

Resistance thermometer

For additional thermowell, flameproof enclosure (Ex d)

Model TR10-L

WIKA data sheet TE 60.02



For further approvals,
see page 14

Applications

- Chemical industry
- Petrochemical industry
- Offshore

Special features

- Sensor ranges from -196 ... +600 °C [-320 ... +1,112 °F]
- Measuring insert replaceable
- Suitable for many thermowell / protection tube designs
- Explosion-protected versions are available for many approval types



Fig. left: model TR10-L with PIH-L connection head

Fig. right: Model TR10-L with 1/4000 connection head

Configurator



Standard articles



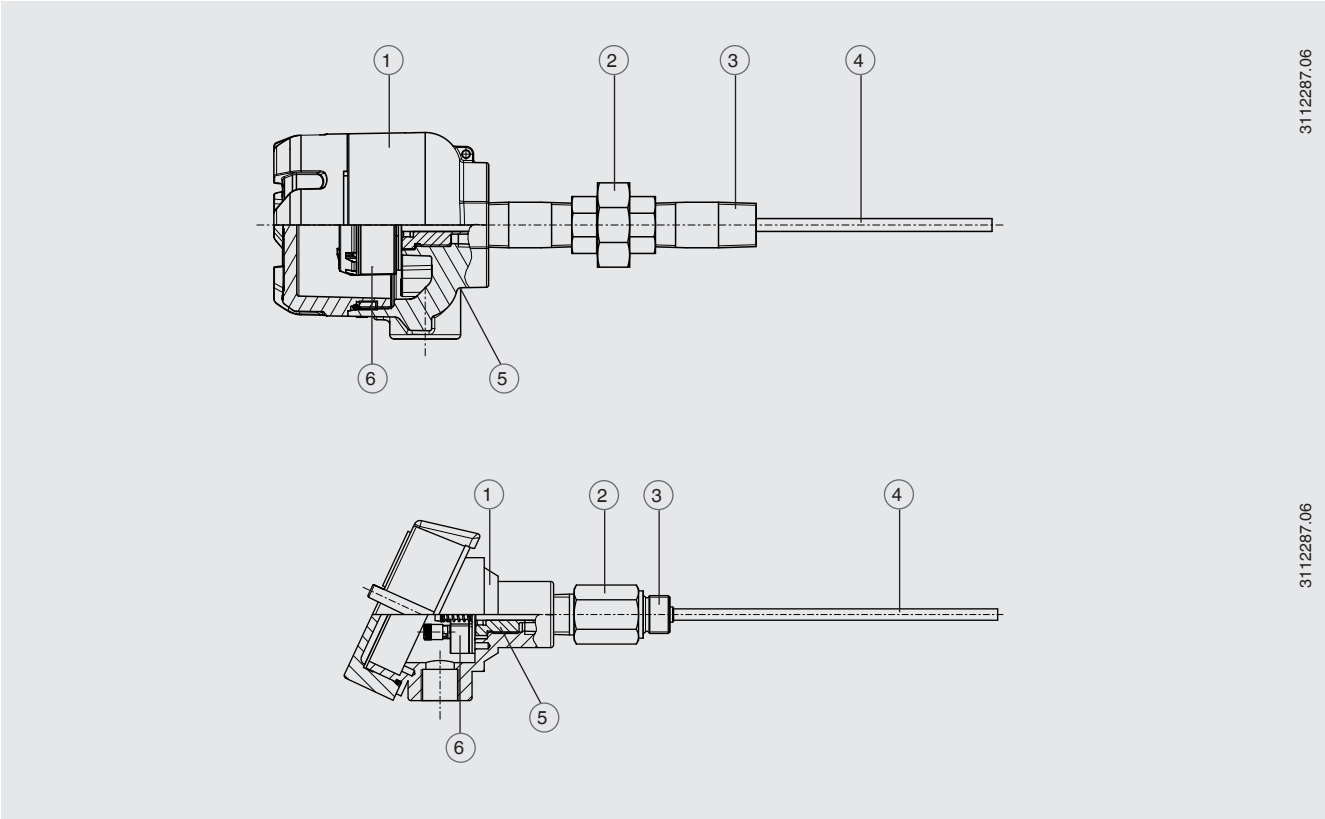
Description

Resistance thermometers in this model series can be combined with a large number of thermowell / protection tube designs.

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

A large number of different explosion-protected approvals are available for the TR10-L.

