

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.


Markets

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

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
2-Way Normally Closed (NC)
3-Way
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: 0.83 in (21 mm)
- Length: 1.54 in (39 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)		
	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" (80 mm) Flying Leads [24 AWG]
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

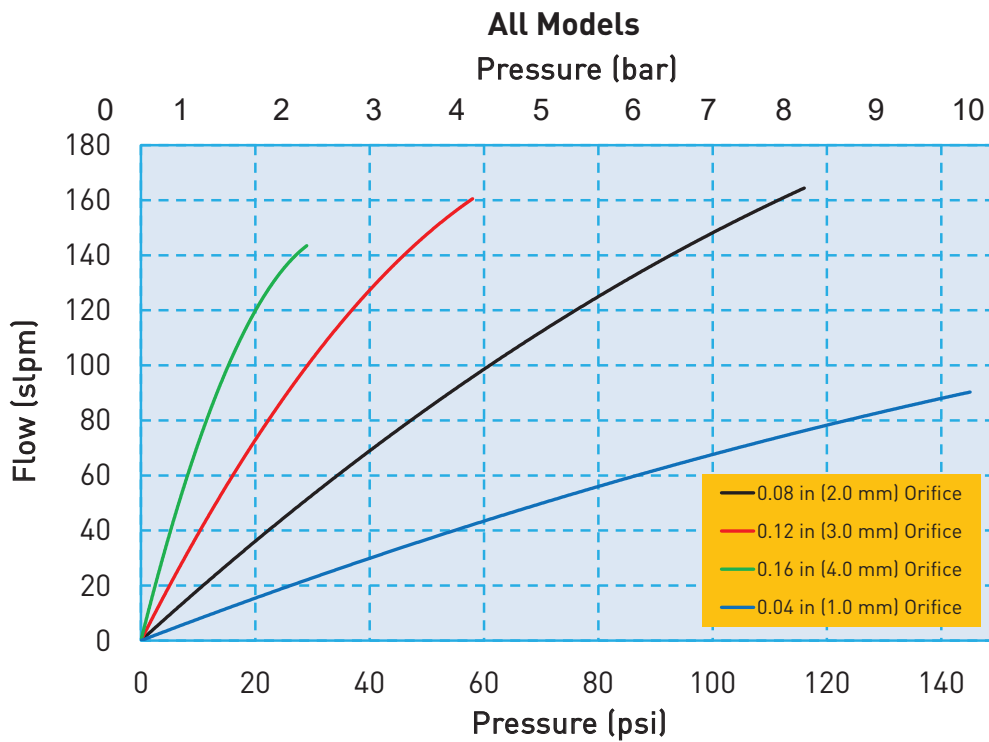
Response:
10 ms Maximum, Cycling
Recommended Filtration:
10 µm
Reliability:
2-Way: 20 Million Cycles
3-Way: 20 Million Cycles
0.90 Reliability Factor
95% Confidence



