Thermocouple
Model TC10-B, for additional thermowell

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 0 ... 1,200 °C (32 ... 2,192 °F)
- For mounting in all standard thermowell designs
- Spring-loaded measuring insert (replaceable)
- Explosion-protected versions

Fig. left: connection head, model BSZ
Fig. right: connection head, model 1/4000

Description

Thermocouples 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 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 transmitters from the WIKA range into the connection head of the TC10-B.

Data sheets showing similar products:
Resistance thermometer for additional thermowell; model TR10-B; see data sheet TE 60.02
Threaded resistance thermometer; model TR10-C; see data sheet TE 60.03
Threaded thermocouple; model TC10-C; see data sheet TE 65.03

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
CE	**EC declaration of conformity** EMC directive [1] EN 61326 emission (group 1, class B) and interference immunity (industrial application)	European Community
Ex	ATEX directive (option) Hazardous areas - Ex i Zone 0 gas [II 1G Ex ia IIC T3 ... T6 Ga] Zone 1 mounting 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 mounting 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 [2] 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]	
IEC IECEx	**IECEx (option)** (in conjunction with ATEX) Hazardous areas - Ex i Zone 0 gas [Ex ia IIC T3 ... T6 Ga] Zone 1 mounting 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 mounting 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
EAC Ex	**EAC (option)** 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] Zone 22 dust [DIP A22 Ta 80 ... 440 °C]	Eurasian Economic Community
INMETRO	**INMETRO (option)** Hazardous areas - Ex i Zone 0 gas [Ex ia IIC T3 ... 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] Zone 20 dust [Ex ia IIIC T125 ... T65 °C Da] Zone 21 mounting to zone 20 dust [Ex ib IIIC T125 ... T65 °C Da/Db] Zone 21 dust [Ex ib IIIC T125 ... T65 °C Db]	Brazil
Ex NEPSI	**NEPSI (option)** Hazardous areas - Ex i Zone 0 gas [Ex ia IIC T3 ~ T6] Zone 1 mounting to zone 0 gas [Ex ia/ib IIC T3 ~ T6] Zone 1 gas [Ex ib IIC T3 ~ T6] Zone 20 dust [Ex iaD 20 T65 ~ T125] Zone 21 mounting to zone 20 dust [Ex ibD 20/21 T65 ~ T125] Zone 21 dust [Ex ibD 21 T65 ~ T125] - Ex n Zone 2 gas [Ex nA IIC T1 ~ T6 Gc]	China

Logo	Description	Country
	KOSHA (option) Hazardous areas - Ex i Zone 0 gas [Ex ia IIC T4 ... T6] Zone 1 gas [Ex ib IIC T4 ... T6]	South Korea
-	**PESO (option)** 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
	DNOP - MakNII (option) 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 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
	GOST (option) Metrology, measurement technology	Russia
	KazInMetr (option) Metrology, measurement technology	Kazakhstan
-	**MTSCHS (option)** Permission for commissioning	Kazakhstan
	BelGIM (option) Metrology, measurement technology	Belarus
	Uzstandard (option) Metrology, measurement technology	Uzbekistan
	DNV (option) Type approval for the shipbuilding industry - Maximum insertion length l_1: 435 mm - Connection head: Model BSZ - Neck tube: min. Ø 11 x 2 mm, 50 mm long - Measuring insert: Ø 6 mm Location classification: *Temperature* *D (ambient temperature: -25 ... +70 °C)* *Humidity* *B (relative humidity: up to 100 %)* *Vibration* *B (frequency: 3 ... 25 Hz; amplitude: 1.6 mm peak; frequency: 25 ... 100 Hz; amplitude: 4 g)* *EMC* *Not relevant* *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.* 3) *(for "open deck")* - Optional with TW10-P (data sheets TW 95.10, TW 95.12)	International

Manufacturer's information and certifications

Logo	Description
	SIL 2 Functional safety (only in conjunction with model T32 temperature transmitter)
	NAMUR NE24 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.

