First Sensor

Series MX – 10 mm solenoid-actuated poppet valve

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 available power.

Features

- 2-way or 3-way, 2 position valve (NO, NC & Distributor)
- Small, 10 mm size enables compact integration and reduces device size
- Highest flow to power consumption ratio increases device battery life
- Lightweight design helps reduce portable device weight
- Universal barbed-tube or manifold mount eases valve integration
- Life cycle rating of 25 million (worst case tested)

Certificates

- RoHS
- CE

Media compatibility

Non-reactive gases

Applications

- Respiratory devices
- Oxygen concentrators
- Deep vein thrombosis
- Negative pressure wound therapy

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Product specifications

Parameter	
Operating temperature	**41 ... 122 °F (5 ... 50 °C)**
Storage temperature	**-40 ... 158 °F (-40 ... 70 °C)**
Weight	**0.3 oz (8.5 g)**
Internal volume	**0.01247 in^3 (0.2043 cm^3)**

Wetted materials

Parameter	
Body/Plunger	**PPE/PA (Polyphenylene Ether/Polyamide)**
Armature	**430 FR series stainless steel**
Seal	**Silicone, FKM**
Other	**302/304 series stainless steel, EPDM (manifold gasket)**

Filtration

40 micron recommended

Performance characteristics

Part no.	Pressure (1)	Typical flow	Orifice size / nominal Cv	Leak rate (tested with air)	Response	Power (hit/hold)
TP...P006...	**0 to 6 psid**	**17.5 slpm @ 6 psid**	**0.075 in (1.9 mm) / 0.062**	**< 0.2 sccm**	**< 20 ms maximum cycling**	**1.0 / 0.25 Watt**
TP...P030...	**0 to 30 psid**	**48 slpm @ 30 psid**	**0.075 in (1.9 mm) / 0.072**			**3.0 / 0.75 Watt**

Specification notes
(1) Proof pressure is 100 psig (6.9 bar).

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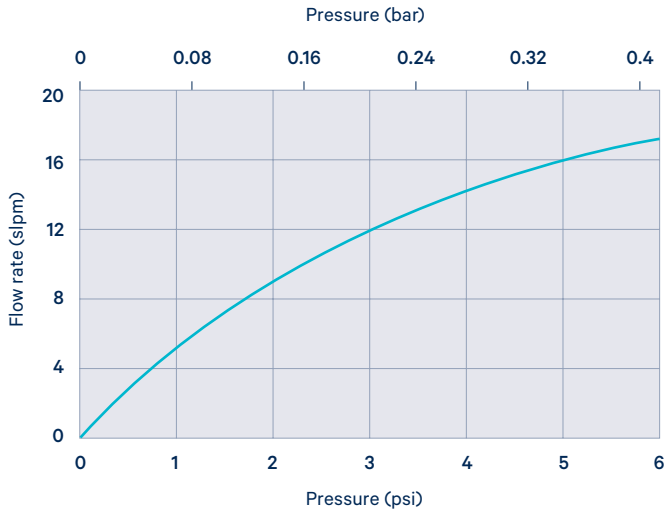
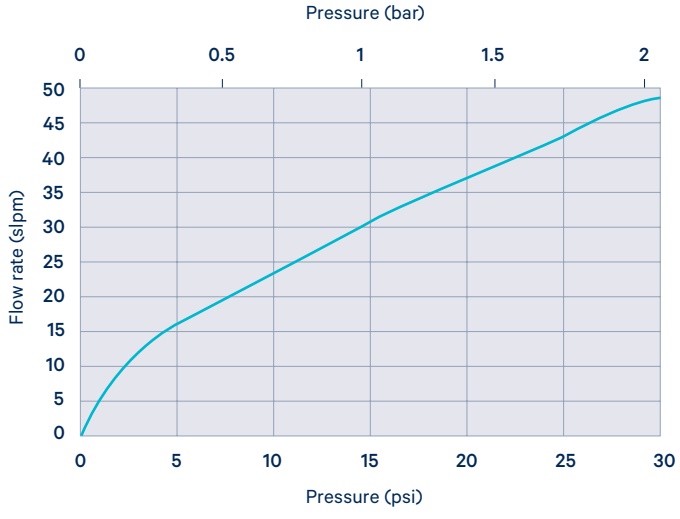
Typical flow curve

(Tested with air @ 20 °C)

