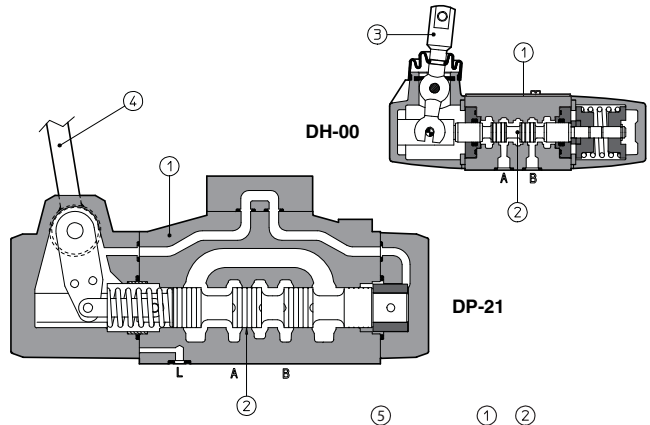
Hand & mechanical directional valves

ISO 4401 sizes 06, 10, 16 and 25



① body
② spool
③ mechanical actuator without lever
④ lever
⑤ cam

Hand & mechanical operated directional valves are spool type, three or four way, two or three position, 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	**	/*

Directional control valve, size:
DH-0 = 06
DK-1 = 10
DP-2 = 16
DP-3 = 25

Type of actuator:
0 = mechanical, without lever
1 = hand-lever
2 = cam (only for DH-0 and DK-1)

Valve configuration, see section 4
0 = free, without springs
1 = spring centered, without detent
2 = retun to internal position (lever toward extern)
3 = return to external position (lever toward the valve)
4 = 3 position, with detent
5 = 2 external positions, with detent
6 = centre plus external positions, with detent
7 = return to external position from the centre position
8 = return to the centre position from the external position

Spool type, see section 5

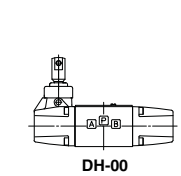
Only for hand-lever valves:
/C = short hand - lever and reducend actuation force (only for DH-01)

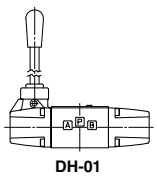
Options:
/A = actuator device mounted on side of port B
Only for configuration 6, 7, 8, of hand-lever valves, see section 4 and 5 for hydraulic connections:
/I = in rest position the lever is inclined towards the valve body
/E = in rest position the lever is inclined in opposite side
Only for DK-1:
/Y = external drain

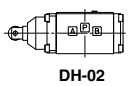
Series number

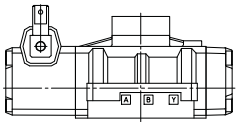
Synthetic fluids:
WG = water-glycol
PE = phosphate ester

