

DIRECTIONAL CONTROL VALVES SOLENOID OPERATED

HD33-EF-*

40 l/min - 25 MPa (250 bar)

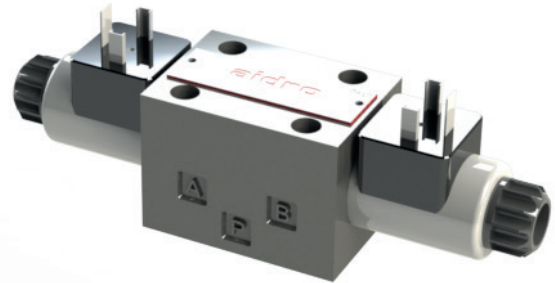
1 DESCRIPTION

Valves HD33-EF are directional control valve with subplate mounting interface acc. to ISO 4401, DIN 24340 (CETOP 03).

The design of the body is a three chamber casting for production cost saving and low pressure drops. HD33-EF has a low power consumption (18 W) and a coMPact design.

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

In the standard version, the valve housing is phosphated 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)	(7)
HD33	-	EF	-	-	-	/ 10

(1) HD33: 4-way directional control valve CETOP 03

(2) Electrically controlled

(3) Spool type (see 4):

-number is the main spool type

-letter is the solenoid or spring arrangement:

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)

(4) Code reserved for option and variants

(5) Electric voltage and solenoid coils: see 6

0000: no coils

012C: coils for V12DC

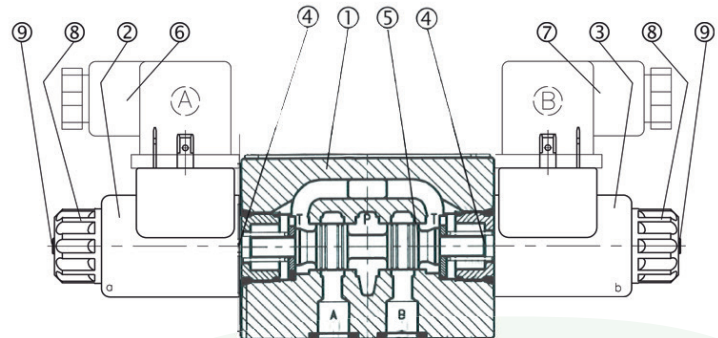
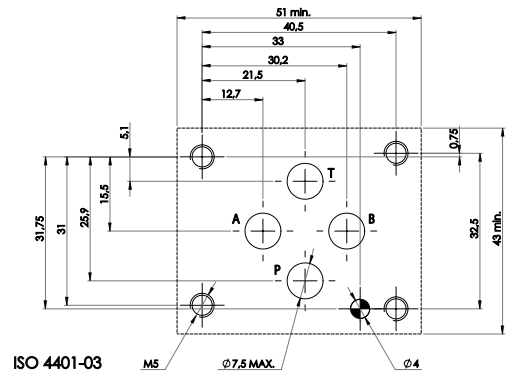
024C: coils for V24DC

(6) Coil connection

no designation: DIN 43650-A ISO 4400

AMPX: Amp Junior Timer

(7) Design number (progressive) of the valves

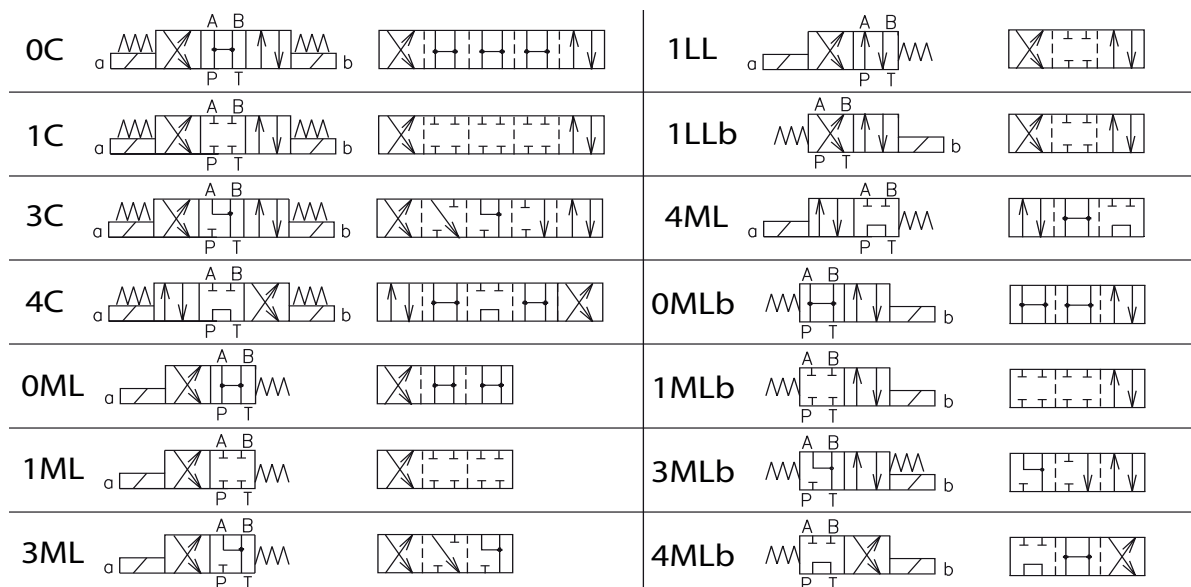


The spool 5 shifts into the valve body 1 subject to the acting springs 4 and solenoids 9. Spool 5 depending from its shape and its position in the valve body 1, opens and/ or closes passages between P,A,B and T ports, thus controlling the direction of the hydraulic flow.

