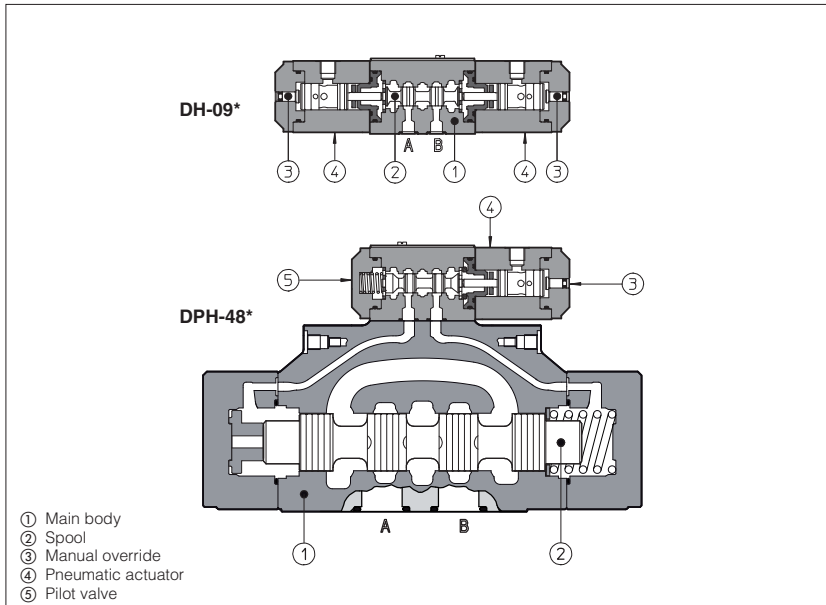


# Pneumatic operated directional valves

ISO 4401 sizes 06, 10, 16, 25 and 32



Pneumatic operated directional valves are spool type ②, 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, 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

## 1 MODEL CODE

<b>DH-0</b>	<b>8</b>	<b>1</b>	<b>3</b>	<b>/A</b>	<b>**</b>	<b>/*</b>
Directional control valve, size: <b>DH-0</b> = 06 <b>DK-1</b> = 10 <b>DPH-2</b> = 16 <b>DPH-3</b> = 25 <b>DPH-4</b> = 25 (high flow) <b>DPH-6</b> = 32					Series number	Seals material: omit for NBR (mineral oil & water glycol) <b>PE</b> = FPM
Type of actuator: <b>8</b> = single actuator <b>9</b> = double actuator					Options: only for valve with single actuator: <b>/A</b> = Actuator device mounted on side of port B (for DH and DK). Actuator device mounted on side of port A of main body (for DPH)	
Valve configuration, see section 4 <b>0</b> = free, without springs <b>1</b> = spring centered, without detent <b>3</b> = spring offset external position <b>5</b> = 2 external positions, with detent <b>7</b> = center and external positions				only for DP: <b>/D</b> = internal drain <b>/E</b> = external pressure <b>/H</b> = adjustable chokes for controlling the main spool shifting time (meter-out to the pilot chambers of the main valve) <b>/H9</b> = adjustable chokes for controlling the main spool shifting time (meter-in to the pilot chambers of the main valve) <b>/R</b> = pilot pressure generator on port P at 4 bar <b>/S</b> = main spool stroke adjustment		
				Spool type, see section 5		

