

## Resistance thermometer with digital indicator Model TR75, battery operation

WIKA data sheet TE 60.75

DiwiTherm®

### Applications

- Machine building, plant and vessel construction
- Chemical industry
- Food and beverage industry
- Automotive engineering
- Sanitary, heating and air-conditioning technology

### Special features

- LCD display
- Variants with sensors for insertion, mounting into a thermowell or with contact bulb for mounting on a pipe surface
- For all standard thermowell designs
- Measuring range -40 ... +450 °C
- With automatic measuring range changeover (Autorange)

### Description

The DiwiTherm® is the ideal combination of a digital display and a resistance thermometer. This compact temperature measuring instrument can be used in a wide range of applications and works without an external power supply.

A wide variety of possibilities for the combination of insertion length, neck length, connection to thermowell etc. are available for the thermometers, suitable for any thermowell dimension and the widest range of applications.

Operation without thermowell is only recommended in certain applications.

Optionally, the DiwiTherm® can be manufactured with a process connection for measuring the temperature on a pipe's surface.



Resistance thermometer, battery operation, model TR75

Specifications	Model TR75
<b>Measuring range</b>	
Display in °C	
Range 1	-40,0 ... +199,9 °C
Range 2	200 ... 450 °C
	with automatic measuring range changeover (Autorange)
<b>Display</b>	
Principle	3 ½ digit LCD, 7 segment display, 21 mm high
Resolution	0.1 K up to 199.9 °C; 1 K from 200 °C
Accuracy	0.5 % of the respective full-range value ±1 digit
<b>Instrument versions</b>	
■ DiwiTherm® with sensor for insertion	
Design	Sensor with connection cable <ul style="list-style-type: none"> <li>■ Working temperature max. 200 °C</li> <li>■ Housing for panel mounting, with panel mounting flange</li> </ul>
■ DiwiTherm® for mounting in a thermowell	
Design	Spring-loaded sensor Threaded connection to thermowell <ul style="list-style-type: none"> <li>■ Housing with neck tube</li> </ul>
Option	■ Adjustable stem and dial (rotatable through 360° and tiltable through 90°)
■ DiwiTherm® for mounting on a pipe surface	
Design	Contact bulb for fixing with tightening strap <ul style="list-style-type: none"> <li>■ Working temperature max. 200 °C</li> <li>■ Housing with neck tube</li> </ul>
Option	■ Adjustable stem and dial (rotatable through 360° and tiltable through 90°) ■ Housing for panel mounting, with connecting cable and panel mounting flange
<b>Case</b>	
Nominal size	100
Material	Stainless steel
Ingress protection	IP 65 per EN 60529 / IEC 60529
Bezel ring	Bayonet ring
Window	Instrument glass
<b>Power supply U<sub>B</sub></b>	DC 3.6 V from 3.6 V Lithium battery, size AA (Mignon), included in delivery <sup>1)</sup>
Operating life	min. 10 years
Special features	If the battery drops below 2.7 V, the display switches into "LO" mode
<b>Miscellaneous</b>	
Sensor	Pt1000
Ambient and storage temperature	-20 ... +60 °C
Vibration (at sensor)	10 ... 500 Hz 5 g EN 60068-2-6 / IEC 60068-2-6
Shock (at sensor)	EN 60068-2-7 / IEC 60068-2-7
Weight	approx. 1 kg (actual weight depends on design and possibly mounted thermowell)

1) Not replaceable by the customer.

## CE conformity

### EMC directive

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

## Certificates (option)

Certification type	Measuring accuracy	Material certificate
<b>2.2 test report</b>	x	x
<b>3.1 inspection certificate</b>	x	-
<b>DKD/DAkS calibration certificate</b>	x	-

The different certifications can be combined with each other.

## DiwiTherm® with sensor for insertion

### Sensor

Material: Stainless steel

Sensor length  $A \leq 150$  mm: Rigid sensor tube

The tubular design features a rigid construction to the metal sensor tip; therefore tubular designs must not be bent. Internally, the measuring resistor is connected directly to an insulated lead. Therefore tubular-design resistance thermometers can only be used up to the temperatures specified for the lead (see operating temperatures).

