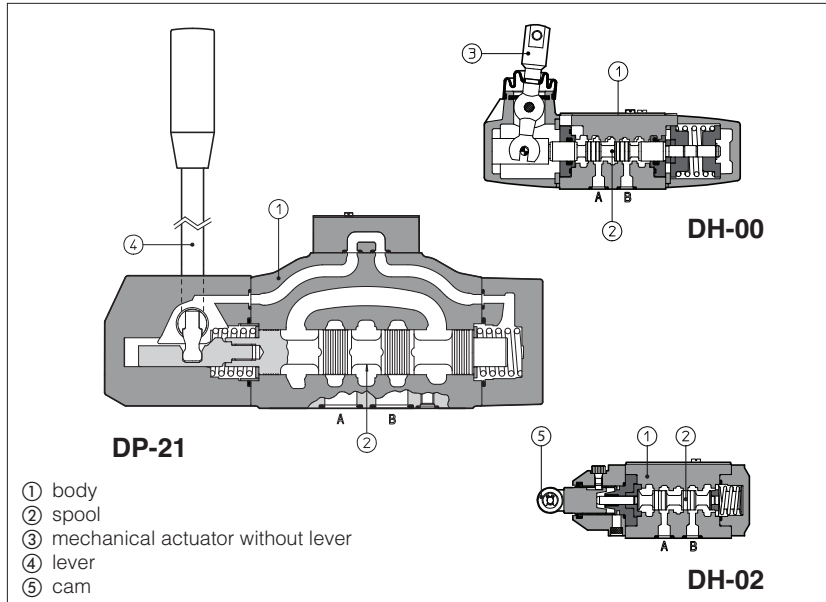


# Hand & mechanical directional valves

ISO 4401 sizes 06, 10, 16 and 25



Hand & mechanical operated directional valves are spool type, three or four way, two or three position valves, available with following actuator types:

- mechanical actuator: general purpose execution for connection to customer device for the valve's remote operation
- hand-lever
- cam (only for DH and DK).

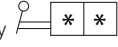
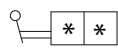
Valve sizes and max flow:

- DH-0** = size 06, flow up to 50 l/min
- DK-10 (11)** = size 10, flow up to 100 l/min
- DK-12** = size 10, flow up to 140 l/min
- DP-2** = size 16, flow up to 300 l/min
- DP-4** = size 25, flow up to 700 l/min

Max pressure:

- 350 bar** for DH-0, DP-2, DP-4
- 315 bar** for DK-1\*

## 1 MODEL CODE

<b>DH-0</b>	1	1	3 /	C /	A	** /	*
Directional control valve, size: <b>DH-0</b> = 06 <b>DK-1</b> = 10 <b>DP-2</b> = 16 <b>DP-4</b> = 25							Seals material: - = NBR <b>PE</b> = FKM
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)							Series number
Valve configuration, <b>see sections 2 and 3</b> <b>0</b> = free, without springs <b>1</b> = spring centered, without detent <b>2</b> = return to internal position <b>3</b> = return to external position <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							Options: <b>/A</b> = actuator device mounted on side of port B Lever position to be specified for DH-00, DH-01 and DK-00, DK-01 with configuration 6, 7, 8, see section 3 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  * * Only for DK-1: <b>/Y</b> = external drain
							Only for DH-01 hand-lever valves: <b>/C</b> = short hand - lever and reduced actuation force

