

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

**RE 18300-53/07.12**  
Replaces: 10.09

1/8

## B8\_48... (EDBZ-VR)

Size 4  
Series 00  
Maximum operating pressure 250 bar [3625 psi]  
Maximum flow 20 l/min [5.3 gpm]  
Port connections G 3/8 SAE6 - M16x1.5



## Summary

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## General specifications

| Description   | Page |
|---|------|
| Valve elements with 4 ways and 3 positions.   | 1    |
| Control spools directly operated by solenoids with removable coils.                                 | 2    |
| 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 as option.                                    | 6    |
|   | 7    |
|   | 8    |

**Ordering Details**

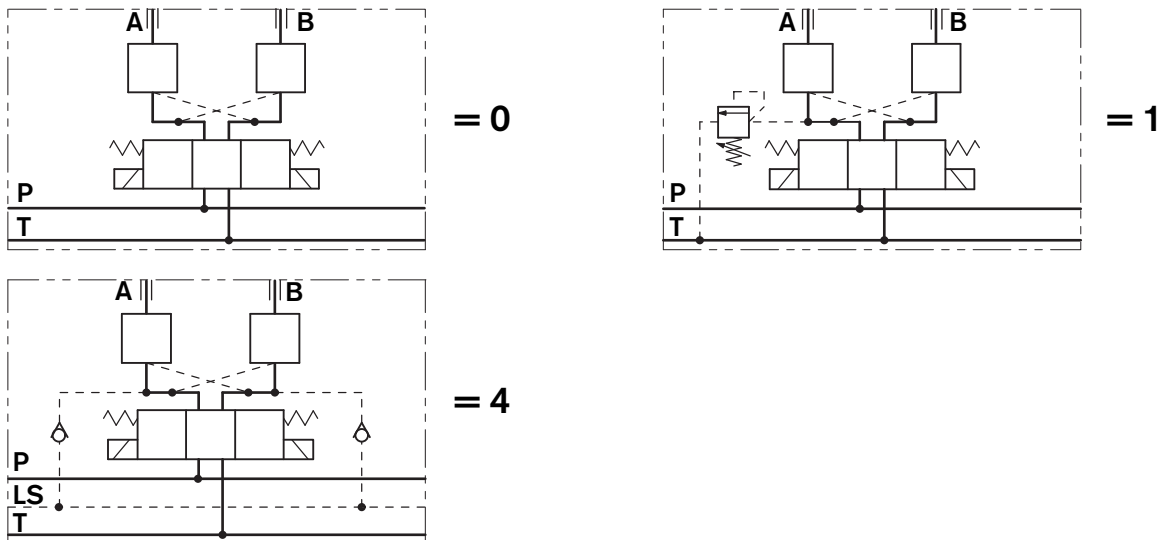
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|--|--|---|--|--|--|--|--|---|--|-----------------------|--|--|--|
| <b>Family</b><br>Directional valve element EDB   |  | <b>Type</b><br>Size 4   |  | <b>Configuration</b><br>Standard = 0<br>With secondary valve on A1 = 1<br>With ch. for Load Sensing = 4  |  | <b>Coil type</b><br>C36  |  | <b>Spool Variants</b> <sup>1)</sup><br>4/3 operated on both sides a and b = _ 2 _   |  | <b>Voltage supply</b> |  | <b>Options</b><br>No code = No options<br>0 = Standard<br>P = Push-button type manual override<br>F = Screw type manual override |  |
| Without coil = 00<br>12V DC = 0B<br>13V DC = AD<br>24V DC = 0C<br>27V DC = AC<br>48V DC = OD<br>110V DC = OE<br>(21.5 DC) 24V AC = OV<br>(98 DC) 110V AC = OW<br>(207 DC) 230V AC = OZ |  | PO check valve position<br>1 = Check valve on port A<br>3 = Check valve on both ports A and B |  | Secondary valves setting<br>0 = 50-210bar [725-3045psi]<br>1 = 100-310bar [1450-4500psi]<br>2 = 25-50bar [362-725psi]<br>3 = Without secondary valve |  | Ports<br>3 = G 3/8 DIN 3852<br>U = M 16x1,5 DIN 3852<br>B = 9/16-18 UNF 2-B (SAE6) |  | Electric connections<br>00 = Without coils<br>01** = With coils, without mating connector DIN EN 175301-803<br>03 = With coils, with bi-directional diode, without mating connector vertical Amp-Junior<br>04 = With coils, with bi-directional diode, without mating connector horizontal Amp-Junior<br>07 = With coils, with bi-directional diode, without mating connector DT04-2P<br>31 = With coils and bipolar sheathed lead 350mm [13,8 in] long |  |                       |  |  |  |
| Available connections<br>00 01 03 04 07 31   |  |   |  |  |  |  |  |   |  |                       |  |  |  |

