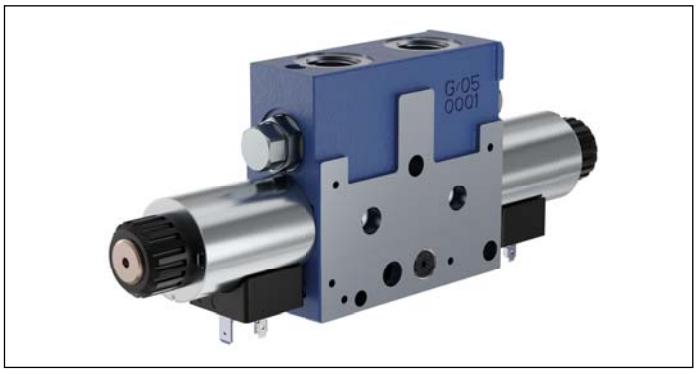
4/3 and 4/2 Proportional directional valve elements with LS (with Cross Piloted Counterbalance or Cross Piloted Check Valves Option)

RE 18301-22
Edition: 02.2025
Replaces: 06.2024

EDG-DP...B1 – EDG-DP...R1

Component Series 1



- Size 6
- Series 1
- Maximum operating pressure:
  350 bar (5000 psi) on pump side
  350 bar (5000 psi) on consumer side
- Maximum flow at 6 bar (87 psi) 40 l/min (10.6 gpm)
- Ports connections G 3/8 - G 1/2 - SAE6 - SAE8

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

General specifications

The inlet section can be configured for either a fixed displacement pump or load-sense variable displacement pump. When simultaneous machine functions are actuated, the pre-compensators will automatically adjust to the highest load pressure via a shuttle arrangement, making the system circuit independent of variations in loads and pump pressures.

- EDG-DP with Cross Piloted Counterbalance (B1)
incorporates one or two Cross Piloted Counterbalance valves which allow free flow toward the A and B outlet ports, and lock in a leak free mode the flow returning from the actuator. Pilot pressure in the opposite line reduces the pressure setting of the counterbalance valve in proportion to the pilot ratio (4:1) until opening and allowing the flow return from the actuator. The pressure setting should be at least 1,3 times the highest expected load. Depending on the version selected, the counterbalance function can be double-acting or single-acting (only A ,only B or both A and B ports).

- EDG-DP with Cross Piloted Check Valve (R1)
incorporates one or two Cross Piloted Check Valves which allow free flow toward the A and B outlet ports, and lock in a leak free mode the flow returning from the actuator, until sufficient pilot pressure is built up in the opposite line and the check valve is opened.

Main Field of Application

- Truck mounted applications
- Forestry machinery
- Forklifts and Telehandler
- Municipal vehicles
- Cranes
- Construction machines
- Aerial working platforms
- Heavy duty vehicles
- Agricultural machines

Contents

New Series 1 features:
- Pole tube and coil (emproved corrosion resistance duration up to 500h)
- Label
- Flange with drain line for VMGLS and combination for EDG Electrohydraulic actuation
- Body valve zinc plating treatment for higher corrosion resistence protection up to 500h

Ordering details

01		02	03		04		05	06		07	08	09	10	11	12		13	14		15		16	17		18	19
EDG	**-**	**D**	**P**	**-**	**_ _ _**	**-**	**_**	**2**	**-**	**_**	**_**	**_**	**_**	**_**	**_**	**-**	**_ _**	**_ _**	**-**	**_ _**	**-**	**_**	**_**	**00**	**_ _**	**1**

