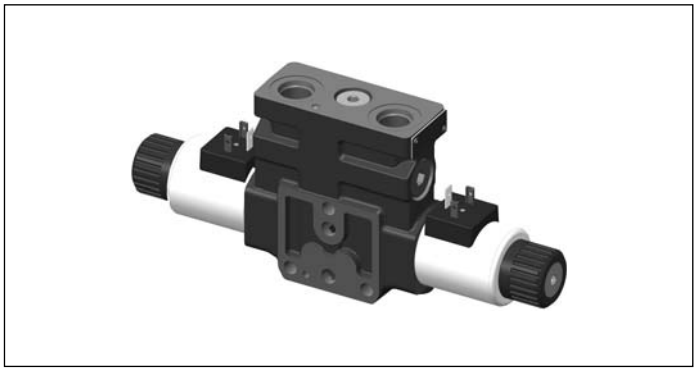
rexroth
A Bosch Company

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

L8581... (EDC-P1)

RE 18301-15
Edition: 01.2023
Replaces: 05.2021



- Size 6
- Series 00
- Maximum operating pressure 310 bar (4500 psi)
- Maximum flow at 14 bar (203 psi) 59 l/min (15.59 gpm)
- Maximum flow at 18 bar (261 psi) 65 l/min (17.17 gpm)
- Ports connections planned G 3/8 - G 1/2 - SAE8 and Modular

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

General specifications

- Valve element with direct proportional flow sharing control.
- It can achieve the simultaneous activation of different actuators by distributing the available flow proportionally to the speeds selected by the operator.
- All simultaneous movements go on at the same reciprocal speed also in case of flow shortage.
- Each energized actuator receives a pressure compensated flow.
- No shuttle valve fitted.
- Wet pin proportional 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**	**81**						**0**	**_ _**

Family

01	Directional Valve elements ED	**L**

Type

02	Size 6 proportional	**8**

Configuration

03	Flow Sharing	**5**

Coil type

04	GP45	**81**

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**
	4/2 operated on side a only; P closed; A and B to T in neutral	**E3**
	4/2 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 4l/min(1.06gpm) - B 4l/min(1.06gpm)	**S0**
	Both meter in and out, A 8l/min(1.85gpm) - B 8l/min(1.85gpm)	**S1**
	Both meter in and out, A 12l/min(3.17gpm) - B 12l/min(3.17gpm)	**S2**
	Both meter in and out, A 16l/min(4.23gpm) - B 16l/min(4.23gpm)	**S3**
	Both meter in and out, A 25l/min(6.6gpm) - B 25l/min(6.6gpm)	**S4**
	Both meter in and out, A 40l/min(10.57gpm) - B 40l/min(10.57gpm)	**S8**
	Both meter in and out, A 50l/min(13.2gpm) - B 50l/min(13.2gpm) [2)]	**S9**
	Only meter in, A 8l/min(1.85gpm) - B 8l/min(1.85gpm)	**I 1**
	Only meter in, A 12l/min(3.17gpm) - B 12l/min(3.17gpm)	**I 2**
	Only meter in, A 25l/min(6.6gpm) - B 25l/min(6.6gpm)	**I 4**
	Only meter in, A 40l/min(10.57gpm) - B 40l/min(10.57gpm)	**I 8**
	Only meter in, A 50l/min(13.2gpm) - B 50l/min(13.2gpm) [2)]	**I 9**
	Only meter in, A 59l/min(15.59gpm) - B 59l/min(15.59gpm) [2)]	**IZ**
	Both meter in and out, A 4l/min(1.06gpm) - B 8l/min(1.85gpm)	**01**
	Both meter in and out, A 8l/min(1.85gpm) - B 12l/min(3.17gpm)	**12**
	Both meter in and out, A 8l/min(1.85gpm) - B 16l/min(4.23gpm)	**13**
	Both meter in and out, A 12l/min(3.17gpm) - B 16l/min(4.23gpm)	**23**
	Both meter in and out, A 12l/min(3.17gpm) - B 25l/min(6.6gpm)	**24**
	Both meter in and out, A 16l/min(4.23gpm) - B 25l/min(6.6gpm)	**34**
	Both meter in and out, A 16l/min(4.23gpm) - B 40l/min(10.57gpm)	**38**
	Both meter in and out, A 25l/min(6.6gpm) - B 40l/min(10.57gpm)	**48**
	Both meter in and out, A 25l/min(6.6gpm) - B 50l/min(13.2gpm) [2)]	**49**
	Both meter in and out, A 40l/min(10.57gpm) - B 50l/min(13.2gpm) [2)]	**89**

Voltage supply

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

Electric connections

08	Without coils	**00**
	With coils, without mating connector DIN EN 175301-803	**01** [6)]
	With coils, without mating connector vertical Amp-Junior	**03**
	With coils, without mating connector DT04-2P	**07**

Ports

09	G 3/8 DIN 3852	**0**
	G 1/2 DIN 3852	**2**
	3/4-16 UNF 2-B (SAE8)	**3**
	Machined to interface modular elements	**M** [5)]

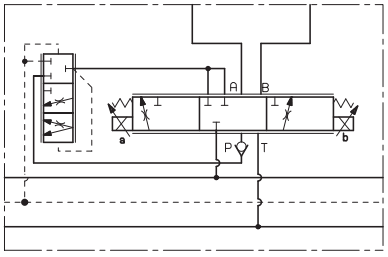
Options

10	Without manual override	**00**
	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)]	**_ _**

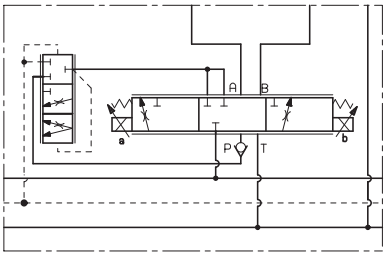
● = Available – = Not available

1) The required hydraulic layout and spool variant can be chosen by consulting page 3.
2) With flow boost system. See external dimension on page 10-11.
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**