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

Approvals and certificates, see website

Sensor

Thermocouple per DIN EN 60584-1
Types K, J, E, N, T (single or double element)

Measuring point
- Ungrounded welded (ungrounded, standard)
- Welded at the bottom (grounded)

Sensor types

Type	Recommended max. operating temperature
K	1,200 °C
J	750 °C
E	900 °C
T	350 °C
N	1,200 °C

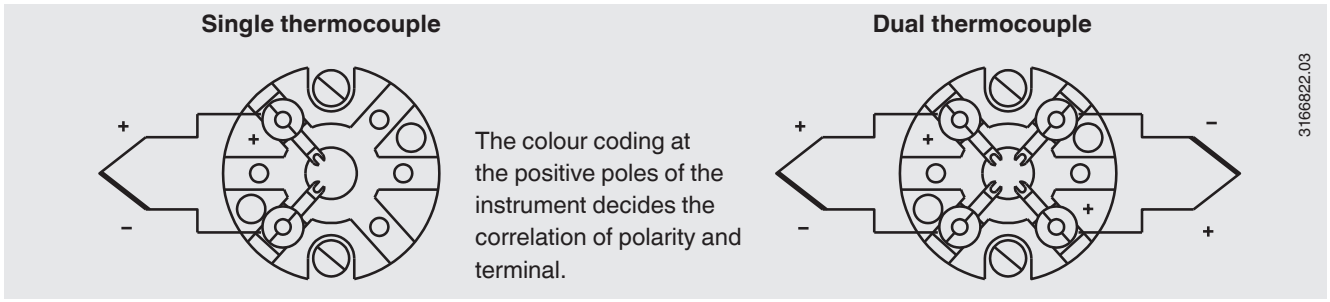
Thermocouple	Class	
Type	**IEC 60584-1:2013**	**ASTM E230**
K	1 and 2	Standard, special
J	1 and 2	Standard, special
E	1 and 2	Standard, special
T	1 and 2	Standard, special
N	1 and 2	Standard, special

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

For detailed specifications for thermocouples, see Technical information IN 00.23 at www.wika.com.

The application range of these thermometers is limited both by the permissible max. working temperature of the thermocouple and by the max. working temperature of the thermowell material.

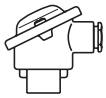
Electrical connection



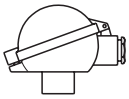
For the electrical connections of built-in temperature transmitters see the corresponding data sheets or operating instructions.

Connection head

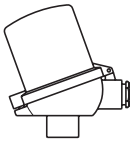
■ **European designs per EN 50446 / DIN 43735**



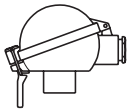
BS



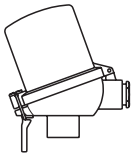
BSZ, BSZ-K



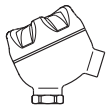
BSZ-H, BSZ-HK, BSZ-H / DIH10



BSS



BSS-H



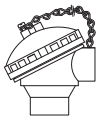
BVS

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

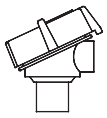
Model	Explosion protection				
	Without	Ex i (gas) Zone 0, 1, 2	Ex i (dust) Zone 20, 21, 22	Ex nA (gas) Zone 2	Ex tc (dust) Zone 22
BS	x	x	-	-	-
BSZ	x	x	x	x	x
BSZ-H	x	x	x	x	x
BSZ-H (2x cable outlet)	x	x	x	x	x
BSZ-H / DIH10 [2]	x	x	-	-	-
BSS	x	x	-	-	-
BSS-H	x	x	-	-	-
BVS	x	x	-	-	-
BSZ-K	x	x	-	-	-
BSZ-HK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

