

Resistance Thermometer TBT

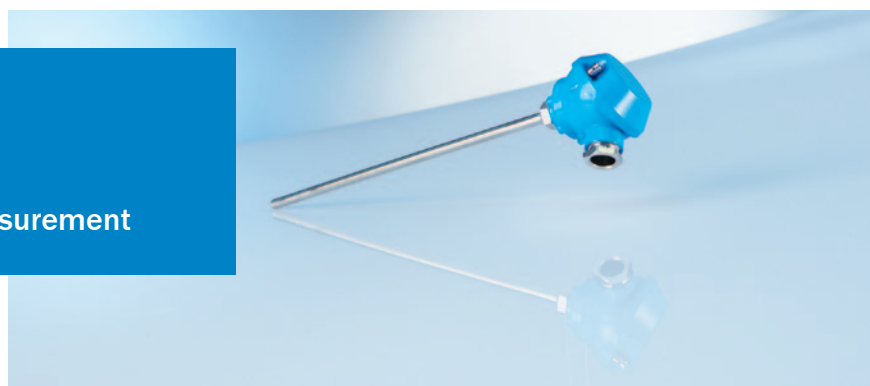
Well-proven temperature measurement

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Product description

The TBT is a universal purpose Pt100 resistance thermometer with a splash-proof die-cast aluminum for the temperature measurement in liquids and gases. It can be adapted to specific applications through its various available process connections and insertion lengths. The

TBT is available with various connection threads, with or without compression fittings. Wetted parts are made from high-grade stainless steel 1.4571. Besides its Pt100 output signal, the TBT is available with an integrated transmitter with output signal 4 mA ... 20 mA.

At a glance

- Pt100 element, accuracy class A according to IEC 60751
- Measuring ranges $-50\text{ °C} \dots +150\text{ °C}$ and $-50\text{ °C} \dots +250\text{ °C}$
- Wetted parts made from corrosion resistant stainless steel 1.4571
- Various mechanical adaptations and insertion lengths
- Pt100 (4-wire) or 4 mA ... 20 mA (2-wire)
- Cable gland M16x1.5

Your benefits

- Reliable operation through rugged design and high-quality materials
- Good long-term stability, accuracy and linearity
- Quick and safe installation
- Convenient system integration even in narrow installation spaces
- Optimal solutions for individual requirements

Detailed technical data

Features

Measuring ranges	-50 °C ... +150 °C -50 °C ... +250 °C
Sensor element	Pt100
Signal outputs and maximum ohmic load R _A	Pt100, 4-wire, 4 mA ... 20 mA, 2-wire (R _A ≤ (L ⁺ - 10 V) / 0.028 A [Ohm])

Performance

Accuracy of sensor element	Class A according to IEC 60751
Accuracy of optional transmitter	≤ ± 0.1 % of span
Linearity of optional transmitter	≤ ± 0.1 % of span

Mechanics/electronics

Process connections ¹⁾	Without process connection, Thread G 1/4 B, Thread G 1/2 B, Thread 1/4" NPT, Thread 1/2" NPT, Compression fitting G 1/4 B, CrNi stainless steel ferrule, Compression fitting G 1/2 B, CrNi stainless steel ferrule, Compression fitting 1/4" NPT, CrNi stainless steel ferrule, Compression fitting 1/2" NPT, CrNi stainless steel ferrule, Compression fitting G 1/4 B, PTFE ferrule, Compression fitting G 1/2 B, PTFE ferrule, Compression fitting 1/4" NPT, PTFE ferrule, Compression fitting 1/2" NPT, PTFE ferrule
Insertion length/diameter of probe ²⁾	25 mm / 3 mm 50 mm / 3 mm 100 mm / 6 mm 150 mm / 6 mm 250 mm / 6 mm 350 mm / 6 mm
Pressure resistance ³⁾	Max. 40 bar with supplied compression fitting with PTFE ferrule, Max. 100 bar with supplied compression fitting with stainless steel ferrule, Max. 120 bar with threaded process connection
Housing material	Stainless steel 1.4571
Wetted parts	Stainless steel 1.4571
Electrical connection/enclosure rating ⁴⁾	Cable gland M16x1.5, IP 65, Cable gland M16x1.5, IP 67
Supply voltage	10 V DC ... 35 V DC for variant with transmitter 4 mA ... 20 mA
Maximum current consumption	Ca. 28 mA for variant with transmitter 4 mA ... 20 mA
Electrical safety	Protection class: III, Dielectric strength: 500 V AC, Reverse polarity protection of variant with transmitter 4 mA ... 20 mA: L ⁺ towards M
CE-conformity	2004/108/EC, EN 61326-2-3
Weight	Ca. 155 g (depending on configuration)

