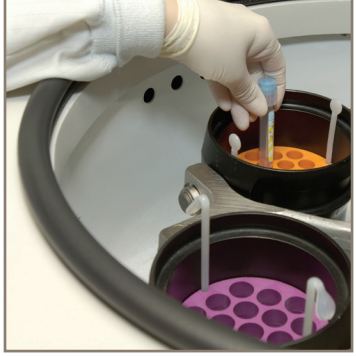




aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding







C Series
Minature Cartridge Valves
Precision Fluidics



Parker

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Table of Contents

	product		page
	**C7 Gas**	Miniature 7 mm Cartridge Pneumatic Solenoid Valve	4
	**C7 Liquid**	Miniature 7 mm Cartridge Liquid Valve	15
	**C15 Gas**	Miniature 15 mm Cartridge Pneumatic Solenoid Valve	25
	**C15 Liquid**	Miniature 15 mm Cartridge Liquid Valve	36
	**C21 Gas**	Miniature 21 mm Cartridge Pneumatic Solenoid Valve	46
	**C21 Liquid**	Miniature 21 mm Cartridge Liquid Valve	57

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

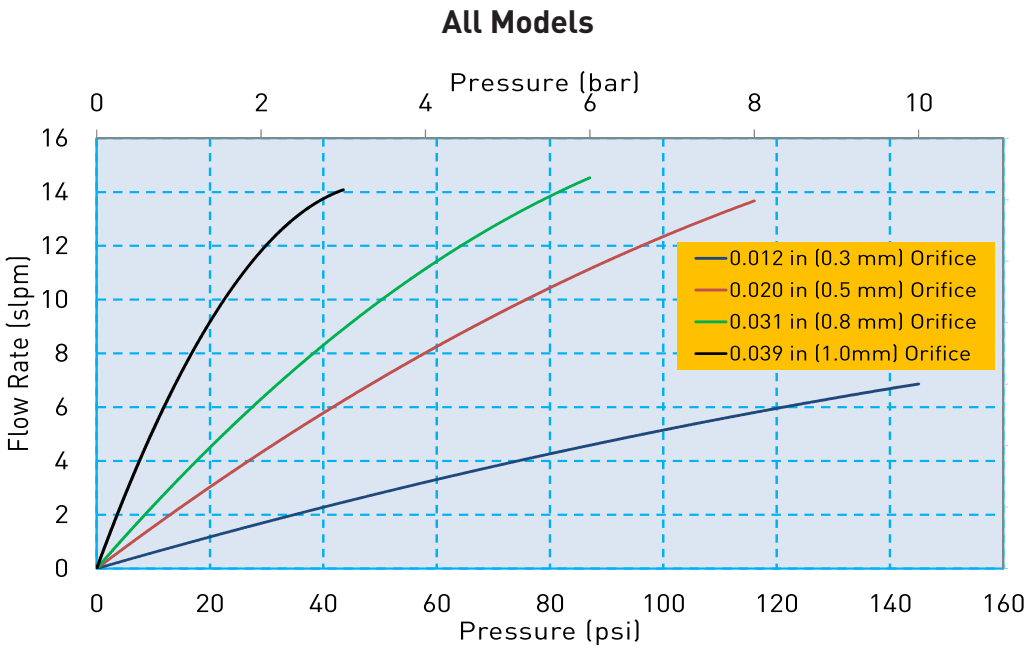
Recommended Filtration:
0.3 mm Orifice
5 µm
0.5 mm, 0.8 mm, & 1.0 mm Orifice
10 µm

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

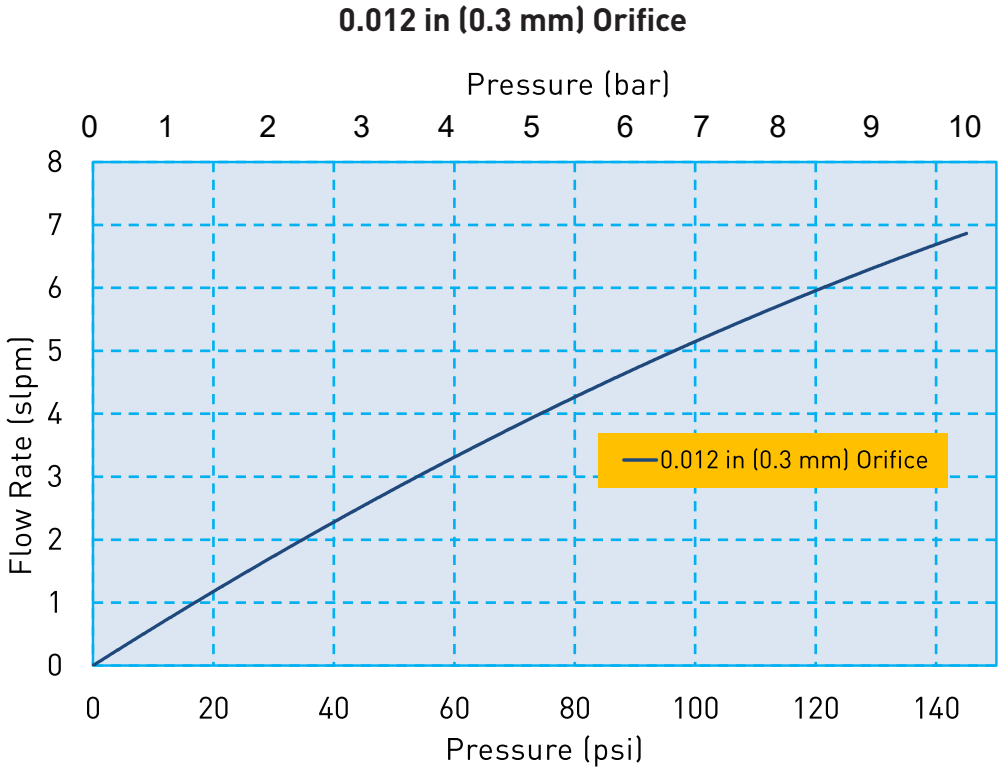
*Please contact factory for additional details on liquid compatibility.

C7 Miniature Cartridge Valve

Flow Curve

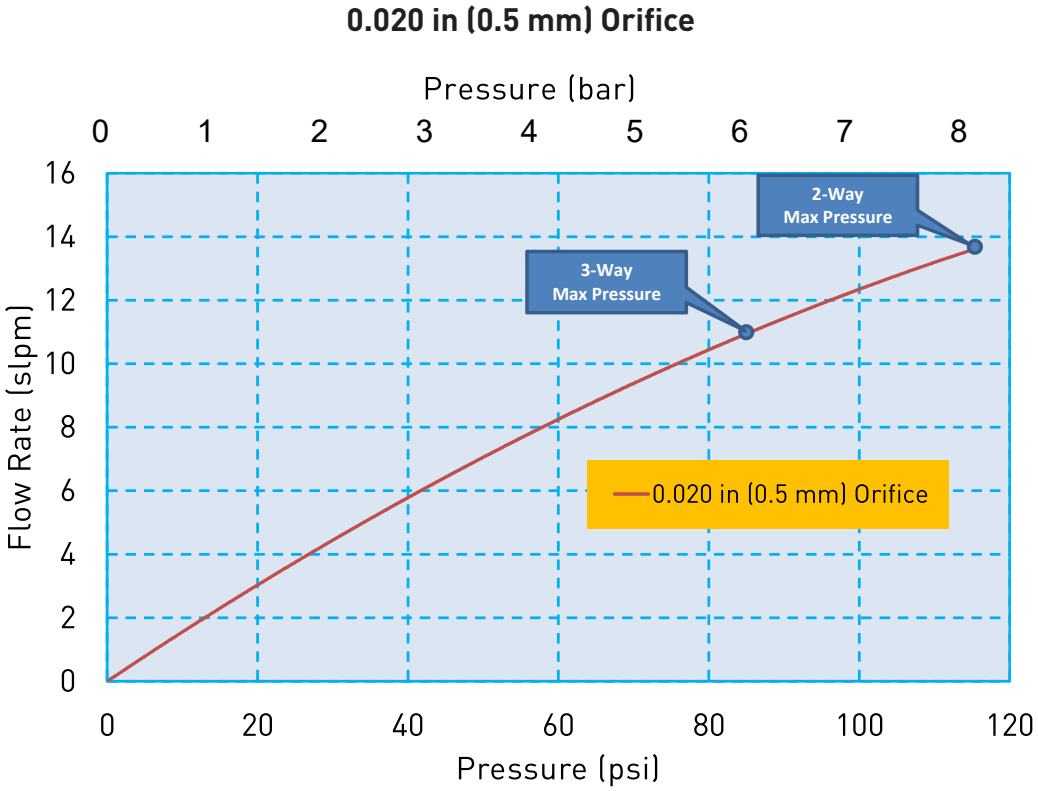


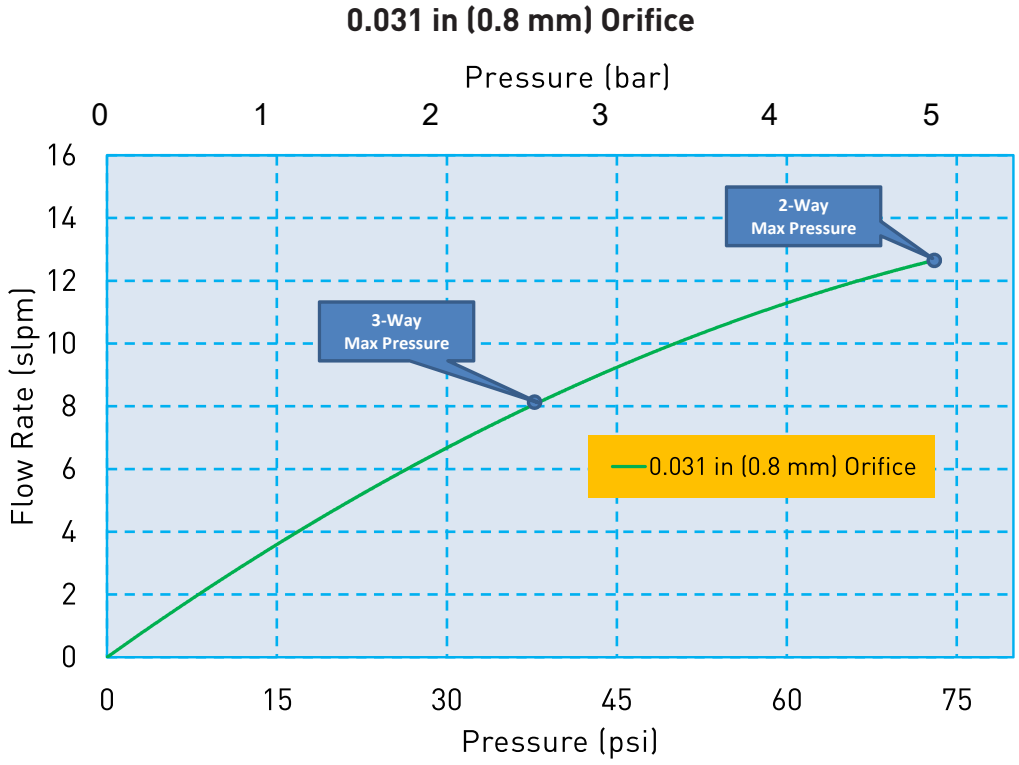
Flow Curve



C7 Miniature Cartridge Valve

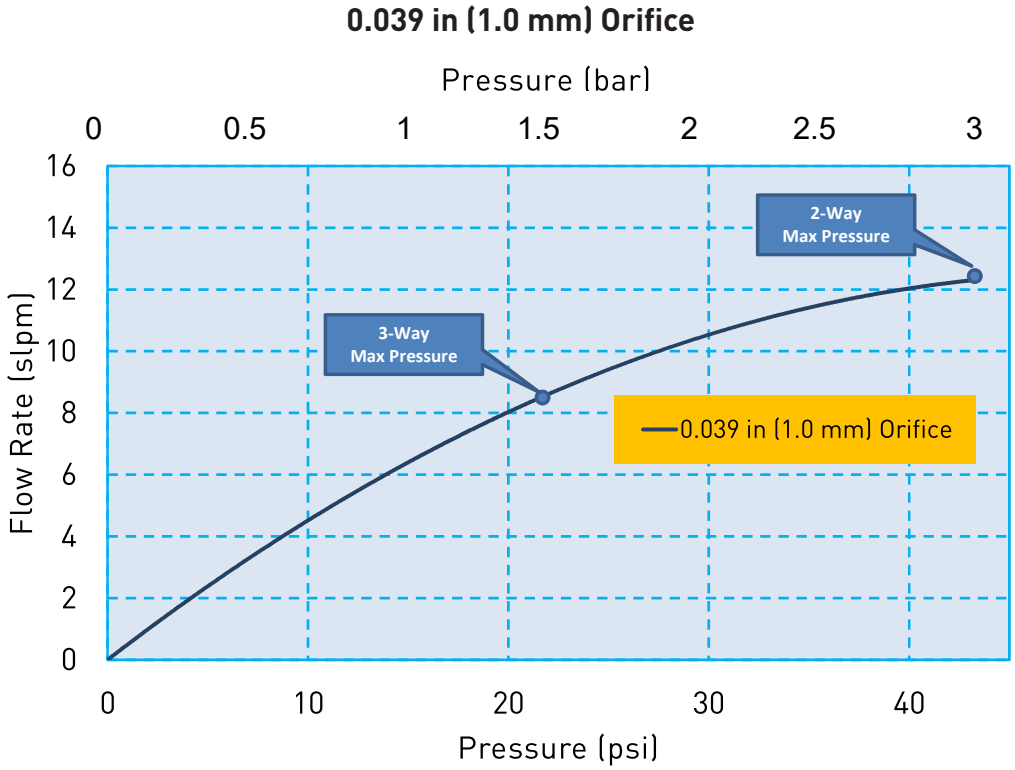
Flow Curve





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

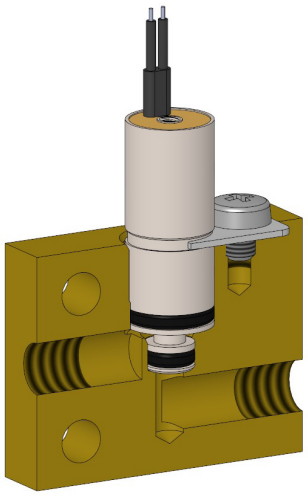
Orifice	0.012 in (0.3 mm)				0.020 in (0.5 mm)				0.031 in (0.8 mm)				0.039 in (1.0 mm)			
Valve Type	2-Way		3-Way		2-Way		3-Way		2-Way		3-Way		2-Way		3-Way	
Voltage (VDC)*	12	24	12	24	12	24	12	24	12	24	12	24	12	24	12	24
Power (Watts)	0.5	0.6	1	1.2	1	0.85	1	1.2	1	1.2	1	1.2	1	1.2	1	1.2
Resistance (Ohm)**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

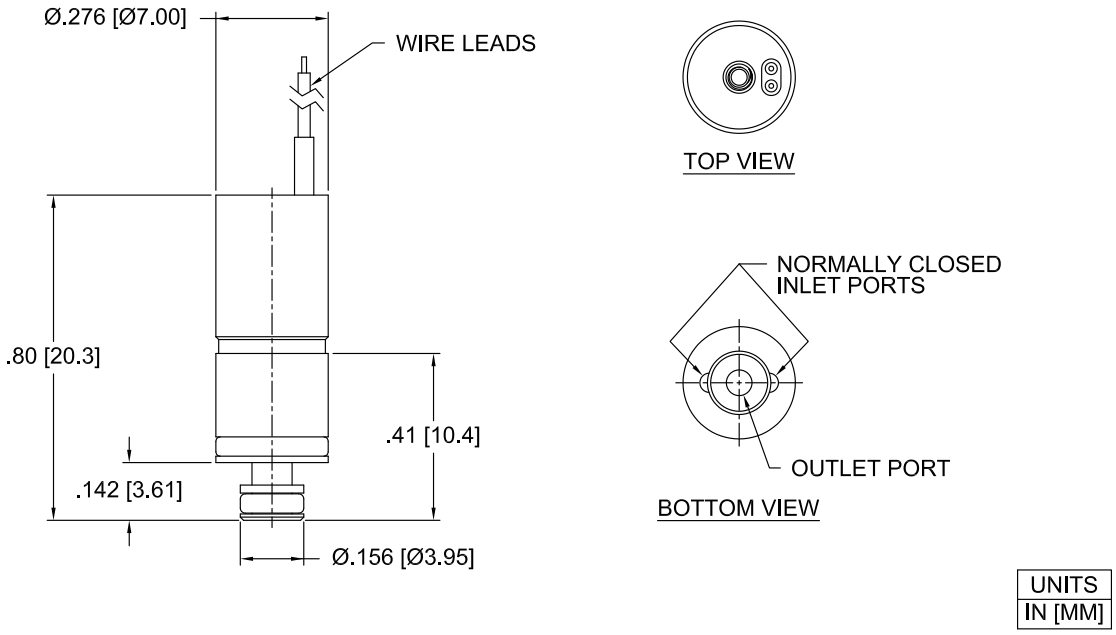




C7 Miniature Cartridge Valve

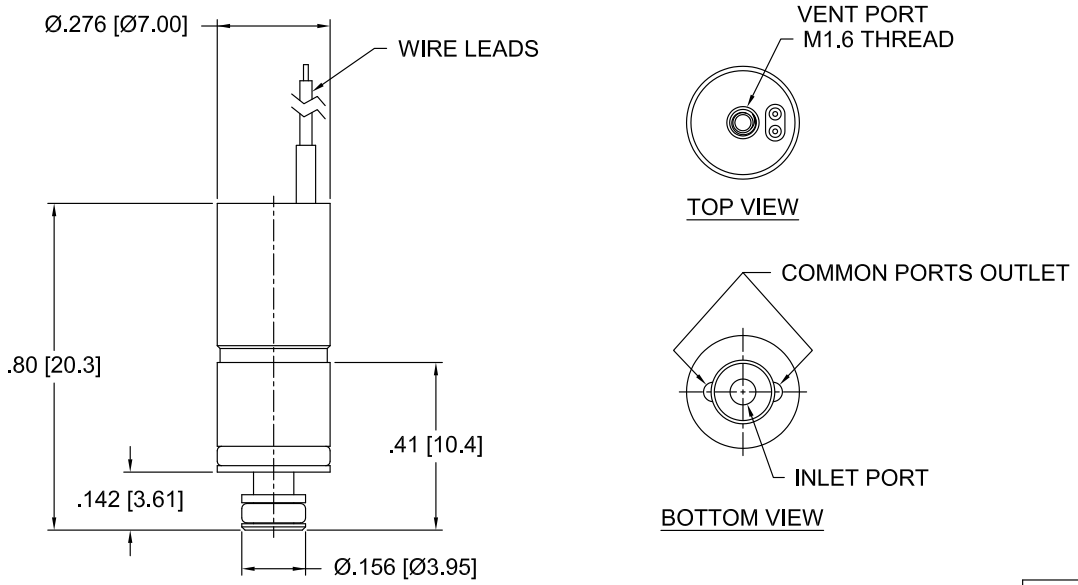
Dimensions

2-Way Valve Configuration



UNITS
IN [MM]

3-Way Valve Configuration

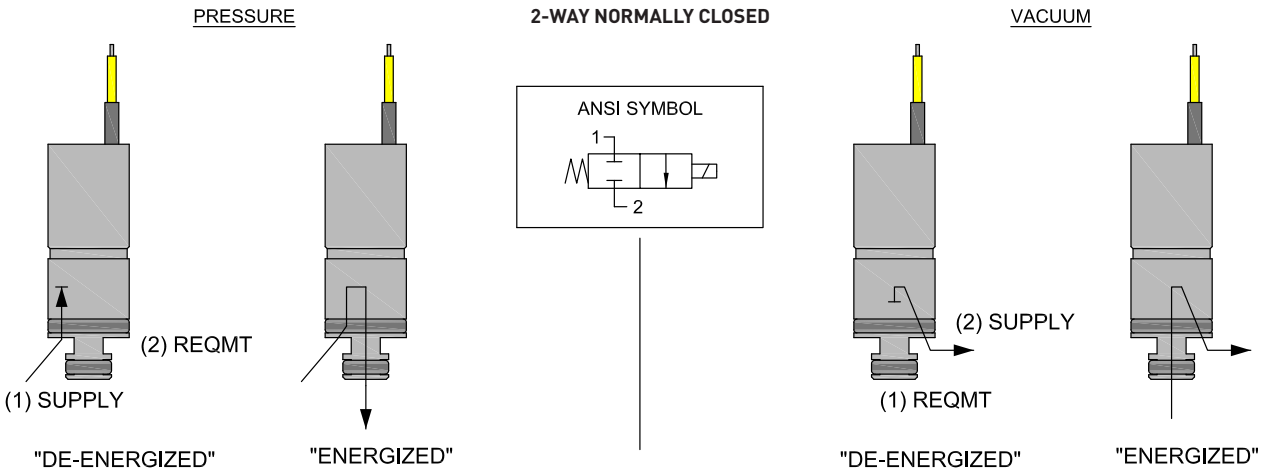


UNITS
IN [MM]

