

Bimetal temperature switch

For switching voltages up to 250 V

Model TFS135

WIKA data sheet TV 35.02



Applications

- Machine building
- Compressors
- Pumps
- Cooling and heating circuits

Special features

- Fixed switching temperature
- Automatic reset
- No additional voltage supply
- Switching voltages up to AC 250 V / 2.5 A
- 2 switching contacts or Pt1000/Pt100 (option)



Fig. left: Rectangular connector per
DIN EN 175301-803

Fig. centre: Circular connector M12 x 1 with neck tube

Fig. right: Circular connector M12 x 1

Description

Temperature switches are generally used in industry for limiting temperature. They monitor the temperature of machinery and equipment and, for example, switch off machinery if it overheats or switch on a fan to cool the equipment.

Function

Bimetals form the basis of the WIKA TFS135 temperature switches. Temperature sensing is carried out by a bimetal disc, which snaps over when the Nominal Switching Temperature (NST) is reached.

After cooling back down to the Reset Switching Temperature (RST), the switch returns to its original state.

The reset switching temperature is typically 15 ... 30 K below the switching temperature.

Contact version

The model TFS135 bimetal temperature switch is built with a Normally Closed contact.

A **Normally Closed** contact (**NC** = closed in the normal state) opens a circuit and shuts down the machinery.

After cooling down below the reset switching temperature, the contact returns to the original state, so that the monitored equipment can again work normally.

For extended temperature control the TFS135 is available with a second normally closed contact or with an additional Pt1000/Pt100 measuring element.

Max. switching output

The maximum switching output depends on the mounted connector.

Resistive load ($\cos \varphi = 1$):

- Rectangular connector DIN EN 175301-803
 - AC 120 V / 60 Hz / 5 A
 - AC 250 V / 50 Hz / 2.5 A
- Circular connector M12 x 1
 - AC 120 V / 60 Hz / 1 A
 - AC 250 V / 50 Hz / 1 A

Contact resistance

< 50 mΩ

Dielectric strength

AC 1,500 V, 50 Hz
between electrical connections and case

Temperature ranges

- Nominal Switching Temperature (NST)
50 ... 130 °C

Note:

The nominal switching temperature can be selected in steps of 5 K. It is preset on delivery and cannot be changed.

- Switch point accuracy
±5 K
- Reset Switching Temperature (RST)
The reset switching temperature for bimetal temperature switches is typically 15 ... 30 K below the switching temperature.
To ensure a safe reset of the switch, care must be taken that the temperature difference between the measuring point and environment is high enough; since otherwise the switch cannot cool back down to the reset switching temperature and thus the instrument will not be able to return to its normal state.

- Ambient temperature
 - Rectangular connector EN 175301-803: -30 ... +85 °C
 - Circular connector M12 x 1: -25 ... +55 °C

Note:

Due to short installation length there is a risk that the temperature at the connector will rise up to an inadmissibly high value. This absolutely must be taken into account when designing the measuring point. The temperature at the connector must not exceed the above mentioned temperature range.

Extended temperature control

In addition to the standard design with one switching contact the TFS135 is available with a second normally closed contact or with a measuring element Pt1000 / Pt100 for extended temperature control applications.

Note:

A second switching contact or measuring element is only permitted with a circular connector M12 x 1.

Thermowell

Material

- Brass
- Stainless steel

Stem diameter F₁

10 mm

Version with 2 switching contacts: 12 mm

Process connection

Mounting thread:

- G ½ B
- G ¼ B ¹⁾
- G ½ A, ISO 1179-2
- M14 x 1.5, ISO 9974-2 ¹⁾
- ½ NPT
- ¼ NPT ¹⁾

Insertion length U₁

- 25 mm
- 30 mm
- 35 mm
- 40 mm
- 50 mm
- 80 mm
- 100 mm

¹⁾ Not available with 2 switching contacts

Response time

The response time is strongly influenced by

- the thermowell used (diameter, material)
- the heat transfer from thermowell to switching element
- the flow rate of the medium

Due to the design of the model TFS135 bimetal temperature switch, there is optimum heat transfer from the medium to the switching element.

Vibration resistance

Due to the specific assembly of the switching elements used, the vibration resistance of the model TFS135 bimetal temperature switch is very high.

Depending on the mounting situation, medium, temperature and insertion length, the vibration resistance can be up to 10 g.

Shock resistance

Up to 100 g, depending on the mounting situation, medium and temperature

Operating pressure

The TFS135 is designed for an operating pressure up to max. 50 bar.

Electrical connection

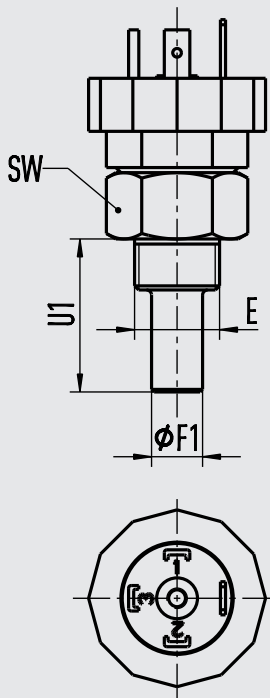
- Rectangular connector per DIN EN 175301-803, form A (replacement for DIN 43650)
- Circular connector M12 x 1
- Circular connector M12 x 1 with neck tube 45 mm

Ingress protection

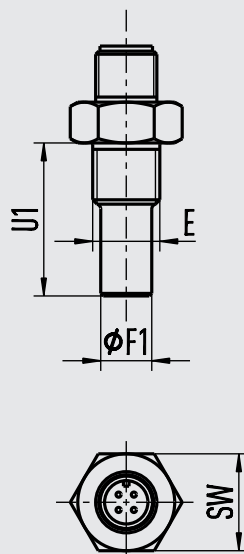
IP65 in connection with a suitable mating connector

Dimensions in mm

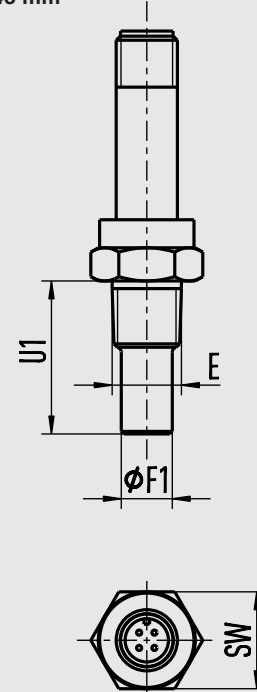
Rectangular connector per
DIN EN 175301-803



Circular connector M12 x 1






Circular connector M12 x 1 with neck
tube 45 mm



Legend:

- U₁ Insertion length
- Ø F₁ Stem diameter
- E Process connection
- SW Spanner width

Approvals

Logo	Description	Country
	EU declaration of conformity <ul style="list-style-type: none">■ Low voltage directive■ RoHS directive	European Union
	UL Component certification	USA and Canada
	EAC Import certificate	Eurasian Economic Community

Approvals and certificates, see website

Ordering information

Model / Nominal Switching Temperature (NST) / Thermowell material / Process connection / Insertion length / Electrical connection

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