

# Threaded resistance thermometer Model TR10-C, with protection tube

WIKA data sheet TE 60.03



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

- Application ranges from -200 ... +600 °C (-328 ... +1,112 °F)
- Model TW35 protection tube included
- Spring-loaded measuring insert (replaceable)
- Explosion-protected versions

## Description

Resistance thermometers of this series are designed for screw-fitting directly into the process, mainly in vessels and pipelines.

These thermometers are suitable for liquid and gaseous media under moderate mechanical load and normal chemical conditions. The model TW35 protection tube from stainless steel is fully welded and screwed into the connection head. The interchangeable measuring insert can be removed without taking out the complete sensor from the plant. This enables inspection, measuring equipment monitoring or, when servicing is necessary, replacement while the plant is running. The choice of standard lengths assists with short delivery times and the possibility of stocking spare parts.



## Threaded resistance thermometer model TR10-C with protection tube

Insertion length, process connection, protection tube design, connection head, type and number of sensors, accuracy and connection method can each be selected to suit the respective application.

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

## Explosion protection (option)








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:

Only with the correspondingly 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>EC declaration of conformity</b> EMC directive, 2004/108/EC <sup>1)</sup> EN 61326 emission (group 1, class B) and interference immunity (industrial application)	European Community
	<b>ATEX directive, 94/9/EC (option)</b> Hazardous areas - Ex i Zone 0 gas [II 1G Ex ia IIC T3 ... T6 Ga] Zone 1 connection to zone 0 gas [II 1/2G Ex ia IIC T3 ... T6 Ga/Gb] Zone 1 gas [II 2G Ex ia IIC T3 ... T6 Gb] Zone 20 dust [II 1D Ex ia IIIC T125 ... T65 °C Da] Zone 21 connection to zone 20 dust [II 1/2D Ex ia IIIC T125 ... T65 °C Da/Db] Zone 21 dust [II 2D Ex ia IIIC T125 ... T65 °C Db] - Ex n <sup>2)</sup> Zone 2 gas [II 3G Ex nA IIC T1 ... T6 Gc X] Zone 22 dust [II 3D Ex tc IIIC T440 ... T80 °C Dc X]	
	<b>IECEx (option)</b> (in conjunction with ATEX) Hazardous areas - Ex i Zone 0 gas [Ex ia IIC T3 ... T6 Ga] Zone 1 connection to zone 0 gas [Ex ia IIC T3 ... T6 Ga/Gb] Zone 1 gas [Ex ia IIC T3 ... T6 Gb] Zone 20 dust [Ex ia IIIC T125 ... T65 °C Da] Zone 21 connection to zone 20 dust [Ex ia IIIC T125 ... T65 °C Da/Db] Zone 21 dust [Ex ia IIIC T125 ... T65 °C Db]	IECEx member states
	<b>EAC (option)</b> Hazardous areas - Ex i Zone 0 gas [0 Ex ia IIC T3/T4/T5/T6] Zone 1 gas [1 Ex ib IIC T3/T4/T5/T6] Zone 20 dust [DIP A20 Ta 65 °C/Ta 95 °C/Ta 125 °C] Zone 21 dust [DIP A21 Ta 65 °C/Ta 95 °C/Ta 125 °C] - Ex n Zone 2 gas [Ex nA IIC T6 ... T1]	Eurasian Economic Community
	<b>INMETRO (option)</b> Hazardous areas - Ex i Zone 1 connection to zone 0 gas [Ex ib IIC T3 ... T6 Ga/Gb]	Brazil
	<b>NEPSI (option)</b> Hazardous areas - Ex i Zone 1 connection to zone 0 gas [Ex ia/ib IIC T3 ~ T6] Zone 1 gas [Ex ib IIC T3 ~ T6] - Ex n Zone 2 gas [Ex nA IIC T1 ~ T6 Gc]	China
	<b>KOSHA (option)</b> Hazardous areas - Ex i Zone 0 gas [Ex ia IIC T4 ... T6] Zone 1 gas [Ex ib IIC T4 ... T6]	South Korea
-	<b>PESO (option)</b> Hazardous areas - Ex i Zone 1 gas [Ex ib IIC T3 ... T6 Gb]	India

Logo	Description	Country
	<b>GOST</b> Metrology, measurement technology	Russia
	<b>KazInMetr</b> Metrology, measurement technology	Kazakhstan
-	<b>MTSCHS</b> Permission for commissioning	Kazakhstan
	<b>BelGIM</b> Metrology, measurement technology	Belarus
	<b>Uzstandard</b> Metrology, measurement technology	Uzbekistan

## 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")

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.

For deliveries to CIS countries and Ukraine, a technical passport is required and generated for each specific order.