<sup>1)</sup> The required hydraulic symbol and spool variant can be chosen by consulting page 3.

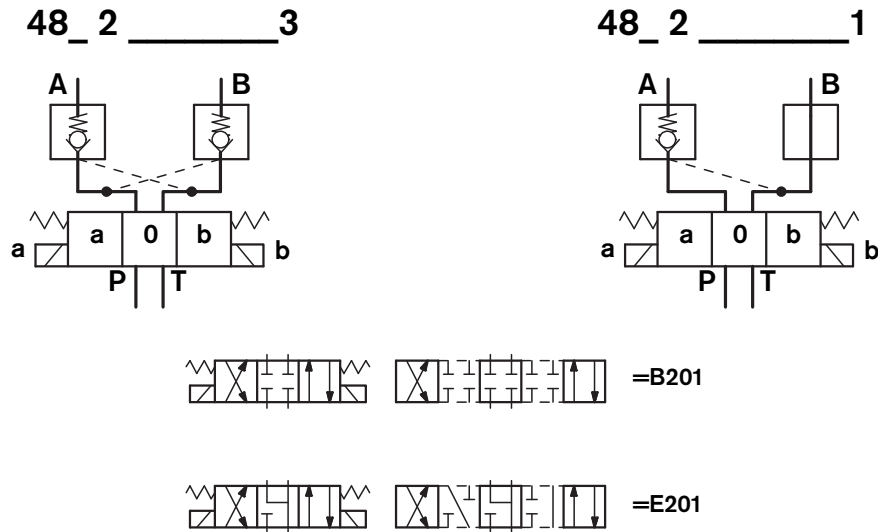
\*\* For connectors ordering code see data sheet RE 18325-90.

The secondary valves have a maximum flow capacity of 6 l/min. [1.6 gpm].

**Configuration**



**Spool variants**



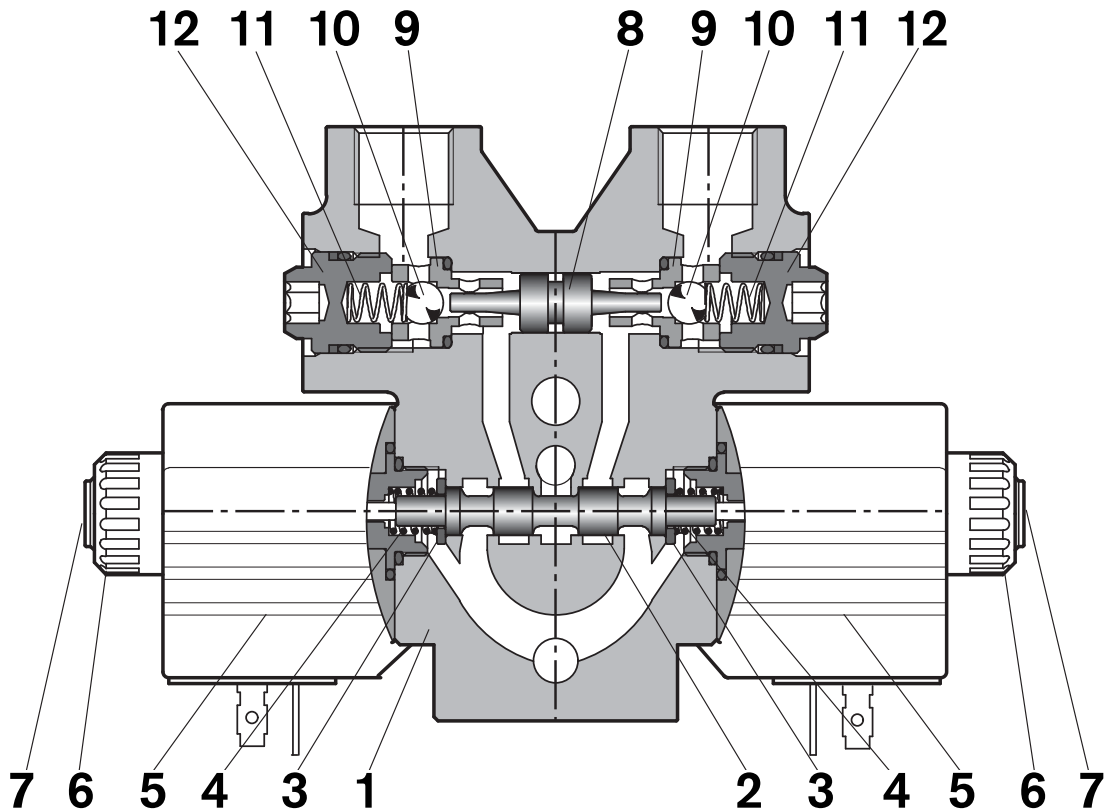
**Principles of operation, cross section**

