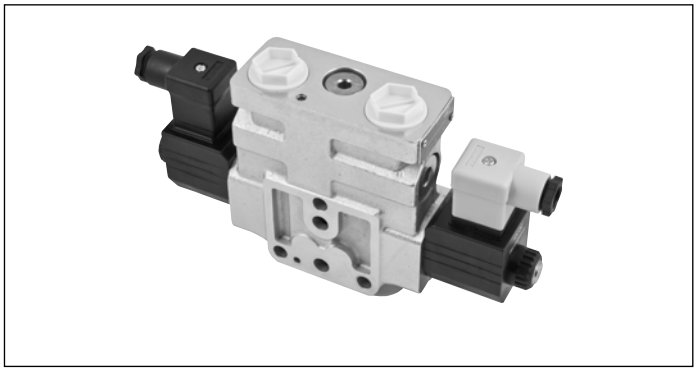
rexroth
A Bosch Company

4/3 and 4/2 on-off directional valve elements with flow sharing control (LUDV concept)

RE 18301-10
Edition: 01.2023
Replaces: 06.2018

L8510... (EDC-Z)



- Size 6
- Series 00
- Maximum operating pressure 310 bar (4500 psi)
- Maximum flow at 14 bar (203 psi) 23.5 l/min (6.2 gpm)
- Maximum flow at 18 bar (261 psi) 26.5 l/min (7 gpm)
- Ports connections G 3/8 - SAE8 and Modular
-

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

General specifications

- Valve element with direct on-off flow sharing control.
- It can achieve multiple simultaneous manoeuvres by distributing the available flow to each actuator selected by the operator, independently from the working pressure required.
- All simultaneous movements go on at the same reduced speed in case of flow shortage.
- Each energized actuator receives a pressure compensated flow.
- No shuttle valve fitted.
- Control spools directly operated by screwed-in solenoids with removable coils.
- Wet pin tubes for DC coils, with push rod for mechanical override; nickel plated surface.
- Manual override (push-button, screw type or lever) available as option.
- Different plug-in connectors available: see ordering details.

Contents

Ordering details

01	02	03	04	05	06	07	08	09	10
L	**8**	**5**	**10**						**0**	**_ _**

Family

01	Directional Valve elements ED	**L**

Type

02	Size 6 on-off	**8**

Configuration

03	Flow Sharing	**5**

Coil type

04	C36	**10**

Spool variants

05	4/3 operated both sides a and b; P, A, B, T closed in neutral	**B2**
	4/2 operated on side a only; P, A, B, T closed in neutral	**B3**
	4/2 operated on side b only; P, A, B, T closed in neutral	**B4**
	4/3 operated on both sides a and b; P closed; A and B to T in neutral	**E2**
	4/3 operated on side a only; P closed; A and B to T in neutral	**E3**
	4/3 operated on side b only; P closed; A and B to T in neutral	**E4**

Flow pattern & Nominal flow [1) - 4)]

06	Both meter in and out, A 3l/min(0.79gpm) - B 3l/min(0.79gpm)	**S0**
	Both meter in and out, A 6l/min(1.59gpm) - B 6l/min(1.59gpm)	**S1**
	Both meter in and out, A 9l/min(2.37gpm) - B 9l/min(2.37gpm)	**S2**
	Both meter in and out, A 13l/min(3.43gpm) - B 13l/min(3.43gpm)	**S3**
	Both meter in and out, A 23.5l/min(6.21gpm) - B 23.5l/min(6.21gpm)	**S4**
	Only meter in, A 6l/min(1.59gpm) - B 6l/min(1.59gpm) [2)]	**I 1**
	Only meter in, A 9l/min(2.37gpm) - B 9l/min(2.37gpm) [2)]	**I 2**
	Only meter in, A 23.5l/min(6.21gpm) - B 23.5l/min(6.21gpm) [2)]	**I 4**
	Both meter in and out, A 3l/min(0.79gpm) - B 6l/min(1.59gpm) [2)]	**01**
	Both meter in and out, A 6l/min(1.59gpm) - B 9l/min(2.37gpm) [2)]	**12**
	Both meter in and out, A 6l/min(1.59gpm) - B 13l/min(3.43gpm) [2)]	**13**
	Both meter in and out, A 9l/min(2.37gpm) - B 13l/min(3.23gpm) [2)]	**23**
	Both meter in and out, A 9l/min(2.37gpm) - B 23.5l/min(6.21gpm) [2)]	**24**
	Both meter in and out, A 13l/min(3.43gpm) - B 23.5l/min(6.21gpm) [2)]	**34**

