M33H ISO
Full Bore Ball Valve
DN50 to DN200 Flanged ASME 150 and ASME 300

Description
The M33H ISO is a full bore, two-piece body, ball valve with floating ball and has ISO mounting as a main feature, the valve has a special ball which has received a surface hardening and also benefits from having reinforced PEEK seats.
The M33H ISO has been designed for use as an isolating valve, not a control valve, and can be installed in high temperature applications, such as steam up to 39 bar g and thermal oils. It is not recommended for gases applications.

Available types
- M33H2 ISO  Zinc plated carbon steel body, reinforced PEEK seats and ISO mounting.
- M33H3 ISO  Stainless steel body, reinforced PEEK seats and ISO mounting.

Standards
This product fully complies with the requirements of the Pressure Equipment Directive (PED) and carries the mark when so required.

Certification
This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Options
- Hollow ball for DN150 and DN200 sizes - Not API 6D rated.
- Self-venting ball.
- Ring joint flanges.
- Extended stems to allow full insulation.
- Operation by pneumatic actuator BVA300 series for all sizes.
- Operation by pneumatic actuator BVA300 series and declutchable gearbox.
- Operation by gearbox.
- Materials according to NACE MR0175
- Lockable handle.
- Relief valve.
- Drain plug.
Sizes and pipe connections
DN50, DN65, DN80, DN100, DN150 and DN200.
Standard flange ASME 150 and ASME 300 with face-to-face dimensions according to ASME B 16.10.

Technical data

<table>
<thead>
<tr>
<th>Flow characteristic</th>
<th>Modified linear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port</td>
<td>Full bore</td>
</tr>
</tbody>
</table>

Leakage test procedure to ISO 5208 (Rate A)/EN 12266-1 (Rate A) and BS 5351

Antistatic device
Complies with ISO 7121 and BS 5351

Pressure/temperature limits

The product must not be used in this region.
The product must only be used in this area for short periods of time *

A - B Flanged ASME 300.
A - C Flanged ASME 150.

Body design conditions

<table>
<thead>
<tr>
<th></th>
<th>ASME 150 and ASME 300</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMA Maximum allowable pressure</td>
<td>ASME 150 19 bar g @ 38 °C</td>
</tr>
<tr>
<td></td>
<td>ASME 300 51 bar g @ 38 °C</td>
</tr>
<tr>
<td>TMA Maximum allowable temperature</td>
<td>310 °C @ 0 bar g</td>
</tr>
<tr>
<td>Minimum allowable temperature</td>
<td>-29 °C</td>
</tr>
<tr>
<td>PMO Maximum operating pressure for saturated steam service</td>
<td>ASME 150 17.5 bar g</td>
</tr>
<tr>
<td></td>
<td>ASME 300 39 bar g</td>
</tr>
<tr>
<td>TMO Maximum operating temperature. For continuous operation, the maximum operating temperature is 260 °C</td>
<td>ASME 150 260 °C @ 11.7 bar g</td>
</tr>
<tr>
<td></td>
<td>ASME 300 260 °C @ 39 bar g</td>
</tr>
</tbody>
</table>

Minimum operating temperature
Note: For lower operating temperatures consult Spirax Sarco

-29 °C

ΔPMX Maximum differential pressure is limited to the PMO

Designed for a maximum cold hydraulic test pressure of:

<table>
<thead>
<tr>
<th></th>
<th>ASME 150</th>
<th>ASME 300</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>28.5 bar g</td>
<td>76.5 bar g</td>
</tr>
</tbody>
</table>
### Materials

