

In-line resistance thermometer Model TR25

WIKA data sheet TE 60.25



for further approvals
see page 5

Applications

- Food and beverage industry, dairies, drink dispensers and bottling plants, breweries
- Biochemical and pharmaceutical industries, cleanroom technology
- For piggable systems
- Paint finishing 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 Ex i



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

Description

Resistance thermometers 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 is available, so that these thermometers can be used for many different processes without any problems.

3- or 4-wire platinum measurement resistances 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® protocol, FOUNDATION™ fieldbus or PROFIBUS® PA.

Specifications

Output signal Pt100

Temperature range	Measuring range -50 ... +250 °C (-58 ... +482 °F)
Sensor	
■ Measuring element (measuring current: 0.1 ... 1.0 mA)	Pt100 measuring resistor DIN
■ Connection method	1 x 3-wire 1 x 4-wire
Sensor class accuracy ¹⁾ per IEC 60751	Class A Class B

Output signal 4 ... 20 mA, HART® protocol, FOUNDATION™ fieldbus and PROFIBUS® PA

Transmitter (selectable versions) ²⁾	model T19	model T24	model T32	model T53
Output				
■ 4 ... 20 mA	x	x	x	
■ HART® protocol			x	
■ FOUNDATION™ Fieldbus and PROFIBUS® PA				x
Connection method				
■ 1 x 3-wire	x	x	x	x
■ 1 x 4-wire			x	x
Measurement current	0.8 mA	0.5 mA	0.3 mA	0.2 mA
Temperature range	Measuring range -50 ... +250 °C (-58 ... +482 °F) ⁵⁾ , other measuring ranges are adjustable			
Response time ³⁾	t ₅₀ < 3.2 s t ₉₀ < 7.3 s + response time of the relevant transmitters (compare transmitter data sheet)			
Measuring deviation ⁴⁾	-1 Kelvin + accuracy of the relevant transmitters			
Measuring insert diameter	3 mm			

- 1) For detailed specifications for Pt100 sensors, see Technical information IN 00.17 at www.wika.com.
 2) For a correct determination of the overall measuring error, both sensor and transmitter measuring deviations have to be considered.
 3) Flow-through housing OD 26.9 mm
 4) Measured at 100 °C
 5) The temperature transmitter should therefore be protected from temperatures over 85 °C (185 °F)

Documentation and correction of measuring errors

With these electrical thermometers, the measuring errors 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 measured error 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.

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 protect any possible built-in transmitter from high medium temperatures.

Tubular body

The standard material for all wetted, metallic surfaces is 1.4435 stainless steel.

Process connection

Material: stainless steel 1.4435

- 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®
- Threaded connection SMS

Others on request

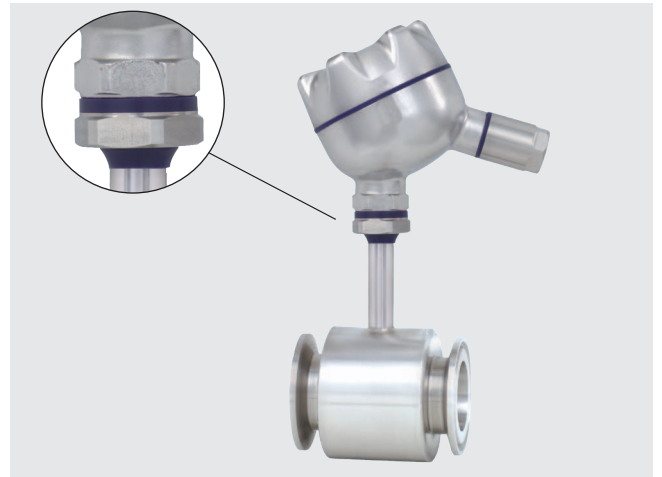
Sealing (option)

Material: NBR, PTFE or EPDM

Sealing combination (option)

