

Duct temperature sensor Model TF40

WIKA data sheet TE 67.16

Applications

- Air conditioning technology
- Ventilation technology
- Refrigeration technology
- Heating technology

Special features

- Smallest housing design
- Protected against dust and water jets, IP 65
- Quick and simple mounting
- Plastic mounting flange
- Temperature ranges from -50 ... +200 °C



Duct temperature sensor, model TF40

Description

The model TF40 duct temperature sensors are used for temperature measurement in heating, ventilation and air-conditioning technology. They are primarily used in air ducts. They are mounted in them by means of a mounting flange. In conjunction with an additional thermowell, they can also be used for temperature measurement in liquids.

The extremely small housing even enables mounting in locations where there is very little space available. By selecting the appropriate measuring elements, the TF40 duct temperature sensors are compatible with all commonly used control systems.

Specifications

Measuring element

As standard, WIKA uses the following measuring elements for the model TF40 duct temperature sensor:

- Pt1000, class B per DIN EN 60751
- Pt100, class B per DIN EN 60751
- NTC 5 k \pm 5 % / B (25/85) = 3976
- NTC 10 k \pm 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. Consequently, the ability to interchange them is limited.

Further advantages of platinum elements are a better long-term stability, better performance with cyclic temperatures and a wider temperature range. A high measuring accuracy and linearity are also possible with NTC's, but only in a very limited temperature range.

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

Strengths and weaknesses of the different measuring elements:

	Pt100	Pt1000	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 \rightarrow 0.42 $^{\circ}$ C/m for Pt100.

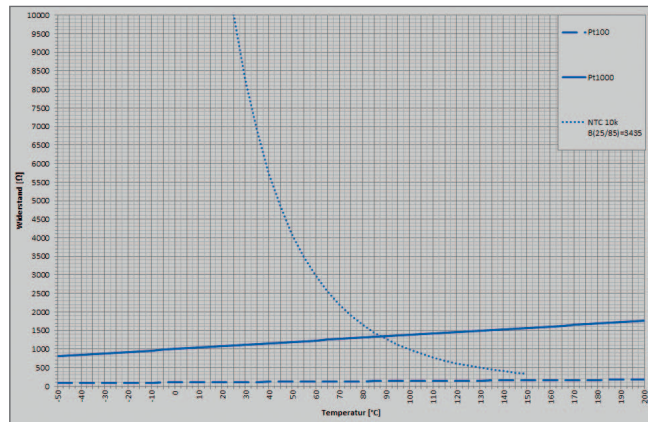
Duct temperature sensors are generally used in applications where a high-accuracy temperature determination is not required. To keep the costs of the measuring point low, we offer our duct temperature sensors with a 2-wire connection.

We recommend selecting a design with Pt1000, with which, on the one hand, the influence of the wires, at 0.04 $^{\circ}$ 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 $^{\circ}$ C/m with Pt100 and 0.004 $^{\circ}$ C/m with Pt1000.

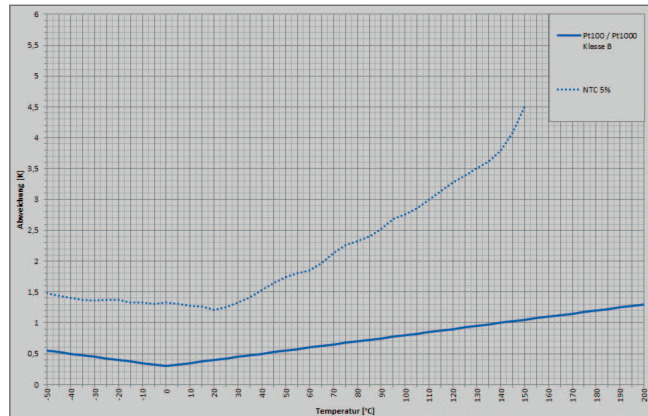
Characteristic curves

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 measuring element. Depending on the measuring element, the following maximum measuring ranges are available:

Measuring element	Measuring range
Pt100	-50 ... +200 $^{\circ}$ C
Pt1000	-50 ... +200 $^{\circ}$ C
NTC	-30 ... +130 $^{\circ}$ C

Ambient temperature

The housing is designed for a temperature range of -40 ... +100 $^{\circ}$ C.

Sensor housing

To enable the mounting of the TF40 duct temperature sensor in space-critical locations as well, 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

Electrical connection: 2 screw terminals, max. 1.5 mm²

Housing ingress protection: IP 65

Stem

For optimal temperature sensing, the TF40 duct temperature sensor should be mounted so that the tip of the stem is located approximately in the centre of the air duct. To match the various duct sizes, there are various standard nominal lengths available.

Material: Stainless steel, 1.4571

Diameter: 6 mm

Nominal lengths N: 100, 150, 200, 250 mm

matched to our thermowells with insertion lengths of 50, 100, 150, 200 mm (see "Thermowell")

Note:

When ordering the TF40 with a WIKA thermowell fitted, the nominal length of the stem N must be selected as 50 mm longer than the insertion length of the thermowell, U₁.