Sensor length above 150 mm:

Sheathed measuring cable (MI cable)

The junction between the metal part of the sensor and the connecting cable, when using MI cable, is either crimped, rolled or potted, depending on the design. This area should not be immersed within the process and must not be bent. Compression fittings should not be attached to the transition. The type and dimensions of the transition depend largely on the combination between input leads and metal sensor and the sealing requirements.

The sensor diameter should be approx. 1 mm smaller than the bore diameter of the thermowell or the blind bore, respectively.

Gaps of more than 0.5 mm between thermowell and the sensor will have a negative effect on the heat transfer, and they will result in unfavourable response behaviour of the thermometer.

### Sensor lengths

Sensor $\varnothing$ in mm	Standard sensor lengths A ( $l_1$ ) in mm		
6	50	100	150
8	-	100	150

Special lengths are possible.

### Process connection

A compression fitting enables simple, on-site adjustment to the required insertion length.

### Compression fitting

Material: Stainless steel

G  $\frac{1}{4}$  B male thread (not with  $\varnothing 8$  mm sensors) or G  $\frac{1}{2}$  B

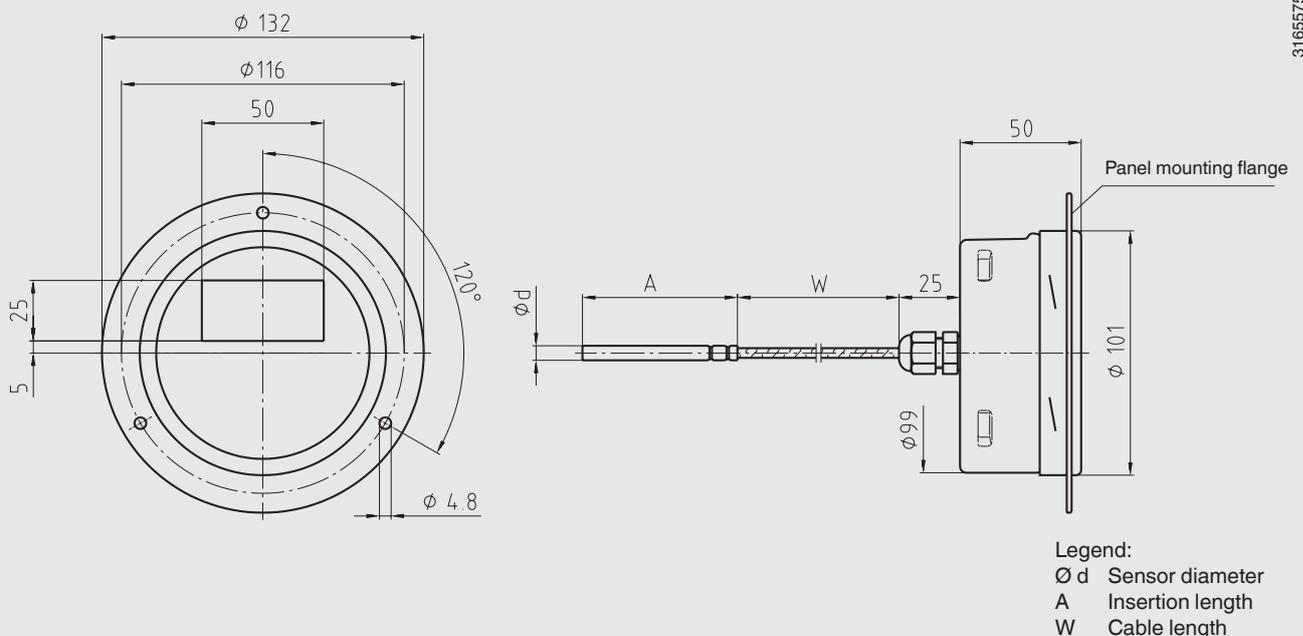
Delivery also possible without process connection.

### Cable

Silicone, shielded, application range  $-40 \dots +200$  °C with EMC cable gland

Cable length to customer specification.

### DiwiTherm® battery operation, model TR75 with sensor for insertion, rear cable entry, with panel mounting flange



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# DiwiTherm® for mounting in a thermowell

## Sensor

Material: Stainless steel

The sensor is made from vibration-resistant, sheathed cable (MI cable).

