Solenoid directional valves type DHE and DHER
direct operated, ISO 4401 size 06

Spool type, direct operated solenoid valves available in two different versions:
- DHE equipped with threaded type, high performance solenoids
- DHER as DHE but with solenoids certified according the North American standard CURUS

Configurations and construction
The valves are available in three or four way configurations and with two or three spool positions, see section 3. The spools ① are interchangeable and they are available in a wide range of hydraulic configurations, see section 3. The solenoids ② have two different executions for AC or DC power supply and they are composed by:
- wet type screwed tube with integrated manual override pin d (the tube are different for AC and DC power supply).
- AC and DC coils see section 4

The coils are interchangeable for the same type of power supply AC or DC and they can be easily replaced without tools (they are not interchangeable between DHE and DHER).
The coils are fully encapsulated with the following temperature classes:
- class H for DC coils
- class F for AC coils

The valve body ③ is 3 chamber type made by shell-moulding casting.

Options
The following optional devices are available for DHE and DHER:
- prolonged manual override protected with rubber cap for easy hand operation
- control devices of the valve switching time
- spool position monitor devices for safety applications

Surface mounting ISO 4401 size 06.
Max flow up to 80 l/min
Max pressure: 350 bar.

1 MODEL CODE

<table>
<thead>
<tr>
<th>DHE</th>
<th>063</th>
<th>1/2</th>
<th>/A- X</th>
<th>24</th>
<th>DC</th>
<th>**</th>
<th>/</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHER</td>
<td>067</td>
<td>**</td>
<td>DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DHE = AC and DC supply, threaded solenoids, high performances
DHER = as DHE but CURUS certified solenoids

Valve configuration, see table 3
61 = single solenoid, center plus external position, spring centered
63 = single solenoid, 2 external positions, spring offset
67 = single solenoid, center plus external position, spring offset
70 = double solenoid, 2 external positions, without springs
71 = double solenoid, 3 positions, spring centered
75 = double solenoid, 2 external positions, with detent

Voltage code, see section 5
00 = valve without coil
X = without connector
See note 2 at section 8 for available connectors.

Spool type, see table 3

Note: configurations 63 is available only with spools type 0/2, 1/2 and 2/2.
configurations 75 is available only with spools type 0/2, and 1/2.

Configuration

Spools - for intermediate passages, see tab. E01.
4 MAIN CHARACTERISTICS OF SDHE DIRECTIONAL VALVES

Assembly position / location Any position for all valves except for type - 070° (without springs) that must be installed with horizontal axis if operated by impulses
Subplate surface finishing Roughness index Rₐ flatness ratio 0.01/100 (ISO 1101)
Ambient temperature from -20°C to +70°C
Fluid Hydraulic oil as per DIN 51524 .... 535; for other fluids see section [1]
Recommended viscosity 15 ± 100 mm²/s at 40°C (ISO VG 15 ± 100)
Fluid contamination class ISO 19/16, achieved with in line filters at 25 μm value to flus ≥ 75 (recommended)
Flow direction As shown in the symbols of tables [2] and [3]
Operating pressure Ports P, A, B 350 bar; Port T 210 bar for DC version; 160 bar for AC version
Rated flow See diagrams Q/Δp at section [8]
Maximum flow 80 l/min, see operating limits at section [9]

4.1 Coils characteristics

<table>
<thead>
<tr>
<th>Insulation class</th>
<th>H (180°C) Due to the occurring surface temperatures of the solenoid coils, the European standards EN563 and EN982 must be taken into account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector protection degree DIN 43650</td>
<td>IP 65</td>
</tr>
<tr>
<td>Relative duty factor</td>
<td>100%</td>
</tr>
<tr>
<td>Supply voltage and frequency</td>
<td>See electric feature</td>
</tr>
<tr>
<td>Relative duty factor</td>
<td>100%</td>
</tr>
<tr>
<td>Connector protection degree DIN 43650</td>
<td>IP 65</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Supply voltage tolerance</td>
<td>± 10%</td>
</tr>
<tr>
<td>Certification (only for DHE)</td>
<td>CURUS North American Standard</td>
</tr>
</tbody>
</table>

5 NOTES

1 Options

- A = Solenoid mounted at side of port B (only for single solenoid valves). In standard versions, solenoid is mounted at side of port A.
- WP = prolonging manual override protected by rubber cap - see section E138.
- MV, MO = auxiliary hand lever positioned vertically (MV) or horizontally (MO). For available configuration and dimensions see table E138.

