

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 20 million cycles. Available in 2-way configuration, the valve is manifold mounted utilizing a simple securing system reducing assembly time.

Markets

- Analytical Chemistry
- Clinical Diagnostics
- Agent Detection
- Print

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 the 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: 0.83 in (21 mm)
- Length: 1.54 in (39 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
	Bar	10	8	4
	Cv	0.03	0.08	0.13
	SCCM (water)	1480	3350	3770

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

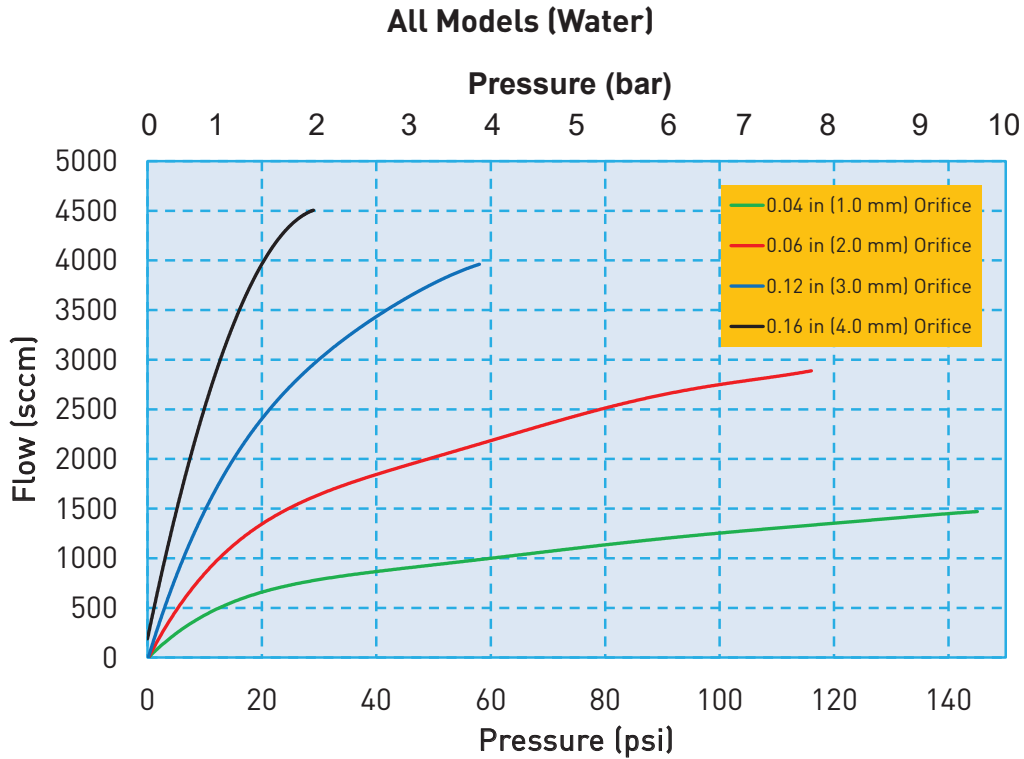
Body:
Stainless Steel
Seals: (Internal and External)
FKM, EPDM

