R6 Valve
6.4 mm Miniature Diaphragm Isolation Valve

The R6 Miniature Diaphragm Isolation Valve delivers liquid dispense performance in a very small package. At just 6.4 mm wide, it can be easily mounted over microplates improving performance and saving space. When mounted on a manifold, the R6’s ultra small footprint enables smaller and more efficient fluidic circuits by taking less space and shortening fluid channels. The R6 provides solutions to today’s demanding Analytical, Clinical, and Agent detection applications.

Features
- 8.1 µL internal volume enables low carryover designs and reduces use of precious reagents
- Low power required with 2 Watts max enables portable and low power control
- Slim design allows for mounting as close as 7 mm centers
- Small enough to be mounted at point of dispense eliminating transfer lines
- 100% tested leak rate ensures a tight seal on every valve
- Optional ported bases for stand-alone operation or testing
- RoHS and Reach compliant

Product Specifications

Physical Properties

<table>
<thead>
<tr>
<th>Valve Type:</th>
<th>Diaphragm Isolation Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Configuration:</td>
<td>2-Way Normally Closed</td>
</tr>
<tr>
<td>Media:</td>
<td>Liquids</td>
</tr>
<tr>
<td>Operating Environment:</td>
<td>50 to 104°F (10 to 50°C)</td>
</tr>
<tr>
<td>Storage Temperature:</td>
<td>14 to 158°F (-10 to 70°C)</td>
</tr>
<tr>
<td>Dimensions:</td>
<td>Width: 0.26” (6.4 mm)</td>
</tr>
<tr>
<td></td>
<td>Depth: 0.87” (22 mm)</td>
</tr>
<tr>
<td></td>
<td>Length: 1.28” (32.5 mm)</td>
</tr>
<tr>
<td>Weight:</td>
<td>Face Seal Version: 0.31 oz. (8.8g)</td>
</tr>
<tr>
<td></td>
<td>1/4-28 Version 0.65 oz (18.3g)</td>
</tr>
<tr>
<td>Porting:</td>
<td>Face seal, 1/4-28 sub-base</td>
</tr>
<tr>
<td></td>
<td>Internal Volume (µL):</td>
</tr>
<tr>
<td></td>
<td>Face Seal 8.1</td>
</tr>
<tr>
<td></td>
<td>1/4-28 34.3</td>
</tr>
</tbody>
</table>

Electrical

| Voltage (VDC):   | 12 and 24 VDC ± 1V |
| Power (Watts):   | 2.0 Max |
| Current (mA):    | 12V 150 80 |
|                  | 24V 80 |
| Resistance (Ohm): | 80.4 305.6 |
|                  | (Ω±10% @ 68°F, 20°C) |
| Connections:     | 5.9” (150 mm) Flying Lead |

Wetted Materials

Seals: FFKM
Body: PEEK (polyetherketone)
Manifold: PEEK (polyetherketone)

Performance Characteristics

Orifice Diameters: 0.031” (0.8 mm)
Operating Pressure:
- 0-14.5 psi (1.0 Bar) Inlet
- 0-7.25 psi (0.5 Bar) Outlet
Proof Pressure: 30 psig (2.1 bar)
Leak Rate: Bubble Tight
Response Time: <25 mSec
Recommended Filtration: 40µM
Reliability: 10 Million Cycles
Regulatory:
- Compliant with RoHS directive (2002/95/EC) and REACH EC 1907/2006
**Miniature Liquid Control Valves**

**R6** Miniature Diaphragm Isolation Valve

**Typical Flow Curve**

[Graph showing flow rate vs. pressure for all models tested with water at 24° C]

**Electrical Interface**

(12V – Black Wires / 24V – Blue Wires)

*Wire Leads*

5.9” [150 mm]

*Custom lead length available.

**Liquid Interface**

Face Seal

[Manifold Mount]
R6 Miniature Diaphragm Isolation Valve

Mechanical Integration

Dimensions

R6 Cross Section
Wetted Materials

COIL ASSEMBLY

PORT 1 (UNDER SEAT)

DIAPHRAGM: (FFKM)

PORT 2 (OVER SEAT)

BASE: (PEEK)

GASKET (FFKM)

R6 1/4-28 CROSS-SECTION

MANIFOLD: (PEEK)

PORT 1 (UNDER SEAT)

PORT 2 (OVER SEAT)
R6 Miniature Diaphragm Isolation Valve

Mechanical Integration

Dimensions

R6

2-Way Face Seal

2-WAY 1/4-28

UNITS

IN. [mm.]

