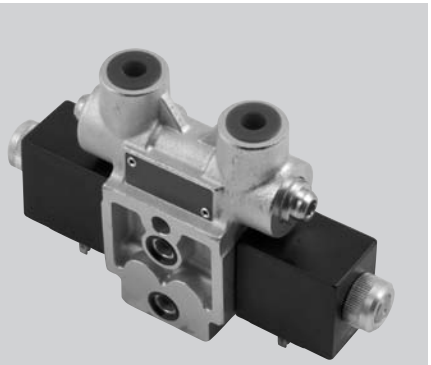
RA 18300-51/10.11

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



B8_45… (EDBY-VR)

Summary

General specifications

- Valve elements with 4 ways and 3 positions.
- Control spools directly operated by screwed-in solenoids with extractable 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; burnish surface treatment.
- Single or Dual cross piloted checks on A and B ports.
- PO checks with 4:1 pilot ratio.
- Coils can be rotated 360° around the tube.
- Manual override (push-button or screw type) available upon request.
- Plug-in connectors available: EN 175301-803 (Was DIN 43650); DT04-2P (Deutsch).

Ordering Details

B	8	_	4 5	_ _ _ _	_ _	_ _	_	_	_	_

Family
Directional valve elements EDB

Type
Size 4

Configuration *
Standard = 0
With secondary valve on A = 1
With ch. for Load Sensing = 4

Coil type
C31

Spool variants [1]
4/3 operated on both sides a and b = _ 2 _ _

Voltage supply
Without coil = 00
12V DC = OB
24V DC = OC

Optional fittings
0 = Standard emergency
P = Push-button type emergency
F = Screw type emergency

PO check valve position
1 = Check valve on port A
3 = Check valve on both ports A and B

Secondary valves setting [2]
0 = 50-210 bar (725-3045 PSI) [1]
1 = 100-310 bar (1450-4500 PSI) [1]
2 = 25-50 bar (362-725 PSI) [1]
3 = Without secondary valves

Ports**
B = 9/16-18 UNF 2-B (SAE6)

Electric connections
00 = Without coils
01 = With coils, without connectors
02 = With coils having connectors EN 175301-803
07 = With coils having DEUTSCH DT 04-2P connector

[1] The required hydraulic symbol and spool variant can be chosen by consulting page 3.

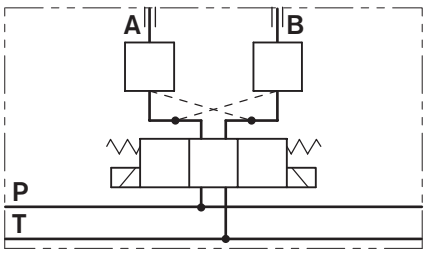
[2] Only for configuration 1.

* Without secondary valve, the standard configuration corresponds to “0”.

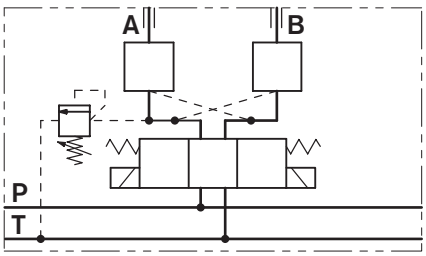
** Additional ports on request.

Note: the secondary valves have a maximum flow capacity of 6 l/min. (1.6 GPM).