Performance Characteristics

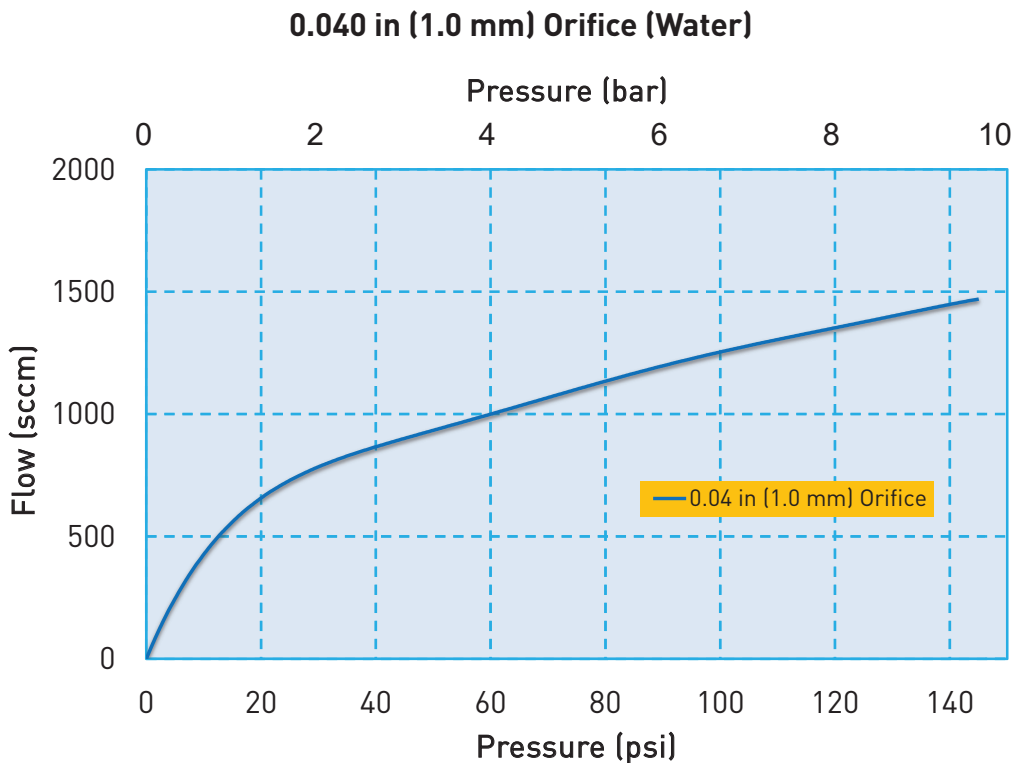
Response:
10 ms Maximum, Cycling
Recommended Filtration:
10 µm
Reliability:
2-Way: 20 Million Cycles
0.90 Reliability Factor
95% Confidence