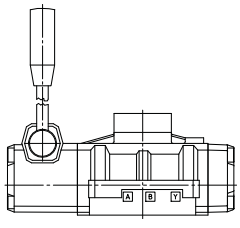
2 HYDRAULIC CHARACTERISTICS

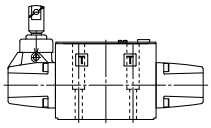

DH-00

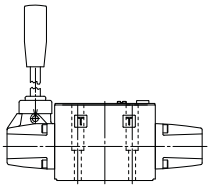

DH-01

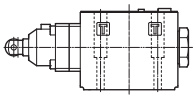

DH-02


DP-20
DP-30


DP-21
DP-31


DK-10


DK-11


DK-12

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

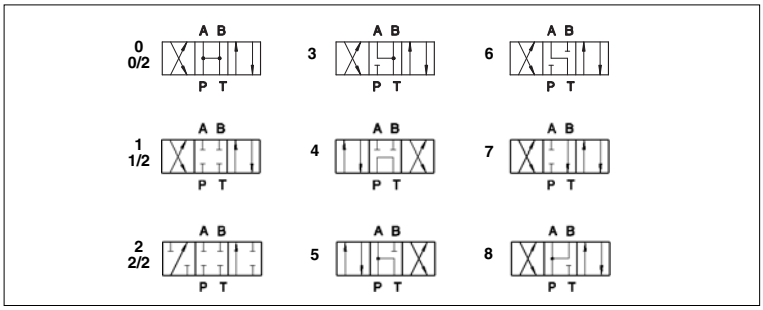
Assembly position / location	Any position.
Subplate surface finishing	Roughness index $\sqrt{}^{0,4}$, flatness ratio 0,01/100 (ISO 1101)
Ambient temperature	-20°C to + 70°C
Fluid	Hydraulic oil as per DIN 51524...535, for other fluids see section 1
Recommended viscosity	15 ÷ 100 mm²/s at 40°C (ISO VG 15 ÷ 100)
Fluid contamination class	ISO 19/16, achieved with in line filters at 25 µm value and $ß_{25} \geq 75$ (recommended)
Fluid temperature	-20°C +60°C (standard and /WG seals) -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 **DH-0231/2** **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 **DP-316*/I**	**DP-216*/E** **DP-316*/E**	**DP-216*/IA** **DP-316*/IA** **DP-216*/EA** **DP-316*/EA**	**DP-217*/I** **DP-317*/I**	**DP-217*/E** **DP-317*/E**
DP-217*/IA **DP-317*/IA** **DP-217*/EA** **DP-317*/EA**	**DP-218*/I** **DP-318*/I**	**DP-218*/E** **DP-318*/E**	**DP-218*/IA** **DP-318*/IA** **DP-218*/EA** **DP-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

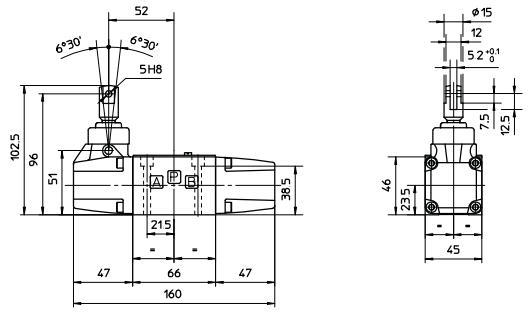


NOTES

- 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.

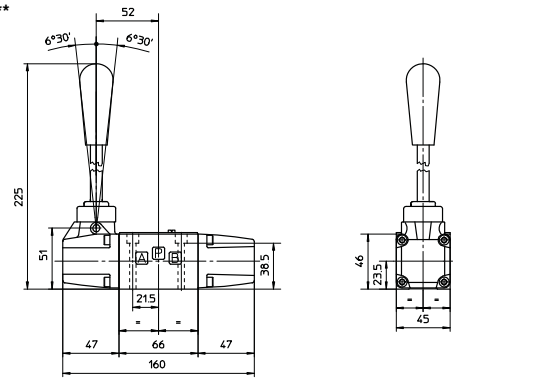
6 DIMENSIONS OF HAND & MECHANICAL OPERATED VALVES ISO 4401 SIZE 06 [mm]

DH-00**



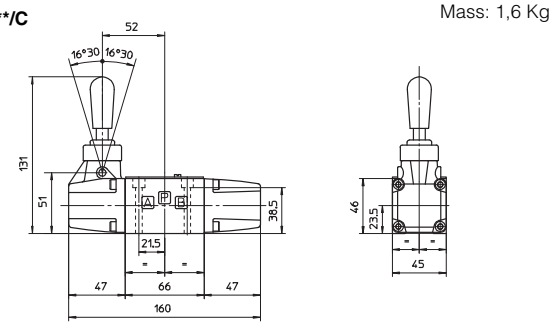
Mass: 1,2 Kg

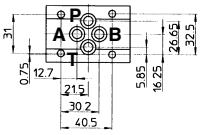
DH-01**



Mass: 1,6 Kg

DH-01/C**

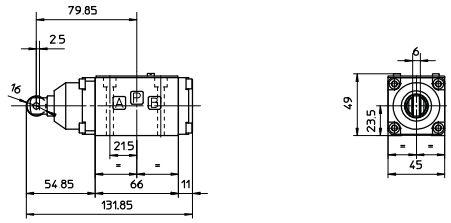




P = PRESSURE PORT
A, B = USE PORT
T = TANK PORT
For the max pressures on ports, see section 2