Family

01	Directional Valve elements EDG Size 6	**EDG**

Type

02	Direct Acting	**D**

Configuration

03	Proportional	**P**

Ports & Connections

04	G 3/8 DIN 3852	**G38**
	G 1/2 DIN 3852	**G12**
	9/16-18 UNF 2-B (SAE6)	**S06**
	3/4-16 UNF 2-B (SAE8)	**S08**

Local compensator bias spring

05	4 bar (58 psi)	**1**
	6 bar (87 psi)	**2**

Flange configuration

06	With P-Ta-Tb-LS-Ya-Yb-X-Y lines	**2**
	With P-Ta-Tb-LS-Ya-Yb-X-Y lines and LS return line	**3**

Hydraulic connections in neutral

07	P, A, B closed and LS to T	**B**
	P closed and A, B, LS to T	**E**

Spool variants

08	4/3 operated both sides A and B	**2**
	4/2 operated on side A only	**3**
	4/2 operated on side B only	**4**

Flow rates over valve connection (from 1 to 9 according to table 1 and table 2)

09	Flow rate P>A	**_**
10	Flow rate P>B	**_**
11	Nominal flow rate (A>T)	**_** [5]
12	Nominal flow rate (B>T)	**_** [5]

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

● = Available – = Not available

Electric connections

14	Without coils	**00**
	With coils, with connection DIN EN 175301-803	**01** [1]
	With coils, with connection vertical Amp - Junior	**03**
	With coils, with connection horizontal DT04-2P	**07**

Secondary valve types

15	Double or single counterbalance valve with 4:1 pilot ratio	**B1** [2][3]
	Double or single piloted check valve with 4:1 pilot ratio and 0,5 bar cracking pressure	**R1** [3][4]

Secondary valve config. setting:

16	A>Ta	**_** [2]
17	B>Tb	**_** [4]

Override option & Emergency Lever

18	Push pin type override	**00**
	Push button override on both sides A and B	**EP**
	Screw type override on both sides A and B	**EF**

Component Series

19	Series 1	**1**

1) For mating connectors ordering code see data sheet RE 18325-90.
2) For B1 Selection Secondary valve types: see table 3.
3) Different pilot ratios available (8:1 and 12:1), please contact factory fot further details
4) For R1 Selection Secondary valve types: see table 4
5) **"I"** for only meter in option.

Ordering details

Table 1

Notches dimension selection	Local compensator bias spring	
--> Flow Rate	**4bar**	**6bar**
1 *	4 l/min	6 l/min
2 *	8 l/min	10 l/min
3 *	12 l/min	14 l/min
4 *	16 l/min	18 l/min
6 **	24 l/min	30 l/min
9 **	32 l/min	40 l/min

*Note: standard spool types (symmetrical):
1111 - 2222 - 3333 - 4444 - 6666 - 9999
** Note: with 6 and 9 spool sizes delta pressure values exceed 30 bar (435 psi)

Table 2

Spool size selection guide

		P->A (corresponding A->T same size or "I" size)					
	Notch size	**1**	**2**	**3**	**4**	**6**	**9**
P->B (corresponding B->T same size or "I" size)	**1**	X	X	●	●	●	●
	2	X	X	X	◇	●	●
	3	●	X	X	X	◇	●
	4	●	◇	X	X	X	◇
	6	●	●	◇	X	X	X
	9	●	●	●	◇	X	X

X = Standard spool flow rate configuration
◇ = Special spool flow rate configuration, contact factory
● = Not available

Table 3

Counterbalance valve configuration setting

9										
With valve cavity plugged (Normally closed plug)										
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
50 bar	60 bar	70 bar	80 bar	90 bar	100 bar	110 bar	120 bar	130 bar	140 bar	150 bar
725 psi	870 psi	1015 psi	1160 psi	1305 psi	1450 psi	1595 psi	1740 psi	1885 psi	2030 psi	2175 psi
L	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**X**
160 bar	170 bar	180 bar	190 bar	200 bar	210 bar	220 bar	230 bar	240 bar	250 bar	270 bar	290 bar
2320 psi	2465 psi	2611 psi	2756 psi	2901 psi	3046 psi	3191 psi	3336 psi	3481 psi	3626 psi	3916 psi	4206 psi