Approvals and certificates, see website

# Sensor

## Measuring element

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

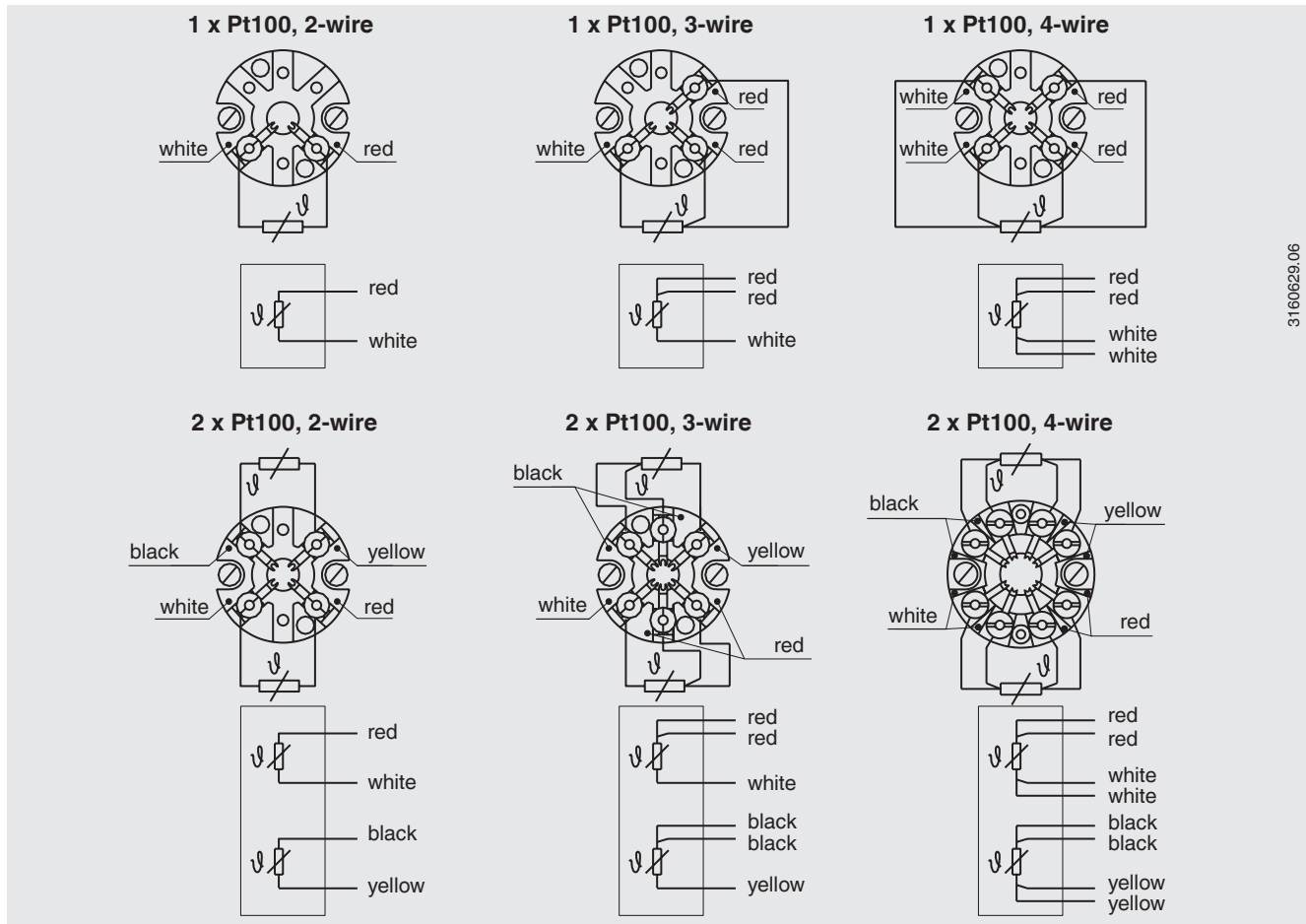
Connection method	
Single elements	1 x 2-wire 1 x 3-wire 1 x 4-wire
Dual elements	2 x 2-wire 2 x 3-wire 2 x 4-wire <sup>3)</sup>

Accuracy class / Range of use of the sensor per EN 60751		
Class	Sensor construction	
	Wire-wound	Thin-film
Class B	-200 ... +600 °C	-50 ... +500 °C
	-200 ... +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

## Electrical connection

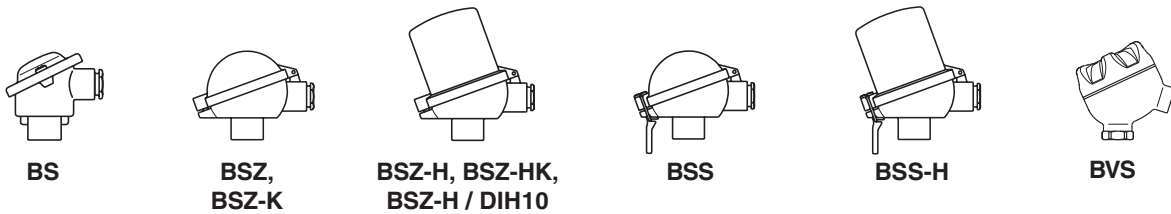
(Colour code per EN/IEC 60751)



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
BS	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
BSZ	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
BSZ-H	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
BSZ-H (2x cable outlet)	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
BSZ-H / DIH10 <sup>2)</sup>	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
BSS	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
BSS-H	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
BVS	Stainless steel	M20 x 1.5 <sup>2)</sup>	IP65	Precision-cast screw-on lid	Blank, electropolished	M24 x 1.5
BSZ-K	Plastic	M20 x 1.5 or ½ NPT <sup>3)</sup>	IP65	Spherical hinged cover with cylinder head screw	Black	M24 x 1.5
BSZ-HK	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
BS	x	x	-	-	-
BSZ	x	x	x	x	x
BSZ-H	x	x	x	x	x
BSZ-H (2x cable outlet)	x	x	x	x	x
BSZ-H / DIH10 <sup>2)</sup>	x	x	-	-	-
BSS	x	x	-	-	-
BSS-H	x	x	-	-	-
BVS	x	x	-	-	-
BSZ-K	x	x	-	-	-
BSZ-HK	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

Model	Material	Cable entry thread size	Ingress protection (max.) <sup>1)</sup>	Cover / Cap	Surface	Connection to neck tube
KN4-A	Aluminium	½ NPT or M20 x 1.5 <sup>3)</sup>	IP65	Screw-on lid	Blue, lacquered <sup>4)</sup>	M24 x 1.5, ½ NPT
KN4-P <sup>5)</sup>	Polypropylene	½ NPT	IP65	Screw-on lid	White	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>5)</sup>	x	-	-	-	-

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

3) Standard (others on request)

