

DIRECTIONAL CONTROL VALVES LEVER OPERATED

HD2-LO-*

30 l/min - 32 MPa (320 bar)

1 DESCRIPTION

The hand operated directional control valves are used mainly to control start, stop and direction of fluid. Manual lever and actuating section can be rotated in 90° increments for flexible installation. The directional control valves are being manufactured as two-position and three-position valves (see table with functional symbols). In the standard version, the valve housing is phosphated and steel parts zinc-coated for 240 h salt spray protection acc. to ISO 9227. Enhanced surface protection for mobile sector available (ISO 9227, 520 h salt spray).

2 ORDERING CODE

(1)	(2)	(3)	(4)	(5)	(6)
HD2	-	LO	-	-	/ 10

(1) HD2: 4-way directional control valve CETOP 02- Pressure 32 MPa (320bar)

(2) LO: standard lever operated

(3) Spool type (see 4)

-number is the main spool type

-letter is lever and spring arrangement:

C: spool is spring centered (3 position)

D: spool is detented (3 position)

N: spool is detented (2 position, end to end)

LL: spool is spring offset (2 position, end to end)

ML: spool is spring offset (2 position, middle to end)

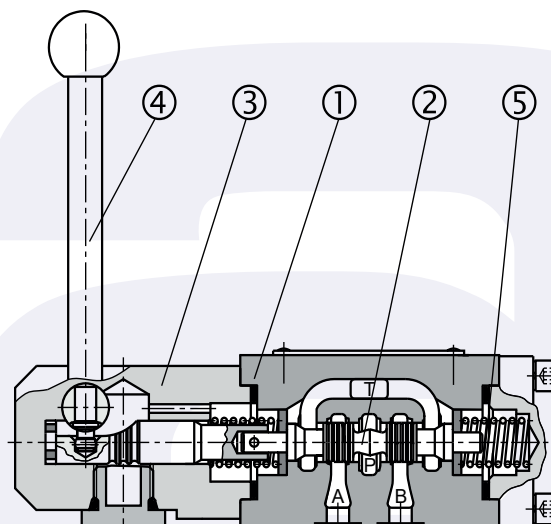
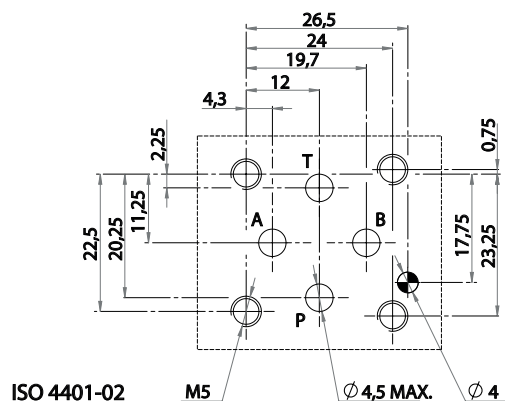
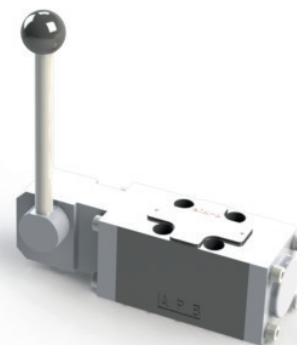
(4) Code reserved for option and variants:

b: level mechanism on B port side only for version LL, ML

(5) Code reserved for special variants

(6) Design number (progressive) of the valves

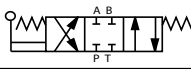
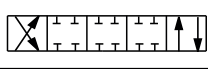


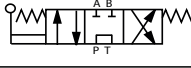
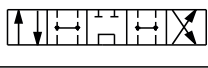

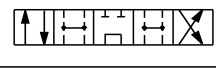
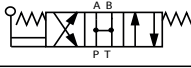
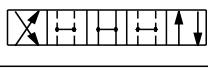

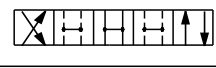

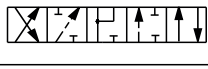






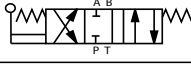
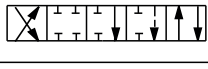

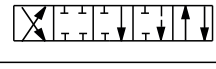



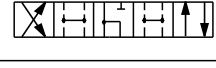



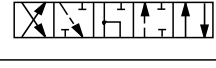










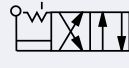
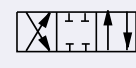

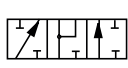
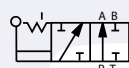
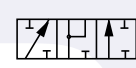




The hydraulic connections that are obtained in the "central" (neutral) position is the characteristic mark of the spool shape and from it derives its identification number: 0 = P,A,B,T connected 1 = P,A,B,T closed 3 = P closed, A,B,T connected for other types see All standard valves have the lever mechanism on the side of port "A". All 2 position, spring offset, standard valves are operated by pulling the lever. All 3 position standard valves have a +/15° angle stroke of the lever. Average effort required on the lever to operate the valve: less than 50 N. Other spool/spring/detent/lever position combinations are possible and they are indicated by a xxx 3 digits code.