Table 4

R1 secondary valve types

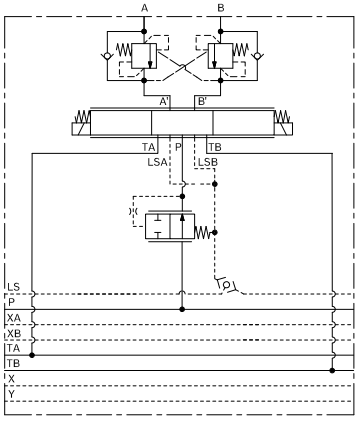
A	**9**
0,5 bar (7.3 psi)	With valve cavity plugged

Note

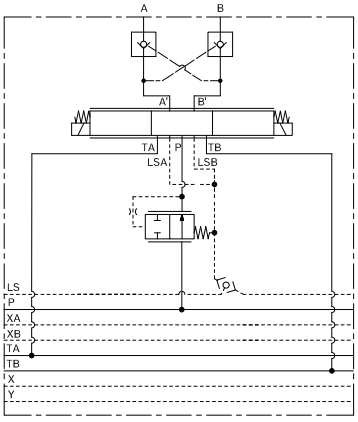
Pressure levels are set at 5 l/min (1.32 gpm).
For pressure higher than 290 bar (4206 psi), contact factory.

General hydraulic layout

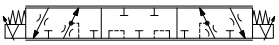
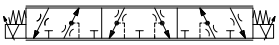
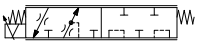
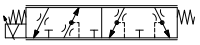
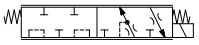
EDG-DP...B1

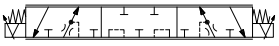
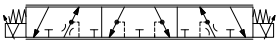
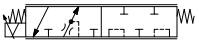


