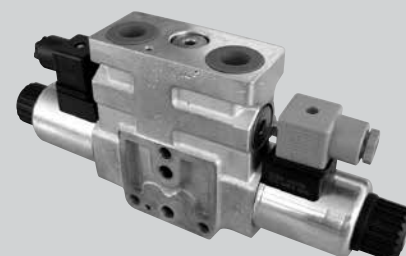


# 4/3 and 4/2 Proportional directional valve elements with flow sharing control (LUDV concept)

**PATENT PENDING**

L8580... (EDC-P)



## Summary

### Description

General specifications	
Ordering details	
Ports options	
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## General Specifications

Page	
	– Valve element with direct proportional flow sharing control.
1	– It can achieve the simultaneous activation of different actuators by distributing the available flow proportionally to the speeds selected by the operator.
2	
3	– All simultaneous movements go on at the same reciprocal speed also in case of flow shortage.
4	
5	– Each energized actuator receives a pressure compensated flow.
6	– No shuttle valve fitted.
8	– Wet pin proportional tubes for DC coils, with push rod for mechanical override; nickel plated surface.
9	
10	– Manual override (push-button, screw type or lever) available upon request.
	– Different plug-in connectors available: see ordering details.

Ordering Details

	L	8	5	80	__	__	__	__	__	0	__
<b>Family</b> Directional valve elements ED											
<b>Model</b> Size 6, proportional											
<b>Configurations</b> Flow sharing											
<b>Coil type</b> Diameter 23 mm (0.91 in.)											
<b>Spool variants</b> <sup>1)</sup>											
4/3 operated both sides a and b; P, A, B, T closed in neutral											<b>= B2</b>
4/2 operated on side a only; P, A, B, T closed in neutral											<b>= B3</b>
4/2 operated on side b only; P, A, B, T closed in neutral											<b>= B4</b>
4/3 operated on both sides a and b; P closed; A and B to T in neutral											<b>= E2</b>
4/3 operated on side a only; P closed; A and B to T in neutral											<b>= E3</b>
4/3 operated on side b only; P closed; A and B to T in neutral											<b>= E4</b>
<b>Flow pattern &amp; Nominal flow</b> <sup>1), 4)</sup>											
Both meter in and out, A 4 l/min [1.06 gpm] – B 4 l/min (1.06 gpm)											<b>= S0</b>
Both meter in and out, A 8 l/min (1.85 gpm) – B 8 l/min (1.85 gpm)											<b>= S1</b>
Both meter in and out, A 12 l/min (3.17 gpm) – B 12 l/min (3.17 gpm)											<b>= S2</b>
Both meter in and out, A 16 l/min (4.23 gpm) – B 16 l/min (4.23 gpm)											<b>= S3</b>
Both meter in and out, A 25 l/min (6.6 gpm) – B 25 l/min (6.6 gpm)											<b>= S4</b>
Both meter in and out, A 40 l/min (10.57 gpm) – B 40 l/min (10.57 gpm)											<b>= S8</b>
Both meter in and out, A 50 l/min (13.2 gpm) – B 50 l/min (13.2 gpm)											<b>= S9</b>
Only meter in, A 8 l/min (1.85 gpm) – B 8 l/min (1.85 gpm) <sup>2)</sup>											<b>= I1</b>
Only meter in, A 12 l/min (3.17 gpm) – B 12 l/min (3.17 gpm) <sup>2)</sup>											<b>= I2</b>
Only meter in, A 25 l/min (6.6 gpm) – B 25 l/min (6.6 gpm) <sup>2)</sup>											<b>= I4</b>
Only meter in, A 40 l/min (10.57 gpm) – B 40 l/min (10.57 gpm) <sup>2)</sup>											<b>= I8</b>
Only meter in, A 50 l/min (13.2 gpm) – B 50 l/min (13.2 gpm) <sup>2)</sup>											<b>= I9</b>
Both meter in and out, A 4 l/min (1.06 gpm) – B 8 l/min (1.85 gpm) <sup>2)</sup>											<b>= O1</b>
Both meter in and out, A 8 l/min (1.85 gpm) – B 12 l/min (3.17 gpm) <sup>2)</sup>											<b>= 12</b>
Both meter in and out, A 8 l/min (1.85 gpm) – B 16 l/min (4.23 gpm) <sup>2)</sup>											<b>= 13</b>
Both meter in and out, A 12 l/min (3.17 gpm) – B 16 l/min (4.23 gpm) <sup>2)</sup>											<b>= 23</b>
Both meter in and out, A 12 l/min (3.17 gpm) – B 25 l/min (6.6 gpm) <sup>2)</sup>											<b>= 24</b>
Both meter in and out, A 16 l/min (4.23 gpm) – B 25 l/min (6.6 gpm) <sup>2)</sup>											<b>= 34</b>
Both meter in and out, A 16 l/min (4.23 gpm) – B 40 l/min (10.57 gpm) <sup>2)</sup>											<b>= 38</b>
Both meter in and out, A 25 l/min (6.6 gpm) – B 40 l/min (10.57 gpm) <sup>2)</sup>											<b>= 48</b>
Both meter in and out, A 25 l/min (6.6 gpm) – B 50 l/min (13.2 gpm) <sup>2)</sup>											<b>= 49</b>
Both meter in and out, A 40 l/min (10.57 gpm) – B 50 l/min (13.2 gpm) <sup>2)</sup>											<b>= 89</b>

