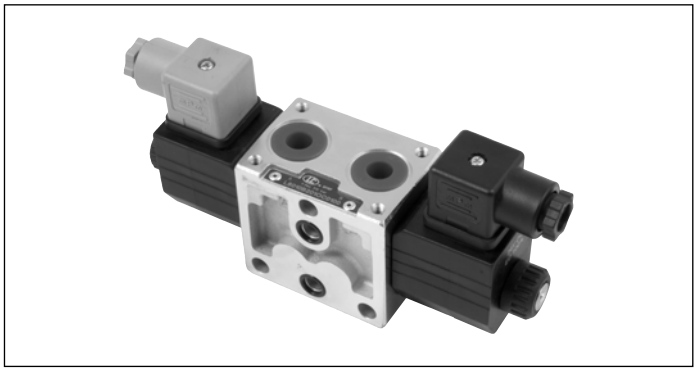
rexroth
A Bosch Company

# 4/3 - 4/2 Directional valve elements with or without secondary relief valves, with or without LS connections

L8_10... (ED1-Z)

**RE 18301-01**
Edition: 09.2018
Replaces: 02.2016



Size 6
Series 00
Maximum operating pressure 310 bar (4500 psi)
Maximum flow 30 l/min (7.9 gpm)
Port connections G 3/8 - SAE6

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

**General specifications**

Valve elements with solenoid operated directional spool. Control spools operated by solenoids with removable coils.
In the de-energized condition, the control spool is held in the central position by return springs.
Wet pin tubes for DC coils, with push rod for mechanical override; nickel plated surface.
Coils can be rotated 360° around the tube; they can be energized by AC current through special connectors with rectifier (RAC).
Manual override (push-button or screw type) available as option.

**Contents**

## Ordering details

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| **L** | **8** | **_** | **10** | **_ _ _ _** | **_ _** | **_ _** | **_** | **_** | **_ _** |

**Family**

| | | |
|---|---|---|
| 01 | Directional Valve elements ED | **L** |

**Type**

| | | |
|---|---|---|
| 02 | Size 6 | **8** |

**Configuration**

| | | |
|---|---|---|
| 03 | Standard | **0** |
| | With secondary valve on A[3)] | **1** |
| | With secondary valve on B[3)] | **2** |
| | With secondary valves on A and B | **3** |
| | With channels for Load Sensing | **4** |

**Coil type**

| | | |
|---|---|---|
| 04 | C36 | **10** |

**Spool variants**[1)]

| | | |
|---|---|---|
| 05 | 4/3 operated on both sides a and b | **_ 2 _ _** |
| | 4/2 operated on side a only | **_ 3 _ _** |
| | 4/2 operated on side b only | **_ 4 _ _** |

| **Voltage supply** | | **31** | **07** | **03** | **04** | **01** | **00** | |
|---|---|---|---|---|---|---|---|---|
| 06 | Without coil | – | – | – | – | – | ● | **00** |
| | 12V DC | ● | ● | ● | ● | ● | – | **OB** |
| | 13V DC | – | ● | – | – | ● | – | **AD** |
| | 24V DC | ● | ● | ● | ● | ● | – | **OC** |
| | 27V DC | – | ● | – | – | ● | – | **AC** |
| | 48V DC | – | – | ● | – | ● | – | **OD** |
| | 110V DC | – | – | – | – | ● | – | **OE** |
| | 24V AC (21.5 DC) | – | – | – | – | ● | – | **OV** |
| | 110V AC (98 DC) | – | – | – | – | ● | – | **OW** |
| | 230V AC (207 DC) | – | – | – | – | ● | – | **OZ** |

**Electric connections**

| | | |
|---|---|---|
| 07 | Without coils | **00** |
| | With coils, without mating connector DIN EN 175301-803 | **01** [5)] |
| | With coils, with bi-directional diode, without mating connector vertical Amp-Junior | **03** |
| | With coils, with bi-directional diode, without mating connector horizontal Amp-Junior | **04** |
| | With coils, with bi-directional diode, without mating connector DT04-2P | **07** |
| | With coils and bipolar sheathed lead 350mm (13,8 in) long with bi-directional diode | **31** |