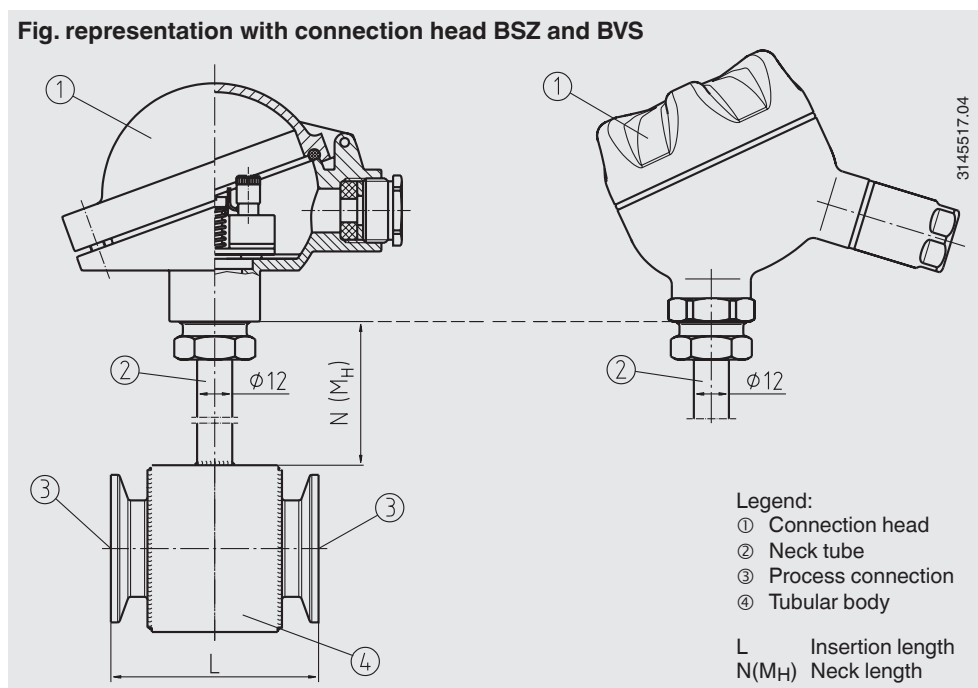
The transition from the connection head to the thermowell is effected via an optional sealing combination (polyurethane) of flat gasket and wiper. This combination permanently prevents the penetration and depositing of humidity and impurities in this area (IP 68). Additionally, the sealing combination simplifies the cleaning process significantly.

In combination with the BVS head and the hygienic cable gland, an easy to clean and hygienic measuring location results, even in non-wetted areas.