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 | 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 pressure at T  | bar [psi]          | 250 [3625]  |
| Maximum inlet flow   | l/min [gpm]        | 20 [5.3]  |
| Hydraulic fluid<br>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).<br>Mineral oil based hydraulic fluids HLP (DIN 51524 part 2).<br>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: $\beta_p \geq 75$ X=12...15<br>ISO 4406: class 20/18/15<br>NAS 1638: class 9  |
| Viscosity range  | mm <sup>2</sup> /s | 5....420  |

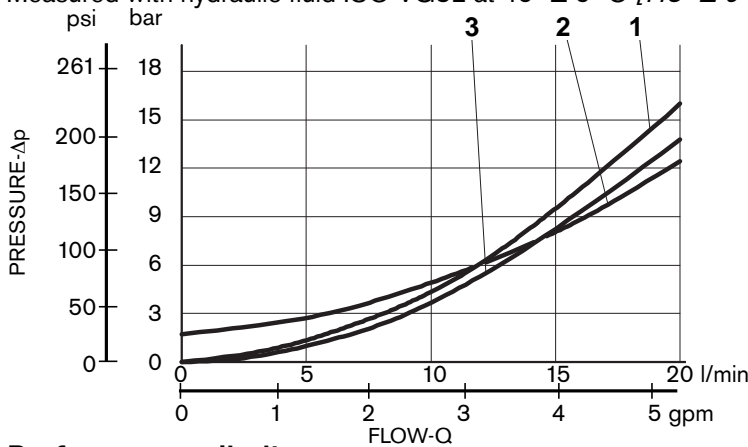
**Electrical**

|  |          |  |     |      |     |      |      |                      |                     |                      |
|--|----------|--|-----|------|-----|------|------|----------------------|---------------------|----------------------|
| 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<br>+RAC<br>(21,5) | 110<br>+RAC<br>(98) | 230<br>+RAC<br>(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 (nominal at 20°C [68°F])         | A        | 2.15   | 2.0 | 1.10 | 1.0 | 0.54 | 0.27 | 1.20                 | 0.29                | 0.14                 |
| Resistance (nominal at 20°C [68°F])      | Ω        | 5.5  | 6.5 | 22   | 28  | 89   | 413  | 18                   | 338                 | 1430                 |