4) RAL 5022

5) On request

## Connection head with digital display

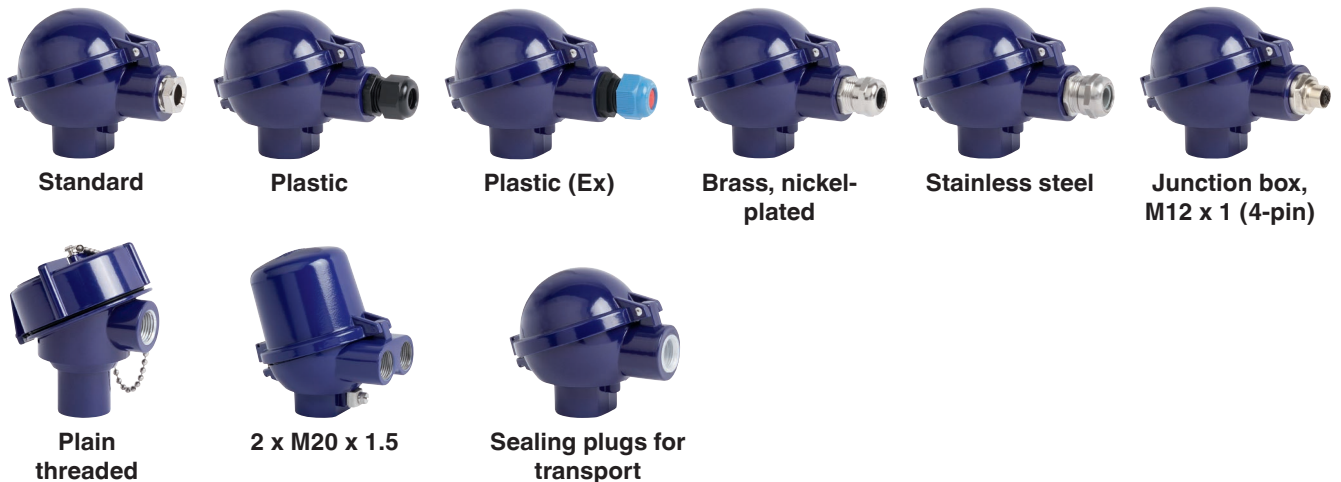


**Connection head BSZ-H with LED display model DIH10**

see data sheet AC 80.11

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	Min./max. ambient temperature	Cable entry thread size
Standard cable entry <sup>1)</sup>	-40 ... +80 °C	M20 x 1.5 or ½ NPT
Plastic cable gland (Cable diameter 6 ... 10 mm) <sup>1)</sup>	-40 ... +80 °C	M20 x 1.5 or ½ NPT
Nickel-plated brass cable gland (Cable diameter 6 ... 12 mm)	-40 ... +80 °C	M20 x 1.5 or ½ NPT
Stainless steel cable gland (Cable diameter 7 ... 12 mm)	-40 ... +80 °C	M20 x 1.5 or ½ NPT
Plain threaded	-	M20 x 1.5 or ½ NPT
2 x M20 x 1.5 <sup>2)</sup>	-	2 x M20 x 1.5
Junction box M12 x 1 (4-pin) <sup>3)</sup>	-40 ... +80 °C	M20 x 1.5
Sealing plugs for transport	-40 ... +80 °C	M20 x 1.5 or ½ NPT

Cable entry	Colour	Ingress protection (max.)	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	x	x	-	-	-
Plastic cable gland <sup>1)</sup>	Black or grey	IP65, IP68	x	-	-	-	-
Plastic cable gland, Ex e <sup>1)</sup>	Light blue	IP65, IP68	x	x	x	-	-
Plastic cable gland, Ex e <sup>1)</sup>	Black	IP65, IP68	x	-	-	x	x
Nickel-plated brass cable gland	Blank	IP65, IP68	x	-	-	-	-
Nickel-plated brass cable gland, Ex e	Blank	IP65, IP68	x	x	x	x	x
Stainless steel cable gland	Blank	IP65, IP68	x	x	x	-	-
Stainless steel cable gland, Ex e	Blank	IP65, IP68	x	x	x	x	x
Plain threaded	-	IP00	x	x	x <sup>5)</sup>	x <sup>5)</sup>	x <sup>5)</sup>
2 x M20 x 1.5 <sup>2)</sup>	-	IP00	x	x	x <sup>5)</sup>	x <sup>5)</sup>	x <sup>5)</sup>
Junction box M12 x 1 (4-pin) <sup>3)</sup>	-	IP65	x	x <sup>4)</sup>	x <sup>4)</sup>	-	-
Sealing plugs for transport	Transparent	-	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) With appropriate mating connector connected

5) Suitable cable gland required for operation

## Ingress protection

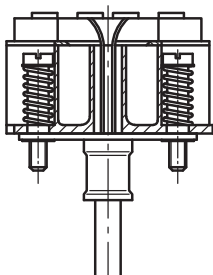
to IP65/IP68 per IEC 60529/EN 60529 under the following conditions:

- 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

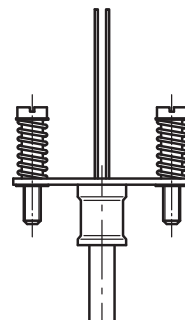
## Transmitter

### 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.



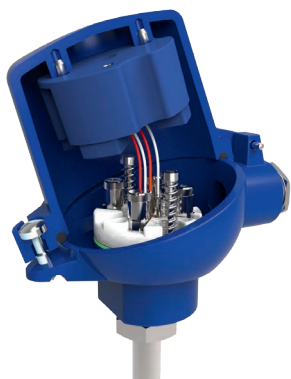
Measuring insert with mounted transmitter (here: model T32)



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



T19



T24



T12



T32



T53

Output signal 4 ... 20 mA, HART® protocol, FOUNDATION™ Fieldbus and PROFIBUS® PA					
Transmitter (selectable versions)	Model T19	Model T24	Model T12	Model T32	Model T53
Data sheet	TE 19.03	TE 24.01	TE 12.03	TE 32.04	TE 53.01
<b>Output</b>					
■ 4 ... 20 mA	x	x	x	x	
■ HART® protocol				x	
■ FOUNDATION™ Fieldbus and PROFIBUS® PA					x
<b>Connection method</b>					
■ 1 x 3-wire	x	x	x	x	x
■ 1 x 4-wire			x	x	x
Measuring current	0.8 mA	0.5 mA	0.2 mA	0.3 mA	0.2 mA
Explosion protection	Without	Optional	Optional	Optional	Standard

## Possible mounting positions for transmitters

Connection head	T19	T24	T12	T32	T53
BS	○	○	-	-	○
BSZ	○	○	○	○	○
BSZ-K	●	●	●	●	●
BSZ-H	●	●	●	●	●
BSZ-H (2x cable outlet)	●	●	●	●	●
BSZ-HK	●	●	●	●	●
BSZ-H / DIH10	●	●	●	●	-
BSS	○	○	○	○	○
BSS-H	●	●	●	●	●
BVS	○	○	○	○	○
KN4-A / KN4-P	○	○	○	○	○

○ 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.