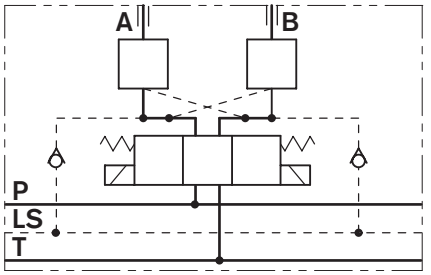
Configuration



= 0

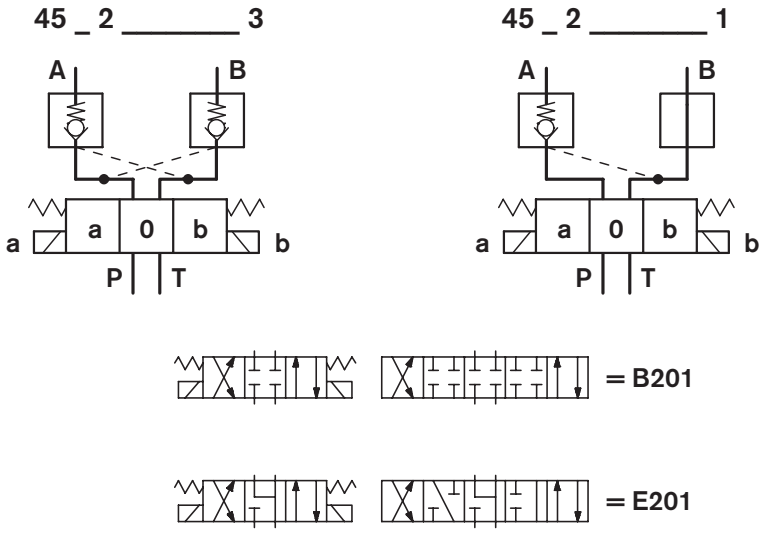


= 1



= 4

Spool variants



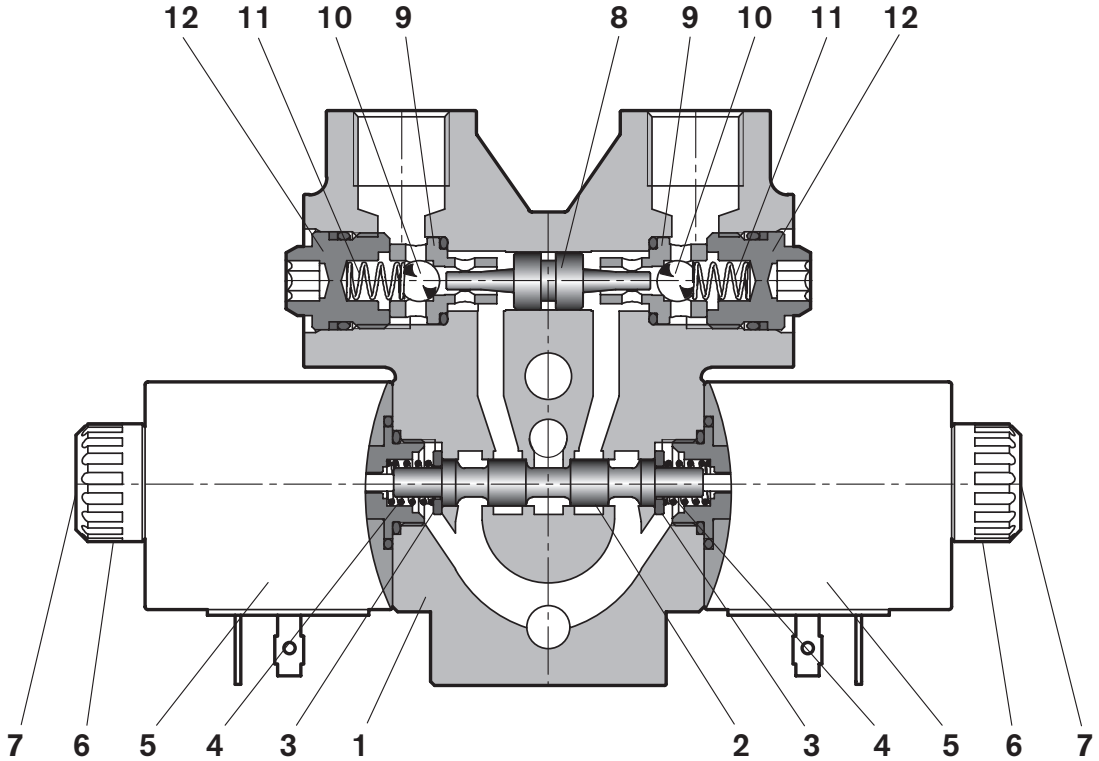
Principles of operation, cross section

The sandwich plate design directional valve elements B8_45… 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)	1.6 (3.5)
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)	150 (2176)
Maximum static pressure at T	bar (PSI)	210 (3045)
Maximum inlet flow	l/min (GPM)	15 (4)
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

