Combination Back Pressure & Solenoid Shut-Off Valve

The Cla-Val Model 658-01 valve performs two separate functions. It maintains a constant back pressure by discharging excess pressure downstream and when the solenoid is activated the valve closes drip-tight.

In operation, the valve is actuated by hydraulic line pressure through the pilot control system. When inlet pressure is greater than the control setting, the valve opens. When inlet pressure is equal to the control setting, the pilot modulates the valve, maintaining the preselected back pressure. When inlet pressure is less than the control setting, the pilot system closes the valve drip tight. Changing the pressure setting simply involves turning an adjusting screw on the pilot control.

The solenoid control is available in energize to open or de-energize to open models.

**Schematic Diagram**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100-20 Hytrol Main Valve</td>
</tr>
<tr>
<td>2</td>
<td>X42N-3 Strainer &amp; Needle Valve</td>
</tr>
<tr>
<td>3</td>
<td>CRL-60 Pressure Relief Control</td>
</tr>
<tr>
<td>4</td>
<td>CS3 Solenoid Control</td>
</tr>
<tr>
<td>5</td>
<td>100-01 Hytrol (Reverse Flow)</td>
</tr>
</tbody>
</table>

**Optional Features**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Shutoff Isolation Valve</td>
</tr>
<tr>
<td>D</td>
<td>Check Valves with Isolation Valve</td>
</tr>
<tr>
<td>F</td>
<td>Remote Pilot Sensing</td>
</tr>
<tr>
<td>H</td>
<td>Drain to Atmosphere</td>
</tr>
<tr>
<td>P</td>
<td>X141 Pressure Gauge</td>
</tr>
<tr>
<td>S</td>
<td>CV Speed Control (Opening)</td>
</tr>
<tr>
<td>V</td>
<td>X101 Valve Position Indicator</td>
</tr>
</tbody>
</table>

**Typical Applications**

- **Back Pressure Maintenance Service**
  A frequent application of this valve is to maintain minimum back pressure in the system while supplying water to a reservoir. The electrode in the storage tank activates the solenoid shutoff feature when the tank reaches a preset level.

- **Electronic Control Service**
  Using a timer connected to the solenoid control of the valve, flow from the high pressure system to the low pressure system can be controlled at certain times during the day.
Model 658-01 (Uses 100-20 Hytrol Main Valve)

**Pressure Ratings** (Recommended Maximum Pressure - psi)

<table>
<thead>
<tr>
<th>Valve Body &amp; Cover</th>
<th>Pressure Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flanged</td>
</tr>
<tr>
<td>Grade</td>
<td>Material</td>
</tr>
<tr>
<td>ASTM A536</td>
<td>Ductile Iron</td>
</tr>
<tr>
<td>ASTM A216-WCB</td>
<td>Cast Steel</td>
</tr>
<tr>
<td>UNS 87850</td>
<td>Bronze</td>
</tr>
</tbody>
</table>

Note: * ANSI standards are for flange dimensions only. Flanged valves are available faced but not drilled. *Valves for higher pressure are available; consult factory for details.

**Materials**

<table>
<thead>
<tr>
<th>Component</th>
<th>Standard Material Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body &amp; Cover</td>
<td>Ductile Iron, Cast Steel, Bronze</td>
</tr>
<tr>
<td>Available Sizes</td>
<td></td>
</tr>
<tr>
<td>3&quot; - 48&quot;</td>
<td>3&quot; - 16&quot;</td>
</tr>
<tr>
<td>80 - 1200 mm</td>
<td>80 - 400 mm</td>
</tr>
<tr>
<td>Disc Retainer &amp; Diaphragm Washer</td>
<td></td>
</tr>
<tr>
<td>Cast Iron</td>
<td>Cast Steel, Bronze</td>
</tr>
<tr>
<td>Trim: Disc Guide, Seal &amp; Cover Bearing</td>
<td>Stainless Steel is Optional</td>
</tr>
<tr>
<td>Disc</td>
<td>Buna-N® Rubber</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>Nylon Reinforced Buna-N® Rubber</td>
</tr>
<tr>
<td>Stem, Nut &amp; Spring</td>
<td>Stainless Steel</td>
</tr>
</tbody>
</table>

For material options not listed, consult factory. Cla-Val manufactures valves in more than 50 different alloys.

