) Barbs	8: 1/8" (3 mm) Barbs
		14: 0-30 psi / 0.050" orifice / 2 Watts	4: 3-Way NO		24: 24 VDC	S: PC Mount, 2 Solder Tabs		
		16: 0-25 psi / 0.030" orifice / 0.5 Watt				Q: Quick Connect Spade		
		17: 0-15 psi / 0.050" orifice / 1 Watt						
		20: 0-6 psi / 0.050" orifice / 0.5 Watt						

Accessories	
191-000115-010: Screw 4-40 x 5/8" Pan Head, Phillips	
890-000027-001: Body Standoff	Used to create a flush mount between coil and valve body
190-007024-002: O-ring, FKM	Used as seal between manifold and valve body

ORDER ON-LINE

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/v2) to configure your V² Miniature Pneumatic Solenoid Valve. For more detailed information, visit us on the Web, or call and refer

to Performance Spec. #790-002156-001 and Drawing #890-003080-001.

Series 9

Miniature High Speed and Pressure Gas Control Valve

2-Way and 3-Way Solenoid Valve

Series 9 solenoid valves offer outstanding potential for precision control in gas analysis. Combining high speed, ultra low leak rate, high flow, and high temperature capability in a small size; this rugged valve operates with extreme repeatability and is constructed of non-corroding, passivated stainless steel.

Features

- Smallest footprint in its class
- 100% duty cycle in environmental temperatures of up to (105°C)
- High speed response times of less than 6 ms eliminate delays in the system
- 100% tested to leak-tight 1 x 108 atm cc/sec Helium
- Pressures up to 1,250 PSI (86.2 bar)
- Available with a variety of fittings, orifices, seals, and voltages to match your application
- Configurations available to handle corrosive gasses
- Hydrocarbon and Lubricant free
- RoHS compliant

Typical Applications

- Calibrant Gas Control for Mass Spectrometers
- Gas Chromatography
- Process Analysis of Gas
- High Pressure Gas Control

Product Specifications

Physical Properties

Valve Type:
Inert Non-Isolation Valve

Valve Configuration:
2-Way Normally Closed or 3-Way

Media:
Gasses
(also capable of handling liquid, for details see the Series 9 Liquid datasheet)

Operating Environment:
40 to 221°F (4 to 105°C)

Dimensions:
See pages 4, 5, 6 & 7

Porting:
A-LOK® compression fittings, 1/4-28, 1/8" FNPT

Weight:
3.1 oz (87.9 g)
[3-Way, 1/8" NPT Body Option]

Internal Volume (µL):
342.7 to 540.6
(Contact factory for details)

Electrical

Voltage (VDC):	12	24
Power (Watts):	12	12
Current (mA):	1000	500
Resistance (Ohm):	12	48

(Ω±5% @ 70°F, 21°C)

Connections:
12" Lead Wires Standard
24 AWG, PTFE Insulated
(Custom connectors are available)

Wetted Materials*

Seals:
FKM or FKM & Vespel®

Body:
316 Stainless Steel

All Others:
PTFE, Stainless Steel, FKM

Consult factory for other options

Performance Characteristics

Orifice Diameters/ Operating Pressure:
0.030" (0.76 mm) /
1x10^5 Torr -1250 psig (86.2 bar)
0.060" (1.52 mm) /
2-way
1x10^5 Torr - 250 psig (17.2 bar)
3-way
1x10^5 Torr - 100 psig (6.9 bar)
0.116" (2.95 mm) /
1x10^5 Torr - 100 psig (6.9 bar)

Proof Pressure:
1.5X rated pressure

Response Time:
<5 ms 0.030" (0.76 mm)
<5 ms 0.060" (1.52 mm)
<6 ms 0.116" (2.95 mm)

Leak Rate:
1 x 10^{-7} cc/sec/atm Helium

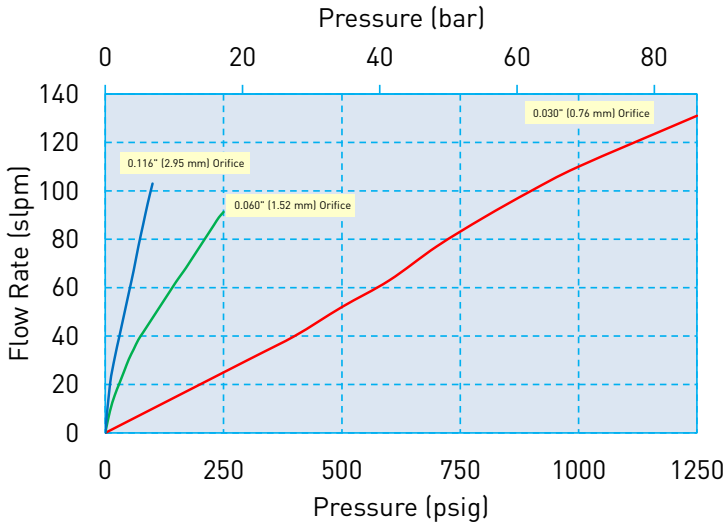
Recommended Filtration:
40 µm max

Series 9 Miniature High Speed and Pressure Gas Control Valve

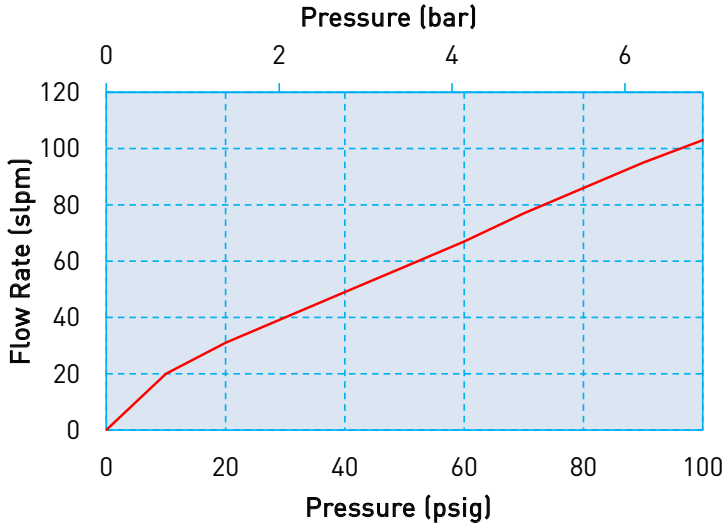
Typical Flow Curve

All Models

(Tested w/air 24° C)

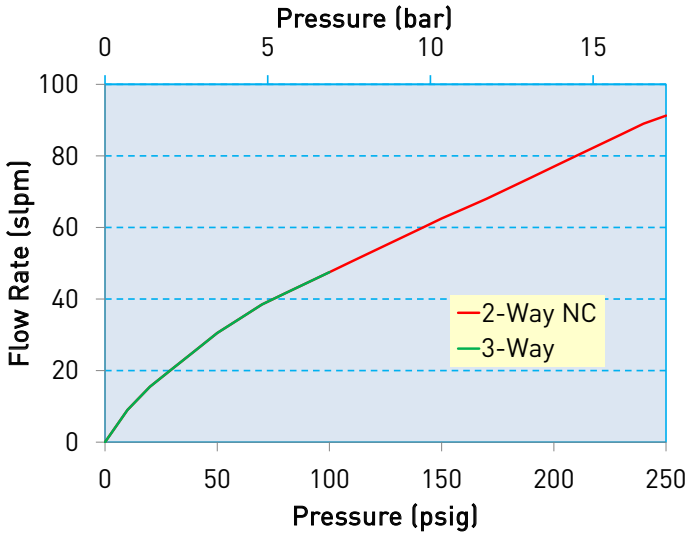


0.030" (0.76 mm) Orifice

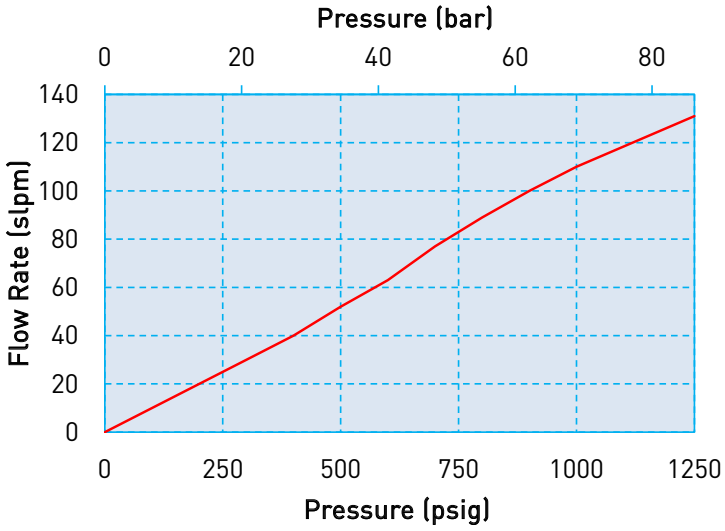


Series 9 Miniature High Speed and Pressure Gas Control Valve

0.060" (1.52 mm) Orifice

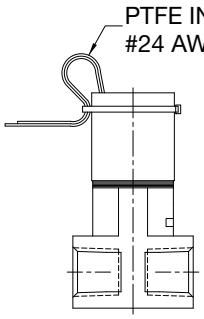


0.116" (2.95 mm) Orifice



Electrical Interface

Wire leads



UNITS
IN. [mm.]

Custom connections available upon request

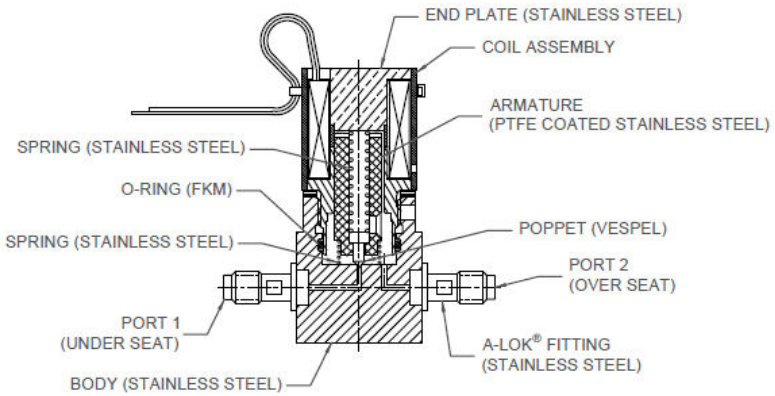
Series 9 Miniature High Speed and Pressure Gas Control Valve

Mechanical Integration

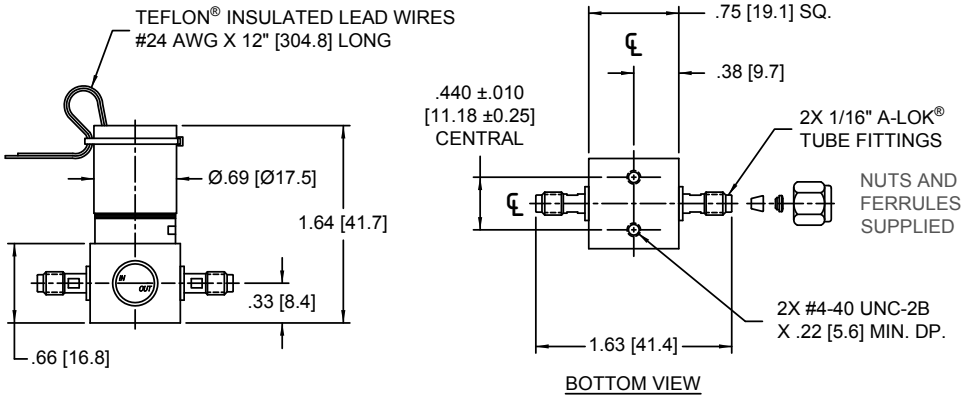
Dimensions

Series 9: 2-Way Cross-Section

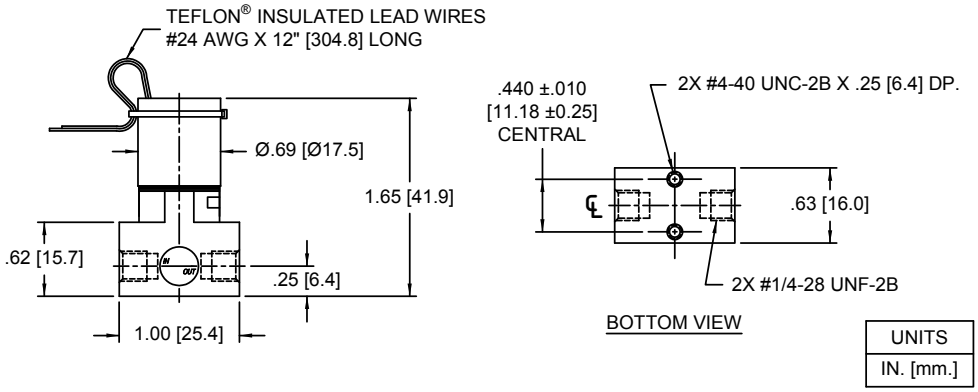
Wetted Materials Dimensions



2-WAY, 0.030" [0.76 mm] ORIFICE, 1/16" [1.6 mm] A-LOK®



2-WAY, 0.030" [0.76 mm] ORIFICE, 1/4-28 UNF-2B



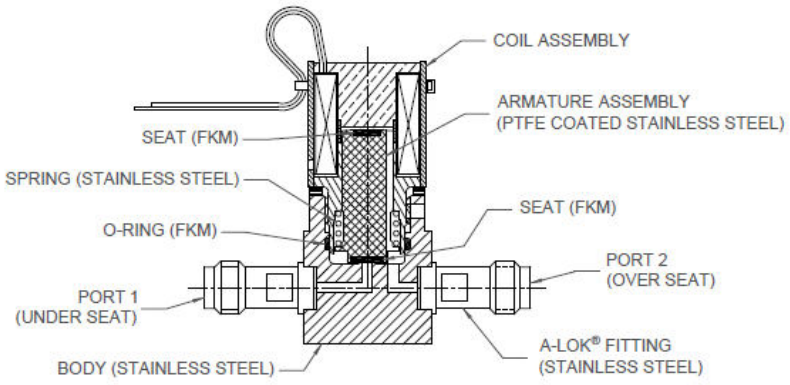
Series 9 Miniature High Speed and Pressure Gas Control Valve

Mechanical Integration

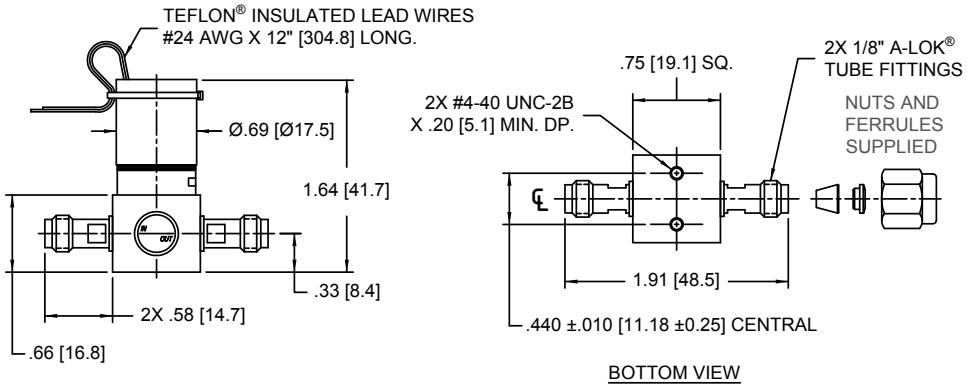
Dimensions

Series 9: 2-Way Cross-Section

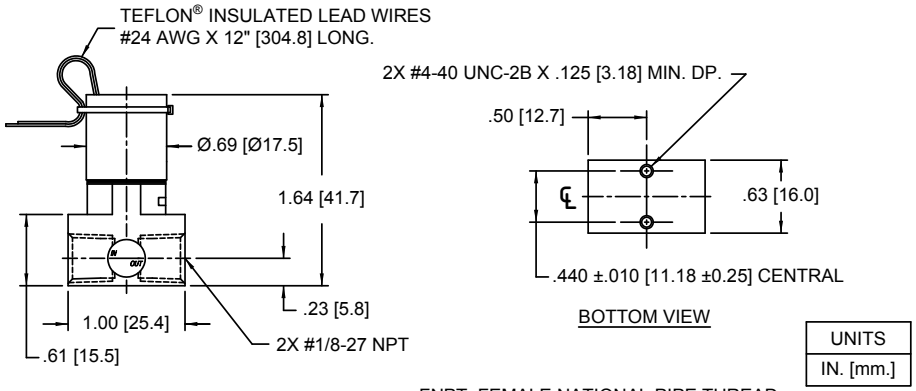
Wetted Material and Dimensions



2-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] A-LOK®



2-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] FNPT



UNITS
IN. [mm.]