**Optional fittings**

<b>00</b> =	Without manual override
<b>0F</b> =	Screw type manual override
<b>0P</b> =	Push-button type manual override
<b>--</b> =	Lever type manual override <sup>3)</sup>

**Ports**

<b>3</b> =	3/4-16 UNF 2B (SAE8)
<b>M</b> =	Machined for interfacing to modular elements

**Electric connections**

	Without coils
<b>00</b> =	With coils, without mating connector
<b>01**</b> =	DIN EN 175301-803
	With coils, with bi-directional diode,
<b>03</b> =	without mating connector vertical Amp-Junior
<b>07</b> =	With coils, with bi-directional diode, without mating connector DT04-2O

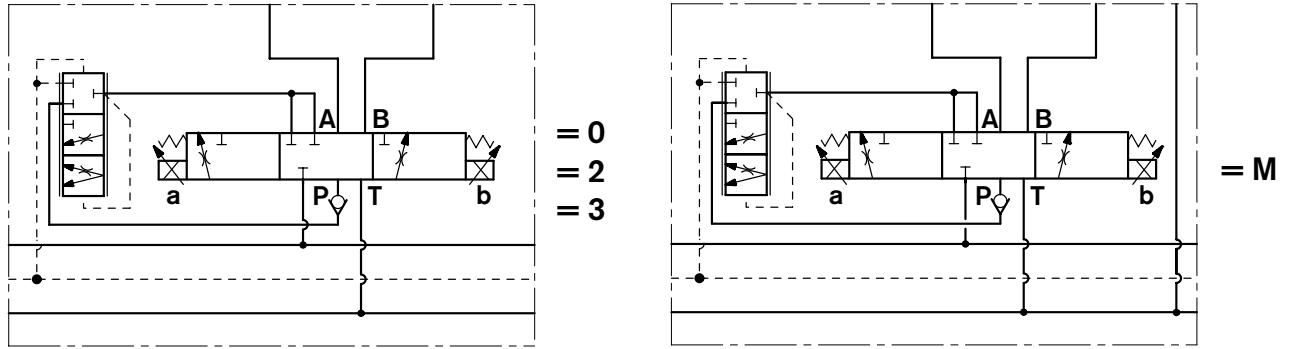
**Voltage supply**

<b>00</b> =	Without coils
<b>0B</b> =	12V DC
<b>0C</b> =	24V DC

- 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  $\Delta p$  (P > A or P > B) 14 bar (203 psi).
- 5) See RE18301-45, RE18301-46, RE18301-47, for flangeable elements.

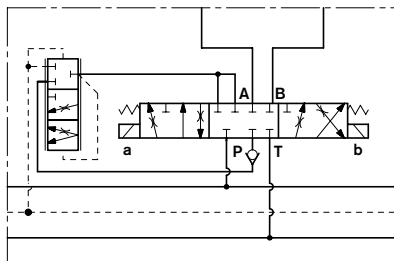
\*\* For connectors ordering code see data sheet RE 18325-90.