**Ports**

| | | |
|---|---|---|
| 08 | G 3/8 DIN 3852 | **0** |
| | 9/16-18 UNF 2-B (SAE6) | **1** |

**Secondary valves setting**

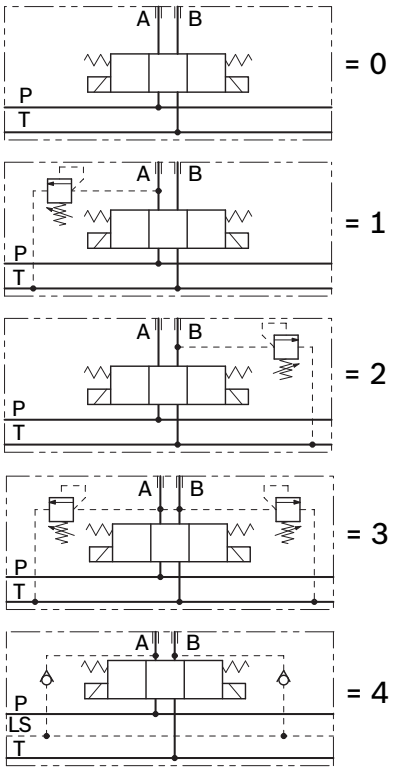
| | | |
|---|---|---|
| 09 | 50-210 bar (725-3045 psi) | **0** [4)] |
| | 100-310 bar (1450-4500 psi) | **1** |
| | 25-50 bar (362-725 psi) | **2** |
| | 50-100 bar (725-1450 psi) | **3** |

**Options**

| | | |
|---|---|---|
| 10 | No options | **No code** |
| | Lever type manual override [2)] | **_ _** |
| | Push-button type manual override | **0P** |
| | Screw type manual override | **0F** |

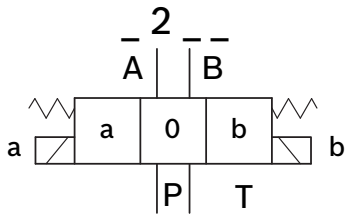
● = Available – = Not available

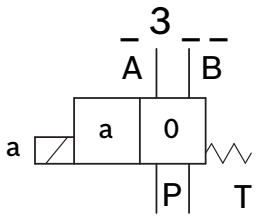
**Symbols**

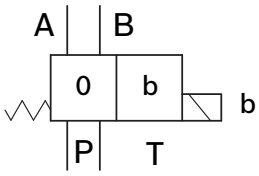


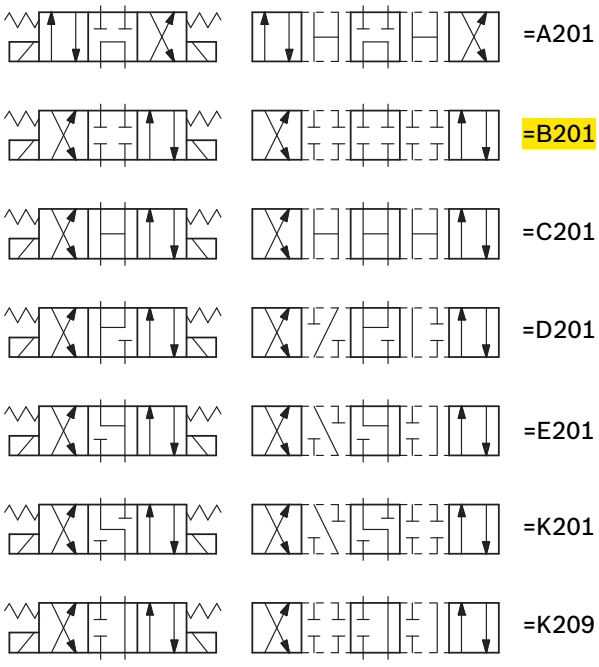

1) The required hydraulic symbol and spool variant can be chosen by consulting page 3.
2) Available only for A, B, E and F spool configurations. See page 9 for code details.
3) The secondary valves have a maximum flow capacity of 6 l/min (1.6 gpm).
4) Without secondary valves (versions L80__; L84__), the standard configuration corresponds to “0”.
5) For connectors ordering code see data sheet RE 18325-90.

