Pneumatic operated directional valves
ISO 4401 sizes 06, 10, 16, 25 and 32

Pneumatic operated directional valves are spool type 3, three or four way, two or three position, designed to operate in oil hydraulic systems. Available with single or double pneumatic actuator 4 with manual override.

DH-0 = ISO 4401 size 06 interface: flow up to 50 l/min.
DK-1 = ISO 4401 size 10 interface: flow up to 160 l/min.
DPH-2 = ISO 4401 size 16 interface: flow up to 300 l/min.
DPH-3 = ISO 4401 size 25 interface: flow up to 700 l/min.
DPH-6 = ISO 4401 size 32 interface: flow up to 1000 l/min.

Max pressure:
- 350 bar for DH-0, DP-2, DP-3, DP-6
- 315 bar for DK-1

Min. recommended oil pressure on piloting line [bar] 4–12
Max recommended pneumatic pressure [bar] 2/12

Min/Max pneumatic pressure [bar] 2/12

Table E255-1/E

1 MODEL CODE

DH-0 8 1 3 /A ** /*

Series number

Options:
- only for valve with single actuator:
  - /A = Actuator device mounted on side of port B (for DH and DK).
  - /A = Actuator device mounted on side of port A of main body (for DPH)

- only for DP:
  - /D = internal drain
  - /E = external pressure
  - /H = adjustable chokes for controlling the main spool shifting time (meter-out to the pilot chambers of the main valve)
  - /H9 = adjustable chokes for controlling the main spool shifting time (meter-in to the pilot chambers of the main valve)
  - /R = pilot pressure generator on port P at 4 bar
  - /S = main spool stroke adjustment

2 HYDRAULIC CHARACTERISTICS

<table>
<thead>
<tr>
<th>Valve model</th>
<th>DH-0</th>
<th>DK-1</th>
<th>DPH-2</th>
<th>DPH-3</th>
<th>DPH-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max recommended flow [l/min]</td>
<td>50</td>
<td>160</td>
<td>300</td>
<td>700</td>
<td>1000</td>
</tr>
<tr>
<td>Max pressure on port P, A, B (also X for DP) [bar]</td>
<td>350</td>
<td>315</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max pressure on port T [bar]</td>
<td>100</td>
<td>210</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max pressure on port L and Y [bar]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>null pressure</td>
</tr>
<tr>
<td>Min. recommended oil pressure on piloting line [bar]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min/Max pneumatic pressure [bar]</td>
<td>2/12</td>
<td>2/12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Acting the actuator on port A, the hydraulic connections are P→B, A→T, except for spool type 4 and 5 where the connections are P→A, B→T.

By activating the actuator on side B of the pilot valve the hydraulic connections are P→A, B→T, except for spool type 4 and 5 where the connections are P→B, A→T.

By activating the actuator on side A of the pilot valve, opposite connections are performed. In the spring centered versions the spools are centered by the spring action when both the pilot chambers are unloaded.
3 MAIN CHARACTERISTICS OF PNEUMATIC OPERATED DIRECTIONAL VALVES

Assembly position / location
Any position except for valves type DH-090, DK-190, DP-*90 (without springs) that must be installed with their longitudinal axis horizontal.

Drain port Y must always be connected directly to tank except for version /D (internal drain).

Subplate surface finishing
Roughness index $R_s$, flatness ratio 0,01/100 (ISO 1101)

Ambient temperature
-20°C to + 70°C

Fluid
Hydraulic oil as per DIN 51524...535, for other fluids see section /L51879

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 and $ß_{25} \geq 75$ (recommended)

Fluid temperature
-20°C +60°C (standard and WG seals) -20°C +80°C (PE seals)

4 VALVE CONFIGURATION

<table>
<thead>
<tr>
<th>DH-081*</th>
<th>DK-181*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>X</td>
<td>M</td>
</tr>
<tr>
<td>P</td>
<td>T</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DH-081*/A</th>
<th>DK-181*/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>X</td>
<td>M</td>
</tr>
<tr>
<td>P</td>
<td>T</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DH-083*/2</th>
<th>DK-183*/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>X</td>
<td>M</td>
</tr>
<tr>
<td>P</td>
<td>T</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DH-085*/2</th>
<th>DK-185*/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>X</td>
<td>M</td>
</tr>
<tr>
<td>P</td>
<td>T</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DH-087*/2</th>
<th>DK-187*/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>X</td>
<td>M</td>
</tr>
<tr>
<td>P</td>
<td>T</td>
</tr>
</tbody>
</table>

Where the symbol doesn’t show the hydraulic connection (*), it depends by the central configuration of the spool, see table 9.

