Partek
PFA/PTFE Valves
Catalog 4182/USA

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

ENGINEERING YOUR SUCCESS.
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Overview
Partek produces products that are made from only the finest Fluoropolymers available. These Fluoropolymers are resistant to numerous chemicals and solvents. This information provides only a brief technical overview. For more comprehensive technical and chemical compatibility information, please ask for Technical Bulletin 0002-T1/USA.

Fluorinated Polymers

**Chemical Properties**
- Resistivity to corrosive agents
- Non-solubility
- Long term weatherability
- Non-adhesiveness
- Nonflammability

**Electrical Properties**
- Low dielectric constant
- Low dissipation factor
- High arc resistance
- High surface resistance
- High volume resistivity

**Mechanical Properties**
- Flexibility at low temperatures
- Low coefficient of friction
- Stability at high temperatures

PTFE is a fluorocarbon resin that is isostatically compression molded into various shapes and configurations. It is chemically resistant to all chemicals and solvents with the exception of some molten alkali metals, molten sodium hydroxide, elemental fluorine and certain fluorinating agents. At Partek we use PTFE for machining the bodies and components of various valves and manifolds. It offers chemical resistance and stability at high temperatures.

Modified PTFE material is used primarily for diaphragms and bellows in our products. This material has the same processing and chemically resistant characteristics as the standard product but offers superior cycle life and integrity in diaphragm products.

PFA is a copolymer of tetrafluoroethylene and perfluoroalkyl vinyl ether. The resultant polymer contains the carbon-fluorine backbone chain typical of PTFE, but unlike PTFE, does not require special fabricating techniques. PFA pellets have good melt flow characteristics that allow for processing via extrusion, compression, blow, transfer and injection molding methods. It has outstanding chemical and solvent resistant characteristics over a temperature range even greater than PTFE. PFA is offered in various grades of purity and cleanliness making it the material of choice for the semiconductor market.

**C_v and K_v Formulas**

\[
Q = C_v \sqrt{\frac{\Delta P}{SG}} \quad Q = \text{Flow (GPM)} \\
\Delta P = \text{Pressure Drop (PSIG)} \\
SG = \text{Specific Gravity}
\]

\[
Q = K_v \sqrt{\frac{\Delta P}{Y}} \quad Q = \text{Flow (LPM)} \\
\Delta P = \text{Pressure Drop (BAR)} \\
Y = \text{Specific Gravity (kg/cm}^3)\]

\[1 \ K_v = 14.26 \ C_v\]

“C_v” flow factor is the number of gallons of fluid that pass through a given orifice area in one minute, at a pressure drop of 1 PSIG.

“K_v” flow factor is the number of liters of fluid that pass through a given orifice area in one minute, at a pressure drop of 1 bar.

For operation at temperatures above ambient conditions, please refer to the chart above for reduced pressure ratings.
Product Overview
The MV-1 PTFE Stop Cock Valve is designed for use in high purity semiconductor fluid applications, and is also ideally suited for ultra-pure water and aggressive chemicals. A precision-machined PTFE body with a straight through flowpath is combined with a PTFE full flow orifice stem for maximum flow, minimum pressure drop and 1/4” turn operation. The MV-1 is offered for inline and panel mounted applications.

Features
- Full flow orifice.
- The precision machined stem and body provide tight shut off and 1/4 turn operation.
- Parofluor O-Ring stem seals.

Benefits
- Maximum flow at the desired size.
- Minimum pressure drop. High cycle life.
- Positive body to stem seal.

Specifications
Materials of Construction
Wetted: PTFE, Parker Parofluor™
Non-wetted: HDPE, PFA, PVC, PVDF, Titanate

Pressure Ranges
0 to 60 PSIG (4.1 bar)
Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: -60° F to 212° F (-51° to 100° C)
Fluid: -60° F to 400° F (-51° to 204° C)
### MV-1 Manual Stop Cock Valve

#### Pressurze Drop vs. Flow Rate

<table>
<thead>
<tr>
<th>Flow Rate (lpm)</th>
<th>DELTA-P (psi)</th>
<th>DELTA-P (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.6</td>
<td>1.72</td>
<td>.125 Orifice</td>
</tr>
<tr>
<td>15.1</td>
<td>1.38</td>
<td>.188 Orifice</td>
</tr>
<tr>
<td>22.7</td>
<td>1.00</td>
<td>.250 Orifice</td>
</tr>
<tr>
<td>30.3</td>
<td>.69</td>
<td>.313 Orifice</td>
</tr>
<tr>
<td>37.9</td>
<td>.34</td>
<td>.375 Orifice</td>
</tr>
<tr>
<td>45.4</td>
<td>.15</td>
<td>.438 Orifice</td>
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</tbody>
</table>

#### Dimensions in [mm]

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Orifice</th>
<th>Flow Config.</th>
<th>Port Config.</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV-1-6618</td>
<td>3.00</td>
<td>42.8</td>
<td>.375</td>
<td>2 WAY</td>
<td>1/2” Flare</td>
<td>.224 [.5690]</td>
</tr>
<tr>
<td>MV-1-6628</td>
<td>3.00</td>
<td>42.8</td>
<td>.375</td>
<td>3 WAY L</td>
<td>1/2” Flare</td>
<td>.224 [.5690]</td>
</tr>
<tr>
<td>MV-1-6638</td>
<td>3.00</td>
<td>42.8</td>
<td>.375</td>
<td>3 WAY T</td>
<td>1/2” Flare</td>
<td>.224 [.5690]</td>
</tr>
</tbody>
</table>

Parflare model numbers are supplied with PVDF nuts. For PFA nuts add -T to model number.

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Parker Hannifin Corporation
Partek Operation
Tucson, AZ

5
Product Overview
The MV-6 PTFE Ball Valves are designed for use in high purity semiconductor applications, and are also ideally suited for use in ultra-pure water and aggressive chemicals. All sizes have wetted parts made entirely of PTFE. All valves are designed full port for minimal flow restrictions and are operated 1/4 turn with minimal torque.

Features
Floating ball design without o-rings ensures bubble tight sealing at high pressure.

Full port design; 1/4 turn operation with low torque tee handle.

Panel mounting is an option on all sizes.

Benefits
Bidirectional flow to 120 psi liquid or gas; High cycle life.

Ideal for quick shut-off in contamination-free applications.

Ideal for process instrumentation applications.

Specifications
Materials of Construction
Wetted: PTFE
Non-wetted: HDPE, PVDF and PVC

Pressure Ranges
25” HG vacuum (846 mbar) to 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: -60° - 176° F (-51° - 80° C)
Fluid: -60° - 400° F (-51° - 204° C)
MV-6 Manual Ball Valve

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Config.</th>
<th>Port Config.</th>
<th>Dimensions in [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV-6-1414-0</td>
<td>1.88</td>
<td>26.81</td>
<td>ON/OFF</td>
<td>1/4&quot; FNPT</td>
<td>A: 1.73 [43.94] B: .66 [16.76] C: 2.91 [73.91] Ø: 1.98 [50.29] E: 1.31 [33.27]</td>
</tr>
<tr>
<td>MV-6-1818-0</td>
<td>6.59</td>
<td>93.97</td>
<td>ON/OFF</td>
<td>1/2&quot; FNPT</td>
<td>A: 2.24 [56.89] B: .89 [22.60] C: 3.72 [94.49] Ø: 2.72 [69.08] E: 2.00 [50.80]</td>
</tr>
<tr>
<td>MV-6-116116-0</td>
<td>28.06</td>
<td>400.14</td>
<td>ON/OFF</td>
<td>1&quot; FNPT</td>
<td>A: 3.18 [80.77] B: 1.39 [35.30] C: 5.00 [127.00] Ø: 4.40 [111.76] E: 2.53 [64.26]</td>
</tr>
</tbody>
</table>

PRESSURE DROP VS. FLOW RATE

FLOW RATE (lpm) | DELTA-P (psi) | DELTA-P (bar)
---|---|---
38 | 3 | 21
76 | 5 | 35
113 | 6 | 41
151 | 7 | 41
189 | 8 | 41
227 | 9 | 41

FLOW RATE (gpm) | DELTA-P (psi) | DELTA-P (bar)
---|---|---
0 | .07 | 0
10 | 1 | .71
20 | 2 | 1.42
30 | 3 | 2.13
40 | 4 | 2.84
50 | 5 | 3.55
60 | 6 | 4.26
**Product Overview**
The MV-8 PTFE Sampling Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water or aggressive chemicals. The design utilizes a machined PTFE body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The valve incorporates a full flow through port with a low dead volume down leg. The purge port option makes this the valve of choice for valve manifold boxes and distribution systems.

**Features**
- One piece precision machined diaphragm manufactured from the latest technology modified PTFE, provides over five times the flexural life as compared to conventional PTFE.
- Full flow through port.
- Purge port option.

**Benefits**
- Higher cycle life resulting in less downtime and lower replacement costs.
- Reduced pressure drop.
- Allows system maintenance downstream of valve without disrupting main flow.

