

In-line resistance thermometer Model TR25

WIKA data sheet TE 60.25



for further approvals
see page 9

Applications

- Food and beverage industry, dairies, drink dispensers and bottling plants, breweries
- Bio and pharmaceutical industry, cleanroom technology
- For piggable systems

Special features

- Hygienic design (dead space free transitions)
- Residue-free and quick cleaning of the measuring point (piggable, suitable for SIP and CIP)
- Materials and surface finish qualities in accordance with pharmaceutical industry directives and standards
- High measuring accuracy with short response times
- Explosion-protected versions



In-line resistance thermometer, model TR25
Options: Sealing combination at neck tube, cable gland in hygienic design

Description

Resistance thermometer for temperature measurement in pipelines with extremely high hygienic requirements. This thermometer is used in applications where a thermowell immersed into the process medium is not possible or not desired, particularly for piggable pipelines, highly viscous media and flow conditions with high shear forces. A wide variety of process connections enables problem-free fitting into many different processes.

3- or 4-wire platinum measuring resistors in accuracy classes A and B per DIN EN 60751 serve as sensors.

Analogue or digital transmitters built into the connection head are capable of making various output signals available, for example 4 ... 20 mA, HART® predocol, FOUNDATION™ Fieldbus or PROFIBUS® PA.

Specifications

Output signal Pt100	
Temperature range ■ Class A ■ Class B	-30 ... +150 °C (-22 ... +302 °F) -50 ... +150 °C (-58 ... +302 °F)
Sensor ¹⁾ ■ Measuring element (measuring current: 0.1 ... 1.0 mA) ■ Connection method	Pt100 (thin-film) 1 x 3-wire 1 x 4-wire
Class accuracy of the sensor ²⁾ in accordance with IEC 60751	Class A Class B
Measuring deviation ³⁾	-1 Kelvin

Output signal 4 ... 20 mA, HART® predocol, FOUNDATION™ Fieldbus and PROFIBUS® PA			
Transmitter (selectable versions) ⁴⁾	Model T15	Model T32	Model T53
Output			
■ 4 ... 20 mA	x	x	
■ HART® predocol		x	
■ FOUNDATION™ Fieldbus and PROFIBUS® PA			x
Connection method			
■ 1 x 3-wire or 1 x 4-wire	x	x	x
Measuring current	< 0.2 mA	< 0.3 mA	< 0.2 mA
Temperature range	Measuring range -50 ... +150 °C (-58 ... +302 °F) ⁶⁾ , other measuring ranges are adjustable		
Response time ⁵⁾	t ₅₀ < 3.2 s t ₉₀ < 7.3 s + response time of the relevant transmitters (cf. transmitter data sheet)		
Measuring deviation ³⁾	-1 Kelvin + accuracy of the relevant transmitter		

1) The instrument does not have an exchangeable measuring insert.

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

3) Measured at 100 °C

4) For a correct determination of the overall measuring deviation, both sensor and transmitter measuring deviations have to be considered.

5) Flow-through housing OD 26.9 mm

6) The connection head should therefore be protected from temperatures over 80 °C (176 °F).

Documentation and correction of measuring deviations

With these electrical thermometers, the measuring deviation can be determined under realistic mounting conditions and certified with a test certificate. The standard test temperature is 70 °C; others available on request.

If a digital transmitter is mounted within the thermometer, any measuring deviation determined can be corrected using the transmitter's adaption feature.

Surface

The cleanability of a plant in the scope of CIP/SIP processes is mainly affected by the quality of the surfaces in contact with the process medium.

Wetted surfaces are available in the following versions:

- R_a ≤ 0.76 µm (standard)
- R_a ≤ 0.38 µm (option)

In addition, the wetted surfaces can be electropolished.

Tubular body

The standard material for all wetted, metallic surfaces is 1.4435 (316L) stainless steel.

Neck tube

Material: stainless steel

The neck tube is screwed into the connection head (M24 x 1.5).

Standard neck length N (M_H): 50 mm

Standard diameter d: 12 mm

In many cases, the neck tube serves as a cooling extension between the connection head and the medium, in order to prevent any possible built-in transmitter from high medium temperatures.

