

### CETOP 2/NG04

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## DIRECTIONAL CONTROL VALVES CETOP 2/NG4

The ARON directional control valves NG4, designed for subplate mounting with an interface in accordance with CETOP RP 121 H-4.2-4-R02 standard, are the smallest on the market in their category whilst still featuring excellent performance.

The use of solenoids with wet armatures ensures quiet operation, means that dynamic seals are no longer required and important levels of counter-pressure are accepted on the return line.

The solenoid's tube is screwed at valve body directly, while a locking ring nut seal the coil in right position.

**The cast body** with a great care in the design and production of the ducts of the 5 chambers have made it possible to improve the spools allowing relatively high flow rate with low pressure drops ( $\Delta p$ ).

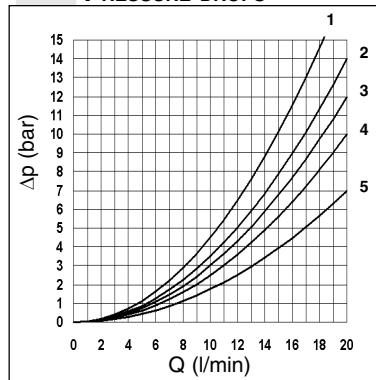
The spool rest positions are obtained by means of springs which centre it when there is no electrical impulse. The solenoids are constructed to DIN 40050 standards and are supplied by means of DIN 43650 ISO 4400 standard connectors which, suitably assembled, ensure a protection class of IP 65.

The solenoid coils are normally arranged for DIN 43650 ISO 4400 type connectors (standard version); is available on request these variant solenoid: with AMP Junior connections, with AMP junior, solenoid with flying leads or solenoid with flying leads and integrated diode.

The supply may be in either DC or AC form (with the use of a connector and rectifier) in most common voltages.

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,  $\beta_{25} \geq 75$ .

### PRESSURE DROPS



Spool type	Connections				
	P→A	P→B	A→T	B→T	P→T
01	2	2	4	4	
02	4	4	5	5	3
03	2	2	5	5	
04	2	2	2	2	1
05	4	4	2	2	
66	3	3	3	5	
06	3	3	5	3	
16	3	3	4	4	
20	3	3	4	4	

Curve No.

The diagram at the side shows the pressure drop curves for spools during normal usage. The fluid used is a mineral based oil with a viscosity of 46 mm<sup>2</sup>/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  $\Delta p$  will be the value for the losses for a specific flow rate Q which can be obtained from the diagram,  $\Delta p_1$  will be the value of the losses for the flow rate Q<sub>1</sub> that is used.

### ORDERING CODE

<b>AD</b>	Directional valve
<b>2</b>	CETOP 2/NG4
<b>E</b>	Electrical operator
<b>**</b>	Spool (tables next page)
<b>*</b>	Mounting (table 1 next page)
<b>*</b>	Voltage (table 2 next page)
<b>**</b>	Variants (table 3 next page)
<b>3</b>	Serial No.

TABLE 1 - MOUNTING TYPE

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

- Mounting type D is only for solenoid valves with detent
- In case of mounting D with detent, the supply to solenoid must be longer than 100 ms.

Tab.3 - VARIANTS

VARIANT	CODE
No variant	00
Viton	V1
Pilot light	X1
Rectifier	R1
Emergency button	E1
Rotary emergency button	P1
Solenoid valve without connectors	S1
Cable gland "PG 11"	C1
Viton + Pilot light	VX
Viton + Rectifier	VR
Pilot light + Rectifier	XR
AMP Junior solenoid	AJ
Solenoid with flying leads (250 mm)	FL
Solenoid with flying leads (150 mm) and integrated diode	LD
Other variants relate to a special design	

Tab.2 - A09 (27 W) COIL

DC VOLTAGES	
L	12V
M	24V
N	48V*
P	110V*
R	98V*
S	196V*
W	Without DC coils

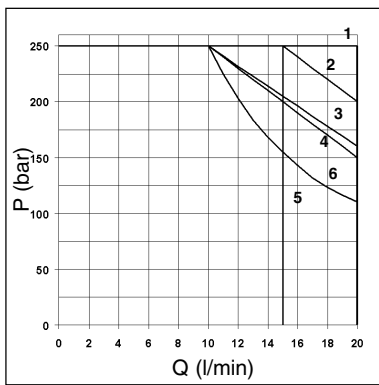
110Vac/50Hz  
120Vac/60Hz with rectifier

220Vac/50Hz  
240Vac/60Hz with rectifier

Voltage codes are not stamped on the plate, they are readable on the coils.

\* Special voltages

LIMITS OF USE



Spool Type	Curves No
01	1
02	3
03	1
04	4
05	1
06	1
16	2 (6*)
20	5

(6\*) = 16 spool used as 2 or 3 way, follow the curve n°4

The tests have been carried out with solenoids at a temperature of 50°C and a voltage 10% less than rated voltage with a fluid temperature of 40°C. The fluid used was a mineral oil with a viscosity of 46 mm<sup>2</sup>/s at 40°C. The values in the diagram refers to tests carried out with the oil flow in two directions simultaneously (e.g. from P to A and at the same time B to T). In case of valve 4/2 or 4/3 used with flow in one direction only, the limits of use could have variations which may even be negative.

Medium switching times Energizing: 20 ms  
De-energizing: 40 ms

Tests have been carried out by spool normally closed with flow of 10 l/min at 125 bar and a 100% supply, warm standard coil and without any electronic components. These values are indicative and depend on the following parameters: the hydraulic circuit, the fluid used and the variation of pressure, flow and temperature.