The sensor diameter should be approx. 1 mm smaller than the bore diameter of the thermowell.

Gaps of more than 0.5 mm between thermowell and the sensor 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  $\leq 5.5$  mm). In order to ensure that the sensor is firmly pressed down onto the bottom of the thermowell, the sensor must be spring-loaded (spring travel: max 10 mm).

## Process connection (standard process connection)

Material: Stainless steel

Threaded connection: G 1/2 B  
M14 x 1.5  
M18 x 1.5  
1/2 NPT

Union nut: G 1/2 B  
Male nut: G 1/2 B

## Neck tube

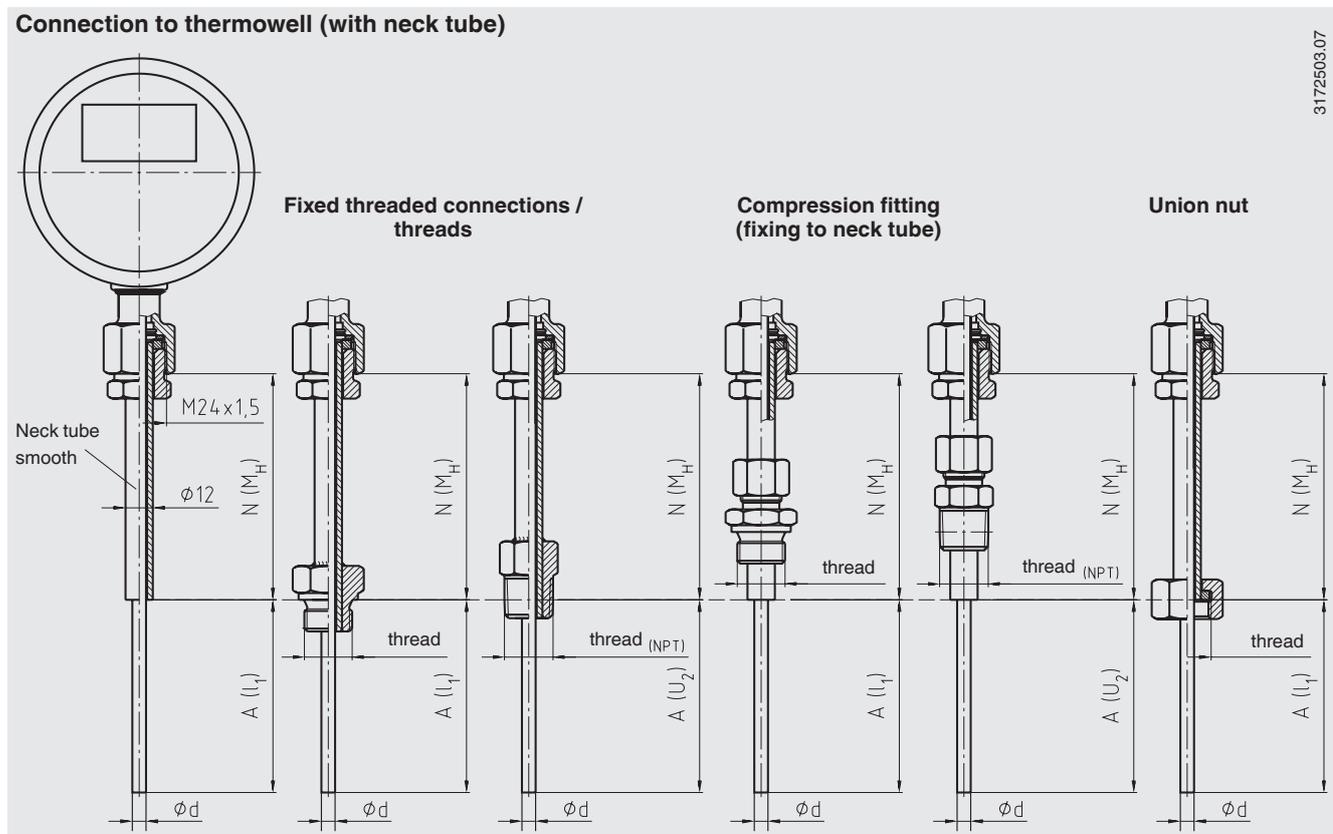
Material: Stainless steel

Neck tube diameter: 12 mm  
Standard neck length: 150 mm  
others on request  
(Minimum neck length: 30 mm)

