Duct thermometer
Model TF40

Applications

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

Special features

- Smallest case design
- Protected against dust and water jets, IP65
- Quick and simple mounting
- Plastic mounting flange
- Temperature ranges from -50 … +200 °C

Description

The model TF40 duct thermometers are used for temperature measurement in heating, ventilation and air-conditioning technology. They are primarily used in air ducts. Mounting is performed using a mounting flange. In conjunction with an additional thermowell, they can also be used for temperature measurement in liquids.

The extremely small case even enables mounting in locations where there is very little space available.

By selecting the appropriate measuring elements, the TF40 duct thermometers are compatible with all commonly used control systems.
Measuring element

WIKA standardly uses the following measuring elements for the model TF40 duct thermometer:

- Pt1000, class B per DIN EN 60751
- Pt100, class B per DIN EN 60751
- NTC 5 k / B (25/85) = 3976
- NTC 10 k / 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 NTCs is not possible. For this reason their interchangeability is limited.

Further advantages of platinum elements are a better long-term stability, better performance with cyclic temperatures and a wider temperature range. High measurement accuracy and linearity are also possible with NTCs, 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

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

Connection method

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 value applies: 0.162 Ω/m → 0.42 °C/m for Pt100

Duct thermometers 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 duct thermometers 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 noticeable just as little with an NTC element.

If the wire from the temperature probe 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.

<table>
<thead>
<tr>
<th>Typical characteristic curves</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Typical tolerance curves</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Typical tolerance curves</th>
</tr>
</thead>
</table>
**Temperature ranges**

**Medium temperature (measuring range)**
The measuring range is dependent, essentially, on the measuring element. Depending on the measuring element, the following maximum measuring ranges are available:

<table>
<thead>
<tr>
<th>Measuring element</th>
<th>Measuring range</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTC</td>
<td>-30 ... +130 °C</td>
</tr>
<tr>
<td>Pt100</td>
<td>-50 ... +200 °C</td>
</tr>
<tr>
<td>Pt1000</td>
<td>-50 ... +200 °C</td>
</tr>
</tbody>
</table>

**Ambient temperature**
The case is designed for a temperature range of -40 ... +100 °C.

**Probe case**
To enable the mounting of the TF40 duct thermometer in space-critical locations as well, we have adopted extremely small dimensions for the case. The case 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
- **Case ingress protection:** IP65

**Stem**
For optimal temperature sensing, the TF40 duct thermometer 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")

**Ingress protection**

- **IP65**
The case is protected from dust and water jets.

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

The mounting flange is also available later as an accessory item. On ordering, please give the order number:

<table>
<thead>
<tr>
<th>Description</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic mounting flange, Ø 40 mm</td>
<td>14091035</td>
</tr>
</tbody>
</table>

**Thermowell**
To use the model TF40 duct thermometer in liquids, thermowells with a G ½ mounting thread (material: brass) are available in four insertion lengths. On ordering, please give the order number:

<table>
<thead>
<tr>
<th>Thermowell</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion length U₁ = 50 mm</td>
<td>14238211</td>
</tr>
<tr>
<td>Insertion length U₁ = 100 mm</td>
<td>14238212</td>
</tr>
<tr>
<td>Insertion length U₁ = 150 mm</td>
<td>14238213</td>
</tr>
<tr>
<td>Insertion length U₁ = 200 mm</td>
<td>14238214</td>
</tr>
</tbody>
</table>

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

Insertion length of the thermowell U₁ = nominal length of the stem N - 50 mm
Dimensions in mm

Model TF40

Model TF40 with mounting flange

Model TF40 with thermowell

Legend:
N  Nominal length of the stem
U₁  Insertion length of the thermowell

Approvals

<table>
<thead>
<tr>
<th>Logo</th>
<th>Description</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOST</td>
<td>Metrology, measurement technology</td>
<td>Russia</td>
</tr>
<tr>
<td>KazinMetr</td>
<td>Metrology, measurement technology</td>
<td>Kazakhstan</td>
</tr>
<tr>
<td>UkrSEPRO</td>
<td>Metrology, measurement technology</td>
<td>Ukraine</td>
</tr>
<tr>
<td>Uzstandard</td>
<td>Metrology, measurement technology</td>
<td>Uzbekistan</td>
</tr>
</tbody>
</table>

Manufacturer’s information and certificates

<table>
<thead>
<tr>
<th>Logo</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>RoHS conformity</td>
</tr>
<tr>
<td>-</td>
<td>China RoHS directive</td>
</tr>
</tbody>
</table>

Approvals and certificates, see website
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 kΩ / B (25/85) = 3976, 2-wire
- NTC 10 kΩ / B (25/85) = 3435, 2-wire
  Others on request

### Nominal length of the stem N
- 100 mm
- 150 mm
- 200 mm
- 250 mm
  Others on request

### Mounting accessories
- Without
- Plastic flange, Ø 40 mm
- Thermowell G ½, brass, insertion length U₁ = nominal length N - 50 mm

Ordering information
Model / Measuring element / Nominal length of the stem N / Mounting accessories

© 01/2014 WIKA Alexander Wiegand SE & Co. KG, all rights reserved.
The specifications given in this document represent the state of engineering at the time of publishing.
We reserve the right to make modifications to the specifications and materials.

WIKA data sheet TE 67.16 ∙ 08/2017