Process connection

Material: stainless steel 1.4435 (316L)

- Connection for pipes per DIN 11866 row A, B, C
 - Clamp per DIN 32676
 - Threaded connection per DIN 11851
 - Threaded connection per DIN 11864-1 form A
 - Threaded connection NEUMO BioConnect®
- Others on request

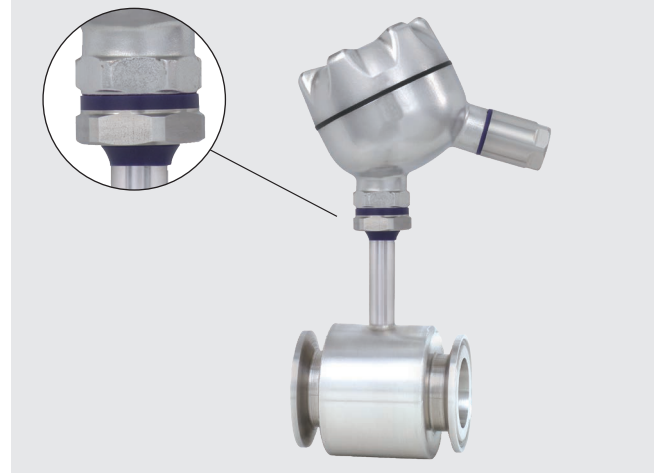
Sealing (option)

Material: NBR, PTFE or EPDM

Sealing combination (option)

The transition from the connection head to the thermowell is effected via an optional sealing combination (polyurethane) of flat gasket and wiper. This combination permanently prevents the penetration and depositing of humidity and impurities in this area (IP68). Additionally, the sealing combination simplifies the cleaning process significantly.

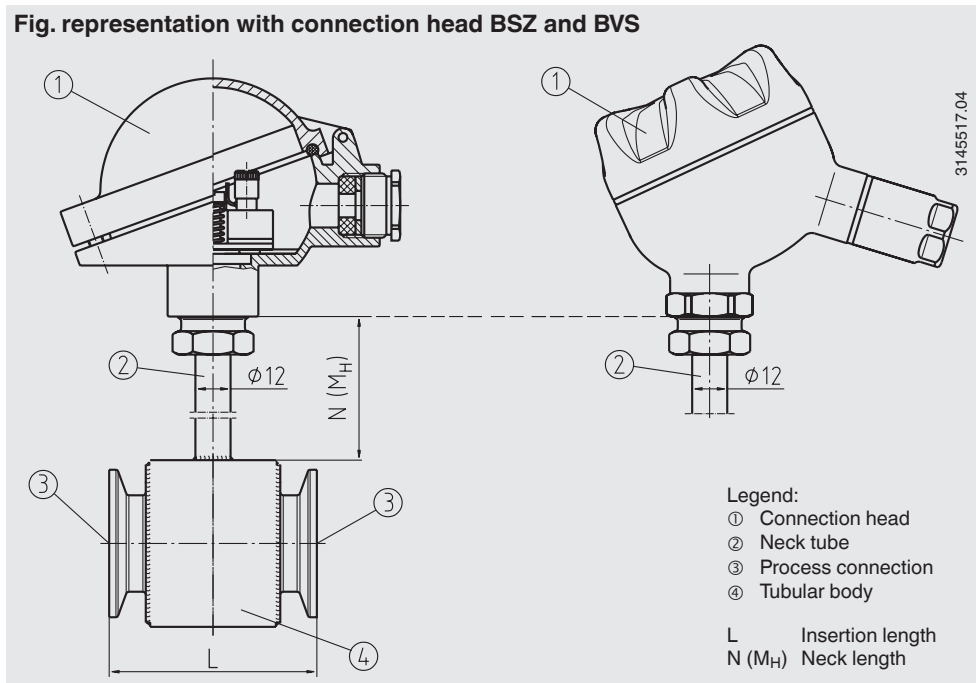
In combination with the patented BVS head and the cable gland in hygienic design, it delivers an easy-to-clean and hygienic measuring point, even in those areas not in contact with the product.



