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Miniature Solenoid Valves

Precision Fluidics



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Series MX

Miniature Pneumatic Solenoid Valve

10 mm Solenoid-Actuated Poppet Valve



Markets

- Respiratory
- Patient Therapy

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 in³ (0.2043 cm³)
Filtration:
40 micron recommended

Electrical

Power Options (Hit/Hold):
6 psid model (1.0/0.25 Watt)
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

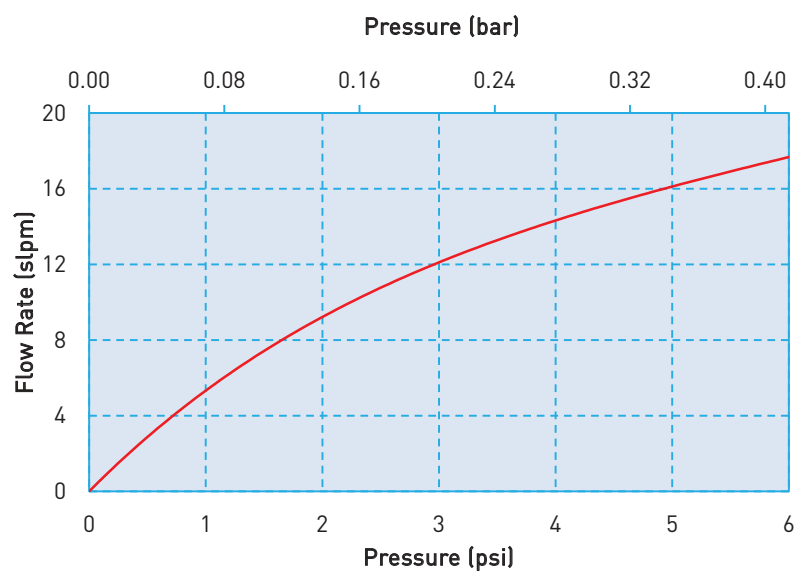
Leak Rate: Tested with Air
<0.2 sccm
Response:
< 20 ms maximum cycling
Pressure/Vacuum:
0 to 6 psid (0.4 bar differential)
0 to 30 psid (2.0 bar differential)
Proof Pressure:
100 psig (6.9 bar)
Typical Flow:
17.5 slpm @ 6 psid
(0.4 bar differential)
48 slpm @ 30 psid
(2.0 bar differential)
Orifice Sizes/Equivalent Cv:
0.075 in (1.91 mm) / 0.072
Reliability:
Life Cycle rating of 25 million
(worst case tested)



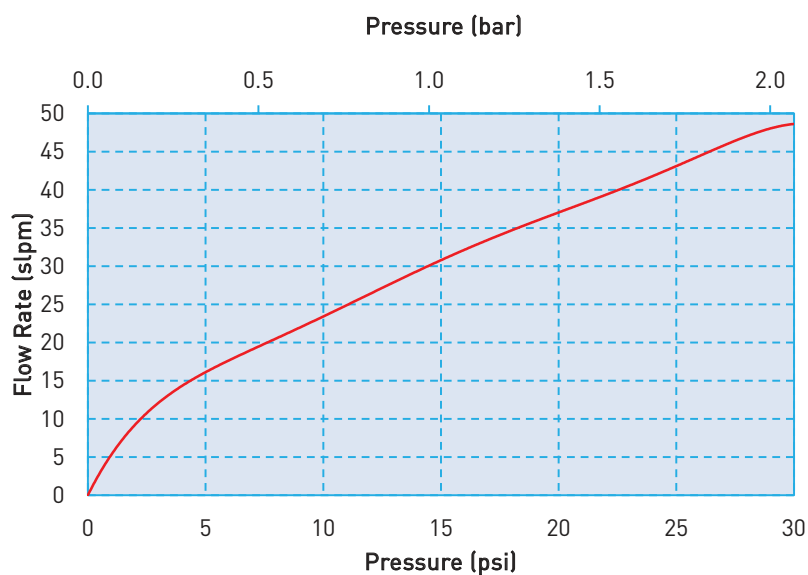
Series MX Miniature Pneumatic Solenoid Valve

