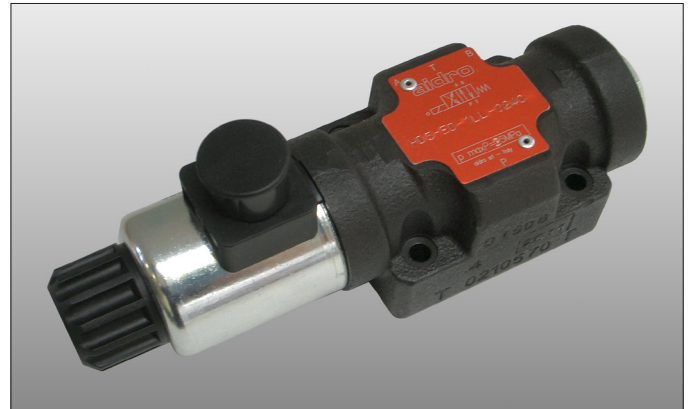
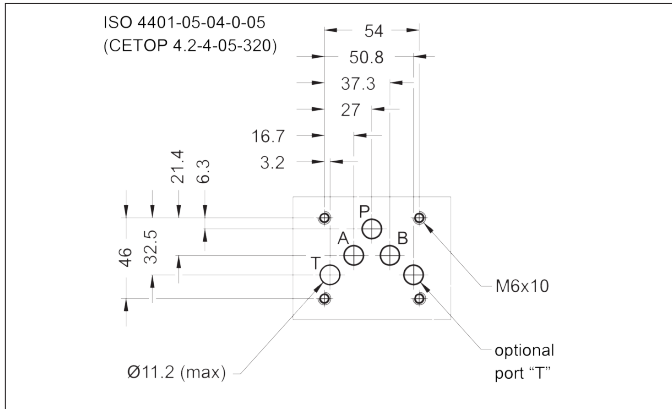


**DIRECTIONAL CONTROL VALVE  
SOLENOID OPERATED – CETOP 05  
TYPE HD5-ED-\***

Qnom= 100 l/min

Pnom = 32 MPa (320 bar)



**1** HOW TO READ THE MODEL CODE FOR HD5-ED

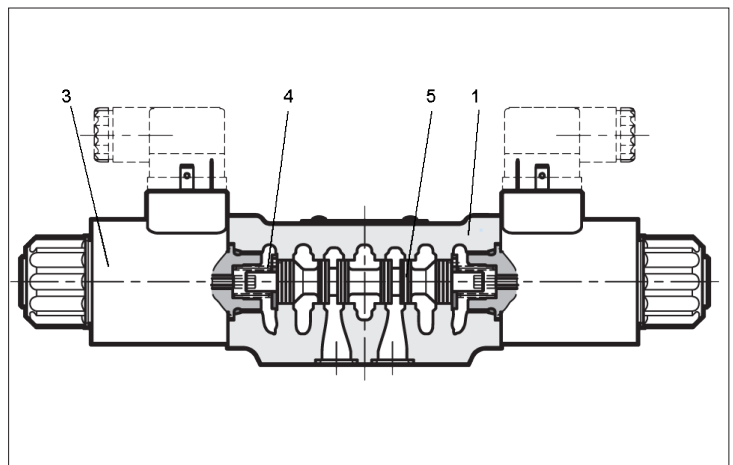
**HD5 - ED - (1) (C) - \* - (012C) (-) / 10**

①      ②                      ③      ④                      ⑤                      ⑥                      ⑦      ⑧

- ① **HD5** : 4-way directional control valve CETOP 05
- ② **ED** : electrically controlled
- ③ **(1)** : spool type, see 5
- ④ **(C)** : solenoid(s) and spring(s) arrangements, see 5
  - C : 2 solenoids, spool is spring centered (3 position)
  - LL : 1 solenoid, spool is spring offset (2 position)
  - ML : 1 solenoid, spool is spring centered (2 position)
- ⑤ **\*** : Code reserved for options and variants
- ⑥ **(012C)** : 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
- ⑦ **-** : Coil connection
  - : DIN 43650-A ISO 4400
  - AMP : Amp Junior Timer - vertical configuration
  - AMPX : Amp Junior Timer - axial configuration
  - D : Deutsch
- ⑧ **10** : Design number (progressive) of the valves.

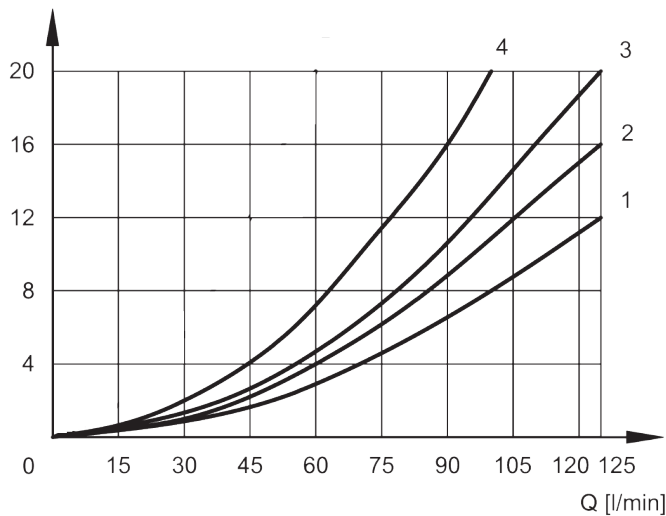
**2** DESCRIPTION

The spool ⑤ shifts into the valve body ① subject to the action of springs ④ and solenoids ③. 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 TYPICAL DIAGRAMS