EDG-DP...R1

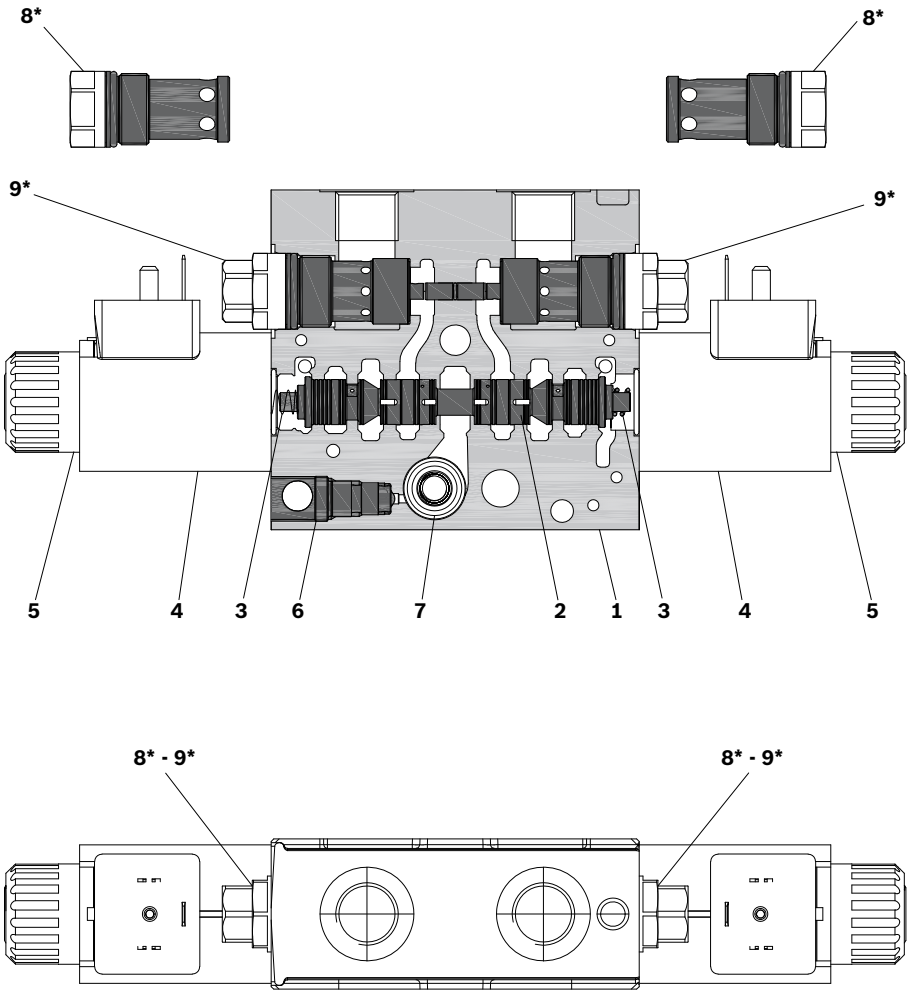


07 - Spool Variants

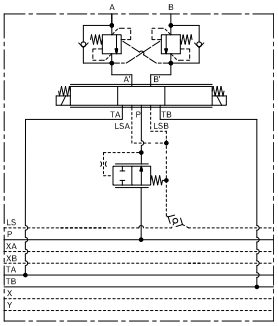
Both meter in and out	
B2	E2
	
B3	E3
	
B4	E4
	

Only meter in	
B2__II	E2__II
	
B3__II	E3__II
	
B4__II	E4__II
	

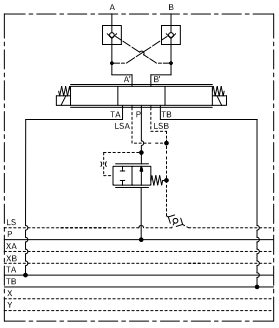
Functional description



EDG-DP...B1



EDG-DP...R1



1 Housing.
2 Main spool.
3 Return Spring.
4 Coil.
5 Ring nut.
6 LS shuttle valve.
7 Compensator spool.
8 VSO30 Check cartridge valve.
9 VSD30 Counterbalance cartridge valve.
***** Normally open plug option as alternative to 8 or 9 cartridge selection.
For Both ports A and B.

The EDG direct acting proportional solenoid sectional valves with pressure compensation control the oil flow to actuators. These elements consist of a stackable housing (**1**) with a control spool (**2**), two solenoids (**4**), two return springs (**3**). Each solenoid (**4**), energized by PWM regulator, displaces the control spool from its neutral-central position “0” proportionally to the current received. When the spool is shifted and the metering notch is open, flow delivery starts and is controlled by a 2 way pressure compensator(**7**) (P > A; P > B).
When the solenoid is de-energized, the return spring pushes the spool back in its neutral-central position.
Each coil (**4**) is fastened to the solenoid tube by the ring nut (**5**). A push-pin manual override is included to actuate the valve without electrical power as needed.

Load pressure compensation
The pressure compensator (**7**) keeps the pressure differential on the main spool (**2**). The flow to the consumers remains constant, despite varying loads.
The highest load pressure on the pump is signaled via the LS line and the integrated shuttle valve (**6**).
Pilot operated check valves on A and B ports (**8**), prevent unexpected movement of the actuators. As alternative, Counterbalance valves (**9**) provide enhanced controllability according to specific application requirements.

