Mini temperature switch
Stainless steel switch enclosure
Model TXS

Applications
- Temperature monitoring and control of processes
- Safety-critical applications in general process instrumentation, especially in the chemical and petrochemical industries, oil and gas industries, power generation incl. nuclear power plants, water/wastewater industries, mining
- For measuring points with limited space, e.g. control panels

Special features
- No power supply needed for switching of electrical loads
- Setting ranges from -15 ... +20 °C to 180 ... 250 °C
- Intrinsic safety Ex ia available
- 1 set point, SPDT, high switching power up to AC 250 V, 5 A
- Direct mounting or remote mounting with capillary ≤ 10 m

Description
These high-quality temperature switches have been developed especially for safety-critical applications. The high quality of the products and manufacturing in accordance with ISO 9001 ensure reliable monitoring of your plant. In production, the switches are traced by quality assurance software at every step and subsequently are 100 % tested.

In order to ensure as flexible operation as possible, the temperature switches are fitted with micro switches, which enable the switching of an electrical load of up to AC 250 V, 5 A directly. For lower switching power ratings, such as for PLC applications, micro switches with gold-plated contacts can be selected as an option.

The measuring system parts and the flexible spiral armour are made of stainless steel. Moreover the snap-acting behaviour of the Belleville spring increases stability and vibration resistance. The model TXS temperature switch is extremely robust and guarantees optimal operating characteristics in a limited space with repeatability lower than 1 % of span.
Standard version

Measuring principle
Vapour pressure measuring system (SAMA IIC and IIA)

Switch enclosure
Stainless steel 316, tamper-proof
Laser-engraved product label from stainless steel

Ingress protection
IP66 per EN/IEC 60529, NEMA 4X

Permissible ambient temperature
-40 ... +85 °C

Switch contact
Hermetically sealed micro switches with fixed dead band.
■ 1 x SPDT (single pole double throw)

<table>
<thead>
<tr>
<th>Contact version</th>
<th>Electrical rating (resistive load)</th>
<th>Suitable for Ex ia option</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>1 x SPDT, silver, hermetically sealed</td>
<td>AC 250 V, 5 A DC 24 V, 5 A Yes</td>
</tr>
<tr>
<td>J</td>
<td>1 x SPDT, gold-plated, hermetically sealed</td>
<td>AC 250 V, 0.5 A DC 24 V, 1 A Yes</td>
</tr>
</tbody>
</table>

Set point adjustment
The set point can be specified by the customer or factory-set within the setting range. Subsequent adjustment of the set point on site is made using the adjustment screw, which is covered by the access cover plate with lead seal option.

Repeatability of the set point
≤ 1 % of span

Please specify:
Set point, switching direction for the contact, e.g.:
Set point: 95 °C, rising

Setting range

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>Setting range depending on the switching direction in °C</th>
<th>Working range</th>
<th>Proof temperature</th>
<th>Max. dead band</th>
<th>SAMA class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising</td>
<td>Falling</td>
<td>in °C</td>
<td>in °C</td>
<td>in °C</td>
<td></td>
</tr>
<tr>
<td>-15 ... +20</td>
<td>-15 ... +15</td>
<td>-40 ... +50</td>
<td>70</td>
<td>≤ 5</td>
<td>IIC</td>
</tr>
<tr>
<td>5 ... 70</td>
<td>11 ... 70</td>
<td>-40 ... +95</td>
<td>120</td>
<td>≤ 6</td>
<td>IIC</td>
</tr>
<tr>
<td>55 ... 140</td>
<td>61 ... 140</td>
<td>-40 ... +160</td>
<td>190</td>
<td>≤ 6</td>
<td>IIC</td>
</tr>
<tr>
<td>130 ... 190</td>
<td>142 ... 190</td>
<td>-40 ... +215</td>
<td>230</td>
<td>≤ 12</td>
<td>IIA</td>
</tr>
<tr>
<td>180 ... 250</td>
<td>192 ... 250</td>
<td>-40 ... +300</td>
<td>330</td>
<td>≤ 12</td>
<td>IIA</td>
</tr>
</tbody>
</table>

Ignition protection type (option)
■ Ex ia I Ma (mines)
■ Ex ia IIC T6/T4 1) Ga (gas)
■ Ex ia IIIC T85/T135 1) Da (dust)

1) The temperature class is related to the ambient temperature range. See the type examination certificate for further details.

