

Measuring insert for process thermocouple Model TC12-A

WIKA data sheet TE 65.16



for further approvals
see page 2

Applications

- Replacement measuring insert for servicing

Special features

- Application ranges from 0 ... 1,200 °C (32 ... 2,192 °F)
- Made of mineral-insulated sheathed measuring cable
- Explosion-protected versions



Measuring insert for process thermocouple,
model TC12-A

Description

The measuring inserts described here are intended for installation in model TC12-B or TC12-M process resistance thermometers (see figures on the right). Operation without thermowell is only recommended in certain applications.

The measuring insert is made of flexible, mineral-insulated sheathed cable. The sensor is located in the tip of the measuring insert.

Type of sensor, number of sensors and accuracy can each be selected to suit the respective application.



Model TC12-B



Model TC12-M

Explosion protection

The classification/suitability of the instrument (permissible power P_{max} as well as the permissible ambient temperature) for the respective category can be seen on the EC-type examination certificate, the Ex certificate or in the operating instructions.

Attention:

Built into a model TC12-B process thermocouple - depending on the version - a measuring insert can be used with “intrinsically safe Ex i” or “flameproof enclosure Ex d” ignition protection type. One such measuring insert, suitable for Ex d, is marked Ex i.

The use of a model TC12-A measuring insert in hazardous areas, without suitable protective components, is not permitted!



Example: Model TC12-B

Approvals (explosion protection, further approvals)

| Logo | Description | Country |
|------|---|-----------------------------|
| | EU declaration of conformity EMC directive ¹⁾ EN 61326 emission (group 1, class B) and interference immunity (industrial application) | European Union |
| | ATEX directive (option) Hazardous areas - Ex i Zone 1 gas [II 2G Ex ia IIC T3 ... T6 Gb] | |
| | IECEx (option) (in conjunction with ATEX) Hazardous areas - Ex i Zone 1 gas [Ex ia IIC T3 ... T6 Gb] | International |
| | EAC (option) Hazardous areas - Ex i Zone 1 gas [1 Ex ib IIC T3/T4/T5/T6] | Eurasian Economic Community |
| | INMETRO (option) Hazardous areas - Ex i Zone 1 gas [Ex ib IIC T3 ... T6 Gb] | Brazil |
| | NEPSI (option) Hazardous areas - Ex i Zone 1 gas [Ex ib IIC T3 ~ T6] | China |
| | KCs - KOSHA (option) Hazardous areas - Ex i Zone 1 gas [Ex ib IIC T4 ... T6] | South Korea |
| - | PESO (option) Hazardous areas - Ex i Zone 1 gas [Ex ib IIC T3 ... T6 Gb] | India |
| | GOST (option) Metrology, measurement technology | Russia |
| | KazInMetr (option) Metrology, measurement technology | Kazakhstan |
| - | MTSCHS (option) Permission for commissioning | Kazakhstan |
| | BelGIM (option) Metrology, measurement technology | Belarus |

1) Only for built-in transmitter

| Logo | Description | Country |
|---|---|------------|
|  | Uzstandard (option) Metrology, measurement technology | Uzbekistan |

Instruments marked with "ia" may also be used in areas only requiring instruments marked with "ib" or "ic".
If an instrument with "ia" marking has been used in an area with requirements in accordance with "ib" or "ic", it can no longer be operated in areas with requirements in accordance with "ia" afterwards.

Approvals and certificates, see website

Sensor

Measuring point

- Ungrounded
- Grounded

Sensor types

| Model | Operating temperatures per | | | |
|----------|----------------------------|-------------------|----------------|---------|
| | IEC 60584-1 | | ASTM E230 | |
| | Class 2 | Class 1 | Standard | Special |
| K | -40 ... +1,200 °C | -40 ... +1,000 °C | 0 ... 1,260 °C | |
| J | -40 ... +750 °C | -40 ... +750 °C | 0 ... 760 °C | |
| E | -40 ... +900 °C | -40 ... +800 °C | 0 ... 870 °C | |
| N | -40 ... +1,200 °C | -40 ... +1,000 °C | 0 ... 1,260 °C | |
| T | -40 ... +350 °C | | 0 ... 370 °C | |

Sheath material and sheath diameter may limit the maximum operating temperature.

The actual operating temperature of the thermometers is limited both by the maximum permissible working temperature and the diameter of the thermocouple and the MI cable, as well as by the maximum permissible working temperature of the thermowell material.