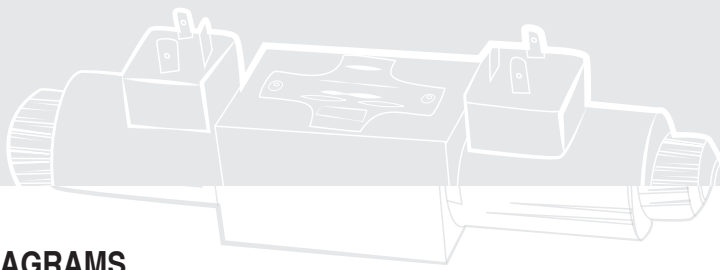


3 TECHNICAL DATA

Maximum nominal flow	30 l/min	Pressure drops	see 5
Maximum rec. flow rate	30 l/min	Installation and dimensions	see 6
maximum nominal pressure (P,A,B)	32 MPa (320 bar)	Mass	approx 1 kg
Pressure at T port	10 MPa (100 bar)		
Exception C54 and C55	10 l/min at 320 bar 30 l/min at 100 bar		

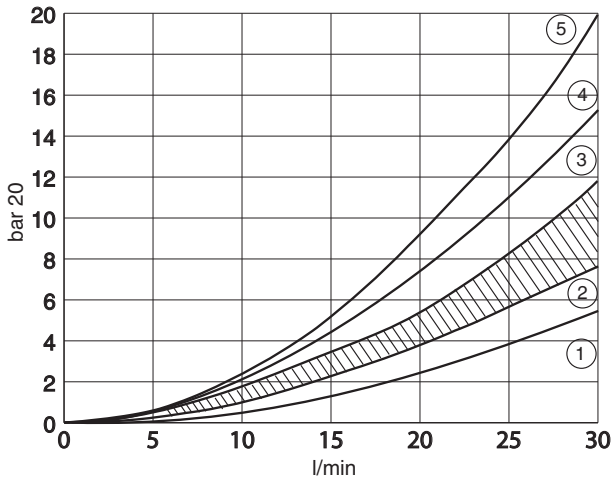
4 SPOOL IDENTIFICATION AND INTERMEDIATE POSITION TRANSITORIES

1C			1D		
4C			4D		
0C			0D		
8C			8D		
3C			3D		
7C			7D		
54C			54D		
55C			55D		
33C			33D		
31C			31D		
1LL			1N		
2LL			2N		
0LL			0N		



5 TYPICAL DIAGRAMS

Δp -Q characteristics



P-> A,P-> B spool 0,8

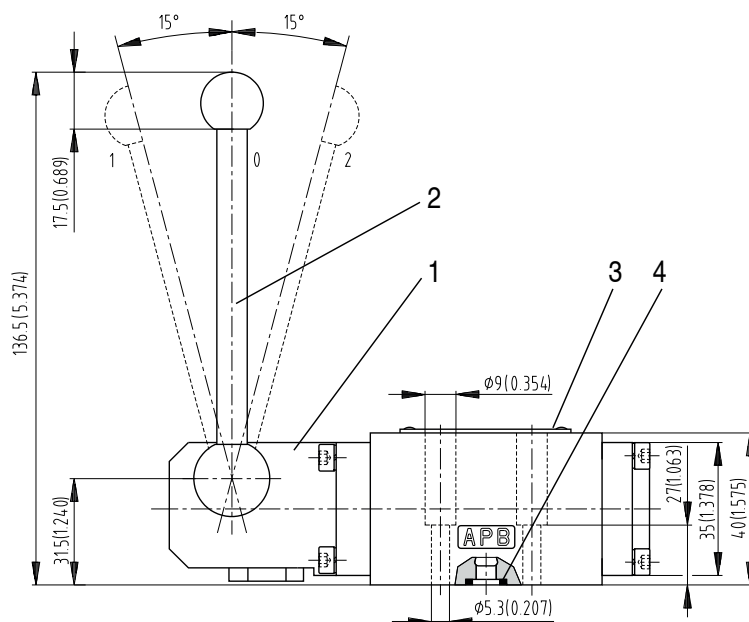
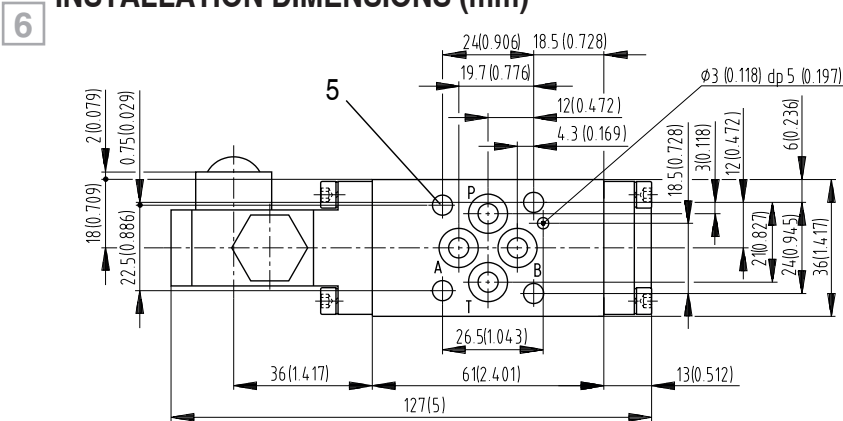
④ A->T,B->T spool 4 P->T spool 54,55