## 2 HYDRAULIC CHARACTERISTICS

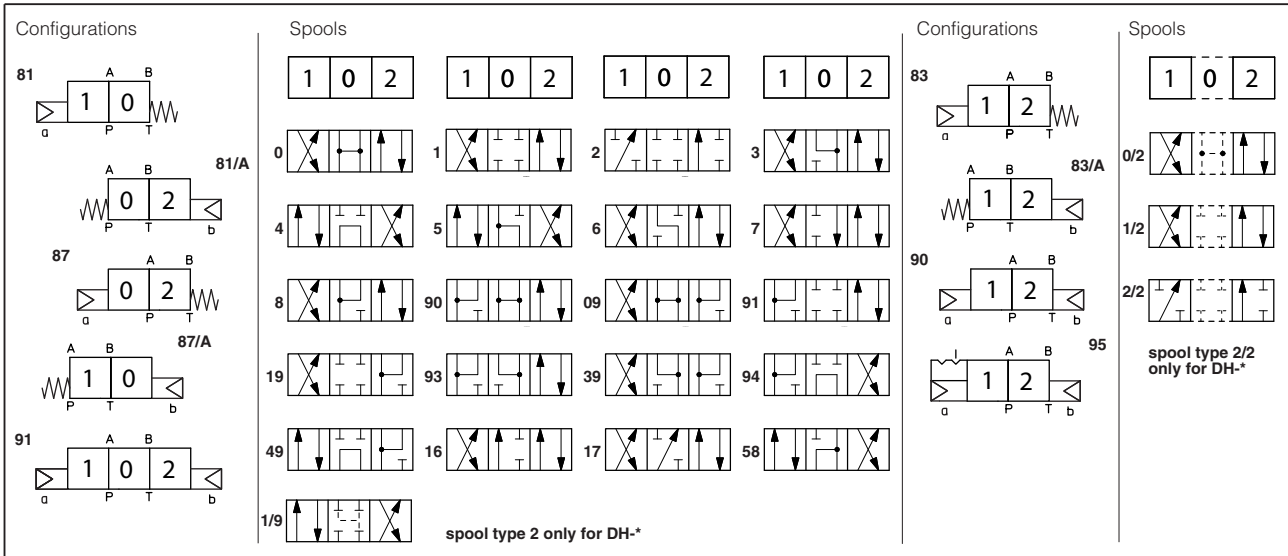
Valve model	DH-0	DK-1	DPH-2	DPH-3	DPH-4	DPH-6
Max recommended flow [l/min]	50	160	300	600	700	1000
Max pressure on port P, A, B (also X for DP) [bar]	350	315	350			
Max pressure on port T [bar]	100	210	250			
Max pressure on port L and Y [bar]	- null pressure					
Min. recommended oil pressure on piloting line [bar]	4; max recommended: 250					
Min/Max pneumatic pressure (1) [bar]	2/12					
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. By activating the actuator on side A of the pilot valve, opposite connections are performed. In the spring centered versions the spool is centered by the spring action when both the pilot chambers are unloaded.		

(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 I
Recommended viscosity	15 ÷ 100 mm <sup>2</sup> /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 (β <sub>25</sub> ≥ 75 recommended)
Fluid temperature	-20°C +60°C (standard seals) -20°C +80°C (/PE seals)

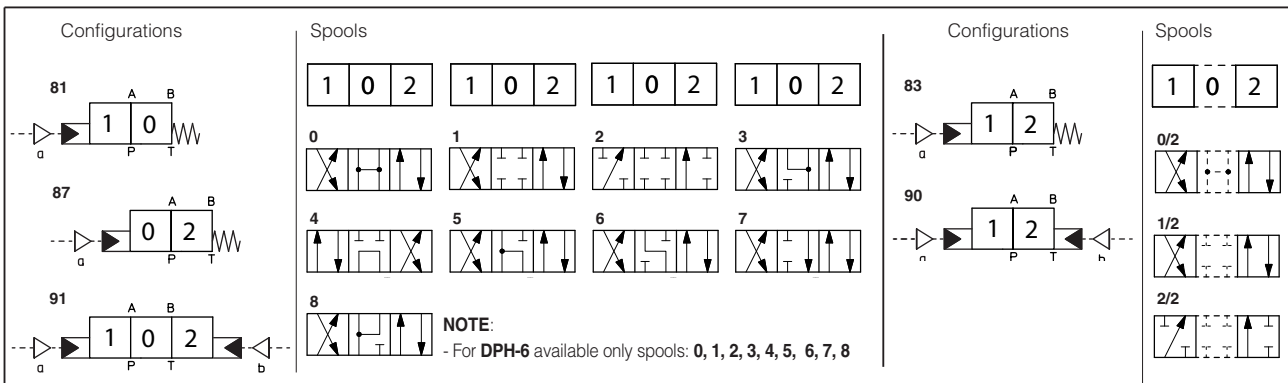
### 4 CONFIGURATIONS and SPOOLS valves type DH-\*, DK-\*



#### 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;
- Spool type 1, 3, 8 and 1/2 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.