= 0
= 2
= 3



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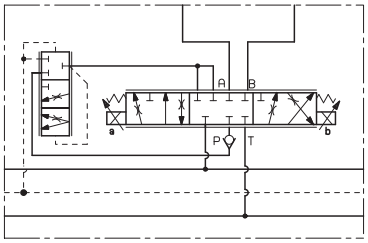
▼ **Spool variant and Flow pattern**

Both meter in and out



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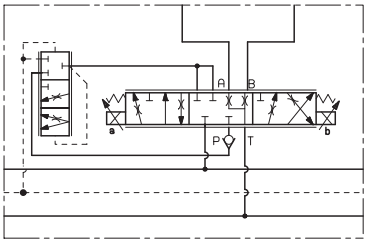

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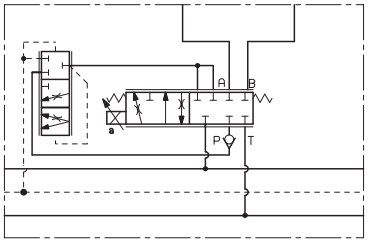

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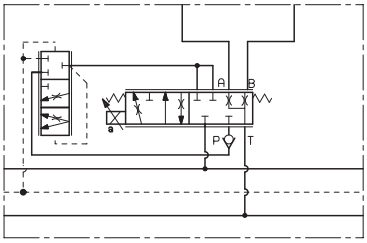

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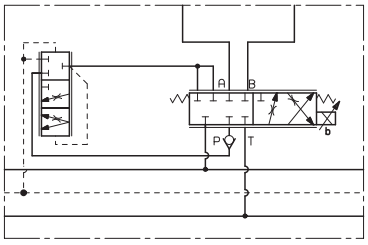

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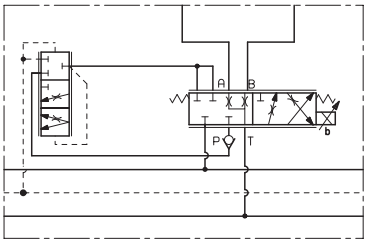

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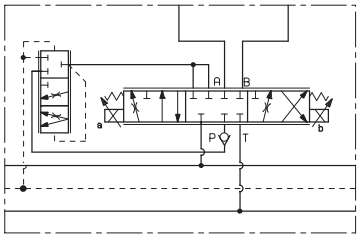
Only meter in



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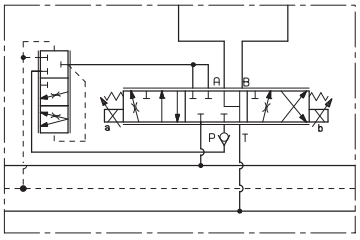

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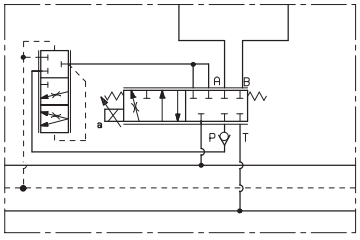

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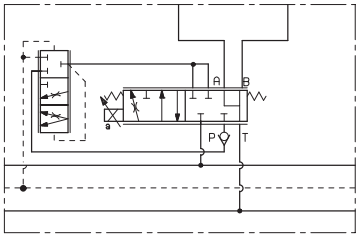

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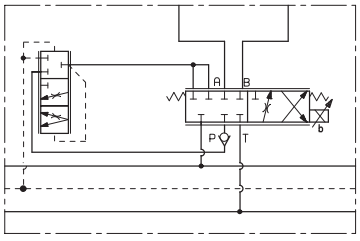

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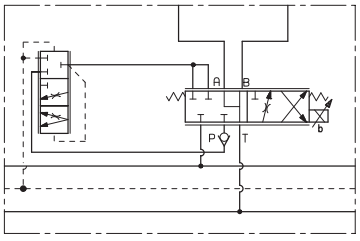

