

DIRECTIONAL CONTROL VALVES SOLENOID OPERATED

HD5-ED-*

100 l/min 32 MPa (320 bar)

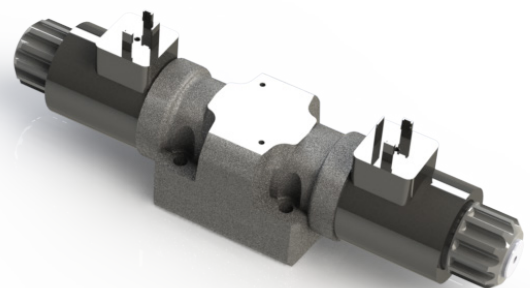
1 DESCRIPTION

Valves HD5-ED are directional control valve with subplate mounting interface acc. to ISO 4401, DIN 24340 (CETOP 05).

The valve is designed for low performance applications when you need a CETOP 5 interface but limited flow rates.

The valve is available with interchangeable metallic DC solenoids, also for AC power supply using a built-in rectifier bridge inside the coil.

In the standard version, the valve housing is phosphated for 240 h salt spray protection acc. to ISO 9227.



2 ORDERING CODE

(1)	(2)	(3)	(4)	(5)	(6)	(7)
HD5	-	ED	-	-	-	/ 10

(1) HD5 : 4-way directional control valve CETOP 05

(2) ED : electrically controlled

(3) Spool type (see 4)

-number is the main spool type

-letter is the solenoid or spring arrangement:

C : 2 solenoid , spool is spring centered (3 position)

LL : 1 solenoid, spool is spring offset (2 position)

ML: 1 solenoid, spool is spring centered (2 position)

(4) Code reserved for special variants

(5) Electric voltage and solenoid coils:

0000: no coil(s)

012C: coil(s) for 12 V DC

024C: coil(s) for 24 V DC

115A: coil(s) for 110/50 V AC- 115/60 V AC

230A: coil(s) for 220/50 V AC - 230/60 V AC

(6) Coil connection:

no designation: DIN 43650-A ISO 4400

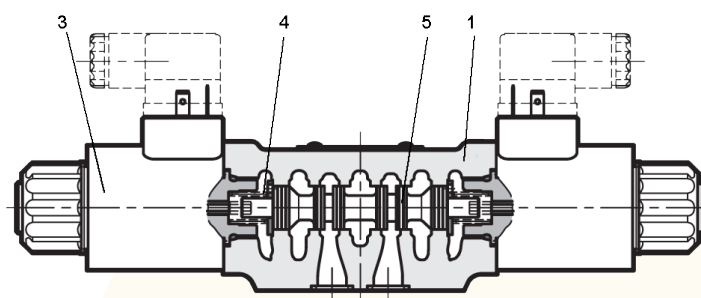
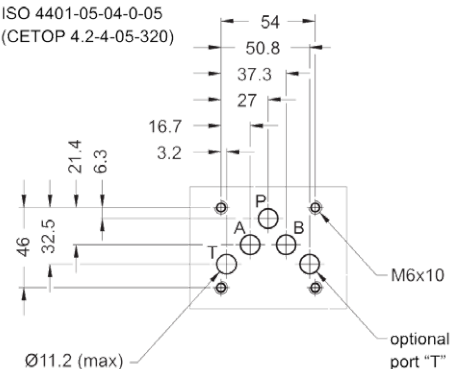
AMP: Amp Junior Timer - vertical configuration

AMPX: Amp Junior Timer - axial configuration

D: Deutsch

(7) Design number (progressive) of the valve

ISO 4401-05-04-0-05
(CETOP 4.2-4-05-320)



The spool 5 shifts into the valve body 1 subject to the action of springs 4 and solenoids. Spool 5, depending from its shape and its position in the valve body 1, opens and/or closes passages between P, A, B and T ports, thus controlling the direction of the hydraulic flow.

