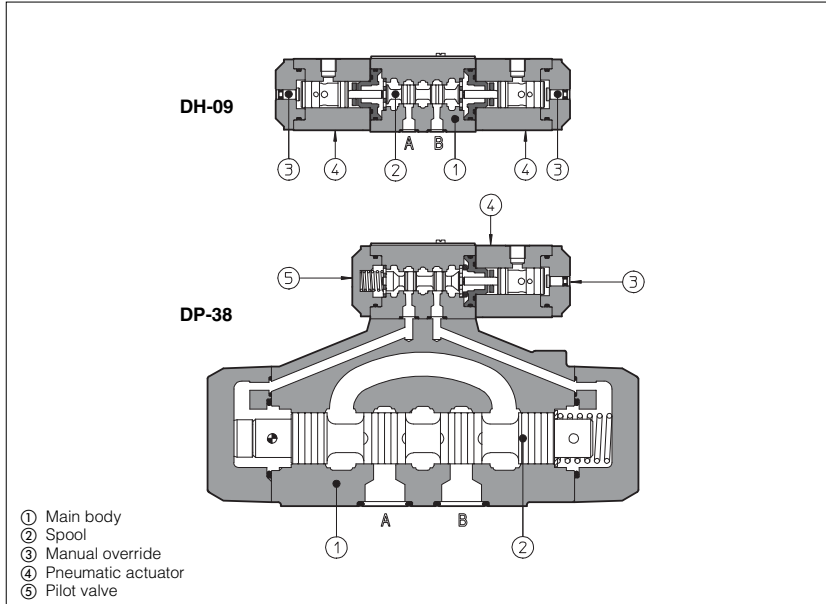


Pneumatic operated directional valves

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 interface: flow up to 50 l/min.
- DK-1 = ISO 4401 size 10 interface: flow up to 160 l/min.
- DP-2 = ISO 4401 size 16 interface: flow up to 300 l/min.
- DP-3 = ISO 4401 size 25 interface: flow up to 650 l/min.
- DP-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

1 MODEL CODE

DH-0	8	1	3	/A	**	/*
Directional control valve, size: DH-0 = 06 DK-1 = 10 DPH-2 = 16 DPH-3 = 25 DPH-6 = 32 Type of actuator: 8 = single actuator 9 = double actuator Valve configuration, see section 4 0 = free, without springs 1 = spring centered, without detent 3 = spring offset external position 5 = 2 external positions, with detent 7 = center and external positions					Synthetic fluids: WG = water-glycol PE = phosphate ester Series number Options: only for valve with single actuator: /A = actuator device mounted on side of port B 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) /M = hydraulic pressure centering device /R = pilot pressure generator on port P at 4 bar /S = main spool stroke adjustment	
				Spool type, see section 5		

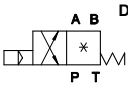
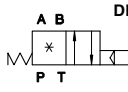


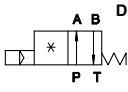
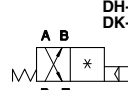
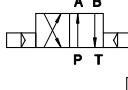
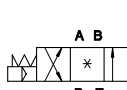

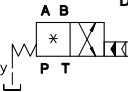
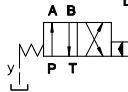
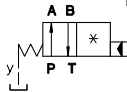
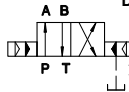
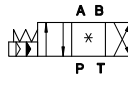
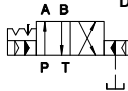
2 HYDRAULIC CHARACTERISTICS

Valve model		DH-0	DK-1	DPH-2	DPH-3	DPH-6
Max recommended flow	[l/min]	50	160	300	650	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 (10 for option /M); max recommended: 250	
Min/Max pneumatic pressure	[bar]	2/12			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 A of the pilot valve 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, opposite connections are performed. In the spring centered versions the spool is centered by the spring action when both the pilot chambers are unloaded. For valves provided with pressure centering device (option /M), the spool is centered by the simultaneous application of pilot pressure at both X and Y ports: the hydraulic centering device provides different section areas and the spool is actuated into centre position by the resulting hydraulic force. When /M device is fitted, the drain port L has to be connected to tank at null pressure.	