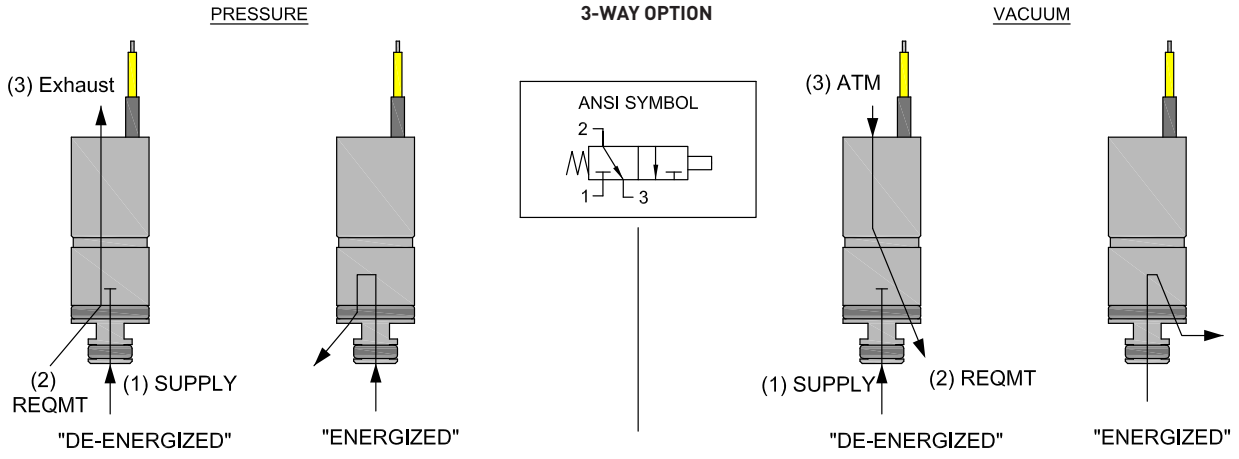
C7 Miniature Cartridge Valve

ANSI Symbols

2-Way Normally Closed



3-Way Normally Closed

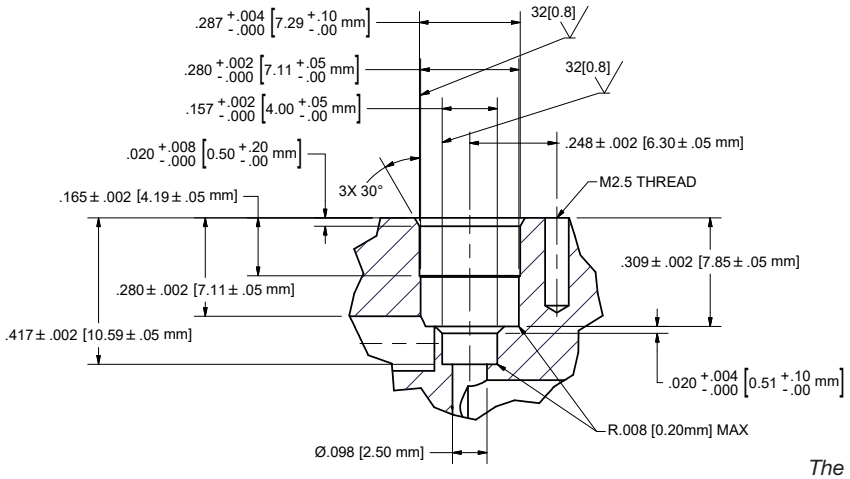


C7 Miniature Cartridge Valve

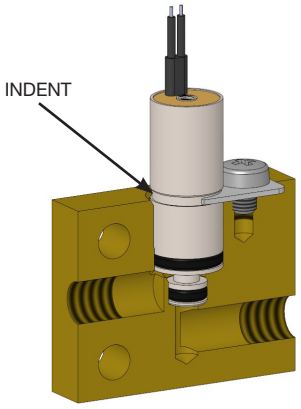
Installation and Use

During installation of the C7 valve, the maximum force allowed to press it into the manifold is: 6.74 lbf (30 N)
Lubrication is recommended (I.E. alcohol or DI water depending on compatibility constraints)

Recommended Valve Manifold Dimensions



Recommended Valve Mounting

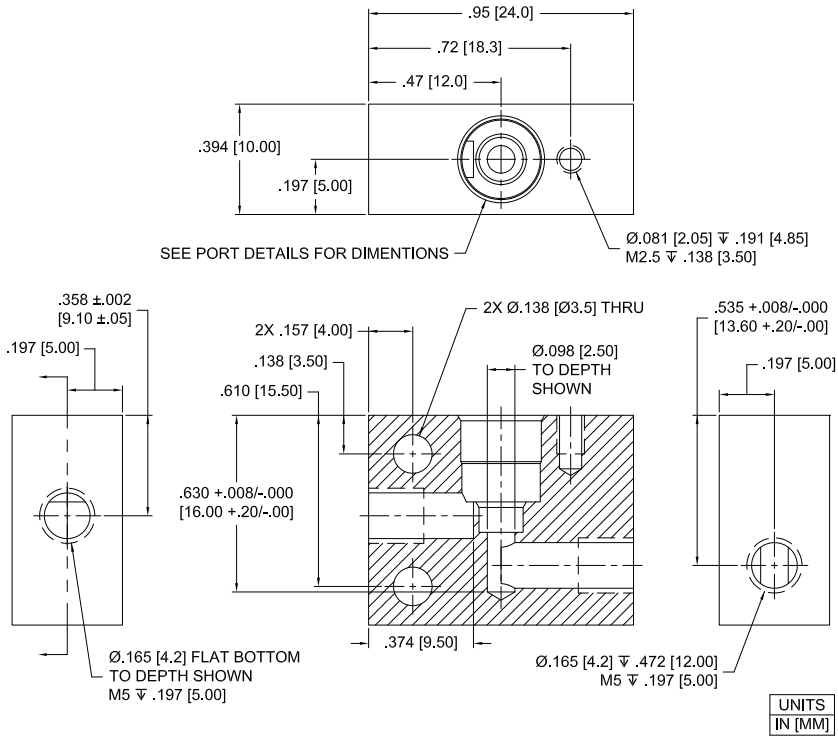


The correct location to use when holding the valve in place in the manifold is the indent at the middle of the valve body. If the top of the valve is used to hold the valve in place, the working pressure the valve will see, can push the valve upward and exceed the maximum insertion force for the valve.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

Installation and Use

C7 Evaluation Manifold Dimensions and Design

C07-MCS



C7 Miniature Cartridge Valve

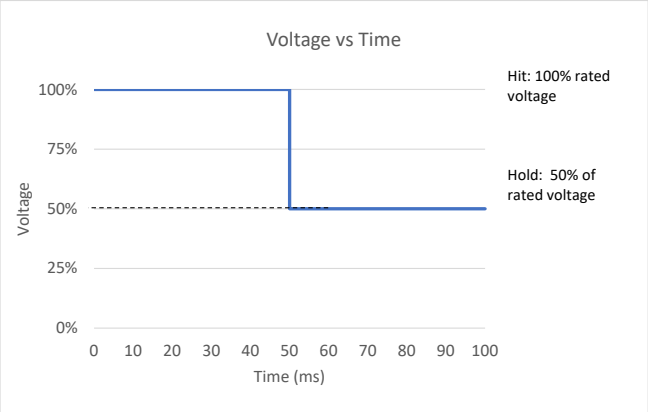
Installation and Use

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)	1 kHz
Hold Nominal Duty Cycle	50%

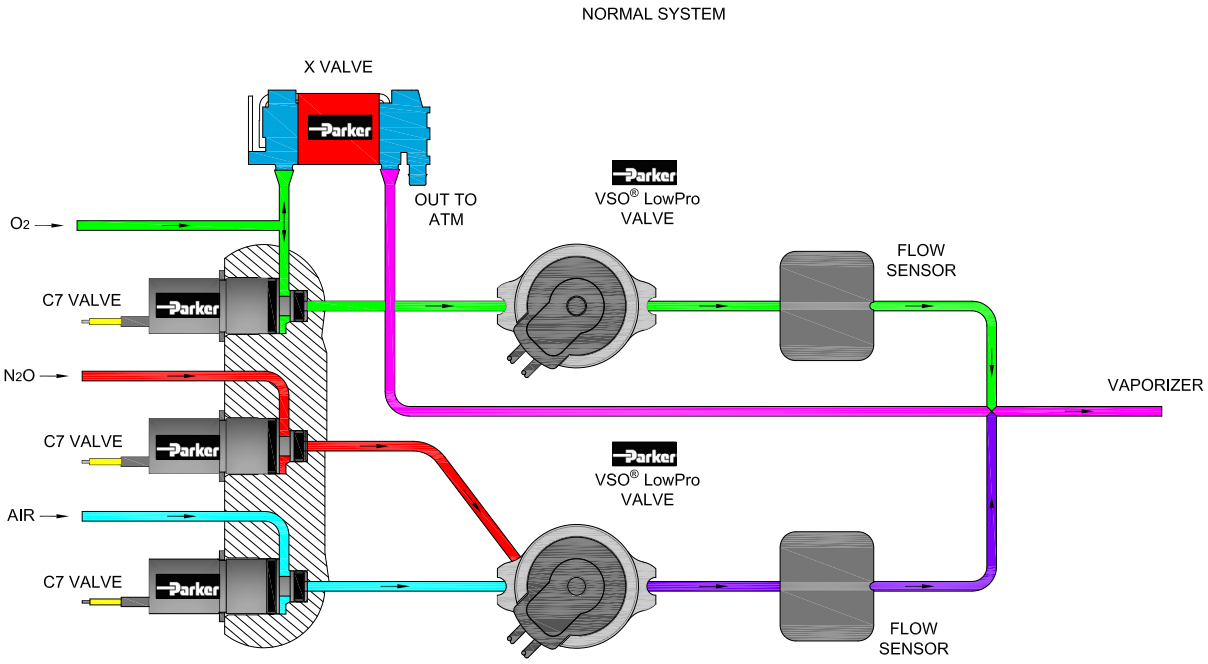
This method greatly reduces power consumption because the valve only draws full current for a short period of time making it ideal for applications with sensitive power budgets.

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 (+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.

C7 Valve **Miniature Cartridge Liquid Valve**

7 mm Miniature Liquid 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 configurations, the valve is manifold mounted utilizing a simple securing system reducing assembly time.

Typical Markets

- Analytical Chemistry
- Clinical Diagnostics
- Environmental Monitoring
- Print

Typical Applications

- Reagent Addition
- Wash
- Waste
- Flow Control
- Large format Inkjet systems

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)
Media: Gases* and Liquids
(For gas performance see the Gas 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

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)
Max Vacuum & Pressure	Type	2-Way	2-Way	2-Way	2-Way
	PSI	145	116	73	43.5
	Bar	10	8	6	3
	SCCM (water)	146	260	429	415

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 FFKM on request

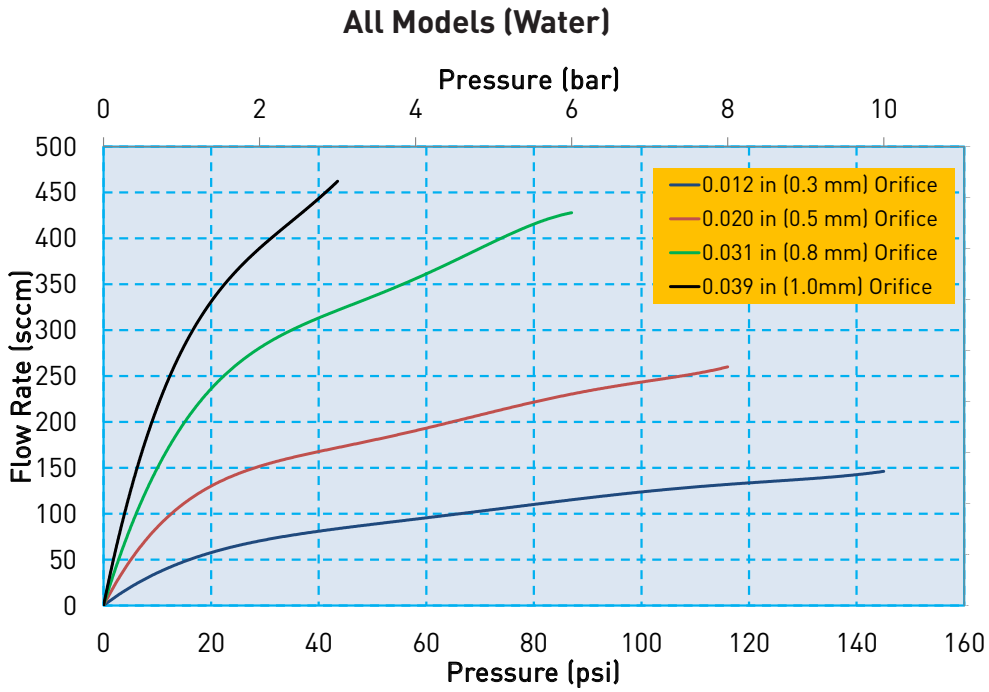
Performance Characteristics

Response:
10 ms Maximum, Cycling
Recommended Filtration:
0.3 mm Orifice 5 µm 0.5 mm, 0.8 mm, & 1.0 mm Orifice 10 µm
Reliability:
2-Way: 130 Million Cycles 0.90 Reliability Factor 95% Confidence

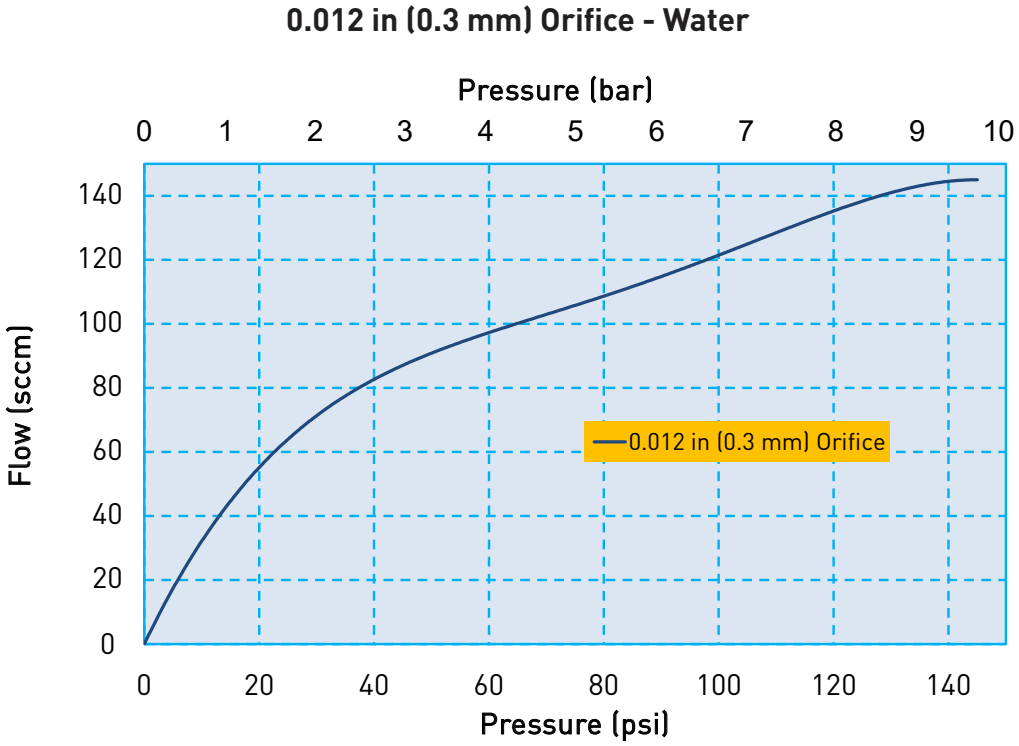
*Please contact factory for additional details on gas compatibility.