Representation of the components



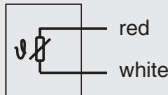
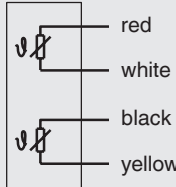
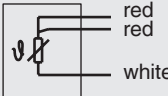
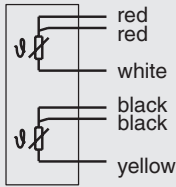
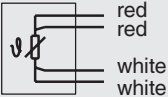
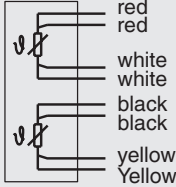
- Legend:
- ① Connection head
 - ② Neck tube
 - ③ Connection to thermowell / protection tube
 - ④ TR10-K measuring insert
 - ⑤ Flame path
 - ⑥ Terminal block / Transmitter (selectable)

Overview of approvals for explosion protection

Approval	Explosion protection	
	Ex d (gas) Zone 1, 2	Ex t (dust) Zone 21, 22
ATEX	x	x
IECEX	x	x
ECASEx	x	x
EACEx	x	x
Ex Ukraine	x	x
INMETRO	x	x
CCC	x	x
NEPSI	x	x
JPEX	x	-

→ For further information, see [“Approvals”](#)

Measuring element

Measuring element			
Type of measuring element		Pt100, Pt1000	
Measuring current		0.1 ... 1.0 mA	
Connection method			
Single elements		Dual elements	
1 x 2-wire		2 x 2-wire	
1 x 3-wire		2 x 3-wire	
1 x 4-wire		2 x 4-wire ¹⁾	
Validity limits of the class accuracy in accordance with IEC 60751			
Class B ± (0.30 + 0.0050 t l) ³⁾		■ -196 ... +600 °C [-321 ... +1,112 °F] ■ -196 ... +450 °C [-321 ... +842 °F]	
Class A ²⁾ ± (0.15 + 0.0020 t l) ³⁾		■ -50 ... +500 °C [-58 ... +932 °F] ■ -50 ... +250 °C [-58 ... +482 °F]	
Class AA ²⁾ ± (0.10 + 0.0017 t l) ³⁾		-100 ... +450 °C [-148 ... +842 °F]	
		-30 ... +300 °C [-22 ... +572 °F]	
		-50 ... +250 °C [-58 ... +482 °F]	
		0 ... 150 °C [32 ... 302 °F]	

1) Not for 3 mm [0.118 in] diameter and 1/8 in [3.2 mm] diameter

2) Not for 2-wire connection method

3) |t| is the numerical value of the temperature in °C without consideration of the sign

→ For further information on Pt100 sensors, see technical information IN 00.17 at www.wika.com.

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

- The combinations of a 2-wire connection with class A or class AA are not permissible, since the lead resistance of the MIMS cable and the connection lead negates the higher sensor accuracy.
- Longer probe/cable lengths should be designed with a 4-wire connection, since this connection method has no length effect on the accuracy.
- The use of TR10-L with a Pt100 sensor in a 2-wire connection is technically feasible, of course, but not recommended due to the lead resistance problem.

Connection head

Model		Material	Thread size of cable inlet	Ingress protection (max.) ^{1) 2)} IEC/EN 60529	Cap	Surface	Connection to neck tube
	1/4000	Aluminium	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66	Screw-on lid	Blue, painted (RAL 5022)	½ NPT
	1/4000	Stainless steel	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66	Screw-on lid	Natural finish	½ NPT
	7/8000	Aluminium	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66	Screw-on lid	Blue, painted (RAL 5022)	½ NPT
	7/8000	Stainless steel	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66	Screw-on lid	Natural finish	½ NPT
	7/8000 / DIH50 ³⁾	Aluminium	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66	Screw-on lid	Blue, painted (RAL 5022)	½ NPT
	7/8000 / DIH50 ³⁾	Stainless steel	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66	Screw-on lid	Natural finish	½ NPT
	PIH-L	Aluminium	■ ½ NPT / closed ■ M20 x 1.5 / closed ■ 2 x ½ NPT ■ 2 x M20 x 1.5	IP66	Screw-on lid, flat	Blue upper body, painted (RAL 5022) Grey lower body, painted (RAL 7032)	■ ½ NPT ■ M20 x 1.5
	PIH-H	Aluminium	■ ½ NPT ■ M20 x 1.5 ■ 2 x ½ NPT ■ 2 x M20 x 1.5	IP66	Screw-on lid, high	Blue upper body, painted (RAL 5022) Grey lower body, painted (RAL 7032)	■ ½ NPT ■ M20 x 1.5
	PIH-W / TND ⁴⁾	Aluminium	■ ½ NPT ■ M20 x 1.5 ■ 2 x ½ NPT ■ 2 x M20 x 1.5	IP66	Screw-on lid, high	Blue upper body, painted (RAL 5022) Grey lower body, painted (RAL 7032)	■ ½ NPT ■ M20 x 1.5
	PIH-W / DIH-50 ³⁾	Aluminium	■ ½ NPT ■ M20 x 1.5 ■ 2 x ½ NPT ■ 2 x M20 x 1.5	IP66	Screw-on lid, high	Blue upper body, painted (RAL 5022) Grey lower body, painted (RAL 7032)	■ ½ NPT ■ M20 x 1.5

1) IP ingress protection of the connection head. The IP ingress protection of the complete TR10-L instrument does not necessarily have to correspond to the connection head.

2) Suitable sealing / cable gland required.

3) LC display DIH50 in conjunction with transmitter with 4 ... 20 mA output (loop).