**Specifications**

**Materials of Construction**
- Wetted: PTFE, Modified PTFE
- Non-wetted: PVDF

**Pressure Ranges**
- 27” HG vacuum (913 mbar) to 120 PSIG (8.3 bar)
- Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

**Temperature Ranges**
- Ambient: 0° - 212° F (17° - 100° C)
- Fluid: 0° - 400° F (17° - 204° C)
**MV-8 Manual Sampling Valve**

**Parflare model numbers are supplied with PVDF nuts. For PFA nuts add -T to model number.**
Product Overview
The MV-10 PFA 2 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/4” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.

PVDF coated stainless steel spring.
Quarter turn operation with removable handle for tamper resistance.

Reduces effects of corrosive environments.
Eliminates need for separate lockout device.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PFA, PVDF, 18-8 SS, Viton seals, PTFE coated SS springs

Pressure Ranges
Forward: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Backward: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (17° - 66° C)
Fluid: 0° - 266° F (17° - 130° C)
**MV-10 1/4” Manual 2 Way Valve**

**BRACKETED DIMENSIONS ARE IN mm.**

Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
<th>Mounting Configuration-XX (Depicted Above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV-10-1044-XX</td>
<td>.60</td>
<td>8.6</td>
<td>ON/OFF</td>
<td>1/4&quot; FNPT</td>
<td>00 = Screw</td>
</tr>
<tr>
<td>MV-10-2034-XX</td>
<td>.24</td>
<td>3.4</td>
<td></td>
<td>1/4&quot; Pargrip</td>
<td>01 = Screw/Stud .60 Square</td>
</tr>
<tr>
<td>MV-10-2046-XX</td>
<td>.62</td>
<td>8.8</td>
<td></td>
<td>3/8&quot; Pargrip</td>
<td>02 = Screw/Stud Ø1.25 Bolt Circle</td>
</tr>
<tr>
<td>MV-10-6024-XX</td>
<td>.20</td>
<td>2.8</td>
<td></td>
<td>1/4&quot; Parflare</td>
<td>10 = PVDF Screw Covers</td>
</tr>
<tr>
<td>MV-10-6046-XX</td>
<td>.62</td>
<td>8.8</td>
<td></td>
<td>3/8&quot; Parflare</td>
<td></td>
</tr>
</tbody>
</table>

Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

**PRESSURE DROP VS. FLOW RATE**

**FLOW RATE (lpm)**

<table>
<thead>
<tr>
<th>DELTA-P (psi)</th>
<th>0.5</th>
<th>1.0</th>
<th>1.5</th>
<th>2.0</th>
<th>2.5</th>
<th>3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW RATE</td>
<td>1.0</td>
<td>3.8</td>
<td>5.7</td>
<td>7.6</td>
<td>9.5</td>
<td>11.3</td>
</tr>
</tbody>
</table>

**DELTA-P (bar)**

<table>
<thead>
<tr>
<th>0.5</th>
<th>1.38</th>
<th>1.03</th>
<th>.69</th>
<th>.34</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Parflare &amp; Pargrip</td>
<td>1/4&quot; Pargrip</td>
<td>1/4&quot; FNPT</td>
<td>3/8&quot; Parflare &amp; Pargrip</td>
<td></td>
</tr>
</tbody>
</table>

**FLOW RATE (gpm)**

<table>
<thead>
<tr>
<th>0.5</th>
<th>1.0</th>
<th>1.5</th>
<th>2.0</th>
<th>2.5</th>
<th>3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>DELTA-P (psi)</td>
<td>.50</td>
<td>.76</td>
<td>1.53</td>
<td>2X R.08 [2.03]</td>
<td>2X X.19 [4.63]</td>
</tr>
</tbody>
</table>

**2X X.15 [3.81]**

**2X X.19 [4.63]**

**SLOT TYP.**

**Parker Hannifin Corporation**

Partek Operation

Tucson, AZ
Product Overview
The MV-10 PFA 3 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/4" orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

PVDF coated stainless steel spring.
Quarter turn operation with removable handle for tamper resistance.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.

Reduces effects of corrosive environments.
Eliminates need for separate lockout device.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PFA, PVDF, 18-8 SS, Viton seals, PTFE coated SS springs

Pressure Ranges
Forward: 27" HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Backward: 27" HG vacuum (913 mbar) to 80 PSIG (5.5 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (17° - 66° C)
Fluid: 0° - 266° F (17° - 130° C)
## MV-10 1/4” Manual 3 Way Valve

### MOUNTING CONFIGURATIONS (MV-10-XXXX-XX)

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
<th>Mounting Configuration-XX (Depicted Above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV-10-1344-XX</td>
<td>.60</td>
<td>8.6</td>
<td>3 WAY</td>
<td>1/4&quot; FNPT</td>
<td>00 = Screw</td>
</tr>
<tr>
<td>MV-10-2334-XX</td>
<td>.24</td>
<td>3.4</td>
<td></td>
<td>1/4&quot; Pargrip</td>
<td>01 = Screw/Stud .80 Square</td>
</tr>
<tr>
<td>MV-10-2346-XX</td>
<td>.62</td>
<td>8.8</td>
<td></td>
<td>3/8&quot; Pargrip</td>
<td>02 = Screw/Stud Ø1.25 Bolt Circle</td>
</tr>
<tr>
<td>MV-10-6324-XX</td>
<td>.20</td>
<td>2.8</td>
<td></td>
<td>1/4&quot; Pargrip</td>
<td>10 = PVDF Screw Covers</td>
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<tr>
<td>MV-10-6346-XX</td>
<td>.62</td>
<td>8.8</td>
<td></td>
<td>3/8&quot; Pargrip</td>
<td></td>
</tr>
</tbody>
</table>

Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

### PRESSURE DROP VS. FLOW RATE

**FLOW RATE (lpm)**

<table>
<thead>
<tr>
<th>FLOW RATE (lpm)</th>
<th>DELTA-P (psi)</th>
<th>DELTA-P (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9</td>
<td>25</td>
<td>1.72</td>
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<tr>
<td>3.8</td>
<td>20</td>
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<td>9.5</td>
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<td>.34</td>
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<td>11.3</td>
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**FLOW RATE (gpm)**

<table>
<thead>
<tr>
<th>FLOW RATE (gpm)</th>
<th>DELTA-P (psi)</th>
<th>DELTA-P (bar)</th>
</tr>
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<tbody>
<tr>
<td>0.5</td>
<td>20</td>
<td>1.38</td>
</tr>
<tr>
<td>1.0</td>
<td>15</td>
<td>1.03</td>
</tr>
<tr>
<td>1.5</td>
<td>10</td>
<td>.69</td>
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<td>2.5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>1</td>
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</tr>
</tbody>
</table>

**SLOT TYP.**

- 1/4" Parflare
- 1/4" Pargrip
- 3/8" Parflare & Pargrip

### Accessories

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>SB-10</td>
</tr>
</tbody>
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Parker Hannifin Corporation
Partek Operation
Tucson, AZ
**Product Overview**
The MV-11 PFA 2 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/2” orifice provides maximum flow capability in a compact package.

**Features**
- One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE.
- Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.
- PVDF coated stainless steel spring.
- Submergible option isolates all valve components from the external environment.

**Benefits**
- High cycle life.
- Lower replacement costs.
- Less downtime.
- Reduces effects of corrosive environments.
- Valve remains functional while operating in wet or gaseous corrosive environments.

**Specifications**

**Materials of Construction**
- Wetted: PFA, Modified PTFE
- Non-wetted: PFA, PVDF, Viton seals, PTFE coated SS springs

**Pressure Ranges**
- Forward: 27" HG vacuum (913 mbar) to 100 PSIG (7 bar)
- Backward: 27" HG vacuum (913 mbar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

**Temperature Ranges**
- Ambient: 0° - 150° F (17° - 66° C)
- Fluid: 0° - 266° F (17° - 130° C)
BRACKETED DIMENSIONS ARE IN mm.

Test Port Connection, 1/4-28 UNF

MV-11 1/2” Manual 2 Way Valve

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV-11-001</td>
<td>2.3</td>
<td>32.8</td>
<td>ON/OFF</td>
<td>1/2” Parflare</td>
</tr>
<tr>
<td>MV-11-002</td>
<td>3.7</td>
<td>52.8</td>
<td></td>
<td>3/4” Parflare</td>
</tr>
<tr>
<td>MV-11-003</td>
<td>3.7</td>
<td>52.8</td>
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<td>1/2” Parbond</td>
</tr>
<tr>
<td>MV-11-004</td>
<td>3.7</td>
<td>52.8</td>
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<td>3/4” Parbond</td>
</tr>
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<td>MV-11-005</td>
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<td>52.8</td>
<td></td>
<td>1/2” FNPT</td>
</tr>
</tbody>
</table>

Pressure Drop vs. Flow Rate

Parflare

All Other Configurations
Product Overview
The MV-11 PFA 3 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. One piece machined modified PTFE diaphragms are also utilized for excellent flexibility and life. A full 1/2” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

PVDF coated stainless steel spring.

Submergible option isolates all valve components from the external environment.

Benefits
High cycle life.

Lower replacement costs.

Less downtime.

Reduces effects of corrosive environments.