**DN50 shown for the main illustration**

| No. | Part                      | Material                        |  
|-----|---------------------------|---------------------------------|---
| 1   | Body                      | ZM33H2 ISO Zinc plated carbon steel | ASTM A 216 WCB  
|     | M33H3 ISO Stainless steel | ASTM A 351 CF8M                |   
| 2   | Insert                    | ZMM33H2 ISO Zinc plated carbon steel | ASTM A 216 WCB  
|     | M33H3 ISO Stainless steel | ASTM A 351 CF8M                |   
| 3   | Solid ball                | Stainless steel                 | AISI 316 hardened surface  
| 4   | Seat                      | Reinforced PEEK                 |   
| 5   | Body gasket               | Graphite with metal insert      |   
| 6   | Stem                      | DN50 to DN80 Duplex stainless steel | AISI 318 LN  
|     | DN100 to DN200 Stainless steel | AISI 316/AISI 420              |   
| 7   | Lower stem seal           | Reinforced PEEK                 |   
| 8   | Stem ’O’ ring             | EPDM                            | Geothermal  
| 9   | Upper stem packing        | Graphite                        |   
| 10  | Separator                 | Zinc plated carbon steel        | SAE 1010  
| 11  | Stop plate with indicator for DN50 | Zinc plated carbon steel | SAE 1010  
| 12  | Belleville stem washer    | Carbon steel/stainless steel    | Geothermal  
| 13  | Gland nut                 | Zinc plated carbon steel        | SAE 1010/SAE 12L14    

*Materials continued on page 4*
# Materials

**DN50 shown for the main illustration**

<table>
<thead>
<tr>
<th>No.</th>
<th>Part</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Locking plate</td>
<td>Stainless steel AISI 304</td>
</tr>
<tr>
<td>15</td>
<td>Adaptor DN50</td>
<td>Zinc plated SG iron</td>
</tr>
<tr>
<td>16</td>
<td>Adaptor screw</td>
<td>Zinc plated carbon steel Grade 5</td>
</tr>
<tr>
<td>17</td>
<td>Handle</td>
<td>Zinc plated carbon steel SAE 1010</td>
</tr>
<tr>
<td>18</td>
<td>Grip</td>
<td>Vinyl Yellow</td>
</tr>
<tr>
<td>19</td>
<td>Stud</td>
<td>Zinc plated alloy steel A193-B7</td>
</tr>
<tr>
<td>20</td>
<td>Nut</td>
<td>Zinc plated carbon steel A194-2H</td>
</tr>
<tr>
<td>21</td>
<td>Nameplate</td>
<td>Stainless steel AISI 430</td>
</tr>
<tr>
<td>22</td>
<td>Stop screw</td>
<td>Zinc plated carbon steel SAE 12L14</td>
</tr>
<tr>
<td>23</td>
<td>Antistatic device ball</td>
<td>Stainless steel AISI 302</td>
</tr>
<tr>
<td>24</td>
<td>Drain plug (optional)</td>
<td>M33H2 ISO Carbon steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M33H3 ISO Stainless steel</td>
</tr>
<tr>
<td>25</td>
<td>Adaptor with indicator for DN65 to DN200</td>
<td>Zinc plated SG iron</td>
</tr>
<tr>
<td>26</td>
<td>Stop screw for DN65 to DN200</td>
<td>Zinc plated carbon steel SAE 12L14</td>
</tr>
<tr>
<td>27</td>
<td>Lifting eye (DN200 only) - not shown</td>
<td>Zinc plated carbon steel SAE 1010</td>
</tr>
<tr>
<td>28</td>
<td>Seat 'O' ring</td>
<td>EPDM Geothermal</td>
</tr>
</tbody>
</table>

**DN80 to DN200**

![Diagram of M33H ISO Full Bore Ball Valve]
## Dimensions/weights (approximate) in mm and kg

### Flanged ASME 150

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN50</td>
<td>178</td>
<td>275</td>
<td>140</td>
<td>152</td>
<td>50</td>
<td>70</td>
<td>10.8</td>
</tr>
<tr>
<td>DN65</td>
<td>190</td>
<td>415</td>
<td>160</td>
<td>178</td>
<td>63</td>
<td>82.5</td>
<td>16.2</td>
</tr>
<tr>
<td>DN80</td>
<td>203</td>
<td>515</td>
<td>168</td>
<td>191</td>
<td>74</td>
<td>87</td>
<td>20.0</td>
</tr>
<tr>
<td>DN100</td>
<td>229</td>
<td>700</td>
<td>202</td>
<td>229</td>
<td>100</td>
<td>106</td>
<td>35.3</td>
</tr>
<tr>
<td>DN150</td>
<td>394</td>
<td>850</td>
<td>283</td>
<td>279</td>
<td>150</td>
<td>197</td>
<td>80.2</td>
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<tr>
<td>DN200</td>
<td>457</td>
<td>950</td>
<td>317</td>
<td>343</td>
<td>201</td>
<td>228</td>
<td>140.0</td>
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</tbody>
</table>

