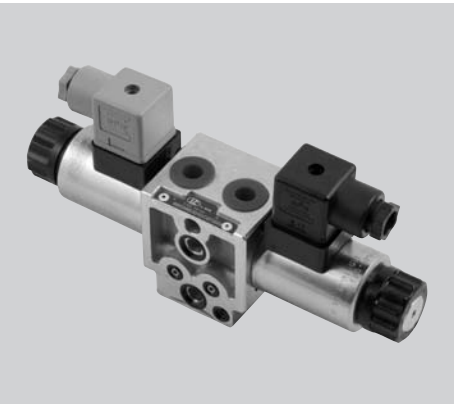
Rexroth
Bosch Group

4/3 4/2 Directional valve elements with proportional control and with or without LS connections



EDB-P

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General specifications

- Valve element with direct proportional control of spool.
- Control spool operated by screwed-in solenoid with extractable coil.
- In the de-energized condition, the control spool is held in the central position by return springs.
- Wet pin proportional tubes for DC coils, with push rod for mechanical override; nickel plated surface.
- Manual override (push-button or screw type) available upon request.
- Plug-in connectors available: EN 175301-803 (Was DIN 43650), AMP Junior.

Ordering Details

B	8	_	8 0	_ _	S	_	_ _	_ _	_	0	0	_

Family
Directional valve elements EDB

Type
Size 4 proportional

Configuration
Standard = 0
With Load Sensing control = 4

Coil type
P45

Spool variants [1)]
4/3 operated both sides a and b;
P – T closed in neutral = B2
4/2 operated on side a only;
P – T closed in neutral = B3
4/2 operated on side b only;
P – T closed in neutral = B4
4/3 operated on both sides a and b;
A and B to T in neutral = E2
4/2 operated on side a only;
A and B to T in neutral = E3
4/2 operated on side b only;
A and B to T in neutral = E4

Flow pattern
Symmetrical

Nominal flow*
4 l/min (1.06 GPM) = 3
9 l/min (2.38 GPM) = 4
17 l/min (4.50 GPM) = 5

Optional fittings
0 = Standard version
F = Screw type emergency

Ports**
B = 9/16-18 UNF 2-B (SAE6)

Electric connection
00 = Without coils
01 = With coils, without connectors
02 = With coils and with non-assembled connectors, type EN 175301-803
03 = With coils having AMP Junior connector

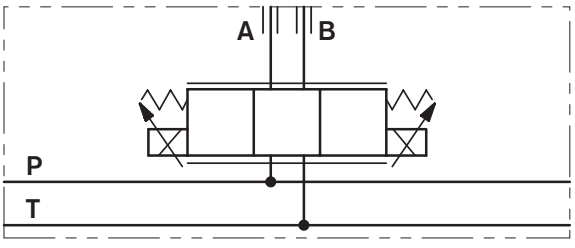
Voltage supply
00 = Without coil
OB = 12V DC
OC = 24V DC

1) The required hydraulic symbol and spool variant can be chosen by consulting page 3.

* With Δp (P > T) 10 bar (145 PSI).

** Additional ports on request

Configuration



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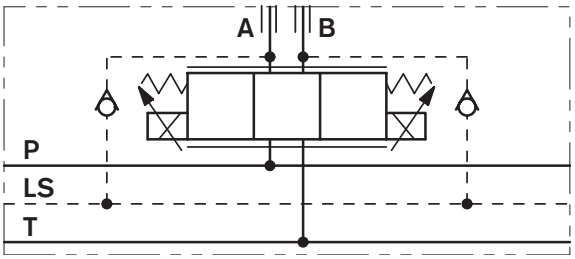
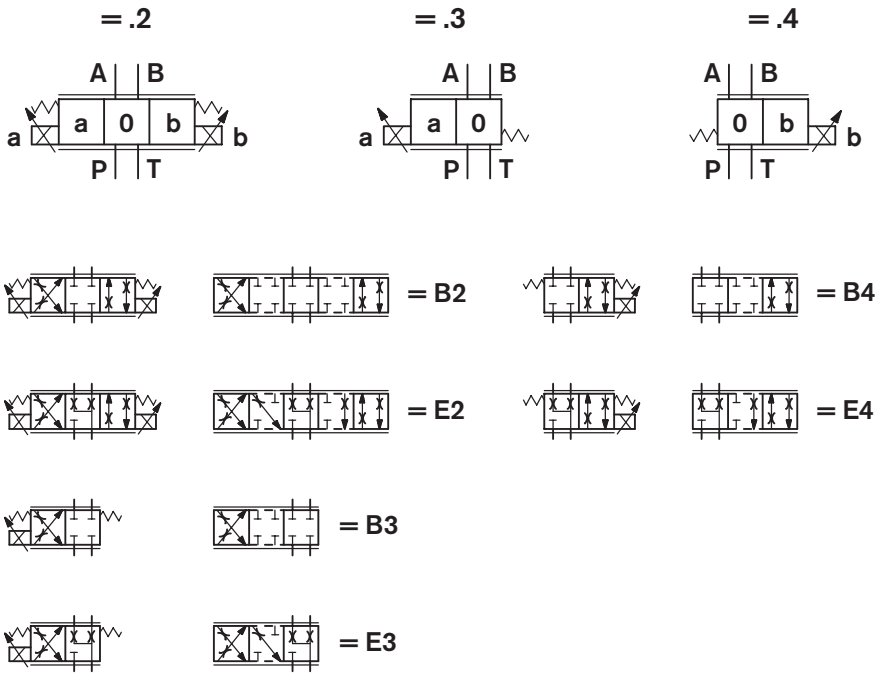