Valve remains functional while operating in wet or gaseous corrosive environments.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PFA, PVDF, Viton seals, PTFE coated SS springs

Pressure Ranges
COM to NO: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
COM to NC: 27” HG vacuum (913 mbar) to 25 PSIG (1.7 bar) minimum
NC to COM: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar) with 50 PSIG (3.4 bar) maximum back pressure

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (17° - 66° C)
Fluid: 0° - 266° F (17° - 130° C)
TEST PORT CONNECTIONS, 1/4-28 UNF

MOUNTING DETAIL

PBH08543 1/2 PARFLARE

MV-11 1/2” Manual 3 Way Valve

Parfl are models are supplied with PVDF nuts. For PFA nuts add -T to model number.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
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<tbody>
<tr>
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<td>MV-11-022</td>
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<td>MV-11-023</td>
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<td>1/2” Parbond</td>
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<td>MV-11-024</td>
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<td>3 WAY</td>
<td>3/4” Parbond</td>
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<td>MV-11-025</td>
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<td>3 WAY</td>
<td>1/2” FNPT</td>
</tr>
</tbody>
</table>

Parflake models are supplied with PVDF nuts. For PFA nuts add -T to model number.
Product Overview
The MV-11 PFA Adjustable Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. Multi-turn capability allows precise flow adjustment. A full 1/2” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove diaphragm to body seal assures leak free operation.

PVDF coated stainless steel spring.
Multi-turn operation.
Removable handle.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.
Reduces effects of corrosive environments.
Precise flow adjustment.
Eliminates need for separate lockout device.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PFA, PVDF, Viton seals, PTFE coated SS springs

Pressure Ranges
Forward: 27” HG vacuum (913 mbar) to 100 PSIG (7 bar)
Backward: 27” HG vacuum (913 mbar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (17° - 66° C)
Fluid: 0° - 266° F (17° - 130° C)
MV-11 1/2” Manual 2 Way Adjustable Valve

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
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<th>Port Configuration</th>
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<tr>
<td>MV-11-202</td>
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<td>3/4” Parflare</td>
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<tr>
<td>MV-11-203</td>
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<td>1/2” Parbond</td>
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<tr>
<td>MV-11-204</td>
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<td>MV-11-205</td>
<td>3.7</td>
<td>52.8</td>
<td></td>
<td>1/2” FNPT</td>
</tr>
</tbody>
</table>

Pressure Drop vs. Flow Rate

Parflare vs. All Other Configurations
MV-12 1” Manual 2 Way Valve

Product Overview
The MV-12 PFA Diaphragm Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The valve requires three full turns from the fully closed to fully open position. A full 1” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.
PVDF coated stainless steel spring.
Submergible option isolates all valve components from the external environment.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.
Reduces effects of corrosive environments.
Valve remains functional while operating in wet or gaseous corrosive environments.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PFA, PVDF, Viton seals, PTFE coated SS springs

Pressure Ranges
Forward: 27” HG vacuum (913 mbar) to 100 PSIG (7 bar)
Backward: 27” HG vacuum (913 mbar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)
MV-12 1” Manual 2 Way Valve

**Part Number**  |  **Cv**  |  **Kv**  |  **Flow Configuration**  |  **Port Configuration**
---|---|---|---|---
MV-12-001  | 15.7  | 224.2  |  | 1” Parbond
MV-12-002  | 13.3  | 189.9  |  | 1” Parflare
MV-12-003  | 9.6  | 142.8  |  | 3/4” Parbond
MV-12-004  | 6.8  | 142.8  |  | 3/4” Parflare

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

**PRESSURE DROP VS. FLOW RATE**

![Graph showing pressure drop vs. flow rate for MV-12 1” Manual 2 Way Valve.](image)

- --- 3/4” Parflare
- --- 3/4” Parbond
- --- 1” Parflare
- --- 1” Parbond
Product Overview

The MV-13 PFA Needle Valve is designed for high purity or aggressive chemical and gas applications. The design utilizes a molded high purity PFA body and stem as the only wetted components. The stem sealing area is precision machined for smooth, consistent flow. A PTFE ferrule assures a leak tight seal between stem and body. A PFA stem stop prevents removal of stem from body during operation. The MV-13 is available in straight through and angle configurations, several orifice sizes, and numerous end configurations.

Features
One piece PFA stem/handle and bodies.

PFA stem stop.

Angle and straight through configurations, with numerous end configurations including Parflare available.

Benefits
High strength and corrosion resistance.

Safer operation.

Reduces connections, mounting space, and overall cost.

Specifications

Materials of Construction
Wetted: PFA, PTFE
Non-wetted: PFA, ETFE, PVDF

Pressure Ranges
27” HG vacuum (913 mbar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 212° F (17° - 100° C)
Fluid: 0° - 266° F (17° - 130° C)
### MV-13 Manual Needle Valve

**Bracketed dimensions are in mm.**

---

**Model Number** | **Orifice Size** | **Inlet / Outlet Port Configuration** | **Flow Configuration**
--- | --- | --- | ---
MV-13-100 | .063 | 1/8" Pargrip X 1/8" Pargrip | Straight
MV-13-104 | .063 | 1/4" Parflare X 1/4" Parflare
MV-13-105 | .063 | 1/4" MNPT X 1/4" Parflare
MV-13-120 | .125 | 1/4" Pargrip X 1/4" Pargrip
MV-13-125 | .125 | 1/2" Parflare X 1/2" Parflare
MV-13-126 | .125 | 1/8" FNPT X 1/8" FNPT
MV-13-163 | .188 | 3/8" Pargrip X 3/8" Pargrip
MV-13-166 | .188 | 1/2" Pargrip X 1/2" Pargrip
MV-13-170 | .188 | 1/4" FNPT X 1/4" FnPT
MV-13-222 | .125 | 1/4" Parflare X 1/4" Parflare
MV-13-223 | .125 | 1/4" FNPT X 1/4" FnPT

Parflare and Pargrip model numbers are supplied with PFA nuts.

---

**Cv / Kv vs. Turns**

- **.188 - All Configurations**
- **.125 - All But 1/4" Pargrip**
- **.125 - All Angle Configurations**
- **.125 - 1/4" Pargrip**
- **.063 - All But 1/8" Pargrip**
- **.063 - 1/8" Pargrip**
Product Overview
The MV-14 PFA 2 Way Stop Cock Valve is designed for use in high purity semiconductor applications. The design utilizes a molded high purity PFA body, and a machined PTFE stem. The press-fit stem assures a leak tight seal between it and the body during operation. Valve operates with a quick 90° turn operation and has a full 1/8” orifice.

Features
One piece precision machined stem and molded high purity PFA body.
All components made of chemical resistant materials.
Numerous end configurations, including Parflare available.

Benefits
Maintains system purity.
Suitable for use in corrosive environments.
Allows direct installation, minimizing additional connections, reducing cost.

Specifications

Materials of Construction
Wetted: PFA, PTFE
Non-wetted: PFA, PVDF

Pressure Ranges
0 to 60 PSIG (4.1 bar)
Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (17° - 66° C)
Fluid: 0° - 266° F (17° - 130° C)
### MV-14 Manual 2 Way Stop Cock Valve

#### Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Inlet Port</th>
<th>Outlet Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV-14-003</td>
<td>.27</td>
<td>3.85</td>
<td></td>
<td>1/4&quot; Pargrip</td>
<td>1/4&quot; Pargrip</td>
</tr>
<tr>
<td>MV-14-004</td>
<td>.27</td>
<td>3.85</td>
<td></td>
<td>1/4&quot; Pargrip</td>
<td>1/8&quot; MNPT</td>
</tr>
<tr>
<td>MV-14-005</td>
<td>.27</td>
<td>3.85</td>
<td></td>
<td>1/4&quot; Pargrip</td>
<td>1/4&quot; MNPT</td>
</tr>
<tr>
<td>MV-14-006</td>
<td>.27</td>
<td>3.85</td>
<td></td>
<td>1/4&quot; MNPT</td>
<td>1/4&quot; MNPT</td>
</tr>
<tr>
<td>MV-14-007</td>
<td>.27</td>
<td>3.85</td>
<td></td>
<td>1/4&quot; Parflare</td>
<td>1/4&quot; Parflare</td>
</tr>
<tr>
<td>MV-14-015</td>
<td>.27</td>
<td>3.85</td>
<td></td>
<td>1/4&quot; Parflare</td>
<td>1/4&quot; MNPT</td>
</tr>
<tr>
<td>MV-14-016</td>
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<td></td>
<td>1/4&quot; Parflare</td>
<td>1/4&quot; Redi-flare</td>
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<tr>
<td>MV-14-018</td>
<td>.27</td>
<td>3.85</td>
<td></td>
<td>1/8&quot; Pargrip</td>
<td>1/8&quot; Pargrip</td>
</tr>
</tbody>
</table>

---

**DELTA-P (psi)**

**FLOW RATE (lpm)**

**DELTA-P (bar)**

**FLOW RATE (gpm)**

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Parker Hannifin Corporation
Partek Operation
Tucson, AZ
MV-16 3/4” Manual PFA 2 Way Valve

Product Overview
The MV-16 PFA diaphragm valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The MV-16’s multi-turn capability allows precise flow adjustment. A full 3/4” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.

