Directional spool valves, direct operated, with solenoid actuation

Type WE

**Features**

- 4/3-, 4/2- or 3/2-way version
- Porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05
- High-power solenoid, optionally rotatable by 90°
- Electrical connection as individual or central connection
- Cartridge optionally equipped with PWM connector (fast switching amplifier, energy reduction)
- Manual override, optional
- CE conformity according to the Low Voltage Directive 2006/95/EC for electrical voltages >50 VAC or > 75 VDC
- Solenoid coil with UR approval UL 429
- Approval according to CSA C22.2 No. 139-10, optional

**Contents**

- Features 1
- Ordering codes 2 ... 4
- Symbols 4, 5
- Dimensions 6 ... 9
### Ordering codes

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<th>Code</th>
<th>Description</th>
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<td>3 main ports</td>
</tr>
<tr>
<td>02</td>
<td>Directional valve</td>
</tr>
<tr>
<td>03</td>
<td>Size 10</td>
</tr>
<tr>
<td>04</td>
<td>Symbols e.g. C, E, EA, EB, etc; possible version see page 4 and 5</td>
</tr>
<tr>
<td>05</td>
<td>Component series 50 to 59 (50 to 59: Unchanged installation and connection dimensions)</td>
</tr>
<tr>
<td>06</td>
<td>With spring return</td>
</tr>
<tr>
<td>07</td>
<td>High-power wet-pin solenoid with detachable coil</td>
</tr>
<tr>
<td>08</td>
<td>Direct voltage 12 V</td>
</tr>
<tr>
<td>09</td>
<td>Without manual override</td>
</tr>
<tr>
<td>10</td>
<td>Corrosion resistance (outside)</td>
</tr>
<tr>
<td>11</td>
<td>Electrical connection</td>
</tr>
</tbody>
</table>

#### 01 3 main ports
- 3 main ports
- 4 main ports

#### 02 Directional valve
- WE

#### 03 Size 10
- 10

#### 04 Symbols e.g. C, E, EA, EB, etc; possible version see page 4 and 5
- e.g. C

#### 05 Component series 50 to 59 (50 to 59: Unchanged installation and connection dimensions)
- 5X

#### 06 With spring return
- no code
- D
- O
- OF

#### 07 High-power wet-pin solenoid with detachable coil
- E

#### 08 Direct voltage 12 V
- G12
- G24
- G26
- G48
- G96
- G110
- G125
- G180
- G205
- G220

#### 09 Without manual override
- no code
- N9
- N8
- N5
- N6

#### 10 Corrosion resistance (outside)
- None (valve housing primed)
- Improved corrosion protection (240 h salt spray test according to EN ISO 9227) (see also page 10)
- J3

#### 11 Electrical connection

<table>
<thead>
<tr>
<th>AC voltage mains (admissible voltage tolerance ±10 %)</th>
<th>Nominal voltage of the DC solenoid in case of operation with alternating voltage</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 V - 50/60 Hz</td>
<td>96 V</td>
<td>G96</td>
</tr>
<tr>
<td>110 V - 50/60 Hz</td>
<td>96 V</td>
<td>G96</td>
</tr>
<tr>
<td>200 V - 50/60 Hz</td>
<td>180 V</td>
<td>G180</td>
</tr>
<tr>
<td>230 V - 50/60 Hz</td>
<td>205 V</td>
<td>G205</td>
</tr>
</tbody>
</table>
Ordering codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WE 10</td>
<td>Individual connection</td>
</tr>
<tr>
<td>5X</td>
<td></td>
</tr>
<tr>
<td>/</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
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<td>/</td>
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<tr>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without mating connector; connector according to DIN EN 175301-803</td>
</tr>
<tr>
<td>Without mating connector; connector according to DIN EN 175301-803 (coil with potted-in connector base and sealing element to valve housing (IP67))</td>
</tr>
<tr>
<td>Without mating connector, 4-pole with connector M12x1 according to IEC 60947-5-2, integrated interference protection circuit and status LED</td>
</tr>
<tr>
<td>Without mating connector; connector AMP Junior-Timer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Central connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable entry at the cover, with indicator light</td>
</tr>
<tr>
<td>Central plug-in connection at the cover, with indicator light (without mating connector); connector according to DIN EN 175201-804</td>
</tr>
<tr>
<td>Without mating connector; threaded connection 1/2”-14 NPT</td>
</tr>
<tr>
<td>Cable gland at the cover, with indicator light and cable bridge at the ground connection</td>
</tr>
<tr>
<td>Mini-change connector, 5-pole</td>
</tr>
</tbody>
</table>