3 TECHNICAL DATA

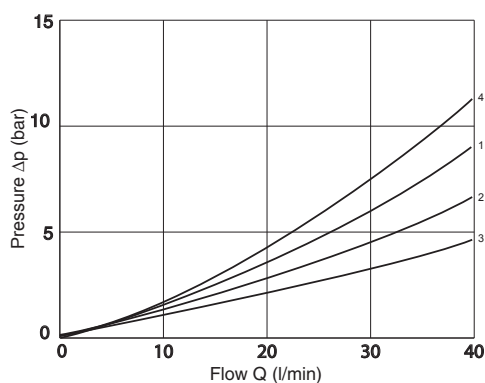
Nominal flow	25 l/min	Electric characteristics: Valve type HD33-EF-* are operated by solenoid that are energized : directly from a D.C. voltage supply V 12 DC = 012C V 24 DC = 024C 3 pin connectors must conform to ISO 4400 (DIN 43650) Permissible supply voltage variation : ± 10 %
Maximum rec. flow rate	40 l/min	
Maximum nominal pressure (P, A, B)	25 MPa (250 bar)	
Maximum pressure at T port	16 MPa (160 bar)	
Pressure drops	see [5]	
Protection to DIN 40050	IP 65	
Duty cycle	100%	
Installation and dimensions	see [9]	
Mass	1,25/1,10 kg	

4 SPOOL IDENTIFICATION AND INTERMEDIATE POSITION TRANSITORIES



5 TYPICAL DIAGRAMS

Typical Δp -Q curves for valves HD33 -EF-* in standard configuration, with mineral oil at $v=32 \text{ mm}^2/\text{s}$ and $T=40^\circ\text{C}$



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

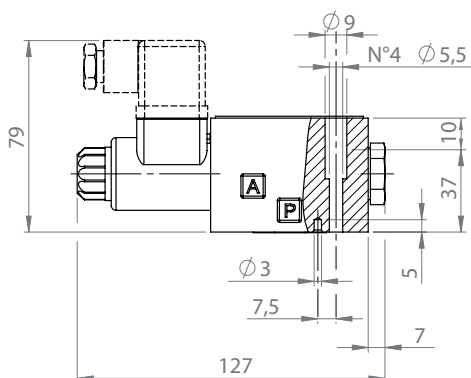
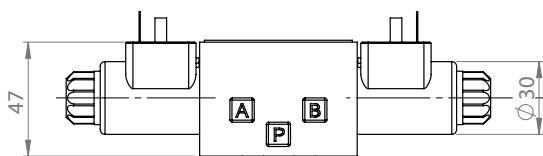
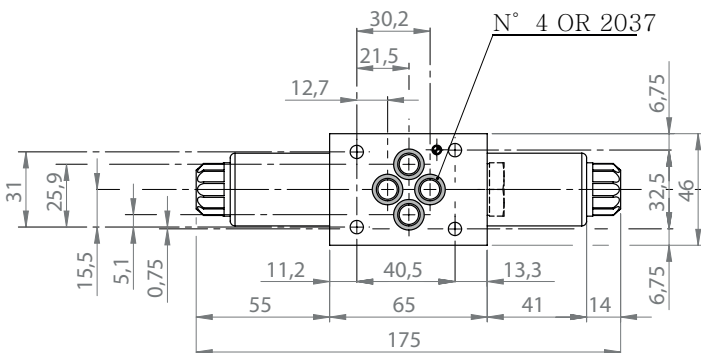
6 SOLENOID

Solenoid valves can be supplied without electric coils, as HD33-EF-****-0000. Coils are supplied separately; standard, 3 electric pins, coils are : - B01-012C - B01-024C. 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.

8 HYDRAULIC FLUID

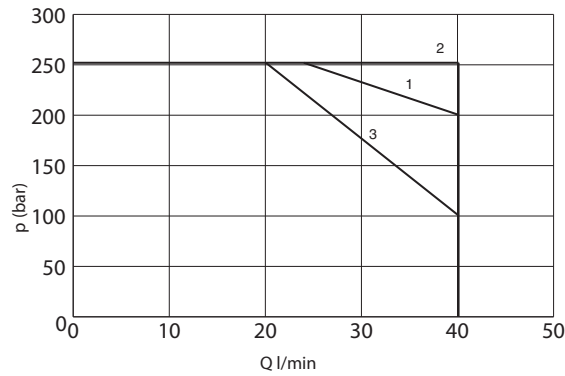
Seals and materials used on standard valves HD3-* are fully compatible with hydraulics fluids of mineral base, upgraded with anti-foaming and anti oxidizing agents. The hydraulic fluid must be kept clean and filtered to ISO 4406 class 19/17/14, or better, and used in a recommended viscosity range from 10 cSt to 60 cSt.

9 INSTALLATION DIMENSIONS (mm)



7 HYDRAULIC LIMIT OF USE

Δp -Q characteristics limits for safe use of HD33-EF-* solenoid operated valves. Measured at $v = 32\text{mm}^2/\text{s}$ and $T = 40^\circ\text{C}$



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

All valves HD33-* conform with ISO and CETOP specifications for mounting surface dimensions and for valves height. When assembled to its mounting plate valve HD33-* must be fastened with 4 bolts M5x45 (or M5x** according to the number of modules) tightened at 8 Nm torque. Leakage between valve and mounting surface is prevented by the positive compression on their seats of 4 seals of O Ring type 9,25x1,78

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.

Standard model of the manual override