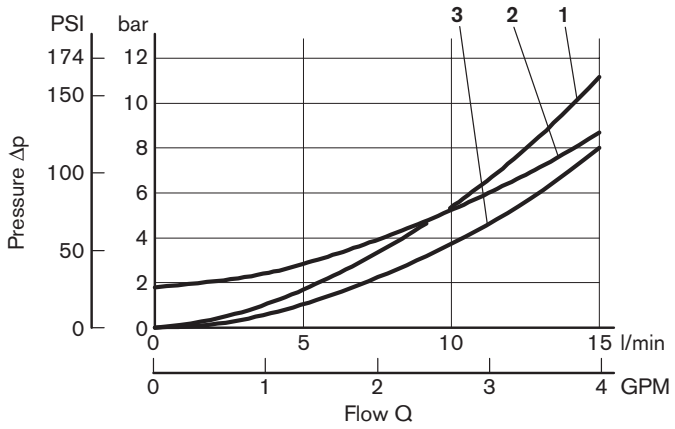
Electrical

Voltage type		DC	
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 with connection EN 175301-803	kg (lbs)	0.18 (0.4)	
Voltage	V	12	24
Voltage type		DC	DC
Power consumption	W	20	20
Current [1]	A	1.72	0.86
Resistance [2]	Ω	6.97	27.88

1) Nominal 2) ± 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)	C3101 12DC	12 DC	R933002776
= OB 07	12 DC	DEUTSCH DT 04-2P	C3107 12DC	12 DC	R933002778
= OC 01 **= OC 02**	24 DC	EN 175301-803 (Ex. DIN 43650)	C3101 24DC	24 DC	R933002777
= OC 07	24 DC	DEUTSCH DT 04-2P	C3107 24DC	24 DC	R933002779

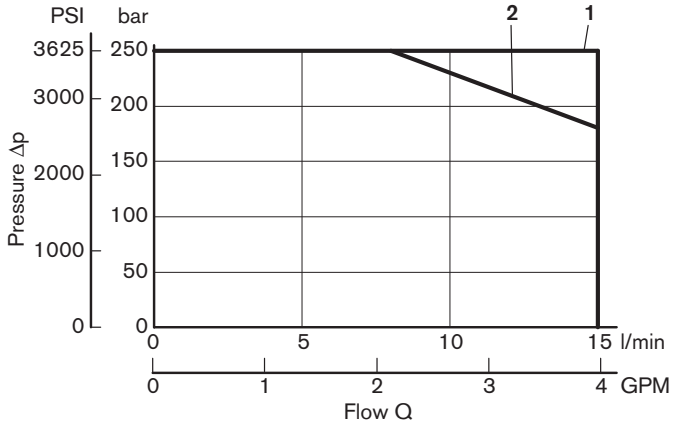
Characteristic curves



Measured with hydraulic fluid ISO-VG32 at 45° ± 5° C (113° ± 9° 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



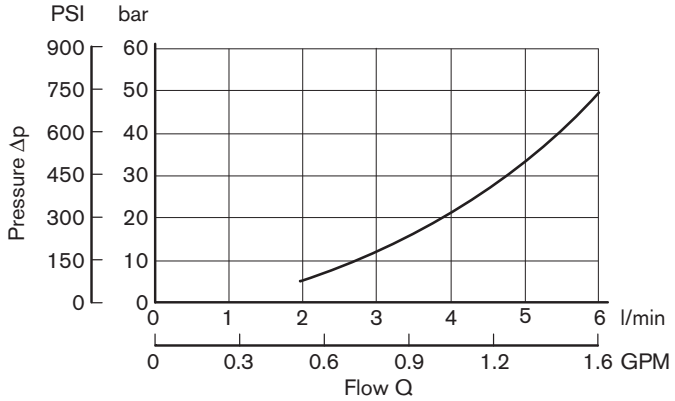
Measured with the solenoids at their operating temperature, 10% under voltage and without pre-loading of the tank.