| Additional electrical connections and available voltages | see page 10 |

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<th>Switching time increase</th>
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<tbody>
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<td>Without switching time increase</td>
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<tr>
<td>With switching time increase (only with symbol &quot;.73&quot;; not for version &quot;D&quot; with reinforced compression spring; more information upon request)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Throttle insert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without throttle insert</td>
</tr>
<tr>
<td>With throttle insert</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port</th>
<th>Throttle Ø in mm [inch]</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>0.8 [0.031]</td>
</tr>
<tr>
<td>A</td>
<td>1.0 [0.039]</td>
</tr>
<tr>
<td>B</td>
<td>1.2 [0.047]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seal material</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR seals</td>
</tr>
<tr>
<td>FKM seals</td>
</tr>
<tr>
<td>Seals for HFC hydraulic fluids</td>
</tr>
<tr>
<td>Low-temperature version</td>
</tr>
</tbody>
</table>

| Approval according to CSA C22.2 No. 139-10 | CSA |
| Porting pattern according to ANSI B93.9 (if solenoid "a" is energized, channel P is connected to A) | AN |

<table>
<thead>
<tr>
<th>Control spool play</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
</tr>
<tr>
<td>Minimum (to be selected in case of reduced leakage → higher level of oil cleanliness recommended)</td>
</tr>
<tr>
<td>Increased (to be selected in case of a hydraulic fluid/environment temperature difference &gt;25 K → increased internal leakage)</td>
</tr>
</tbody>
</table>

| Further details in the plain text | * |

Explanation of the footnotes see page 4.
Ordering codes

1) Only for version "Central connection"
2) Only for version "Individual connection"
3) The manual override cannot be allocated a safety function. The manual override units may only be used up to a tank pressure of 50 bar.
4) With tank pressures above 50 bar, it cannot be guaranteed that the valve remains in the position switched by the "NS" manual override.
5) Protective cap must be removed prior to actuation.
6) Mating connectors, separate order, see page 20 and data sheet 08006.
7) Recommended for mobile applications; with additional sealing between solenoid coil and pole tube.
8) When the admissible valve performance limits are exceeded, throttle inserts are to be installed (for performance limits, see page 12 and 13).
9) Not with low-temperature version "MT".
10) If throttle inserts are used in channel T, the pressure in the working ports and for connection to the tank chambers must not exceed 210 bar.

Symbols

Notice:
Representation according to DIN ISO 1219-1.
Hydraulic interim positions are shown by dashes.
Symbols

1) Example:
   - Symbol E with spool position "a" ordering code ..EA..
   - Symbol E with spool position "b" ordering code ..EB..

2) Flow cross-section see page 8.

Notices!
- Representation according to DIN ISO 1219-1.
- Hydraulic interim positions are shown by dashes.
- Other symbols upon request.
**Dimensions:** Individual connection  
(dimensions in mm [inch])

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**Notices:**
- Deviating from ISO 4401, port T is called TA and port T1 is called TB in this data sheet.  
- The dimensions are nominal dimensions which are subject to tolerances.
**Dimensions: Central connection**  
(dimensions in mm [inch])

### Special points with version "DAL" and "DL"

- **Version "DL"** is only suitable for permanently installed cables. Lines must be routed in a pull-relieved manner.
- Minimum line cross-section 0.75 mm² (AWG 18)
- With a maximum line cross-section of 1.50 mm² (AWG 16) and if wire end ferrules are used, wire end ferrules without flange must be crimped to a maximum cross-section of 1.5 mm x 2 mm (trapezoidal crimp) using an appropriate tool (e.g. "PZ 6/5", co. Weidmüller) to ensure that they fit into the printed circuit board terminals.
- Before crimping, the wires have to be stripped to 9-1 mm [0.35–0.039 inch].
- For the corresponding line cross-section 1), wire end ferrules without flange (according to DIN 46228-1) with a length of 8 mm [0.31 inch] are to be used.
- For the earthing connection, ring cable lugs according to DIN 46234-4-1 are to be used, tightening torque $M_A = 1.75 \text{Nm} \pm 10\%$

1) 0.75 mm² (AWG 20)  
1.00 mm² (AWG 18)  
1.50 mm² (AWG 16)

### Notice:
The dimensions are nominal dimensions which are subject to tolerances.

### Dimensions for manual overrides** see page 16.  
Item explanations, valve mounting screws and subplates see page 17.

**Notice:**
The lines must be finely stranded.
Dimensions: Manual overrides
(dimensions in mm [inch])

**Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

2 Version **without** and **with concealed** manual override "N9" (standard)

3 Version **with** concealed manual override and protective cap "N8". (The protective cap must be removed prior to actuation.)