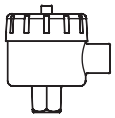
■ North American designs



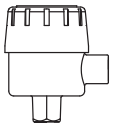
KN4-A
KN4-P



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.) [1]	Cover/Cap	Surface	Connection to neck tube
KN4-A	Aluminium	½ NPT, M20 x 1.5 [2]	IP65 [7]	Screw-on lid	Blue, lacquered [4]	M24 x 1.5, ½ NPT
KN4-P [4]	Polypropylene	½ NPT	IP65 [7]	Screw-on lid	White	½ NPT
1/4000 F	Aluminium	½ NPT, ¾ NPT, M20 x 1.5 [2]	IP66 [7]	Screw-on lid	Blue, lacquered [4]	½ NPT
1/4000 S	Stainless steel	½ NPT, ¾ NPT, M20 x 1.5 [2]	IP66 [7]	Screw-on lid	Blank	½ NPT
7/8000 W	Aluminium	½ NPT, ¾ NPT, M20 x 1.5 [2]	IP66 [7]	Screw-on lid	Blue, lacquered [4]	½ NPT
7/8000 S	Stainless steel	½ NPT, ¾ NPT, M20 x 1.5 [2]	IP66 [7]	Screw-on lid	Blank	½ NPT
7/8000 W / DIH50 [6]	Aluminium	½ NPT, ¾ NPT, M20 x 1.5 [2]	IP66 [7]	Screw-on lid	Blue, lacquered [4]	½ NPT
7/8000 S / DIH50 [6]	Stainless steel	½ NPT, ¾ NPT, M20 x 1.5 [2]	IP66 [7]	Screw-on lid	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 [5]	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 [6]	x	x	-	-	-
7/8000 S / DIH50 [6]	x	x	-	-	-

1) The ingress protection refers to the connection head, for information on the cable glands, see page 7
2) Standard
4) RAL 5022
5) On request
6) DIH50 LC display
7) Suitable seal/cable gland required

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

Standard

Plastic

Plastic (Ex)

Brass, nickel-plated

Stainless steel

Junction box, M12 x 1 (4-pin)

Plain threaded

2 x plain threaded

Sealing plugs for transport

The pictures show examples of connection heads.

Cable entry	Cable entry thread size
Standard cable entry [1]	M20 x 1.5 or ½ NPT
Plastic cable gland (cable Ø 6 ... 10 mm) [1]	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 [2]	2 x M20 x 1.5 or 2 x ½ NPT
Junction box M12 x 1 (4-pin) [3]	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 [1]	Blank	IP65	-40 ... +80 °C	x	x	-	-	-
Plastic cable gland [1]	Black or grey	IP66, IP68	-40 ... +80 °C	x	-	-	-	-
Plastic cable gland, Ex e [1]	Light blue	IP66, IP68	-20 ... +80 °C (standard) -40 ... +70 °C (option)	x	x	x	-	-
Plastic cable gland, Ex e [1]	Black	IP66, IP68	-20 ... +80 °C (standard) -40 ... +70 °C (option)	x	-	-	x	x
Nickel-plated brass cable gland	Blank	IP66, IP68	-40 ... +80 °C	x	-	-	-	-
Nickel-plated brass cable gland, Ex e	Blank	IP66, IP68	-40 ... +80 °C	x	x	x	x	x
Stainless steel cable gland	Blank	IP66, IP68	-40 ... +80 °C	x	x	x	-	-
Stainless steel cable gland, Ex e	Blank	IP66, IP68	-40 ... +80 °C	x	x	x	x	x
Plain threaded	-	IP00	-	x	x	x [5]	x [5]	x [5]
2 x plain threaded [2]	-	IP00	-	x	x	x [5]	x [5]	x [5]
Junction box M12 x 1 (4-pin) [3]	-	IP65	-40 ... +80 °C	x	x [4]	x [4]	-	-
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) With appropriate mating connector connected
5) Suitable cable gland required for operation

Ingress protection

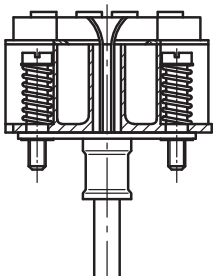
to IP65/IP68 per IEC/EN 60529 under the following conditions:

- 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

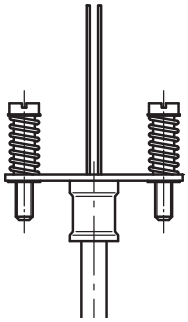
Transmitter

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.