= 4

Spool variants

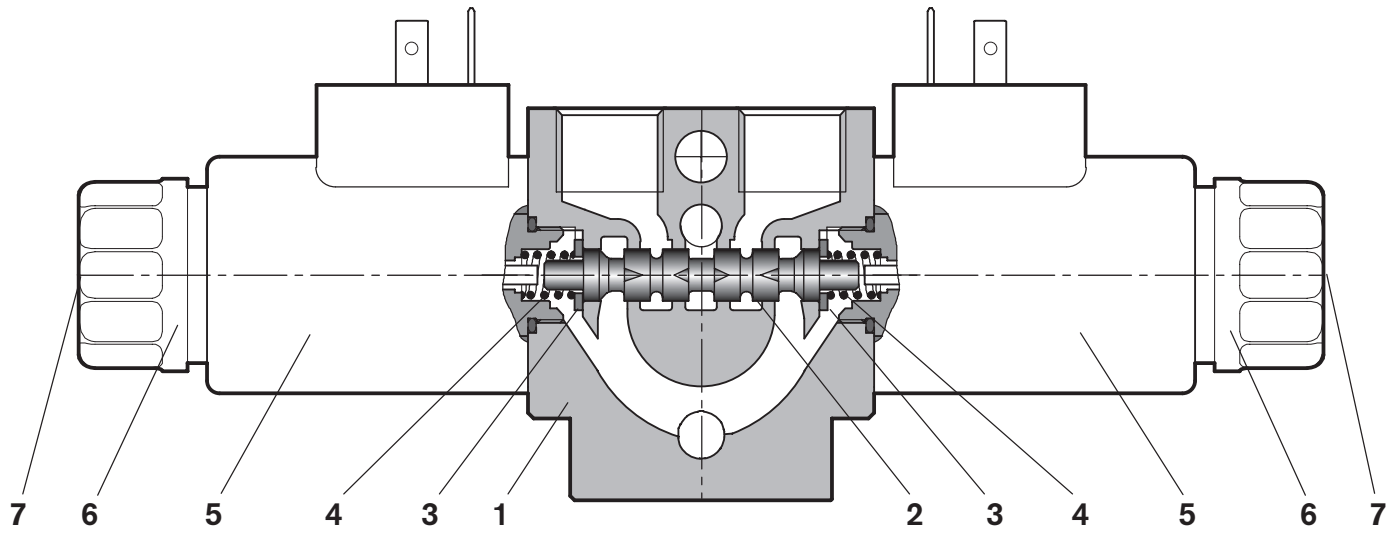


Principles of operation, cross section

The sandwich plate design directional valve elements B8080… are compact direct operated proportional solenoid valves which control the start, the stop, the direction and the quantity of the oil flow. These elements basically consist of a stackable housing (1) with a control spool (2), one or two solenoids (5), and one or two return springs (4).

Energized by an electronic feed regulator, each solenoid (5) displaces the control spool (2) from its neutral-central position “0” proportionally to the current received, in open loop mode; a regulated oil flow P to A , or P to B, is achieved. Once the solenoid is de-energized, the return spring (4) pushes the spool thrust washer (3) back against the housing and the spool (2) returns in its neutral-central position “0”.

