



TEMPERATURE

2025

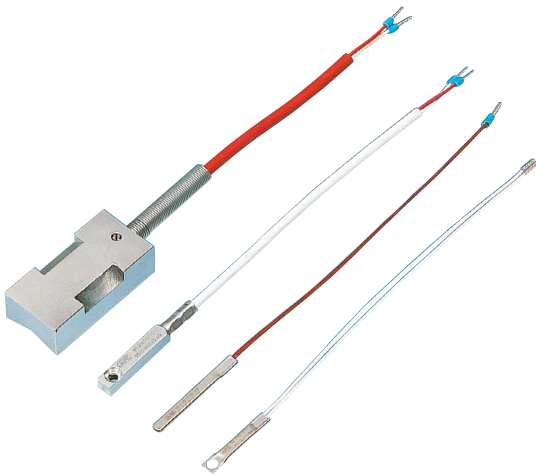


OVERVIEW



PT-00

Surface Resistance Thermometer



Features

- / Easy and fast assembly
- / For round and plane surfaces
- / Temp. range of -50. . . +260°C
- / Different protection fittings
- / Less thermal mass

Description:

The PT-00 series of resistance thermometers are surface temperature sensors on the basis of Pt100. Depending on the requirement, the devices can be supplied with permanent connecting cable or with housing and cable gland. A Pt100 temperature sensor is inserted into the protection fitting in 2-wire circuit which changes its ohmic resistance depending on the temperature. According to the version, the surface fittings are screw-mounted through a mounting hole or clamped by means of strap retainers to the surface to be measured. These thermometers are available in aluminium or stainless steel.

Application:

Thanks to their easy and fast assembly by means of strap retainers, hose band clips or screws, the PT-00 series of surface resistance thermometers well suited for a number of applications such as temperature measurement in closed pipelines as well as on plane surfaces. Since the temperature is measured indirectly, there is no interference with the process medium and, moreover, there is no or very less mechanical groundwork required at the location of measurement. The temperature transmitters in the PT-00 series are not affected by any operational pressure or chemical influences of the medium, thus ensuring their durability. Due to the less thermal mass of the PT-00, the object being measured is not at all affected which enormously simplifies a streamlined measurement of surface temperature.



Versions:

PT-00 Surface Resistance Thermometer

The PT-00 series of contact resistance thermometers is supplied with various fittings for screw-mounting or for fastening with strap retainers or hose clips. In PT-00.1 and PT-00.2 versions, the electrical connection is made through a clamp housing while, in all other versions, it is implemented through a 2.5 meter long cable that has silicon or PTFE sheathing depending the type of fittings.

Protection class: The various versions of PT-00 with clamp housing belong to the IP54 protection class as a standard. Optionally, IP65 protection class is also available.

Accessories: Installation kit (clamping band and thermal conductance paste) for pipes up to a max. diameter of 100 mm.

Technical Specifications:

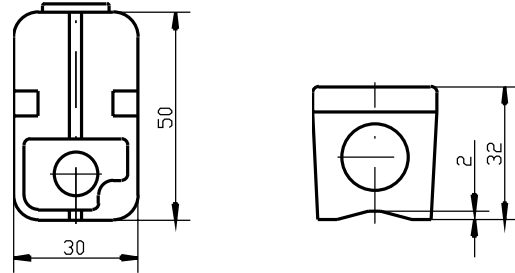
Connection /	pipe ends Sn-plated, with wire sleeves
Connecting cables /	silicone, ambient temperature -50...+180°C PTFE, ambient temperature -50...+260°C
Sensor element /	Pt100 temperature sensor, DIN EN 60751, Cl. B, 2-wire
Protection fitting /	stainless steel 1.4571, aluminium, plastic
Process connection /	strap retainers, hose Binder or screw fastening
Cable length /	2500 mm standard, special lengths on request

Ordering Codes:

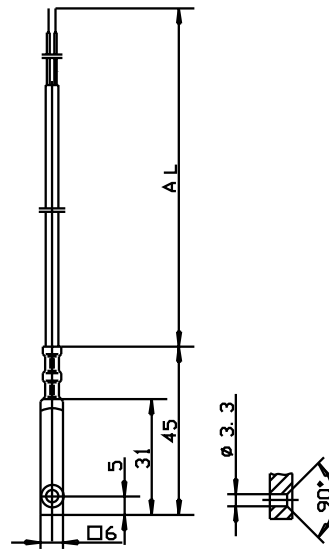
Order number	PT-00. 1
PT-00 Surface Resistance Thermometer	
Version /	
1 = tube contact sensor with clamp housing, (-50°C...+120°C)	
2 = surface contact sensor with clamp housing, (-50°C...+120°C)	
3 = with connecting cable PTFE, fixture hole, protective aluminium fittings (-190°C...+260°C)	
4 = with connecting cable PTFE, fixture hole, protective stainless steel fittings (-190°C...+260°C)	
5a = with connecting cable PTFE, no fixture hole, protective stainless steel fittings (-190°C...+260°C)	
6 = with connecting cable Silicon, fixture by container strap, protective aluminium fittings (-50°C...+180°C)	

Dimensions in mm:

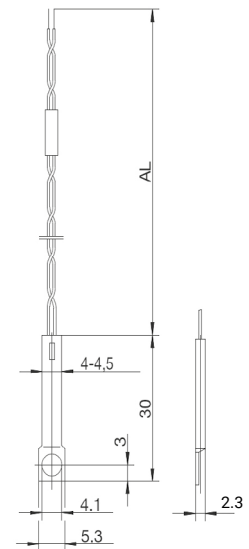
PT-00.1/2



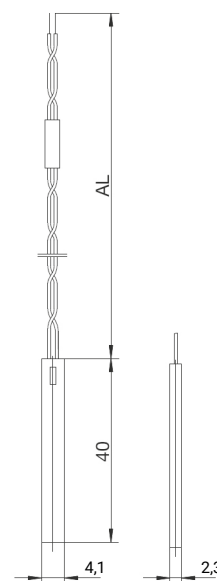
PT-00.3



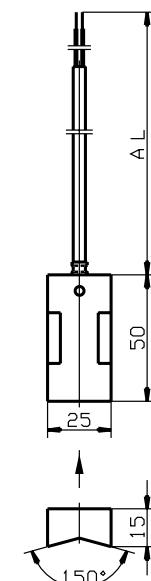
PT-00.4



PT-00.5



PT-00.6





PT-01

Compact Resistance Thermometer



Features

/ Small design

/ Integrated transmitter

/ Power- or resistance output

/ Stainless steel

/ -200°C to +400°C

Description:

A temperature-dependent electrical resistance is integrated in a stainless steel protection tube. It changes its ohmic resistance in relation to the temperature of the media. In the version with a built-in transmitter, the measured value will be converted into a 4...20 mA current signal and made available at the connections of the square-type plug point in 2-wire system. In the version without a transmitter, the plain resistance can be tapped at the plug point. The sensor element is designed in 2-, 3- or 4-wire with a system in order to compensate for the measuring errors through the electrical leads.

Application:

The PT-01 series of Compact Thermometers is unbeatable in their versatility. A choice of 2 shaft diameters, 5 different shaft lengths and various connecting threads allow the user to customize them practically in any location of measurement. In addition, the wide range of temperatures of -200...400°C contributes its part to the fact, that these sensors are used nearly in the entire industry with great success. From a temperature of 120°C upwards, the thermometers are provided with an additional neck tube that serves as a cooling section and protects the sensitive electronic components against overheating.



Versions:

PT-01 Compact Resistance Thermometer

Output: Resistance outputs PT100 2-, 3- or 4-wire without a transmitter are possible. With transmitter the device gives a 4...20 mA current signal in 2-wire circuit.

Process connection: G1/2" B male, smooth shaft (others on request)

Shaft diameter: Protective pipes with 6 mm or 8 mm are available.

Shaft length: Depends on the required depth.

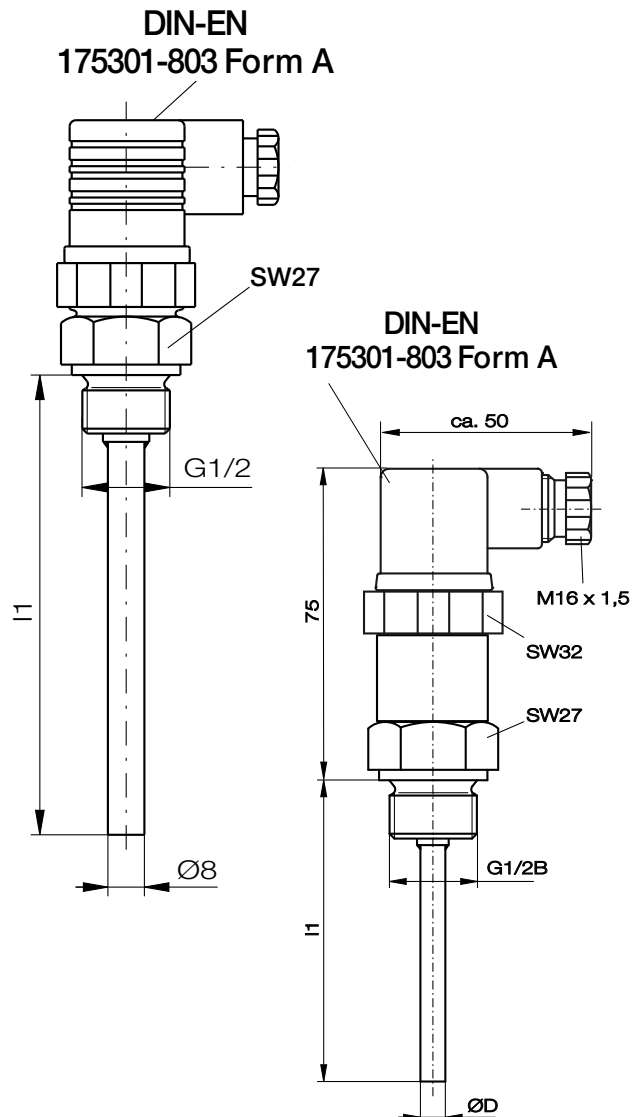
Electrical Specifications:

Output /	4...20 mA, 2-wire or 1 x PT100, 2-, 3- or 4-wire
Supply voltage /	7.5...35 VDC
max. Current /	0.3...1.0 mA
Connection /	angled plug from DIN EN 175301-803 A for 2-, 3- or 4-wire
Protection class /	IP65 ENC60529
EMC /	2004/108/EG, EN 61326 emission (Group 1 Class B) and immune to interference (industrial)

Technical Specifications:

Accuracy /	Transmitter: < 0.1% from the range Class A for DIN EN 60751 $\pm(0.15^{\circ}\text{C} + 0.002^{\circ}\text{C} \times t)$ Class B for DIN EN 60751 $\pm(0.3^{\circ}\text{C} + 0.005^{\circ}\text{C} \times t)$
Material /	Stainless steel 1.4571
Process connection /	G1/2"B (others on request)
Shaft diameter /	6 mm or 8 mm (others on request)
Shaft length /	50...2000 mm
Neck tube /	55 ± 2 mm from 120°C
Storage temp. /	-40...85°C
Pressure /	max. 25 bar

Dimensions in mm:



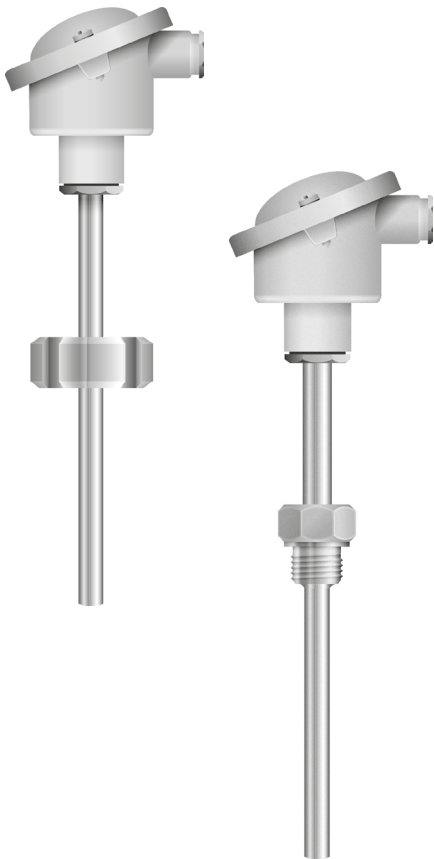
Ordering Codes:

Order number	PT-01.	1.	2.	□□□.	□□□.	□□□
PT-01 Compact Resistance Thermometer						
Output /						
1 = 1 x PT100 3-wire						
2 = 4...20 mA 2-wire						
Shaft diameter /						
1 = 6 mm						
2 = 8 mm						
Desired shaft length /						
□□□ mm (max. 2000mm)						
Temperature range /						
□□□ = start value (from -200°C)						
Temperature range /						
□□□ = end value (up to +400°C)						



PT-02

Insertion Resistance Thermometer



Features

- / All types of designs
- / Integrated transmitter
- / Current or resistance output
- / Stainless steel
- / -50. . . +550°C
- / Insertible into process-
or protection tube
- / Special type connections

Description:

A temperature-dependent electrical Pt100 resistance is situated in a protective stainless steel tube as specified by the customer. It changes its ohmic resistance value proportionally to the temperature of the media and the same is tapped at the connecting head of the PT-02 in 2-, 3- or 4-wire system. This ensures compensation of measuring errors through the electrical feeder lines. If the device has an integrated head transmitter, it generates a 4. . .20 mA current signal, proportional to the temperature, directly from the tapped resistance value as per the proven 2-wire system. The transmitter can also be supplied as ex-version with intrinsically safe operation so that the head of the device can be used in Zone 1.

Application:

The PT-02 series of insertion resistance thermometers is manufactured as per the customer specifications with regard to process connection, shaft length and shaft diameter. They are ideally suited for use in protective tubes (in high pressure applications or hostile media) as well as for direct insertion into the process. The wide range temperatures from -50. . .+550°C contributes to the fact that these sensors are used nearly in the entire industry with great success. The thermometers for temperatures +120°C and up are provided with an additional neck tube that serves as a cooling line and protects the connecting head against overheating. In order to ensure maximum accuracy, only carefully tested measuring elements as per DIN are used, thus allowing the customer to select from Classes A and B.



