



DIRECTIONAL CONTROL VALVES CETOP 5/NG10

INTRODUCTION

The directional control valves NG10 designed for subplate mounting with an interface in accordance with UNI ISO 4401 - 05 - 04 - 0 - 94 standard (ex CETOP R 35 H 4.2-4-05), and can be used in all fields on account of their excellent capacity and pressure specifications.

The use of solenoids with wet armatures means that the construction is extremely functional and safe completely dispensing with need for dynamic seals. The solenoid dust cover is screwed directly onto the valve casing whilst the coil is kept in position by a ring nut.

Great care has been taken in the design and the production of the ducts and the improvement of the spools has allowed relatively high flow rates to be accommodated with minimal pressure drops (Δp). The operation of the directional valves can be electrical, pneumatic, oleodynamic, mechanical or lever operated .

The centring position is achieved by means of calibrated length springs which, once the action of impulse is over, return the spool to the centre or end travel position.

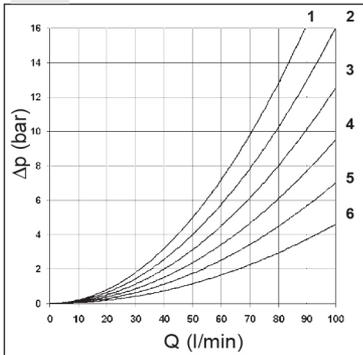
The solenoids constructed with protection class in accordance with DIN 40050 standards are available in either direct current (IP65) or alternating current (IP66) with different voltage and frequencies.

All types of electrical controls can be fitted, on request, with different types of manual emergency controls. The electrical supply takes place through connectors meeting DIN 43650 ISO 4400 standards; connectors are also available with built in rectifier or pilot lights.

The valves are designed for use with DIN 51524 standard hydraulic mineral oils and it is recommended that filters should be fitted to ensure a maximum contamination level of class 10 in accordance with NAS 1638, $\beta_{25} \geq 75$.

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STANDARD SPOOLS	CH. I PAGE 30
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AD.5.E...J*	CH. I PAGE 32
AD.5.E...Q5	CH. I PAGE 32
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"A16" DC SOLENOIDS	CH. I PAGE 35
"K16" AC SOLENOIDS	CH. I PAGE 35
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PRESSURE DROPS



The diagram at the side show the pressure drop curves for spools during normal usage. The fluid used is a mineral oil with a viscosity of 46 mm²/s at 40°C; the tests have been carried out at a fluid

temperature of 40°C.

For higher flow rates than those in the diagram, the losses will be those expressed by the following formula:

$$\Delta p_1 = \Delta p \times (Q_1/Q)^2$$

where Δp will be the value for the losses for a specific flow rate Q which can be obtained from the diagram, Δp_1 will be the value of the losses for the flow rate Q1 that is used.

Spool type	Connections				
	P→A	P→B	A→T	B→T	P→T
01	2	2	5	5	
02	3	3	6	6	3
03	2	2	6	6	
04	3	3	4	4	1
05	3	3	5	5	
06	2	2	5	5	
66	2	2	5	5	
07		1	5		
10	3	3	5	5	
11	4			5	
	Curve No.				

Spool type	Connections				
	P→A	P→B	A→T	B→T	P→T
22		4	5		
14	3	3	6	6	2
15	2	2	4	5	
16	2	2	4	5	
17	3	3			
19	3	3	4	5	
20	3	3	4	5	
21	3	3			
28	3	3	6	6	2
	Curve No.				

ORDERING CODE

AD	Directional valve
5	CETOP 5/NG10
*	Type of operator (tab.1)
**	Spools (see tables on page I•30)
*	Mounting type (tab.2)
*	Voltage (tab.3)
**	Variants (tab.4)
2	Serial No.