Voltage supply		**31**	**07**	**04**	**03**	**01**	**00**	
07	Without coil	–	–	–	–	–	●	**00**
	12V DC	●	●	●	●	●	–	**OB**
	13V DC	–	●	–	–	●	–	**AD**
	24V DC	●	●	●	●	●	–	**OC**
	27V DC	–	●	–	–	●	–	**AC**
	48V DC	–	–	●	–	●	–	**OD**
	110V DC	–	–	–	–	●	–	**OE**
	24V DC (21.5 DC)	–	–	–	–	●	–	**OV**
	110V DC (98 DC)	–	–	–	–	●	–	**OW**
	230V DC (207 DC)	–	–	–	–	●	–	**OZ**

Electric connections

08	Without coils	**00**
	With coils, without mating connector DIN EN 175301-803	**01** [6)]
	With coils, with bi-directional diode, without mating connector vertical Amp-Junior	**03**
	With coils, with bi-directional diode, without mating connector horizontal Amp-Junior	**04**
	With coils, with bi-directional diode, without mating connector DT04-2P	**07**
	With coils and bipolar sheathed lead 350mm (13,8 inch) long	**31**

Ports

09	G 3/8 DIN 3852	**0**
	3/4-16 UNF 2-B (SAE8)	**3**
	Machined for interfacing to modular elements	**M** [5)]

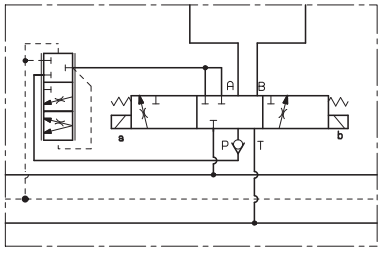
Options

10	Without manual override	**00**
	Push-button type manual override	**0P**
	Screw type manual override	**0F**
	Lever type manual override [3)]	**_ _**

● = Available – = Not available

1) The required hydraulic layout and spool variant can be chosen by consulting page 3.
2) Available only for E_ spool variant.
3) Each different option for the type of emergency chosen implies a specific ordering code (refer to page 8).
4) With Δp (P > A or P > B) 14 bar (203 psi).
5) See RE18301-45, RE18301-46, RE18301-47, for flangeable elements.
6) For connectors ordering code see data sheet RE 18325-90.

▼ **Symbols**



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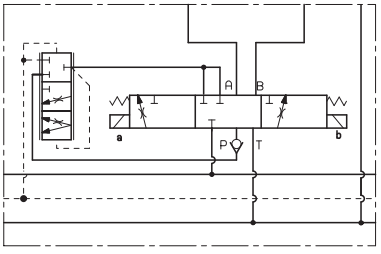
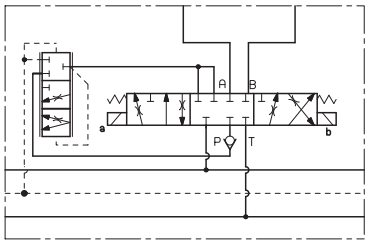
= 3



= M

▼ **Spool variant and Flow pattern**

Both meter in and out



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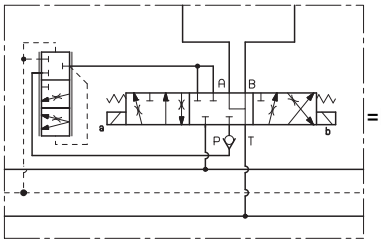

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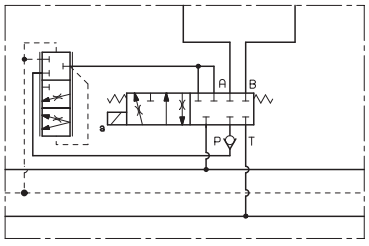

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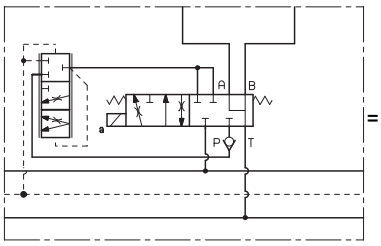

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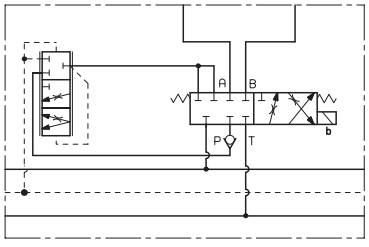

