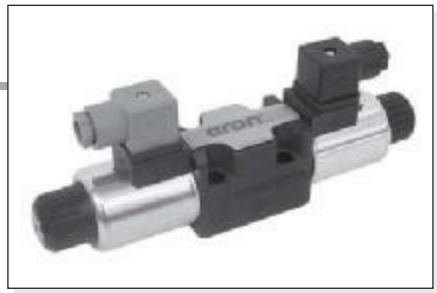


DIRECTIONAL CONTROL VALVES CETOP 3/NG6

CETOP 3/NG06	
STANDARD SPOOLS	CH. I PAGE 10
AD.3.E...	CH. I PAGE 11
AD.3.E...J*	CH. I PAGE 12
AD.3.V...	CH. I PAGE 13
AD.3.L...	CH. I PAGE 14
OTHER OPERATOR	CH. I PAGE 15
AD.3.P...	CH. I PAGE 16
AD.3.O...	CH. I PAGE 16
AD.3.M...	CH. I PAGE 17
AD.3.D...	CH. I PAGE 17
"D15" DC COILS	CH. I PAGE 18
"B14" AC SOLENOIDS	CH. I PAGE 18
STANDARD CONNECTORS	CH. I PAGE 19
"LE" VARIANTS	CH. I PAGE 20
L.V.D.T.	CH. I PAGE 21

INTRODUCTION

The ARON directional control valves NG6 are designed for subplate mounting with an interface in accordance with UNI ISO 4401 - 03 - 02 - 0 - 94 standard (ex CETOP R 35 H 4.2-4-03), and can be used in all fields on account of their high flow rate and pressure capacities combined with compact overall dimensions.

The use of solenoids with wet armatures allows a very practical, safe construction completely dispensing with dynamic seals; the solenoid tube is screwed directly onto the valve chest whilst the coil is kept in position by means of a lock nut.

The special, precise construction of the ports and the improvement of the spools enables relatively high flow rates to be accommodated with a minimal pressure drop (Δp).
The operation of the directional valves may be electrical, pneumatic, oleodynamic, mechanical or lever.

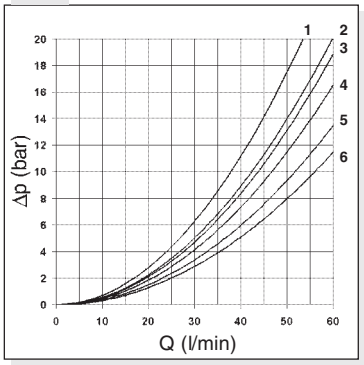
The centre position is obtained by means of calibrated length springs which reposition the spool in the centre or end of travel position once the action of the impulse is over.

The solenoids are constructed with a protection class of IP66 to DIN 40050 standards and are available in either AC or DC form in different voltage and frequencies.
The new type DC coil "D15", of cause their high performance, allows to increasing the limits of use respect to last series.
All types of electrical control are available, on request, with different types of manual emergency controls.

The solenoid coils are normally arranged for DIN 43650 ISO 4400 type connectors; is available on request these variant coils: with AMP Junior connections, with AMP junior and integrated diode, with Deutsch DT04-2P connections or solenoid with flying leads. Connectors with built in rectifiers or pilot lights are also available.

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, $ß_{25} \geq 75$.

PRESSURE DROPS



The diagram at the side shows 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:

$$\Delta p1 = \Delta p \times (Q1/Q)^2$$

where Δp will be the value for the losses for a specific flow rate Q which can be obtained from the diagram, Δp1 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	5	5	5	5	
02	6	6	6	6	5
03	5	5	6	6	
04	1	1	1	1	4
44	1	1	1	1	2
05	5	5	5	5	
06	5	5	6	5	
66	5	5	5	6	
07		4	6		
08	6	6			
09		5		5	
10	5	5	5	5	
	Curve No.				

Spool type	Connections				
	P →A	P →B	A →T	B →T	P →T
11	4			6	
22		4	6		
12		5		6	
13		5	6	6	
14	2	1	1	1	2
28	1	2	1	1	2
19	4	4	6	6	
16	5	5	4	4	
17 - 21	1	3			
18	5	5			
20	4	4	4	4	
15	4	4	5	5	
	Curve No.				