Each coil is fastened to the solenoid tube (5) by a ring nut (6). A pin (7) allows to push the spool (2) in emergency conditions, when the solenoid cannot be energized, like in case of voltage shortage.



Technical Data (for applications with different specifications consult us)

General

Valve element with 2 solenoids	kg (lbs)	1.5 (3.3)
Valve element with 1 solenoids	kg (lbs)	1.1 (2.5)
Ambient Temperature	°C (°F)	–20....+50 (–4....+122) [NBR seals]

Hydraulic

Maximum pressure at P, A, and B ports	bar (PSI)	310 (4500)
Maximum dynamic pressure at T	bar (PSI)	180 (2610)
Maximum static pressure at T	bar (PSI)	210 (3045)
Maximum inlet flow	l/min (GPM)	24 (6.3)
Hydraulic fluid General properties: it must have physical lubricating and chemical properties suitable for use in hydraulic systems such as, for example:		Mineral oil based hydraulic fluids HL (DIN 51524 part 1). Mineral oil based hydraulic fluids HLP (DIN 51524 part 2). For use of environmentally acceptable fluids (vegetable or polyglycol base) please consult us.
Fluid Temperature	°C (°F)	–20....+80 (–4....+176) [NBR seals]
Permissible degree of fluid contamination		ISO 4572: $\beta_x \geq 75$ X=10...12 ISO 4406: class 19/17/14 NAS 1638: class 8
Viscosity range	mm^2/s	20....380 (best 30....46)

Electrical

Voltage type		PWM (Power Wave Modulator) best 120 Hz	
Voltage tolerance (nominal voltage)	%	–10 .... +10	
Duty		Continuous, with ambient temperature ≤ 50°C (122°F)	
Maximum coil temperature	°C (°F)	150 (302)	
Insulation class		H	
Compliance with		Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC	
Coil weight with connection EN 175301-803	kg (lbs)	0.228 (0.503)	
Voltage	V	12	24
Voltage type		DC	DC
Current [1]	A	1.76	0.94
Cool max resistance [2]	Ω	3.71	13
Hot max resistance	Ω	6.1	22.9

1) Nominal 2) ± 7% at temperature 20°C *[68°F]*

	Voltage (V)	Connector type	Coil description	Marking	Coil Mat no.
=OB 01 **=OB 02**	12 DC	EN 175301-803 (Ex. DIN 43650)	P45 01	12 DC	R933000088
=OB 03	12 DC	AMP-JUNIOR	P45 03	12 DC	R933000089
=OC 01 **=OC 02**	24 DC	EN 175301-803 (Ex. DIN 43650)	P45 01	24 DC	R933000090
=OC 03	24 DC	AMP-JUNIOR	P45 03	24 DC	R933000091