4) LC display TND in conjunction with T38

Model	Explosion protection	
	Ex d (gas) Zone 1, 2	Ex t (dust) Zone 21, 22
1/4000	x	x
7/8000	x	x
7/8000 / DIH50 ¹⁾	x	x
PIH-L / PIH-H	x	x
PIH-W / TND ²⁾	x	x
PIH-W / DIH-50 ¹⁾	x	x

1) LC display DIH50 in conjunction with transmitter with 4 ... 20 mA output (loop)

2) LC display TND in conjunction with T38

Connection head with digital display



Connection head PIH-W with model TND LC display

→ See data sheet TE 38.01 and AC 80.30



Connection head PIH-W with model DIH50 LC display

→ See data sheet AC 80.10

A model T38 transmitter is always required to operate the TND digital display.

A transmitter with 4 ... 20 mA output is always required to operate the model DIH50 digital display.

Flame path

A flame path fitting is built into the connection head which, in conjunction with the measuring insert, generates a flame-proof gap.

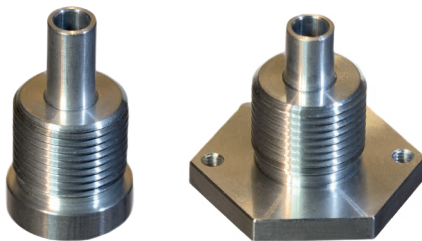


Fig. left: Flame path for model 1/4000 connection head

Fig. right: Flame path for model 7/8000, PIH-L, PIH-H and PIH-W connection head

Cable inlet

Cable inlet		Colour	Ingress protection (max.) IEC/EN 60529 ¹⁾	Thread size of cable inlet	Min./Max. ambient temperature
	Plain threaded	-	IP00	■ M20 x 1.5 ■ ½ NPT	-
	Sealing plugs for shipment	Transparent	-	■ M20 x 1.5 ■ ½ NPT	-40 ... +80 °C [-40 ... +176 °F]
	Ex d nickel-plated brass cable gland (cable Ø 7.5 ... 11.9 mm)	Natural finish	IP66	■ M20 x 1.5 ■ ½ NPT	-60 ²⁾ / -40 ... +80 °C [-76 / -40 ... +176 °F]
	Ex d stainless steel cable gland (cable Ø 7.2 ... 10 mm)	Natural finish	IP66	■ M20 x 1.5 ■ ½ NPT	-60 ²⁾ / -40 ... +80 °C [-76 / -40 ... +176 °F]

1) IP ingress protection of the cable gland. The IP ingress protection of the complete instrument TR10-L does not necessarily have to correspond to the cable gland.

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

Measuring insert

Measuring insert		
Version	Vibration-resistant mineral-insulated metal-sheathed cable (MIMS cable)	
Optimal heat transfer	Requirement	■ Correct measuring insert length ■ Correct measuring insert diameter
	Bore diameter of the thermowell / protection tube	Max. 1 mm [0.039 in] larger than the measuring insert diameter
	Gap width	With gap widths > 0.5 mm [> 0.020 in] between thermowell / protection tube and measuring insert: → Negative impact on heat transfer → Unfavourable response behaviour of the thermometer
Insertion length	When mounting the measuring insert into a thermowell / protection tube, it is very important to determine the correct insertion length (= thermowell length for tip thicknesses of ≤ 5.5 mm [≤ 0.217 in]). In order to ensure that the measuring insert is firmly pressed down onto the bottom of the thermowell / protection tube, the measuring insert must be spring-loaded (spring travel: max. 10 mm [0.394 in]).	
Spring travel	Max. 10 mm [0.394 in]	

Measuring insert diameter Ø d in mm [in]		Code number per DIN 43735	Tolerance in mm	Sheath material
3 [0.118]	Standard	30	3 ^{+0.05} _{-0.05}	■ 1.4571 ■ 316L
6 [0.236]	Standard	60	6 ⁰ _{-0.1}	
8 [0.315] (6 [0.2366] with sleeve)	Standard	-	8 ⁰ _{-0.1}	■ 1.4571
8 [0.315]	Standard	80	8 ⁰ _{-0.1}	■ 1.4571 ■ 316L

Transmitter

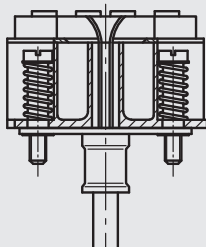
Transmitter models	T15	T38
Transmitter data sheet	TE 15.01	TE 38.01
Figure		
Output signal		
4 ... 20 mA	x	x
HART® protocol	-	x
WIKA True Drift Detection	-	x
		→ See data sheet SP 05.26
Connection method	■ 1 x 2-wire ■ 1 x 3-wire ■ 1 x 4-wire	■ 1 x 2-wire ■ 1 x 3-wire ■ 1 x 4-wire ■ 2 x 2-wire ■ 2 x 3-wire
Measuring current	< 0.2 mA	< 0.33 mA
Explosion protection	Ex version possible	
Mounting type		
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.	

Mounting type

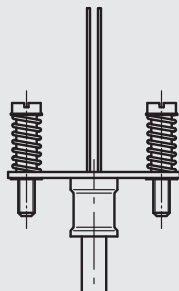
Mounting onto the measuring insert



Measuring insert with mounted transmitter (here: model T38)



Measuring insert prepared for transmitter mounting



When using dual sensors in conjunction with a single transmitter, sensor 1 is connected to the transmitter. The connection leads of sensor 2 (insulated against short-circuits) protrude loosely into the connection head.