3 MAIN CHARACTERISTICS OF PNEUMATIC OPERATED DIRECTIONAL VALVES








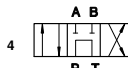
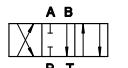
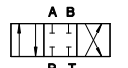

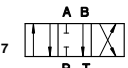
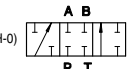
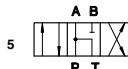

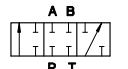

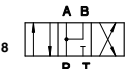
Assembly position / location	Any position except for valves type DH-090, DK-190, DP-*90 (without springs) that must be installed with their longitudinal axis horizontal. Drain port Y must always be connected directly to tank except for version /D (internal drain)
Subplate surface finishing	Roughness index $\sqrt{0.4}$, 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 11
Recommended viscosity	15 ÷ 100 mm ² /s at 40°C (ISO VG 15 ÷ 100)
Fluid contamination class	ISO 19/16, achieved with in line filters at 25 µm value and $\beta_{25} \geq 75$ (recommended)
Fluid temperature	-20°C +60°C (standard and /WG seals) -20°C +80°C (/PE seals)

4 VALVE CONFIGURATION

 DH-081* DK-181*	 DH-081*/A DK-181*/A	 DH-083*/2 DK-183*/2	 DH-083*/2/A DK-183*/2/A	 DH-087* DK-187*
 DH-087*/A DK-187*/A	 DH-090*/2 DK-190*/2	 DH-091* DK-191*	 DH-095* DK-195*	
 DP-281* DP-381* DP-681*	 DP-283* DP-383* DP-683*	 DP-287* DP-387* DP-687*	 DP-290* DP-390* DP-690*	 DP-291* DP-391* DP-691*
 DP-295* DP-395* DP-695*				

Where the symbol doesn't show the hydraulic connection (*), it depends by the central configuration of the spool, see table 5.

5 SPOOLS - for intermediate passages, see tab. E001

DH-0 DK-1	0 0/2		3		6		DP-2 DP-3 DP-6	0 0/2		3		6	
	1/2		4		7			1/2		4		7	
	2 (ONLY DH-0) 2/2		5		8			2 2/2		5		8	

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 Q/Δp DIAGRAMS

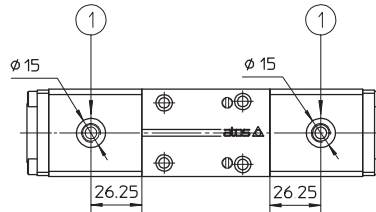
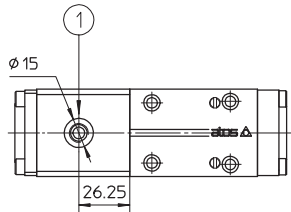
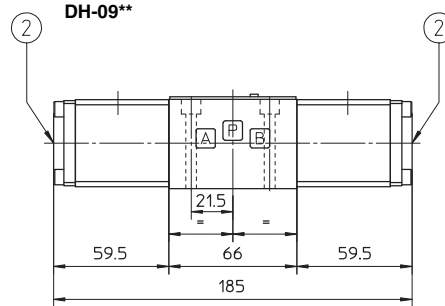
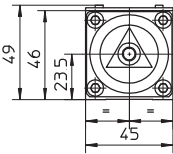
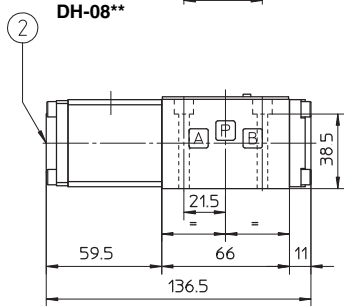
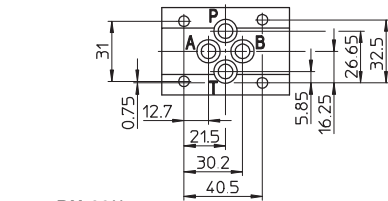
DH-0	See note and diagrams on table E010 relating the DHO valve from which DH-0* are derivated
DK-1	See note and diagrams on table E025 relating the DKE, DKER valve from which DK-1* are derivated
DPH-2	See note and diagrams on table E080 relating the DPHO-2 valve from which DP-2* are derivated
DPH-3	See note and diagrams on table E080 relating the DPHO-3 valve from which DP-3* are derivated
DPH-6	See note and diagrams on table E080 relating the DPHO-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: $\varnothing = 7,5$ 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 G18/**
- ② Manual override