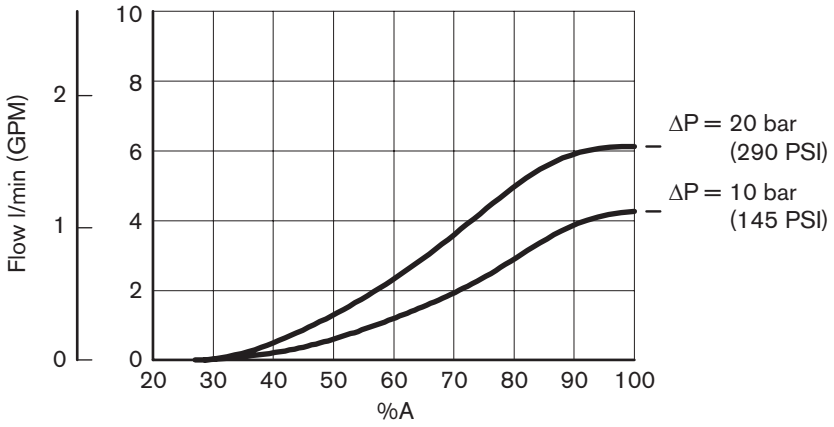
Electronic control

Electronic feed regulators (1)	Upon request

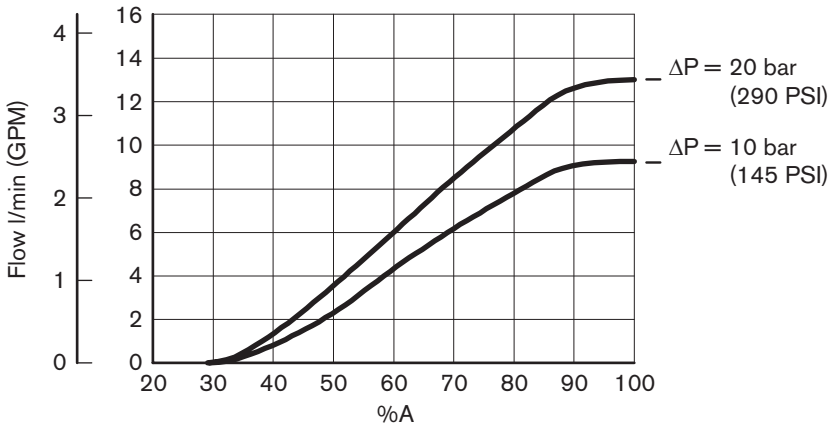
1) An electronic, open loop type, regulator with plug-in pins EN 175301-803 is available and can be fitted onto the solenoid directly. For valve elements with two solenoids, two electronic regulators are needed.

Characteristic curves

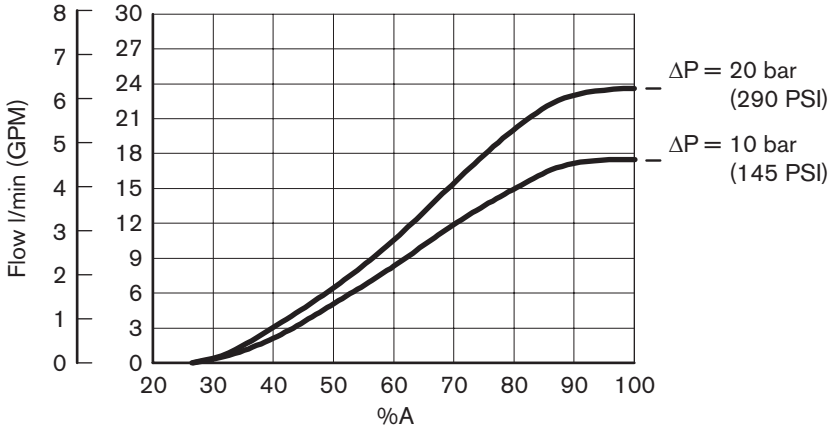
Ordering code S3: 4 l/min (1.06 GPM) with ΔP 10 bar (145 PSI)

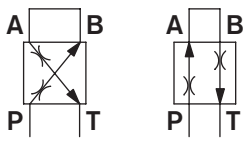


Ordering code S4: 9 l/min (2.38 GPM) with ΔP 10 bar (145 PSI)



Ordering code S5: 17 l/min (4.50 GPM) with ΔP 10 bar (145 PSI)