Technical data

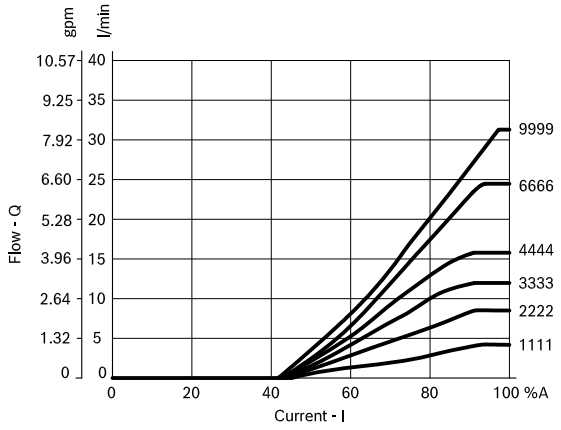
General		
Valve element with 2 solenoids	kg (lbs)	2.2 (4.85)
Valve element with 1 solenoid	kg (lbs)	1.7 (3.75)
Ambient Temperature	°C (°F)	-30....+90 (-22....+194)
Hydraulic		
Maximum pressure at P, A and B ports	bar (psi)	350 (5000)
Maximum static pressure at T	bar (psi)	210 (3050) [in case of Emergency Lever option, max. pressure is limited up to 30 bar at T]
Max. regulated flow at 6 bar (87 psi)	l/min (gpm)	40 (10.6)
For E schemes symmetrical spool pattern in neutral position (connection A to T and B to T) E-schemes flow pattern with only meter IN (spool type E_ _ _ I I)in neutral position: the opening area is approx the 50% of nominal cross-section. This spool type is suitable in combination with load holding valves applications.		Approx. 2% of the nominal cross-section
Hydraulic fluid General properties: it must have physical lubricating and chemical properties suitable for use in hydraulic systems.		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 ≤ 50°C (122°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)	0.228 (0.503)
Voltage	V	12 24
Nominal 100% current	A	1.76 0.94
Nominal Coil Resistance at 20°C (68°F)	Ω	4.05 13.6

Note
For applications with different specifications consult us.
* In addition to relief valve pressure setting value.

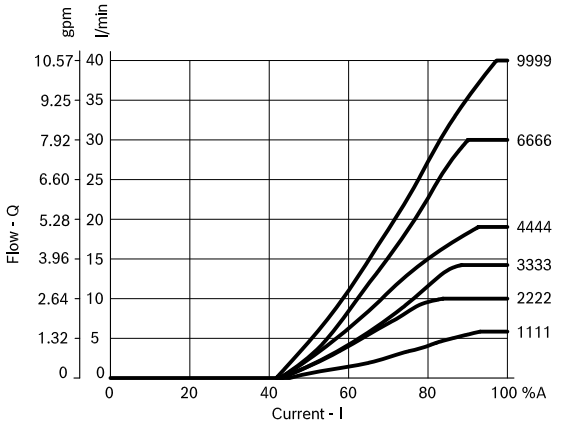
Code	Voltage [V]	Connector type	Coil description	Marking	Coil Mat no.
=OB 01	12 DC	EN 175301-803 (Ex. DIN 43650)	C37 01	12 DC	R930077022
=OB 03	12 DC	AMP JUNIOR	C37 03	12 DC	R930063954
=OB 07	12 DC	DEUTSCH DT 04-2P	C37 07	12 DC	R930077020
=OC 01	24 DC	EN 175301-803 (Ex. DIN 43650)	C37 01	24 DC	R930077023
=OC 03	24 DC	AMP JUNIOR	C37 03	24 DC	R930063955
=OC 07	24 DC	DEUTSCH DT 04-2P	C37 07	24 DC	R930077021