- .87 [22.0]
- .14 [3.5]
- 1.28 [32.5]
- .08 [2.0]

2X Ø.087 [Ø2.20]
THRU HOLES

PORT 1
(UNDER SEAT)

PORT 2
(OVER SEAT)

.028 [0.70]

.24 [6.0]

.24 [6.1]

.46 [11.7]

.22 [5.6]

.67 [17.0]

.028 [0.70]

.028 [0.70]

.047 [1.20]

.047 [1.20]

.390 [9.91]

.625 [15.88]

.390 [9.91]

.028 [0.71]

2X Ø.102 +.006
[-.000] THRU

Ø.219 ≈ .125 ± .002 [Ø5.56 ± 3.18 ± .05]

.875 [22.23]

.1.91 [48.4]

.390 [9.91]

2X TAP DRILL [Ø.213 ± .007]

TAP #1/4-28 UNF

.320 [Ø5.41 ± .18]

.325 [5.97] MIN.

PORT 1 (UNDER SEAT)

PORT 2 (OVER SEAT)

UNITS

IN. [mm.]
**R6** Miniature Diaphragm Isolation Valve

**Installation and Use**

**R6 Manifold Interface**

Reccomended R6 Valve Mounting

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**ANSI Symbols**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Pressure Under Seat</th>
<th>Pressure Over Seat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PORT 1 (UNDER SEAT)</td>
<td>PORT 2 (OVER SEAT)</td>
</tr>
<tr>
<td></td>
<td>&quot;DE-ENERGIZED&quot;</td>
<td>&quot;ENERGIZED&quot;</td>
</tr>
</tbody>
</table>

2-WAY 1/4-28

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**Pressure**

2X FOR #2-56 X 5/8" LG. OR M2x0.4 X 16 mm LG. SCREW (.155 [3.94] MIN. DEPTH)

---

UNITS

IN. [mm.]
R6 Miniature Diaphragm Isolation Valve

Hit and Hold Specifications

Hit and Hold is a method for driving valves that can be used to reduce power consumption and heat generation while maintaining valve performance specifications. The valve is "hit" with the full rated voltage for some time period to open it (T1 in the graph) and then "held" open with substantially reduced voltage until the desired pulse length is reached (T2 in the graph). The following table shows the possible holding voltages and power consumption for our standard 12 and 24 VDC solenoids.

<table>
<thead>
<tr>
<th>Rated Voltage (VDC)</th>
<th>R6 Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hold Voltage</td>
</tr>
<tr>
<td>24</td>
<td>12VDC</td>
</tr>
<tr>
<td>12</td>
<td>6VDC</td>
</tr>
</tbody>
</table>

*Hold Voltage Graph*
## Chemical Compatibility Chart*

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Diaphragm</th>
<th>Other Wetted Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI Water</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Methanol</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Isopropanol</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ethanol</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Acetonitrile</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Tetrahydrofuran</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Toluene</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Organic Acids - Dilute</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Non Organic Acids - Dilute</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bases - Dilute</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Saline</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bleach 12%</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Sodium Hydroxide 20%</td>
<td>1</td>
<td>1</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 a complete list.*
R6 Miniature Diaphragm Isolation Valve

Typical Flow Diagram

9 mm on center dispense application

- Compact size of the R6 valve enables it to be mounted directly at the point of dispense eliminating transfer lines.
- Can be mounted on 9 mm centers for 96 well microplate use or with a dual sided manifold design can be mounted on 4.5 mm centers over 384 well microplates.
- Parker can offer complete fluidic solutions integrating Parker tubing, fittings, filtration, Pneumatic and liquid pumps, pneumatic and liquid valves and precision motion systems.
R6  Miniature Diaphragm Isolation Valve

Comparison of Footprint of 4 R6 Valves vs. Typical 10 mm Rocker Valve

FOOTPRINT OF 4 R6 VALVES

FOOTPRINT OF 4 10mm VALVES

OVER 59% SPACE SAVINGS

Ordering Information

<table>
<thead>
<tr>
<th>Orifice Size</th>
<th>Valve Type</th>
<th>Seal Material</th>
<th>Pressure</th>
<th>Voltage</th>
<th>Electrical Connection</th>
<th>Porting</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.040&quot;(1.02mm)</td>
<td>2- Way NC</td>
<td>FFKM</td>
<td>0-14.5 PSI (1.0 bar)</td>
<td>12V</td>
<td>Flying leads</td>
<td>Manifold Mount</td>
<td>R6-212FF30FF-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1/4 - 28</td>
<td>R6-212FF304F-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24V</td>
<td>Flying leads</td>
<td>Manifold Mount</td>
<td>R6-224FF30FF-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1/4 - 28</td>
<td>R6-224FF304F-000</td>
</tr>
</tbody>
</table>

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 (or go to www.parker.com/precisionfluidics/r6) to configure your R6 Miniature Diaphragm Isolation Valve. For more detailed information, visit us on the Web, or call 603-595-1500.