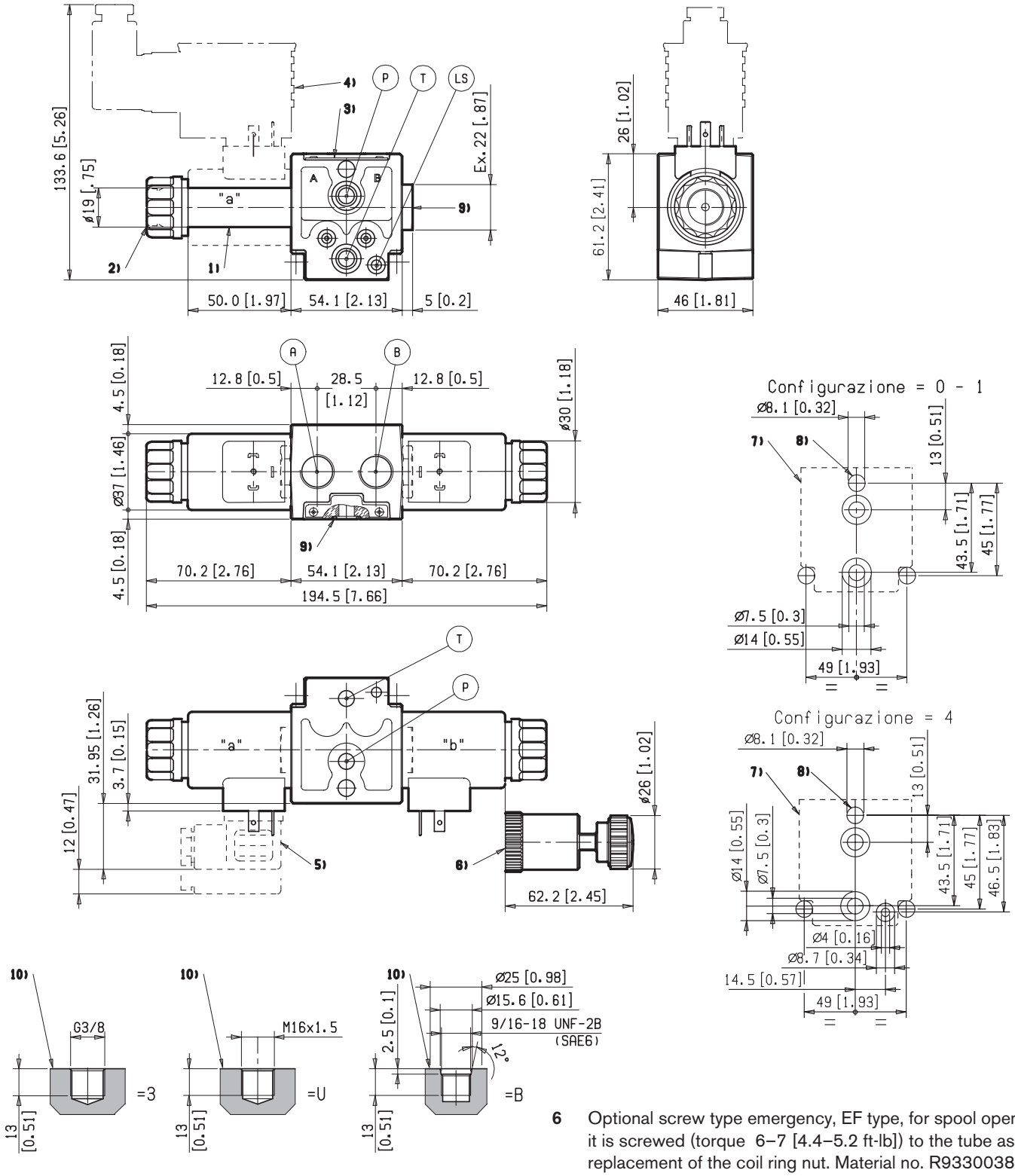




ΔP = is the actual one-way pressure drop across the open spool (inlet pressure minus outlet – port pressure)

The curves refer to the spool fully open

External Dimensions and Fittings



1 Solenoid tube hex 16 mm (0.63 inch). Torque 20–22 Nm (14.6–16.2 ft-lb).

2 Ring nut for coil locking OD 30 mm (1.18 inch); torque 6–7 Nm (4.4–5.2 ft-lb).

3 Identification label.

4 Dimension with electronic feed regulator.

5 Clearance needed for connector removal.

6 Optional screw type emergency, EF type, for spool opening: it is screwed (torque 6–7 [4.4–5.2 ft-lb]) to the tube as replacement of the coil ring nut. Material no. R933003848.

7 Flange specifications for coupling to ED intermediate elements.

8 One through hole for coupling of the ED Directional Valve Elements. Recommended tie rod M8 with strength class DIN 8.8. Torque 20–22 Nm (14.7–16.2 ft-lb).

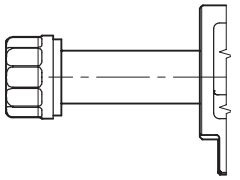
9 Plug for 2 positions versions (4/2); hex 22 mm, torque 20–22 Nm (14.6–16.2 ft-lb).

10 A and B ports.

Electric connection (or connections, in case of two solenoids)

= 00

Without coils, but with ring nut and O-Rings for coil fitting (solution recommended for flexible stock handling)



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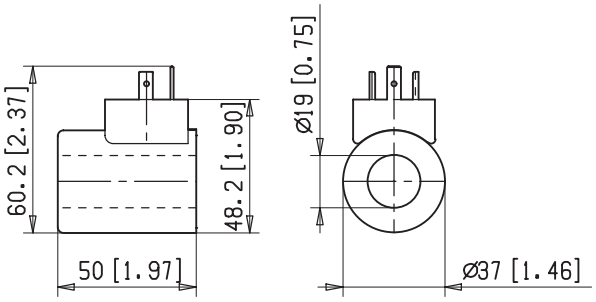
With coils having plug-in pins DIN 43650 – ISO 4400, without connectors.

Protection class: IP 65 when connector with seal is properly screwed down.