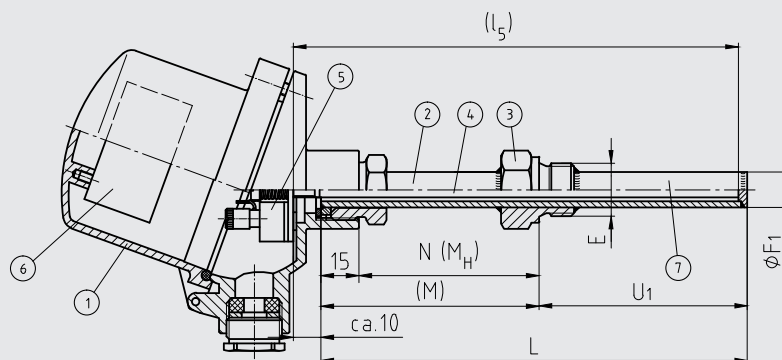
Selected TR10-C resistance thermometers, in combination with a suitable temperature transmitter (e.g. model T32.1S, TÜV certified SIL version for protection systems developed

in accordance with IEC 61508), are suitable as sensors for safety functions to SIL 2.

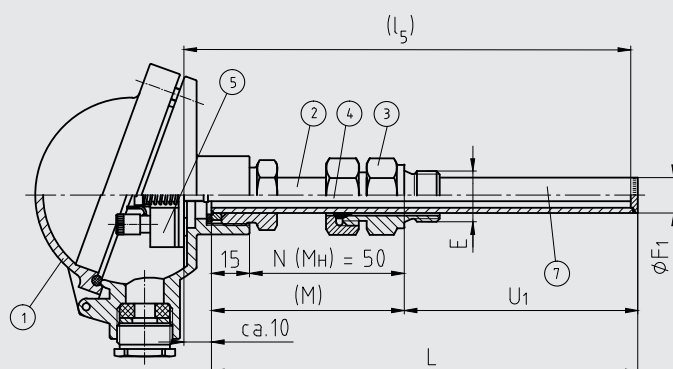
For detailed specifications, see Technical information IN 00.19 at [www.wika.com](http://www.wika.com).

## Components model TR10-C

### Process connection: mounting thread, firmly welded



### Process connection: compression fitting



#### Legend:

① Connection head	(L) Overall length protection tube
② Neck tube	$l_5$ Measuring insert length
③ Process connection	$U_1$ Protection tube insertion length per DIN 43772
④ Measuring insert	$\varnothing F_1$ Protection tube diameter
⑤ Terminal block/transmitter (option)	E Mounting thread
⑥ Transmitter (option)	$N (M_H)$ Neck length
⑦ Model TW35 protection tube	(M) Neck tube length

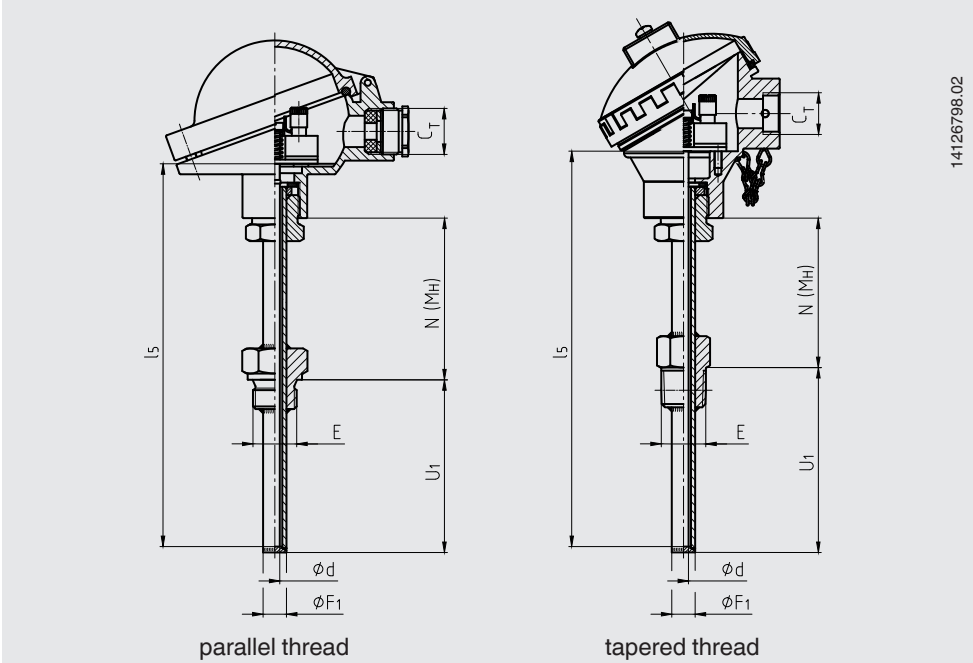
Fig. with parallel or tapered thread see chapter "Protection tube"

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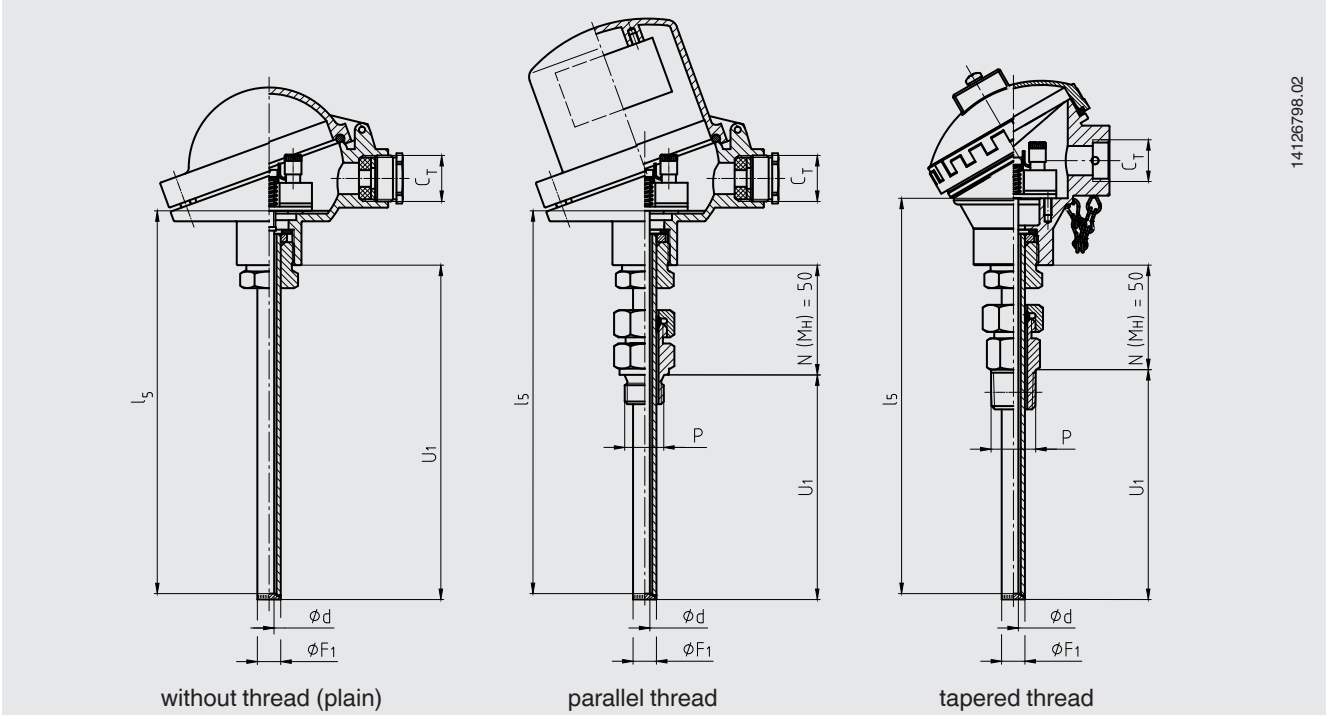
# Protection tube