C21 Miniature Liquid Cartridge Valve

Flow Curve

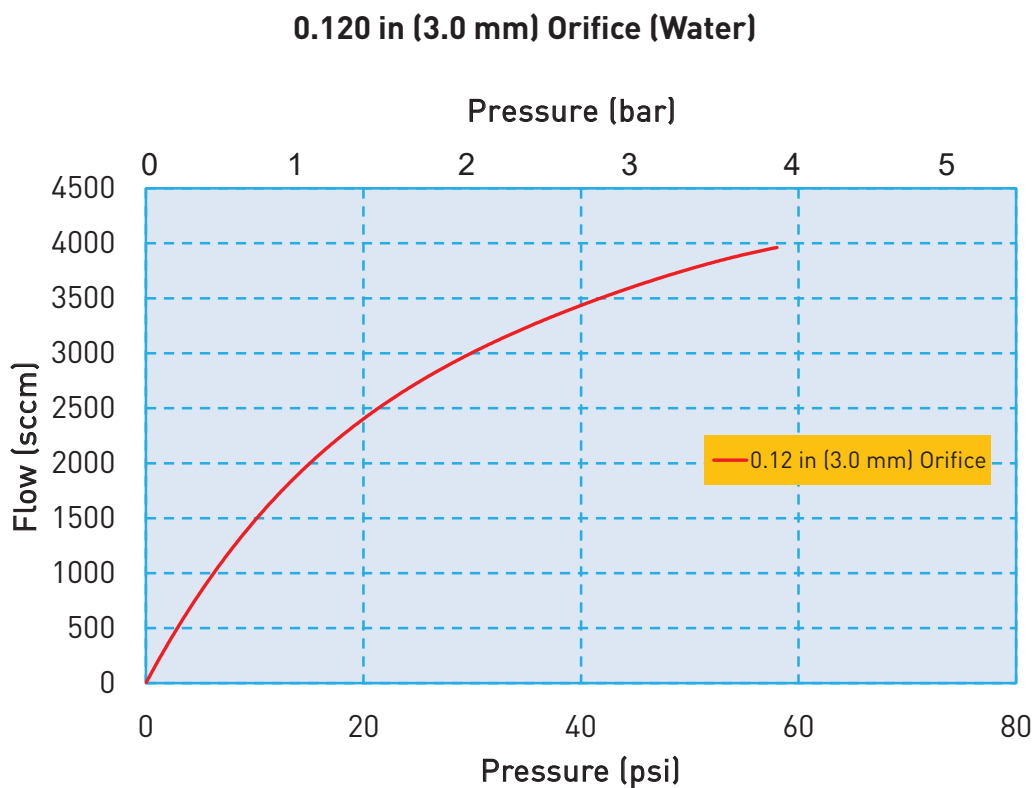
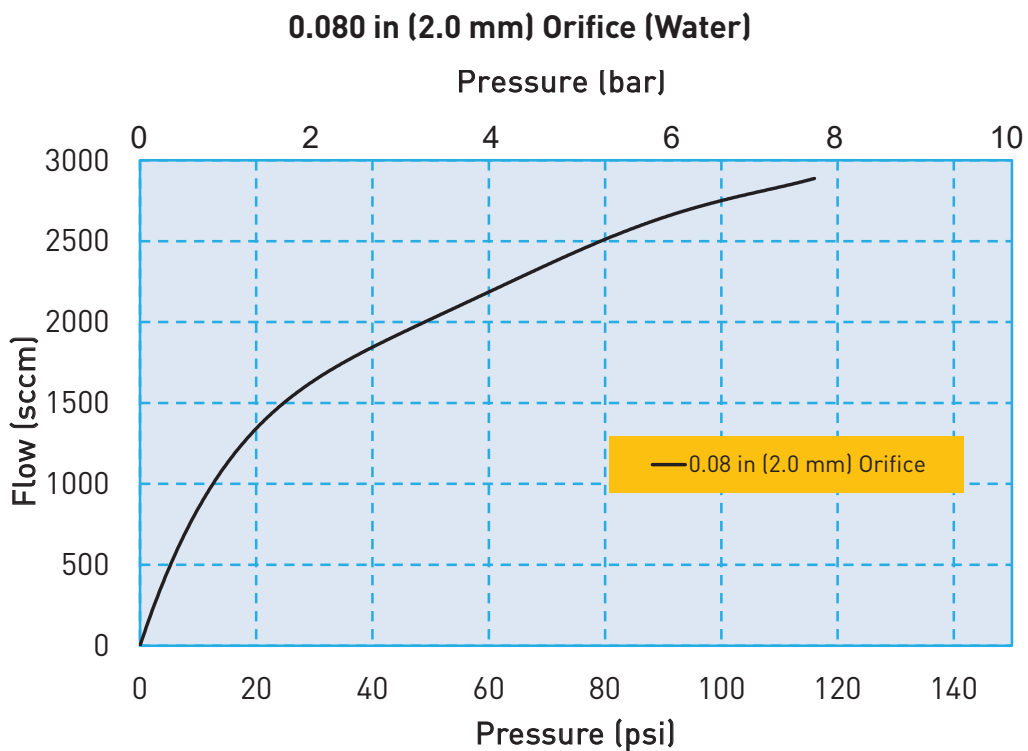