Versions:

PT-02 Insertion Resistance Thermometer

Neck tube: From a temperature of +120°C upwards using a neck tube is recommendable which serves as a cooling line.

Process Connection: The process connection can be designed as male thread or swivel nut. For pharmaceutical or food-processing industries aseptic glands or clamp connections are available. Chemical and petro-chemical industries can be supplied with any type of flange connection.

Measuring element: The user can select from among elements of Classes A ($\pm (0.15 + 0.002 \cdot t)$ °C) and B ($\pm (0.3 + 0.005 \cdot t)$ °C).

Output: Depending on the further processing of the signal, the Pt 100 can be designed as 2-, 3- or 4-wire system. Also available is a version with two PT 100 measuring elements in one shaft. In this case the Pt100's must be connected as 2- or 3-wire. For integrated head transmitter a 4...20 mA 2-wire signal is generated.

Insertion length: Customer can specify the inserting length from the sealing surface.

Connecting head: 6 different connecting heads as per DIN are available. Please refer to "Drawing for connecting heads". In versions with integrated head measuring transmitter the head Form B is used as a standard.

Technical Specifications:

Pressure /	max. 6 bar for protective stainless tube (mounting in high-pressure protective tubes possible)
Temperature /	max. +70°C at head transmitter
Neck tube /	from media temperature +120°C upwards the standard is a 120 mm neck tube (customized manufacturing possible)
Temperature range /	-50...+550°C
Material /	shaft, neck tube and thread in stainless steel 1.4571
Accuracy /	Pt100 Class A or B as per DIN IEC 751
Electrical connection /	ceramic clamping block in connecting head
Process connection /	welded or screwed in bushing, protective tube, compression fitting

Electrical Specifications:

Supply voltage /	24 VDC (for head transmitter)
Output /	1 x Pt100 2-wire, 1 x Pt100 3-wire, 1 x Pt100 4-wire, 2 x Pt100 2-wire, 2 x Pt100 2-wire or 4 to 20 mA 2-wire
Protection class /	IP54 EN 60529



Ordering Codes:

Order number

PT-02.

1.

2.

1.

1.

□□□□.

3.

2.

□□□□.

□□□□

PT-02 Insertion Resistance Thermometers

Neck tube /

- 1 = no neck tube (up to +120°C)
- 2 = with neck tube (from +120°C upwards)

Process connection /

- 1 = smooth shaft
- 2 = G 1/2"-male
- 3 = G 1/2" swivel nut
- 4 = G 3/4"-male
- 5 = G 3/4" swivel nut
- 6 = G 1"-male
- 7 = G 1" swivel nut
- 8 = NPT 1/2"-male
- 9 = NPT 3/4"-male
- 10 = M 18 x 1.5-male
- 11 = M 18 x 1.5 swivel nut
- 12 = M 20 x 1.5-male
- 13 = M 20 x 1.5 swivel nut
- 14 = M 27 x 2-male
- 15 = M 27 x 2 swivel nut
- 16 = clamp 1"
- 17 = clamp 2"
- 18 = special connection (flange or aseptic gland) in detailed text

Measuring element:

- 1 = 1 x Pt100, Class A as per DIN EC 751
- 2 = 1 x Pt100, Class B as per DIN EC 751
- 3 = 2 x Pt100, Class A as per DIN EC 751 (2- or 3-wire only)
- 4 = 2 x Pt100, Class B as per DIN EC 751 (2- or 3-wire only)

Output:

- 0 = 2-wire
- 1 = 3-wire
- 2 = 4-wire
- 3 = 4 to 20 mA with head transmitter

Insertion length:

□□□□ shaft length from sealing surface in mm

Shaft diameter:

- 1 = 3 mm (for mounting in protection tube)
- 2 = 6 mm
- 3 = 8 mm
- 4 = 15 mm

Connecting head /

- 1 = form A
- 2 = form B (standard for head transmitter)
- 3 = form BUZ (DAN)
- 4 = form BUZ-H (DANW)
- 6 = form BEG
- 7 = form GG

Temperature range /

□□□□ initial value

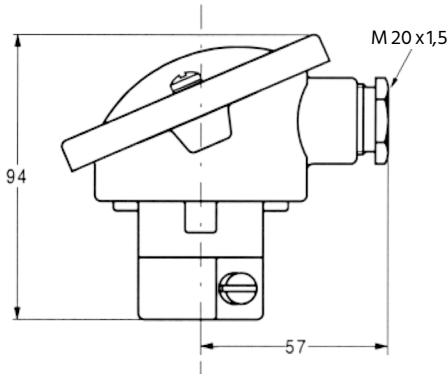
Temperature range /

□□□□ end value

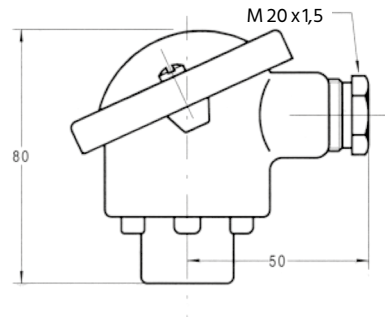


Dimensions in mm:

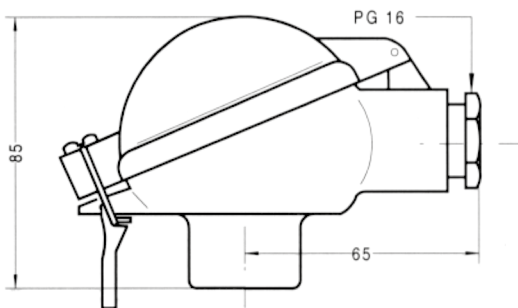
Form A – cover with 2 fastening screws
Material: aluminium pressure casting



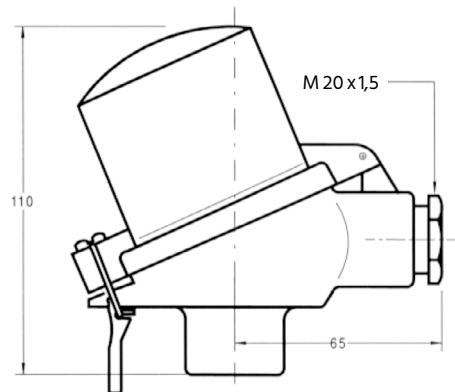
Form B – cover with 2 fastening screws
Material: aluminium pressure casting



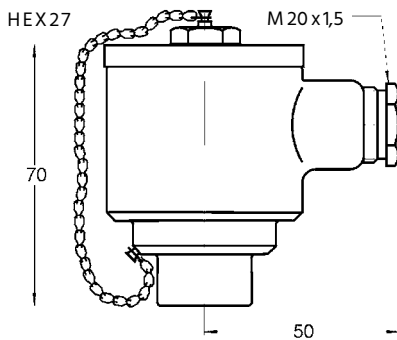
Form BUZ (DAN) – flap cover with bracket
Material: aluminium pressure casting



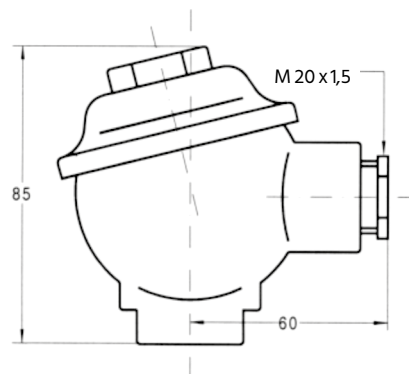
Form BUZ-H (DANW) – high flap cover with bracket



Form BEG – screw cap with chain
Material: stainless steel 1.4571



Form GG – cover with screw closure
Material: steel/cast iron





PT-03

Resistance Thermometer or Thermocouples with Cable Connection



Features

- / With thread or smooth shaft
- / Cable tolerance up to 260°C
- / Sleeve -50 up to +1200°C
- / Pt-100, 2-, 3- or 4-wire
- / 3, 4 or 6 mm sensor diameter
- / Thermocouple K and J
- / Customer-specific solutions

Description:

The PT-03 cable thermometer is an universally applicable temperature sensor on the basis of Pt100 or a thermocouple. A temperature-sensitive measuring element is situated in a protective sleeve made of stainless steel which is permanently fixed to a cable. It can be supplied in different variants with regard to material and length. The measuring element is available as a PT100 class B (optional accuracy class A) in 2-, 3- or 4-wire technology or as a thermocouple type K or J. Using the PT-03, a temperature range of -50...+1200°C can be easily detected. However, the maximum temperature on the cable must not exceed 260°C. Customer-specific special solutions are available on request.

Application:

Cable thermometers are widely used in the industry in a variety of versions. Besides the versions with clamp connection housing or plug, the PT-03 exemplifies a simple and cost-effective method for measuring temperatures securely and accurately even in places which are difficult to access, e.g. shafts or narrow spaces, safely and accurately. By attaching an additional protective hose on the joint between the cable and protective sleeve, the protection class in some of the versions can be upgraded to IP68 so that the PT-03 is also suitable for measuring temperatures in wells. Basically, any type of fluid and gaseous media can be measured which are compatible with the material used.



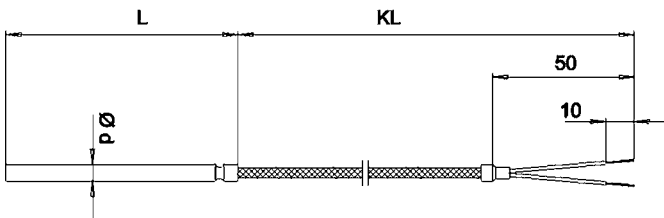
Technical Specifications:

Protection sleeve /	stainless steel 1.4571, optionally 1.4541 or 2.4816 Inconel
Shaft length /	25 mm, 50 mm, 100 mm, 150 mm, 200 mm, 250 mm, 400 mm, special types on request
Shaft diameter /	3 mm, 4 mm or 6 mm
Connecting thread /	G1/2"-male or smooth shaft, optionally G1/4"-male, 1/4"-NPT, 1/2"-NPT or slidable compression fitting, special type connections on request
Media-temperature /	-50...+550°C for resistance thermometer -50...+1200°C for thermocouples
Temperature ranges /	-20...+70°C (PVC-cable) -60...+180°C (Silicone-cable) -65...+200°C (Teflon-cable) -50...+260°C (glass fibre insulated cable)
Cable length /	1000 mm standard, special type lengths on request

Electrical Specifications:

Measuring element /	1 x Pt100 2-wire, 1 x Pt100 3-wire, 1 x Pt100 4-wire, 2 x Pt100 2-wire, or 2 x Pt100 3-wire, 1 or 2 thermocouples type K or J
Accuracy /	Class B, optionally Class A for Pt100, Class 1 for thermocouples type K or J
Prot. Class /	IP65 as per IEC 751 Class B, optionally IP68 (cable material glass fibre: IP50)
El. Connection /	bare cable ends, insulated, or core cable ends, optionally miniature plug for thermocouples

Dimensions in mm:



Ordering Codes:

Order number	PT-03.	3.	2.	1.	1.	1.	3
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PT-03 Resistance Thermometer with Cable Connection

Version /

- 3 = ø 3 mm, for inserting
- 3a = ø 4 mm, for inserting
- 4 = ø 6 mm, for inserting

Insertion or sleeve length /

- 1 = 25 mm
- 2 = 50 mm
- 3 = 100 mm
- 4 = 150 mm
- 5 = 200 mm
- 6 = 250 mm
- 7 = 400 mm
- = special type length in mm

Cable material /

- 1 = -20...+70°C with PVC cable
- 2 = -60...+180°C with silicone cable
- 3 = -65...+200°C with PTFE cable
- 4 = -50...+260°C with glass fibre insulated cable
- 5 = -55...+180°C with shielded FEP cable
- 6 = -50...+260°C with SS-shielded glass fibre cable
- 7 = special material

Cable length /

- 1 = 1000 mm (standard)
- = special type length in mm

Measuring element /

- 1 = 1 x Pt100 Class B, 2-wire
- 2 = 1 x Pt100 Class B, 3-wire
- 3 = 1 x Pt100 Class B, 4-wire
- 4 = 2 x Pt100 Class B, 2-wire
- 4a = 2 x Pt100 Class B, 3-wire
- 5 = 1 x NiCr-Ni
- 6 = 1 x Fe-CuNi
- 7 = 2 x NiCr-Ni
- 8 = 2 x Fe-CuNi

Options / (multiple entries such as /2/9/10 are possible):

- 0 = none
- 1 = process connection G1/4"-male fixed
- 2 = process connection G1/2"-male fixed
- 3 = process connection 1/4"-NPT fixed
- 4 = process connection 1/2"-NPT fixed
- 5 = process connection G1/4"-male slidable
- 6 = process connection G1/2"-male slidable
- 7 = process connection 1/4"-NPT slidable
- 8 = process connection 1/2"-NPT slidable
- 8a = special connection, please specify in detailed text
- 9 = sensor class A instead of Class B
- 10 = material 1.4541 instead of stainless steel 1.4571
- 11 = material Inconel instead of stainless steel 1.4571
- 12 = miniature plug for thermocouples (only thermocouples)



PT-05N



Resistance Thermometer in wall-mounted Housing

Features

/ Room temperature measurement

/ Wall-mounting

/ Class A or Class B

/ Optionally with analogue output

Description:

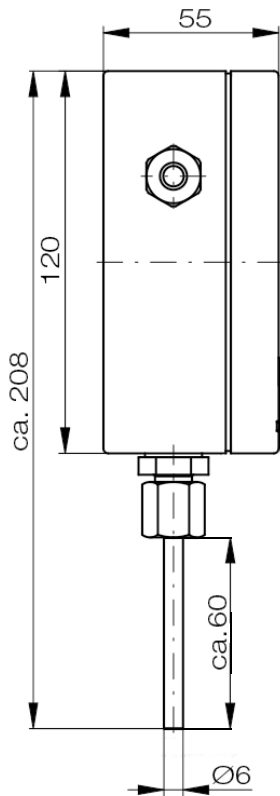
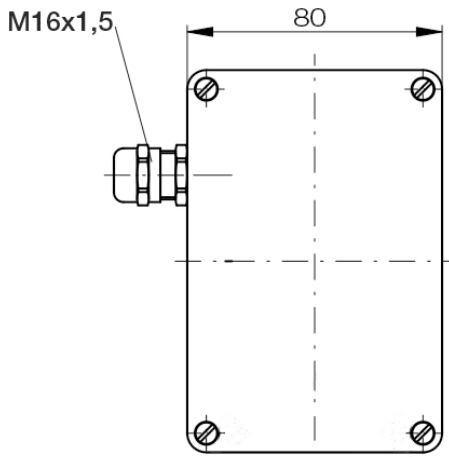
A Pt100 sensing resistor of accuracy class A or B is situated in a stainless steel tube; it changes its ohmic resistance according to the room temperature present outside the measuring tube. This resistance value is tapped either unaltered at the connecting terminals inside the wall-mounted housing of the PT-05 or, first, converted into a 4 to 20 mA output signal and then made available in 2-wire system.

