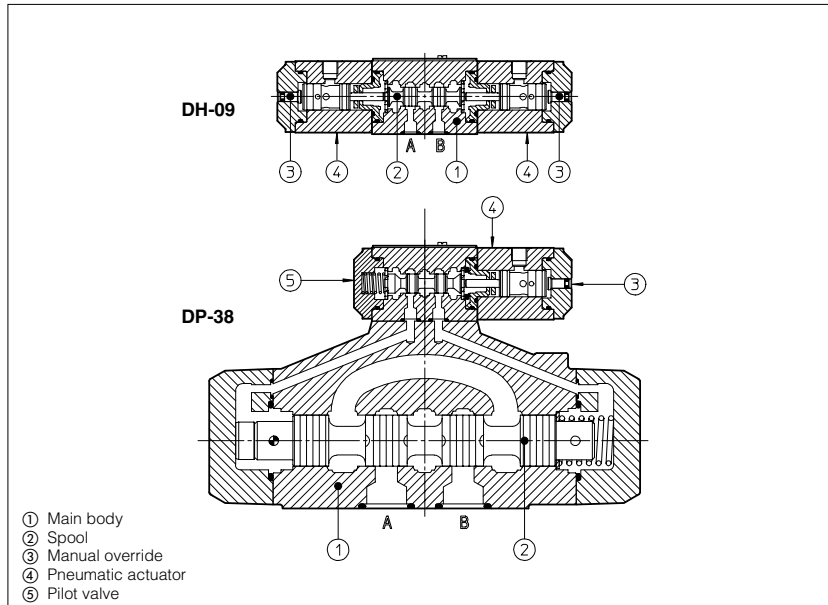


Pneumatic operated directional valves

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. Rugged execution suitable for outdoor use.

- DH-0 = ISO 4401 size 06 interface: flow up to 50 l/min.
- DK-1 = ISO 4401 size 10 interface: flow up to 100 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.

Pressure up to 350 bar.

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					Synthetic fluids: WG = water-glycol PE = phosphate ester	
Type of actuator: 8 = single actuator 9 = double actuator				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 (flow controlled from the pilot chambers to the pilot valve) /H9 = adjustable chokes for controlling the main spool shifting time (flow controlled from the pilot valve to the pilot chambers) /M = hydraulic pressure centering device /R = pilot pressure generator on port P at 4 bar /S = main spool stroke adjustment		Design number
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				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	100	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		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: DH-0*14, DH-0*15 and DK-1*14, DK-1*15 where the connections are P→A, B→T; DH-087 and DK-187 where by acting the actuator on port A, the spool is driven to centre position.		By activating the actuator on side A of the pilot valve the hydraulic connections are P→B, A→T, except for DP-*914 where the connections are P→A, B→T, and DP-*87* where by pressurizing port X the spool reaches the central position. 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°
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	T ≤ 80°C if T ≥ 60°C select /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

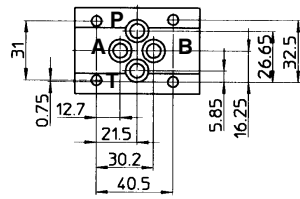
DH-0 DK-1	0 0/2		3		6		DP-2 DP-3 DP-6	0 0/2		3		6	
	1 1/2		4		7			1 1/2		4		7	
	2 2/2		5		8			2 2/2		5		8	

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

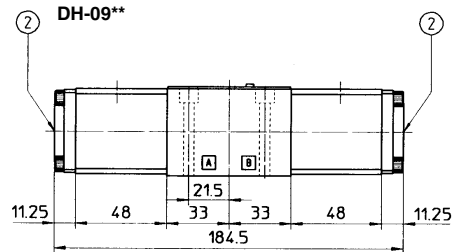
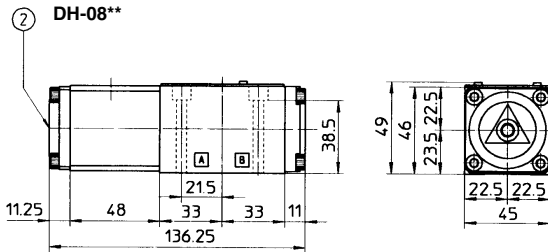
DH-0	See note and diagrams on table E010 relating the DHO valve from which DH-0* are derived
DK-1	See note and diagrams on table E020 relating the DKOR valve from which DK-1* are derived
DPH-2	See note and diagrams on table E075 relating the DPHO-2 valve from which DP-2* are derived
DPH-3	See note and diagrams on table E075 relating the DPHO-3 valve from which DP-3* are derived
DPH-6	See note and diagrams on table E075 relating the DPHO-6 valve from which DP-6* are derived