### 5 CONFIGURATIONS and SPOOLS valves type DPH-\*



#### 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/Δp DIAGRAMS

<b>DH-0</b>	See note and diagrams on table E010 relating the DH* valve from which DH-0* are derived
<b>DK-1</b>	See note and diagrams on table E025 relating the DKE, DKER valve from which DK-1* are derived
<b>DPH-2</b>	See note and diagrams on table E085 relating the DPH*-2 valve from which DP-2* are derived
<b>DPH-3</b>	See note and diagrams on table E085 relating the DPH*-3 valve from which DP-3* are derived
<b>DPH-4</b>	See note and diagrams on table E085 relating the DPH*-4 valve from which DP-4* are derived
<b>DPH-6</b>	See note and diagrams on table E085 relating the DPH*-6 valve from which DP-6* are derived

**ISO 4401: 2005**

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

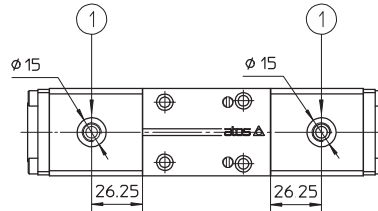
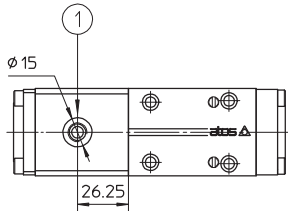
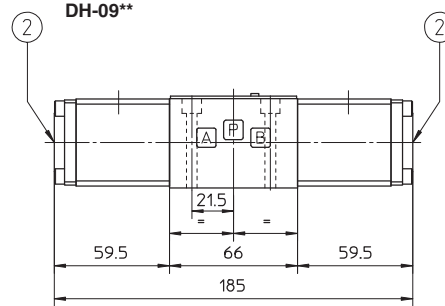
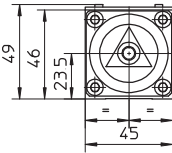
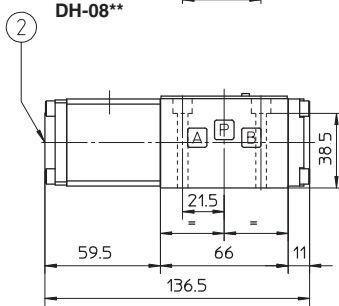
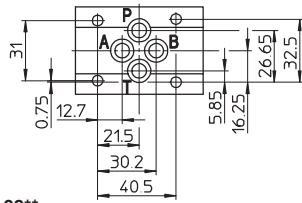
Fastening bolts: 4 socket head screws M5x50 class 12.9  
 Tightening torque = 8 Nm  
 Diameter of ports A, B, P, T:  $\varnothing = 7,5$  mm (max)  
 Seals: 4 OR 108