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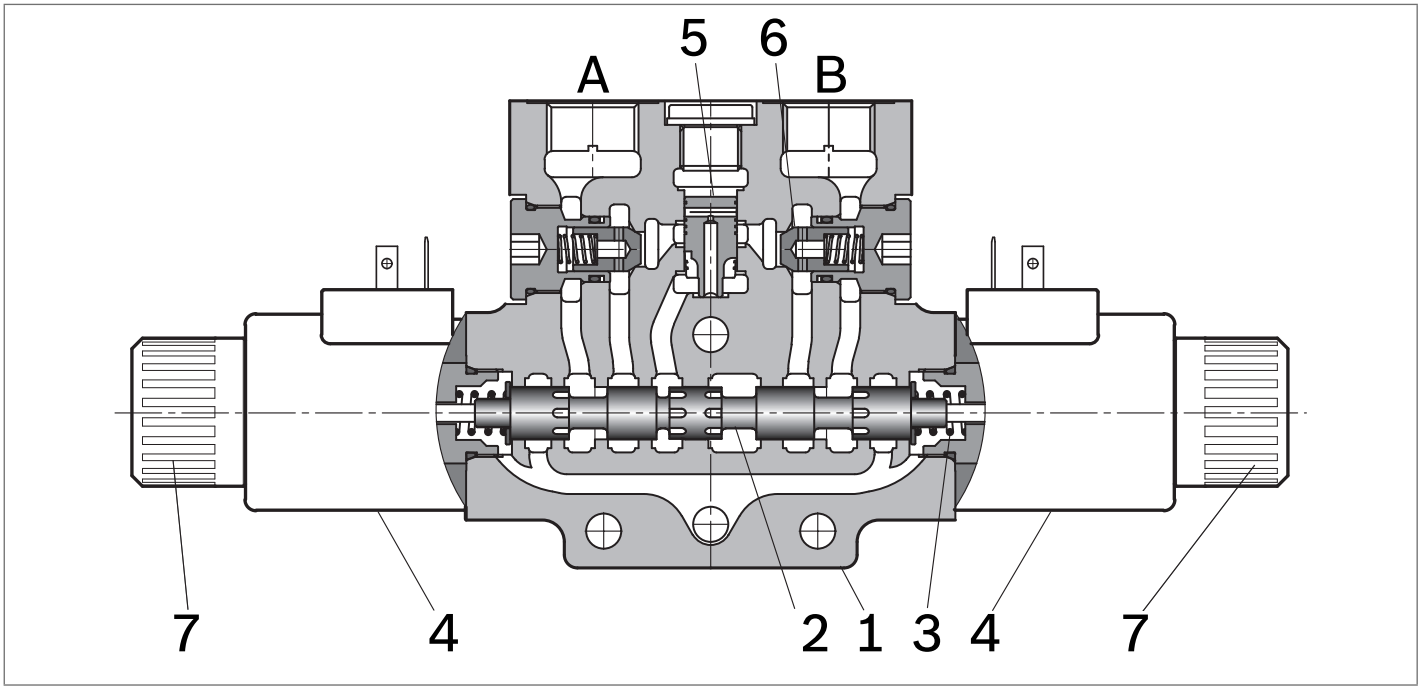
Functional description



The sandwich plate design directional valve elements L8581... are compact direct operated pressure compensated proportional 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. Energized by an electronic feed regulator, each solenoid (**4**) 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 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 regulated 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 the 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

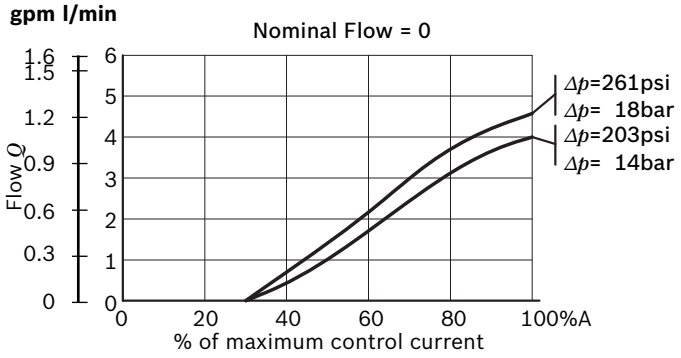
General		
Valve element with 2 solenoids	kg (lbs)	3.95 (8.71)
Valve element with 1 solenoid	kg (lbs)	3.60 (7.91)
Ambient Temperature	°C (°F)	-30....+90 (-22....+194) (NBR seals)
MTTFd		150 years see RE 18350-51
Hydraulic		
Maximum pressure at P, A and B ports	bar (psi)	310 (4500)
Maximum pressure at T	bar (psi)	210 (3050)
Maximum pressure with lever emergency at T	bar (psi)	140 (2030)
Max. regulated flow at 14 bar (203 psi)	l/min (gpm)	59 (15.59)
Max. regulated flow at 18 bar (261 psi)	l/min (gpm)	65 (17.17)
E-schemes flow pattern symmetrical closed pass in the neutral position (connection from A to T and B to T)		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 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

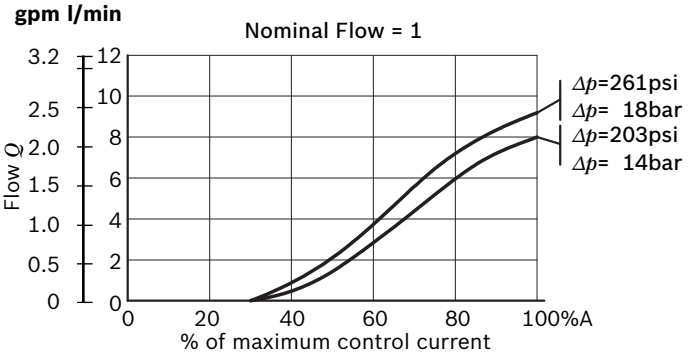
Note
For applications with different specifications consult us

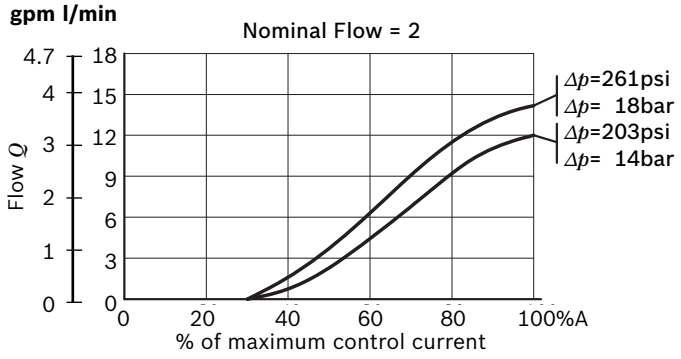
Code	Voltage [V]	Connector type	Coil description	Marking	Coil Mat no.
=OB 01	12 DC	EN 175301-803 (Ex. DIN 43650)	GP45 01 - 45 K4	12 DC	R901022180
=OB 03	12 DC	AMP JUNIOR	GP45 03 - 45 C4	12 DC	R901022680
=OB 07	12 DC	DEUTSCH DT 04-2P	GP45 07 - 45 K40	12 DC	R901272648
=OC 01	24 DC	EN 175301-803 (Ex. DIN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

