

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

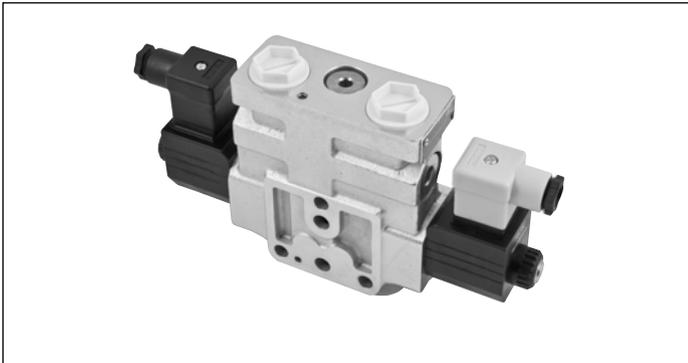
### **PATENT PENDING**

L8510... (EDC-Z)

**RE 18301-10**

Edition: 06.2018

Replaces: 02.2016



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

#### **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	2
Functional description	4
Technical data	5
Characteristic curves	7
External dimensions and fittings	8
Electric connection	10

## Ordering details

01	02	03	04	05	06	07	08	09	10
<b>L</b>	<b>8</b>	<b>5</b>	<b>10</b>					<b>0</b>	<b>--</b>

### Family

01	Directional Valve elements ED	<b>L</b>
----	-------------------------------	----------

### Type

02	Size 6 proportional	<b>8</b>
----	---------------------	----------

### Configuration

03	Flow Sharing	<b>5</b>
----	--------------	----------

### Coil type

04	C36	<b>10</b>
----	-----	-----------

### Spool variants

05	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>

### Flow pattern & Nominal flow <sup>1) - 4)</sup>

06	Both meter in and out, A 3l/min(0.79gpm) - B 3l/min(0.79gpm)	<b>S0</b>
	Both meter in and out, A 6l/min(1.59gpm) - B 6l/min(1.59gpm)	<b>S1</b>
	Both meter in and out, A 9l/min(2.37gpm) - B 9l/min(2.37gpm)	<b>S2</b>
	Both meter in and out, A 13l/min(3.43gpm) - B 13l/min(3.43gpm)	<b>S3</b>
	Both meter in and out, A 23.5l/min(6.21gpm) - B 23.5l/min(6.21gpm)	<b>S4</b>
	Only meter in, A 6l/min(1.59gpm) - B 6l/min(1.59gpm) <sup>2)</sup>	<b>I1</b>
	Only meter in, A 9l/min(2.37gpm) - B 9l/min(2.37gpm) <sup>2)</sup>	<b>I2</b>
	Only meter in, A 23.5l/min(6.21gpm) - B 23.5l/min(6.21gpm) <sup>2)</sup>	<b>I4</b>
	Both meter in and out, A 3l/min(0.79gpm) - B 6l/min(1.59gpm) <sup>2)</sup>	<b>01</b>
	Both meter in and out, A 6l/min(1.59gpm) - B 9l/min(2.37gpm) <sup>2)</sup>	<b>12</b>
	Both meter in and out, A 6l/min(1.59gpm) - B 13l/min(3.43gpm) <sup>2)</sup>	<b>13</b>
	Both meter in and out, A 9l/min(2.37gpm) - B 13l/min(3.23gpm) <sup>2)</sup>	<b>23</b>
	Both meter in and out, A 9l/min(2.37gpm) - B 23.5l/min(6.21gpm) <sup>2)</sup>	<b>24</b>
	Both meter in and out, A 13l/min(3.43gpm) - B 23.5l/min(6.21gpm) <sup>2)</sup>	<b>34</b>

