Explosion Proof 2/2 Directional Valve, Solenoid Operated, Poppet Type, Piloted

**SD3EX-C2**

1-1/16-12 UN • Q<sub>max</sub> 150 l/min (40 GPM) • p<sub>max</sub> 350 bar (5100 PSI)

### Technical Features

- Valve and solenoid design prevents a surface temperature capable of igniting
- Solenoid coil in acc. with directive 2014/34/EU (ATEX) for explosion-hazard zones
- Explosion protection for gas, dust, and mining; solutions for all zones
- Solenoid with encapsulated enclosure
- Hardened precision parts
- High flow capacity, transmitted hydraulic power and leak-free closing
- All ports may be fully pressurised
- Wide range of manual overrides available
- Coils interchangeable within Argo-Hytos ATEX/IECEx product line
- In the standard version, the valve is zinc-coated for 520 h protection acc. to ISO 9227

### Technical Data

#### Valve size / Cartridge cavity

<table>
<thead>
<tr>
<th>Measurements</th>
<th>1-1/16-12 UN / C2 (C-12-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. flow</td>
<td>l/min (GPM)</td>
</tr>
<tr>
<td></td>
<td>150 (39.6)</td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>bar (PSI)</td>
</tr>
<tr>
<td></td>
<td>350 (5080)</td>
</tr>
<tr>
<td>Fluid temperature range</td>
<td>°C (°F)</td>
</tr>
<tr>
<td></td>
<td>-30 ... +70 (-22 ... +158)</td>
</tr>
<tr>
<td>Max. switching frequency</td>
<td>1/h</td>
</tr>
<tr>
<td></td>
<td>7 000</td>
</tr>
<tr>
<td>Weight with coil</td>
<td>kg (lbs)</td>
</tr>
<tr>
<td></td>
<td>1.70 (3.75)</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>10</td>
</tr>
<tr>
<td>Supply voltage tolerance</td>
<td>%</td>
<td>AC, DC ± 10</td>
</tr>
<tr>
<td>Duty cycle</td>
<td>S1 (100 % ED)</td>
<td></td>
</tr>
<tr>
<td>Enclosure type acc. to EN 60529</td>
<td>IP 66/68</td>
<td></td>
</tr>
<tr>
<td>Weight (solenoid only)</td>
<td>kg (lbs)</td>
<td>1.3 (2.87)</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature class / Nominal power</td>
<td>T4 / 10 W</td>
<td>T5 / 10 W</td>
</tr>
<tr>
<td></td>
<td>°C (°F)</td>
<td>°C (°F)</td>
</tr>
<tr>
<td></td>
<td>-30 ... +70 (-22 ... +158)</td>
<td>-30 ... +55 (-22 ... +131)</td>
</tr>
</tbody>
</table>

### ATEX/IECEx Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>EPS14ATEX1744 X</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC I M2 Ex mb I Mb</td>
<td></td>
</tr>
<tr>
<td>AC II 2G Ex mb IIC T4, T5, T6 Gb</td>
<td></td>
</tr>
<tr>
<td>DC II 2D Ex mb IIC T135°C, T100°C, T85°C Db</td>
<td></td>
</tr>
<tr>
<td>DC EPS14.0064 X</td>
<td></td>
</tr>
<tr>
<td>AC Ex mb I Mb</td>
<td></td>
</tr>
<tr>
<td>AC Ex mb IIC T4, T5, T6 Gb</td>
<td></td>
</tr>
<tr>
<td>AC Ex mb IIC T135°C, T100°C, T85°C Db</td>
<td></td>
</tr>
<tr>
<td>DC Ex e mb I Mb</td>
<td></td>
</tr>
<tr>
<td>DC Ex e mb IIC T4, T5, T6 Gb</td>
<td></td>
</tr>
<tr>
<td>DC Ex e mb IIC T135°C, T100°C, T85°C Db</td>
<td></td>
</tr>
<tr>
<td>DC Ex tb IIC T135°C, T100°C, T85°C Db</td>
<td></td>
</tr>
</tbody>
</table>

### Characteristics

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

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Q [l/min (GPM)]</td>
<td>(13.2) (26.4) (39.6)</td>
</tr>
<tr>
<td>Pressure drop related to flow rate</td>
<td></td>
</tr>
<tr>
<td>Pressure drop Ap [bar (PSI)]</td>
<td>(6.6) (13.2) (19.8) (26.4) (33.0) (39.6)</td>
</tr>
</tbody>
</table>