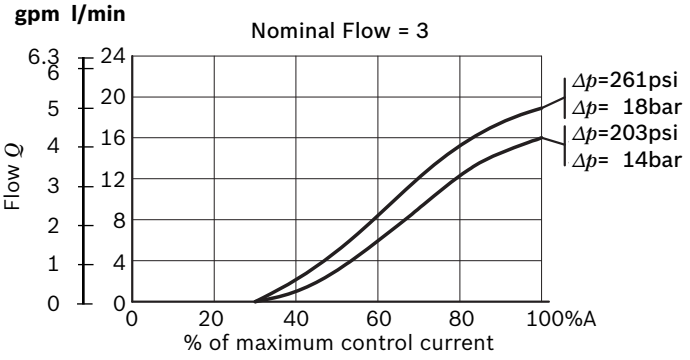
Characteristic curves

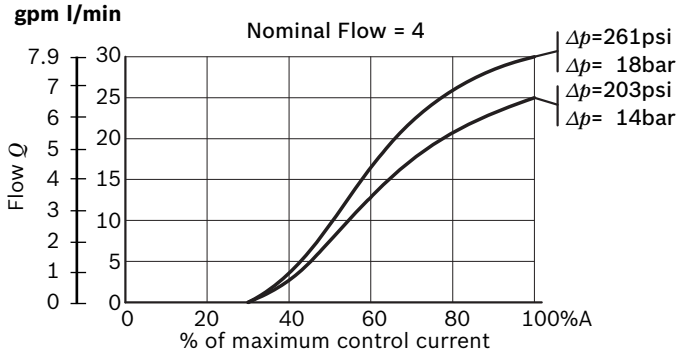
Characteristic curves Q=Q (I)