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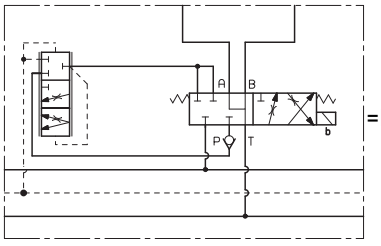
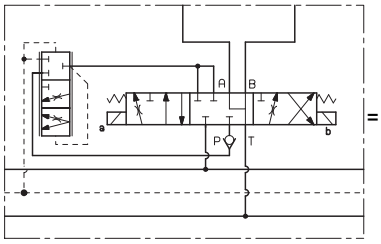


=E4

Only meter in



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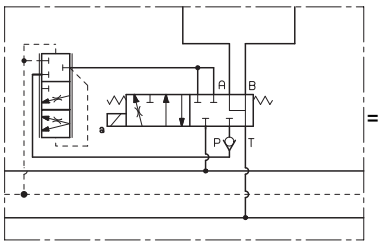

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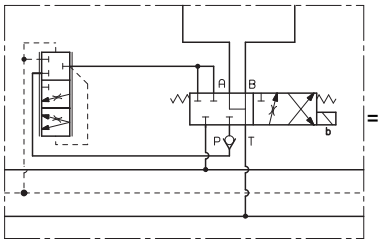
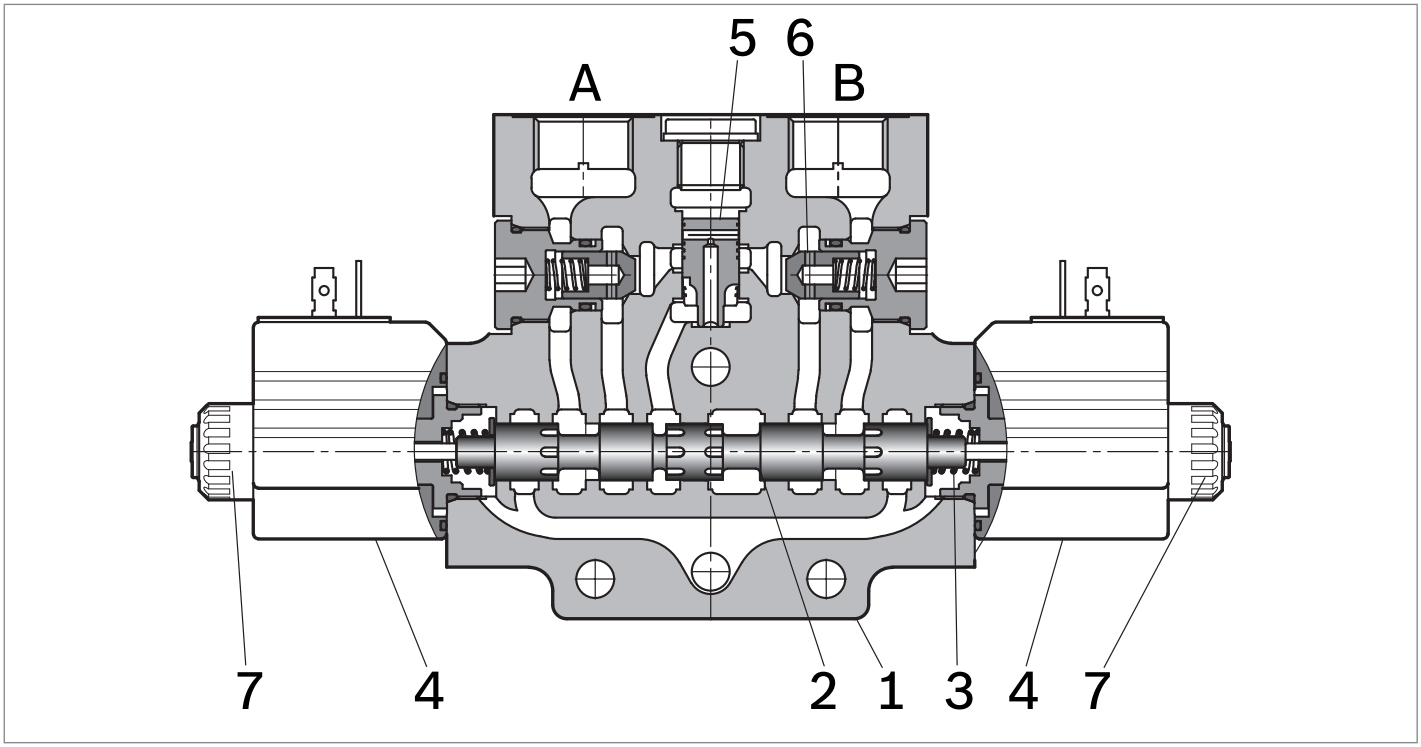