1

ORDERING CODE

AD	Directional valve
3	CETOP 3/NG6
E	Type of operator For other operator see next pages
**	Spool see page I•10
*	Mounting type (table 1)
*	Voltage (table 2)
**	Variants (table 3)
*	Serial No.

3 = DC voltage ("D15" coil)
3 = AC voltage ("B14" solenoid)

TAB.2 - VOLTAGE

AC SOLENOID B14

A	24V/50-60 Hz
B	48V/50-60 Hz
J	115V/50Hz - 120V/60Hz
Y	230V/50Hz - 240V/60Hz
K	AC without coils

Other voltages available on request.

DC COIL D15 (30W)

L	12V
M	24V
V	28V*
N	48V*
Z	102V*
P	110V*
X	205V*
W	DC without coils

115Vac/50Hz
120Vac/60Hz
with rectifier

230Vac/50Hz
240Vac/60Hz
with rectifier

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

(*) Special voltage

• AMP Junior coils (with or without diode) and coils with flying leads and coils type Deutsch, are available in 12V or 24V DC voltage only.

• The pastic type coil (BR variant) is available in 12V, 24V, 28V or 110V DC voltage only.

TAB.1-MOUNTING

STANDARD

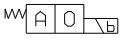
C 

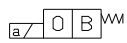
D 

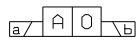
E 

F 

SPECIALS (WITH PRICE INCREASING)

G 

H 

I 

L 

M 

• **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).

TAB.3 - VARIANTS

VARIANT	CODE	♦	PAGE
No variant	00		
Viton	V1		
Emergency control lever for directional control valves type ADC3 and AD3E	LE		I•20
Emergency button	E1		I•18
Rotary emergency button	P1		I•18
Rotary emergency button (180°)	P5		I•18
Pilot light	X1		I•19
Rectifier	R1		I•19
Preset for microswitch (E/F/G/H mounting only) (see below note ◊)	M1	♦	I•11- I•14
Solenoid valve without connectors	S1		
Marine version (AD.3.P..)	H1	♦	
Cable gland "PG 11"	C1		I•19
Emergency button+ Viton	EV		
Emergency button+ Pilot light	EX		
Viton + Pilot light	VX		
Emergency button+ Viton + Pilot light	A1		
Emergency button+ Rectifier	ER		
Viton + Rectifier	VR		
Viton + Rectifier + Emergency button	A2		
Pilot light + Rectifier	XR		I•19
Pilot light + Rectifier + Emergency button	A3		
Pilot light + Rectifier + Emergency button+ Viton	A4		
Preset for microswitch + Viton	MV	♦	
5 micron clearance	Q1	♦	
Spool movement speed control (only VDC) with ø 0.3 mm orifice	J3	♦	I•12
Spool movement speed control (only VDC) with ø 0.4 mm orifice	J4	♦	I•12
Spool movement speed control (only VDC) with ø 0.5 mm orifice	J5	♦	I•12
Spool movement speed control (only VDC) with ø 0.6 mm orifice	J6	♦	I•12
AMP Junior coil - for12V or 24V DC voltage only	AJ		I•18
AMP Junior coil and integrated diode - for12V or 24V DC voltage only	AD		I•18
Coil with flying leads (175 mm) - for12V or 24V DC voltage only	SL		I•18
D15 plastic type coil - for12V, 24V, 28V or 110V DC voltage only	BR		
Deutsch DT04-2P coil - for12V or 24V DC voltage only	CZ		I•18
IP67 type of connector	CN		I•19

Other variants relate to a special design

◊ = Maximum counter-pressure on T port: 8 bar
♦ = Variant codes stamped on the plate

DIRECTIONAL CONTROL VALVES
STANDARD SPOOLS CETOP 3/NG6

aron

NOTE

(*) Spool with price increasing

- With spools **15** / **16** / **17** only mounting **E** / **F** are possible
- **16 / 19** / **20** / **21** spool not planned for **AD3E 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