Typical Flow Curve

6 PSID Model
(Tested w/air 20° C)



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
		30 psid (2.0 bar)	48 slpm	0.072

Electrical Interface

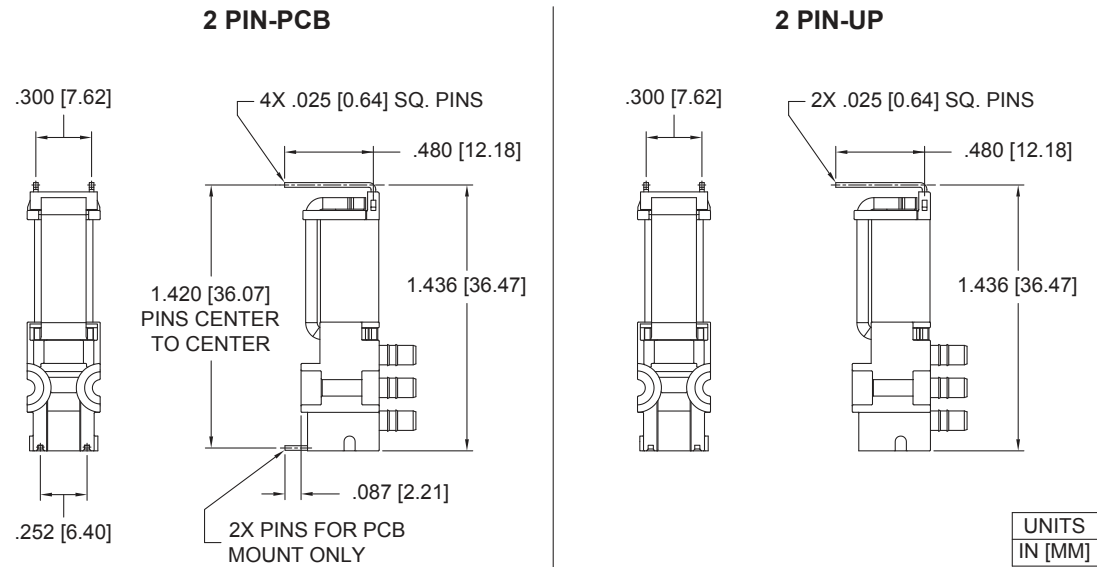
2 Pin-PCB
(For Pin/PCB solder mount connection)



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



Coil Connections



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 $\pm 5\%$)	Minimum Hold Voltage (VDC)	Hold Power, Typical @ 20°C (Watts)	Resistance @ 20°C (Ohms $\pm 5\%$)
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.