C7 Miniature Liquid Cartridge Valve

Flow Curve

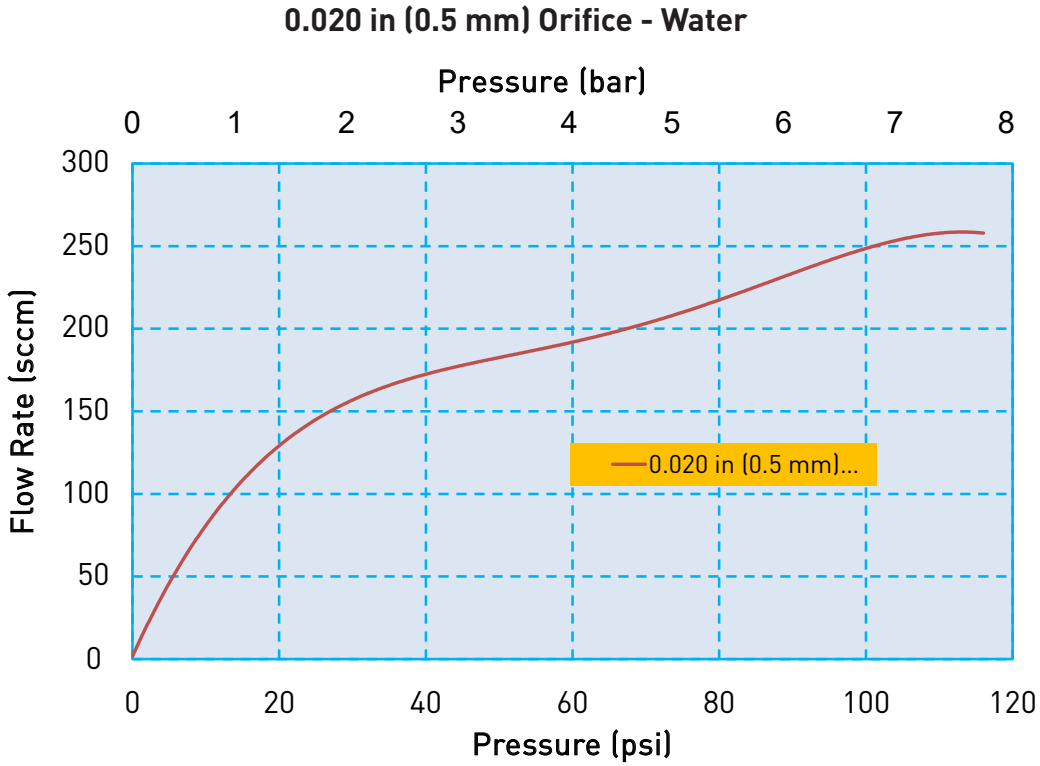


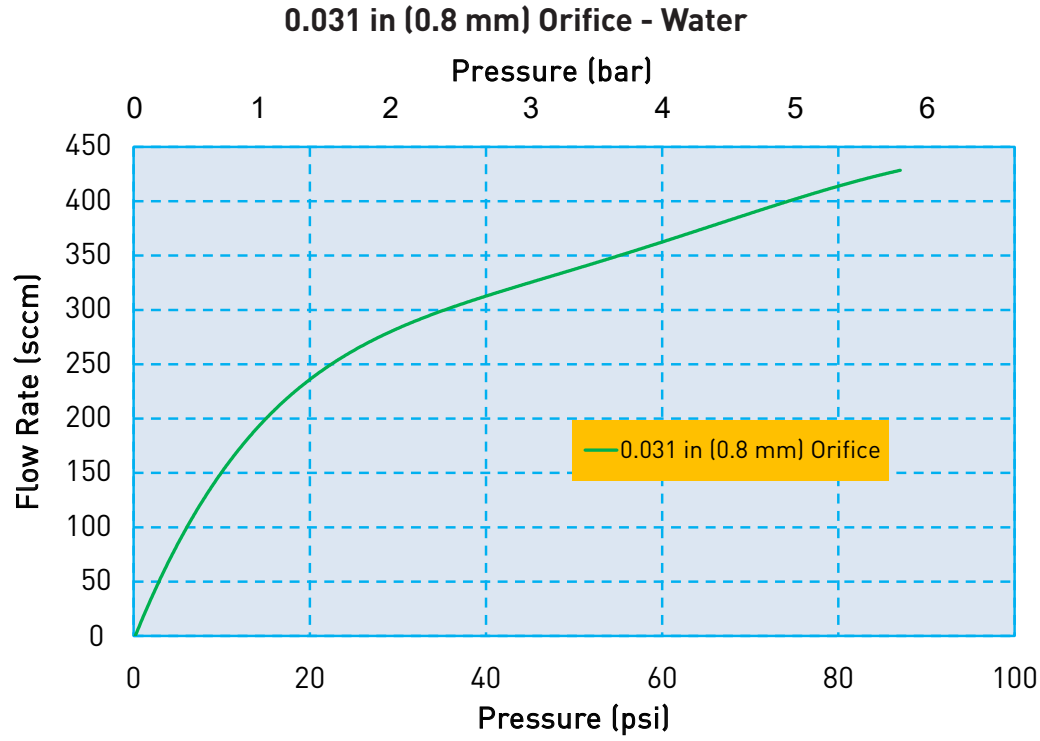
Flow Curve



C7 Miniature Liquid Cartridge Valve

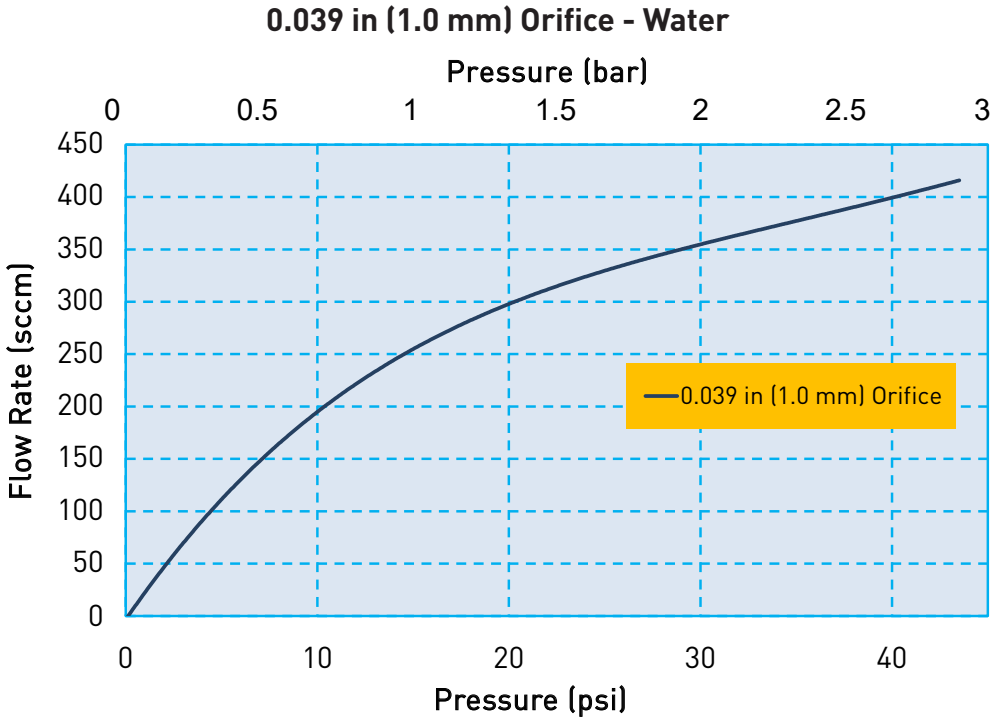
Flow Curve





C7 Miniature Liquid Cartridge Valve

Flow Curve



Electrical Interface



Wire Leads

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

C7 Miniature Liquid Cartridge Valve

Electrical Requirements

Table 1

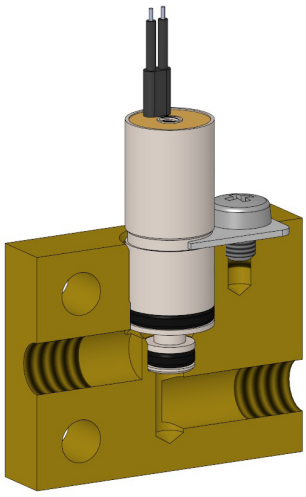
Orifice	0.012 in (0.3 mm)		0.020 in (0.5 mm)		0.031 in (0.8 mm)		0.039 in (1.0 mm)	
Valve Type	2-Way		2-Way		2-Way		2-Way	
Voltage (VDC)*	12	24	12	24	12	24	12	24
Power (Watts)	0.5	0.6	1	0.85	1	1.2	1	1.2
Resistance (Ohm)**	288	995	140	700	140	495	140	495

* ± 5%, other voltages available on request

** ±5% @ 68°F, 20°C

Liquid Interface/Mechanical Integration

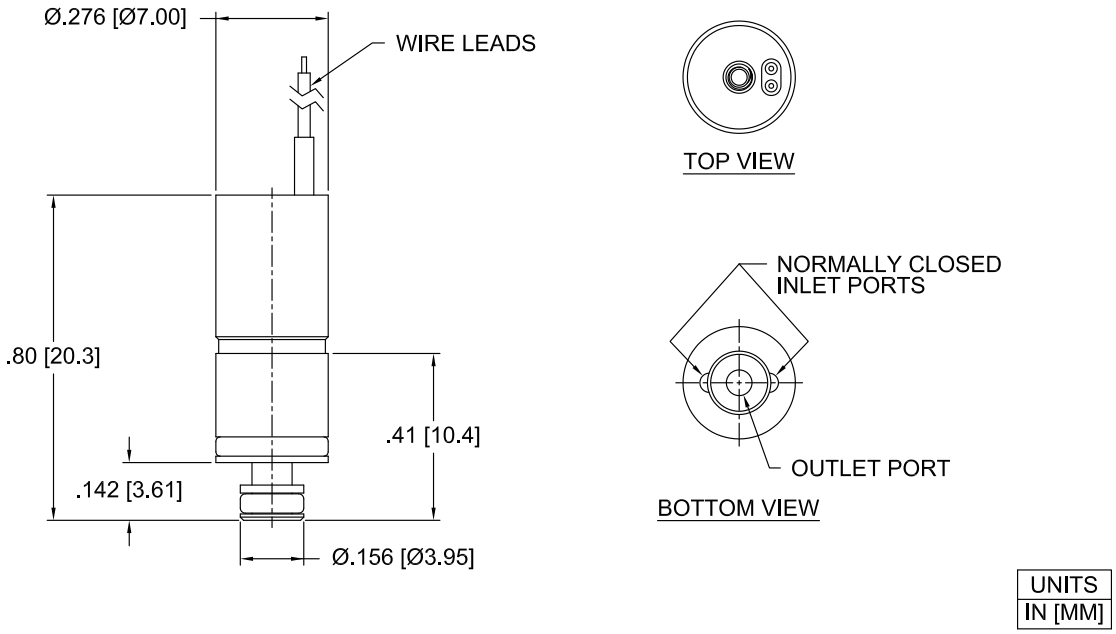




C7 Miniature Liquid Cartridge Valve

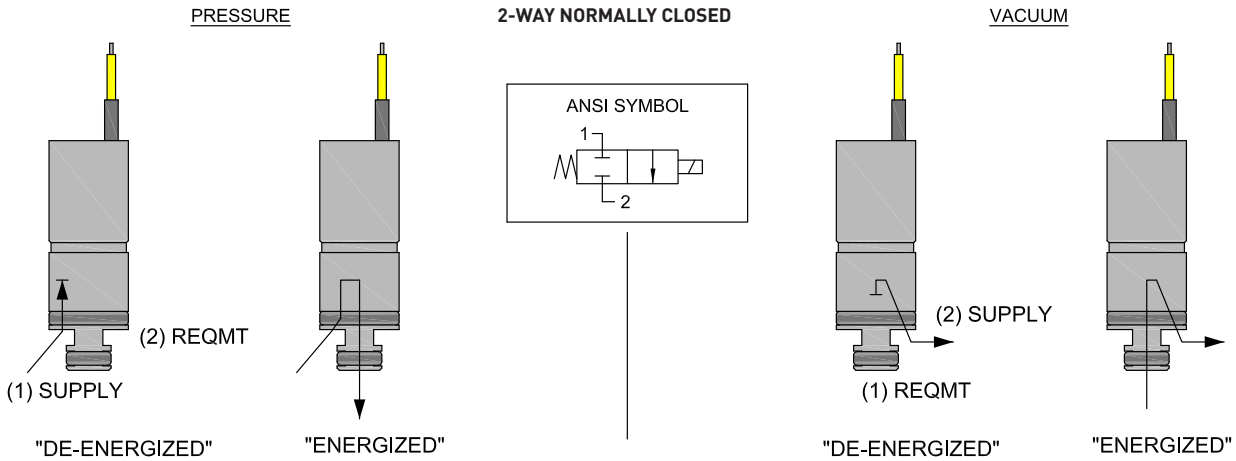
Dimensions

2-Way Valve Configuration



ANSI Symbols

2-Way Normally Closed

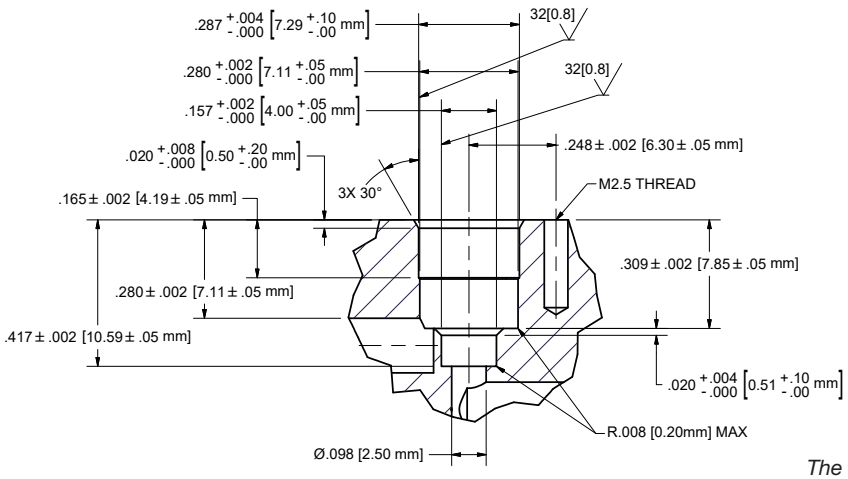


C7 Miniature Liquid Cartridge Valve

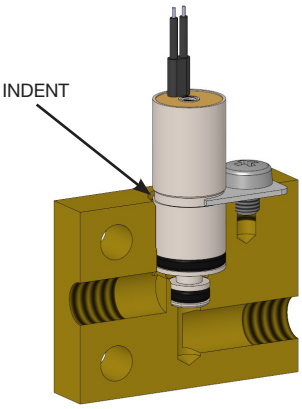
Installation and Use

During installation of the C7 valve, the maximum force allowed to press it into the manifold is: 6.74 lbf (30 N)
Lubrication is recommended (I.E. alcohol or DI water depending on compatibility constraints)

Recommended Valve Manifold Dimensions



Recommended Valve Mounting

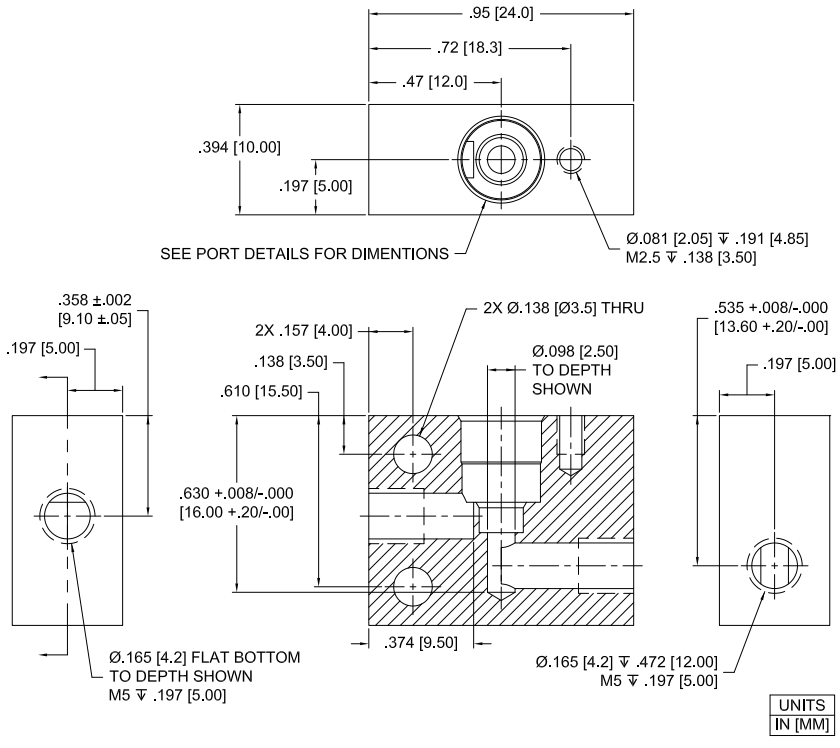


The correct location to use when holding the valve in place in the manifold is the indent at the middle of the valve body. If the top of the valve is used to hold the valve in place, the working pressure the valve will see, can push the valve upward and exceed the maximum insertion force for the valve.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

Installation and Use

C7 Evaluation Manifold Dimensions and Design

C07-MCS



C7 Miniature Liquid Cartridge Valve

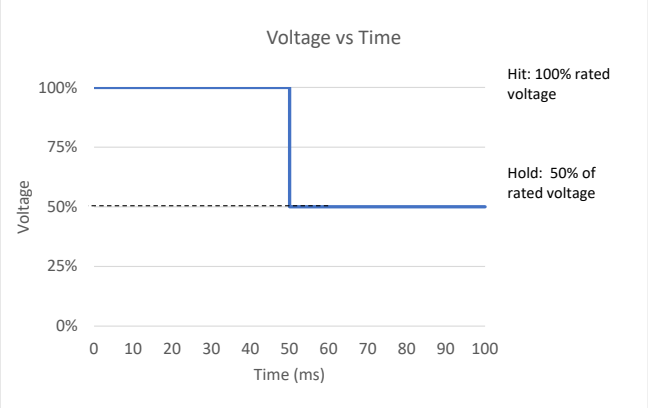
Installation and Use

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)	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 Liquid Cartridge Valve

Chemical Compatibility Chart*

	Seal Options			Other Wetted Materials
Chemical	FFKM	FKM	EPDM	Stainless Steel
DI Water	1	1	1	1
Methanol	1	4	1	2
Isopropanol	1	1	1	1
Ethanol	1	3	1	1
Acetonitrile	1	4	1	
Tetrahydrofuran	1	4	4	
Toluene	1	2	4	1
MEK	4	1	1	3
Organic Acids - Dilute	1	1	1	4
Non Organic Acids - Dilute	1	1	1	2
Bases - Dilute	1	1	1	1
Saline	1	1	1	2
Bleach 12%	2	1	1	4
Sodium Hydroxide 20%	1	2	1	2

*The above is an Abbreviated Chemical Compatibility Chart. Please consult factory for additional information.

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

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 O-Ring for C7 Valve, Large
C07-LG (FKM)
C07-LGE (EPDM)



Replacement FKM O-Ring for C7 Valve, Small
C07-SM (FKM)
C07-SME (EPDM)



C7 Miniature Liquid 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	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_LiquidCartridgeValve), 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.

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

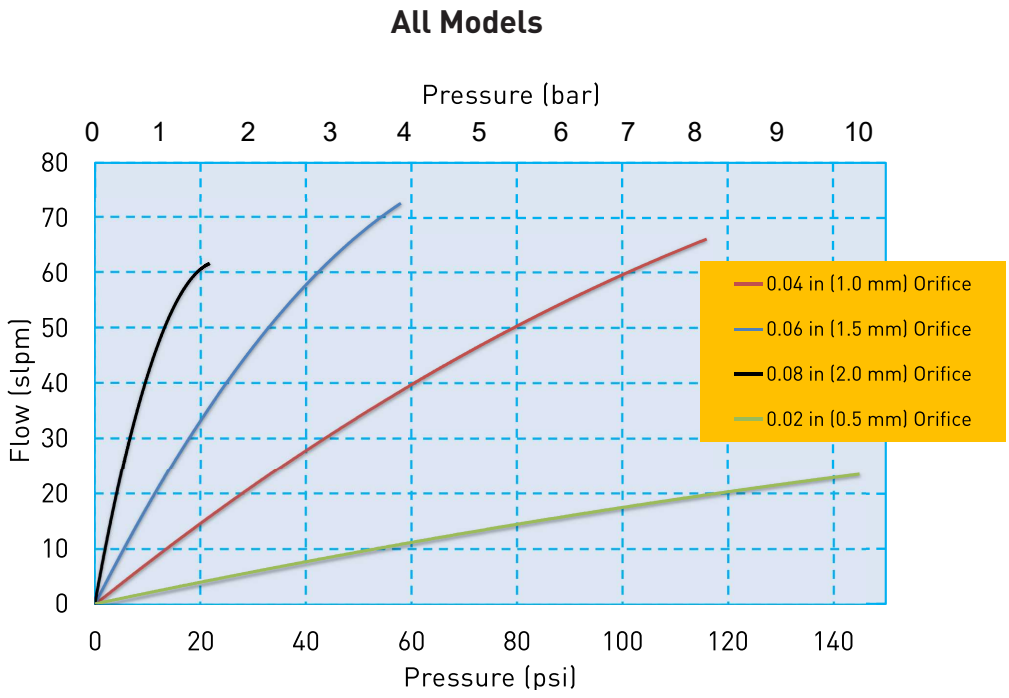
Recommended Filtration:
10 µm

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

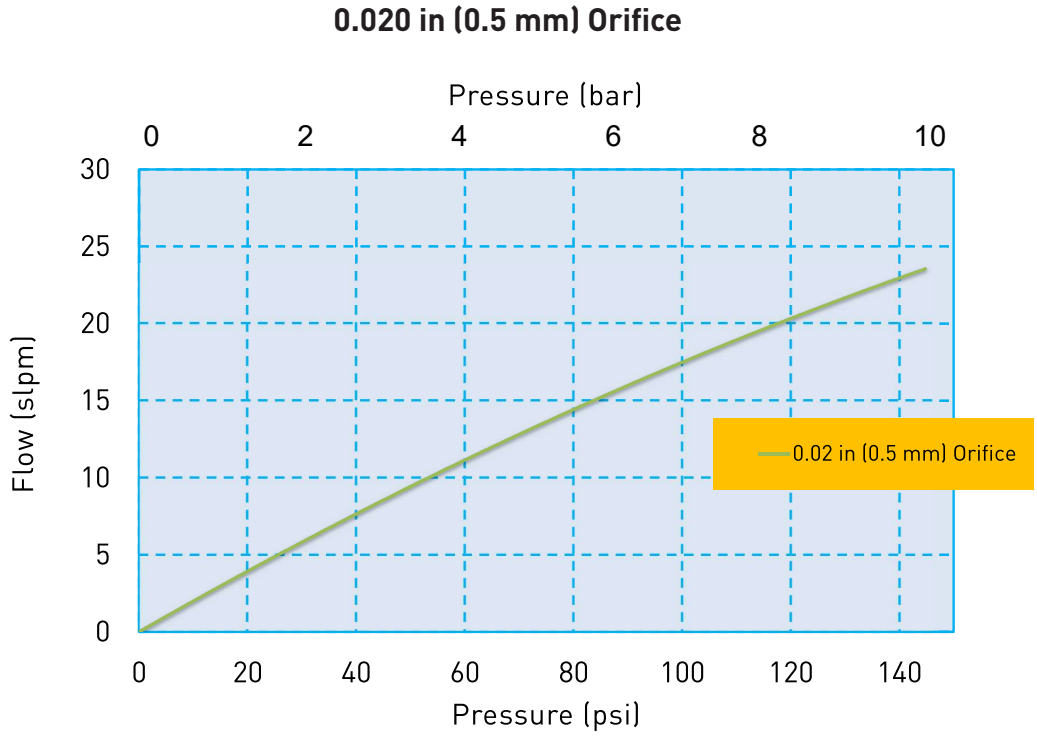
*Please contact factory for additional details on liquid compatibility.