### Voltage supply

		<b>31</b>	<b>07</b>	<b>04</b>	<b>03</b>	<b>01</b>	<b>00</b>	
07	Without coil	-	-	-	-	-	●	<b>00</b>
	12V DC	●	●	●	●	●	-	<b>OB</b>
	13V DC	-	●	-	-	●	-	<b>AD</b>
	24V DC	●	●	●	●	●	-	<b>OC</b>
	27V DC	-	●	-	-	●	-	<b>AC</b>
	48V DC	-	-	●	-	●	-	<b>OD</b>
	110V DC	-	-	-	-	●	-	<b>OE</b>
	24V DC (21.5 DC)	-	-	-	-	●	-	<b>OV</b>
	110V DC (98 DC)	-	-	-	-	●	-	<b>OW</b>
230V DC (207 DC)	-	-	-	-	●	-	<b>OZ</b>	

### Electric connections

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

### Ports

09	G 3/8 DIN 3852	<b>0</b>
	3/4-16 UNF 2-B (SAE8)	<b>3</b>
	Machined for interfacing to modular elements	<b>M</b> <sup>5)</sup>

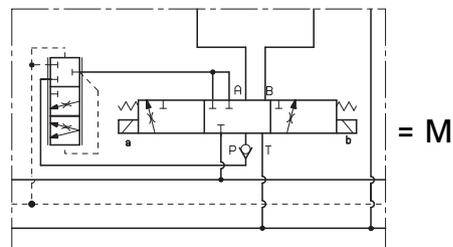
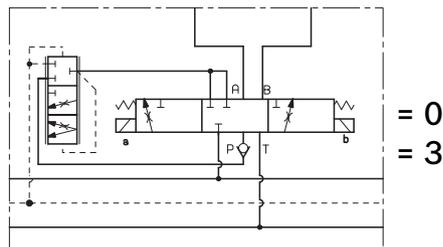
### Options

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

● = Available    - = Not available

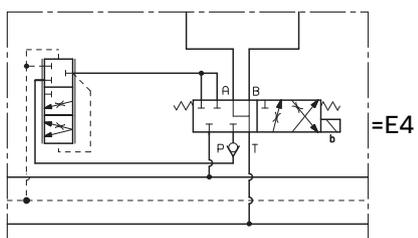
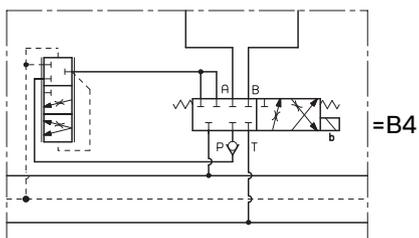
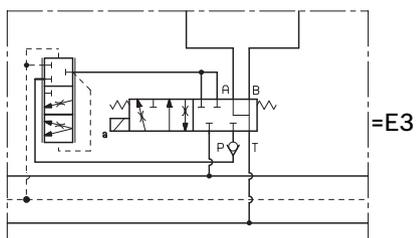
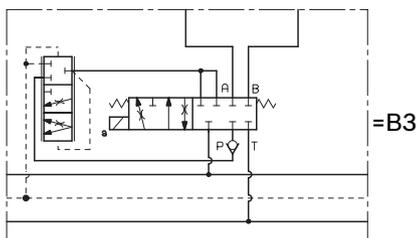
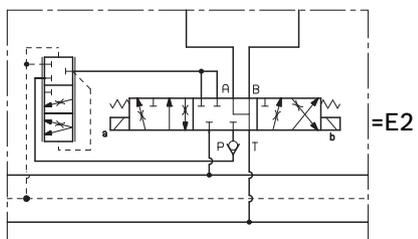
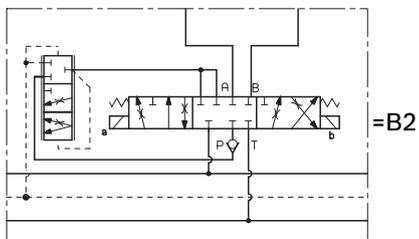
- The required hydraulic layout and spool variant can be chosen by consulting page 3.
- Available only for E\_ spool variant.
- Each different option for the type of emergency chosen implies a specific ordering code (refer to page 8).
- With  $\Delta p$  ( $P > A$  or  $P > B$ ) 14 bar (203 psi).
- See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