¹⁾ The compression fittings with PTFE ferrule are suited for temperatures up to +150 °C.

²⁾ For measuring range -50 °C ... +250 °C insertion lengths from 100 mm required.

³⁾ Pressure resistance at room temperature.

⁴⁾ Enclosure rating IP per IEC 60529. The enclosure rating classes specified only apply while the pressure transmitter is connected with female connectors that provide the corresponding enclosure rating.

Ambient data

Ambient temperature	-40 °C ... +85 °C for variant with transmitter 4 mA ... 20 mA, -40 °C ... +125 °C for variant with output signal Pt100
Storage and transport temperature	-40 °C ... +60 °C
Shock resistance according to IEC 60751	500 g
Vibration resistance according to IEC 60751	3 g

Type code

Output signal

P	Output signal Pt100, 4-wire
A	Transmitter 4...20 mA, 2-wire

Measuring range

A	-50 °C ... +150 °C
B	-50 °C ... +250 °C

Process connection

ZZ	Without process connection
G1	Thread G 1/4 B
GE	Thread G 1/2 B
N4	Thread 1/4" NPT
N2	Thread 1/2" NPT
S1	Compression fitting G 1/4 B, CrNi stainless steel ferrule
SE	Compression fitting G 1/2 B, CrNi stainless steel ferrule
S4	Compression fitting 1/4" NPT, CrNi stainless steel ferrule
S2	Compression fitting 1/2" NPT, CrNi stainless steel ferrule
P1	Compression fitting G 1/4 B, PTFE ferrule ¹⁾
PE	Compression fitting G 1/2 B, PTFE ferrule ¹⁾
P4	Compression fitting 1/4" NPT, PTFE ferrule ¹⁾
P2	Compression fitting 1/2" NPT, PTFE ferrule ¹⁾

Insertion length / diameter

0253	25 mm / 3 mm ²⁾
0503	50 mm / 3 mm ²⁾
1006	100 mm / 6 mm
1506	150 mm / 6 mm
2506	250 mm / 6 mm
3506	350 mm / 6 mm

Electrical connection

G	Cable gland M16x1.5, IP 65
P	Cable gland M16x1.5, IP 67

Design specifics

Z	Without
G	Free from oil and grease

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¹⁾ Not for measuring range up to 250 °C

²⁾ For measuring range -50 °C ... +250 °C insertion length from 100 mm required

Ordering information

The part numbers below show a selection of our common configurations and represent only an extract of the product portfolio.

- Measuring range: -50 °C ... +150 °C
- Electrical connection/enclosure rating: cable gland M16x1.5, IP 65

