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

B8_05… (EDBY)

<table>
<thead>
<tr>
<th>Summary</th>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>General specifications</td>
<td>1</td>
</tr>
<tr>
<td>Ordering Details</td>
<td>2</td>
</tr>
<tr>
<td>Configuration</td>
<td>2</td>
</tr>
<tr>
<td>Spool variants</td>
<td>3</td>
</tr>
<tr>
<td>Principles of operation, cross section</td>
<td>3</td>
</tr>
<tr>
<td>Technical Data</td>
<td>4</td>
</tr>
<tr>
<td>Δp-Qv characteristic curves</td>
<td>5</td>
</tr>
<tr>
<td>Performance limits</td>
<td>5</td>
</tr>
<tr>
<td>External Dimensions and Fittings</td>
<td>6</td>
</tr>
<tr>
<td>Electric connection</td>
<td>7</td>
</tr>
</tbody>
</table>

- Valve elements with 4 ways and 3, or 2, 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.
- 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

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_ _
4/2 operated on side a only = _3_ _

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

Secondary valves setting 2)
0 = 50-210 bar (725-3045 PSI) *
1 = 100-310 bar (1450-4500 PSI)
2 = 25-50 bar (362-725 PSI)

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

Electric connections
00 = Without coils
01 = With coils, without connectors
02 = With coils and with non-assembled connectors, type 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 valve has a maximum flow capacity of 6 l/min. (1.6 GPM).

Configuration

A | B
P | T

= 0

A | B
P | T

= 1

A | B
P | T

= 4
Spool variants

05_2__

The sandwich plate design directional valve elements B8_05… 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), 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.

Principles of operation, cross section

The sandwich plate design directional valve elements B8_05… 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), 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 (for applications with different specifications consult us)

**General**

- Valve element with 2 solenoids and plug-in pins EN 175301-803: kg (lbs) 1.2 (2.65)
- Valve element with 1 solenoid and plug-in pins EN 175301-803: kg (lbs) 1.0 (2.20)
- 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)
- Fluid Temperature: °C (°F) –20....+80 (–4....+176) [NBR seals]
- Permissible degree of fluid contamination: ISO 4572: \[B\geq 75 \times X=12...15\]
- ISO 4406: class 20/18/15
- NAS 1638: class 9
- Viscosity range: mm²/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
- 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)

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>Connector type</th>
<th>Coil description</th>
<th>Marking</th>
<th>Coil Mat no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>= OB 01</td>
<td>= OB 02</td>
<td>12 DC</td>
<td>EN 175301-803 (Ex. DIN 43650)</td>
<td>C3101 12DC</td>
</tr>
<tr>
<td>= OB 07</td>
<td>12 DC</td>
<td>DEUTSCH DT 04-2P</td>
<td>C3107 12DC</td>
<td>24 DC</td>
</tr>
<tr>
<td>= OC 01</td>
<td>= OC 02</td>
<td>24 DC</td>
<td>EN 175301-803 (Ex. DIN 43650)</td>
<td>C3101 24DC</td>
</tr>
<tr>
<td>= OC 07</td>
<td>24 DC</td>
<td>DEUTSCH DT 04-2P</td>
<td>C3107 24DC</td>
<td>24 DC</td>
</tr>
</tbody>
</table>
Characteristic curves

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

Performances limits

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

Minimum flow for efficiency of LS control

Lowest pressure setting curve for secondary valves

<table>
<thead>
<tr>
<th>Spool Variants</th>
<th>Curve No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P &gt; T</td>
</tr>
<tr>
<td>A201</td>
<td>2</td>
</tr>
<tr>
<td>B201</td>
<td>3</td>
</tr>
<tr>
<td>C201</td>
<td>4</td>
</tr>
<tr>
<td>E201</td>
<td>3</td>
</tr>
<tr>
<td>K201</td>
<td>3</td>
</tr>
<tr>
<td>Y301</td>
<td>2</td>
</tr>
<tr>
<td>X301</td>
<td>3</td>
</tr>
</tbody>
</table>

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.
1 Solenoid tube hex 12.7 mm (0.5 inch).
Torque 15–16 Nm (11–11.8 ft-lb).
2 Ring nut for coil locking [OD 20.5 mm (0.81 inch)];
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. Mat no.
R9330006377.
6 Optional screw type emergency, 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. R9330006377.
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
9 O-Rings for P and T ports.
10 Space needed for secondary valve.
11 Plug for 2 positions versions (4/2); hex 22 mm,
torque 20–22 Nm (14.7–16.2 ft-lb).
12 A and B ports.
**Electric connection** (or connections, in case of two solenoids)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Without coils, but with ring nut and O-Rings for coil fitting (solution recommended for flexible stock handling)</td>
</tr>
<tr>
<td>01</td>
<td>With coils having plug-in pins EN 175301-803, without connectors</td>
</tr>
<tr>
<td>02</td>
<td>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.</td>
</tr>
<tr>
<td>07</td>
<td>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).</td>
</tr>
</tbody>
</table>

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