**Mounting surface
ISO 4401-AB-03-4 size 06**

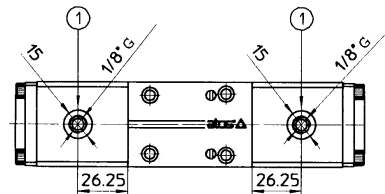
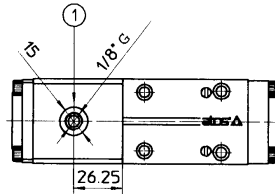
Fastening bolts: 4 socket head screws M5x50
Diameter of ports A, B, P, T: $\varnothing = 7,5$ mm (max)
Seals: 4 OR 108

P = PRESSURE PORT
A, B = USE PORT
T = TANK PORT
For the max pressures on ports, see section 2



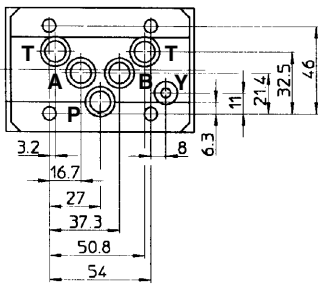
Mass: 1,2 Kg

Mass: 1,6 Kg



- ① Pilot pressure port
- ② Manual override

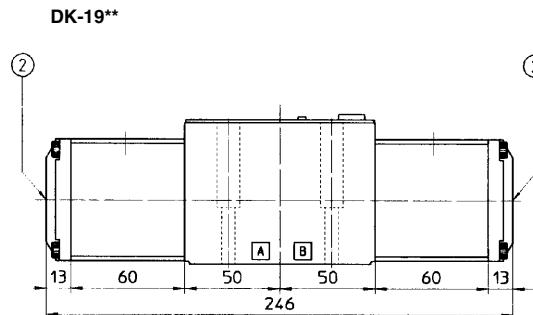
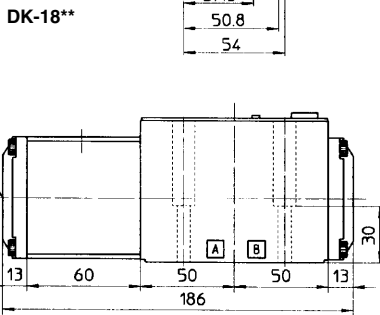
Mounting subplates: see tab. E010



**Mounting surface
ISO 4401-AC-05-4 size 10**

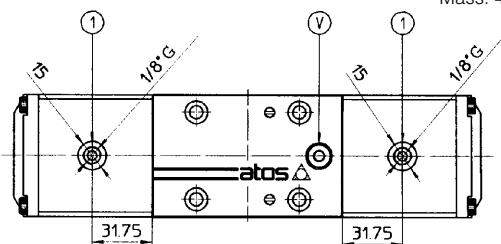
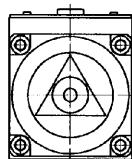
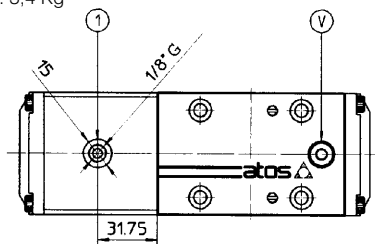
Fastening bolts: 4 socket head screws M6x40
Diameter of ports A, B, P, T: $\varnothing = 11,2$ mm (max)
Seals: 5 OR 2050

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



Mass: 3,4 Kg

Mass: 4,2 Kg

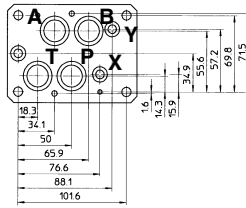


- ① Pilot pressure port
- ② Manual override
- ∇ Air bleed

Mounting subplates: see tab. E020

DPH-2

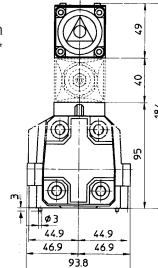
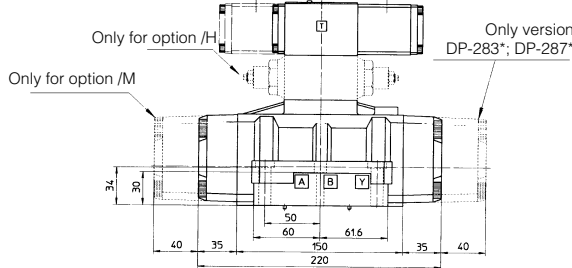
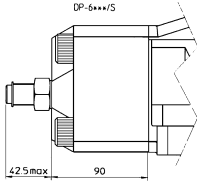
- P = PRESSURE PORT
 - A, B = USE PORT
 - T = TANK PORT
 - X = EXTERNAL OIL PILOT PORT not used
 - Y = DRAIN PORT
- For the max pressures on ports, see section 2



