

# Resistance thermometer For additional thermowell Model TR10-B

WIKA data sheet TE 60.02



for further approvals  
see page 2

## Applications

- Machine building, plant and vessel construction
- Energy and power plant technology
- Chemical industry
- Food and beverage industry
- Sanitary, heating and air-conditioning technology

## Special features

- Sensor ranges from -196 ... +600 °C (-320 ... +1.112 °F)
- For mounting in all standard thermowell designs
- Spring-loaded measuring insert (replaceable)
- Pt100 or Pt1000 sensors
- Explosion-protected versions



**Fig. left: Model TR10-B with connection head BSZ**  
**Fig. right: Model TR10-B with connection head 1/4000**

## Description

Resistance thermometers in this series can be combined with a large number of thermowell designs. Operation without thermowell is only recommended in certain applications.

A wide variety of possible combinations of Pt100 or Pt1000 sensor, connection head, insertion length, neck length, connection to thermowell etc. are available for the thermometers; suitable for any thermowell dimension and any application.

Optionally we can fit analogue or digital transmitters from the WIKA range into the connection head of the TR10-B.

## Explosion protection (option)









The 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:

Only with the corresponding suitable protective fitting is operation in dust Ex hazardous areas permissible.



Built-in transmitters have their own EC-type examination certificate. The permissible ambient temperature ranges of the built-in transmitters can be taken from the corresponding transmitter approval.

## Approvals (explosion protection, further approvals)

Logo	Description	Country
 	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ EMC directive <sup>1)</sup> EN 61326 emission (group 1, class B) and interference immunity (industrial application)</li> <li>■ RoHS directive</li> <li>■ ATEX directive (option) Hazardous areas           <ul style="list-style-type: none"> <li>- Ex i Zone 0 gas [II 1G Ex ia IIC T1 ... T6 Ga]</li> <li>Zone 1 mounting to zone 0 gas [II 1/2G Ex ia IIC T1 ... T6 Ga/Gb]</li> <li>Zone 1 gas [II 2G Ex ia IIC T1 ... T6 Gb]</li> <li>Zone 20 dust [II 1D Ex ia IIIC T125 ... T65 °C Da]</li> <li>Zone 21 mounting to zone 20 dust [II 1/2D Ex ia IIIC T125 ... T65 °C Da/Db]</li> <li>Zone 21 dust [II 2D Ex ia IIIC T125 ... T65 °C Db]</li> <li>- Ex n <sup>2)</sup> Zone 2 gas [II 3G Ex nA IIC T1 ... T6 Gc X]</li> <li>Zone 22 dust [II 3D Ex tc IIIC T440 ... T80 °C Dc X]</li> </ul> </li> </ul>	European Union
 	<b>IECEx (option)</b> (in conjunction with ATEX) Hazardous areas <ul style="list-style-type: none"> <li>- Ex i Zone 0 gas [Ex ia IIC T1 ... T6 Ga]</li> <li>Zone 1 mounting to zone 0 gas [Ex ia IIC T1 ... T6 Ga/Gb]</li> <li>Zone 1 gas [Ex ia IIC T1 ... T6 Gb]</li> <li>Zone 20 dust [Ex ia IIIC T125 ... T65 °C Da]</li> <li>Zone 21 mounting to zone 20 dust [Ex ia IIIC T125 ... T65 °C Da/Db]</li> <li>Zone 21 dust [Ex ia IIIC T125 ... T65 °C Db]</li> </ul>	International
	<b>EAC (option)</b> Hazardous areas <ul style="list-style-type: none"> <li>- Ex i Zone 0 gas [0 Ex ia IIC T3/T4/T5/T6]</li> <li>Zone 1 gas [1 Ex ib IIC T3/T4/T5/T6]</li> <li>Zone 20 dust [DIP A20 Ta 65 °C/Ta 95 °C/Ta 125 °C]</li> <li>Zone 21 dust [DIP A21 Ta 65 °C/Ta 95 °C/Ta 125 °C]</li> <li>- Ex n Zone 2 gas [Ex nA IIC T6 ... T1]</li> <li>Zone 22 dust [DIP A22 Ta 80 ... 440 °C]</li> </ul>	Eurasian Economic Community
	<b>INMETRO (option)</b> Hazardous areas <ul style="list-style-type: none"> <li>- Ex i Zone 0 gas [Ex ia IIC T3 ... T6 Ga]</li> <li>Zone 1 mounting to zone 0 gas [Ex ib IIC T3 ... T6 Ga/Gb]</li> <li>Zone 1 gas [Ex ib IIC T3 ... T6 Gb]</li> <li>Zone 20 dust [Ex ia IIIC T125 ... T65 °C Da]</li> <li>Zone 21 mounting to zone 20 dust [Ex ib IIIC T125 ... T65 °C Da/Db]</li> <li>Zone 21 dust [Ex ib IIIC T125 ... T65 °C Db]</li> </ul>	Brazil
	<b>NEPSI (option)</b> Hazardous areas <ul style="list-style-type: none"> <li>- Ex i Zone 0 gas [Ex ia IIC T3 ~ T6]</li> <li>Zone 1 mounting to zone 0 gas [Ex ia/ib IIC T3 ~ T6]</li> <li>Zone 1 gas [Ex ib IIC T3 ~ T6]</li> <li>- Ex n Zone 2 gas [Ex nA IIC T1 ~ T6 Gc]</li> </ul>	China
	<b>KCs - KOSHA (option)</b> Hazardous areas <ul style="list-style-type: none"> <li>- Ex i Zone 0 gas [Ex ia IIC T4 ... T6]</li> <li>Zone 1 gas [Ex ib IIC T4 ... T6]</li> </ul>	South Korea

Logo	Description	Country
-	<b>PESO (option)</b> Hazardous areas - Ex i Zone 0 gas [Ex ia IIC T1 ... T6 Ga] Zone 1 mounting to zone 0 gas [Ex ib IIC T3 ... T6 Ga/Gb] Zone 1 gas [Ex ib IIC T3 ... T6 Gb]	India
	<b>DNOP - MakNII (option)</b> Hazardous areas - Ex i Zone 0 gas [II 1G Ex ia IIC T3, T4, T5, T6 Ga] Zone 1 mounting to zone 0 gas [II 1/2G Ex ib IIC T3, T4, T5, T6 Ga/Gb] Zone 1 gas [II 2G Ex ia IIC T3, T4, T5, T6 Gb] Zone 20 dust [II 1D Ex ia IIIC T65, T95, T125 °C Da] Zone 21 mounting to zone 20 dust [II 1/2D Ex ib IIIC T65, T95, T125 °C Da/Db] Zone 21 dust [II 2D Ex ib IIIC T125 ... T65 °C Db]	Ukraine
	<b>GOST (option)</b> Metrology, measurement technology	Russia
	<b>KazInMetr (option)</b> Metrology, measurement technology	Kazakhstan
-	<b>MTSCHS (option)</b> Permission for commissioning	Kazakhstan
	<b>BelGIM (option)</b> Metrology, measurement technology	Belarus
	<b>UkrSEPRO (option)</b> Metrology, measurement technology	Ukraine
	<b>Uzstandard (option)</b> Metrology, measurement technology	Uzbekistan
	<b>DNV GL (option)</b> Type approval for the shipbuilding industry - Maximum insertion length $l_1$ : 435 mm - Connection head: Model BSZ - Neck tube: $\varnothing$ 11 x 2 mm or $\varnothing$ 12 x 2.5 mm, max. 150 mm long - Measuring insert: $\varnothing$ 6 mm  Location classification: <i>Temperature D (ambient temperature: -25 ... +70 °C)</i> <i>Humidity B (relative humidity: up to 100 %)</i> <i>Vibration B (frequency: 3 ... 25 Hz; amplitude: 1.6 mm peak; frequency: 25 ... 100 Hz; amplitude: 4 g)</i> <i>EMC Not relevant</i> <i>Case Required protection according to DNV rules shall be provided upon installation on board. For use on open deck a connection head IP68 is required. <sup>3)</sup> (for "open deck")</i>  - Optional with TW10-P (data sheets TW 95.10, TW 95.12)	International

