### Piston Valve (1/2”, 3/4”, 1”, 1¼”, 1½”)

**Description**

Forbes Marshall Piston Valves, PSVAL, provide perfect tightness and durable stability on different media such as steam, superheated steam, heat transfer fluid, water and compressed air.

**Sizes and Pipe Connection**

- 1/2”, 3/4”, 1”, 1¼”, 1½”
- BSPT / NPT, socket weld ends, flanged to class 150 / 300 / 600 available on special request

### Limiting Conditions

**For 1/2”, 3/4”, 1”, 1¼”, 1½” Socket weld ends**

- Maximum operating pressure: 1131 psig
- Maximum operating temperature: 797°F for 1/2”, 3/4”, 1”
  - 450°F for 1¼”, 1½”
- Maximum hydraulic test pressure: 2262 psig

**For DN 1/2”, 3/4”, 1” Screwed ends**

- Maximum operating pressure: 1131 psig
- Maximum operating temperature: 797°F
- Maximum hydraulic test pressure: 2262 psig

**For 1¼”, 1½” Screwed ends**

- Maximum operating pressure: 602 psig
- Maximum operating temperature: 797°F
- Maximum hydraulic test pressure: 1204 psig

**Body design conditions:**

- **1/2”, 3/4”, 1”, 1¼”, 1½” Class 150 Flanged ends**
  - Maximum allowable pressure: 284 psig at 100°F
  - Maximum operating pressure: 203 psig at 387°F
  - Maximum operating temperature: 797°F at 80 psig for 1/2”, 3/4”, 1”
    - 450°F at 184 psig for 1¼”, 1½”
  - Cold hydraulic test pressure: 406 psig

**Body design conditions:**

- **1/2”, 3/4”, 1”, 1¼”, 1½” Class 300 Flanged ends**
  - Maximum allowable pressure: 740 psig at 100°F
  - Maximum operating pressure: 602 psig at 488°F for 1/2”, 3/4”, 1”
    - 602 psig at 450°F for 1¼”, 1½”
  - Maximum operating temperature: 797°F at 417.8 psig for 1/2”, 3/4”, 1”
    - 450°F at 602 psig for 1¼”, 1½”
  - Cold hydraulic test pressure: 1204 psig

**Body design conditions:**

- **1/2”, 3/4”, 1”, 1¼”, 1½” Class 600 Flanged ends**
  - Maximum allowable pressure: 1479 psig at 100°F
  - Maximum operating pressure: 1131 psig at 93°F for 1/2”, 3/4”, 1”
    - 1131 psig at 450°F for 1¼”, 1½”
  - Maximum operating temperature: 797°F at 80 psig for 1/2”, 3/4”, 1”
    - 450°F at 1131 psig for 1¼”, 1½”
  - Maximum hydraulic test pressure: 2262 psig

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### Operating Range

**Class 150-300**

- Steam saturation curve

**Class 600**

- Steam saturation curve

**Class 800 - Body design condition**

- The product must not be used in this region.
  - A - D Screwed and socket weld

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The PSVAL valve body design conditions must be considered when selecting the appropriate valve for a specific application.
Dimensions (approx. in Inches)

Screwed & Socket weld ends

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>4.3</td>
<td>4.6</td>
<td>5.7</td>
<td>4.4</td>
</tr>
<tr>
<td>3/4</td>
<td>4.3</td>
<td>4.6</td>
<td>5.7</td>
<td>4.4</td>
</tr>
<tr>
<td>1</td>
<td>5.0</td>
<td>5.2</td>
<td>6.5</td>
<td>8.8</td>
</tr>
<tr>
<td>1¼</td>
<td>6.5</td>
<td>6.9</td>
<td>8.5</td>
<td>16.9</td>
</tr>
<tr>
<td>1½</td>
<td>6.5</td>
<td>6.9</td>
<td>8.5</td>
<td>17.6</td>
</tr>
</tbody>
</table>

Dimensions (approx. in Inches) & Weights (approx. in lbs)

Weld on Flanges

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>A+</th>
<th>B</th>
<th>C</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>9.9</td>
<td>10.4</td>
<td>10.4</td>
<td>4.6</td>
</tr>
<tr>
<td>3/4</td>
<td>9.9</td>
<td>10.4</td>
<td>10.4</td>
<td>4.6</td>
</tr>
<tr>
<td>1</td>
<td>10.2</td>
<td>10.9</td>
<td>9.5</td>
<td>5.2</td>
</tr>
<tr>
<td>1¼</td>
<td>12</td>
<td>12.5</td>
<td>12.6</td>
<td>6.9</td>
</tr>
<tr>
<td>1½</td>
<td>12</td>
<td>12.5</td>
<td>12.6</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Additional material: 1/2"-1½" Weld on Flanges

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Description</th>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Pipe</td>
<td>Carbon Steel</td>
<td>ASTM A106 GR B</td>
</tr>
<tr>
<td>19</td>
<td>Flange</td>
<td>Forged Carbon Steel</td>
<td>ASTM A105</td>
</tr>
</tbody>
</table>

*Note: For 1 1/4", 1" Handwheel - Sheet Metal
For 1 1/4" only Class 300 is available in integral flange end.
How to Order
Example: 1/2” Piston Valve with socket weld ends.

Installation
The valve is designed for installation in a vertical or horizontal line with inlet as per the arrow direction. To open the valve turn hand wheel till it stops at the top and to close, turn hand wheel till it touches the bonnet. Do not use “F” key. If any leakage is observed during operation at the outlet, close valve fully and tighten opposite nuts equally half or one turn until leakage stops.

Safety Information
Pressure: Before attempting any maintenance of the valve, ensure that pressure is isolated and safely vented to atmosphere. Do not assume that the system is depressurized even when a pressure gauge indicates zero.

Maintenance
Use Molykote M30 oil for lubrication. For 1/2” - 1½” sizes lubricate spindle regularly through bonnet hole and spindle threads.

Operate the valve once or twice after lubrication.

Piston Valve Operating Guidelines
1. Flush the line properly before taking the Piston Valve in operation

2. Do not use valve “F” key for opening & closing the valve

3. Please do oiling of valve as shown in below figure with Molykote M30 oil or high temperature lubricating oil to ensure smooth operation of valve

Available Spares
Refer Piston Valve user manual for available spares.

How to Order Spares
Order spares as per the code no. specified in the user manual.

Cv Values

<table>
<thead>
<tr>
<th>Size</th>
<th>1/2”</th>
<th>3/4”</th>
<th>1”</th>
<th>1¼”</th>
<th>1½”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>2.9</td>
<td>2.9</td>
<td>6.7</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

Recommended Tightening Torques
For Bonnet Nut

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Size</th>
<th>Torque (ft-lbsf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/2”</td>
<td>2.2-3.7</td>
</tr>
<tr>
<td>2</td>
<td>3/4”</td>
<td>3.7-5</td>
</tr>
<tr>
<td>3</td>
<td>1”</td>
<td>13-15</td>
</tr>
<tr>
<td>4</td>
<td>1¼”</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1½”</td>
<td></td>
</tr>
</tbody>
</table>

Lubrication Details
1/2”, 3/4”, 1”, 1¼”, 1½”