Characteristic curves

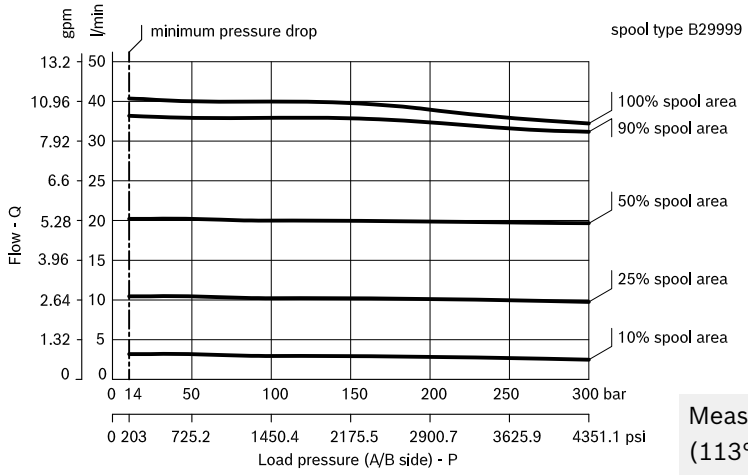
Characteristic curves Q=Q (I) at 4 bar



Characteristic curves Q=Q (I) at 6 bar

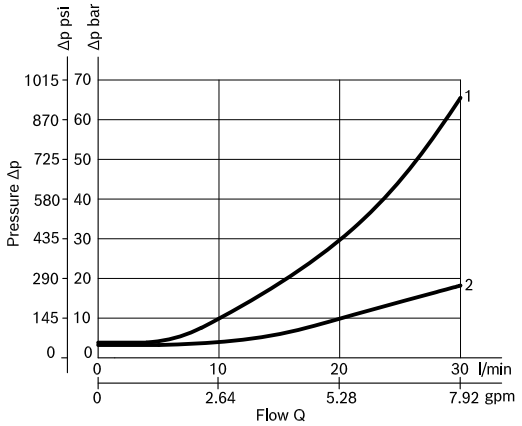


2-way inflow controller



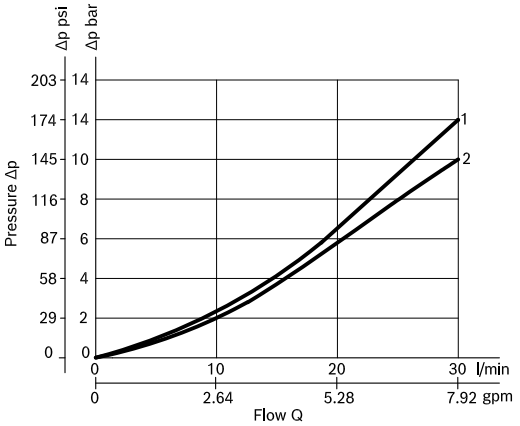
Measured with hydraulic fluid ISO-VG32 at 45° ±5 °C (113° ±9 °F); ambient temperature 20 °C (68 °F).