## Manufacturer's information and certifications

Logo	Description
	<b>SIL 2</b> Functional safety (only in conjunction with model T32 temperature transmitter)
	<b>NAMUR NE24</b> Hazardous areas (Ex i)

1) Only for built-in transmitter

2) Only with model BSZ or BSZ-H connection head (see "Connection heads")

3) Suitable cable gland required

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 element

Pt100, Pt1000 <sup>1)</sup> (measuring current: 0.1 ... 1.0 mA) <sup>2)</sup>

Connection method	
Single elements	1 x 2-wire 1 x 3-wire 1 x 4-wire
Dual elements	2 x 2-wire 2 x 3-wire 2 x 4-wire <sup>3)</sup>

Accuracy class / Range of use for the sensor per EN 60751		
Class	Sensor construction	
	Wire-wound	Thin-film
Class B	-196 ... +600 °C	-50 ... +500 °C
	-196 ... +450 °C	-50 ... +250 °C
Class A <sup>4)</sup>	-100 ... +450 °C	-30 ... +300 °C
Class AA <sup>4)</sup>	-50 ... +250 °C	0 ... 150 °C

1) Pt1000 only available as a thin-film measuring resistor

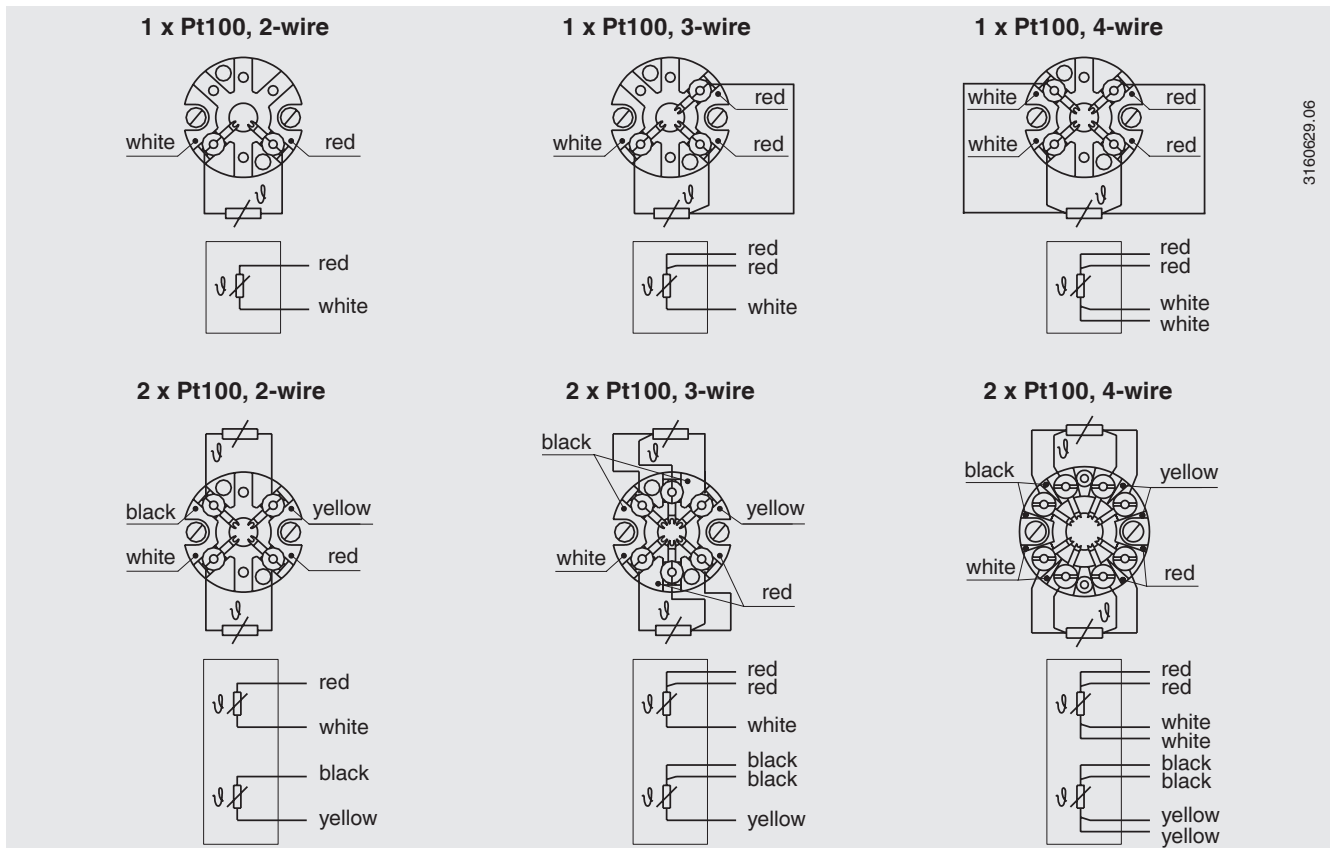
2) For detailed specifications for Pt100 sensors, see Technical information IN 00.17 at [www.wika.com](http://www.wika.com).

3) Not with 3 mm diameter

4) Not with 2-wire connection method

The table shows the temperature ranges listed in the respective standards, in which the tolerance values (class accuracies) are valid.

## Electrical connection (colour code per IEC/EN 60751)

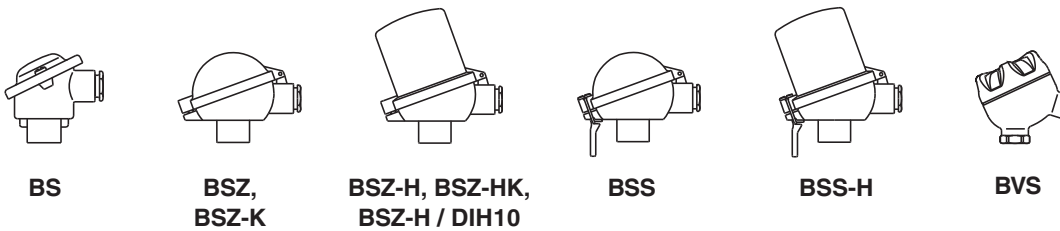


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For the electrical connections of built-in temperature transmitters see the corresponding data sheets or operating instructions.