Exception

T38: The combination of a 2 x 2-wire or 2 x 3-wire in conjunction with a T38 transmitter in the "redundancy" configuration.

WIKA True Drift Detection



Special dual sensor functionality

- Special probe (RTD/TC combination, realised in the common probe tip of a measuring insert with 6 mm [0.24 in] diameter, in conjunction with T38 transmitter)
- Permanent monitoring of the resistance sensor by the reference thermocouple
- An incorrect reading can be detected immediately and before the next calibration. Uncertainties between the calibration intervals are thus eliminated
- Error signalling in accordance with NAMUR NE043, can be configured in accordance with customer specifications
- Individual monitoring of the single measuring locations
- Process optimisation

The mounting of a transmitter on the measuring insert is possible with all the connection heads listed here. The mounting of a transmitter in the screw-on lid of a 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 with model T38 temperature transmitter



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 achieved by the safety devices.

Selected TR10-L resistance thermometers, in conjunction with a suitable temperature transmitter (e.g. model T38, TÜV certified SIL version for protection systems developed in accordance with IEC 61508), are suitable as sensors for safety functions to SIL 2.

For SIL 3 applications, WIKA recommends the use of two individual TR10-L with one SIL-certified T38 transmitter connected to each.

→ For further information, see technical information IN 00.19 at www.wika.com.

Neck tube

Thread sizes				
Neck tube design	Diameter	Thread to the thermowell / protection tube	Connection to head	Materials ¹⁾
Neck tube with counter nut to head	14 x 2.5 mm [0.551 x 0.098 in]	■ 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	M20 x 1.5 (with counter nut)	1.4571
Double threaded hex bushing (with hexagon 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	½ NPT	1.4571
“Nipple-union-nipple” neck tube ²⁾	~ 22 mm [~ 0.9 in]	½ NPT	½ NPT	316
Double threaded hex bushing (tube section)	~ 22 mm [~ 0.9 in]	½ NPT	½ NPT	316

1) Other materials on request

2) Union material: stainless steel

Neck length		
Neck tube design	Neck length	Min./Max. neck length
“Nipple-union-nipple” neck tube	~ 150 mm [6 in]	■ ~ 75 mm [3 in] ■ ~ 250 mm [10 in]
Double threaded hex bushing (tube section)	~ 50 mm [2 in]	■ ~ 50 mm [2 in] ■ ~ 250 mm [10 in]
Double threaded hex bushing (with hexagonal spanner flats)		
½ NPT to connection head, parallel thread to thermowell / protection tube	~ 25 mm [1 in]	-
½ NPT to connection head, tapered thread to thermowell / protection tube	~ 25 mm [1 in]	-
Neck tube with counter nut to head	150 mm [~ 6 in]	■ 75 mm [~ 3 in] ■ 250 mm [~ 10 in]

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 element between the connection head and the medium, in order to protect a possible built-in transmitter from high medium temperatures.

→ Other versions on request.

Operating conditions

Operating conditions	
Ambient and storage temperature	■ -40 ... +80 °C [-40 ... +176 °F] ■ -60 ¹⁾ ... +80 °C [-76 ... +176 °F]
Vibration resistance	The information on vibration resistance refers to the tip of the measuring insert. → For detailed specifications on the vibration resistance of Pt100 sensors, see technical information IN 00.17 at www.wika.com.

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

Examples of vibration resistance		
	Measuring insert Ø 6 mm [0.236 in]	Measuring insert Ø 3 mm [0.118 in]
Thermometer version		
Sensor	■ 1 x Pt100 (thin film) ■ 2 x Pt100 (thin film)	■ 1 x Pt100 (thin film) ■ 2 x Pt100 (thin film)
Connection method	■ 3-wire ■ 4-wire	■ 3-wire ■ 4-wire (only 1 x Pt100)
Insertion length (A) + neck length (N)	100 ... 1,100 mm [~ 4 ... 43 in]	100 ... 1,100 mm [~ 4 ... 43 in]
Material	■ Stainless steel 1.4571 ■ Stainless steel 316L	■ Stainless steel 1.4571 ■ Stainless steel 316L
Vibration resistance		
Standard probe tip (max. 3g amplitude / 6g peak-to-peak)	x	x
Vibration-resistant probe tip (max. 10g amplitude / 20g peak-to-peak)	x	x
Highly vibration-resistant probe tip (max. 25g amplitude / 50g peak-to-peak)	x	x
Extremely vibration-resistant probe tip (max. 50g amplitude / 100g peak-to-peak)	x	-

The thermometer designs listed above describe instruments in standard designs.

Testing of the vibration resistance per IEC 60068-2-6. Vibration resistance of thermometers in other configurations as well as vibration resistance higher than 50g amplitude / 100g peak-to-peak on request.