## Protection tube designs

### Protection tube model TW35, straight, mounting thread, form 2G DIN 43772



### Protection tube model TW35, straight, plain, form 2 DIN 43772, with/without compression fitting

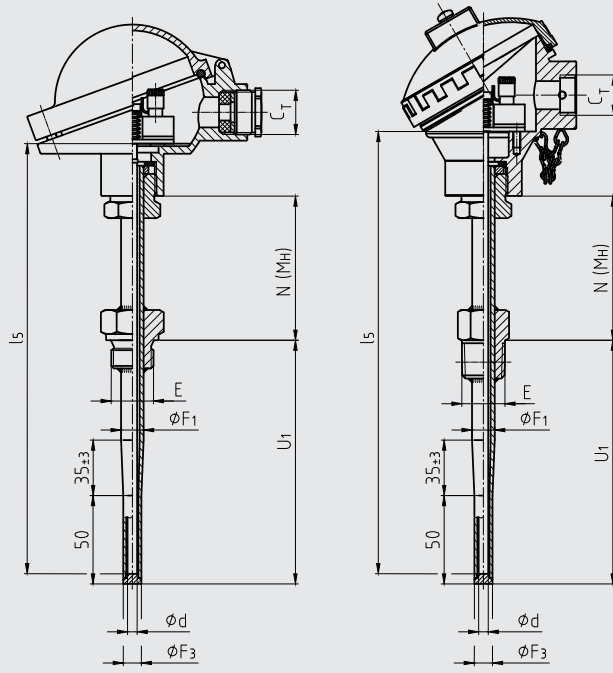


**Legend:**

- |                |                         |                  |                                     |
|----------------|-------------------------|------------------|-------------------------------------|
| U <sub>1</sub> | Insertion length        | Ø F <sub>1</sub> | Protection tube diameter            |
| l <sub>5</sub> | Measuring insert length | E                | Mounting thread                     |
| N (MH)         | Neck length             | Ø d              | Measuring insert diameter           |
| C <sub>T</sub> | Thread cable entry      | P                | Compression fitting mounting thread |

The pictures show examples of connection heads.

Protection tube model TW35, tapered, mounting thread, form 3G DIN 43772

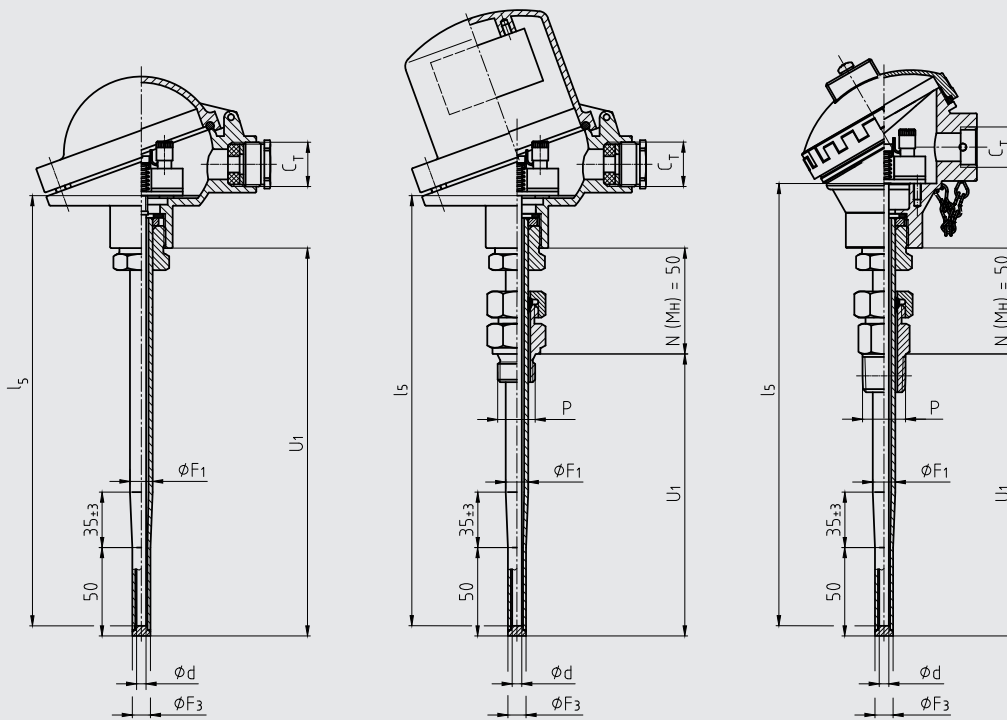


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parallel thread

tapered thread

Protection tube model TW35, tapered, plain, form 3 DIN 43772, with/without compression fitting