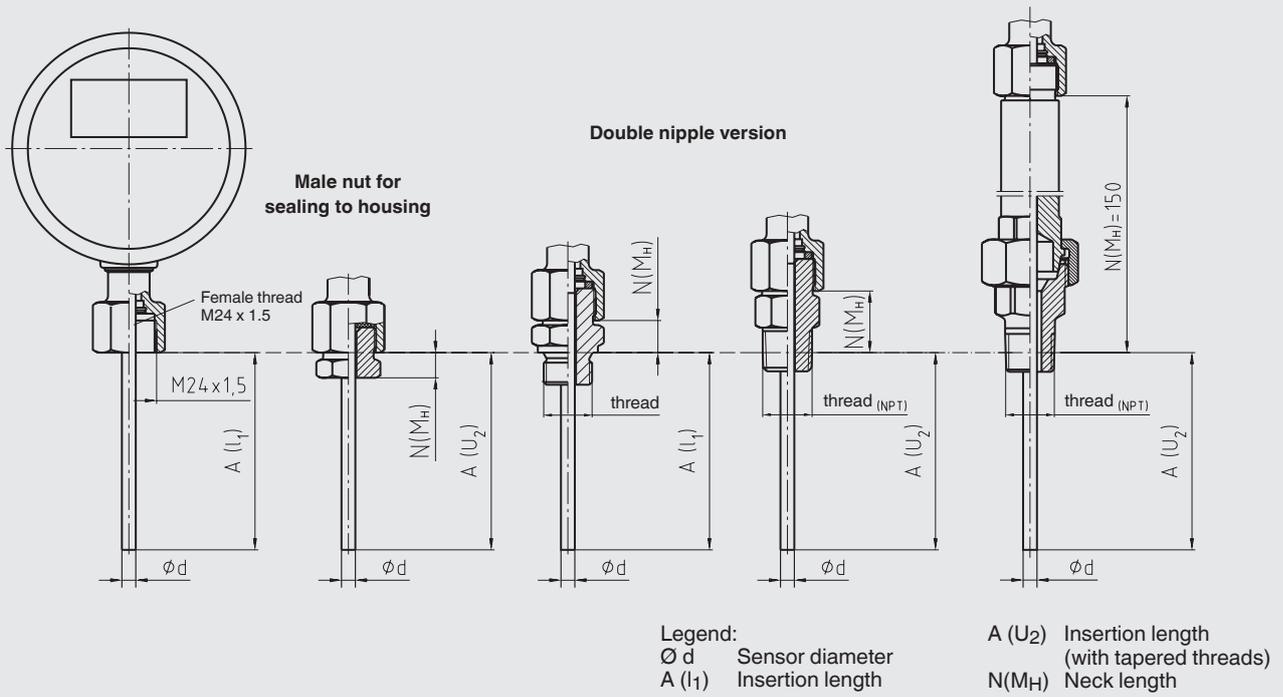
## Insertion lengths

Sensor $\varnothing$ in mm	Standard insertion length A ( $l_1$ ) in mm																
3	110	140	145	170	200	205	230	245	260	294	305	345	350	395	410	445	545
6	-	-	-	170	200	205	230	245	260	295	305	345	350	395	410	445	545
8	-	-	-	-	200	205	230	245	260	295	305	345	350	395	410	445	545

Special lengths are possible.