Spool Variant	Curve No.
B201	2
E201	1

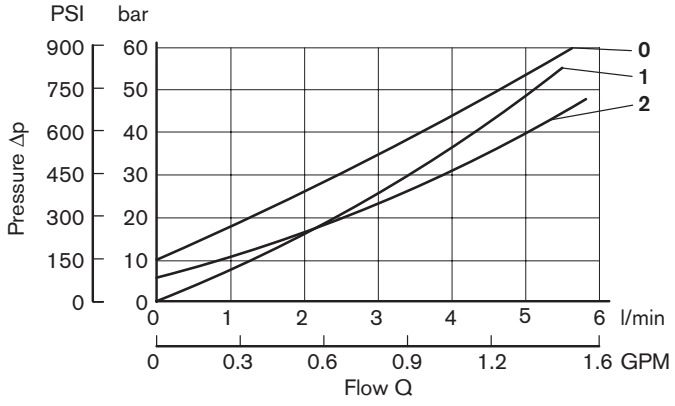
The performance curves are measured with flow going across and coming back, like P > A and B > T, with symmetrical flow areas.

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

Minimum flow for efficiency of LS control

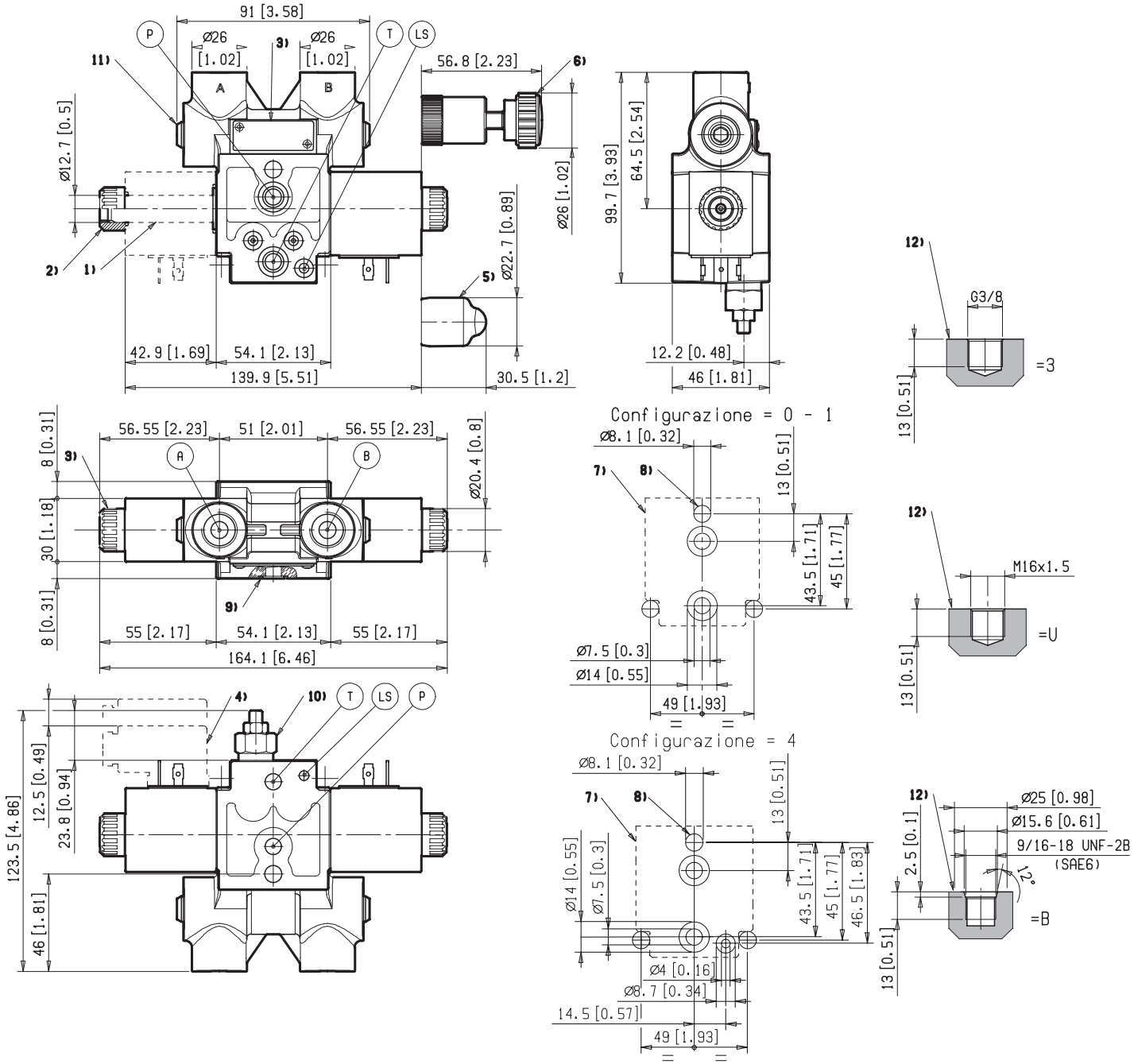


Lowest pressure setting curve for secondary valves



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 11 mm (0.43 inch). Torque 15–16 Nm (11–11.8 ft-lb).

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. R933006377.

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.

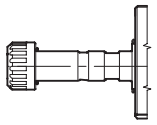
11 Plug hex. 6 mm; torque 30–33 Nm (22–24 ft-lb).

12 A and B ports.

