Explosion Proof, 4/2 and 4/3, Directional Control Valve - Spool Position Monitoring

RPEX3-06*S6

Size 06 (D03) • Q_max 60 l/min (16 GPM) • p_max 350 bar (5100 PSI)

Technical Features

› Solenoid coil in acc. with directive ATEX 2014/34/EU for explosion-hazard zones
› Explosion protection for gas
› Valve and solenoid design prevents a surface temperature capable of igniting
› Encapsulation enclosure solenoid version
› Direct acting, directional control valve with subplate mounting surface acc. to ISO 4401, DIN 24340 (CETOP 03) standards
› Inductive spool position contactless sensor
› High transmitted hydraulic power up to 350 bar with optimized design to minimize the flow pressure drop
› Five chambers housing design with reduced hydraulic power dependence on fluid viscosity
› Wide range of interchangeable spools and manual overrides available
› Coil interchangeability with all Argo-Hytos ATEX/IECEx product line
› In the standard version, the valve is zinc coated for 520 h protection acc. to ISO 9227

ATEX/IECEx Classification

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

Certificate number EPS14ATEX1744 X IECEx EPS14.0064 X
AC solenoid Ex mb IIC T4, T5, T6 Gb Ex mb IIC T4, T5, T6 Gb
DC solenoid Ex e mb IIC T4, T5, T6 Gb Ex mb IIC T4, T5, T6 Gb
Proximity sensor Ex ia IIC T6 Gb Ex ia IIC T6/T4 Gb
Complete valve assembly Ex h IIC T4...T6

ISO 4401-03-02-0-05

Technical Data

<table>
<thead>
<tr>
<th>Valve size</th>
<th>06 (D03)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. flow</td>
<td>l/min (GPM)</td>
</tr>
<tr>
<td>Max. operating pressure at ports P, A, B</td>
<td>bar (PSI)</td>
</tr>
<tr>
<td>Max. operating pressure at port T</td>
<td>bar (PSI)</td>
</tr>
<tr>
<td>Pressure drop</td>
<td>see Δp-Q characteristics</td>
</tr>
<tr>
<td>Fluid temperature range (NBR)</td>
<td>°C (°F)</td>
</tr>
<tr>
<td>Max. switching frequency</td>
<td>1/h</td>
</tr>
<tr>
<td>Switching time ON at ν=32 mm²/s (156 SUS)</td>
<td>ms</td>
</tr>
<tr>
<td>Switching time OFF at ν=32 mm²/s (156 SUS)</td>
<td>ms</td>
</tr>
<tr>
<td>Weight valve with 1 solenoid and 1 sensor</td>
<td>kg (lbs)</td>
</tr>
<tr>
<td>Weight valve with 2 solenoids and 2 sensors</td>
<td>kg (lbs)</td>
</tr>
</tbody>
</table>

Technical Data - Explosion proof Solenoid

<table>
<thead>
<tr>
<th>Voltage type</th>
<th>AC 50/60 HZ</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available voltages</td>
<td>V</td>
<td>110, 230</td>
</tr>
<tr>
<td>Available nominal power</td>
<td>W</td>
<td>DC: 12, 24, 48, 110</td>
</tr>
<tr>
<td>Supply voltage tolerance</td>
<td>%</td>
<td>AC: ±10</td>
</tr>
<tr>
<td>Duty cycle</td>
<td>(100 % ED)</td>
<td>DC: ±10</td>
</tr>
<tr>
<td>Enclosure type of the Solenoid to EN 60529</td>
<td>IP 68</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>°C (°F)</td>
<td>-25 ... +70/60 (-13 ... +158/140)</td>
</tr>
<tr>
<td>Temperature class / Nominal power</td>
<td>T4-10 W / 18 W</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T5-10 W</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T6-10 W</td>
<td></td>
</tr>
</tbody>
</table>

Data Sheet

<table>
<thead>
<tr>
<th>General information</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting surface</td>
<td>SMT_0019 products and operating conditions</td>
</tr>
<tr>
<td>Subplates</td>
<td>DP* 0002 Size 06</td>
</tr>
<tr>
<td>Spare parts</td>
<td>SP_8010</td>
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</tbody>
</table>

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Subject to change · RPEX3-06*S6_4094_2en_01/2020
Ordering Code

Explosion proof, 4/2 and 4/3, directional control valve

Valve size

Number of valve positions
two positions 2
three positions 3

Spool symbols
see the table „Spool Symbols“

Operating pressure p [bar (PSI)]

Flow Q [l/min (GPM)]

Surface treatment
520 h salt spray test (ISO 9227)

Spool position monitoring
210 bar (3050 PSI) at port T

No designation
N7
N9

Manual override
standard detent assembly with the nut
without manual override

No designation (only for DC)
3 (AC and DC version) 3 m Solenoid, 2 m Sensor
8 (AC and DC version) 8 m Solenoid, 10 m Sensor

Temperature class - solenoid nominal power

Class T4 - 10 W
A4
A6

Class T6 (T5) - 10 W
B4

Class T4 - 18 W*
Z11

Mounting bolts M5 x 45 DIN 912-10.9 or studs must be ordered separately. Tightening torque is 8.9+1 Nm (6.56+0.7 lbf.ft). Besides the valve versions shown, which are the most frequently used, other special versions are available. Consult our technical department for their identification, feasibility and operating limits.