3 TECHNICAL DATA

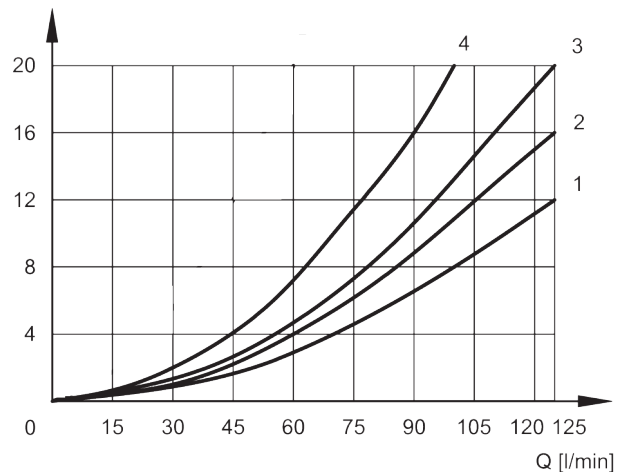
Nominal flow	100 l/min	Electric characteristics: Valve type HD5-ED-* are operated by solenoid that are energized: - directly from a DC voltage supply 24 V DC = 024C 12 V DC = 012C - by the use of coils that incorporate a full wave rectifier, from AC voltage supply: 115A110/50 V AC- 115/60 V AC = 115A 220/50 V AC - 230/60 V AC = 230A All connectors must conform to ISO 4400 (DIN 43650) and electric circuitry must be able to carry the following rated current values : V 12 DC = 2,4 A V 115/50 = 0,26 A V 24 DC = 1,2 A V 230/50 = 0,14 A Coils with 2 electric pins, conforming with AMP connectors, are only available for DC supply (example of code : B03-012C AMP). Permissible supply voltage variation : ± 10 %
Maximum rec. flow rate see	100 l/min	
Maximum nominal pressure (P,A,B)	32 MPa (320 bar)	
Maximum pressure at T port	21 MPa (210 bar)	
Pressure drops	see 5	
Energizing switching times	70-100 ms	
Protection to DIN 40050	IP 65	
Duty cycle	100%	
Installation and dimensions	see 7	
Mass	3,0/2,4 kg	

4 SPOOL IDENTIFICATION AND INTERMEDIATE POSITION TRANSITORIES

1C		1ML	
4C		0ML	
0C		1MLb	
3C		1LLb	
1LL		4MLb	
3ML		0MLb	
4ML		3MLb	

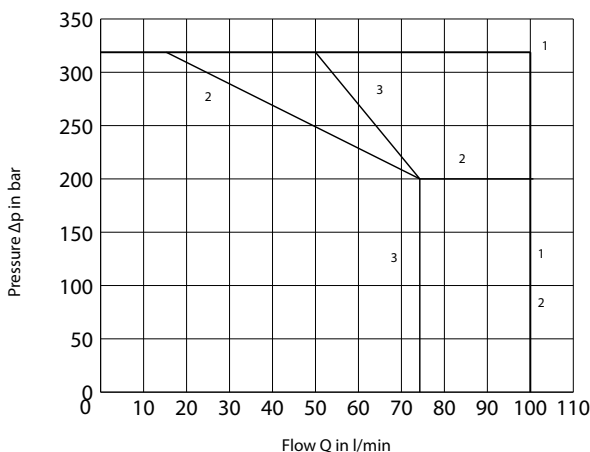
5 TYPICAL DIAGRAMS

Typical P-Q curves for valves HD5-ED-* in standard configuration, with mineral oil at $v=32 \text{ mm}^2/\text{s}$ and at $T=40^\circ\text{C}$.