Ports Options

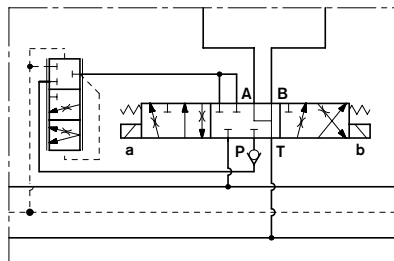


Spool Variant and Flow Pattern

Both meter in and out

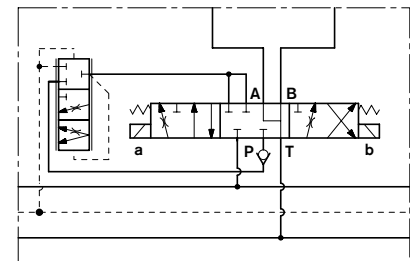


= B2

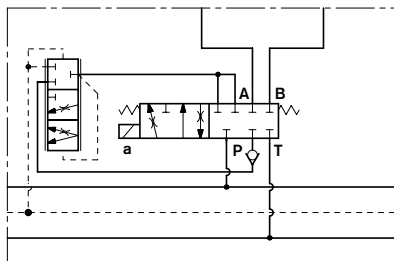


= E2

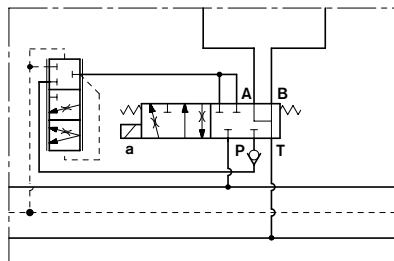
Only meter in



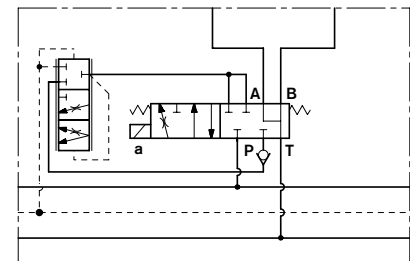
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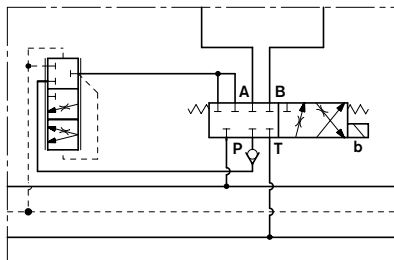
= B3



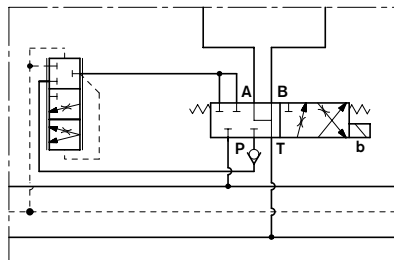
= E3



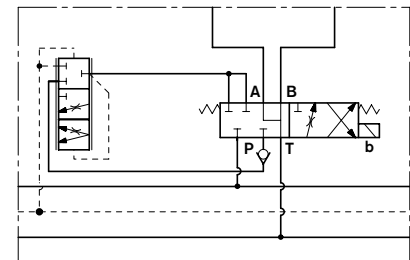
= E31



= B4



= E4



= E41

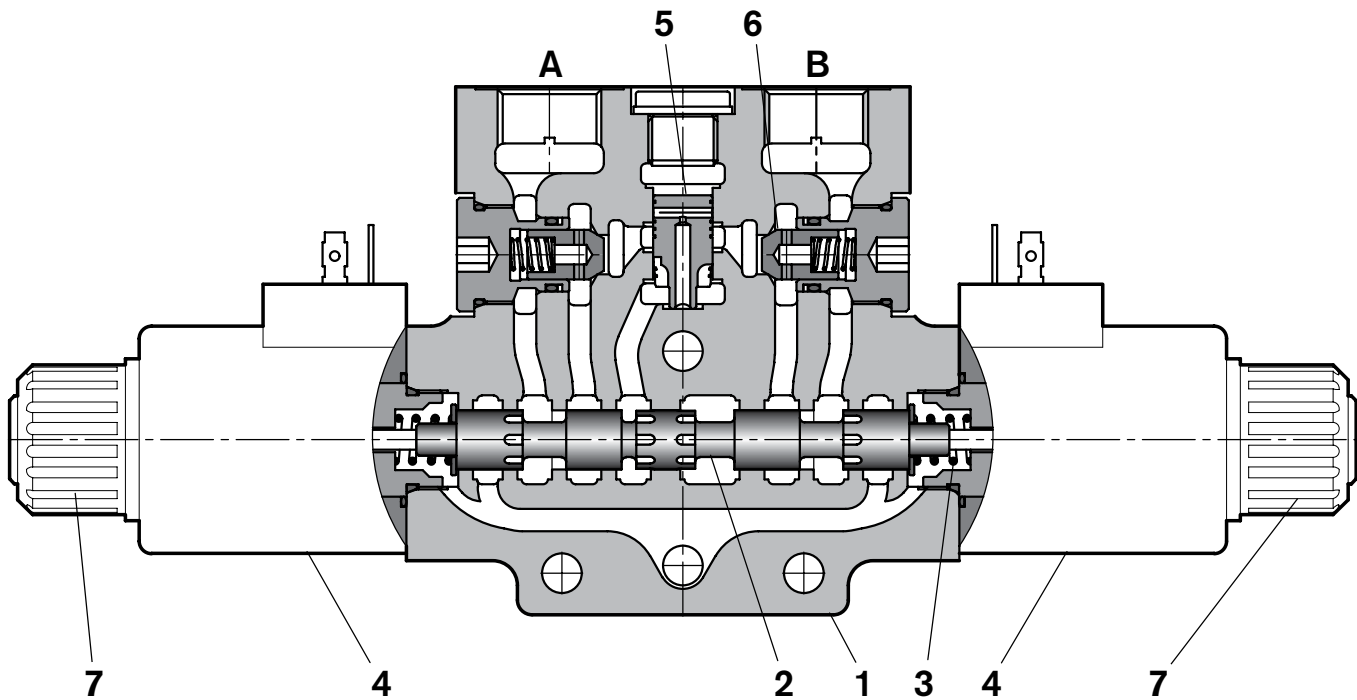
## Principles of Operation, Cross Section

