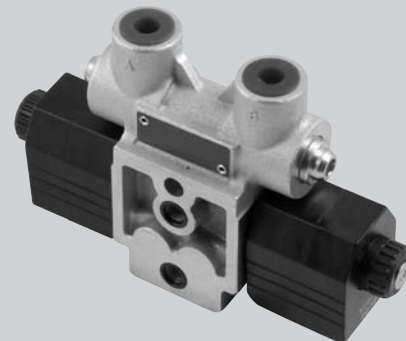


4/3 Directional valve elements with or without secondary relief valves, with or without LS connections, and with PO check valves

B8_48... (EDBZ-VR)



Summary

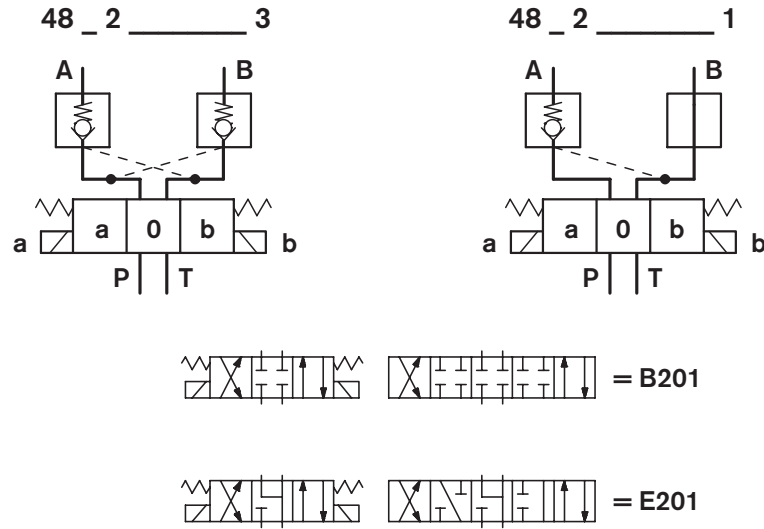
Description

General specifications	
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General specifications

Description	Page
– Valve elements with 4 ways and 3 positions.	
– Control spools directly operated by screwed-in solenoids with extractable coils.	1
– In the de-energized condition, the control spool is held in the central position by return springs.	2
– Wet pin tubes for DC coils, with push rod for mechanical override; burnish surface treatment.	3
– Single or Dual cross piloted check valves on A and B ports.	3
– PO checks valves with 4:1 pilot ratio.	4
– Coils can be rotated 360° around the tube.	6
– Manual override (push-button or screw type) available upon request.	6
– Plug-in connectors available: EN 175301-803 (Was DIN 43650); AMP JUNIOR; DT04-2P (Deutsch); free leads.	7
	8