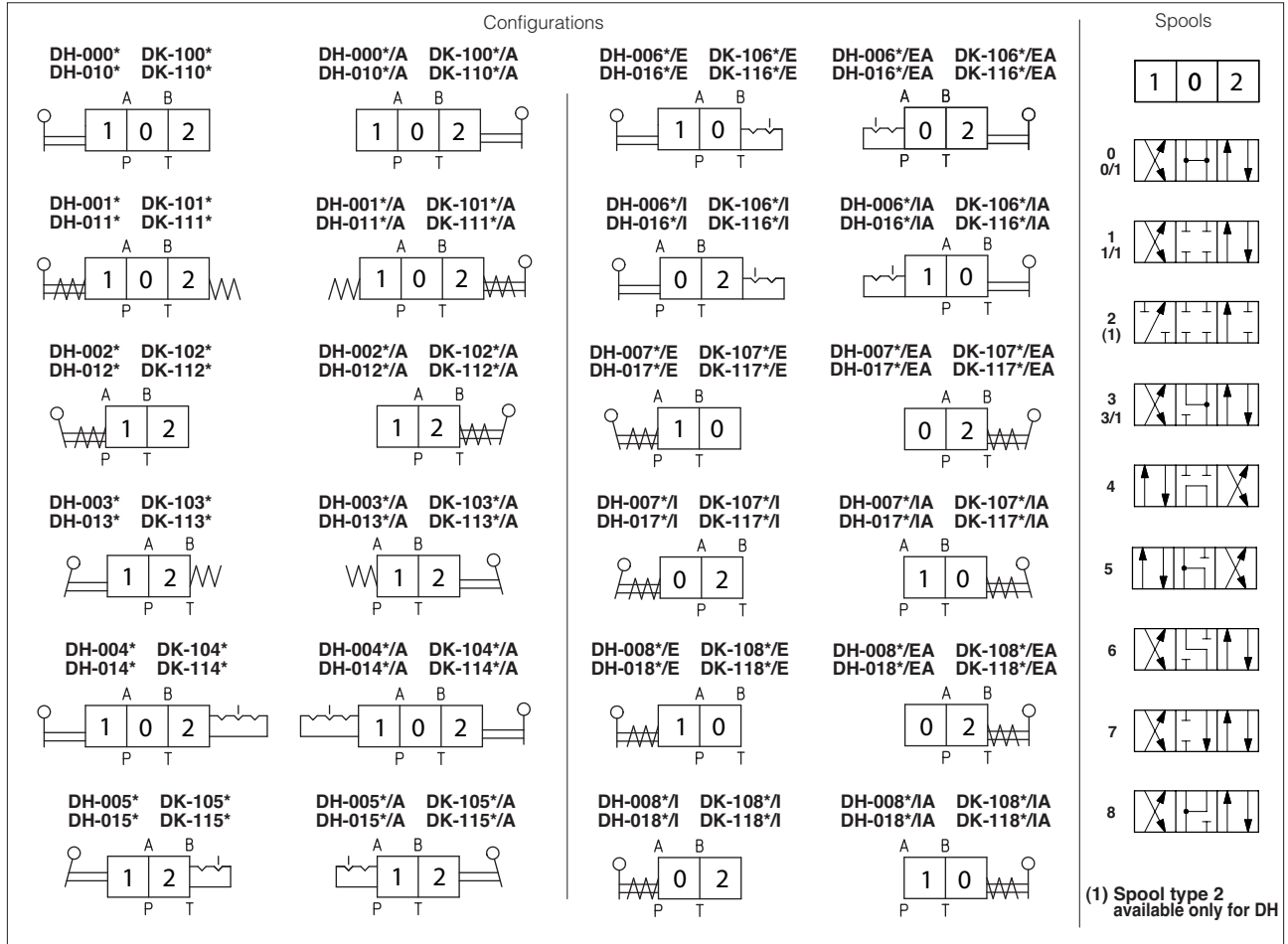
Spool type, see section 3

## 2 RANGE OF VALVE'S MODELS

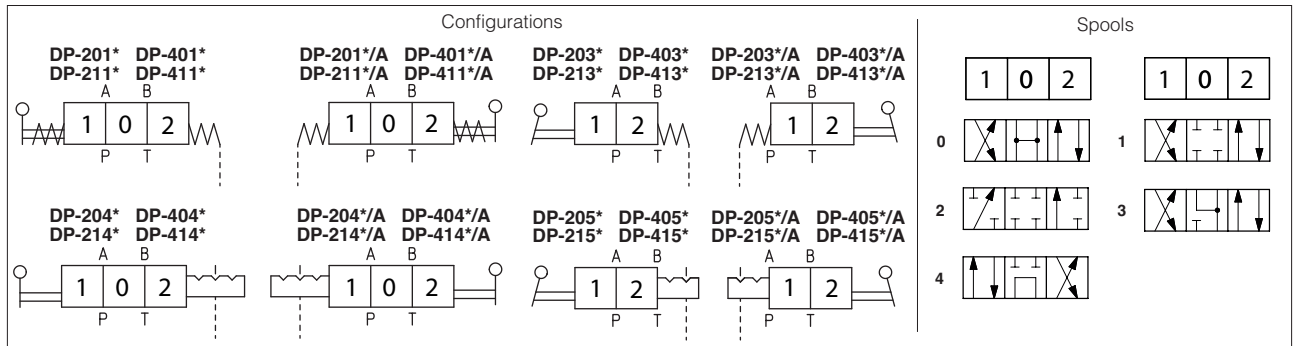
VALVE TYPE	SIZE	VALVE CONFIGURATION									
		0	1	2	3	4	5	6	7	8	
DH-00	06	•	•	•	•	•	•	•	•	•	
DH-01		•	•	•	•	•	•	•	•	•	
DH-02		•	•	•	•	•	•	•	•	•	
DK-10	10	•	•	•	•	•	•	•	•	•	
DK-11		•	•	•	•	•	•	•	•	•	
DK-12		•	•	•	•	•	•	•	•	•	
DP-20	16	•	•	•	•	•	•	•	•	•	
DP-21		•	•	•	•	•	•	•	•	•	
DP-40		•	•	•	•	•	•	•	•	•	
DP-41	25	•	•	•	•	•	•	•	•	•	