C15 Miniature Cartridge Valve

Flow Curve

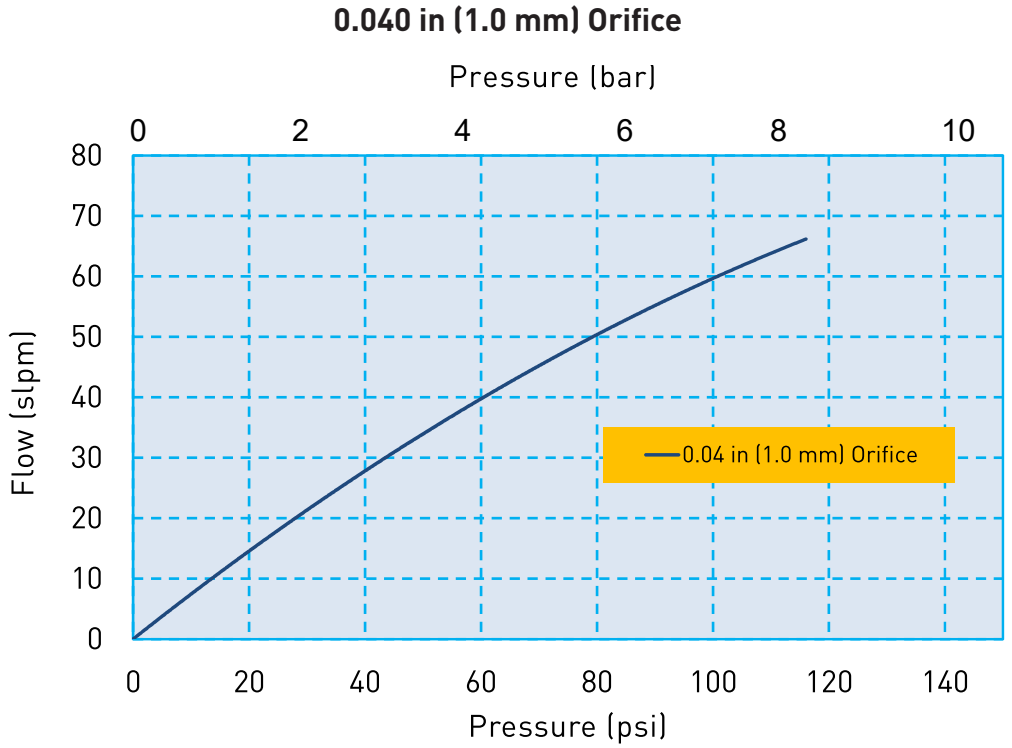


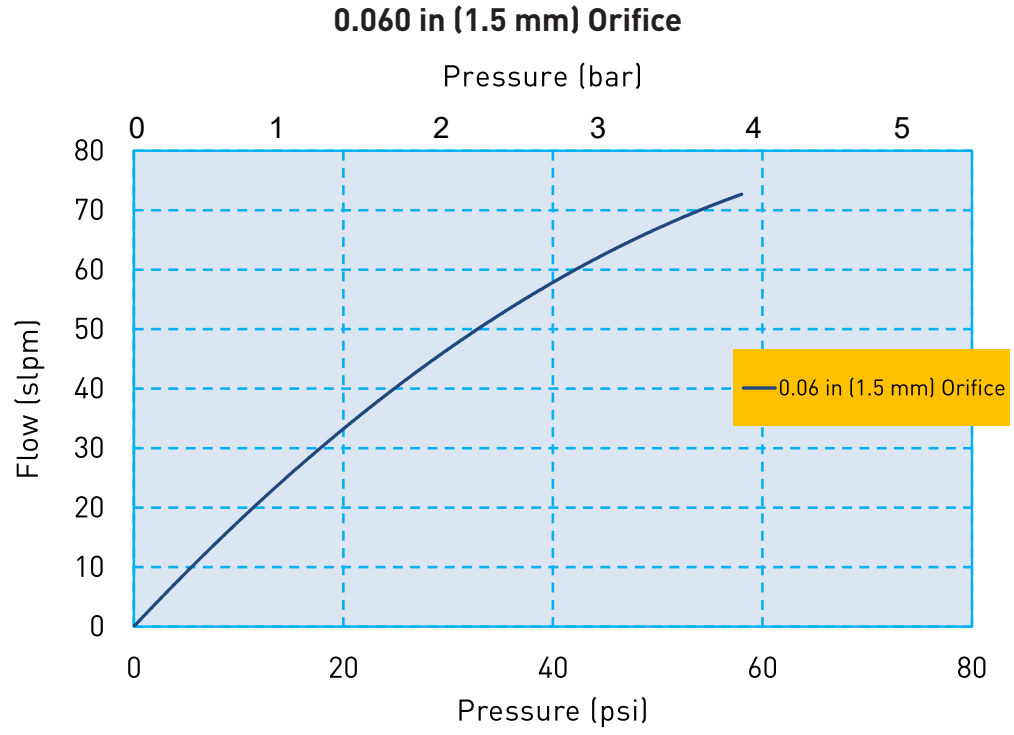
Flow Curve



C15 Miniature Cartridge Valve

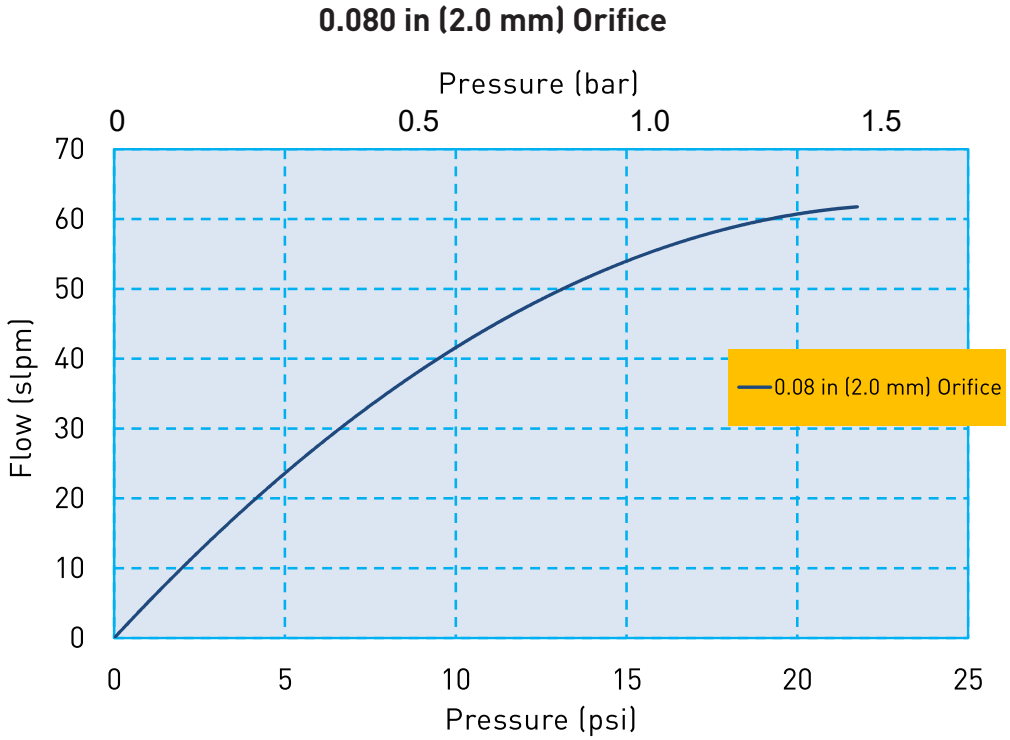
Flow Curve





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

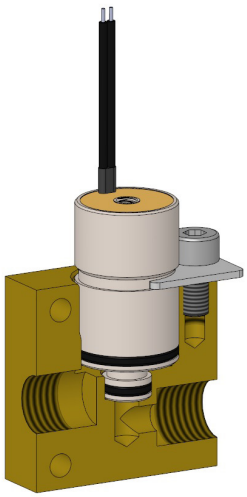
Orifice	0.020 in (0.5 mm)				0.040 in (1.0 mm)				0.060 in (1.5 mm)				0.080 in (2.0 mm)			
Valve Type	2-Way		3-Way		2-Way		3-Way		2-Way		3-Way		2-Way		3-Way	
Voltage (VDC)*	12	24	12	24	12	24	12	24	12	24	12	24	12	24	12	24
Power (Watts)	1.1	1.1	1.7	1.6	1.7	1.6	1.7	1.6	1.7	1.6	1.7	1.6	1.7	1.6	1.7	1.6
Resistance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

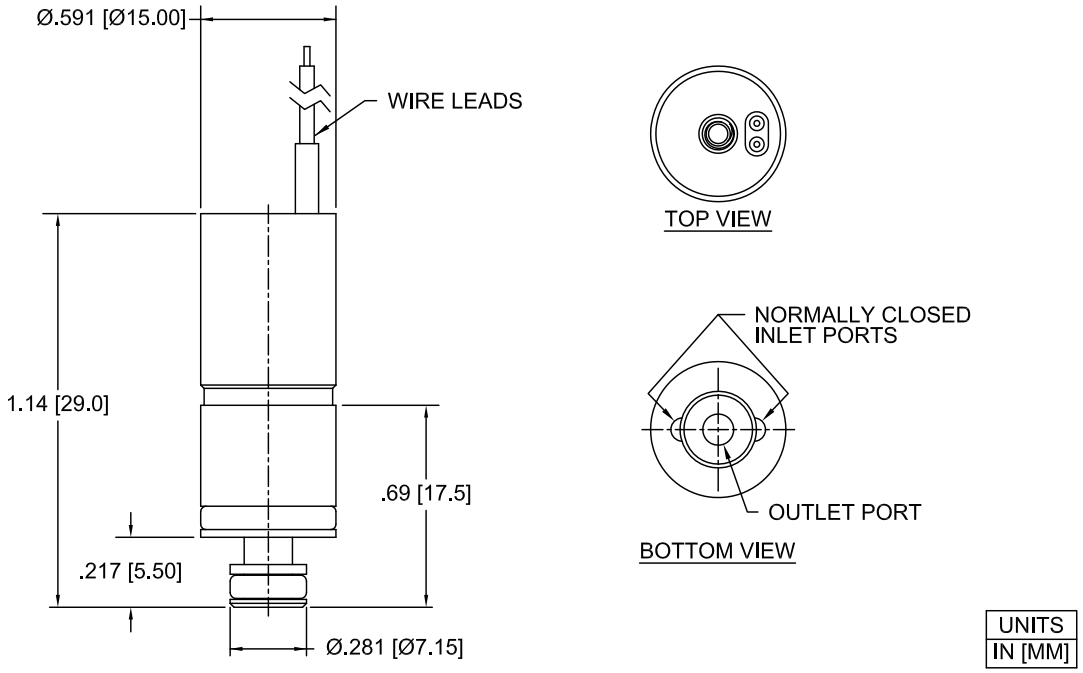




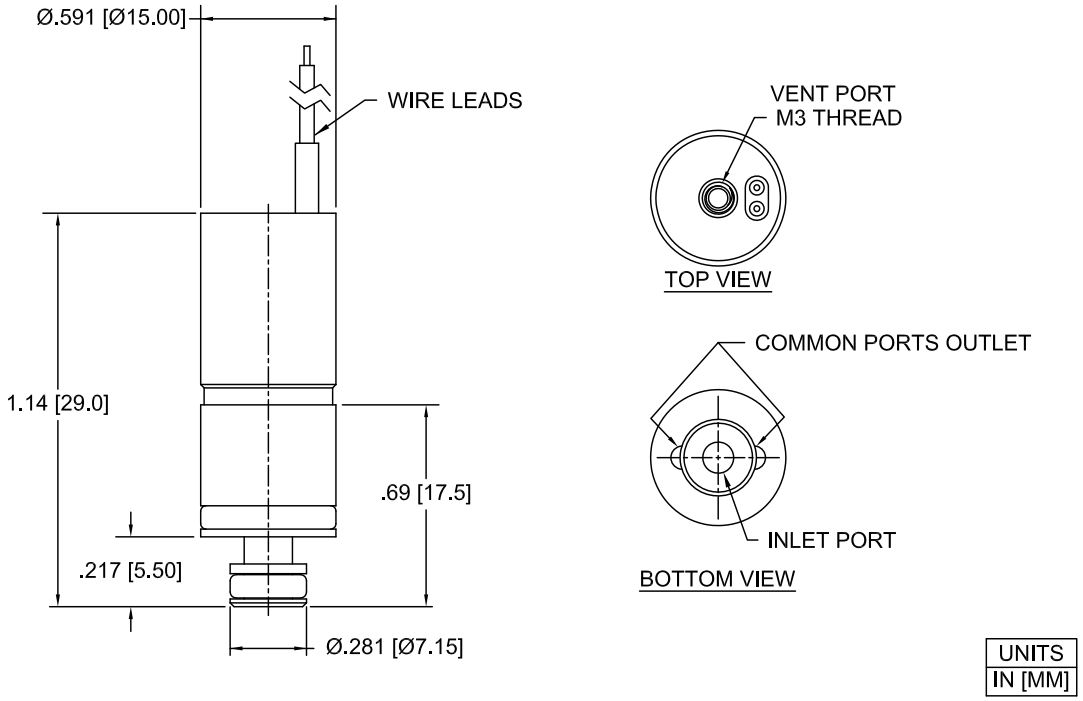
C15 Miniature Cartridge Valve

Dimensions

2-Way Valve Configuration



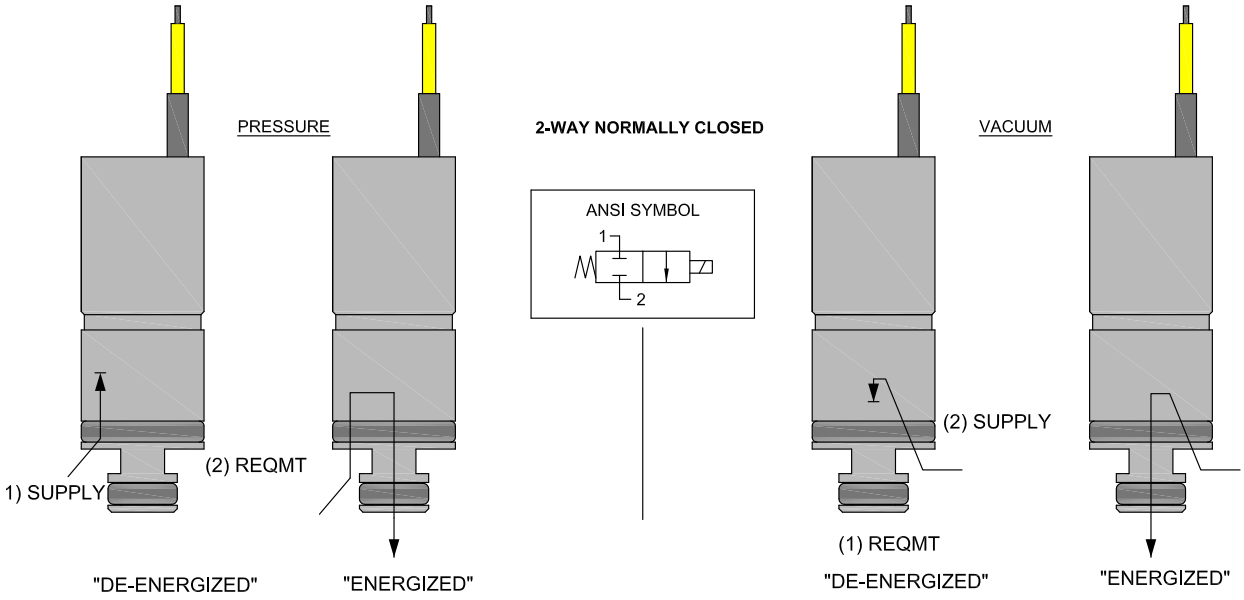
3-Way Valve Configuration



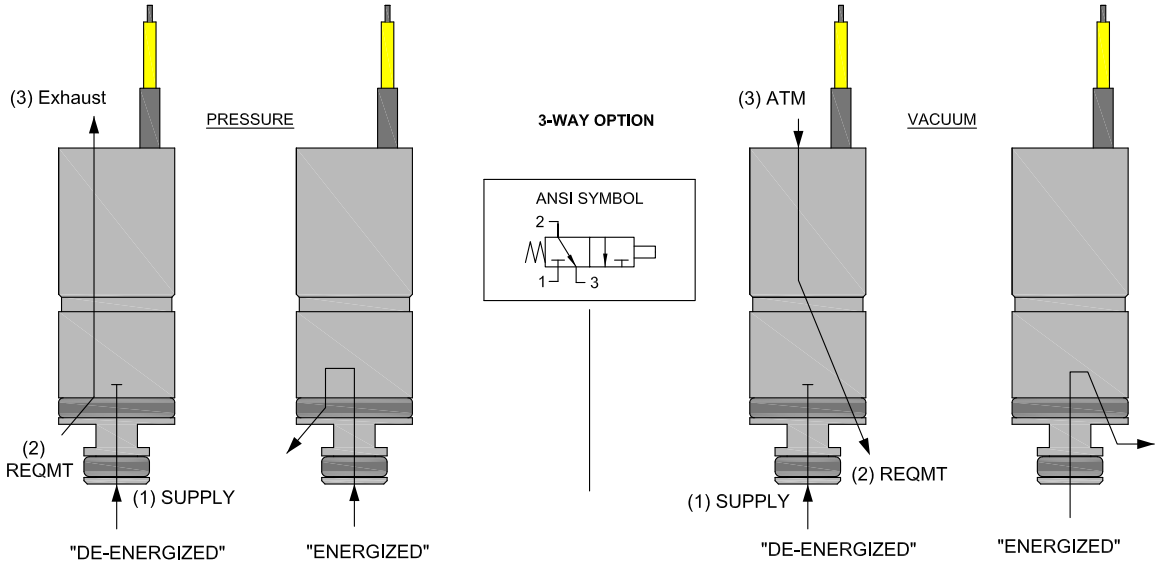
C15 Miniature Cartridge Valve

ANSI Symbols

2-Way Normally Closed



3-Way Normally Closed

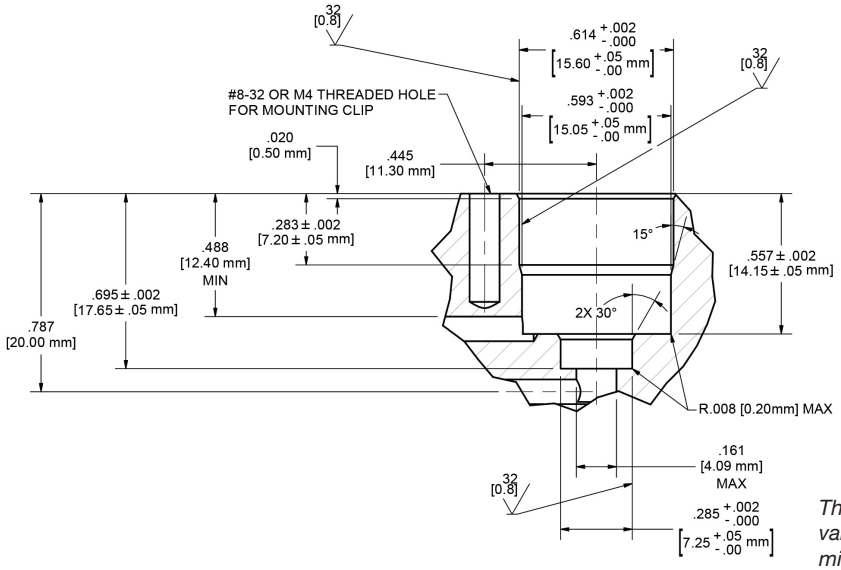


C15 Miniature Cartridge Valve

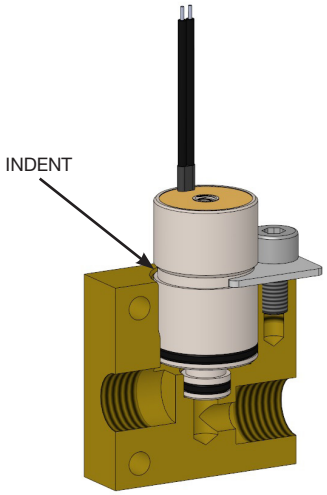
Installation and Use

During installation of the C15 valve, the maximum force allowed to press it into the manifold is: 22.48 lbf (100 N)
Lubrication is recommended (I.E. alcohol or DI water depending on compatibility constraints)

Recommended Valve Manifold Dimensions



Recommended Valve Mounting

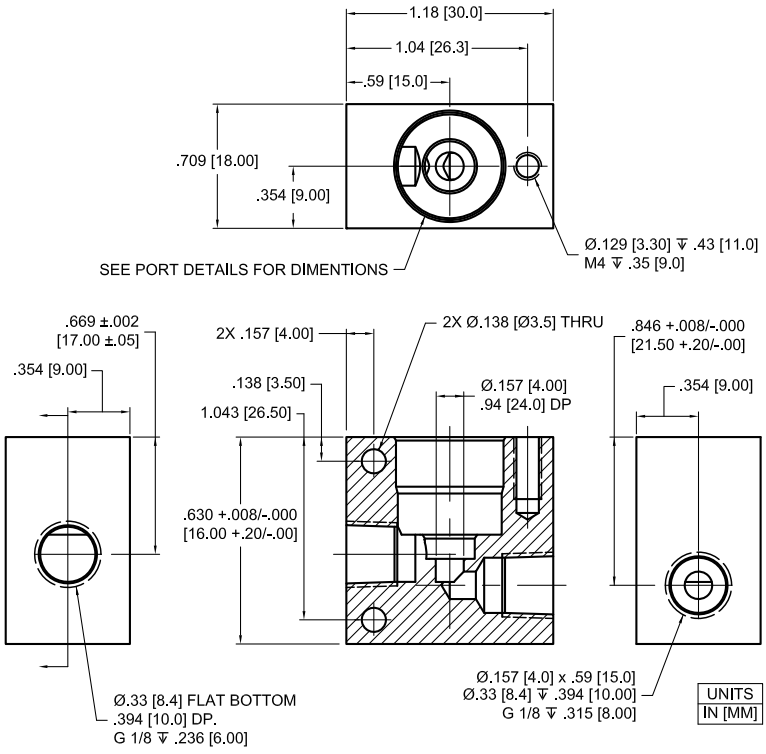


The correct location to use when holding the valve in place in the manifold is the indent at the middle of the valve body. If the top of the valve is used to hold the valve in place, the working pressure the valve will see, can push the valve upward and exceed the maximum insertion force for the valve.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

Installation and Use

C15 Evaluation Manifold Dimensions and Design

C15-MCS



C15 Miniature Cartridge Valve

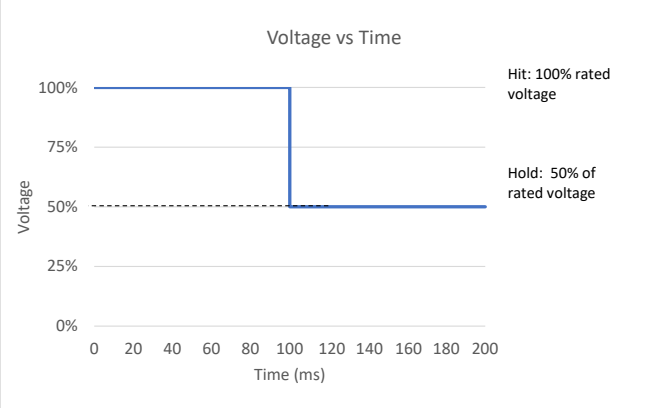
Installation and Use

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.