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

DH-02**

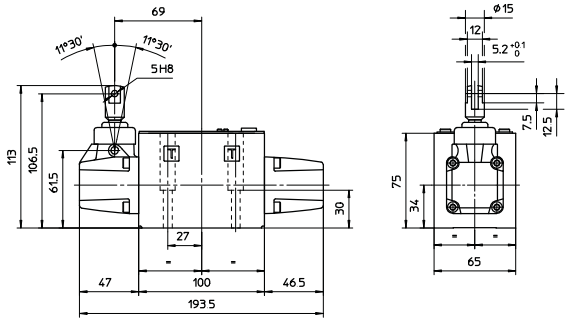


Working stroke: 2,5 mm; extra-stroke: 0,5 mm max. Mass: 1,2 Kg

Mounting subplates: see tab. E010

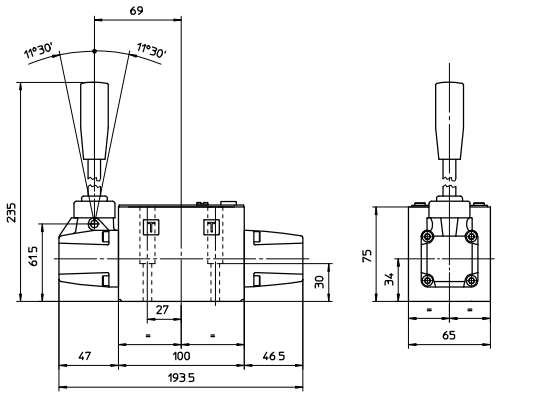
7 DIMENSIONS OF HAND & MECHANICAL OPERATED VALVES ISO 4401 SIZE 10 [mm]

DK-10**



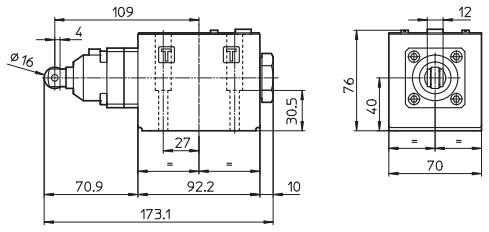
Mass: 2,5 Kg

DK-11**

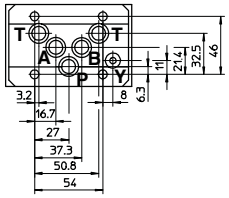


Mass: 2,8 Kg

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

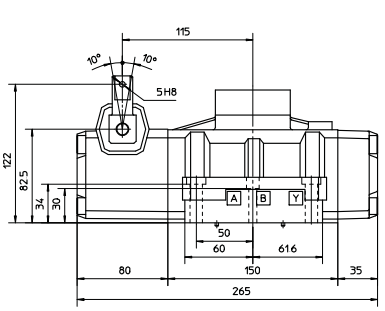
Note: port Y is normally plugged; for option /Y it must be connected separately and directly to tank

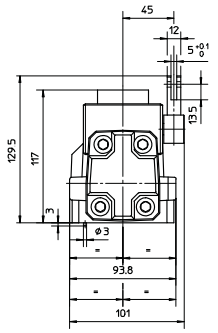
ISO 4401: 2005
Mounting surface: 4401-05-05-0-05
(Without X port, Y port optional)
Fastening bolts: 4 socket head screws M6x40 class 12.9
Tightening torque = 15 Nm
Diameter of ports A, B, P, T: Ø = 11,2 mm (max)
Seals: 5 OR 2050