**3 CONFIGURATIONS and SPOOLS** - for intermediate passages, see tab. E001

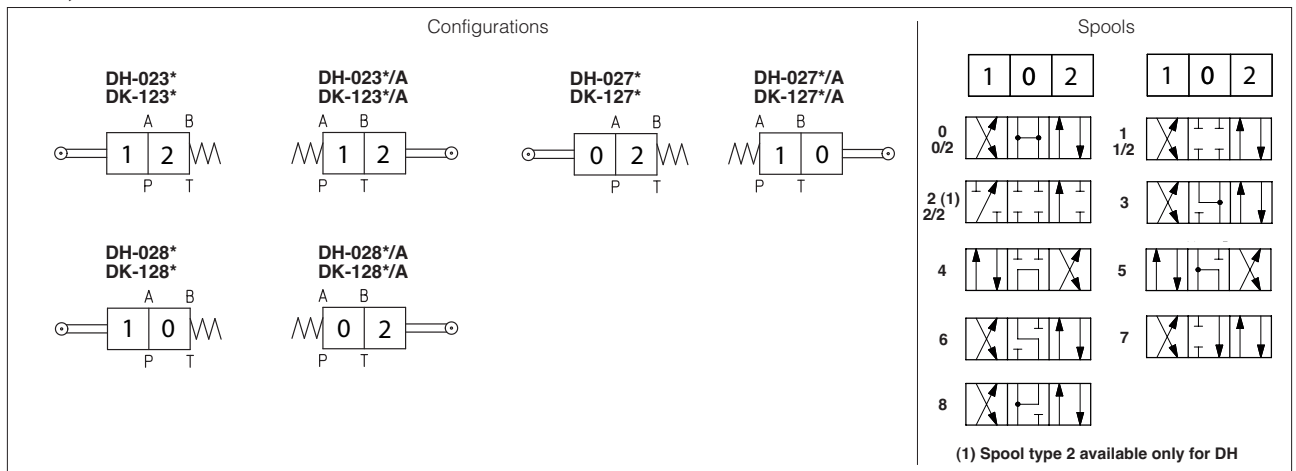
**DH-00\*, DH-01\* and DK-10\*, DK-11\*** - mechanical and hand lever actuator



**DP-20\*, DP-21\*, DP-40\*, DP-41\*** - hand lever actuator



**DH-02\*, DK-12\*** - cam actuator



**NOTE**

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

**4 MAIN CHARACTERISTICS**

Assembly position		Any position except for configuration 7 (without spring) that must be installed with horizontal axis
Subplate surface finishing		Roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101)
Ambient temperature		from -30°C to +70°C (standard seals) -20°C to +70°C (/PE seals)
Flow direction		As shown in the symbols of tables 3
Operating pressure	DH	P, A, B = <b>350 bar</b> T = <b>160 bar</b>
	DK	P, A, B = <b>315 bar</b> T = <b>160 bar</b>
	DP	P, A, B, X = <b>350 bar</b> T = <b>250 bar</b> for external drain (standard) Ports Y = 0 bar
Maximum flow	DH	<b>50 l/min</b>
	DK-10, DK-11 DK-12	<b>100 l/min</b> <b>140 l/min</b>
	DP-2 DP-4	<b>300 l/min</b> <b>700 l/min</b>