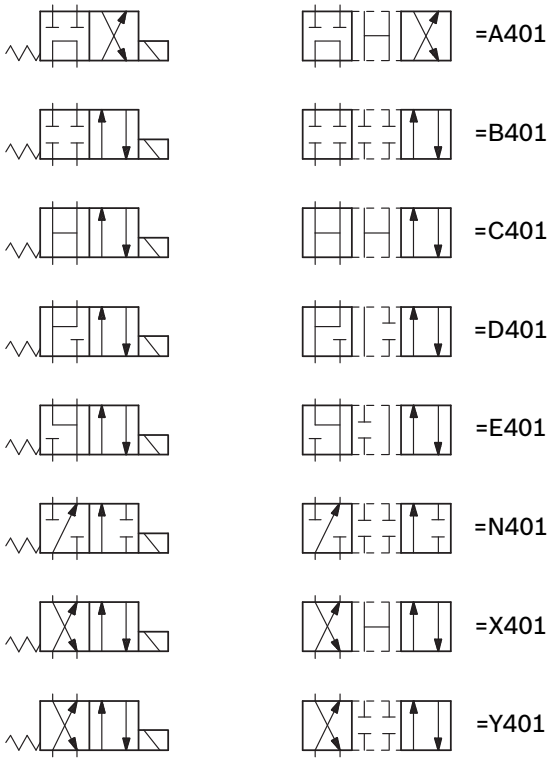
**Spool variants**

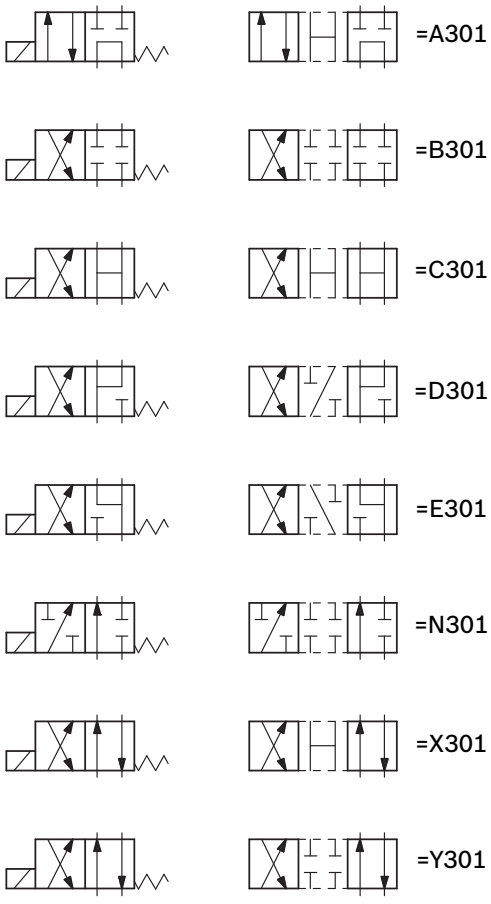


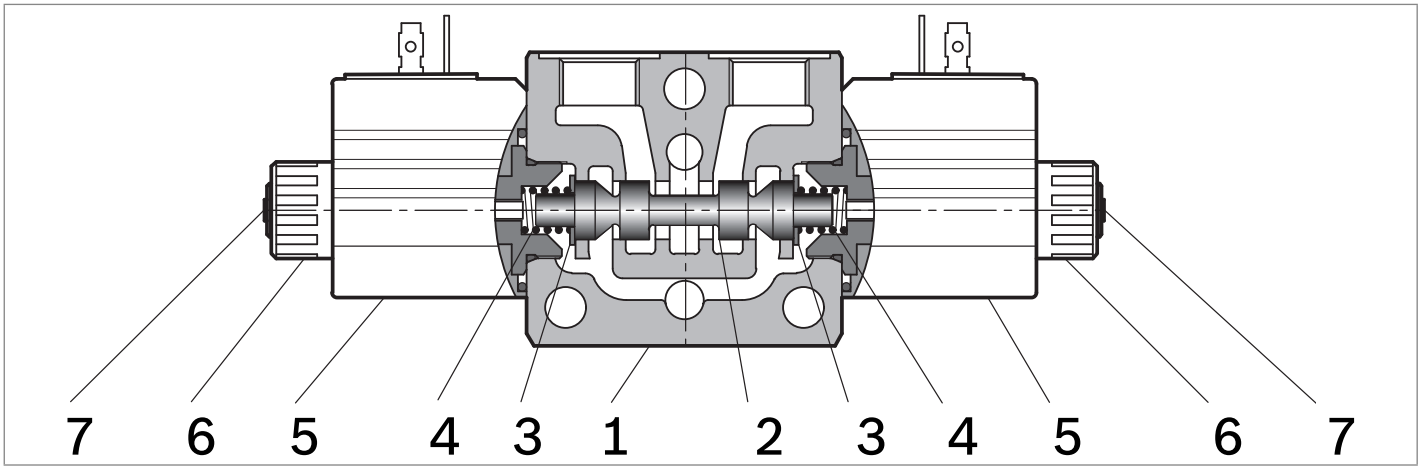



## Functional description




The sandwich plate design directional valve elements L8_10... are 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**), one or two solenoids (**5**), and one or two return springs (**4**).
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 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

