

Resistance thermometer Model TR10-L, Ex d, for additional thermowell

WIKA data sheet TE 60.12



for further approvals
see page 6

Applications

- Chemical industry
- Petrochemical industry
- Offshore

Special features

- Examination certificate (ATEX)
- Measuring insert replaceable
- For many thermowell designs



Resistance thermometer, model TR10-L, Ex d, for
additional thermowell

Description

Resistance thermometers in this series can be combined with a large number of thermowell designs. Use without a thermowell is not permitted.

A wide variety of possible combinations of sensor, connection head, insertion length, neck length, connection to thermowell etc. are available for the thermometers; suitable for almost any thermowell dimension.

Sensor

The sensor is located in the tip of the measuring insert.
This is replaceable and spring-loaded.

Sensor connection method

- 2-wire
- 3-wire
- 4-wire

Sensor tolerance value per DIN EN 60751

- Class B
- Class A
- Class AA

The combinations of a 2-wire connection with class A or class AA are not advisable, since the lead resistance of the measuring insert negates the higher sensor accuracy.

For detailed specifications for Pt100 sensors, see Technical information IN 00.17 at www.wika.com.

Neck tube (option)

The neck tube is screwed into the connection head.
Connection to head: M20 x 1.5 or ½ NPT
The neck length depends on the intended use. Usually an isolation is bridged by the neck tube. Also, in many cases, the neck tube serves as a cooling extension between the connection head and the medium, in order to protect any possible built-in transmitter from high medium temperatures.

The standard material for neck tubes is stainless steel.

Other neck tube versions and materials are available on request

Measuring insert

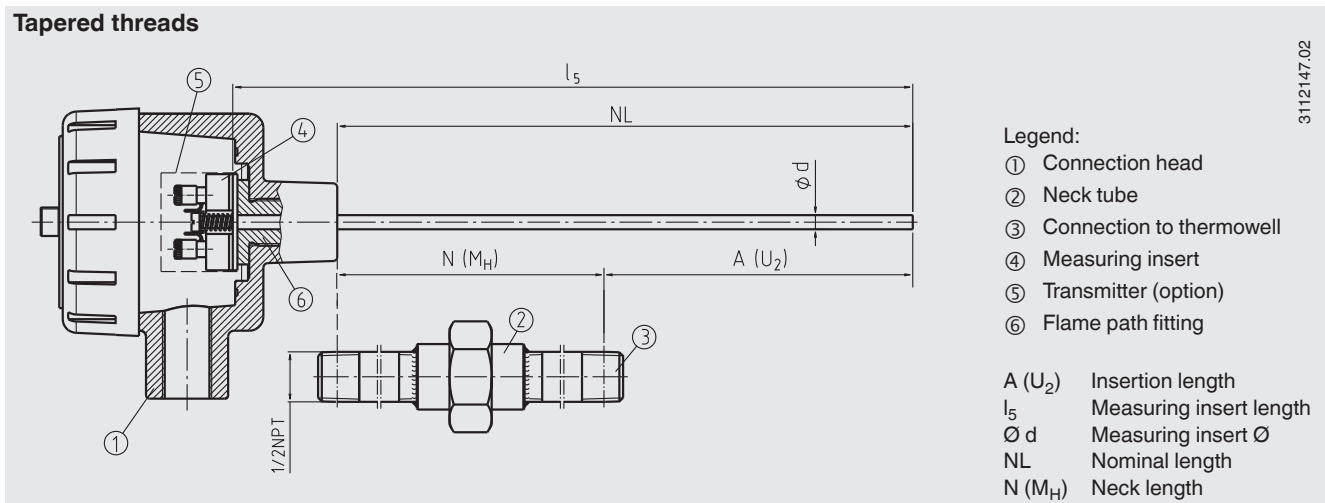
The measuring insert is made of a vibration-resistant, sheathed, mineral-insulated cable (MI cable).
The diameter of the measuring insert should be approx. 1 mm smaller than the bore diameter of the thermowell.
Gaps of more than 0.5 mm between thermowell and the measuring insert will have a negative effect on the heat transfer, and they will result in unfavourable response behaviour from 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).
The measuring insert should be spring-loaded (spring travel: 0 to 10 mm) in order to ensure that it presses against the bottom of the thermowell. Furthermore, we recommend to select a neck length in order to give a standard length for the thermometer's measuring insert. Measuring inserts for model TR10-L thermometers are manufactured with a fit below the terminal block. This guarantees a specific joint width, which is defined in the approval regulations, between the measuring insert and the built-in flame path fitting.