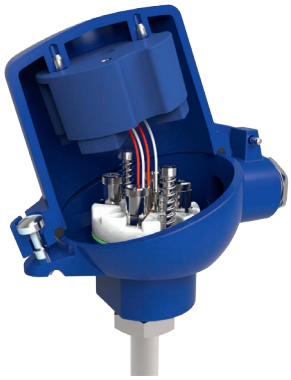
Measuring insert with mounted transmitter (here: Model T32)



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

T12

T32

T53

Output signal 4 ... 20 mA, HART® protocol, FOUNDATION™ Fieldbus and PROFIBUS® PA			
Transmitter (selectable versions)	**Model T12**	**Model T32**	**Model T53**
Data sheet	**TE 12.03**	**TE 32.04**	**TE 53.01**
Output			
■ 4 ... 20 mA	x	x	
■ HART® protocol		x	
■ FOUNDATION™ Fieldbus and PROFIBUS® PA			x
Connection method			
■ 1 x 3-wire	x	x	x
■ 1 x 4-wire	x	x	x
Measuring current	0.2 mA	0.3 mA	0.2 mA
Explosion protection	Optional	Optional	Standard

Possible mounting positions for transmitters

Connection head	T12	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

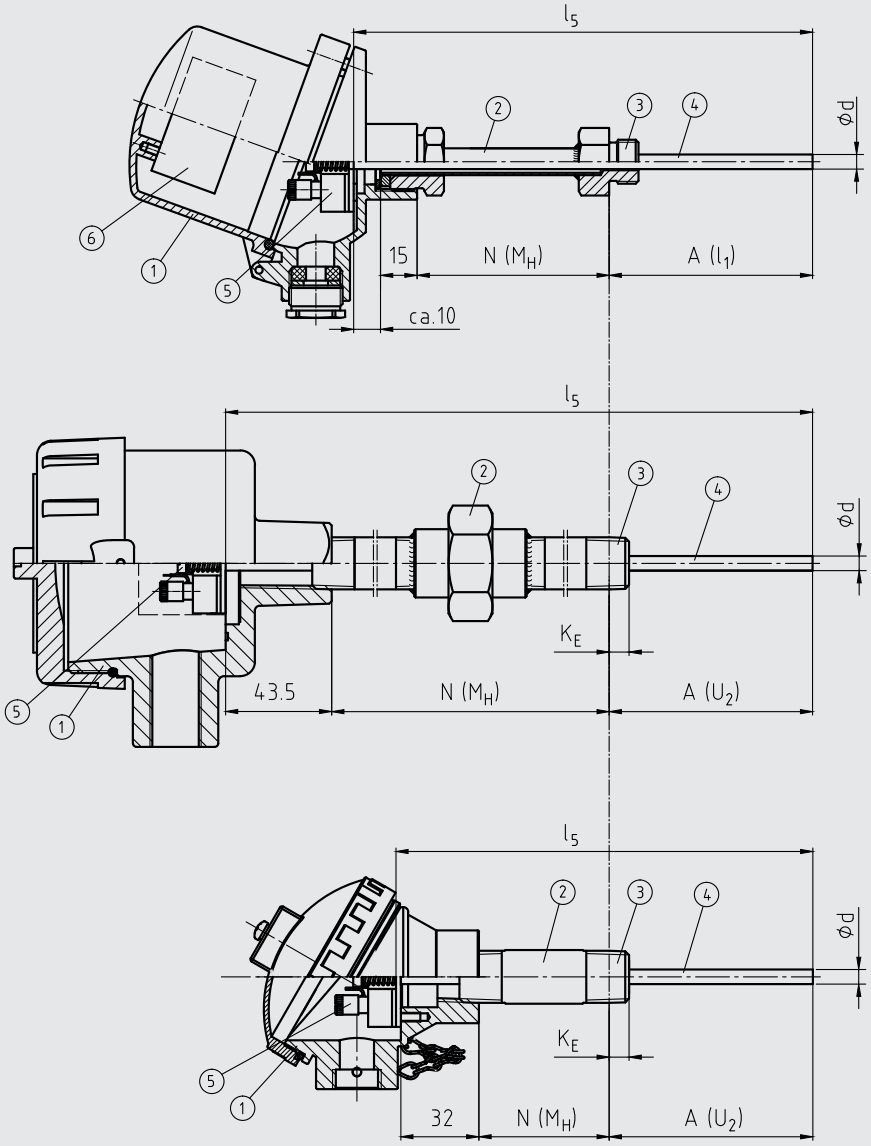
In safety-critical applications, the entire measuring chain must be taken into consideration in terms of the safety parameters. The SIL classification allows the assessment of the risk reduction reached by the safety installations.

Selected TC10-B thermocouples, 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.