FNPT: FEMALE NATIONAL PIPE THREAD

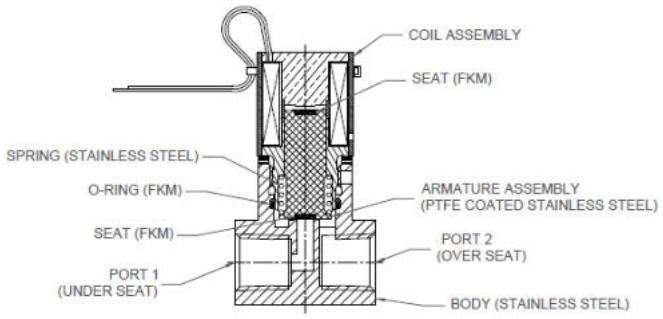
Series 9 Miniature High Speed and Pressure Gas Control Valve

Mechanical Integration

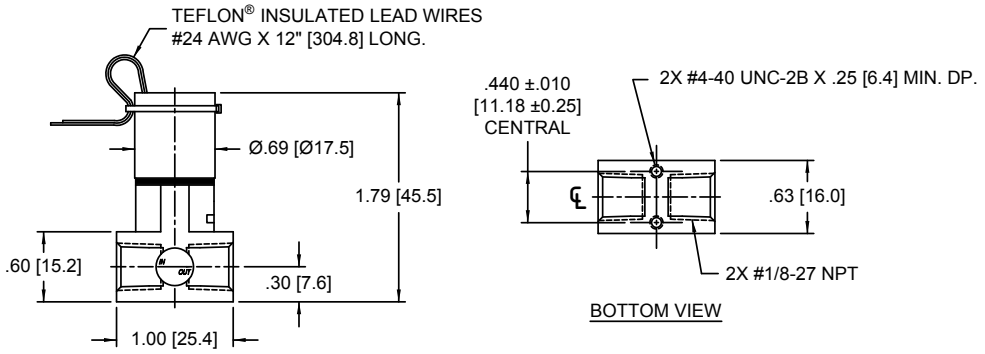
Dimensions

Series 9: 2-Way Cross-Section

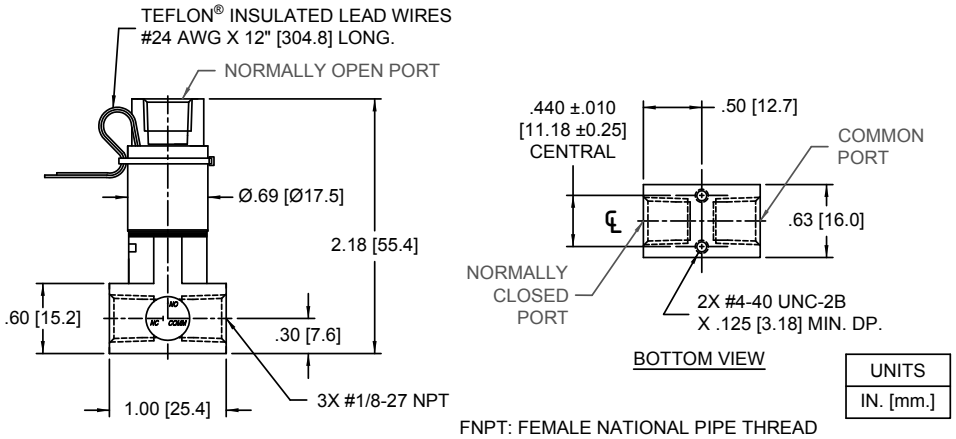
Wetted Material and Dimensions



2-WAY, 0.116" [2.95 mm] ORIFICE, 1/8" [3.18 mm] FNPT



3-WAY, 0.116" [2.95 mm] ORIFICE, 1/8" [3.18 mm] FNPT



UNITS
IN. [mm.]

FNPT: FEMALE NATIONAL PIPE THREAD

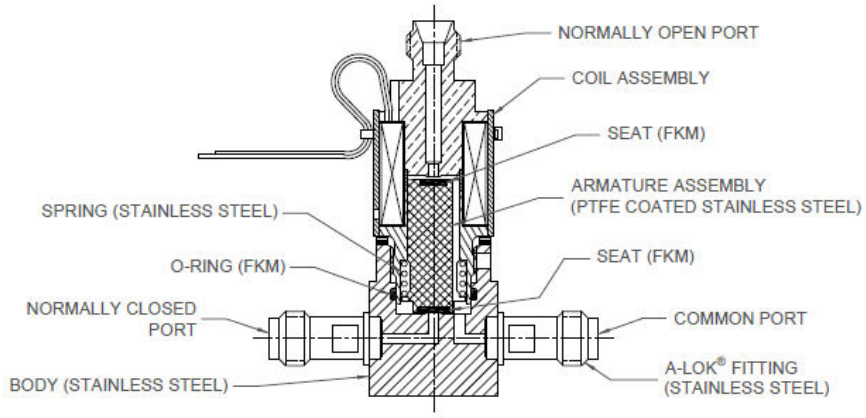
Series 9 Miniature High Speed and Pressure Gas Control Valve

Mechanical Integration

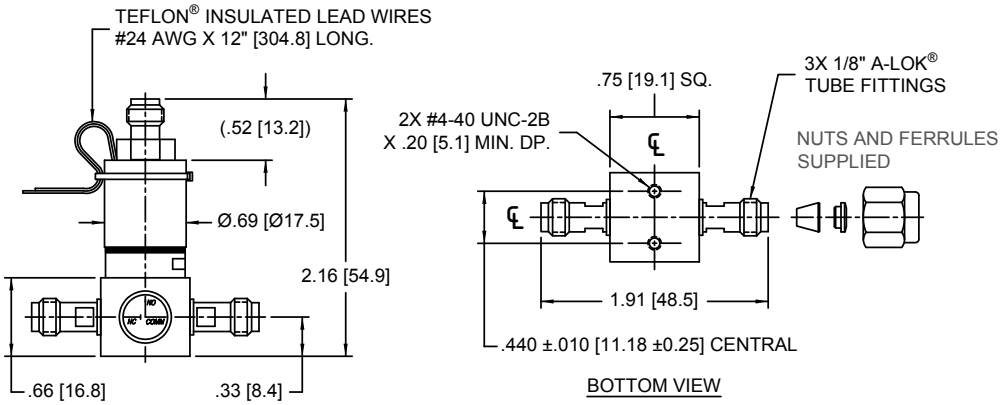
Dimensions

Series 9: 3-Way Cross-Section

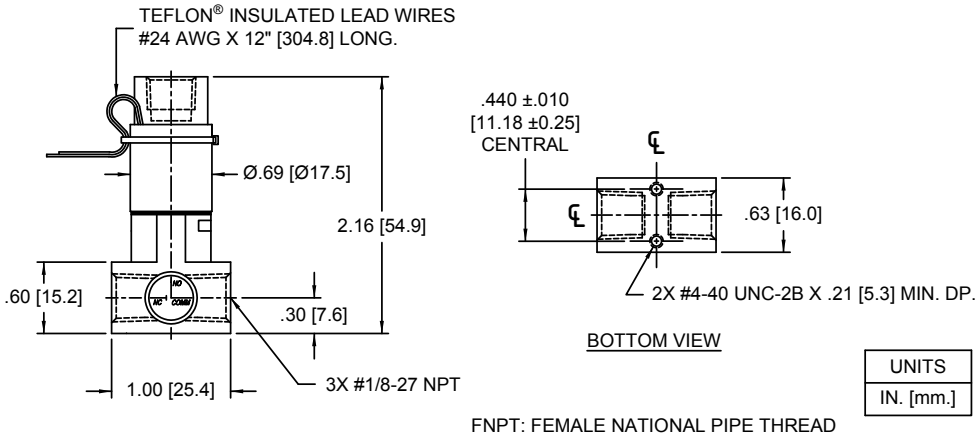
Wetted Material and Dimensions



3-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] A-LOK®



3-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] FNPT

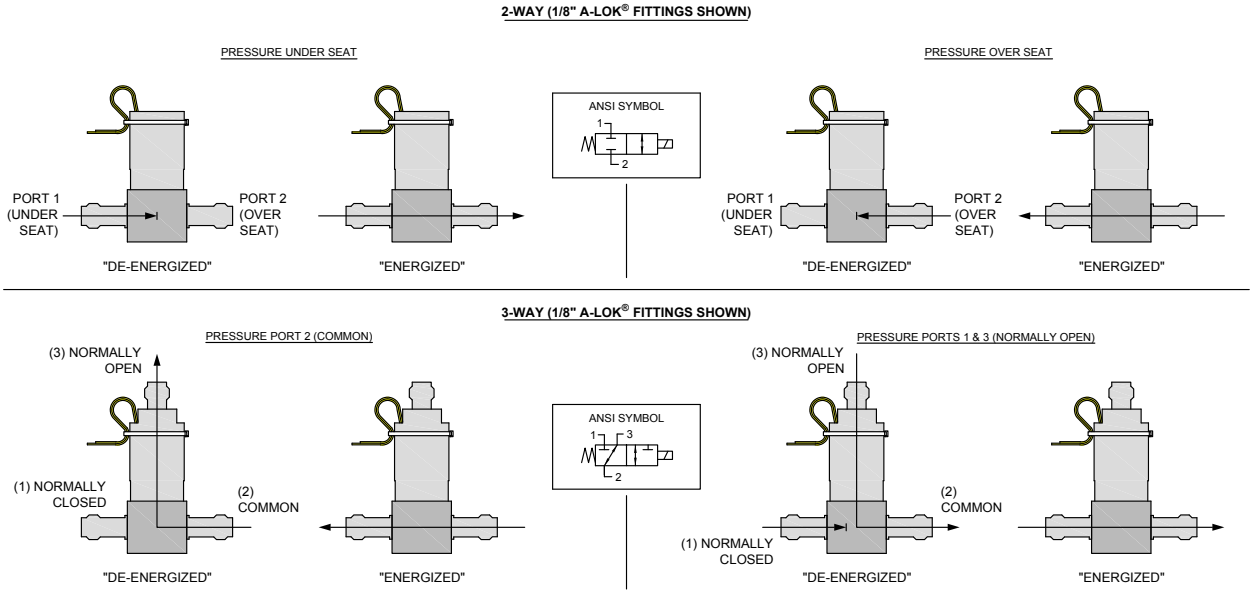


FNPT: FEMALE NATIONAL PIPE THREAD

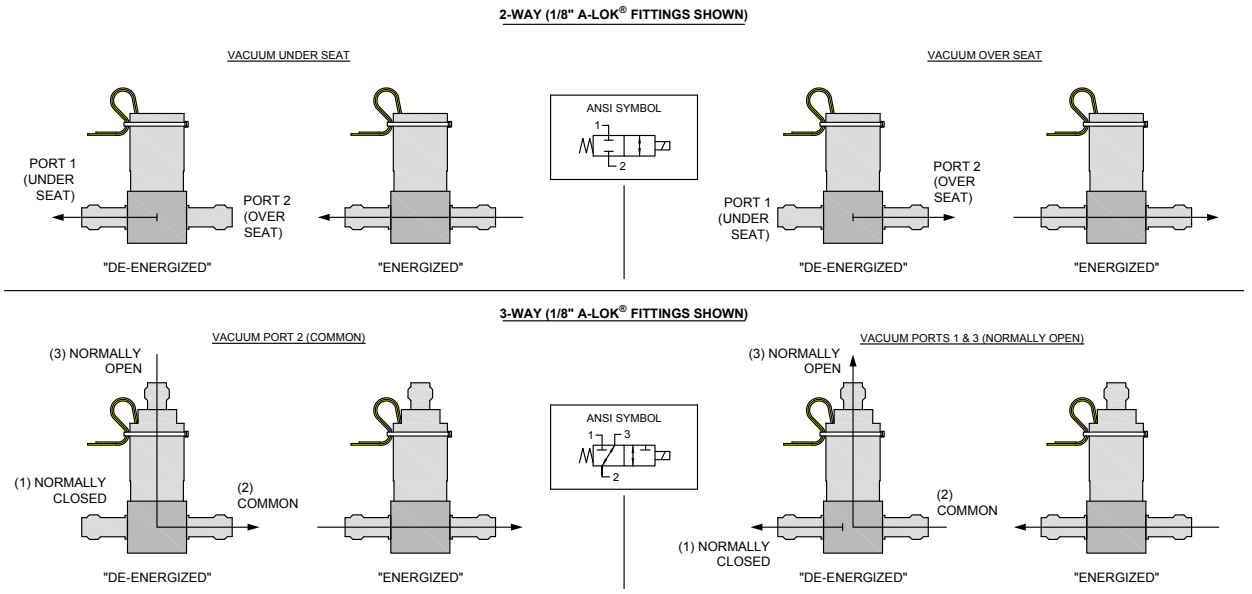
Series 9 Miniature High Speed and Pressure Gas Control Valve

ANSI Symbols

Pressure



Vacuum



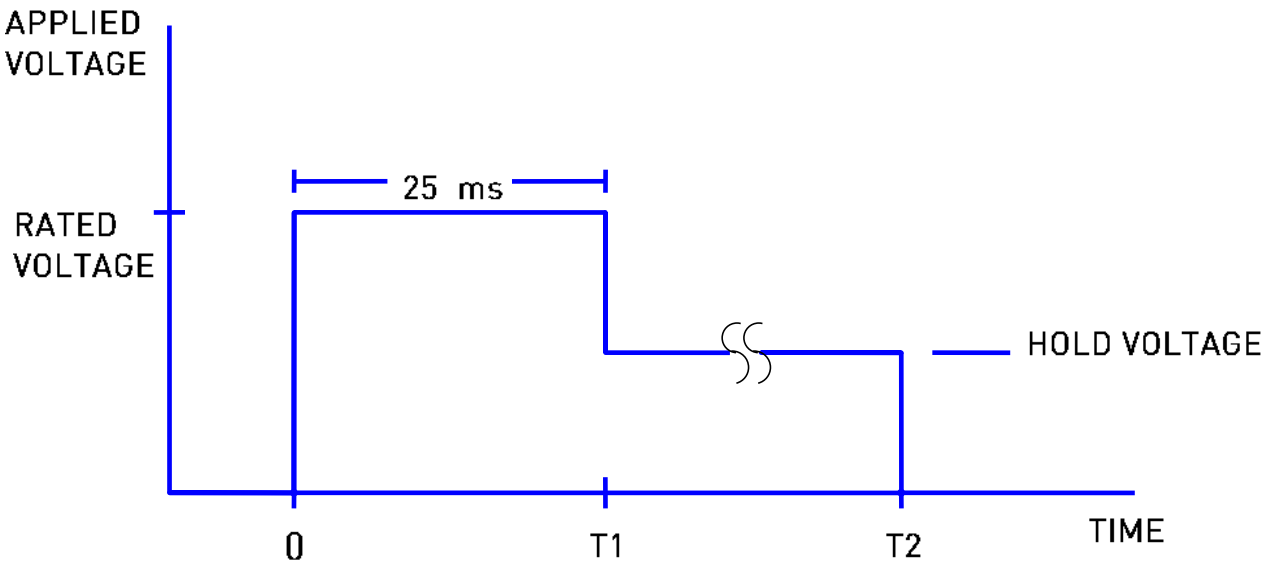
Series 9 Miniature High Speed and Pressure Gas Control Valve

Hit and Hold Specifications (12-Watt coils):

Hit and Hold is a method for driving valves that can be used to reduce power consumption and heat generation while maintaining valve performance specifications. The valve is "hit" with the full rated voltage for some time period to open it (T1 in the graph) and then "held" open with substantially reduced voltage until the desired pulse length is reached (T2 in the graph). The following table shows the possible holding voltages and power consumption for our standard 12 and 24VDC solenoids.