|        | Voltage (V) | Connector type                   | Coil description | Marking | Coil Mat no. |
|--------|-------------|----------------------------------|------------------|---------|--------------|
| =OB 01 | 12 DC       | EN 175301-803<br>(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 | 13 DC       | EN 175301-803<br>(Ex. DIN 43650) | C3601 13DC       | 13 DC   | R933000051   |
| =AD 07 | 13 DC       | DEUTSCH DT 04-2P                 | C3607 13DC       | 13 DC   | R933000049   |
| =OC 01 | 24 DC       | EN 175301-803<br>(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 | 27 DC       | EN 175301-803<br>(Ex. DIN 43650) | C3601 27DC       | 27 DC   | R933000056   |
| =AC 07 | 27 DC       | DEUTSCH DT 04-2P                 | C3607 27DC       | 27 DC   | R933000050   |
| =OD 01 | 48 DC       | EN 175301-803<br>(Ex. DIN 43650) | C3601 48DC       | 48 DC   | R933000059   |
| =OD 04 | 48 DC       | AMP JUNIOR Horizontal            | C3604 48DC       | 48 DC   | R933002915   |
| =OE 01 | 110 DC      | EN 175301-803<br>(Ex. DIN 43650) | C3601 110DC      | 110 DC  | R933000061   |
| =OV 01 | 24 RAC      | EN 175301-803<br>(Ex. DIN 43650) | C3601 21.5DC     | 21.5 DC | R933000054   |
| =OW 01 | 110 RAC     | EN 175301-803<br>(Ex. DIN 43650) | C3601 98DC       | 98 DC   | R933000060   |
| =OZ 01 | 230 RAC     | EN 175301-803<br>(Ex. DIN 43650) | C3601 207DC      | 207 DC  | R933000062   |

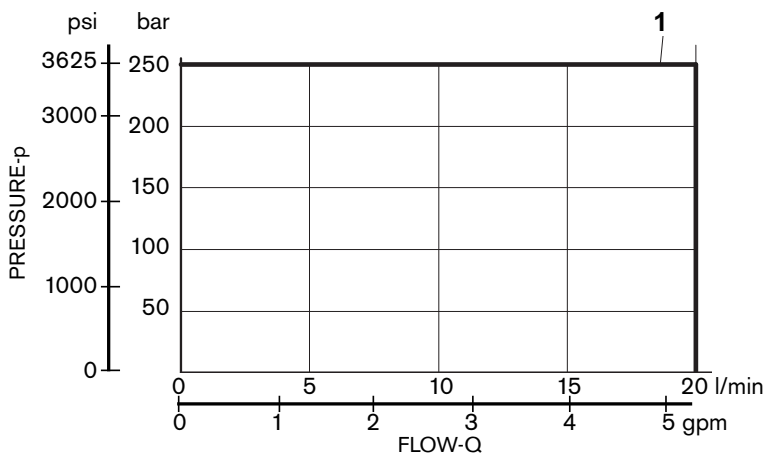
### Characteristic curves

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



| SPOOL VARIANT | Curve No. |     |     |     |
|---------------|-----------|-----|-----|-----|
|               | P>A       | P>B | A>T | B>T |
| B201          | 2         | 2   | 1   | 1   |
| E201          | 2         | 2   | 3   | 3   |

### Performances limits

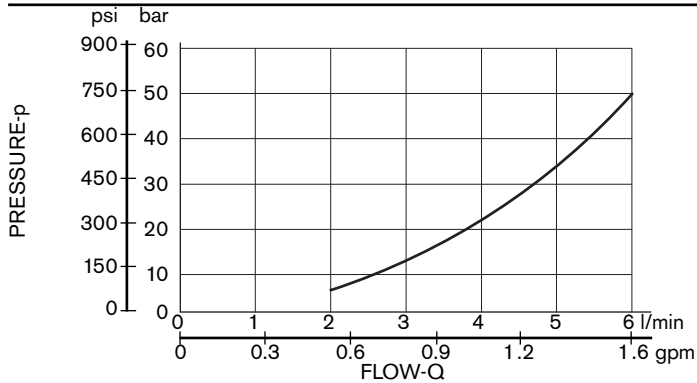


| SPOOL VARIANT | Curve No. |
|---------------|-----------|
| B201          | 1         |
| E201          | 1         |