IP ingress protection per IEC/EN 60529

First numeral	Degree of protection / Short description	Test parameters
Degrees of protection against solid foreign bodies (defined by the 1st numeral)		
5	Dust-protected	Per IEC/EN 60529
6	Dust-tight	Per IEC/EN 60529
Degrees of protection against water (defined by the 2nd numeral)		
4	Protected against splash water	Per IEC/EN 60529
5	Protected against water jets	Per IEC/EN 60529
6	Protected against powerful water jets	Per IEC/EN 60529

Standard ingress protection of model TR10-L is IP65.

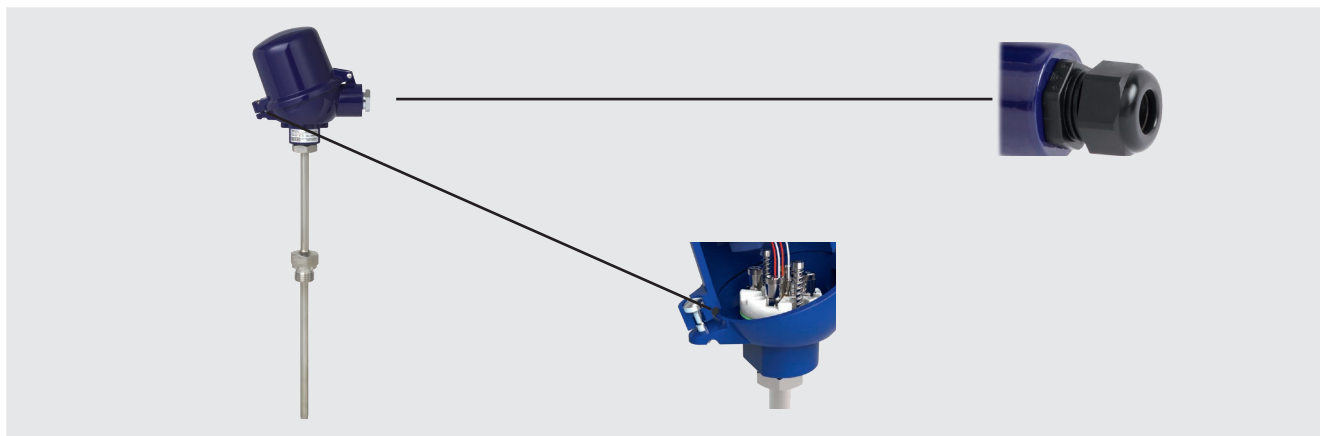
The specified degrees of protection apply under the following conditions:

- Use of a suitable thermowell (without suitable thermowell: IP40)
- Use of a suitable cable gland
- Use 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

→ For further information, see technical information IN 00.64 at www.wika.com

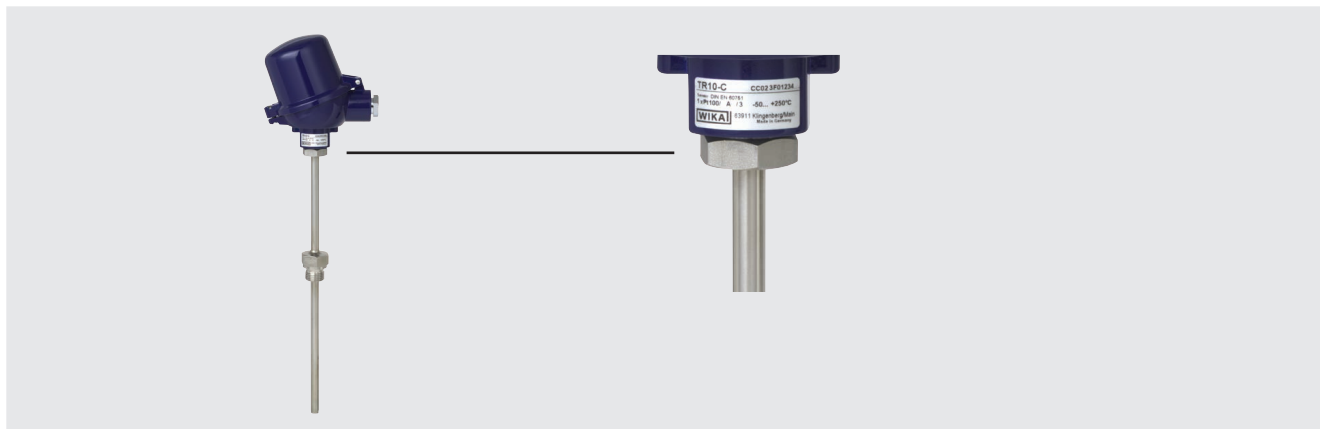
Sealing at the connection head

A ring-shaped seal in the cover of the connection head and a suitable cable gland prevent the ingress of dust and water.



Sealing at the junction of the protection tube / neck tube to the connection head

The thermowell / protection tube is screwed to the connection head or neck tube, which means that IP65 ingress protection is usually achieved without any problems. A suitable ring-shaped seal and, if necessary, PTFE sealing tape are used.