6 psid model



30 psid model



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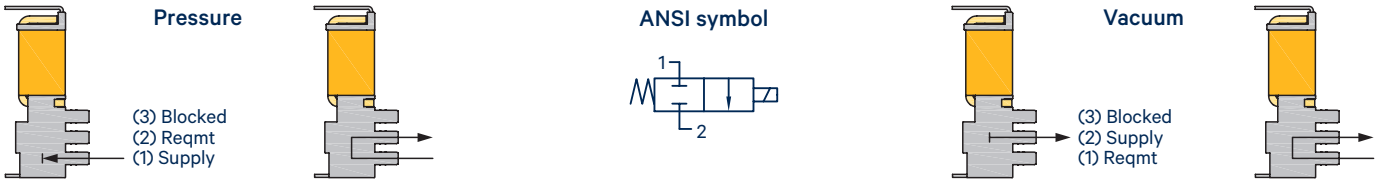
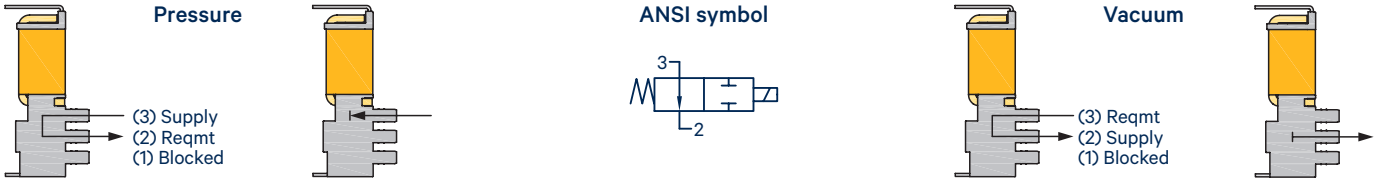
Pneumatic schematics

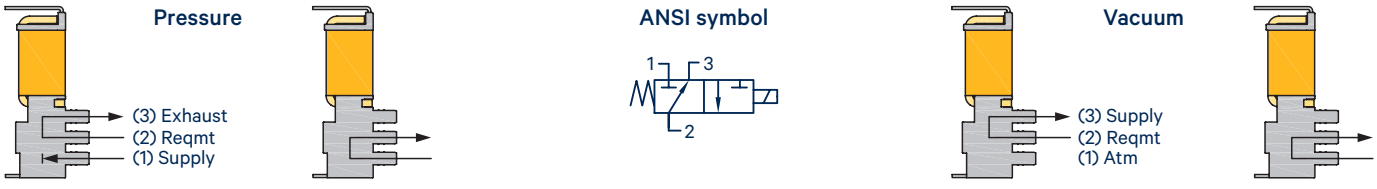
2-way normally closed



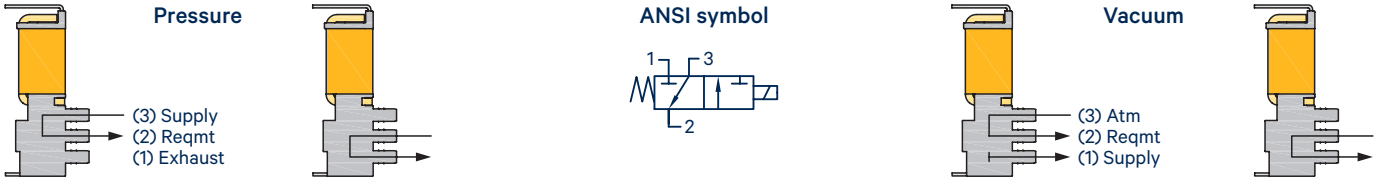
2-way normally open



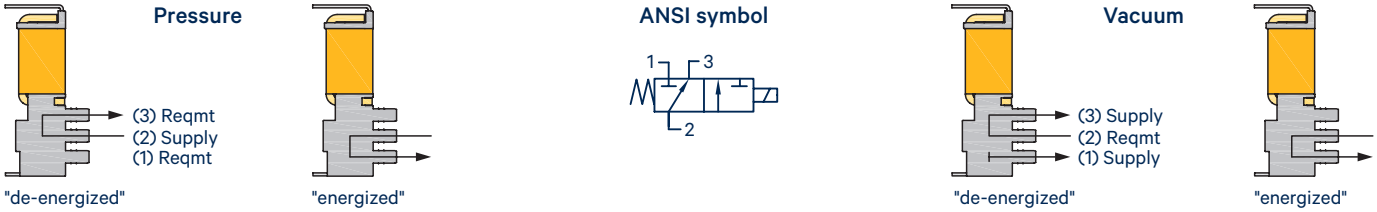
3-way normally closed



3-way normally open



3-way distributor



Legend
Supply: Pneumatic source or supply pressure **Exhaust**: Exhaust to atmospheric pressure **Reqmt**: Customer requirement or application **Atm**: Atmospheric pressure