C15 Valve **Miniature Cartridge Liquid Valve**

15 mm Miniature Liquid 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 a 2-way configuration, the valve is manifold mounted utilizing a simple securing system reducing assembly time.

Typical Markets

- Analytical Chemistry
- Clinical Diagnostics
- Environmental Monitoring
- Print

Typical Applications

- Reagent Addition
- Wash
- Waste
- Flow Control
- Large format Inkjet systems

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)

Media: Gases* and Liquids
(See details in gas 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

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	2-Way	2-Way	2-Way
Max Vacuum & Pressure	PSI	145	116	58	22
	Bar	10	8	4	1.5
	Cv	0.01	0.032	0.058	0.093
SCCM (water)		400	1160	1670	1640

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
FFKM available on request

Performance Characteristics

Response:
10 ms Maximum, Cycling

Proof Pressure:
120% of Rated Maximum Pressure

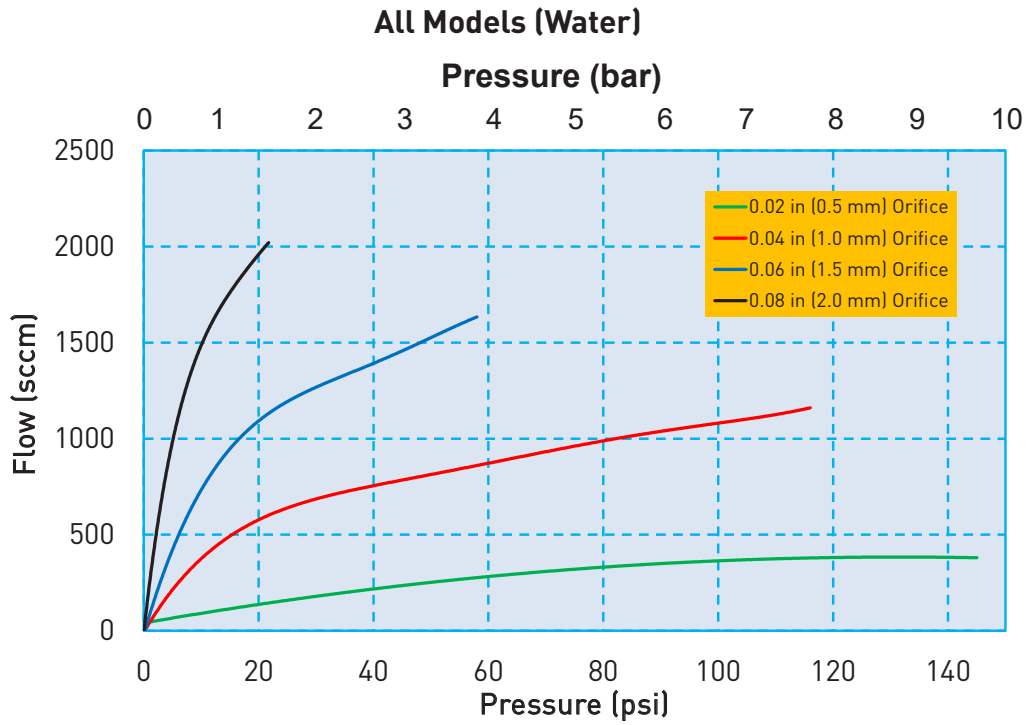
Recommended Filtration:
10 µm

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

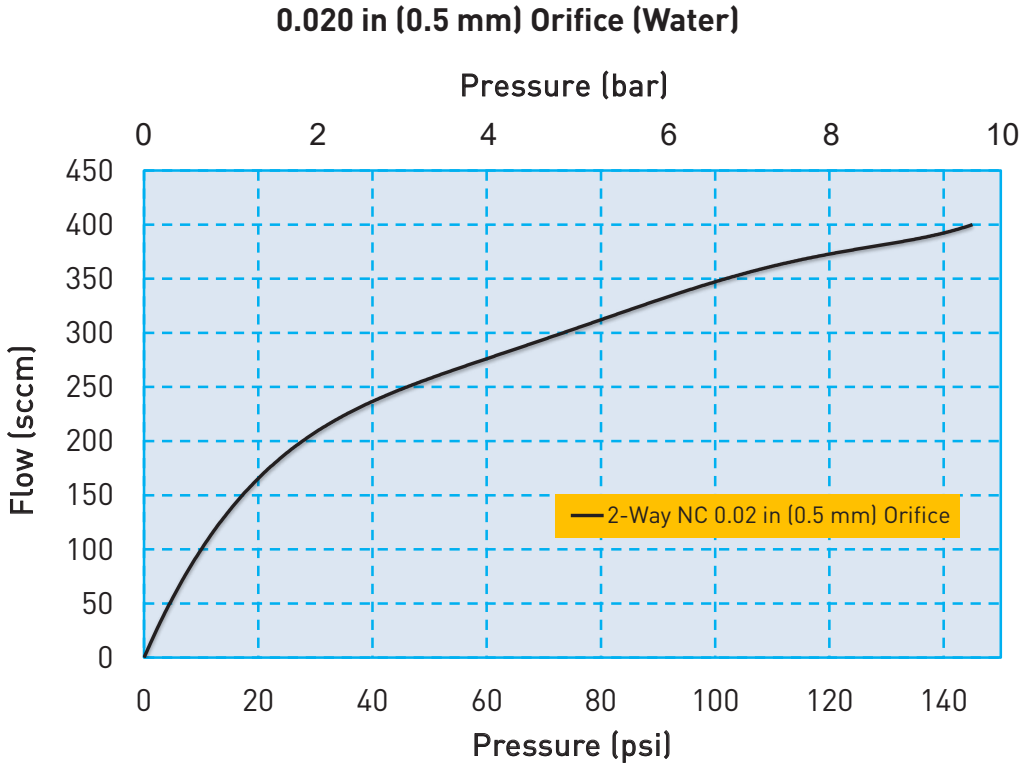
*Please contact factory for additional details on gas compatibility.

C15 Miniature Liquid Cartridge Valve

Flow Curve

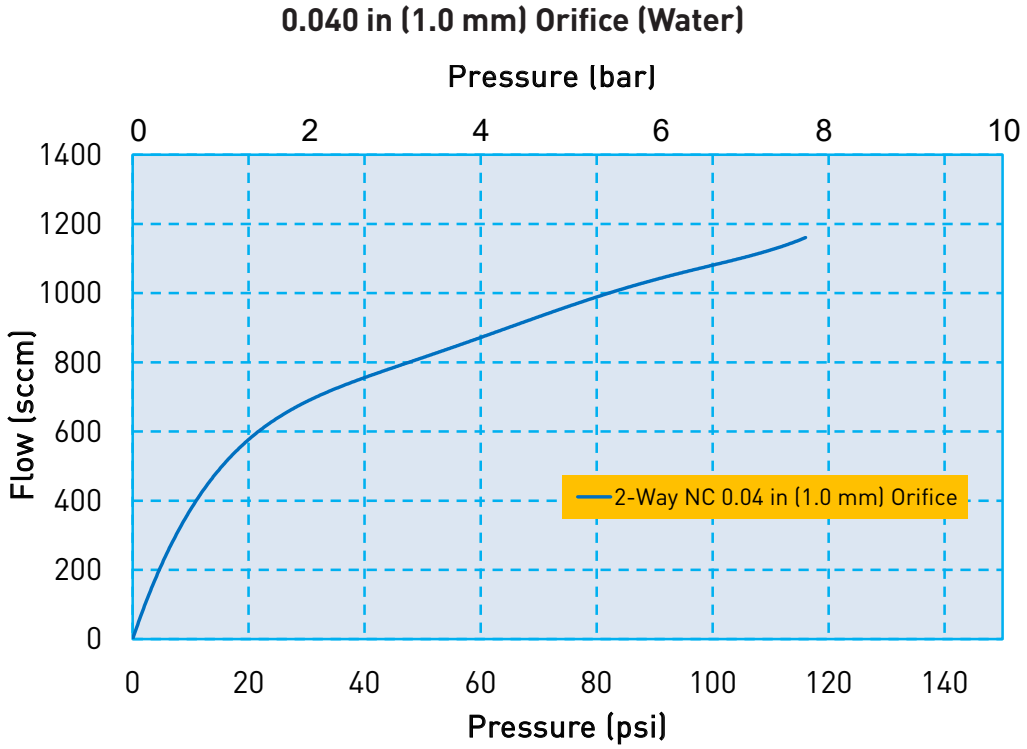


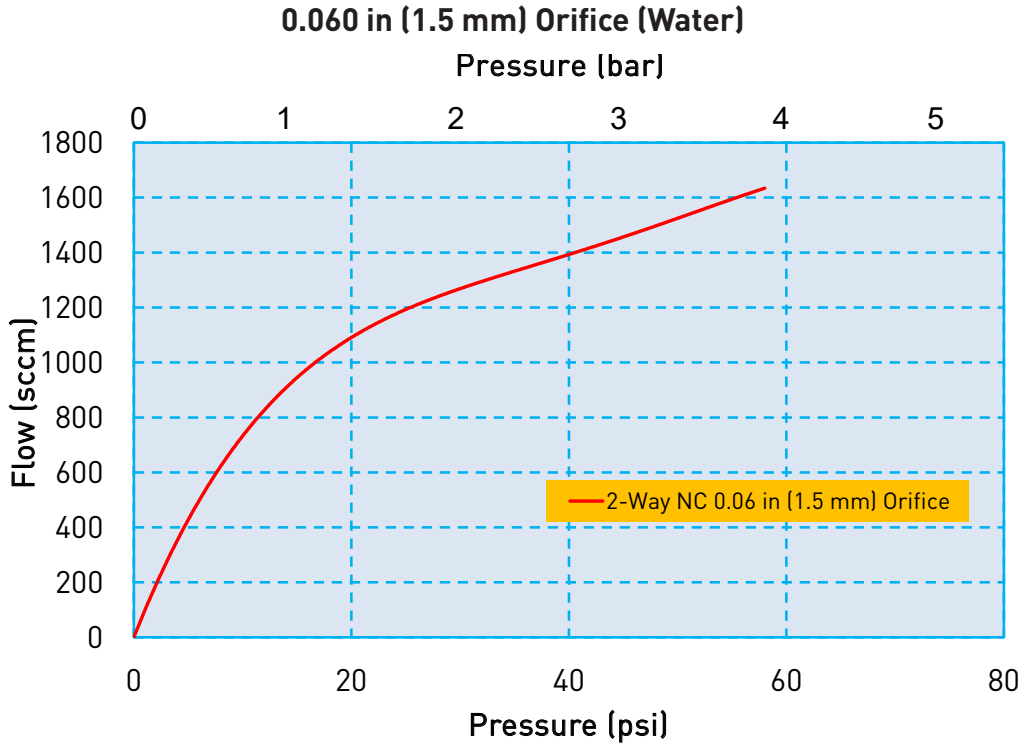
Flow Curve



C15 Miniature Liquid Cartridge Valve

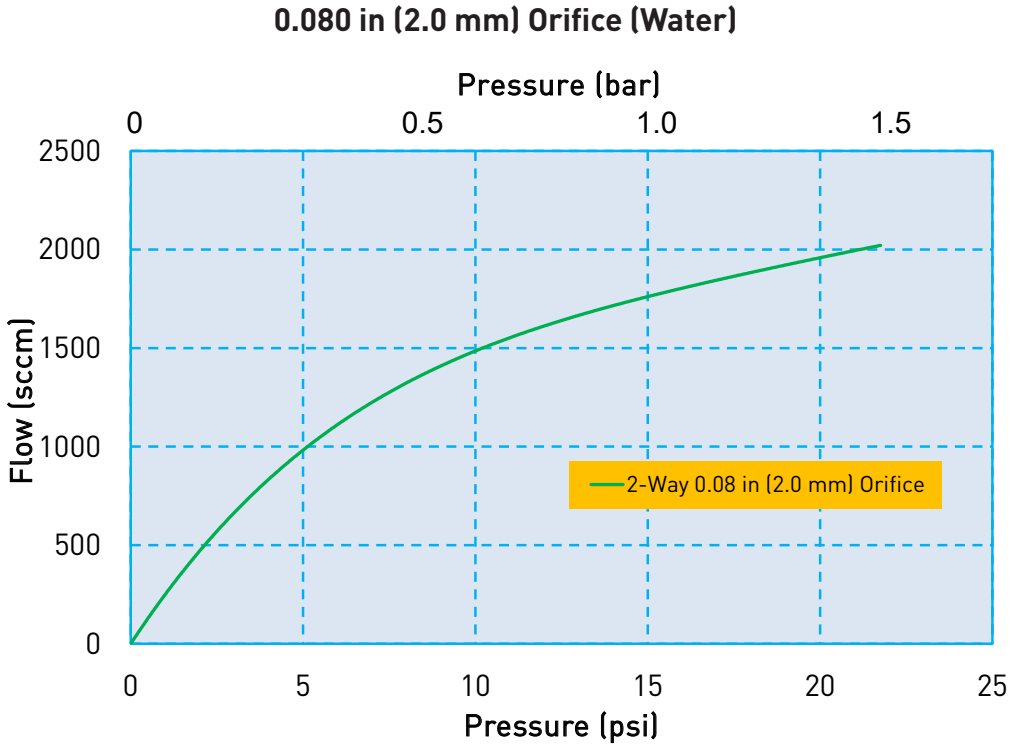
Flow Curve





C15 Miniature Liquid Cartridge Valve

Flow Curve



Electrical Interface



Wire Leads

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

C15 Miniature Liquid Cartridge Valve

Electrical Requirements

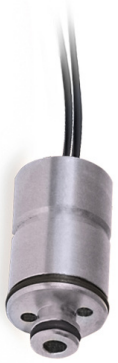
Table 1

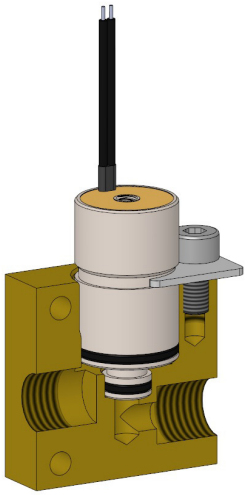
Orifice	0.02 in (0.5 mm)		0.04 in (1.0 mm)		0.06 in (1.5 mm)		0.08 in (2.0 mm)	
Valve Type	2-Way		2-Way		2-Way		2-Way	
Voltage (VDC)*	12	24	12	24	12	24	12	24
Power (Watts)	1.1	1.1	1.7	1.6	1.7	1.6	1.7	1.6
Resistance (Ohm)**	132	525	85	361	85	361	85	361