Rated Voltage (volts)	3-way		2-way	
	Hold Voltage	Hold Power	Hold Voltage	Hold Power
24	12 volts	3 watts	5 volts	0.52 watts
12	6 volts	3 watts	5 volts	2.1 watts

Note: Other voltages available

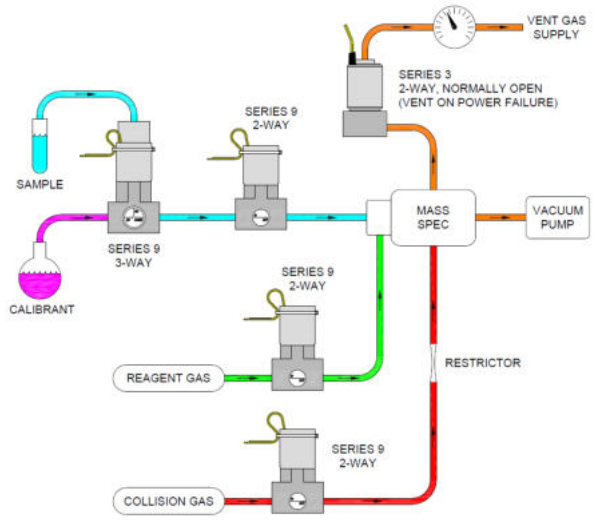


Hold Voltage Graph

Series 9 Miniature High Speed and Pressure Gas Control Valve

Typical Flow Diagram

Gas Control for Mass Spectrometry



- Proven performance in high pressure and low leak applications using liquids
- Proven lowest leak rate among valves in this form factor.
- Highest pressure capacity in valves of its size.

Ordering Information

Orifice Size	Seal Material	Pressure	Valve Type	Voltage	Porting	Part Number
0.030" (0.76 mm)	Vespel, FKM	Vac-1250 psig (86.2 bar)	2-Way NC	12V	1/16"(1.6mm) A-Lok®	009-0100-900
				24V	1/16"(1.6mm) A-Lok®	009-0172-900
				24V	1/4"(6.4mm)-28	009-0272-900

Orifice Size	Seal Material	Pressure	Valve Type	Voltage	Porting	Part Number
0.060" (1.52 mm)	FKM	Vac-250 psig (17.2 bar)	2-Way NC	24V	1/8"(3.2mm) A-Lok®	009-0270-900
				24V	1/8"(3.2mm) FNPT	009-0631-900
		Vac-100psig (6.89 bar)	3-Way	12V	1/8"(3.2mm)FNPT	091-0094-900
				24V	1/8"(3.2mm)A-Lok®	009-0269-900
				24V	1/8"(3.2mm)FNPT	009-0933-900

Orifice Size	Seal Material	Pressure	Valve Type	Voltage	Porting	Part Number
0.116" (2.95 mm)	FKM	Vac-100 psig (6.89 bar)	2-Way NC	24V	1/8"(3.2mm)FNPT	009-0089-900
			3-Way	12V	1/8"(3.2mm) FNPT	009-0207-900
				24V	1/8"(3.2mm) FNPT	009-0143-900

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/s9) to configure your Series 9 Miniature High Speed and Pressure Liquid Dispense Valve. For more detailed information, visit us on the Web, or call 603-595-1500.

ORDER ON-LINE

Parker Hannifin Precision Fluidics Division reserves the right to make changes. Drawings are for reference only.

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

Series 99

Miniature High Speed and Pressure Gas Control Valve

Ultra Low Leak Extreme Performance Valve

Series 99 solenoid valves offer outstanding potential for precision control of gases. Combining high speed, ultra low leak rate, high flow, and high temperature capability, in a small size. This rugged valve operates with extreme repeatability and is constructed of non-corroding, passivated stainless steel. Series 99 coils are rated for continuous duty and are potted to protect against the environment.

Typical Applications

- Calibrant Gas Control for Mass Spectrometers
- Precision Control of Gas Dosing
- Gas Chromatography
- High Pressure Gas Control

Features

- Smallest footprint in its class
- 100% duty cycle in environmental temperatures of up to to 221°F (105°C)
- High speed response times of less than 6 ms eliminate delays in the system
- 100% tested to leak-tight 1 x 108 atm cc/sec Helium
- Pressures up to 1,250 PSI (86.2 bar)
- Available with a variety of fittings, orifices, seals, and voltages to match your application
- Configurations available to handle corrosive gasses
- Hydrocarbon and Lubricant free
- RoHS compliant

Product Specifications

Physical Properties

Valve Type:
Inert Non-Isolation Valve
Valve Configuration (Type):
2-Way Normally Closed or 3-Way
Media:
Gasses (also capable of handling liquids, for details see the Series 9 Liquid datasheet)
Operating Environment:
40 to 221°F (4 to 105°C)
Dimensions:
See pages 4, 5 & 6
Porting (Orifice Dependent):
A-LOK® compression fittings, 1/4" Female VacuSeal
Weight:
3.1 oz (88.9 g) [3-Way, 1/8" NPT Body Option]
Internal Volume (µL):
354.5 to 2645.8 (Contact factory for details)

Electrical

Voltage (VDC):	12	24
Power (Watts):	12	12
Current (mA):	1000	500
Resistance (Ohm):	12	48
(Ω±5% @ 70°F, 21°C)		

Connections:
12" Minimum Lead Wires Standard 24 AWG, PTFE Insulated (Custom connectors are available)

Wetted Materials*

Seals:
Vespel & Silver-Plated Nickel or FKM & Silver-Plated Nickel
Body:
316 Stainless Steel
All Others:
PTFE, Stainless Steel, Body, Seals

Consult factory for other options

Performance Characteristics

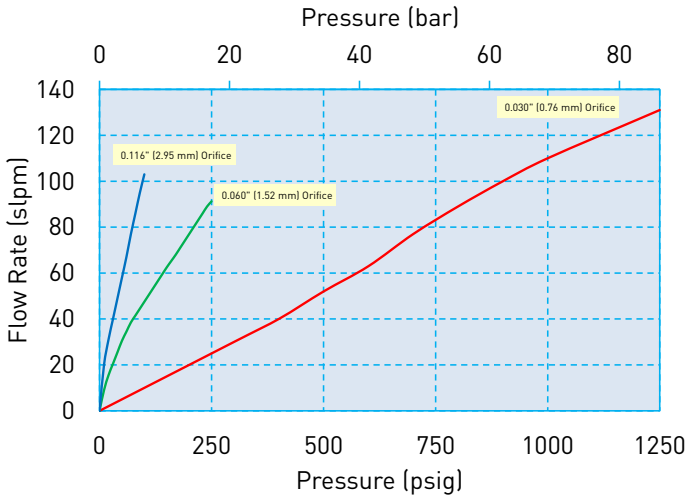
Orifice Diameters/ **Operating Pressure:**
0.030" (0.76 mm) / 1x10^5 Torr -1250 psig (86.2 bar)
0.060" (1.52 mm) / 2-way 1x10^5 Torr - 250 psig (17.2 bar)
3-way 1x10^5 Torr - 100 psig (6.9 bar)
0.116" (2.95 mm) / 1x10^5 Torr - 100 psig (6.9 bar)
Proof Pressure:
1.5X rated pressure
Response Time:
<5 ms 0.030" (0.76 mm) <5 ms 0.060" (1.52 mm) <6 ms 0.116" (2.95 mm)
Leak Rate:
1 x 10^{-8} atm cc/sec Helium
Recommended Filtration:
40 µm max

Series 99 Miniature High Speed and Pressure Gas Control Valve

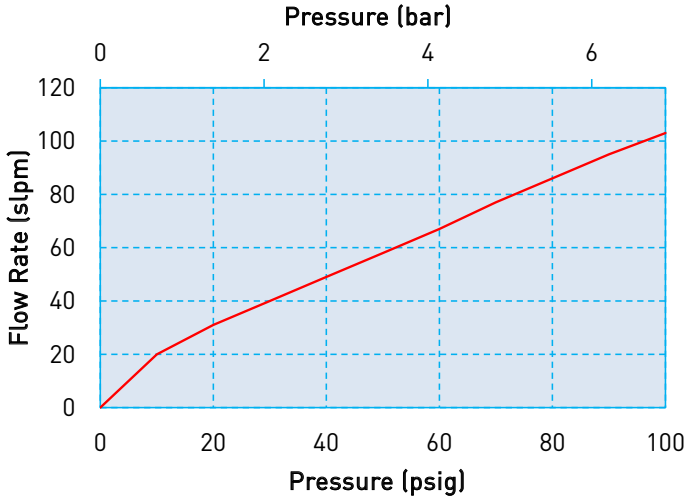
Typical Flow Curve

All Models

(Tested w/air 24° C)

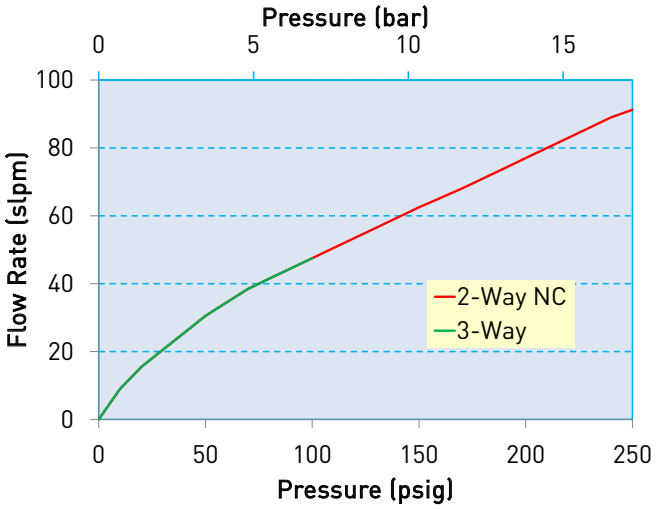


0.030" (0.76 mm) Orifice

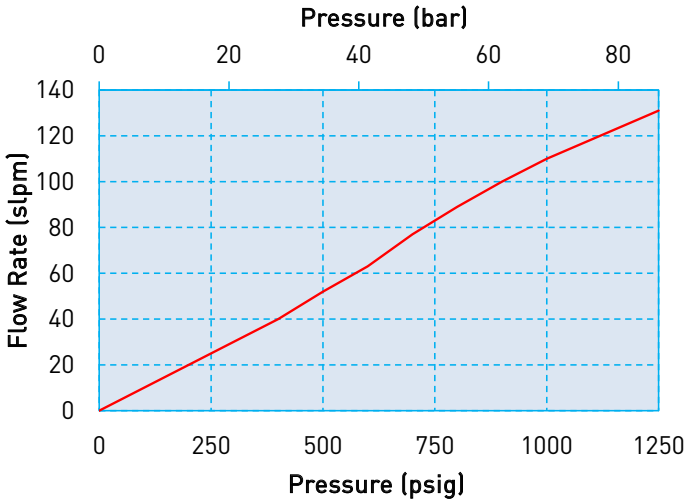


Series 99 Miniature High Speed and Pressure Gas Control Valve

0.060" (1.52 mm) Orifice

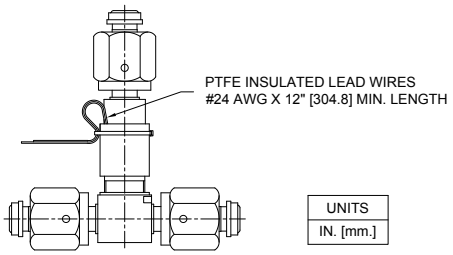


0.116" (2.95 mm) Orifice



Electrical Interface

Coil Type: Wire leads



Custom connections available upon request

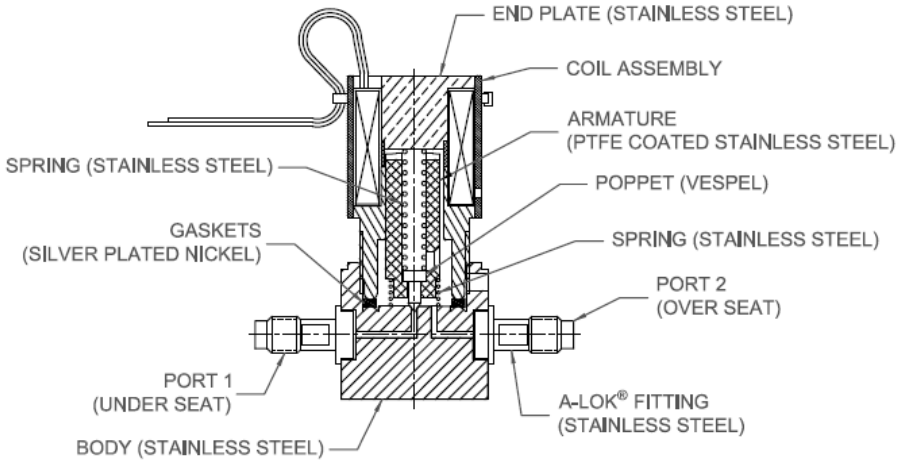
Series 99 Miniature High Speed and Pressure Gas Control Valve