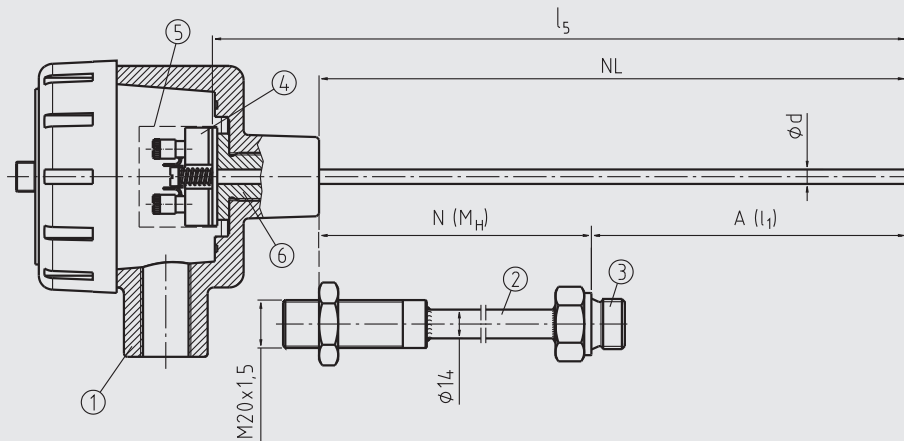
Due to the use of a flame path fitting and its fitting tolerances, the use of standard measuring inserts for replacement requirements is not allowed!

Replacement measuring insert with model TR10-K examination certificate, including flame path fitting (Has to be replaced when replacing the measuring insert!)

Components model TR10-L



Parallel threads



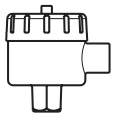
Legend:

- ① Connection head
- ② Neck tube
- ③ Connection to thermowell
- ④ Measuring insert
- ⑤ Transmitter (option)
- ⑥ Flame path fitting

- A (U₂) Insertion length
- l₅ Measuring insert length
- Ø d Measuring insert Ø
- NL Nominal length
- N (M_H) Neck length

3112287.01

Connection head



7000 W

| Model | Material | Cable outlet | Ingress protection | Cap | Surface |
|--------|-----------|---------------------------|--------------------|-------------|-------------------------------|
| 7000 W | Aluminium | ½ NPT, ¾ NPT or M20 x 1.5 | IP 65 | Screw cover | Blue, lacquered ¹⁾ |

1) RAL 5022

Transmitter (option)

An optional transmitter can be mounted into the ground of the connection head.

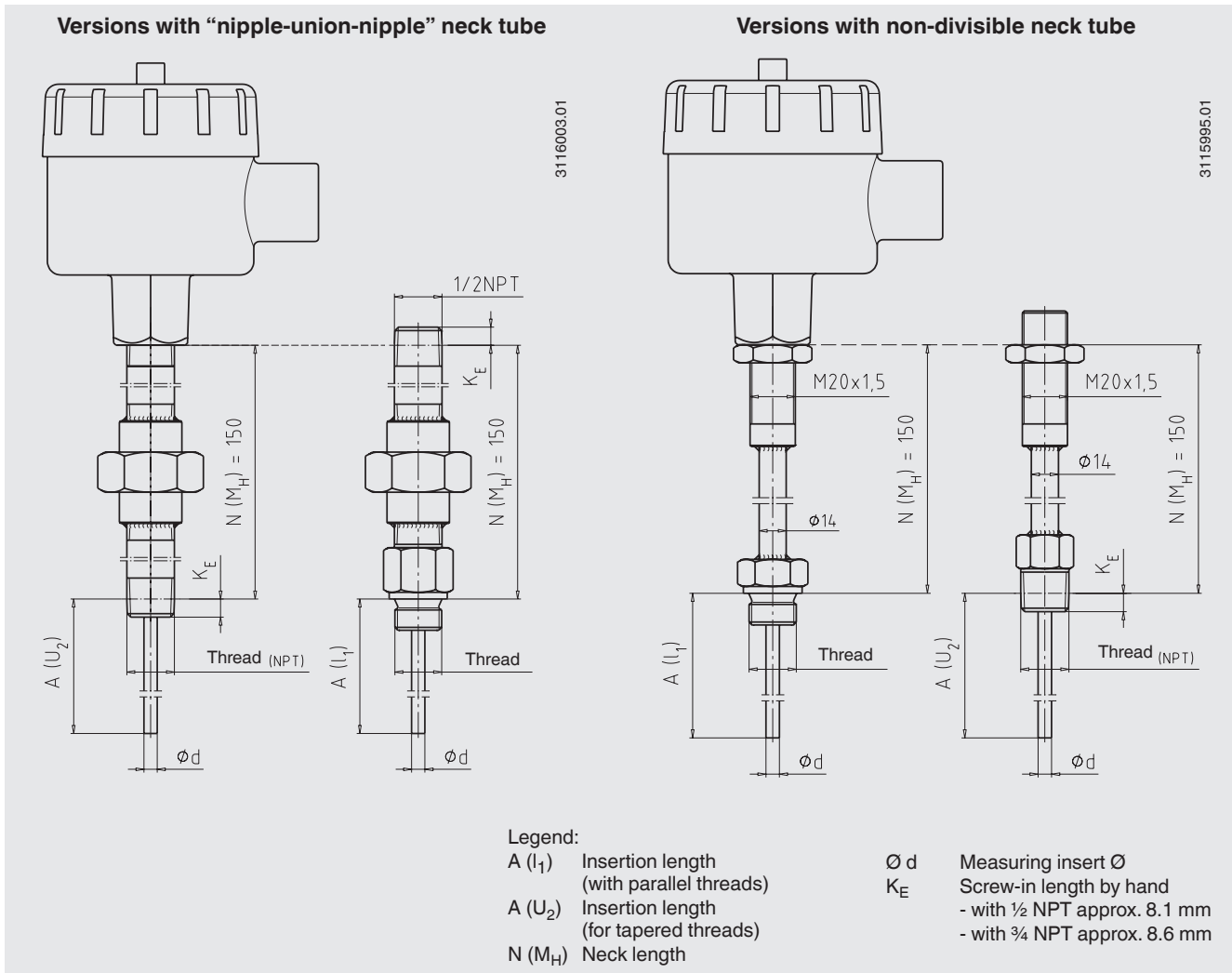
A separate certification of a built-in transmitter is not necessary.