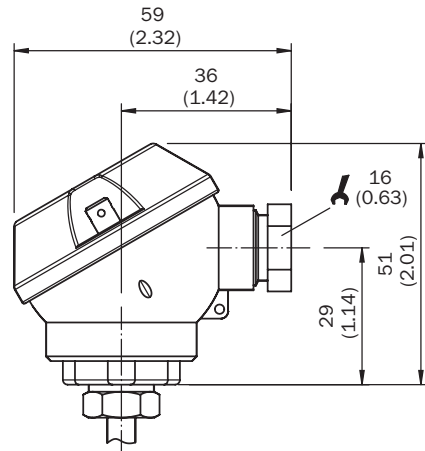
Output signal	Process connection	Insertion length/diameter of probe	Model name	Part No.
Pt100, 4-wire	Without process connection	25 mm / 3 mm	TBT-1PAZZ0253GZ	6043007
		50 mm / 3 mm	TBT-1PAZZ0503GZ	6043008
		100 mm / 6 mm	TBT-1PAZZ1006GZ	6043009
		150 mm / 6 mm	TBT-1PAZZ1506GZ	6043010
		250 mm / 6 mm	TBT-1PAZZ2506GZ	6043011
		350 mm / 6 mm	TBT-1PAZZ3506GZ	6043013
	Thread G 1/4 B	25 mm / 3 mm	TBT-1PAG10253GZ	6043014
		50 mm / 3 mm	TBT-1PAG10503GZ	6043015
		100 mm / 6 mm	TBT-1PAG11006GZ	6043016
		150 mm / 6 mm	TBT-1PAG11506GZ	6043017
		250 mm / 6 mm	TBT-1PAG12506GZ	6043018
		350 mm / 6 mm	TBT-1PAG13506GZ	6043019
	Thread G 1/2 B	25 mm / 3 mm	TBT-1PAGE0253GZ	6043020
		50 mm / 3 mm	TBT-1PAGE0503GZ	6043021
		100 mm / 6 mm	TBT-1PAGE1006GZ	6043022
		150 mm / 6 mm	TBT-1PAGE1506GZ	6043023
		250 mm / 6 mm	TBT-1PAGE2506GZ	6043024
		350 mm / 6 mm	TBT-1PAGE3506GZ	6043025
	Compression fitting G 1/4 B, CrNi stainless steel ferrule	25 mm / 3 mm	TBT-1PAS10253GZ	6043026
		50 mm / 3 mm	TBT-1PAS10503GZ	6043027
		100 mm / 6 mm	TBT-1PAS11006GZ	6043028
		150 mm / 6 mm	TBT-1PAS11506GZ	6043029
		250 mm / 6 mm	TBT-1PAS12506GZ	6043030
		350 mm / 6 mm	TBT-1PAS13506GZ	6043031
	Compression fitting G 1/2 B, CrNi stainless steel ferrule	25 mm / 3 mm	TBT-1PASE0253GZ	6043032
		50 mm / 3 mm	TBT-1PASE0503GZ	6043033
		100 mm / 6 mm	TBT-1PASE1006GZ	6043034
150 mm / 6 mm		TBT-1PASE1506GZ	6043035	
250 mm / 6 mm		TBT-1PASE2506GZ	6043036	
350 mm / 6 mm		TBT-1PASE3506GZ	6043037	

Output signal	Process connection	Insertion length/diameter of probe	Model name	Part No.
4 mA ... 20 mA, 2-wire ($R_A \leq (L^+ - 10 \text{ V}) / 0.028 \text{ A [Ohm]}$)	Without process connection	25 mm / 3 mm	TBT-1AAZZ0253GZ	6043038
		50 mm / 3 mm	TBT-1AAZZ0503GZ	6043039
		100 mm / 6 mm	TBT-1AAZZ1006GZ	6043040
		150 mm / 6 mm	TBT-1AAZZ1506GZ	6043041
		250 mm / 6 mm	TBT-1AAZZ2506GZ	6043042
		350 mm / 6 mm	TBT-1AAZZ3506GZ	6043043
	Thread G 1/4 B	25 mm / 3 mm	TBT-1AAG10253GZ	6043044
		50 mm / 3 mm	TBT-1AAG10503GZ	6043045
		100 mm / 6 mm	TBT-1AAG11006GZ	6043046
		150 mm / 6 mm	TBT-1AAG11506GZ	6043047
		250 mm / 6 mm	TBT-1AAG12506GZ	6043048
		350 mm / 6 mm	TBT-1AAG13506GZ	6043049
	Thread G 1/2 B	25 mm / 3 mm	TBT-1AAGE0253GZ	6043050
		50 mm / 3 mm	TBT-1AAGE0503GZ	6043051
		100 mm / 6 mm	TBT-1AAGE1006GZ	6043052
		150 mm / 6 mm	TBT-1AAGE1506GZ	6043053
		250 mm / 6 mm	TBT-1AAGE2506GZ	6043054
		350 mm / 6 mm	TBT-1AAGE3506GZ	6043055
	Compression fitting G 1/4 B, CrNi stainless steel ferrule	25 mm / 3 mm	TBT-1AAS10253GZ	6043059
		50 mm / 3 mm	TBT-1AAS10503GZ	6043060
		100 mm / 6 mm	TBT-1AAS11006GZ	6043061
		150 mm / 6 mm	TBT-1AAS11506GZ	6043062
		250 mm / 6 mm	TBT-1AAS12506GZ	6043063
		350 mm / 6 mm	TBT-1AAS13506GZ	6043064
	Compression fitting G 1/2 B, CrNi stainless steel ferrule	25 mm / 3 mm	TBT-1AASE0253GZ	6043065
		50 mm / 3 mm	TBT-1AASE0503GZ	6043066
		100 mm / 6 mm	TBT-1AASE1006GZ	6043067
		150 mm / 6 mm	TBT-1AASE1506GZ	6043068
250 mm / 6 mm		TBT-1AASE2506GZ	6043069	
350 mm / 6 mm		TBT-1AASE3506GZ	6043070	