Mechanical Integration

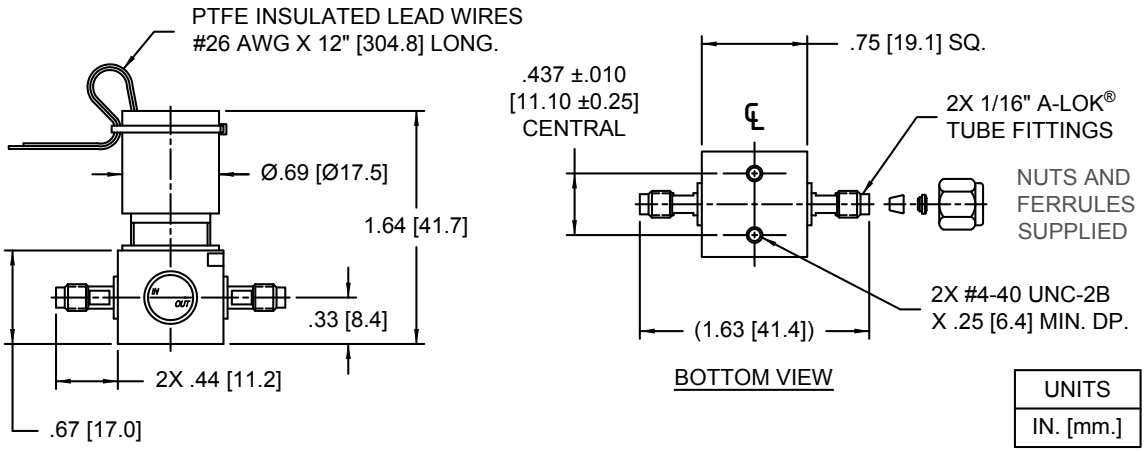
Dimensions

Series 99: 2-Way Cross-Section

Wetted Materials and Dimensions



2-WAY, 0.030" [0.76 mm] ORIFICE, 1/16" [1.6 mm] A-LOK®



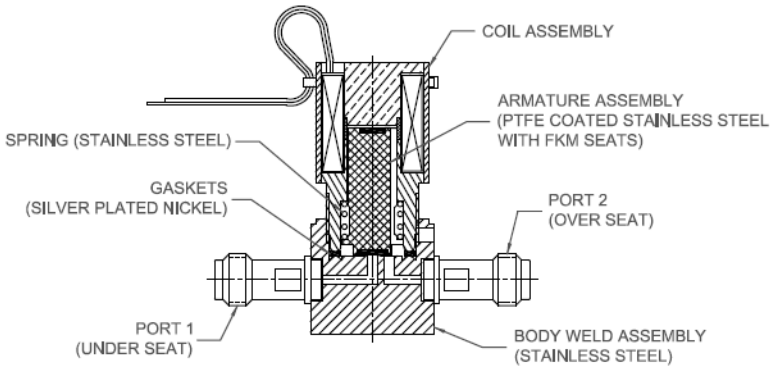
Series 99 Miniature High Speed and Pressure Gas Control Valve

Mechanical Integration

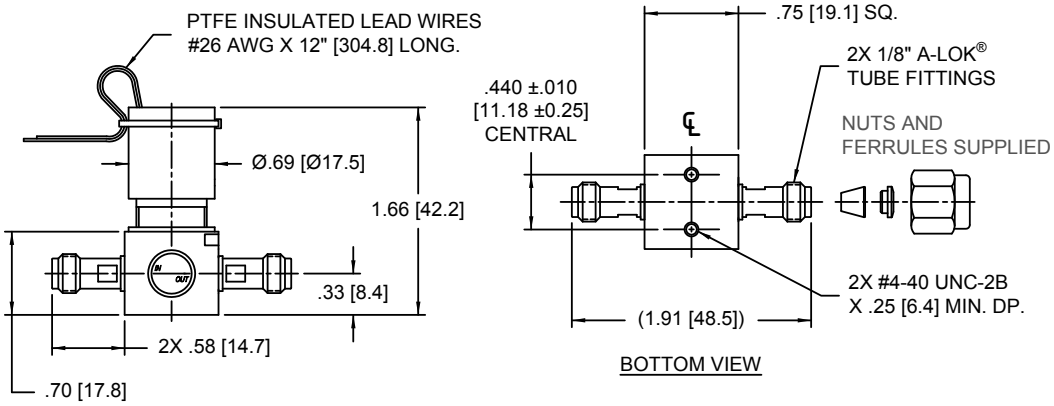
Dimensions

Series 99: 2-Way Cross-Section

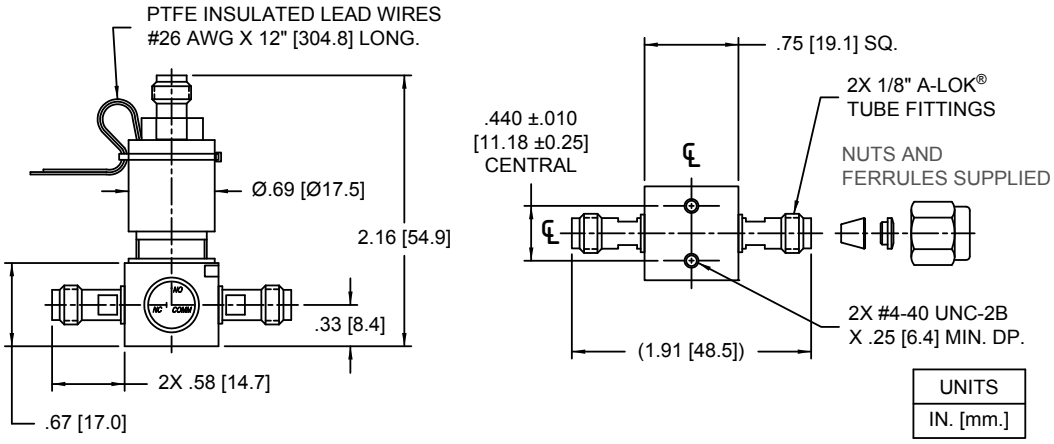
Wetted Materials and Dimensions



2-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] A-LOK®



3-WAY, 0.060" [1.52 mm] ORIFICE, 1/8" [3.18 mm] A-LOK®



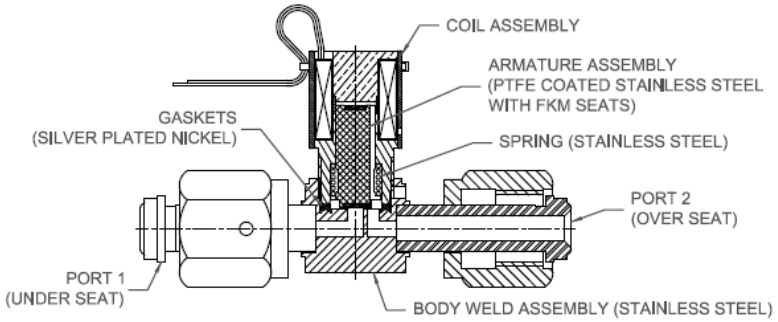
Series 99 Miniature High Speed and Pressure Gas Control Valve

Mechanical Integration

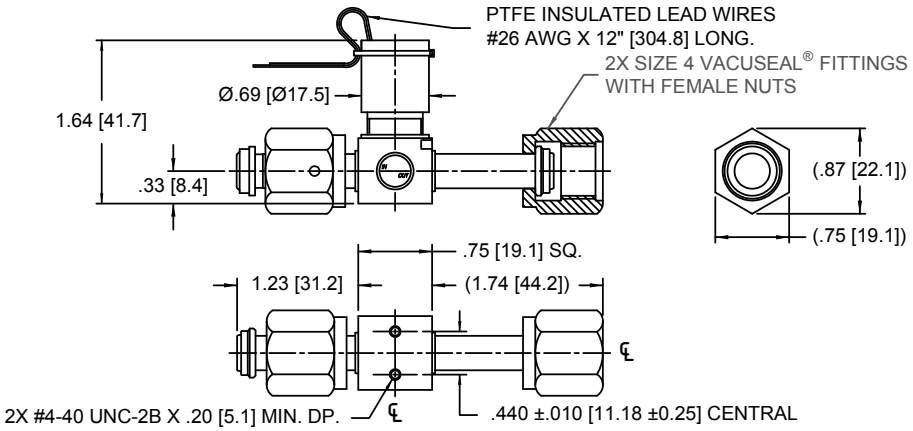
Dimensions

Series 99: 2-Way Cross-Section

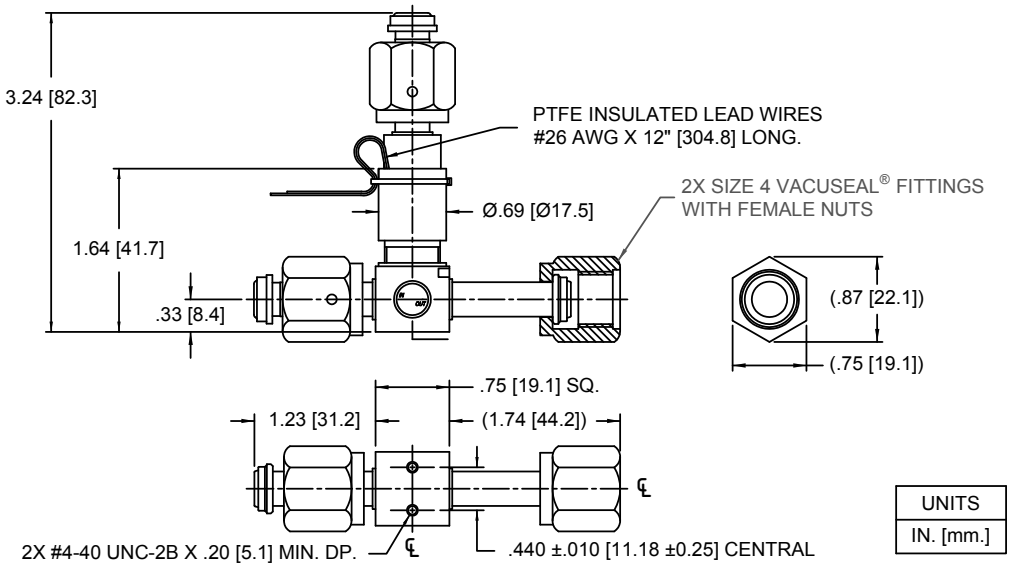
Wetted Materials and Dimensions



2-WAY, 0.116" [2.95 mm] ORIFICE, 1/4" [6.35 mm] VACUSEAL®



3-WAY, 0.116" [2.95 mm] ORIFICE, 1/4" [6.35 mm] VACUSEAL®

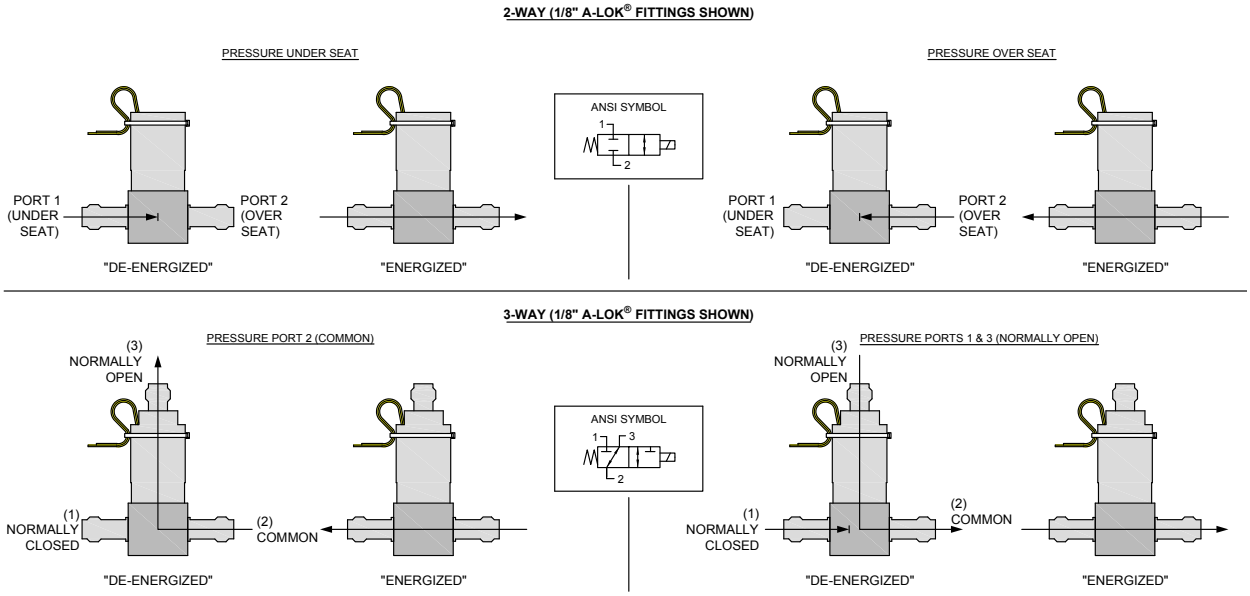


UNITS
IN. [mm.]

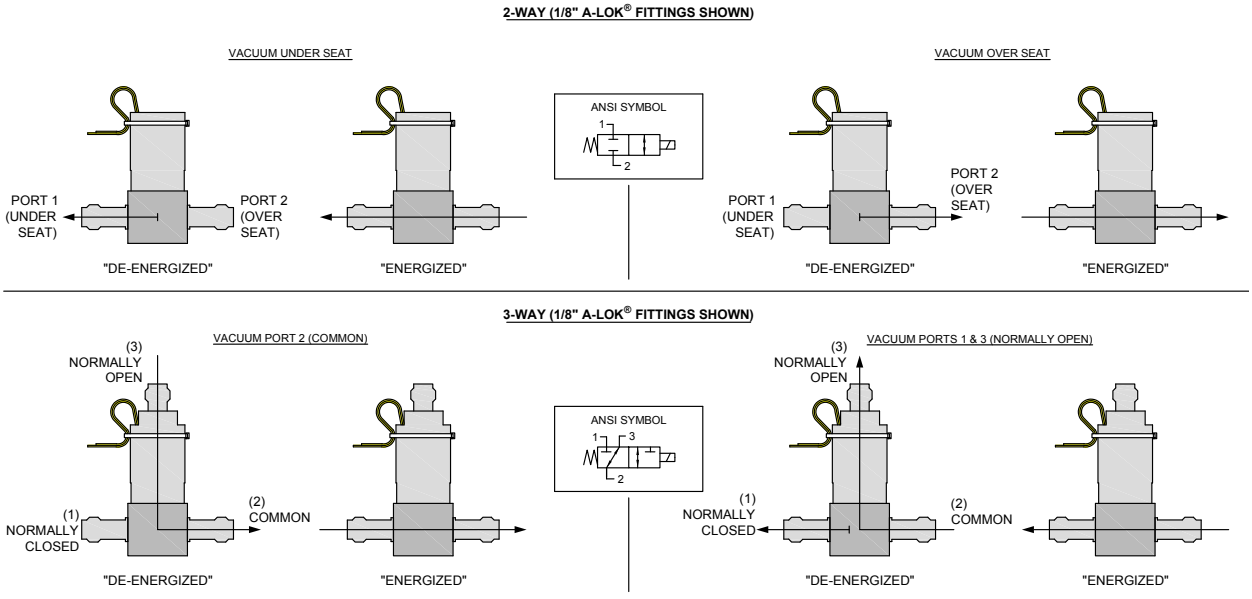
Series 99 Miniature High Speed and Pressure Gas Control Valve