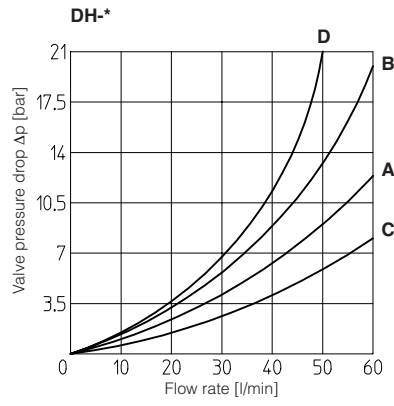
**5 SEALS AND HYDRAULIC FLUIDS** - For other fluids not included in above table, consult our technical office

Seals, recommended fluid temperature	NBR seals = (standard) -30°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals = (/PE option) -20°C ÷ +80°C		
Recommended viscosity	15 ÷ 100 mm <sup>2</sup> /s - max allowed range 15 ÷ 380 mm <sup>2</sup> /s		
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)		
<b>Hydraulic fluid</b>	<b>Suitable seals type</b>	<b>Classification</b>	<b>Ref. Standard</b>
Mineral oils	NBR, FKM	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR	HFC	

**6 Q/ΔP DIAGRAMS** based on mineral oil ISO VG 46 at 50°C

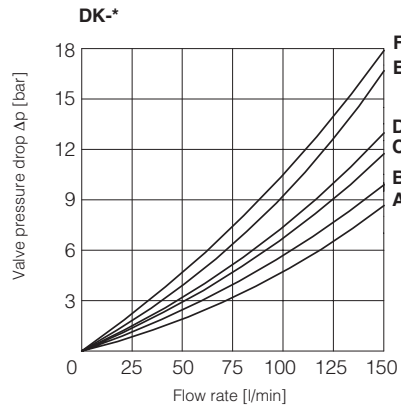
**DH-\***

Spool type \ Flow direction	Flow direction				
	P→A	P→B	A→T	B→T	P→T
0, 0/1, 0/2	C	C	C	C	
1, 1/1, 1/2	A	A	A	A	
2, 2/2, 3, 3/1	A	A	C	C	
4, 5	D	D	D	D	A
6, 7	A	A	C	A	
8	C	C	B	B	



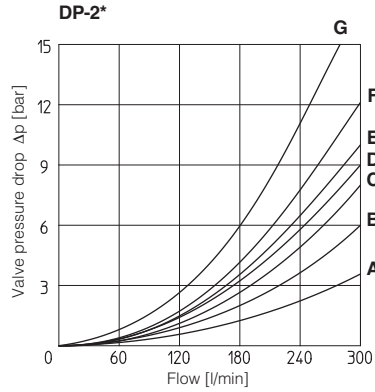
**DK-\***

Spool type \ Flow direction	Flow direction				
	P→A	P→B	A→T	B→T	P→T
0, 0/1, 0/2	A	A	B	B	
1, 1/1, 1/2, 6, 8	A	A	D	C	
3, 3/1, 7	A	A	C	D	
4	B	B	B	B	E
5	A	B	C	C	F



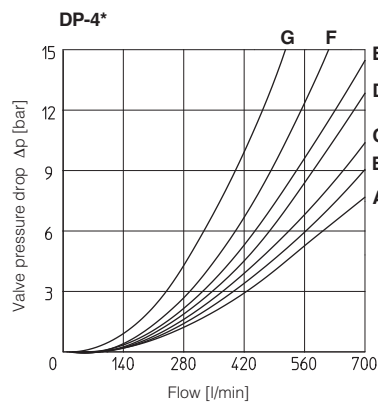
**DP-2\***

Spool type \ Flow direction	Flow direction				
	P→A	P→B	A→T	B→T	P→T
1, 3	A	A	C	A	-
0	A	A	C	D	B
2	A	A	-	-	-
4	B	B	F	G	E