### Symbols

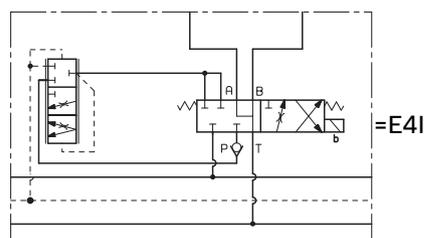
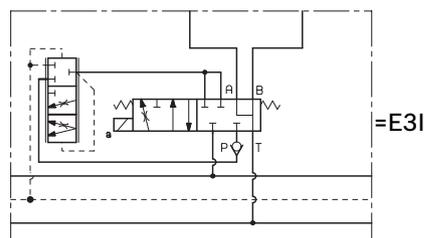
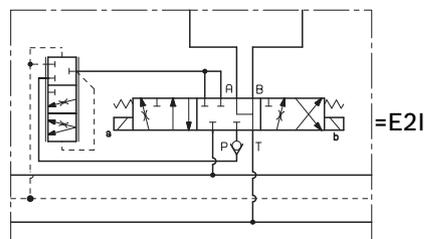


**Spool variant and Flow pattern**

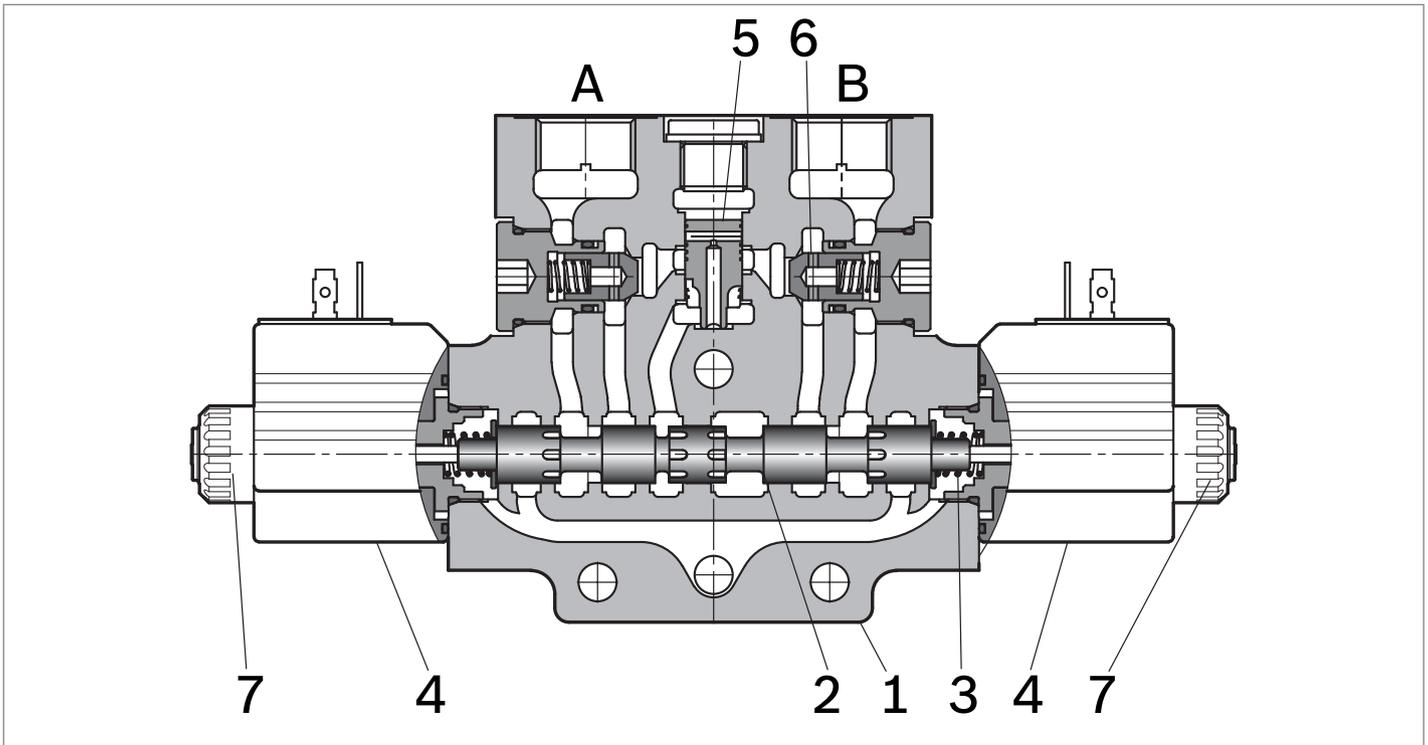
**Both meter in and out**



**Only meter in**



## 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		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.								
General properties: it must have physical lubricating and chemical properties suitable for use in hydraulic systems such as, for example:										
Fluid Temperature	°C (°F)	-20....+80 (-4....+176) (NBR seals)								
