4/2 and 4/3 Directional Control Valve, Solenoid Operated

RPE4-10

Size 10 (D05) • \( Q_{\text{max}} = 140 \text{ l/min (37 GPM)} \) • \( p_{\text{max}} = 350 \text{ bar (5100 PSI)} \)

**Technical Features**

- Direct acting directional control valve with subplate mounting interface acc. to ISO 4401, DIN 24340 (CETOP 05)
- High transmitted hydraulic power up to 350 bar with optimized design to minimize pressure drop
- Five chamber housing design with reduced hydraulic power dependence on fluid viscosity
- The valve is available with interchangeable DC solenoids, also for AC power supply using a built-in rectifier bridge
- Wide range of solenoid electrical terminal versions available
- Wide range of interchangeable spools and manual overrides available
- CSA Certificate upon request
- Inductive contactless Normally Open and Normally Closed spool position sensor option
- Soft-shift spool speed control option
- The coil is fastened to the core tube with a retaining nut and can be rotated by 90° to suit the available space.
- In the standard version, the valve housing is phosphated and steel parts zinc-coated for 240 h salt spray protection acc. to ISO 9227
- Enhanced surface protection for mobile sector available (ISO 9227, 520 h salt spray)

**Technical Data**

| Valve size | 10 (D05) |
| Max. flow | 140 (37) |
| Max. operating pressure at ports P, A, B | bar (PSI) |
| standard | 350 (5080) |
| Max. operating pressure at port T | bar (PSI) |
| standard | 210 (3050) |
| Fluid temperature range (NBR) | °C (°F) |
| -30 ... +80 (+22 ... +176) |
| Fluid temperature range (FPM) | °C (°F) |
| -20 ... +80 (-4 ... +176) |
| Ambient temperature range | °C (°F) |
| -30 ... +50 (+22 ... +122) |
| Supply voltage tolerance | % |
| AC: ±10 | DC: ±10 |
| Max. switching frequency | 1/h |
| 15 000 |
| Switching time at \( v = 32 \text{ mm/s (156 SUS)} \) |
| ON | ms |
| AC: 30 ... 40 | DC: 30 ... 40 |
| OFF | AC: 30 ... 70 | DC: 10 ... 50 |
| Enclosure type acc. to EN 60529 | IP65 / IP67 (see Dimensions, page 3) |
| Weight - valve with 1 solenoid | kg (lbs) |
| - valve with 2 solenoids | 3.9 (8.60) | 5.4 (11.90) |
| Datasheet Type | General information |
| GI_0060 | Products and operating conditions |
| Coil types / connectors | C_8007 / K_8008 | C31* / K* |
| Mounting interface | SMT_0019 | Size 10 |
| Spare parts | SP_8010 |

**Characteristics** measured at \( v = 32 \text{ mm/s (156 SUS)} \)

### Operating limits

Operating limits for maximum hydraulic power at rated temperature and supply voltage equal to 90% nominal.

### Pressure drop related to flow rate

For operating limits under conditions and flow directions other than shown contact our technical support. Admissible operating limits may be considerably lower with only one direction of flow (A or B plugged, or without flow.)
### Ordering Code

<table>
<thead>
<tr>
<th>Ordering Code</th>
<th>RPE4 - 10</th>
</tr>
</thead>
</table>

#### 4/2 and 4/3 directional control valve, solenoid operated

<table>
<thead>
<tr>
<th>Valve size</th>
<th>Number of spool positions</th>
<th>Spool symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>see the table &quot;Spool Symbols&quot;</td>
</tr>
</tbody>
</table>

#### Rated supply voltage of solenoids

- **(at the coil terminals)**
  - 12 V DC / 3.17 A: 01200
  - 24 V DC / 1.73 A: 02400
  - 27 V DC / 1.52 A: 02700
  - 205 V DC / 0.20 A: 20500
  - 120 V AC / 0.38 A / 60 Hz: 12060
  - 230 V AC / 0.20 A / 50 (60) Hz: 23050

#### Connector

- EN 175301-803-A with quenching diode
- Amp Junior Timer - radial direction (2 pins; male)
- E1 with quenching diode
- E3 with quenching diode
- E4 with quenching diode
- EN 175301-803-A with integrated rectifier
- Loose conductors (two insulated wires)
- E8 with quenching diode
- E9 with quenching diode
- Deutsch DT04-2P - axial direction (2 pins; male)
- E12A with quenching diode
- E13A with quenching diode

#### Spool Symbols

<table>
<thead>
<tr>
<th>Type</th>
<th>Symbol</th>
<th>Interposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z11</td>
<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
<tr>
<td>C11</td>
<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
<tr>
<td>H11</td>
<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
<tr>
<td>P11</td>
<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
<tr>
<td>Y11</td>
<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
<tr>
<td>L21</td>
<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
<tr>
<td>B11</td>
<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
<tr>
<td>C21</td>
<td><img src="image" alt="Symbol" /></td>
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</tr>
<tr>
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<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
<tr>
<td>R21</td>
<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
<tr>
<td>A51</td>
<td><img src="image" alt="Symbol" /></td>
<td><img src="image" alt="Interposition" /></td>
</tr>
</tbody>
</table>

#### Seals

- NBR
- FPM (Viton)

#### Manual override

- Standard
- Cap nut covered
- Rubber boot protected
- Hand screw
- Socket head screw
- Without manual override

#### Rated supply voltage of solenoids (at the coil terminals)

- 12 V DC / 3.17 A: 01200
- 24 V DC / 1.73 A: 02400
- 27 V DC / 1.52 A: 02700
- 205 V DC / 0.20 A: 20500
- 120 V AC / 0.38 A / 60 Hz: 12060
- 230 V AC / 0.20 A / 50 (60) Hz: 23050

- CSA upon request.