14126834.01

without thread (plain)

parallel thread

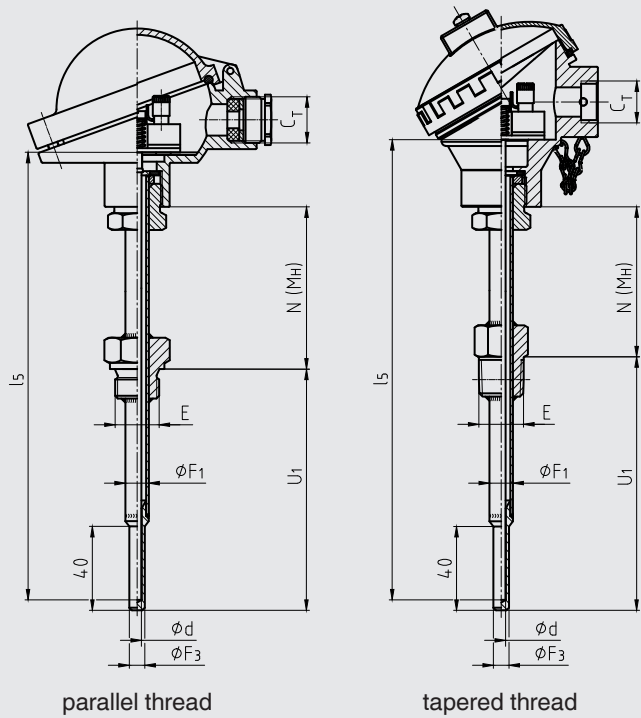
tapered thread

Legend:

$U_1$	Insertion length	$\text{Ø } F_3$	Diameter of protection tube tip
$l_5$	Measuring insert length	E	Mounting thread
$N (M_H)$	Neck length	$\text{Ø } d$	Measuring insert diameter
$C_T$	Thread cable entry	P	Compression fitting mounting thread
$\text{Ø } F_1$	Protection tube diameter		

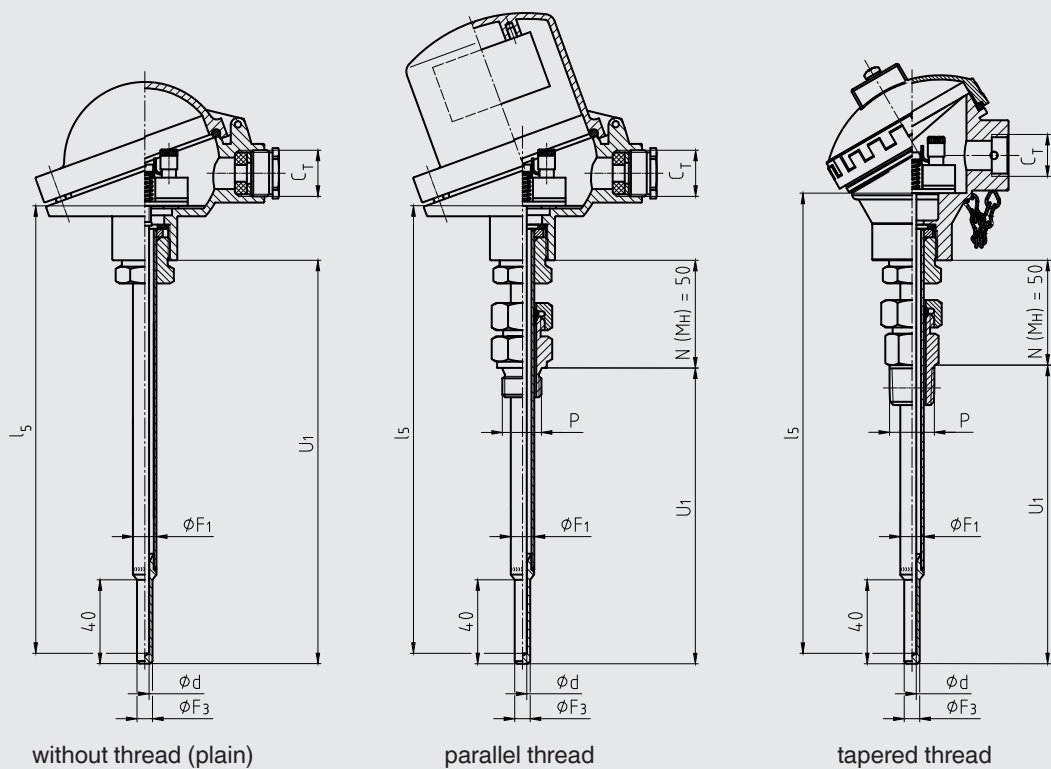
The pictures show examples of connection heads.

**Protection tube model TW35, tapered, weld-on solid tip, mounting thread, non-standard design**



14126855.02

**Protection tube model TW35, tapered, weld-on solid tip, plain, with/without compression fitting**



14126855.02

**Legend:**

$U_1$	Insertion length	$\varnothing F_1$	Protection tube diameter
$l_5$	Measuring insert length	$\varnothing F_3$	Diameter of protection tube tip
$N (M_H)$	Neck length	E	Mounting thread
$K_E$	1/2 NPT: 8.13 mm	$\varnothing d$	Measuring insert diameter
	3/4 NPT: 8.61 mm	P	Compression fitting mounting thread
$C_T$	Thread cable entry		

The pictures show examples of connection heads.

## TW35 protection tube

The protection tubes are made of drawn tube with a welded bottom and are screwed into the connection head with a rotatable threaded connection (male nut). By loosening this male nut, the connection head - and thus the cable outlet - can be adjusted to the desired position. The process connection is welded on to customer specification at the factory. This determines the insertion length. Insertion lengths to DIN standards are preferable.

The immersion depth into the process medium should be at least 10 times the protection tube outer diameter.