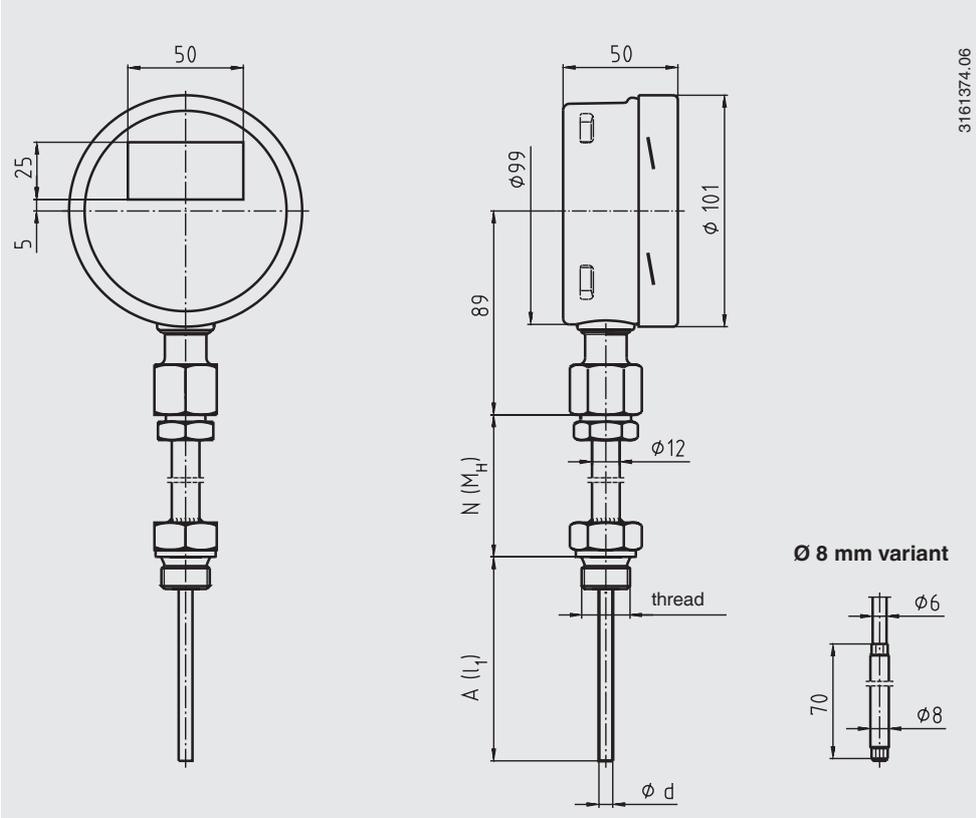


Connection to thermowell



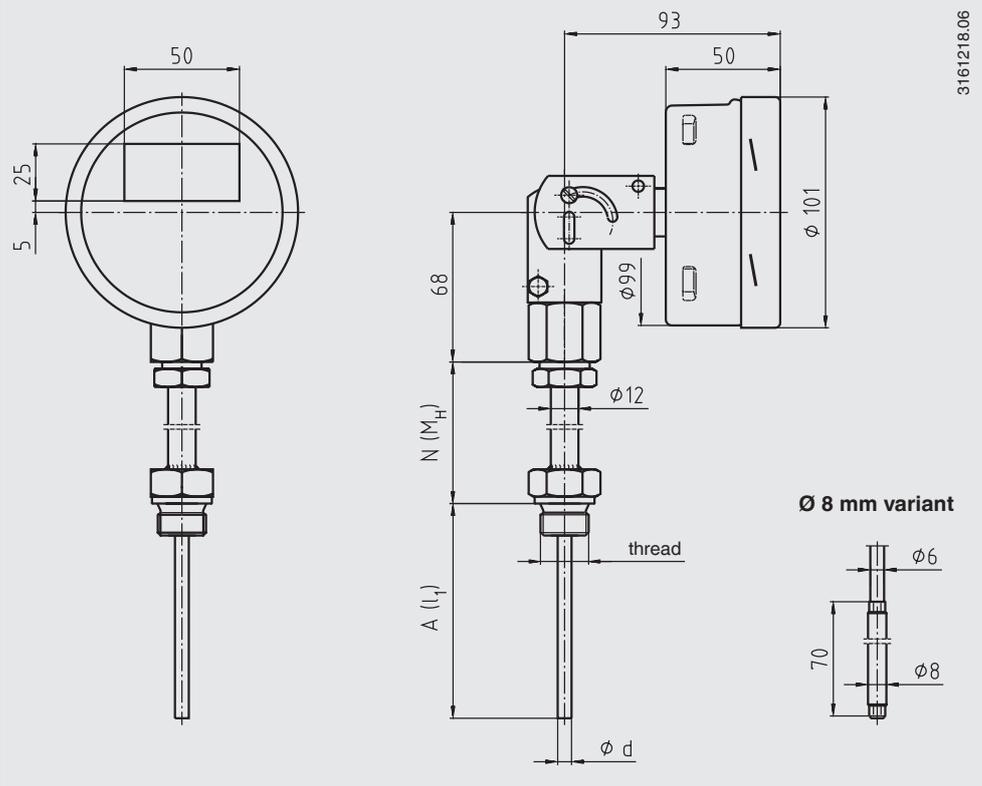
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DiwiTherm® model TR75 for mounting in a thermowell, with neck tube  
 Connection from housing to neck tube: fixed, lower mount