Components model TC10-B

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



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Legend:

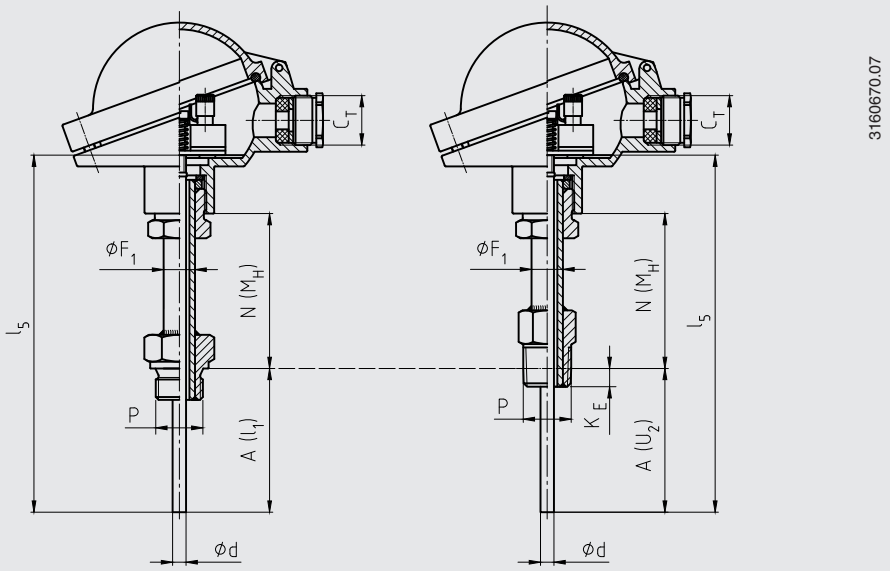
① Connection head
② Neck tube
③ Connection to thermowell
④ Measuring insert
⑤ Terminal block/transmitter (option)
⑥ Transmitter (option)

A (l_1)	Insertion length (parallel threads)
A (U_2)	Insertion length (tapered threads)
l_5	Measuring insert length
N (M_H)	Neck length
K_E	1/2 NPT: 8.13 mm 3/4 NPT: 8.61 mm
Ø d	Measuring insert diameter