**Model 658-01 Dimensions** (In Inches)

<table>
<thead>
<tr>
<th>Valve Size (Inches)</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 150 ANSI</td>
<td>10.25</td>
<td>13.88</td>
<td>17.75</td>
<td>21.38</td>
<td>26.00</td>
<td>30.00</td>
<td>34.25</td>
<td>35.00</td>
<td>42.12</td>
<td>48.00</td>
<td>48.00</td>
<td>63.25</td>
<td>65.00</td>
<td>88.0</td>
</tr>
<tr>
<td>AA 300 ANSI</td>
<td>11.00</td>
<td>14.50</td>
<td>18.62</td>
<td>22.38</td>
<td>27.38</td>
<td>31.50</td>
<td>35.75</td>
<td>36.62</td>
<td>43.63</td>
<td>49.62</td>
<td>49.75</td>
<td>63.75</td>
<td>67.00</td>
<td>90.62</td>
</tr>
<tr>
<td>B Diameter</td>
<td>6.62</td>
<td>9.12</td>
<td>11.50</td>
<td>15.75</td>
<td>20.00</td>
<td>23.62</td>
<td>27.47</td>
<td>28.00</td>
<td>35.44</td>
<td>35.44</td>
<td>35.44</td>
<td>53.19</td>
<td>56.00</td>
<td>66.00</td>
</tr>
<tr>
<td>C Maximum</td>
<td>7.00</td>
<td>8.62</td>
<td>11.62</td>
<td>15.00</td>
<td>17.88</td>
<td>21.00</td>
<td>20.88</td>
<td>25.75</td>
<td>25.00</td>
<td>31.50</td>
<td>31.50</td>
<td>43.94</td>
<td>54.75</td>
<td>59.00</td>
</tr>
<tr>
<td>D 150 ANSI</td>
<td>—</td>
<td>6.94</td>
<td>8.88</td>
<td>10.69</td>
<td>CF*</td>
<td>17.00</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>21.06</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>DD 300 ANSI</td>
<td>—</td>
<td>7.25</td>
<td>9.38</td>
<td>11.09</td>
<td>CF*</td>
<td>17.75</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>E 150 ANSI</td>
<td>—</td>
<td>5.50</td>
<td>6.75</td>
<td>7.25</td>
<td>CF*</td>
<td>13.75</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>15.94</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>EE 300 ANSI</td>
<td>—</td>
<td>5.81</td>
<td>7.25</td>
<td>7.75</td>
<td>CF*</td>
<td>14.75</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>F 150 ANSI</td>
<td>3.75</td>
<td>4.50</td>
<td>5.50</td>
<td>6.75</td>
<td>8.00</td>
<td>9.50</td>
<td>11.00</td>
<td>11.75</td>
<td>15.68</td>
<td>14.56</td>
<td>17.00</td>
<td>19.88</td>
<td>25.50</td>
<td>34.00</td>
</tr>
<tr>
<td>FF 300 ANSI</td>
<td>4.12</td>
<td>5.00</td>
<td>6.25</td>
<td>7.50</td>
<td>8.75</td>
<td>10.25</td>
<td>11.50</td>
<td>12.75</td>
<td>15.88</td>
<td>16.06</td>
<td>19.00</td>
<td>22.00</td>
<td>27.50</td>
<td>38.50</td>
</tr>
<tr>
<td>H NPT Body Tapping</td>
<td>0.375</td>
<td>0.50</td>
<td>0.75</td>
<td>0.75</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td>J NPT Cover Center Plug</td>
<td>0.50</td>
<td>0.50</td>
<td>0.75</td>
<td>0.75</td>
<td>1.00</td>
<td>1.00</td>
<td>1.25</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>K NPT Cover Tapping</td>
<td>0.375</td>
<td>0.50</td>
<td>0.75</td>
<td>0.75</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Stem Travel</td>
<td>0.60</td>
<td>0.80</td>
<td>1.10</td>
<td>1.70</td>
<td>2.30</td>
<td>2.80</td>
<td>3.40</td>
<td>4.50</td>
<td>4.50</td>
<td>4.50</td>
<td>4.50</td>
<td>6.50</td>
<td>7.50</td>
<td>8.50</td>
</tr>
<tr>
<td>Approx. Ship Weight (lbs)</td>
<td>45</td>
<td>85</td>
<td>195</td>
<td>330</td>
<td>625</td>
<td>900</td>
<td>1250</td>
<td>1380</td>
<td>2365</td>
<td>2551</td>
<td>2733</td>
<td>6500</td>
<td>8545</td>
<td>13100</td>
</tr>
<tr>
<td>Approx. X Pivot System</td>
<td>13</td>
<td>15</td>
<td>27</td>
<td>30</td>
<td>33</td>
<td>36</td>
<td>36</td>
<td>41</td>
<td>40</td>
<td>46</td>
<td>55</td>
<td>68</td>
<td>79</td>
<td>86</td>
</tr>
<tr>
<td>Approx. Y Pivot System</td>
<td>10</td>
<td>11</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>26</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>39</td>
<td>40</td>
<td>47</td>
</tr>
<tr>
<td>Approx. Z Pivot System</td>
<td>10</td>
<td>11</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>26</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>39</td>
<td>42</td>
<td>49</td>
</tr>
</tbody>
</table>

