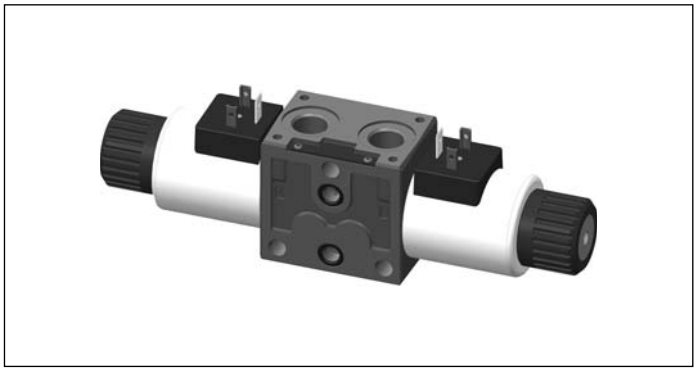
rexroth
A Bosch Company

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

L8_81... (ED4-P1)

RE 18301-16
Edition: 09.2018
Replaces: 03.2017



Size 6
Series 00
Maximum operating pressure 310 bar (4500 psi)
Maximum flow 40 l/min (10.5 gpm)
Port connections G 3/8 - G 1/2 - SAE6 - SAE8

NEW spool position sensor available for this valve.
See RE18300-30

General specifications

Valve element with direct proportional control of spool.
Control spool operated by solenoid with removable coils.
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 as option.
Plug-in connectors available: EN 175301-803 (Was DIN 43650) and DT04-2P (Deutsch).

Contents

Ordering details

01	02	03	04	05	06	07	08	09	10		11
L	**8**		**81**							**0**	

Family

01	Directional Valve elements ED	**L**

Type

02	Size 6 proportional	**8**

Configuration

03	Standard	**0**
	With Load Sensing control	**4**

Coil type

04	GP45	**81**

Spool variants

05	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

06	Both meter in and out	**S**
	Meter in	**I**

Nominal flow [1)]

07	10 l/min (2.64 gpm)	**2**
	20 l/min (5.28 gpm)	**4**
	30 l/min (7.9 gpm)	**6**

Voltage supply		**07**	**03**	**01**	**00**	
08	Without coil	–	–	–	●	**00**
	12V DC	●	●	●	–	**OB**
	24V DC	●	●	●	–	**OC**

Electric connections

09	Without coils	**00**
	With coils, without mating connector DIN EN 175301-803	**01** [2)]
	With coils, without mating connector vertical Amp-Junior	**03**
	With coils, without mating connector DT04-2P	**07**

Ports

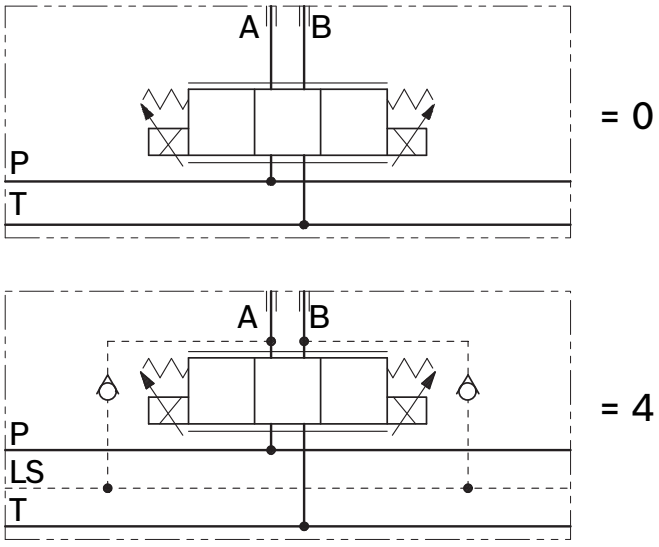
10	G 3/8 DIN 3852	**0**
	9/16-18 UNF 2-B (SAE6)	**1**
	G 1/2 DIN 3852	**2**
	3/4-16 UNF 2-B (SAE8)	**3**

