Solenoid directional valves type DHI and DHU
direct operated, ISO 4401 size 06

DHI and DHU are spool type, three or four way, two or three position direct
operated solenoid valves designed to operate in oil hydraulic systems.
They are operated by wet and pressure sealed solenoid with manual overri-
de and with coils certified according the North American standard CURus:
- DHI for AC and DC supply;
- DHU for DC supply with improved performances.
Moving parts are protected, lubricated and cushioned in oil.
Shell-moulding casting machined by transfer lines and then cleaned by thermal
deburring.
Optimized flow paths largely cored with extrawide channels to tank for low
pressure drops.
Interchangeable spools available in a wide variety of configurations.
DHU valves can be supplied with optional devices for control of switch-
ing times.
Standard electric/electronic connectors able to satisfy the requirements of
modern machines for electric interfa-
ces characteristics.
Coils are fully encapsulated (class H) and are easily replaceable without aid
of tools.
Rugged execution suitable for outdoor use.
Surface mounting ISO 4401 size 06.
Max flow up to 60 l/min.
Max pressure: 350 bar.

1 MODELE CODE

DHI – 0 63 1/2 /A - X 24 DC ** */

Seals material:
omit for NBR (mineral oil & water glycol)
PE = FPM

Series number
Voltage code, see section [9]
00 = valve without coils
X = without connector
See note 2 at section [9] for available connec-
tors, to be ordered separately
Coils with special connectors, see section [9]
XJ = AMP Junior Timer connector
XK = Deutsch connector (only for DHU)
XS = Lead Wire connection

Options, see note 1 at section [9].

2 CONFIGURATIONS and SPOOLS
### 3 MAIN CHARACTERISTICS OF DHI AND DHU DIRECTIONAL VALVES

<table>
<thead>
<tr>
<th>Assembly position / location</th>
<th>Any position for all valves except for type - 0/7° (without springs) that must be installed with horizontal axis if operated by impulsive signals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subplate surface finishing</td>
<td>Roughness index Ra 0.4 - flatness ratio 0.01/100 (ISO 1101)</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>from -20°C to +70°C</td>
</tr>
<tr>
<td>Fluid</td>
<td>Hydraulic oil as per DIN 51524, ... 535; for other fluids see section [1]</td>
</tr>
<tr>
<td>Recommended viscosity</td>
<td>15 ± 100 mm³/s at 40°C (ISO VG 15 ± 100)</td>
</tr>
<tr>
<td>Fluid contamination class</td>
<td>ISO 4406: class 21/19/16, NAS 1638: class 10, in line filters of 25 μm (βμ≥2.75 recommended)</td>
</tr>
<tr>
<td>Fluid temperature</td>
<td>-30°C +80°C (standard seals and water glycol) -20°C +80°C (PE seals)</td>
</tr>
</tbody>
</table>

#### 4.1 Coils characteristics

- **Type of electric/electronic connector DIN 43650, EN ISO 13732-1 and EN ISO 4413 must be taken into account**
- **Connector protection degree DIN 43650 IP 65**
- **Supply voltage and frequency** See electric feature [4]
- **Relative duty factor** 100%
- **Supply voltage tolerance** ± 10%
- **Supply voltage and frequency** See electric feature [4]
- **Connector protection degree DIN 43650 IP 65**
- **Maximum flow** 60 l/min see operating limits at section [4]

#### 4 NOTES

**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** = Prolonged manual override protected by rubber cap - see section [4]

**SP-WPD/H** = Electronic connector which eliminates electric disturbances when solenoid valves are de-energized.

**F** = With proximity switch for monitoring spool position: see tab. E110.

**L1, L2, L3** = Device for switching time control, installed in the valve solenoid (only for DHU models).

For spools 4 and 4/8 only device L3 is available.

**MV, MO** = Auxiliary hand lever positioned vertically (MV) or horizontally (MO). For available configuration and dimensions see table E138.

#### 5 ELECTRIC FEATURES

<table>
<thead>
<tr>
<th>External supply nominal voltage</th>
<th>Voltage code</th>
<th>Type of connector</th>
<th>Power consumption (2)</th>
<th>Code of spare coil</th>
<th>Colour of coil label</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 DC</td>
<td>6 DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 DC</td>
<td>9 DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 DC</td>
<td>12 DC</td>
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<tr>
<td>14 DC</td>
<td>14 DC</td>
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<tr>
<td>18 DC</td>
<td>18 DC</td>
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<td></td>
<td></td>
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<tr>
<td>24 DC</td>
<td>24 DC</td>
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<tr>
<td>28 DC</td>
<td>28 DC</td>
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<tr>
<td>48 DC</td>
<td>48 DC</td>
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<tr>
<td>110 DC</td>
<td>110 DC</td>
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<td></td>
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<tr>
<td>125 DC</td>
<td>125 DC</td>
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<tr>
<td>220 DC</td>
<td>220 DC</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>240/40 AC</td>
<td>240/40 AC</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>48/60 AC</td>
<td>48/60 AC</td>
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<td></td>
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<tr>
<td>110/50/60 AC</td>
<td>110/50/60 AC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120/60 AC</td>
<td>120/60 AC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>230/50/60 AC</td>
<td>230/50/60 AC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110RAC</td>
<td>110RAC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>230RAC</td>
<td>230RAC</td>
<td></td>
<td></td>
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</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 55 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 105 VA.
**QAP Diagrams** based on mineral oil ISO VG 46 at 50°C

The diagrams have been obtained with warm solenoids and power supply at lowest value (V nom - 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.

**Operating Limits** based on mineral oil ISO VG 46 at 50°C

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.

**Switching Times** (average values in msec)

**Coils with Special Connectors**

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. 9.
**ISO 4401: 2005**  
Mounting surface: 4401-03-02-0-05  
Fastening bolts: 4 socket head screws M5x50 class 12.9  
Tightening torque = 8 Nm  
Seals: 4 OR 108  
Ports P,A,B,T: Ø = 7.5 mm (max).

**Masses:**  
- DHI-06: 1.5 kg  
- DHU-06: 1.5 kg  
- DHI-07: 1.8 kg  
- DHU-07: 1.8 kg

Overall dimensions refer to valves with connectors type 666

**Option /WP**

**Electrical Connectors According to DIN 43650**

- Connectors must be ordered separately.
- Connectors type 666, 667, 669
- Connectors 669 for DC supply  
- Connectors 666, 667 for AC supply

**Connector Wiring**

- **Supply Voltages**
  - 666: 24 V AC or DC  
  - 667: 24 V AC or DC  
  - 669: 110/60 V AC

**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>3.5</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.