Application:

The PT-05 resistance thermometer is used for simple measuring of room temperatures and is, therefore, used in building and air-conditioning technologies. Wherever room temperature plays an important role in regulating processes, it must be tapped accurately and output electrically. In this respect, PT-05 offers a cost-effective and yet robust solution.



Dimensions in mm:



Technical Specifications:

Housing /	120 x 80 x 55 mm (H x W x D)
Sensor length /	60 mm stainless steel (other lengths available on request)
Sensor diameter /	6 mm
Temperature range /	-50. . . +70°C
Accuracy of measurement /	Class A as per DIN EN 60751 ± (0.15°C + 0.002°C x t) Class B as per DIN EN 60751 ± (0.3°C + 0.005°C x t)
Output /	MU-410 4. . .20 mA
Measuring resistance /	Pt100 as per DIN EN 60751 Load capacity: 0.3. . .1.0 mA
Options /	PT1000 & Ni100

Electrical Spec.(Transmitter):

Protection class /	IP68
Cable gland /	M16 x 1.5
Power output /	4. . .20 mA, 2-wire technology
max. Load /	$R_b \leq (U_b - 12V) 20 \text{ mA}$
Supply voltage /	12. . .30 VDC

Ordering Codes:

Order number	PT-05N.	1B.	1.	0.	0
PT-05N Resistance thermometer in wall-mounted housing					
Sensing resistor /	1B = 1 x Pt100, Class B, 3-wire 1A = 1 x Pt100, Class A, 3-wire 2B = 2 x Pt100, Class B, 3-wire 2A = 2 x Pt100, Class A, 3-wire				
Transmitter /	0 = none 1 = standard transmitter 4. . .20 mA, 2-wire, factory configured				
Temperature range of power output /	0 = no power output □□□ - □□□°C Assignment of power output to temp. range in detailed text				
Special features /	0 = none 1 = please specify in detailed text				



PT-06

Resistance Thermometer for Pipes



Features

/ For round surfaces

/ Pt100, Pt1000, NiCr-Ni

/ Aluminium sensor

Description:

The PT-06 is a resistance temperature-sensor, specifically designed for round surfaces. The slightly angled form of the sensor helps to obtain the value from a greater area from rounded objects for a more accurate measurement of temperatures, as opposed to other, flat thermometers. A thermal-element (NiCr-Ni Typ K) or a resistance-temperature-sensor (Pt100/Pt1000) can be used for the measurement. The standard Version of the PT-06 comes with a 2 m silicone-cable with loose ends and end ferrules. Other lengths are available on request.

Application:

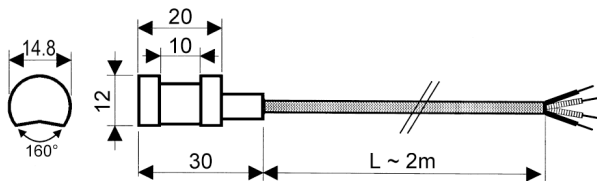
The PT-06 can be installed via tension belts or hose connectors, making it very easy to use. The indirect measuring does not disturb the media and only few to none mechanical work has to be done on the pipe itself. The PT-06 series thermometers are not subjected to any kind of process-pressures or chemical influences of the media, increasing their lifespan. To reach the highest efficiency, the use of thermal compound between sensor and pipe is strongly advised.



Technical Specifications:

Sensor /	Pt100 (4-wire) Pt1000 (4-wire) NiCr-Ni
Measuring range /	-50. . .+200 °C
Accuracy /	Pt100 / Pt1000: DIN class B NiCr-Ni: class 1
Sensor material /	aluminium
Cable connection /	silicone cable or rather silicone compensation-cable, loose ends length: 2 m (max. 200 °C) other lengths on request
Protection class /	IP54

Dimensions in mm:



Ordering Codes:

Order number	PT-06.	1.	2
PT-06 Surface-Sensor for pipes			
Sensor /	1 = Pt100 (4-wire) 2 = Pt1000 (4-wire) 3 = NiCr-Ni		
Cable length L /	1 = 2 m (Standard) 2 = any, please specify in m □□□		



PT-07

Resistance thermometer for Ambient Temperatures



Features

- / Efficient temperature measuring
- / Surface mounted
- / IP66 protection for outside areas
- / Economic alternative

Description:

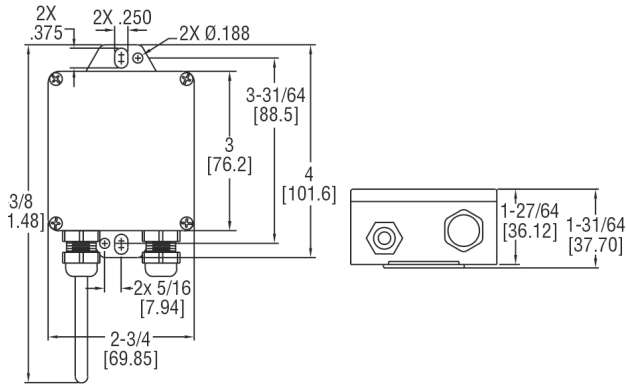
A Pt100 sensing resistor of accuracy class B is situated in a stainless steel tube, changing its ohmic resistance according to the room temperature present outside the measuring tube. This resistance value is tapped unaltered at the connecting terminals inside the wall-mounted housing of the PT-07, available as a 2-wire signal.

Application:

The resistance thermometer PT-07 supplies an easy way of measuring ambient temperatures and is best used within the fields of building- and climate-technologies. Whenever the room- or ambient-temperature is of concern for a process, it has to be measured accurately. The PT-07 offers a solution for that, while being very cost-effective but still resilient.



Dimensions in inch [mm]:



Technical Specifications:

Accuracy /	Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); PT100 temperature sensor: DIN class B: $\pm 0.3^{\circ}\text{C}$ @ 0°C ($\pm 0.54^{\circ}\text{F}$ @ 32°F)
Operating temperature /	-40. . . +120 $^{\circ}\text{C}$
Probe diameter /	6 mm
Probe length /	88.9 mm
Probe material /	304 SS
Temperature sensor /	Pt100 Class B two wire DIN 385
Mounting /	Suspension or surface
Enclosure /	NEMA 4X (IP66)
Weight /	85 g

Ordering Codes:

Order number	PT-07.	1
PT-07 Resistance thermometer		
Version /		
1 = 10 k Ω thermistor, Type III		
2 = 10 k Ω thermistor, Type II		
3 = 3K Ω		
4 = Pt100 Ω RTD		
5 = Pt1000 Ω RTD		
6 = 20K Ω thermistor		



TD-01

Digital Thermometer



Features

- / Large size LCD-display
- / Optional analogue output
- / Various process connections
- / Completely from stainless steel
- / Protection class IP65

Description:

A temperature-sensitive resistor is located in the stainless steel sensor TD-01, which responds to a change of the upcoming temperature. The electronic modul of the unit evaluates this process and either purely indicates the temperature on a large LCD display. The purely indicating version of the TD-01 is supplied via a 3.6 VDC long life lithium battery and doesn't need any auxiliary energy. The version with power output however needs a 17 to 30 VDC supply voltage. To connect the TD-01 to the monitored process seven standard threads are available and can even be supplemented by customized versions. The electronic housing of the unit is either rigidly or cable connected to the stem and it is fixed either directly to the measuring spot by means of the process connection or wall or surface mounted by 3-hole flanges and wall brackets.

Application:

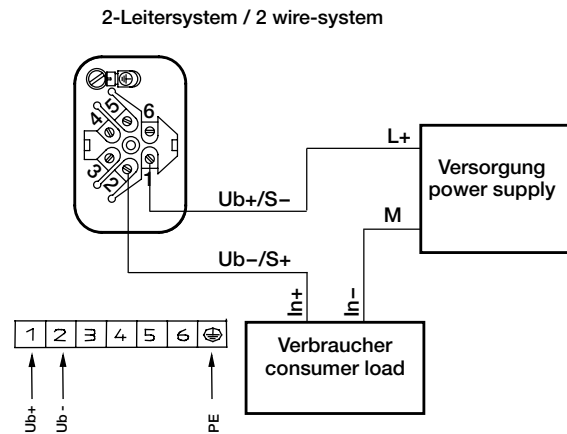
With the material-version (wetted parts stainless steel) and an IP65 protection class for the NG100 stainless steel housing, the TD-01 is well prepared for duty in common machine-, apparatus-, tank- or pipe-constructions, as well as in chemical- and food-production. Besides the standard versions (see ordering codes) special versions of the digital thermometer can be manufactured on demand. The advantage of this is that existing measuring points (protective tubes) as well as outdated, defective temperature indicators or transmitters can easily be replaced.



Technical Specifications:

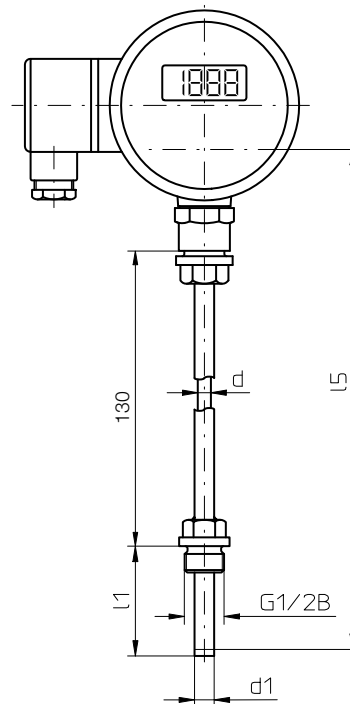
- Temp. range /** -200...+600°C DIN EN 60751
- Ambient temp. /** -10...+50°C
- Storage temp. /** -20...+70°C
- Protection class /** IP65 EN 60529
- Neck tube /** beginning with medium temperatures of +120°C a 120 mm neck tube is standard (customized version e.g. for thicker pipe or vessel isolations are possible)
- Accuracy /** Display: 0,3% FS ± 1 Digit
Sensor: ± 0,3K at 0°C; ±(0,3 + 0,005*|t|)
- Version with transmitter:
Pt 100 Class 0,5
- Temperature indicator:
Pt1000 Class B, DIN EN 60751
- Display /** 4-digit LCD display, character height 18 mm
- Housing /** Ø 100mm, stainless steel 1.4301
- Protective tube /** Stainless steel 1.4571
- Cable material /** PTFE

Electrical Connection:

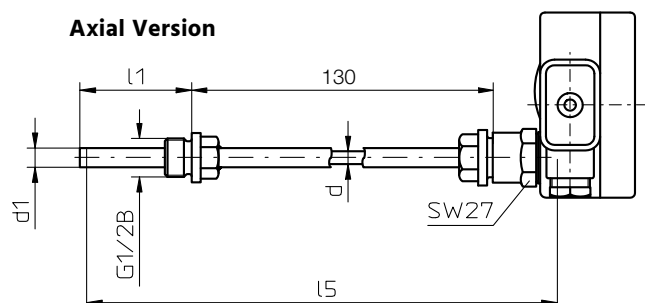


Dimensions in mm:

Vertical Version



Axial Version



Electrical Specifications:

- Supply voltage /** Temperature indicator:
3.6 V lithium battery, AA, changeable, life span 5 year (lifespan in months, dep. on use, about 56h cont. operation)
- Temperature indicator with 2-wire transmitter: 17...30 VDC
- Power consumption /** P max: 1 W
- Output /** 4...20 mA 2-wire
- Load /** Temperature indicator with transmitter:
 $R_B = (U_B - 17V) / 20 \text{ mA max.}$
 $R_B = \text{burden,}$
 $U_B = \text{supply voltage}$
- El. connection /** Cable housing



Ordering Codes:

Order number	TD-01.	1.	3.	B.	□.	1.	□.	□.	□.	A.	0.
TD-01 Digital Thermometer											
Sensor /											
1 = sensor directly mounted to the electronic housing (rigid)											
2 = sensor cable mounted to the electronic housing (flexible)											
Process connection /											
1 = without thread											
2 = G 1/2"-AG turnable											
3 = G 3/4"-AG turnable											
4 = G 1"-AG turnable											
5 = M 18 x 1.5 turnable											
6 = M 20 x 1.5 turnable											
7 = M 24 x 1.5 turnable											
8 = M 27 x 1.5 turnable											
Version /											
A = Batterieversion mit reinem Temperaturanzeiger (Pt1000)											
B = Anzeige der Temperatur mit zusätzlichem 4..20 mA Ausgang (Pt100)											
Insertion length L1 /											
□□□□ insertion length from sealing surface in mm											
Shaft diameter d1 /											
1 = 6 mm											
2 = 8 mm											
3 = 10 mm											
Cable length for flexible sensor /											
0 = no cable, connected to the housing											
□□□□ = cable length in meter											
Temperature range start value /											
□□□□ start value in °C (for transmitter = 4 mA)											
Temperature range end value /											
□□□□ end value in °C (for transmitter = 20 mA)											
Mounting position /											
F = flexible sensor with cable connection on the side of the electronic housing											
A = rigid sensor mounted to the back of the electronic housing											
V = rigid sensor mounted to the bottom of the electronic housing											
Housing /											
0 = standard housing without mounting flange											
1 = prepared for wall mounting with separate wall bracket											
2 = 3 hole front ring for flush mounting											
3 = 3 hole ring at the back for surface mounting											





GT-04

Gas Expansion Thermometer with Nitrogen Filling



Features

- / Housing sizes from 2.5" to 10"
- / Stainless steel housing
- / Directly att. sensor or capillary tube
- / Temperature sensor and process connection, individually configurable
- / Measuring ranges up to +800°C
- / Optionally, alarm or analogue output
- / Measuring acc.: Cl. 1.0 and Cl. 0.6

Description:

The GT-04 series of gas expansion thermometers consists of a housing with integrated movement and a sensor system connected directly or through a capillary tube. The sensors are filled with neutral nitrogen gas that serves as a transmission medium for the temperature data. The nitrogen gas pressure in the sensor system is evaluated by the movement and mechanically displayed.

