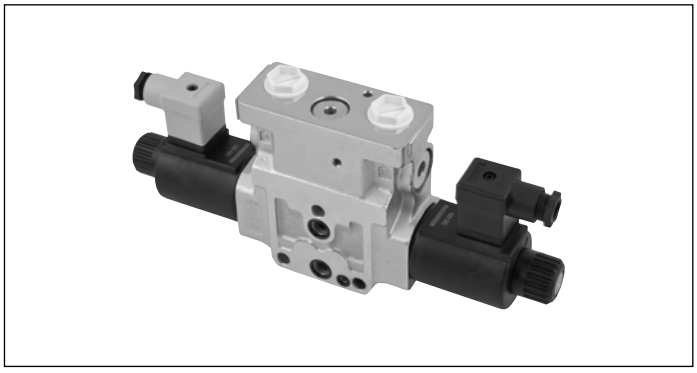
rexroth
A Bosch Company

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

RE 18301-11
Edition: 06.2018
Replaces: 02.2016

L8511... (EDC-DZ)



Size 6
Series 00
Maximum operating pressure 310 bar (4500 psi)
Maximum flow at 14 bar (206psi) 48 l/min (12.7 gpm)
Maximum flow at 18 bar (261psi) 54 l/min (15.3 gpm)
Ports connections G 1/2 - 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 extractable 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 upon request.
Different plug-in connectors available: see ordering details.

Contents

Ordering details

01	02	03	04	05	06	07	08	09	10
L	**8**	**5**	**11**					**0**	**_ _**

Family

01	Directional Valve elements ED	**L**

Type

02	Size 6 proportional	**8**

Configuration

03	Flow Sharing	**5**

Coil type

04	C45	**11**

Spool variants [1)]

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) - 2)]

06	Both meter in and out, A 35l/min(9.25gpm) - B 35l/min(9.25gpm)	**S8**
	Both meter in and out, A 48l/min(12.7gpm) - B 48l/min(12.7gpm)	**S9**
	Only meter in, A 35l/min(9.25gpm) - B 35l/min(9.25gpm) [5)]	**I 8**
	Only meter in, A 48l/min(12.7gpm) - B 48l/min(12.7gpm) [5)]	**I 9**
	Both meter in and out, A 15l/min(3.9gpm) - B 35l/min(9.25gpm) [5)]	**38**
	Both meter in and out, A 24l/min(6.3gpm) - B 35l/min(9.25gpm) [5)]	**48**
	Both meter in and out, A 24l/min(6.3gpm) - B 48l/min(12.7gpm) [5)]	**49**
	Both meter in and out, A 35l/min(9.25gpm) - B 48l/min(12.7gpm) [5)]	**89**

Voltage supply		**07**	**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 DT04-2P	**07**

Ports

09	G 1/2 DIN 3852	**2**
	3/4-16 UNF 2-B (SAE8)	**3**
	Machined for interfacing to modular elements	**M** [4)]

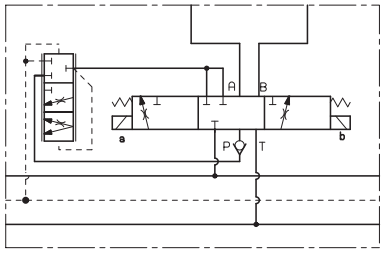
Options

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

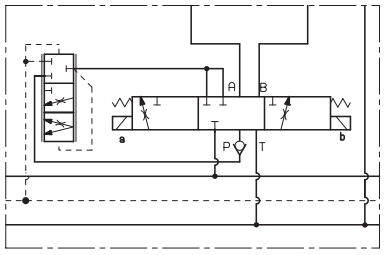
● = Available – = Not available

1) The required hydraulic layout and spool variant can be chosen by consulting page 3.
2) With ΔP (P>A or P>B) 14 bar (203 psi).
3) Each different option for the type of emergency chosen implies a specific ordering code (refer to page 9).
4) See RE18301-45, RE18301-46, RE18301-47, for flangeable elements.
5) Available only for E_spool variant.
6) For connectors ordering code see data sheet RE 18325-90.