Options

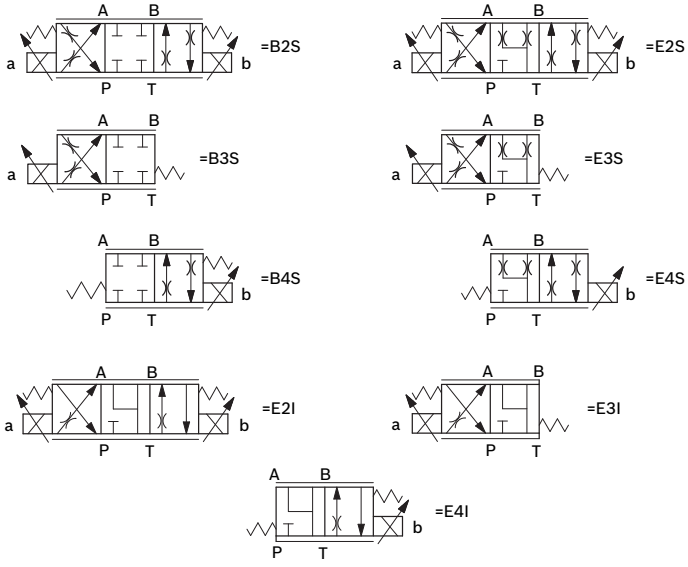
11	No options	**No code**
	Push-button type manual override	**0P**
	Screw type manual override	**0F**
	Twist type manual override (180°)	**0T**
	Red push-button type manual override	**RP**
	Black push-button type manual override	**NP**
	Lever type manual override [3)]	**_ _**

● = Available – = Not available

Symbols



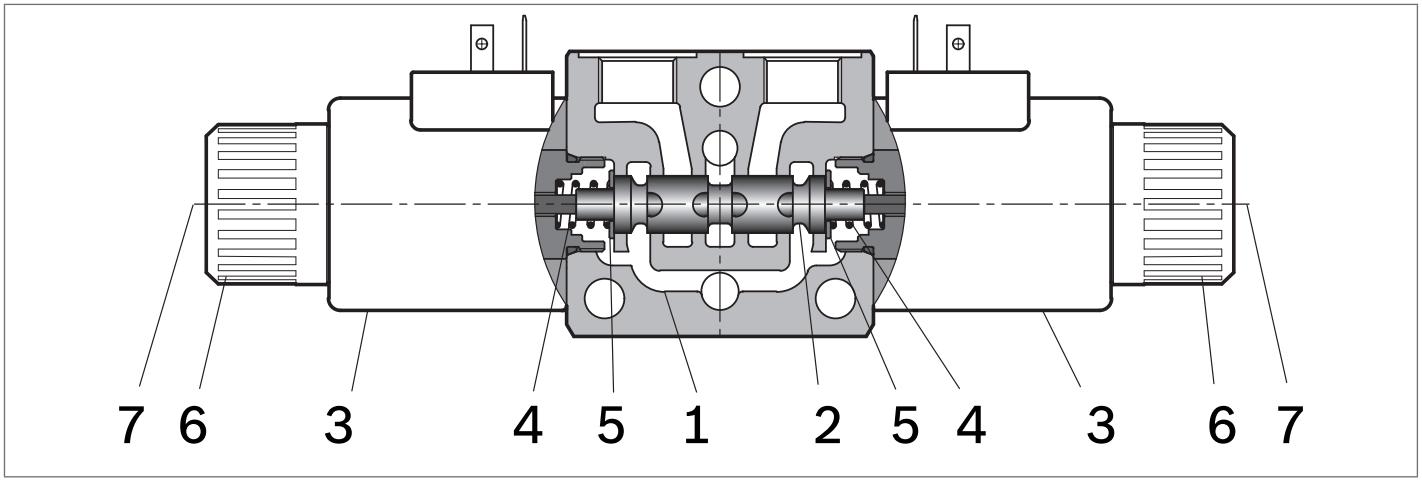
Spool variants



In neutral position, the valves cross section are as follows:
E_I ≥ 20% of nominal cross section.
E_S ≥ 2% of nominal cross section.