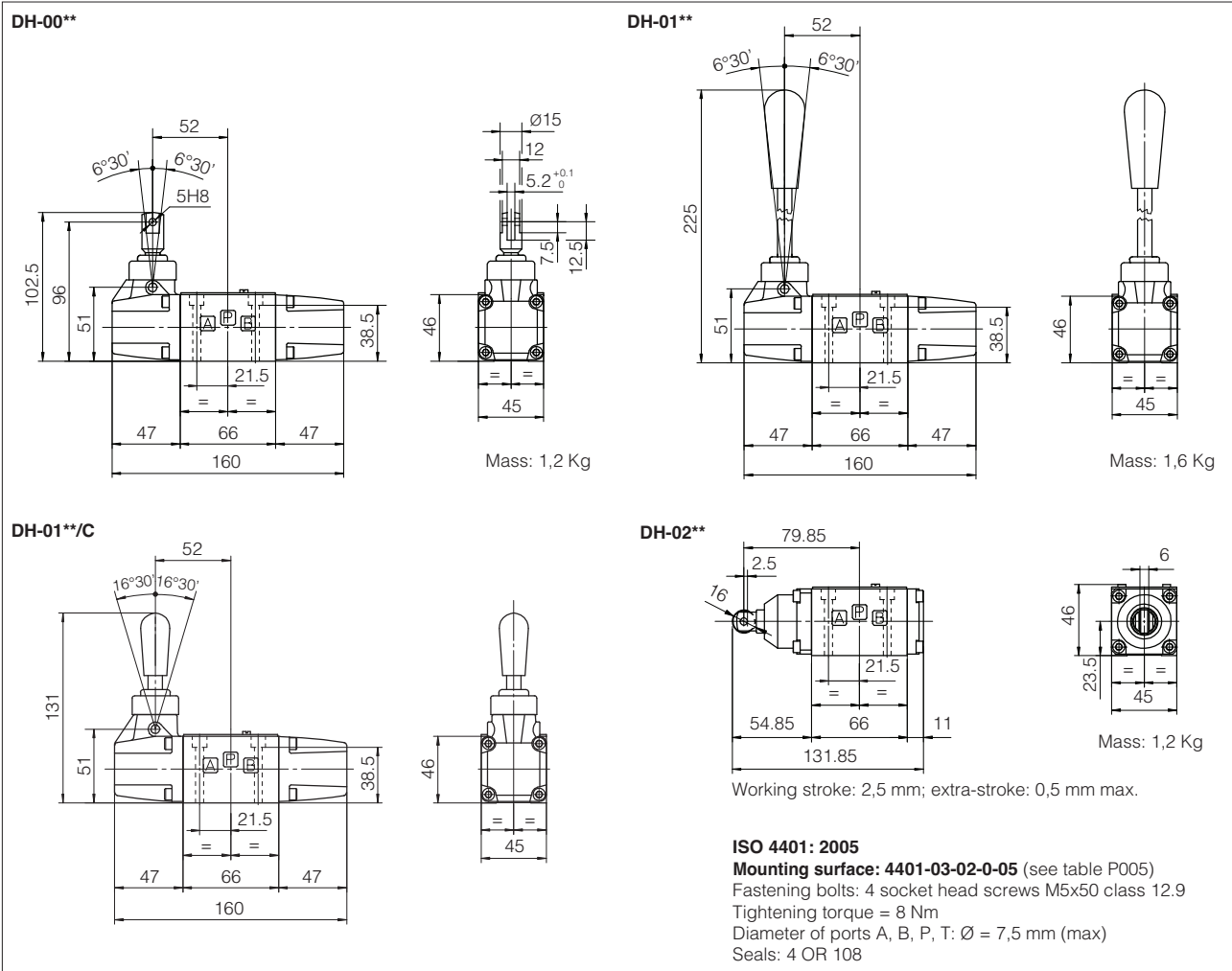


**DP-4\***

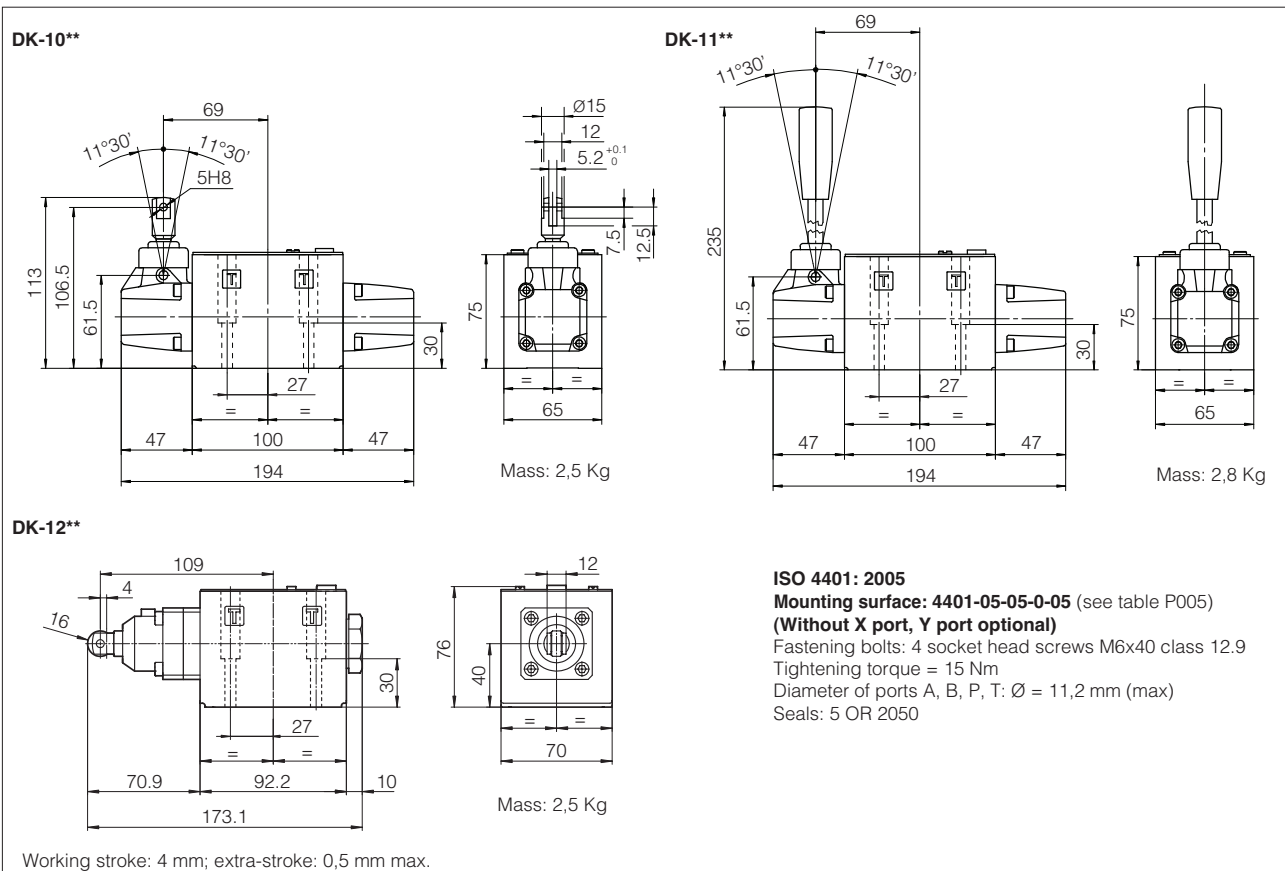
Spool type \ Flow direction	Flow direction				
	P→A	P→B	A→T	B→T	P→T
1	A	A	A	C	-
0	C	B	C	D	E
2	A	A	-	-	-
3	A	A	C	E	-
4	B	B	F	G	G