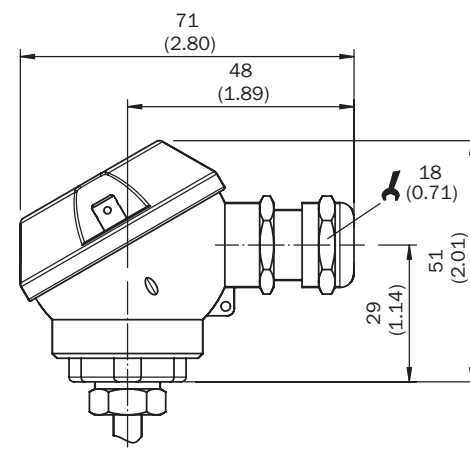
Dimensional drawings

Housing dimensions, without process connection

With cable gland IP 65



With cable gland IP 67



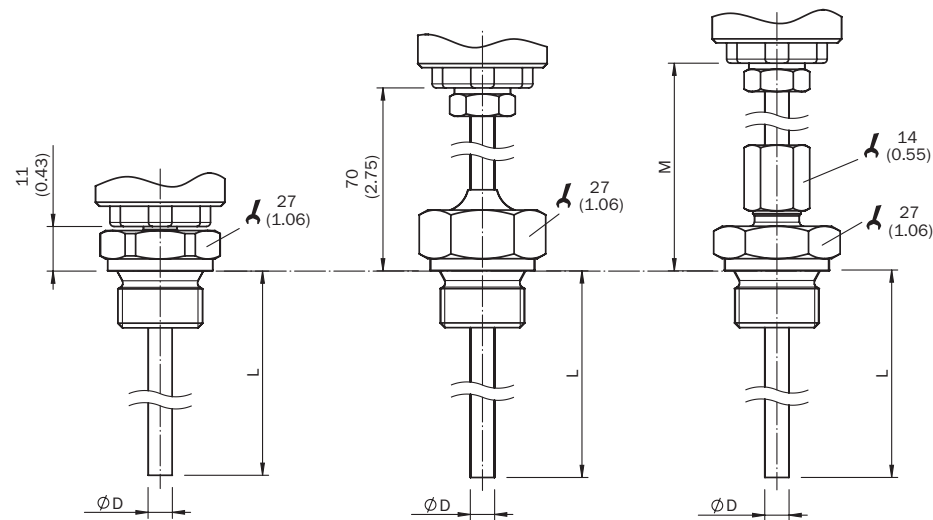
All dimensions in mm (inch)