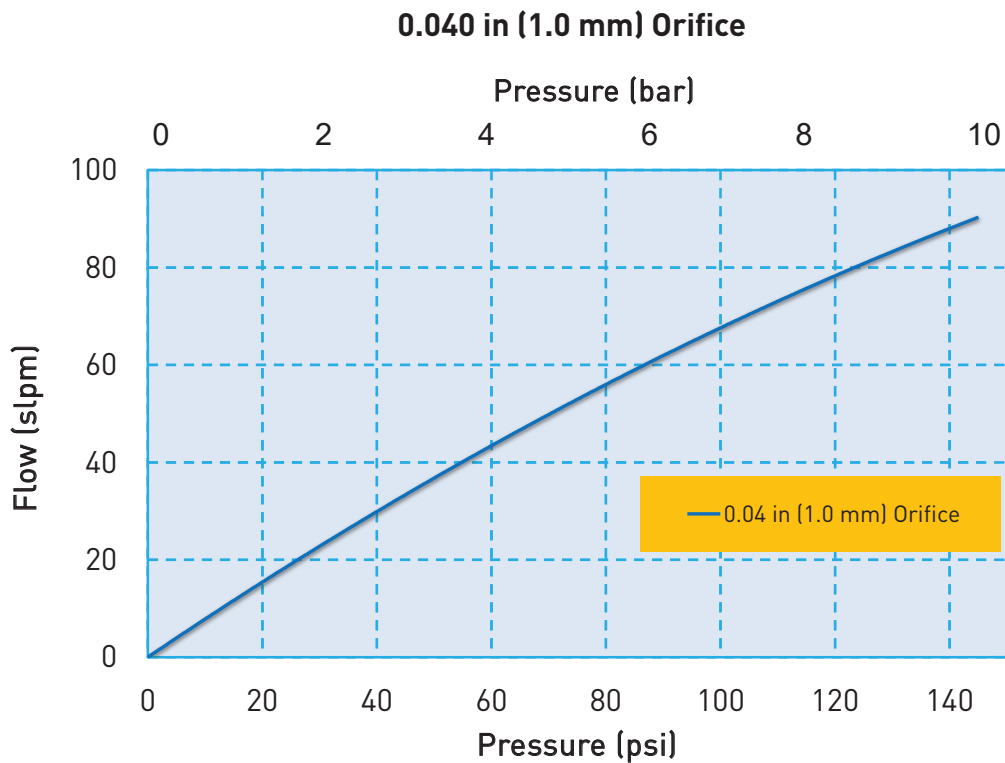
*Please contact factory for additional details on liquid compatibility.

