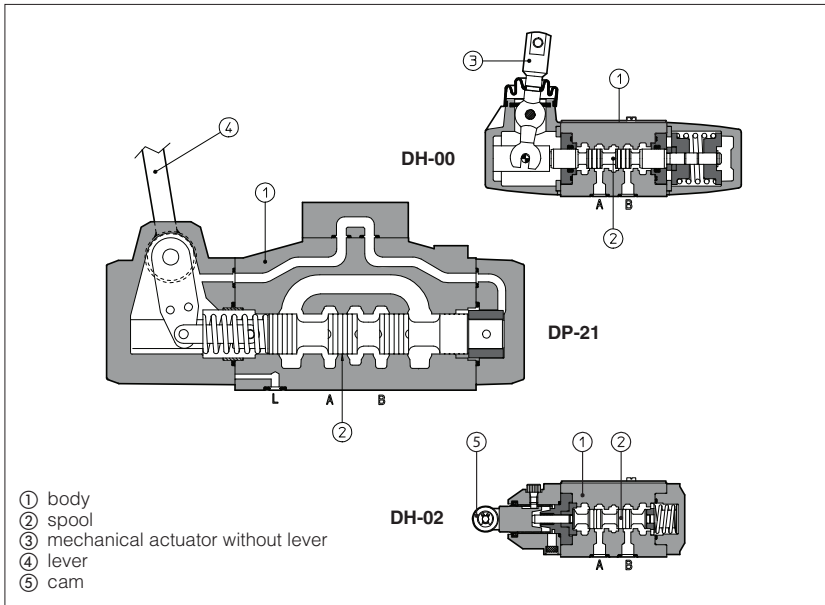


# Hand & mechanical directional valves

ISO 4401 sizes 06, 10, 16 and 25



Hand & mechanical operated directional valves are spool type, three or four way, two or three position systems, designed to operate in oil hydraulic systems.

Available versions:

- mechanical actuator without lever;
- hand-lever;
- cam (only for size 06 and 10).

- DH-0 = ISO 4401 size 06 interface: flow up to 50 l/min.
- DK-10 (11) = ISO 4401 size 10 interface: flow up to 100 l/min.
- DK-12 = ISO 4401 size 10 interface: flow up to 140 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.

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

## 1 MODEL CODE

DH-0	1	1	3	/C	/A	**	/*
<p>Directional control valve, size:  <b>DH-0</b> = 06  <b>DK-1</b> = 10  <b>DP-2</b> = 16  <b>DP-3</b> = 25</p> <p>Type of actuator:  <b>0</b> = mechanical, without lever  <b>1</b> = hand-lever  <b>2</b> = cam (only for DH-0 and DK-1)</p> <p>Valve configuration, see section 4  <b>0</b> = free, without springs  <b>1</b> = spring centered, without detent  <b>2</b> = return to internal position (lever toward extern)  <b>3</b> = return to external position (lever toward the valve)  <b>4</b> = 3 position, with detent  <b>5</b> = 2 external positions, with detent  <b>6</b> = centre plus external positions, with detent  <b>7</b> = return to external position from the centre position  <b>8</b> = return to the centre position from the external position</p>						<p>Seals material: omit for NBR (mineral oil &amp; water glycol) <b>PE</b> = FPM</p> <p>Series number</p>	
						<p>Options:  <b>/A</b> = actuator device mounted on side of port B</p> <p>Only for configuration 6, 7, 8, of hand-lever valves, see section 4 and 5 for hydraulic connections:  <b>/I</b> = in rest position the lever is inclined towards the valve body  <b>/E</b> = in rest position the lever is inclined in opposite side</p> <p>Only for DK-1:  <b>/Y</b> = external drain</p>	
						<p>Only for hand-lever valves:  <b>/C</b> = short hand - lever and reduced actuation force (only for DH-01)</p>	

Spool type, see section 5




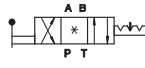

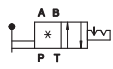
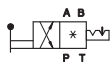
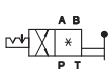
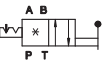









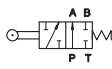
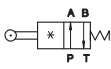
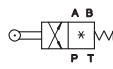
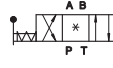






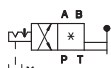
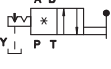








## 2 HYDRAULIC CHARACTERISTICS

Valve model		DH-0	DK-1 (DK-12)	DP-2	DP-3
Max recommended flow	[l/min]	50	100 (140)	300	650
Max pressure on port P, A, B	[bar]	350	315		350
Max pressure on port T	[bar]		160		250