TWO SOLENOIDS, SPRING CENTRED "C" MOUNTING

Spool type	Covering	Transient position
01	+	
02	-	
03	+	
04*	-	
44*	-	
05	+	
66	+	
06	+	
07*	+	
08*	+	
09*	+	
10*	+	
22*	+	
11*	+	
12*	+	
13*	+	
14*	-	
28*	-	

ONE SOLENOID, SIDE A "E" MOUNTING

Spool type	Covering	Transient position
01	+	
02	-	
03	+	
04*	-	
44*	-	
05	+	
66	+	
06	+	
08*	+	
10*	+	
12*	+	
15	-	
16	+	
17	+	
14*	-	
28*	-	

ONE SOLENOID, SIDE B "F" MOUNTING

Spool type	Covering	Transient position
01	+	
02	-	
03	+	
04*	-	
44*	-	
05	+	
66	+	
06	+	
08*	+	
09*	+	
10*	+	
22*	+	
12*	+	
13*	+	
07*	+	
15	-	
16	+	
17	+	
14*	-	
28*	-	

TWO SOLENOIDS "D" MOUNTING

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

AD.3.L... LEVER OPERATED CETOP 3/NG6

Max. pressure ports P/A/B	320 bar
Max. pressure port T	160 bar
Max. flow	60 l/min
Lever angle	2 x 17°
Fluid viscosity	10 ÷ 500 mm²/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	1,2 Kg
Weight M1 variant	1,8 Kg

AD.3.L...

STANDARD SPOOLS CH. I PAGE 10

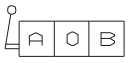
ORDERING CODE

AD	Directional valve
3	CETOP 3/NG6
L	Lever operation
**	Spool type (see table 1) Spool symbol see page I•10
*	Mounting type (see table 2)
*	**Z** = Valve with lever **X** = Valve without lever
*	Variants (see table 3)
4	Serial No.

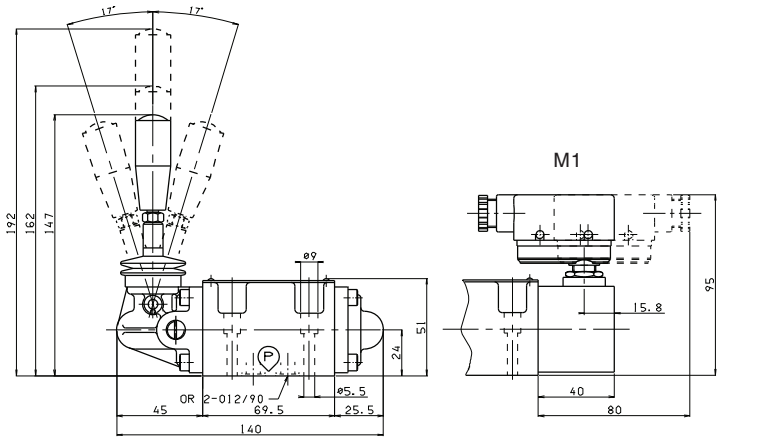
TAB.1 SPOOLS TYPE

- For these valves spools are different from ones used on the other directional valves
- Available spools:
01 / 02 / 03 / 04 / 05 / 06 / 66
07 / 22 / 13 / 15 / 16 / 17

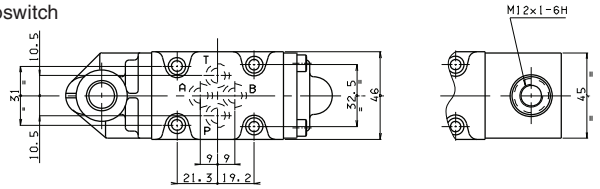
TAB.2 MOUNTING TYPE

C	
E	
F	

OVERALL DIMENSIONS



M1 = microswitch



Fixing screws UNI 5931 M5x30
with material specifications min. 8.8
Tightening torque 5 Nm / 0.5 Kgm

Support plane specifications

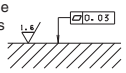


TABLE 3 - VARIANTS TABLE

VARIANTS	CODE (♦)
No variant	00
Viton	V1
Preset for microswitch Available on request NATIONAL AM1107 type microswitch	M1 (♦)
Preset for microswitch + Viton	MV (♦)
With detent (*) (mechanical connection) (Springs are different from those for standard versions)	D1 (♦)
Preset for microswitch + Detent (*)	MD (♦)
Lever length 162 mm	L1
Lever length 192 mm	L2
♦ Variant codes stamped on the plate	

(*) max. 150.000 cycles.

