Ambient temperature sensor
Model TF41

WIKA data sheet TE 67.17

Applications

- Heat pumps
- Combined heat and power plant
- Heating, ventilation and air-conditioning
- Refrigeration technology

Special features

- Smallest housing design
- Protected against dust and water jets, IP 65
- UV-resistant
- Clip-on sun protector
- Temperature ranges from -40 … +100 °C

**Fig. top: Ambient temperature sensor, model TF41
Fig. bottom: Ambient temperature sensor, model TF41
with sensor sleeve**

Description

Model TF41 ambient temperature sensors are used for temperature measurement in external areas as well as in cold rooms and production and storage facilities. The extremely small housing even enables mounting in locations where there is very little space available.

The model TF41 ambient temperature sensors are delivered as standard with the measuring element integrated within the housing. For faster temperature measurement, the TF41 can alternatively be delivered with an external sensor shaft. To prevent erroneous measurements through strong radiation from sunlight, we offer a clip-on sun cover as an accessory. By selecting the appropriate measuring elements, the TF41 ambient temperature sensors are compatible with all commonly used control systems.

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Specifications

Measuring element
As standard, WIKA uses the following measuring elements for the model TF41 ambient temperature sensor:

- Pt1000, class B per DIN EN 60751
- Pt100, class B per DIN EN 60751
- NTC 5 k ±5 % / B (25/85) = 3976
- NTC 10 k ±5 % / B (25/85) = 3435

Others on request

Platinum elements offer the advantage of meeting international standards (IEC 751 / DIN EN 60751). Due to material- and production-specific criteria, a standardisation of semiconductor elements such as NTC's is not possible. For this reason their interchange ability is limited.

Further advantages of platinum elements are: better long-term stability and better behaviour over temperature cycles as well as a wider temperature range. High measuring accuracy and linearity are also possible with NTC's, but only in a limited temperature range.

This is set against the lower temperature sensitivity of platinum elements.

Strengths and weaknesses of the different measuring elements:

	Pt1000	Pt100	NTC
Temperature range	++	++	-
Accuracy	++	++	-
Linearity	++	++	-
Long-term stability	++	++	+
International standards	++	++	-
Temperature sensitivity [dR/dT]	+	-	++
Impact of the connecting cable	+	-	++

Connection method:
The resistance of the connecting cable affects the measurement value of 2-wire connections and must be taken into consideration.
For copper cable with a cross-section of 0.22 mm², the following value applies: 0.162 Ω/m → 0.42 °C/m for Pt100.

Ambient temperature sensors are generally used in applications where a high-accuracy temperature measurement is not required. To keep the costs of the measuring point low, we offer our ambient temperature sensors with a 2-wire connection.

We recommend selecting a design with Pt1000, with which, on the one hand, the influence of the wires, at 0.04 °C/m, is a factor of 10 lower, and on the other, the international standardisation of platinum measuring resistors guarantees a higher market availability. The lead resistance, however, is less noticeable with an NTC element. If the wire from the temperature sensor to the controller is designed with a cross-section of 0.5 mm², then the influence of the wires is also reduced here to under 0.04 °C/m with Pt100 and 0.004 °C/m with Pt1000.
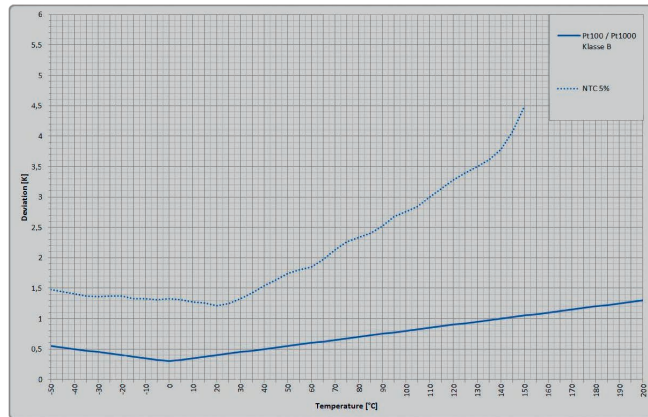
Characteristic curves

The following characteristic curves show the typical curve shapes for the standard WIKA measuring elements, depending on the temperature and the typical tolerance curves.