Symbols



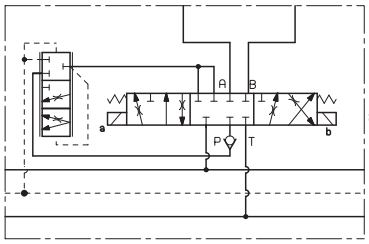
= 2
= 3



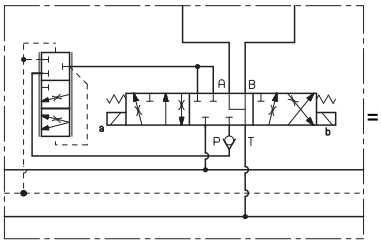
= M

Spool variant and Flow pattern

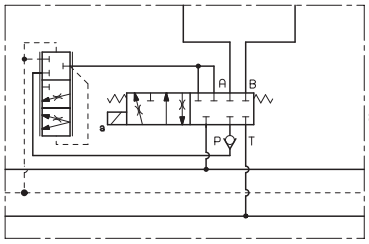
Both meter in and out



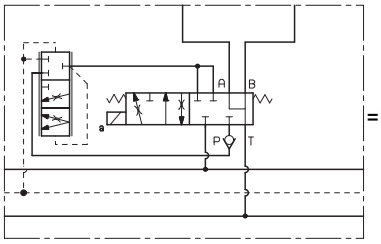
=B2



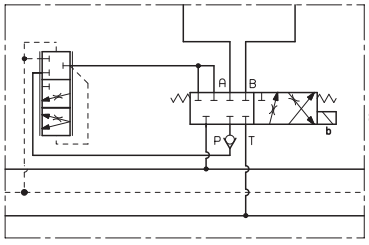
=E2



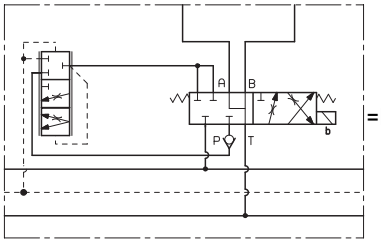
=B3



=E3

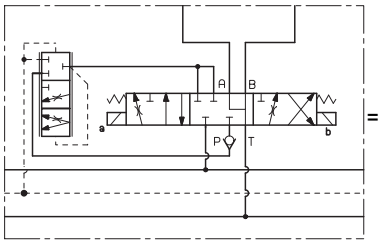


=B4

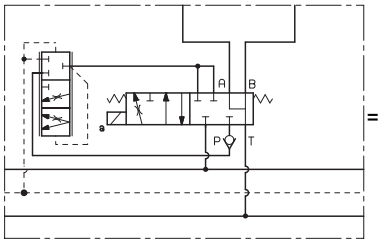


=E4

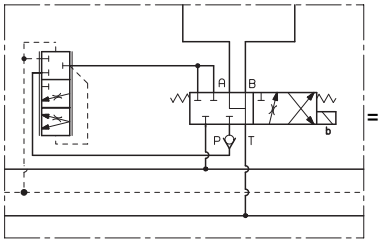
Only meter in



=E2I

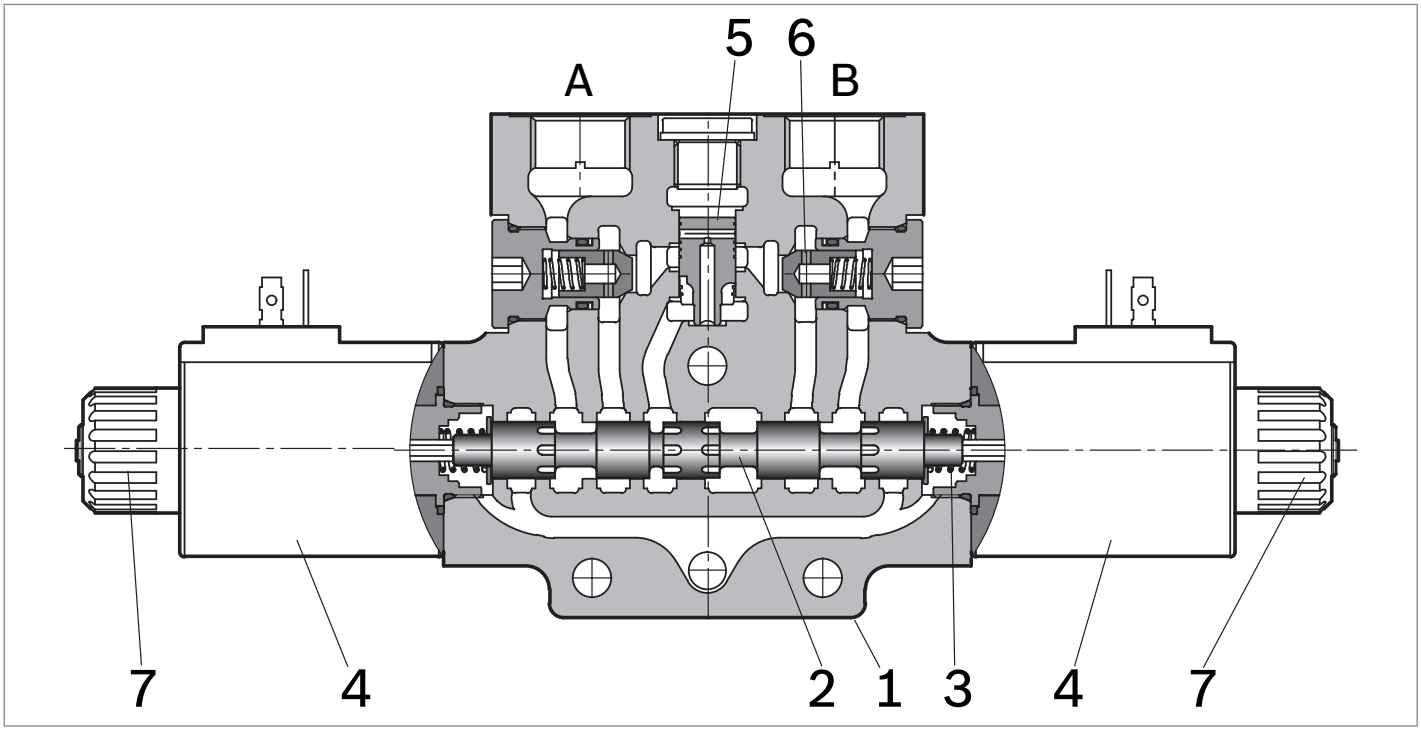


=E3I



=E4I

Functional description



The sandwich plate design directional valve elements L8511... 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

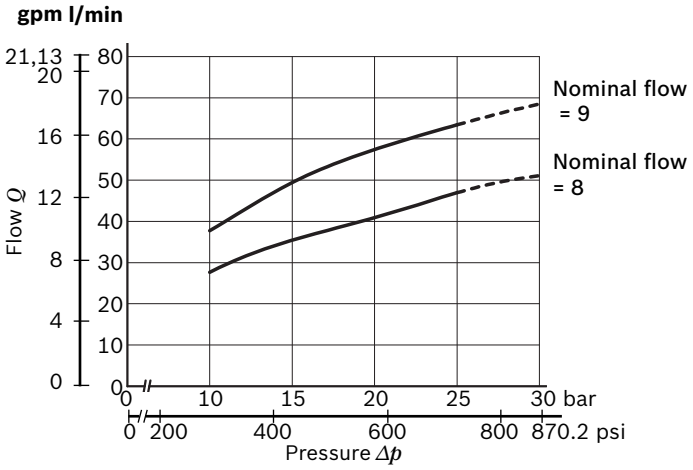
General										
Valve element with 2 solenoids	kg (lbs)	3.82 (8.42)								
Valve element with 1 solenoid	kg (lbs)	3.00 (6.61)								
Valve element with 2 solenoids and lever type emergency	kg (lbs)	4.1 (9.00)								
Valve element with 1 solenoid and lever type emergency	kg (lbs)	3.25 (7.16)								
Ambient Temperature	°C (°F)	–20....+50 (-4....+122) (NBR seals)								
MTTFd		150 years see RE 18350-51								
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)								
Maximum flow	l/min (gpm)	48 (12.7)								
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	PWM	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 with connection EN 175301-803	kg (lbs)	0.335 (0.74)								
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	33	31	33	33	33	35	33	33	35
Nominal 100% current	A	2.8	2.30	1.40	1.20	0.7	0.32	1.60	0.34	0.16
Coil resistance (nominal at 20°C (68°F))	Ω	4.24	5.42	17	21.8	69.8	341.8	13.6	285	1229