Halar coated stainless steel spring.

Reduces effects of corrosive environments.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

Pressure Ranges
0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)
MV-16 3/4" Manual PFA 2 Way Valve

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
<th>Dimension in [mm]</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV-16-0612</td>
<td>5.8</td>
<td>82.7</td>
<td>OFF</td>
<td>3/4&quot; Parflare</td>
<td>5.54 [140.72]</td>
<td></td>
</tr>
<tr>
<td>MV-16-0612-01</td>
<td>5.8</td>
<td>82.7</td>
<td></td>
<td>3/4&quot; Parflare Long</td>
<td>6.48 [164.59]</td>
<td></td>
</tr>
<tr>
<td>MV-16-0616</td>
<td>7.9</td>
<td>112.6</td>
<td></td>
<td>1&quot; Parflare*</td>
<td>9.12 [231.65]</td>
<td></td>
</tr>
<tr>
<td>MV-16-0712</td>
<td>7.9</td>
<td>112.6</td>
<td></td>
<td>3/4&quot; Parbond</td>
<td>5.90 [149.86]</td>
<td></td>
</tr>
</tbody>
</table>

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

*Ends are fused on.
Product Overview
The MV-16 PFA diaphragm valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The MV-16’s multi-turn capability allows precise flow adjustment. A full 3/4” orifice provides maximum flow capability in a compact package.

Features
- One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE.
- Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.
- Halar coated stainless steel spring.

Benefits
- High cycle life.
- Lower replacement costs.
- Less downtime.
- Reduces effects of corrosive environments.

Specifications
Materials of Construction
- Wetted: PFA, Modified PTFE
- Non-wetted: PVDF, Viton, PTFE coated SS spring

Pressure Ranges
0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.
Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
- Ambient: 0° - 150° F (-17° - 66° C)
- Fluid: 0° - 266° F (-17° - 130° C)
**MV-16 3/4” Manual PFA 3 Way Valve**

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

**CRACKING PRESSURE**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
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<th>Dimensions in [mm]</th>
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<tbody>
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<td>77.0</td>
<td>3 WAY</td>
<td>3/4” Parflare</td>
<td>5.54 [140.72]</td>
</tr>
<tr>
<td>MV-16-3612-01</td>
<td>5.4</td>
<td>77.0</td>
<td></td>
<td>3/4” Parflare Long</td>
<td>6.48 [164.59]</td>
</tr>
<tr>
<td>MV-16-3716</td>
<td>7.3</td>
<td>104.1</td>
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<td>1” Parflare*</td>
<td>9.12 [231.65]</td>
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<td>MV-16-4612</td>
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<td>3/4” Parflare</td>
<td>5.54 [140.72]</td>
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<td>MV-16-4612-01</td>
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<td>77.0</td>
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<td>3/4” Parflare Long</td>
<td>6.48 [164.59]</td>
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<tr>
<td>MV-16-4616</td>
<td>7.3</td>
<td>104.1</td>
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<td>1” Parflare*</td>
<td>9.12 [231.65]</td>
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<td>104.1</td>
<td></td>
<td>3/4” Parbond</td>
<td>5.90 [149.86]</td>
</tr>
</tbody>
</table>

**PRESSURE DROP VS. FLOW RATE**

- **SPECIFIED SEALING AREA**
- **PRESSURE TO INLET PORT (psi)**
- **PRESSURE TO OUTLET PORT (psi)**
- **DELTA-P (psi)**
- **DELTA-P (bar)**
- **FLOW RATE (lpm)**
- **FLOW RATE (gpm)**

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

*Ends are fused on.
MV-16 3/4” Manual PFA Sampling Valve

Product Overview
The MV-16 PFA sampling valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The MV-16’s multi-turn capability allows precise flow adjustment. The valve incorporates a full flow through port with a low dead volume down leg.

Features
- One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE.
- Halar coated stainless steel spring.
- Full flow through port.

Benefits
- High cycle life.
- Lower replacement costs.
- Less downtime.
- Reduces effects of corrosive environments.
- Reduced pressure drop.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

Pressure Ranges
0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)
MV-16 3/4” Manual PFA Sampling Valve

Parfl are models are supplied with PVDF nuts. For PFA nuts add -T to model number.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Through Port</th>
<th>Sample Port</th>
<th>Through Port</th>
<th>Sample Port</th>
<th>Dimensions in [mm]</th>
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<td></td>
<td>Cv</td>
<td>Kv</td>
<td>Cv</td>
<td>Kv</td>
<td>A</td>
</tr>
<tr>
<td>MV-16-5612-608</td>
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<td>1/2” Parflare</td>
</tr>
<tr>
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<td>185.4</td>
<td>4.6</td>
<td>65.6</td>
<td>3/4” Parflare</td>
</tr>
<tr>
<td>MV-16-5612-712</td>
<td>13.0</td>
<td>185.4</td>
<td>6.9</td>
<td>98.7</td>
<td>3/4” Parflare</td>
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<tr>
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<td>359.92</td>
<td>2.3</td>
<td>32.8</td>
<td>3/4” Parflare</td>
</tr>
<tr>
<td>MV-16-5712-612</td>
<td>25.2</td>
<td>359.92</td>
<td>4.6</td>
<td>65.6</td>
<td>3/4” Parflare</td>
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<tr>
<td>MV-16-5712-712</td>
<td>25.2</td>
<td>359.92</td>
<td>6.9</td>
<td>98.7</td>
<td>3/4” Parflare</td>
</tr>
</tbody>
</table>

**CRACKING PRESSURE**

- PRESSURE TO THROUGH PORT (bar)
- PRESSURE TO SAMPLE PORT (psi)
- SPECIFIED SEALING AREA

Parker Hannifin Corporation
Partek Operation
Tucson, AZ

31
MV-20 1/4” - 1” Manual PTFE Slurry Valve

Product Overview
The MV-20 slurry valve is designed for use slurry applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a machined PTFE body with precision machined seat and diaphragm sealing areas. The valve is offered in 3 orifice sizes (1/4”, 1/2” and 1”) and port sizes ranging from 1/4” to 1 1/4”.

Features
- Fully swept open bowl diaphragm seat area.
- Self draining design.
- High load point seat seal.
- Angled and rounded internal flow path.
- One piece precision machined diaphragm manufactured from modified PTFE.
- Evenly distributed seat sealing forces.

Benefits
- Minimizes fluid shear and smooth flow transition.
- Minimizes area for entrapment and stagnation of media.
- Improves sealing mechanism for aggressive chemicals, deionized water and abrasive slurry media.
- Minimizes particle contribution of valve.
- Provides faster purging and cleaning of valve.
- Less pressure drop allows for lower pressure requirements upstream.
- Improves fluid flow dynamics.
- Improves cycle life, less shear than standard PTFE material, lower replacement costs, less downtime.
- Minimized diaphragm and valve seat strain.
- Stabilizes valve back pressure capability.
- Minimizes potential for permeation while maximizing cycle life.

Specifications
- Materials of Construction
  - Wetted: PTFE, Modified PTFE
  - Non-wetted: PVDF, Viton, PTFE coated SS spring

- Pressure Ranges
  - 1/4” Orifice: 27” HG vacuum (913 mbar) - 80 PSIG (5.5 bar)
  - 1/2” Orifice: 27” HG vacuum (913 mbar) - 100 PSIG (7 bar)
  - 1” Orifice: 27” HG vacuum (913 mbar) - 100 PSIG (7 bar)

  Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

- Temperature Ranges
  - Ambient: 0° - 150° F (-17° - 66° C)
  - Fluid: 0° - 266° F (-17° - 130° C)
MV-20 1/4" - 1" Manual PTFE Slurry Valve