Typical characteristic curves
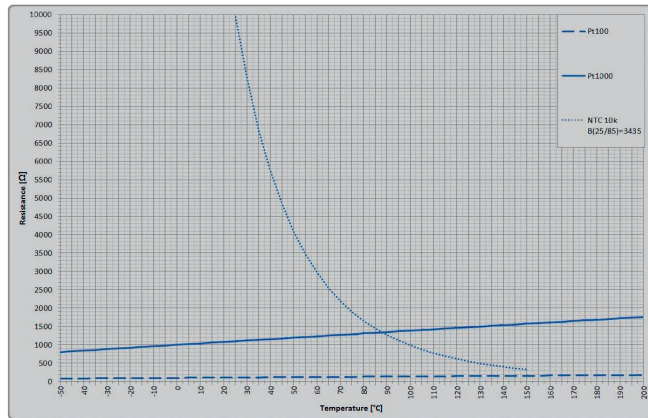
Typical tolerance curves

Temperature ranges

- Measuring range
  The measuring range is dependent, essentially, on the material of the housing and the measuring element. The housing is designed for a temperature range of -40 … +100 °C. In conjunction with the measuring element, the following measuring ranges are available:

Measuring element	Measuring range
Pt1000	-40 … +100 °C
Pt100	-40 … +100 °C
NTC	-30 … +100 °C

- Ambient temperature
  The permissible ambient temperature range is identical to the measuring range.

Sensor housing

To enable the most unobtrusive mounting possible for
the TF41 ambient temperature sensor, we have adopted
extremely small dimensions for the housing.
The housing is made from PA66 GK30 UV-resistant plastic.

Colour: Pure white, RAL 9010
Cable gland: M16
Connection: 2 screw terminals, max. 1.5 mm^2
Housing ingress protection: IP 65

Sensor design

As standard, the measuring elements are integrated into
the housing of the ambient temperature sensor. If a faster
response is desired, it is possible to fit the TF41 with an
external sensor sleeve, in the tip of which the measuring
element is installed.

Material: Stainless steel 1.4571
Diameter: 6 mm
Length: 30 mm

Ingress protection

IP 65
The connection housing is protected from dust and water jets.

Sun protector

Generally, with the mounting of ambient temperature sen-
sors, it must be ensured that these are not placed in direct
sunlight. It is therefore recommended that they are mounted
on the north side of buildings.

If this is not possible, we offer a sun protector as an acces-
sory. It is from the same material as the housing and is easily
attached to it.

Accessories

To protect the model TF41 ambient temperature sensor from
radiation from direct sunlight, there is the possibility of using
a clip-on protective sun cover.
The protective sun cover for retrofitting is available as an
accessory item.

On ordering, please give the order number!