=E4I

Functional description



The sandwich plate design directional valve elements L8510... are compact direct operated pressure compensated solenoid valves which control the start, the stop, the direction and the quantity of the oil flow, with a FLOW SHARING principle. These elements basically consist of a stackable housing (**1**) with a control spool, two solenoids (**4**), two return springs. When energized, each solenoid (**4**) displaces the control spool from its neutral-central position “0” and the metering notches are open; flow is delivered to the 3 way pressure compensator followed by a check valve for each port A and B. The compensator, balanced by the LS pressure at the opposite end, lifts up and unloads a pressure compensated flow which is sent to the A (or B) port through the relevant check valve; at the same time the opposite port allows oil return to tank.

LS pressure reaches the compensator “dead end” directly from the A or B port, while the check valves lock eventual pressure oscillations which could affect the compensator function.

When the solenoid is de-energized, the return spring pushes the spool thrust washer back against the housing and the spool returns in its neutral-central position.

Each coil (**4**) is fastened to the solenoid tube by a ring nut (**7**). A pin allows to push the spool under emergency conditions, when the solenoid cannot be energized, like in case of voltage shortage.

Technical data

General										
Valve element with 2 solenoids	kg (lbs)	3.42 (7.54)								
Valve element with 1 solenoid	kg (lbs)	2.81 (6.19)								
Ambient Temperature	°C (°F)	–20....+50 (-4....+122) (NBR seals)								
MTTFd		150 years se RE18350-51								
Hydraulic										
Maximum pressure at P, A and B ports	bar (psi)	310 (4500)								
Maximum pressure at T	bar (psi)	210 (3050)								
Maximum pressure with lever emergency at T	bar (psi)	140 (2030)								
Max. regulated flow at 14 bar (203 psi)	l/min (gpm)	23,5 (6.2)								
Max. regulated flow at 18 bar (261 psi)	l/min (gpm)	26.5 (7)								
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=12...15 ISO 4406: class 20/18/15 NAS 1638: class 9								
Viscosity range	mm^2/s	5....420								
Electrical										
Voltage type		DC (AC only with RAC connection)								
Voltage tolerance (nominal voltage)	%	-10 .... +10								
Duty		Continuous, with ambient temperature ≤ 50°C (122°F)								
Coil wire temperature not to be exceeded	°C (°F)	150 (302)								
Insulation class		H								
Compliance with		Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC								
Coil weight	kg (lbs)	0.215 (0.44)								
Voltage	V	12	13	24	27	48	110	24 +RAC (21,5)	110 +RAC (98)	230 +RAC (207)
Voltage type		DC	DC	DC	DC	DC	DC	AC	AC	AC
Power consumption	W	26	26	26	26	26	26	29	29	29
Nominal 100% current	A	2.15	2.00	1.10	1.10	0.54	0.27	1.20	0.29	0.14
Coil resistance (nominal at 20°C (68°F))	Ω	5.5	6.5	22	28	89	413	18	338	1430