Spool Symbols

<table>
<thead>
<tr>
<th>Type</th>
<th>Symbol</th>
<th>Interposition</th>
<th>Type</th>
<th>Symbol</th>
<th>Interposition</th>
<th>Type</th>
<th>Symbol</th>
<th>Interposition</th>
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<tbody>
<tr>
<td>Z11</td>
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<td>R30</td>
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<td>Z11</td>
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<tr>
<td>C11</td>
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<td>A51</td>
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<td>X30</td>
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<td>Y51</td>
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<td>C51</td>
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<td>B71</td>
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<td>J15</td>
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<td></td>
<td>Y13</td>
<td></td>
<td></td>
<td>V41</td>
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<td></td>
</tr>
</tbody>
</table>

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

Operating limits

Ambient temperature 70 °C (158 °F), Voltage \( U_n \) -10 % (24 V DC), Power \( P_n \) 10 W

Operating limits of other than shown versions consult with our technical department.

*Spool J15 available only with solenoid B4 (18 W).
Group II

- ATEX mark of conformity to the 2014/34/EU directive and to the technical norms.
- II 2G Solenoid for surface plants with Gas and Vapors environment for zones 1 and 2.
- Ex e mb Type of protection:  e - increased safety, mb - encapsulated
- IIC Equipment suitable for substances (gas) of all group
- T6/T4 Temperature class (maximum solenoid surface temperature)
- T85/T135 Maximum solenoid surface temperature
- Gb Equipment protection level - High level protection for explosive Gas atmosphere

Spool Position Sensor

S6 - Circuit diagram of the sensor

NAMUR

Sensor has to be electrically fed by means of a safety barrier (Switching Repeater) for intrinsically safe circuits.

For details see Operating manual of the sensor - BALLUFF document number 897278.

The Sensor on the side “a” responds to switching the coil “a”. The Sensor on the side “b” responds to switching the coil “b”.

Example of 2 channels Switching Repeater

Hazardous area

SAFE AREA

HAZARDOUS AREA

Power Supply, Monitoring Instruments, Controls, etc....

Technical Data of the Sensor

Power supply voltage range V DC 7,7 ... 9

Current mA ≥ 4 (level 1) ≤ 1 (level 2)
The ambient temperature range shall not overstep the temperatures given in the chapter Technical Data - Explosion proof solenoid (page 1). The maximum temperature of the medium (generally hydraulic fluid) shall not exceed 70 °C (158 °F). It is the users duty to ensure free and unhindered heat emission during operation. This means that the solenoid shall neither be covered not stored immediately adjacent to heat sources (e.g. fan heaters) during operation.

Care is to be given that the solenoid is not subjected to direct sunlight during operation.

Initial installation
- Installing the type V DC for temperature class T4 a cable with an ambient operating temperature of at least +105 °C (+221 °F) is to be used. For T5 and T6 a cable with an ambient operating temperature of a least +90 °C (+194 °F) is sufficient. The fastening torque on the cable gland depends of the used cable and is to be determined by installing user.
- When installing the V DC solenoid type, please note the fastening torque of the screws (4 Nm or 2.95 lbf.ft) and of the Connection box (0.4 Nm or 0.30 lbf.ft).
- When installing the V DC solenoid type, an appropriate cable shoe M3 - 0.75 mm² (with an ambient operating temperature of at least +105 °C or +221 °F) is to be used.
- The user has to safeguard each solenoid with a fuse: Iₖ ≤ 3xIₜ₉, with trigger characteristic “slow blow”. (Iₜ₉ values see Operating Instructions HA 4090 - Table 2). The breaking capacity of the fuse link has to be stronger than the max short circuit current at the users operating area.
- EX-secured components must be used during mounting in case the fuse and/or the interface are within the EX-range.
- In addition, the solenoid may be connected to ground via the purpose-built ground clamp an the connector casing.

Safety notice - please read carefully
- In case the solenoid shows any signs of a defect, malfunctioning or external damage (including corrosion), the device must immediately be taken out of operation.
- Any deposits on the surface of the device shall not obstruct heat emission.
- To maintain legibility of the date plate, the solenoid must not be coated.

Caution
- Always disconnect the solenoid from the power supply before any maintenance or other work on it.
- Always exchange the complete solenoid. Do not try to repair the solenoid.
- In no case shall any changes be made to the solenoid or the connecting cable.
- Demount the solenoid only in secure areas (not in EX-areas). If this is not possible, the solenoid must cool for 10 minutes minimum.