* ± 5%, other voltages available on request

** ±5% @ 68°F, 20°C

Liquid Interface/Mechanical Integration

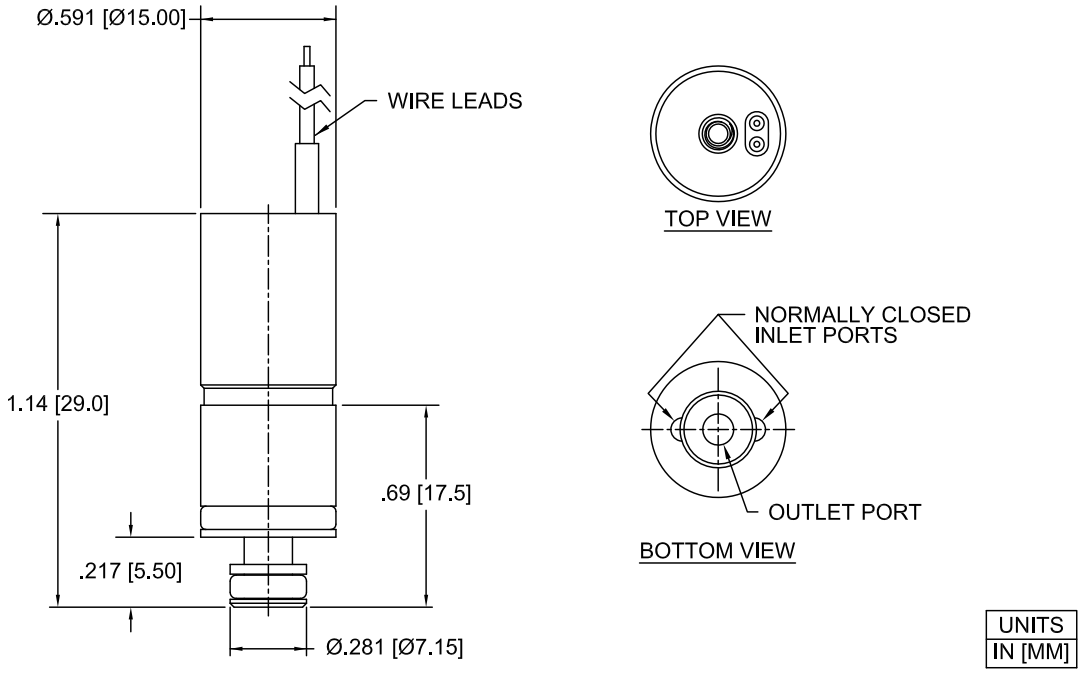




C15 Miniature Liquid Cartridge Valve

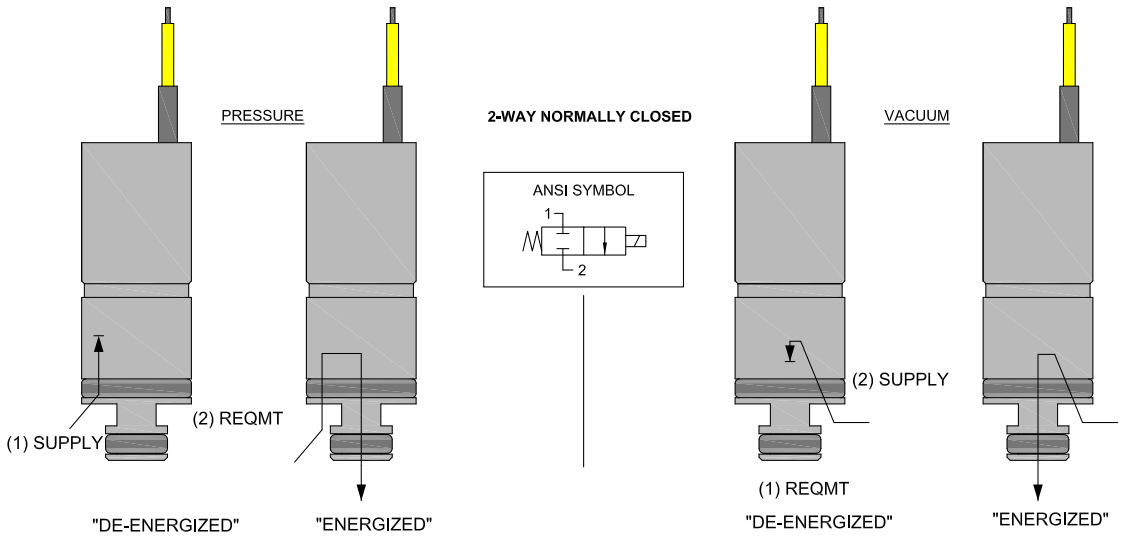
Dimensions

2-Way Valve Configuration



ANSI Symbols

2-Way Normally Closed

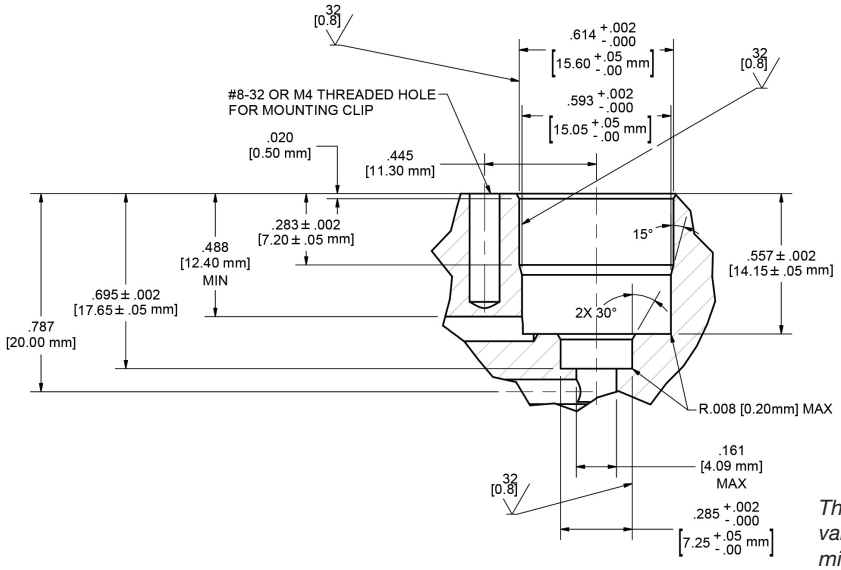


C15 Miniature Liquid Cartridge Valve

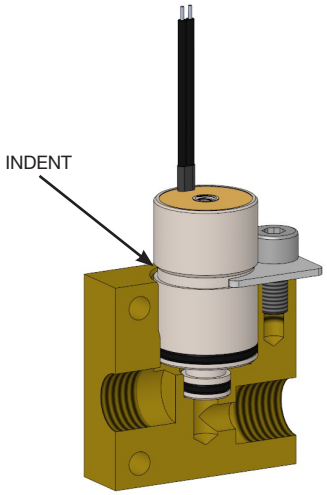
Installation and Use

During installation of the C15 valve, the maximum force allowed to press it into the manifold is: 22.48 lbf (100 N)
Lubrication is recommended (I.E. alcohol or DI water depending on compatibility constraints)

Recommended Valve Manifold Dimensions



Recommended Valve Mounting

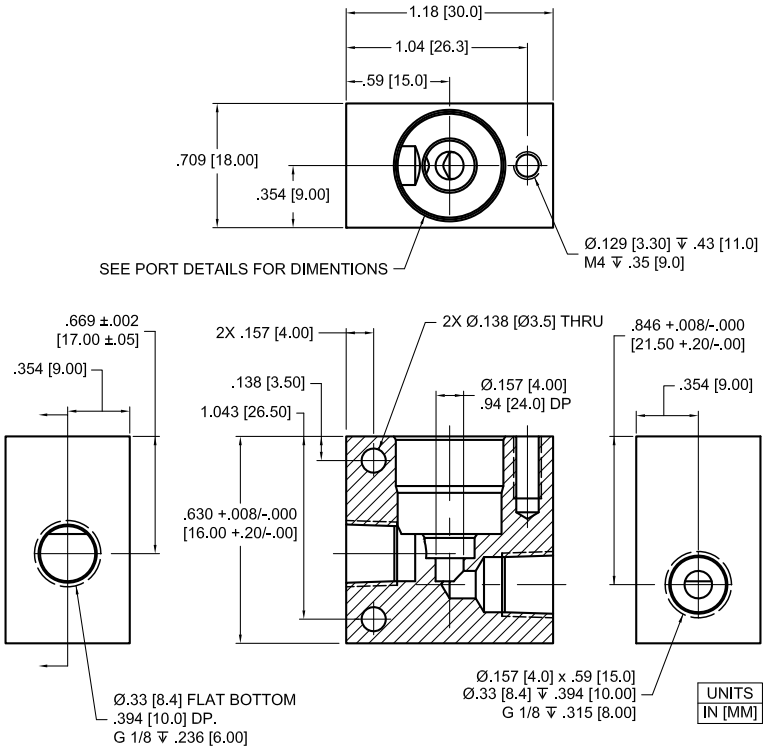


The correct location to use when holding the valve in place in the manifold is the indent at the middle of the valve body. If the top of the valve is used to hold the valve in place, the working pressure the valve will see, can push the valve upward and exceed the maximum insertion force for the valve.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

Installation and Use

C15 Evaluation Manifold Dimensions and Design

C15-MCS



C15 Miniature Liquid Cartridge Valve

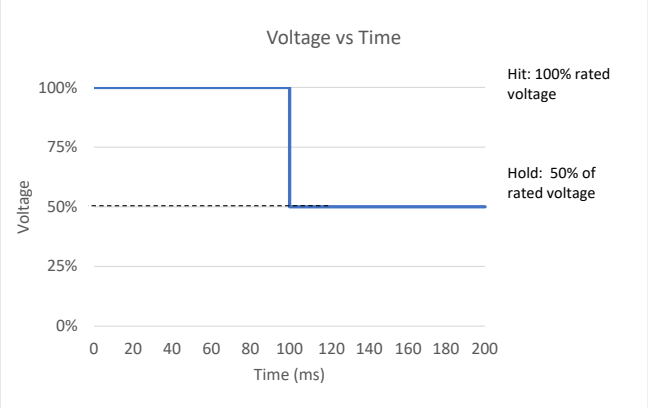
Installation and Use

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 Liquid Cartridge Valve

Chemical Compatibility Chart*

	Seal Options			Other Wetted Materials
Chemical	FFKM	FKM	EPDM	Stainless Steel
DI Water	1	1	1	1
Methanol	1	4	1	2
Isopropanol	1	1	1	1
Ethanol	1	3	1	1
Acetonitrile	1	4	1	
Tetrahydrofuran	1	4	4	
Toluene	1	2	4	1
MEK	4	1	1	3
Organic Acids - Dilute	1	1	1	4
Non Organic Acids - Dilute	1	1	1	2
Bases - Dilute	1	1	1	1
Saline	1	1	1	2
Bleach 12%	2	1	1	4
Sodium Hydroxide 20%	1	2	1	2

*The above is an Abbreviated Chemical Compatibility Chart. Please consult factory for additional information.

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

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 (FKM)
C15-LGE (EPDM)



Replacement FKM O-Ring for C15 Valve, Small

C15-SM (FKM)
C15-SME (EPDM)



C15 Miniature Liquid 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	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, FKM, Large**

C15-LGE: Spare O-Ring for C15 Valve, EPDM, Large**

C15-SM: Spare O-Ring for C15 Valve, FKM, Small**

C15-SME: Spare O-Ring for C15 Valve, EPDM, 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_LiquidCartridgeValve), 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

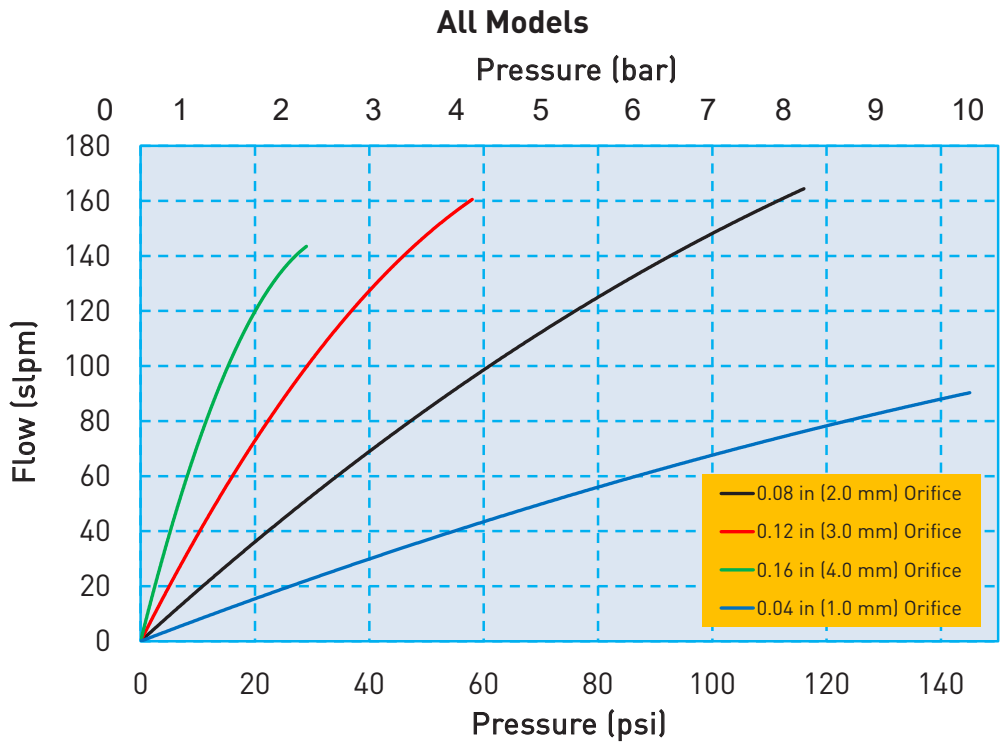
Recommended Filtration:
10 µm

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

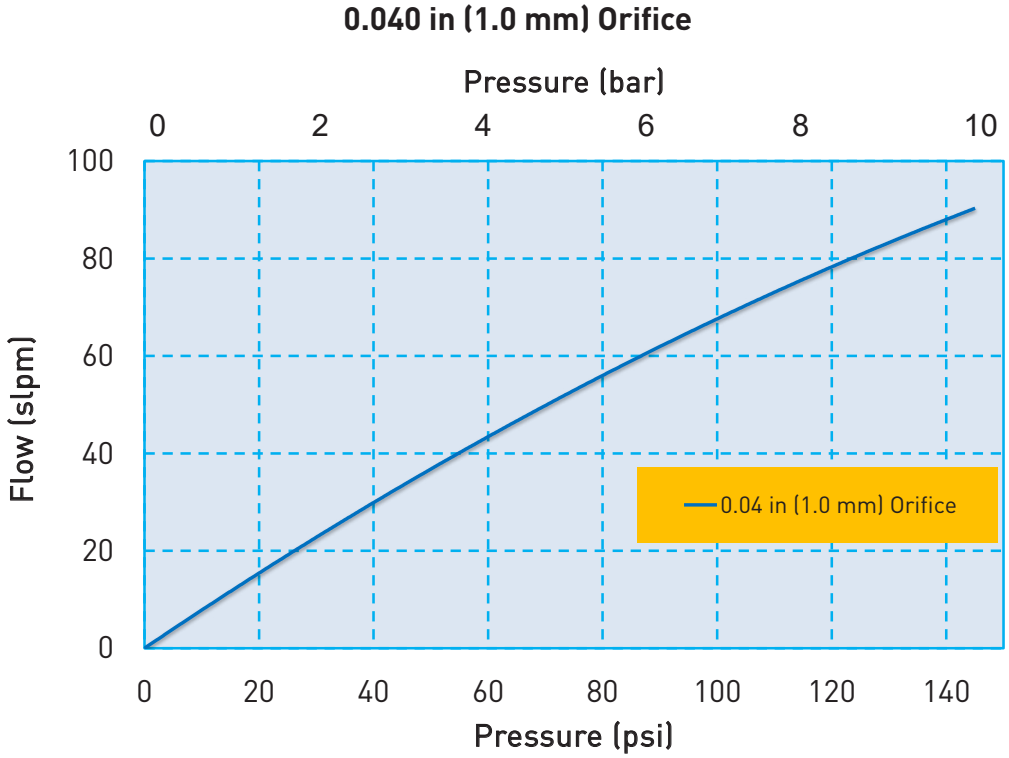
*Please contact factory for additional details on liquid compatibility.

C21 Miniature Liquid Cartridge Valve

Flow Curve

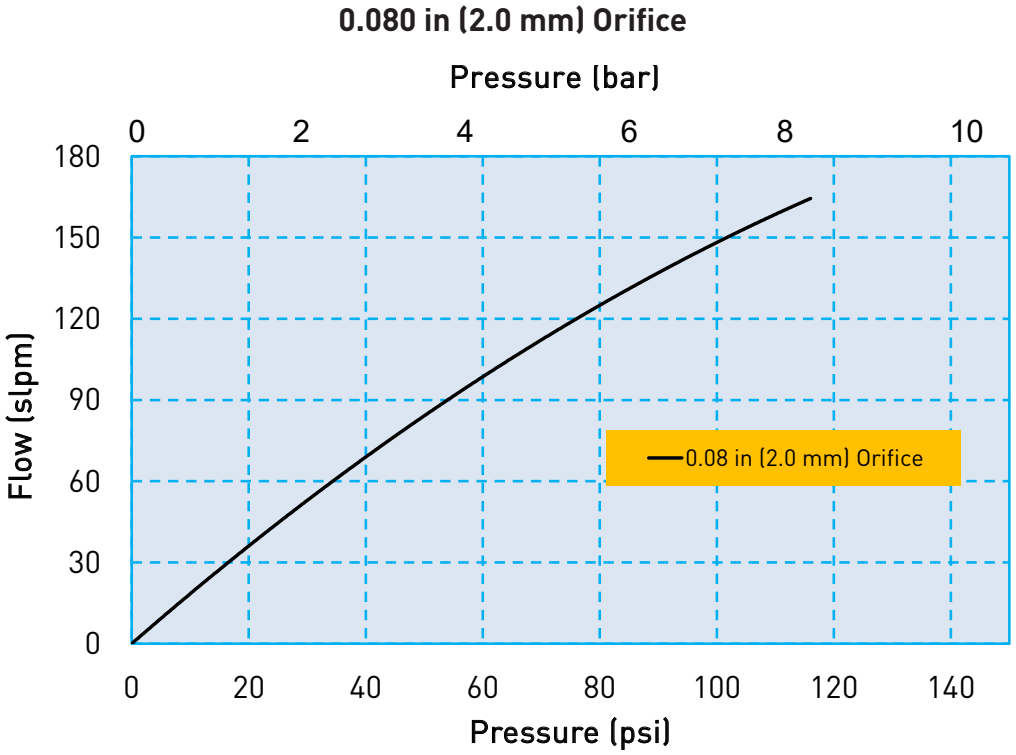


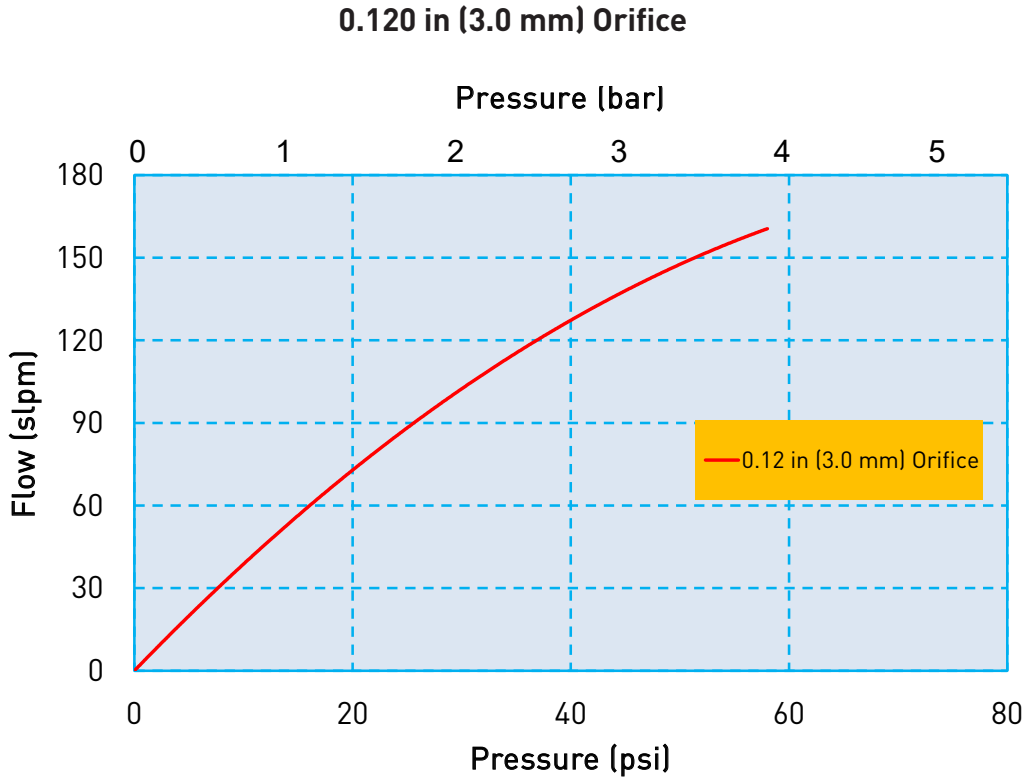
Flow Curve



C21 Miniature Cartridge Valve

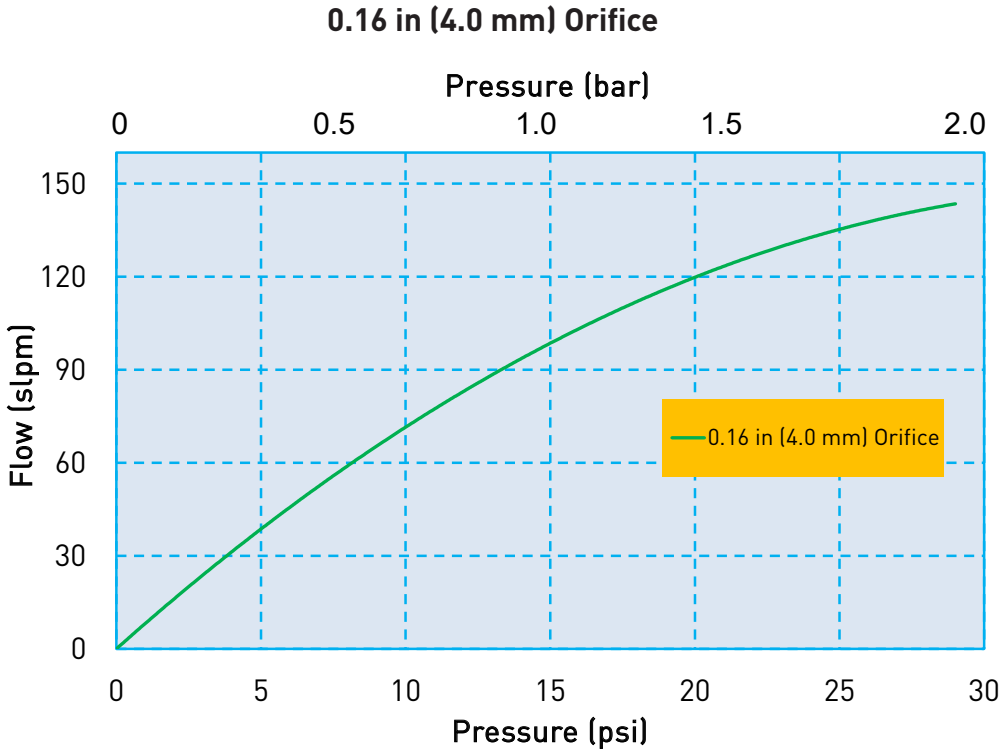
Flow Curve





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

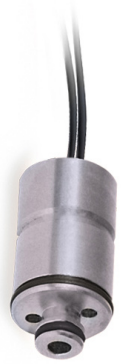
Table 1

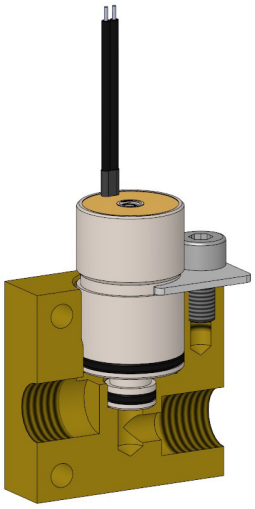
Orifice	0.040 in (1.0 mm)				0.080 in (2.0 mm)				0.12 in (3.0 mm)				0.16 in (4.0 mm)			
Valve Type	2-Way		3-Way		2-Way		3-Way		2-Way		3-Way		2-Way		3-Way	
Voltage (VDC)*	12	24	12	24	12	24	12	24	12	24	12	24	12	24	12	24
Power (Watts)	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5
Resistance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