ANSI Symbols

Pressure



Vacuum



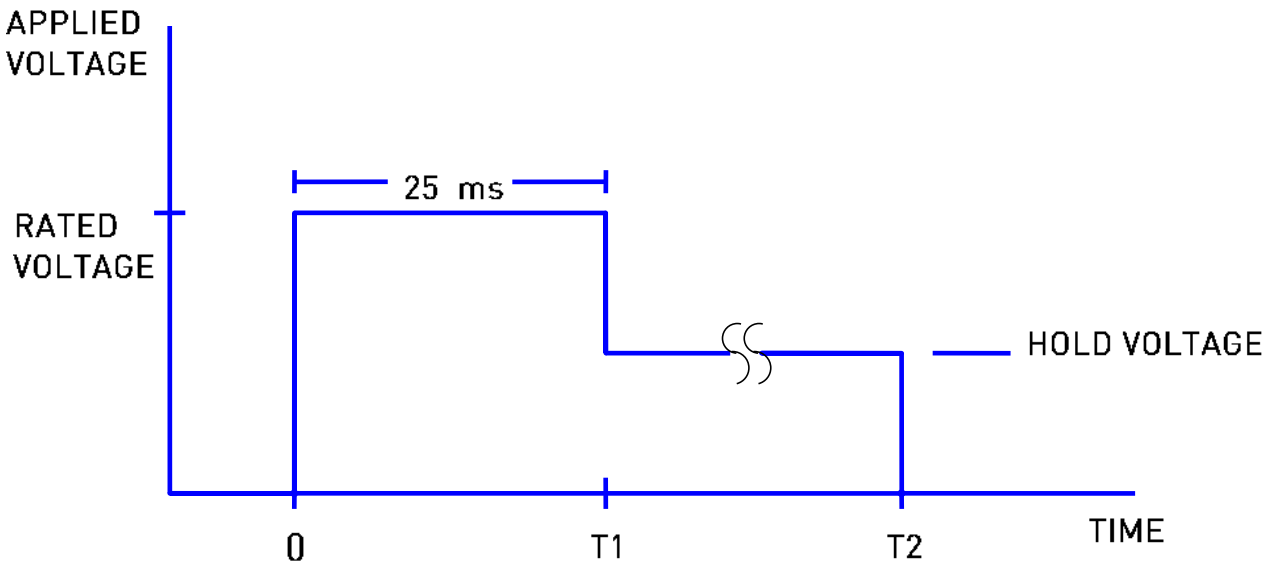
Series 99 Miniature High Speed and Pressure Gas Control Valve

Hit and Hold Specifications (12-Watt coils):

Hit and Hold is a method for driving valves that can be used to reduce power consumption and heat generation while maintaining valve performance specifications. The valve is "hit" with the full rated voltage for some time period to open it (T1 in the graph) and then "held" open with substantially reduced voltage until the desired pulse length is reached (T2 in the graph). The following table shows the possible holding voltages and power consumption for our standard 12 and 24VDC solenoids.

Rated Voltage (volts)	3-way		2-way	
	Hold Voltage	Hold Power	Hold Voltage	Hold Power
24	12 volts	3 watts	5 volts	0.52 watts
12	6 volts	3 watts	5 volts	2.1 watts

Note: Other voltages available

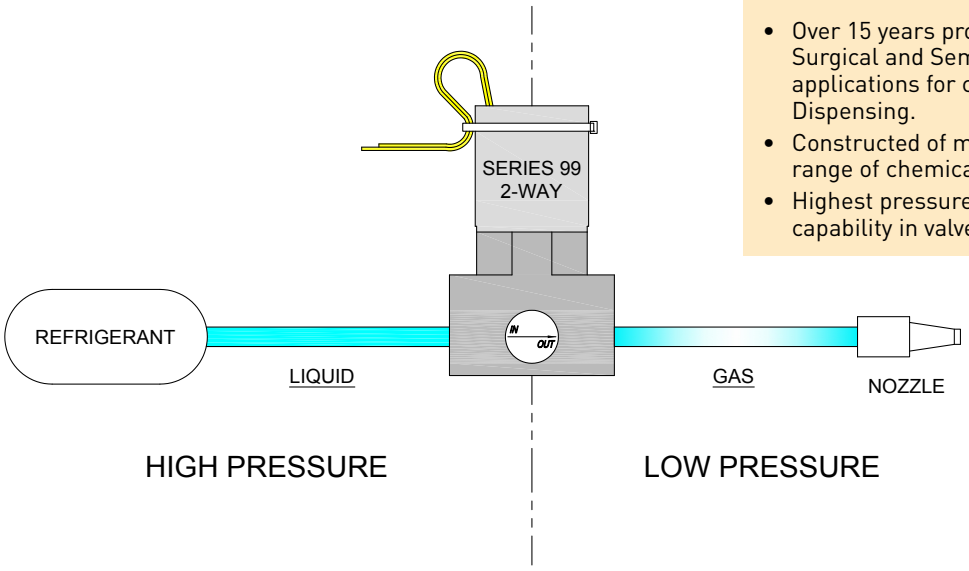


Hold Voltage Graph

Series 99 Miniature High Speed and Pressure Gas Control Valve

Typical Flow Diagram

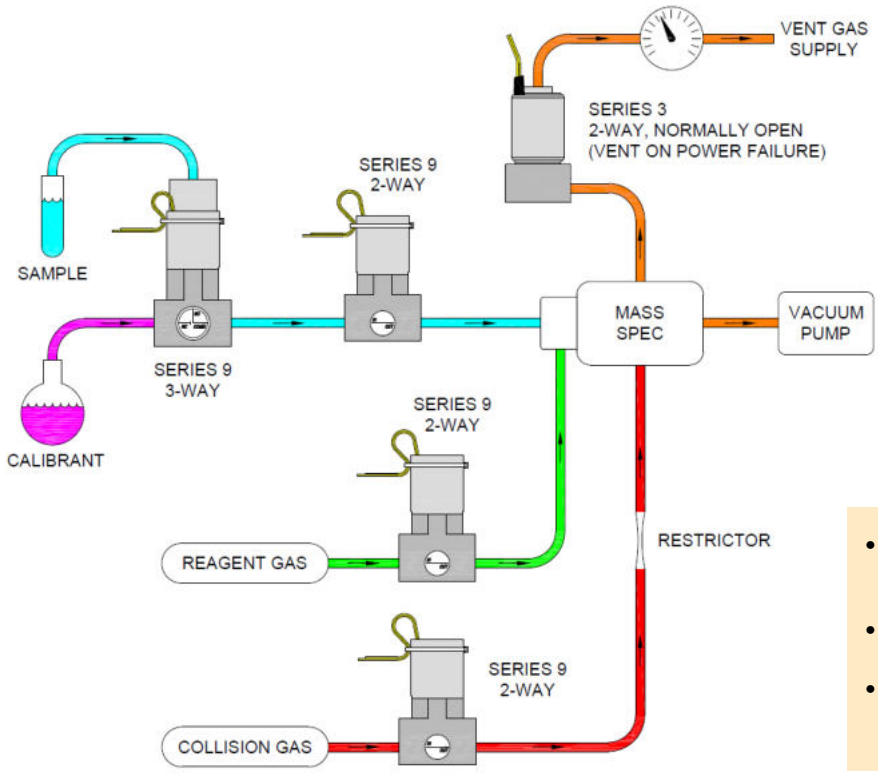
Typical Sample Control of Refrigerant Dispensing



- Over 15 years proven track record in Surgical and Semiconductor applications for control of Refrigerant Dispensing.
- Constructed of materials to handle wide range of chemicals.
- Highest pressure and temperature capability in valves of its size.

Gas Control for Mass Spectrometry

(See Series 9)



- Proven performance in high pressure and low leak applications using liquids
- Proven lowest leak rate among valves in this form factor.
- Highest pressure capacity in valves of its size.

Series 99 Miniature High Speed and Pressure Gas Control Valve

Ordering Information

Orifice Size	Seal Material	Pressure	Valve Type	Voltage	Porting	Part Number
0.030" (0.76mm)	Vespel, Silver Plated Nickel	Vac-1250psig (86.2 bar)	2 Way NC	12V	1/16" (1.6 mm) A-Lok®	099-0051-900
				24V	1/16" (1.6 mm) A-Lok®	099-0340-900

Orifice Size	Seal Material	Pressure	Valve Type	Voltage	Porting	Part Number
0.060" (1.52mm)	FKM,Silver Plated Nickel	Vac-250psig (17.2 bar)	2 Way NC	24V	1/8" (3.2 mm) A-Lok®	099-0080-900
		Vac-100psig (6.89 bar)	3 Way	12V	1/8" (3.2 mm) A-Lok®	099-0075-900
				24V	1/8" (3.2 mm) A-Lok®	099-0135-900

Orifice Size	Seal Material	Pressure	Valve Type	Voltage	Porting	Part Number
0.116" (2.95mm)	FKM,Silver Plated Nickel	Vac-100psig (6.89 bar)	2 Way NC	24V	1/4" (6.4 mm) Female VacuSeal®	099-0167-900
			3 Way	24V	1/4" (6.4 mm) Female VacuSeal®	099-0107-900

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/s99) to configure your Series 99 Miniature High Speed and Pressure Dispense Valve. For more detailed information, visit us on the Web, or call 603-595-1500.

Parker Hannifin Precision Fluidics Division reseves the right to make changes. Drawings are for reference only.

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

SRS Miniature Pneumatic Solenoid Valve

10 mm Manifold Mount Solenoid Valve

The SRS miniature solenoid valve is a compact and lightweight 10 mm manifold mount solenoid valve designed for portable instruments and medical devices requiring minimal power consumption and quiet operation. Utilizing an integrated manifold seal design in combination with a variety of electrical termination options, the SRS miniature solenoid valve simplifies pneumatic and electronic integration. With flow rates of up to 18 slpm and inlet pressures of up to 85 psig, the SRS miniature solenoid valve is an ideal solution for demanding portable instruments and medical devices.

Typical Applications

- Medical & Analytical Gas Control
- Blood Pressure Monitoring
- Sensor Zeroing
- Patient Monitors
- Portable Medical Devices

Features

- Lightweight and compact to reduce system size and weight
- Integrated manifold seal and PC mount capability to simplify integration
- Hermetically-sealed coil protects the valve from accidental exposure to liquids
- Constucted of PBT and non-corrosive metal for use with non-reactive gases
- RoHS compliant

Product Specifications

Mechanical

Valve Type:
3 Port, Direct-acting poppet style
- Normally Closed
- Normally Open
- Distributor

Media:
Non-Reactive gases

Operating Environment:
32 to 131°F (0 to 55°C)

Storage Temperature:
-40 to 158°F (-40 to 70°C)

Dimensions:
- Length: 1.5 in (38.1 mm)
- Width: 0.39 in (10.0 mm)
- Height: 0.61 in (15.5 mm)

Porting:
Manifold mount; Gasket supplied

Weight:
0.23 oz (6.5 g)

Internal Volume:
0.0016 in^3 (0.027 cm^3)

Filtration:
40 micron (recommended)

Electrical

Power Options:
0.5 or 1.0 Watt

Voltage Options: (±10%)
5, 12 or 24 VDC
Further power reduction may be achieved through the use of spike and hold or PWM electrical control.

Wetted Materials

Bobbin/Body:
Glass Reinforced PBT (Polybutylene terephthalate)

Pole & Plunger:
430 FR Stainless Steel

Seal:
FKM

Other:
300 Series Stainless Steel

Performance Characteristics

Leak Rate:
<0.016 sccm of air

Response:
<30 ms cycling

Pressure:
0 to 85 psid (5.86 bar)

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

Burst Pressure:
200 psig (13.7 bar)

Orifice Sizes / Equivalent Cv:
0.045" (1.14 mm) / 0.027
0.030" (0.76 mm) / 0.017
0.020" (0.51 mm) / 0.0075

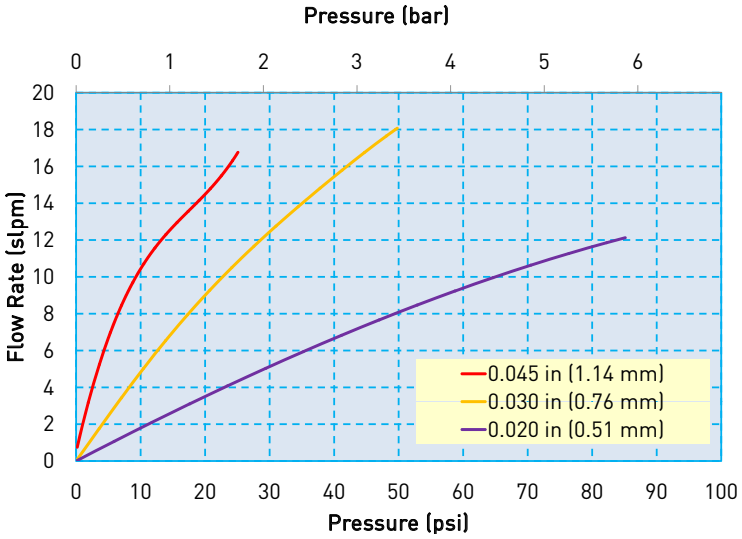
(See Life-cycle information in Performance Parameters section.)

SRS Miniature Pneumatic Solenoid Valve

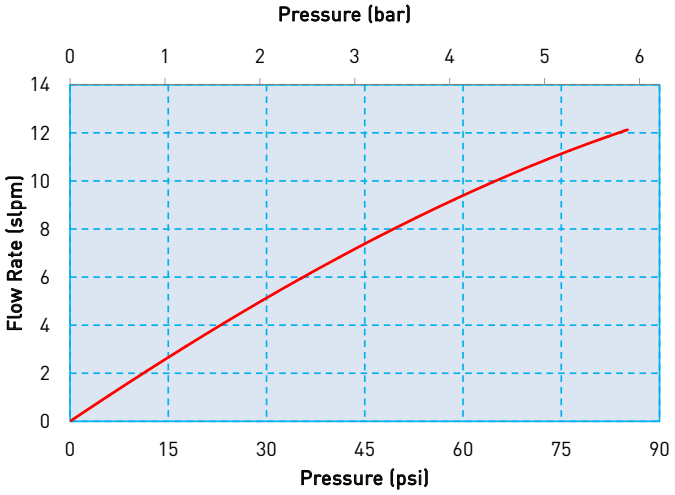
Typical Flow Curve

All Models

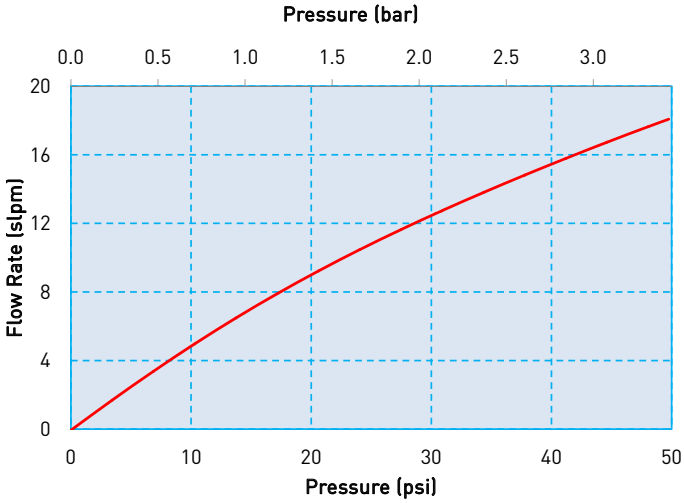
(Tested w/air 24° C)