### Flanged ASME 300

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN50</td>
<td>216</td>
<td>275</td>
<td>140</td>
<td>165</td>
<td>50</td>
<td>85.5</td>
<td>14.8</td>
</tr>
<tr>
<td>DN65</td>
<td>241</td>
<td>415</td>
<td>160</td>
<td>191</td>
<td>63</td>
<td>90.5</td>
<td>22.8</td>
</tr>
<tr>
<td>DN80</td>
<td>283</td>
<td>515</td>
<td>168</td>
<td>210</td>
<td>74</td>
<td>99</td>
<td>30.0</td>
</tr>
<tr>
<td>DN100</td>
<td>305</td>
<td>700</td>
<td>202</td>
<td>254</td>
<td>100</td>
<td>122</td>
<td>50.0</td>
</tr>
<tr>
<td>DN150</td>
<td>403</td>
<td>850</td>
<td>283</td>
<td>318</td>
<td>150</td>
<td>179</td>
<td>111.2</td>
</tr>
<tr>
<td>DN200</td>
<td>502</td>
<td>950</td>
<td>317</td>
<td>381</td>
<td>201</td>
<td>213</td>
<td>185.3</td>
</tr>
</tbody>
</table>

### Kv values

<table>
<thead>
<tr>
<th>DN</th>
<th>50</th>
<th>65</th>
<th>80</th>
<th>100</th>
<th>150</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kv</td>
<td>300</td>
<td>430</td>
<td>750</td>
<td>1030</td>
<td>2410</td>
<td>4800</td>
</tr>
</tbody>
</table>

For conversion:
- $C_v^{(UK)} = K_v \times 0.963$
- $C_v^{(US)} = K_v \times 1.156$

### Operating torque (N m)

<table>
<thead>
<tr>
<th>DN</th>
<th>50</th>
<th>65</th>
<th>80</th>
<th>100</th>
<th>150</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>N m</td>
<td>90</td>
<td>120</td>
<td>190</td>
<td>350</td>
<td>750</td>
<td>1150</td>
</tr>
</tbody>
</table>

The torque figures shown are for a valve at maximum operating pressure that is operated frequently. Valves that are subject to long static periods, may require greater break-out torque.
Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions supplied with the product.

Welding
Only the models that have connections designed for welding (SW, BW, Imperial Tube connections) should be welded. Valves with flanged connections must not be welded to avoid damages to the valve and/or injury to personnel.

How to order

<table>
<thead>
<tr>
<th>Specify:</th>
<th>Example: 1 off Spirax Sarco DN50 flanged ASME 150 M33H2 ISO ball valve.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>DN50, DN65, DN80, DN100, DN150, DN200</td>
</tr>
<tr>
<td>Model</td>
<td>M33H_ISO</td>
</tr>
<tr>
<td>Body material</td>
<td>2 = Carbon steel</td>
</tr>
<tr>
<td>Flanges</td>
<td>ASME 150 or ASME 300</td>
</tr>
</tbody>
</table>

Spare parts
The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares
Seats, body gasket, lower stem seal, upper stem packing, stem 'O' ring and seat 'O' ring set

How to order spares
Always order spares by using the description given in the column headed 'Available spares' and state the size and type of ball valve.

Example: 1 - Seats, body gasket, lower stem seal, upper stem packing, stem 'O' ring and seat 'O' ring set for a Spirax Sarco DN80 flanged ASME 150 M33H2 ISO ball valve.