### 3 MAIN CHARACTERISTICS OF HAND & MECHANICAL OPERATED DIRECTIONAL VALVES

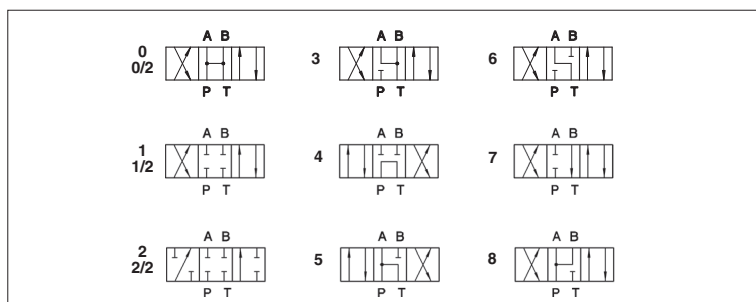
Assembly position / location	Any position
Subplate surface finishing	Roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101)
Ambient temperature	-20°C to + 70°C
Fluid	Hydraulic oil as per DIN 51524...535, for other fluids see section 1
Recommended viscosity	15 ÷ 100 mm <sup>2</sup> /s at 40°C (ISO 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 and water glycol) -20°C +80°C (/PE seals)

### 4 VALVE CONFIGURATION

 DH-011* DK-111*	 DH-012* DK-112*	 DH-013* DK-113*	 DH-014* DK-114*	 DH-015* DK-115*
 DH-016*/I DK-116*/I	 DH-016*/E DK-116*/E	 DH-016*/IA DK-116*/IA  DH-016*/EA DK-116*/EA	 DH-017*/I DK-117*/I	 DH-017*/E DK-117*/E
 DH-017*/IA DK-117*/IA  DH-017*/EA DK-117*/EA	 DH-018*/I DK-118*/I	 DH-018*/E DK-118*/E	 DH-018*/IA DK-118*/IA  DH-018*/EA DK-118*/EA	
 DH-0230/2 DK-1230/2 DK-1231/2	 DH-0232/2 DK-1232/2	 DH-027* DK-127*	 DH-028* DK-128*	
 DP-211* DP-311*	 DP-212* DP-312*	 DP-213* DP-313*	 DP-214* DP-314*	 DP-215* DP-315*
 DP-216*/I DK-316*/I	 DP-216*/E DK-316*/E	 DP-216*/IA DK-316*/IA  DP-216*/EA DK-316*/EA	 DP-217*/I DK-317*/I	 DP-217*/E DK-317*/E
 DP-217*/IA DK-317*/IA  DP-217*/EA DK-317*/EA	 DP-218*/I DK-318*/I	 DP-218*/E DK-318*/E	 DP-218*/IA DK-318*/IA  DP-218*/EA DK-318*/EA	

- (1) Where the symbol doesn't show the hydraulic connection (\*), it depends by the central configuration of the spool, see table 5 .  
 (2) All the configuration shown for the lever operated valves are also available for valves actuated by mechanic without lever device.

### 5 SPOOLS - for intermediate passages, see tab. E001

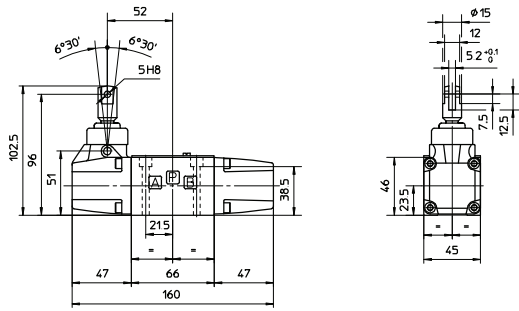


#### NOTES

- Spools type 0/2, 1/2, 2/2 are only used for valves type DH-023\*/2 and DK 123\*/2;
- 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.

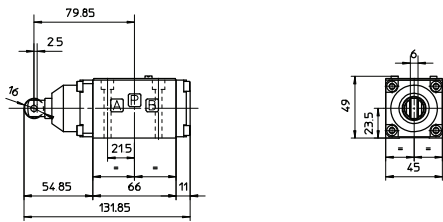
6 DIMENSIONS OF HAND & MECHANICAL OPERATED VALVES ISO 4401 SIZE 06 [mm]

