VALVES WITH BALL SHUTTER

For refrigeration plants that use:
HFC, HFO, HC refrigerants
APPLICATIONS

The 2-ways valves with ball shutter illustrated in this leaflet are designed for installation on commercial refrigeration systems and on civil and industrial air conditioning plants that use the following refrigerant fluids:

- HFC (R134a, R32, R404A, R407C, R410A, R507)
- HFO and HFO/HFC mixture (R1234yf, R1234ze, R448A, R449A, R450A, R452A, R452B, R454B, R513A)
- HC (R290, R600, R600a, R1270) belonging to Group 1 and 2, as defined in Article 13, Chapter 1, Point (a) and (b) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.

For specific applications with refrigerant fluids not listed above, please contact Castel Technical Department.

CONSTRUCTION

The specific design of Castel valves with ball shutter:
- ensures the internal pressure equilibrium when the valve is closed,
- permits the two-directional flow of the refrigerant
- prevents any risk of ejection or explosion of the spindle.

The electric welding of the body and the seal gaskets, assembled on the spindle, ensure perfect hermetic seal of the valve.

Valves with ball shutter are available in the following two types:
- Valves in series 6570N – 6590N, full port, without access fitting.
- Valves in series 6570N/A – 6590N/A, full port, with access fitting. These valves are equipped with mechanism 8395/A3 and cap 8392/A.

The main parts of the valves with ball shutter are made with the following materials:

- Hot forged brass EN 12420 – CW 617N for the body
- Hot forged brass EN 12420 – CW 617N, chromium plated, for the ball
- Copper pipe EN 12735-1 – Cu--DHP for solder connections
- Steel, with proper surface protection, for the spindle.
- Hydrogenated nitrile butadiene rubber [HNBR] for outlet seal gaskets.
- P.T.F.E. for the ball seat gaskets
- Hot forged brass EN 12420 – CW 617N for the protective cap of the spindle,

INSTALLATION

The valves with ball shutter can be installed in all sections of a refrigerating system, in compliance with the limits and capacities indicated in the respective tables. Instead the first table shows the following functional characteristics of a valve with ball shutter.

- PS
- TS
- Kv factor

Brazing of the valves with ball shutter with solder connections should be carried out with care, using a low melting point filler material [min. 5% Ag]. It is important to avoid direct contact between the torch flame and the valve body, which could be damaged and compromise the proper functioning of the entire valve.
## General characteristics

<table>
<thead>
<tr>
<th>Catalogue Number</th>
<th>Connections without access fitting</th>
<th>Connections with access fitting</th>
<th>Ball Port Ø (mm)</th>
<th>Kv Factor (m³/h)</th>
<th>PS [bar]</th>
<th>TS [°C]</th>
<th>TA [°C]</th>
<th>Risk Category according to PED Recast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ø [in.]</td>
<td>Ø [mm]</td>
<td></td>
<td></td>
<td></td>
<td>min.</td>
<td>max.</td>
<td>min.</td>
</tr>
<tr>
<td>6570N/6</td>
<td>–</td>
<td>6</td>
<td>0,8</td>
<td></td>
<td>0,8</td>
<td>–</td>
<td>–</td>
<td>0,8</td>
</tr>
<tr>
<td>6570N/2</td>
<td>1/4&quot;</td>
<td>–</td>
<td>3</td>
<td></td>
<td>3</td>
<td>–</td>
<td>–</td>
<td>3</td>
</tr>
<tr>
<td>6570N/3</td>
<td>3/8&quot;</td>
<td>–</td>
<td>5</td>
<td></td>
<td>5</td>
<td>–</td>
<td>–</td>
<td>5</td>
</tr>
<tr>
<td>6570N/10</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td></td>
<td>17</td>
<td>–</td>
<td>–</td>
<td>17</td>
</tr>
<tr>
<td>6570N/15</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td></td>
<td>17</td>
<td>–</td>
<td>–</td>
<td>17</td>
</tr>
<tr>
<td>6570N/5</td>
<td>7/8&quot;</td>
<td>22</td>
<td>29</td>
<td></td>
<td>29</td>
<td>–</td>
<td>–</td>
<td>29</td>
</tr>
<tr>
<td>6570N/7</td>
<td>1.1/8&quot;</td>
<td>–</td>
<td>51</td>
<td></td>
<td>51</td>
<td>–</td>
<td>–</td>
<td>51</td>
</tr>
<tr>
<td>6570N/9</td>
<td>1.3/8&quot;</td>
<td>35</td>
<td>86</td>
<td></td>
<td>86</td>
<td>–</td>
<td>–</td>
<td>86</td>
</tr>
<tr>
<td>6570N/11</td>
<td>1.5/8&quot;</td>
<td>38</td>
<td>117</td>
<td></td>
<td>117</td>
<td>–</td>
<td>–</td>
<td>117</td>
</tr>
<tr>
<td>6570N/13</td>
<td>2.1/8&quot;</td>
<td>54</td>
<td>214</td>
<td></td>
<td>214</td>
<td>–</td>
<td>–</td>
<td>214</td>
</tr>
<tr>
<td>6570N/17</td>
<td>2.5/8&quot;</td>
<td>–</td>
<td>380</td>
<td></td>
<td>380</td>
<td>–</td>
<td>–</td>
<td>380</td>
</tr>
<tr>
<td>6590N/17</td>
<td>3&quot;</td>
<td>76</td>
<td>550</td>
<td></td>
<td>550</td>
<td>–</td>
<td>–</td>
<td>550</td>
</tr>
<tr>
<td>6590N/19</td>
<td>3.1/8&quot;</td>
<td>80</td>
<td>2470</td>
<td></td>
<td>2470</td>
<td>–</td>
<td>–</td>
<td>2470</td>
</tr>
<tr>
<td>6590N/21</td>
<td>3.1/2&quot;</td>
<td>89</td>
<td>356</td>
<td></td>
<td>356</td>
<td>–</td>
<td>–</td>
<td>356</td>
</tr>
<tr>
<td>6590N/23</td>
<td>3.5/8&quot;</td>
<td>92</td>
<td>–</td>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