### Operating limits

Ambient temperature 70 °C (158 °F), Voltage U<sub>n</sub> -10 % (24 V DC), Power P<sub>n</sub> 10 W

### Pressure drop related to flow rate

For operating limits under conditions other than shown contact the technical support.
**Manual Override** in millimeters (inches)

<table>
<thead>
<tr>
<th>No designation</th>
<th>M7 - detent assembly for 2O2 only</th>
<th>M9 - without manual override</th>
</tr>
</thead>
<tbody>
<tr>
<td>- standard for 2O2 only</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>[Diagram of Manual Override]</td>
<td>[Diagram of Manual Override]</td>
<td>[Diagram of Manual Override]</td>
</tr>
</tbody>
</table>

In case of solenoid malfunction or power failure, the spool of the valve can be shifted by manual override. For alternative manual overrides contact our technical support.

**Ordering Code**

- **Model**
  - High performance

- **Model / Symbol**
  - 2O2
  - 2L2

- **Explosion proof 2/2 directional valve, solenoid operated, poppet type, piloted**

- **Surface treatment**
  - zinc-coated (ZnNi), ISO 9227 (520 h)

- **Seals**
  - NBR

- **Valve cavity**
  - 1-1/16-12UN / C2 (C-12-2)

- **Model / Symbol**
  - [Diagram of Model / Symbol]

- **Dimensions**
  - in millimeters (inches)

- **Model / Symbol**
  - [Diagram of Model / Symbol]

- **Cable length**
  - without cable: 3000 mm
  - with cable: 8000 mm

- **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 50/60 Hz, fix installed cable**
  - 110 V AC / 0.112 A
  - 230 V AC / 0.052 A

Besides the shown, commonly used valve versions other special models are available. Contact our technical support for their identification, feasibility and operating limits.

Subject to change · SD3EX-C2_4089_4en_01/2020
**Solenoid Marking**

Group I (Mining)

- **I**
  - Group I for mines
- **M2**
  - High protection - equipment category
- **Ex e mb**
  - Type of protection: e - increased safety, mb - encapsulated
- **I**
  - Gas group (methane)
- **Mb**
  - Equipment protection level - high level protection for explosive atmosphere

Group II

- **II 2G**
  - Solenoid for surface plants with gas and vapors environment for zones 1 and 2
- **II 2D**
  - Solenoid for surface plants with dust environment for zones 21 and 22
- **Ex e mb**
  - Type of protection: e - increased safety, mb - encapsulated
- **Ex tb**
  - Type of protection: tb - protection by enclosure
- **IIC**
  - Equipment suitable for substances (gas) of all group
- **IIIC**
  - Equipment suitable for all kinds of dust
- **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
- **Db**
  - Equipment protection level - high level protection for explosive dust atmosphere
Initial installation

› The ambient temperature range shall not exceed the temperatures given in chapter 2. The maximum temperature of the medium (generally hydraulic fluid) shall not exceed 70 °C (158 °F).

› It is the user's duty to ensure free and unhindered heat emission during operation. This means that the solenoid shall neither be covered nor stored immediately adjacent to heat sources (e.g. fan heaters) during operation.

› The solenoid shall not be subjected to direct sunlight during operation.

Installation notice - installation, mounting, demounting

› Using the V DC type for temperature class T4 requires a cable with an operating temperature limit of at least +105 °C (221 °F), e.g. LAPP FD Robust. T5 and T6 require a cable with an operating temperature limit of at least +90 °C (194 °F).

The fastening torque on the cable gland depends of the used cable and is to be determined by the installing user.

› When installing the V DC solenoid, the fastening torque of the screws shall be [4 Nm (2.95 lbf.ft)] and for the BARTEC connection box [0.4 Nm (0.30 lbf.ft)].

› When installing the V DC solenoid, an appropriate cable shoe of size M3 with a crosssectional area of 0.75mm² with an operating temperature limit of at least +105 °C (221 °F) is to be used.

The user has to safeguard each solenoid with a fuse: $I_n \leq 3 \times I_G$, with trigger characteristic “slow blow”.

($I_G$ values see Operating Instructions HA 4090 - Table 2). The breaking capacity of the fuse link has to be stronger than the maximum short circuit current at the user’s operating area.

› EX-secured components must be used during mounting in case the fuse and/or the interface are within the EX-range.

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 data 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.

› Under no circumstances shall any changes be made to the solenoid or the connecting cable.

› Never operate the solenoid when disconnected from the valve body.

› Demount the solenoid only in secure areas (not in EX-areas). If this is not possible, the solenoid must cool off for at least 10 minutes.