**P** = PRESSURE PORT

**A, B** = USE PORT

**T** = TANK PORT

For the max pressures on ports, see section 2



Mass: 1,2 Kg

- ① Pilot pressure port G1/8"
- ② Manual override

Mass: 1,6 Kg

Mounting subplates: see tab. E010

**ISO 4401: 2005**

**Mounting surface: 4401-05-04-0-05**

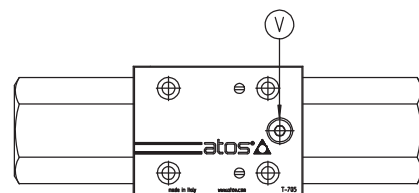
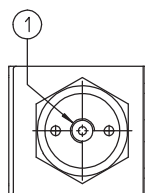
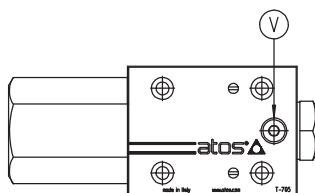
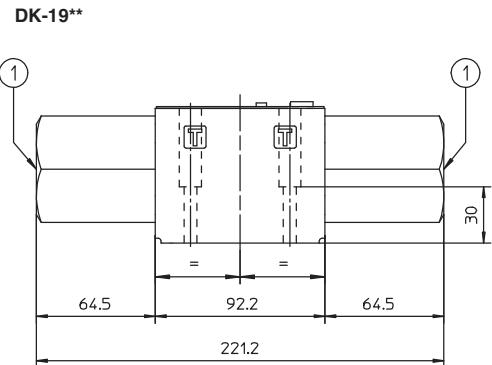
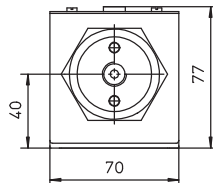
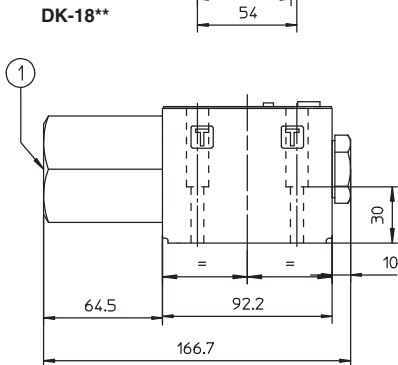
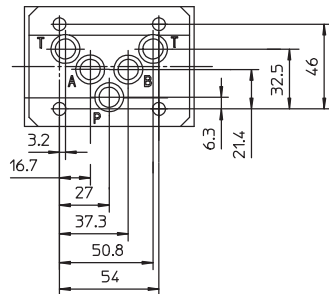
Fastening bolts: 4 socket head screws M6x40 class 12.9  
 Tightening torque = 15 Nm  
 Diameter of ports A, B, P, T:  $\varnothing = 11,2$  mm (max)  
 Seals: 5 OR 2050

**P** = PRESSURE PORT

**A, B** = USE PORT

**T** = TANK PORT

For the max pressures on ports, see section 2



Mass: 3,4 Kg

- ① Pilot pressure port G1/4"
- ∇ Air bleed

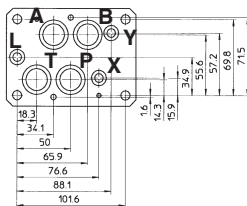
Mass: 4,2 Kg

Mounting subplates: see tab. E025

**DPH-2**

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

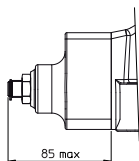
For the max pressures on ports, see section 2



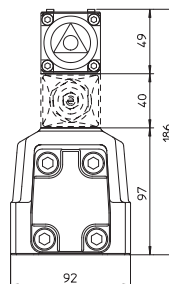
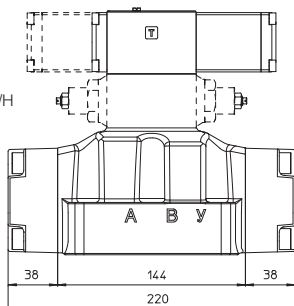
**ISO 4401: 2005**  
**Mounting surface: 4401-07-07-0-05**

Fastening bolts:  
 4 socket head screws M10x50 class 12.9  
 Tightening torque = 70 Nm  
 2 socket head screws M6x45 class 12.9  
 Tightening torque = 15 Nm  
 Diameter of ports A, B, P, T :  $\varnothing = 20$   
 Diameter of ports X, Y:  $\varnothing = 7$  mm  
 Seals: 4 OR 130, 2 OR 2043

**Stroke adjustment device for option /S**



Only for option /H

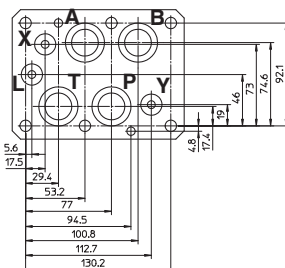


Mass: 11,5 Kg

**DPH-3**

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

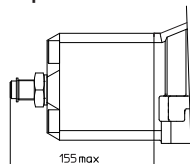
For the max pressures on ports, see section 2



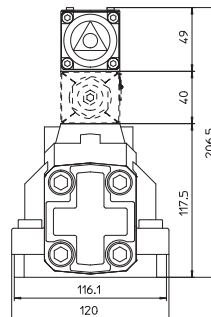
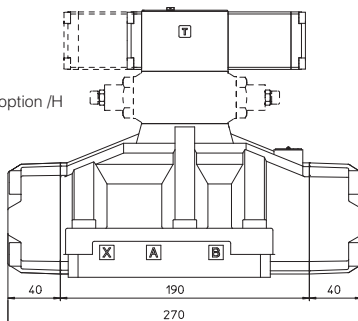
**ISO 4401: 2005**  
**Mounting surface: 4401-08-08-0-05**