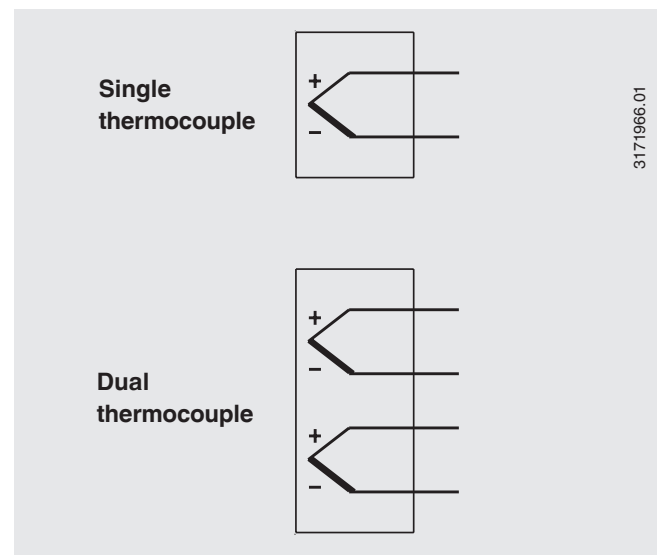
For detailed specifications for thermocouples, see IEC 60584-1 or ASTM E230 and Technical information IN 00.23 at www.wika.com.

Tolerance value

For the tolerance value of thermocouples, a cold junction temperature of 0 °C has been taken as the basis.

Listed models are available both as single or dual thermocouples. The thermocouple will be delivered with an ungrounded measuring point, unless explicitly specified otherwise.

Electrical connection



Colour code of cable strands

| Sensor type | Standard | Positive | Negative |
|-------------|-----------|----------|----------|
| K | IEC 60584 | green | white |
| J | IEC 60584 | black | white |
| E | IEC 60584 | violet | white |
| N | IEC 60584 | pink | white |

Dimensions in mm

The replaceable measuring insert is made of a vibration-resistant, sheathed measuring cable (MI cable).
Material of MI cable: Ni alloy 2.4816 (Inconel 600),
others on request

| Dimensions | |
|--|--|
| Measuring insert length l_5 | ≥ 300 mm |
| Measuring insert diameter $\varnothing d$ Standard: | 3 mm 4.5 mm 6 mm 8 mm |
| Option (on request): | 1/8 inch (3.17 mm) 1/4 inch (6.35 mm) 3/8 inch (9.53 mm) |