5 SPOOLS - for intermediate passages, see tab. E001

<table>
<thead>
<tr>
<th>DH-0</th>
<th>DK-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/2</td>
<td>1/2</td>
</tr>
<tr>
<td>5/2</td>
<td>7/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DP-2</th>
<th>DP-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/2</td>
<td>1/2</td>
</tr>
<tr>
<td>5/2</td>
<td>7/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DP-4</th>
<th>DP-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/2</td>
<td>1/2</td>
</tr>
<tr>
<td>5/2</td>
<td>7/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DP-6</th>
<th>DP-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/2</td>
<td>1/2</td>
</tr>
<tr>
<td>5/2</td>
<td>7/2</td>
</tr>
</tbody>
</table>

NOTES
- Spools type 0 and 3 are also available as 0/1 and 3/1, where in centre position oil passage from ports to tank are restricted;
- Spools type 1, 4 and 5 are also available as 1/1, 4/8 and 5/1 (not available for DP-6). They are properly shaped to reduce water-hammer shocks during the switching;
- Spool type 1, 3, 8 and 1/2 (only for DH-0 and DK-1) are available as 1P, 3P, 8P (only for DH-0) and 1/2P to limit valve leakage.
- On request, other type of spools are available.

6 QΔp DIAGRAMS

<table>
<thead>
<tr>
<th>DH-0</th>
<th>See note and diagrams on table E010 relating the DH* valve from which DH-0* are derivated</th>
</tr>
</thead>
<tbody>
<tr>
<td>DK-1</td>
<td>See note and diagrams on table E025 relating the DKE, DKER valve from which DK-1* are derivated</td>
</tr>
<tr>
<td>DPH-2</td>
<td>See note and diagrams on table E085 relating the DPH<em>2 valve from which DPH-2</em> are derivated</td>
</tr>
<tr>
<td>DPH-3</td>
<td>See note and diagrams on table E085 relating the DPH<em>3 valve from which DPH-3</em> are derivated</td>
</tr>
<tr>
<td>DPH-6</td>
<td>See note and diagrams on table E085 relating the DPH<em>6 valve from which DPH-6</em> are derivated</td>
</tr>
</tbody>
</table>
**DIMENSIONS OF PNEUMATIC OPERATED VALVES ISO 4401 SIZE 06 AND 10 [mm]**

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

- **P** = PRESSURE PORT  
- **A, B** = USE PORT  
- **T** = TANK PORT

For the max pressures on ports, see section (8)

**DH-08**
- Pilot pressure port G1/8"  
- Manual override

Mass: 1.2 Kg

Mounting subplates: see tab. E010

**ISO 4401: 2005**  
Mounting surface: 4401-05-04-0-05  
Fastening bolts: 4 socket head screws M6x40 class 12.9  
Tightening torque = 15 Nm  
Diameter of ports A, B, P, T: Ø = 11.2 mm (max)  
Seals: 5 OR 2050

- **P** = PRESSURE PORT  
- **A, B** = USE PORT  
- **T** = TANK PORT

For the max pressures on ports, see section (8)

**DK-18**
- Pilot pressure port G1/4"  
- Air bleed

Mass: 3.4 Kg

Mounting subplates: see tab. E025
DIMENSIONS OF PNEUMATIC OPERATED VALVES ISO 4401 SIZE 16, 25 AND 32 [mm]

**DPH-2**

P = PRESSURE PORT  
A, B = USE PORT  
T = TANK PORT  
X = EXTERNAL OIL PILOT PORT not used  
Y = DRAIN PORT

For the max pressures on ports, see section [3]

Stroke adjustment device for option /S

ISO 4401: 2005  
Mounting surface: 4401-07-07-0-05

Fastening bolts:  
4 socket head screws M10x50 class 12.9  
2 socket head screws M8x45 class 12.9

Tightening torque = 70 Nm  
Diameter of ports A, B, P, T: Ø = 20  
Diameter of ports X, Y: Ø = 7 mm  
Seals: 4 OR 130, 2 OR 2043

Mass: 11.5 Kg

**DPH-3**

P = PRESSURE PORT  
A, B = USE PORT  
T = TANK PORT  
X = EXTERNAL OIL PILOT PORT not used  
Y = DRAIN PORT

For the max pressures on ports, see section [3]

Stroke adjustment device for option /S

ISO 4401: 2005  
Mounting surface: 4401-08-08-0-05

Fastening bolts:  
6 socket head screws M12x60 class 12.9

Tightening torque = 125 Nm  
Diameter of ports A, B, P, T: Ø = 24  
Diameter of ports X, Y: Ø = 7 mm  
Seals: 4 OR 4112, 2 OR 3056

Mass: 16.7 Kg

**DPH-6**

P = PRESSURE PORT  
A, B = USE PORT  
T = TANK PORT  
X = EXTERNAL OIL PILOT PORT not used  
Y = DRAIN PORT

For the max pressures on ports, see section [3]

Stroke adjustment device for option /S

ISO 4401: 2005  
Mounting surface: 4401-10-09-0-05

Fastening bolts:  
6 socket head screws M20x80 class 12.9

Tightening torque = 600 Nm  
Diameter of ports A, B, P, T: Ø = 34 mm  
Diameter of ports X, Y: Ø = 7 mm  
Seals: 4 OR 144, 2 OR 3056

Mass: 39.5 Kg