Process connections, cylindrical threads

Thread, up to 150 °C

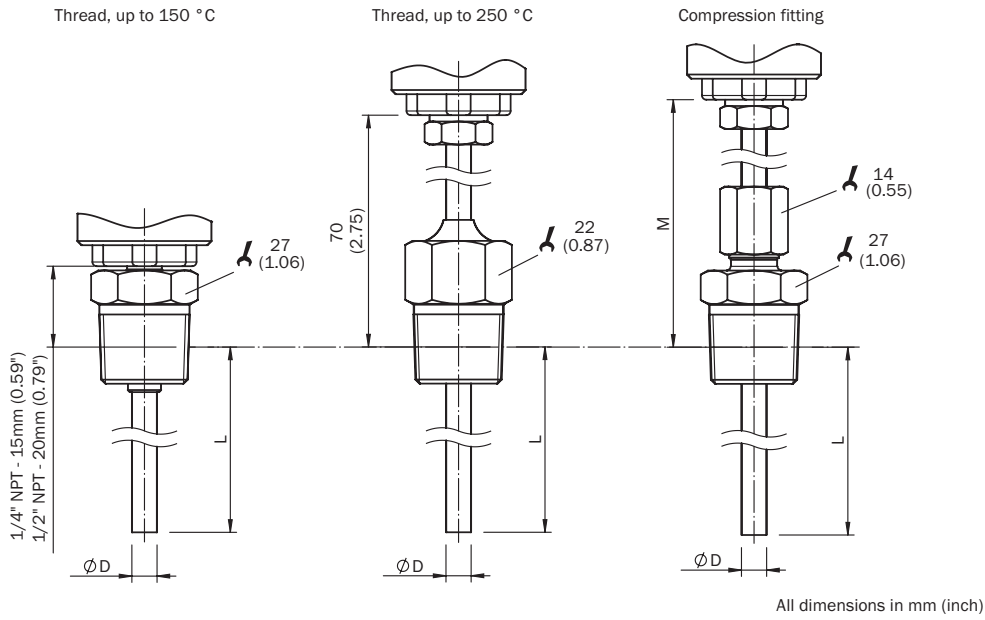
Thread, up to 250 °C

Compression fitting



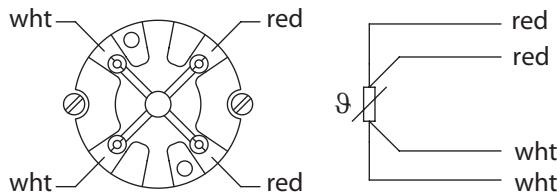
All dimensions in mm (inch)

Process connections, conical threads

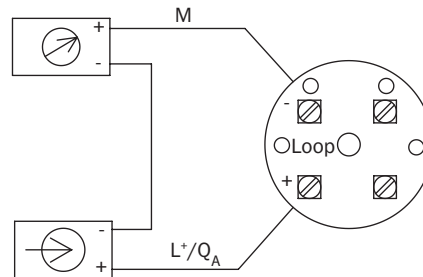


Connection type and diagram

Cable gland M16x1.5, conductor cross section up to 0.75 mm², output signal Pt100



Cable gland M16x1.5, conductor cross section up to 0.75 mm², output signal 4 mA ... 20 mA



Notes

Notes

Notes

Worldwide presence with subsidiaries in the following countries:

Australia
Belgium/Luxembourg
Brasil
Ceská Republika
China
Danmark
Deutschland
España
France
Great Britain
India
Israel
Italia
Japan
Nederland
Norge

Österreich
Polska
Republic of Korea
Republika Slovenija
România
Russia
Schweiz
Singapore
Suomi
Sverige
Taiwan
Türkiye
United Arab Emirates
USA/Canada/México

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Our Business Segment Expertise

Factory automation

With its intelligent sensors, safety systems, and automatic identification applications, SICK provides comprehensive solutions for factory automation.



- Non-contact detecting, counting, classifying, and positioning of any type of object
- Accident protection and personal safety using sensors, as well as safety software and services

Logistics automation

Sensors made by SICK form the basis for automating material flows and the optimization of sorting and warehousing processes.



- Automated identification with barcode and RFID reading devices for the purpose of sorting and target control in industrial material flow
- Detecting volume, position, and contours of objects and surroundings with laser measurement systems

Process automation

Optimized system solutions from SICK ensure efficient acquisition of environmental and process data in many industrial processes.



- Precise measurement of gases, liquids and dust concentrations for continuous monitoring of emissions and the acquisition of process data in production processes
- Gas flow measurements with maximum accuracy thanks to compact gas meters