Permissible degree of fluid contamination		ISO 4572: $\beta_{x \geq 75} X = 12 \dots 15$ ISO 4406: class 20/18/15 NAS 1638: class 9								
Viscosity range	mm <sup>2</sup> /s	5....420								
Electrical										
Voltage type		DC (AC only with RAC connection)								
Voltage tolerance (nominal voltage)	%	-10 .... +10								
Duty		Continuous, with ambient temperature $\leq 50^\circ\text{C}$ (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

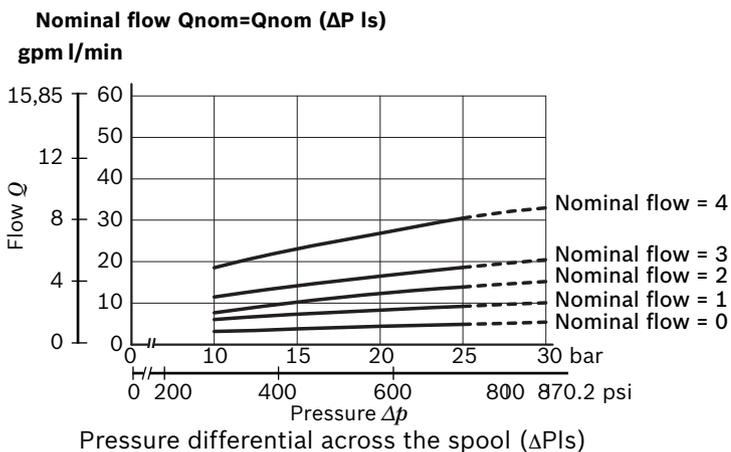
### Note

For applications with different specifications consult us

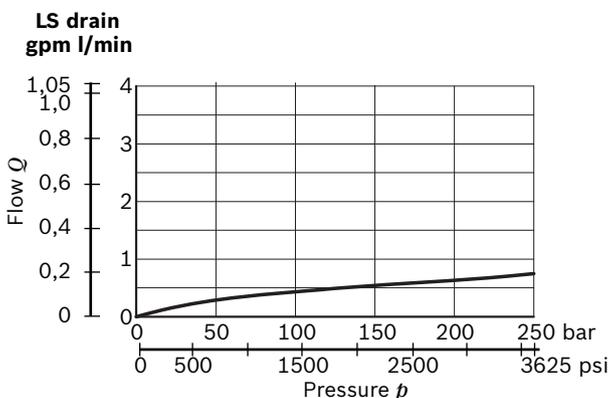
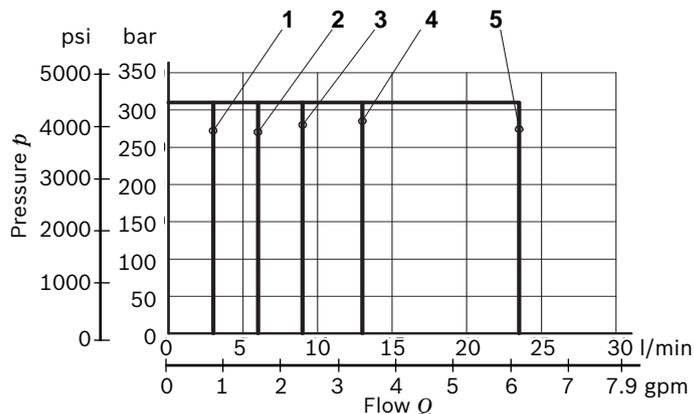
6 **L8510... (EDC-Z)** | 4/3 and 4/2 on-off directional valve elements  
 Technical data