## Connection head

### ■ European designs per EN 50446 / DIN 43735



Model	Material	Cable entry thread size	Ingress protection (max) <sup>1)</sup>	Cap	Surface	Connection to neck tube
<b>BS</b>	Aluminium	M20 x 1.5 or ½ NPT <sup>3)</sup>	IP65, IP68	Flat cap with 2 screws	Blue, lacquered <sup>4)</sup>	M24 x 1.5, ½ NPT
<b>BSZ</b>	Aluminium	M20 x 1.5 or ½ NPT <sup>3)</sup>	IP65, IP68	Spherical hinged cover with cylinder head screw	Blue, lacquered <sup>4)</sup>	M24 x 1.5, ½ NPT
<b>BSZ-H</b>	Aluminium	M20 x 1.5 or ½ NPT <sup>3)</sup>	IP65, IP68	Raised hinged cover with cylinder head screw	Blue, lacquered <sup>4)</sup>	M24 x 1.5, ½ NPT
<b>BSZ-H (2x cable outlet)</b>	Aluminium	2 x M20 x 1.5 or 2 x ½ NPT <sup>3)</sup>	IP65, IP68	Raised hinged cover with cylinder head screw	Blue, lacquered <sup>4)</sup>	M24 x 1.5
<b>BSZ-H / DIH10 <sup>2)</sup></b>	Aluminium	M20 x 1.5 or ½ NPT <sup>3)</sup>	IP65	Raised hinged cover with cylinder head screw	Blue, lacquered <sup>4)</sup>	M24 x 1.5, ½ NPT
<b>BSS</b>	Aluminium	M20 x 1.5 or ½ NPT <sup>3)</sup>	IP65	Spherical hinged cover with clamping lever	Blue, lacquered <sup>4)</sup>	M24 x 1.5, ½ NPT
<b>BSS-H</b>	Aluminium	M20 x 1.5 or ½ NPT <sup>3)</sup>	IP65	Raised hinged cover with clamping lever	Blue, lacquered <sup>4)</sup>	M24 x 1.5, ½ NPT
<b>BVS</b>	Stainless steel	M20 x 1.5 <sup>3)</sup>	IP65	Precision-cast screw cap	Blank, electropolished	M24 x 1.5
<b>BSZ-K</b>	Plastic	M20 x 1.5 or ½ NPT <sup>3)</sup>	IP65	Spherical hinged cover with cylinder head screw	Black	M24 x 1.5
<b>BSZ-HK</b>	Plastic	M20 x 1.5 or ½ NPT <sup>3)</sup>	IP65	Raised hinged cover with cylinder head screw	Black	M24 x 1.5

Model	Explosion protection				
	without	Ex i (gas) Zone 0, 1, 2	Ex i (dust) Zone 20, 21, 22	Ex nA (gas) Zone 2	Ex tc (dust) Zone 22
<b>BS</b>	x	x	-	-	-
<b>BSZ</b>	x	x	x	x	x
<b>BSZ-H</b>	x	x	x	x	x
<b>BSZ-H (2x cable outlet)</b>	x	x	x	x	x
<b>BSZ-H / DIH10 <sup>1)</sup></b>	x	x	-	-	-
<b>BSS</b>	x	x	-	-	-
<b>BSS-H</b>	x	x	-	-	-
<b>BVS</b>	x	x	-	-	-
<b>BSZ-K</b>	x	x	-	-	-
<b>BSZ-HK</b>	x	x	-	-	-

1) The ingress protection refers to the connection head, for information on the cable glands, see page 7

2) LED display DIH10

3) Standard (others on request)

4) RAL 5022

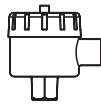
■ North American designs



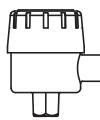
KN4-A  
KN4-P



1/4000 F  
1/4000 S



7/8000 W  
7/8000 S



7/8000 W / DIH50  
7/8000 S / DIH50

Model	Material	Cable entry thread size	Ingress protection (max.) <sup>1)</sup>	Cover / Cap	Surface	Connection to neck tube
KN4-A	Aluminium	½ NPT, M20 x 1.5 <sup>3)</sup>	IP65 <sup>4)</sup>	Screw cap	Blue, lacquered <sup>5)</sup>	M24 x 1.5, ½ NPT
KN4-P <sup>2)</sup>	Polypropylene	½ NPT	IP65 <sup>4)</sup>	Screw cap	White	½ NPT
1/4000 F	Aluminium	½ NPT, ¾ NPT, M20 x 1.5 <sup>3)</sup>	IP66 <sup>4)</sup>	Screw cap	Blue, lacquered <sup>5)</sup>	½ NPT
1/4000 S	Stainless steel	½ NPT, ¾ NPT, M20 x 1.5 <sup>3)</sup>	IP66 <sup>4)</sup>	Screw cap	Blank	½ NPT
7/8000 W	Aluminium	½ NPT, ¾ NPT, M20 x 1.5 <sup>3)</sup>	IP66 <sup>4)</sup>	Screw cap	Blue, lacquered <sup>5)</sup>	½ NPT
7/8000 S	Stainless steel	½ NPT, ¾ NPT, M20 x 1.5 <sup>3)</sup>	IP66 <sup>4)</sup>	Screw cap	Blank	½ NPT
7/8000 W / DIH50 <sup>6)</sup>	Aluminium	½ NPT, ¾ NPT, M20 x 1.5 <sup>3)</sup>	IP66 <sup>4)</sup>	Screw cap	Blue, lacquered <sup>5)</sup>	½ NPT
7/8000 S / DIH50 <sup>6)</sup>	Stainless steel	½ NPT, ¾ NPT, M20 x 1.5 <sup>3)</sup>	IP66 <sup>4)</sup>	Screw cap	Blank	½ NPT

Model	Explosion protection				
	without	Ex i (gas) Zone 0, 1, 2	Ex i (dust) Zone 20, 21, 22	Ex nA (gas) Zone 2	Ex tc (dust) Zone 22
KN4-A	x	x	-	-	-
KN4-P <sup>2)</sup>	x	-	-	-	-
1/4000 F	x	x	-	-	-
1/4000 S	x	x	-	-	-
7/8000 W	x	x	-	-	-
7/8000 S	x	x	-	-	-
7/8000 W / DIH50 <sup>6)</sup>	x	x	-	-	-
7/8000 S / DIH50 <sup>6)</sup>	x	x	-	-	-

1) The ingress protection refers to the connection head, for information on the cable glands, see page 7

2) On request

3) Standard

4) Suitable seal/cable gland required

5) RAL 5022

6) DIH50 LC display

## Connection head with digital display



Connection head BSZ-H with LED display model DIH10  
see data sheet AC 80.11



Connection head 7/8000 W with LC display  
model DIH50 see data sheet AC 80.10

To operate the digital displays, a transmitter with a 4 ... 20 mA output is always required.

## Cable entry



The pictures show examples of connection heads.