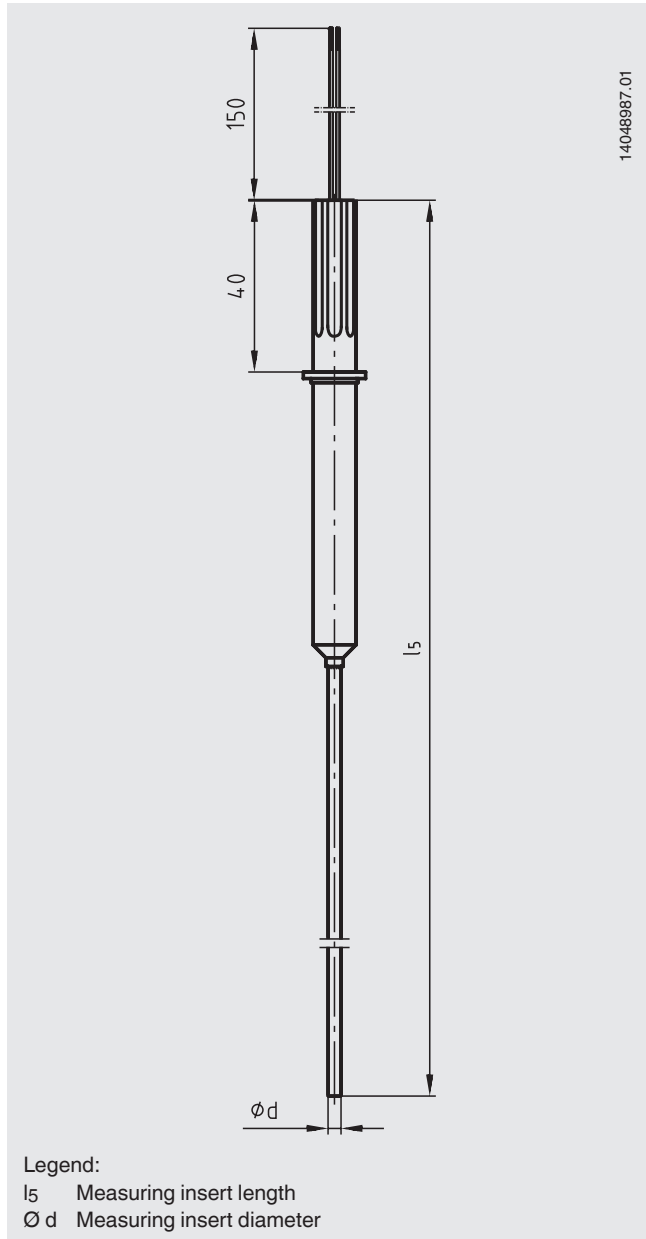
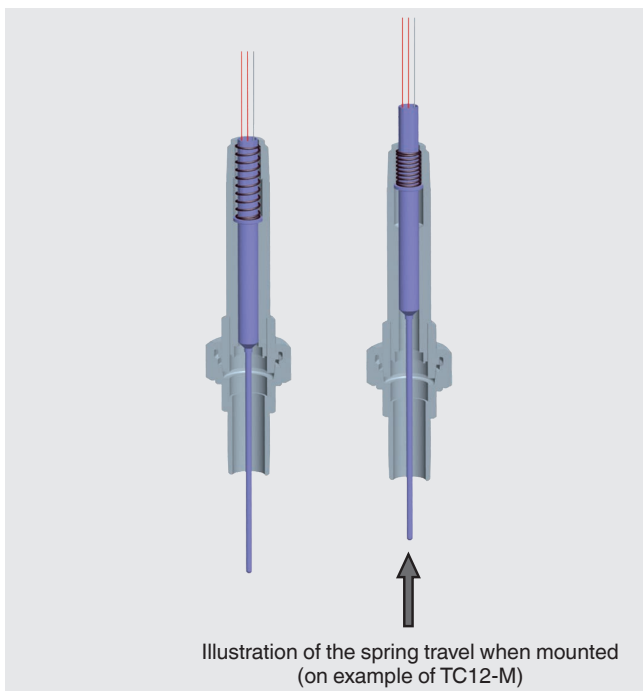
The measuring insert diameter should be approx. 1 mm smaller than the bore diameter of the thermowell. Gaps of more than 0.5 mm between thermowell and the measuring insert will have a negative effect on the heat transfer, and they will result in unfavourable response behaviour of the thermometer.

When fitting the measuring insert into a thermowell, it is very important to determine the correct insertion length (= thermowell length for bottom thicknesses of ≤ 5.5 mm). In order to ensure that the measuring insert is firmly pressed down onto the bottom of the thermowell, the measuring insert must be spring-loaded (spring travel: max. 20 mm).

Calculation of the measuring insert length in the event of replacement

| Thread to connection head | Measuring insert length l_5 |
|---------------------------|-------------------------------|
| 1/2 NPT | NL + 12 mm |
| M20 x 1.5 | NL + 18 mm |

NL = Nominal length of the TC12-B or TC12-M



Attention:

The use of a model TC12-A measuring insert is exclusively allowed with a model TC12-B or TC12-M thermocouple!

Operating conditions

Vibration resistance

50 g, peak-to-peak

Response time (in water)

$t_{50} < 5$ s

$t_{90} < 10$ s

Specifications for measuring insert diameter 6 mm:
The thermowell required for operation increases the response time dependent upon the actual parameters for the thermowell and the process.

Ambient and storage temperature

-60 ¹⁾ / -40 ... +80 °C

1) Special version on request (only available with specific approvals)

Other ambient and storage temperatures on request

Ingress protection

IP00 per IEC/EN 60529

The measuring inserts for the model TC12-A are designed for mounting into a model TC12-B thermocouple.

These thermocouples feature connection housings/cable glands/protective components which ensure a higher IP protection (see data sheet TE 65.17).

Certificates (option)

| Certification type | Measurement accuracy | Material certificate |
|-----------------------------------|----------------------|----------------------|
| Test report | x | x |
| 2.2 test report | x | x |
| 3.1 inspection certificate | x | - |
| DKD/DAkkS calibration certificate | x | - |

The different certifications can be combined with each other.

Ordering information

Model / Explosion protection / Ignition protection type / Zone / Sensor / Sensor specification / Application range of the thermometer / Insertion length / Measuring insert diameter Ø d / Sheath material / Mechanical requirements / Certificates / Options

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