STANDARD SPOOLS

TWO SOLENOIDS, SPRING CENTERED "C" MOUNTING			
Spool Type		Covering	Transient position
01		+	
02		-	
03		+	
04*		-	
05		+	
66		+	
06		+	

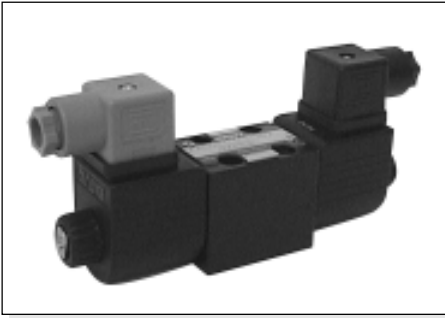
ONE SOLENOID, SIDE A "E" MOUNTING			
Spool Type		Covering	Transient position
01		+	
02		-	
03		+	
04*		-	
05		+	
66		+	
06		+	
16		+	

ONE SOLENOID, SIDE B "F" MOUNTING			
Spool Type		Covering	Transient position
01		+	
02		-	
03		+	
04*		-	
05		+	
66		+	
06		+	
16		+	

TWO SOLENOIDS "D" MOUNTING			
Spool Type		Covering	Transient position
20*		+	

\* SPOOLS WITH PRICE INCREASING

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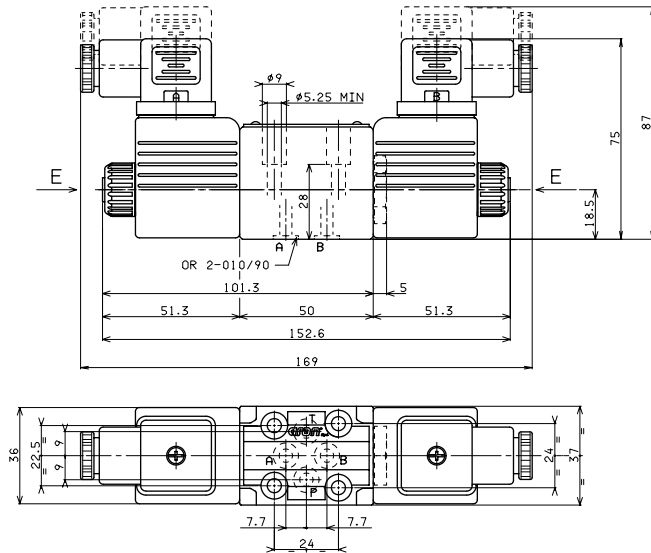
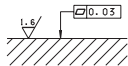


Max. pressure ports P/A/B	250 bar
Max pressure port T (dynamic)	250 bar
Max flow	20 l/min
Max excitation frequency	3 Hz
Duty cycle	100% ED
Fluid viscosity	10 ÷ 500 mm <sup>2</sup> /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max contamination level	class 10 in accordance with NAS 1638 with filter $\beta_{25} \geq 75$
Weight with one DC solenoid	0,88 Kg
Weight with two DC solenoids	1,1 Kg

E = Manual override

Screws with material specification 12.9 recommended - UNI 5931  
Tightening torque of screws M5x35 = 5 Nm / 0.5 Kgm.

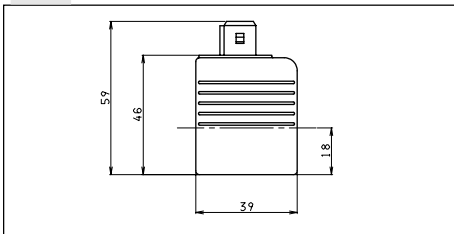
Support plane specifications



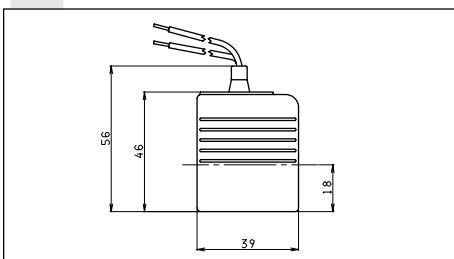
DC COILS A09



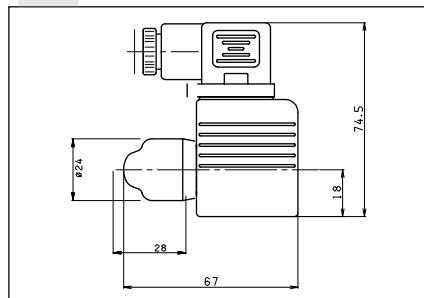
COIL WITH AMP JUNIOR



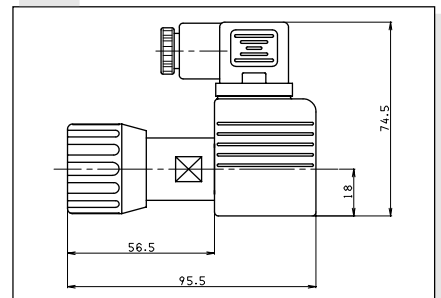
COIL WITH FLYNG LEADS, AND WITH ITEGRATED DIODE VERSION



E1 VARIANT WITH MALE EMERGENCY



P1 VARIANT WITH ROT. EMERGENCY



Type of protection (in relation to connector used)	IP 65
Number of cycle	18.000/h
Supply tolerance	±10%
Ambient temperature	-30°C ÷ 60°C
Duty cycle	100% ED
Insulation class	H
Weight	0,215 Kg

VOLTAGE (V)	MAX WINDING TEMPERATURE (AMBIENT TEMPERATURE 25°C)	RATED POWER (W)	RESISTANCE AT 20°C (OHM) ±7%
12V	123°C	27	5.3
24V	123°C	27	21.3
48V*	123°C	27	85.3
98V*	123°C	27	355
110V*	123°C	27	448
196V*	123°C	27	1422

\* Special voltages