Mass: 1,6 Kg

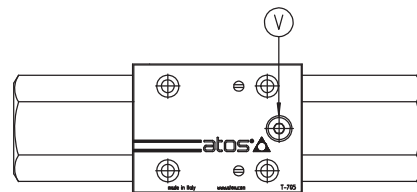
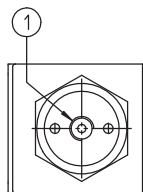
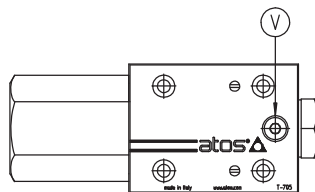
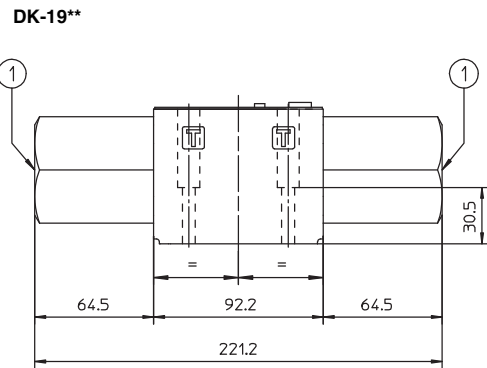
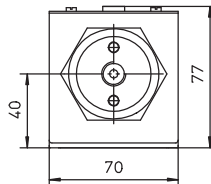
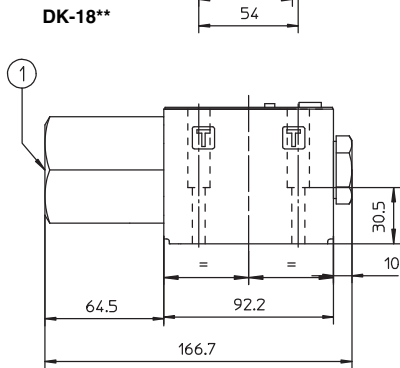
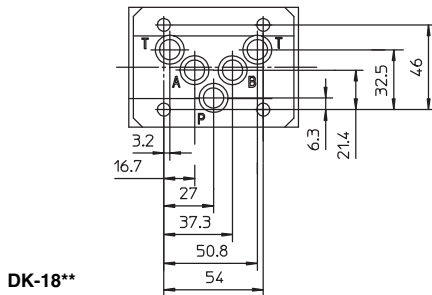
Mounting subplates: see tab. E010

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

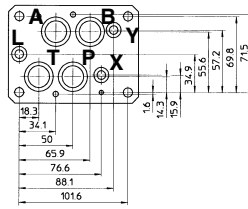
- ① Pilot pressure port G1/4**
- ∇ Air bleed

Mass: 4,2 Kg

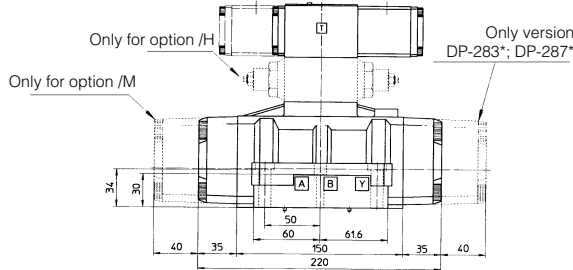
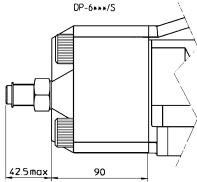
Mounting subplates: see tab. E025

DPH-2

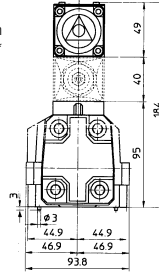
P = PRESSURE PORT
 A, B = USE PORT
 T = TANK PORT
 X = EXTERNAL OIL PILOT PORT not used
 Y = DRAIN PORT
 For the max pressures on ports, see section 2



Stroke adjustment device for option /S



ISO 4401: 2005
Mounting surface: 4401-07-07-0-05
(L port optional)
 Fastening bolts:
 4 socket head screws M10x50 class 12.9
 Tightening torque = 70 Nm
 2 socket head screws M6x40 class 12.9
 Tightening torque = 15 Nm
 Diameter of ports A, B, P, T : $\varnothing = 20$
 Diameter of ports X, Y: $\varnothing = 7$ mm
 Diameter of port L: $\varnothing = 5$ mm
 Seals: 4 OR 130, 3 OR 109/70