- For directional valves with two solenoids, one solenoid must be de-energized before the other solenoid can be charged.
- For AC voltage supply use coils with connector type E5.
- For other solenoid voltage supply options see data sheet C_8007.
- The solenoid operated valves are delivered without connectors. For available connectors see data sheet K_8008.

- The orifice to the P port can be ordered separately, see data sheet SP_8010.
- Mounting bolts M6 x 45 DIN 912-10.9 or studs must be ordered separately.
- Tightening torque is 14 Nm (10.3 lbf.ft).
- Besides the commonly used valve versions shown other special models are available. Contact our technical support for their identification, feasibility and operating limits.
- For AC voltage supply use coils with connector type E5.
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### Connectors

- EN 175301-803-A
- E1 with quenching diode
- E2 with quenching diode
- E3 with quenching diode
- E4 with quenching diode
- E5 with quenching diode
- E6 with quenching diode
- E7 with quenching diode
- E8 with quenching diode
- E9 with quenching diode
- E12A with quenching diode
- E13A with quenching diode

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### Type of Solenoid Coil in millimeters (inches)

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1, E2</td>
<td>Protection degree IP65</td>
</tr>
<tr>
<td>E3, E4</td>
<td>Protection degree IP65</td>
</tr>
<tr>
<td>E5</td>
<td>Protection degree IP65</td>
</tr>
<tr>
<td>E8, E9</td>
<td>Protection degree IP65</td>
</tr>
<tr>
<td>E12A, E13A</td>
<td>Protection IP67 / 69K</td>
</tr>
</tbody>
</table>

### Manual Override in millimeters (inches)

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No designation</td>
<td>Standard</td>
</tr>
<tr>
<td>N1</td>
<td>Cap nut covered</td>
</tr>
<tr>
<td>N2</td>
<td>Rubber boot protected</td>
</tr>
<tr>
<td>N4</td>
<td>Hand screw</td>
</tr>
<tr>
<td>N5</td>
<td>Socket head screw size 3</td>
</tr>
<tr>
<td>N9</td>
<td>Without manual override</td>
</tr>
</tbody>
</table>

### Spool Position Sensor

**Function of the position sensor:**
In the basic position (when the solenoid is switched off), a steel core, connected to the spool, is under the position sensor. The sensor is activated, it means contacts of the sensor S1 are closed and contacts of the sensor S4 are open. After switching on the solenoid the spool with core moves out of the sensor range and the sensor is deactivated.

**Technical Data of the Sensor**

<table>
<thead>
<tr>
<th>Sensor</th>
<th>V</th>
<th>mA</th>
<th>Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1, S4</td>
<td>24 DC</td>
<td>200</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Technical Data of the Connector**

<table>
<thead>
<tr>
<th>Sensor</th>
<th>V</th>
<th>°C (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1, S4</td>
<td>10 ... 30 DC</td>
<td>-25 ... +80 (-13 ... +176)</td>
</tr>
</tbody>
</table>

**Typical configurations of the valve with a sensor:**
3-position valve with two solenoids, equipped with two sensors
2-position valve with one solenoid, equipped with one sensor on the solenoid side
2-position valve with a detent assembly of spool, equipped with one sensor on the side of the solenoid which moves the spool from the basic position to the switched position according to the spool symbol.

**Note:** the sensor always indicates the change of spool position realised by the energised solenoid, mounted on the side of the sensor.
### Spool Speed Control in millimeters (inches)

<table>
<thead>
<tr>
<th>Designation T0 - Plug VSTI M10x1</th>
<th>Designation T2 - Orifice Ø 0.6 (0.02)</th>
<th>Designation T3 - Needle valve</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Plastic nut 6+1 Nm (4.4+0.7 lbf.ft)" /></td>
<td><img src="image" alt="Switching time ON and OFF" /></td>
<td><img src="image" alt="The needle valve allows continuous adjustment of the shifting time." /></td>
</tr>
<tr>
<td>Plugged cavity for optional soft-shift control devices installation (T2, T3)</td>
<td>The orifice extends the valve shifting time.</td>
<td>The switching times shown are valid for viscosity $\nu = 32 \text{ mm}^2/\text{s} (156 \text{ SUS})$ and nominal voltage. They depend on working pressure and flow rate of the directional control valve.</td>
</tr>
</tbody>
</table>

### Dimensions in millimeters (inches)

#### Valve with two solenoids

**RPE4-103**/**E1**

- Plastic nut 6+1 Nm (4.4+0.7 lbf.ft)
- Switching time ON and OFF
- The orifice extends the valve shifting time.
- The needle valve allows continuous adjustment of the shifting time.

#### Valve with one solenoid "b"

Spool symbols X11, C11, H11

- Designation: T0 - Plug VSTI M10x1
- Designation: T2 - Orifice Ø 0.6 (0.02)
- Designation: T3 - Needle valve

#### Valve with one solenoid "a"

Spool symbols R11, R21, A51, P51, Y51, C51, B51, Z51, H51

- Designation: T0 - Plug VSTI M10x1
- Designation: T2 - Orifice Ø 0.6 (0.02)
- Designation: T3 - Needle valve

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Subject to change · RPE4-10_4039_3en_05/2018