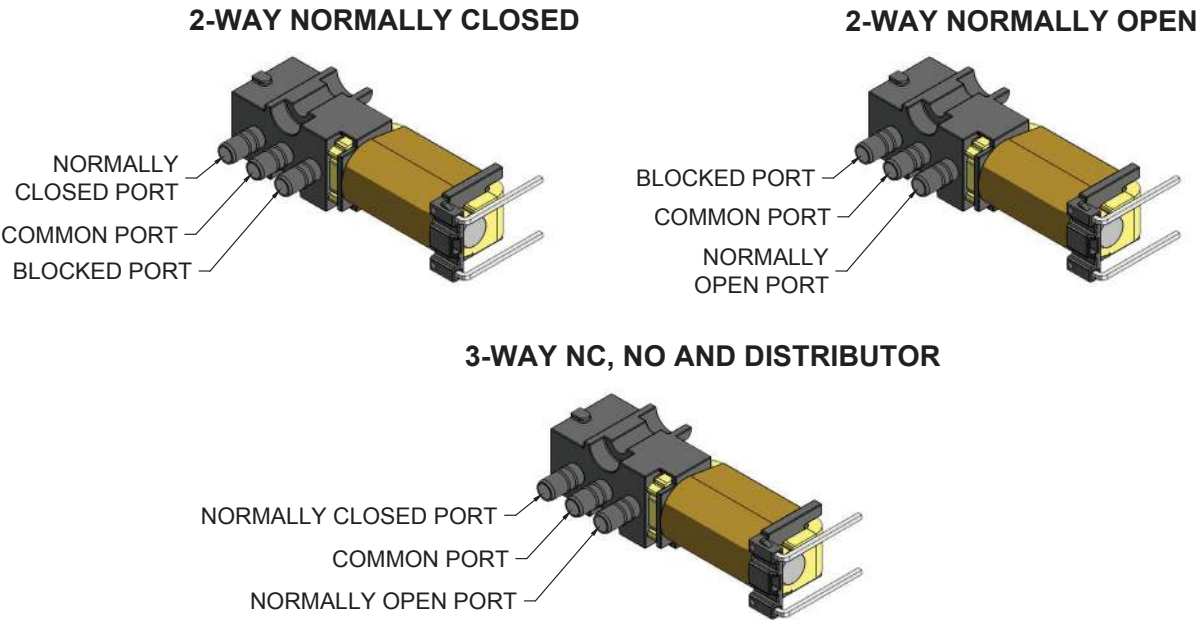
30 PSI Version

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

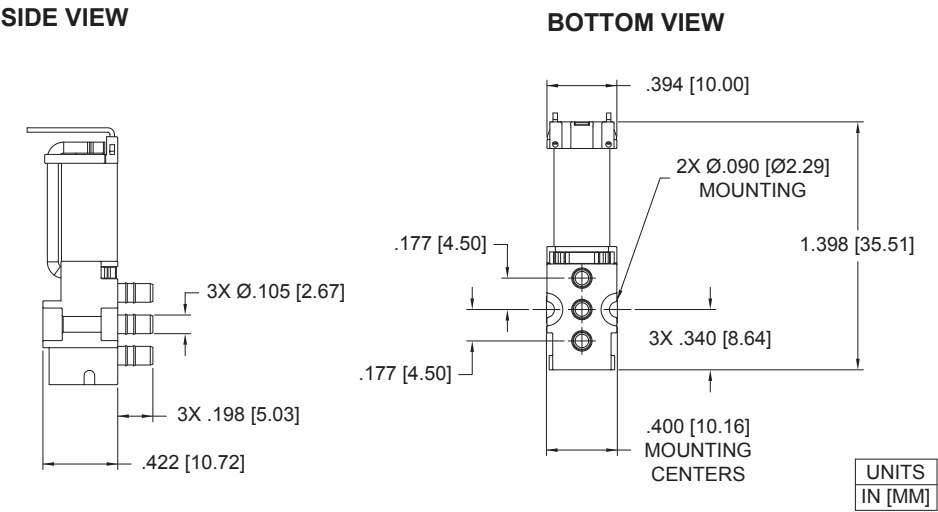
* Valve is not rated for continuous duty at rated in-rush voltage. Recommended minimum actuation time is 50 milliseconds. Actuation voltage time must not exceed 20 seconds.