| Model | Description | Explosion protection | Data sheet |
|-------|---|----------------------|------------|
| T19 | Analogue transmitter, configurable | Without | TE 19.03 |
| T24 | Analogue transmitter, PC configurable | Optional | TE 24.01 |
| T12 | Digital transmitter, PC configurable | Optional | TE 12.03 |
| T32 | Digital transmitter, HART® protocol | Optional | TE 32.04 |
| T53 | Digital transmitter FOUNDATION™ Fieldbus and PROFIBUS® PA | Standard | TE 53.01 |

Connection to thermowell

The many possible designs ensure that the model TR10-L resistance thermometer can be combined with almost all possible thermowells.

The most usual designs of connection are shown in the following drawings; further connections on request.



Possible combinations of measuring insert diameter, number of sensors and sensor connection method

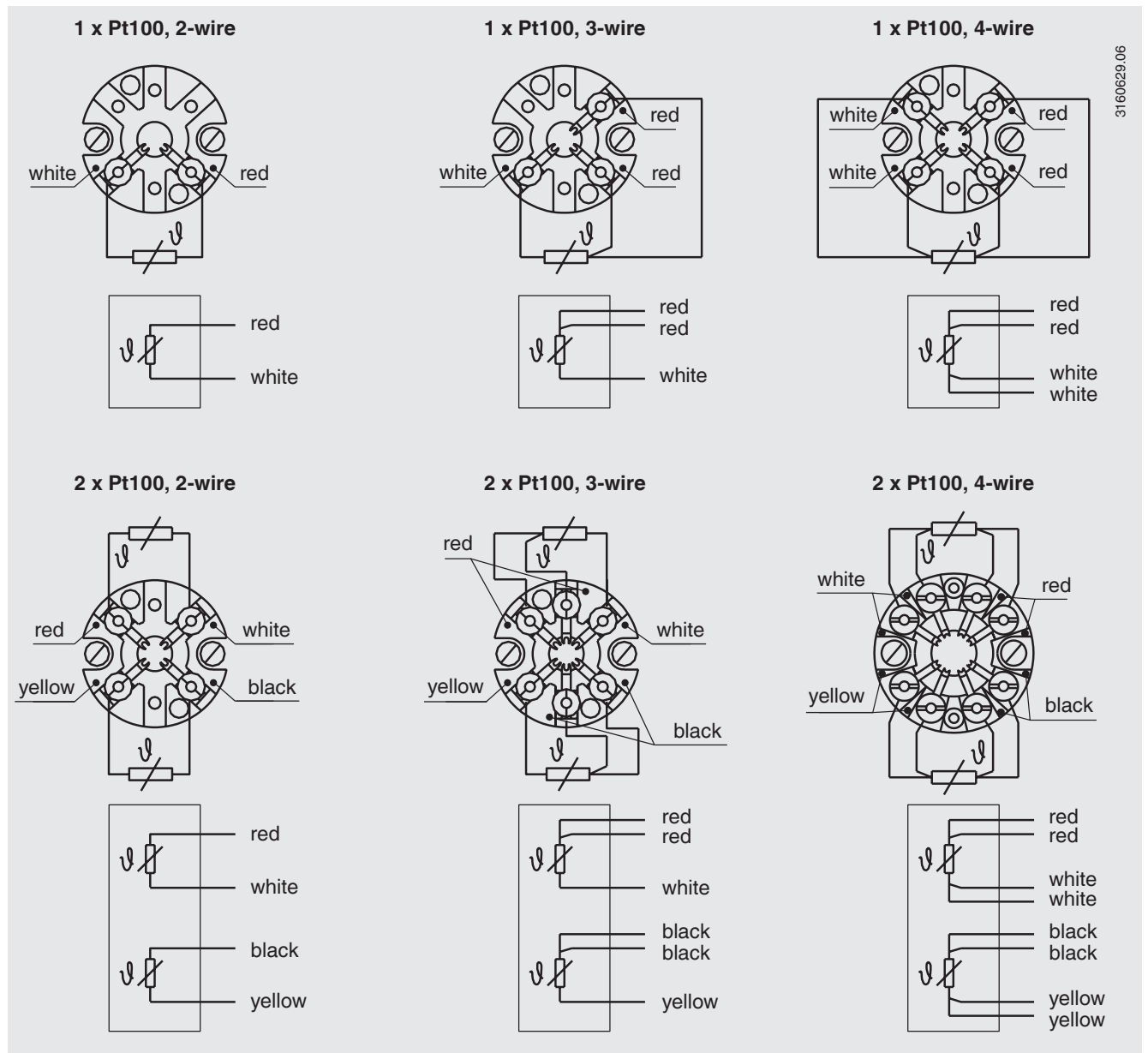
| Measuring insert Ø in mm | Sensor / connection method 1 x Pt100 | | | Sensor / connection method 2 x Pt100 | | |
|--------------------------|--------------------------------------|--------|--------|--------------------------------------|--------|--------|
| | 2-wire | 3-wire | 4-wire | 2-wire | 3-wire | 4-wire |
| 3 | x | x | x | x | x | - |
| 6 | x | x | x | x | x | x |

Possible thread sizes of the male threads at the neck tube

| Connection thread to the thermowell |
|-------------------------------------|
| G 1/2 B |
| G 3/4 B |
| M14 x 1.5 |
| M18 x 1.5 |
| 1/2 NPT |
| 3/4 NPT |

| Connection thread to the head |
|-------------------------------|
| M20 x 1.5 |
| 1/2 NPT |

Electrical connection



For the electrical connections of built-in temperature transmitters see the corresponding data sheets or operating instructions.

Explosion protection