C21 Miniature Cartridge Valve

Flow Curve

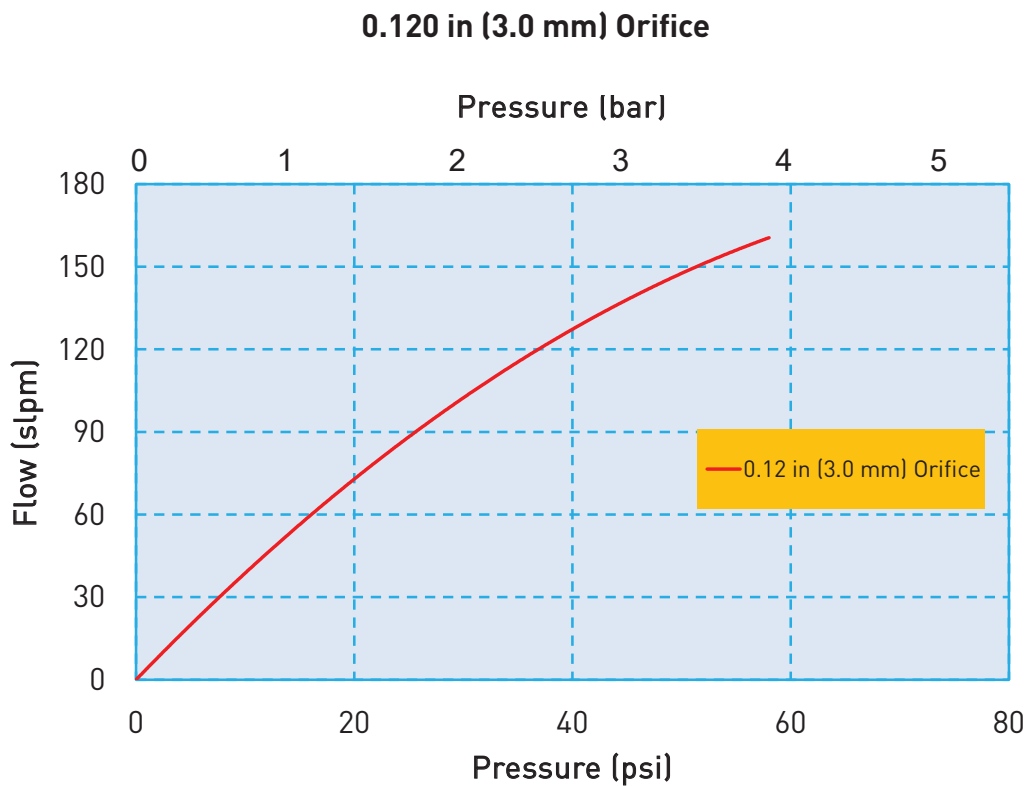
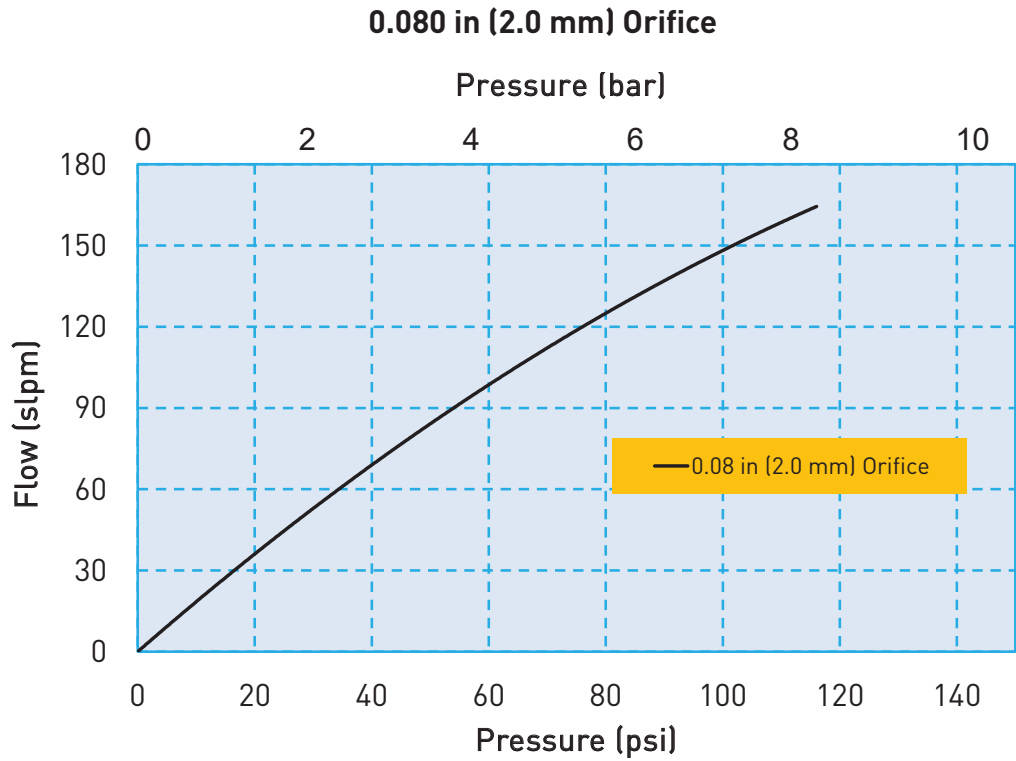