The sandwich plate design directional valve elements L8580... 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** (for applications with different specifications consult us)**General**

Valve element with 2 solenoids	kg [lbs]	3.95 [8.71]
Valve element with 1 solenoid	kg [lbs]	3.6 [7.91]
Ambient Temperature	°C [°F]	-20....+50 [-4....+122] (NBR seals)

**Hydraulic**

Maximum pressure at P, A and B ports	bar [psi]	310 [4500]
Maximum pressure at T	bar [psi]	210 [3045]
Maximum pressure with lever emergency at T	bar [psi]	140 [2030]
Maximum regulated flow at 14 bar [203 psi]	l/min [gpm]	50 [13.2]
Maximum regulated flow at 18 bar [261 psi]	l/min [gpm]	58 [15.3]
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]	-20....+80 [-4....+176] (NBR seals)
Permissible degree of fluid contamination		ISO 4572: $\beta_x \geq 75$ X=10...12 ISO 4406: class 19/17/14 NAS 1638: class 8
Viscosity range	mm <sup>2</sup> /s	20....380 (optional 30....46)

**Electrical**

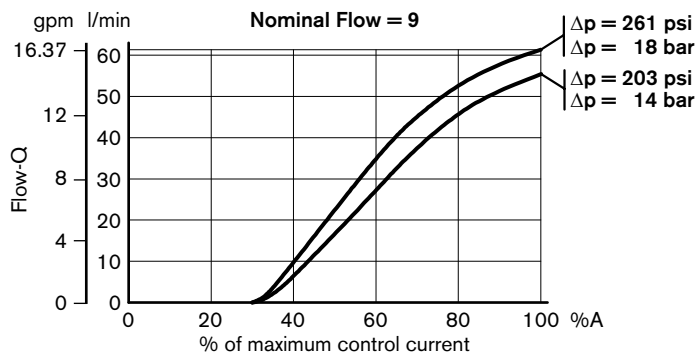
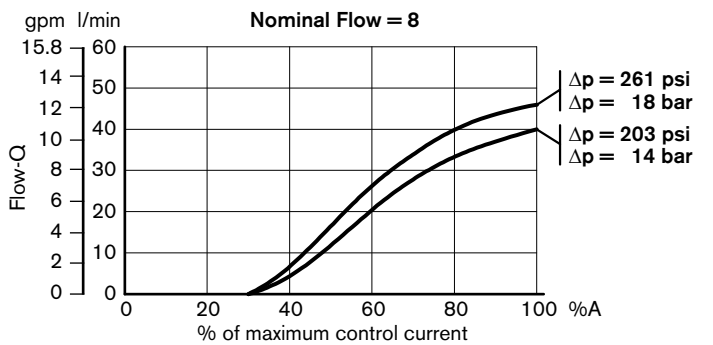
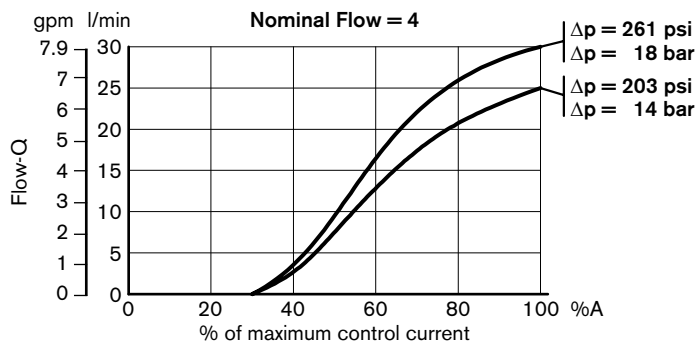
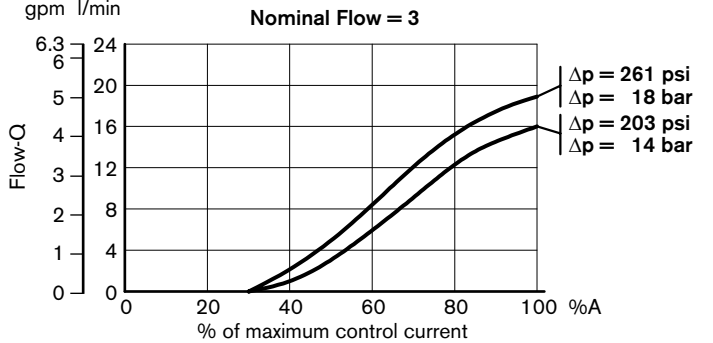
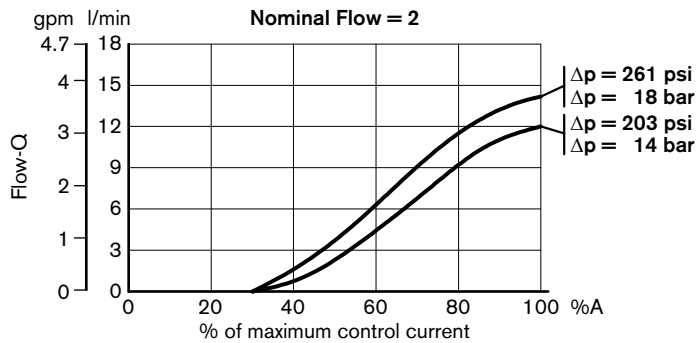