Neck tube

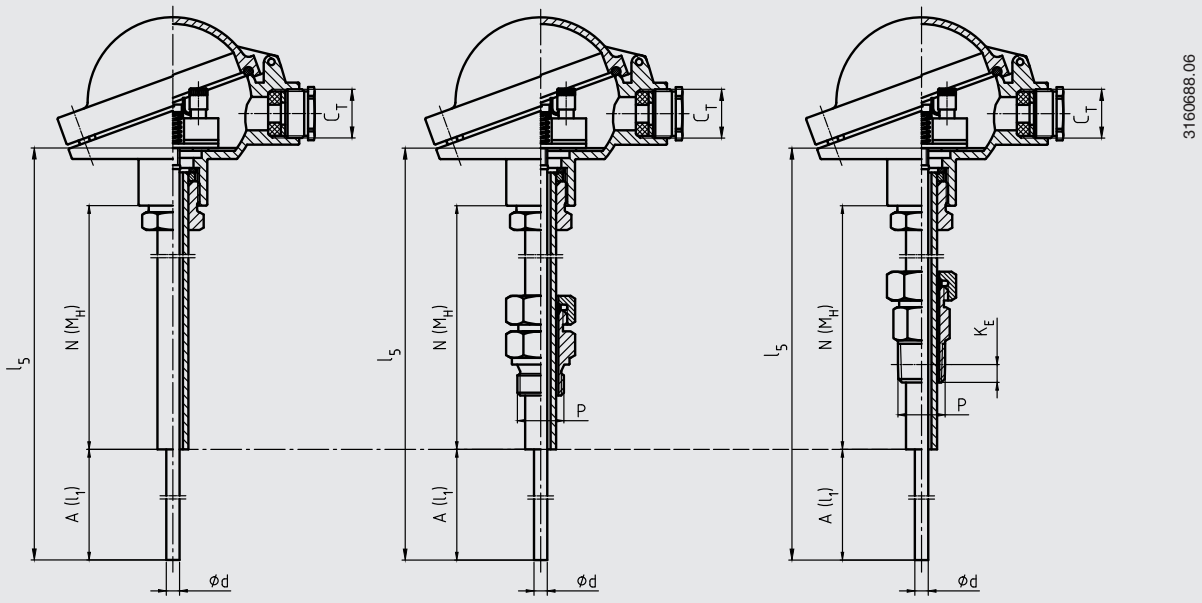
Neck tube designs

Neck tube per DIN 43772



parallel thread tapered thread

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



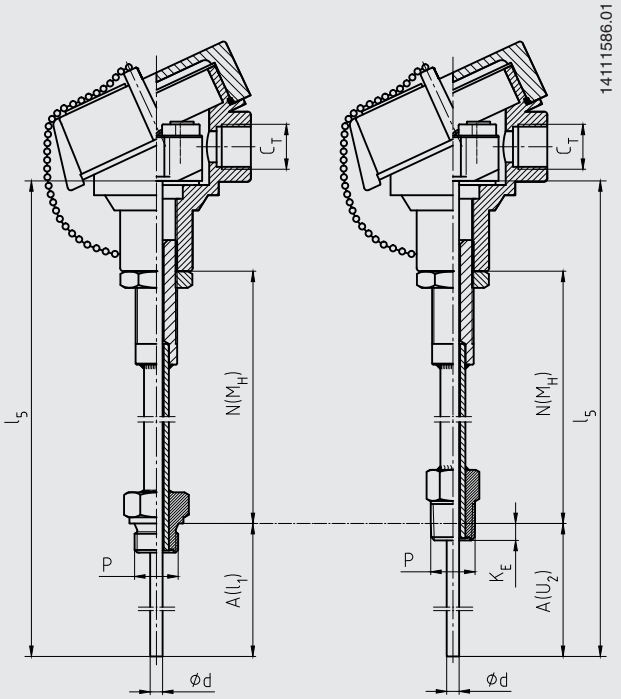
without thread (plain) parallel thread tapered thread

Legend:

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

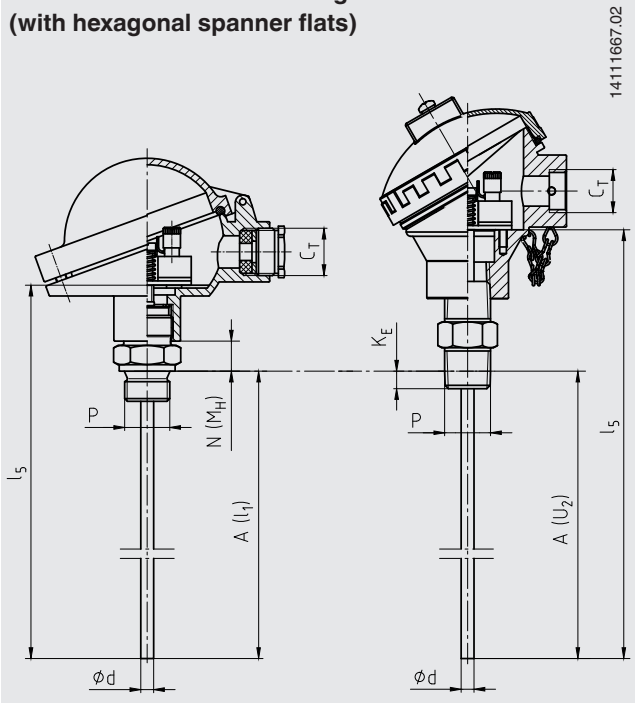
The pictures show examples of connection heads.

Neck tube, with counter nut to head



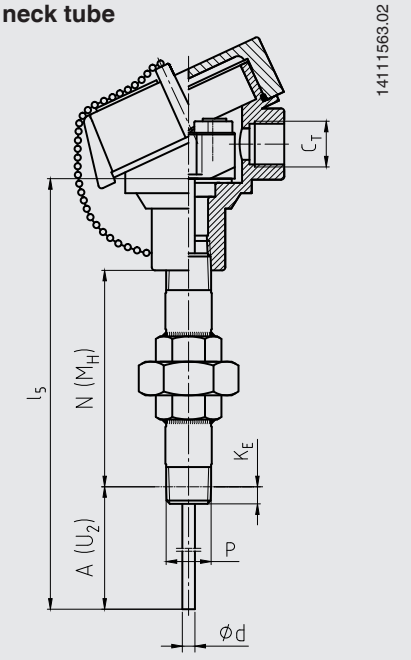
parallel thread tapered thread

Double threaded hex bushing (with hexagonal spanner flats)