*Consult Factory

For sizes 18 through 36-inches, use the 650-66 E-Sheet
**Model 658-01 Metric Dimensions** (Uses 100-20 Hytrol Main Valve)

![Model 100-20 Reduced Port Hytrol Main Valve]

Model 658-01 Dimensions (In mm)

<table>
<thead>
<tr>
<th>Valve Size (mm)</th>
<th>80</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>450</th>
<th>500</th>
<th>600</th>
<th>750</th>
<th>900</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 150 ANSI</td>
<td>260</td>
<td>350</td>
<td>451</td>
<td>543</td>
<td>660</td>
<td>762</td>
<td>870</td>
<td>889</td>
<td>1070</td>
<td>1219</td>
<td>1219</td>
<td>1607</td>
<td>1651</td>
<td>2235</td>
</tr>
<tr>
<td>AA 300 ANSI</td>
<td>279</td>
<td>368</td>
<td>473</td>
<td>568</td>
<td>695</td>
<td>800</td>
<td>908</td>
<td>930</td>
<td>1108</td>
<td>1260</td>
<td>1263</td>
<td>1619</td>
<td>1702</td>
<td>2302</td>
</tr>
<tr>
<td>B Diameter</td>
<td>168</td>
<td>232</td>
<td>292</td>
<td>400</td>
<td>508</td>
<td>600</td>
<td>698</td>
<td>711</td>
<td>900</td>
<td>900</td>
<td>900</td>
<td>1351</td>
<td>1422</td>
<td>1676</td>
</tr>
<tr>
<td>C Maximum</td>
<td>178</td>
<td>219</td>
<td>295</td>
<td>381</td>
<td>454</td>
<td>533</td>
<td>530</td>
<td>854</td>
<td>800</td>
<td>800</td>
<td>1116</td>
<td>1391</td>
<td>1489</td>
<td></td>
</tr>
<tr>
<td>D 150 ANSI</td>
<td>176</td>
<td>226</td>
<td>272</td>
<td>342</td>
<td>432</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>535</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>DD 300 ANSI</td>
<td>184</td>
<td>238</td>
<td>284</td>
<td>CF*</td>
<td>451</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>405</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>E 150 ANSI</td>
<td>140</td>
<td>171</td>
<td>164</td>
<td>CF*</td>
<td>349</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>405</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>EE 300 ANSI</td>
<td>146</td>
<td>184</td>
<td>197</td>
<td>CF*</td>
<td>368</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>CF*</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>F 150 ANSI</td>
<td>95</td>
<td>114</td>
<td>140</td>
<td>171</td>
<td>203</td>
<td>241</td>
<td>279</td>
<td>289</td>
<td>403</td>
<td>370</td>
<td>432</td>
<td>505</td>
<td>648</td>
<td>864</td>
</tr>
<tr>
<td>FF 300 ANSI</td>
<td>105</td>
<td>127</td>
<td>159</td>
<td>191</td>
<td>222</td>
<td>260</td>
<td>292</td>
<td>324</td>
<td>403</td>
<td>408</td>
<td>483</td>
<td>559</td>
<td>699</td>
<td>978</td>
</tr>
<tr>
<td>H NPT Body Tapping</td>
<td>0.375</td>
<td>0.50</td>
<td>0.75</td>
<td>0.75</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td>J NPT Cover Center Plug</td>
<td>0.50</td>
<td>0.50</td>
<td>0.75</td>
<td>0.75</td>
<td>1.00</td>
<td>1.00</td>
<td>1.25</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>K NPT Cover Tapping</td>
<td>0.375</td>
<td>0.50</td>
<td>0.75</td>
<td>0.75</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Stem Travel</td>
<td>15</td>
<td>20</td>
<td>28</td>
<td>43</td>
<td>58</td>
<td>71</td>
<td>86</td>
<td>86</td>
<td>114</td>
<td>114</td>
<td>114</td>
<td>165</td>
<td>165</td>
<td>216</td>
</tr>
<tr>
<td>Approx. Ship Weight (lbs)</td>
<td>20</td>
<td>39</td>
<td>89</td>
<td>150</td>
<td>284</td>
<td>409</td>
<td>568</td>
<td>627</td>
<td>681</td>
<td>1157</td>
<td>1249</td>
<td>2951</td>
<td>3876</td>
<td>5942</td>
</tr>
<tr>
<td>Approx. X Pilot System</td>
<td>331</td>
<td>381</td>
<td>486</td>
<td>762</td>
<td>839</td>
<td>915</td>
<td>915</td>
<td>1042</td>
<td>1016</td>
<td>1169</td>
<td>1397</td>
<td>1728</td>
<td>2007</td>
<td>2185</td>
</tr>
<tr>
<td>Approx. Y Pilot System</td>
<td>254</td>
<td>280</td>
<td>458</td>
<td>508</td>
<td>559</td>
<td>610</td>
<td>661</td>
<td>661</td>
<td>762</td>
<td>762</td>
<td>762</td>
<td>991</td>
<td>1016</td>
<td>1194</td>
</tr>
<tr>
<td>Approx. Z Pilot System</td>
<td>254</td>
<td>280</td>
<td>458</td>
<td>508</td>
<td>559</td>
<td>610</td>
<td>661</td>
<td>661</td>
<td>762</td>
<td>762</td>
<td>762</td>
<td>991</td>
<td>1067</td>
<td>1245</td>
</tr>
</tbody>
</table>