Examples of response time for measuring insert		
	Measuring insert Ø 6 mm [0.236 in]	Measuring insert Ø 3 mm [0.118 in]
Thermometer version		
Sensor	■ 1 x Pt100 (thin film) ■ 2 x Pt100 (thin film)	■ 1 x Pt100 (thin film) ■ 2 x Pt100 (thin film)
Connection method	■ 3-wire ■ 4-wire	■ 3-wire ■ 4-wire (only 1 x Pt100)
Insertion length (A) + neck length (N)	100 ... 1,100 mm [4 ... 43 in]	100 ... 1,100 mm [4 ... 43 in]
Material	■ Stainless steel 1.4571 ■ Stainless steel 316L	■ Stainless steel 1.4571 ■ Stainless steel 316L
Response time in seconds (± 10 %)		
$t_{0.5}$	3.8	2.8
$t_{0.63}$	4.8	3.5
$t_{0.9}$	8.6	6.6

Example for the response time of the complete instrument with bar stock material thermowell			
	TW10 Flanged thermowell	TW25 Weld-in thermowell	TW55 Weld-in thermowell (DIN 43772)
Thermometer version			
Sensor	■ 1 x Pt100 (thin film) ■ 2 x Pt100 (thin film)	■ 1 x Pt100 (thin film) ■ 2 x Pt100 (thin film)	■ 1 x Pt100 (thin film) ■ 2 x Pt100 (thin film)
Connection method	■ 3-wire ■ 4-wire	■ 3-wire ■ 4-wire	■ 3-wire ■ 4-wire (only 1 x Pt100)
Thermowell	TW10, tapered, 12.7/20.0 mm	TW25-B, straight, 27.0 mm	TW55-6 form 4, 12.5/24.0 mm
Bore / Tip thickness	6.6 mm / 6.4 mm [0.26 in / 0.25 in]	6.6 mm / 6.4 mm [0.26 in / 0.25 in]	7.0 mm / min. 4 mm
Diameter	Ø 6 mm [0.236 in]	Ø 6 mm [0.236 in]	Ø 6 mm [0.236 in]
Insertion length U	175 mm [approx. 7 in]	250 mm [approx. 10 in]	65 mm (L = 200 mm)
Material	Stainless steel 316L	Stainless steel 316L	Stainless steel 316L
Response time in seconds (± 10 %)			
$t_{0.5}$	28	26	33
$t_{0.63}$	36	33	45
$t_{0.9}$	80	68	114

Immersion depth during measurement: approx. 125 mm [4.92 in]

Fundamentals of measurements:

VDI/VDE directive 3522 part 1: Dynamic behaviour of contact thermometers / Principles and characteristic values

VDI/VDE directive 3522 part 2 Dynamic behaviour of contact thermometers / Experimental determination of time percentage values

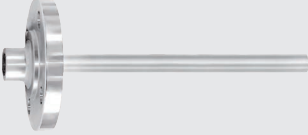
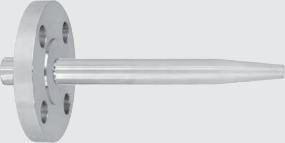
IEC 60751 Definition of thermal response time / Specification of measurement parameters

IEC 60751 Thermal response time

Medium: water

→ Further response times of thermometers in other dimensions, configurations or materials on request.

Thermowell

Thermowell / Protection tube selection		
Representation	Model	Data sheet
	TW10	■ TW 95.10 ■ TW 95.11 ■ TW 95.12
	TW15	TW 95.15
	TW20	TW 95.20
	TW25	TW 95.25
	TW30	TW 95.30
	TW50	TW 95.50
	TW55	TW 95.55

→ Further special thermowells / protection tubes on request.

Approvals

Approvals included in the scope of delivery

Logo	Description	Country
	EU declaration of conformity	European Union
	EMC Directive ¹⁾	
	EN 61326 emission (group 1, class B) and immunity (industrial environment)	
	RoHS directive	

1) Only for built-in transmitter

Optional approvals

Logo	Description	Country
	EU declaration of conformity ATEX directive Hazardous areas - Ex d Zone 1 Gas + H2 II 2 G Ex db IIB + H2 T6...T4 Gb - Ex t Zone 21 dust II 2D Ex tb IIIC T85°C Db IP66	European Union
	IECEx Hazardous areas - Ex d Zone 1 Gas + H2 Ex db IIB + H2 T6...T4 Gb - Ex t Zone 21 dust Ex tb IIIC T85°C Db IP66	International
	EACEx Hazardous areas - Ex d Zone 1 Gas + H2 1Ex db IIB + H2 T6...T4 Gb X - Ex t Zone 21 dust Ex tb IIIC T85°C Db X	Eurasian Economic Community
	Ex Ukraine Hazardous areas - Ex d Zone 1 Gas + H2 II 2G Ex db IIB + H2 T6...T4 Gb - Ex t Zone 21 dust II 2D Ex tb IIIC T85°C Db	Ukraine
	INMETRO Hazardous areas - Ex d Zone 1 Gas + H2 Ex db IIB + H2 T6...T4 Gb IP66 - Ex t Zone 21 dust Ex db IIC T6...T4 Gb IP66	Brazil
	CCC Hazardous areas - Ex d Zone 1 Gas + H2 Ex db IIB + H2 T4...T6 Gb - Ex t Zone 21 dust Ex tb IIIC T85°C Db	China
	NEPSI Hazardous areas - Ex d Zone 1 Gas + H2 Ex d IIB + H2 T4~T6 Gb - Ex t Zone 21 dust Ex tD A21 IP66 T85°C	China
-	JPEX Hazardous areas - Ex d Zone 1 Gas + H2 Ex db IIB + H2 T4 Gb	Japan
-	ECASEx Hazardous areas - Ex d Zone 1 Gas + H2 Ex db IIB + H2 T6...T4 Gb - Ex t Zone 21 dust Ex tb IIIC T85°C Db IP66	United Arab Emirates
-	PAC Ukraine Metrology, measurement technology	Ukraine
	PAC Kazakhstan Metrology, measurement technology	Kazakhstan
	PAC Uzbekistan 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.