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**DiwiTherm® model TR75 for mounting in a thermowell, with neck tube**  
**Connection from housing to neck tube: adjustable stem and dial, rear mount, centric**



**DiwiTherm® for mounting on a pipe surface**

**Contact bulb**

Material: Stainless steel

Mounting tube: 120 mm

Fixing with a tightening strap (not included in delivery)

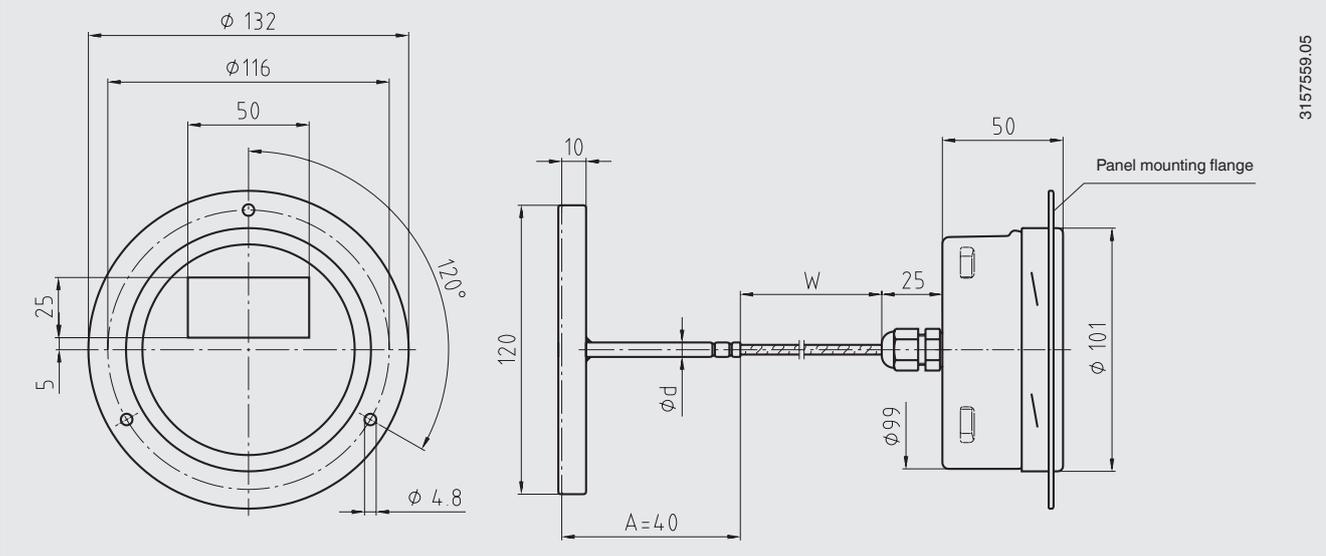
**Cable**

Silicone, shielded, application range -40 ... +200 °C

Cable length to user specifications

The specified accuracy can only be guaranteed up to a maximum cable length of 15 m. With longer cable lengths, the accuracy can deviate sharply.