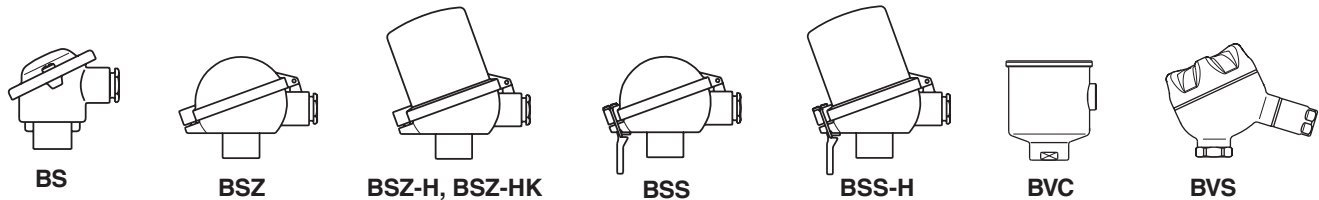


Components model TR25

Fig. representation with connection head BSZ and BVS



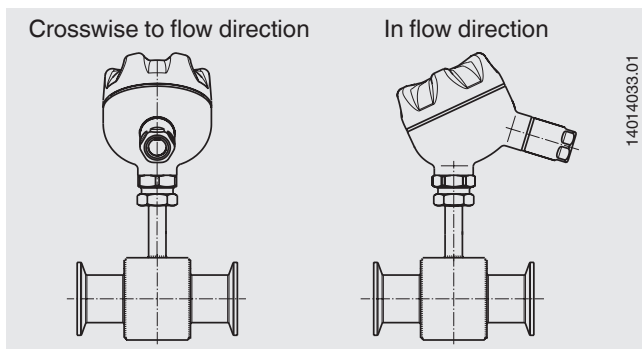
Connection head



Model	Material	Cable outlet	Ingress protection	Cap	Surface	Weight in kg
BS	Aluminium	M20 x 1.5 ¹⁾	IP 65	Cap with 2 screws	Blue, lacquered ²⁾	0.14
BSZ	Aluminium	M20 x 1.5 ¹⁾	IP 65	Hinged cover with cylinder head screw	Blue, lacquered ²⁾	0.29
BSZ-H	Aluminium	M20 x 1.5 ¹⁾	IP 65	Hinged cover with cylinder head screw	Blue, lacquered ²⁾	0.30
BSZ-HK	Plastic	M20 x 1.5 ¹⁾	IP 65	Hinged cover with cylinder head screw	Blank	0.14
BSS	Aluminium	M20 x 1.5 ¹⁾	IP 65	Hinged cover with clip	Blue, lacquered ²⁾	0.27
BSS-H	Aluminium	M20 x 1.5 ¹⁾	IP 65	Hinged cover with clip	Blue, lacquered ²⁾	0.32
BVC	Stainless steel (1.4571)	M16 x 1.5 ¹⁾	IP 68	Flat screw cap	Natural finish	0.60
BVS	Stainless steel (1.4308)	M20 x 1.5 ¹⁾	IP 68	Screw cap, hygienic design	Precision casting, electropolished	0.51

1) Standard
2) RAL 5022

Position of the cable outlet at the connection head



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 to the measuring insert. 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				
	T12	T19	T24	T32	T53
BS	-	○	○	-	○
BSZ / BSZ-K	○	○	○	○	○
BSZ-H / BSZ-HK	●	●	●	●	●
BSS	○	○	○	○	○
BSS-H	●	●	●	●	●
BVS	○	○	○	○	○
BVC	○	○	○	○	○

Model	Description	Explosion protection	Data sheet
T19	Analogue transmitter, configurable	Without	TE 19.03
T24	Analogue transmitter, PC configurable	Optional	TE 24.01
T12	Digital transmitter, PC configurable	Optional	TE 12.03
T32	Digital transmitter, HART® protocol	Optional	TE 32.04
T53	Digital transmitter FOUNDATION™ Fieldbus and PROFIBUS® PA	Standard	TE 53.01

Explosion protection (optional)

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

These instruments comply with the requirements of 94/9/EC (ATEX) directive for gas.

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 and in 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.

CE conformity

EMC directive ¹⁾

2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (industrial application)

ATEX directive

94/9/EC, EN 60079-0, EN 60079-11

¹⁾ Only for built-in transmitter

Approvals (option)

- **IECEx**, international certification for the Ex area
- **NEPSI**, ignition protection type “i” - intrinsic safety, ignition protection type “ID” - dust protection through intrinsic safety, ignition protection type “n”, ignition protection type “d” - flameproof enclosure, China
- **GOST-R**, import certificate, Russia
- **GOST**, metrology/measurement technology, Russia
- **3-A**, food, USA
- **EHEDG**, food, Germany

Certificates (option)

- 2.2 test report
- 3.1 inspection certificate
- DKD/DAkkS calibration certificate
- Hygiene certificates