<b>Code</b>	<b>Voltage [V]</b>	<b>Connector type</b>	<b>Coil description</b>	<b>Marking</b>	<b>Coil Mat no.</b>
<b>OB 01</b>	12 DC	EN 175301-803 (Ex. DIN 43650)	C3601 12DC	12 DC	R933000044
<b>OB 03</b>	12 DC	AMP JUNIOR	C3603 12DC	12 DC	R933000047
<b>OB 04</b>	12 DC	AMP JUNIOR Horizontal	C3604 12DC	12 DC	R933002913
<b>OB 07</b>	12 DC	DEUTSCH DT 04-2P	C3607 12DC	12 DC	R933000048
<b>OB 31</b>	12 DC	Cable 350 mm long	C3631 12DC	12 DC	R933000045
<b>AD 01</b>	13 DC	EN 175301-803 (Ex. DIN 43650)	C3601 13DC	13 DC	R933000051
<b>AD 07</b>	13 DC	DEUTSCH DT 04-2P	C3607 13DC	13 DC	R933000049
<b>OC 01</b>	24 DC	EN 175301-803 (Ex. DIN 43650)	C3601 24DC	24 DC	R933000053
<b>OC 03</b>	24 DC	AMP JUNIOR	C3603 24DC	24 DC	R933000057
<b>OC 04</b>	24 DC	AMP JUNIOR Horizontal	C3604 24DC	24 DC	R933002914
<b>OC 07</b>	24 DC	DEUTSCH DT 04-2P	C3607 24DC	24 DC	R933000058
<b>OC 31</b>	24 DC	Cable 350 mm long	C3637 24DC	24 DC	R933000055
<b>AC 01</b>	27 DC	EN 175301-803 (Ex. DIN 43650)	C3601 27DC	27 DC	R933000056
<b>AC 07</b>	27 DC	DEUTSCH DT 04-2P	C3607 27DC	27 DC	R933000050
<b>OD 01</b>	48 DC	EN 175301-803 (Ex. DIN 43650)	C3601 48DC	48 DC	R933000059
<b>OD 04</b>	48 DC	AMP JUNIOR Horizontal	C3604 48DC	48 DC	R933002915
<b>OE 01</b>	110 DC	EN 175301-803 (Ex. DIN 43650)	C3601 110DC	110 DC	R933000061
<b>OV 01</b>	24 RAC	EN 175301-803 (Ex. DIN 43650)	C3601 21.5DC	21.5 DC	R933000054
<b>OW 01</b>	110 RAC	EN 175301-803 (Ex. DIN 43650)	C3601 98DC	98 DC	R933000060
<b>OZ 01</b>	230 RAC	EN 175301-803 (Ex. DIN 43650)	C3601 207DC	207 DC	R933000062