Cable entry	Cable entry thread size
Standard cable entry <sup>1)</sup>	M20 x 1.5 or ½ NPT
Plastic cable gland (cable Ø 6 ... 10 mm) <sup>1)</sup>	M20 x 1.5 or ½ NPT
Nickel-plated brass cable gland (cable Ø 6 ... 12 mm)	M20 x 1.5 or ½ NPT
Stainless steel cable gland (cable Ø 7 ... 12 mm)	M20 x 1.5 or ½ NPT
Plain threaded	M20 x 1.5 or ½ NPT
2 x plain threaded <sup>2)</sup>	2 x M20 x 1.5 or 2 x ½ NPT
Junction box M12 x 1 (4-pin) <sup>3)</sup>	M20 x 1.5
Sealing plugs for transport	M20 x 1.5 or ½ NPT

Cable entry	Colour	Ingress protection (max.)	Min./max. ambient temperature	Explosion protection				
				without	Ex i (gas) Zone 0, 1, 2	Ex i (dust) Zone 20, 21, 22	Ex nA (gas) Zone 2	Ex tc (dust) Zone 22
Standard cable entry <sup>1)</sup>	Blank	IP65	-40 ... +80 °C	x	x	-	-	-
Plastic cable gland <sup>1)</sup>	Black or grey	IP66, IP68	-40 ... +80 °C	x	-	-	-	-
Plastic cable gland, Ex e <sup>1)</sup>	Light blue	IP66, IP68	-20 ... +80 °C (standard) -40 ... +70 °C (option)	x	x	x	-	-
Plastic cable gland, Ex e <sup>1)</sup>	Black	IP66, IP68	-20 ... +80 °C (standard) -40 ... +70 °C (option)	x	-	-	x	x
Nickel-plated brass cable gland	Blank	IP66, IP68	-60 <sup>4)</sup> / -40 ... +80 °C	x	-	-	-	-
Nickel-plated brass cable gland, Ex e	Blank	IP66, IP68	-60 <sup>4)</sup> / -40 ... +80 °C	x	x	x	x	x
Stainless steel cable gland	Blank	IP66, IP68	-60 <sup>4)</sup> / -40 ... +80 °C	x	x	x	-	-
Stainless steel cable gland, Ex e	Blank	IP66, IP68	-60 <sup>4)</sup> / -40 ... +80 °C	x	x	x	x	x
Plain threaded	-	IP00	-	x	x	x <sup>6)</sup>	x <sup>6)</sup>	x <sup>6)</sup>
2 x plain threaded <sup>2)</sup>	-	IP00	-	x	x	x <sup>6)</sup>	x <sup>6)</sup>	x <sup>6)</sup>
Junction box M12 x 1 (4-pin) <sup>3)</sup>	-	IP65	-40 ... +80 °C	x	x <sup>5)</sup>	x <sup>5)</sup>	-	-
Sealing plugs for transport	Transparent	-	-40 ... +80 °C	not applicable, transport protection				

1) Not available for BVS connection head

2) Only for BSZ-H connection head

3) Not available for ½ NPT thread size cable entry

4) Special version on request (only available with specific approvals), other temperatures on request

5) With appropriate mating connector connected

6) Suitable cable gland required for operation

## Ingress protection

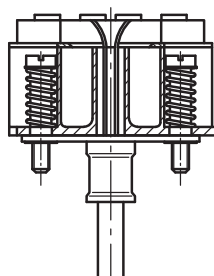
to IP65, IP68 per IEC/EN 60529 under the following conditions:

- Use of a suitable cable gland
- Use of a cable cross-section appropriate for the gland or select the appropriate cable gland for the available cable
- Adhere to the tightening torques for all threaded connections

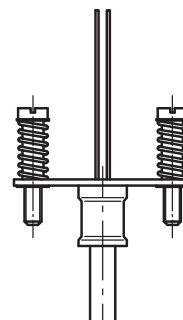
## Transmitter

### Mounting onto the measuring insert

With mounting on the measuring insert, the transmitter replaces the terminal block and is fixed directly to the terminal plate of the measuring insert.



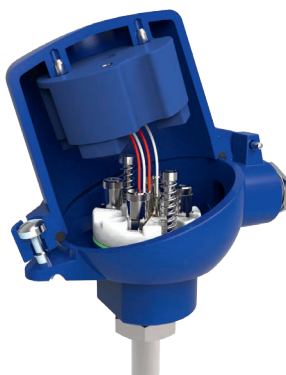
Measuring insert with mounted transmitter (here: model T32)



Measuring insert prepared for transmitter mounting

### Mounted within the cap of the connection head

Mounting the transmitter in the cap of the connection head is preferable to mounting it on the measuring insert. With this type of mounting, for one, a better thermal insulation is ensured, and in addition, exchange and mounting for servicing is simplified.





## Transmitter models



Output signal 4 ... 20 mA, HART® protocol, FOUNDATION™ Fieldbus and PROFIBUS® PA			
Transmitter (selectable versions)	Model T15	Model T32	Model T53
Data sheet	TE 15.01	TE 32.04	TE 53.01
<b>Output</b>			
■ 4 ... 20 mA	x	x	
■ HART® protocol		x	
■ FOUNDATION™ Fieldbus and PROFIBUS® PA			x
<b>Connection method</b>			
■ 1 x 2-wire, 3-wire or 4-wire	x	x	x
<b>Measuring current</b>	< 0.2 mA	< 0.3 mA	< 0.2 mA
<b>Explosion protection</b>	Optional	Optional	Standard

## Possible mounting positions for transmitters

Connection head	T15	T32	T53
BS	○	-	○
BSZ, BSZ-K	○	○	○
BSZ-H, BSZ-HK	●	●	●
BSZ-H (2x cable outlet)	●	●	●
BSZ-H / DIH10	○	○	-
BSS	○	○	○
BSS-H	●	●	●
BVS	○	○	○
KN4-A / KN4-P	○	○	○
1/4000 F, 1/4000 S	○	○	○
7/8000 W, 7/8000 S	○	○	○
7/8000 W / DIH50, 7/8000 S / DIH50	○	○	-

○ Mounted instead of terminal block      ● Mounted within the cap of the connection head      – Mounting not possible

The mounting of a transmitter on the measuring insert is possible with all the connection heads listed here. The fitting of a transmitter in the (screw) cap of a North American design connection head is not possible.

Mounting of 2 transmitters on request.

For a correct determination of the overall measuring deviation, the sensor and transmitter measuring deviations must be added.

## Functional safety (option) with temperature transmitter model T32



In safety-critical applications, the entire measuring chain must be taken into consideration in terms of the safety parameters. The SIL classification allows the assessment of the risk reduction reached by the safety installations.