Flow Curve



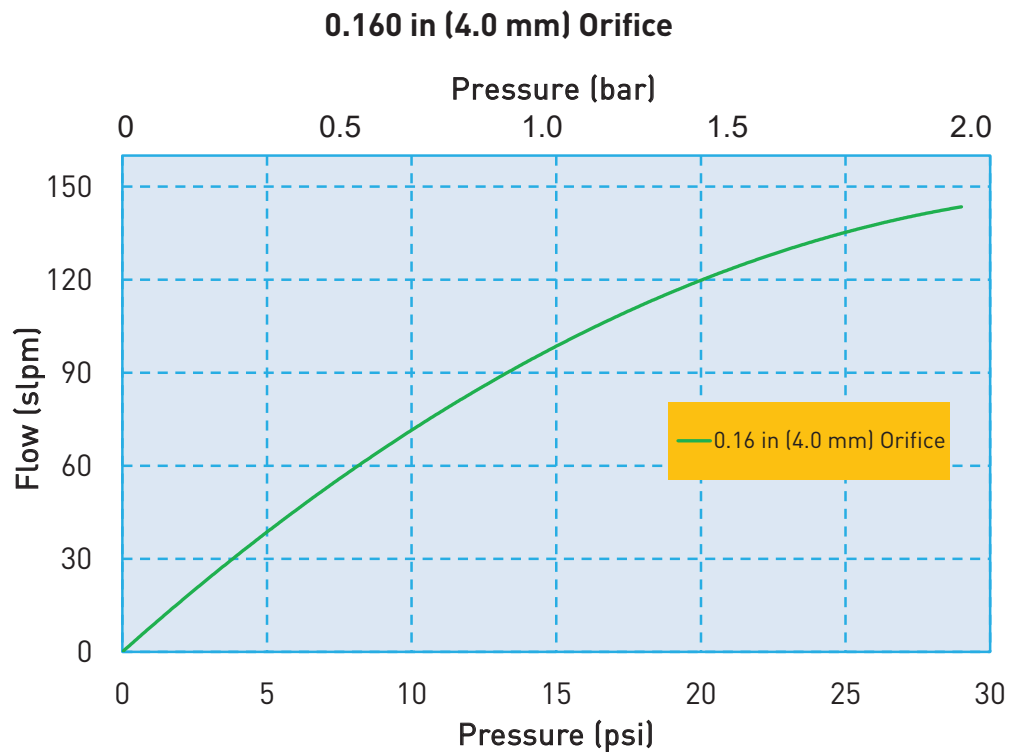
C21 Miniature Cartridge Valve

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

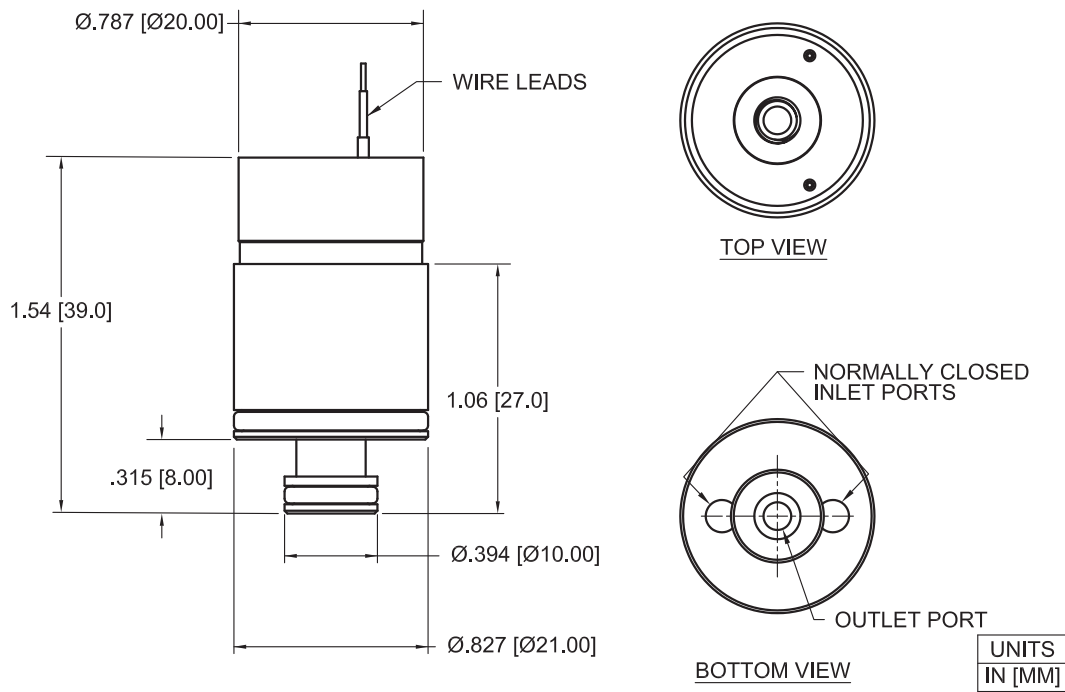
Pneumatic Interface/Mechanical Integration



