Explosion Proof, 4/2 and 4/3 Directional Control Valve, Pilot Operated

RNEXH1-10

Size 10 (D05) • Q\textsubscript{max} 150 l/min (40 GPM) • p\textsubscript{max} 320 bar (4600 PSI) / 420 bar (6100 PSI)

Technical Features

› Directional control valve internally or externally pilot operated with standard mounting interface CETOP 4.2-4 P05-320, optional interface acc. to ISO 4401-05-05-0-05
› Driven by an ISO 4401-03 (CETOP 03) solenoid operated directional valve
› High pressure version of main stage 420 bar (6090 PSI) available
› High transmitted hydraulic power, optimized design to minimize the pressure drop
› Flexibly changed from internal pilot or drain to external by inserting or removing threaded plugs in the main control valve body
› Wide range of interchangeable spools and valve controls available
› In the standard version, the valve housing is zinc-coated for 520 h protection acc. to ISO 9227

ATEX/IECEx Classification

The valves equipped with explosion proof solenoids are available with following certifications and protection modes:

<table>
<thead>
<tr>
<th>Certification</th>
<th>Protection Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS14ATEX1744 X</td>
<td>IECEx EPS14.0064 X</td>
</tr>
<tr>
<td>I M2 Ex mb l Mb</td>
<td>Ex mb l Mb</td>
</tr>
<tr>
<td>II 2G Ex mb IIIC T4, T5, T6 Gb</td>
<td>Ex mb IIIC T4, T5, T6 Gb</td>
</tr>
<tr>
<td>II 2D Ex mb IIIC T135°C, T100°C, T85°C Db</td>
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Technical Data

<table>
<thead>
<tr>
<th>Valve type</th>
<th>RNEX*1-10</th>
<th>RNEX*1H-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve size</td>
<td>10 (D05)</td>
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</tr>
<tr>
<td>Max. flow l/min (GPM)</td>
<td>150 (37)</td>
<td>150 (37)</td>
</tr>
<tr>
<td>Max. operating pressure at port A, B bar (PSI)</td>
<td>320 (4640)</td>
<td>420 (6090)</td>
</tr>
<tr>
<td>- at port T (external drain)</td>
<td>210 (3050)</td>
<td>350 (5080)</td>
</tr>
<tr>
<td>- at port T (internal drain)</td>
<td>210 (3050)</td>
<td>210 (3050)</td>
</tr>
<tr>
<td>Minimum pilot pressure bar (PSI)</td>
<td>12 (174)</td>
<td>12 (174)</td>
</tr>
<tr>
<td>Maximum pilot pressure bar (PSI)</td>
<td>210 (3050)*</td>
<td>350 (5080)*</td>
</tr>
<tr>
<td>Fluid temperature range (NBR) °C (°F)</td>
<td>-30 ... +80 (-22 ... +176)</td>
<td>-30 ... +80 (-22 ... +176)</td>
</tr>
<tr>
<td>Fluid temperature range (FPM) °C (°F)</td>
<td>-20 ... +60 (-4 ... +140)</td>
<td>-20 ... +60 (-4 ... +140)</td>
</tr>
<tr>
<td>Ambient temperature range °C (°F)</td>
<td>-30 ... +50 (-22 ... +122)</td>
<td>-30 ... +50 (-22 ... +122)</td>
</tr>
<tr>
<td>Supply voltage tolerance % AC: ±10 DC: ±10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. switching frequency 1/h</td>
<td>10 000</td>
<td></td>
</tr>
<tr>
<td>Enclosure type acc. to EN 60529</td>
<td>IP 66/68</td>
<td></td>
</tr>
<tr>
<td>Switching time at ν=32 mm/s (125 SUS) ON ms AC: 45 ... 60** DC: 55 ... 75**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OFF ms AC: 45 ... 60** DC: 55 ... 75**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight RNEXH1-102 kg (lbs)</td>
<td>7.3 (16.1)</td>
<td></td>
</tr>
<tr>
<td>RNEXH1-103 kg (lbs)</td>
<td>8.8 (19.4)</td>
<td></td>
</tr>
<tr>
<td>Data Sheet</td>
<td>SP_8010</td>
<td></td>
</tr>
</tbody>
</table>

*For higher system pressure use option “Z”
**The values indicated refer to a solenoid valve working with a pilot pressure of 100 bar (mineral oil, temperature = 50 °C, viscosity = 36 mm²/s, P - A and B - T connected).
### Ordering Code

- **Surface treatment**: zinc-coated (ZnNi), ISO 9227 (520 h)
- **Seals**: NBR
- **Manual override on pilot valve**: standard detent assembly, without manual override
- **Cable length**: 3000 mm (for AC and DC version), 8000 mm (for DC version on request)
- **Temperature class - solenoid nominal power**: class T4 - 10 W, class T6 (T5) - 10 W
- **DC voltage**: connection box + cable gland, 12 V DC / 0.75 A, 24 V DC / 0.39 A, 48 V DC / 0.19 A, 110 V DC / 0.094 A
- **AC voltage**: 110 V AC / 0.112 A, 230 V AC / 0.052 A