Resistance thermometers of the TR10-L series are available with an EC-type examination certificate for the "flameproof enclosure" ignition protection type (DNV 10 ATEX 88843X). These instruments comply with the requirements of 94/9/EC (ATEX) directive for gas and dust.

Assignment/suitability of the instrument for each category is specified in the table. The use of suitable thermowells is the responsibility of the user.

Marking

II 2G Ex d IIB + H₂ T4/T5/T6
II 2D Ex tD A21 IP 66 T85 °C

with solid-machined thermowell:

II 2G Ex d IIC T4/T5/T6

Ambient temperature

| Atmosphere | T _{class} | T _{amb} |
|------------|--------------------|------------------|
| Gas | T6 | -50 ... +60 °C |
| | T5 | -50 ... +75 °C |
| | T4 | -50 ... +85 °C |
| Dust | T85 °C | -50 ... +60 °C |

Values for electrical connection

only sensor: 2 V, 5 mA

with transmitter: 30 V, 2 W

CE conformity

EMC directive ¹⁾

2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (industrial application)

ATEX directive (option)

94/9/EC, EN 60079-0, EN 60079-11

¹⁾ Only for built-in transmitter

Approvals (option)

- **GOST-R**, import certificate, ignition protection type "d" - flameproof enclosure, Russia
- **GOST**, metrology/measurement technology, Russia
- **DNV**, ignition protection type "d" - flameproof enclosure, ignition protection type "tD" - dust protection through case, European Community

Certificates (option)

| Certification type | Measuring accuracy | Material certificate |
|-----------------------------------|--------------------|----------------------|
| 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.

Approvals and certificates, see website

Ordering information

Model / Explosion protection / Process connection / Version and material of threaded connection / Thread size / Measuring element / Connection method / Temperature range / Sensor diameter / Insertion length A / Neck length N(M_H) / Certificates / Options

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