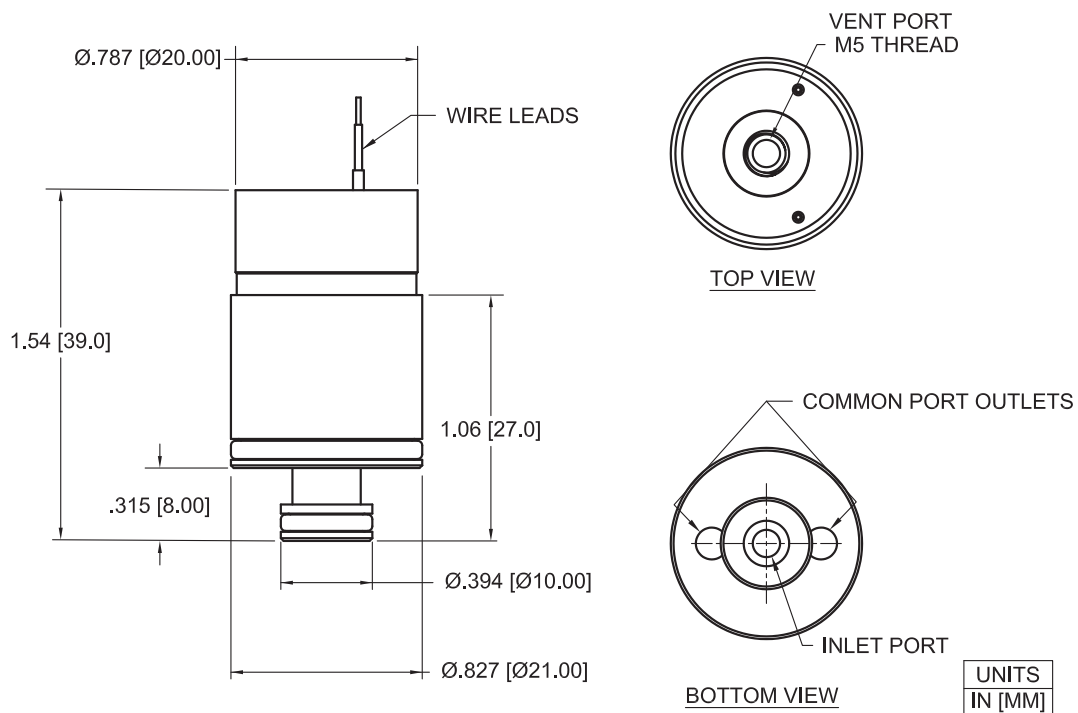
C21 Miniature Cartridge Valve

Dimensions

2-Way Valve Configuration

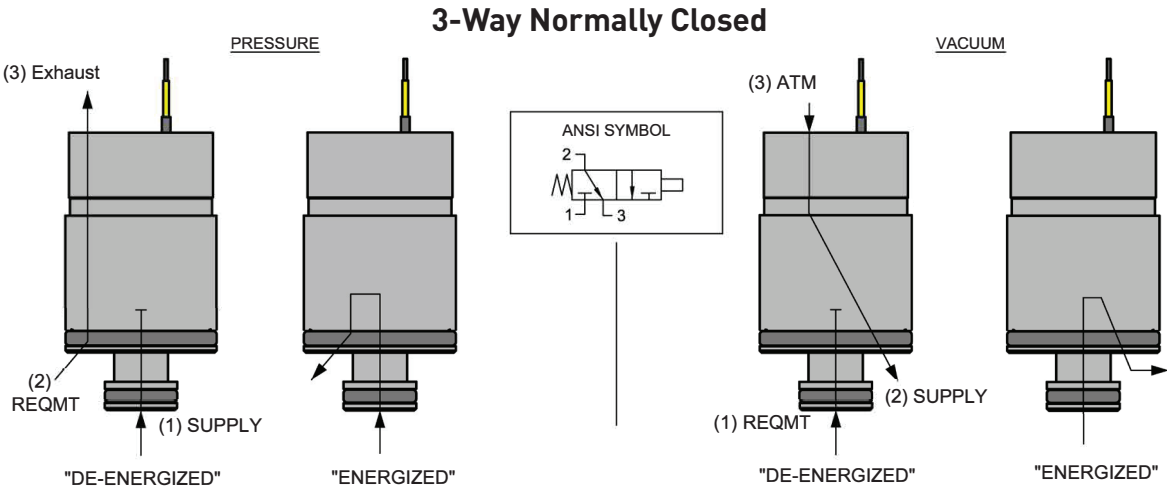
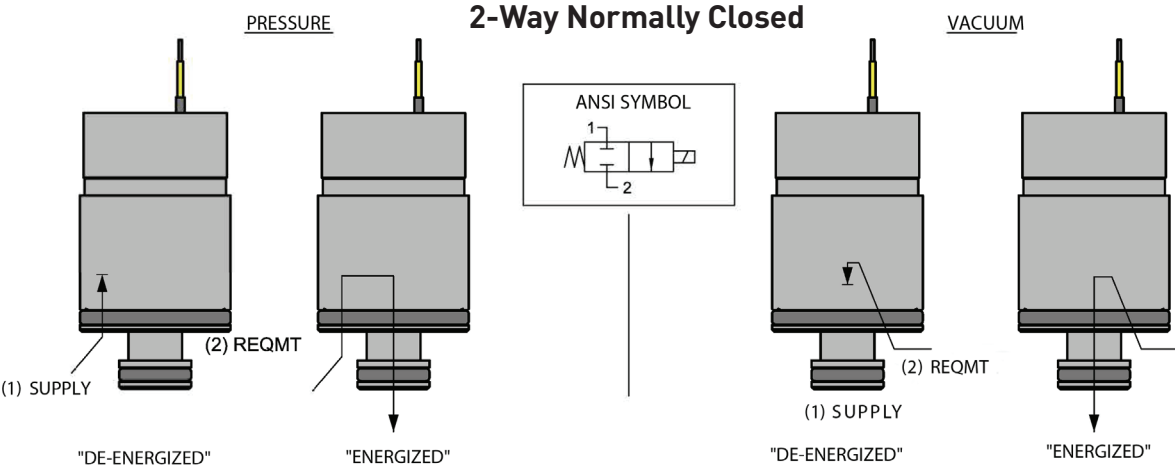


3-Way Valve Configuration