## Characteristic curves

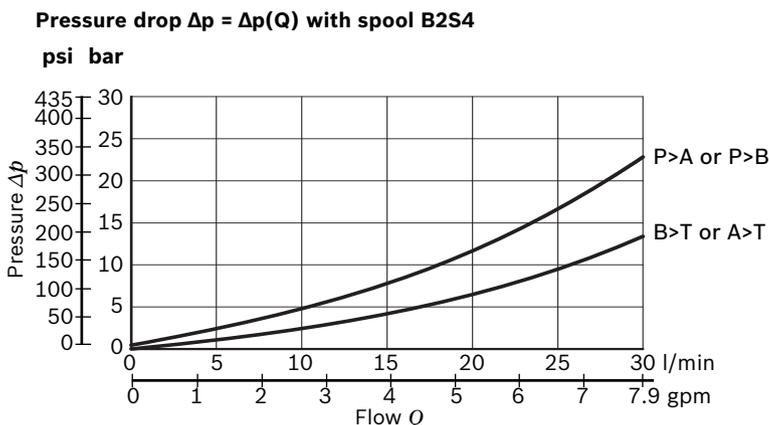
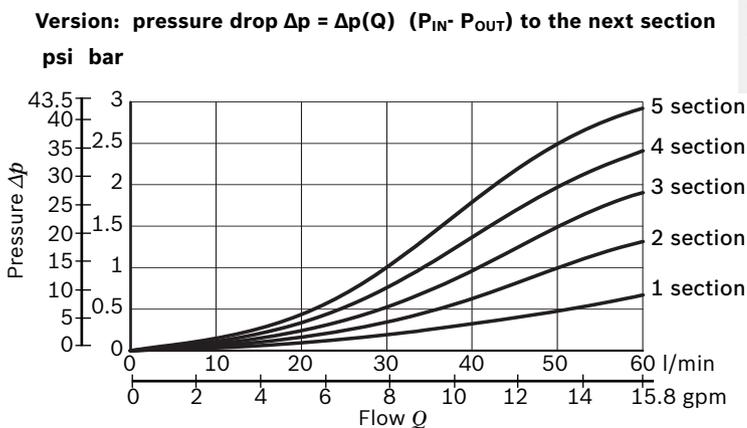