Characteristic curve for EDG-DP...B1



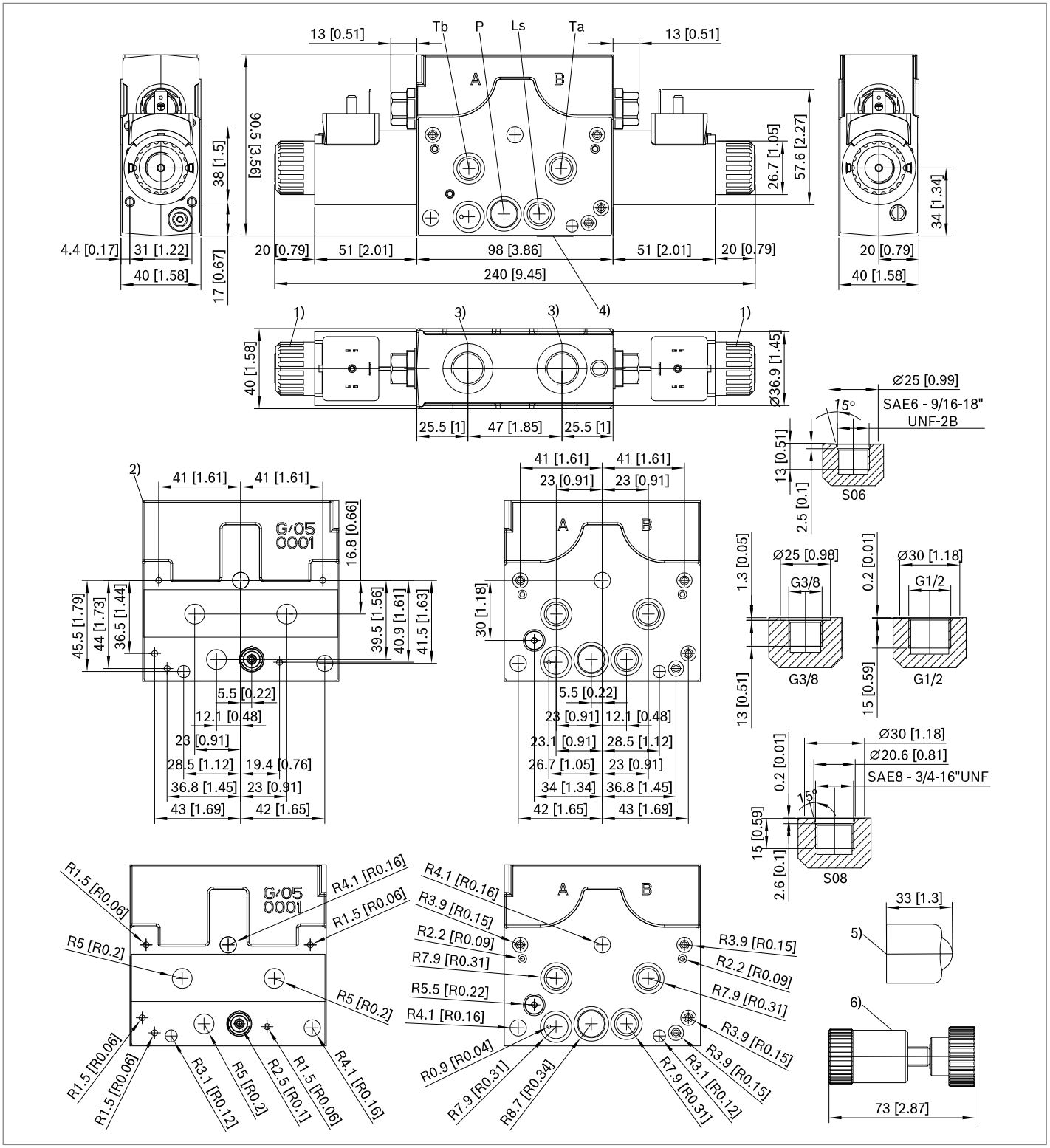
Pressure drop	Curve no.
Fully piloted	1
Through check valve	2

Characteristic curve for EDG-DP...R1



Cracking Pressure	Curve no.
0.5 bar (7.3 psi) free flow	1
Returning flow, fully piloted	2