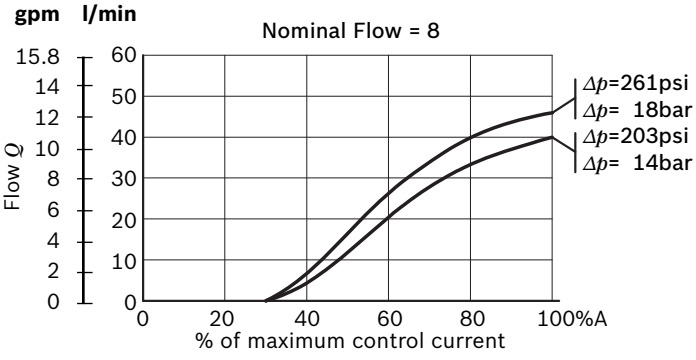


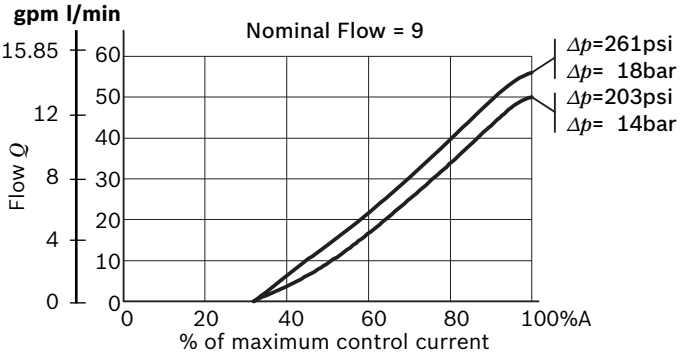


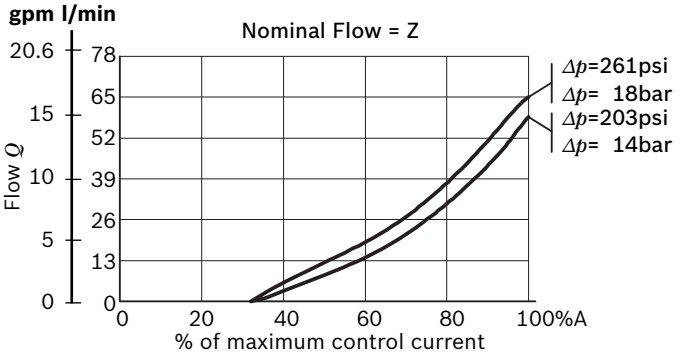






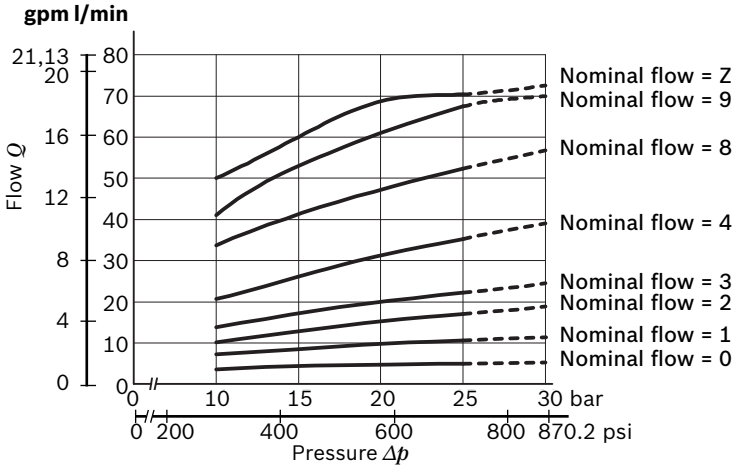






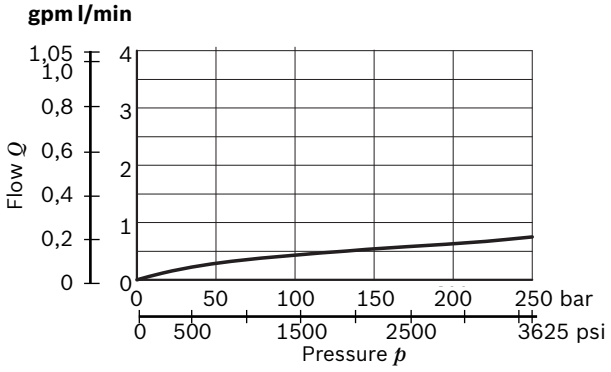
The curves refer to the spool fully open.
Measured with hydraulic fluid ISO-VG32 at 45° ±5 °C (113° ±9 °F); ambient temperature 20 °C (68 °F).

Nominal flow Qnom=Qnom (ΔP ls)

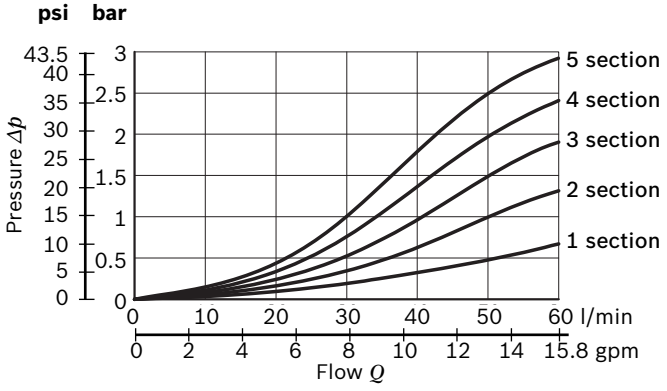


Pressure differential across the spool (ΔPls)

