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.

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 & REA CH compliant.

Typical Markets
• Analytical Chemistry
• Clinical Diagnostics
• Environmental Monitoring
• Print

Typical Applications
• Reagent Addition
• Wash
• Waste
• Flow Control
• Large format Inkjet systems

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

<table>
<thead>
<tr>
<th>Orifice</th>
<th>0.012 in (0.3 mm)</th>
<th>0.020 in (0.5 mm)</th>
<th>0.031 in (0.8 mm)</th>
<th>0.039 in (1.0 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>2-Way</td>
<td>2-Way</td>
<td>2-Way</td>
<td>2-Way</td>
</tr>
<tr>
<td>PSI</td>
<td>145</td>
<td>116</td>
<td>73</td>
<td>43.5</td>
</tr>
<tr>
<td>Bar</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>SCCM (water)</td>
<td>146</td>
<td>240</td>
<td>429</td>
<td>415</td>
</tr>
</tbody>
</table>

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
FKKM 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

All Models (Water)

Flow Rate (scm)

Pressure (bar)

0.012 in (0.3 mm) Orifice
0.020 in (0.5 mm) Orifice
0.031 in (0.8 mm) Orifice
0.039 in (1.0 mm) Orifice

Flow Curve

0.012 in (0.3 mm) Orifice - Water

Flow (scm)

Pressure (psi)

0 1 2 3 4 5 6 7 8 9 10

0 20 40 60 80 100 120 140 160

Parker
C7 Miniature Liquid Cartridge Valve

Flow Curve

0.020 in (0.5 mm) Orifice - Water

0.031 in (0.8 mm) Orifice - Water
C7 Miniature Liquid Cartridge Valve

Flow Curve

0.039 in (1.0 mm) Orifice - Water

![Flow Curve Graph]

Electrical Interface

Wire Leads
Standard: 3.2 in (80 mm) Wire Leads, stripped at end
C7  Miniature Liquid Cartridge Valve

Electrical Requirements

<table>
<thead>
<tr>
<th>Orifice</th>
<th>0.012 in (0.3 mm)</th>
<th>0.020 in (0.5 mm)</th>
<th>0.031 in (0.8 mm)</th>
<th>0.039 in (1.0 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Type</td>
<td>2-Way</td>
<td>2-Way</td>
<td>2-Way</td>
<td>2-Way</td>
</tr>
<tr>
<td>Voltage (VDC)*</td>
<td>12</td>
<td>24</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Power (Watts)</td>
<td>0.5</td>
<td>0.6</td>
<td>1</td>
<td>0.85</td>
</tr>
<tr>
<td>Resistance (Ohm)**</td>
<td>288</td>
<td>995</td>
<td>140</td>
<td>700</td>
</tr>
</tbody>
</table>

* ±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

2-WAY NORMALLY CLOSED

ANSI Symbols

2-WAY NORMALLY CLOSED

"DE-ENERGIZED"  "ENERGIZED"

"DE-ENERGIZED"  "ENERGIZED"

PARKER
**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.

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**C7 Evaluation Manifold Dimensions and Design**

**C07-MCS**

**Installation and Use**

**Recommended Valve Mounting**

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**Parker**
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.

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*

<table>
<thead>
<tr>
<th>Chemical</th>
<th>FFKM</th>
<th>FKM</th>
<th>EPDM</th>
<th>Stainless Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI Water</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Methanol</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Isopropanol</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ethanol</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Acetonitrile</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Tetrahydrofuran</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>MEK</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Organic Acids - Dilute</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Non Organic Acids - Dilute</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Bases - Dilute</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Saline</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Bleach 12%</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Sodium Hydroxide 20%</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

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

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

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

<table>
<thead>
<tr>
<th>Sample Part ID</th>
<th>C07</th>
<th>2</th>
<th>24</th>
<th>FK</th>
<th>03</th>
<th>F</th>
<th>F</th>
<th>000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Series</td>
<td>Configuration</td>
<td>Coil Voltage</td>
<td>Elastomer</td>
<td>Orifice</td>
<td>Mounting Style</td>
<td>Electrical Interface</td>
<td>Custom</td>
</tr>
<tr>
<td>Options</td>
<td>C07: 7 mm Cartridge Valve</td>
<td>2: 2-Way</td>
<td>24: 24 VDC</td>
<td>EP: EPDM</td>
<td>03: 0.012 in (0.3 mm)</td>
<td>F: Face Seal</td>
<td>F: 3.2 in (80 mm) flying lead</td>
<td>000: Standard</td>
</tr>
</tbody>
</table>

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.

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