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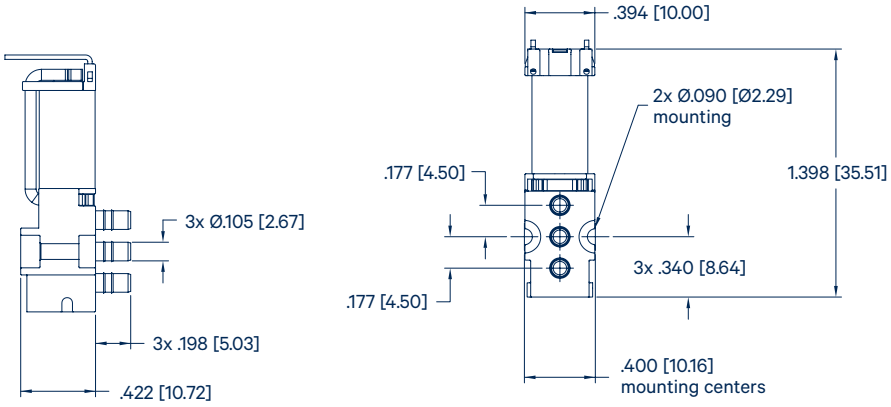
Dimensional drawing

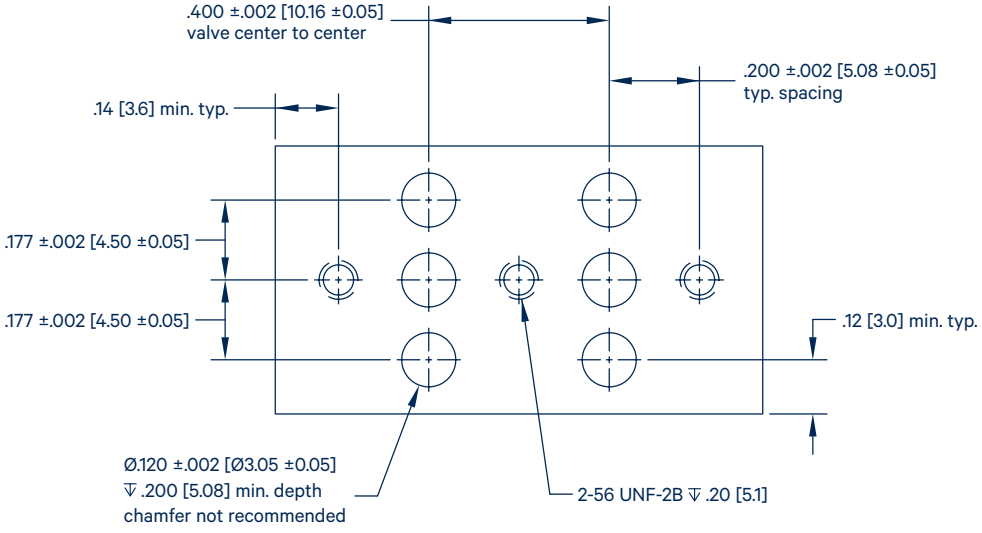


dimensions in inch [mm]

Mounting Requirements

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

Manifold mount diagram (3)



dimensions in inch [mm]

Notes

(2) Pan head machine screw. Mounting screws are not provided with the valve. See Accessories.

(3) Recommended manifold surface finish 16 µm or better.