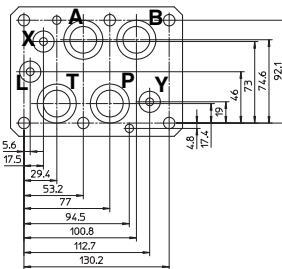
Mass: 11,5 Kg

Mounting subplates: see tab. E080

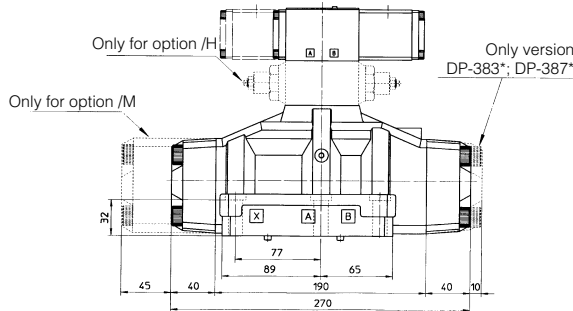
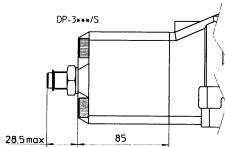
Port L is used only for valves with option /M

DPH-3

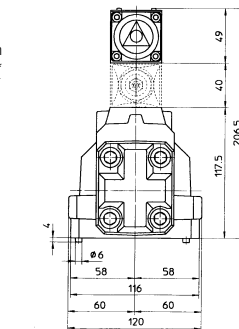
P = PRESSURE PORT
 A, B = USE PORT
 T = TANK PORT
 X = EXTERNAL OIL PILOT PORT not used
 Y = DRAIN PORT
 L = DRAIN PORT FOR HYDRAULIC CENTERING DEVICE used only for /M versions
 For the max pressures on ports, see section 2



Stroke adjustment device for option /S



ISO 4401: 2005
Mounting surface: 4401-08-08-0-05
(L port optional)
 Fastening bolts:
 6 socket head screws M12x50 class 12.9
 Tightening torque = 125 Nm
 Diameter of ports A, B, P, T : $\varnothing = 24$
 Diameter of ports X, Y: $\varnothing = 7$ mm
 Diameter of port L: $\varnothing = 5$ mm
 Seals: 4 OR 4112, 3 OR 3056



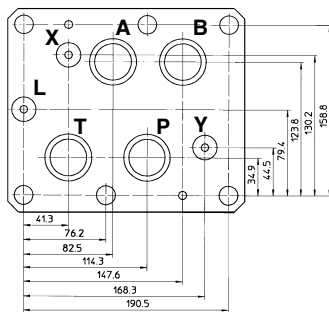
Mass: 16,7 Kg

Mounting subplates: see tab. E080

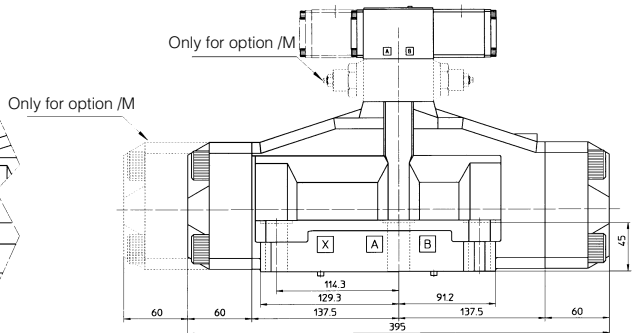
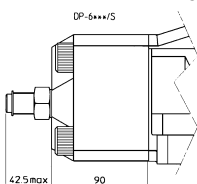
Port L is used only for valves with option /M

DPH-6

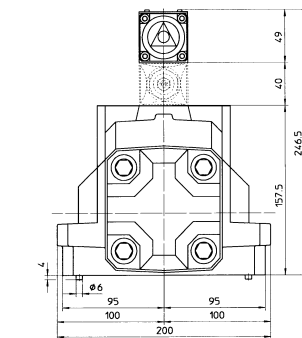
P = PRESSURE PORT
 A, B = USE PORT
 T = TANK PORT
 X = EXTERNAL OIL PILOT PORT not used
 Y = DRAIN PORT
 L = DRAIN PORT FOR HYDRAULIC CENTERING DEVICE used only for /M versions
 For the max pressures on ports, see section 2



Stroke adjustment device for option /S



ISO 4401: 2005
Mounting surface: 4401-10-09-0-05
(port L optional)
 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
 Diameter of port L: $\varnothing = 5$ mm
 Seals: 4 OR 4137, 3 OR 3081



Mass: 39,5 Kg

Mounting subplates: see tab. K280

Port L is used only for valves with option /M

When valves are fitted with /M option, mounting subplates /DR are to be used.