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

Pneumatic operated directional valves are spool type 8, three or four way, two or three position, designed to operate in oil hydraulic systems. Available with single or double pneumatic actuator 9 with manual override.

DH-0 = ISO 4401 size 06, flow up to 50 l/min
DK-1 = ISO 4401 size 10, flow up to 160 l/min
DPH-2 = ISO 4401 size 16, flow up to 300 l/min
DPH-3 = ISO 4401 size 25, flow up to 600 l/min
DPH-4 = ISO 4401 size 25, flow up to 700 l/min
DPH-6 = ISO 4401 size 32, flow up to 1000 l/min

Max pressure:
- 350 bar for DH-0, DPH-2, DPH-3, DPH-4, DPH-6
- 315 bar for DK-1

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

Min. recommended oil pressure on piloting line [bar]:
- DH-0 = 4
- DK-1 = 5
- DPH-2 = 6
- DPH-3 = 7
- DPH-4 = 8
- DPH-6 = 9

Pilot pressure can be internal or external (/E) through port X. The device /R generates an additional pressure drop, in order to ensure the minimum pilot pressure, for correct operation of the valves with internal pilot.

Valve model
<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-4</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>600</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>350</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Max pressure on port T [bar]</td>
<td>100</td>
<td>-</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>null pressure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Min. recommended oil pressure on piloting line [bar]</td>
<td>2/12</td>
<td>2/12</td>
<td>2/12</td>
<td>2/12</td>
<td>2/12</td>
<td>2/12</td>
</tr>
<tr>
<td>Min/Max pneumatic pressure (1) [bar]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

| Operation | 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. |

(1) filtered and lubricated air
3 MAIN CHARACTERISTICS OF PNEUMATIC OPERATED DIRECTIONAL VALVES

| Assembly position / location | Any position except for valves type DH-090, DK-190, DPH-*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 Ra 0.4 - 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 4406 class 21/19/16 NAS 1638 class 10, in line filters of 25 μm (β25 >75 recommended) |
| Fluid temperature | -20°C +60°C (standard seals) -20°C +80°C (PE seals) |

4 CONFIGURATIONS and SPOOLS valves type DH-*, DK-*

<table>
<thead>
<tr>
<th>Configurations</th>
<th>Spools</th>
</tr>
</thead>
<tbody>
<tr>
<td>81</td>
<td>1 0 2</td>
</tr>
<tr>
<td>87</td>
<td>0 2</td>
</tr>
<tr>
<td>91</td>
<td>1 0 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. They are properly shaped to reduce water-hammer shocks during the switching;
- On request, other type of spools are available.

5 CONFIGURATIONS and SPOOLS valves type DPH-*

<table>
<thead>
<tr>
<th>Configurations</th>
<th>Spools</th>
</tr>
</thead>
<tbody>
<tr>
<td>81</td>
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</tr>
<tr>
<td>87</td>
<td>0 2</td>
</tr>
<tr>
<td>91</td>
<td>1 0 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 DPH-6). They are properly shaped to reduce water-hammer shocks during the switching;
- On request, other type of spools are available.

6 Q/Ap DIAGRAMS

| DH-0 | See note and diagrams on table E010 relating the DH* valve from which DH-0* are derivated |
| DK-1 | See note and diagrams on table E025 relating the DKE, DKER valve from which DK-1* are derivated |
| DPH-2 | See note and diagrams on table E085 relating the DPH*2 valve from which DP-2* are derivated |
| DPH-3 | See note and diagrams on table E085 relating the DPH*3 valve from which DP-3* are derivated |
| DPH-4 | See note and diagrams on table E085 relating the DPH*4 valve from which DP-4* are derivated |
| DPH-6 | See note and diagrams on table E085 relating the DPH*6 valve from which DP-6* are derivated |
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]

Mass: 1,2 Kg
1. Pilot pressure port G1/8*
2. Manual override

Mass: 1,6 Kg

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]

Mass: 3,4 Kg
1. Pilot pressure port G1/4*
3. Air bleed

Mass: 4,2 Kg
DPH-2

**ISO 4401: 2005**

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

Fastening bolts:
- 4 socket head screws M10x50 class 12.9
- 2 socket head screws M6x45 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

**Stroke adjustment device for option /S**

For the max pressures on ports, see section [8]

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DPH-3

**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

**Stroke adjustment device for option /S**

For the max pressures on ports, see section [8]

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DPH-4

- Pressure port: P
- Use port: A, B
- Tank port: T
- External oil pilot port: X
- Drain port: Y

For the max pressures on ports, see section [8]

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: 18 Kg

Stroke adjustment device for option /S

DPH-6

- Pressure port: P
- Use port: A, B
- Tank port: T
- External oil pilot port: X
- Drain port: Y

For the max pressures on ports, see section [8]

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

Stroke adjustment device for option /S

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