Flow Curve



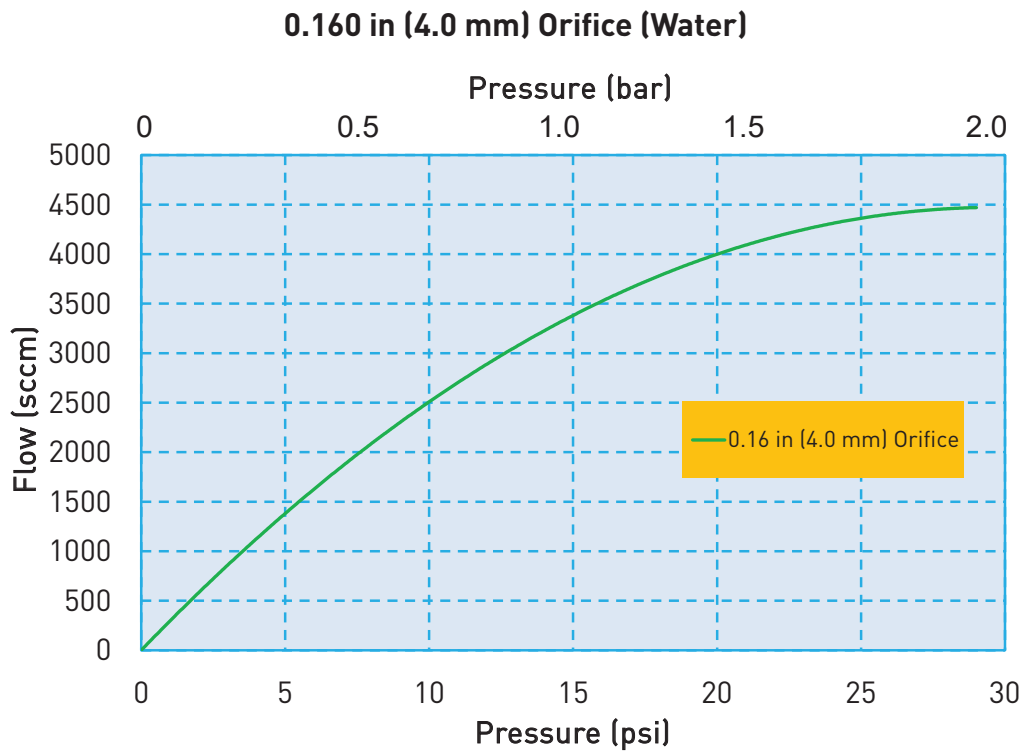
C21 Miniature Liquid Cartridge Valve

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

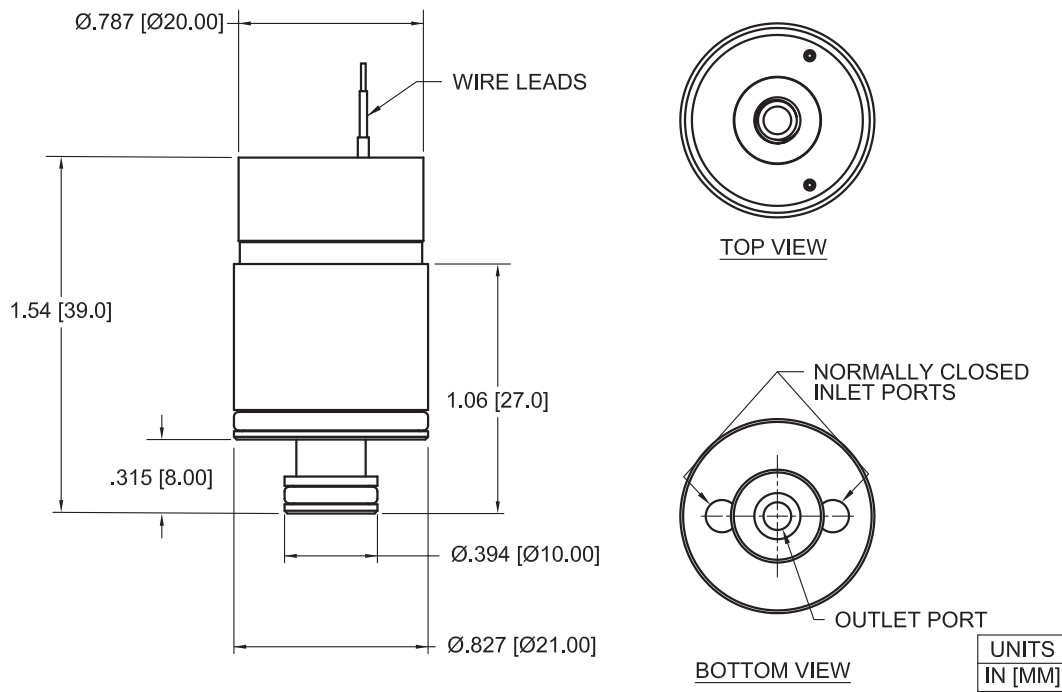
Liquid Interface/Mechanical Integration



C21 Miniature Liquid Cartridge Valve

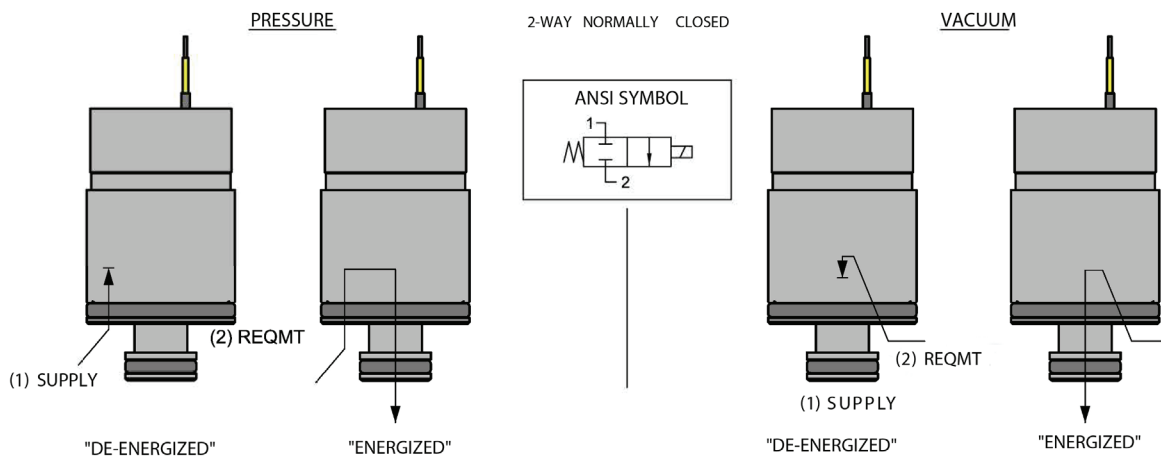
Dimensions

2-Way Valve Configuration



ANSI Symbols

2-Way Normally Closed