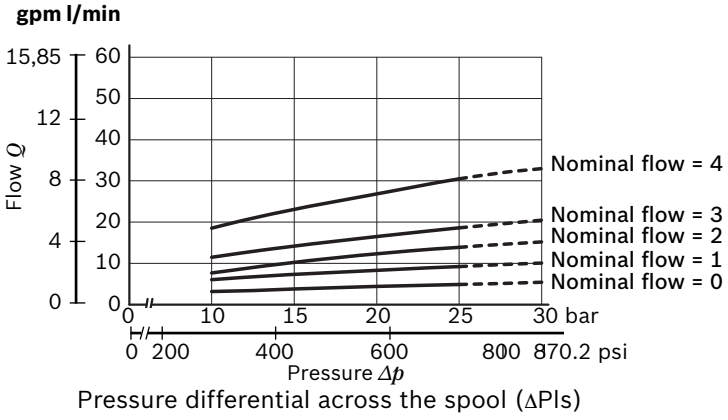
Note

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)	C3601 12DC	12 DC	R933000044
OB 03	12 DC	AMP JUNIOR	C3603 12DC	12 DC	R933000047
OB 04	12 DC	AMP JUNIOR Horizontal	C3604 12DC	12 DC	R933002913
OB 07	12 DC	DEUTSCH DT 04-2P	C3607 12DC	12 DC	R933000048
OB 31	12 DC	Cable 350 mm long	C3631 12DC	12 DC	R933000045
AD 01	13 DC	EN 175301-803 (Ex. DIN 43650)	C3601 13DC	13 DC	R933000051
AD 07	13 DC	DEUTSCH DT 04-2P	C3607 13DC	13 DC	R933000049
OC 01	24 DC	EN 175301-803 (Ex. DIN 43650)	C3601 24DC	24 DC	R933000053
OC 03	24 DC	AMP JUNIOR	C3603 24DC	24 DC	R933000057
OC 04	24 DC	AMP JUNIOR Horizontal	C3604 24DC	24 DC	R933002914
OC 07	24 DC	DEUTSCH DT 04-2P	C3607 24DC	24 DC	R933000058
OC 31	24 DC	Cable 350 mm long	C3637 24DC	24 DC	R933000055
AC 01	27 DC	EN 175301-803 (Ex. DIN 43650)	C3601 27DC	27 DC	R933000056
AC 07	27 DC	DEUTSCH DT 04-2P	C3607 27DC	27 DC	R933000050
OD 01	48 DC	EN 175301-803 (Ex. DIN 43650)	C3601 48DC	48 DC	R933000059
OD 04	48 DC	AMP JUNIOR Horizontal	C3604 48DC	48 DC	R933002915
OE 01	110 DC	EN 175301-803 (Ex. DIN 43650)	C3601 110DC	110 DC	R933000061
OV 01	24 RAC	EN 175301-803 (Ex. DIN 43650)	C3601 21.5DC	21.5 DC	R933000054
OW 01	110 RAC	EN 175301-803 (Ex. DIN 43650)	C3601 98DC	98 DC	R933000060
OZ 01	230 RAC	EN 175301-803 (Ex. DIN 43650)	C3601 207DC	207 DC	R933000062

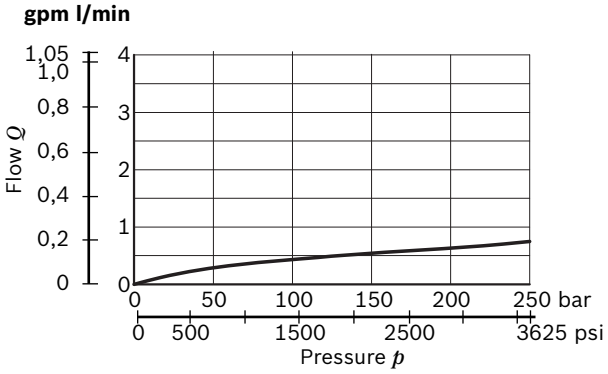
Characteristic curves

▼ **Nominal flow Qnom=Qnom (ΔP ls)**

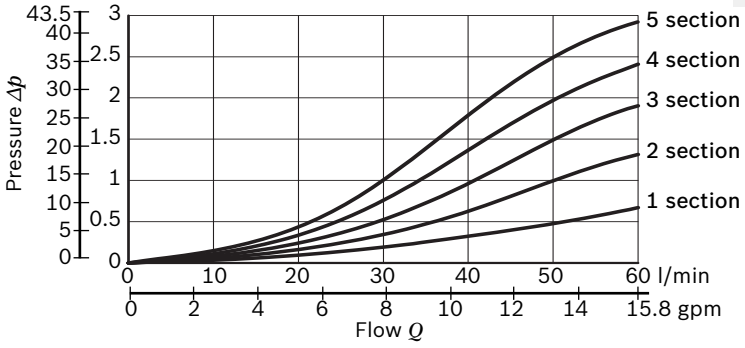


Pressure differential across the spool (ΔPls)