4 Version **with** manual override "N5" and "N6"

**Item explanations, valve mounting screws** and **subplates** see page 17.
**Dimensions**

1.1 Solenoid "a"
1.2 Solenoid "b"

2 Version **without** and **with concealed** manual override "N9" (standard)

3 Version **with** concealed manual override and protective cap "N8". (The protective cap must be removed prior to actuation.)

4 Version **with** manual override "N5" and "N6"

5.1 Mating connector **without** circuitry for connector "K4" (separate order, see page 20 and data sheet 08006)

5.2 Mating connector **without** circuitry for connector "K4K" (separate order, see data sheet 08006)

5.3 Mating connector angled with M12x1 plug-in connection and status LED for connector "K72L" (separate order, see data sheet 08006)

5.4 Double mating connector **without/with** circuitry for connector "K4" (separate order, see data sheet 08006)

5.5 Mating connector (AMP Junior Timer) for connector "C4Z" (separate order, see data sheet 08006)

6 Mating connector **with** circuitry for connector "K4" (separate order, see data sheet 08006)

7.1 Cable gland Pg 16 "DL" (terminal area 6 ... 12 mm [0.24 ... 0.47 inch]); lock nut, tightening torque $M_A = 3.3$ Nm [2.43 ft-lbs] ± 10 %

7.2 Central connection box "DAL" 1/2" NPT, tightening torque $M_A = 5$ Nm [3.69 ft-lbs] ± 10 %; sealing by sealant

7.3 Connector "DK6L" and "DK25L"

8.1 Mating connector for connector "DK6L" (separate order, material no. R900002803, see data sheet 08006)

8.2 Mini-change connector, 5-pole for connector "DK25L" (separate order, material no. R900057631)

9 Name plate

10 Identical seal rings for ports A, B, P, TA, TB

11.1 Plug screw for valves with one solenoid on B side

11.2 Plug screw for valves with one solenoid on A side

12 Space required to remove the mating connector/angled socket

13 Space required to remove the coil

14 Mounting nut, tightening torque $M_A = 14.5 \times 1.5$ Nm [10.69 ± 1.1 ft-lbs]

15 Porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05

16 Connection TB can only be used in connection with separately produced bore.

17 Cover

**Notice:** The valve may only be operated with properly mounted cover! Tightening torque of the cover screws $M_A = 1.0$ Nm [0.74 ft-lbs] ± 10 %.

Prior to opening the frame, it must be ensured that the valve has no voltage!

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**Subplates** according to data sheet 45054 (separate order)

G 66/01 (G3/8)
G 67/01 (G1/2)
G 534/01 (G3/4)
G 66/12 (SAE-6; 9/16-18) 1)
G 67/12 (SAE-8; 3/4-16) 1)
G 534/12 (SAE-12; 1-1/16-12) 1)

1) Upon request

**Valve mounting screws** (separate order)

4 metric hexagon socket head cap screws

ISO 4762 - M6 x 40 - 10.9-flZn-240h-L

(friction coefficient $\mu_{total} = 0.09$ to 0.14);

tightening torque $M_A = 12.5$ Nm [9.2 ft-lbs] ± 10 %,

material no. R913000058

or

4 hexagon socket head cap screws

ISO 4762 - M6 x 40 - 10.9 (self procurement)

(friction coefficient $\mu_{total} = 0.12$ to 0.17);

tightening torque $M_A = 15.5$ Nm [11.4 ft-lbs] ± 10 %

4 UNC hexagon socket head cap screws

1/4-20 UNC x 1-1/2" ASTM-A574

(friction coefficient $\mu_{total} = 0.19$ to 0.24);

tightening torque $M_A = 25$ Nm [18.4 ft-lbs] ± 15 %,

(friction coefficient $\mu_{total} = 0.12$ to 0.17);

tightening torque $M_A = 19$ Nm [14.0 ft-lbs] ± 10 %,

material no. R978800710

With different friction coefficients, the tightening torques are to be adjusted accordingly!