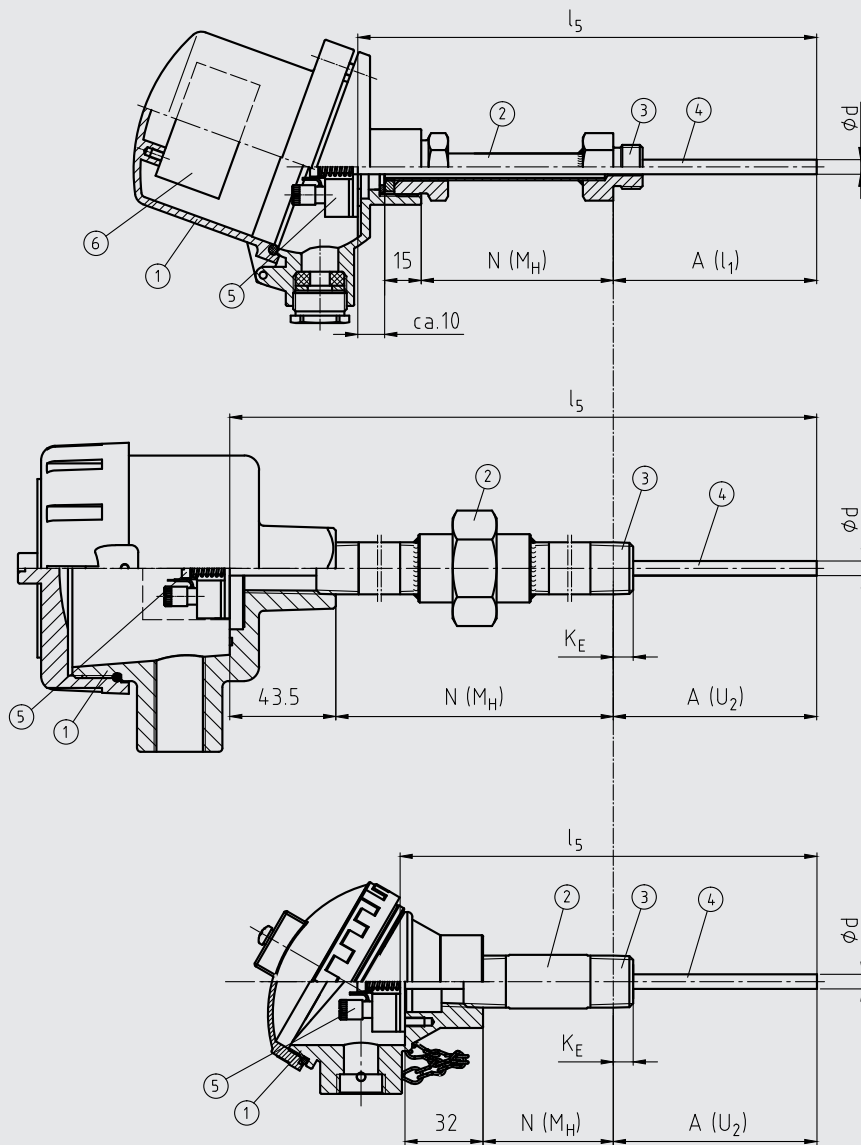
Selected TR10-B resistance thermometers, in combination with a suitable temperature transmitter (e.g. model T32.1S,

TÜV certified SIL version for protection systems developed in accordance with IEC 61508), are suitable as sensors for safety functions to SIL 2.

For detailed specifications, see Technical information IN 00.19 at [www.wika.com](http://www.wika.com).

# Components model TR10-B

Fig. with parallel thread, for tapered thread see "Connection to thermowell"



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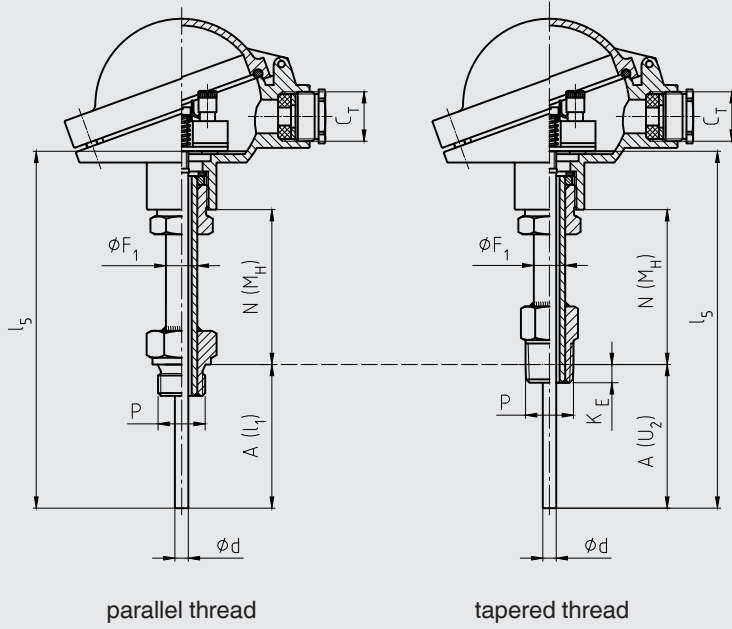
**Legend:**

- |                                       |   |
|---------------------------------------|---|
| ① Connection head                     | A (I <sub>1</sub> ) Insertion length (parallel threads) |
| ② Neck tube                           | A (U <sub>2</sub> ) Insertion length (tapered threads)  |
| ③ Connection to thermowell            | l <sub>5</sub> Measuring insert length                  |
| ④ Measuring insert (TR10-A)           | N (M <sub>H</sub> ) Neck length                         |
| ⑤ Terminal block/transmitter (option) | K <sub>E</sub> 1/2 NPT: 8.13 mm                         |
| ⑥ Transmitter (option)                | 3/4 NPT: 8.61 mm  |
|                                       | Ø d Measuring insert diameter                           |

# Neck tube

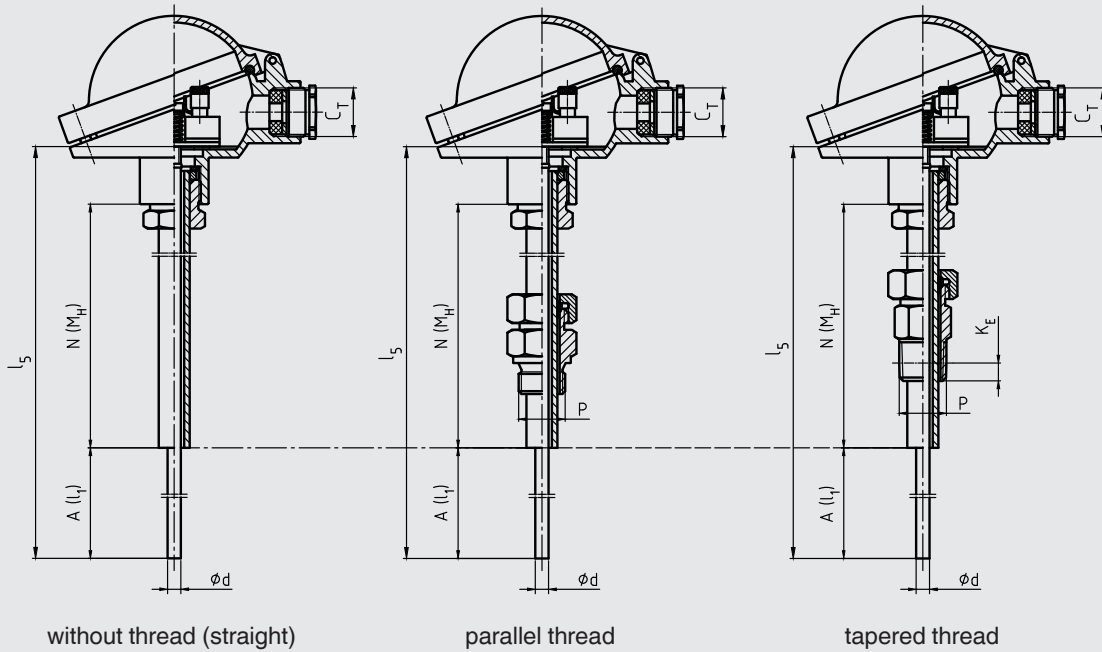
## Neck tube designs

### Neck tube per DIN 43772



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### Neck tube per DIN 43772, straight, with/without compression fitting