*Consult Factory For sizes 450 through 1200mm, use 690-66 E-Sheet*
# Valve Selection

<table>
<thead>
<tr>
<th>100-20 Pattern: Globe (G), Angle (A), End Connections: Flanged (F)</th>
<th>Indicate Available Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches</td>
<td>3</td>
</tr>
<tr>
<td>mm</td>
<td>80</td>
</tr>
</tbody>
</table>

## Basic Valve 100-20


## Suggested Flow (gpm)

- **Maximum**: 260, 580, 1025, 2300, 4100, 6400, 9230, 9230, 16500, 16500, 28000, 42000, 57000, 57000
- **Maximum Surge**: 440, 990, 1760, 3970, 7050, 11000, 15900, 15900, 28200, 28200, 28200, 56500, 67000, 90000, 90000

## Suggested Flow (Liters/Sec)

- **Maximum**: 16, 37, 65, 145, 258, 403, 581, 581, 1040, 1040, 1040, 1764, 2115, 2115, 2115
- **Maximum Surge**: 28, 62, 111, 250, 444, 693, 1002, 1002, 1777, 1777, 1777, 3560, 3700, 3700, 3700

## Adjustment Ranges

- **Temperature Range**: Water: to 180°F (82°C)
- **Materials**: Standard Pilot System Materials
  - Pilot Control: Low Lead Bronze
  - Trim: Stainless Steel Type 303
  - Rubber: Buna-N® Synthetic Rubber
  - Tubing & Fittings: Copper and Bronze

## Epoxy Coating - suffix KC

- NSF/ANSI 61 Fusion Bonded Epoxy Coating

## Dura-Kleen® Stem - suffix KD

- Fluted design prevents dissolved minerals build-up on the stem

## LFS Trim

- Designed to regulate precisely and smoothly at typical flow rates as well as lower than the industry standard of 1 fps, without decreasing the valve’s capacity

---

**When Ordering, Specify:**

1. Catalog No. 658-01
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Threaded or Flanged
6. Trim Material
7. Energized or De-energized to Open Main Valve
8. Adjustment Range
9. Desired Options
10. Electrical Selection
11. When Vertically Installed

---

**Main Valve Options**

- **EPDM Rubber Parts**
  - Optional diaphragm, disc and o-ring fabricated with EPDM synthetic rubber
- **Viton® Rubber Parts - suffix KB**
  - Optional diaphragm, disc and o-ring fabricated with Viton® synthetic rubber
- **Epoxy Coating - suffix KC**
  - NSF/ANSI 61 Fusion Bonded Epoxy Coating
- **Dura-Kleen® Stem - suffix KD**
  - Fluted design prevents dissolved minerals build-up on the stem
- **LFS Trim**
  - Designed to regulate precisely and smoothly at typical flow rates as well as lower than the industry standard of 1 fps, without decreasing the valve’s capacity

---

**Pilot System Specifications**

- **Adjustment Ranges**
  - 0 to 75 psi Max.
  - 20 to 105 psi
  - 20 to 200 psi *
  - 100 to 300 psi

*Supplied unless otherwise specified. Other ranges are available, please consult factory.

- **Temperature Range**: Water: to 180°F (82°C)
- **Materials**
  - Standard Pilot System Materials
    - Pilot Control: Low Lead Bronze
    - Trim: Stainless Steel Type 303
    - Rubber: Buna-N® Synthetic Rubber
    - Tubing & Fittings: Copper and Bronze

## Optional Pilot System Materials

- Pilot Systems are available with optional Aluminum, Stainless Steel or Monel materials.

## Electrical Ratings:

- **Voltage**: 24, 48, 120, 240, 480 – 60 Hz. VAC
- **6, 12, 24, 120, 240 VDC**