Spool variants



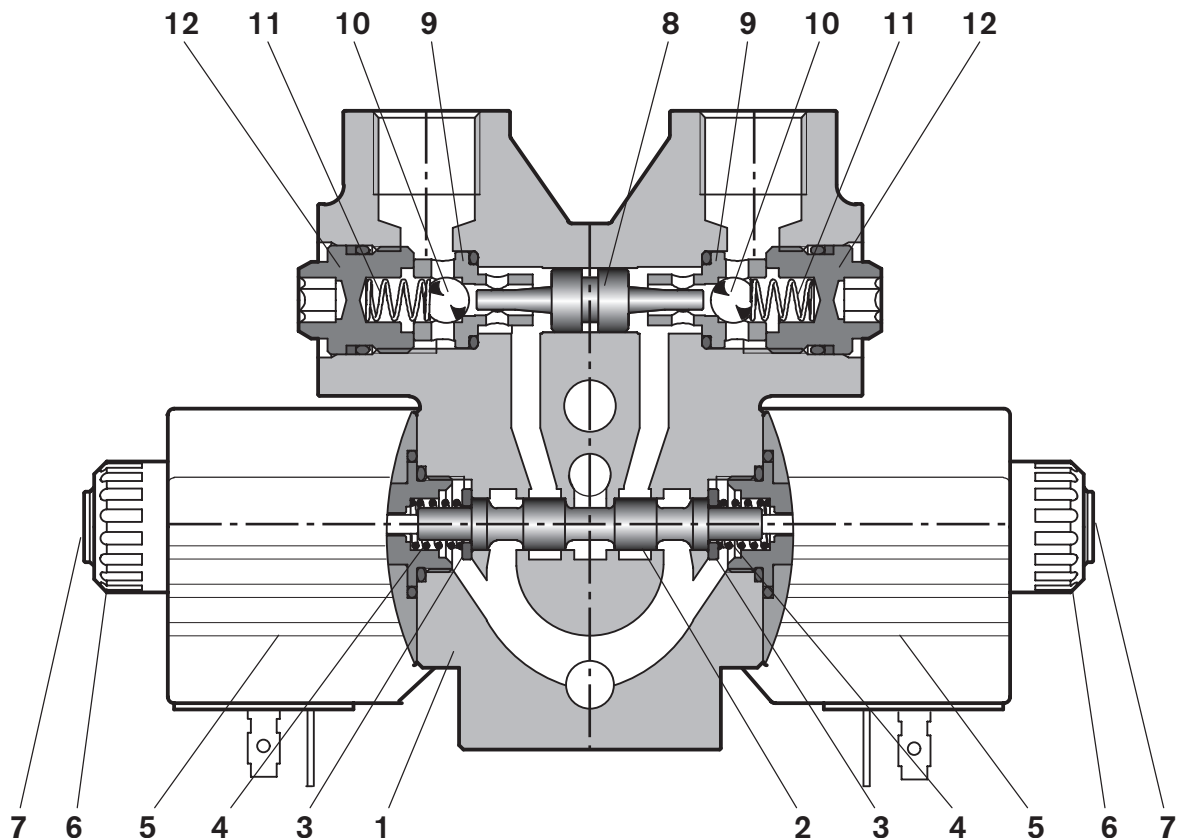
Principles of operation, cross section

The sandwich plate design directional valve elements B8_48... are very compact direct operated solenoid valves which control the start, the stop and the direction of the oil flow. These elements basically consist of a stackable housing (1) with a control spool (2), two solenoids (5), and two return springs (4). The upper part of the housing is extended in order to provide space for the cavities where two PO check valves are fitted. They consist of two calibrated balls (10), with return springs (11), which allow upstream flow but lock on the respective seats (9) and prevent the return flow. The return flow is possible when they are opened by the pilot piston (8), if enough pilot pressure is present in the opposite line.

When energized, the force of the solenoid (5) pushes the control spool (2) from its neutral-central position "0" to the required end position "a" or "b", and the required flow from P to A (with B to T), or P to B (with A to T) is achieved.

Once the solenoid is de-energized, the return spring (4) pushes the spool thrust washer (3) back against the housing and the spool (2) returns in its neutral-central position.

Each coil is fastened to the solenoid tube by a ring nut (6). A pin (7) allows to push the spool (2) in 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 and plug-in pins EN 175301-803	kg (lbs)	1.75 (3.86)
Ambient Temperature	°C (°F)	-20....+50 (-4....+122) [NBR seals]

Hydraulic

Maximum pressure at P, A, and B ports	bar (PSI)	250 (3625)
Maximum dynamic pressure at T	bar (PSI)	180 (2610)
Maximum static pressure at T	bar (PSI)	210 (3045)
Maximum inlet flow	l/min (GPM)	20 (5.3)
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