Application:

Thanks to a wide variety of possible versions, GT-04 gas expansion thermometers can be used in nearly any type of applications where the process temperature needs to be captured locally or by means of a remote display. Moreover, limit contacts, analogue output signals or optionally available temperature recorders enable evaluation of temperature data as well as controlling processes upstream or downstream.



Ordering Codes:

Order number	GT-04.	R.	X.	100.	L.	A.	37.	0.	0.	9x90.	BX1.	0.	0
GT-04 Gas Expansion Thermometer													
Version (table 1) / R = with directly mounted sensor C = with capillary tube S = special design													
Housing material / X = stainless steel													
Housing diameter / 63 = 2.5" (63 mm) 80 = 3" (80 mm) 100 = 4" (100 mm) 160 = 6" (160 mm) 250 = 10" (250 mm) xxx = special design, please specify in detailed text													
Damping / X = unfilled (standard) L = with glycerin filling S = with silicone oil filling K = with oil filling for devices with built-in limit contacts													
Version / A..H = as per table 1													
Operating range / 1..47 = as per table 2													
Capillary tube (in mm)** / 0 = none X [..] = as per table 3 XP [..] = as per table 3													
Capillary sheathing / 0 = none SP..PB = as per table 4 (only for capillary tube X)													
Sensor / DxL = sensor diameter x sensor length as per table 5													
Process connection / BX1..CS3X6 = as per table 6													
Electrical output signals / 0 = none M..TT2 = as per table 7													
Options / Multiple naming possible 0 = none A..L = as per table 8													

** Example: X [1000] = Capillary tube; Material: stainless steel 1.451; Length: 1000 mm;



Version (table 1):

with directly mounted sensor			
	connection at the bottom		A
	connection at the back, in the center		E
	connection at the bottom, at 90° angle (A to D: direction of 90° angle)		T
	connection at the back, at the center with rim at the back		F

with capillary tube			
	connection at the bottom with wall holder		A
	connection at the bottom with rim at the back for surface-mounting		B
	connection at the bottom with rim in the front for flush mounting		D
	connection at the back with rim at the back		F
	connection at the back, in the center with rim in the front		G
	connection at the back, eccentric with triangular front ring and U-clamp for flush mounting		H

Technical Specifications:

Versions and material / see the following pages

Limit contacts and analogue outputs / see table 7

Options / see table 8

max. Process pressure /

without protection sleeve: min. 16 bar (depending on temperature, sensor diameter and length)

with protection sleeve: 25 bar (special designs for higher pressure on request)

min. Sensor length / see table 5 (shorter lengths on request)

Depending on the medium and the sensor diameter different minimum sensor lengths are recommended.

Example:

Sensor diameter: 10 mm

Medium:

water: $L_{\min} = 60 \text{ mm}$

oil: $L_{\min} = 100 \text{ mm}$

air: $L_{\min} = 160 \text{ mm}$

max. Sensor length / 3 m (greater lengths on request)

max. length of capillary tube / 30 m (greater lengths on request)

Accuracy /

NG 63, 80,
NG 100, 160, 250: Cl. 1.0

Optional
NG 100, 160, 250: Cl. 0.6

Overload safety / 30 % of operating range end value however, max. +800°C (optionally 100 %)

Protection / IP65



Versions:

GT-04 Gas Expansion Thermometer

R = Thermometer with directly mounted sensor

C = Thermometer with capillary tube

Materials:

X = housing stainless steel 1.4301, with bayonet ring, IP 65 mineral glass dial, 4 mm aluminium scale, white, lettering black aluminium indicator, black brass movement

Housing diameter:

Nominal size: diameters: 63, 80, 100, 160, 250 mm

Customized designs:

(on request) rectangular housing:
72x72, 96x96,
144x144, 192x192,
72x144 vertical or horizontal,
96x192 vertical or horizontal
temperature recorder rectangular:
192 x192, 288x288 mm,
round: d = 260 mm

Damping:

X = unfilled

L = with glycerin filling for vibration attenuation

S = with silicon oil filling (increased vibration attenuation)

K = with oil filling (for devices with built-in limit contacts)

Sensor:

The temperature sensors are basically made of stainless steel 1.4541. Minimum sensor length is limited by the parameter L_s (see Table 5). This parameter indicates the sensitive part of the sensor which must be immersed into the medium in any case.

While specifying, please use the following format:

Sensor diameter x sensor length (in mm)

Example: 10x200

Operating ranges (table 2):

Nr.	Range in °C	Scale division in °C		Annotation
		Class 1.0	Class 0.6	
1	-200...+50	5	2	option
2	-120...+40	2	1	option
3	-110...+50	5	1	option
4	-100...+100	5	1	option
5	-100...+50	5	1	option
6	-80...+40	2	1	option
7	-60...+40	2	0.5	option
8	-60...+60	2	1	option
9	-50...+50	2	0.5	option
10	-40...+20	1	0.5	option
11	-40...+40	1	0.5	standard
12	-40...+60	2	0.5	option
13	-40...+80	2	1	option
14	-40...+110	5	1	option
15	-40...+120	2	0.5	option
16	-40...+160	5	1	option
17	-30...+30	1	0.5	standard
18	-30...+50	1	0.5	option
19	-30...+70	2	0.5	option
20	-30...+170	5	1	option
21	-20...+40	1	0.5	option
22	-20...+60	1	0.5	option
23	-20...+80	2	0.5	option
24	-20...+100	2	1	option
25	-20...+120	2	1	option
26	-20...+180	5	1	option
27	-15...+45	1	0.5	option
30	-10...+50	1	0.5	option
31	-10...+110	2	1	option
32	-10...+150	5	1	option
35	0...+60	1	0.5	standard
36	0...+80	1	0.5	option
37	0...+100	2	0.5	standard
38	0...+120	2	1	standard
39	0...+160	5	1	standard
40	0...+200	5	1	option
41	0...+250	5	2	option
42	0...+300	5	2	option
43	0...+400	10	2	option
44	0...+500	10	5	option
45	0...+600	10	5	option
46	0...+700	10	5	option
47	0...+800	10	5	option



Capillary tube (table 3):

only for GT-04.C...

	Material	d (mm)	T _{min.} (°C)	T _{max.} (°C)	Code
	stainless steel 1.4541	2	-260	800	X
	stainless steel with PVC-coating	4	-60	120	XP

Capillary sheathing (tab. 4):

only for GT-04.C...

	Material	d (mm)	T _{min.} (°C)	T _{max.} (°C)	Code
	flexible, stainless steel 1.4301 with PVC coating	8	-60	120	SP
	flexible, stainless steel 1.4401	7	-260	800	X
	flexible, stainless steel 1.4401 with PVC coating	7	-60	120	XP
	lead cladding	16	-20	200	PB

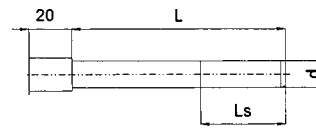
Limit contacts and analogous outputs:

Limit contacts are intended for alerting when certain threshold limits are crossed in either direction. The GT-04 thermometers in housing sizes 4" (100 mm) and 6" (160 mm) as well as the rectangular housing designs can be optionally equipped with up to 4 snap action contacts or inductive contacts integrated into the housing. The contacts will be designed as NO-contact or NC-contact (as the case may be, with reference to increasing temperature). In addition, micro-switches with higher switching load, contacts mounted on the housing or pneumatic contacts can be supplied on request.

Analogue outputs are meant for transferring the measuring data to higher-level display, evaluation or control systems. Angle of rotation measuring transmitters mounted into the housing or PT-100 measuring transmitters with sensor integrated PT-100 sensor are available.

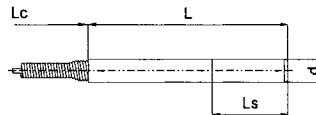
Sensor dimensions (table 5):

Possible sensor diameter and minimum sensor length L_s (in mm)* (see table)



GT-04.R

sensor directly mounted
min. sensor length:
L = L_s



GT-04.C

with capillary tube
min. sensor length:
L = L_s

Sensor Diameter (in mm)	Standard Thermometer			Thermometer with alarm contact	
	GT-04.R sensor directly mounted	GT-04.C with capillary up to 5 m	GT-04.C with capillary above 5 m	GT-04.R sensor directly mounted	GT-04.C span: 80 °C above 5 m
6	120	---	---	120	---
6.35	96	---	---	96	---
7	80	190	---	80	---
8	60	135	---	60	---
9	45	100	190	45	190
10	35	80	150	35	150
11	30	65	120	30	120
12	25	55	95	25	95
12.5	25	50	90	25	90
13	25	50	90	25	90
14	20	40	70	20	70
15	20	35	60	20	60
16	17	30	55	17	55
18	16	30	50	16	50
20	15	20	43	15	43

* others on request



Process connection (tab. 6):

Versions (tab. 7):

	Version	Connection	Material stainless steel 1.4301
	with swivel nut for GT-04.R and GT-04.C	1/2" BSP	BX1
		3/4" BSP	BX2
		1" BSP	BX3
	with perman- ent nipple for GT-04.R and GT-04.C	1/2" BSP	CX1
		3/4" BSP	CX2
		1" BSP	CX3
		1/2" NPT	CX4
		3/4" NPT	CX5
		1" NPT	CX6
	with turnable nipple for GT-04.R & GT-04.C	1/2" BSP	A04X1
		3/4" BSP	A04X2
		1" BSP	A04X3
	with double nipple and swivel nut for GT-04.R and GT-04.C	1/2" BSP	B01X1
		3/4" BSP	B01X2
		1" BSP	B01X3
		1/2" NPT	B01X4
		3/4" NPT	B01X5
		1" NPT	B01X6
	with double nipple and swivel nut, can be shifted to capil- lary for GT-04.C	1/2" BSP	CS2X1
		3/4" BSP	CS2X2
		1" BSP	CS2X3
		1/2" NPT	CS2X4
		3/4" NPT	CS2X5
		1" NPT	CS2X6
	with dou- ble nipple and swivel nut, can be shifted to sensor for GT-04.R and GT-04.C	1/2" BSP	CS3X1
		3/4" BSP	CS3X2
		1" BSP	CS3X3
		1/2" NPT	CS3X4
		3/4" NPT	CS3X5
		1" NPT	CS3X6
Other process connections:			
Metric threads, aseptic glands, tri-clamp, surface sensors, helical sensors for air etc. on request			

snap action contacts		AC: 50 VA (max. 250V) DC: 30 W (max. 250V)
x = 1: NO-contact function x = 2: NC-contact function x = 3: change-over	for housing diameters 4", 6", rectangular housing 96x96, 144x144, 72x144 mm	
1 contact	NC-contact or NO-contact, change-over	Mx
2 contacts	NC-contact, NO-contact or 2 change-over	Mxx
3 contacts	NC-contact or NO-contact not meant for 72x144 housing	Mxxx
4 contacts	NC-contact or NO-contact, not meant for 72x144 housing	Mxxxx
Inductive contacts as per NAMUR (intrinsically safe contact protecting relay required for operation)		
1 contact	NC-contact or NO-contact	Ix
2 contacts	NC-contact, NO-contact	Ixx
3 contacts	NC-contact or NO-contact not meant for 72x144 housing	Ixxx
Analogue outputs:		
Angle of rotation measuring transmitter with 0...100 Ohm, 3-wire output	diameters 100, 160 mm 96x96, 144x144 mm	R
PT-100-Measuring transmitters with 4 to 20 mA, 2-wire output, including PT-100 element in the sensor and cable	diameters 100, 160 mm 96x96, 144x144, 72x144 mm	TT2

Options (tab. 8):

housing stainless steel 1.4401 instead of 1.4301	for GT-04...X...	A
dial made of safety glass		B
maximum indicator, can be reset with key	for devices without contact	C
maximum indicator, can be reset with key	for devices with contact	D
micrometer indicator		E
movement and indicator made of stainless steel 1.4301		F
double scale °C + °F		G
precision measuring version class 0.6	for 6" (160 mm), 10" (250 mm), 144x144, 192x192, 72x144 mm only	H
mirror scale	in combination with precision measuring version only for 6" (160 mm), 10" (250 mm) only	I
polished sensor		K
sensor HALAR coated	max. 1000 mm, max. 200°C	L



Stainless steel sensor protection sleeves:

can be used for sensors with A04, B, C and CS3 connections

Versions (Table 9):

		<p>TS02... with male thread sensor-side</p>				
		<p>TS03... with female thread sensor-side</p>				
Typ	.1	.2	.3	.4	.5	.6
max. sensor diameter	10	10	10	12.5	12.5	12.5
L (mm) (min. length)	100	100	100	63	63	63
sensor connection d1 (mm)	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2
Process connection d2 (mm)	G 1/2	G 3/4	G 1	G 1/2	G 3/4	G 1
internal diameter d3 (mm)	10.5	10.5	10.5	13	13	13
external diameter D (mm)	12.5	12.5	12.5	15	15	15
HEX 1 (mm)	22	27	36	22	27	36
HEX 2 (mm)	27	32	36	27	32	36

Parameter L1: for sensor connections B, C, CS3: L1 = sensor length
for sensor connection A04: L1 = sensor length + 15

Example: TS02.2.120 protection sleeve with G1/2-male sensor-side, G 3/4male process-side, length 120 mm, for sensor diameter 10 mm





BT-01

Bimetallic Thermometer



Features

/ Affordable price

/ Robust

/ Accuracy Class 1.0

/ Bayonet ring housing

/ Many possibilities of connection

/ Switching contacts

Description:

In bimetallic thermometers, varying thermal expansion of metals is utilized to measure and regulate temperatures. A spring element is present in an immersible brass or stainless steel tube that consists of two curved metallic strips rolled over each other, possessing different coefficients of thermal expansion. When the temperature rises the outer metallic strip expands more than the inner strip. The torsion of the spiral resulting from this action directly influences an indicator movement that displays the temperature on a dial.