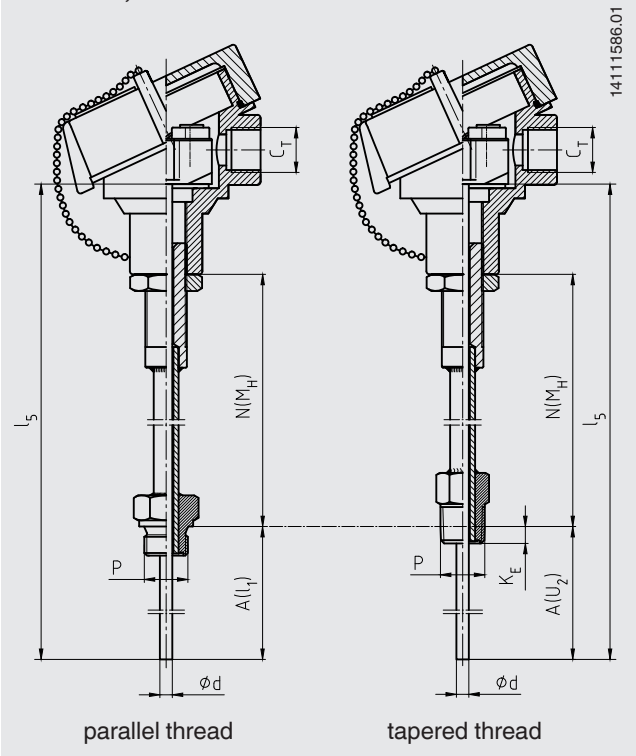
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#### Legend:

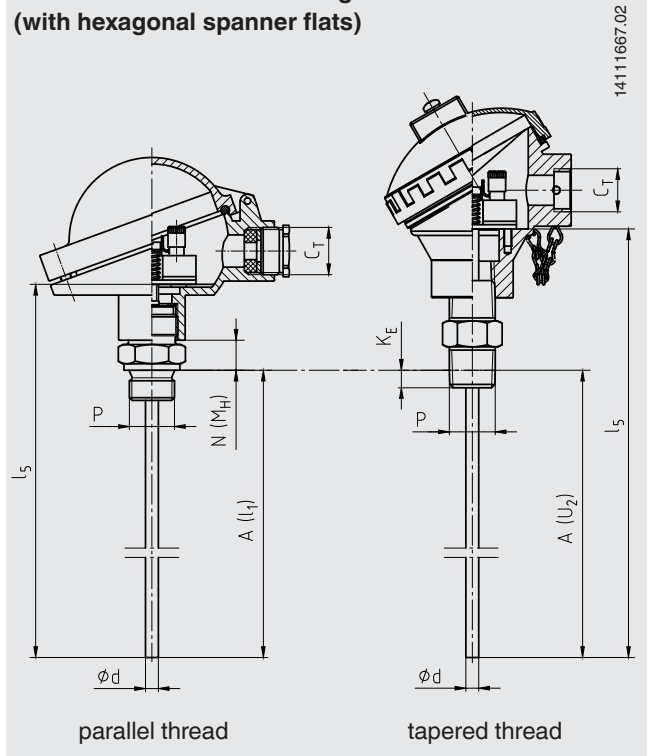
A (l <sub>1</sub> )	Insertion length (parallel threads)	C <sub>T</sub>	Thread cable entry
A (U <sub>2</sub> )	Insertion length (tapered threads)	Ø F <sub>1</sub>	Neck tube diameter
l <sub>5</sub>	Measuring insert length	P	Thread to the thermowell
N (M <sub>H</sub> )	Neck length	Ø d	Measuring insert diameter
K <sub>E</sub>	1/2 NPT: 8.13 mm 3/4 NPT: 8.61 mm		

The pictures show examples of connection heads.

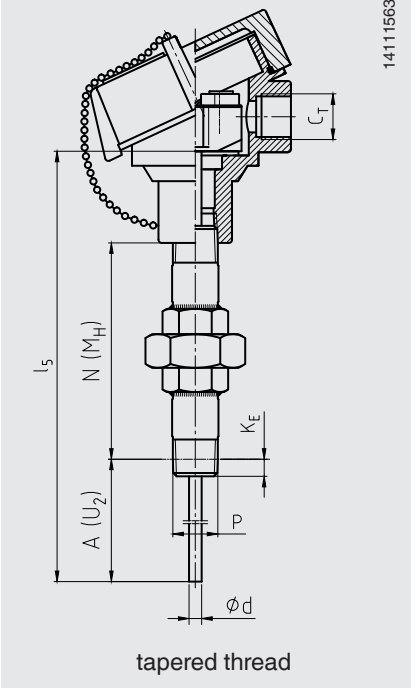
**Neck tube, with counter nut to head**



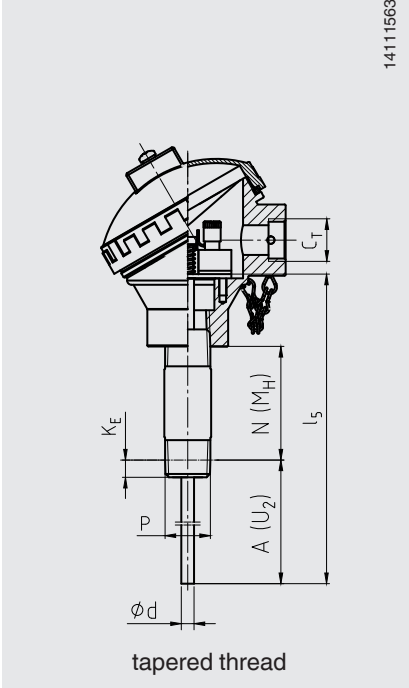
**Double threaded hex bushing (with hexagonal spanner flats)**



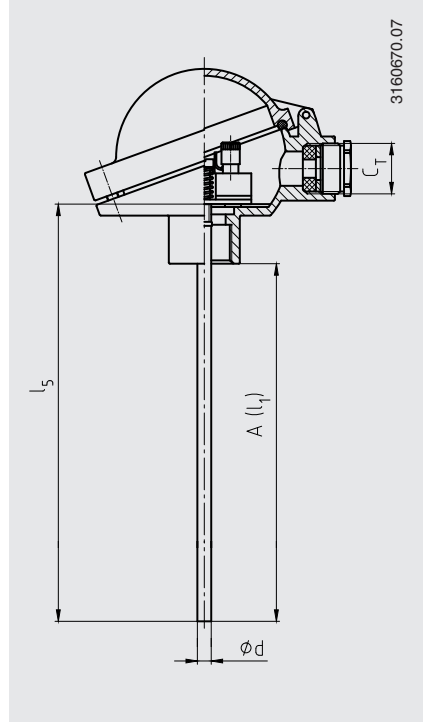
**"Nipple-union-nipple" neck tube**



**Double threaded hex bushing (tube section)**



**Without neck tube**



**Legend:**

- |   |                                    |
|---|------------------------------------|
| $A (l_1)$ Insertion length (parallel threads) | $C_T$ Thread cable entry           |
| $A (U_2)$ Insertion length (tapered threads)  | $\phi F_1$ Neck tube diameter      |
| $l_5$ Measuring insert length                 | $P$ Thread to the thermowell       |
| $N (M_H)$ Neck length                         | $\phi d$ Measuring insert diameter |
| $K_E$ 1/2 NPT: 8.13 mm                        |                                    |
| 3/4 NPT: 8.61 mm                              |                                    |

The pictures show examples of connection heads.