Series MX Miniature Pneumatic Solenoid Valve

Pneumatic Integration



Mechanical Integration



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

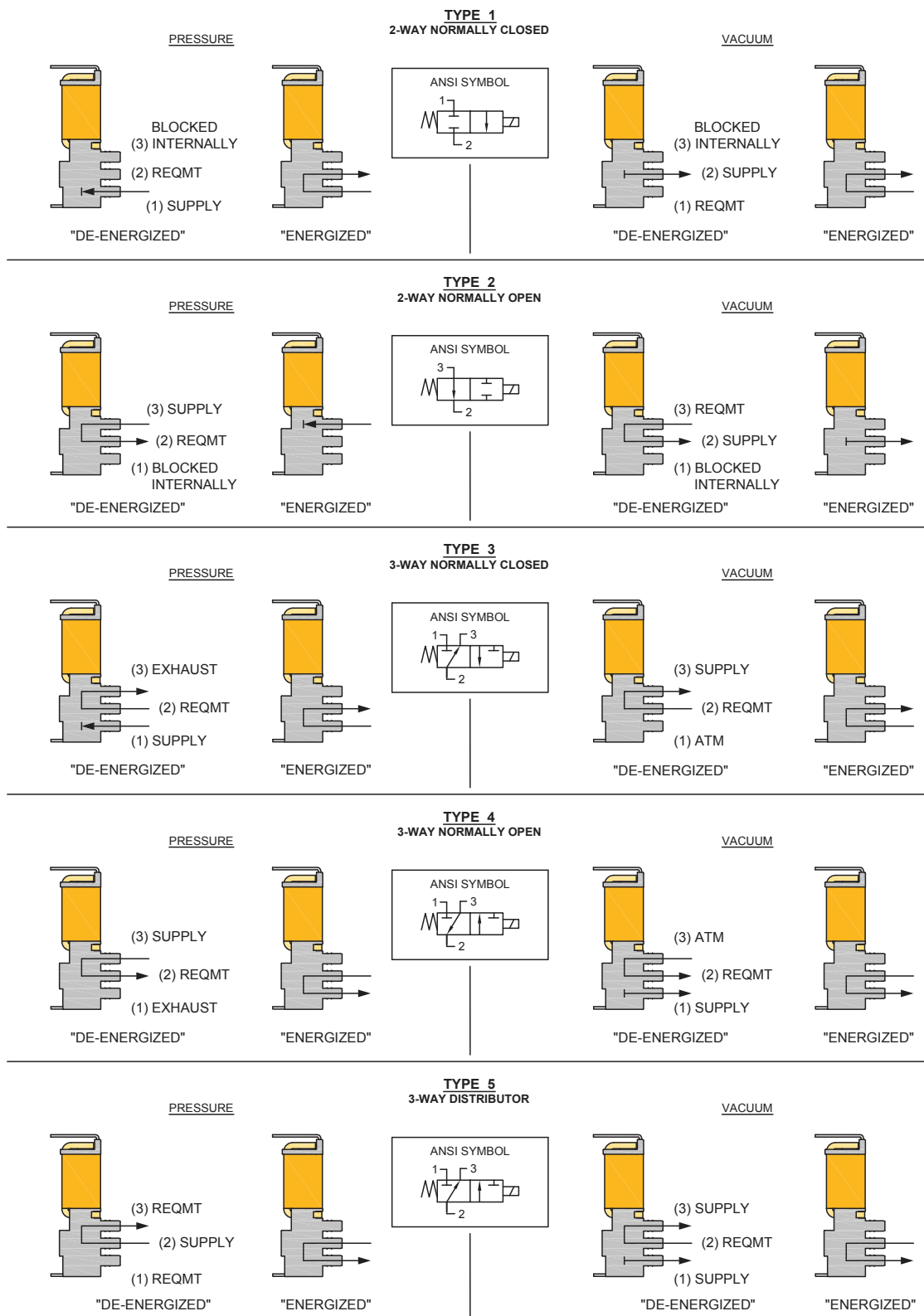


Series MX Miniature Pneumatic Solenoid Valve

ANSI Symbols

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

Pneumatic Schematics by Valve Types



Series MX Miniature Pneumatic Solenoid Valve

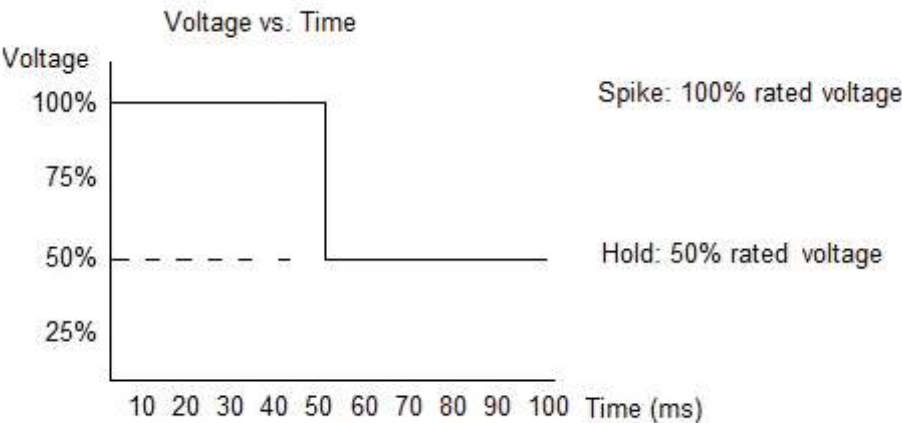
Installation and Use

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.**

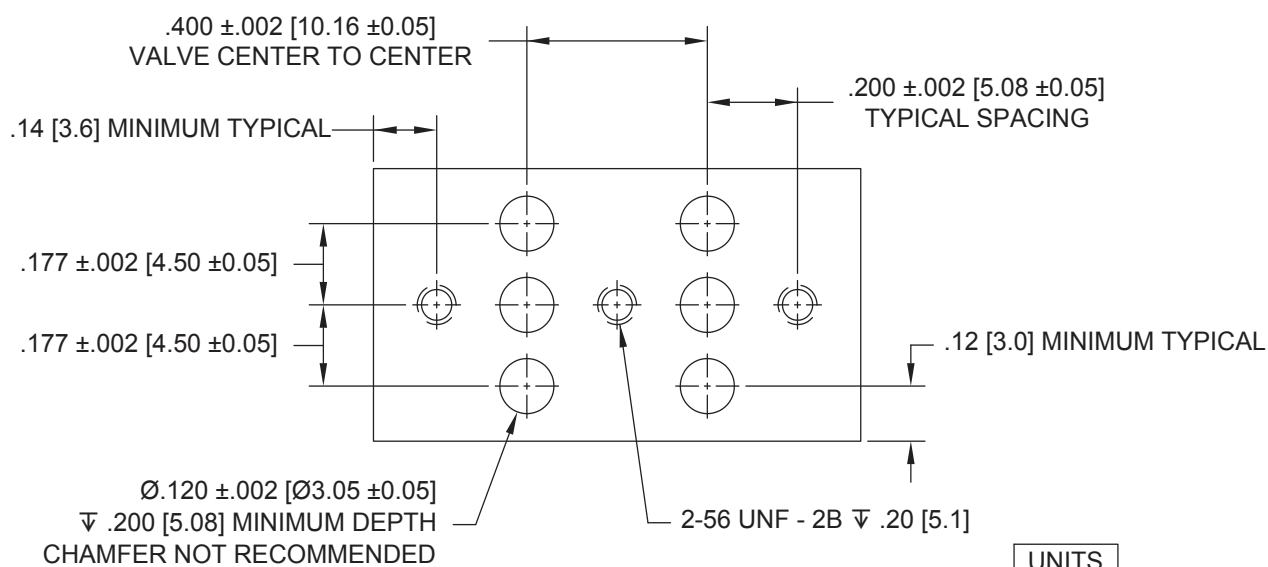