Application:

The BT-01 series of precision bimetallic thermometers offers an excellent alternative to machine or glass thermometers considering the fact that they are just as cost-effective and accurate as their siblings, however, offer better reading comfort. The design of the bimetallic thermometer is extremely robust and the protection tubes which can be supplied in brass or stainless steel, are resistant to hostile media. These thermometers are available for direct mounting as well as for inserting into protection tubes, optionally with a smooth shaft, permanently fixed threaded stem or swivel nut in all commonly used thread variants. This makes the BT-01 compatible with nearly any type of processes. Starting from a minimum temperature of -50°C up to a maximum temperature of $+500^{\circ}\text{C}$, the BT-01 series of thermometers is capable of recording a temperature range that covers a large section of all applications.



Versions:

BT-01 Bimetallic Thermometer

Mounting position: The mounting position of BT-01 can be selected between axial and vertical positions. For most of the versions a pivoted housing that can be tilted in both directions is available on request.

Nominal size: The housing diameters can be selected between 63, 80, 100 und 160 mm.

Process connection: All versions are available with smooth shaft, permanently fixed screw on pin, turnable screw on pin or with loose-fitting swivel nut where only the variants with permanently fixed pin can be provided with NPT thread.

Immersion tube diameter: The immersion tube diameters can be selected between 6, 8 and 10 mm to facilitate mounting in protection tube as well as for direct mounting.

Shaft length: The immersion shaft is manufactured as per customer's specification for length which must be indicated in mm from the point of sealing surface.

Neck tube: If the housing and process connection are separated, for example, by means of an insulating layer, the thermometer can be fitted with a neck tube. Normally, these extensions protect the display from extreme access heat. The lengths are displayed in a table.

Housing material: St. steel – other materials on request.

Operating range: The operating ranges are between -50°C and +500°C.

Additional features: For all devices marking or maximum value indicators and fluid filled housings are available (for 4" and 6" diameters only).

Connecting thread: With regard to connecting threads various cylindrical or conical thread standards can be selected.

Material: As materials for the immersion tube and thread brass or stainless steel can be selected.

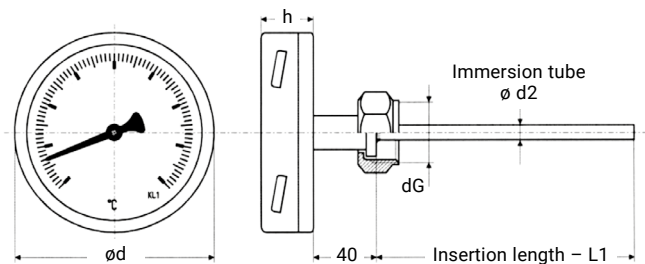
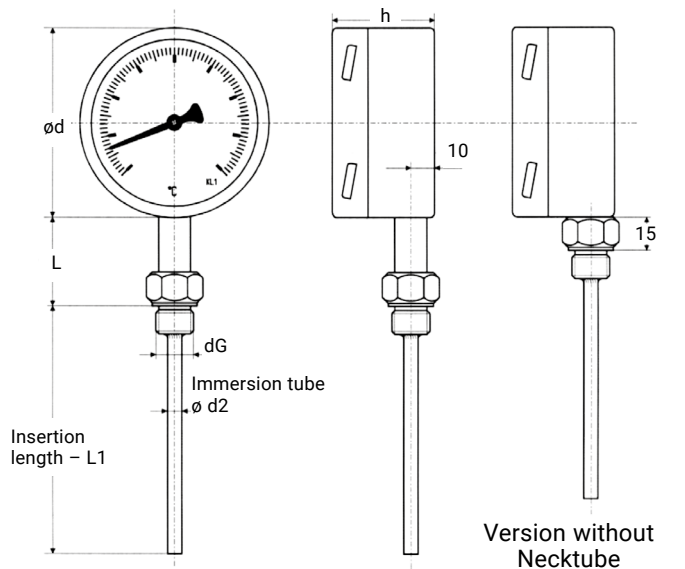
Neck tube lengths (standard):

Temperature	Length for vertical thread	Length for axial thread	Length for immersion tube
< 300 °C	37 mm	12 mm	11 mm
> 300 °C	60 mm	37 mm	37 mm
500 °C	-	60 mm	57 mm

Technical Specifications:

- Ambient temp. /** -25. .+70°C
- Pressure /** PN16 without immersion tube
PN50 with immersion tube
- Accuracy /** Class 1 according to DIN EN 13190
- Housing /** Bayonet ringcap, 63, 80, 100, or 160 mm diameter
- Housing material /** St. Steel 1.4301 – other materials on request
- Protection class /** IP 65 according to EN 60529
- Options /**
 - crimped ring housing with/without oil filling
 - Low-cost-version

Dimensions in mm:





Ordering Codes:

Order number **BT-01.** **A.** **F.** **80.** **2.** **1.** **□□□□.** **1.** **E.** **04.** **B.** **2.** **1.** **0**

BT-01 Bimetallic Thermometer

Mounting position /

- A = axial
- V = vertikal
- Z = tilted (special order)

Housing style /

- B = bayonet ringcap
- F = crimped ring

Nominal size /

- 63 = 63 mm diameter
- 80 = 80 mm diameter
- 100 = 100 mm diameter
- 160 = 160 mm diameter

Process connection /

- 1 = smooth shaft
- 2 = smooth with screw fitting
- 3 = fixed screw on pin
- 4 = turnable screw on pin
- 5 = loose swivel nut

Immersion tube diameter /

- 1 = 6 mm
- 2 = 8 mm
- 3 = 10 mm

Shaft length /

□□□□ please specify shaft length in mm

Neck tube /

- 1 = standard length (siehe Tabelle)
- 9 = special lengths on request

Housing material /

- E = Stainless steel
- 9 = other materials on request

Measuring range /

- | | |
|-------------------|------------------------------|
| 01 = -50...+50 °C | 09 = 0...+160 °C |
| 02 = -30...+50 °C | 10 = 0...+200 °C |
| 03 = -20...+40 °C | 11 = 0...+250 °C |
| 04 = -20...+60 °C | 12 = 0...+300 °C |
| 05 = 0...+60 °C | 13 = 0...+400 °C |
| 06 = 0...+80 °C | 14 = 0...+500 °C |
| 07 = 0...+100 °C | 99 = other ranges on request |
| 08 = 0...+120 °C | |

Additional features /

- A = none
- B = marking indicator
- C = flyback hand indicator with max. value pointer
- D = oil filling (up to 200 °C)

Connecting thread /

- 1 = none (smooth shaft)
- 2 = G 1/2"
- 3 = G 3/4"
- 4 = G 1"
- 5 = 1/2"-NPT
- 6 = 3/4"-NPT
- 7 = M20 x 1,5
- 8 = M24 x 1,5
- 9 = special thread (please specify)

Material (immersion tube and thread) /

- 1 = st. steel

Immersion tube from st. steel /

- 0 = none
- 1 = screw-in
- 2 = weld-on





MT-01

Industrial Thermometer



Features

- / Long scale
- / Robust design
- / Scratch-proof lettering
- / Legible from any direction
- / Straight or angled immersion tube
- / Connectable to any type of protection tubes

Description:

The immersion tube of the MT-01 series of industrial thermometers is either directly in contact with the medium or it is built into a protection tube to counter high processing pressure or chemically hostile environment. Within a short span of time it picks up the medium's temperature and transfers it to a glass capillary in its interior. The fluid filling in the capillary expands proportionally to the temperature. Its height is a reference for the measured temperature which can be read on a burned-in scale with an accuracy of 1% of the range end value.

Application:

The Profimess MT-01 Industrial Thermometers are deployed where temperatures need to be reliably measured without the use of electrical power. Their top portion is V-shaped and, therefore, can be comfortably read from any angle of view. It consists of brass-coloured anodized aluminium in which the lettering is placed below the anodized layer to ensure maximum mechanical strength. The prismatic capillary in the stem consists of solid glass material with a diameter of approx. 6 mm and has a black burned-in scale which is also absolutely resistant to scratches. The immersion tubes of the MT-01 series are made of brass for media temperatures up to 200°C. Moreover, steel or stainless steel tubes are also used. For special applications like sea-water, different suitable materials can be used.



Versions:

MT-01 Industrial Thermometer

Process connection: The thermometer can be connected to the process or to the protection tube without screw threads by insertion, with threads for screw mounting or by means of a brass swivel nut.

Immersion tube position: The top part and immersion tube are in vertical or rectangular position to each other. A third possibility is aligning it at 135°.

Scaling: The top part of MT-01 can have a single-side Celsius scale or a Celsius and a Fahrenheit scale on the right and left side of the capillary.

Filling: The capillary is white back with a wide, easy-to-read column with blue filling. The graduation is indelibly diffused into the glass. Other capillary fillings are available.

Insertion length: For MT-01 intended for insertion, the insertion length is according to the immersion tube length from "lower edge of the pin" and, in the screw on version and the variant with swivel nut it is the immersion tube length including the thread.

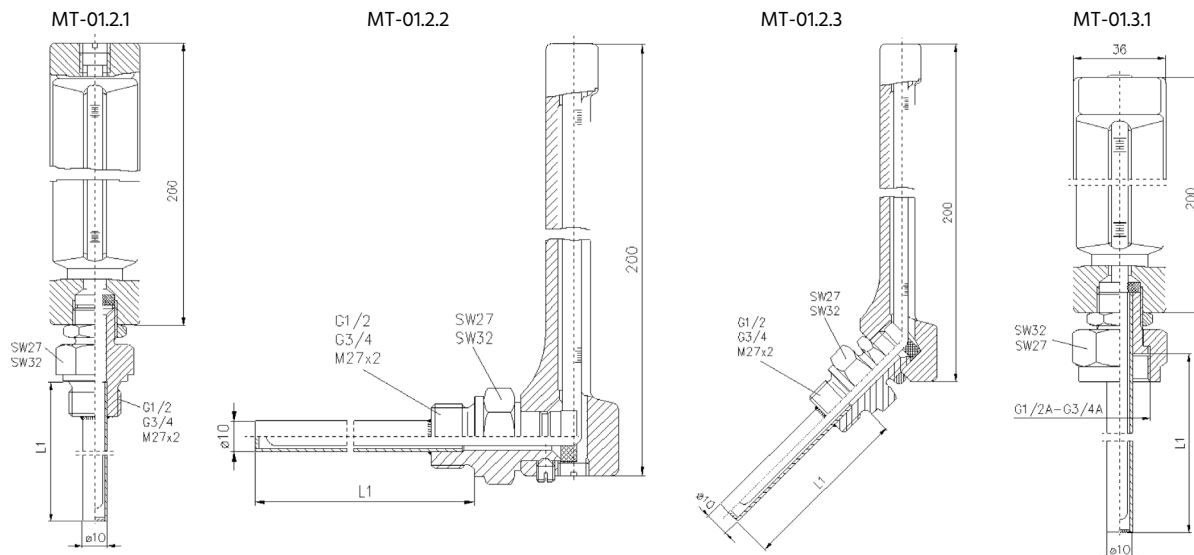
Connecting thread: Different thread types are available for the thread pin of MT-01.2 as well as for the swivel nut of MT-01.3.

Immersion tube material: The screw stems are available in brass, made from one piece, as per DIN Standard type B with threads for mounting lengths up to L1 = 63 mm. They are hard-soldered for other lengths.

Ordering Codes:

Order number	MT-01.	2.	2.	1.	1.	1.	4.	2
MT-01 Industrial Thermometer								
Process connection /								
1 = plug-in design, no thread (on request)								
2 = screw on design								
3 = brass swivel nut								
Immersion tube position /								
1 = immersion tube vertical								
2 = immersion tube 90° angled								
3 = immersion tube 135° angled								
Operating range /								
1 = -60...+40°C								
2 = -30...+50°C								
3 = 0...+60°C								
4 = 0...+100°C								
5 = 0...+120°C								
6 = 0...+160°C								
7 = 0...+200°C								
Graduation /								
1 = Celsius (°C)								
2 = Celsius and Fahrenheit (°C + F)								
Insertion length /								
1 = 40 mm								
2 = 50 mm								
3 = 63 mm								
4 = 100 mm								
5 = 160 mm								
6 = 250 mm								
7 = 400 mm								
Connecting thread /								
0 = no thread (on request)								
1 = G1/2A, SW27								
2 = G3/4A, SW32								
3 = M20 x 1,5, SW27								
4 = M27 x 2, SW32								
Immersion tube material /								
1 = brass								
2 = steel								
3 = stainless steel 1.4571								
4 = CuNi30Mn1Fe								

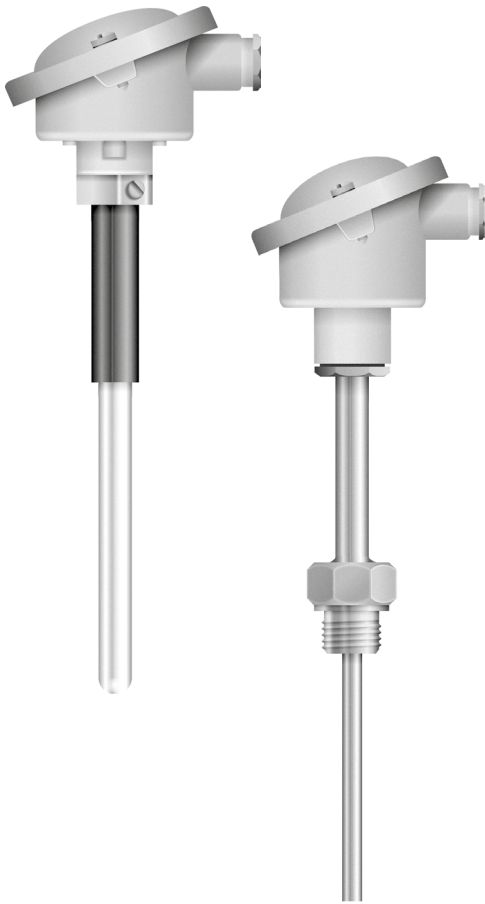
Dimensions in mm:





TE-01

Insertion-Thermocouple



Features

/ Temperatures up to 1600°C

/ Head-mounted
measuring transmitter

/ Wide range of thread variants

/ Insertion length as per
customer specification

Description:

In thermocouples, the temperature dependence of the electrical voltage between two wires of different materials is utilized to which a setpoint of the temperature to be measured and to which another point of a fixed reference temperature are subjected. In the TE-01 the welded ends of both wires being used are embedded in a metallic or ceramic protection tube which are insulated from each other. The reference point is situated in the connecting head of the device. When the temperature of the measuring point at the tip of the protection tube changes in relation to the reference temperature, a thermal voltage occurs which is proportional to the change in the temperature and the same can be tapped at the connecting head. For foolproof and accurate functioning of the thermoelements, the reference temperature must be constant and 0°C. In case of values like 20...50°C, the resulting errors can be balanced by generating a compensation voltage or by taking the ratios in the evaluating software outputs into consideration. However, if the TE-01 is used with a head-mounted measuring transmitter which is capable of converting the thermal voltage directly into a 4...20 mA current signal, the compensation will be generated internally and hence minimizes the measuring errors.