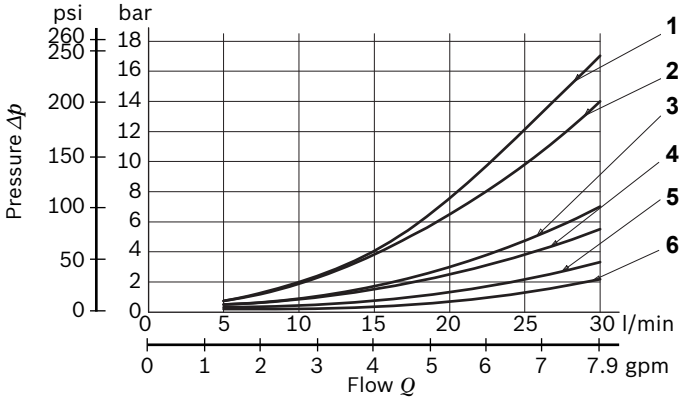
| | | |
|---|---|---|
| **General** | | |
| Valve element with 2 solenoids | kg (lbs) | 1.55 (3.42) |
| Valve element with 1 solenoid | kg (lbs) | 1.25 (2.76) |
| Valve element with 2 solenoids, with lever type emergency | kg (lbs) | 1.9 (4.2) |
| Valve element with 1 solenoid, with lever type emergency | kg (lbs) | 1.6 (3.5) |
| Ambient Temperature | °C (°F) | –20....+50 (-4....+122) (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) | 250 (3625) |
| Max pressure, with lever type emergency at T | bar (psi) | 200 (2900) |
| Maximum inlet flow | l/min (gpm) | 30 (7.9) |
| 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: $\beta_x \geq 75$ X=12...15<br>ISO 4406: class 20/18/15<br>NAS 1638: class 9 |
| Viscosity range | $mm^2/s$ | 5....420 |

| **Electrical** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Voltage type | | DC (AC only with RAC connection) | | | | | | | | |
| Voltage tolerance (nominal voltage) | % | -10 .... +10 | | | | | | | | |
| Duty | | Continuous, with ambient temperature ≤ 50°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 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 | DC | DC | DC |
| Power consumption | W | 26 | 26 | 26 | 26 | 26 | 26 | 29 | 29 | 29 |
| Current (nominal at 20 °C (68 °F)) | A | 2.15 | 2.00 | 1.10 | 1.00 | 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 |

**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) | 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 (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 (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 (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 (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 (Ex. DIN 43650) | C3601 110DC | 110 DC | R933000061 |
| =OV 01 | 24 RAC | EN 175301-803 (Ex. DIN 43650) | C3601 21.5DC | 21.5 DC | R933000054 |
| =OW 01 | 110 RAC | EN 175301-803 (Ex. DIN 43650) | C3601 98DC | 98 DC | R933000060 |
| =OZ 01 | 230 RAC | EN 175301-803 (Ex. DIN 43650) | C3601 207DC | 207 DC | R933000062 |

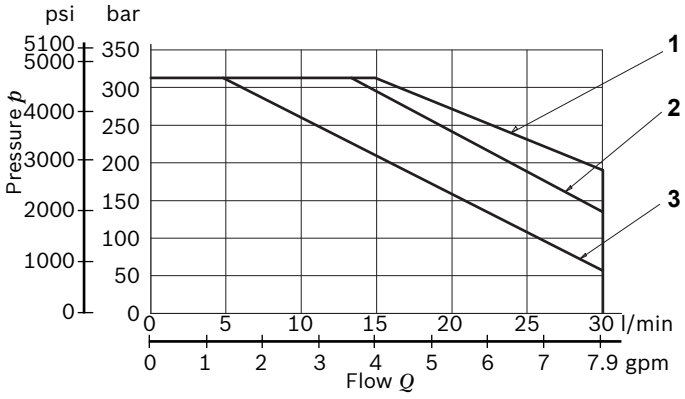
## Characteristic curves




| Spool Variant | Curve no. | | | | |
|---|---|---|---|---|---|
| | P>T | P>A | P>B | A>T | B>T |
| A201, A301, A401 | 3 | 2 | 2 | 1 | 1 |
| X301, X401 | | 4 | 4 | 5 | 5 |
| Y301, Y401 | | 4 | 4 | 5 | 5 |
| B201, B301, B401 | | 5 | 5 | 5 | 5 |
| C201, C301, C401 | 5 | 4 | 4 | 6 | 6 |
| D201, D301, D401 | | 5 | 5 | 4 | 4 |
| E201, E301, E401 | | 4 | 4 | 6 | 6 |
| N301, N401 | | 4 | 4 | | |
| K201, K209 | | 4 | 4 | 4 | 4 |

Measured with hydraulic fluid ISO-VG32 at 45° ±5 °C (113° ±9 °F); ambient temperature 20 °C (68 °F).