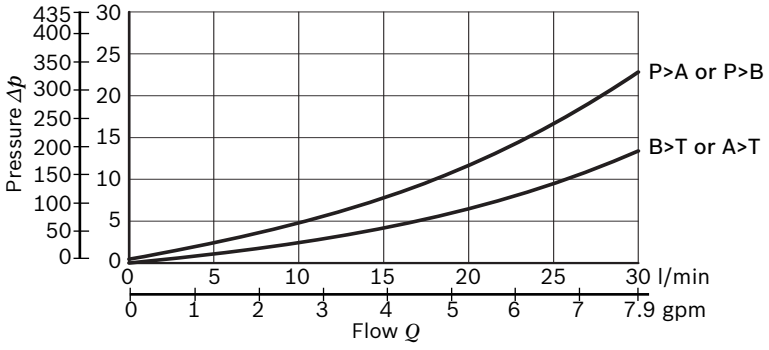
▼ **LS drain**



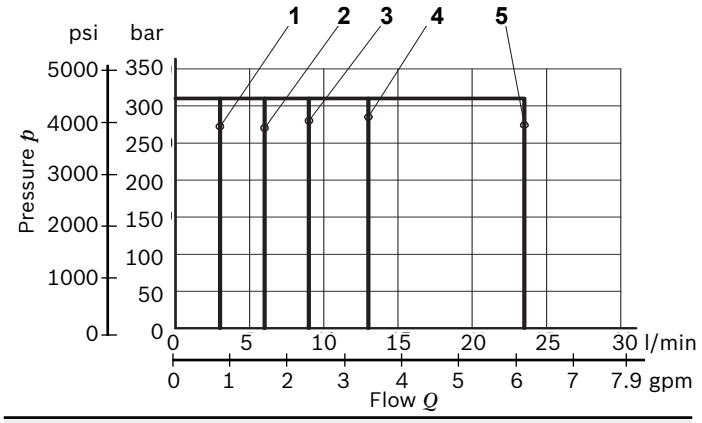
▼ **Version: pressure drop Δp = Δp(Q) (P_{IN}- P_{OUT}) to the next section**



