

Bimetal temperature switch

For switching voltages up to 48 V

Model TFS35

WIKA data sheet TV 35.01

Applications

- Mobile hydraulics
- Machine building
- Compressors
- Motors
- Cooling and heating circuits

Special features

- Fixed switching temperature
- Current-independent switching
- Automatic reset
- No additional voltage supply
- Simple and fast mounting

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 temperature switches model TFS35. Temperature sensing is carried out by a bimetal disc, which snaps over when the nominal switching temperature (NST) is reached.

On cooling back down to the reset switching temperature (RST), the switch returns to its original state.

The bimetal disc in the TFS35 carries no current, and this eliminates the possibility of arcing.

With current-carrying bimetal discs there is also a danger of premature switching as a result of higher self-heating.



Fig. left: Model TFS35 with rectangular connector per EN 175301-803

Fig. centre: Model TFS35 with connector AMP Junior Power Timer

Fig. right: Model TFS35 with circular connector M12 x 1

The reset switching temperature is typically 15 ... 40 K below the switching temperature.

Contact design

The model TFS35 bimetal temperature switch can be delivered in two contact designs.

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

A **Normally Open (NO)** = open in the normal state) closes a circuit on reaching the switching temperature, in order that, for example, a fan or warning lamp can be switched on.

In both cases, on cooling down below the reset switching temperature, the contacts return to their original state, so that the monitored equipment can again work normally.

Max. switching voltage

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

- AC 48 V, 50/60 Hz, 3 A
- DC 24 V, 3 A
- DC 12 V, 4 A

Contact resistance

< 50 mΩ

Dielectric strength

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

Temperature ranges

- Nominal Switching Temperature (NST)
50 ... 155 °C [122 ... 311 °F]

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 in bimetal temperature switches is typically 15 ... 40 K below the switching temperature.
To ensure a safe reset of the switch at low switching temperatures, care must be taken that the temperature difference between the measuring point and ambient is high enough; since otherwise the switch cannot cool back down to the reset switching temperature and thus the equipment will not be able to return to its normal state.

- Ambient temperature
The maximum permissible ambient temperature depends on the electrical connection.

Rectangular connector per EN 175301-803

-40 ... +125 °C [-40 ... +257 °F]

Connector AMP Junior Power Timer

-40 ... +150 °C [-40 ... +302 °F]

Circular connector M12 x 1

-40 ... +100 °C [-40 ... +212 °F]

Note:

With small insertion lengths there is a possibility that the temperature at the connector can reach impermissibly high values. This absolutely must be taken into account in the design of the measuring point.

Thermowell

Material

- Brass
- Stainless steel

Stem diameter Ø F₁

10 mm [0.394 in]

Process connection E

Mounting thread:

- G ¼ B
- G ⅜ B
- G ½ B
- M14 x 1,5
- ¼ NPT
- ½ NPT

Others on request

Insertion length U₁

- 30 mm [1.181 in]
- 40 mm [1.575 in]
- 50 mm [1.969 in]

Others on request (minimum length 20 mm [0.787 in])

Response time

- The response time is strongly influenced by
- the thermowell used (diameter, material, insertion length)
 - the heat transfer from thermowell to the switching element
 - the flow-rate of the medium

Due to the design of the model TFS35 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 TFS35 bimetal temperature switch is very high.

Depending on the thermowell design, installation situation, medium and temperature, the vibration resistance can be up to 10 g.

Shock resistance

Up to 10 g, depending on the version, installation situation, medium and temperature

Static operating pressure

The model TFS35 standard instrument is suitable for static pressures up to a maximum of 50 bar. For higher pressure ranges, please contact a WIKA contact person.

Electrical connection

- Rectangular connector per EN 175301-803, form A
 - Connector AMP Junior Power Timer
 - Circular connector M12 x 1
- Customer-specific connections on request

Ingress protection

The ingress protection depends on the electrical connection.

- Rectangular connector per EN 175301-803: IP65
- Connector AMP Junior Power Timer: IP66, IP67
- Circular connector M12 x 1: IP66, IP67

Note:

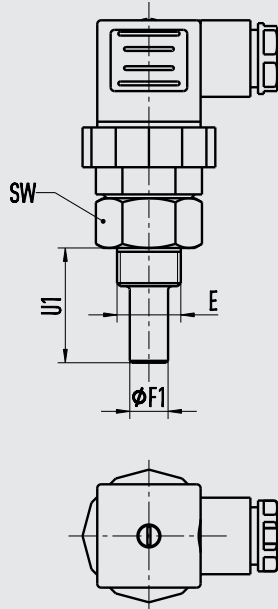
The stated ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.

Accessories

On request, WIKA supplies a suitable mating connector for the electrical connections as a separate accessory.

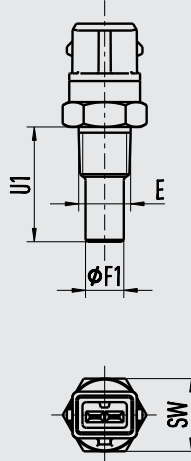
Dimensions in mm [in]

Rectangular connector
per EN 175301-803



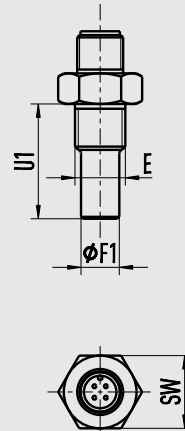
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Connector AMP Junior Power Timer



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Circular connector M12 x 1



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Ordering information

Model / Switching temperature / Contact design / Switching voltage / Thermowell material / Thermowell diameter / Process connection / Insertion length / Electrical connection

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