Application:

Thermoelements are used in the industry wherever conventional resistance thermometers reach their limitations. This is the case, mostly, if the media temperatures are too high or if space constraints exist. For operating the TE-01, the user has a choice of three mostly used elements (Type J, Type K and Type S) depending on the required working temperature and the extent of the resulting thermal voltage. Normally, only elements belonging to Class 1 are used which ensures the maximum accuracy. Depending on the media temperature and media properties protection tubes made of stainless steel or ceramic can be supplied. A wide range of connection variants offer maximum possible compatibility with the process. Insertion lengths and shaft diameters can be implemented directly according to customer specifications so that the TE-01 can be customized to any point of measurement.



Versions:

TE-01 Thermocouples in Protection Tube

Protection tube: For temperatures up to 800°C protection tubes made of stainless steel can be used. For higher temperatures, we recommend ceramic protection tubes with a metallic support tube that is capable of managing temperatures up to 1600°C.

Process connection: The versions with a metallic protection tube can be supplied with a variety of connecting thread types or with a smooth shaft. Linking to the process can be, for example, by means of a screw in bushing or compression fitting. In the case of variants with ceramic protection tube, the materials like C610 and C799 are available which can be supplied with 15 mm or 24 mm diameters. In this case, the process connection is on the metallic support tube over a stopper flange or a screw in bushing with compression fitting.

Output: Depending on the temperature range and the required thermal voltage, thermoelements of Types J (Fe-CuNi up to 750°C), K (NiCr-Ni up to 1200°C) or S (Pt10Rh-Pt up to 1600°C) are mounted. Other DIN types can be supplied on request. In the versions with integrated head-mounted measuring transmitter the resulting thermal voltage is converted directly into a 4 to 20 mA current signal in 2-wire system.

Insertion length: The insertion length is the length of the shaft from the sealing surface and is manufactured as per the customer specifications.

Shaft diameter: In the case of stainless steel protection tubes the diameters can be selected from 6 mm, 9 mm, 11 mm and 15 mm depending on the conditions of available space. In the case of ceramic protection tubes only 15 mm or 24 mm are used.

Connecting head: Six different connecting heads as per DIN are available. Please refer to "Drawings for connecting heads". For versions with integrated head measuring transmitters, we're using head form B by standard. The connecting head BUZ-H is optional.

Ordering Codes:

Order number	TE-01.	1.	2.	1.	□.	3.	2.	□.	□
TE-01 Insertion Thermocouple									
Protection tube /									
1 = screw in version with stainless steel protection tube (up to 800°C)									
2 = version with ceramic protection tube (up to 1600°C)									
Process connection /									
1 = smooth shaft (for version TE-01.1)									
2 = G½" (for version TE-01.1)									
3 = G¾" (for version TE-01.1)									
4 = G1" (for version TE-01.1)									
5 = NPT½" (for version TE-01.1)									
6 = NPT¾" (for version TE-01.1)									
7 = M18 x 1.5 (for version TE-01.1)									
8 = M20 x 1.5 (for version TE-01.1)									
9 = M27 x 2 (for version TE-01.1)									
10 = Protection tube 15x2 of C610 capable up to 1500°C (for version TE-01.2), support tube 200 mm 22x2									
11 = Protection tube 15x2 of C799 capable up to 1600°C (for version TE-01.2), support tube 200 mm 22x2									
12 = Protection tube 24x2.5 of C610 capable up to 1500°C (for version TE-01.2), support tube 200 mm 32x2									
13 = Protection tube 24x2.5 of C799 capable up to 1600°C (for version TE-01.2), Support tube 200 mm 32x2									
Output /									
1 = Type J (Fe-CuNi) as per DIN IEC 584 (up to 750 °C)									
2 = Type K (NiCr-Ni) as per DIN IEC 584 (up to 1200 °C)									
3 = Type S (Pt10Rh-Pt) as per DIN IEC 584 (up to 1600 °C)									
4 = Type J (Fe-CuNi) with head-mounted transmitter									
5 = Type K (NiCr-Ni) with head-mounted transmitter									
6 = Type S (Pt10Rh-Pt) with head-mounted transmitter									
Insertion length /									
□□□□ Shaft length from sealing surface in mm									
Shaft diameter of stainless steel protection tube /									
1 = 6 mm									
2 = 9 mm									
3 = 11 mm									
4 = 15 mm									
5 = Ceramic protection tube									
Connecting head /									
1 = Form A (standard for ceramic protection tube)									
2 = Form B (standard for stainless steel protection tube)									
3 = Form BUZ (DAN)									
4 = Form BUZ-H (DANW) (standard for head-mounted transmitter)									
5 = Form BEG									
6 = Form GG									
Temperature range /									
□□□□ Initial value									
Temperature range /									
□□□□ End value									



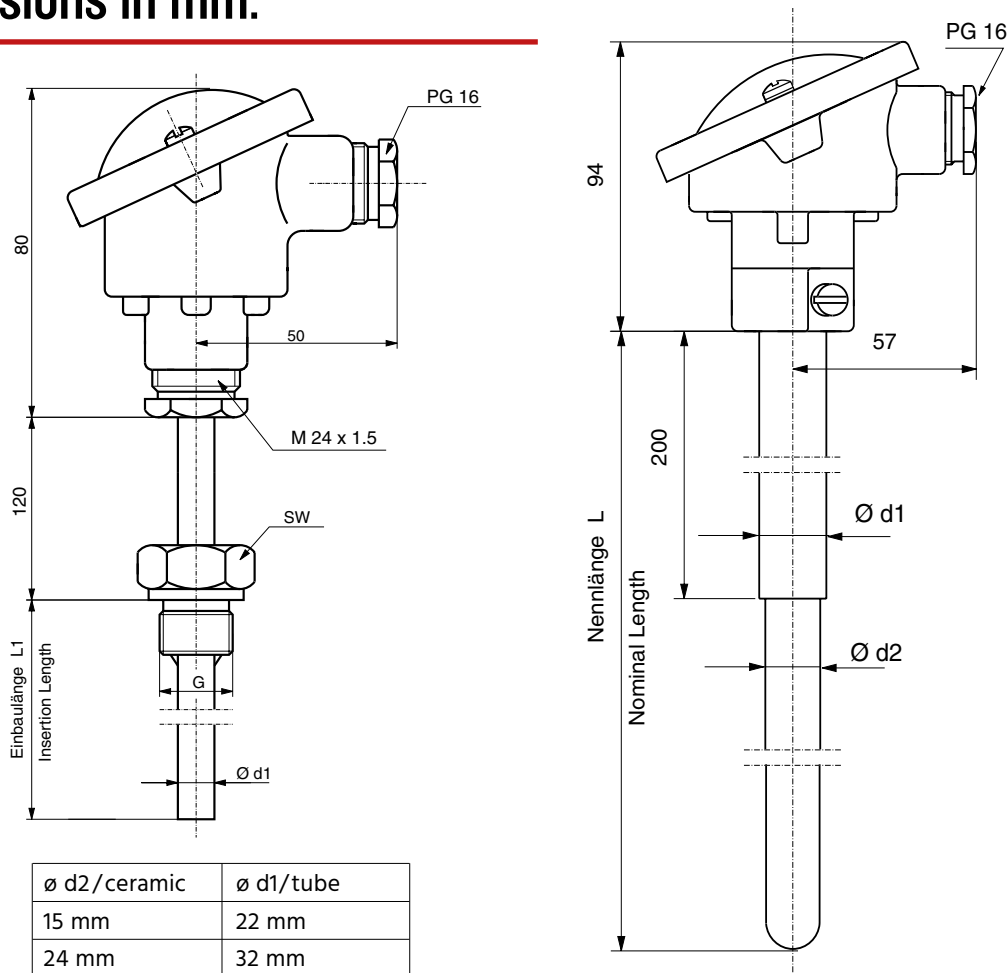
Technical Specifications:

Pressure /	max. 6 bar for stainless steel protection tube (insertion into high-pressure protection tubes possible) pressureless for ceramic protection tube
Temperature /	max. 70°C at the connecting head for head-mounted transmitter
Neck tube /	120 mm (standard)
Temp. range /	up to 1600°C
Material /	Measuring unit: <600 °C: st. steel 1.4571 >600 °C: Inconel 600 2.4816 Protection tube: <600 °C: st. steel 1.4571 >600 °C: st. steel 1.4749
Accuracy /	Class 1 as per DIN IEC 584
El. Connection /	ceramic connection terminal in connection head
Process Connection /	stopper flange, welded or screw in bushing

Electrical Specifications:

Supply voltage /	24 VDC (for head transmitter)
Output /	Typ J, Typ K, Typ S or 4...20 mA
Protection class /	IP65

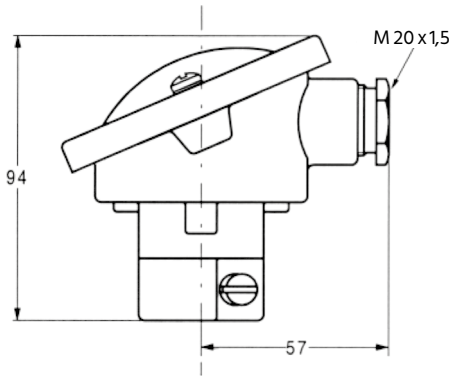
Dimensions in mm:



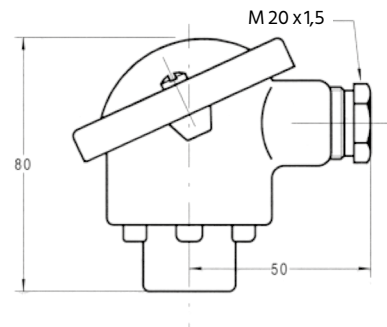


Connecting Heads for Insertion-Thermocouples:

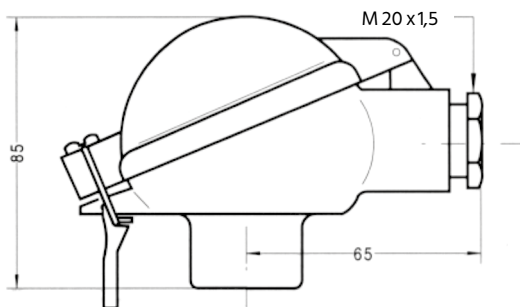
Form A – cover with 2 fastening screws
Material: aluminium pressure casting



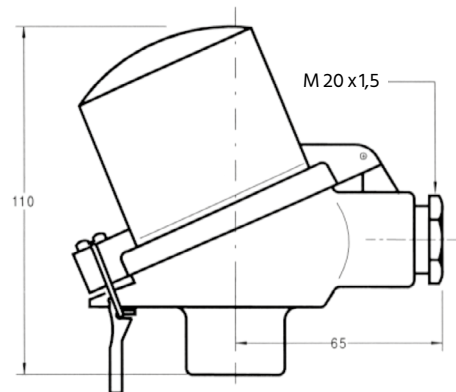
Form B – cover with 2 fastening screws
Material: aluminium pressure casting



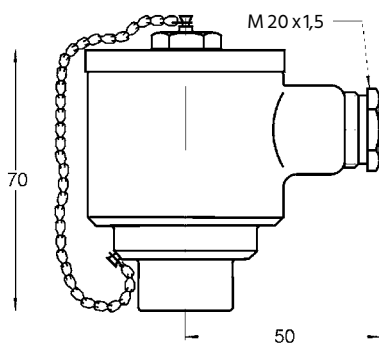
Form BUZ (DAN) – flap cover with bracket
Material: aluminium pressure casting



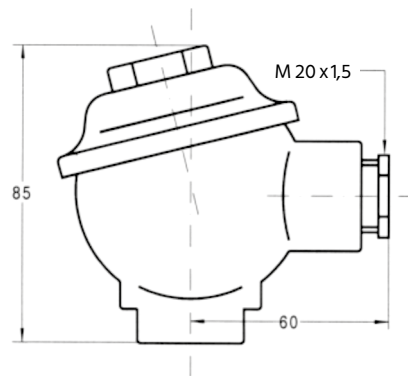
Form BUZ-H (DANW) – high flap cover with bracket
Material: aluminium pressure casting



Form BEG – screw cap with chain
Material: stainless steel 1.4571



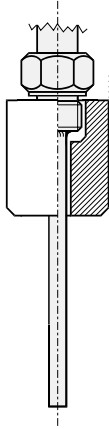
Form GG – cover with screw closure
Material: steel/cast iron