C21 Miniature Cartridge Valve

ANSI Symbols

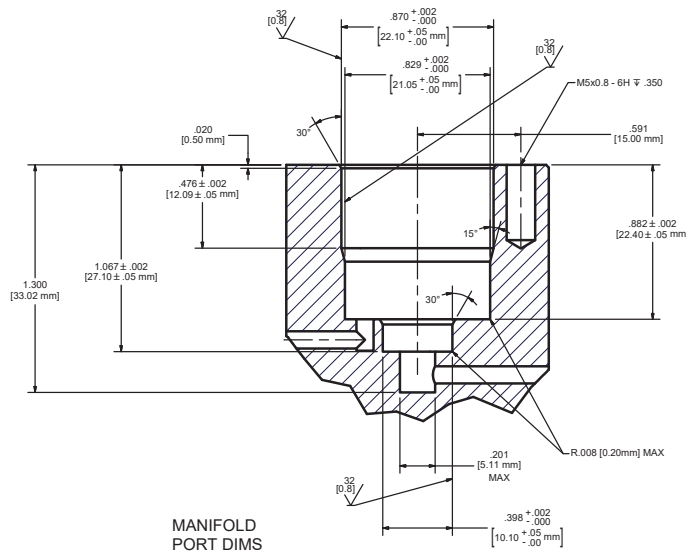


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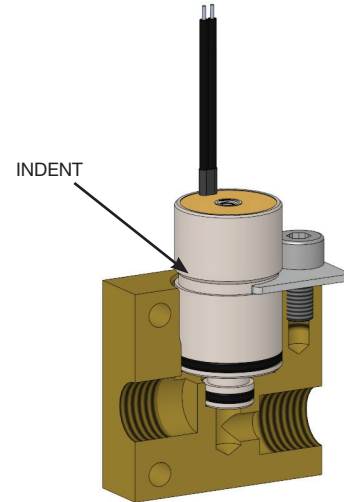
Installation and Use