① ③ spool 0, 1, 2, 3, 7, 54, 55, 33, 31

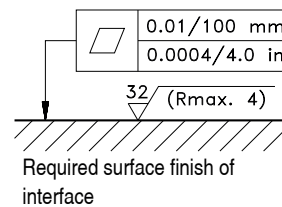
⑤ P->A,P->B spool 4

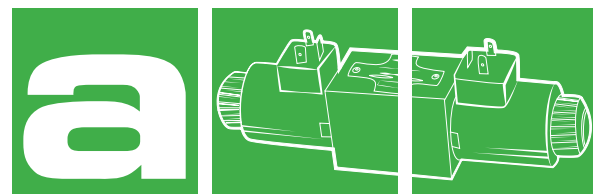
② and P->T spool 4

6 INSTALLATION DIMENSIONS (mm)



- 1 Actuating section
- 2 Hand lever
- 3 Name plate
- 4 Square ring 7.65x1.68 (4 pcs.)
supplied with valve
- 5 4 mounting holes





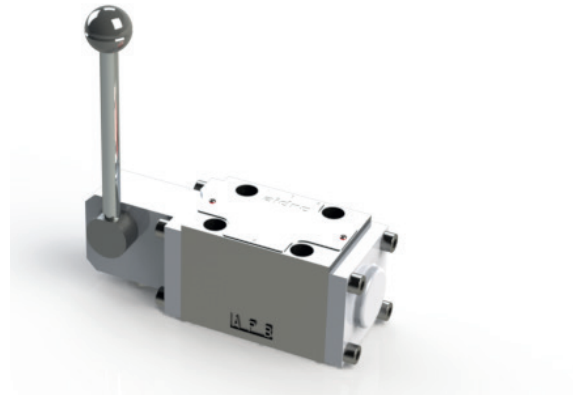
DIRECTIONAL CONTROL VALVES LEVER OPERATED

HD3-LO-*

60 l/min - 32 MPa (320 bar)

1 DESCRIPTION

The hand operated directional control valves are used mainly to control start, stop and direction of fluid. Manual lever and actuating section can be rotated in 90° increments for flexible installation. The directional control valves are being manufactured as two-position and three-position valves (see table with functional symbols). In the standard version, the valve housing is phosphated and steel parts zinc-coated for 240 h salt spray protection acc. to ISO 9227. Enhanced surface protection for mobile sector available (ISO 9227, 520 h salt spray).



2 ORDERING CODE

(1)	(2)	(3)	(4)	(5)	(6)	
HD3	-	LO	-	b	/	10

(1) HD3: 4-way directional control valve CETOP 03 - Pressure 32 MPa (320bar)

(2) Standard, level operated

(3) Spool type (see 4):

-number is the main spool type

-letter is the spring arrangement:

C : spool is spring centered (3 position)

D : spool is detented (3 position)

N : spool is detented (2 position, end to end)