"D15" DC COILS FOR CETOP 3

Type of protection (in relation to the connector used)	IP 66
Number of cycles	18.000/h
Supply tolerance	±10%
Ambient temperature	-54°C ÷ 60°C
Duty cycle	100% ED
Insulation class wire	H
Weight	0,354 Kg

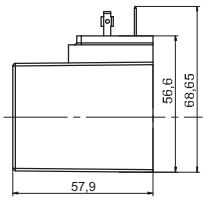
- AMP Junior coils (with or without diode) and coils with flying leads and coils type Deutsch, are available in 12V or 24V DC voltage only.
- The pastic type coil (BR variant) is available in 12V, 24V, 28V or 110V DC voltage only.

VOLTAGE (V)	MAX. WINDING TEMPERATURE (AMBIENT TEMPERATURE 25°C)	RATED POWER (W)	RESISTANCE AT 20°C (OHM) ±10%
12V	110°C	30	4.8
24V	110°C	30	18.8
28V*	110°C	30	25.6
48V*	110°C	30	75.2
102V*	110°C	30	340
110V*	110°C	30	387
205V*	110°C	30	1375

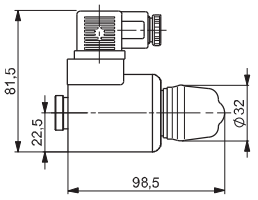
(*) SPECIAL VOLTAGES

ETD15 - 04/2001/e

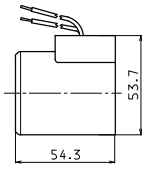
PLASTIC COIL (BR)



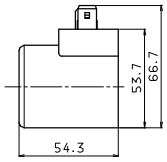
E1 MANUAL EMERGENCY



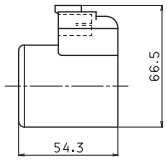
FLYING LEADS (SL)



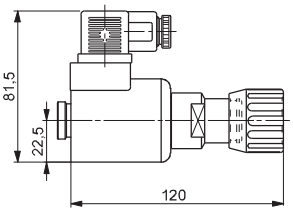
AMP JUNIOR (AJ) AJ + DIODE (AD)



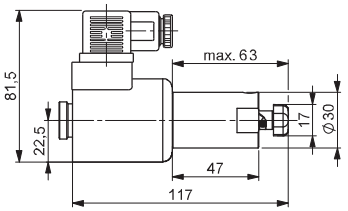
DEUTSCH (CZ) DT04 - 2P



P1 ROTARY EMERGENCY

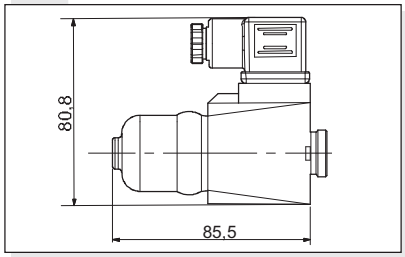


P5 ROTARY EMERGENCY 180°

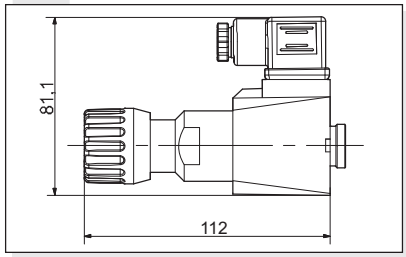


"B14" AC SOLENOIDS FOR CETOP 3

MANUAL EMERGENCY (E1)



ROTARY EMERGENCY (P1)



Type of protection (in relation to the connector used)	IP 65
Number of cycles	18.000/h
Supply tolerance	+10% / -10%
Ambient temperature	-30°C ÷ 60°C
Duty cycle	100% ED
Insulation class wire	H
Weight	0,436 Kg

