Temperature switch
Model TS-972

Applications

- Industrial heat exchangers
- Pumps and compressors for lubrication
- Power generation
- Oil and Gas
- Petrochemical industries

Special features

- Adjustable switch differential to realise flexible on/off control
- Robust aluminium enclosure
- Switch point repeatability of ±1% of FSR for reliable switching
- Upto 2 possible positions for electrical connection
- High-quality micro switches with long service life

Fig.: Model TS-972

Description

The model TS-972 temperature switch has been designed for control and monitoring applications. The measuring element is a fully welded bellow made of phosphor bronze. This corrosion-resistant temperature switch is suitable for a broad range of media used in the process industry.

The enclosure made of a high-grade aluminium alloy with which the temperature switch can withstand the harsh operating conditions of the process industry.

The model TS-972 has a high switch point repeatability of ±1%, which enables reliable switching. The switch point can be specified on site with external adjustment option. Adjustable switch differential enable to realise flexible on/off controls, this wide setting range is often needed for the on/off control mode of cyclic applications.

Specifications

Basic information	
Case type	Weatherproof external switch point adjustment
Case material	Die cast aluminium epoxy powder coated enclosure with ABS plastic cover
Environment sealing	EPDM

Output signal	
Number of switch point	One
Setting ranges	→ See table "Setting range" External with lock
Response time	→ See table "Response time"
Setpoint repeatability	± 1% of FSR
Scale accuracy	±5% of FSR
Switching function	■ 1 x SPDT (single pole double throw) ■ 2 x SPDT (single pole double throw), for DPDT action Synchronising error within 2% of FSR
Contact version	General purpose silver contact
Electrical rating	■ AC: 15A, 250V ■ DC: 0.5A, 110V / 0.25A, 220V / 8A, 24V (resistive) 0.2A, 110V / 0.1A, 220V / 7A, 24V (inductive)

Sensor element	
Type of measuring element	Gas filled thermal system actuating PB bellows
Bulb material	■ Phosphor bronze (PB) ■ SS 316
Capillary material	■ Copper for PB bulb material ■ SS 316 for SS 316 bulb material
Capillary length	■ 3 meter ■ 5 meter ■ 8 meter ■ 10 meter (only for SS 316 bulb material)
Armour material	SS 304 PVC cover (optional)
Bulb diameter and length	■ D 9.5 × 110 mm for capillary length 3 meters ■ D 9.5 × 120 mm for capillary length 5, 8, 10 meters

Electrical connection	
Number of Entries	■ 1 x left side ■ 1 x left side and 1 x top side
Conduit type	■ 1/2" NPT(F) per ASME B1.20.1 ■ 7 pin plug for 1 × left side entry ■ 3/4" NPT(F) per ASME B1.20.1 through mild steel adaptor ■ M20 × 1.5 (F) per ISO724 through mild steel adaptor

Process connection	
Type	Lower mount - remote
Size	■ M16 X1.5 (M) per ISO724 ■ G3/8 (M) per ISO228 ■ G1/2 (M) per ISO228 ■ G3/4 (M) per ISO228 ■ 3/8" NPT (M) per ASME B20.1 ■ 1/2" NPT (M) per ASME B20.1 ■ 3/4" NPT (M) per ASME B20.1
Material	SS 304

Thermowell (option)	
Immersion length	Standard bulb length Optional length upto 300 mm in multiples of 5
Size	■ G1/2 (M) per ISO 228 ■ G3/4 (M) per ISO 228 ■ G1 (M) per IS0 228 ■ 3/4" NPT (M) per ASME B20.1 ■ 1/2" NPT (M) per ASME B20.1 ■ 1" NPT (M) per ASME B20.1
Material	■ SS 304 ■ SS 316L

Mounting	
Type	■ Panel (standard) ■ Pipe-2" ■ Wall
Material	■ SS 304 for panel mounting ■ SS 316 for pipe-2", wall mounting ■ Mild steel epoxy coated for pipe-2", wall mounting

Operating condition	
Ambient temperature range	-10°C ... +60°C [14 ... 140°F]
Storage temperature range	-10°C ... +60°C [14 ... 140°F]
Ingress protection	IP66 per IS/IEC 60529
Weight	Approx. 600 grams

Setting range

Code	Range	Maximum working temperature	Switching differential for contact versions	
			1 × SPDT	2 × SPDT
C009	25 ... 90°C	300°C	6 ... 20°C	8 ... 20°C
C010	70 ... 150°C	300°C	8 ... 30°C	10.5 ... 30°C
C024	5 …60°C	110°C	8 ... 10°C	12 ... 15°C

(1) In the absence of customer specification, the switch point will be preset on falling temperature to the mid point of the range [I.e. 50% of span + minimum range value]

(2) The values indicate the maximum achievable limits of switch differential. The above mentioned differentials are calculated at midpoint of range, the differentials will vary with range setting and operating conditions

(3) Set and reset point of the switch should not exceed the upper and lower range limits.