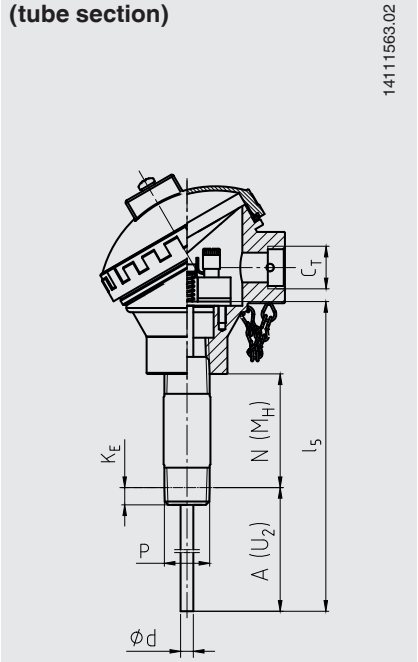
parallel thread tapered thread

"Nipple-union-nipple" neck tube



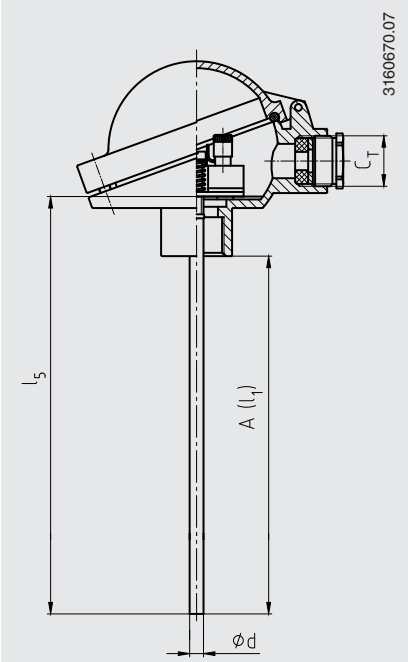
tapered thread

Double threaded hex bushing (tube section)



tapered thread

Without neck tube



Legend:

A (l_1)	Insertion length (parallel threads)	C_T	Thread cable entry
A (U_2)	Insertion length (tapered threads)	Ø F_1	Neck tube diameter
l_5	Measuring insert length	P	Thread to the thermowell
N (M_H)	Neck length	Ø 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 (nipple-union-nipple)	~ 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, plain
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)	25 mm (approx. 1 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