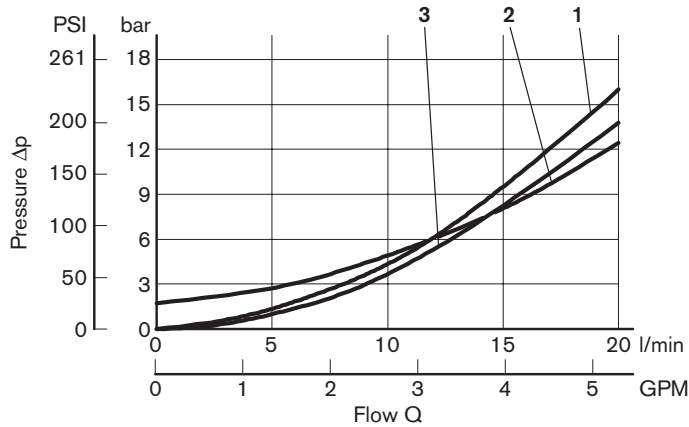
Electrical

Voltage type		DC (AC only with RAC)								
Voltage tolerance (nominal voltage)	%	-10 +10								
Duty		Continuous, with ambient temperature $\leq 50^{\circ}\text{C}$ (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 with connection EN 175301-803	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
Current ¹⁾	A	2.15	2.00	1.10	1.00	0.54	0.27	1.20	0.29	0.14
Resistance ²⁾	Ω	5.5	6.5	22	28	89	413	18	338	1430

1) Nominal 2) $\pm 7\%$ at temperature 20°C [68°F]

	Voltage (V)	Connector type	Coil description	Marking	Coil Mat no.
=OB 01 =OB 02	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 =AD 02	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 =OC 02	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 =AC 02	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 =OD 02	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 =OE 02	110 DC	EN 175301-803 (Ex. DIN 43650)	C3601 110DC	110 DC	R933000061
=OV 01 =OV 02	24 RAC	EN 175301-803 (Ex. DIN 43650)	C3601 21.5DC	21.5 DC	R933000054
=OW 01 =OW 02	110 RAC	EN 175301-803 (Ex. DIN 43650)	C3601 98DC	98 DC	R933000060
=OZ 01 =OZ 02	230 RAC	EN 175301-803 (Ex. DIN 43650)	C3601 207DC	207 DC	R933000062

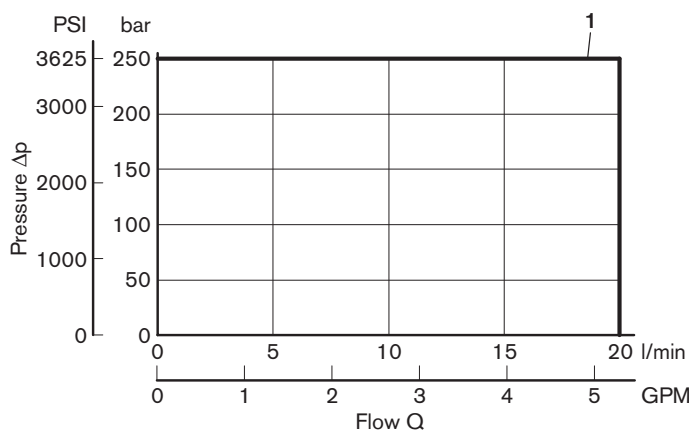
Characteristic curves



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

Spool Variant	Curve No.			
	P > A	P > B	A > T	B > T
B201	2	2	1	1
E201	2	2	3	3

Performances limits



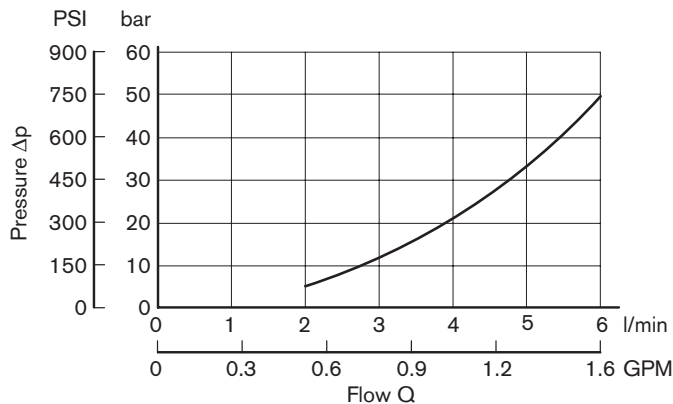
Measured with the solenoids at their operating temperature, 10% under voltage and without pre-loading of the tank.