## Performances limits

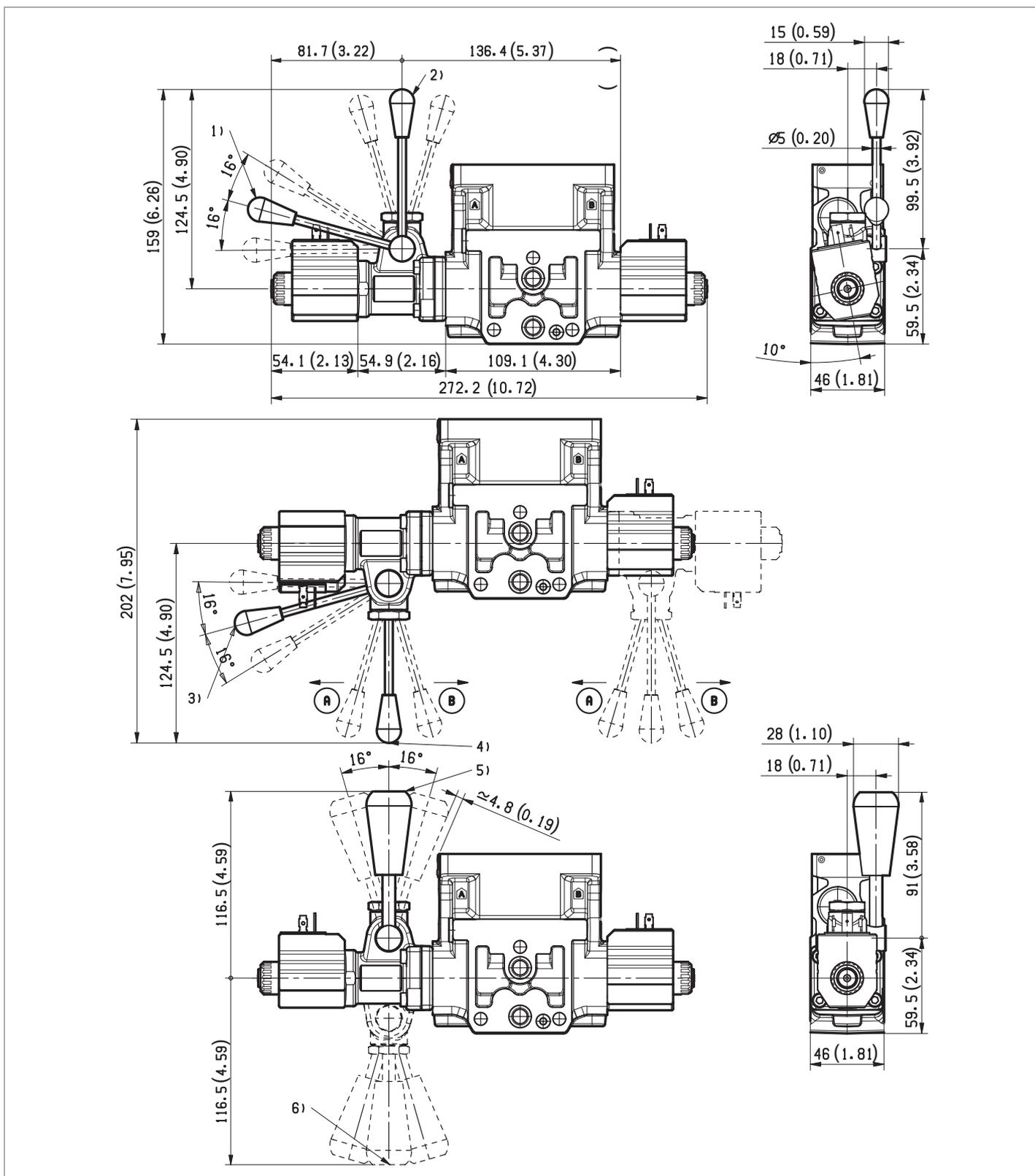


Spool Variant	Curve no.
B2S0, E2S0, B3S0, E3S0, B4S0, E4S0, B2I0, E2I0, B3I0, E3I0, B4I0, E4I0	1
B2S1, E2S1, B3S1, E3S1, B4S1, E4S1, B2I1, E2I1, B3I1, E3I1, B4I1, E4I1	2
B2S2, E2S2, B3S2, E3S2, B4S2, E4S2, B2I2, E2I2, B3I2, E3I2, B4I2, E4I2	3
B2S3, E2S3, B3S3, E3S3, B4S3, E4S3, B2I3, E2I3, B3I3, E3I3, 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.