1) With Δp (P > T) 10 bar (145 psi), corresponding approx. to Δp P>A,B 5 bar (73 psi).
2) For connectors ordering code see data sheet RE 18325-90.
3) Each different option for the type of manual override chosen implies a specific ordering code (refer to page 6).

Functional description



The sandwich plate design directional valve elements L8081... 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 (**3**), and one or two return springs (**4**).
Energized by an electronic feed regulator, each solenoid (**3**) displaces the control spool (**2**) from its neutral-central position “0” proportionally to the current received; 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 (**5**) back against the housing and the spool returns in its neutral-central position.
Each coil (**3**) is fastened to the solenoid tube 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

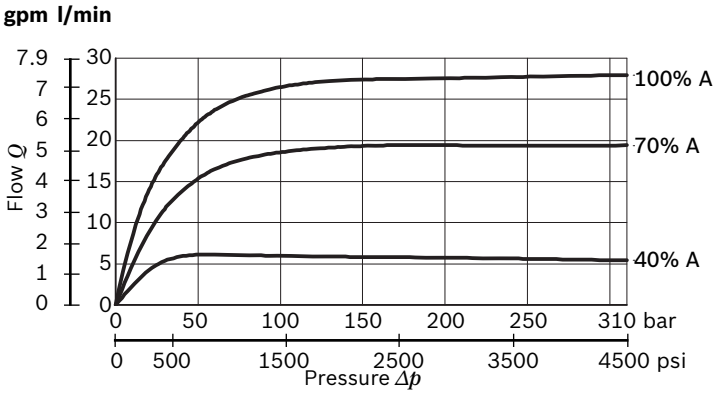
General		
Valve element with 2 solenoids	kg (lbs)	2.20 (4.85)
Valve element with 1 solenoid	kg (lbs)	1.70 (3.75)
Ambient Temperature	°C (°F)	-30....+90 (-22....+194) (NBR seals)
MTTFd		150 years see RE 18350-51
Hydraulic		
Maximum pressure at P	bar (psi)	310 (4500)
Maximum pressure at T	bar (psi)	210 (3050)
Maximum inlet flow	l/min (gpm)	40 (10.5)
Nominal flow with DP P>T = 10 bar (145 psi)	l/min (gpm)	10, 20, 30, 40 (2.64, 5.28, 7.9, 10.5)
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)	-30....+100 (-22....+212) (NBR seals)
Permissible degree of fluid contamination		ISO 4572: $\beta_x \geq 75$ X=12...15 ISO 4406: class 20/18/15 NAS 1638: class 9
Viscosity range	mm^2/s	20....380 (optimal 30....46)
Electrical		
Voltage type	PWM	120 Hz
Voltage tolerance (nominal voltage)	%	-10 .... +10
Duty		Continuous, with ambient temperature ≤ 90°C (194°F)
Coil wire temperature not to be exceeded	°C (°F)	180 (356)
Insulation class		H
Compliance with		Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC
Coil weight	kg (lbs)	0.335 (0.739)
Voltage	V	12 24
Nominal 100% current	A	1.8 1.2
Coil resistance - Cold value (nominal at 20°C (68°F))	Ω	3.3 7.2