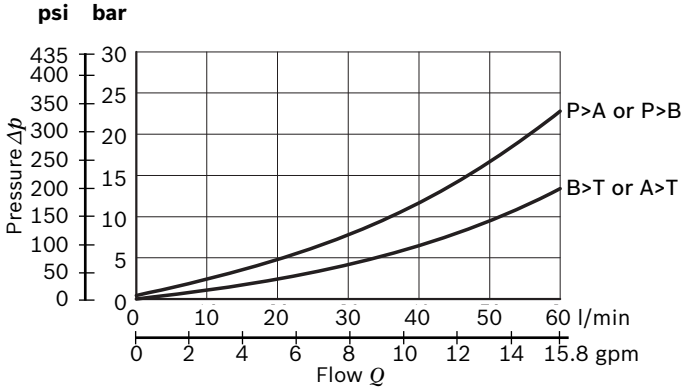
LS drain



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

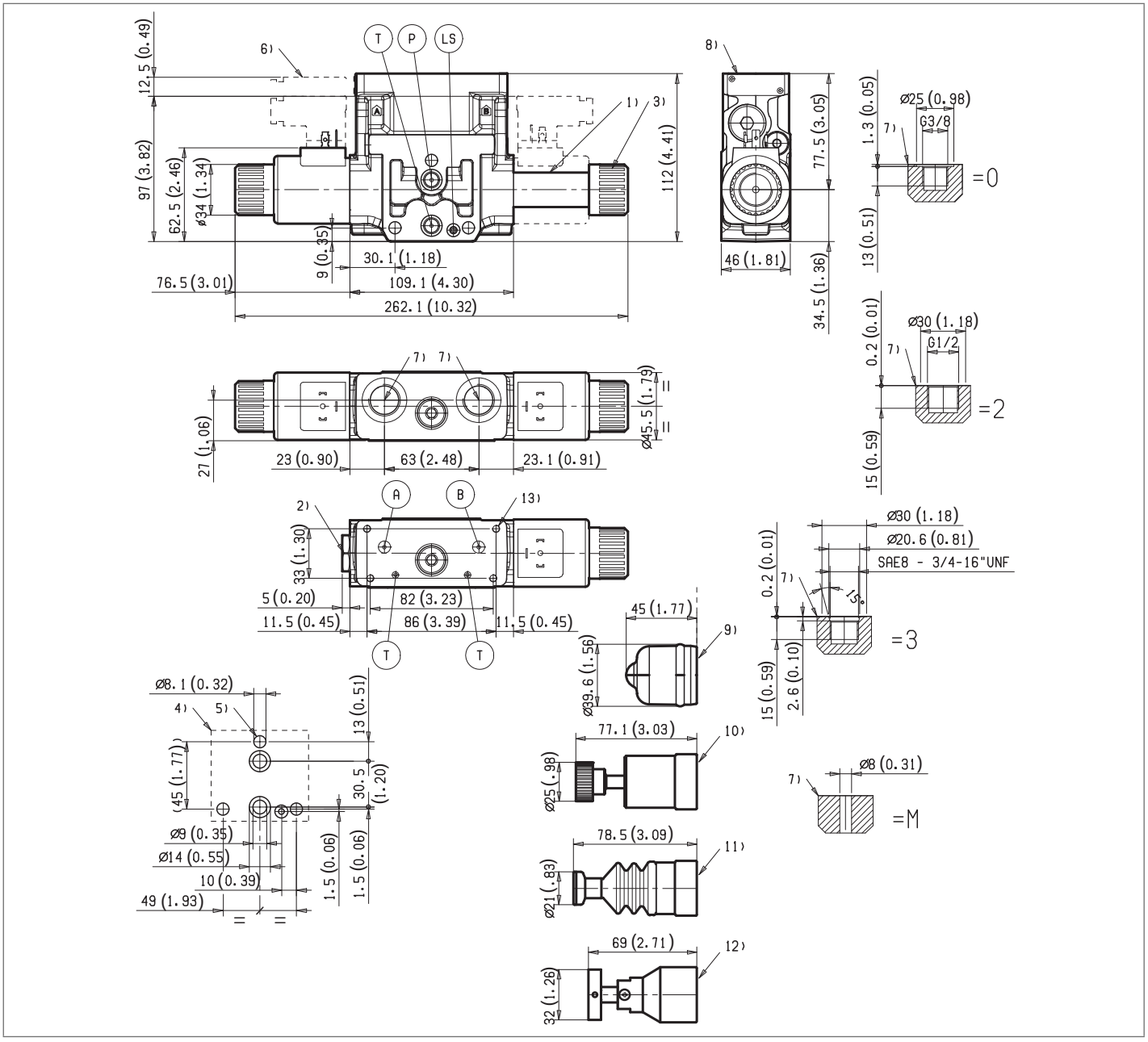


Pressure drop Δp = Δp(Q) with spool B2S9

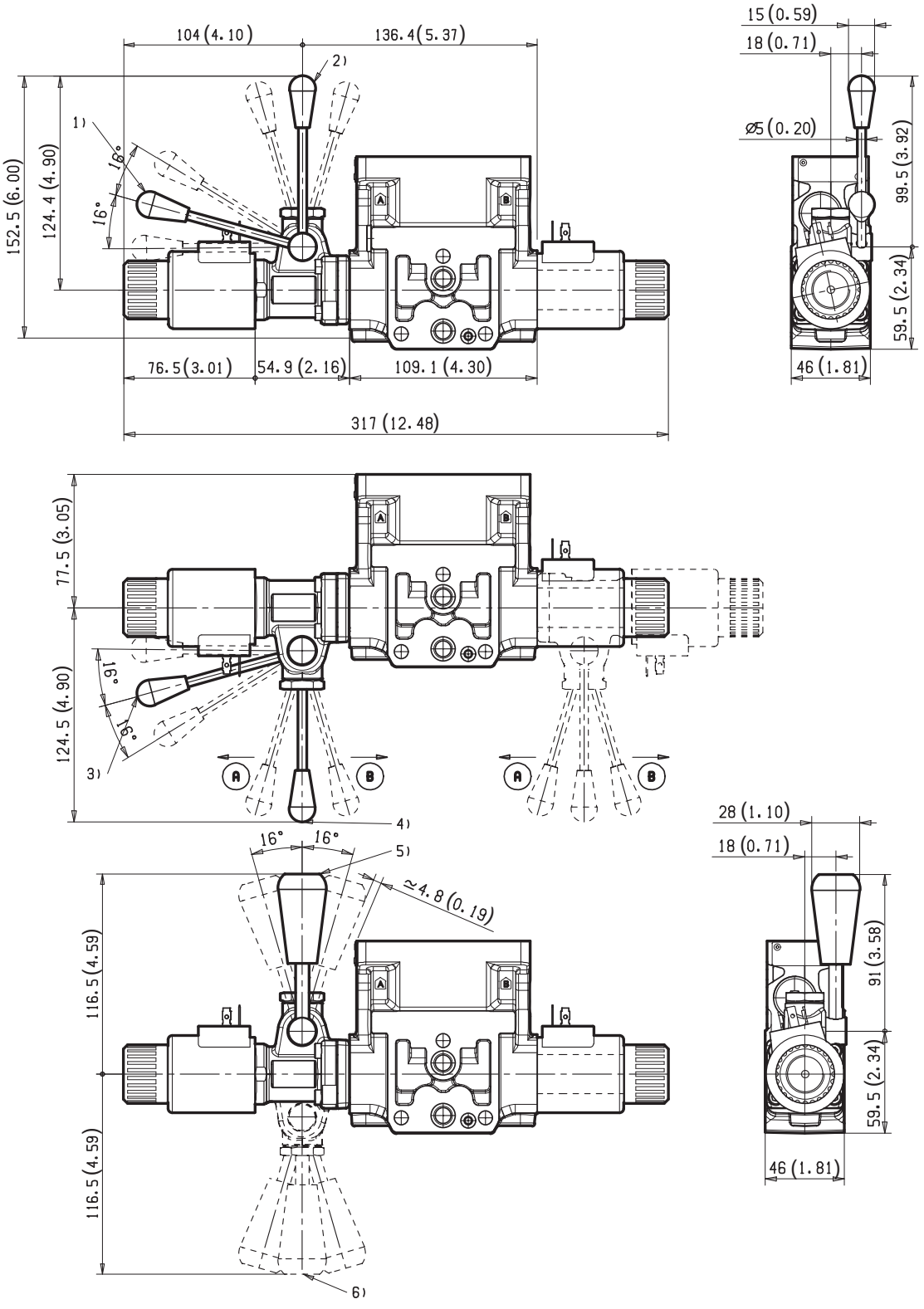


The curves refer to the spool fully open.
Measured with hydraulic fluid ISO-VG32 at 45° ±5 °C (113° ±9 °F); ambient temperature 20 °C (68 °F).