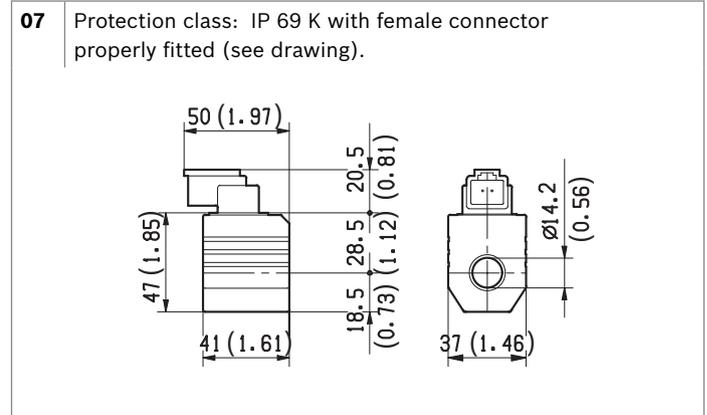
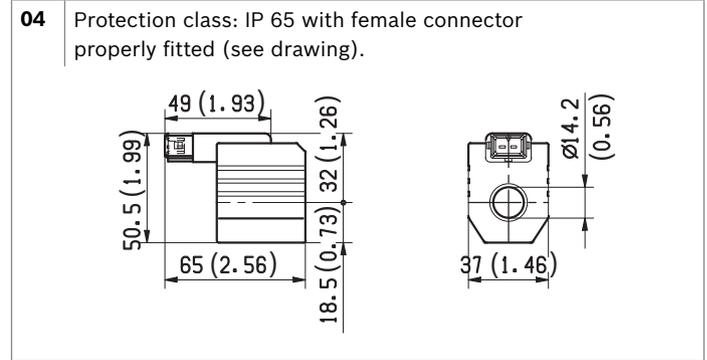
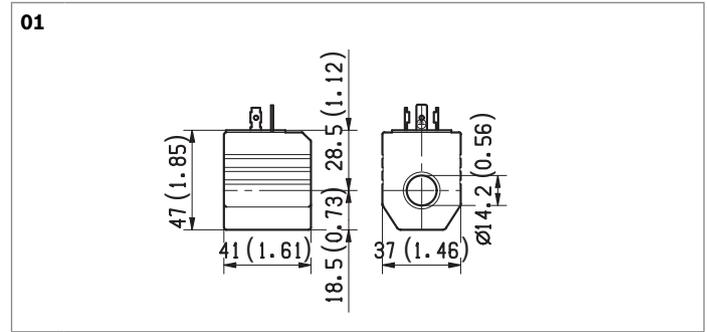
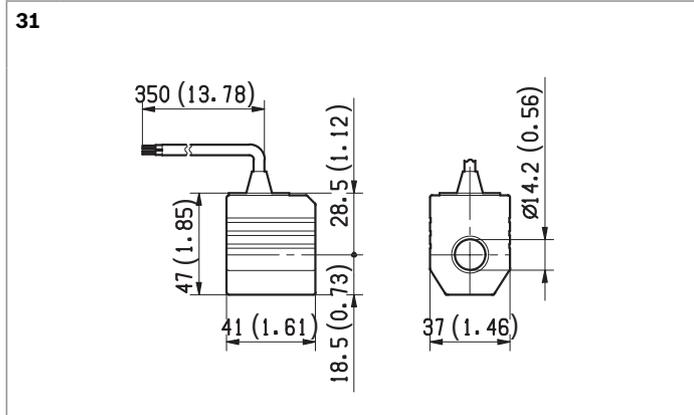
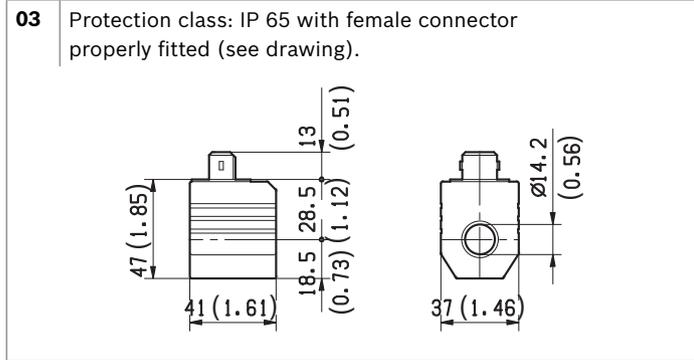
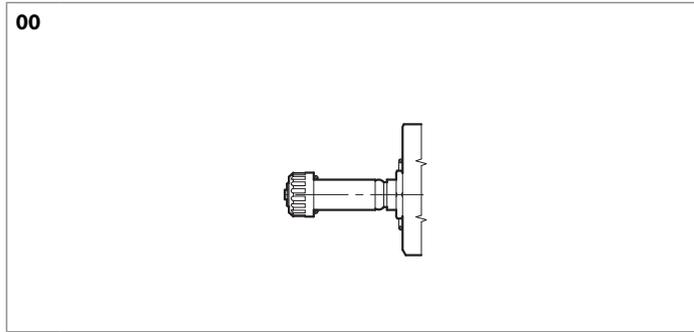




- 1 Ordering Details: HA (if fitted to side A) or HB (if fitted to side B)
- 2 Ordering Details: VA (if fitted to side A) or VB (if fitted to side B)
- 3 Ordering Details: H1 (if fitted to side A) or H9 (if fitted to side B)

- 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**



**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

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth Oil Control S.p.a.. It may not be reproduced or given to third parties without its consent. The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.  
Subject to change.