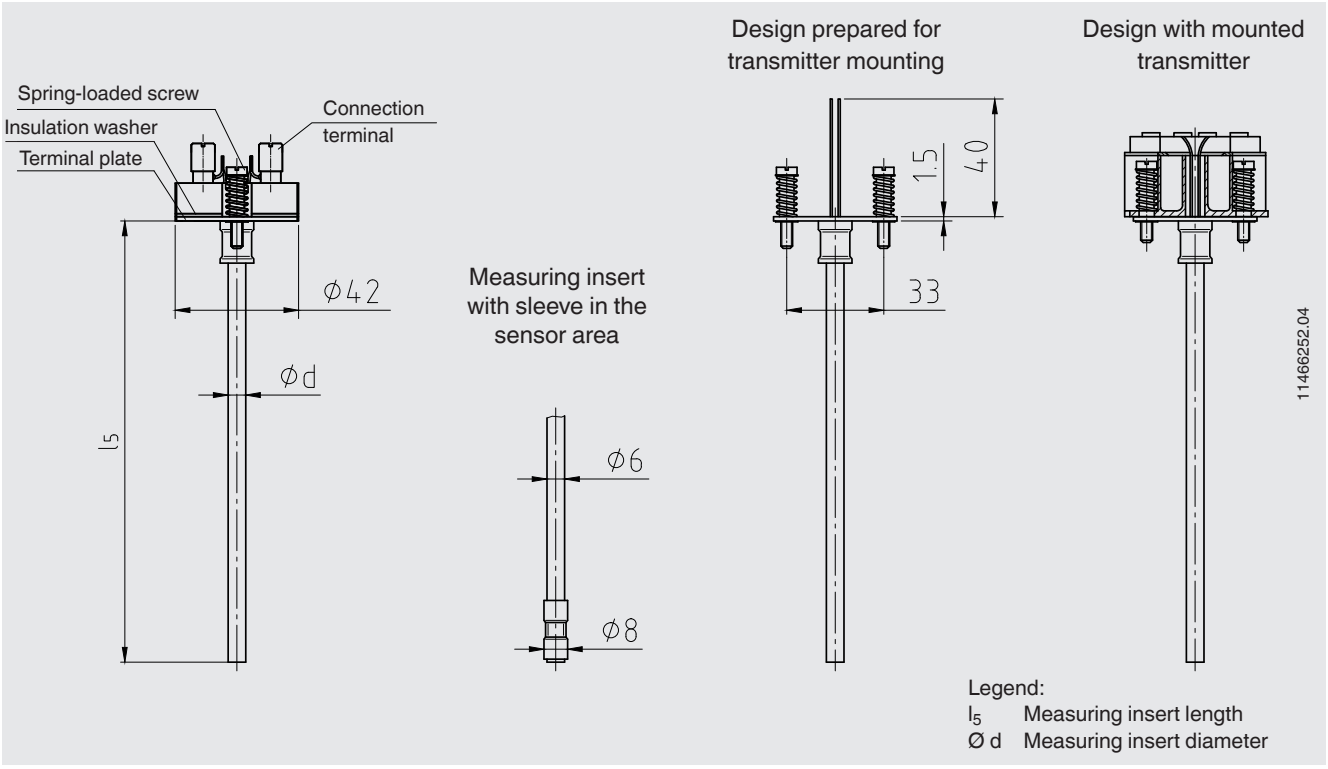
Measuring insert

Within the TC10-B, the measuring insert of model TC10-A is fitted.

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

Measuring insert for thermocouple, model TC10-A

Dimensions in mm



Measuring insert length l_5 in mm	Tolerance in mm
75 ... 825	+2 0
> 825	+3 0

Measuring insert diameter Ø d in mm		Index per DIN 43735	Tolerance in mm
3 [1)]	Standard	30	3 ±0.05
6	Standard	60	6 $^{0}_{-0.1}$
8 (6 mm with sleeve)	Standard	-	8 $^{0}_{-0.1}$
8	Standard	80	8 $^{0}_{-0.1}$
1/8 inch (3.17 mm) **1/4 inch (6.35 mm)** **3/8 inch (9.53 mm)**	Option, on request	-	-

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 of the thermometer.

When fitting the measuring insert into a thermowell, it is very important to determine the correct insertion length (= thermowell length for bottom thicknesses of ≤ 5.5 mm). In order to ensure that the measuring insert is firmly pressed down onto the bottom of the thermowell, the measuring insert must be spring-loaded (spring travel: max. 10 mm).

Material	
Sheath material	Ni alloy 2.4816 (Inconel 600)

Other sheath materials on request

Thermowell selection

TW10

Data sheets:
TW 95.10
TW 95.11
TW 95.12

TW15

Data sheet:
TW 95.15

TW20

Data sheet:
TW 95.20

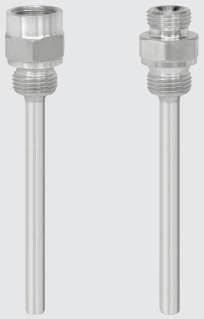
TW25

Data sheet:
TW 95.25

TW30

Data sheet:
TW 95.30

TW45



Data sheet:
TW 95.45

TW50

Data sheet:
TW 95.50

TW55

Data sheet:
TW 95.55

Special thermowells on request

Operating conditions

The replaceable measuring insert is made of a vibration-resistant, sheathed measuring cable (MI cable).
Standard vibration resistance: 50 g (sensor tip)

Ambient and storage temperature
-40 ... +80 °C

Other abient and storage temperatures on request

Certificates

Certification type	Measurement accuracy	Material certificate [1)]
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.

1) 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 (M_H) / Insertion length A (l_1), A (U_2) / Measuring insert diameter Ø d / Measuring insert sheath material / Certificates / Options

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