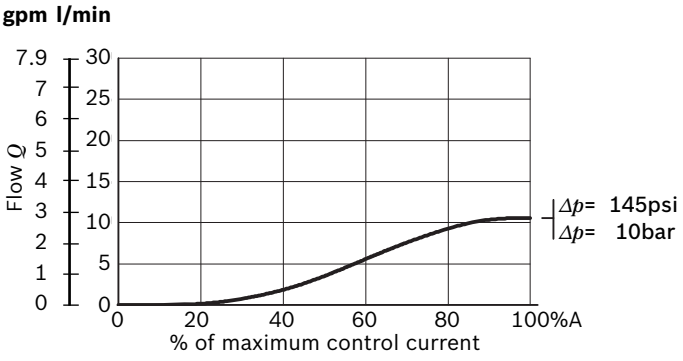
Note
For applications with different specifications consult us

Code	Voltage [V]	Connector type	Coil description	Marking	Coil Mat no.
=OB 01	12 DC	EN 175301-803 (Ex. DIN 43650)	GP45 01 - 45 K4	12 DC	R901022180
=OB 03	12 DC	AMP JUNIOR	GP45 03 - 45 C4	12 DC	R901022680
=OB 07	12 DC	DEUTSCH DT 04-2P	GP45 07 - 45 K40	12 DC	R901272648
=OC 01	24 DC	EN 175301-803 (Ex. DIN 43650)	GP45 01 - 45 K4	24 DC	R901022174
=OC 03	24 DC	AMP JUNIOR	GP45 03 - 45 C4	24 DC	R901022683
=OC 07	24 DC	DEUTSCH DT 04-2P	GP45 07 - 45 K40	24 DC	R901272647