Part Number | Cv | Kv | Body Size | Valve Type | Port Configuration | A | B | C | D | E | F
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
MV-20-04-0604 | .20 | 2.8 | 1/4" | 1/4 TURN | LOTO | 3.60 | 96.52 | 1.50 | 38.10 | 1.15 | 29.21 | 2.91 | 73.91 | 1.25 | 31.75 | 0.50 | 12.70
MV-20-04-0606 | .76 | 10.8 | 1/4" | 1/4 TURN | LOTO | 3.60 | 96.52 | 1.50 | 38.10 | 1.15 | 29.21 | 2.91 | 73.91 | 1.25 | 31.75 | 0.50 | 12.70
MV-20-04-0604-MT | .20 | 2.8 | 1/4" | MULTITURN | 1/4" Parflare | 3.60 | 96.52 | 1.50 | 38.10 | 1.15 | 29.21 | 2.91 | 73.91 | 1.25 | 31.75 | 0.50 | 12.70
MV-20-04-0606-MT | .76 | 10.8 | 1/4" | MULTITURN | 1/4" Parflare | 3.60 | 96.52 | 1.50 | 38.10 | 1.15 | 29.21 | 2.91 | 73.91 | 1.25 | 31.75 | 0.50 | 12.70
MV-20-08-0608 | 2.4 | 34.2 | 1/4" | MULTITURN | 1/2" Parflare | 5.20 | 132.08 | 2.50 | 63.50 | 1.80 | 45.72 | 5.04 | 128.02 | 2.00 | 50.80 | 0.78 | 19.81
MV-20-08-0606 | 3.9 | 55.8 | 1/4" | MULTITURN | 1/4" Parflare | 5.35 | 135.89 | 2.50 | 63.50 | 2.00 | 50.80 | 5.24 | 133.10 | 2.00 | 50.80 | 0.83 | 20.96
MV-20-16-0612 | 6.4 | 91.5 | 1" | MULTITURN | 1" Parflare | 6.22 | 167.99 | 3.39 | 85.85 | 2.88 | 73.15 | 7.05 | 179.07 | 3.00 | 76.20 | 1.00 | 25.40
MV-20-16-0616 | 10.9 | 155.4 | 1" | MULTITURN | 1" Parflare | 6.98 | 177.29 | 3.39 | 85.85 | 2.88 | 73.15 | 7.05 | 179.07 | 3.00 | 76.20 | 1.00 | 25.40
MV-20-16-0620 | 13.5 | 192.9 | 1" | 1/4" Parflare | 8.07 | 204.98 | 3.75 | 96.25 | 3.25 | 82.55 | 7.43 | 188.72 | 3.00 | 76.20 | 1.25 | 31.75
MV-20-04-0604-MT-P | .20 | 2.8 | 1/4" | PANEL MOUNT | MULTI-TURN | 3.55 | 90.17 | 1.25 | 31.75 | 1.15 | 29.21 | 2.63 | 66.80 | 1.25 | 31.75 | 0.50 | 12.70
MV-20-04-0606-MT-P | .76 | 10.8 | 1/4" | PANEL MOUNT | MULTI-TURN | 3.56 | 90.17 | 1.25 | 31.75 | 1.15 | 29.21 | 2.63 | 66.80 | 1.25 | 31.75 | 0.50 | 12.70

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number. Contact factory for Pillar end connections.

*Does not include mounting holes for this model only.

**PRESSURE DROP VS. FLOW RATE**

FLOW RATE (lpm) | DELTA-P (psi) | DELTA-P (bar)
--- | --- | ---
0 | 3.8 | 0.25
5 | 7.6 | 0.50
10 | 11.3 | 1.00
15 | 15.1 | 1.50
20 | 18.9 | 2.00
25 | 22.7 | 2.50

FLOW RATE (gpm) | DELTA-P (psi) | DELTA-P (bar)
--- | --- | ---
0 | 3.8 | 0.25
10 | 7.6 | 0.50
20 | 11.3 | 1.00
30 | 15.1 | 1.50
40 | 18.9 | 2.00
50 | 22.7 | 2.50

MV-20 1/4" - 1" Manual PTFE Slurry Valve

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number. Contact factory for Pillar end connections.

*Does not include mounting holes for this model only.
PV-1 Miniature Pneumatic Valve

Product Overview
The PV-1 PTFE Miniature Diaphragm Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical systems. The design utilizes a machined modified PTFE body, seat and diaphragm ensuring excellent flexibility and long life. The valve is available in 2 and 3 way configurations. It is ideal for low flow and small dose injection applications.

Features
Precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seal for positive diaphragm to body seal.

Compact design actuator works on as little as 20 psi.

Benefits
High cycle life.

Lower replacement costs.

Less downtime.

Isolates media from actuator.

Ease of installation and maintenance.

Specifications
Materials of Construction
Wetted: PTFE, Modified PTFE
Non-wetted: Anodized Aluminum, SS, Nitrile

Pressure Ranges
Forward: 25” HG vacuum (846 mbar) to 20 PSIG (1.4 bar)
Back: 25” HG vacuum (846 mbar) to 20 PSIG (1.4 bar)
Actuator: 20 PSIG (1.4 bar) to 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: -60° - 212° F (-51° - 100° C)
Fluid: -60° - 400° F (-51° - 204° C)
PV-1 Miniature Pneumatic Valve

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Orifice Size</th>
<th>Port Configuration</th>
<th>Dimension B</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV-1-1134</td>
<td>.08</td>
<td>1.1</td>
<td>NC</td>
<td>.094</td>
<td>1/8&quot; FNPT</td>
<td>.38 [9.65]</td>
</tr>
<tr>
<td>PV-1-1334-03</td>
<td>.08</td>
<td>1.1</td>
<td>3 WAY</td>
<td>.094</td>
<td>1/8&quot; FNPT</td>
<td>.38 [9.65]</td>
</tr>
<tr>
<td>PV-1-2134</td>
<td>.08</td>
<td>1.1</td>
<td>NC</td>
<td>.094</td>
<td>1/8&quot; Pargrip</td>
<td>.32 [8.13]</td>
</tr>
<tr>
<td>PV-1-2334-03</td>
<td>.08</td>
<td>1.1</td>
<td>3 WAY</td>
<td>.094</td>
<td>1/8&quot; Pargrip</td>
<td>.32 [8.13]</td>
</tr>
</tbody>
</table>

PRESSURE DROP VS. FLOW RATE

FLOW RATE (gpm)  

DELTA-P (psi)  

DELTA-P (bar)  

All Configurations
PV-10 1/4” Pneumatic 2 Way Valve

Product Overview
The PV-10 PFA Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/4” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.

PVDF coated stainless steel spring.

Reduces effects of corrosive environments.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PFA, PVDF, 18-8 SS, Viton seals, PTFE coated SS springs

Pressure Ranges
Forward: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Back: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Actuator: 20 PSIG (1.4 bar) to 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)
PV-10 1/4” Pneumatic 2 Way Valve

Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
<th>Mounting Configuration-XX (Depicted Above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV-10-1144-XX</td>
<td>.60</td>
<td>8.6</td>
<td>NC</td>
<td>1/4” FNPT</td>
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</tr>
<tr>
<td>PV-10-1244-XX</td>
<td>.60</td>
<td>8.6</td>
<td>NO</td>
<td>1/4” FNPT</td>
<td></td>
</tr>
<tr>
<td>PV-10-2134-XX</td>
<td>.24</td>
<td>3.4</td>
<td>NC</td>
<td>1/4” Pargrip</td>
<td></td>
</tr>
<tr>
<td>PV-10-2234-XX</td>
<td>.24</td>
<td>3.4</td>
<td>NO</td>
<td>1/4” Pargrip</td>
<td></td>
</tr>
<tr>
<td>PV-10-2146-XX</td>
<td>.62</td>
<td>8.8</td>
<td>NC</td>
<td>3/8” Pargrip</td>
<td></td>
</tr>
<tr>
<td>PV-10-2246-XX</td>
<td>.62</td>
<td>8.8</td>
<td>NO</td>
<td>3/8” Pargrip</td>
<td></td>
</tr>
<tr>
<td>PV-10-6124-XX</td>
<td>.20</td>
<td>2.8</td>
<td>NC</td>
<td>1/4” Parflare</td>
<td></td>
</tr>
<tr>
<td>PV-10-6224-XX</td>
<td>.20</td>
<td>2.8</td>
<td>NO</td>
<td>1/4” Parflare</td>
<td></td>
</tr>
<tr>
<td>PV-10-6146-XX</td>
<td>.62</td>
<td>8.8</td>
<td>NC</td>
<td>3/8” Parflare</td>
<td></td>
</tr>
<tr>
<td>PV-10-6246-XX</td>
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<td>8.8</td>
<td>NO</td>
<td>3/8” Parflare</td>
<td></td>
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</tbody>
</table>

Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE

FLOW RATE (lpm)

DELTA-P (psi)

DELTA-P (bar)

FLOW RATE (gpm)

Accessories

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB-10</td>
</tr>
</tbody>
</table>
PV-10 1/4” Pneumatic 3 Way Valve

Product Overview
The PV-10 PFA 3 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined areas. One piece machined modified PTFE diaphragms are also utilized for excellent flexibility and life. A full 1/4” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

PVDF coated stainless steel springs.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.

Reduces effects of corrosive environments.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PFA, PVDF, 18-8 SS, Viton seals, PTFE coated SS springs

Pressure Ranges
Forward: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Back: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
Actuator: 20 PSIG (1.4 bar) to 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)
PV-10 1/4” Pneumatic 3 Way Valve

Model Number | Cv | Kv | Flow Configuration | Port Configuration | Mounting Configuration-XX (Depicted Above)
--- | --- | --- | --- | --- | ---
PV-10-1344-XX | .60 | 8.6 | 3 WAY | 1/4” FNPT | 00 = Screw
PV-10-2334-XX | .24 | 3.4 | | 1/4” Pargrip | 01 = Screw/Stud .80 Square
PV-10-2346-XX | .62 | 8.8 | | 3/8” Pargrip | 02 = Screw/Stud Ø1.25 Bolt Circle
PV-10-6324-XX | .20 | 2.8 | | 1/4” Parflare | 10 = PVDF Screw Covers
PV-10-6346-XX | .62 | 8.8 | | 3/8” Parflare |

Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

Pressure Drop vs. Flow Rate

Accessories | Description
--- | ---
SB-10 | PVDF Snap-in Mounting Base. For use with PV-10-XXXX-00 and PV-10-XXXX-10 models only. (Sold separately)
Product Overview
The PV-11 PFA Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1/2” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.