Fastening bolts:  
 6 socket head screws M12x60 class 12.9  
 Tightening torque = 125 Nm  
 Diameter of ports A, B, P, T :  $\varnothing = 24$   
 Diameter of ports X, Y:  $\varnothing = 7$  mm  
 Seals: 4 OR 4112, 2 OR 3056

**Stroke adjustment device for option /S**



Only for option /H

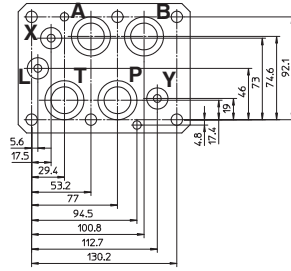


Mass: 16,7 Kg

**DPH-4**

- 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 2

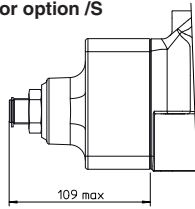


**ISO 4401: 2005**

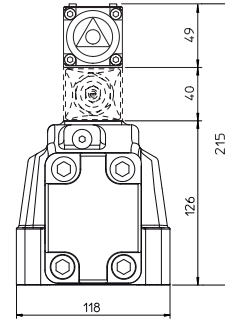
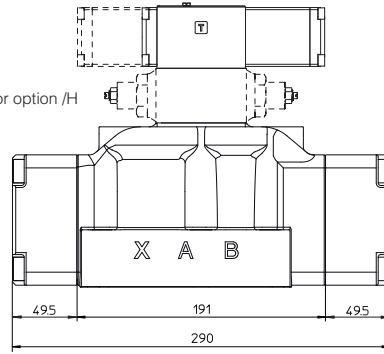
**Mounting surface: 4401-08-08-0-05**

Fastening bolts:  
 6 socket head screws M12x60 class 12.9  
 Tightening torque = 125 Nm  
 Diameter of ports A, B, P, T :  $\varnothing = 24$   
 Diameter of ports X, Y:  $\varnothing = 7$  mm  
 Seals: 4 OR 4112, 2 OR 3056

**Stroke adjustment device for option /S**



Only for option /H

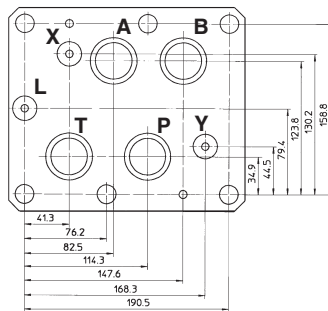


Mass: 18 Kg

**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 2

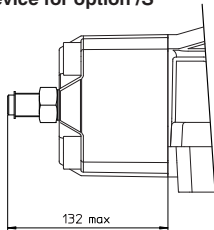


**ISO 4401: 2005**

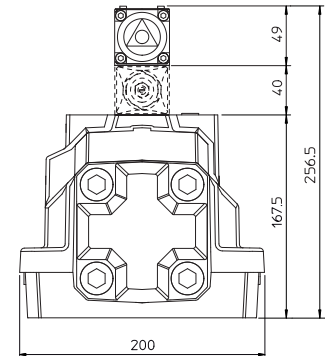
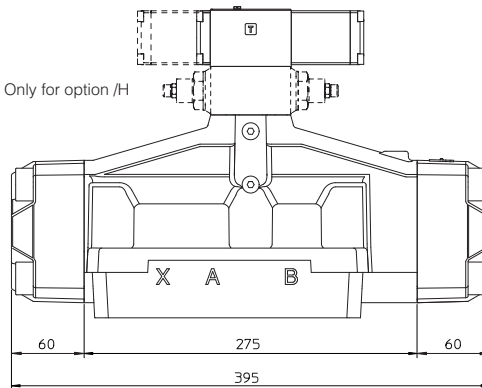
**Mounting surface: 4401-10-09-0-05**

Fastening bolts:  
 6 socket head screws M20x80 class 12.9  
 Tightening torque = 600 Nm  
 Diameter of ports A, B, P, T :  $\varnothing = 34$  mm  
 Diameter of ports X, Y:  $\varnothing = 7$  mm  
 Seals: 4 OR 144, 2 OR 3056

**Stroke adjustment device for option /S**



Only for option /H



Mass: 39,5 Kg