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)	C4501 12DC	12 DC	R933000026
OB 03	12 DC	AMP JUNIOR	C4503 12DC	12 DC	R933000027
OB 07	12 DC	DEUTSCH DT 04-2P	C4507 12DC	12 DC	R933000030
AD 01	13 DC	EN 175301-803 (Ex. DIN 43650)	C4501 13DC	13 DC	R933000028
AD 03	13 DC	AMP JUNIOR	C4503 13DC	13 DC	R933000029
AD 07	13 DC	DEUTSCH DT 04-2P	C4507 13DC	13 DC	R933000031
OC 01	24 DC	EN 175301-803 (Ex. DIN 43650)	C4501 24DC	24 DC	R933000034
OC 03	24 DC	AMP JUNIOR	C4503 24DC	24 DC	R933003630
OC 07	24 DC	DEUTSCH DT 04-2P	C4507 24DC	24 DC	R933000032
AC 01	27 DC	EN 175301-803 (Ex. DIN 43650)	C4501 27DC	27 DC	R933000035
AC 03	27 DC	AMP JUNIOR	C4503 27DC	27 DC	R933000036
AC 07	27 DC	DEUTSCH DT 04-2P	C4507 27DC	27 DC	R933000033
OD 01	48 DC	EN 175301-803 (Ex. DIN 43650)	C4501 48DC	48 DC	R933000037
OE 01	110 DC	EN 175301-803 (Ex. DIN 43650)	C4501 110DC	110 DC	R933000040
OV 01	24 RAC	EN 175301-803 (Ex. DIN 43650)	C4501 21.5DC	21.5 DC	R933000038
OW 01	110 RAC	EN 175301-803 (Ex. DIN 43650)	C4501 98DC	98 DC	R933000039
OZ 01	230 RAC	EN 175301-803 (Ex. DIN 43650)	C4501 207DC	207 DC	R933000041

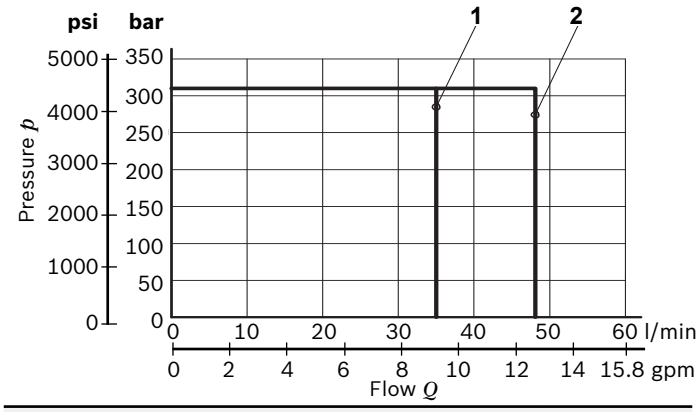
Characteristic curves

Nominal flow Qnom=Qnom (ΔP ls)



Pressure differential across the spool (ΔPls)

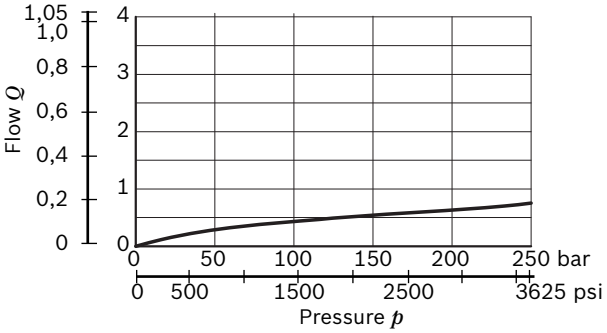
Performances limits



Spool Variant	Curve no.
B2S8, E2S8, B3S8, E3S8, B4S8, E4S8, B2I8, E2I8, B3I8, E3I8, B4I8, E4I8	1
B2S9, E2S9, B3S9, E3S9, B4S9, E4S9, B2I9, E2I9, B3I9, E3I9, B4I9, E4I9	2