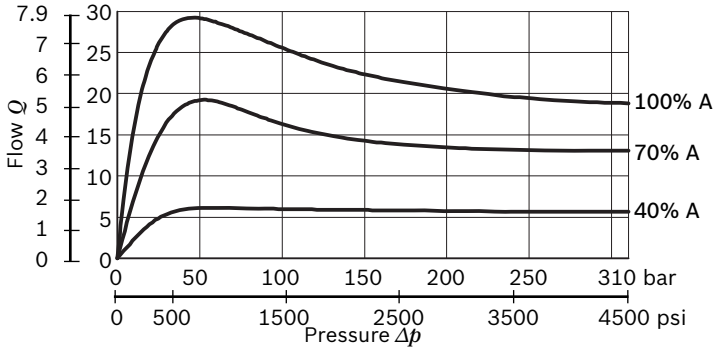
Characteristic curves

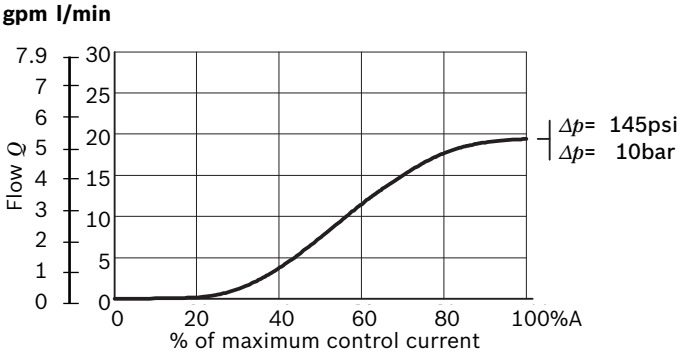
Nominal Flow = 2



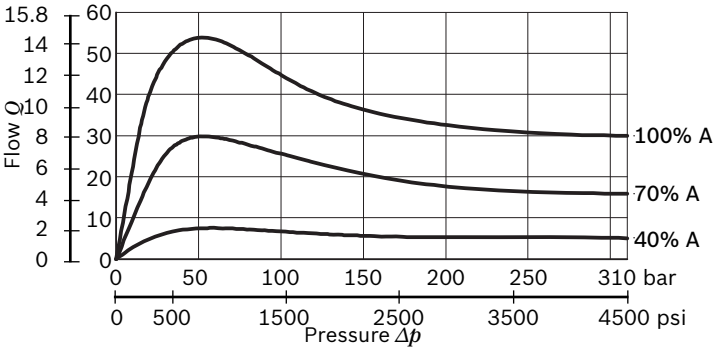


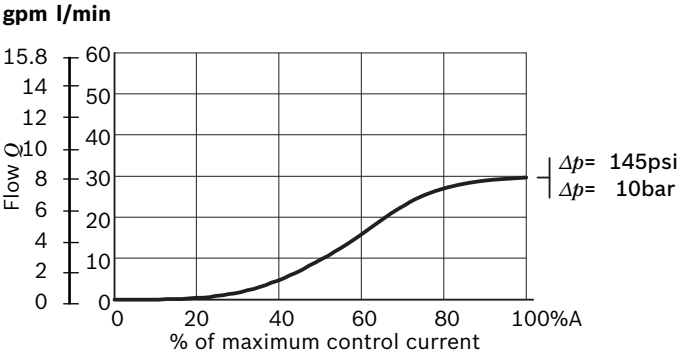
Nominal Flow = 4

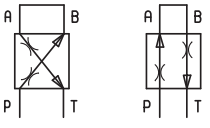




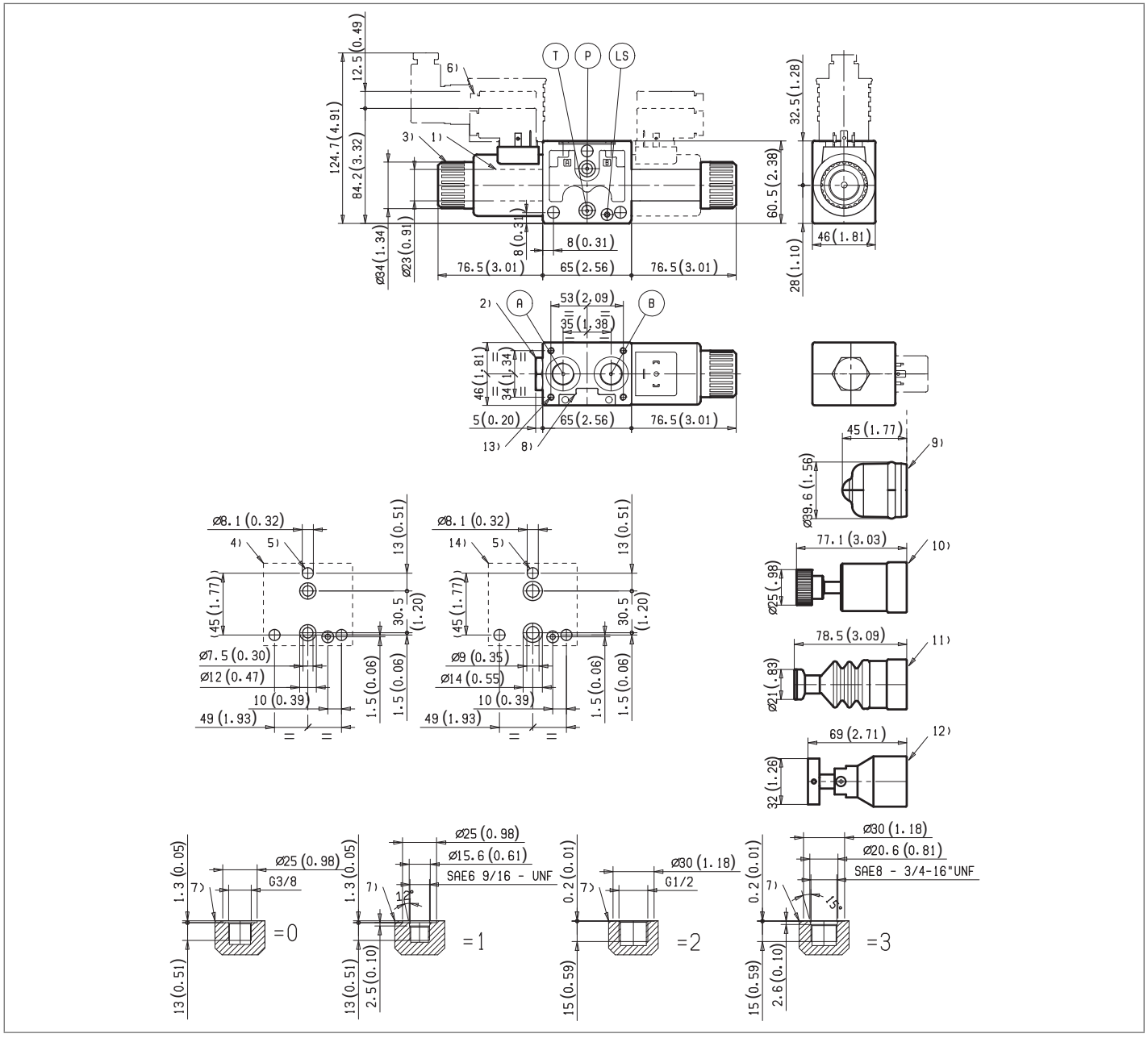
Nominal Flow = 6



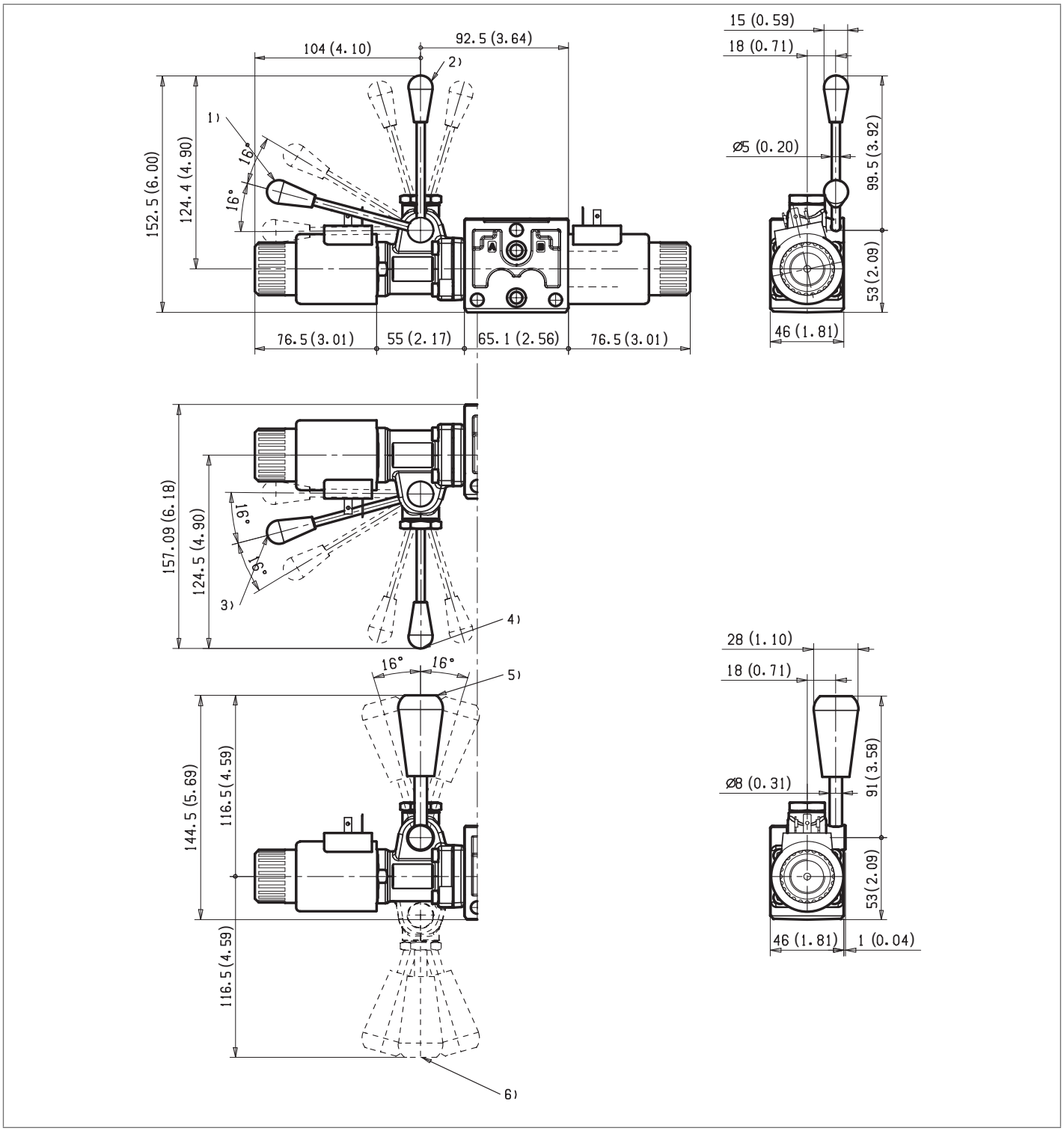




External dimensions and fittings



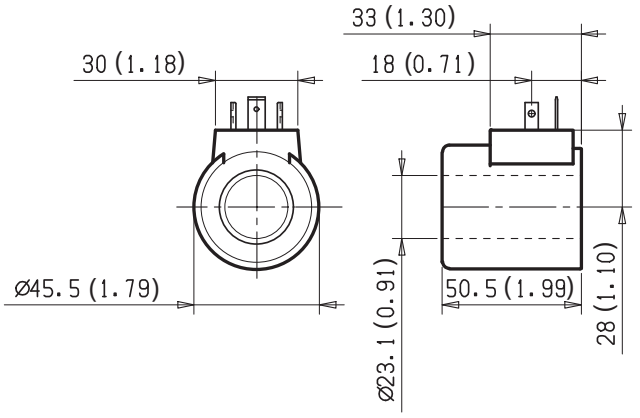
1 Solenoid tube Ø 23 mm (0.9 inch).
3 Ring nut for coil locking (Ø 30 mm);
torque 6 – 7 Nm (4.4 – 5.2 ft-lb).
4 Flange specifications for coupling to ED intermediate elements with ports G 3/8 and SAE 6.
5 For tie rod and tightening torque information see data sheet RE 18301-90.
6 Clearance needed for connector removal.
7 A and B ports.
8 Identification label.
9 Optional push-button manual override, 0P type, for spool opening: it is pressure stuck to the ring nut for coil locking. Mat no. R933003424.
10 Optional screw type manual override, 0F 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. Mat no. R930056486.
11 Optional push-button manual override NP (black) and RP (red) type, for spool opening. It is screwed (torque 6-7Nm(4.4-5.2 ft-lb)) to the tube as replacement of the coil ring nut. Mat no. R930056488(black) - R930056489 (red).
12 Optional twist type manual override, 0T type, for spool opening and locking in the energised position. It is screwed (torque 6-7Nm (44-5.2 ft-lb)) to the tube as replacement of the coil ring nut. Mat no. R930056487
13 Four threaded holes M5 for fitting a secondary flangeable element (only for elements with ports G 3/8 and SAE 6). Bolts M5 with recommended strength class DIN 8.8:
torque 5 – 6 Nm (3.6-4.4 ft-lb).
14 Flange specifications for coupling to ED intermediate elements with ports G 1/2 and SAE 8.