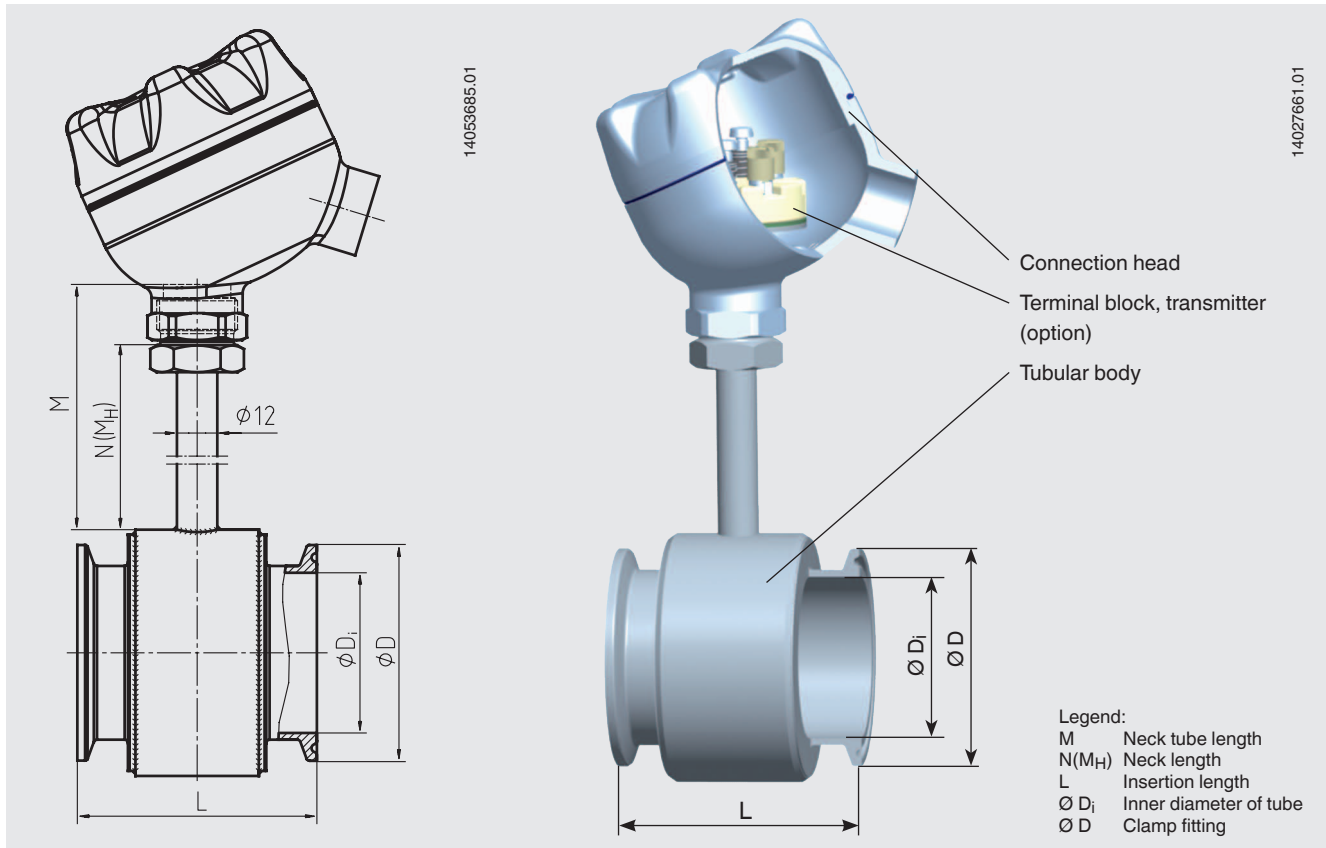
Process connection	3-A (74-06)
Clamp	yes
BioControl®	yes
DIN 11851	yes ¹⁾
DIN 11864-1	yes
DIN 11864-2	yes
DIN 11864-3	yes
IDF	yes
APV RJT	no
SMS	no

¹⁾ In combination with
 - ASEPTO-STAR k-flex upgrade gaskets from Kieselmann GmbH, Germany or
 - SKS gasket set DIN 11851 EHEDG from Siersema Komponenten

Approvals and certificates, see website

Dimensions in mm

Version with clamp connection



Clamp to DIN 32676 for pipes per DIN 11866, series A

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

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

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

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

DN	For pipe External Ø x Wall thickness	Dimensions in mm			PN ^{1) 2) 3)}
		Ø D _i	L	Ø D	
¾"	19.05 x 1.65	15.75	71	25	40
1"	25.4 x 1.65	22.1	71	50.5	40
1 ½"	38.1 x 1.65	34.8	71	50.5	40
2"	50.8 x 1.65	47.5	71	64.0	25

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

DN	For pipe External Ø x Wall thickness	Dimensions in mm			PN ^{1) 2) 3)}
		Ø D _i	L	Ø D	
½"	12.7 x 1.6	9.5	71	25.0	40
¾"	19.05 x 1.6	15.85	71	25.0	40
1"	25.4 x 1.6	22.2	71	50.5	40
1 ½"	38.1 x 1.6	34.9	71	50.5	40
2"	50.8 x 1.6	47.6	71	64.0	25

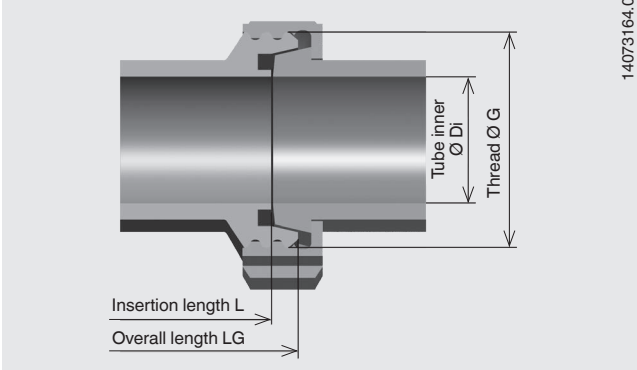
1) For maximum pressure range consider pressure rating of clamp.