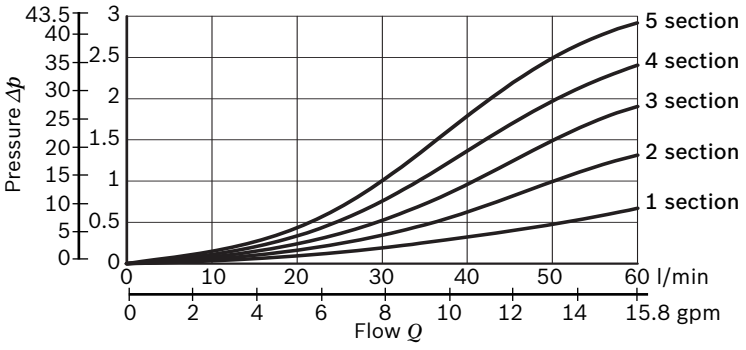
The performance curves are measured with flow going across and coming back, like P>A and B>T. With “lever type” emergency control, the performance limits are slightly lower.

LS drain
gpm l/min

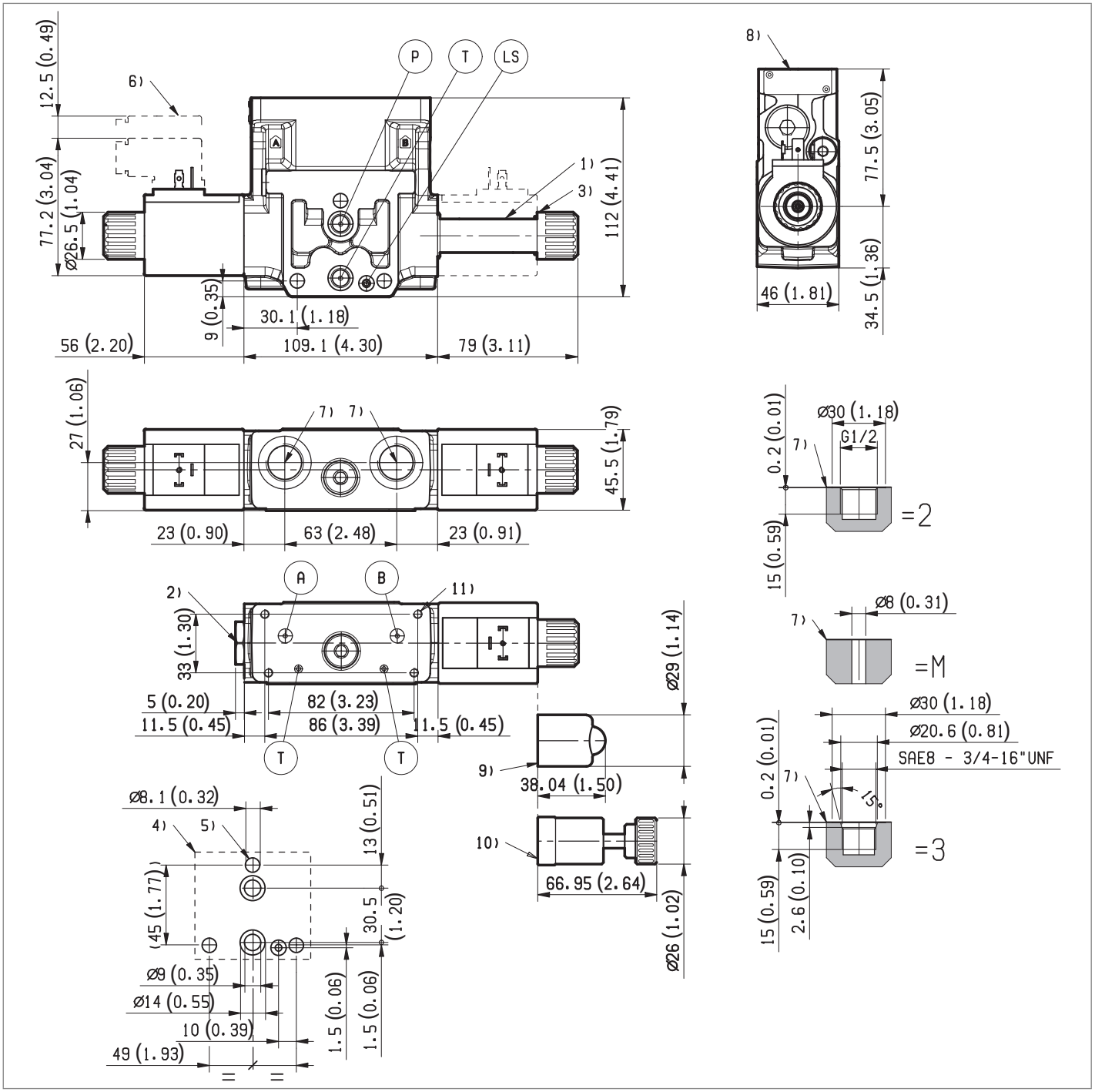


Version: pressure drop Δp = Δp(Q) (P_{IN}- P_{OUT}) to the next section

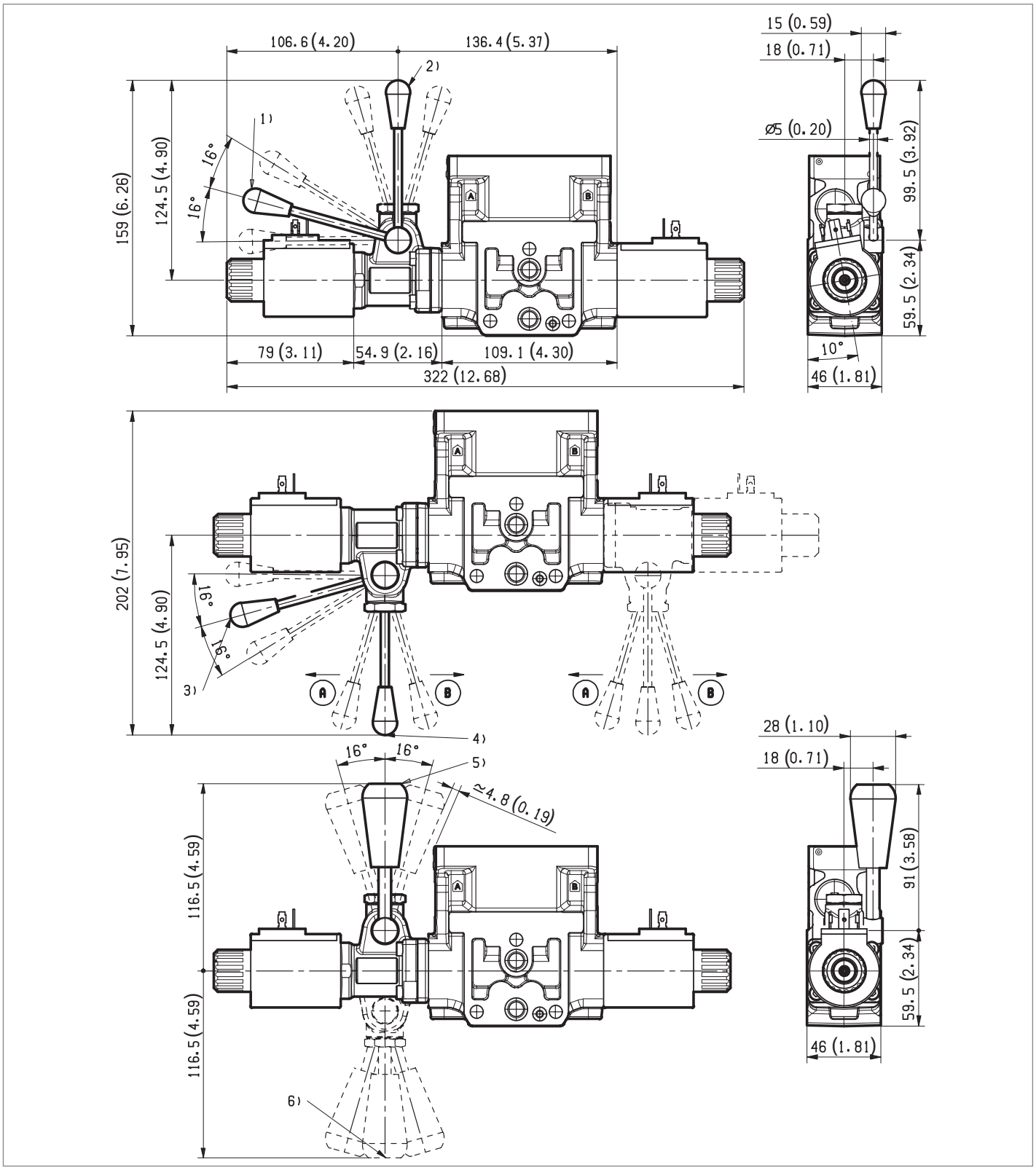
psi bar



External dimensions and fittings



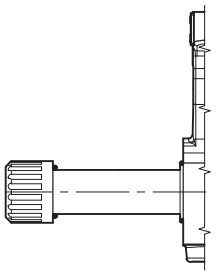
1 Solenoid tube Ø19mm (0.75 inch).
2 Plug for 2position version (4/2).
3 Ring nut for coil locking (Ø26.5mm).
Torque 6-7 Nm (4.4-5.2 ft-lb).