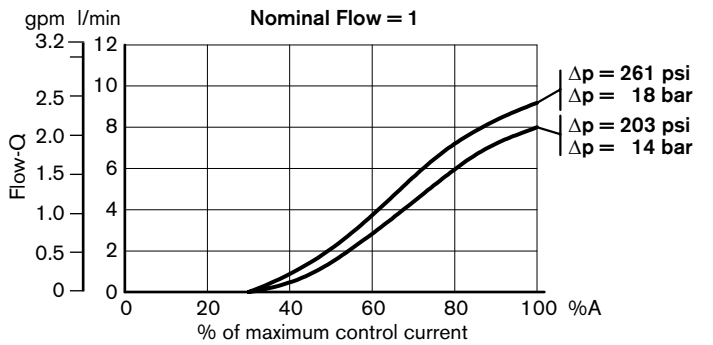
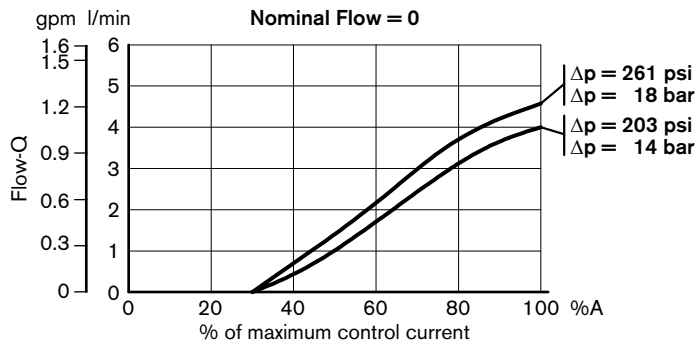
Voltage type	PWM	Pulse Width Modulation pre-set at 120 Hz	
Voltage tolerance (nominal voltage)	%	-10 .... +10	
Duty		Continuous, with ambient temperature ≤ 50°C [122°F]	
Maximum coil temperature	°C [°F]	150 [302]	
Insulation class		H	
Compliance with		Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC	
Coil weight	kg [lbs]	0.335 [0.739]	
Voltage	V	12	24
Current (nominal at 20° C[68° F])	A	1.76	0.88
Resistance	Ω	4	16
(nominal at 20° C[68° F])	Ω	6.1	24.4

	Voltage (V)	Connector type	Coil description	Marking	Coil mat. no.
<b>=OB 01</b>	12 DC	EN 175301-803 (Ex. DIN 43650)	D15 01	12 DC	R933000092
<b>=OB 03</b>	12 DC	AMP JUNIOR	D15 03	12 DC	R933002877
<b>=OB 07</b>	12 DC	DEUTSCH DT 04-2P	D15 07	12 DC	R933000094
<b>=OC 01</b>	24 DC	EN 175301-803 (Ex. DIN 43650)	D15 01	24 DC	R933000093
<b>=OC 03</b>	24 DC	AMP JUNIOR	D15 03	24 DC	R933003515
<b>=OC 07</b>	24 DC	DEUTSCH DT 04-2P	D15 07	24 DC	R933002798

### Characteristic Curves

Measured with hydraulic fluid ISO-VG32 at  $45^\circ \pm 5^\circ\text{C}$  ( $113^\circ \pm 9^\circ\text{F}$ ); ambient temperature  $20^\circ\text{C}$  ( $68^\circ\text{F}$ ).