Spool Variant	Curve No.
B201	1
E201	1

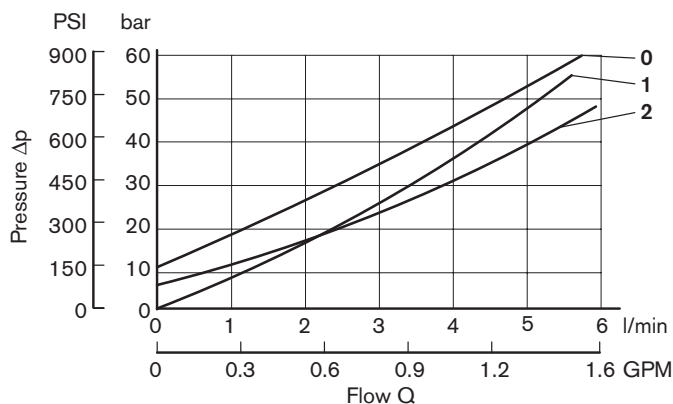
The performance curves are measured with flow going across and coming back, like P > A and B > T, with symmetrical flow areas.

In case of special circuit connections, the performance limits can change.

Minimum flow for efficiency of LS control

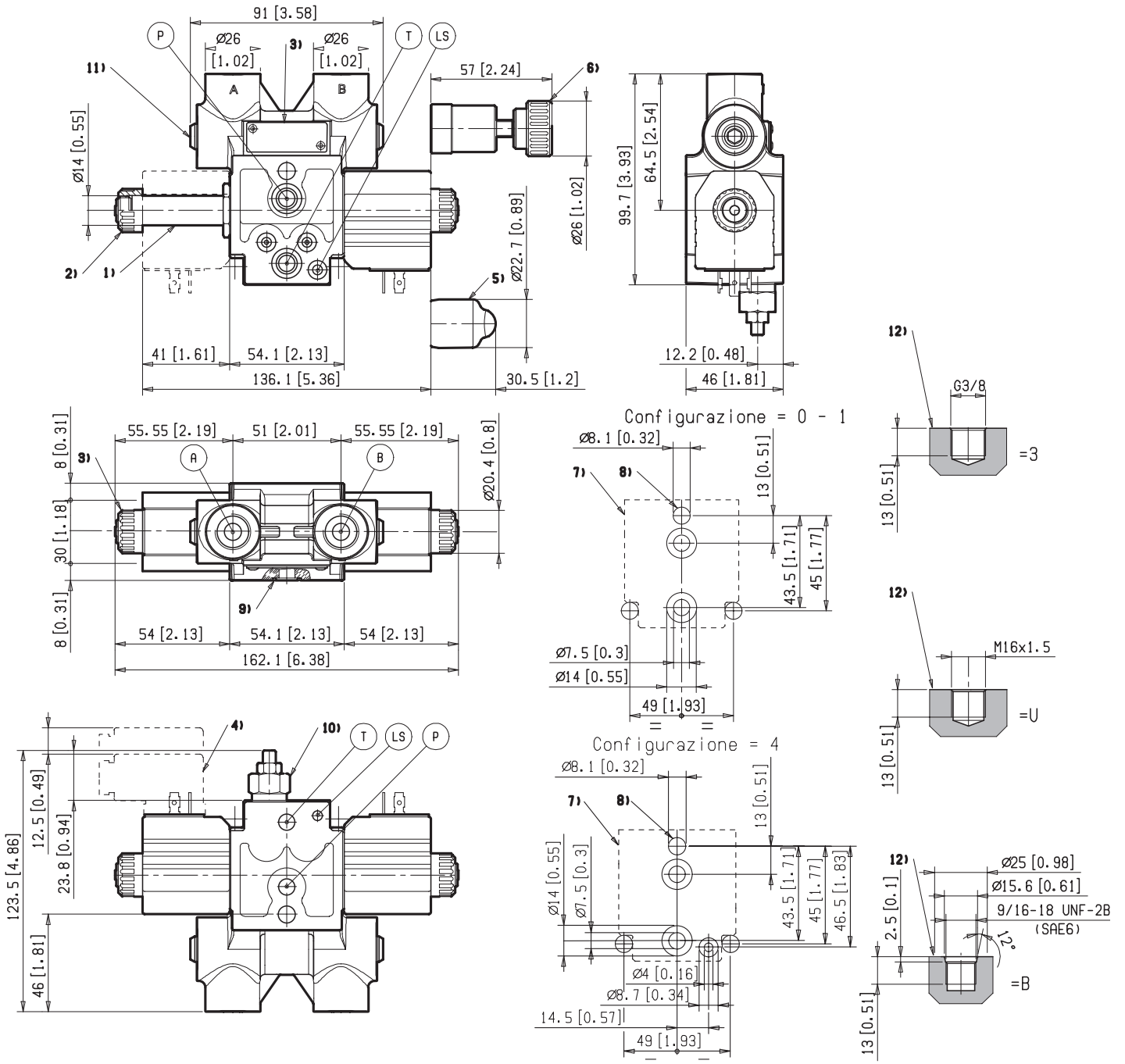


Lowest pressure setting curve for secondary valves