## Dimensions and weights

<table>
<thead>
<tr>
<th>Catalogue Number</th>
<th>Dimensions [mm]</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H</td>
<td>H₁</td>
</tr>
<tr>
<td>6570N/6</td>
<td>48</td>
<td>15</td>
</tr>
<tr>
<td>6570N/2</td>
<td>48</td>
<td>15</td>
</tr>
<tr>
<td>6570N/3</td>
<td>55</td>
<td>19</td>
</tr>
<tr>
<td>6570N/5</td>
<td>55</td>
<td>19</td>
</tr>
<tr>
<td>6570N/7</td>
<td>55</td>
<td>19</td>
</tr>
<tr>
<td>6570N/9</td>
<td>79</td>
<td>27</td>
</tr>
<tr>
<td>6570N/11</td>
<td>117</td>
<td>37</td>
</tr>
<tr>
<td>6570N/13</td>
<td>127</td>
<td>44</td>
</tr>
<tr>
<td>6570N/17</td>
<td>148</td>
<td>54</td>
</tr>
<tr>
<td>6590N/17</td>
<td>150</td>
<td>55</td>
</tr>
<tr>
<td>6590N/21</td>
<td>186,5</td>
<td>70</td>
</tr>
<tr>
<td>6590N/23</td>
<td>195</td>
<td>75</td>
</tr>
<tr>
<td>6590N/25</td>
<td>150</td>
<td>55</td>
</tr>
<tr>
<td>6590N/27</td>
<td>186,5</td>
<td>70</td>
</tr>
<tr>
<td>6590N/29</td>
<td>195</td>
<td>75</td>
</tr>
<tr>
<td>Catalogue Number</td>
<td>R134a</td>
<td>R32</td>
</tr>
<tr>
<td>------------------</td>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>6570N/M6</td>
<td>6570N/M6A</td>
<td>13.6</td>
</tr>
<tr>
<td>6570N/2</td>
<td>6570N/2A</td>
<td>51</td>
</tr>
<tr>
<td>6570N/3</td>
<td>6570N/3A</td>
<td>85</td>
</tr>
<tr>
<td>6570N/M10</td>
<td>6570N/M10A</td>
<td>289</td>
</tr>
<tr>
<td>6570N/M12</td>
<td>6570N/M12A</td>
<td>493</td>
</tr>
<tr>
<td>6570N/4</td>
<td>6570N/4A</td>
<td>867</td>
</tr>
<tr>
<td>6590N/11</td>
<td>6590N/11A</td>
<td>1442</td>
</tr>
<tr>
<td>6590N/12</td>
<td>6590N/12A</td>
<td>1989</td>
</tr>
<tr>
<td>6590N/13</td>
<td>6590N/13A</td>
<td>3638</td>
</tr>
<tr>
<td>6590N/17</td>
<td>6590N/17A</td>
<td>12070</td>
</tr>
</tbody>
</table>