4 Flange specifications for coupling to ED intermediate elements.
5 For tie road and tightening torque information see data sheet RE 18301-90.
6 Clearance needed 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. R933000043.
10 Optional screw type manual override, 0F type, for spool opening: it is screwed (torque 6-7 Nm (4.4-5.2ft-lb) to the tube as replacement of the coil ring nut. Mat no. R933007215.
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).



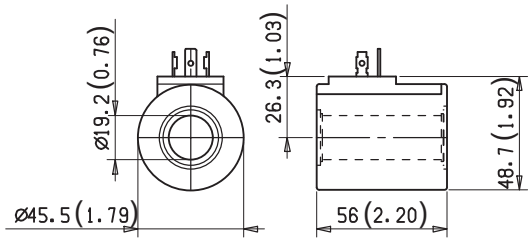
1 Ordering Details: HA (if fitted to side A) or HB (if fitted to side B)
2 Ordering Details: VA (if fitted to side A) or VB (if fitted to side B)
3 Ordering Details: H1 (if fitted to side A) or H9 (if fitted to side B)
4 Ordering Details: V1 (if fitted to side A) or V9 (if fitted to side B)
5 Ordering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

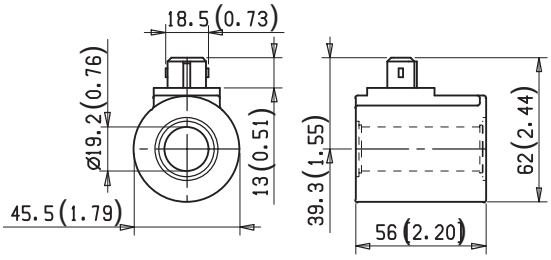
00



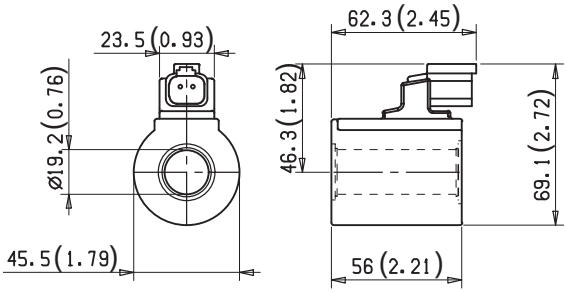
01



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



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



Bosch Rexroth Oil Control S.p.A.
Oleodinamica LC Division
Via Artigianale Sedrio, 12
42030 Vezzano sul Crostolo
Reggio Emilia - Italy
Tel. +39 0522 601 801
Fax +39 0522 606 226 / 601 802
compact-hydraulics-cdv@boschrexroth.com
www.boschrexroth.com/compacthydraulics