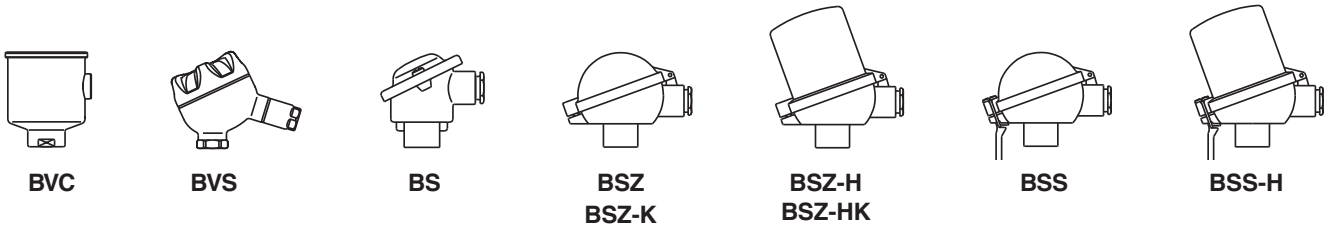
BioConnect® is a registered trademark of the company NEUMO.

Components model TR25

Fig. representation with connection head BSZ and BVS



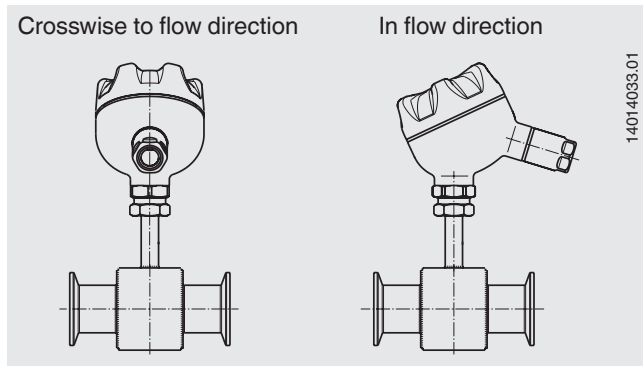
Connection head



Model	Material	Cable entry	Ingress protection	Cap	Surface	Weight in kg
BS	Aluminium	M20 x 1.5 ¹⁾	IP65 (IP68)	Cap with 2 screws	Blue, lacquered ²⁾	0.14
BSZ	Aluminium	M20 x 1.5 ¹⁾	IP65 (IP68)	Hinged cover with cylinder head screw	Blue, lacquered ²⁾	0.29
BSZ-H	Aluminium	M20 x 1.5 ¹⁾	IP65 (IP68)	Hinged cover with cylinder head screw	Blue, lacquered ²⁾	0.30
BSZ-HK	Plastic	M20 x 1.5 ¹⁾	IP65	Hinged cover with cylinder head screw	Blank	0.14
BSS	Aluminium	M20 x 1.5 ¹⁾	IP65	Hinged cover with clamping lever	Blue, lacquered ²⁾	0.27
BSS-H	Aluminium	M20 x 1.5 ¹⁾	IP65	Hinged cover with clamping lever	Blue, lacquered ²⁾	0.32
BVC	Stainless steel (1.4571)	M16 x 1.5 ¹⁾	IP68	Flat screw cap	Natural finish	0.60
BVS	Stainless steel (1.4308)	M20 x 1.5 ¹⁾	IP65	Screw cap, hygienic design	Precision casting, electropolished	0.51

1) Standard
2) RAL 5022

Position of the cable entry at the connection head



Cable entry with M12 x 1 coupler connector / 4-pin (option)

Instead of a standard cable gland, the cable entry of a connection head can optionally be designed with a M12 x 1 (4-pin) coupler connector. The maximum resulting ingress protection is IP65.

Connecting with single strands for operation is not needed as pre-assembled cables can be used.



Connection head with M12 x 1 coupler connector (4-pin)

Connection head with digital indicator (option)

As an alternative to the standard connection head, the thermometer can be fitted with an optional DIH10 digital indicator. The connection head used for this is similar to the model BSZ-H head. For operation, a 4 ... 20 mA transmitter is needed, which is mounted instead of the terminal block. The indication range is configured identically to the measuring range of the transmitter.

Designs with ignition protection type "intrinsically safe", Ex i, are also available.



Connection head with digital indicator, model DIH10

Transmitter (option)

Depending on the connection head used, a transmitter can be mounted within the thermometer.