TAB.1

TYPE OF OPERATOR

E	Electrical
D	Direct mechanical
O	Oleo-pneumatic
L	Lever

TAB.2

MOUNTING

STANDARD	
C	
D	
E	
F	
SPECIALS (WITH PRICE INCREASING)	
G	
H	
I	
L	
M	

TAB.3 - "E" TYPE OPERATION

AC VOLTAGE	
A	24V/50Hz
B	48V/50Hz*
J	115V/50Hz - 120V/60Hz
Y	230V/50Hz - 240V/60Hz
E	240V/50Hz*
F	24V/60Hz*
DC VOLTAGE	
L	12V
M	24V
N	48V*
P	110V*
Z	102V*
X	205V*
K	Without AC coils
W	Without DC coils
Z	other controls

115Vac/50Hz 120Vac/60Hz with rectifier
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230Vac/50Hz 240Vac/60Hz with rectifier
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Voltage codes are not stamped on the plate, their are readable on the coils.

* Special voltage

• Mounting type **D** is only for valves with detent

• In case of mounting **D** with detent a maximum supply time of 2 sec is needed (only for AC coils).

• The springs for the version with detent (mounting **D**) are different from those for standard versions.

TAB.4 - VARIANTS

VARIANT	CODE	◆	PAGE
No variant	00		
Viton	V1		
Emergency button	E1		I•35
Pilot light	X1		I•19
Rectifier	R1		I•19
Preset for microswitch - (E/F/G/H only) see below note ◇	M1	◆	I•31- I•34
Rotary emergency button	P1		I•35
Solenoid valve without connectors	S1		
Marine version (AD.5.O..)	H1	◆	
Cable gland "PG 11"	C1		I•19
Emergency + Viton	EV		
Emergency + Pilot light	EX		
Viton + Pilot light	VX		
Emergency + Viton + Pilot light	A1		
Emergency + Rectifier	ER		
Viton + Rectifier	VR		
Viton + Rectifier + Emergency	A2		
Pilot light + Rectifier	XR		I•19
Pilot light + Rectifier + Emergency	A3		
Pilot light + Rectifier + Emergency + Viton	A4		
Preset for microswitch + Viton	MV	◆	
Spool movement speed control (VDC only) with ø 0.5 mm diameter orifice	J5	◆	I•32
Spool movement speed control (VDC only) with ø 0.6 mm diameter orifice	J6	◆	I•32
Spool movement speed control (VDC only) with ø 0.7 mm diameter orifice	J7	◆	I•32
Spool movement speed control (VDC only) with ø 0.8 mm diameter orifice	J8	◆	I•32
External draining solenoid (electrically operated only)	Q5	◆	I•32
Microswitch+ Detent (for lever operation)	MD	◆	
Detent for lever control	D1	◆	

◇ = Maximum counter-pressure on T port: 4 bar

◆ = Variant codes stamped on the plate

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TWO SOLENOIDS, SPRING CENTRED "C" MOUNTING

Spool type		Covering	Transient position
01		+	
02		-	
03		+	
04*		-	
05		+	
66		+	
06		+	
07*		+	
08*		+	
10*		+	
22*		+	
11*		+	
12*		+	
13*		+	
14*		-	
28*		-	

ONE SOLENOID, SIDE A "E" MOUNTING

Spool type		Covering	Transient position
01		+	
02		-	
03		+	
04*		-	
05		+	
66		+	
06		+	
08*		+	
10*		+	
12*		+	
15		-	
16		+	
17		+	
14*		-	
28*		-	

STANDARD SPOOLS

(* Spool with price increasing

- With spools 15 / 16 / 17 only the mounting E / F are possible
- 19 / 20 / 21 spool not planned for variant J*
- For lever operated the spools used are different.

Available spools for this kind of valve are: 01 / 02 / 03 / 04 / 05 / 06 / 66 / 07 / 22 / 13 / 15 / 16 / 17

ONE SOLENOID, SIDE B "F" MOUNTING

Spool type		Covering	Transient position
01		+	
02		-	
03		+	
04*		-	
05		+	
66		+	
06		+	
08*		+	
10*		+	
22*		+	
12*		+	
13*		+	
07*		+	
15		-	
16		+	
17		+	
14*		-	
28*		-	

TWO SOLENOIDS "D" MOUNTING

Spool type		Covering	Transient position
19*		-	
20*		+	
21*		+	