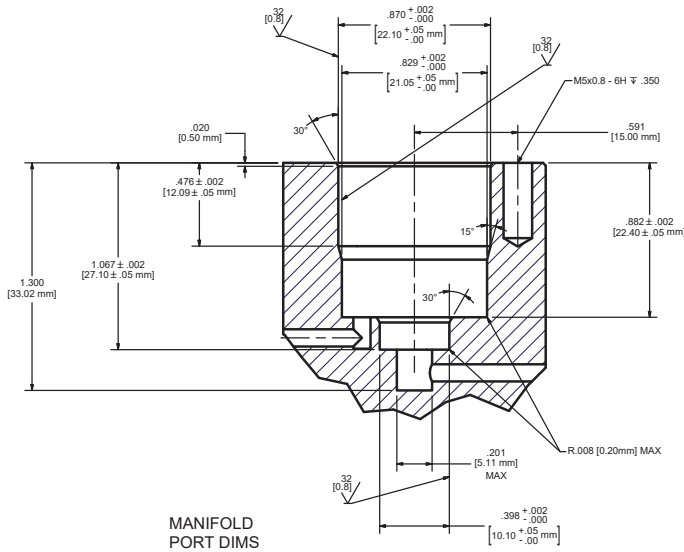


C21 Miniature Liquid Cartridge Valve

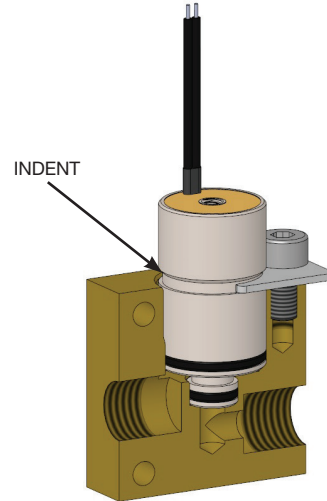
Installation and Use

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



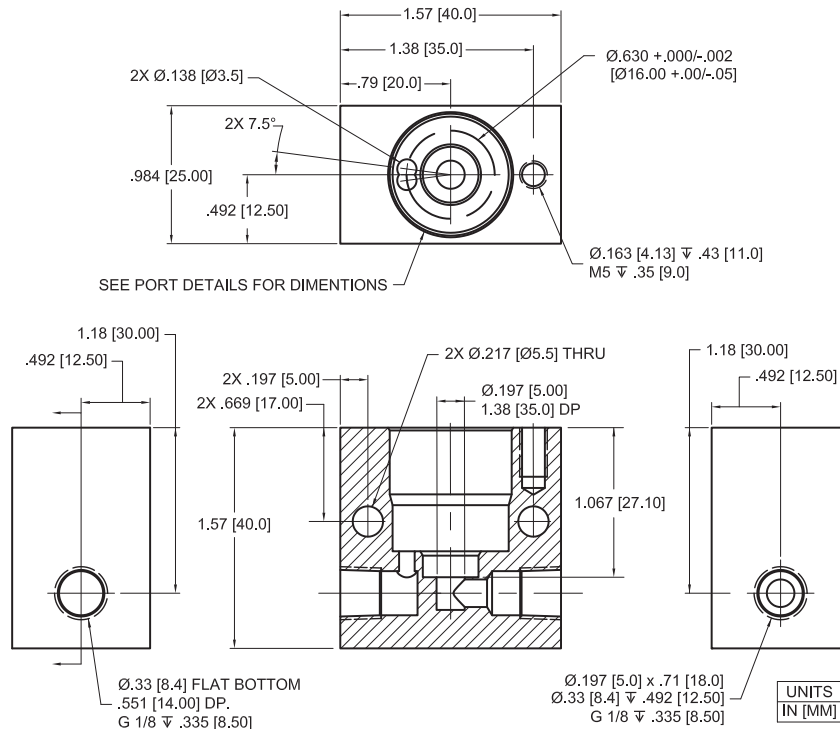
Recommended Valve Mounting



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



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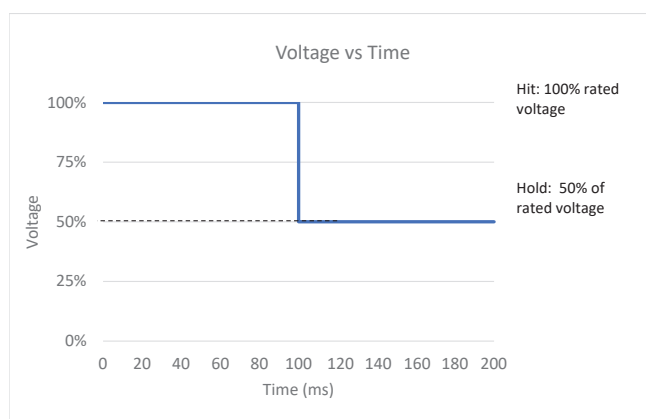
Installation and Use

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.**

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Chemical Compatibility Chart*

Chemical	Seal Options			Other Wetted Materials
	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 Liquid 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.

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