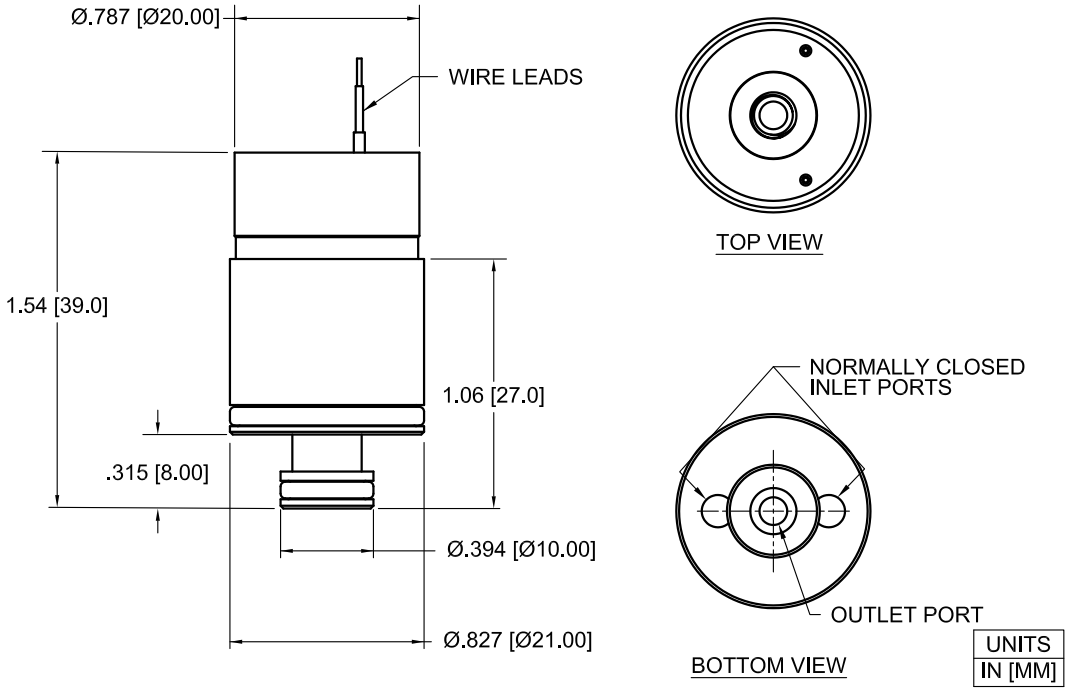




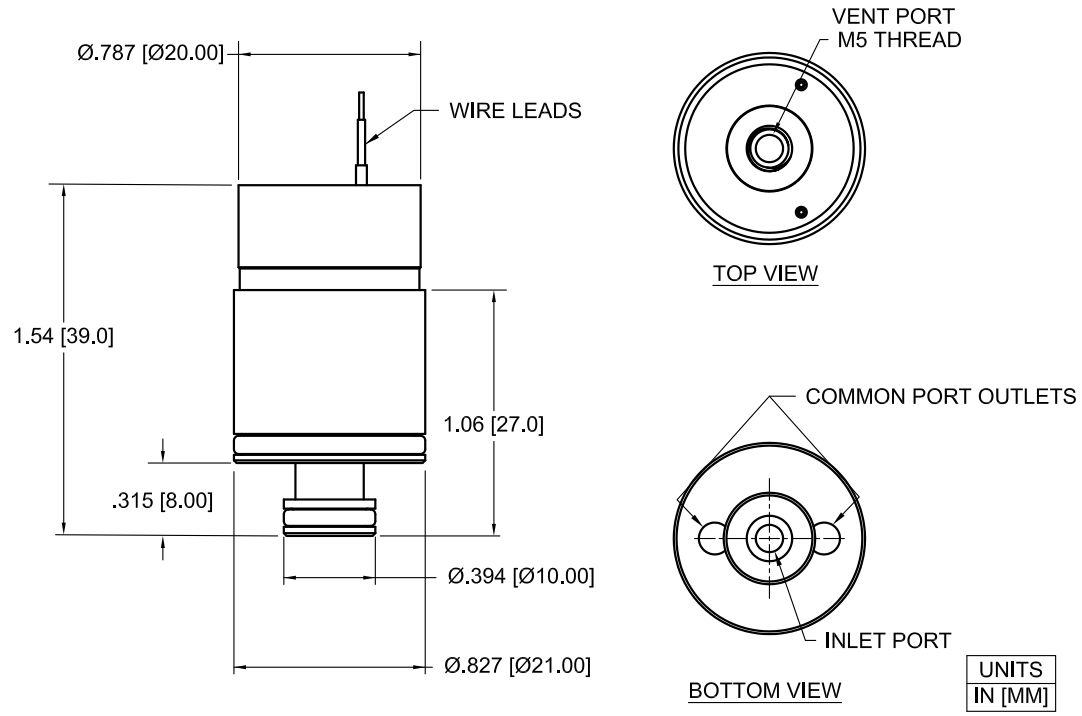
C21 Miniature Cartridge Valve

Dimensions

2-Way Valve Configuration



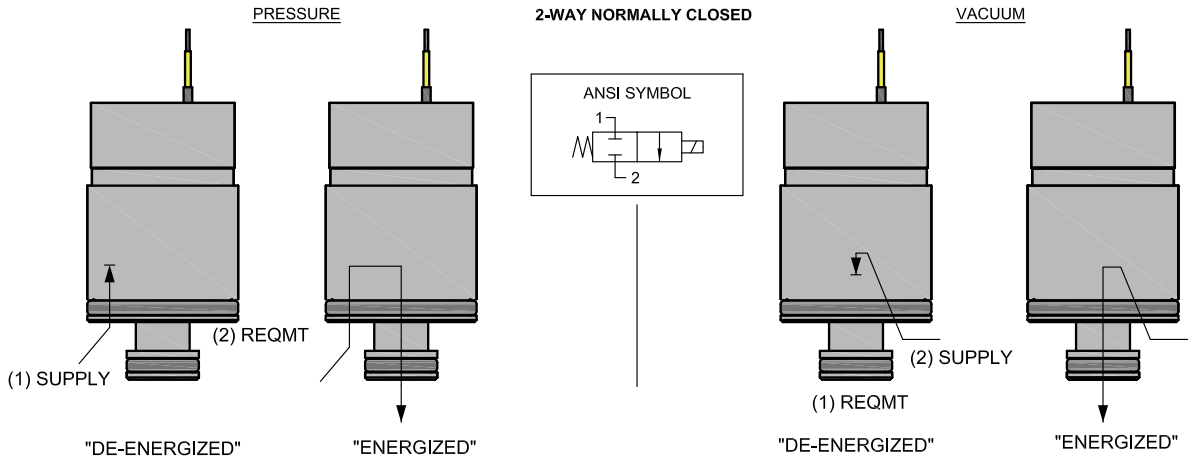
3-Way Valve Configuration



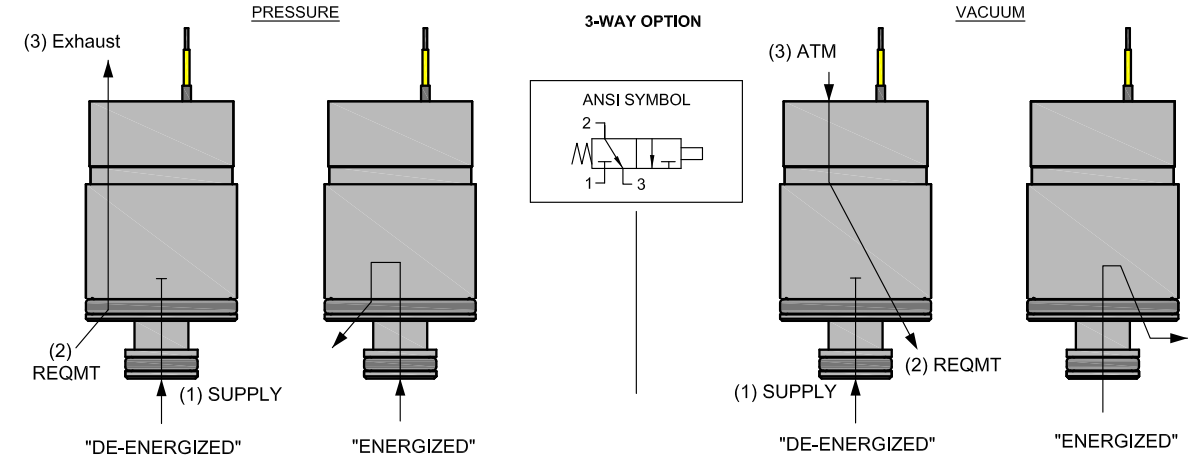
C21 Miniature Cartridge Valve

ANSI Symbols

2-Way Normally Closed



3-Way Normally Closed

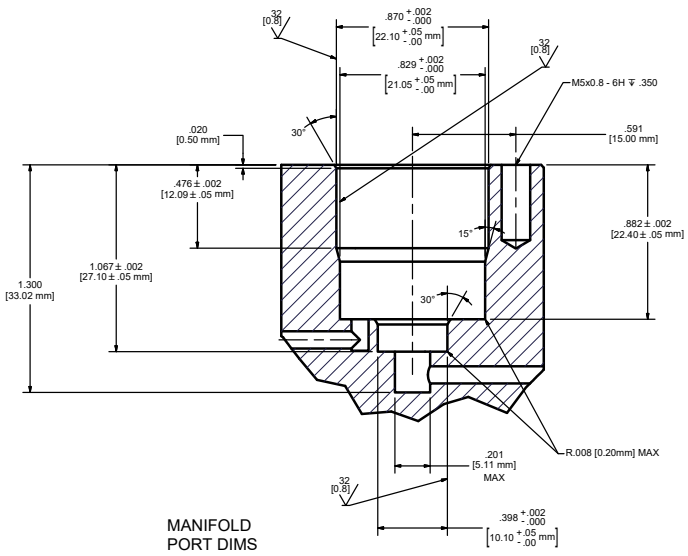


C21 Miniature Cartridge Valve

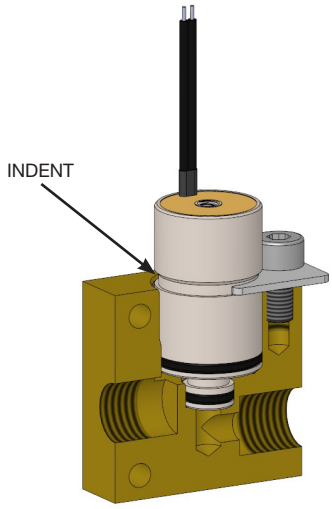
Installation and Use

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



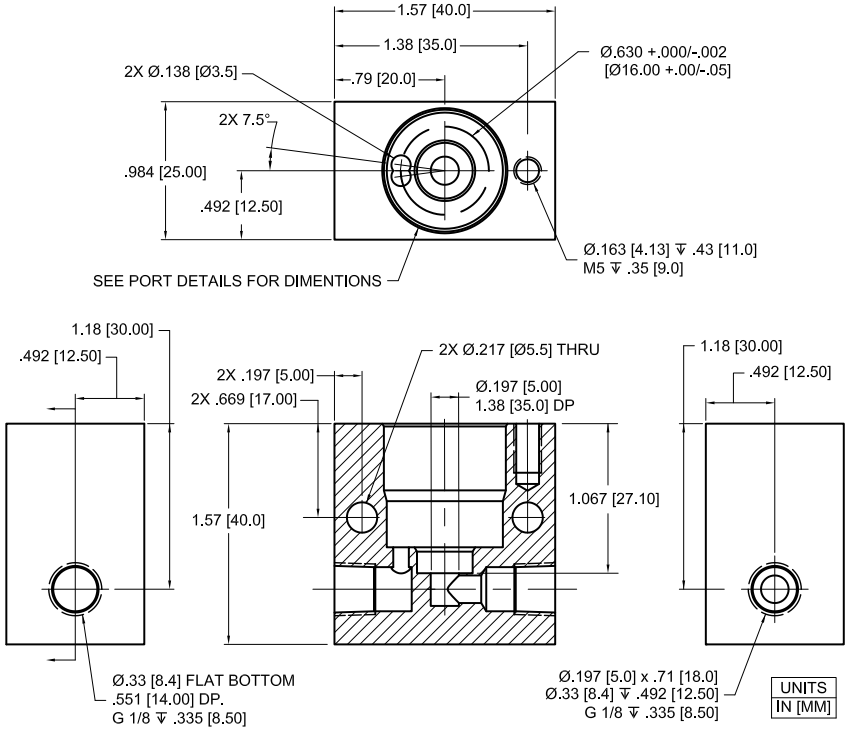
Recommended Valve Mounting



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 see, 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

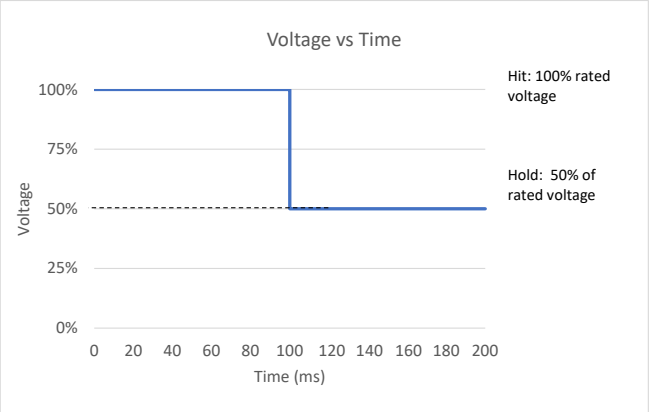
Installation and Use

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 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

ORDER ON-LINE

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.

C21 Valve **Miniature Cartridge Liquid Valve**

21 mm Miniature Liquid Cartridge Valve



The Series C21 is a miniature cartridge style solenoid valve with a compact 21 mm diameter. This unique design combines compact size, light weight and low power consumption with high flow repeatability and fast response time over an exceptionally long life up to ??? million cycles. Available in 2-way configuration, the valve is manifold mounted utilizing a simple securing system reducing assembly time.

Typical Markets

- Analytical Chemistry
- Clinical Diagnostics
- Agent Detection
- Print

Typical Applications

- Large format Inkjet systems
- Reagent Addition
- Wash
- Waste
- Flow Control

Features

- Variety of orifice sizes with pressures up to 145 PSI (10 bar).
- Floating frictionless plunger enables reliable and repeatable operation up to 20 Million cycles.
- Low power design reduces heat and energy consumption.
- Compact reduces space and weight.
- 100% calibrated ensuring minimal valve to valve variation.
- RoHS & REACH compliant.

Product Specifications

Mechanical

Valve Type:
Solenoid Cartridge Valve 2-Way Normally Closed (NC)
Media: Gases* and Liquids (See more Information in Gas 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

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	2-Way	2-Way	2-Way
Max Vacuum & Pressure	PSI	145	116	58	29
	Bar	10	8	4	2
	Cv	0.03	0.08	0.13	0.18
SCCM (water)		1480	3350	3770	3630

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 FFKM available on request

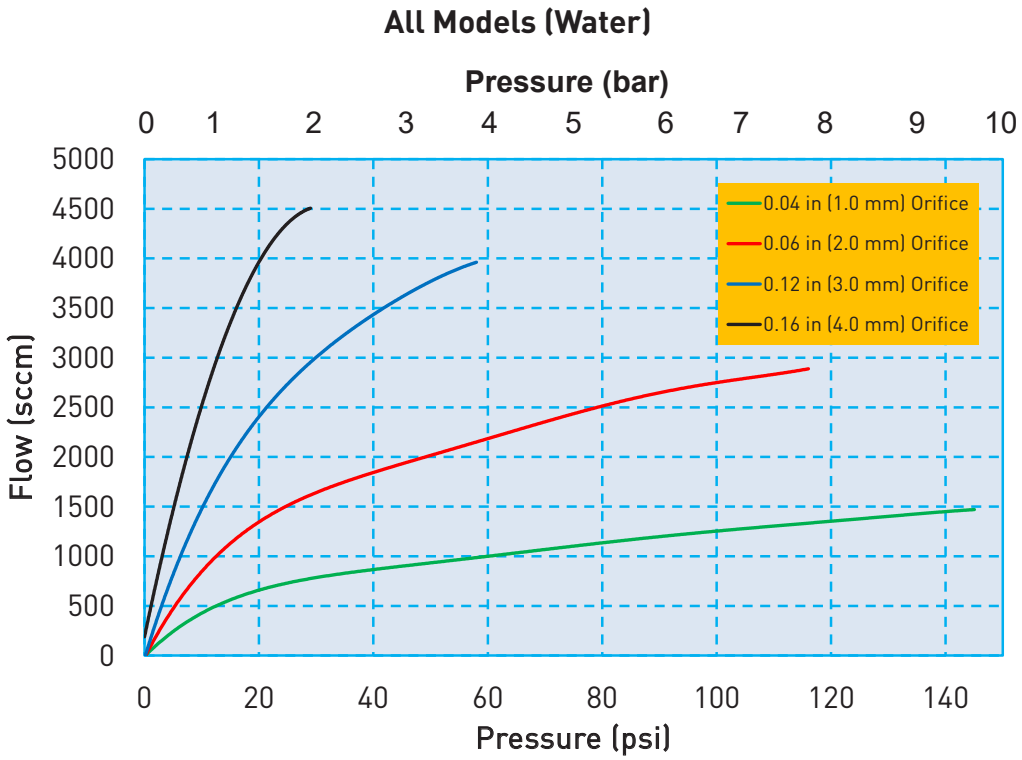
Performance Characteristics

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

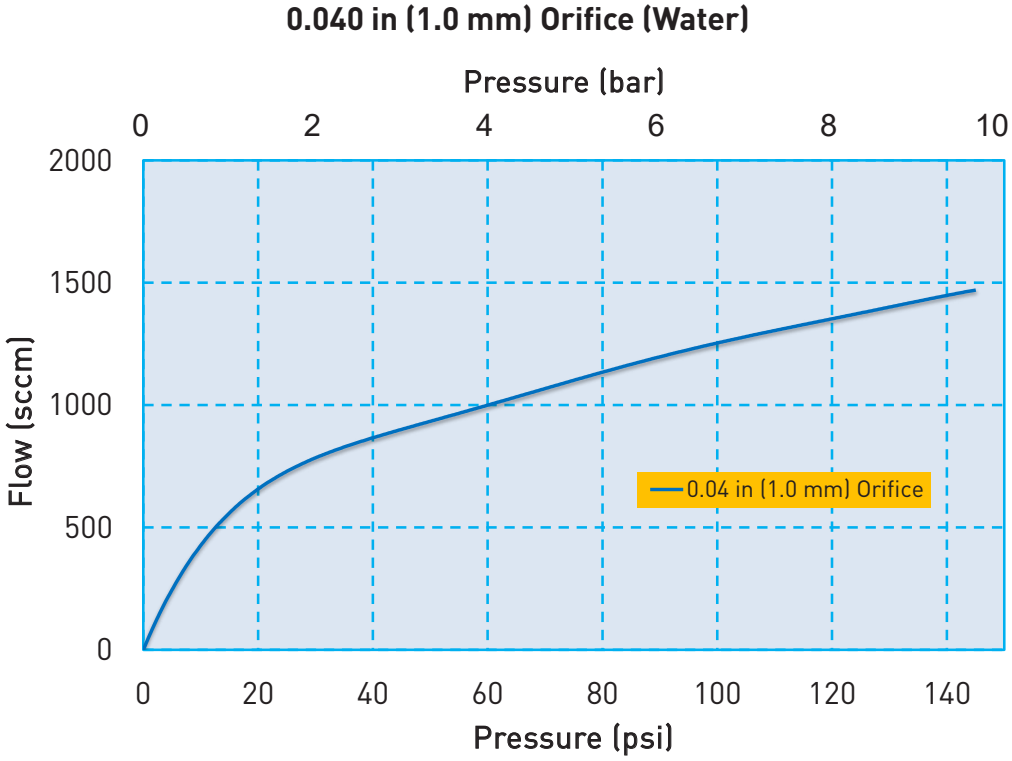
*Please contact factory for additional details on gas compatibility.