### Spool Symbols

<table>
<thead>
<tr>
<th>Spool Symbol</th>
<th>Spool Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z11</td>
<td>Three positions with centering spring</td>
</tr>
<tr>
<td>H11</td>
<td>Two positions with return spring</td>
</tr>
<tr>
<td>Y11</td>
<td>Three positions with centering spring</td>
</tr>
<tr>
<td>C11</td>
<td>Two positions with mechanical detent on pilot valve</td>
</tr>
<tr>
<td>P11</td>
<td></td>
</tr>
</tbody>
</table>

**Installation Note:**
- It is necessary to ensure minimum pilot pressure, therefore external piloting must be used for spools which have connection between P and T ports (H11, C11, R52, X52, J27).
- Attention: spools J17, J27 may assume an undefined position without energy supply.
- Other special versions are available. Consult our technical department.
Pilot and Drain

The RNEXH valves are available with pilot and drain, both internal and external.

<table>
<thead>
<tr>
<th>Type of valve</th>
<th>Plug assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>RNEXH1-10**/*</td>
<td>internal pilot and external drain</td>
</tr>
<tr>
<td>RNEXH1-10**/*I</td>
<td>internal pilot and internal drain</td>
</tr>
<tr>
<td>RNEXH1-10**/*E</td>
<td>external pilot and external drain</td>
</tr>
<tr>
<td>RNEXH1-10**/*EI</td>
<td>external pilot and internal drain</td>
</tr>
</tbody>
</table>

X: plug M5x6 for external pilot
Y: plug M5x6 for external drain

Operating limits
Operating limits for maximum hydraulic power at rated temperature and supplied with voltage equal to 90 % of the nominal value.

<table>
<thead>
<tr>
<th>Maximum flow rates in l/min (GPM)</th>
<th>at pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>210 bar (3050 PSI)</td>
<td>320 bar (4640 PSI)</td>
</tr>
<tr>
<td>Spool type C11</td>
<td>500 (133) 450 (119)</td>
</tr>
<tr>
<td>All other spools</td>
<td>600 (159) 500 (133)</td>
</tr>
</tbody>
</table>

| Characteristics measured at v = 32 mm/s (156 SUS) |

Pressure drop related to flow rate

<table>
<thead>
<tr>
<th>Flow Q [l/min (GPM)]</th>
<th>Pressure drop Δp [bar (PSI)]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(6.6) (13.2) (19.8) (26.4) (33.0) (39.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spool position</th>
<th>P-A</th>
<th>P-B</th>
<th>A-T</th>
<th>B-T</th>
<th>P-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z11</td>
<td>Energized</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>De-energized</td>
<td>6</td>
<td>*RS1, R52, X51, X52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H11</td>
<td>Energized</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>De-energized</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y11</td>
<td>Energized</td>
<td>1**</td>
<td>1***</td>
<td>P11</td>
<td></td>
</tr>
<tr>
<td>De-energized</td>
<td>6***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C11</td>
<td>Energized</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>*A-B blocked</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>**B blocked</td>
<td>6**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>***A blocked</td>
<td>6***</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

Actuation in millimeters (inches)

Solenoid control: RNEXH
The valve is supplied with an RPEX3-06 pilot solenoid valve.

The minimum piloting pressure can be as low as 5 bar at low flow rates, but with higher flow rates a pressure of 12 bar is needed.

If the valve operates with higher pressures it is necessary to use the version with external pilot and reduced pressure. Otherwise, the valve with internal pilot and a pressure reducing valve with a 30 bar fixed setting can be ordered.
Control Options - Special Features

Control of the main spool shifting speed: D
By placing a flow control valve between the pilot solenoid valve and the hydopiloted valve, the pilot flow rate can be controlled and therefore the shifting speed adjusted. Add the letter D to the identification code to request this device.

Pilot pressure reducing valve - 30 bar fixed setting: Z
Internal piloting with mounted pressure reducing valve with 30 bar fixed setting. The option Z may be used together with option D.

Control of the main spool stroke: C
Using special side plugs, it is possible to introduce stroke control the piloted valve so as to vary the maximum spool opening clearance. This solution allows the control of the flow rate from the pump to the actuator and from the actuator to the outlet, resulting in double adjustable control of the actuator. Add the letter C to the identification code to request this device.

Shifting speed control: PF
with an orifice (0.8 mm) in port P of the solenoid pilot valve
Add PF to the identification code to request this device

Solenoid operated distributor with pilot valve in the configuration 3H11
It is possible to deliver the solenoid operated distributor with the pilot valve in configuration 3H11 (all the ports at the outlet). This configuration is used with external piloting in order to allow the unloading of the piloting line when the solenoid operated valve is in the rest position. With this option, the piloting is necessarily external.

Dimensions in millimeters (inches)

RNEXH1-103

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
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<tbody>
<tr>
<td>75 (2.95)</td>
<td>262 (10.31)</td>
<td>100 (3.94)</td>
</tr>
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</table>

Space required to remove coil

mounting hole threads: M6 x 10

*bolts not supplied