### Protection tube versions

Protection tube in accordance with DIN 43722	Protection tube diameter	Process connection	Suitable for measuring insert diameter	Connection to head	Material
<b>TW35, straight, form 2G, mounting thread</b>	9 x 1 mm	G 1/4 B, mounting thread	6 mm	M24 x 1.5 (rotatable threaded connection, male nut)	1.4571
		G 1/2 B, mounting thread			
		G 3/4 B, mounting thread			
		G 1 B, mounting thread			
		M18 x 1.5, mounting thread			
		M20 x 1.5, mounting thread			
		M27 x 2, mounting thread			
		1/2 NPT, mounting thread			
	3/4 NPT, mounting thread				
	11 x 2 mm 12 x 2.5 mm	G 1/2 B, mounting thread	6 mm		
		G 3/4 B, mounting thread			
		G 1 B, mounting thread			
		M18 x 1.5, mounting thread			
		M20 x 1.5, mounting thread			
		M27 x 2, mounting thread			
		1/2 NPT, mounting thread			
		3/4 NPT, mounting thread			
	14 x 2.5 mm	G 1/2 B, mounting thread	8 mm (6 mm with sleeve)		
		G 3/4 B, mounting thread			
		G 1 B, mounting thread			
		M18 x 1.5, mounting thread			
M20 x 1.5, mounting thread					
M27 x 2, mounting thread					
1/2 NPT, mounting thread					
3/4 NPT, mounting thread					
<b>TW35, tapered, form 3G, mounting thread</b>	12 x 2.5 mm, tapered to 9 mm	G 1/2 B, mounting thread	6 mm		
		G 3/4 B, mounting thread			
		G 1 B, mounting thread			
		M18 x 1.5, mounting thread			
		M20 x 1.5, mounting thread			
		M27 x 2, mounting thread			
		1/2 NPT, mounting thread			
		3/4 NPT, mounting thread			
<b>TW35, straight, plain, form 2, with/without compression fitting</b>	9 x 1 mm 11 x 2 mm 12 x 2.5 mm	G 1/2 B compression fitting (metal ferrule)	6 mm		
		1/2 NPT compression fitting (metal ferrule)			
		Without threaded connection, plain			
<b>TW35, tapered, plain, form 3, with/without compression fitting</b>	12 x 2.5 mm, tapered to 9 mm	G 1/2 B compression fitting (metal ferrule)	6 mm		
		1/2 NPT compression fitting (metal ferrule)			
		Without threaded connection, plain			

other versions on next page

Tapered protection tube, non-standard	Protection tube diameter	Process connection	Suitable for measuring insert diameter	Connection to head	Material
<b>TW35, tapered, weld-on solid tip, mounting thread</b>	9 x 1 mm, tapered to 6 mm	G 1/4 B, mounting thread	3 mm	M24 x 1.5 (rotatable threaded connection, male nut)	1.4571
		G 1/2 B, mounting thread			
		G 3/4 B, mounting thread			
		G 1 B, mounting thread			
		M18 x 1.5, mounting thread			
		M20 x 1.5, mounting thread			
		M27 x 2, mounting thread			
		1/2 NPT, mounting thread			
		3/4 NPT, mounting thread			
	11 x 2 mm, tapered to 6 mm 12 x 2.5 mm, tapered to 6 mm	G 1/2 B, mounting thread			
		G 3/4 B, mounting thread			
		G 1 B, mounting thread			
		M14 x 1.5, mounting thread			
		M18 x 1.5, mounting thread			
		M20 x 1.5, mounting thread			
<b>TW35, tapered, weld-on solid tip, plain, with/without compression fitting</b>	9 x 1 mm, tapered to 6 mm 11 x 2 mm, tapered to 6 mm 12 x 2.5 mm, tapered to 6 mm	G 1/2 B compression fitting (metal ferrule)	3 mm	M24 x 1.5 (rotatable threaded connection, male nut)	1.4571
		1/2 NPT compression fitting (metal ferrule)			
		Without threaded connection, plain			

Straight protection tube, non-standard	Protection tube diameter	Process connection	Suitable for measuring insert diameter	Connection to head	Material
<b>TW35, straight, mounting thread</b>	6 x 1 mm 8 x 1 mm	G 1/4 B, mounting thread	3 mm	M24 x 1.5 (rotatable threaded connection, male nut)	1.4571 316L (8 x 1 mm)
		G 1/2 B, mounting thread			
		M18 x 1.5, mounting thread			
		M20 x 1.5, mounting thread			
		1/2 NPT, mounting thread			
	10 x 1 mm 10 x 1.5 mm	G 1/2 B, mounting thread	6 mm		316L
		G 3/4 B, mounting thread			
		G 1 B, mounting thread			
		M18 x 1.5, mounting thread			
		M20 x 1.5, mounting thread			
		M27 x 2, mounting thread			
		1/2 NPT, mounting thread			
	3/4 NPT, mounting thread				
	12 x 1 mm 12 x 1.5 mm	G 1/2 B, mounting thread	8 mm (6 mm with sleeve)		316L
		G 3/4 B, mounting thread			
		G 1 B, mounting thread			
		M18 x 1.5, mounting thread			
		M20 x 1.5, mounting thread			
M27 x 2, mounting thread					
1/2 NPT, mounting thread					
3/4 NPT, mounting thread					
<b>TW35, straight, plain, with/without compression fitting</b>	6 x 1 mm 8 x 1 mm	G 1/2 B compression fitting (metal ferrule)	3 mm	M24 x 1.5 (rotatable threaded connection, male nut)	1.4571 316L (8 x 1 mm)
		1/2 NPT compression fitting (metal ferrule)			
		Without threaded connection, plain			
	9 x 1 mm 10 x 1 mm 10 x 1.5 mm 12 x 1 mm 12 x 1.5 mm	G 1/2 B compression fitting (metal ferrule)	6 mm		316L
		1/2 NPT compression fitting (metal ferrule)			
		Without threaded connection, plain			
		Without threaded connection, plain			
		Without threaded connection, plain			
		Without threaded connection, plain			

## Insertion lengths

Protection tube design	Standard insertion length	Min./max. insertion length
TW35, straight, mounting thread, form 2G DIN 43772	160, 250, 400 mm	50 mm / 4,000 mm
TW35, tapered, mounting thread, form 3G DIN 43772	160, 220, 280 mm	110 mm / 4,000 mm
TW35, straight, plain, with/without compression fitting, form 2 DIN 43772	-	50 mm / 4,000 mm
TW35, tapered, plain, with/without compression fitting, form 3 DIN 43772	-	110 mm / 4,000 mm
TW35, tapered, weld-on solid tip, mounting thread, non-standard design	160, 250, 400 mm	75 mm / 4,000 mm
TW35, tapered, plain, weld-on solid tip, with/without compression fitting, non-standard design	-	75 mm / 4,000 mm

## Neck lengths

Protection tube design	Standard neck length	Min./max. neck length
TW35, straight, mounting thread, form 2G DIN 43772	130 mm	30 mm / 1,000 mm
TW35, tapered, mounting thread, form 3G DIN 43772	132 mm	30 mm / 1,000 mm
TW35, straight, plain, with compression fitting, form 2 DIN 43772	50 mm	50 mm
TW35, straight, plain, without compression fitting, form 2 DIN 43772	-	-
TW35, tapered, plain, with compression fitting, form 3 DIN 43772	50 mm	50 mm
TW35, tapered, plain, without compression fitting, form 3 DIN 43772	-	-
TW35, tapered, weld-on solid tip, mounting thread, non-standard design	130 mm	30 mm / 1,000 mm
TW35, tapered, weld-on solid tip, with compression fitting, non-standard design	50 mm	50 mm
TW35, tapered, weld-on solid tip, without process connection, non-standard design	-	-

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.