- Mounted instead of terminal block
- Mounted within the cap of the connection head
- Mounting not possible

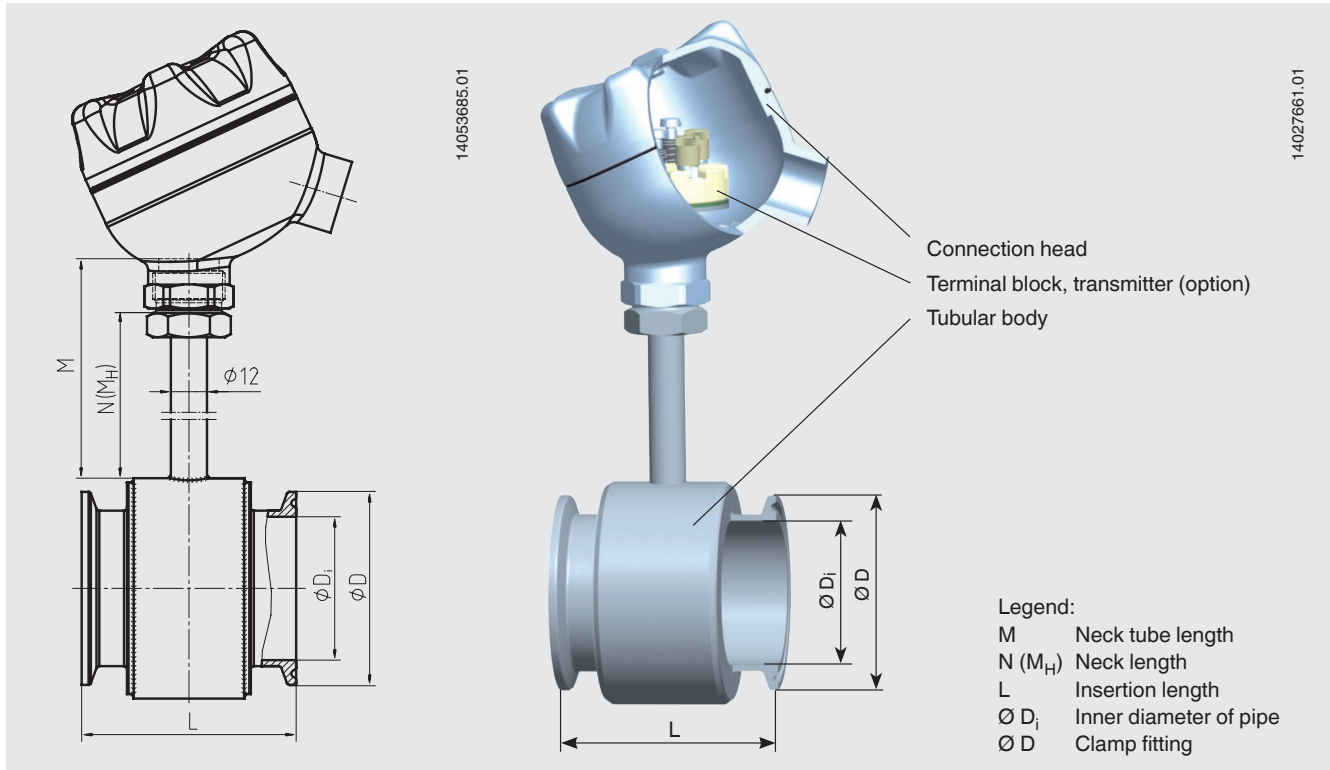
Mounting of 2 transmitters on request.

Connection head	Transmitter model		
	T15	T32	T53
BVC	○	○	○
BVS	○	○	○
BS	-	-	○
BSZ / BSZ-K	○	○	○
BSZ-H / BSZ-HK	●	●	●
BSS	○	○	○
BSS-H	●	●	●

Model	Description	Explosion protection	Data sheet
T15	Digital transmitter, PC configurable	Optional	TE 15.01
T32	Digital transmitter, HART® protocol	Optional	TE 32.04
T53	Digital transmitter FOUNDATION™ Fieldbus and PROFIBUS® PA	Standard	TE 53.01

Dimensions in mm

Version with clamp connection



Clamp per DIN 32676 for pipes per DIN 11866, row A

DN	For pipe	Dimensions in mm			PN ^{1) 2) 3)}
	External Ø x wall thickness	Ø D _i	L	Ø D	
10	13 x 1.5	10	71	34	25
15	19 x 1.5	16	71	34	25
20	23 x 1.5	20	71	34	25
25	28 x 1	26	71	50.5	25
32	34 x 1	32	71	50.5	25
40	40 x 1	38	71	50.5	25
50	52 x 1	50	71	64.0	16