Series MX Miniature Pneumatic Solenoid Valve Installation and Use

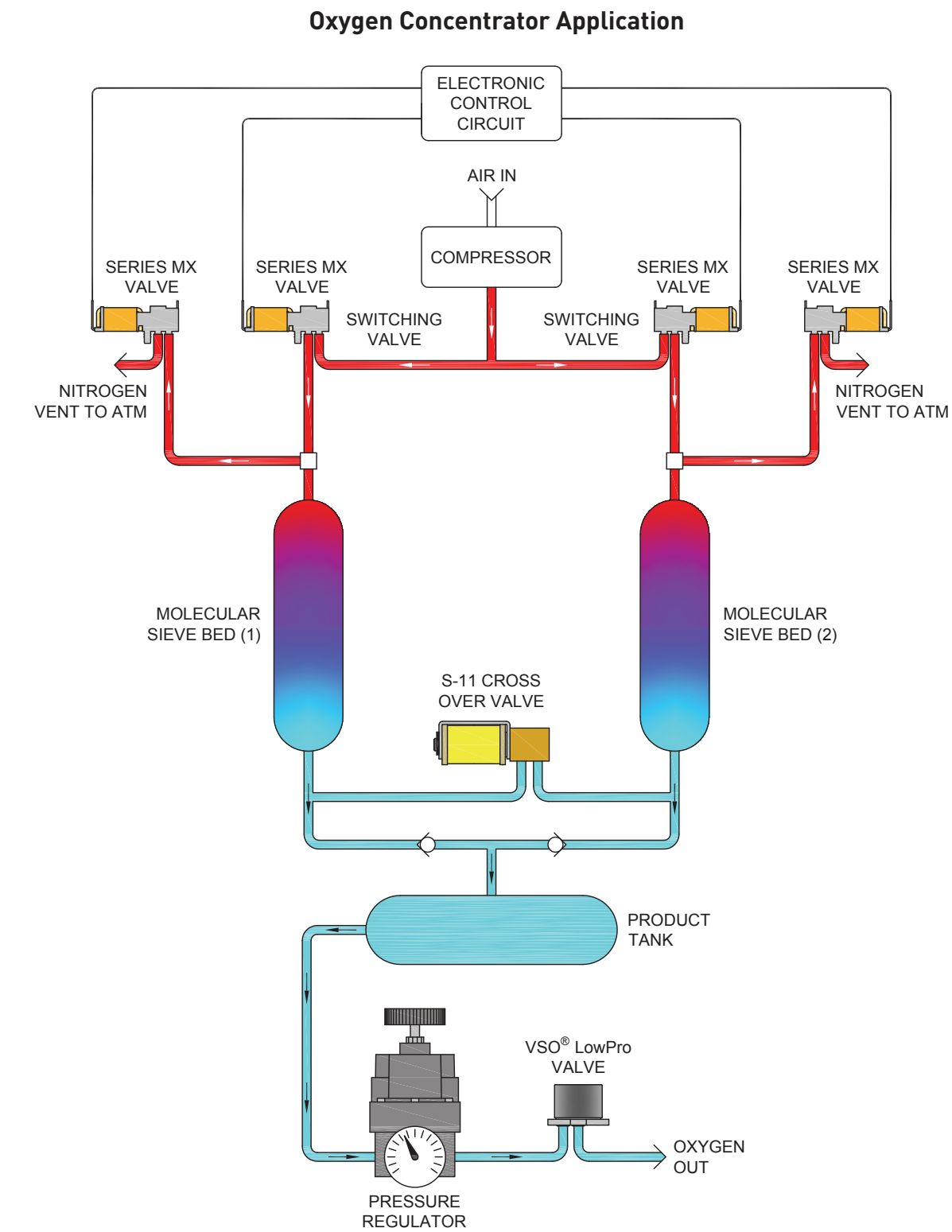
Recommended Series MX Mounting



Series MX Manifold Mount Diagram



Series MX Miniature Pneumatic Solenoid Valve
Typical Flow Diagram



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



Screw 2-56 x 1/2"

Pan Head, Phillips

191-000112-008

(see valve mounting
requirements above)

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 3: 30 psig / 0.75 Watt	1: FKM 2: Silicone (6 PSI Only)	
Accessories								
Part Number	Description		Comments					
00444-05-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 configuration 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:

- Series MX-Model 7 Performance Specification
- 3-Way, 2 Pin-Up Line Drawing
- 2-Way NO, 2 Pin-Up Line Drawing
- 2-Way NC, 2 Pin-Up Line Drawing
- 3-Way, 2 Pin-PCB Line Drawing
- 2-Way NO, 2 Pin-PCB Line Drawing
- 2-Way NC, 2 Pin-PCB Line Drawing

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890-003360-002
890-003360-003
890-003361-001
890-003361-002
890-003361-003

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