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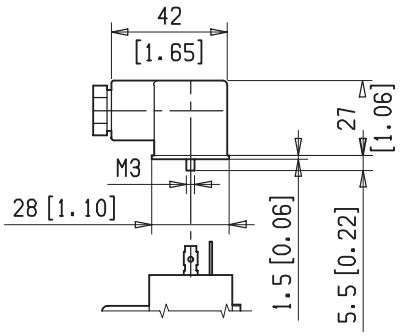
With coils and with connectors non-assembled, type DIN 43650 – ISO 4400.

Protection class: IP 65 when connector with seal is properly screwed down.

182-09: Standard

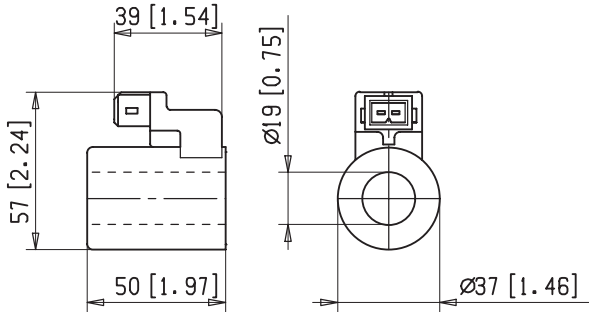


Material No.	**Description**
R933002885	182-09 GRAY
R933002889	182-09 BLACK

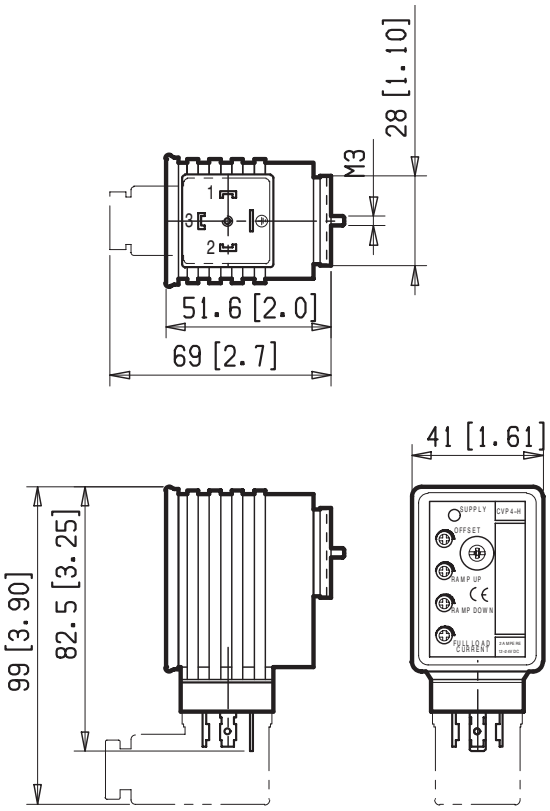
=03

With coils having AMP Junior connector, and with bi-directional diode.

Protection class: IP 69 K with female connector properly fitted (see drawing).



Electronic feed regulator (or regulators, in case of two solenoids)



Supply: yellow LED, lit up with power ON.

Off set: minimum current adjustment. Adjust solenoid current so that the desired minimum value is obtained. Clockwise rotation increases current.

Ramp up: Ramping up time adjustment.

Ramp down: Ramping down time adjustment.
For longer ramping times, turn potentiometers clockwise; for shorter ramping times, turn the potentiometers counter-clockwise.

Full load current: Maximum current adjustment. Adjust solenoid current so that the desired maximum value is obtained (up to 2A). Clockwise rotation increases current.

Frequency adjustment: it is possible to set the PWM frequency obtaining the desired control sensitivity. After removing the external plastic cover, turn the adjusting screw; clockwise rotation increases frequency from 100 to 500 Hz.

Regulator ordering code	R933003290
Supply voltage	12-30 VDC
Control Signal	0-10 VDC
Max. output current	2 A
Minimum output current	0....0.6 A
Ramp adjustment up/down	0.1....10 s
PWM Frequency adjustment (pre-set 120 Hz)	100....500 Hz
Ambient operating temperature	-10....+60 °C *[14....+140 °F]*
Weight	0.12Kg *[26.4 lbs]*
4 pins connector details	R933002888 (Grey) R933002890 (Black)
Electromagnetic compatibility	EN50081-1/2EN61000-4-2/3/4/5/6
Protection class with connector and seal correctly fitted and properly screwed down.	IP 65 (DIN40050 part 9)
Potentiometer resistance	5....10 κ Ω

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