Miniature Solenoid Valves

C15 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.

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.

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

Product Specifications

Mechanical

<table>
<thead>
<tr>
<th>Valve Type:</th>
<th>Solenoid Cartridge Valve</th>
<th>2-Way Normally Closed (NC)</th>
<th>3-Way Normally Closed (NC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media: Gases and Liquids*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See details in liquid datasheet)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Environment:</td>
<td>32°F to 122°F (0°C to 50°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Environment:</td>
<td>-40°F to 158°F (-40°C to 70°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions:</td>
<td>- Diameter: 0.59 in (15 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Porting:</td>
<td>- Cartridge Seal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight:</td>
<td>0.78 oz (22 g)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Internal Volume: | 2-Way: 391 µL | 3-Way: 461 µL |

<table>
<thead>
<tr>
<th>Orifice</th>
<th>0.020 in (0.5 mm)</th>
<th>0.040 in (1.0 mm)</th>
<th>0.060 in (1.5 mm)</th>
<th>0.080 in (2.0 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure (Psi)</td>
<td>145</td>
<td>145</td>
<td>116</td>
<td>102</td>
</tr>
<tr>
<td>Pressure (Bar)</td>
<td>10</td>
<td>10</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Proof Pressure</td>
<td>120% of Rated Maximum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow (SLM [l/min])</td>
<td>18</td>
<td>18</td>
<td>55</td>
<td>43</td>
</tr>
</tbody>
</table>

Electrical

| Voltage (VDC): | 12 and 24 VDC ± 5% |
|               | (Other voltages available on request.) |
| 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    |                           |

Typical Applications

- 10 ms Maximum, Cycling
- 120% of Rated Maximum Pressure
- Recommended Filtration: 10 µm
- 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

All Models

Flow Curve

0.020 in (0.5 mm) Orifice

Flow Curve

0.02 in (0.5 mm) Orifice
C15 Miniature Cartridge Valve

Flow Curve

**0.040 in (1.0 mm) Orifice**

![Graph showing flow vs. pressure for 0.040 in (1.0 mm) orifice.]

- Flow [s.lpm] vs. Pressure [bar]
- Flow increases linearly with pressure.

**0.060 in (1.5 mm) Orifice**

![Graph showing flow vs. pressure for 0.060 in (1.5 mm) orifice.]

- Flow [s.lpm] vs. Pressure [psi]
- Flow increases linearly with pressure.
C15 Miniature Cartridge Valve

Flow Curve

0.080 in (2.0 mm) Orifice

Electrical Interface

Wire Leads
Standard: 3.2 in (80 mm) Wire Leads, stripped at end
C15 Miniature Cartridge Valve

Electrical Requirements

<table>
<thead>
<tr>
<th>Orifice</th>
<th>0.020 in (0.5 mm)</th>
<th>0.040 in (1.0 mm)</th>
<th>0.060 in (1.5 mm)</th>
<th>0.080 in (2.0 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Type</td>
<td>2-Way</td>
<td>3-Way</td>
<td>2-Way</td>
<td>3-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>1.1</td>
<td>1.1</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Resistance (Ohm)**</td>
<td>132</td>
<td>525</td>
<td>85</td>
<td>361</td>
</tr>
</tbody>
</table>

* ± 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

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.

Recommended Valve Mounting

C15 Evaluation Manifold Dimensions and Design

UNITS

Parker
**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.

![Voltage vs Time Graph](image)

**C15 Hit and Hold Specification**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hit Voltage Level</td>
<td>Rated Voltage</td>
</tr>
<tr>
<td>Hold Voltage Level</td>
<td>50% of Rated Voltage</td>
</tr>
<tr>
<td>Minimum Hit Time</td>
<td>100 ms</td>
</tr>
<tr>
<td>Maximum Hit Time</td>
<td>N/A</td>
</tr>
<tr>
<td>PWM Frequency (Minimum)</td>
<td>1 kHz</td>
</tr>
<tr>
<td>Hold Nominal Duty Cycle</td>
<td>50%</td>
</tr>
</tbody>
</table>

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
**Miniature Solenoid Valves**

**Ordering Information**

<table>
<thead>
<tr>
<th>Description</th>
<th>Sample Part ID</th>
<th>C15 Options</th>
<th>Configuration</th>
<th>Coil Voltage</th>
<th>Elastomer</th>
<th>Orifice</th>
<th>Mounting Style</th>
<th>Electrical Interface</th>
<th>Custom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td></td>
<td>C15: 15 mm Cartridge Valve</td>
<td>2: 2-Way</td>
<td>12: 12 VDC</td>
<td>EP: EPDM</td>
<td>0.000 in (0.5 mm)</td>
<td>F: Face Seal</td>
<td>F: 3.2 in (80 mm) flying lead</td>
<td>000: Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3: 3-Way</td>
<td>24: 24 VDC</td>
<td>FK: FKM</td>
<td>0.040 in (1.0 mm)</td>
<td>10: 0.060 in (1.5 mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15: 0.080 in (2.0 mm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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.

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