## Neck tube versions

Neck tube design	Diameter	Connection to head	Connection to thermowell	Material
Neck tube per DIN 43772	12 x 1.5 mm	M24 x 1.5 (rotatable threaded connection)	Mounting thread, compression fitting, union nut, male nut, straight	1.4571
	12 x 2.5 mm			
	14 x 2.5 mm		Mounting thread, union nut, male nut	
Neck tube with counter nut to head	14 x 2.5 mm	M20 x 1.5 (with counter nut)	Mounting thread	1.4571
Double threaded hex bushing (with hexagonal spanner flats)	-	M24 x 1.5, ½ NPT	Mounting thread	1.4571
“Nipple-union-nipple” neck tube	~ 22 mm	½ NPT	Mounting thread	316
	~ 27 mm	¾ NPT		
Double threaded hex bushing (tube section)	~ 22 mm	½ NPT	Mounting thread	316
	~ 27 mm	¾ NPT		

## Thread sizes

Neck tube design	Diameter	Thread to the thermowell
Neck tube per DIN 43772	12 x 1.5 mm 12 x 2.5 mm	G ½ B
		G ¾ B
		G ¼ B
		M20 x 1.5
		M18 x 1.5
		M14 x 1.5
		½ NPT
		¾ NPT
		G ½ B compression fitting (metal ring)
		G ¾ B compression fitting (metal ring)
		M18 x 1.5 compression fitting (metal ring)
		M20 x 1.5 compression fitting (metal ring)
		G ½ B union nut
		G ¾ B union nut
		M20 x 1.5 union nut
		G ½ B male nut
		G ¾ B male nut
		M20 x 1.5 male nut
		Without threaded connection, straight
Neck tube per DIN 43772	14 x 2.5 mm	G ½ B
		G ¾ B
		G ¼ B
		M20 x 1.5
		M18 x 1.5
		M14 x 1.5
		½ NPT
		¾ NPT
		G ½ B union nut
		G ¾ B union nut
		M20 x 1.5 union nut
		G ½ B male nut
		G ¾ B male nut
		M20 x 1.5 male nut

Continued on next page

Neck tube design	Diameter	Thread to the thermowell
Neck tube with counter nut to head	14 x 2.5 mm	½ NPT
		¾ NPT
		G ½ B
		G ¾ B
		G ¼ B
		M14 x 1.5
		M18 x 1.5
		M20 x 1.5
Double threaded hex bushing (with hexagonal spanner flats)	-	G ½ B
		G ¾ B
		G ¼ B
		½ NPT
		¾ NPT
		M14 x 1.5
		M18 x 1.5
		M20 x 1.5
"Nipple-union-nipple" neck tube	~ 22 mm	½ NPT
	~ 27 mm	¾ NPT
Double threaded hex bushing (tube section)	~ 22 mm	½ NPT
	~ 27 mm	¾ NPT

### Neck lengths

Neck tube design	Neck length	Min. / max. neck length
Neck tube per DIN 43772	150 mm (approx. 6 inch)	30 mm (approx. 1.2 inch) / 500 mm (approx. 20 inch)
Neck tube per DIN 43772, straight	150 mm (approx. 6 inch)	75 mm (approx. 3 inch) / 900 mm (approx. 35 inch)
Neck tube with counter nut to head	150 mm (approx. 6 inch)	75 mm (approx. 3 inch) / 250 mm (approx. 10 inch)
Double threaded hex bushing (with hexagonal spanner flats)		
■ M24 x 1.5 to connection head, parallel thread to thermowell	13 mm	-
■ 1/2 NPT to connection head, parallel thread to thermowell	25 mm	-
■ M24 x 1.5 to connection head, tapered thread to thermowell	25 mm	-
■ 1/2 NPT to connection head, tapered thread to thermowell	25 mm	-
"Nipple-union-nipple" neck tube	150 mm (approx. 6 inch)	75 mm (approx. 3 inch) / 250 mm (approx. 10 inch)
Double threaded hex bushing (tube section)	50 mm (approx. 2 inch)	50 mm (approx. 2 inch) / 250 mm (approx. 10 inch)

The neck tube is screwed into the connection head. 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.

Other versions on request

## Measuring insert

Within the TR10-B, the measuring insert of model TR10-A is fitted.

The replaceable measuring insert is made of a vibration-resistant, sheathed, mineral-insulated cable (MI cable).

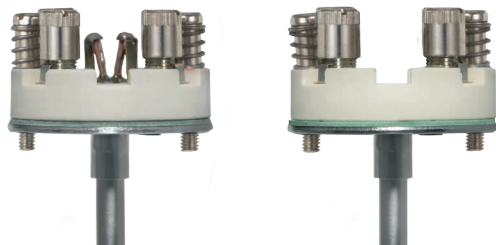


Fig. left: standard version

Fig. right: version with recessed soldering lugs (option)

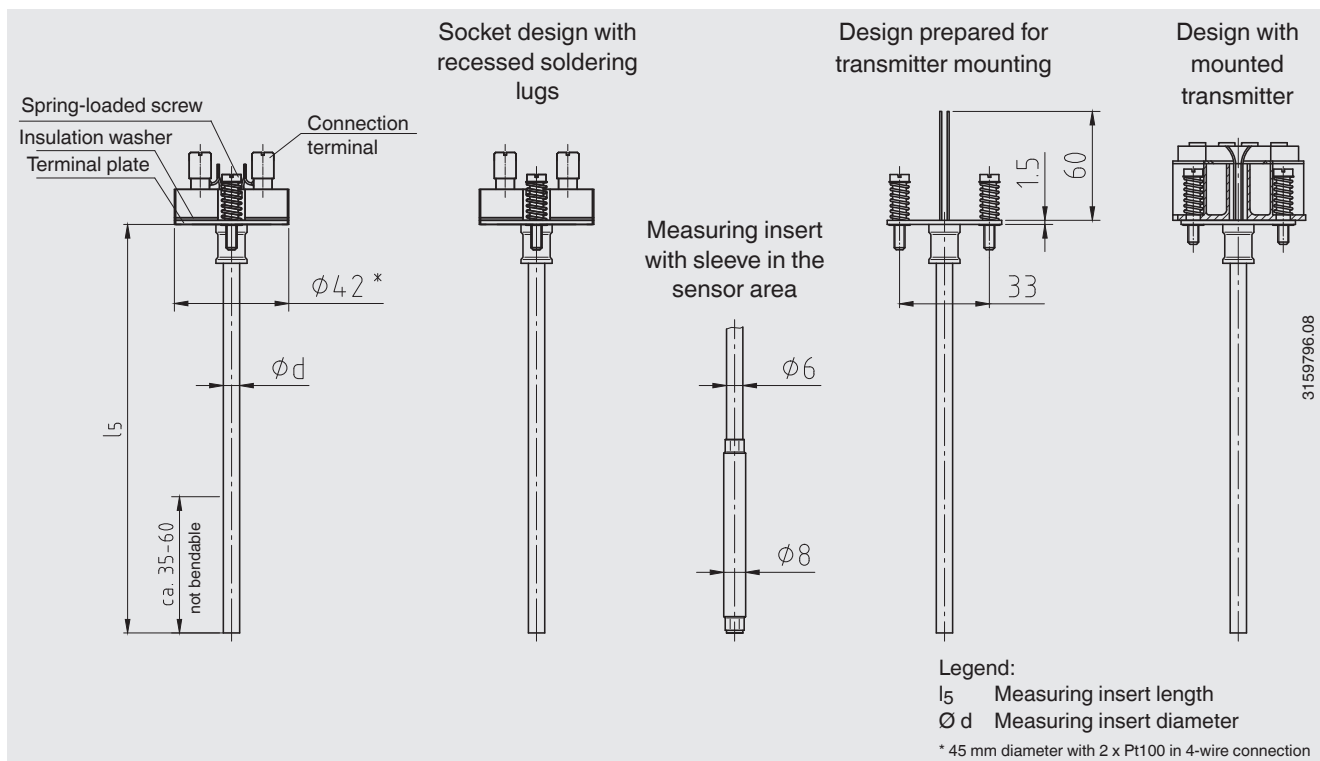
Only correct measuring insert length and correct measuring insert diameter ensure sufficient heat transfer from thermowell to the measuring insert.