2 Type of electric/electronic connector DIN 43650, to be ordered separately

- SP-666 = standard connector IP-65, suitable for direct connection to electric supply source.
- SP-WPD/HS-DC = auxiliary hand lever positioned vertically (MV) or horizontally (MO). For available configuration and dimensions see table E138.

3 Spools

- Spools type 02, 1/2, 2/2 are only used for two position valves: single solenoid, type SDHE-063*2 and double solenoid type SDHE-075*2 (only spools 02 and 1/2).
- Spools type 0 and 3 are also available as 01 and 31 with restricted oil passages in central position, from user ports to tank.
- Spools type 1, 4, 5 and 8 are also available as 1/1, 4/8, 5/8 and 58. They are properly shaped to reduce water-hammer shocks during the switching.
- Spools type 1, 2, 28, 3 are also available as 1P, 1/2P, 3P, 8P to limit valve internal leakages.
- Other types of spool can be supplied on request.

6 ELECTRIC FEATURES

<table>
<thead>
<tr>
<th>External supply nominal voltage ± 10%</th>
<th>Voltage code</th>
<th>Type of connector</th>
<th>Power consumption (W)</th>
<th>Code of spare coil DHE</th>
<th>Code of spare coil DHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 DC</td>
<td>12 DC</td>
<td>SP-666 or SP-667</td>
<td>30 W</td>
<td>SP-COE-12DC/10</td>
<td>SP-COER-12DC/10</td>
</tr>
<tr>
<td>14 DC</td>
<td>14 DC</td>
<td>SP-666 or SP-667</td>
<td>30 W</td>
<td>SP-COE-14DC/10</td>
<td>SP-COER-14DC/10</td>
</tr>
<tr>
<td>24 DC</td>
<td>24 DC</td>
<td>SP-666 or SP-667</td>
<td>30 W</td>
<td>SP-COE-24DC/10</td>
<td>SP-COER-24DC/10</td>
</tr>
<tr>
<td>28 DC</td>
<td>28 DC</td>
<td>SP-666 or SP-667</td>
<td>30 W</td>
<td>SP-COE-28DC/10</td>
<td>SP-COER-28DC/10</td>
</tr>
<tr>
<td>48 DC</td>
<td>48 DC</td>
<td>SP-666 or SP-667</td>
<td>30 W</td>
<td>SP-COE-48DC/10</td>
<td>SP-COER-48DC/10</td>
</tr>
<tr>
<td>110 DC</td>
<td>110 DC</td>
<td>SP-666 or SP-667</td>
<td>30 W</td>
<td>SP-COE-110DC/10</td>
<td>SP-COER-110DC/10</td>
</tr>
<tr>
<td>125 DC</td>
<td>125 DC</td>
<td>SP-666 or SP-667</td>
<td>30 W</td>
<td>SP-COE-125DC/10</td>
<td>SP-COER-125DC/10</td>
</tr>
<tr>
<td>220 DC</td>
<td>220 DC</td>
<td>SP-666 or SP-667</td>
<td>30 W</td>
<td>SP-COE-220DC/10</td>
<td>SP-COER-220DC/10</td>
</tr>
<tr>
<td>110/50 AC</td>
<td>110/50/90 AC</td>
<td>SP-666 or SP-667</td>
<td>58 VA (3)</td>
<td>SP-COE-110/50/90AC/10</td>
<td>SP-COER-110/50/90AC/10</td>
</tr>
<tr>
<td>230/50 AC</td>
<td>230/50/90 AC</td>
<td>SP-666 or SP-667</td>
<td>58 VA (3)</td>
<td>SP-COE-230/50/90AC/10</td>
<td>SP-COER-230/50/90AC/10</td>
</tr>
<tr>
<td>115/60 AC</td>
<td>115/60 AC</td>
<td>SP-669</td>
<td>58 VA (3)</td>
<td>SP-COE-115/60AC</td>
<td>SP-COER-115/60AC</td>
</tr>
<tr>
<td>230/60 AC</td>
<td>230/60 AC</td>
<td>SP-669</td>
<td>58 VA (3)</td>
<td>SP-COE-230/60AC</td>
<td>SP-COER-230/60AC</td>
</tr>
<tr>
<td>110/50 AC - 120/60 AC</td>
<td>110 RC</td>
<td>SP-669</td>
<td>58 VA (3)</td>
<td>SP-COE-110RC</td>
<td>SP-COER-110RC</td>
</tr>
<tr>
<td>230/60 AC - 290/60 AC</td>
<td>230 RC</td>
<td>SP-669</td>
<td>58 VA (3)</td>
<td>SP-COE-230RC</td>
<td>SP-COER-230RC</td>
</tr>
</tbody>
</table>