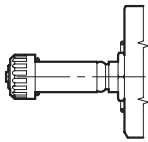
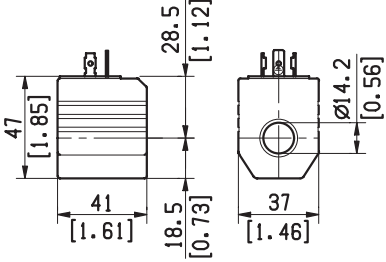
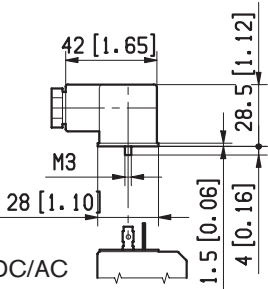
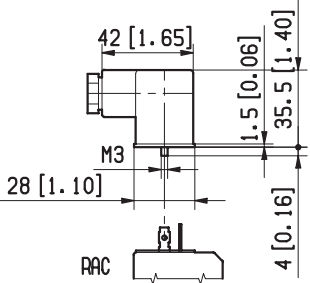
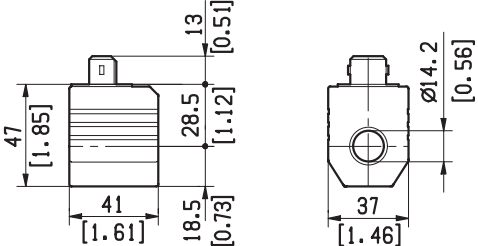
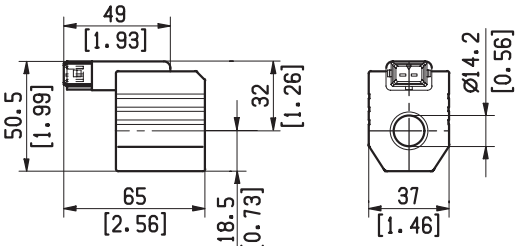
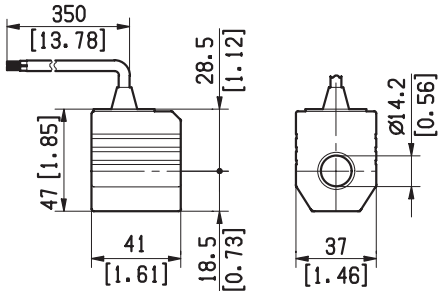
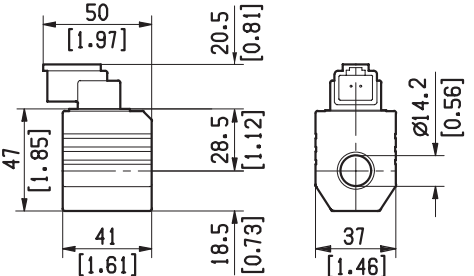
Secondary valve setting	Curve No.
50–210 bar (700–2950 PSI)	0
100–310 bar (1400–4500 PSI)	1
25–50 bar (350–700 PSI)	2