Safety-related maximum values
(only for Ex ia version)

<table>
<thead>
<tr>
<th>Voltage U_i</th>
<th>DC 30 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current I_i</td>
<td>100 mA</td>
</tr>
<tr>
<td>Power P_i</td>
<td>0.75 W</td>
</tr>
<tr>
<td>Internal capacitance C_i</td>
<td>0 μF</td>
</tr>
<tr>
<td>Internal inductance L_i</td>
<td>0 mH</td>
</tr>
</tbody>
</table>

Example:
Setting range: 5 ... 70 °C with one switch contact
Rising temperature: Adjust set point between 11 ... 70 °C.
Falling temperature: Adjust set point between 5 ... 64 °C.
See setting range table.
Sensor version
- Direct mounting
- Remote mounting with capillary

Sensor dimensions
Direct mounting

Adjustable insertion length Y for remote mounting with capillary
Due to the flexibility of the spiral armour, the insertion length (Y) can be adjusted during installation with the sliding compression fitting. The insertion length is adjustable between Y_{min} and Y_{max} (see table).

Example:
Capillary length K: 2 m
Setting range: 5 ... 70 °C (SAMA IIC)
Stem diameter Ø D: 9.5 mm

Minimum insertion length Y_{min} = 100 mm
Maximum insertion length Y_{max} = 350 mm

Adjustable insertion length Y = 100 ... 350 mm
The capillary length is reduced accordingly.
Maximum capillary reduction
K' = Y_{max} - Y_{min} = 350 - 100 = 250 mm

Minimum capillary length
K_{min} = K' = 2,000 - 250 = 1,750 mm

Due to the adjustable insertion length (Y) of 100 ... 350 mm, the resulting capillary length (K) varies between 2.0 ... 1.75 m.

Process connection (A)
Stainless steel compression fitting, sliding on capillary or stem
- ½ NPT male (standard)
- ¾ NPT male
- G ½ A male
- G ¾ A male

Remote mounting with capillary

Bulb

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Electrical connection
- Connection cable
  Length: 1.5 m
  Wire cross-section: 0.5 mm² (20 AWG)
  Insulation material: Silicone
- Threaded connection (B)
  Material: AISI 316
  - ½ NPT male (standard)
  - M20 x 1.5 male (adapter)
  - M20 x 1.5 female (adapter)
  - ½ NPT female (adapter)
  - ¾ NPT female (adapter)
- Terminal box

Dielectric strength
Safety class I (IEC 61298-2: 2008)

Mounting option
- Direct
- Wall bracket (only for remote mounting with capillary)
  Option: Mounting bracket for 2" pipe mounting

Weight
- 0.8 kg, direct mounting
- 1.0 kg, remote mounting with 2 m capillary
Thermowell
In principle, the operation of a mechanical temperature switch without a thermowell is possible with low process-side loading (low pressure, low viscosity and low flow velocities).

However, in order to enable exchanging the temperature switch during operation (e.g. instrument replacement or calibration) and to ensure a better protection of the instrument and also the plant and the environment, it is advisable to use a thermowell from the extensive WIKA thermowell portfolio.

For further information on the calculation of the thermowell, see Technical information IN 00.15.

Options
- Other process connections, also with adapter
- Helical bulb for measuring ranges: -15 ... +20 °C and 5 ... 70 °C, proof temperature = 100 °C
- Contact bulb, to measure surface temperatures on flat surfaces or pipes
- Other insertion length for direct mounting, ≤ 1 m
- Terminal box, aluminium alloy, copper-free epoxy resin coated, with 3 connections ½ NPT female, ingress protection IP65
- Grounding cable cross-section: max. 4 mm²
- Other cable lengths 3 m, 5 m
- Offshore version
- NACE version

Approvals

<table>
<thead>
<tr>
<th>Logo</th>
<th>Description</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>EC declaration of conformity</td>
<td>European Community</td>
</tr>
<tr>
<td></td>
<td>■ Low voltage directive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ ATEX 1) (option)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I M 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>II 1 GD</td>
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<tr>
<td>IECEx</td>
<td>IECEx 1) per IEC 60079-0, IEC 60079-11, IEC 60079-26 (option)</td>
<td>IECEx member states</td>
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<td>Ex ia I Ma</td>
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<tr>
<td></td>
<td>Ex ia IIIC T6/T4 2) Ga</td>
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<tr>
<td></td>
<td>Ex ia IIIC T85/T135 2) Da</td>
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<tr>
<td>EAC (option)</td>
<td>Hazardous areas (option)</td>
<td>Eurasian Economic Community</td>
</tr>
<tr>
<td>KOSHA (option)</td>
<td>Hazardous areas</td>
<td>South Korea</td>
</tr>
</tbody>
</table>

1) Double marking ATEX and IECEx on the same product label.
2) The temperature class is related to the ambient temperature range.

Certificates (option)
- 2.2 test report per EN 10204
- 3.1 inspection certificate per EN 10204

Approvals and certificates, see website
Dimensions in mm

Direct mounting

Remote mounting with capillary

For dimensions A, B, D, K, X and Y see page 3

Option: Terminal box

Ordering information
Model / Sensor version / Capillary length (if applicable) / Contact version / Measuring range / Process connection /
Electrical connection / Options

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