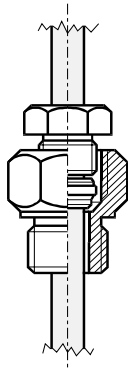


Possibilities of Installation for Insertion-Thermocouples:

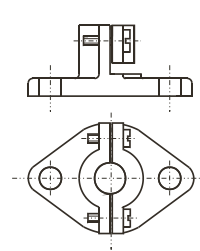
welded bushing for male thread



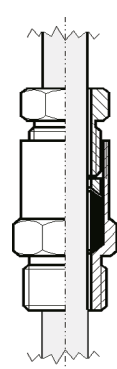
compression fitting for screwing in for smooth shaft



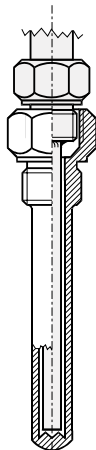
stopper flange for ceramic protection tube



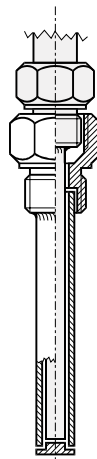
screw in bushing for ceramic protection tube



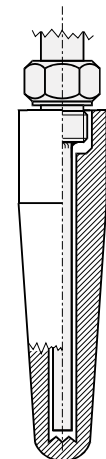
screw in protection tube for male thread, one-piece



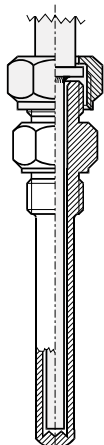
screw in protection tube for male thread, multi-piece



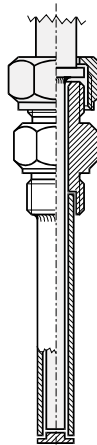
weld in protection tube for male thread



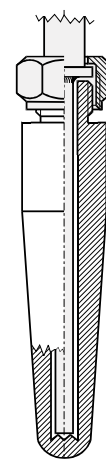
screw in protection tube for swivel nut, one-piece



screw in protection tube for swivel nut, multi-piece



weld in protection tube for swivel nut

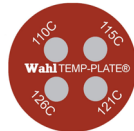






TA-17

Temperature-Labels for recording of overheating



Features

- / More security
- / Economic alternative
- / Secure documentation
- / Proof for warranty issues

Description:

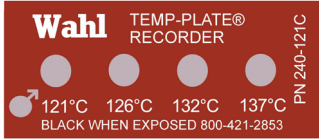
The self-adhesive temperature-labels Type TA-17 possess temperature-sensitive elements. On reaching the corresponding nominal temperature, they change their colour irreversibly. They can be chosen from a wide range of temperatures and special, resilient versions for harsher environments. The labels are manufactured and tested with a high quality in mind, after the NIST-standard (U.S.-Industry standard). Therefore, the TA-17 labels are superior in quality compared to the majority of other temperature-labels.

Application:

The temperature labels are directly applied to the object to be monitored. They are resilient against solvents, fuels, fats, oils, water and vaporized water. Irreversible labels are being used to rule out a sole and exclusive fault in warranty cases. They protect hydraulic systems, electrical and mechanical equipment in an economic manner. Process temperatures can quickly be proved or measuring devices checked for accuracy. Lower temperature labels should be cooled until applied, to prevent an early discolouration through environmental influences. Because of the additional logistic requirements, all models with a working temperature of 48°C or less will be only available in reasonable quantities.



Standard Temperature-Labels:



Standard-four

19 x 44 mm

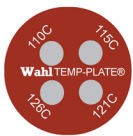
A-Code: 400-



Mini-four

10 x 21 mm

A-Code: 401-



Mini-four round

Ø 14 mm

A-Code: 402-



Micro-four

3 x 11 mm

A-Code: 403-



Micro-four round

Ø 6 mm

A-Code: 404-



Neutral

Neutral labels have no temperature indicators, but each box comes with a chart, displaying the corresponding temperatures, thus preventing external manipulation.

Ø 6 mm

A-Code: 440-

Stand. A-Code	Mini A-Code	Mini round A-Code	Micro A-Code	Micro round A-Code	Neutral A-Code	B-Code	°C
400-					440-	-032F	32-37-43-48
400-					440-	-033F	32-35-37-41
400-	401-	402-	403-	404-	440-	-037F	37-43-48-54
400-	401-	402-	403-	404-	440-	-038F	37-48-60-71
400-	401-	402-	403-	404-	440-	-043F	43-48-54-60
400-	401-	402-	403-	404-	440-	-048F	48-60-71-82
400-	401-	402-	403-	404-	440-	-060F	60-71-82-93
400-	401-	402-	403-	404-	440-	-061F	60-82-104-126
400-	401-	402-	403-	404-	440-	-065F	65-71-76-82
400-	401-	402-	403-	404-	440-	-066F	65-93-121-148
400-	401-	402-	403-	404-	440-	-071F	71-82-93-104
400-	401-	402-	403-	404-	440-	-072F	71-76-82-87
400-	401-	402-	403-	404-	440-	-076F	76-82-87-93
		402-			440-	-077F	76-93-110-126
		402-			440-	-078F	76-98-110-132
		402-			440-	-079F	76-93-104-132
400-	401-	402-	403-	404-	440-	-082F	82-93-110-121
400-	401-	402-	403-	404-	440-	-087F	87-93-98-104
400-	401-	402-	403-	404-	440-	-093F	93-98-104-110
400-	401-	402-	403-	404-	440-	-094F	93-104-115-126
400-	401-	402-	403-	404-	440-	-095F	93-121-148-176
400-	401-	402-	403-	404-	440-	-110F	110-115-121-126
400-	401-	402-	403-	404-	440-	-121F	121-126-132-137
			403-		440-	-126F	126-132-137-143
400-	401-	402-	403-		440-	-132F	132-137-143-148
400-	401-	402-	403-	404-	440-	-137F	137-148-160-171
400-	401-	402-	403-	404-	440-	-154F	154-160-165-171
400-	401-		403-		440-	-176F	176-182-187-193
400-	401-		403-		440-	-177F	176-204-232-260
400-	401-		403-		440-	-182F	182-193-204-215
400-	401-		403-		440-	-198F	198-204-210-215
400-	401-		403-		440-	-199F	198-210-223-232
400-	401-		403-		440-	-215F	215-223-232-240
400-	401-		403-		440-	-223F	223-232-240-254

Ordering Codes:

Order number

TA-17.

A - B

TA-17 Temperature-Labels

Article-Codes /

Combine Codes A and B: eg. **443-037C** or **441-154F**
always 10 labels per box, if not mentioned otherwise!



Mini-eight

10 x 38 mm

A-Code: 800-

B-Code	°C
-043A	43-48-54-60-65-71-76-82
-087A	87-93-98-104-110-115-121-126
-132A	132-137-143-148-154-160-165-171
-176A	176-187-198-210-223-232-240-260

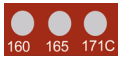


Mini-six

10 x 29 mm

A-Code: 600-

B-Code	°C
-043B	43-48-54-60-65-71
-076B	76-82-87-93-98-104
-110B	110-115-121-126-132-137
-143B	143-148-154-160-165-171
-176B	176-182-187-193-198-204
-215B	215-223-232-240-248-260



Micro-three

3 x 8 mm

A-Code: 300-

B-Code	°C
-043D	43-48-54
-060D	60-65-71
-076D	76-82-87
-082D	82-93-104
-093D	93-98-104
-104D	104-115-121
-110D	110-115-121
-121D	121-126-132
-126D	126-132-137
-143D	143-148-154
-160D	160-165-171



Standard-single

25 x 19 mm

A-Code: 210-

B-Code	°C
-043E	43
-054E	54
-071E	71



Mini-single

Ø 14 mm

A-Code: 110-

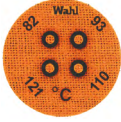
(20 labels per box)

B-Code	°C	B-Code	°C	B-Code	°C
-038S	38	-104S	104	-182S	182
-041S	41	-110S	110	-188S	188
-043S	43	-116S	116	-193S	193
-046S	46	-121S	121	-199S	199
-049S	49	-127S	127	-204S	204
-054S	54	-132S	132	-210S	210
-060S	60	-138S	138	-216S	216
-066S	66	-143S	143	-224S	224
-071S	71	-149S	149	-232S	232
-077S	77	-154S	154	-241S	241
-082S	82	-160S	160	-249S	249
-088S	88	-166S	166	-254S	254
-093S	93	-171S	171	-260S	260
-099S	99	-177S	177		



Robust Temperature Labels:

These labels are manufactured to be very resilient and can withstand even high temperatures, vacuum areas und corrosive gases. Therefore, they are used best within semiconductor environments.



Mini-four round

Ø 14 mm

A-Code: 405-

B-Code	°C	B-Code	°C	B-Code	°C
-037C	37-43-48-54	-076C	76-82-87-93	-154C	154-160-165-171
-038C	37-48-60-71	-082C	82-93-110-121	-176C	176-182-187-193
-043C	43-48-54-60	-087C	87-93-98-104	-177C	176-204-232-260
-048C	48-60-71-82	-093C	93-98-104-110	-182C	182-193-204-215
-060C	60-71-82-93	-094C	93-104-115-126	-198C	198-204-210-215
-061C	60-82-104-126	-095C	93-121-148-176	-199C	198-210-223-232
-065C	65-71-76-82	-110C	110-115-121-126	-215C	215-223-232-240
-066C	65-93-121-148	-121C	121-126-132-137	-223C	223-232-240-254
-071C	71-82-93-104	-132C	132-137-143-148		
-072C	71-76-82-87	-137C	137-148-160-171		



Mini-four

10 x 21 mm

A-Code: 406-

B-Code	°C	B-Code	°C	B-Code	°C
-037VQ	37-43-48-54	-072VQ	71-76-82-87	-132VQ	132-137-143-148
-038VQ	37-48-60-71	-076VQ	76-82-87-93	-137VQ	137-148-160-171
-043VQ	43-48-54-60	-082VQ	82-93-110-121	-154VQ	154-160-165-171
-048VQ	48-60-71-82	-087VQ	87-93-98-104	-176VQ	176-182-187-193
-060VQ	60-71-82-93	-093VQ	93-98-104-110	-177VQ	176-204-232-260
-061VQ	60-82-104-126	-094VQ	93-104-115-126	-198VQ	198-204-210-215
-065VQ	65-71-76-82	-095VQ	93-121-148-176	-199VQ	198-210-223-232
-066VQ	65-93-121-148	-110VQ	110-115-121-126	-223VQ	223-232-240-254
-071VQ	71-82-93-104	-121VQ	121-126-132-137		



Micro-four

5 x 16,5 mm

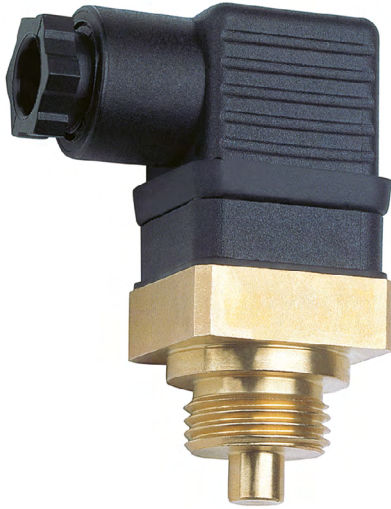
A-Code: 407-

B-Code	°C	B-Code	°C
-043VC	43-48-54-60	-115VC	115-121-126-132
-065VC	65-71-76-82	-132VC	132-137-143-148
-087VC	87-93-98-104	-154VC	154-160-165-171
-110VC	110-115-121-126	-176VC	176-182-187-193



TS-01

Temperature Switch



Features

- / Any mounting position
- / Compact design
- / Brass or stainless steel
- / Cost-effective

Description:

A fully compound-filled bimetallic thermostat is embedded in a fitting from brass or stainless steel. The thermostat has a temperature value set at the factory. On reaching this temperature when the sensor is fully immersed into the medium, the switch connects either as a NO-contact or a NC-contact between pins 1 and 2 of the DIN plug which is included in the delivery. On request, the plug can be provided with an additional LED which will display the switching status.

Application:

As a temperature switch, the TS-01 is unbeatable in its simplicity. It is widely used in various applications and it is capable of reliably monitoring temperatures with fixed switch- and return points in the narrowest of space at a very affordable price. The version made of stainless steel 1.4305 is resistant to a number of extremely hostile media, thus making the TS-01 ideally suited for applications in the chemical and petrochemical industries without any problem.



Versions:

TS-01 Temperature Switches

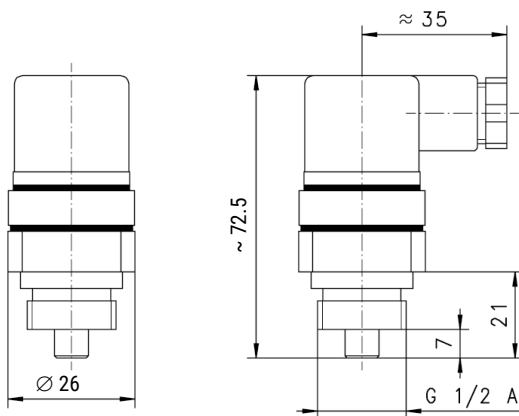
Sensor material: Optionally the TS-01 is available in brass or stainless steel versions

Switching values: The switching point can be freely selected between 40 to 120°C at intervals of 10°C

Contact function: The TS-01 can be supplied as NC or NO.