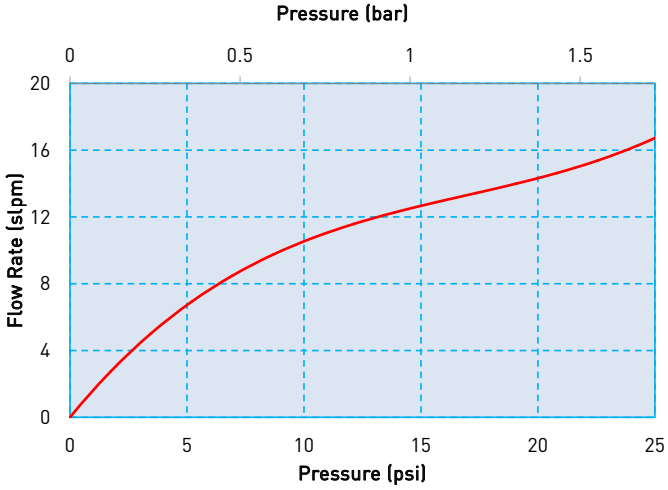
Models 10 and 11 – 0.020" (0.51 mm) Orifice



Models 13 and 14 – 0.030" (0.76 mm) Orifice



Models 16 and 17 – 0.045" (1.14 mm) Orifice



SRS Miniature Pneumatic Solenoid Valve

Performance Parameters

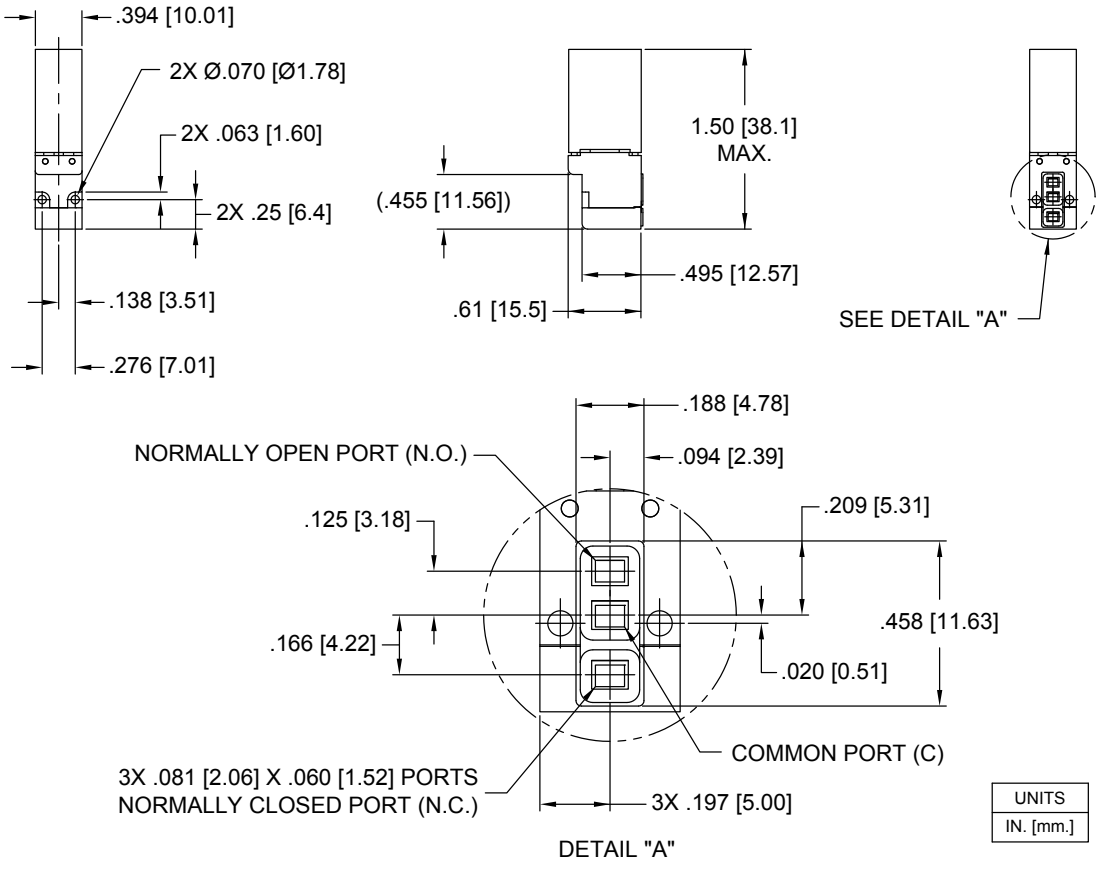
Model No.	Orifice Size	Maximum Supply Pressure	Maximum Supply Vacuum	Power Consumption	Life Requirements (millions of cycles)
10	0.020 in (0.51 mm)	35 psi (2.41 bar)	27 in Hg (686 mm Hg)	0.5 Watt	175
11	0.020 in (0.51 mm)	85 psi (5.86 bar)	27 in Hg (686 mm Hg)	1 Watt	50
13	0.030 in (0.76 mm)	20 psi (1.37 bar)	27 in Hg (686 mm Hg)	0.5 Watt	200
14	0.030 in (0.76 mm)	50 psi (3.44 bar)	27 in Hg (686 mm Hg)	1 Watt	25
16	0.045 in (1.14 mm)	10 psi (0.68 bar)	20 in Hg (508 mm Hg)	0.5 Watt	100
17	0.045 in (1.14 mm)	20 psi (1.37 bar)	27 in Hg (686 mm Hg)	1 Watt	25

Pneumatic Interface

Mechanical Integration

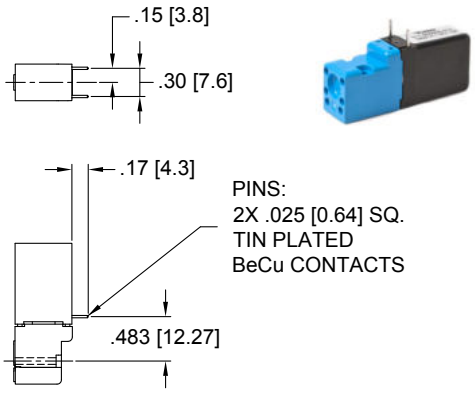
Dimensions

SRS Basic Valve Dimensions

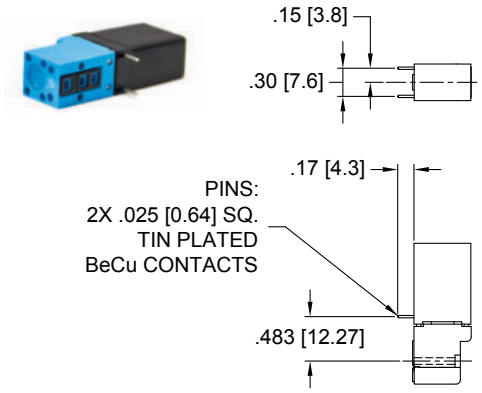


SRS Miniature Pneumatic Solenoid Valve

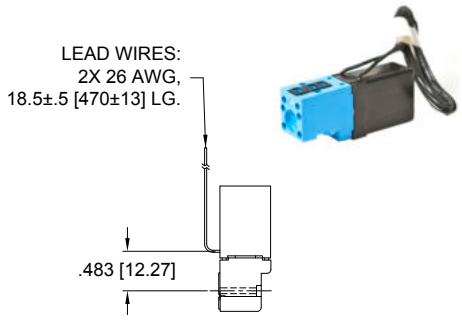
Electrical Interface



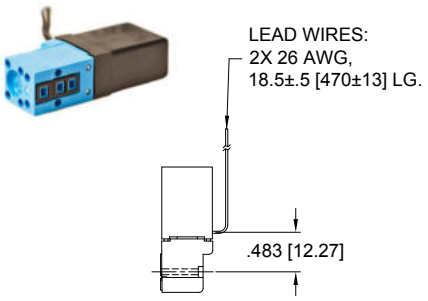
"F" - TYPE
ELECTRICAL CONNECTION
(.025 [0.64] SQUARE PINS, FRONT)



"M" - TYPE
ELECTRICAL CONNECTION
(.025 [0.64] SQUARE PINS,
MANIFOLD INTERFACE)



"R" - TYPE
ELECTRICAL CONNECTION
(INSLATED WIRE LEADS, 18" [457.2]
MANIFOLD INTERFACE)



"L" - TYPE
ELECTRICAL CONNECTION
(INSLATED WIRE LEADS,
18" [457.2] FRONT)

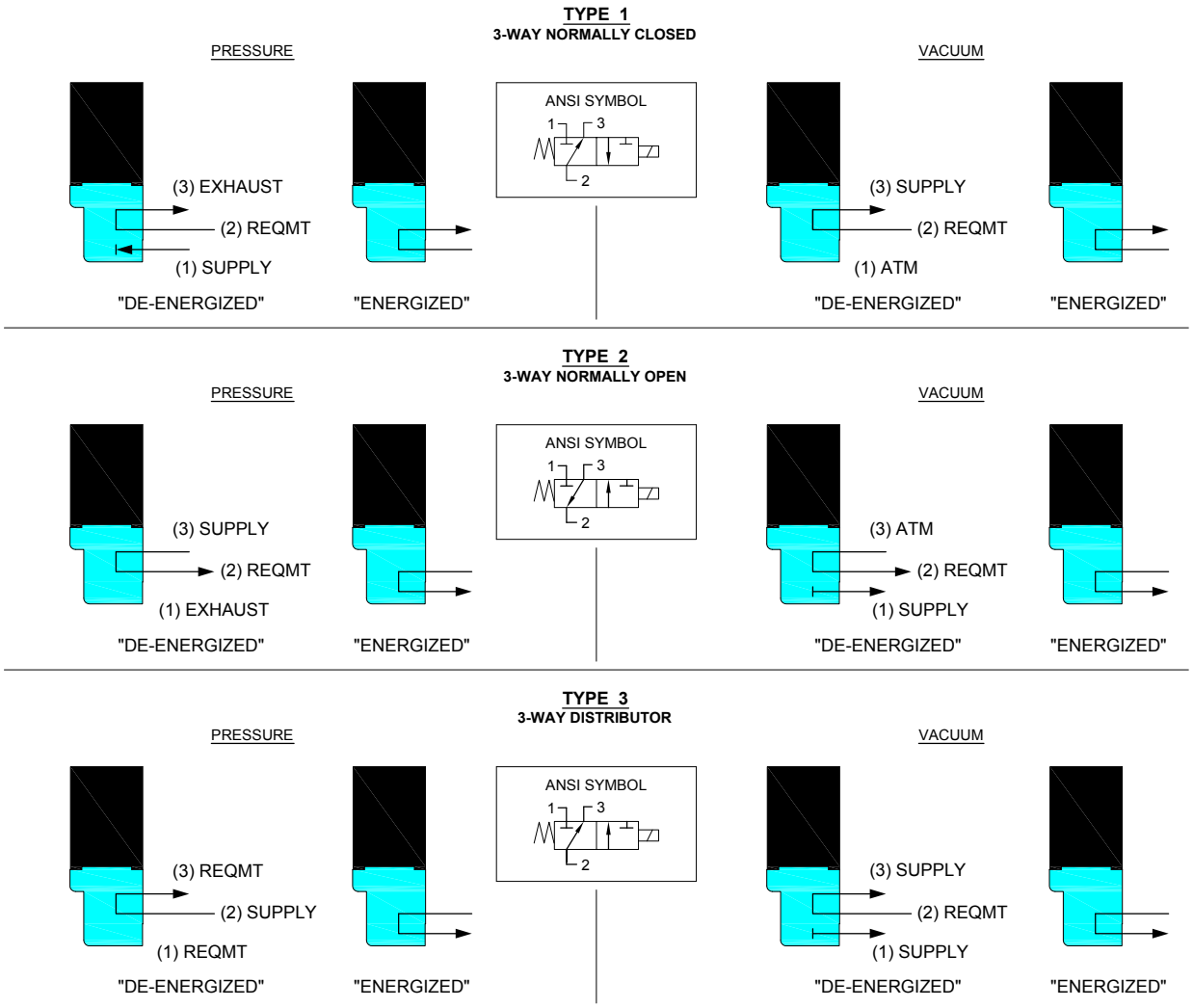
UNITS
IN. [mm.]

SRS Miniature Pneumatic Solenoid Valve

LEGEND:	
SUPPLY:	Pneumatic Source or Supply Pressure
EXHAUST:	Exhaust to Atmospheric Pressure
REQMT:	Customer Requirement or Application
ATM:	Atmospheric Pressure

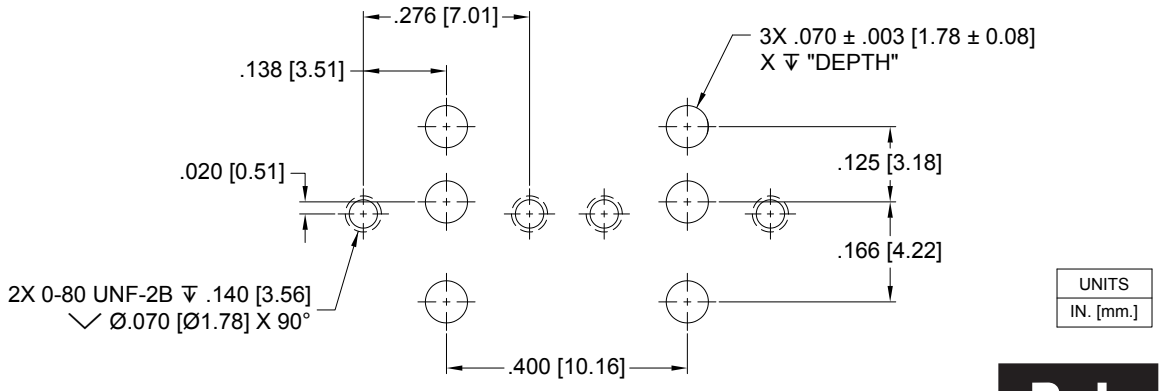
ANSI Symbols

Pneumatic Schematics by Valve Types



Installation and Use

SRS Manifold Mount Diagram



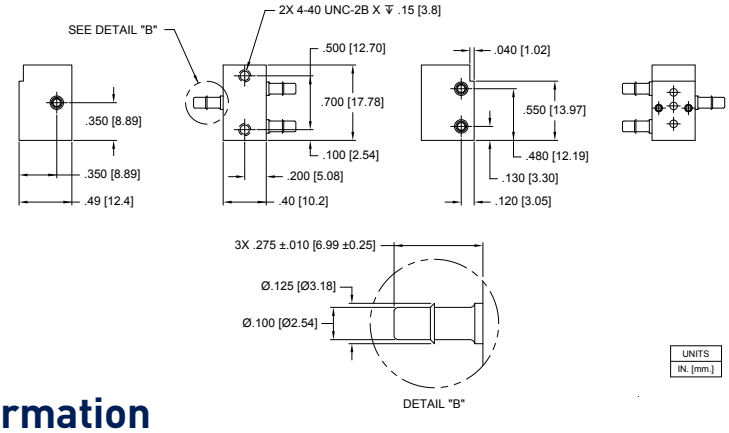
SRS Miniature Pneumatic Solenoid Valve

Accessories

Seal, Valve Manifold, SRS
195-000139-001

Screw 0-80 x 9/16" Pan Head, Phillips
191-000100-009
(2 required for each valve)

Test Manifold, Single Station, SRS
990-001362-001



Ordering Information

Sample Part ID	SRS	10	2	P	V	12	M
Description	**Series**	**Model Number: Pressure / Orifice**	**Type**	**Material**	**Seal Material**	**Voltage**	**Electrical Connection**
Options	SRS	10: 0-35 psi / 0.020"	1: 3-Way NC	P: Engineering Plastic	V: FKM	5: 5 VDC	F: 0.025" Square Pins, Front
		11: 0-85 psi / 0.020"	2: 3-Way NO			12: 12 VDC	M: 0.025" Square Pins, Manifold Interface
		13: 0-20 psi / 0.030"	3: 3-Way NC or Distributor			24: 24 VDC	L: Insulated Wire Leads, 18", Front
		14: 0-50 psi / 0.030"					R: Insulated Wire Leads, 18", Manifold Interface
		16: 0-10 psi / 0.045"					
		17: 0-20 psi / 0.045"					

Accessories	
195-000139-001: Seal, Valve Manifold, SRS *	* Used as seal between manifold and valve body
191-000100-009: Screw 0-80 x 9/16", Pan Head, Phillips (2 required for each valve)	
990-001362-001: Test Manifold, Single Station, SRS	

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

ORDER ON-LINE

Please click on the Order On-line button (or go to www.parker.com/precisionfluidics/srs) to configure your SRS Miniature Pneumatic Solenoid Valve. For more detailed information, visit us on the Web, or call and refer to Performance Spec. #790-002090-001 and Drawing #890-003061-001.