During installation of the C21 valve, the maximum force allowed to press it into the manifold is: 44.96 lbf (200 N)
 Lubrication is recommended (I.E. alcohol or DI water depending on compatibility constraints)

Recommended Valve Manifold Dimensions



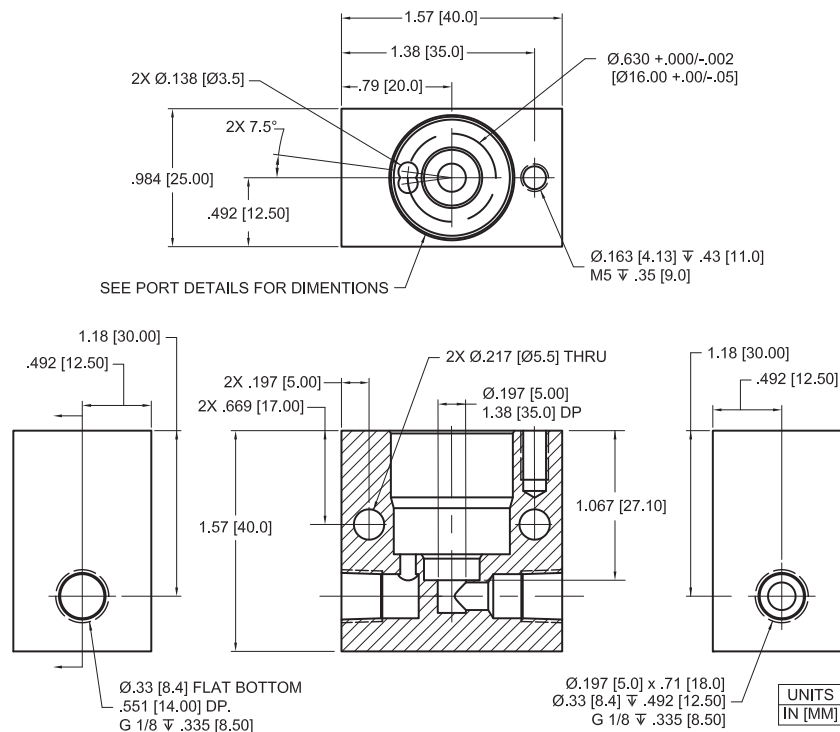
Recommended Valve Mounting



The correct location to use when holding the valve in place in the manifold is the indent at the middle of the valve body. If the top of the valve is used to hold the valve in place, the working pressure the valve will receive, can push the valve upward and exceed the maximum insertion force for the valve. This could damage the valve.

Installation and Use

C21 Evaluation Manifold Dimensions and Design C21-MCS



C21 Miniature Cartridge Valve

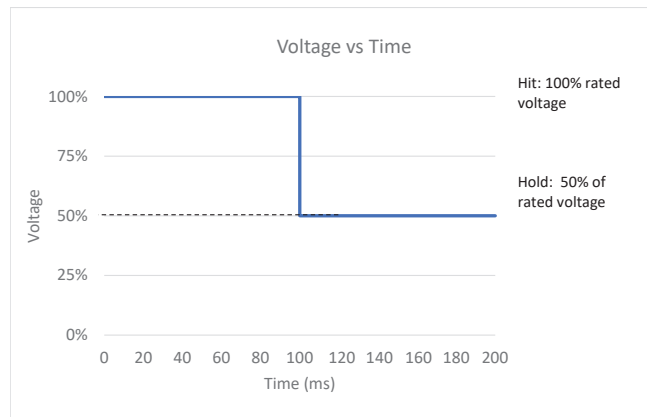
Installation and Use

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	12: 12 VDC	EP: EPDM	10: 0.040 in (1.0 mm)	F: Face Seal	F: 3.2 in (80 mm) flying lead		000: Standard
			3: 3-Way	24: 24 VDC	FK: FKM	20: 0.080 in (2.0 mm)				
						30: 0.12 in (3.0 mm)				
						40: 0.16 in (4.0 mm)				

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.

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

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