External Dimensions and Fittings



- 1 Solenoid tube hex 22 mm [0.87 inch]. Torque 15-16 20-22 Nm [14.6-16.2 lb-ft].
- 2 Ring nut for coil locking (OD 20.5 mm); torque 3-4 Nm [2.2-3 ft-lb].
- 3 Identification label.
- 4 Clearance needed for connector removal.
- 5 Optional push-button emergency, EP type, for spool opening: it is pressure stuck to the ring nut for coil locking. Material no. R933000042.
- 6 Optional screw type emergency, EF 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. Material no. R933000021.
- 7 Flange specifications for coupling to ED intermediate elements.
- 8 One through hole for coupling of the ED Directional Valve Elements. Recommended tie rod M8 with strength class DIN 8.8. Torque 20-22 Nm [14.7-16.2 ft-lb].
- 9 O-Rings for P and T ports.
- 10 Space needed for secondary valve, for configuration 1. Hex. 17, torque 9-10 Nm [6.6-7.4 lb-ft].
- 11 Plug hex. 6 mm ; torque 30-33 Nm [22-24 ft-lb].
- 12 A and B ports.

Electric connection (or connections, in case of two solenoids)

<p>= 00</p>	<p>Without coils, but with ring nut and O-Rings for coil fitting (solution recommended for flexible stock handling)</p> 	<p>= 01</p>	<p>With coils having plug-in pins EN 175301-803, without connectors</p> 																										
<p>= 02</p>	<p>With coils and with connectors non-assembled, type EN 175301-803. Protection class: IP 65 when connector with seal is properly screwed down, and cable clamp is correctly tightened.</p> <p>182-09: Standard. 182-LED-T-A1: with LED monitoring presence of voltage. 182-09-G-DO-2-1: with VDR (Voltage Dependent Resistor), to prevent input voltage over-shootings.</p> <table border="1"> <thead> <tr> <th>Material No.</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>R933002885</td> <td>182-09 GRAY</td> </tr> <tr> <td>R933002889</td> <td>182-09 BLACK</td> </tr> <tr> <td>R933002893</td> <td>182-LED-T-A1 12 DC/AC</td> </tr> <tr> <td>R933002894</td> <td>182-LED-T-A1 24 DC/AC</td> </tr> <tr> <td>R933002896</td> <td>182-LED-T-A1 48 DC/AC</td> </tr> <tr> <td>R933002897</td> <td>182-LED-T-A1 110 DC/AC</td> </tr> <tr> <td>R933002898</td> <td>182-LED-T-A1 230 DC/AC</td> </tr> <tr> <td>R933002886</td> <td>182-09-G-DO-2-1 12DC with VDR</td> </tr> <tr> <td>R933002887</td> <td>182-09-G-DO-2-1 24DC with VDR</td> </tr> </tbody> </table> 	Material No.	Description	R933002885	182-09 GRAY	R933002889	182-09 BLACK	R933002893	182-LED-T-A1 12 DC/AC	R933002894	182-LED-T-A1 24 DC/AC	R933002896	182-LED-T-A1 48 DC/AC	R933002897	182-LED-T-A1 110 DC/AC	R933002898	182-LED-T-A1 230 DC/AC	R933002886	182-09-G-DO-2-1 12DC with VDR	R933002887	182-09-G-DO-2-1 24DC with VDR	<p>= 03</p>	<p>532-09 RAC: special connectors with rectifier (RAC) for AC applications.</p>  <table border="1"> <thead> <tr> <th>Material No.</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>R933002892</td> <td>532-09 RAC GRAY</td> </tr> <tr> <td>R933002891</td> <td>532-09 RAC BLACK</td> </tr> </tbody> </table>	Material No.	Description	R933002892	532-09 RAC GRAY	R933002891	532-09 RAC BLACK
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<p>= 03</p>	<p>With coils having AMP Junior connector, and with bi-directional diode. Protection class: IP 65 with female connector properly fitted (see drawing).</p> 	<p>= 04</p>	<p>With coils having Horizontal AMP Junior connector, and with bi-directional diode. Protection class: IP 65 with female connector properly fitted (see drawing).</p> 																										
<p>= 31</p>	<p>With coils having bi-directional diode and bipolar sheathed free lead, 350 mm long, without pins.</p> 	<p>= 07</p>	<p>With coils having DEUTSCH DT 04-2P connector, and with bi-directional diode. Protection class: IP 69 K with female connector properly fitted (see drawing).</p> 																										

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