(1) Coil can be supplied also with 60 Hz of voltage frequency; in this case the performances are reduced by 10 ± 15% and the power consumption is 52 VA.
(2) Average values based on tests performed at nominal hydraulic condition and ambient/coil temperature of 20°C.
(3) When solenoid is energized, the inrush current is approx 3 times the holding current. Inrush current values correspond to a power consumption of about 160 VA.

7 COILS WITH SPECIAL CONNECTORS

AMP Junior timer connector
Deutsch connector DT-04-2P
Lead Wire connection

Note: The above coils are available only for voltage supply 12, 14, 24 and 28 Vdc. For the characteristics refer to standard coils features - see sect. 8.
The diagrams have been obtained with warm solenoids and power supply at lowest value (Vnom - 10%). The curves refer to application with symmetrical flow through the valve (i.e., P→A and B→T). In case of asymmetric flow and if the valves have the devices for controlling the switching times the operating limits must be reduced.

Test conditions:
- 36 l/min; 150 bar
- nominal voltage
- 2 bar of counter pressure on port T
- mineral oil: ISO VG 46 at 50°C.

The elasticity of the hydraulic circuit and the variations of the hydraulic characteristics and temperature affect the response time.

The connectors must be ordered separately

<table>
<thead>
<tr>
<th>Valve</th>
<th>Switch-on AC</th>
<th>Switch-on DC</th>
<th>Switch-off</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHE</td>
<td>—</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>DHER-*/L1</td>
<td>—</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>DHER-*/L2</td>
<td>—</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>DHER-*/L3</td>
<td>—</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPPLY VOLTAGES</th>
<th>SP-666</th>
<th>SP-667</th>
<th>SP-669</th>
</tr>
</thead>
<tbody>
<tr>
<td>All voltages</td>
<td>24 AC</td>
<td>110 AC</td>
<td>110/50 AC</td>
</tr>
<tr>
<td>110 AC or DC</td>
<td>220 AC</td>
<td>230/50 AC</td>
<td></td>
</tr>
<tr>
<td>230/60 AC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**ISO 4401: 2005**

Mounting surface: 4401-03-02-0-05

- Fastening bolts: 4 socket head screws:
  - M5x30 class 12.9
- Tightening torque = 8 Nm
- Seals: 4 OR 108
- Ports P, A, B, T: \( \varnothing = 7.5 \text{ mm (max)} \)

**Options**

- Option /WP

**Overall dimensions** refer to valves with connectors type SP-666

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**14 MOUNTING SUBPLATES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Ports location</th>
<th>GAS Ports A-B-P-T</th>
<th>Ø Counterbore [mm]</th>
<th>Mass [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA-202</td>
<td>Ports A, B, P, T underneath;</td>
<td>3/8&quot;</td>
<td>3/8&quot;</td>
<td>1.2</td>
</tr>
<tr>
<td>BA-204</td>
<td>Ports P, T underneath; ports A, B on lateral side</td>
<td>3/8&quot;</td>
<td>25,5</td>
<td>1.8</td>
</tr>
<tr>
<td>BA-302</td>
<td>Ports A, B, P, T underneath</td>
<td>1/2&quot;</td>
<td>30</td>
<td>1.8</td>
</tr>
</tbody>
</table>

The subplates are supplied with 4 fastening bolts M5x50. Also available are multi-station subplates and modular subplates. For further details see table K280. 

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**Model**

- DHE-06(DC)
  - Mass: 1.75 kg
- DHE-07(DC)
  - Mass: 2 kg

- DHE-06(AC)
  - Mass: 1.6 kg
- DHE-07(AC)
  - Mass: 1.9 kg

- DHER-06(DC)
  - Mass: 1.75 kg
- DHER-07(DC)
  - Mass: 2 kg

- DHER-06(AC)
  - Mass: 1.6 kg
- DHER-07(AC)
  - Mass: 1.9 kg