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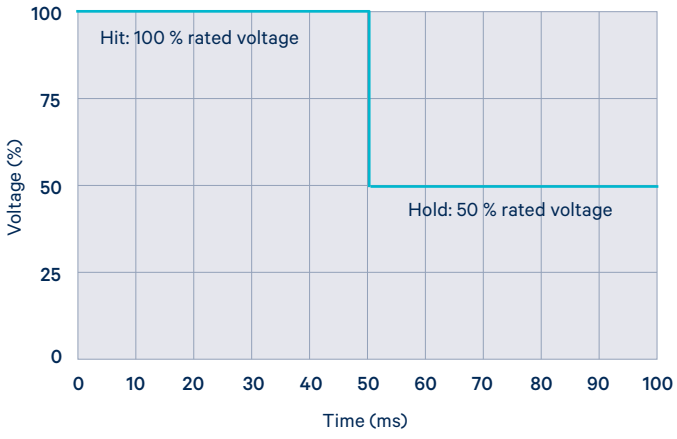
Hit and hold specifications

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. Figure 1 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 will consume an excessive amount of power dissipated by the coil as heat and may adversely affect valve performance.

Typical “Hit” and “Hold” control method



Electrical requirements

Rated in-rush voltage [4] (VDC ±5 %)	Minimum hold voltage (VDC)	Hold power, typical @ 20 °C (watts)		Resistance @ 20°C (ohms ±5 %)
		6 psi	30 psi	
5	2.5			24.5
12	6	0.25	0.75	145
24	12			567

Specification notes

(4) Valve is not rated for continuous duty at rated in-rush voltage. Recommended minimum rated in-rush time is 50 milliseconds. Rated in-rush voltage time must not exceed 20 seconds.

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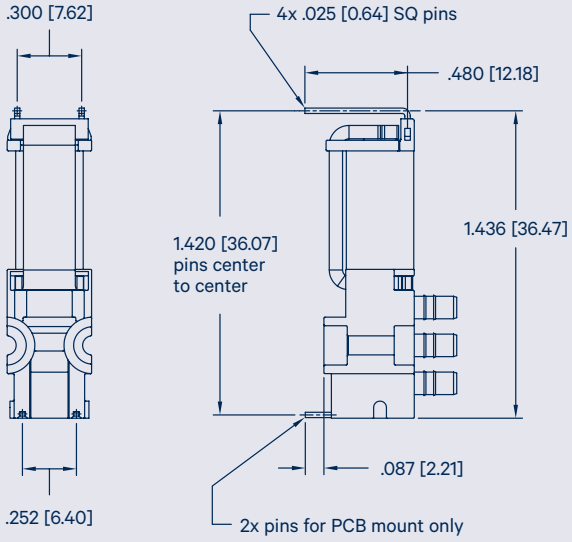
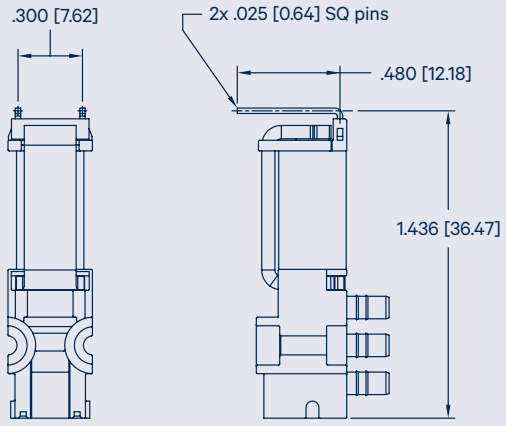
Electrical connection

For pin/PCB solder mount connection



For pin/wire lead or PCB terminal housing connection



dimensions in inch [mm]

Electrical connection options:
Electrical terminals compatible with Molex 0511910400 (4 position) connector and Molex 0508029101 crimp terminal or equivalent.

Ordering information

Part	Ways		Pressure		Function		Elastomer		Voltage		Electrical	
TP	**2**	2-way	**P006***	6 psi	**C**	NC	**S**	Silicone	**05**	5 VDC	**P**	PCB solder mount
	3	3-way	**P030****	30 psi	**P**	NO	**F**	FKM	**12**	12 VDC	**L**	Long pins
					D	Distributor (only 3-way)			**24**	24 VDC		

* only Silicone
** only FKM

Accessories		
00444-05-E099	Manifold rubber gasket, EPDM, required for manifold mounting	**supplied with each valve**
290-006061-002	12 inch (30 cm) wire leads, used to electrically interface with the "L" electrical connection version	**not supplied with the valve**
191-000112-008	Screw 2-56 x 1/2 inch pan head, two (2) required for each discrete valve mounted on a manifold	**not supplied with the valve**