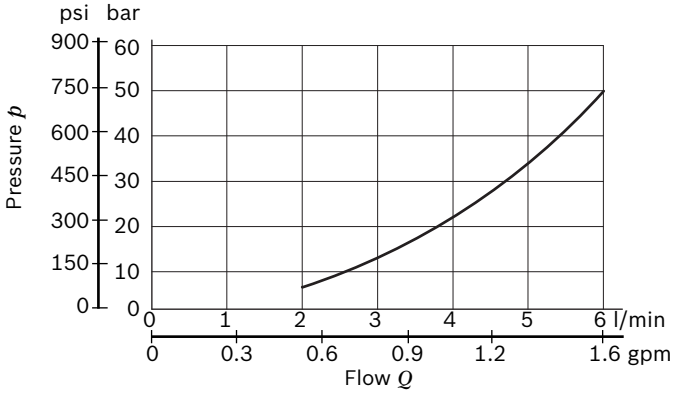
### Performance limits



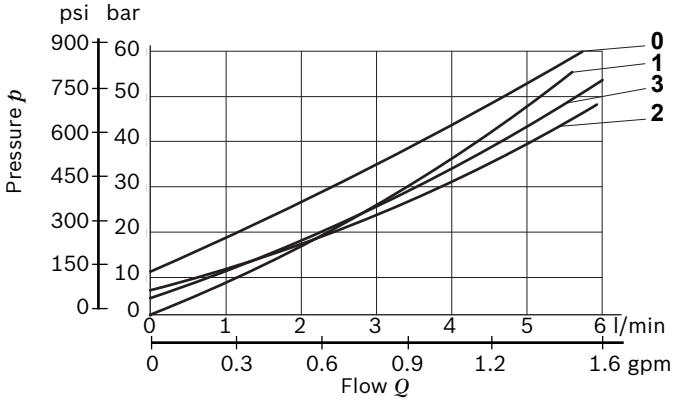

| Spool Variant | Curve no. |
|---|---|
| A201-A301-A401-B201-B301-B401-Y401-X401-X301-Y301-C201-C301-C401-D201-D301-D401 | 1 |
| K201-E201-E301-E401 | 2 |
| N301, N401 | 3 |

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.