Reduces effects of corrosive environments.

PVDF coated stainless steel spring.
Submergible option isolates all valve components from the external environment.
Valve remains functional while operating in wet or gaseous corrosive environments.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PFA, PVDF, Viton seals, PTFE coated SS springs

Pressure Ranges
Forward: 27” HG vacuum (913 mbar) to 100 PSIG (7 bar)
Back: 80 PSIG (5.5 bar) with 80 PSIG (5.5 bar) inlet pressure
Actuator: 60 PSIG (4.2 bar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)
PV-11 1/2” Pneumatic 2 Way Valve

Bracketed dimensions are in mm.

Air port connection, 1/8” FNPT
Test port connection, 1/4-28 UNF

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Config.</th>
<th>Port Config.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV-11-001</td>
<td>2.3</td>
<td>32.8</td>
<td>N C</td>
<td>1/2” Parflare</td>
</tr>
<tr>
<td>PV-11-002</td>
<td>3.7</td>
<td>52.8</td>
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<td>3/4” Parflare</td>
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<tr>
<td>PV-11-003</td>
<td>3.7</td>
<td>52.8</td>
<td></td>
<td>1/2” Parflare</td>
</tr>
<tr>
<td>PV-11-004</td>
<td>3.7</td>
<td>52.8</td>
<td></td>
<td>3/4” Parflare</td>
</tr>
<tr>
<td>PV-11-005</td>
<td>3.7</td>
<td>52.8</td>
<td></td>
<td>1/2” FNPT</td>
</tr>
</tbody>
</table>

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

Cracking pressure

<table>
<thead>
<tr>
<th>Pressure to Inlet Port (bar)</th>
<th>1.7</th>
<th>3.4</th>
<th>5.2</th>
<th>6.9</th>
<th>8.6</th>
<th>10.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure to Outlet Port (bar)</td>
<td>18.6</td>
<td>15.5</td>
<td>12.4</td>
<td>9.3</td>
<td>6.2</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Pressure drop vs. flow rate

<table>
<thead>
<tr>
<th>Flow Rate (lpm)</th>
<th>19 38 57 76 95 113</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure to Outlet Port (bar)</td>
<td>24 20 16 12 8 4</td>
</tr>
</tbody>
</table>

Specified sealing area

<table>
<thead>
<tr>
<th>Pressure to Inlet Port (psi)</th>
<th>0 25 50 75 100 125 150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure to Outlet Port (psi)</td>
<td>270 225 180 135 90 45</td>
</tr>
</tbody>
</table>
PV-11 1/2” Pneumatic 3 Way Valve

Product Overview
The PV-11 PFA 3 Way Diaphragm Valve is designed for use in high purity semiconductor applications. It is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined areas. One piece machined modified PTFE diaphragms are also utilized for excellent flexibility and life. A full 1/2” orifice provides maximum flow capability in a compact package.

Features
- One piece precision machined diaphragms manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE.
- Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.
- PVDF coated stainless steel springs.
- Submergible option isolates all valve components from the external environment.
- Multi-position mounting base.

Benefits
- High cycle life.
- Lower replacement costs.
- Less downtime.
- Reduces effects of corrosive environments.
- Valve remains functional while operating in wet or gaseous corrosive environments.
- Allows for more mounting flexibility and connector fitting reduction.

Specifications
Materials of Construction
- Wetted: PFA, Modified PTFE
- Non-wetted: PFA, PVDF, Viton seals, PTFE coated SS springs

Pressure Ranges
- COM to NO: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
- NO to COM: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar)
- COM to NC: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar) with 20 PSIG (1.4 bar) maximum back pressure
- NC to COM: 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar) with 50 PSIG (3.4 bar) maximum back pressure
- Actuator: 60 PSIG (4.2 bar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
- Ambient: 0° to 150° F (-17° to 66° C)
- Fluid: 0° to 266° F (-17° to 130° C)
**PV-11 1/2” Pneumatic 3 Way Valve**

**Air Port Connection, 1/8” FNPT**
**Test Port Connections, 1/4-28 UNF**

Bracketed dimensions are in mm.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV-11-021</td>
<td>1.9</td>
<td>27.1</td>
<td>Flow Configuration</td>
<td>1/2 Parflare</td>
</tr>
<tr>
<td>PV-11-022</td>
<td>2.8</td>
<td>40.0</td>
<td></td>
<td>3/4 Parflare</td>
</tr>
<tr>
<td>PV-11-023</td>
<td>2.8</td>
<td>40.0</td>
<td></td>
<td>1/2 Parbond</td>
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<tr>
<td>PV-11-024</td>
<td>2.8</td>
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<td>2.8</td>
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<td></td>
<td>1/2 FNPT</td>
</tr>
</tbody>
</table>

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

*To order part without mounting ring add -01 to model number.

**Pressure Drop vs. Flow Rate**

- **Flow Rate (lpm)**
- **Flow Rate (gpm)**
- **Delta-P (ps)**
- **Delta-P (bar)**

1/2" Parflare

All Other Configurations
**Product Overview**

The PV-11 Adjustable Bypass Valve is designed for use in ultra-pure water applications. The design utilizes a molded high purity PFA body with precision machined seats. A machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The integral bypass valve prevents the stagnation and deadheading of media in an ultra-pure water system.

**Features**

- Precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE.
- Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.
- PVDF coated stainless steel spring.
- Bypass integral to valve body to prevent stagnation of ultra-pure water.
- Modified flow configurations with numerous end connections including Parflare available.

**Benefits**

- High cycle life.
- Lower replacement costs.
- Less downtime.
- Reduces effects of corrosive environment.
- Prevents contamination of media.
- Reduces connections, mounting space, and overall cost.

**Specifications**

**Materials of Construction**

- Wetted: PFA, Modified PTFE
- Non-wetted: PFA, PVDF, Viton seals, PTFE coated SS springs

**Pressure Ranges**

- **Forward:** 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar) with 20 PSIG (1.4 bar) maximum back pressure
- **Backward:** 27” HG vacuum (913 mbar) to 80 PSIG (5.5 bar) with 50 PSIG (3.4 bar) maximum back pressure
- **Actuator:** 60 PSIG (4.2 bar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

**Temperature Ranges**

- **Ambient:** 0° - 150° F (-17° - 66° C)
- **Fluid:** 0° - 266° F (-17° - 130° C)
PV-11 1/2” Pneumatic Adjustable Bypass Valve

AIR PORT CONNECTION, 1/8” FNPT
TEST PORT CONNECTIONS, 1/4-28 UNF

BRACKETED DIMENSIONS
ARE IN mm.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV-11-301</td>
<td>1.9</td>
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<td>1/2” Parflare</td>
</tr>
<tr>
<td>PV-11-302</td>
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<td>3/4” Parflare</td>
</tr>
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<td>PV-11-305</td>
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<td>40.0</td>
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<td>1/2” FNPT</td>
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</table>

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

PRESSURE DROP VS. FLOW RATE

Cv / Kv vs. TURNS FOR BYPASS PORT
**Product Overview**

The PV-12 Diaphragm Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 1” orifice provides maximum flow capability in a compact package.

**Features**

- One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE.
- Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.
- PVDF coated stainless steel spring.
- Submergible option isolates all valve components from the external environment.

**Benefits**

- High cycle life.
- Lower replacement costs.
- Less downtime.
- Reduces effects of corrosive environments.
- Valve remains functional while operating in wet or gaseous corrosive environments.

**Specifications**

**Materials of Construction**

- Wetted: PFA, Modified PTFE
- Non-wetted: PFA, PVDF, Viton seals, PTFE coated SS springs

**Pressure Ranges**

- Forward: 27” HG vacumm (913 mbar) to 100 PSIG (7 bar)
- Backward: 80 PSIG (5.5 bar) with 100 PSIG (3.4 bar) inlet pressure
  100 PSIG (7 bar) with 60 PSIG (4.2 bar) inlet pressure
- Actuator: 60 PSIG (4.2 bar) to 100 PSIG (7 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

**Temperature Ranges**

- Ambient: 0° - 150° F (-17° - 66° C)
- Fluid: 0° - 266° F (-17° - 130° C)
PV-12 1” Pneumatic 2 Way Valve

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
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<th>Flow Config.</th>
<th>Port Config.</th>
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<td>PV-12-002</td>
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<td>3/4” Parbond</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Config.</th>
<th>Port Config.</th>
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</table>

Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

**PRESSURE DROP VS. FLOW RATE**

FLOW RATE (lpm)

DELTA-P (psig)

DELTA-P (bar)

FLOW RATE (gpm)
Product Overview
The PV-16 PFA diaphragm valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 3/4” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.

Specifications

Features
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.