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

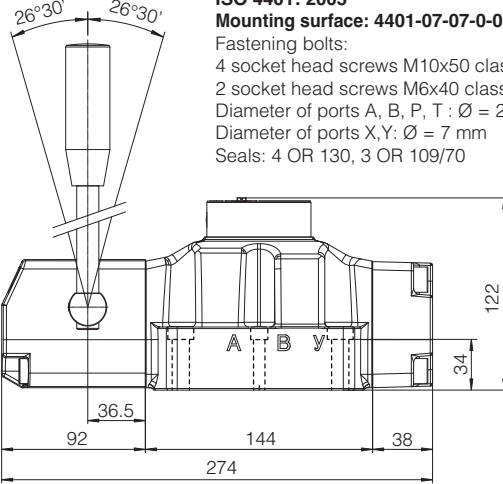


**8 DIMENSIONS OF HAND & MECHANICAL OPERATED VALVES ISO 4401 SIZE 10 [mm]**

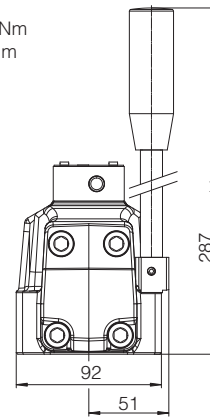


**8 DIMENSIONS OF HAND & MECHANICAL OPERATED VALVES ISO 4401 SIZE 16 [mm]**

**DP-21**

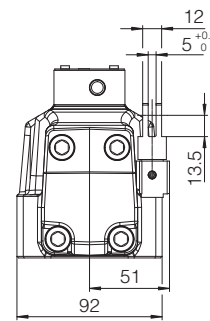
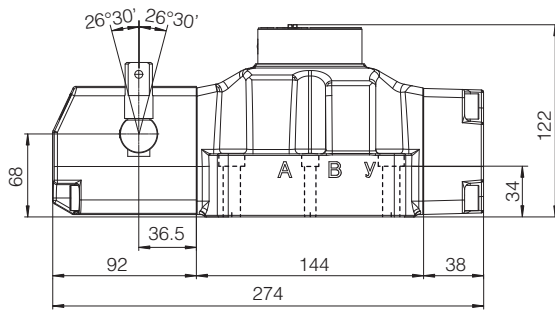


**ISO 4401: 2005**  
**Mounting surface: 4401-07-07-0-05** (see table P005)  
 Fastening bolts:  
 4 socket head screws M10x50 class 12.9, Tightening torque = 70 Nm  
 2 socket head screws M6x40 class 12.9, Tightening torque = 15 Nm  
 Diameter of ports A, B, P, T :  $\varnothing = 20$  mm  
 Diameter of ports X, Y:  $\varnothing = 7$  mm  
 Seals: 4 OR 130, 3 OR 109/70



Mass: 10 Kg

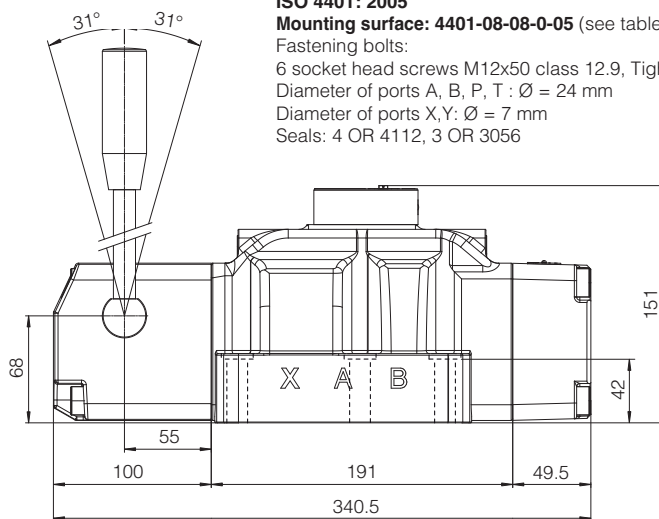
**DP-20**



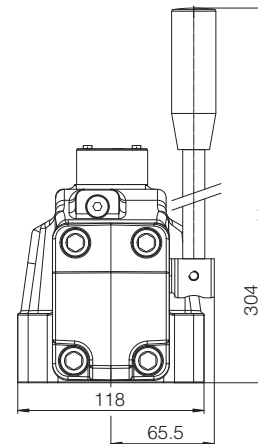
Mass: 9,7 Kg

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

**DP-41**

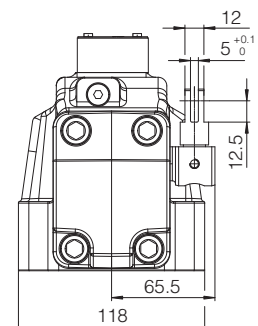
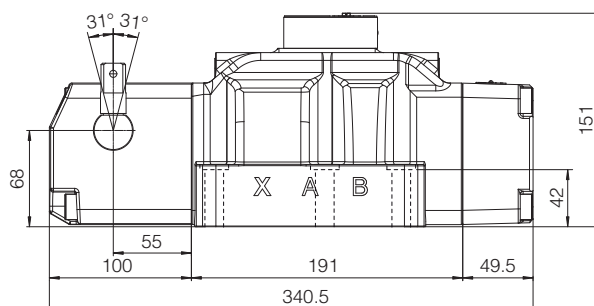


**ISO 4401: 2005**  
**Mounting surface: 4401-08-08-0-05** (see table P005)  
 Fastening bolts:  
 6 socket head screws M12x50 class 12.9, Tightening torque = 125 Nm  
 Diameter of ports A, B, P, T :  $\varnothing = 24$  mm  
 Diameter of ports X, Y:  $\varnothing = 7$  mm  
 Seals: 4 OR 4112, 3 OR 3056



Mass: 15,5 Kg

**DP-40**



Mass: 15,2 Kg