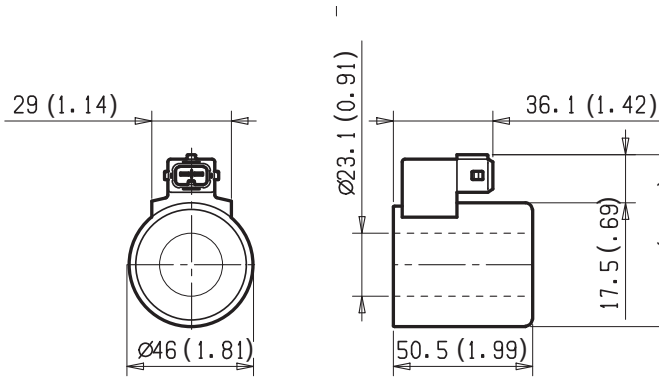
1 Ordering Details: HA (if fitted to side A) or HB (if fitted to side B)
2 Ordering Details: VA (if fitted to side A) or VB (if fitted to side B)
3 Ordering Details: H1 (if fitted to side A) or H9 (if fitted to side B)
4 Ordering Details: V1 (if fitted to side A) or V9 (if fitted to side B)
5 Ordering Details: XA (if fitted to side A) or XB (if fitted to side B)
6 Ordering Details: X1 (if fitted to side A) or X9 (if fitted to side B)

Electric connection

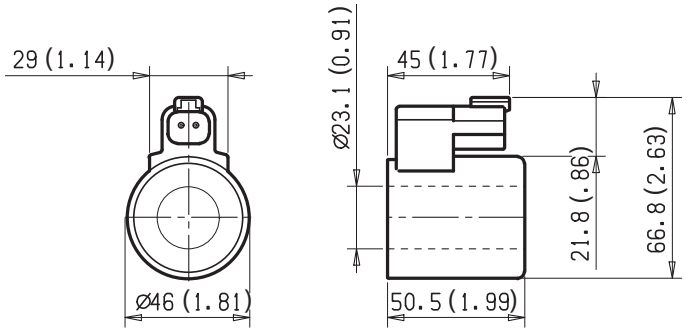
01 Protection class: IP 65 when connector with seal is properly screwed down.



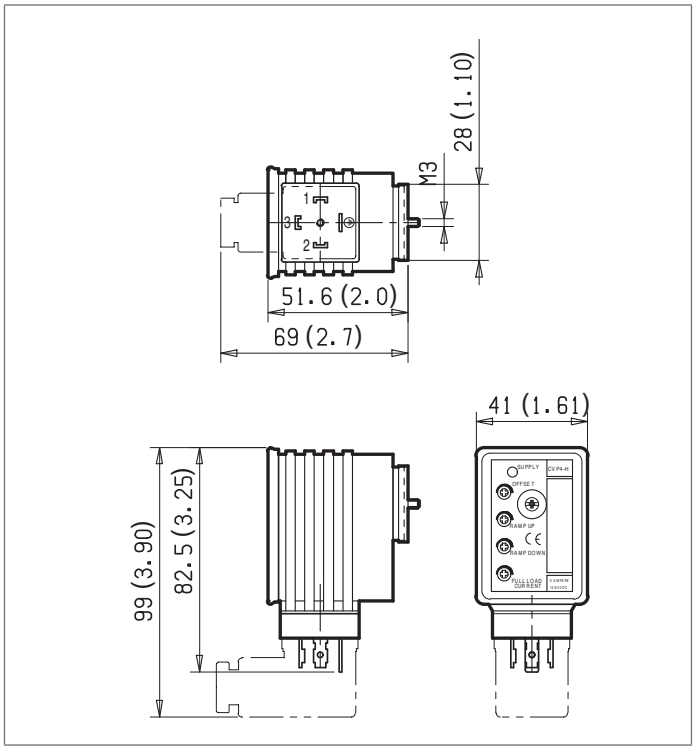
03 Protection class: IP 65 with female connector properly fitted (see drawing).



07 Protection class: IP 69 K with female connector properly fitted.



Electronic feed regulator



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.

Electronic feed regulator	
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	0.12 kg *(26.4 lbs)*
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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