DH-00\*\*



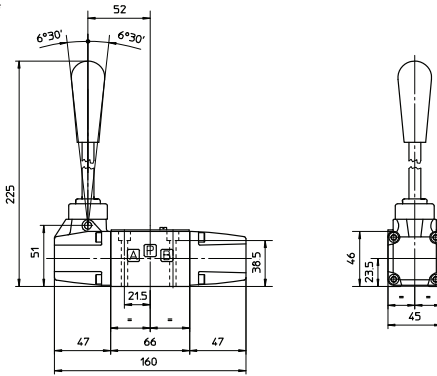
Mass: 1,2 Kg

DH-02\*\*



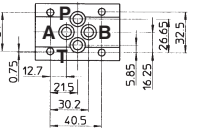
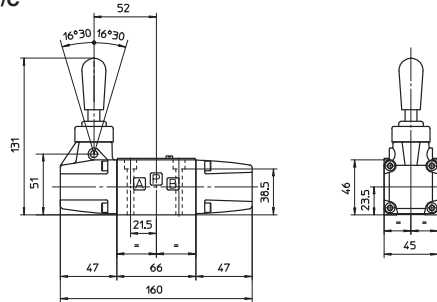
Working stroke: 2,5 mm; extra-stroke: 0,5 mm max. Mass: 1,2 Kg

DH-01\*\*



Mass: 1,6 Kg

DH-01\*\*/C



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

ISO 4401: 2005

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

Fastening bolts: 4 socket head screws M5x50 class 12.9

Tightening torque = 8 Nm

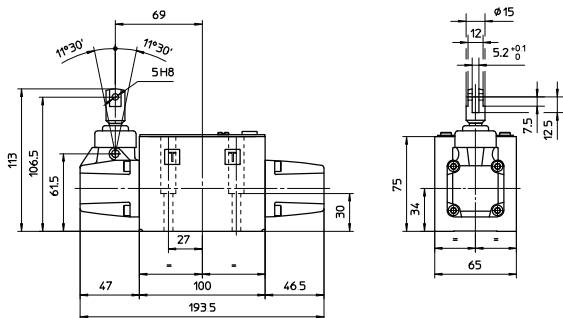
Diameter of ports A, B, P, T: Ø = 7,5 mm (max)

Seals: 4 OR 108

Mounting subplates: see tab. E010

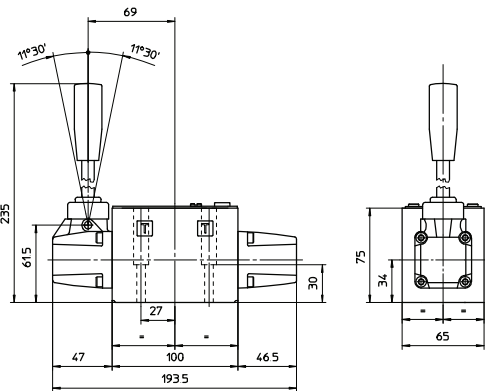
7 DIMENSIONS OF HAND & MECHANICAL OPERATED VALVES ISO 4401 SIZE 10 [mm]

DK-10\*\*



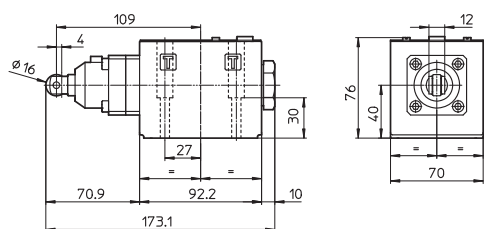
Mass: 2,5 Kg

DK-11\*\*

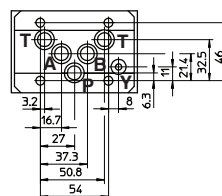


Mass: 2,8 Kg

DK-12\*\*



Working stroke: 4 mm; extra-stroke: 0,5 mm max. Mass: 2,5 Kg



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

Note: port Y is normally plugged;  
for option /Y it must be connected  
separately and directly to tank

ISO 4401: 2005

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

(Without X port, Y port optional)

Fastening bolts: 4 socket head screws M6x40 class 12.9

Tightening torque = 15 Nm

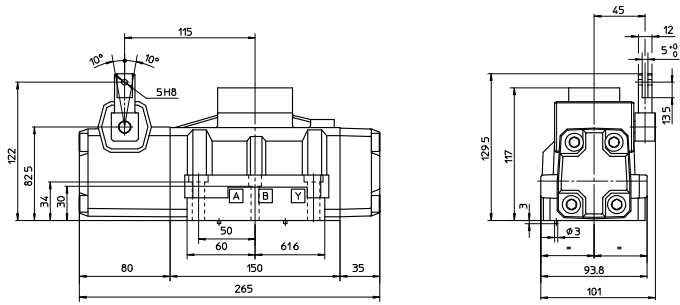
Diameter of ports A, B, P, T: Ø = 11,2 mm (max)

Seals: 5 OR 2050

Mounting subplates: see tab. E020

8 DIMENSIONS OF HAND & MECHANICAL OPERATED VALVES ISO 4401 SIZE 16 [mm]

DP-20



Mass: 9,7 Kg

ISO 4401: 2005

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

Fastening bolts:

4 socket head screws M10x50 class 12.9

Tightening torque = 70 Nm

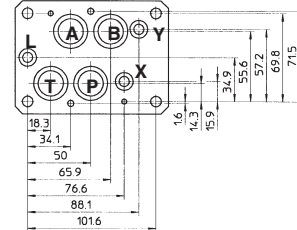
2 socket head screws M6x40 class 12.9

Tightening torque = 15 Nm

Diameter of ports A, B, P, T :  $\varnothing = 20$  mm

Diameter of ports X,Y:  $\varnothing = 7$  mm

Seals: 4 OR 130, 3 OR 109/70



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 not used

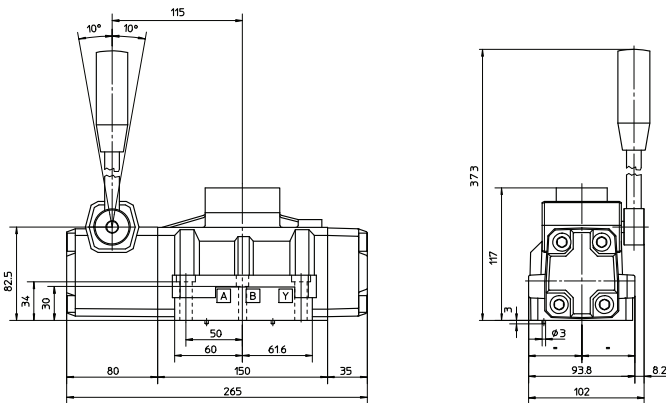
For the max pressures on ports, see section 2

Note: ports X, L are not used.

Port Y for drain must be connected directly to tank.

No counter pressure are allowed on Y port.

DP-21

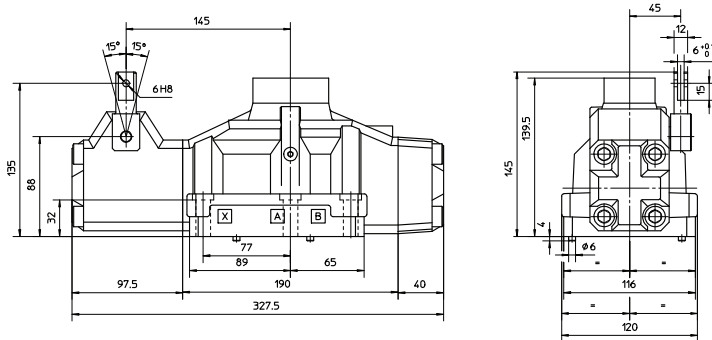


Mass: 10 Kg

Mounting subplates: see tab. E080

9 DIMENSIONS OF HAND & MECHANICAL OPERATED VALVES ISO 4401 SIZE 25 [mm]

DP-30



Mass: 15,2 Kg

ISO 4401: 2005

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

Fastening bolts:

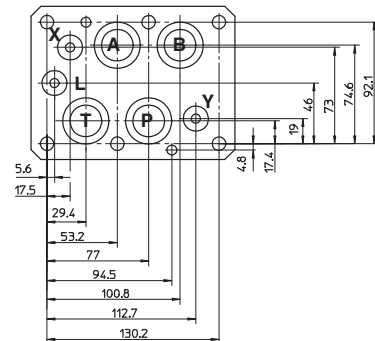
6 socket head screws M12x50 class 12.9

Tightening torque = 125 Nm

Diameter of ports A, B, P, T :  $\varnothing = 24$  mm

Diameter of ports X,Y:  $\varnothing = 7$  mm

Seals: 4 OR 4112, 3 OR 3056



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 not used

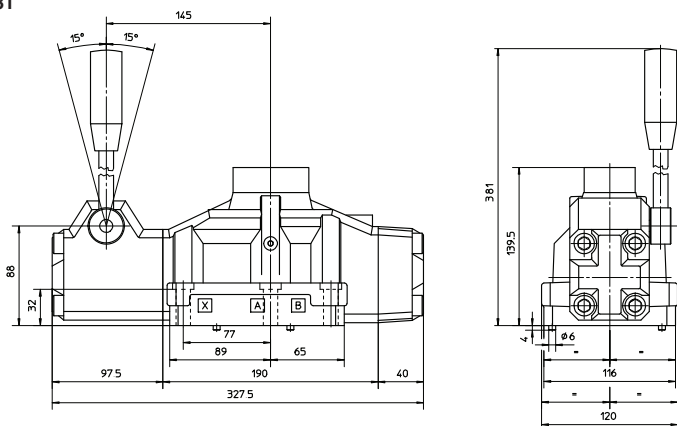
For the max pressures on ports, see section 2

Note: ports X, L are not used.

Port Y for drain must be connected directly to tank.

No counter pressure are allowed on Y port.

DP-31



Mass: 15,5 Kg

Mounting subplates: see tab. E080