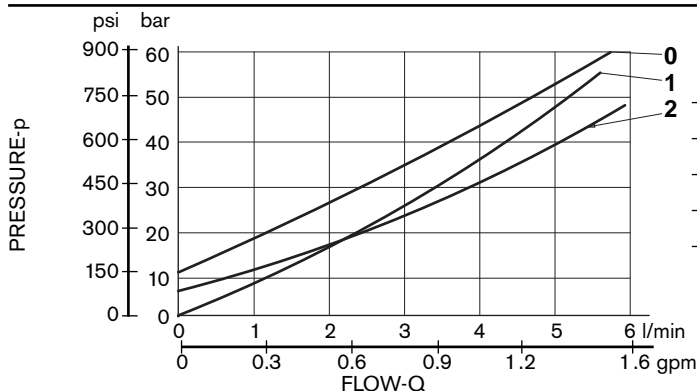
The performance curves are measured with flow going across and coming back, like P>A and B>T, with symmetrical flow areas.

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

### Minimum flow for efficiency of LS control

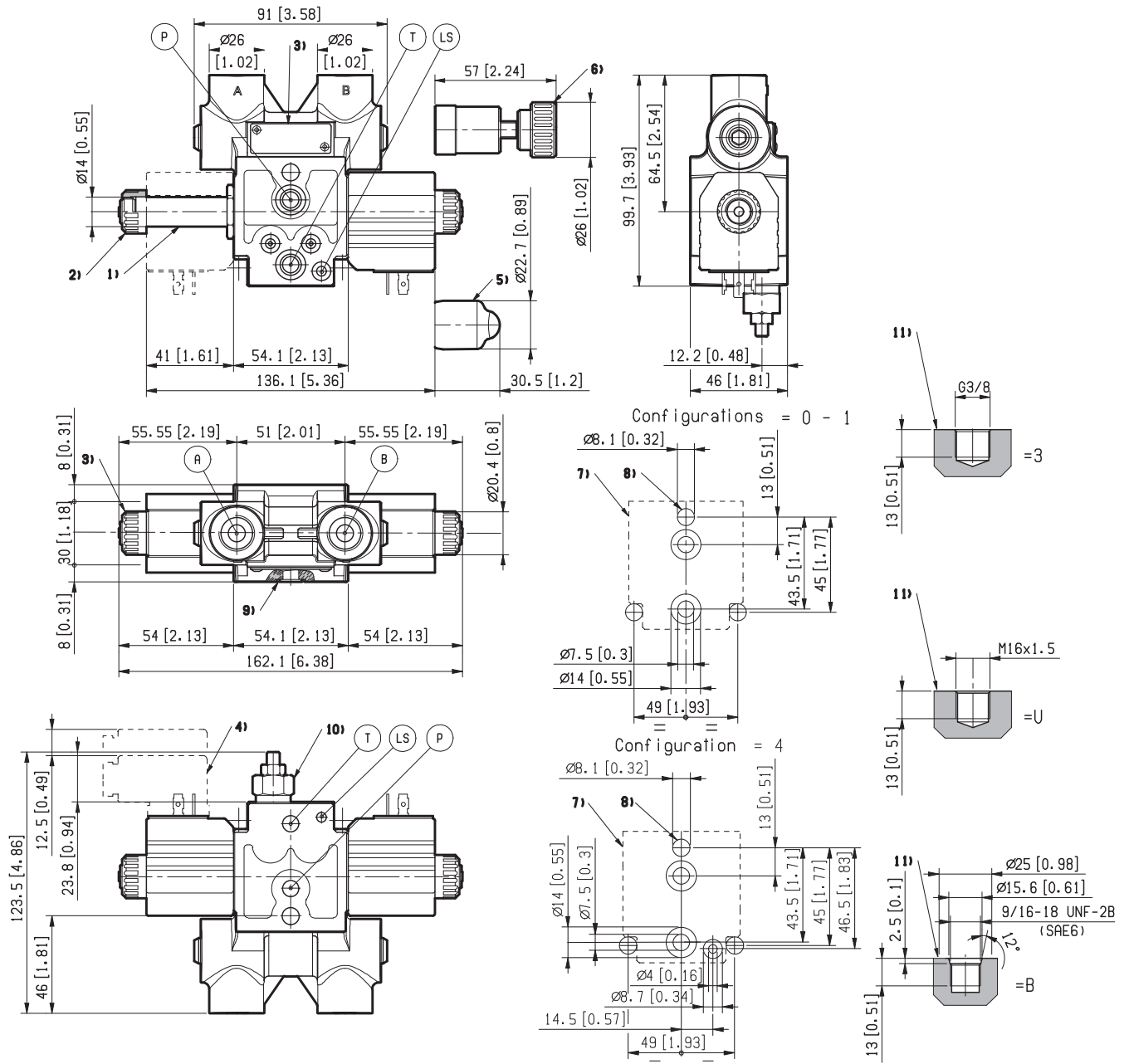


### Lowest pressure setting curve for secondary valves



| 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  $\varnothing$  14 mm [0.55 inch].

2 Ring nut for coil locking (OD 20.5 mm); torque 3-4Nm [2.2-3 ft-lb].

3 Identification label.

4 Clearance needed for connector removal.

5 Optional push-button manual override, EP type, for spool opening: it is pressure stuck to the ring nut for coil locking. Mat no. R933000042.

6 Optional screw type manual override, EF type, for spool opening: it is screwed (torque 6-7 [4.4-5.2 ft-lb]) to the tube as replacement of the coil ring nut. Mat no. R933000021.