### Minimum flow for efficiency of LS control

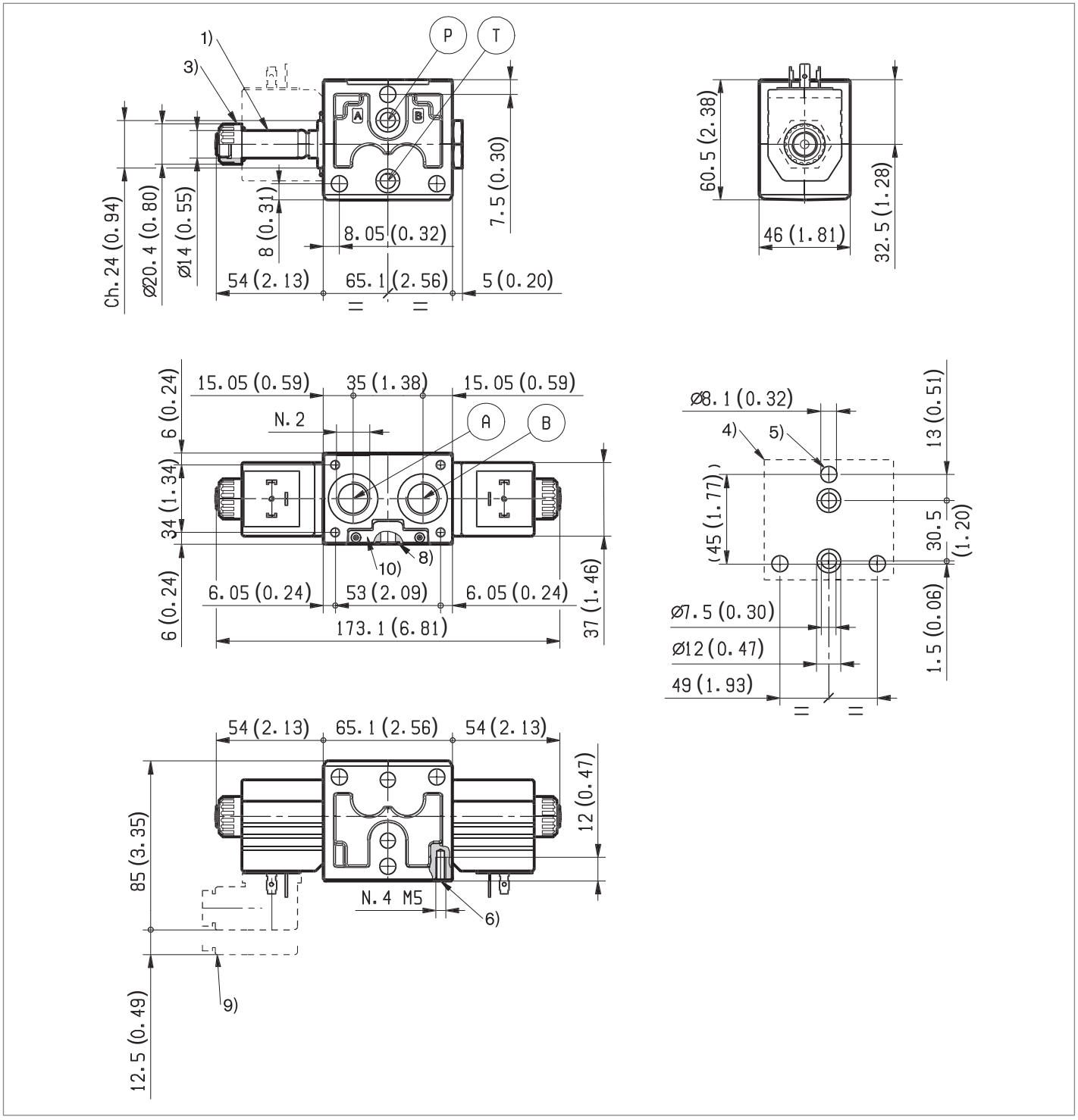



### Lowest pressure setting curve for secondary valves

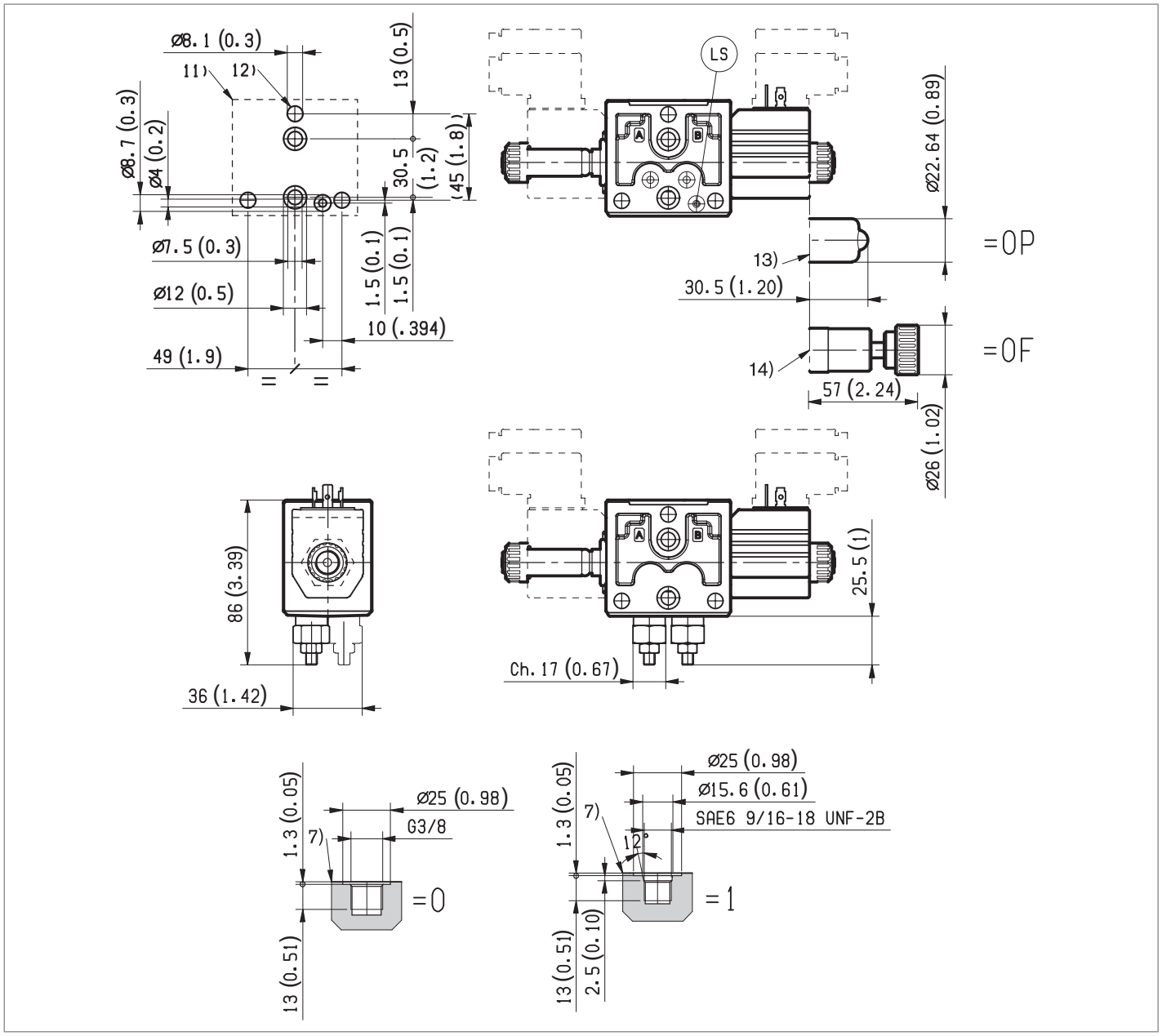



| Secondary valve setting | Curve no. |
|---|---|
| 50-210 bar (700-2950 psi) | 0 |
| 100-310 bar (1400-4500 psi) | 1 |
| 25-50 bar (350-700 psi) | 2 |
| 50-100 bar (700-2950 psi) | 3 |