External dimensions and fittings

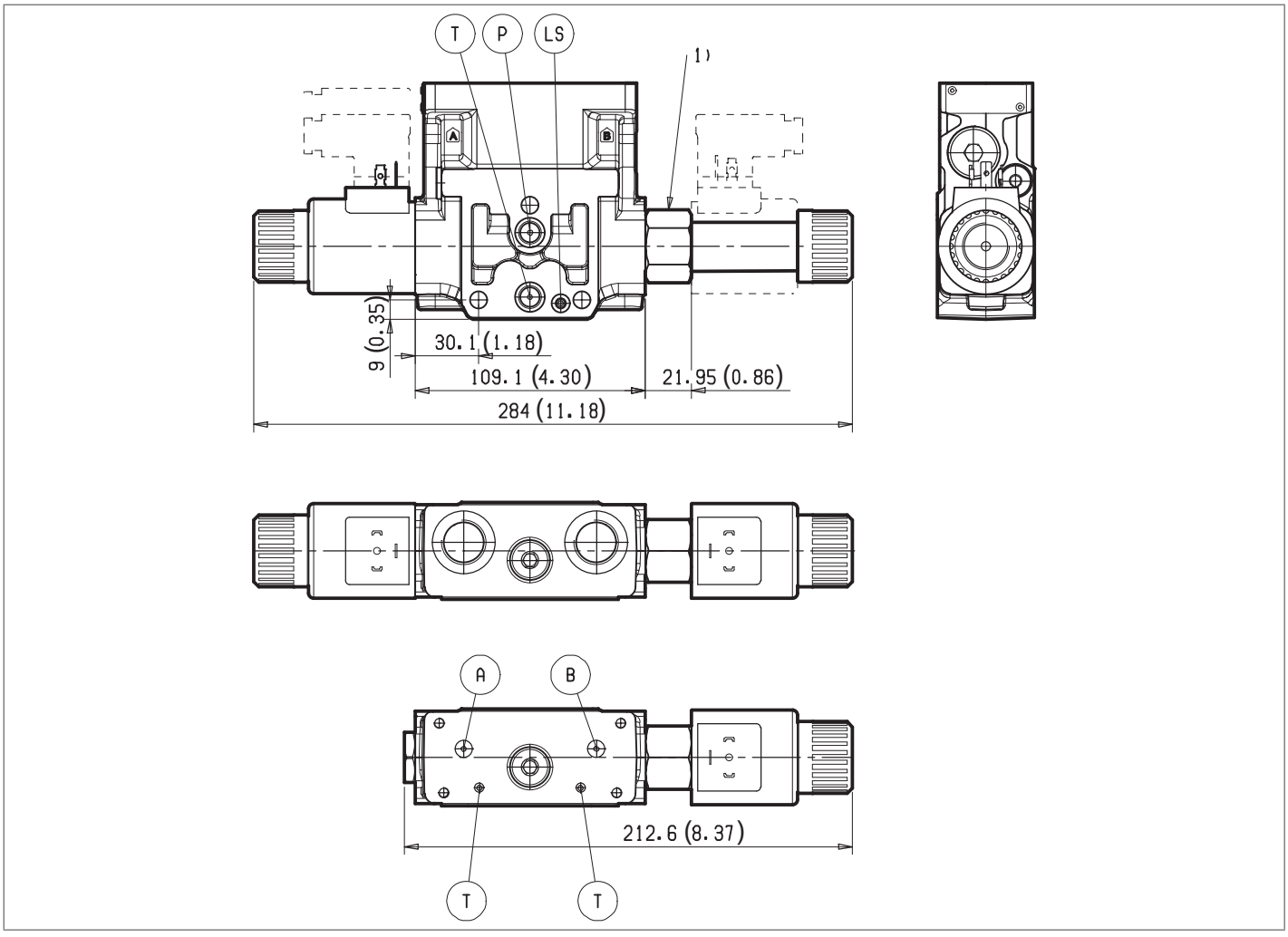


1 Solenoid tube Ø 23 mm (0.91 inch).
2 Plug for 2 positions versions (4/2).
3 Ring nut for coil locking (Ø 30.3 mm).
Torque 6 – 7 Nm (4.4 – 5.2 ft-lb).
4 Flange specifications for coupling to ED intermediate elements.
5 For tie rod and tightening torque information see data sheet RE 18301-90.
6 Clearance 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. R933003424.
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. 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 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).