6 HYDRAULIC LIMIT OF USE

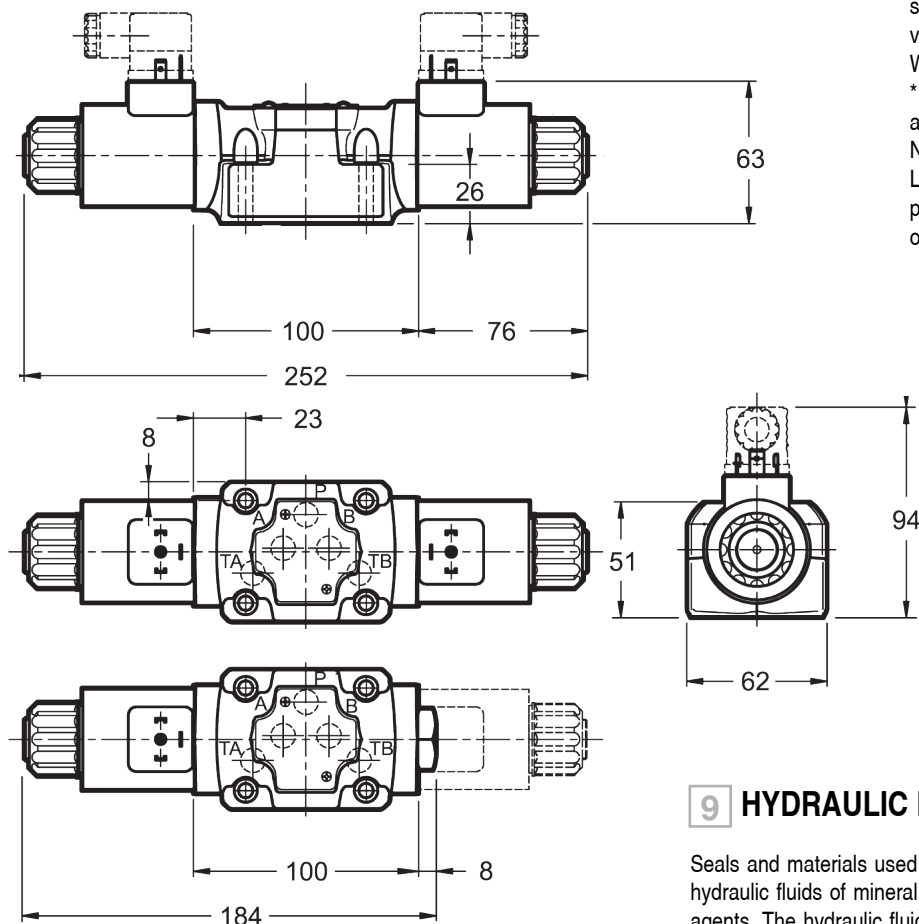
P-Q characteristics limits for safe use of HD5-ED-* solenoid operated valves. Measured at $v=32 \text{ mm}^2/\text{s}$ and $T = 40^\circ\text{C}$



1C	1
4C	3
0C	1
3C	2
1LL	1
3ML	2
4ML	3
1ML	1
1MLb	1
1LLb	1
4MLb	3

Spool	P-A	P-B	A-T	B-T	P-T
1C	1	1	2	2	
4C	4	4	4	4	1
0C	1	1	1	1	1
3C	1	1	1	1	
1LL	2	2	3	3	
1LLb	2	2	3	3	

7 INSTALLATION DIMENSION (mm)



All valves HD5-* conform with ISO and CETOP specifications for mounting surface dimensions and for valves height.

When assembled to its mounting plate valve HD5-* must be fastened with 4 bolts M6x35 (or M6x** according to the number of modules) tightened at 12 Nm torque.

Leakage between valve and mounting surface is prevented by the positive compression on their seats of 5 seals of O Ring type 12,42x1,78 - 90 Shore.

9 HYDRAULIC FLUID

Seals and materials used on standard valves HD5-* are fully compatible with hydraulic fluids of mineral base, upgraded with antifoaming and anti oxidizing agents. The hydraulic fluid must be kept clean and filtered to ISO 4406 class 19/17/14, or better, and used in a recommended viscosity range from 10 cSt to 60 cSt.

8 SOLENOID

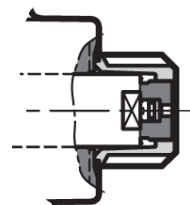
Solenoid valves can be supplied without electric coils, as HD5-ED-***-0000. Coils are ordered separately; standard, 3 electric pins, coils are:

- B03-024C ; B03-012C
- B03-115A ; B03-230A

Connections to the electric supply is made by standard 3-PIN connectors, according to ISO 4400 (DIN 43650). Connectors can be with different cable exit size (PG9, PG11) and beside of the plain connecting function they may incorporate various features like

- Signal led
- Voltage surge suppressor, etc.

10 MANUAL OVERRIDE



In case of electric cut-offs, the spool can be manually shifted by acting on the emergency pins, located at the end of the solenoids and accessible through the retaining nuts.