The bore diameter of the thermowell should be a max. 1 mm larger than the measuring insert diameter.

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  $\leq 5.5$  mm). In order to ensure that the measuring insert is firmly pressed down onto the bottom of the thermowell, the insert must be spring-loaded (spring travel: max 10 mm).

## Dimensions in mm

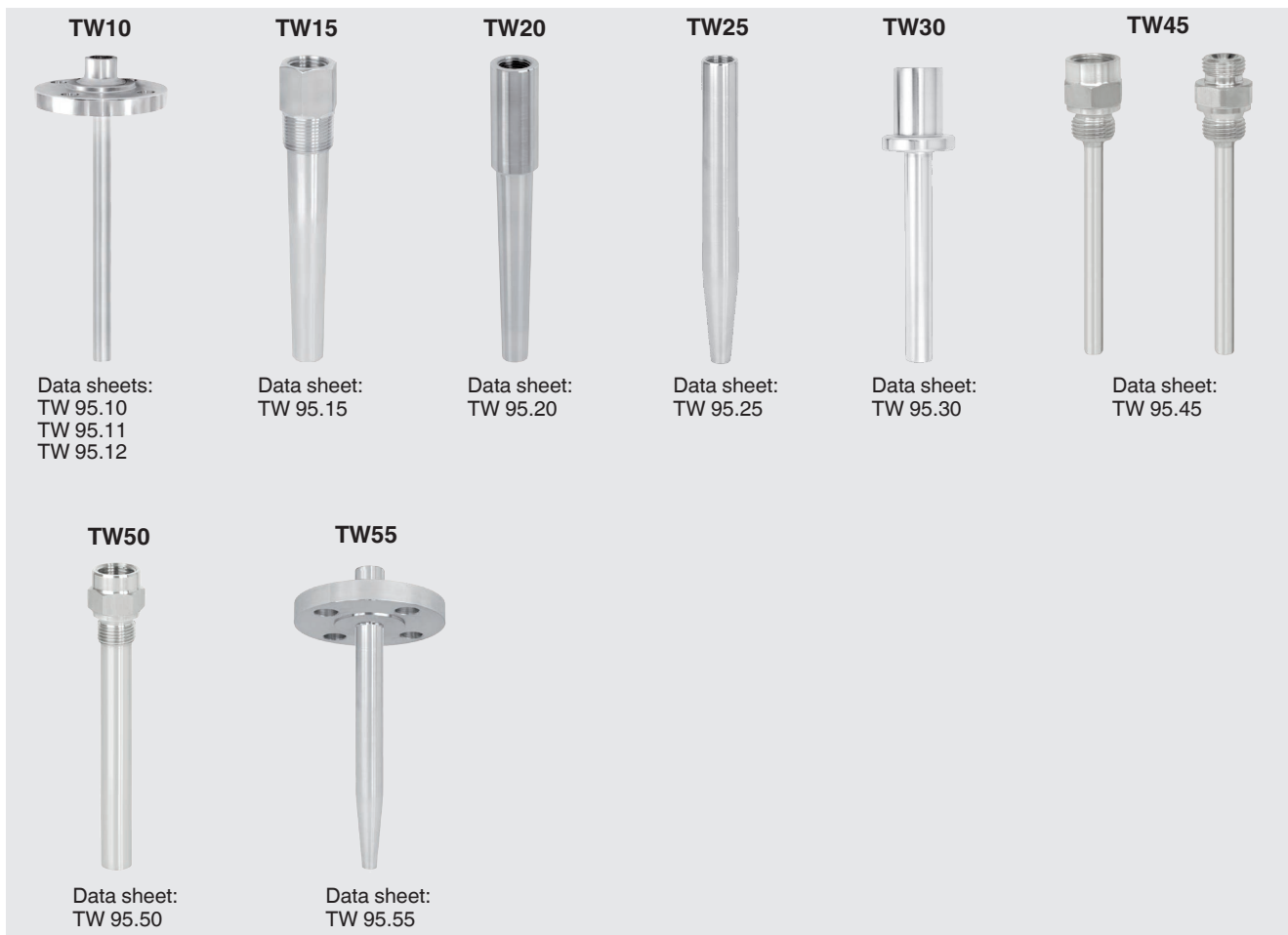


Measuring insert diameter $\varnothing d$ in mm	Index per DIN 43735	Tolerance in mm	Sheath material	
			Standard design	Recessed soldering lugs
3 <sup>1)</sup>	Standard	3 $\pm 0.05$	1.4571, 316L <sup>1)2)</sup>	1.4571
6	Standard	6 $\begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$	1.4571, 316L <sup>1)2)</sup>	1.4571
8 (6 mm with sleeve)	Standard	8 $\begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$	1.4571	1.4571
8	Standard	8 $\begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$	1.4571, 316L <sup>1)2)</sup>	1.4571

1) Not possible with 2 x 4-wire versions

2) Not with socket design with recessed soldering lugs

## Thermowell selection



Special thermowells on request



## Operating conditions

### Mechanical requirements

Version	
<b>Standard</b>	6 g peak-to-peak, wire-wound or thin film measuring resistor
<b>Option</b>	Vibration-resistant sensor tip, max. 20 g peak-to-peak, thin-film measuring resistor
	Highly vibration-resistant sensor tip, max. 50 g peak-to-peak, thin-film measuring resistor

The information on the vibration resistance refers to the tip of the measuring insert.

For detailed specifications for vibration resistance of Pt100 sensors, see Technical information IN 00.17 at [www.wika.com](http://www.wika.com).

### Ambient and storage temperature

-60 <sup>1)</sup> / -40 ... +80 °C

1) Special version on request (explosion-protected versions only available with specific approvals)

Other ambient and storage temperatures on request

## Certificates (option)

Certification type	Measuring accuracy	Material certificate <sup>2)</sup>
<b>2.2 test report</b>	x	x
<b>3.1 inspection certificate</b>	x	x
<b>DKD/DAkkS calibration certificate</b>	x	-

The different certifications can be combined with each other.

2) Thermowells have their own material certificates

### Ordering information

Model / Explosion protection / Further approvals, certificates / Sensor / Accuracy class, range of use of the sensor / Connection housing / Cable entry / Transmitter / Connection to neck tube / Neck tube / Thread size / Neck length N (MH) / Insertion length A (I<sub>1</sub>), A (U<sub>2</sub>) / Measuring insert diameter Ø d / Measuring insert sheath material / Certificates / Options

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