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



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	

## 4 TECHNICAL DATA

Nominal flow	100 l/min
Maximum rec. flow rate see [7]	125 l/min
Maximum nominal pressure (P, A, B)	32 MPa (320 bar)
Maximum pressure at T port	21 MPa (210 bar)
Pressure drops	see [3]
Electric characteristics	see [6]
Energizing switching times	70-100 ms
Protection to DIN 40050	IP 65
Duty cycle	100%
Dimensions	see [9]
Installation	see [8]
Mass	3,0/2,4 kg

## 5 SPOOL IDENTIFICATION AND INTERMEDIATE POSITION TRANSITORIES

Functional Symbols					
Designation	Symbol	Interposition	Designation	Symbol	Interposition
1C			1ML		
4C			0ML		
0C			1MLb		
3C			1LLb		
1LL			4MLb		
3ML			0MLb		
4ML			3MLb		

## 6 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

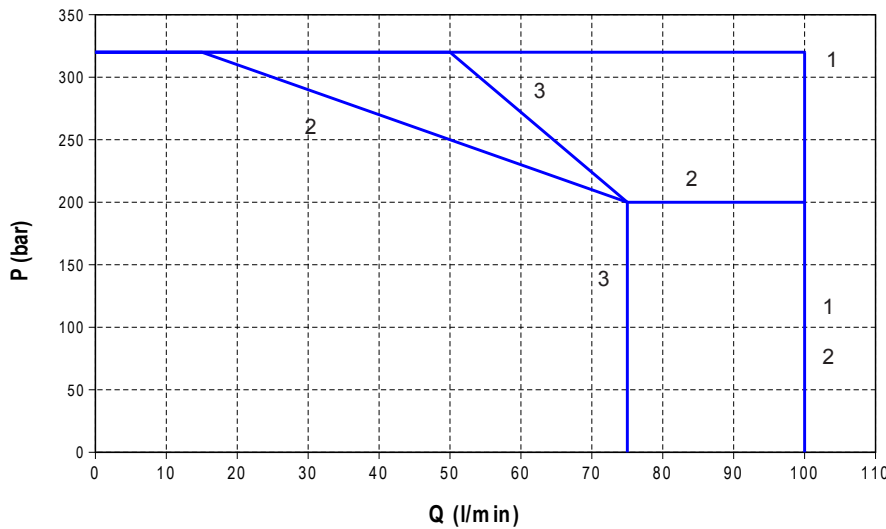
V 24 DC = 1,2 A V 230/50 = 0,14 A

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 :  $\pm 10 \%$

**7** HYDRAULIC LIMITS OF USE

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

**8** INSTALLATION

All valves HD5-\* conform with ISO and CETOP specifications for mounting surface dimensions (see **9**) 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.

**10** 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.

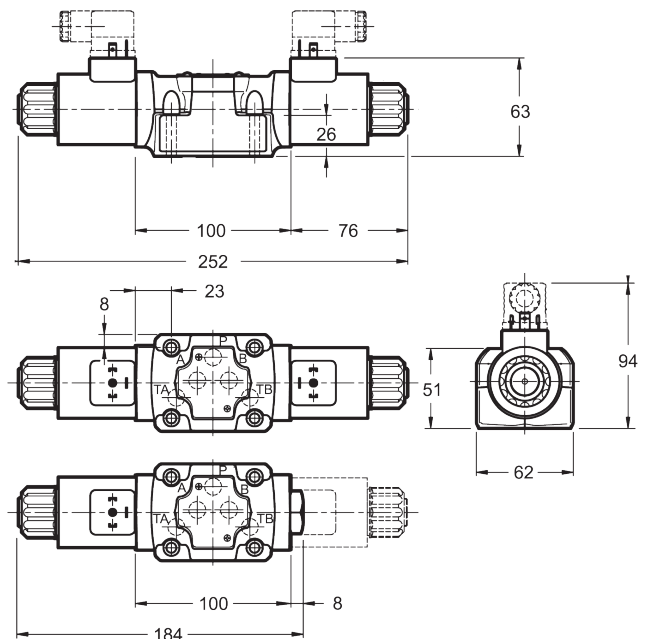
**11** HYDRAULIC FLUID

Seals and materials used on standard valves HD5-\* are fully compatible with hydraulic fluids of mineral base, upgraded with antifoaming and anti oxidizing agents.

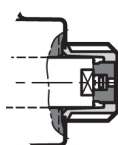
The hydraulic fluid must be kept clean and filtered to ISO 4406 class 19/17/14, or better, and used in a recommended viscosity range from 10 cSt to 60 cSt.

**9** INSTALLATION DIMENSIONS

(dimensions in mm)



**12** 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.

Standard model of the manual override