The permissible power, $P_{\max}$, as well as the permissible ambient temperature, for the respective category can be seen on the Ex certificate or the operating instructions.

The transmitters have their own certificates for hazardous areas. The permissible ambient temperature ranges of the built-in transmitters can be taken from the corresponding transmitter operating instructions and approvals.

Manufacturer's declaration

Logo	Description
	For SIL 2, SIL 3, see page 8 Functional safety

Certificates

Certificate type	Measurement accuracy	Material proof ¹⁾
2.2 test report	x	x
3.1 inspection certificate	x	x
DAkkS calibration certificate	x	-

1) Thermowells / Protection tubes have their own material proofs for selected components

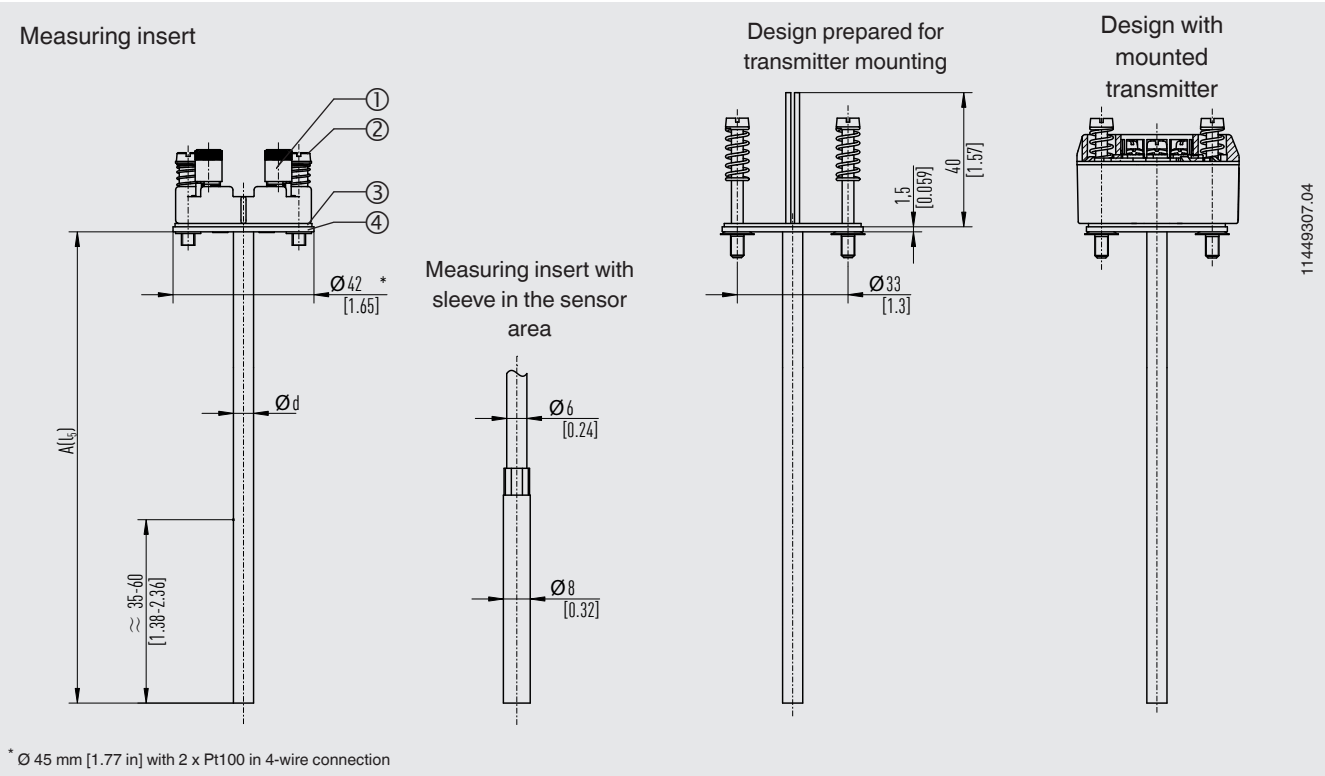
For calibration, the measuring insert is removed from the thermometer. The minimum length (metal part of the probe) for carrying out a 3.1 or DAkkS measurement accuracy test is 100 mm [~ 4 in].