Specifications

Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

Pressure Ranges
0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.
Actuation: 60 PSIG (4.1 bar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)
PV-16 3/4” Pneumatic PFA 2 Way Valve

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration-X</th>
<th>Port Configuration</th>
<th>Dimension in [mm] A</th>
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</thead>
<tbody>
<tr>
<td>PV-16-X612</td>
<td>5.8</td>
<td>82.7</td>
<td></td>
<td>3/4” Parflare</td>
<td>5.54 [140.72 ]</td>
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<tr>
<td>PV-16-X612-01</td>
<td>5.8</td>
<td>82.7</td>
<td></td>
<td>3/4” Parflare Long</td>
<td>6.48 [164.59 ]</td>
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<tr>
<td>PV-16-X616</td>
<td>7.9</td>
<td>112.6</td>
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<td>1” Parflare*</td>
<td>9.12 [231.65 ]</td>
</tr>
<tr>
<td>PV-16-X712</td>
<td>7.9</td>
<td>112.6</td>
<td></td>
<td>3/4” Parbond</td>
<td>5.90 [149.86 ]</td>
</tr>
</tbody>
</table>

Parflare model numbers are supplied with PVDF nuts. Also available with PFA (-T) nuts. *Ends are fused on.

**CRACKING PRESSURE**

PRESSURE TO INLET PORT (bar)

**PRESSURE DROP VS. FLOW RATE**

FLOW RATE (lpm)

<table>
<thead>
<tr>
<th>FLOW RATE (gpm)</th>
<th>DELTA-P (psl)</th>
<th>DELTA-P (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>3.5</td>
<td>7.1</td>
</tr>
<tr>
<td>76</td>
<td>3.0</td>
<td>6.0</td>
</tr>
<tr>
<td>113</td>
<td>2.5</td>
<td>5.0</td>
</tr>
<tr>
<td>151</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td>189</td>
<td>1.5</td>
<td>3.0</td>
</tr>
<tr>
<td>227</td>
<td>1.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**SPECIFIED SEALING AREA**

PRESSURE TO INLET PORT (psi)
Product Overview
The PV-16 PFA diaphragm valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. A full 3/4” orifice provides maximum flow capability in a compact package.

Features
One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE. Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

Benefits
High cycle life.
Lower replacement costs.
Less downtime.

Halar coated stainless steel spring.

Reduces effects of corrosive environments.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PVDF, Viton, PTFE coated SS spring

Pressure Ranges
0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.
Actuation: 60 PSIG (4.1 bar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)
PV-16 3/4" Pneumatic PFA 3 Way Valve

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV-16-3612</td>
<td>5.4</td>
<td>77.0</td>
<td></td>
<td>3/4 Parflate</td>
<td>5.54&quot; [140.72 mm]</td>
</tr>
<tr>
<td>PV-16-3612-01</td>
<td>5.4</td>
<td>77.0</td>
<td></td>
<td>3/4 Parflate Long</td>
<td>6.48&quot; [164.59 mm]</td>
</tr>
<tr>
<td>PV-16-3616</td>
<td>7.3</td>
<td>104.1</td>
<td></td>
<td>1&quot; Parflate*</td>
<td>9.12&quot; [231.65 mm]</td>
</tr>
<tr>
<td>PV-16-3712</td>
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<td>104.1</td>
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<td>3/4 Parbond</td>
<td>5.90&quot; [149.86 mm]</td>
</tr>
<tr>
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<td>77.0</td>
<td></td>
<td>3/4 Parflate</td>
<td>5.54&quot; [140.72 mm]</td>
</tr>
<tr>
<td>PV-16-4612-01</td>
<td>5.4</td>
<td>77.0</td>
<td></td>
<td>3/4 Parflate Long</td>
<td>6.48&quot; [164.59 mm]</td>
</tr>
<tr>
<td>PV-16-4616</td>
<td>7.3</td>
<td>104.1</td>
<td></td>
<td>1&quot; Parflate*</td>
<td>9.12&quot; [231.65 mm]</td>
</tr>
<tr>
<td>PV-16-4712</td>
<td>7.3</td>
<td>104.1</td>
<td></td>
<td>3/4 Parbond</td>
<td>5.90&quot; [149.86 mm]</td>
</tr>
</tbody>
</table>

Parflate model numbers are supplied with PVDF nuts. Also available with PFA (-T) nuts.

*Ends are fused on.

CRACKING PRESSURE

PRESSURE TO INLET PORT (bar)

<table>
<thead>
<tr>
<th>Pressure to Outlet Port (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>144</td>
</tr>
<tr>
<td>120</td>
</tr>
<tr>
<td>96</td>
</tr>
<tr>
<td>72</td>
</tr>
<tr>
<td>48</td>
</tr>
<tr>
<td>24</td>
</tr>
</tbody>
</table>

PRESSURE DROP VS. FLOW RATE

FLOW RATE (lpm)

<table>
<thead>
<tr>
<th>Flow Rate (lpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>113</td>
</tr>
<tr>
<td>151</td>
</tr>
<tr>
<td>189</td>
</tr>
<tr>
<td>227</td>
</tr>
</tbody>
</table>

3/4" Parflate
3/4" Parbond, 1" Parflate
Product Overview

The PV-16 PFA sampling valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a molded high purity PFA body with precision machined seat and diaphragm sealing areas. A one piece machined modified PTFE diaphragm is also utilized for excellent flexibility and life. The valve incorporates a full flow through port with a low dead volume down leg.

Features
- One piece precision machined diaphragm manufactured from the latest technology modified PTFE. Provides over five times the flexural life as compared to conventional PTFE.
- Halar coated stainless steel spring.
- Full flow through port.

Benefits
- High cycle life.
- Lower replacement costs.
- Less downtime.
- Reduces effects of corrosive environments.
- Reduced pressure drop.

Specifications

Materials of Construction
- Wetted: PFA, Modified PTFE
- Non-wetted: PVDF, Viton, PTFE coated SS spring

Pressure Ranges
- 0 - 120 PSIG (8.3 bar) See Cracking Pressure Chart on next page.
- Actuation: 60 PSIG (4.1 bar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
- Ambient: 0° - 150° F (-17° - 66° C)
- Fluid: 0° - 266° F (-17° - 130° C)
PV-16 3/4” Pneumatic PFA Sampling Valve

**Model Number** | **Through Port** | **Sample Port** | **Dimensions**
---|---|---|---
PV-16-5612-608 | 13.0 | 185.4 | 2.3 | 32.8 | 2.3" Parflare | 1/2" Parflare | 5.54" [140.72 mm] | 2.71" [68.83 mm]
PV-16-5612-612 | 13.0 | 185.4 | 4.6 | 65.6 | 3/4" Parflare | 3/4" Parflare | 5.54" [140.72 mm] | 2.81" [71.37 mm]
PV-16-5612-712 | 13.0 | 185.4 | 6.9 | 98.7 | 3/4" Parflare | 3/4" Parflapd | 5.54" [140.72 mm] | 2.95 [74.93 mm]
PV-16-5712-608 | 25.2 | 359.92 | 2.3 | 32.8 | 3/4" Parflapd | 1/2" Parflare | 5.90" [149.86 mm] | 2.71" [68.83 mm]
PV-16-5712-612 | 25.2 | 359.92 | 4.6 | 65.6 | 3/4" Parflapd | 3/4" Parflare | 5.90" [149.86 mm] | 2.81" [71.37 mm]
PV-16-5712-712 | 25.2 | 359.92 | 6.9 | 98.7 | 3/4" Parflapd | 3/4" Parflapd | 5.90" [149.86 mm] | 2.95 [74.93 mm]

Parflare model numbers are supplied with PVDF nuts. Also available with PFA (-T) nuts.

**CRACKING PRESSURE**

<table>
<thead>
<tr>
<th>PRESSURE TO INLET PORT (bar)</th>
<th>PRESSURE TO OUTLET PORT (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7</td>
<td>120</td>
</tr>
<tr>
<td>3.3</td>
<td>96</td>
</tr>
<tr>
<td>5.0</td>
<td>72</td>
</tr>
<tr>
<td>6.6</td>
<td>48</td>
</tr>
<tr>
<td>8.3</td>
<td>24</td>
</tr>
<tr>
<td>9.9</td>
<td>0</td>
</tr>
</tbody>
</table>

**SPECIFIED SEALING AREA**

---

Parker Hannifin Corporation
Partek Operation
Tucson, AZ

53
Product Overview
The PV-20 distribution valve is designed for use in slurry applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes a machined PTFE body with precision machined seat and diaphragm sealing areas. The valve is offered in 3 orifice sizes (1/4", 1/2" and 1") and port sizes ranging from 1/4" to 1 1/4".

Features
- Fully swept open bowl diaphragm seat area.
- Self draining design.
- High load point seat seal.
- Angled and rounded internal flow path.
- One piece precision machined diaphragm manufactured from modified PTFE.
- Evenly distributed seat sealing forces.

Benefits
- Minimizes fluid shear and smooth flow transition.
- Minimizes area for entrapment and stagnation of media.
- Improves sealing mechanism for aggressive chemicals, deionized water and abrasive slurry media.
- Minimizes particle contribution of valve.
- Provides faster purging and cleaning of valve.
- Less pressure drop allows for lower pressure requirements upstream.
- Improves fluid flow dynamics.
- Improves cycle life, less shear than standard PTFE material, lower replacement costs, less downtime.
- Minimized diaphragm and valve seat strain.
- Stabilizes valve back pressure capability.
- Minimizes potential for permeation while maximizing cycle life.