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

PND Series Miniature Pneumatic Solenoid Valve

10 mm Normally Open Exhaust Valve

The PND Series miniature pneumatic solenoid valve is an economical 2-way normally open exhaust valve designed for rapid pressure relief. The PND Series miniature pneumatic solenoid valve is the perfect solution for safety oriented applications that require pressure relief to atmosphere upon power loss.

Features

- Compact, economical design to reduce size and cost of integration
- Normally Open configuration to ensure rapid deflation upon power loss
- Low power design reduces heat generation and power consumption
- Proven performance tested to 250,000 life cycles
- RoHS compliant

Typical Applications

- Non-Invasive Blood Pressure Devices
- Normally Open Fail-Safe Exhaust

Product Specifications

Mechanical

Valve Type:
2 Port, Direct-acting poppet style
- Normally Open (NO)

Media:
Air, Nitrogen, Argon, Carbon Dioxide, & other non-reacting gasses

Operating Environment:
32 to 131°F (0 to 55°C)

Storage Temperature:
-13 to 158°F (-25 to 70°C)

Dimensions:
PND-05D:
- Length: 1.01 in (25.7 mm)
- Width: 0.39 (10.0 mm)
- Height: 0.47 in (12.0 mm)

Porting:
Single Barb for 0.078" (2.0 mm) I.D. Tubing

Weight (Typical):
PND-05A: 0.60 oz (17.0 g)
PND-05D: 0.40 oz (11.4 g)

Internal Volume:
PND-05A: 0.0035 in^3 (0.056 cm^3)
PND-05D: 0.0025 in^3 (0.041 cm^3)

Filtration:
40 micron (recommended)

Electrical

Power:
PND-05A: 0.36 Watt
PND-05D: 0.50 Watt

Voltage:
3, 6 or 12 VDC
Further power reduction can be achieved with the use of PWM control.

Wetted Materials

Bobbin:
PBT (Polybutylene terephthalate)

Plunger/Barb:
SUM24L Steel

Seal:
Silicone

Frame:
SPCC Steel (Treatment: MFZn-c)

Other:
304 Stainless Steel

Performance Characteristics

Leak Rate:
< 0.016 sccm of air

Response:
< 100 ms cycling

Pressure:
0 to 6 psig (0.4 bar)

Orifice Sizes/Equivalent Cv:
PND-05A:
0.050" (1.27 mm) / 0.035
PND-05D:
0.030" (0.75 mm) / 0.017

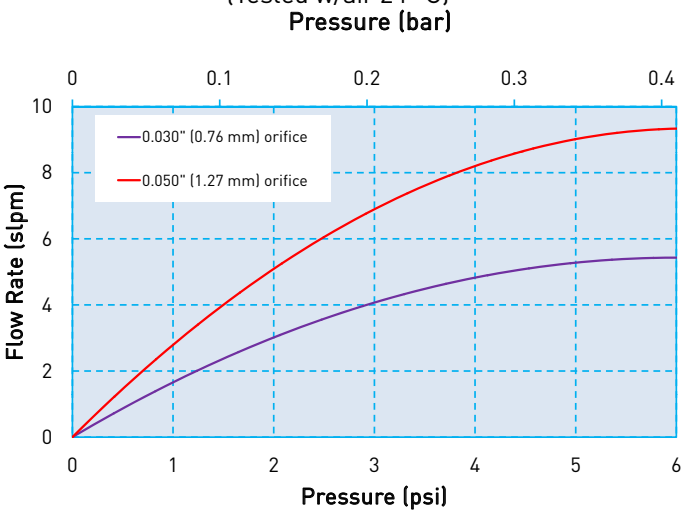
Reliability:
Life cycle rating of 250,000 cycles (worst case tested, no performance degradation)

PND Series Miniature Pneumatic Solenoid Valves

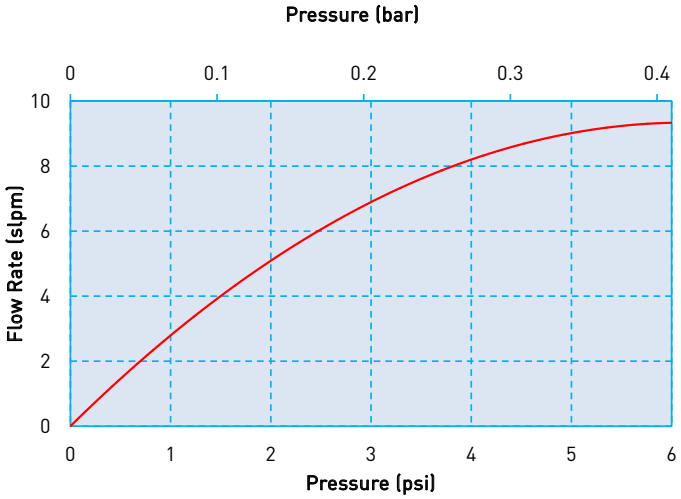
Typical Flow Curve

All Models

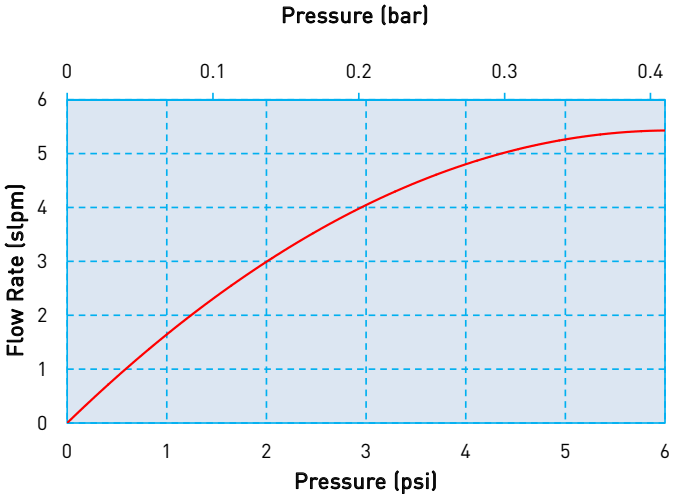
(Tested w/air 24° C)



Model PND-05A – 0.050" (1.27 mm) Orifice



Model PND-05D – 0.030" (0.76 mm) Orifice



PND Series Miniature Pneumatic Solenoid Valves

Pressure and Flow Capabilities/Power

Model No.	Orifice Size	Nominal Cv	Maximum Supply Pressure	Power Consumption
PND-05A	0.050 in (1.27 mm)	0.035	6 psig (0.4 bar)	0.36 Watt
PND-05D	0.030 in (0.76 mm)	0.017	6 psig (0.4 bar)	0.50 Watt

Pneumatic Interface

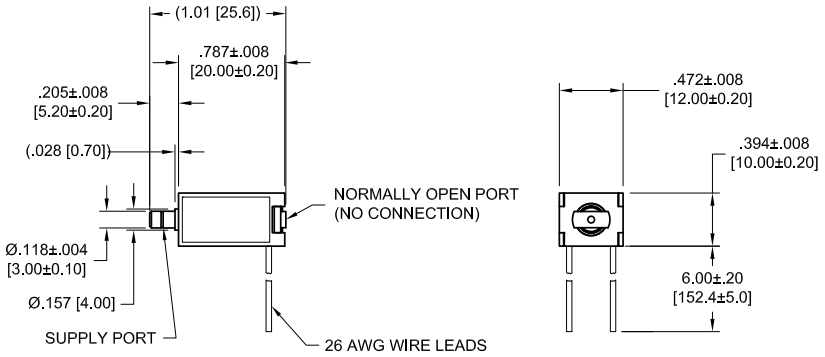
PND Series 05A

PDN Series 05D

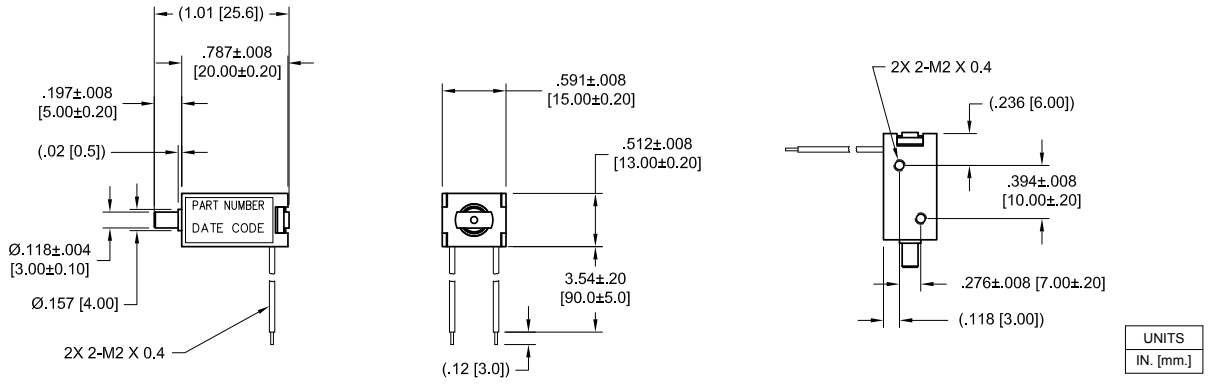
Mechanical Integration

Dimensions

Basic Dimensions, PND-05D



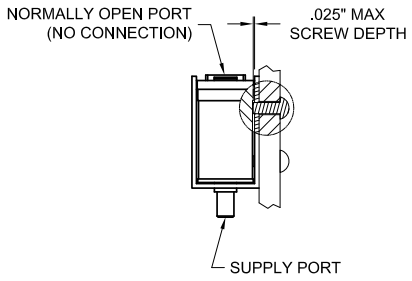
Basic Dimensions, PND-05A



PND Series Miniature Pneumatic Solenoid Valves

Installation and Use

Mounting Guidelines (PND-05A Only)



Ordering Information

Sample Part ID	PND	-	05D	-	12
Description	**Series**	-	**Model: Orifice / Power**	-	**Voltage**
Options	PND		05A: 0.050" / 0.36 Watt 05D: 0.030" / 0.50 Watt		03: 3 VDC 06: 6 VDC 12:12 VDC

ORDER ON-LINE

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/pndvalve) to configure your PND Miniature Pneumatic Solenoid Valve. For more detailed information, visit us on the Web, or call and refer to Performance Spec. #790-002198-001 and Drawing #s: PND-05A-DWG and PND-05D-DWG.

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

Pulse Valves

Ultra Low Leak Extreme Performance Valve

Pulse Valves solenoid valves offer outstanding potential for precision control of Laser Spectroscopy Gas Analysis. Combining high speed, ultra low leak rate, high flow, and high temperature capability in a small size; this rugged valve operates with extreme repeatability and is constructed of non-corroding, passivated stainless steel. Pulse Valves coils are rated for continuous duty and are potted to exclude the environment.

Typical Applications

- Gas pulse generation for Laser Spectroscopy

Features

- Smallest footprint in its class
- High speed response times of less than 2 ms
- 100% tested to leak-tight 1 x 10^{-7} cc/sec/atm Helium
- 100% duty cycle in environmental temperatures of up to 221°F (105°C)
- Pressures up to 1250 PSI (86.2 bar)
- Available with a variety of orifices, seals, and voltages to match your application
- RoHS compliant

Product Specifications

Physical Properties

Valve Type:
Inert Non Isolation
Valve Configuration:
2-Way Normally Closed
Media:
Gases
Operating Environment:
40 to 221°F (4 to 105°C)
Dimensions:
See Dimensions Page
Weight:
2.8 oz (79.4 g)
Porting:
A-LOK®, Flange
Internal Volume:
(Contact factory for details)

Electrical

Voltage (VDC):	**20**	**28**
Power (Watts):	**12.1**	**11.2**
Current (mA):	**606**	**400**
Resistance (Ohm):	**33**	**70**
(Ω±5% @ 70°F, 21°C)		
Connection:		
12" Lead Wires Standard		

Wetted Materials

Poppet Materials*:
Vespel®**
PTFE
O-Ring:
FFKM (Kalrez®**)
**NOTE: Vespel and Kalrez are trademarks of Dupont.

* See accessories table under ordering information for additional poppet materials.

