Insertion thermometer
For refrigeration technology
Model TF43

Applications
- Refrigeration technology
- Cooling systems
- Air-conditioning equipment

Special features
- Measuring ranges from -50 ... +105 °C (briefly up to +120 °C)
- Plastic-moulded measuring element
- Dust- and waterproof (IP68)

Description
The model TF43 insertion thermometer is mainly used to measure the temperature of gaseous and liquid media in the range of -50 ... +105 °C (-58 ... +221 °F).

The measuring element is connected to a connection lead. The measuring element and connection point are then completely encapsulated with plastic, making the insertion thermometer dustproof and waterproof (IP68). This makes the TF43 ideal for applications with regular freeze-thaw cycles.

For mechanical stabilisation, the thermometer can optionally be reinforced with a probe sleeve made of stainless steel.

As a distinct OEM product, it has been designed for medium to large quantities. For small quantities for testing purposes, please consult your WIKA contact.
**Measuring element**

As standard, WIKA uses the following measuring elements for the model TF43 insertion thermometer:

- Pt1000, class F 0.3 per IEC/EN 60751
- Pt100, class F 0.3 per IEC/EN 60751
- NTC, $R_{25} = 10 \, \text{k}\Omega$, B (25/85) = 3977
- NTC, $R_{25} = 10 \, \text{k}\Omega$, B (25/85) = 3435

Others on request

Platinum elements offer the advantage of meeting international standards (IEC/EN 60751). Due to material- and production-specific criteria, a standardisation of semiconductor elements, e.g. NTCs and KTY, is not possible. For this reason their interchangeability is limited.

Further advantages of platinum elements are: better long-term stability and better behaviour over temperature cycles, a wider temperature range as well as a high measurement accuracy and linearity.

High measurement accuracy and linearity are also possible with NTCs, but only in a very limited temperature range.

**Strengths and weaknesses of the different measuring elements**

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<th>Pt1000</th>
<th>Pt100</th>
<th>NTC</th>
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<tbody>
<tr>
<td>Temperature range</td>
<td>++</td>
<td>++</td>
<td>-</td>
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<tr>
<td>Accuracy</td>
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<td>++</td>
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<td>Linearity</td>
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<tr>
<td>Long-term stability</td>
<td>++</td>
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<td>+</td>
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<td>International standards</td>
<td>++</td>
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<tr>
<td>Temperature sensitivity [dR/dT]</td>
<td>+</td>
<td>-</td>
<td>++</td>
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<tr>
<td>Impact of the connection lead</td>
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**Connection method**

For all versions of the model TF43 insertion thermometer, WIKA offers a 2-wire connection as standard.

The lead resistance of the connection lead affects the measured value of 2-wire connections and must be taken into consideration.

For copper cable with cross-section 0.22 mm² the following standard value applies: $0.162 \, \text{Ω}/\text{m} \rightarrow 0.42 \, ^\circ\text{C}/\text{m}$ for Pt100

With a Pt1000 measuring element, the influence of the connection lead of 0.04 \, ^\circ\text{C}/\text{m} is a factor of 10 lower. The lead resistance becomes still less significant in relation to the basic resistance $R_{25}$ with a NTC or KTY element.

**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

![Characteristic curves](image1)

- Typical tolerance curves

![Tolerance curves](image2)
Temperature ranges

Medium temperature (measuring range)
-50 ... +105 °C, briefly up to +120 °C

Ambient temperature
-50 ... +105 °C

Probe sleeve

The measuring element and connection lead are hot-coated. As a result, the model TF43 insertion thermometer is waterproof (IP68), even without a probe sleeve.

For mechanical stabilisation and mounting, the model TF43 insertion thermometer can be delivered with an additional probe sleeve made of stainless steel.

Diameter: 6 mm
Length: 50 or 100 mm

Connection lead

The connection lead and the measuring element are moulded together as one single unit. The connection lead is halogen-free and has been designed as a double-insulated round cable.

Electrical connection

The model TF43 insertion thermometer is delivered with bare-end wires as standard. If required, fitting with customer-specific plug connectors is possible.

Probe length L

The standard probe length is 3000 mm. For other lengths, please consult your WIKA contact.

Ingress protection

IP68

Dimensions in mm

[Diagram of Model TF43]

[Diagram of Model TF43 with additional probe sleeve]

Legend:
L Probe length

Probe sleeve length
Approvals

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Manufacturer's information and certificates

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Approvals and certificates, see website