(4) Maximum working temperature that the sensor element can withstand without suffering any permanent damage. The instrument might have to be calibrated afterwards.

Response time

Switching differential	Response time in seconds	
	Without thermowell	With thermowell *
Upto 6 meters and 100°C	15	45
Upto 6 meters and >100°C	25	75
> 6 meteres and 100°C	25	75
> 6 meters and >100°C	40	90

* Response time for thermowell version will vary depending on the design of thermowell & filling media

Certificates (option)

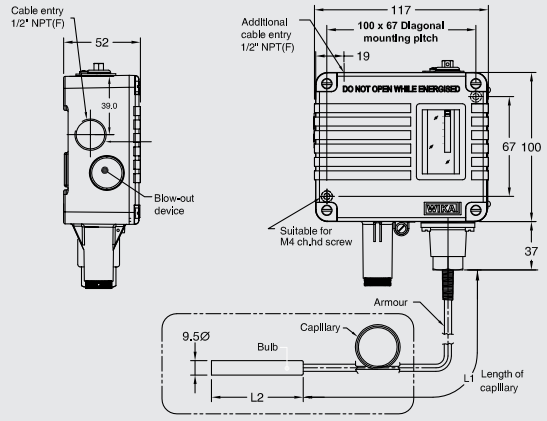
- 2.2 test report per EN 10204
- 3.1 calibration certificate per EN 10204
- 3.1 material restamping certificate per EN 10204

Accessories

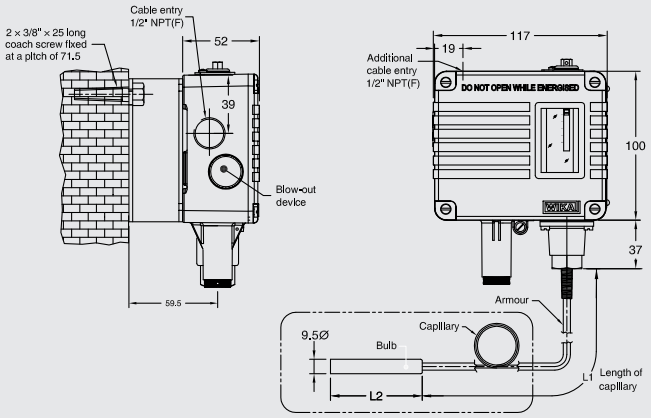
See data sheet AC 10.82

Dimensions in mm

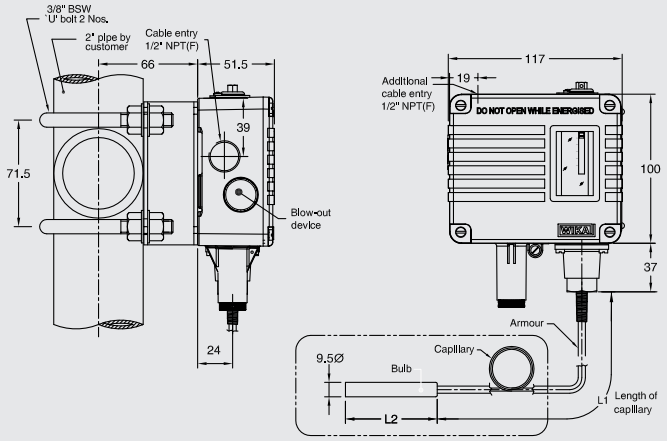
Panel mounting

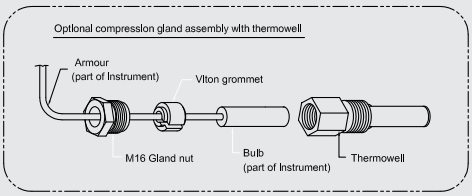


Wall mounting



2" Pipe mounting





Length of Capillary L1	Bulb length L2
3 mts.	110
5, 8, 10 mts.	120

Ordering information

Model / Setting Range / Switching direction / Switch point / Switching function / Sensor element / Electrical connection / Process connection / Mounting

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