**Mounting surface
ISO 4401-AD-07-4 size 16**

Fastening bolts:
 4 socket head screws M10 x 50
 2 socket head screws M6 x 40
 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

**Stroke adjustment
device for option /S**



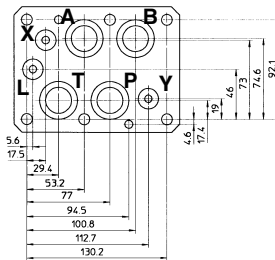
Mass: 11,5 Kg

Mounting subplates: see tab. E080

Port L is used only for valves with option /M

DPH-3

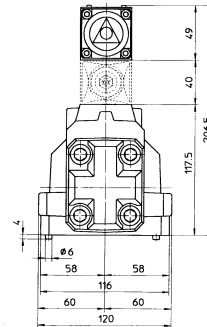
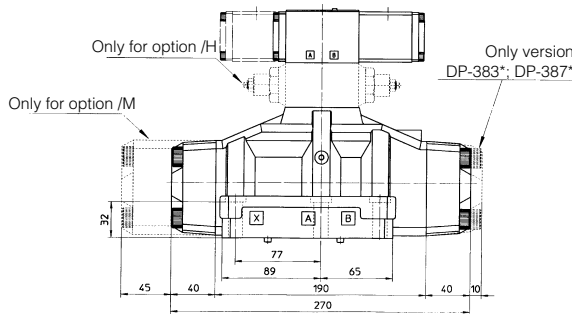
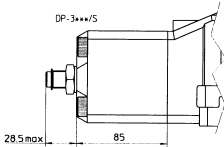
- P = PRESSURE PORT
 - A, B = USE PORT
 - T = TANK PORT
 - X = EXTERNAL OIL PILOT PORT not used
 - Y = DRAIN PORT
 - L = DRAIN PORT FOR HYDRAULIC CENTERING DEVICE used only for /M versions
- For the max pressures on ports, see section 2



**Mounting surface
ISO 4401-AE-08-4 size 25**

Fastening bolts:
 6 socket head screws M12 x 50
 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

**Stroke adjustment
device for option /S**



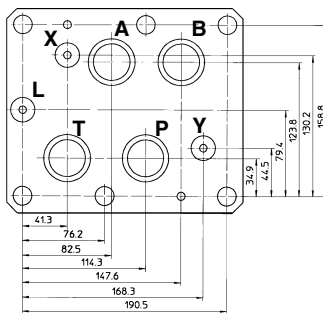
Mass: 16,7 Kg

Mounting subplates: see tab. E080

Port L is used only for valves with option /M

DPH-6

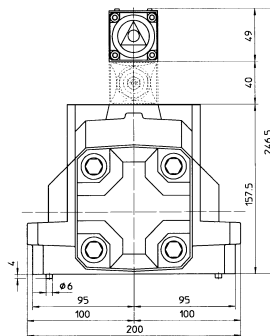
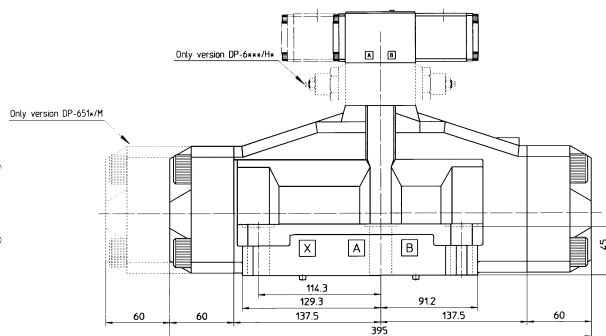
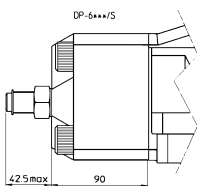
- P = PRESSURE PORT
 - A, B = USE PORT
 - T = TANK PORT
 - X = EXTERNAL OIL PILOT PORT not used
 - Y = DRAIN PORT
 - L = DRAIN PORT FOR HYDRAULIC CENTERING DEVICE used only for /M versions
- For the max pressures on ports, see section 2



**Mounting surface
ISO 4401-AF-10-4 size 32**

Fastening bolts:
 6 socket head screws M20 x 80
 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

**Stroke adjustment
device for option /S**



Mass: 39,5 Kg

Mounting subplates: see tab. K280

Port L is used only for valves with option /M