Specifications
Materials of Construction
- Wetted: PTFE, Modified PTFE
- Non-wetted: PVDF, Viton, PTFE coated SS spring

Pressure Ranges
- 1/4" Orifice: 27" HG vacuum (913 mbar) - 80 PSIG (5.5 bar)
- 1/2" Orifice: 27" HG vacuum (913 mbar) - 100 PSIG (7 bar)
- 1" Orifice: 27" HG vacuum (913 mbar) - 100 PSIG (7 bar)
- Actuation: 60 PSIG (4.1 bar) - 80 PSIG (5.5 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
- Ambient: 0° - 150° F (-17° - 66° C)
- Fluid: 0° - 266° F (-17° - 130° C)
Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number. Contact factory for Pillar end connections.
CV-1 Check Valve

Product Overview
The CV-1 PTFE Check Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemical or gas applications. The design utilizes machined PTFE components to provide superior chemical resistance and purity without requiring o-rings for sealing. The machined PTFE spring allows for low cracking pressure operation and minimal back pressure for resealing.

Features
- Polished sealing surfaces.
- Tongue and groove external seal.
- Machined PTFE spring.
- Numerous end configurations available including Parflare. Available with different configurations on either end.

Benefits
- Long life and superior sealing characteristics.
- Eliminates o-rings and compatibility problems.
- Low cracking pressure.
- Reduces connections, mounting space, and overall cost.

Specifications

Materials of Construction
- Wetted: PTFE
- Non-wetted: PFA, PVDF, ETFE

Cracking Pressure
- 0.25 PSIG (.017 bar) - 0.75 PSIG (.052 bar)

Back Check Sealing Pressure
- 5.0 PSIG (.35 bar)

Pressure Range
- 27” Hg vacuum (913 mbar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
- Style 1: 32° - 212° F (0° - 100° C) Ambient
  32° - 266° F (0° - 130° C) Fluid
- Style 2 & 3: 50° - 212° F (10° - 100° C) Ambient
  50° - 266° F (10° - 130° C) Fluid
- Style 4 & 5: 60° - 212° F (15° - 100° C) Ambient
  60° - 266° F (15° - 130° C) Fluid
CV-1 Check Valve

BRACKETED DIMENSIONS ARE IN mm.

Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>CV</th>
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<th>Port Configuration</th>
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</thead>
<tbody>
<tr>
<td>CV-1-11122</td>
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Pargrip models are supplied with PFA nuts. Parflare models are supplied with PVDF nuts. For PFA nuts add -T to model number.
RV Relief Valve

Product Overview
The RV Relief Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemicals. The design utilizes a molded PFA body with precision-machined PTFE seats and diaphragm poppet. When a field set relief pressure is reached, the valve opens and permits flow. The valve resets when 25% of original setpoint is reached.

Features
One piece precision machined diaphragm poppet manufactured from the latest technology modified PTFE.

Provides over five times the flexural life as compared to conventional PTFE.

Tongue and groove seat and diaphragm poppet for positive through flow shut off and diaphragm to body seal.

Field adjustable relief pressure.

Benefits
High cycle life.

Lower replacement costs.

Less downtime.

Isolates media from adjusting screw.

Prevent over pressurization in critical applications.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: PVDF, SS, Brass, ABS, HDPE

Pressure Ranges
15 PSIG (1.03 bar) - 120 PSIG (8.3 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)

Note: The RV Series Relief Valves should only be used to protect Article 3, Paragraph 3 category equipment as defined in Pressure Equipment Directive 97/23/EC Dated 29, May 1997.
RV Relief Valve

**Bracketed dimensions are in mm.**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Port Configuration</th>
<th>Relieving Pressure Range-XX</th>
</tr>
</thead>
<tbody>
<tr>
<td>RV-144-XX</td>
<td>.78</td>
<td>11.3</td>
<td>ON/OFF</td>
<td>1/4&quot; FNPT</td>
<td>01 - 15 to 60 PSIG</td>
</tr>
<tr>
<td>RV-624-XX</td>
<td>.24</td>
<td>3.5</td>
<td></td>
<td>1/4&quot; Parflare</td>
<td>02 - 60 to 120 PSIG</td>
</tr>
<tr>
<td>RV-646-XX</td>
<td>.70</td>
<td>10.2</td>
<td></td>
<td>3/8&quot; Parflare</td>
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</tbody>
</table>

Parflare model numbers are supplied with PVDF nuts. Also available with PFA (-T) nuts.
SV-2 1/4" Solenoid Valve

Product Overview
The SV-2 Solenoid Valve is designed for use in high purity semiconductor applications, and is also ideally suited for ultra-pure water and aggressive chemicals. The design utilizes a molded high purity PFA body with precision machined areas. A one-piece machined modified PTFE diaphragm is also utilized for excellent flexibility and long life. The valve is offered in 2 and 3 way configurations, in 3 orifice sizes, and in 2 standard voltages.

Features
One piece precision machined diaphragm manufactured from the latest technology modified PTFE.

Provides over five times the flexural life as compared to conventional PTFE.

Tongue and groove seat and diaphragm for positive through flow shut off and diaphragm to body seal.

Benefits
High cycle life.

Lower replacement costs.

Less downtime.

Isolates media from solenoid.

Specifications
Materials of Construction
Wetted: PFA, Modified PTFE
Non-wetted: Coated Aluminum, Plated Steel, SS, PFA, PVDF, Titanate

Pressure Ranges
Forward: 0 - 80 PSIG (5.5 bar)

Pressure ranges for operation at ambient temperatures. For use at higher temperatures consult Pressure/Temperature chart on page 3.

Temperature Ranges
Ambient: 0° - 150° F (-17° - 66° C)
Fluid: 0° - 266° F (-17° - 130° C)

Solenoid Ratings
24 VDC, 115 VAC (Double Wire)
All models rated at 12.88 watts for 24 VDC and 14 watts for 115 VAC at ambient temperature.
Col Duty Cycle: 100%, however, 100% continuous duty may affect performance of valve, therefore 50% continuous duty is recommended.

Orientation
All models must be mounted vertically as indicated by the label on the product.
SV-2 1/4" Solenoid Valve

BRACKETED DIMENSIONS ARE IN mm.

3-WAY VALVE

2-WAY VALVE

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Cv</th>
<th>Kv</th>
<th>Flow Configuration</th>
<th>Orifice Size</th>
<th>Port Configuration</th>
<th>Solenoid Voltage-X</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV-2-1144-X</td>
<td>.60</td>
<td>8.6</td>
<td>NC</td>
<td>.250</td>
<td>1/4&quot; FNPT</td>
<td>2 = 24 VDC</td>
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<tr>
<td>SV-2-1244-X</td>
<td>.60</td>
<td>8.6</td>
<td>NO</td>
<td>.250</td>
<td>1/4&quot; FNPT</td>
<td>7 = 115 VAC</td>
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<tr>
<td>SV-2-1344-X</td>
<td>.60</td>
<td>8.6</td>
<td>3 WAY</td>
<td>.250</td>
<td>1/4&quot; FNPT</td>
<td></td>
</tr>
</tbody>
</table>

PRESSURE DROP VS. FLOW RATE

FLOW RATE (lpm) 1.9 3.8 5.7 7.6 9.5 11.3
DELTA-P (ps) 1.72 1.38 1.03 0.69 0.34

FLOW RATE (gpm) 0 0.5 1.0 1.5 2.0 2.5 3.0
Offer of Sale

The items described in this document and other documents or descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors are hereby offered for sale at prices to be established by Parker Hannifin Corporation, its subsidiaries and its authorized distributors. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer’s orders, when committed to Parker Hannifin Corporation, its subsidiary or an authorized distributor ("Seller") verbally or in writing, shall constitute acceptance of this offer.

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2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof until paid by Buyer. Any such interest shall be paid by Buyer upon Seller’s delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller’s plant. Regardless of the method of delivery, however, risk shall pass from Seller to Buyer upon Seller’s delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from Parker Hannifin Corporation. THIS WARRANTY COM普REHENS THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WAR-RANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED. NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES WHATSOEVER ON ITEMS BUILT OR ACQUIRED WHOLLY OR PAR TIALL Y, TO BUYER’S DESIGNS OR SPECIFICATIONS.

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6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller’s discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling requests, without limitation, design, fixturing, and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller’s property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer’s Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer’s property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller’s possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against all claims of infringement of U.S. Patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter ‘Intellectual Property Rights’). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third person. Seller’s obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and risk, procure for Buyer the right to continue using said item, replace or modify said item so as to make it non infringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to or performed hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller’s sole and exclusive liability and Buyer’s sole and exclusive remedy for infringement of Intel-llectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller’s obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter ‘Events of Force Majeure’). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or governmental agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller’s control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire understanding between Buyer and Seller, and there are no oral or other representations or agreements which warrant thereunto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

9/91-P
About Parker Hannifin Corporation
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Parker’s Charter
To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

Product Information
North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In Europe, call 00800-C-PARKER-H (00800-2727-5374).