Mounting subplates: see tab. E020

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

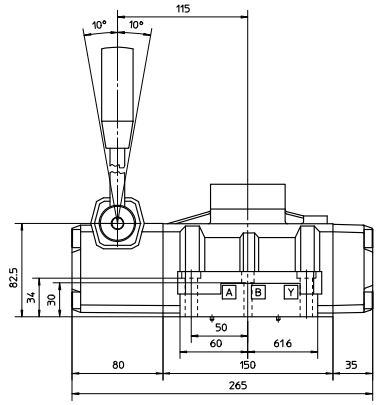
DP-20

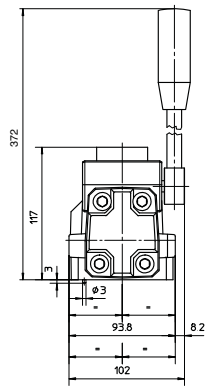




Mass: 9,7 Kg

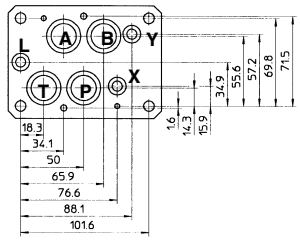
DP-21





Mass: 10 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 : Ø = 20 mm
Diameter of ports X,Y: Ø = 7 mm
Seals: 4 OR 130, 3 OR 109/70



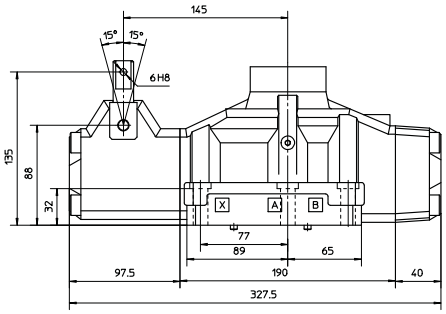
P = PRESSURE PORT
A, B = USE PORT
T = TANK PORT
X = EXTERNAL OIL PILOT PORT not used
Y = DRAIN PORT
L = DRAIN PORT FOR HYDRAULIC CENTERING DEVICE not used
For the max pressures on ports, see section [2]

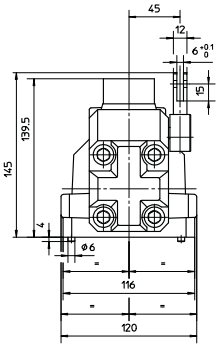
Note: ports X, L are not used.
Port Y for drain must be connected directly to tank.
No counter pressure are allowed on Y port.

Mounting subplates: see tab. E080

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

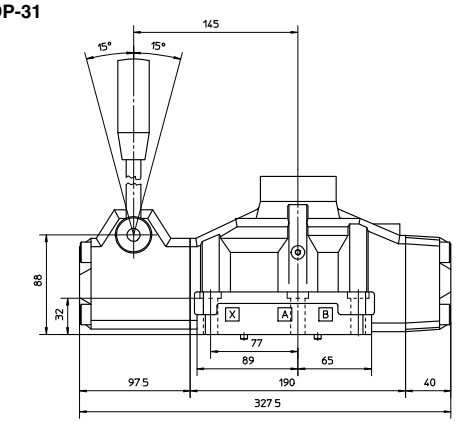
DP-30

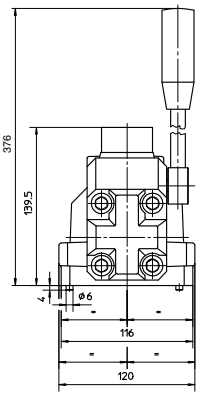




Mass: 15,2 Kg

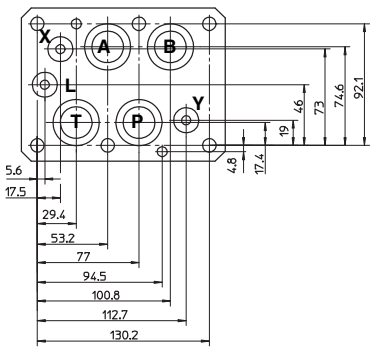
DP-31





Mass: 15,5 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 : Ø = 24 mm
Diameter of ports X,Y: Ø = 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.

Mounting subplates: see tab. E080