▼ **Pressure drop Δp = Δp(Q) with spool B2S4**



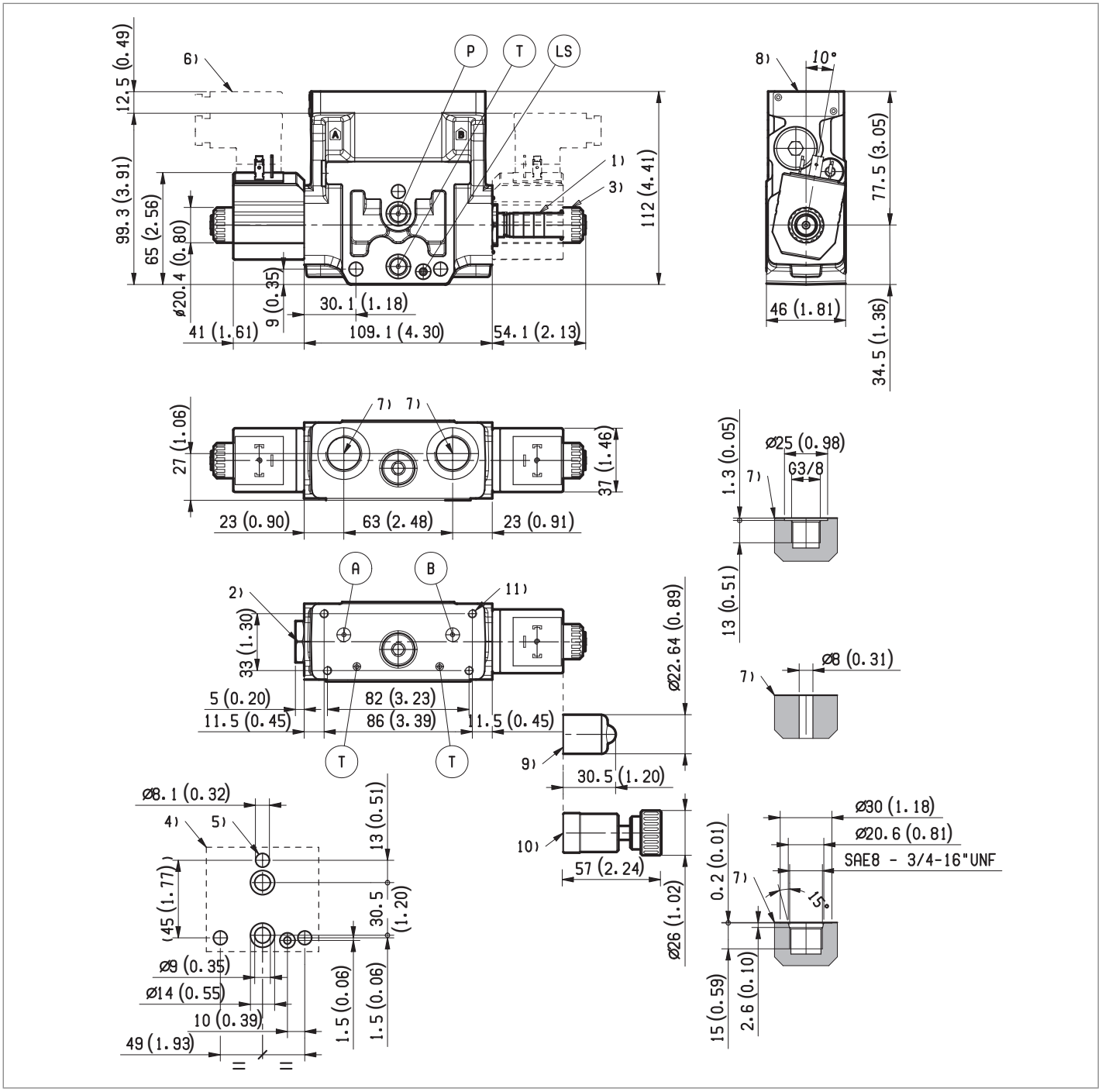
▼ **Performances limits**



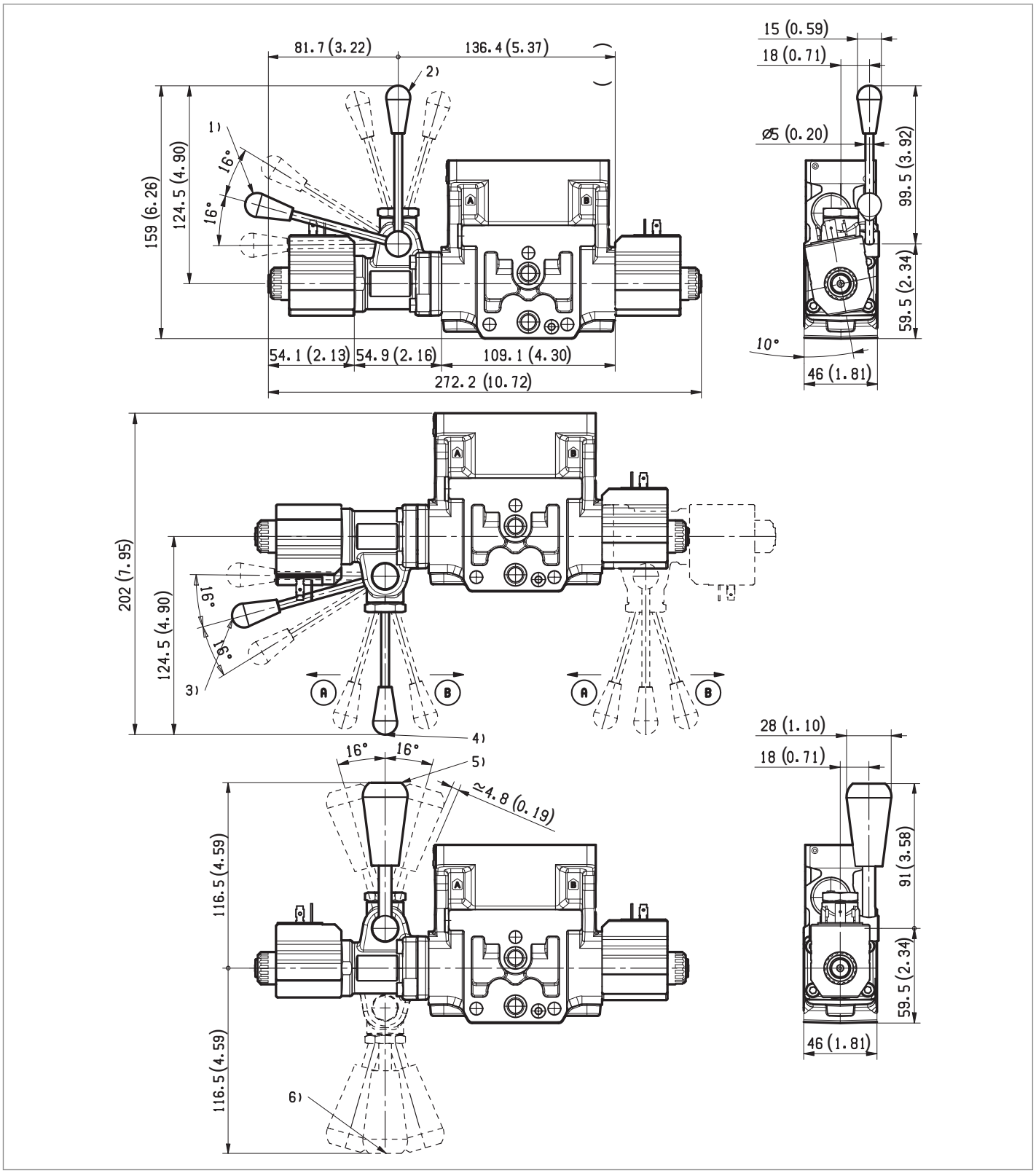
Spool Variant	Curve no.
B2S0, E2S0, B3S0, E3S0, B4S0, E4S0, B2I0, E2I0, B3I0, E3I0, B4I0, E4I0	1
B2S1, E2S1, B3S1, E3S1, B4S1, E4S1, B2I1, E2I1, B3I1, E3I1, B4I1, E4I1	2
B2S2, E2S2, B3S2, E3S2, B4S2, E4S2, B2I2, E2I2, B3I2, E3I2, B4I2, E4I2	3
B2S3, E2S3, B3S3, E3S3, B4S3, E4S3, B2I3, E2I3, B3I3, E3I3, B4I3, E4I3	4
B2S4, E2S4, B3S4, E3S4, B4S4, E4S4, B2I4, E2I4, B3I4, E3I4, B4I4, E4I4	5