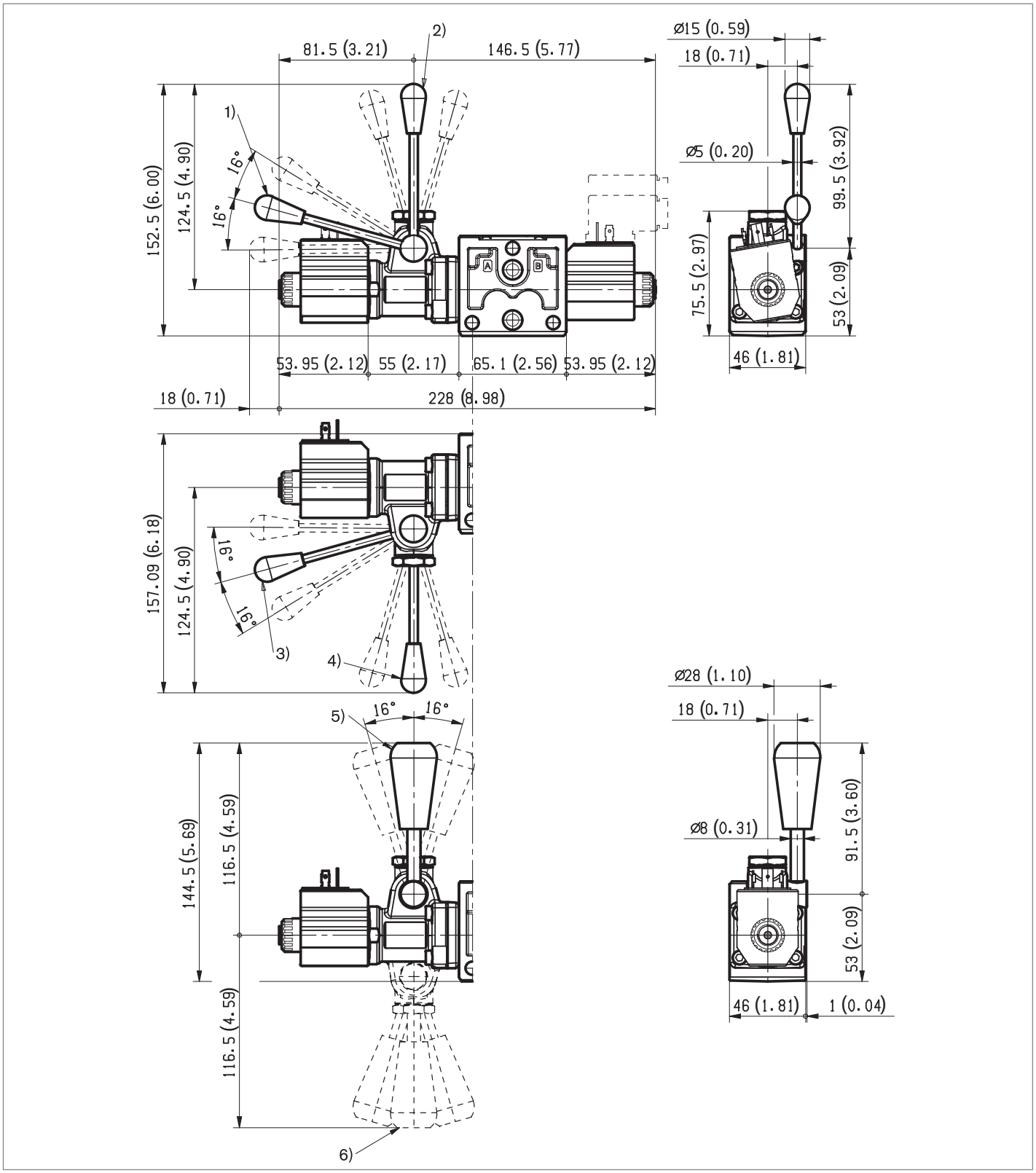
## External dimensions and fittings




**1** Solenoid tube Ø 14 mm (0.55 inch).
**3** Ring nut for coil locking (Ø 24 mm); torque 3-4Nm (2.2-3 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** Four threaded holes M5 for fitting a secondary flangeable element. Bolts M5 with recommended strength class DIN 8.8: torque 5-6 Nm (3.6-4.4 ft-lb).
**7** A and B ports.
**8** O-Rings for P and T ports.
**9** Clearance needed for connector removal.
**10** Identification label.




**11** Flange specifications for coupling to ED intermediate elements.
**12** For tie rod and tightening torque information see data sheet RE 18301-90.
**13** Optional push-button manual override, 0P type, for spool opening: it is pressure stuck to the ring nut for coil locking. Mat no. R933000042.
**14** Optional screw type manual override, 0F 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..




**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)

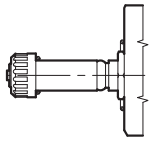
**4** Ordering Details: V1 (if fitted to side A) or V9 (if fitted to side B)

**5** Ordering Details: XA (if fitted to side A) or XB (if fitted to side B)

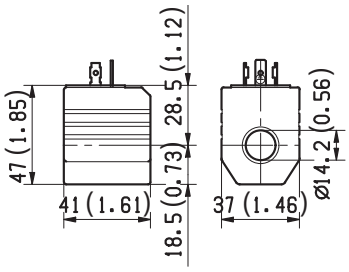
**6** Ordering Details: X1 (if fitted to side A) or X9 (if fitted to side B)

## Electric connection

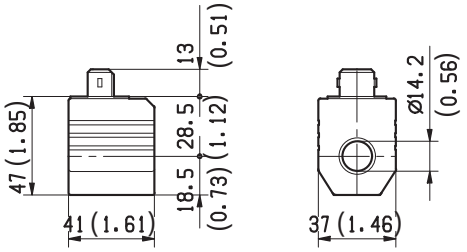
**00**



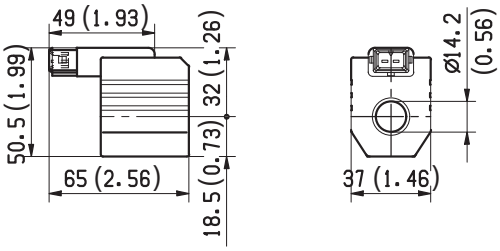
**01**



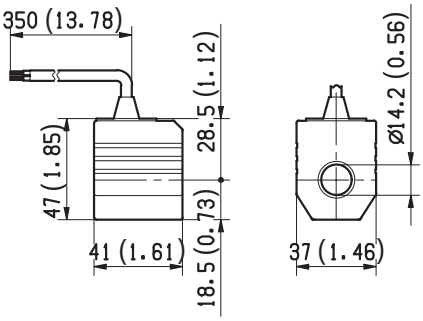

**03** Protection class: IP 65 with female connector properly fitted (see drawing).



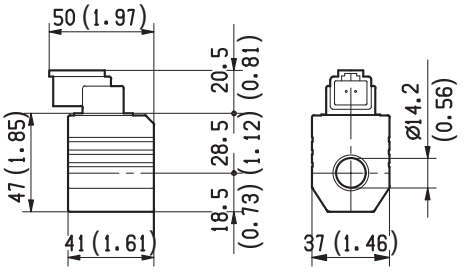

**04** Protection class: IP 65 with female connector properly fitted (see drawing).




**31**




**07** Protection class: IP 69 K with female connector properly fitted (see drawing).

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