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

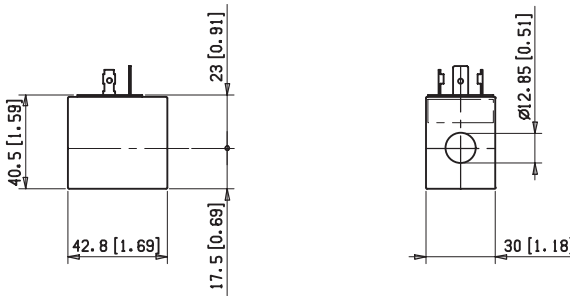
= 00

Without coils, but with ring nut and O-Rings for coil fitting (solution recommended for flexible stock handling)



= 01

With coils having plug-in pins EN 175301-803, without connectors

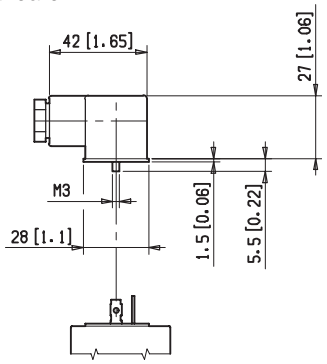


= 02

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.

182-09: Standard

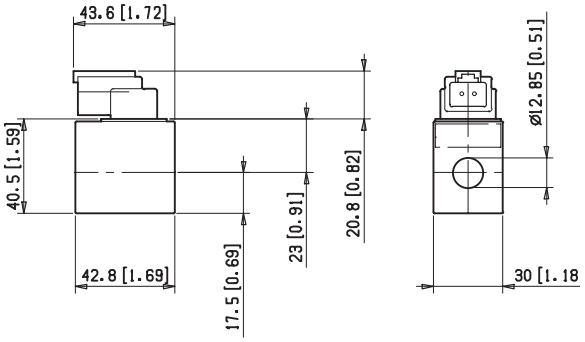


Material No.	**Description**
R933002885	182-09 GRAY
R933002889	182-09 BLACK

=07

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).



Bosch Rexroth Corp.
Hydraulics
2315 City Line Road
Bethlehem, PA 18017-2131
USA
Telephone (610) 694-8300
Facsimile (610) 694-8467
www.boschrexroth-us.com