The performance curves are measured with flow going across and coming back, like P>A and B>T. With “lever type” emergency control, the performance limits are slightly lower.

External dimensions and fittings



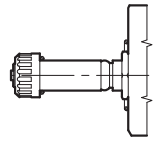
1 Solenoid tube Ø 14 mm (0.55 inch).
2 Plug for 2 positions versions (4/2).
3 Ring nut for coil locking (Ø 20.4 mm).
Torque 5-6Nm (3.6-4 4 ft-lb).
4 Flange specifications for coupling to ED intermediate elements.
5 For tie rod and tightening torque information see data sheet RE 18301-90.
6 Clearance 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. R933000042.
10 Optional screw type manual override, 0F 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. R933000021.
11 Four threaded holes M5 deepth 12mm (0.47 inch) for fitting a secondary flangeable element. Bolts M5 with recommended strength class DIN8.8: torque 5-6 Nm (3.6-4.4 ft-lb) (only for version with modular secondary valves).



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

00



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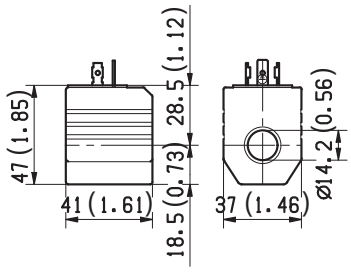
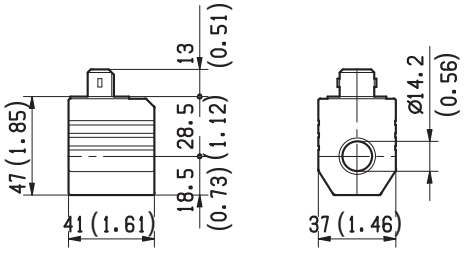
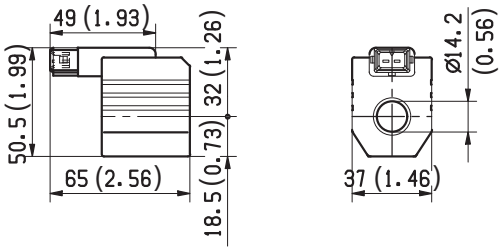


03 Protection class: IP 65 with female connector properly fitted (see drawing).



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



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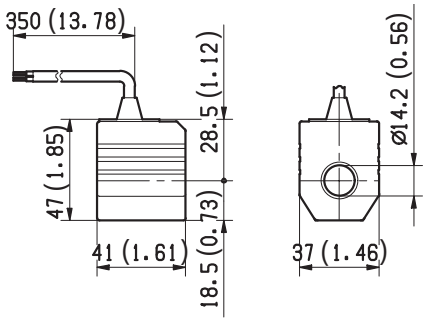
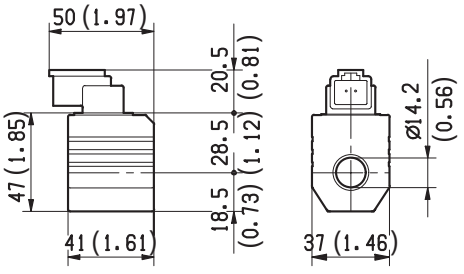


07 Protection class: IP 69 K with female connector properly fitted (see drawing).



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