

Mini temperature switch Stainless steel switch enclosure Model TXS

WIKA data sheet TV 31.70



Process Mini Series

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



Fig. left: Direct mounting

Fig. right: Remote mounting with capillary

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)

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)

Maximum values	
Voltage U_i	DC 30 V
Current I_i	100 mA
Power P_i	0.75 W
Internal capacitance C_i	0 μ F
Internal inductance L_i	0 mH

Contact version		Electrical rating (resistive load)		Suitable for Ex ia option
		AC	DC	
E	1 x SPDT, silver, hermetically sealed	250 V, 5 A	24 V, 5 A	Yes
J	1 x SPDT, gold-plated, hermetically sealed	250 V, 0.5 A	24 V, 1 A	Yes

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.

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.

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

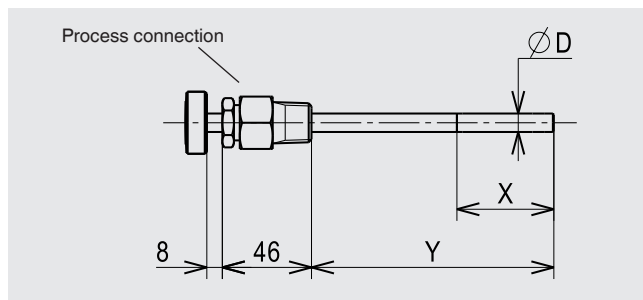
Measuring range	Setting range depending on the switching direction in °C		Working range	Proof temperature	Max. dead band	SAMA class
in °C	Rising	Falling	in °C	in °C	in °C	
-15 ... +20	-10 ... +20	-15 ... +15	-40 ... +50	70	≤ 5	IIC
5 ... 70	11 ... 70	5 ... 64	-40 ... +95	120	≤ 6	IIC
55 ... 140	61 ... 140	55 ... 134	-40 ... +160	190	≤ 6	IIC
130 ... 190	142 ... 190	130 ... 178	-40 ... +215	230	≤ 12	IIA
180 ... 250	192 ... 250	180 ... 238	-40 ... +300	330	≤ 12	IIA

Sensor version

- Direct mounting
- Remote mounting with capillary

Sensor dimensions

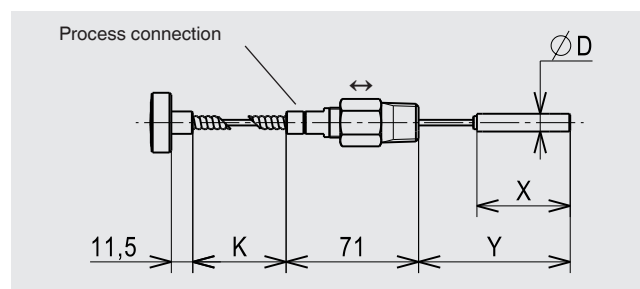
Direct mounting



Stem diameter Ø D in mm	Active length X in mm	Insertion length Y in mm
9.5	50	125 ¹⁾

1) Other insertion length for direct mounting, ≤ 1 m

Remote mounting with capillary



Bulb		Insertion length Y in mm		Capillary length K in m
Stem diameter Ø D in mm	Active length X in mm	Y _{min}	Y _{max}	
9.5	50	100	350	2
	70	130	900	5 ¹⁾
	100	170	1,800	10 ¹⁾

1) For SAMA IIA ranges the recommended height difference between sensor and case is ≤ 2 m. otherwise the "bulb elevation error" has to be considered.

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

$$K^- = Y_{\max} - Y_{\min} = 350 - 100 = 250 \text{ mm}$$

Minimum capillary length

$$K_{\min} = K - K^- = 2,000 - 250 = 1,750 \text{ mm}$$

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

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

Logo	Description	Country
	EC declaration of conformity <ul style="list-style-type: none"> ■ Low voltage directive ■ ATEX ¹⁾ (option) I M 1 II 1 GD 	European Community
	IECEx ¹⁾ per IEC 60079-0, IEC 60079-11, IEC 60079-26 (option) <ul style="list-style-type: none"> Ex ia I Ma Ex ia IIC T6/T4 ²⁾ Ga Ex ia IIIC T85/T135 ²⁾ Da 	IECEx member states
	EAC (option) Hazardous areas (option)	Eurasian Economic Community
	KOSHA (option) Hazardous areas	South Korea

1) Double marking ATEX and IECEx on the same product label.

2) The temperature class is related to the ambient temperature range.

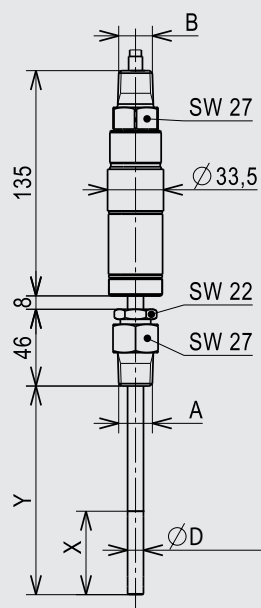
Certificates (option)

- 2.2 test report per EN 10204
- 3.1 inspection certificate per EN 10204

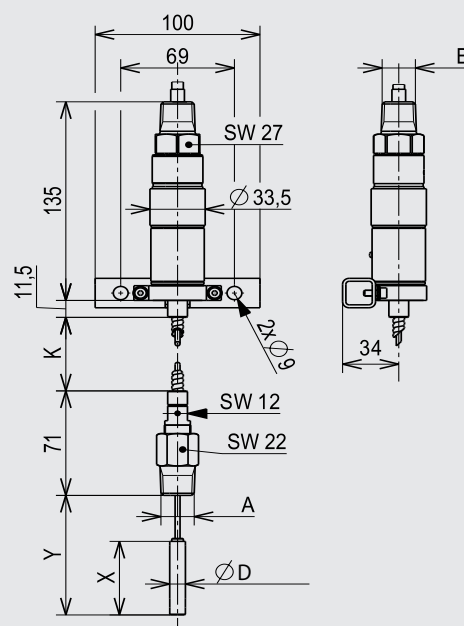
Approvals and certificates, see website

Dimensions in mm

Direct mounting

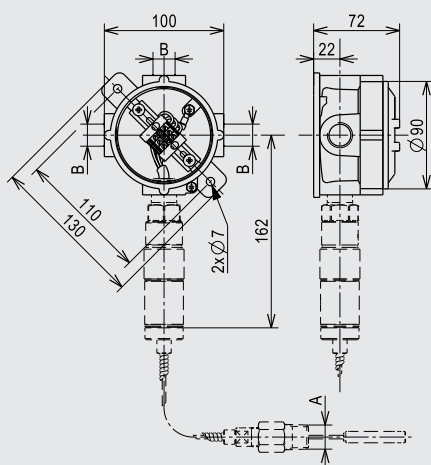


Remote mounting with capillary



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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