7 Flange specifications for coupling to ED intermediate elements.

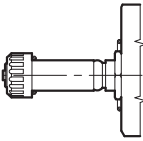
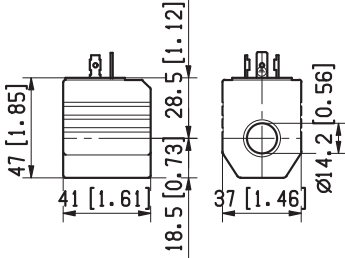
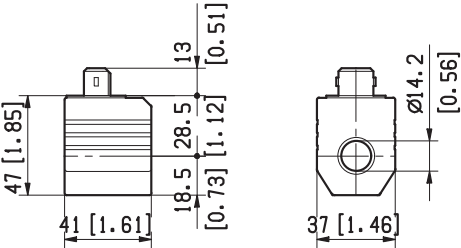
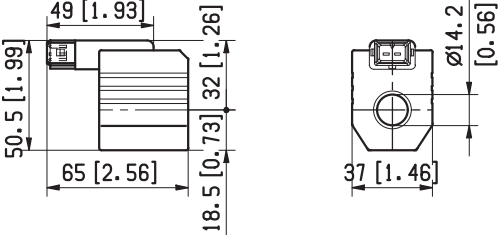
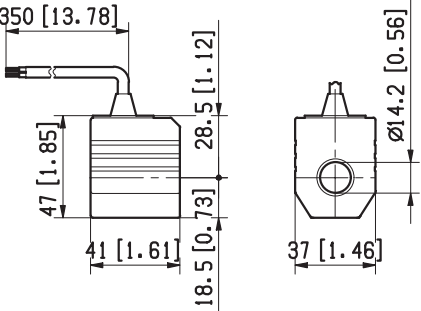
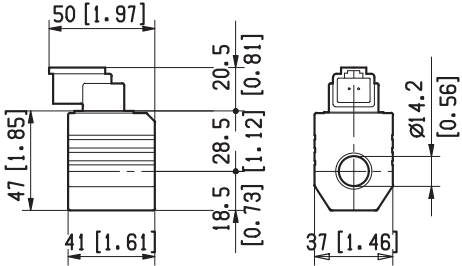
8 For tie rod and tightening torque information see data sheet RE 18301-90.

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 A and B ports.

## Electric connections

|     |   |     |  |
|-----|---|-----|--|
| =00 |    | =01 |    |
| =03 | <p>Protection class: IP 65 with female connector properly fitted (see drawing).</p>  | =04 | <p>Protection class: IP 65 with female connector properly fitted (see drawing).</p>      |
| =31 |    | =07 | <p>Protection class: IP 69 K with female connector properly fitted (see drawing).</p>  |