#### 3/1 - Characteristic curves $Q=Q(I)$

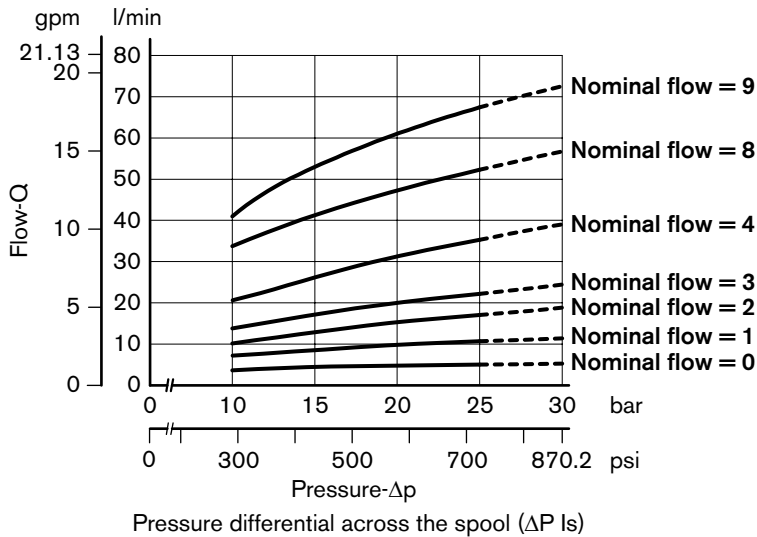


The curves refer to the spool fully open.

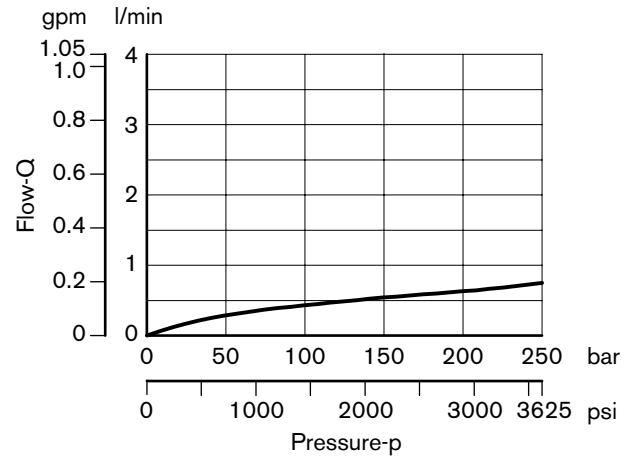
### Characteristic Curves

Measured with hydraulic fluid ISO-VG32 at  $45^{\circ} \pm 5^{\circ}\text{C}$  ( $113^{\circ} \pm 9^{\circ}\text{F}$ ); ambient temperature  $20^{\circ}\text{C}$  ( $68^{\circ}\text{F}$ ).

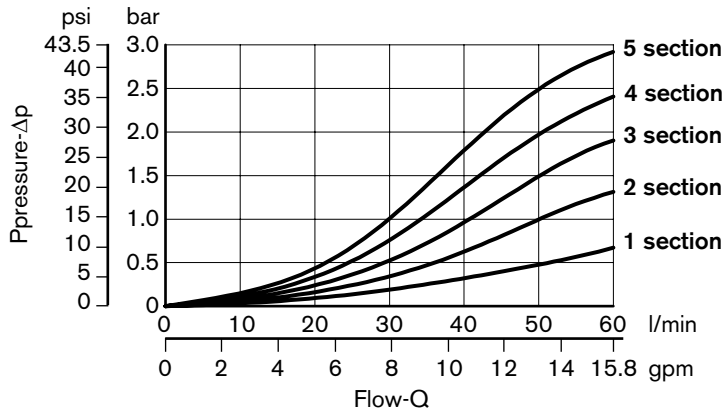
#### Nominal flow $Q_{nom} = Q_{nom}(\Delta P_{Is})$