Clamp to DIN 32676 for pipes per DIN 11866 row B (ISO 1127)

DN	For pipe	Dimensions in mm			PN ^{1) 2) 3)}
	External Ø x wall thickness	Ø D _i	L	Ø D	
8	13.5 x 1.6	10.3	71	25.0	25
10	17.2 x 1.6	14.0	71	25.0	25
15	21.3 x 1.6	18.1	71	34.0	25
20	26.9 x 1.6	23.7	71	50.5	25
25	33.7 x 2	29.7	71	50.5	25
32	42.4 x 2	38.4	71	50.5	25
40	48.3 x 2	44.3	71	64.0	25

Clamp per DIN 32676 for pipes per DIN 11866 row C (ASME BPE)

DN	For pipe	Dimensions in mm			PN ^{1) 2) 3)}
	External Ø x wall thickness	Ø D _i	L	Ø D	
¾"	19.05 x 1.65	15.75	71	25	25
1"	25.4 x 1.65	22.1	71	50.5	25
1 ½"	38.1 x 1.65	34.8	71	50.5	25
2"	50.8 x 1.65	47.5	71	64.0	16

Tri-clamp for pipes per BS4825 part 3 and O.D.-tube

DN	For pipe	Dimensions in mm			PN ^{1) 2) 3)}
	External Ø x wall thickness	Ø D _i	L	Ø D	
½"	12.7 x 1.6	9.5	71	25.0	25
¾"	19.05 x 1.6	15.85	71	25.0	25
1"	25.4 x 1.6	22.2	71	50.5	25
1 ½"	38.1 x 1.6	34.9	71	50.5	25
2"	50.8 x 1.6	47.6	71	64.0	16

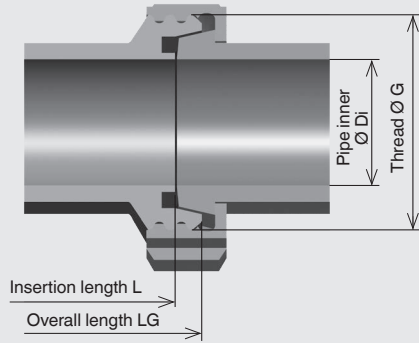
1) For maximum pressure range consider pressure rating of clamp.

2) Maximum operating temperature 150 °C

3) All thermowells of this series that are internally pressurised, with a nominal diameter (DN) > 25 mm, are manufactured and tested to module H of the pressure equipment directive.

Version with threaded connection

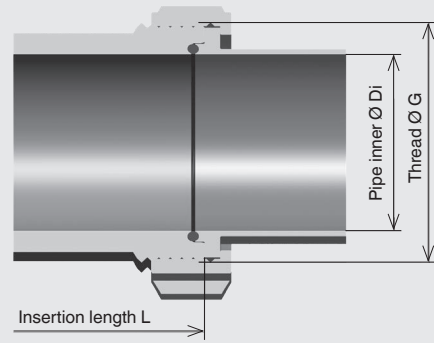
Thread per DIN 11851 for pipes per DIN 11866 row A



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DN	For pipe External Ø x wall thickness	Dimensions in mm				PN 2) 3)
		Ø D _i	G	LG	L	
10	13 x 1.5	10	Rd 28 x 1/8	84	76	40
15	19 x 1.5	16	Rd 34 x 1/6	84	76	40
20	23 x 1.5	20	Rd 44 x 1/6	84	72	40
25	29 x 1.5	26	Rd 52 x 1/6	84	70	40
32	35 x 1.5	32	Rd 58 x 1/6	84	70	40
40	41 x 1.5	38	Rd 65 x 1/6	84	70	40
50	53 x 1.5	50	Rd 78 x 1/6	84	70	25
65	70 x 2	66	Rd 95 x 1/6	88	72	25

Thread NEUMO BioConnect®

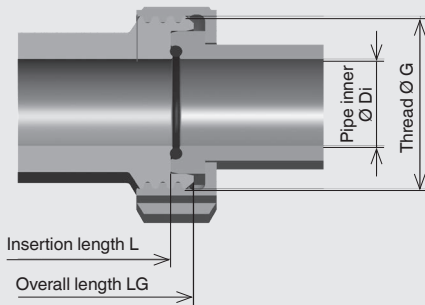


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Thread NEUMO BioConnect®
for pipes per DIN 11866 row A