C21 Miniature Liquid Cartridge Valve

Flow Curve

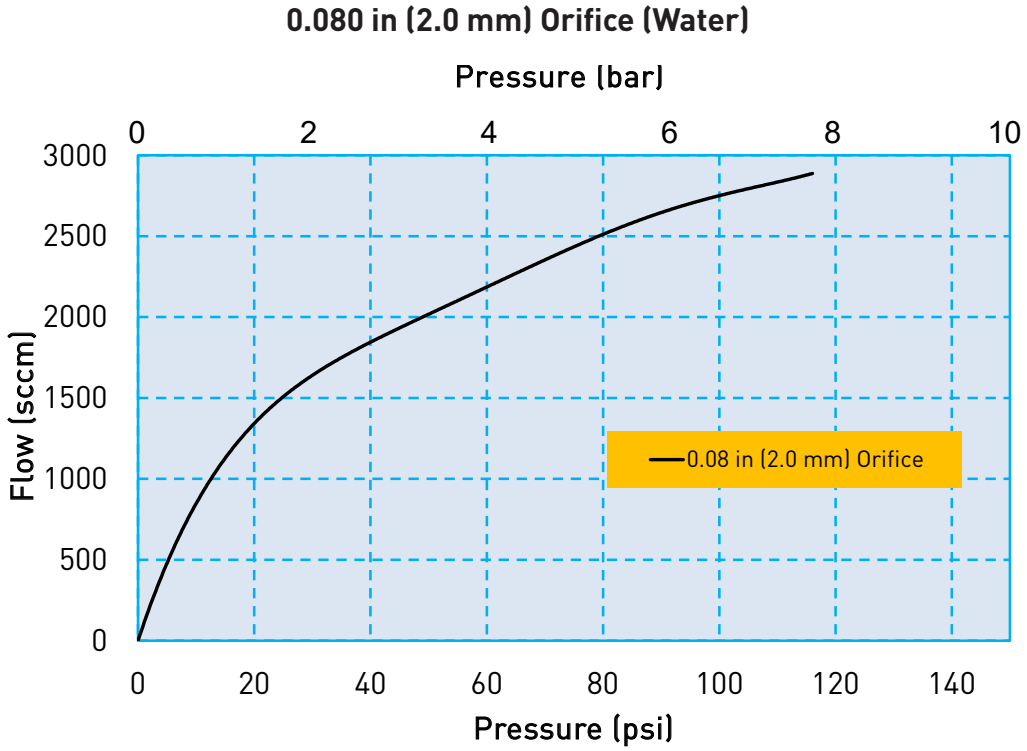


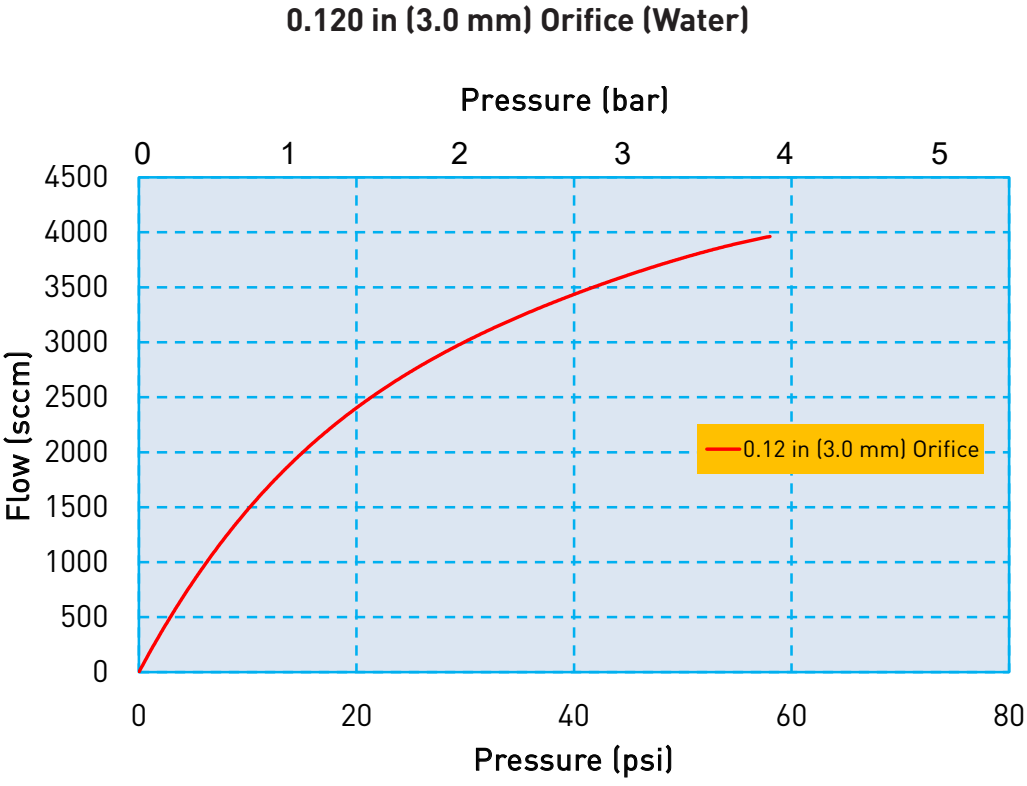
Flow Curve



C21 Miniature Liquid Cartridge Valve

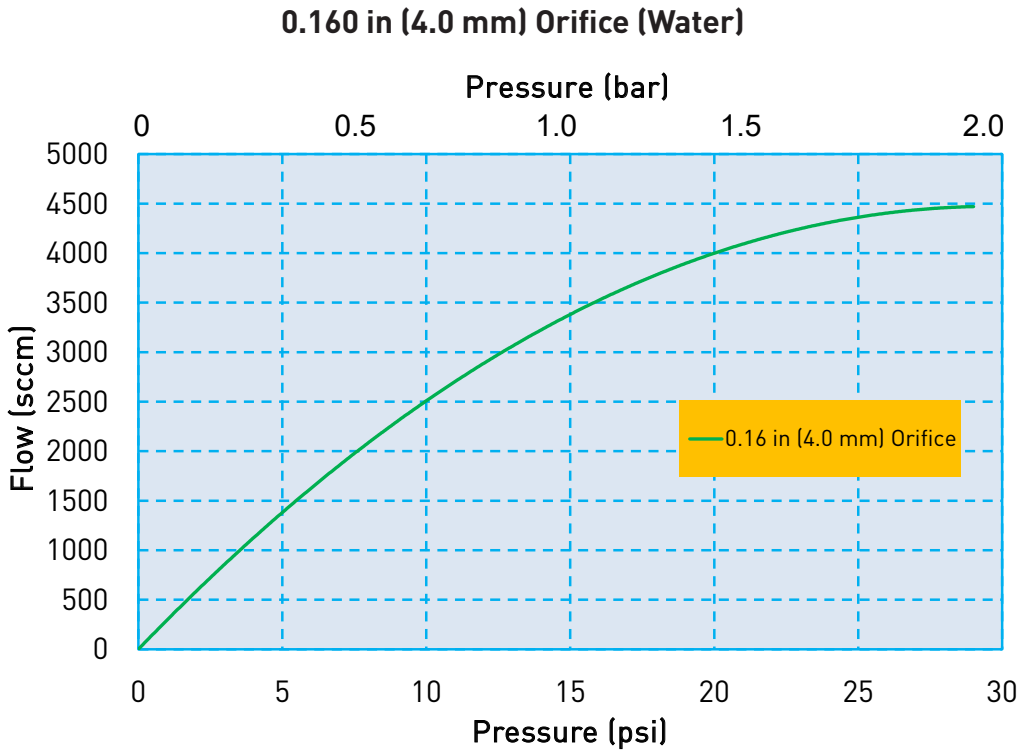
Flow Curve





C21 Miniature Liquid Cartridge Valve

Flow Curve



Electrical Interface



Wire Leads

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

C21 Miniature Liquid Cartridge Valve

Electrical Requirements

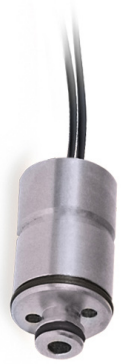
Table 1

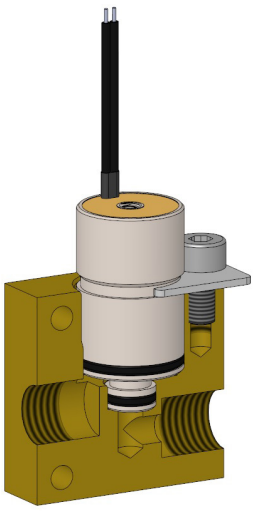
Orifice	0.040 in (1.0 mm)		0.080 in (2.0 mm)		0.12 in (3.0 mm)		0.16 in (4.0 mm)	
Valve Type	2-Way		2-Way		2-Way		2-Way	
Voltage (VDC)*	12	24	12	24	12	24	12	24
Power (Watts)	2.6	2.5	2.6	2.5	2.6	2.5	2.6	2.5
Resistance (Ohm)**	56	235	56	235	56	235	56	235

* ± 5%, other voltages available on request

** ±5% @ 68°F, 20°C

Liquid Interface/Mechanical Integration

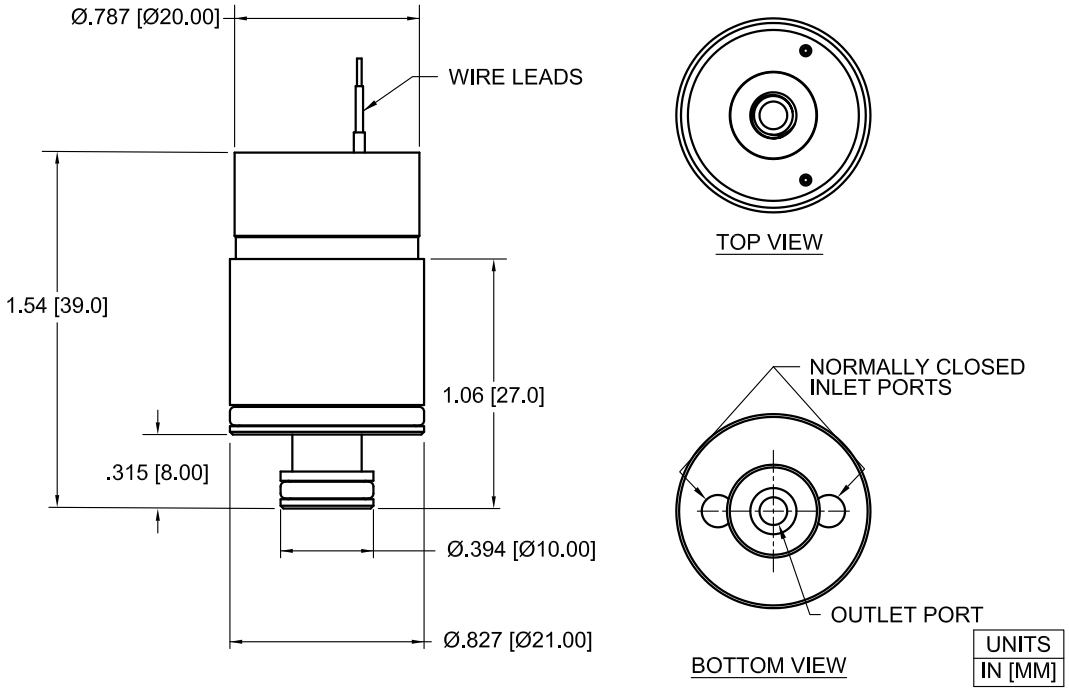




C21 Miniature Liquid Cartridge Valve

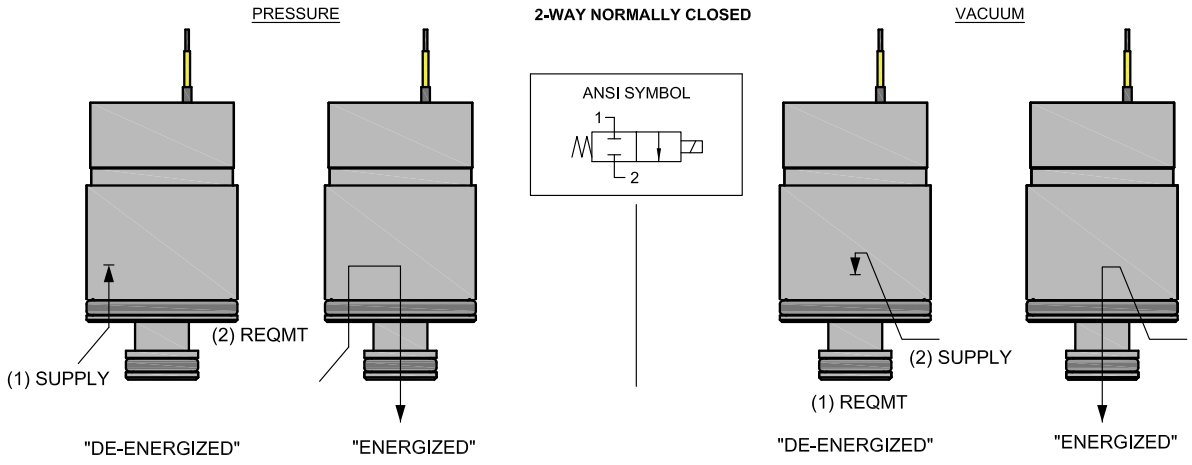
Dimensions

2-Way Valve Configuration



ANSI Symbols

2-Way Normally Closed

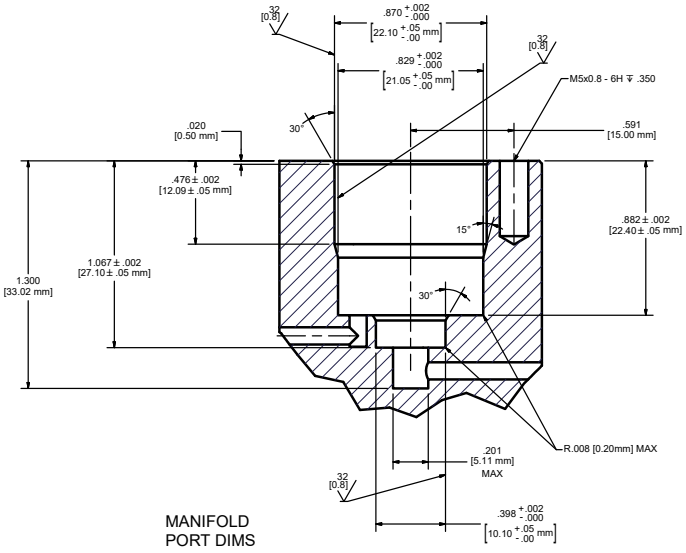


C21 Miniature Liquid Cartridge Valve

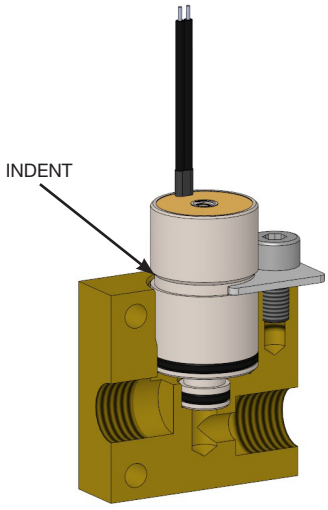
Installation and Use

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

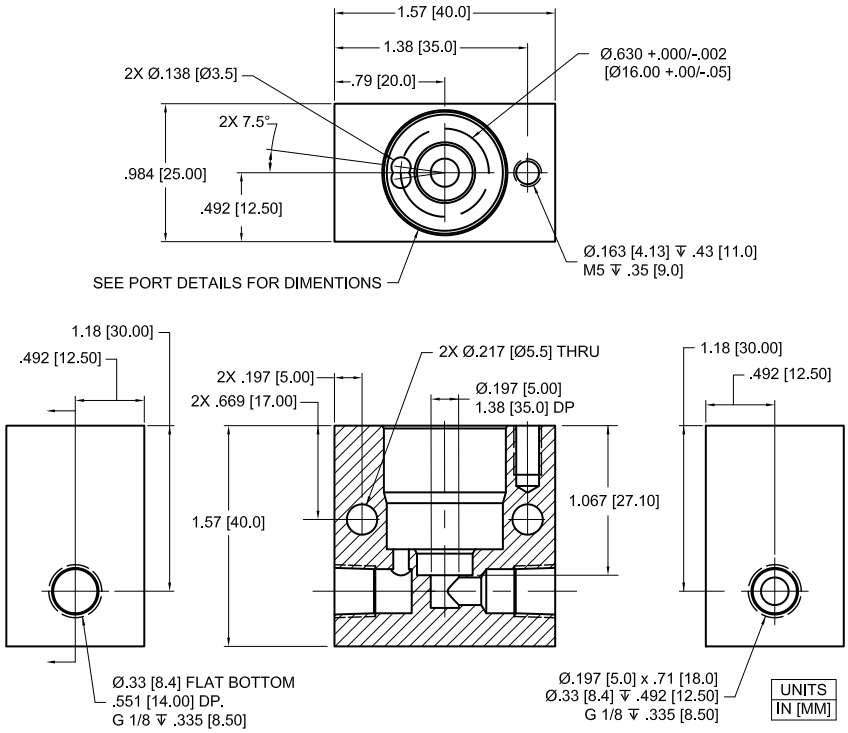


The correct location to use when holding the valve in place in the manifold is the indent at the middle of the valve body. If the top of the valve is used to hold the valve in place, the working pressure the valve will see, can push the valve upward and exceed the maximum insertion force for the valve.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

Installation and Use

C21 Evaluation Manifold Dimensions and Design

C21-MCS



C21 Miniature Liquid Cartridge Valve

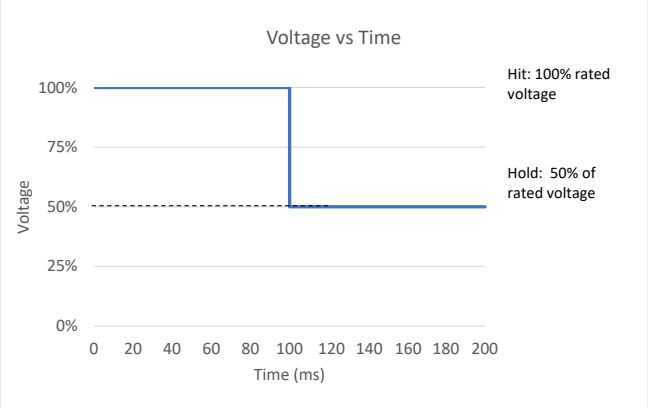
Installation and Use

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 Liquid Cartridge Valve

Chemical Compatibility Chart*

	Seal Options			Other Wetted Materials
Chemical	FFKM	FKM	EPDM	Stainless Steel
DI Water	1	1	1	1
Methanol	1	4	1	2
Isopropanol	1	1	1	1
Ethanol	1	3	1	1
Acetonitrile	1	4	1	
Tetrahydrofuran	1	4	4	
Toluene	1	2	4	1
MEK	4	1	1	3
Organic Acids - Dilute	1	1	1	4
Non Organic Acids - Dilute	1	1	1	2
Bases - Dilute	1	1	1	1
Saline	1	1	1	2
Bleach 12%	2	1	1	4
Sodium Hydroxide 20%	1	2	1	2

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

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 (FKM)
C21-LGE (EPDM)



Replacement FKM O-Ring for C21 Valve, Small
C21-SM (FKM)
C21-SME (EPDM)



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 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, FKM, Large**

C21-LGE: Spare O-Ring for C21 Valve, EPDM, Large**

C21-SM: Spare O-Ring for C21 Valve, FKM, Small**

C21-SME: Spare O-Ring for C21 Valve, EPDM, 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_LiquidCartridgeValve), 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.

NOTES



WARNING

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

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