**DiwiTherm® model TR75 for mounting on a pipe-surface, rear cable output, with panel mounting flange**

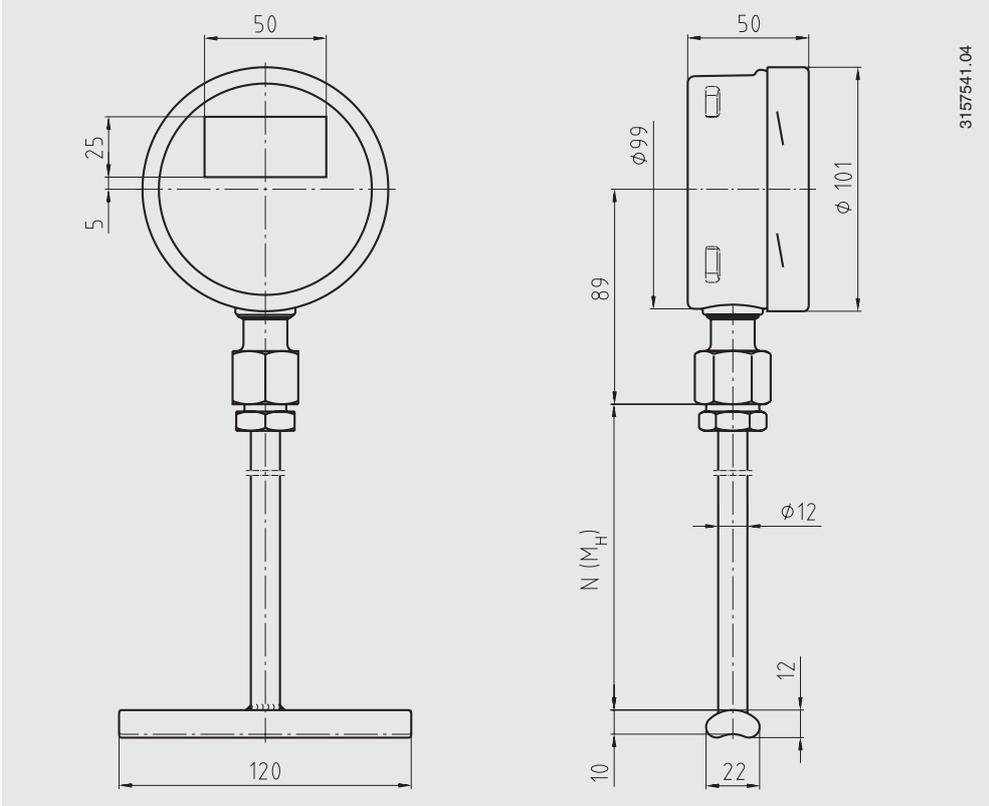


**Neck tube**

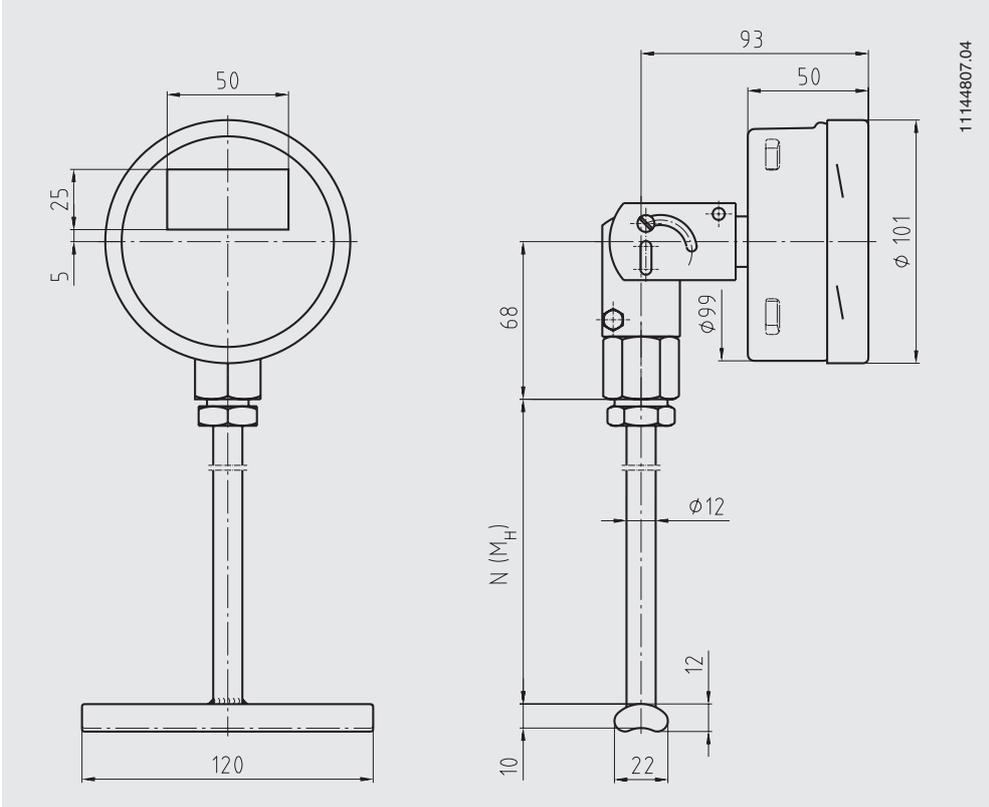
Material: Stainless steel  
Neck tube diameter: 12 mm