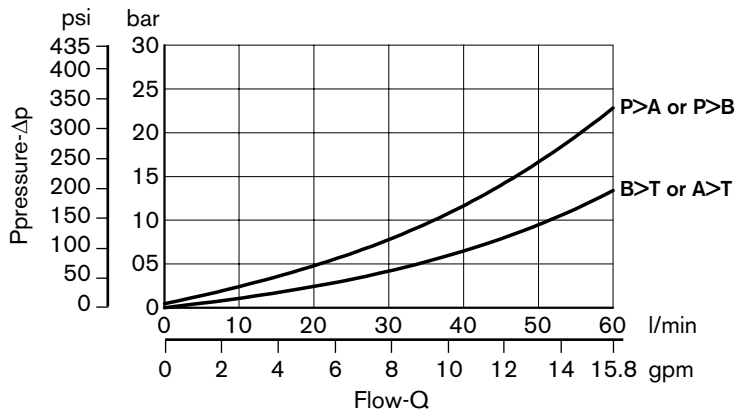
#### LS drain



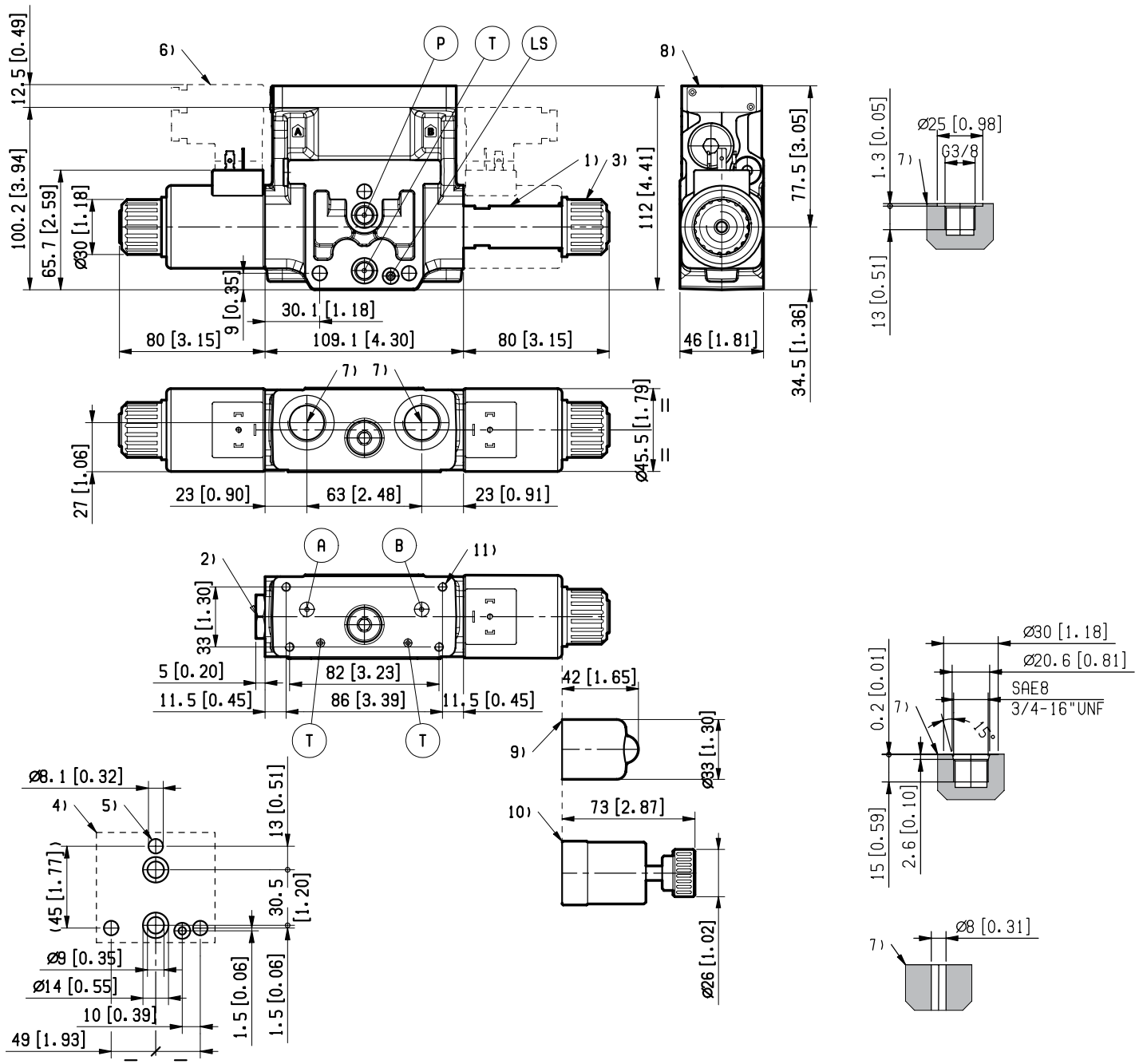
#### Pressure drop $\Delta p = \Delta p(Q) (P_{IN} - P_{OUT})$ to the next section