Ingress protection

IP 65

The connection housing is protected from dust and water jets.

Mounting flange

To fix the duct temperature sensor to the air duct, a PA66 GK30 plastic mounting flange is available. If desired, it can be delivered with the temperature sensor.

The mounting flange is also available later as an accessory item.

On ordering, please give the order number!

Article	Order no.
Plastic mounting flange, Ø 40 mm	14091035

Thermowell

To use TF40 temperature sensors in liquids, chrome-plated brass thermowells with a G ½ mounting thread is available in 4 insertion lengths.

On ordering, please give the order number!

Article	Order no.
Thermowell, insertion length U ₁ = 50 mm	14087900
Thermowell, insertion length U ₁ = 100 mm	14087902
Thermowell, insertion length U ₁ = 150 mm	14087903
Thermowell, insertion length U ₁ = 200 mm	14087905

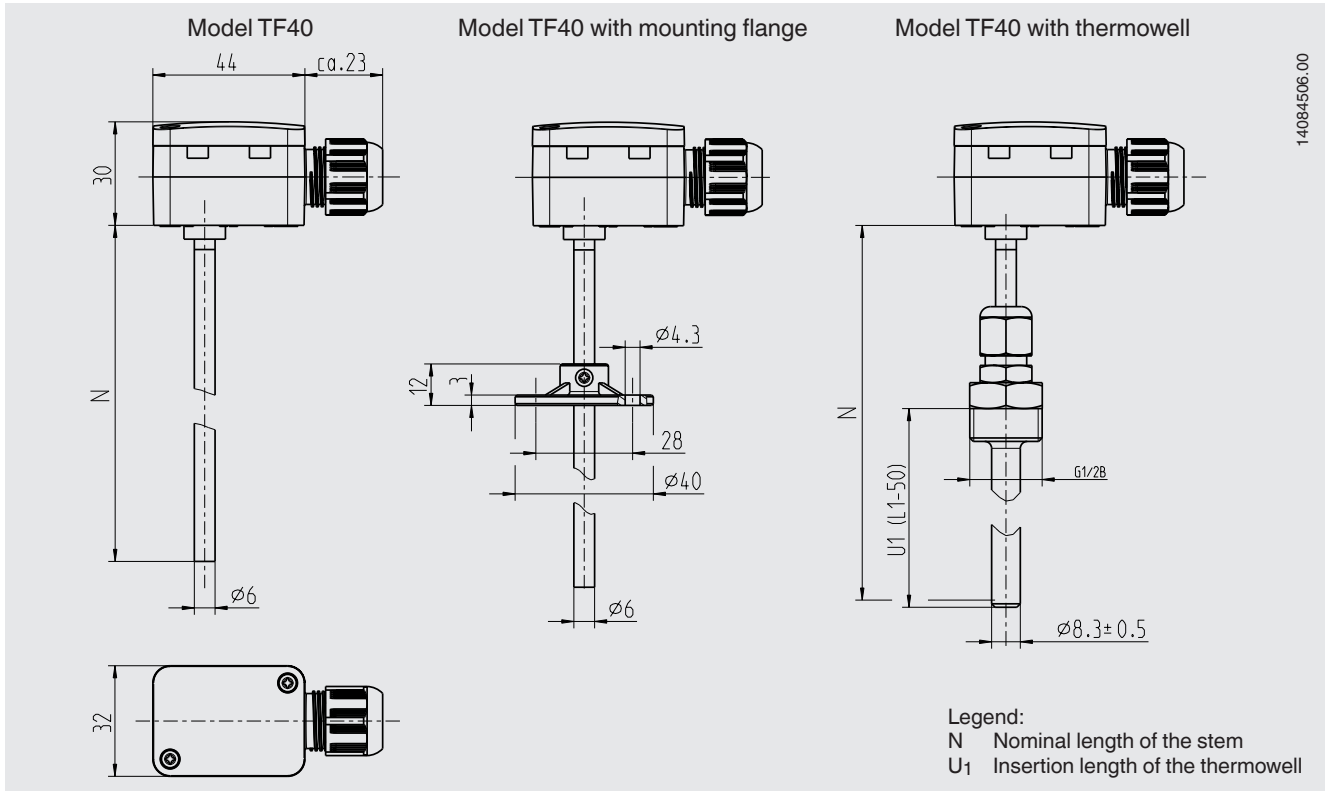
Note:

When ordering the TF40 with a WIKA thermowell fitted, the insertion length of the thermowell, U₁, is calculated automatically.

This is:

Insertion length of the thermowell (U₁) = nominal length of the stem (N) - 50 mm

Dimensions in mm



Ordering information

When ordering choose one criterion from each category.

Measuring element

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

Others on request

Mounting accessories

- Without
- Plastic flange, \varnothing 40 mm
- Thermowell, G $\frac{1}{2}$, chrome-plated brass, insertion length (U₁) = nominal length (N) - 50 mm

Nominal length of the stem N

- 100 mm
- 150 mm
- 200 mm
- 250 mm

Others on request

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