DN	For pipe External Ø x wall thickness	Dimensions in mm			PN 2) 3)
		Ø D _i	G	L	
15	19 x 1.5	16	M30 x 1.5	84	16
20	23 x 1.5	20	M36 x 2	84	16
25	29 x 1.5	26	M42 x 2	84	16
32	35 x 1.5	32	M52 x 2	84	16
40	41 x 1.5	38	M56 x 2	84	16
50	53 x 1.5	50	M86 x 2	84	16
65	70 x 2	66	M90 x 3	88	16

Thread per DIN 11864-1 form A for pipes per DIN 11866 row A



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DN	For pipe External Ø x wall thickness	Dimensions in mm				PN 2) 3)
		Ø D _i	G	LG	L	
10	13 x 1.5	10	Rd 28 x 1/8	84	76	40
15	19 x 1.5	16	Rd 34 x 1/8	84	76	40
20	23 x 1.5	20	Rd 44 x 1/6	84	74	40
25	29 x 1.5	26	Rd 52 x 1/6	84	72	40
32	35 x 1.5	32	Rd 58 x 1/6	84	70	40
40	41 x 1.5	38	Rd 65 x 1/6	84	70	40
50	53 x 1.5	50	Rd 78 x 1/6	84	70	25
65	70 x 2	66	Rd 95 x 1/6	88	72	25

Thread NEUMO BioConnect®
for pipes per DIN 11866 row B (ISO 1127)

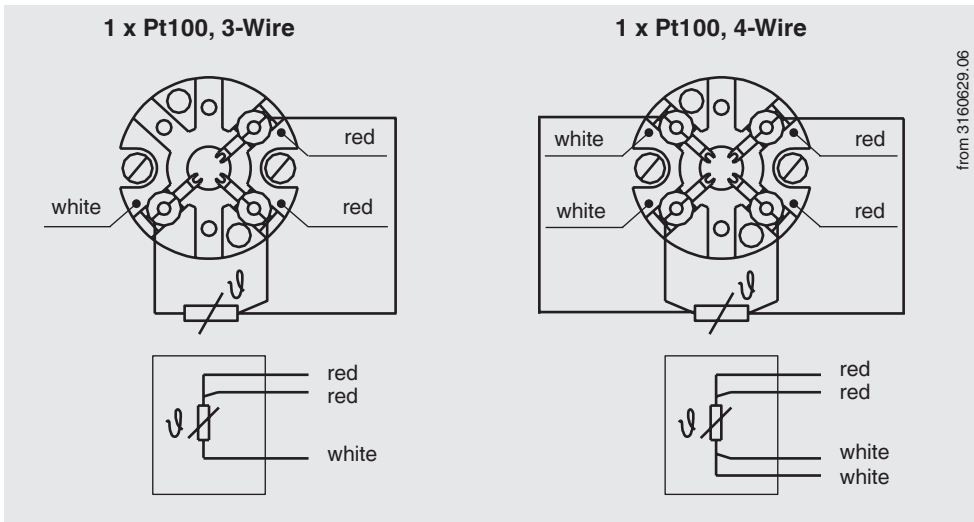
DN	For pipe External Ø x wall thickness	Dimensions in mm			PN 2) 3)
		Ø D _i	G	L	
15	21.3 x 1.6	18.1	M30 x 1.5	84	16
20	26.9 x 1.6	23.7	M36 x 2	84	16
25	33.7 x 2	29.7	M42 x 2	84	16
32	42.4 x 2	38.4	M52 x 2	84	16
40	48.3 x 2	44.3	M56 x 2	84	16
50	60.3 x 2	56.3	M86 x 2	84	16
65	76.1 x 2.3	71.5	M90 x 3	88	16

2) Maximum operating temperature 150 °C

3) All thermowells of this series that are internally pressurised, with a nominal diameter (DN) > 25 mm, are manufactured and tested to module H of the pressure equipment directive.

Flange connections, clamp connections and further nominal widths on request.

Electrical connection



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

Explosion prediction (optional)













Resistance thermometers of the TR25 series are available with an EC-type examination certificate for “intrinsically safe”, Ex i, ignition prediction.

These instruments comply with the requirements of the ATEX directive for gas.

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 and the certificate for hazardous areas or the operating instructions.

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. The system operator is responsible for using suitable thermowells.