**Refrigerant flow capacity of liquid line [kW]**
### Refrigerant flow capacity of suction line [kW]

<table>
<thead>
<tr>
<th>Catalogue Number</th>
<th>R134a</th>
<th>R32</th>
<th>R404A</th>
<th>R407C</th>
<th>R410A</th>
<th>R507</th>
<th>R1234yf</th>
<th>R1234ze</th>
<th>R448A</th>
<th>R450A</th>
<th>R452A</th>
<th>R452B</th>
<th>R454B</th>
<th>R513A</th>
<th>R290</th>
<th>R600</th>
<th>R600a</th>
<th>R1270</th>
</tr>
</thead>
<tbody>
<tr>
<td>6570N/M6, 6570N/M6A</td>
<td>1,5</td>
<td>3,4</td>
<td>1,8</td>
<td>1,8</td>
<td>2,6</td>
<td>1,8</td>
<td>1,2</td>
<td>1,1</td>
<td>1,9</td>
<td>1,8</td>
<td>1,3</td>
<td>1,7</td>
<td>2,8</td>
<td>2,8</td>
<td>1,4</td>
<td>2,4</td>
<td>1,0</td>
<td>1,3</td>
</tr>
<tr>
<td>6570N/2, 6570N/2A</td>
<td>5</td>
<td>12,8</td>
<td>7</td>
<td>7</td>
<td>10</td>
<td>7</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>10</td>
<td>11</td>
<td>5</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>6570N/3, 6570N/3A</td>
<td>9</td>
<td>21</td>
<td>11</td>
<td>11</td>
<td>17</td>
<td>11</td>
<td>7</td>
<td>7</td>
<td>12</td>
<td>11</td>
<td>8</td>
<td>11</td>
<td>17</td>
<td>10</td>
<td>9</td>
<td>6</td>
<td>8</td>
<td>17</td>
</tr>
</tbody>
</table>

### Refrigerant flow capacity of hot gas line [kW]

<table>
<thead>
<tr>
<th>Catalogue Number</th>
<th>R134a</th>
<th>R32</th>
<th>R404A</th>
<th>R407C</th>
<th>R410A</th>
<th>R507</th>
<th>R1234yf</th>
<th>R1234ze</th>
<th>R448A</th>
<th>R450A</th>
<th>R452A</th>
<th>R452B</th>
<th>R454B</th>
<th>R513A</th>
<th>R290</th>
<th>R600</th>
<th>R600a</th>
<th>R1270</th>
</tr>
</thead>
<tbody>
<tr>
<td>6570N/M6, 6570N/M6A</td>
<td>6,8</td>
<td>14,5</td>
<td>7,7</td>
<td>9,5</td>
<td>10,9</td>
<td>7,6</td>
<td>5,3</td>
<td>5,5</td>
<td>9,4</td>
<td>8,6</td>
<td>6,1</td>
<td>8,0</td>
<td>12,2</td>
<td>12,3</td>
<td>6,5</td>
<td>10,2</td>
<td>5,2</td>
<td>6,0</td>
</tr>
<tr>
<td>6570N/2, 6570N/2A</td>
<td>93</td>
<td>217</td>
<td>112</td>
<td>116</td>
<td>168</td>
<td>114</td>
<td>75</td>
<td>72</td>
<td>122</td>
<td>112</td>
<td>81</td>
<td>108</td>
<td>178</td>
<td>179</td>
<td>91</td>
<td>156</td>
<td>66</td>
<td>81</td>
</tr>
<tr>
<td>6570N/3, 6570N/3A</td>
<td>157</td>
<td>366</td>
<td>189</td>
<td>195</td>
<td>284</td>
<td>192</td>
<td>126</td>
<td>122</td>
<td>206</td>
<td>189</td>
<td>137</td>
<td>181</td>
<td>301</td>
<td>301</td>
<td>154</td>
<td>262</td>
<td>111</td>
<td>136</td>
</tr>
</tbody>
</table>

### Standard rating conditions according to AHRI Standard 760-2007

- **Condensing temperature**: 110 °F (43.3 °C)
- **Liquid temperature**: 100 °F (37.8 °C)
- **Subcooling**: 10 °R (5.5 °K)
- **Evaporating temperature**: 40 °F (4.4 °C)
- **Evaporator superheating**: 10 °R (5.5 °K)
- **Suction line temperature**: 45 °F (16.3 °C)
- **Suction superheating**: 15 °R (8.4 °K)
- **Discharge temperature**: 160 °F (71.1 °C)
- **Discharge temperature**: 160 °F (71.1 °C)
Castel has always been aware of environmental sustainability issues and gives its contribution to a cleaner environment, supplying the refrigeration and air conditioning industry with state-of-the-art and environment-friendly technology. With its commitment and steady research in its laboratories, Castel has developed a whole range of products using natural refrigerants, which reduce emissions to the minimum.

ISO 14001

CASTEL S.r.l.
Via Provinciale, 2-4 (C.P. 67) | 20060 Pessano con Bornago (MI) | Tel. +39 02.957021 | Fax +39 02.95741317 | info@castel.it | www.castel.it