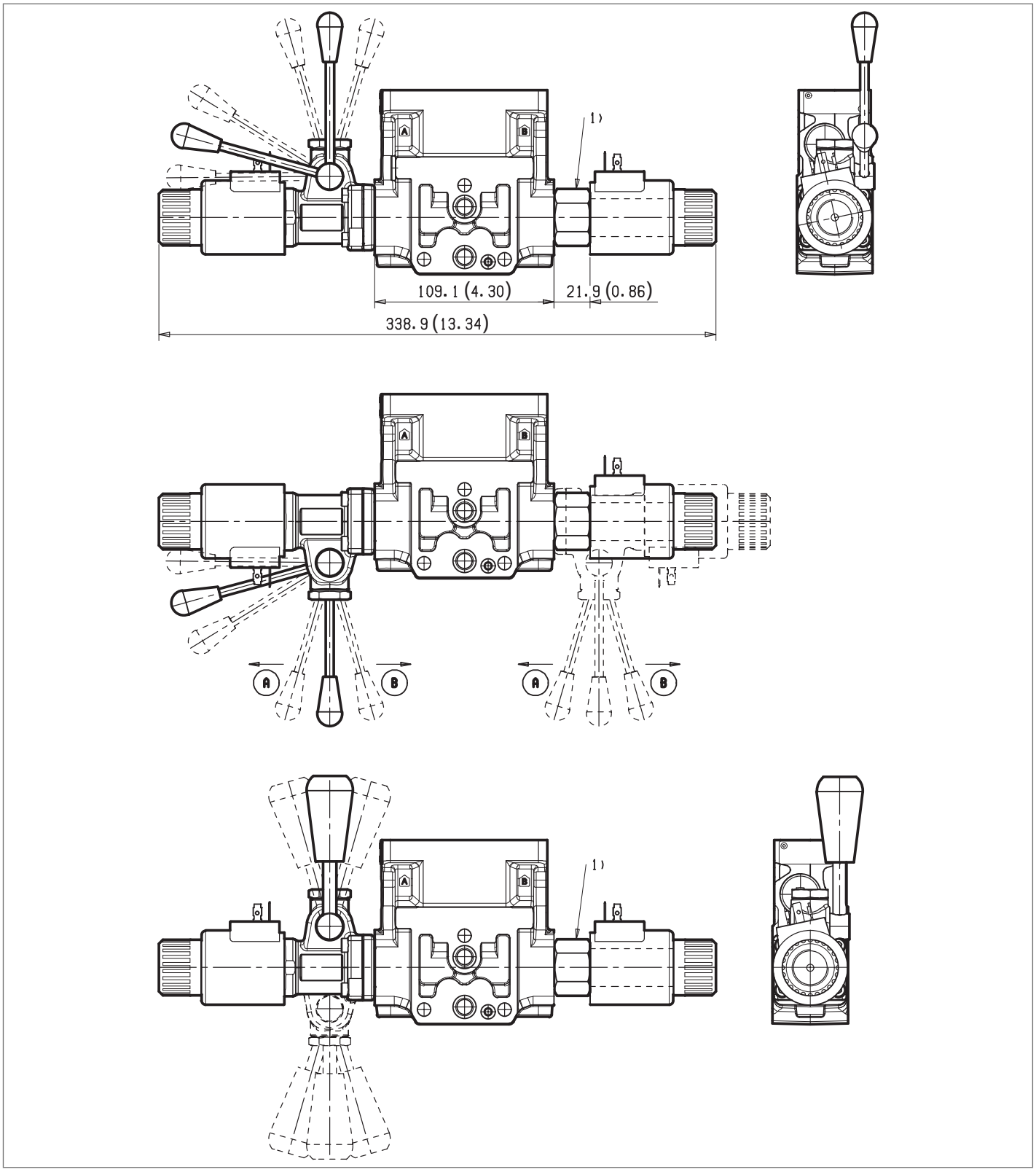
1 Ordering Details: HA (if fitted to side A) or HB (if fitted to side B)
2 Ordering Details: VA (if fitted to side A) or VB (if fitted to side B)
3 Ordering Details: H1 (if fitted to side A) or H9 (if fitted to side B)
4 Ordering Details: V1 (if fitted to side A) or V9 (if fitted to side B)
5 Ordering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

External dimensions for spool with nominal flow 9 and Z



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

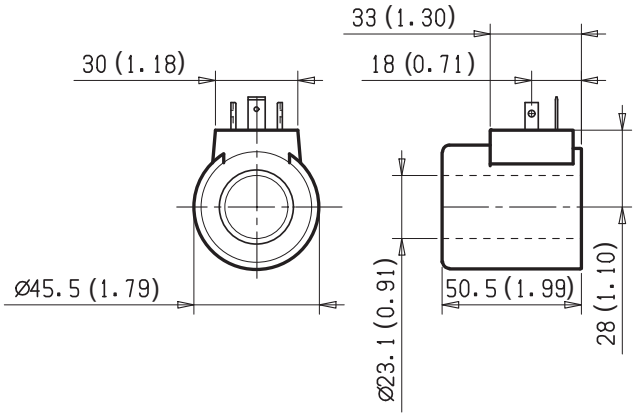
External dimensions for spool with nominal flow 9 and Z



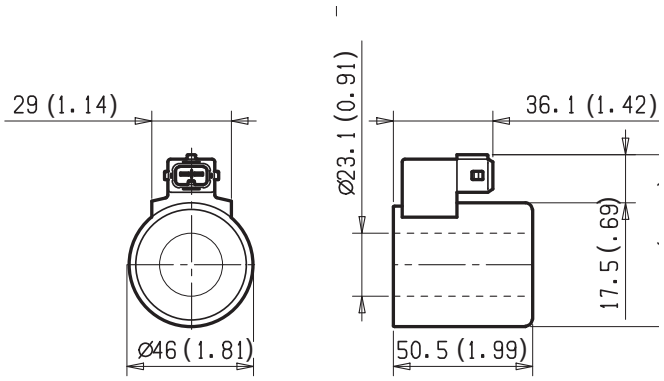
1 Flow-boost system only for spool with nominal flow 9 and Z. It always mounted on the opposite side of the lever manual override.

Electric connection

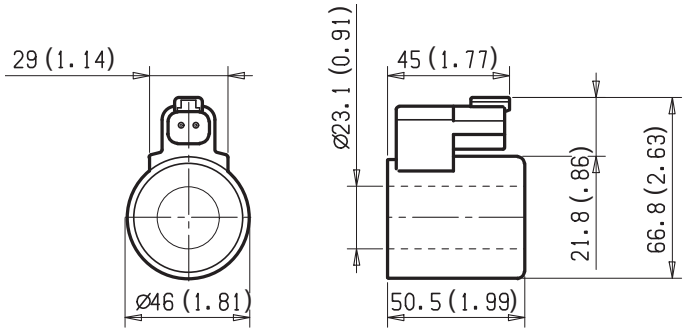
01 Protection class: IP 65 when connector with seal is properly screwed down.



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



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



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