Approvals

Logo	Description	Country
	<p>EU declaration of conformity</p> <ul style="list-style-type: none"> EMV directive¹⁾ EN 61326 emission (group 1, class B) and interference immunity (industrial application) Pressure equipment directive PS > 200 bar, module H, pressure accessory <p>For thermowells > DN 25 (1") and for the associated marking on the measuring instrument or thermowell, WIKA confirms conformity with the pressure equipment directive in accordance with the conformity assessment procedure, module H.</p> <p>For thermowells with nominal widths of ≤ DN 25 (1"), a CE marking in accordance with the pressure equipment directive (PED) is not permitted and therefore, they are designed and manufactured without CE marking in line with the applicable sound engineering practice (PED article 4, chapter 3).</p> <ul style="list-style-type: none"> RoHS directive ATEX directive (option) Hazardous areas Zone 0 gas [II 1G Ex ia IIC T1 ... T6 Ga] Zone 1 gas [II 2G Ex ia IIC T1 ... T6 Gb] 	European Union
	<p>IECEx (option) - in conjunction with ATEX</p> <p>Hazardous areas Zone 0 gas [Ex ia IIC T1 ... T6 Ga] Zone 1 gas [Ex ia IIC T1 ... T6 Gb]</p>	International
	<p>EAC (option)</p> <ul style="list-style-type: none"> EMV directive¹⁾ Hazardous areas Zone 0 gas [0 Ex ia IIC T3/T4/5/T6] Zone 1 gas [1 Ex ib IIC T3/T4/5/T6] 	Eurasian Economic Community
	<p>DNOP - MakNII (option)</p> <p>Hazardous areas Zone 0 gas [II 1G Ex ia IIC T3, T4, T5, T6 Ga] Zone 1 gas [II 2G Ex ia IIC T3, T4, T5, T6 Gb]</p>	Ukraine
	<p>KCs - KOSHA (option)</p> <p>Hazardous areas Zone 0 gas [Ex ia IIC T4 ... T6] Zone 1 gas [Ex ib IIC T4 ... T6]</p>	South Korea
-	<p>PESO - CCOE (option)</p> <p>Hazardous areas Zone 0 gas [Ex ia IIC T1 ... T6 Ga] Zone 1 gas [Ex ia IIC T1 ... T6 Gb]</p>	Indien
	<p>GOST (option)</p> <p>Metrology, measurement technology</p>	Russia
	<p>KazInMetr (option)</p> <p>Metrology, measurement technology</p>	Kazakhstan
-	<p>MTSCHS (option)</p> <p>Permission for commissioning</p>	Kazakhstan
	<p>BelGIM (option)</p> <p>Metrology, measurement technology</p>	Belarus
	<p>UkrSEPRO (option)</p> <p>Metrology, measurement technology</p>	Ukraine
	<p>Uzstandard (option)</p> <p>Metrology, measurement technology</p>	Uzbekistan
	<p>3-A (option)²⁾</p> <p>Sanitary Standard</p>	USA
	<p>EHEDG (option)²⁾</p> <p>Hygienic Equipment Design</p>	European Union

1) Only for built-in transmitter

2) Confirmation of 3-A or EHEDG conformity only valid with separately selectable 2.2 test report

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.

Certificates (option)

- 2.2 test report
- 3.1 inspection certificate
- DKD/DAkkS calibration certificate
- Certificate of surface roughness of wetted parts
- Hygiene certificates

Process connection	3-A	EHDG
Clamp	yes	yes ⁴⁾
BioControl®	yes	no
DIN 11851	yes ³⁾	yes ⁴⁾
DIN 11864-1	yes	yes
DIN 11864-2	yes	yes
DIN 11864-3	yes	yes

3) In combination with
- ASEPTO-STAR k-flex upgrade gaskets from Kieselmann GmbH, Germany or
- SKS gasket set DIN 11851 EHDG from Siersema Komponenten

4) In combination with
T-ring seals from Combifit International B. V., Netherlands

Approvals and certificates, see website

Patents, property rights

Case with easily cleanable twist crown, integrated into the case cap (GM 000984349)

Ordering information

Model / Explosion protection / Connection head / Female thread on connection head / Terminal block / Transmitter / Position of the cable entry / Process connection / Material wetted parts / Surface roughness / Insertion length / Neck tube, length / Measuring element / Connection method / Temperature range / Certificates / Options

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