#### Pressure drop $\Delta p = \Delta p(Q)$ with spool B2S9



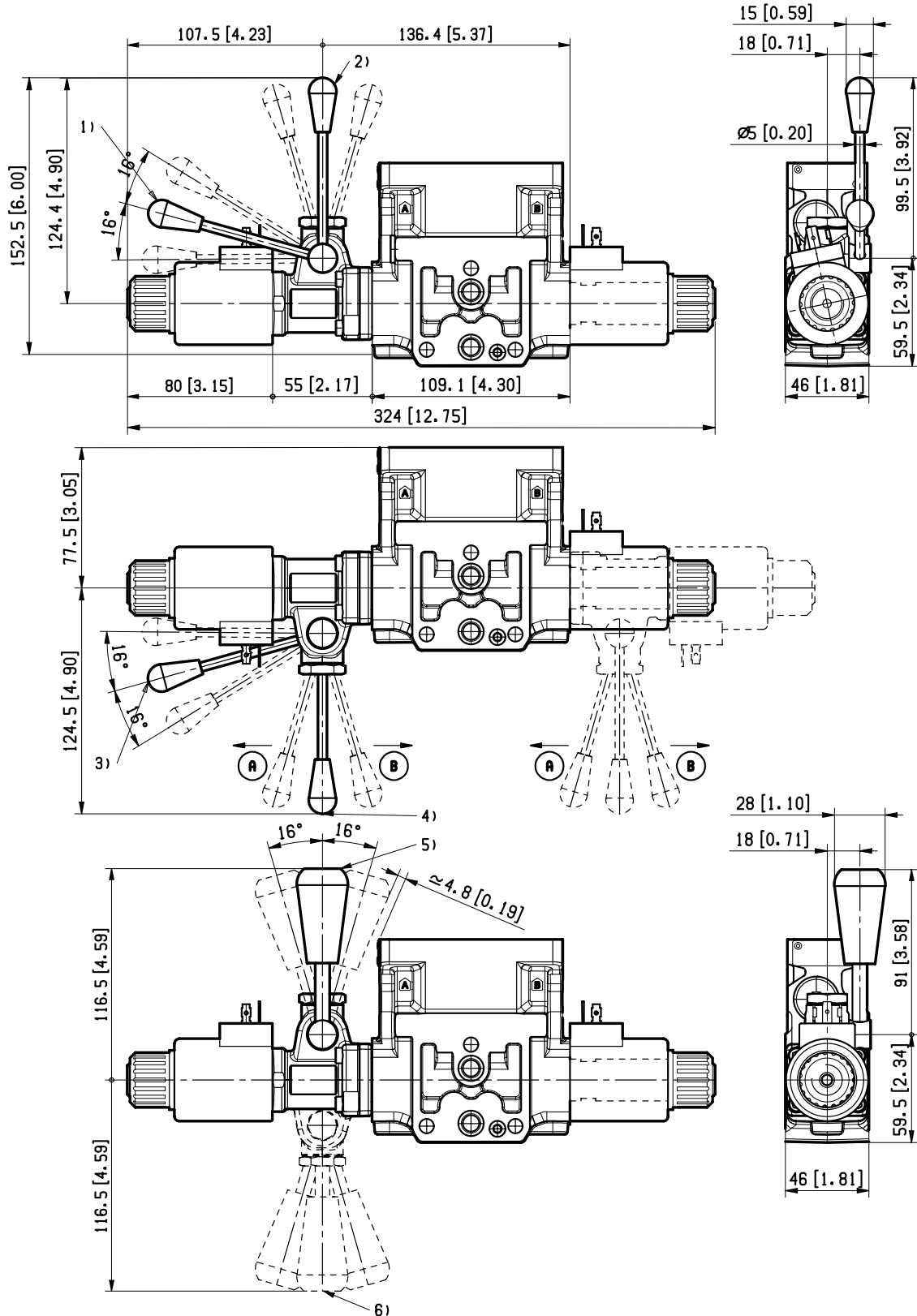
## External Dimensions and Fittings



- 1 Solenoid tube  $\varnothing 23$  mm (0.91 inch).
- 2 Plug for 2 positions versions (4/2).
- 3 Ring nut for coil locking ( $\varnothing 30.3$  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. R933003289.
- 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. R933003116.
- 11 Four threaded holes M5 depth 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).



External Dimensions and Ports



- 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** (or connections, in case of two solenoids)

= 01	<p style="text-align: center;">Protection class: IP 65 when connector with seal is properly screwed down.</p>	
= 03	<p style="text-align: center;">Protection class: IP 65 with female connector properly fitted (see drawing).</p>	<p style="text-align: center;">Protection class: IP 69 K with female connector properly fitted (see drawing).</p>

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