Performance Characteristics

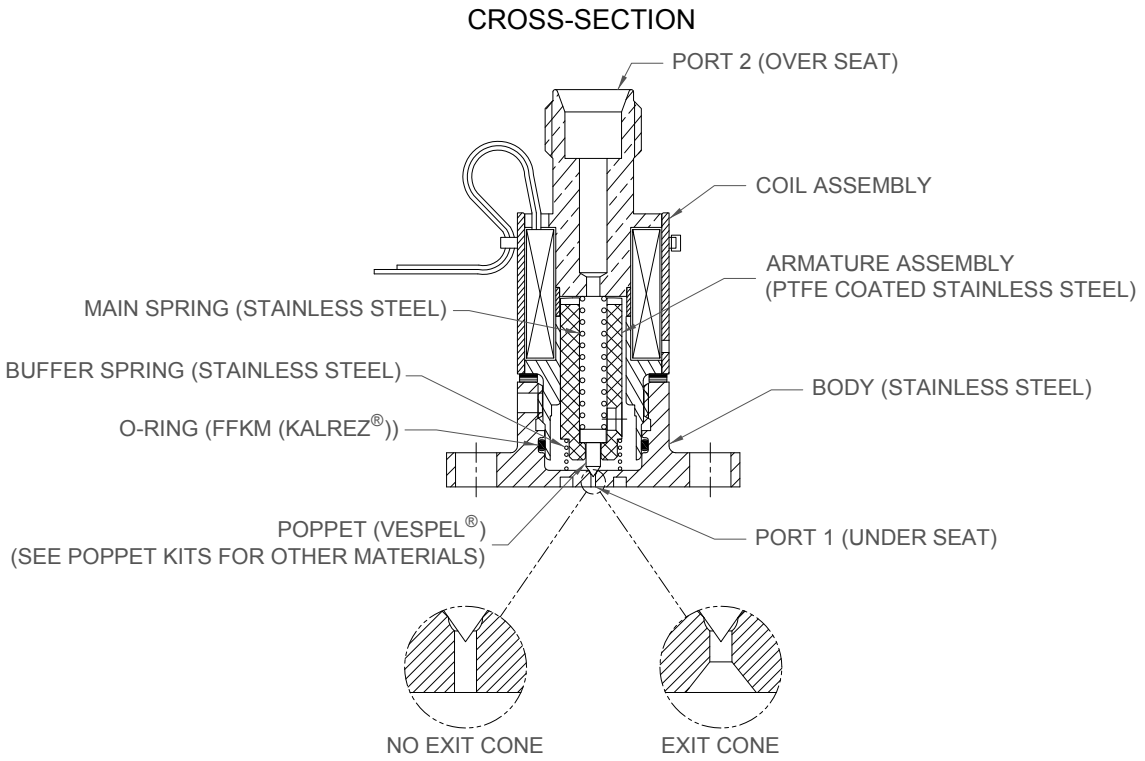
Operating Pressures / Orifice Diameters:
1x10^{-5} Torr -1250 psi (86.2 bar)/ 0.004" (.10 mm) 0.020" (.51 mm) 0.031" (.79 mm) 1x10^{-5} Torr -750 psi (51.7 bar)/ 0.039" (99 mm)
Proof Pressure:
1.5X rated pressure
Response Time:
<2 ms cycling Down to 160µs with the Parker IOTA ONE Valve Driver. (See Accessories)
Leak Rate:
1 x 10^{-7} cc/sec/atm Helium
Recommended Filtration:
40 µm max
Orifice Shape:
Cone, No Cone (Cone improves exit stream uniformity)

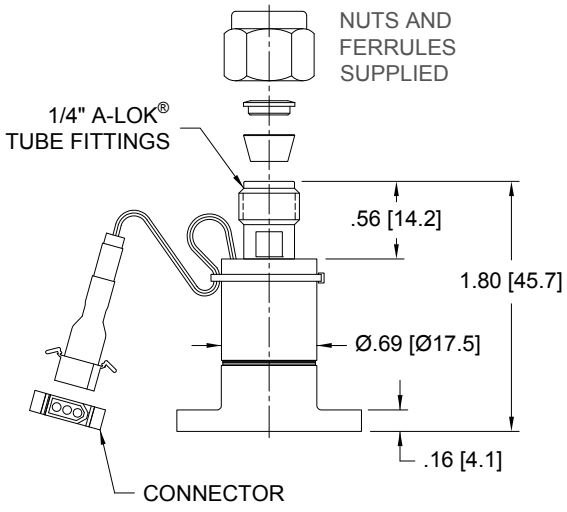
Pulse Valves Ultra Low Leak Extreme Performance Valve

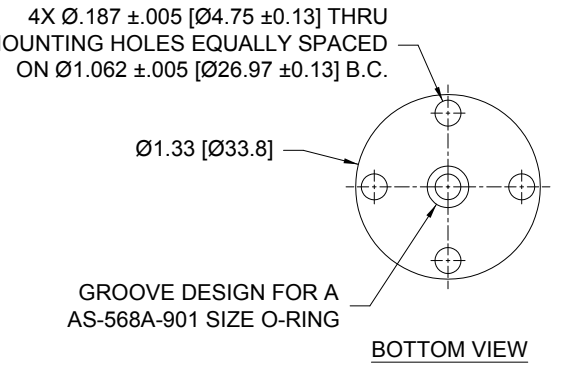
Mechanical Integration

Dimensions

1/4" [6.35 mm] A-LOK® CROSS-SECTION







UNITS
IN. [mm.]

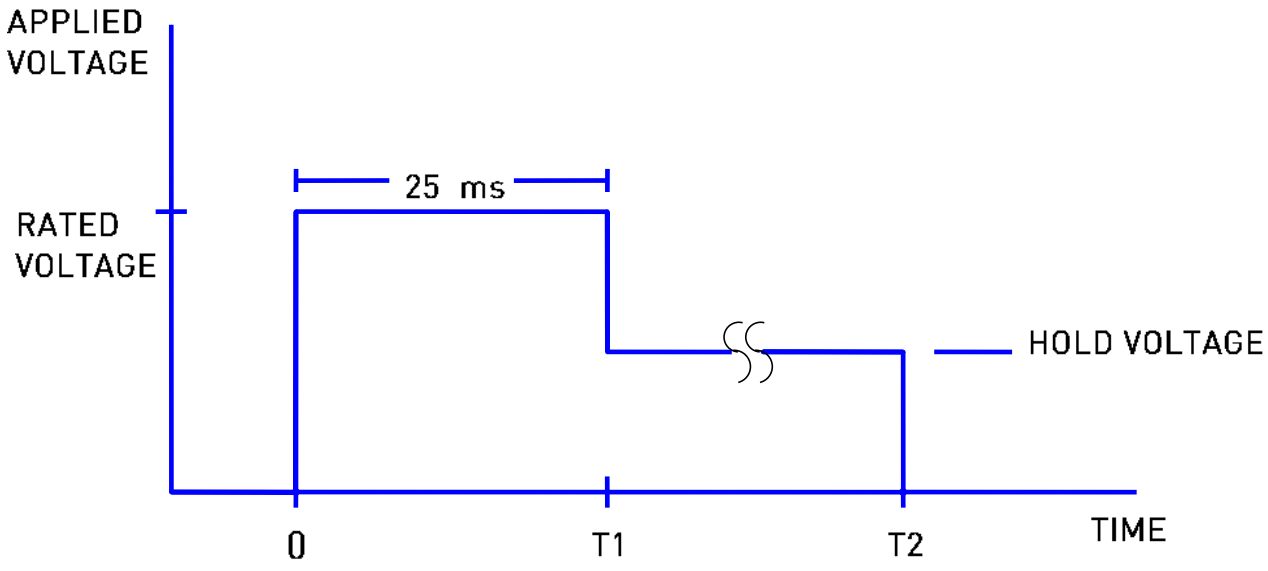
Pulse Valves Ultra Low Leak Extreme Performance Valve

Hit and Hold Specifications (12-Watt coils):

Hit and Hold is a method for driving valves that can be used to reduce power consumption and heat generation while maintaining valve performance specifications. The valve is "hit" with the full rated voltage for some time period to open it (T1 in the graph) and then "held" open with substantially reduced voltage until the desired pulse length is reached (T2 in the graph). The following table shows the possible holding voltages and power consumption for most of our standard 12-watt valve solenoids.

Rated Voltage (volts)	*3-way*		*2-way*	
	Hold Voltage	*Hold Power*	*Hold Voltage*	*Hold Power*
28	14 volts	2.8 watts	6 volts	0.51 watts
24	12 volts	3 watts	5 volts	0.52 watts
20	10 volts	3 watts	5 volts	0.76 watts
12	6 volts	3 watts	5 volts	2.1 watts

Note: values for 7-watt coils may be different



Hold Voltage Graph

Pulse Valves Ultra Low Leak Extreme Performance Valve

Chemical Compatibility Chart

Chemical	FFKM	PTFE	Stainless Steel	Vespel
DI Water	1	1	1	2
Methanol	1	1	1	1
Isopropanol	1	1	1	1
Ethanol	1	1	1	1
Acetonitrile	1	1	1	1
Tetrahydrofuran	1	1	1	2
Toluene	1	1	1	1
Organic Acids - Dilute	1	1	1	1
Non Organic Acids - Dilute	1	1	1	1
Bases - Dilute	1	1	1	1
Saline	1	1	1	1
Bleach 12%	1	1	2	4
Sodium Hydroxide 20%	1	1	1	4

COMPATIBILITY LEGEND		
1	EXCELLENT	Minimal or no effect
2	GOOD	Possible swelling and/or loss of physical properties
3	DOUBTFUL	Moderate or severe swelling and loss of physical properties
4	NOT RECOMMENDED	Severe effect and should not be considered

Pulse Valves Ultra Low Leak Extreme Performance Valve

Accessories

IOTA ONE
060-0001-900
(Microfluidic Valve Driver)

Ordering Information

Orifice Size	Pressure	Valve Type	Seal Material	Voltage	Inlet Porting	Outlet Porting	Part Number
0.004" (.10 mm)	Vac-1250 psi (86.2 bar)	2-Way NC	PTFE, FFKM	28V	1/4" A-Lok®	Flange, No Cone	009-1668-900
			Vespel, FFKM	20V			009-1670-900

Orifice Size	Pressure	Valve Type	Seal Material	Voltage	Inlet Porting	Outlet Porting	Part Number
0.020" (.51 mm)	Vac-1250 psi (86.2 bar)	2-Way NC	PTFE, FFKM	28V	1/4" A-Lok®	Flange, No Cone	009-0582-900
						Flange, Exit Cone	009-0442-900
			Vespel, FFKM	20V	1/4" A-Lok®	Flange, No Cone	009-1421-900
						Flange, Exit Cone	009-0347-900

Orifice Size	Pressure	Valve Type	Seal Material	Voltage	Inlet Porting	Outlet Porting	Part Number
0.031" (.79 mm)	Vac-1250 psi (86.2 bar)	2-Way NC	PTFE, FFKM	28V	1/4" A-Lok®	Flange, No Cone	009-0381-900
						Flange, Exit Cone	009-0181-900
			Vespel, FFKM	20V	1/4" A-Lok®	Flange, No Cone	009-1671-900
						Flange, Exit Cone	009-0279-900

Orifice Size	Pressure	Valve Type	Seal Material	Voltage	Inlet Porting	Outlet Porting	Part Number
0.039" (.99 mm)	Vac-750 psi (51.7 bar)	2-Way NC	PTFE, FFKM	28V	1/4" A-Lok®	Flange, No Cone	009-1669-900
			Vespel, FFKM	20V			009-1643-900

Pulse Valve Rebuild Kits

Pulse Valve Rebuild Kits	Part Number
With Teflon Poppets	009-PTFE-KIT
With Vespel® Poppets	009-VSPL-KIT
With Kel-F® Poppets	009-KELF-KIT
With PEEK Poppets	009-PEEK-KIT
Kit Contents	**Quantity Per Kit**
Poppet	10
Buffer Spring	5
Load Spring	5
Internal Viton® O - Ring	5
External Viton® O - Ring	5
Teflon Coated Armature	1
Shims (Various Thicknesses)	40

Pulse Valve Poppet Kits	Part Number
PTFE Poppets Qty. 50pcs	003-0023-050-KIT
Kel-F® Poppets Qty. 50pcs	009-0185-020-KIT
Vespel® Poppets Qty. 10pcs	009-0595-020-KIT
PEEK Poppets Qty. 50pcs	009-0424-030-KIT
Pulse Valve Coils	**Part Number**
12 VDC	009-0280-050-2
20 VDC	009-0279-050-2
28 VDC	009-0181-050-2
Pulse Valve Bodies (Flange with conical discharge)	**Part Number**
0.020"(0.5 mm) Orifice	009-0309-010-003
0.031"(0.8 mm) Orifice	009-0181-010-003

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/pulse) to configure your Pulse Valve Ultra Low Leak Extreme Performance Valve. For more detailed information, visit us on the Web, or call 603-595-1500.

Pulse Valves Ultra Low Leak Extreme Performance Valve

Series 9 Accessory Kits

	SERIES 9 Accessory Kits	
	Teflon Pulse Valve Kit - Contents	**Qty**
	Teflon Poppet	10
	Buffer Spring	5
	Load Spring	5
	Internal Viton Oring	5
	External Viton Oring	5
	Teflon Coated Armature	1
	Shims (Various Thicknesses)	40
Part Number	**009-PTFE-KIT**	**1**
	Vespel Pulse Valve Kit - Contents	**Qty**
	Vespel Poppet	5
	Buffer Spring	5
	Load Spring	5
	Internal Viton Oring	5
	External Viton Oring	5
	Teflon Coated Armature	1
	Shims (Various Thicknesses)	40
Part Number	**009-VSPL-KIT**	**1**
	Kel-f Pulse Valve Kit - Contents	**Qty**
	Kel-f Poppet	10
	Buffer Spring	5
	Load Spring	5
	Internal Viton Oring	5
	External Viton Oring	5
	Teflon Coated Armature	1
	Shims (Various Thicknesses)	40
Part Number	**009-KELF-KIT**	**1**
	PEEK Pulse Valve Kit - Contents	**Qty**
	PEEK Poppet	10
	Buffer Spring	5
	Load Spring	5
	Internal Viton Oring	5
	External Viton Oring	5
	Teflon Coated Armature	1
	Shims (Various Thicknesses)	40
Part Number	**009-PEEK-KIT**	**1**

	SERIES 9 POPPET KITs		**Qty**
Part Number	003-0023-050-KIT	PTFE Poppets	50
Part Number	009-0185-020-KIT	Kel-F Poppets	50
Part Number	009-0595-020-KIT	Vespel Poppets	10
Part Number	009-0424-030-KIT	PEEK Poppets	50

	SERIES 9 ORINGS (Kalrez)		**Qty**
Part Number	009-0070-100-001	Internal Kalrez Oring	1
Part Number	001-0045-020-001	External Kalrez Oring	1

	SERIES 9 COIL (1/4" A-LOK FITTING)* **		**Qty**
Part Number	009-0280-050-2	12 VDC	1
Part Number	009-0181-050-2	28 VDC	1
Part Number	009-0279-050-2	20 VDC	1

	SERIES 9 BODIES (Flange with conical discharge)		**Qty**
Part Number	009-0309-010-003	.020" (0.5 mm)	1
Part Number	009-0181-010-003	.031" (0.8 mm)	1
Part Number	091-0351-010-003	.004" (0.1 mm)	1

Please contact customer service for order placement, leadtime and price

***Series 9 coils shown do not ship with electrical connectors

Pulse Valves Ultra Low Leak Extreme Performance Valve

FAQs

1. Can the IOTA One trigger both 20 and 28V pulse valves?

Yes, the IOTA One can trigger 12, 20, 24, and 28V pulse valves. However, you will need to change the jumper settings in the unit, reference manual that ships with the unit. Please note current standard coil are 20 and 28V.

2. I used to purchase a pulse valve which is not listed in the chart above, is this pulse valve still available?

Currently, only the pulse valve configurations listed in the chart above are available for purchase.

3. I used to purchase spare parts for my pulse valve, are they still available?

Yes, spare parts are still available for pulse valves. Please note that only the kits and part numbers abov are available for purchase. Poppets, armatures, springs, etc… are no longer available for individual purchase and will need to be purchased as part of a kit.

4. Can the IOTA One trigger multiple valves at once?

Currently, the IOTA One is designed to trigger only one valve at a time.

5. What is the fastest pulse duration, opening response time and closing response time?

Typically, the fastest achievable pulse duration is 300 microseconds, opening response time is 180-200 microseconds, and closing response time is 50-250 microseconds.

6. Which Poppet material should I choose and why?

Poppet material should first be chosen based on compatibility with the gas you are flowing through the valve. If multiple materials are compatible then for general and low temperature and pressure applications PTFE and Kel-F should be used, for higher temperature and pressure applications Vespel ar PEEK should be used.

7. Is there a performance advantage between the different voltage valves?

The performance difference between voltages is negligible. However, please note that the 20V coil is capable of handling 125C temperatures.

8. What is the maximum cycle frequency for the valve?

The maximum cycle frequency for the valve is 250Hz.