External dimensions and fittings



1 Ring nut for coil locking (Ø 30.3 mm).
Torque 6 – 7 Nm (4.4 – 5.2 ft-lb).

2 Flange specifications. For tie rod and tightening torque information see data sheet RE 18301-90.

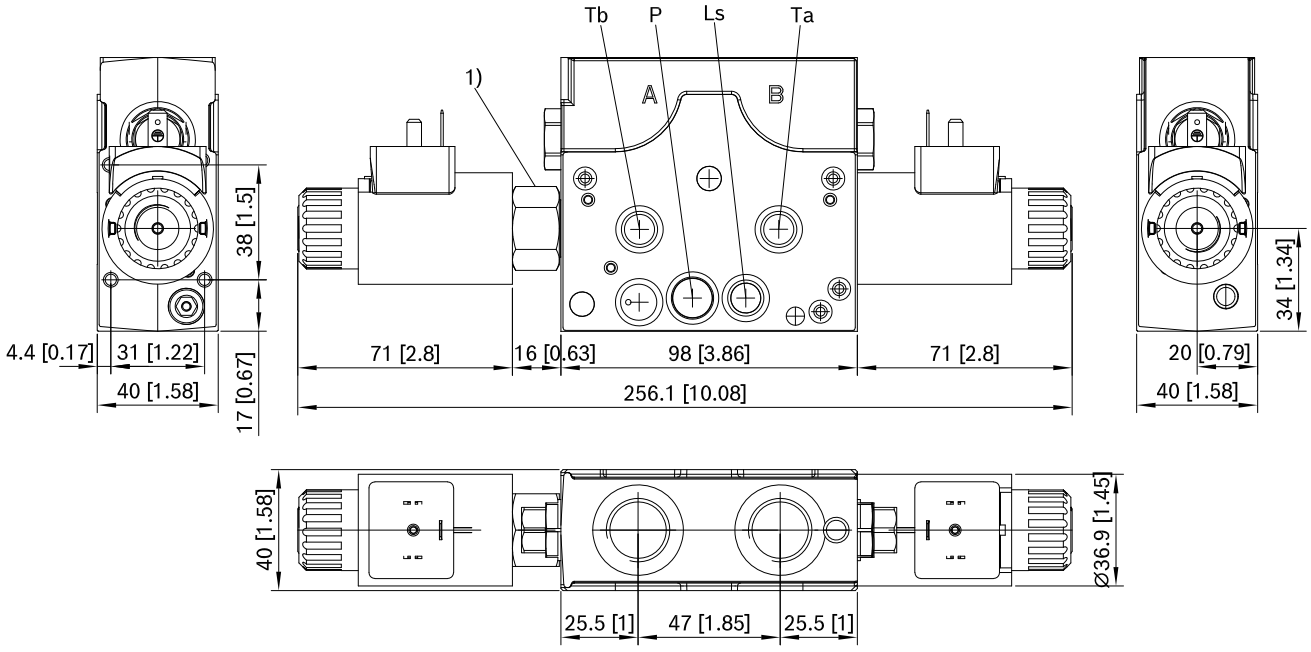
3 A and B ports.

4 Identification label.

5 Optional push-button manual override, EP type, for spool opening: it is pressure stuck to the ring nut for coil locking.
Mat no. R933002705

6 Optional screw type manual override, EF type, for spool opening: it is screwed (torque 6-7 Nm (4.4-5.2 ft-lb)) to the tube as replacement of the coil ring nut. Mat no. R930084529.

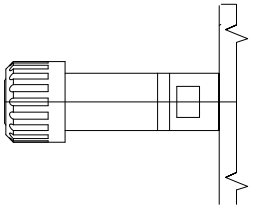
External dimensions for spool with nominal flow 9



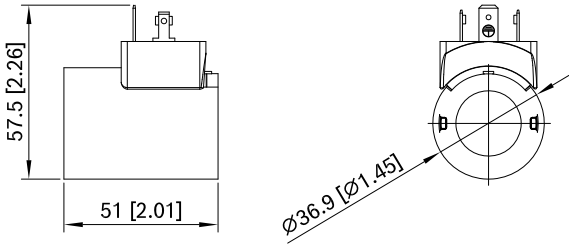
1 Flow-boost system only for spool with nominal flow 9.
It always mounted on "A" side of the valve.

Electric connections

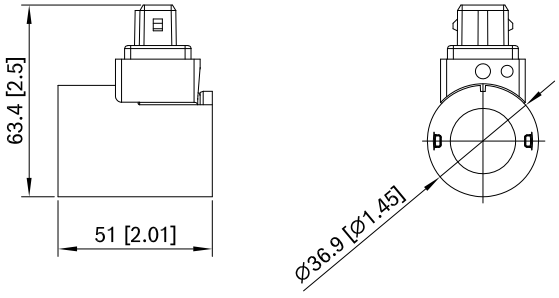
00 Without coil



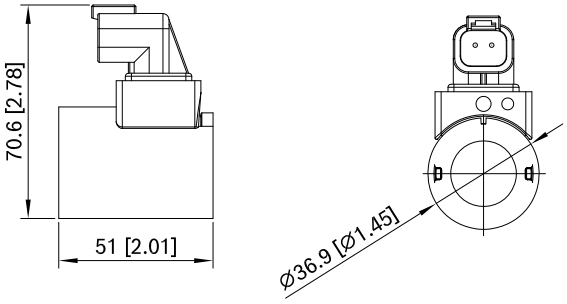
01 Protection class: IP 65 when connector with seal is properly screwed down.



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



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



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