Calibration of shorter lengths as well as calibration of versions in 2-wire connection possible on request.

The different certificates can be combined with each other.

→ For approvals and certificates, see website

Dimensions in mm [in]

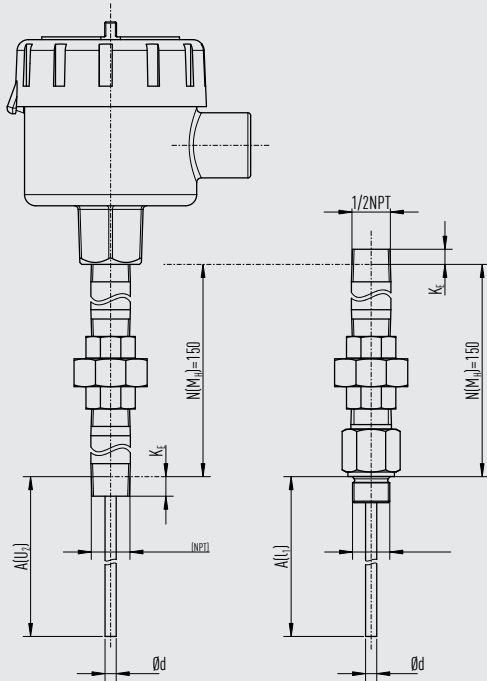


Legend

- ① Connection terminal
- ② Spring-loaded mounting
- ③ Insulation washer
- ④ Terminal plate
- l_5 Measuring insert length
- $\varnothing d$ Measuring insert diameter

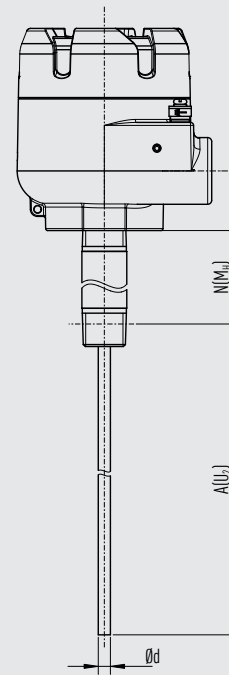
Neck tube designs

“Nipple-union-nipple” neck tube



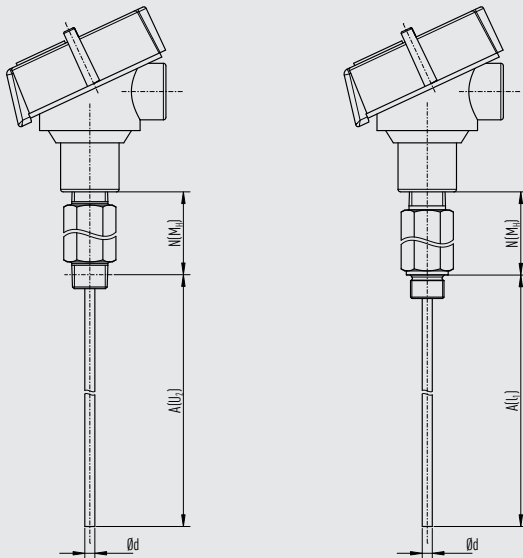
3116003.03

Double threaded hex bushing (tube section)



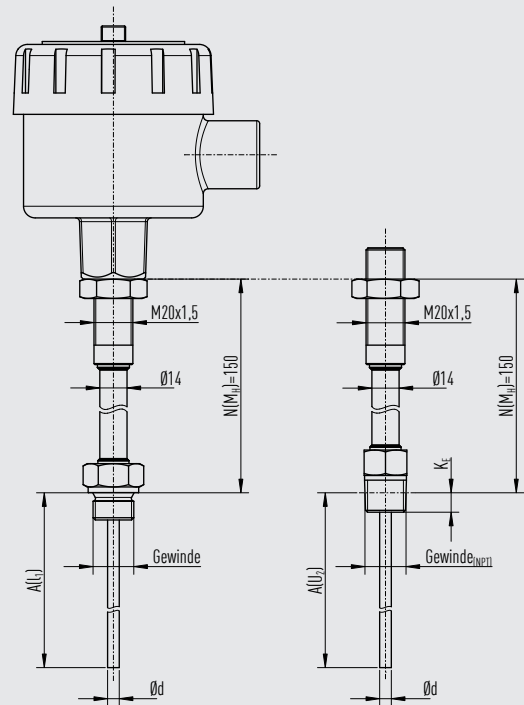
14235871.02

Double threaded hex bushing (with hexagon spanner flats)



14235871.02

Neck tube with counter nut to head



3115995.03

Legend:

- A (l_1) Insertion length (with parallel threads)
- A (U_2) Insertion length (with tapered threads)
- N (M_H) Neck length
- $\varnothing d$ Measuring insert diameter
- K_E Screw-in length by hand
- $1/2$ NPT: approx. 8.1 mm [0.32 in]
- $3/4$ NPT: approx. 8.6 mm [0.34 in]

Ordering information

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



Standard
articles



Configurator

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