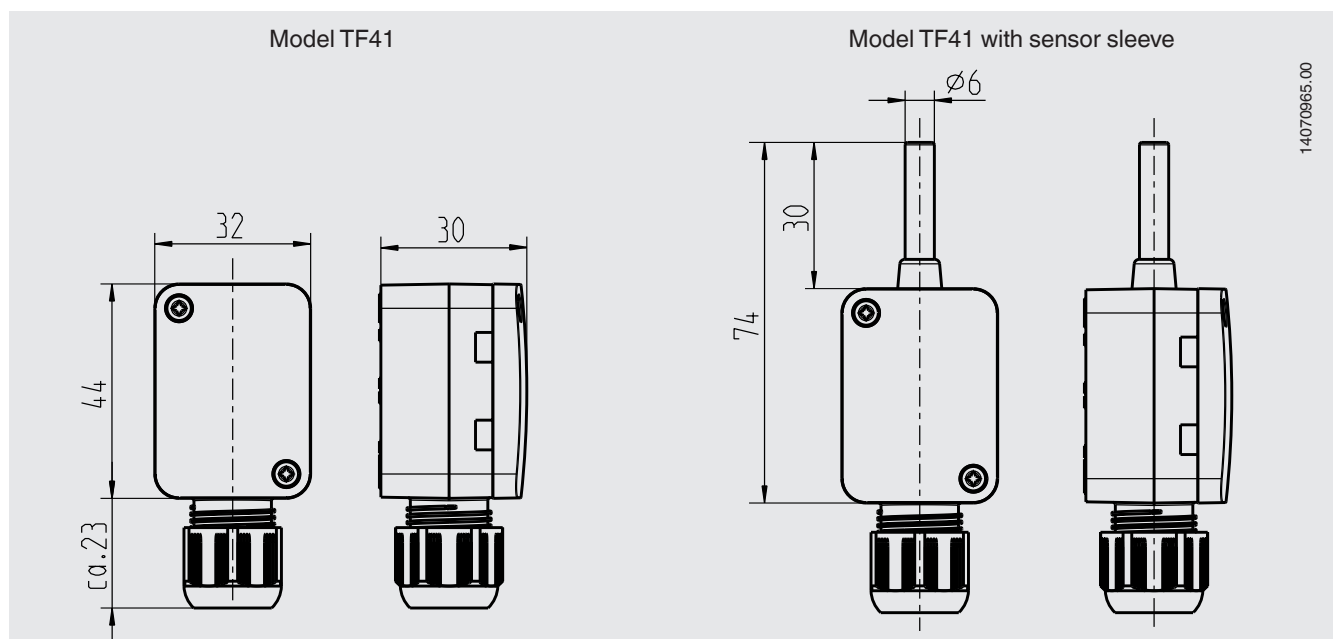| Article	Order no.
Protective sun cover for TF41	14067113

To affix the ambient temperature sensor to the building wall, a
wall-mounting kit is available.
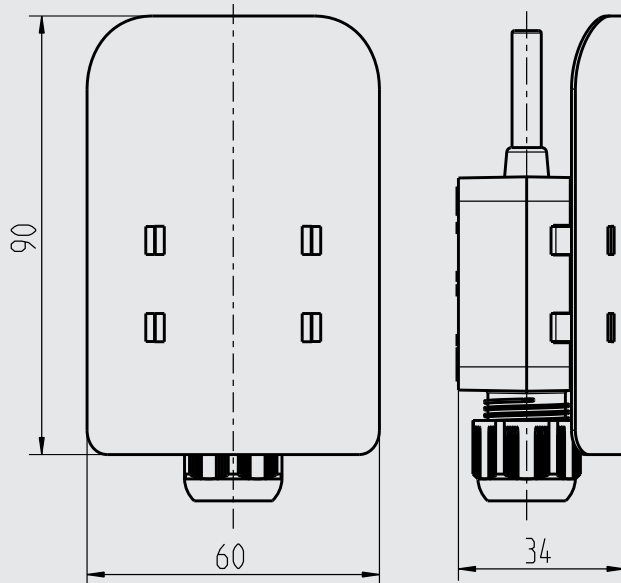
On ordering, please give the order number!

Article	Order no.
Wall-mounting kit for TF41	14069467

It consists of two wall-plugs Ø 6 x 30 mm and the appropriate
screws.

Dimensions in mm

Model TF41 with sensor sleeve and sun protection

14070965.00

90

60

34

Ordering information

When ordering choose one criterion from each category.

Measuring element

- Pt1000, class B per DIN EN 60751
- Pt100, class B per DIN EN 60751
- NTC 5 k ±5 % / B (25/85) = 3976, 2-wire
- NTC 10 k ±5 % / B (25/85) = 3435, 2-wire

Others on request

Additional options (multiple selections possible)

- External sensor sleeve, stainless steel
- Clip-on protective sun cover
- Wall-mounting kit

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