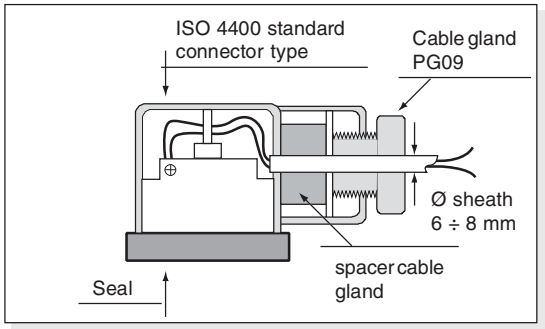
VOLTAGE (V)	MAX. WINDING TEMPERATURE (AMBIENT TEMPERATURE 25°C)	RESISTANCE AT 20°C (OHM) ±10%
24V/50Hz - 24V/60Hz	100°C - 96°C	1.7
48V/50Hz - 48V/60Hz	—	—
115V/50Hz - 120V/60Hz	133°C - 101C°	32.5
230V/50Hz - 240V/60Hz	120°C - 103C°	134

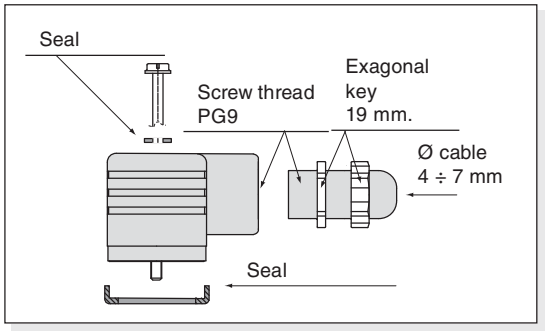
CONNECTORS DIRECTIONAL CONTROL VALVES IN ACCORDANCE WITH DIN 43650/ISO4400

CONNECTOR	VOLTAGE *SPECIAL VOLTAGE	ORDERING CODE	CODE (VARIANTS)
STANDARD (IP65)			
Grey (side A)		V86.05.0004	No variant
Black (side B)		V86.05.0002	
TYPE WITH CABLE GLAND PG 11			**C1**
Grey (side A)		V86.05.0008	
Black (side B)		V86.05.0006	
LENS COVER WITH PILOT LIGHT			**X1**
	12 VAC/VDC	V86.10.0018	
(sides A and B)	24 VAC/VDC	V86.10.0012	
	115 VAC/VDC	V86.10.0020	
	230 VAC/VDC	V86.10.0022	
WITH RECTIFIER			**R1**
Grey (side A)		V86.20.0004	
Black (side B)		V86.20.0002	
	Inlet voltage: 12÷220VAC Rectified voltage: 9÷200VDC		
LENS COVER WITH PILOT LIGHT AND RECTIFIER			**XR**
	12 VAC	V86.25.0018	
	24 VAC	V86.25.0019	
(sides A and B)	48 VAC*	V86.25.0020	
	115 VAC*	V86.25.0021	
	230 VAC*	V86.25.0022	
TYPE OF PROTECTION IP67			**CN**
Grey (side A)		V86.28.0002	
Black (side B)		V86.28.0001	

- Screw tightening torque: 60Ncm.
- **Note: the screw has to enter less than 4 mm into the threaded section of the coil.**
- It is suggest the use of the CN connector type (IP67) with the variant BR coil, which made in plastic material.

ELECTRICAL FEATURES OF CONNECTORS





CONNECTORS IP 65 (STANDARD)

AC rated voltage	Max. 250 V
DC rated voltage	Max. 300 V
Pin conctat rated flow	10A
Pin conctat max. flow	16A
Max. section cable	1,5 mm²
Ø Cable gland PG09 - M16x1,5	6 ÷ 8 mm
Type of protection	IP65 EN60529
Insulation class	VDE 0110-1/89
Operating temperature	-40°C ÷ 90 C°

CONNECTORS IP67 (CN VARIANT)

AC rated voltage	Max. 250 V
DC rated voltage	Max. 300 V
Pin conctat rated flow	10A
Pin conctat max. flow	16A
Max. section cable	1,5 mm²
Ø Cable gland PG09 - M16x1,5	4 ÷ 7 mm
Type of protection	IP67 EN60529
Insulation class	VDE 0110-1/89
Operating temperature	-20°C ÷ 80 C°

The degrees of protection indicate is guaranteed only if the connectors were properly mounted with his original seals.