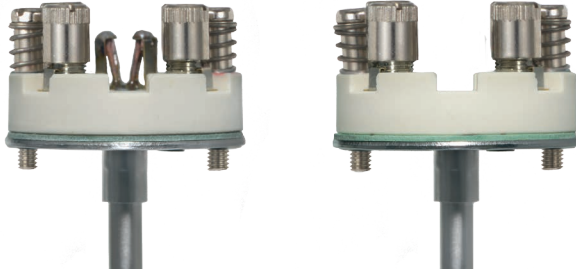
Other versions on request



## Measuring insert

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

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



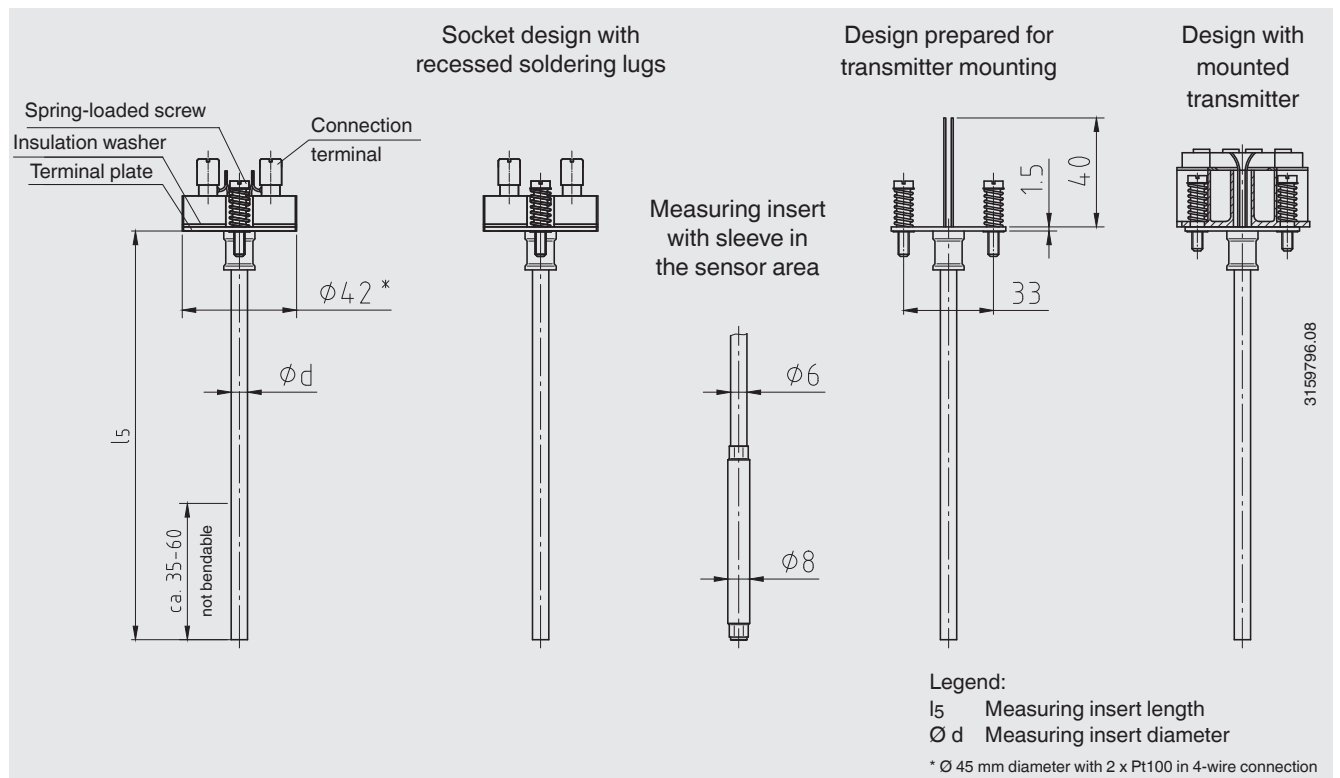
**Fig. left: standard version**  
**Fig. right: Version with recessed soldering lugs (option)**

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

The bore diameter of the protection tube should be a max. 1 mm larger than the measuring insert diameter. Gaps of more than 0.5 mm between protection tube 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 protection tube, it is very important to determine the correct insertion length (= protection tube 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 protection tube, the measuring 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	30	3 ±0.05	1.4571, 316L <sup>1)2)</sup>	1.4571
6	Standard	60	6 <sup>0</sup> <sub>-0.1</sub>	1.4571, 316L <sup>1)2)</sup>	1.4571
8 (6 mm with sleeve)	Standard	-	8 <sup>0</sup> <sub>-0.1</sub>	1.4571	1.4571
8	Standard	80	8 <sup>0</sup> <sub>-0.1</sub>	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

## Operating conditions

### Mechanical requirements

Version	
<b>Standard</b>	6 g peak-to-peak, wire-wound measuring resistor or thin film
<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.

### Max. process temperature, process pressure

Depending on:

- Load diagram DIN 43772
- Protection tube design
  - Dimensions
  - Material
- Process conditions
  - Flow rate
  - Medium density

### Ambient and storage temperature

-40 ... +80 °C

Other ambient and storage temperatures on request

### Thermowell calculation

With critical operating conditions, a thermowell calculation in accordance with Dittrich/Klotter is recommended as a WIKA engineering service.

Note: ASME PTC 19.3 TW-2010 is not applicable for the TR10-C.

For further information, see Technical information IN 00.15 "Strength calculation for thermowells".

### 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 / Protection tube / Protection tube diameter / Process connection / Protection tube material / Insertion length / Neck length / Certificates / Options

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We reserve the right to make modifications to the specifications and materials.

## Certificates

Certification type	Measurement accuracy	Material certificate <sup>1)</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.

1) Protection tubes



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