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, 97/23/EC.

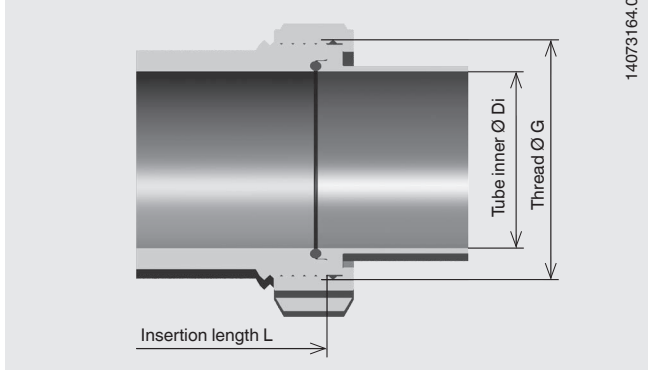
Version with threaded connection

Threads per DIN 11851



DN	For pipe External Ø x Wall thickness	Dimensions in mm Ø Di G	LG	L	PN ^{2) 3)}
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

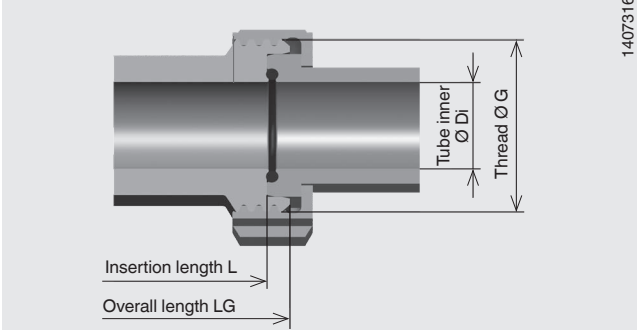
Thread NEUMO BioConnect®



NEUMO BioConnect® thread
for pipes per DIN 11866 row A

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

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



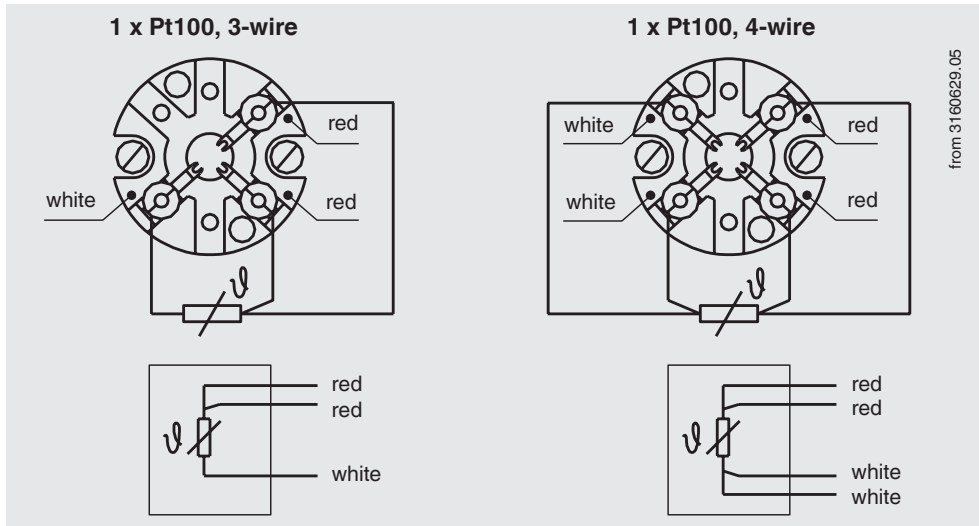
DN	For pipe External Ø x Wall thickness	Dimensions in mm Ø Di G	LG	L	PN ^{2) 3)}
10	13 x 1.5	10 Rd 28 x 1/8	84	76	40
15	19 x 1.5	16 Rd 34 x 1/8	84	76	40
20	23 x 1.5	20 Rd 44 x 1/6	84	74	40
25	29 x 1.5	26 Rd 52 x 1/6	84	72	40
32	35 x 1.5	32 Rd 58 x 1/6	84	70	40
40	41 x 1.5	38 Rd 65 x 1/6	84	70	40
50	53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

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, 97/23/EC.

Flange connections, clamp connections and further nominal widths per DIN 11864 on request.

Electrical connection



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

Ordering information

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

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