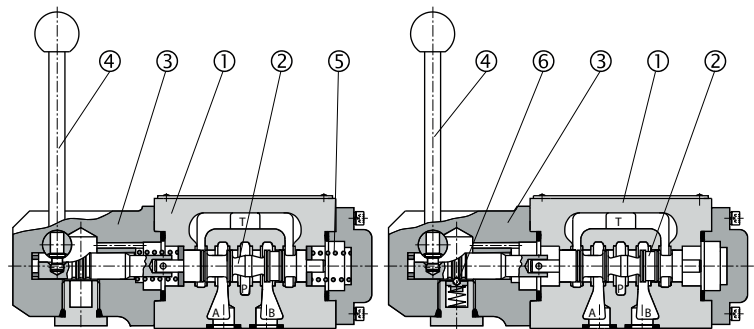
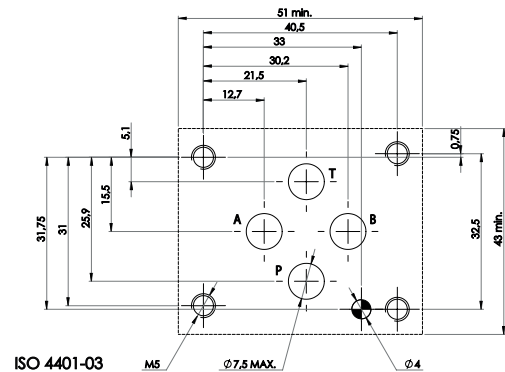
LL : spool is spring offset (2 position, end to end)

ML: spool is spring offset (2 position, middle to end)

(4) b: lever mechanism on B port side

(5) Code reserved for option and variants

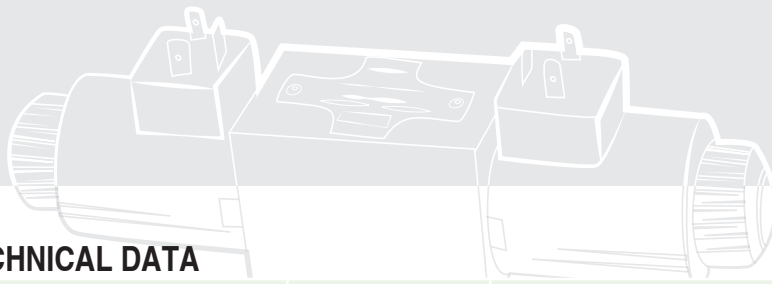
(6) Design number (progressive) of the valves



Type with return springs

Type with detent assembly

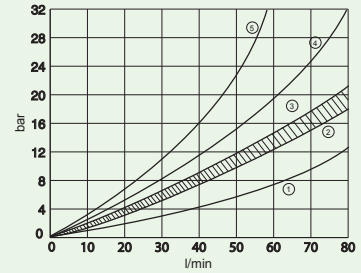
The hand operated directional valves are used mainly to control start, stop and direction of fluid. they consist of housing 1 with control spool 2 and the actuating section 3. the actuating section consists either of the hard lever 4 and of one or two return springs 5, or of the hand lever 4 and the detent assembly 6. The detent assembly holds the spool in its last shifted position.



3 TECHNICAL DATA

Maximum nominal flow	60 l/min	Pressure drops: Δp -Q characteristics
Maximum rec. flow rate	80 l/min	
Maximum nominal pressure (P, A, B)	32 MPa (320 bar)	
Maximum pressure at T port	10 MPa (100 bar)	
Installation and dimensions	see 5	
Mass	approx 1,6 kg	

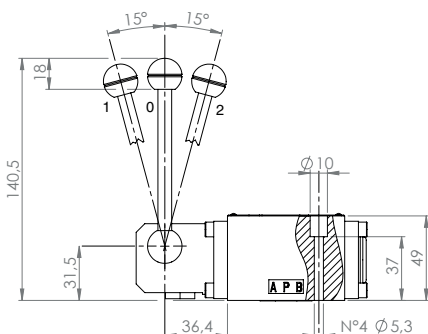
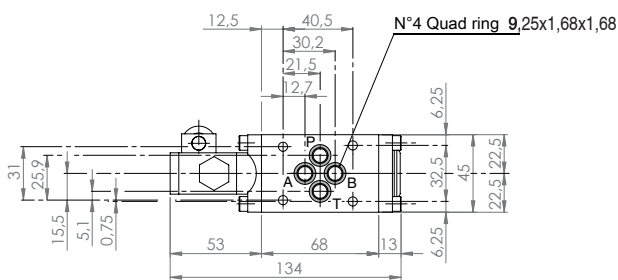
- ① P -> A, P -> B spool 0,8
- ② -> ③ spool 0,1,2,3,4,7
- ④ A -> T, B -> T spool 4
- ⑤ P -> T spool 4



4 SPOOL IDENTIFICATION AND INTERMEDIATE POSITION TRANSITORIES

1C			1D		
4C			4D		
0C			0D		
8C			8D		
3C			3D		
7C			7D		
1LL			1N		
2LL			2N		
0LL			0N		

5 INSTALLATION DIMENSIONS (mm)



6 HYDRAULIC LIMITS OF USE

Valves HD3-LO-1C, 1LL and all detent type valve can operate at 320 bar and 80 l/min. Other spring centered and spring offset valves have limits reduced to max 60l/min