Standard neck length: 150 mm  
others on request (minimum neck length: 100 mm)

**DiwiTherm® model TR75 for mounting on a pipe surface, with neck tube**  
**Connection from housing to neck tube: fixed, lower mount**



**DiwiTherm® model TR75 for mounting on a pipe surface, with neck tube**  
**Connection from housing to neck tube: adjustable stem and dial, rear mount, centric**



# Mounting instructions for contact bulb

## General

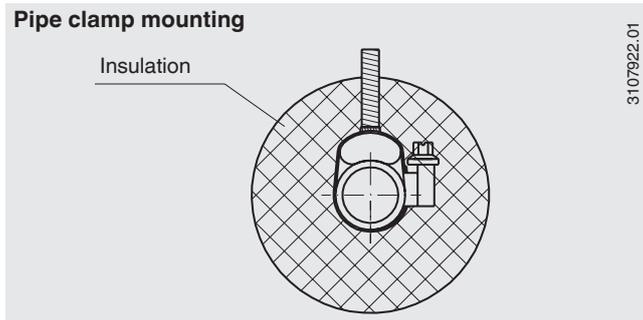
The contact bulb has been designed for mounting on pipes or tanks. The basic requirements to ensure a perfect measurement result is to retain good thermal contact between the probe and the outside wall of the vessel or pipe. Minimal heat loss to the environment from both the probe and the measuring point is imperative.

The sensor should have direct, metallic contact with the measuring point and sit firmly on the surface of the measuring point.

A heat conductive paste can be used to optimise the heat transmission between contact bulb and vessel, if temperatures under 200 °C are expected. Insulation must be applied at the mounting point to avoid error due to heat loss. This insulation must have sufficient temperature resistance and is not included in the scope of delivery.

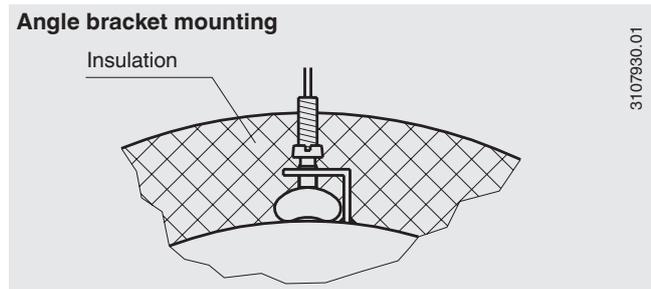
## ■ Mounting on pipes

The geometry of the contact bulb has been designed for pipes with external diameters between 20 and 160 mm. For fixing the contact bulb to the pipe, pipe clamps are sufficient. The contact bulb should have direct metallic contact with the measuring point and have firm contact with the surface of the pipe.



## ■ Mounting on tanks

The geometry of the contact bulb has been designed for vessels with an external diameter of up to 160 mm. If the mounting point of the contact bulb on the vessel has an external diameter greater than 160 mm, we recommend the use of an intermediate piece designed for the respective tank diameter, made of a material with good thermal conductivity. The contact bulb can be fastened to the tank by means of an angle bracket with clamping screws, or any similar method. The contact bulb should have direct metallic contact with the measuring point and have firm contact with the surface of the tank.



## Ordering information

Model / Instrument design / Process connection / Neck length N(MH) / Connection cable, sheathed cable / Sensor diameter  $\varnothing$  d / Insertion length A (I<sub>1</sub>), A (U<sub>2</sub>) / Certificates / Options

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