DSPRV41
Double Seated Pressure Reducing Valve

Description
The Forbes Marshall Double Seated Pressure Reducing Valve, DSPRV41 is a SG iron pilot operated pressure reducing valve designed for steam applications with improved turndown

Available Sizes and Pipe Connections
1 1/2” and 2” Flanged: Class 150

Limiting Conditions
<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMO - Maximum operating pressure</td>
<td>247 psig</td>
</tr>
<tr>
<td>TMO - Maximum operating temperature</td>
<td>450°F</td>
</tr>
<tr>
<td>Cold hydraulic test pressure</td>
<td>493 psig</td>
</tr>
<tr>
<td>Spring range</td>
<td>2.9 to 247 psig</td>
</tr>
<tr>
<td>Min Operating Temperature</td>
<td>32°F</td>
</tr>
</tbody>
</table>

Pressure Sensing Pipe
The DSPRV41 controls the pressure by sensing the downstream pressure through a pressure sensing pipe taken to the union (item L in Fig.1) or through the internal sensing pipe (item M in Fig.1). Fitting of the external pressure sensing pipe is described in the user manual supplied with the valve.

Note: Capacity is reduced and there is a possibility of hunting if an external pressure sensing pipe is not fitted.

Operating Range

<table>
<thead>
<tr>
<th>Temperature °F</th>
<th>Pressure psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>73</td>
</tr>
<tr>
<td>122</td>
<td>112</td>
</tr>
<tr>
<td>218</td>
<td>145</td>
</tr>
<tr>
<td>247</td>
<td>290</td>
</tr>
<tr>
<td>290</td>
<td>450</td>
</tr>
</tbody>
</table>

Dimensions (approx.) in inch and lbs

<table>
<thead>
<tr>
<th>Size</th>
<th>Flange A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Weight(lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2”</td>
<td>8.3”</td>
<td>9.9”</td>
<td>12.2”</td>
<td>6.8”</td>
<td>88</td>
</tr>
<tr>
<td>2”</td>
<td>9.1”</td>
<td>9.9”</td>
<td>12.2”</td>
<td>6.8”</td>
<td>92.6</td>
</tr>
</tbody>
</table>
### Materials

<table>
<thead>
<tr>
<th>No.</th>
<th>Part</th>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adjustment screw</td>
<td>Carbon steel</td>
<td>IS 1367 Gr.14 (ASTM A193)</td>
</tr>
<tr>
<td>2</td>
<td>Adjustment lock nut</td>
<td>Stainless steel Type 304</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Spring housing</td>
<td>SG iron EN-JS 1025 DIN EN 1563 (ASTM 60-40-18)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Top spring pad</td>
<td>C-20 IS 2062 (ASTM A 36)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pressure adjustment spring</td>
<td>Stainless steel Type 302</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Bottom spring pad</td>
<td>Stainless steel S3304</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Spring housing securing nuts</td>
<td>Carbon steel ASTM A 194 Gr 2H</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Pilot diaphragm</td>
<td>Stainless steel ASTM A240 SS304</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Pilot valve chamber</td>
<td>SG iron EN-JS 1025 DIN EN 1563 (ASTM 60-40-18)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Pilot valve plunger</td>
<td>Stainless steel ASTM A 276 SS304</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pilot valve seat with integral seal</td>
<td>Stainless steel AISI 420</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Pilot valve ball</td>
<td>Stainless steel ASTM A 2057 SS302</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Pilot valve spring</td>
<td>Stainless steel ASTM A 276 SS420</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Pilot valve clip</td>
<td>Stainless steel ASTM A 240 SS301</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Pilot filter cap gasket</td>
<td>Stainless steel BS 1449-304-S16 (AISI 304)</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Pilot filter cap</td>
<td>Stainless steel ASTM A 743 Gr.CA 40</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Pilot filter element</td>
<td>Bronze</td>
<td></td>
</tr>
<tr>
<td>18*</td>
<td>Internal strainer screen</td>
<td>Stainless steel ASTM A 240 SS304</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Body gasket</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reinforced graphite</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Main valve head return spring</td>
<td>Stainless steel BS 2056 302 S 26 (ASTM A310-302)</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Main valve head</td>
<td>Stainless steel ASTM A 276 SS420</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Auxiliary valve head</td>
<td>Stainless steel ASTM A 276 SS420</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Auxiliary valve head return spring</td>
<td>Stainless steel BS 2056 302 S 26 (ASTM A310-302)</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Main valve seat</td>
<td>Stainless steel ASTM A 276 SS420</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Balance pipe assembly</td>
<td>Stainless steel ASTM A 213 SS304</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Main valve body</td>
<td>SG iron EN-JS 1025 DIN EN 1563 (ASTM 60-40-18)</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Lower diaphragm chamber</td>
<td>SG iron EN-JS 1025 DIN EN 1563 (ASTM 60-40-18)</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Lower diaphragm chamber securing nuts</td>
<td>Carbon steel ASTM A194 Gr 2H</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower diaphragm chamber securing bolts</td>
<td>Carbon steel ASTM A193 Gr B7</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Main diaphrags</td>
<td>Stainless steel ASTM A 240 SS304</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Lower diaphragm pad</td>
<td>Stainless steel ASTM A 276 SS304</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Push rod</td>
<td>Stainless steel ASTM A 276 SS431</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Lock nut</td>
<td>Stainless steel SS316</td>
<td></td>
</tr>
<tr>
<td>33*</td>
<td>Control pipe assembly</td>
<td>Stainless steel ASTM A 213 SS304</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Name Plate</td>
<td>Stainless steel ASTM A 240 SS304</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Material specification in brackets are for reference only.

* Not shown in figure

+ **Note:** Items 10, 11, 12, 13 and 14 are shown in the exploded view as they are hidden by the pilot filter on the main illustration.
Note
The capacities quoted above are based on valves fitted with an external pressure sensing pipe. Reliance on the internal pressure sensing pipe will mean that capacities may be reduced. In the case of low downstream pressure this reduction could be up to 30% of the valve capacity.

How to use the chart 1-1/2"
Saturated steam
From the intersection point of required upstream and downstream pressures draw a perpendicular till it cuts horizontal line A2. This will give maximum capacity of the valve (approx 2645.5 lbs/hr), when both main and auxiliary valve head will be open.

In the said example to cater flow below 330.7 lbs/hr (cutting the vertical with the horizontal line A1) auxiliary valve head will remain open and main valve head will be closed. Thus flow turndown improves.

Superheated steam
Because of the higher specific volume of superheated steam a correction factor must be applied to the figure obtained from the chart above. For 131°F of superheat the factor is 0.95 and for 212°F of superheat the factor is 0.9.

Using the example given for saturated steam, the 1-1/2" valve would pass 1200 X 0.95 =1140lbs/hr if the steam had 131°F superheat.
**Cv Values**
The Kv values are full capacities and should be used for safety valve sizing purpose only

<table>
<thead>
<tr>
<th>Size</th>
<th>1-1/2&quot;</th>
<th>2&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cv</td>
<td>19.7</td>
<td>32.4</td>
</tr>
</tbody>
</table>

**How to Order**
Example: 1 No. Forbes Marshall 1-1/2" DSPRV41 double seated pressure reducing valve having a 2.9 - 247 psig spring and flanged class 150 connections.

**Safety Information, Installation and Maintenance**
For full details see the user manual supplied with the product.

**Installation**
The double seated pilot operated pressure reducing valve should be installed in a horizontal pipeline, protected by a strainer and a separator, with the direction of flow as indicated by the arrow on the valve body.

**How to Order Spares**
For spares refer the user manual supplied with this product.