Materials: Ni-plated brass CW614N or stainless steel 1.4305, plug material PA 6.6, NBR

Dimensions in mm:



Technical Specifications:

Connection /	G1/2"-male (G3/4"-male on request)
Pressure /	PN100
Hysteresis /	10K to 20K
Tolerance /	+/-10K
Weight /	0.12 kg
Mounting /	sensor should be fully covered from media in front

Switch	Media temperature
40 °C	- 20...+90 °C
50 °C	-20...+100 °C
60 °C	-20...+110 °C
70 °C	-20...+120 °C
80 °C	-20...+130 °C
ab 90 °C	-20...+140 °C

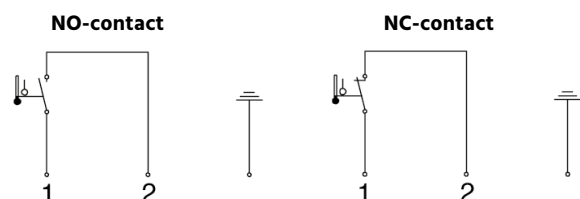
Electrical Specifications:

Electrical connection /	plug connection DIN 43650-A (plug type "Hirschmann")
Protection class /	IP65
Switching load /	250 VAC, 10 A
Media /	e.g. water, gas/air, oil
Option /	Tolerance selection from smaller hysteresis up to 10K

Ordering Codes:

Order number	TS-01. 1. [50]. 1
TS-01 Temperature Switch	
Sensor material /	1 = brass 2 = stainless steel (on request)
Setpoint in °C /	[040] [050] [060] in 10°C steps up to 120°C [120]
Contact function /	1 = NO-contact 2 = NC-contact

Electrical Connection:





TS-03

Surface-Mounting Thermostat with Rigid or Flexible Connection



Description:

Thermostats belonging to the TS-03 series are universally applicable temperature switches which, according to the mounted evaluating unit, are designed as temperature switches, temperature controllers or temperature limiters. The limiter and switch versions can also be supplied with safety engineering which means that, in the event of a defect in the measuring system in the TS-03, an alarm signal triggers and cannot be reset again. Any contamination in the medium under surveillance with the filling in the TS-03 cannot escape undetected under any circumstances. In this, the principle of measuring is simple but very reliable. A fluid or gas is located within the sensor system of the TS-03 depending on the control range. When the temperature rises the filled medium expands. In turn, a micro-switch is activated by means of a mechanical transmission system on reaching the limiting temperature. Depending on the design as a controller, switch or limiter, this switch acts as a change-over or NC-contact which reverts to the initial position either automatically on returning to normal temperature value or manually by releasing the appropriate button. The TS-03 series is available with a rigid or flexible connection so that they can be directly screw mounted into the process or also installed away from the process. The delivery for thermostats with rigid connection includes suitable brass protection tubes, other materials and lengths are available.

Features

- / Switch, controller or limiter
- / Optionally with safety engineering
- / Temperatures up to +500°C
- / Gas or fluid-filled
- / Brass, steel or stainless steel protection tube

Application:

Thermostats belonging to the TS-03 series are used wherever any fluid or gaseous medium needs to be reliably monitored for reaching a limiting temperature. The micro-switch used is capable of processing high degree of switching performance and, therefore, capable of switching pumps, magnetic valves or heating rods directly. Thanks to the wide range of connection variants designed for universal application of brass, steel or stainless steel protection tubes including rigid or flexible versions and the various temperature ranges up to +500°C, the limits for the TS-03 are very far fetched which has enabled the devices to achieve a strong market penetration.



Versions:

TS-03 Surface-Mounting Thermostat

Temperature controller: If the media temperature at the sensor of the temperature controller exceeds the externally adjustable limiting temperature, the micro-switch is actuated by means of the transmission mechanism and the power circuit gets opened or closed. On dropping below the limit (by hysteresis) the micro-switch is reset automatically to initial position.

Temperature switch: If the media temperature at the sensor of the temperature controller exceeds the limiting temperature adjustable internally by means of a screw-driver, the micro-switch is actuated by means of the transmission mechanism and the power circuit gets opened or closed. On dropping below the limit (by hysteresis) the micro-switch is reset automatically to initial position.

Safety temperature switch: If the media temperature at the safety temperature switch exceeds the limiting temperature adjustable internally by means of a screw-driver, the micro-switch is actuated by means of the transmission mechanism and the power circuit gets broken or closed. On dropping below the limit (by hysteresis) the micro-switch is reset automatically to initial position. In case of possible damage to the measurement system, that is, if the expansion fluid escapes, the pressure in the diaphragm drops and opens the power circuit continuously. Unlocking will no longer be possible. Similarly, if the sensor cools down to below approx. -20°C the power circuit gets opened. Subsequently, on reaching a temperature above approx. -20°C the power circuit is gets closed automatically.

Safety temperature limiter: If the media temperature at the safety temperature limiter exceeds the limiting temperature adjustable internally by means of a screw-driver, the micro-switch is actuated by means of the transmission mechanism and the power circuit gets opened or closed. On dropping below the limit (by hysteresis) the micro-switch is reset automatically to initial position. In case of possible damage to the measurement system, that is, if the expansion fluid escapes, the pressure in the diaphragm drops and interrupts the power circuit continuously. Unlocking will no longer be possible. Similarly, if the sensor cools down below approx. -20°C, the power circuit gets opens. Subsequently, on reaching a temperature above approx. -20°C the safety temperature limiter must be unlocked manually.

Ordering Codes:

Order number	TS-03. [-][T][R][S][1][6]
TS-03 Surface-Mounting Thermostat	
Version as per table 1 (rigid shaft) or table 2 (flexible cord) /	
[][][][][] e.g TRS16 for temperature controller, rigid shaft 8 x 100 mm stainless steel, 20...150°C, G1/2"	

Technical Specifications:

Control ranges /	see tables 1 and 2
Filling /	up to +350°C end value of the control range fluid, above this gaseous
Housing /	cover polycarbonate unbreakable, colour pebble gray RAL 7032, bottom part aluminium pressure casting painted, colour anthracite gray RAL 7015
Capillary material /	up to +350°C end value of the control range copper (CU-DHP), (Ø 1,5 mm) above this stainless steel 1.4571
Sensor material /	up to +200°C end value of the control range copper (CU-DHP), above this up to +350°C end value of the control range stainless steel 1.4571 hard soldered, above this stainless steel 1.4571 welded
Capillary length /	see table 2 (liquid filled – max. 5000 mm)
Bending radius of capillary /	max. 5 mm
Ambient temp. /	max. +80°C
Storage temperature /	-50°C...+80°C
Accuracy /	
TR, TW	± 1.5% in the upper 1/3 of the scale ± 6% at the start of scale
STW, STB	+ 0/-5% in the upper 1/3 of the scale + 0/-10% at the start of scale
Hysteresis /	see tables 1 and 2
Temperature error in rigid connection /	
TR, TW	0.08% / K for operating range: < +200°C 0.06% / K for operating range: > +200°C ≤ +350°C 0.14% / K for operating range: > +350°C ≤ +500°C in deviations of +22°C ambient temperature
STW, STB	0.17% / K for operating range: < +200°C 0.13% / K for operating range: > 200°C < +350°C 0.12% / K for operating range: > +350°C ≤ +500°C in deviations of +22°C ambient temperature



Additional temperature error in flexible connection /

TR, TW
 0.047% / K for operating range: < +200°C
 0.09% / K for operating range:
 > +200°C ≤ +350°C
 0.04% / K for operating range:
 > +350°C ≤ +500°C
 in deviations of +22°C
 ambient temperature,
 per meter of capillary

STW, STB
 0.054% / K for operating range: < +200°C
 0.11 % / K for operating range:
 > +200°C ≤ +350°C
 0.03% / K for operating range:
 > +350°C ≤ +500°C
 in deviations of +22°C ambient
 temperature, per meter of capillary

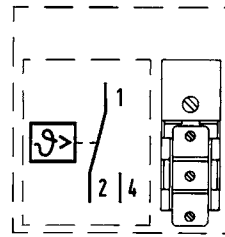
Process connect. / see Tables 1 and 2

- Typ A plain cylindrical probe
- Typ U protective sleeve for screw mounting
- Typ UZ protective sleeve for screw mounting with intermediate piece
- Typ UZO protective sleeve for screw mounting with intermediate piece, open
- Typ ES welding sleeve for swivel nut, conical
- Typ EZS welding sleeve for swivel nut with intermediate piece, conical

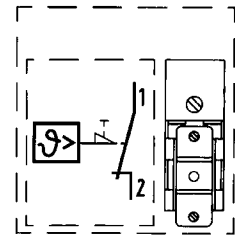
Rated position / as per DIN 16 257, NL 0. . .NL 90

Weight / approx. 0.5 kg

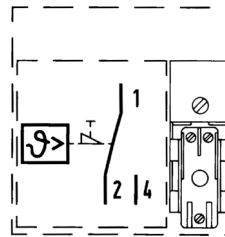
Electrical Connection:



TR
 TW
 STW



STB



STBxS

Electrical Specifications:

Connect. element /

- TR, TW, STW micro-switch with change-over contact
- STB micro-switch with NC-contact and restart lock
- STBxS micro-switch with NC-contact, restart lock and additional signal contact

Switching load /

for hysteresis > 2%
 max. 230 VAC +10%, 10 (2) A, cos Phi = 1 (0.6)
 or max. 230 VDC +10%, 0.25 A
 for hysteresis ≤ 2%
 max. 230 VAC +10%, 6 (1.2) A, cos Phi = 1 (0.6)

Cable insertion /

choke nipple M20 x 1.5 for 8. . .10 mm
 cable diameter

Protection class /

IP54



Table 1

Version Code	Shaft	Function	Control range in °C	Hysteresis in %	Process connection	Imm. tube Ø x length [mm]
TRS01	rigid	TR	-10°C .. +40°C	3-4	U G1/2"	8 x 200
TRS03	rigid	TR	0°C .. 50°C	1.5	U G1/2"	15 x 100 CrNi
TRS09	rigid	TR	0°C .. 100°C	3-4	U G1/2"	8 x 120
TRS10	rigid	TR	0°C .. 100°C	3-4	U G1/2"	8 x 120 CrNi
TRS11	rigid	TR	0°C .. 100°C	3-4	U G1/2"	8 x 150
TRS12	rigid	TR	0°C .. 100°C	1.5	U G1/2"	8 x 200
TRS13	rigid	TR	0°C .. 100°C	3-4	U G1/2"	8 x 200
TRS16	rigid	TR	20°C .. 150°C	3-4	U G1/2"	8 x 100
TRS18	rigid	TR	20°C .. 150°C	3-4	U G1/2"	8 x 200
TRS19	rigid	TR	20°C .. 150°C	3-4	U G1/2"	8 x 300
TRS20b	rigid	TR	50°C .. 200°C	3-4	UZ G1/2"	8 x 200 CrNi
TRS21	rigid	TR	50°C .. 300°C	3-4	UZ G1/2"	8 x 150 CrNi
TRS22b	rigid	TR	20°C .. 500°C	5	UZ G1/2"	8 x 200 CrNi
TWS01	rigid	TW	-10°C .. +40°C	3-4	U G1/2"	8 x 200
TWS03	rigid	TW	0°C .. 50°C	1.5	U G1/2"	15 x 100 CrNi
TWS04	rigid	TW	0°C .. 50°C	3-4	U G1/2"	8 x 200
TWS06	rigid	TW	20°C .. 90°C	1.5	U G1/2"	15 x 100
TWS07	rigid	TW	20°C .. 90°C	6-8	U G1/2"	15 x 100
TWS08	rigid	TW	20°C .. 90°C	3-4	U G1/2"	8 x 150
TWS10	rigid	TW	0°C .. 100°C	3-4	U G1/2"	8 x 120
TWS11	rigid	TW	0°C .. 100°C	3-4	U G1/2"	8 x 120 CrNi
TWS12	rigid	TW	0°C .. 100°C	3-4	U G1/2"	8 x 150
TWS13	rigid	TW	0°C .. 100°C	3-4	U G1/2"	8 x 200
TWS14	rigid	TW	0°C .. 100°C	3-4	U G1/2"	8 x 300
TWS16	rigid	TW	20°C .. 150°C	3-4	U G1/2"	8 x 100
TWS17	rigid	TW	20°C .. 150°C	3-4	U G1/2"	8 x 100 CrNi
TWS18	rigid	TW	20°C .. 150°C	3-4	U G1/2"	8 x 200
TWS19	rigid	TW	20°C .. 150°C	3-4	U G1/2"	8 x 200 CrNi
TWS20	rigid	TW	20°C .. 150°C	3-4	U G1/2"	8 x 300
TWS21	rigid	TW	50°C .. 200°C	3-4	UZ G1/2"	8 x 120 CrNi
TWS22	rigid	TW	50°C .. 200°C	3-4	UZ G1/2"	8 x 200 CrNi
TWS25	rigid	TW	50°C .. 300°C	3-4	UZ G1/2"	8 x 150 CrNi
TWS26	rigid	TW	20°C .. 500°C	5	UZ G1/2"	8 x 200 CrNi
STWS01	rigid	STW	20°C .. 150°C	4-6	U G1/2"	8 x 150
STWS02	rigid	STW	50°C .. 300°C	5	UZ G1/2"	8 X 200 CrNi
STWS03	rigid	STW	50°C .. 350°C	4-6	EZS G3/4"	170 steel conical
STWS04	rigid	STW	20°C .. 500°C	7	UZO G1/2"	8 X 200 CrNi
STBS01	rigid	STB	30°C .. 110°C	-	U G1/2"	8 x 150
STBS02	rigid	STB	30°C .. 110°C	-	U G1/2"	8 x 200
STBS03	rigid	STB	30°C .. 110°C	-	U G1/2"	8 x 300
STBS04	rigid	STB	60°C .. 130°C	-	U G1/2"	8 x 150
STBS05	rigid	STB	60°C .. 130°C	-	U G1/2"	8 x 200
STBS06	rigid	STB	20°C .. 150°C	-	U G1/2"	8 x 200
STBS07	rigid	STB	130°C .. 200°C	-	UZ G1/2"	8 x 150 CrNi
STBS08	rigid	STB	130°C .. 200°C	-	UZ G1/2"	8 x 300 CrNi
STBS09	rigid	STB	50°C .. 300°C	-	UZ G1/2"	8 x 200 CrNi
STBS10S	rigid	STB	30°C .. 110°C	-	U G1/2"	8 x 150
STBS11S	rigid	STB	20°C .. 150°C	-	U G1/2"	8 x 200
STBS12S	rigid	STB	50°C .. 300°C	-	UZ G1/2"	8 x 200 CrNi
STBS13S	rigid	STB	50°C .. 350°C	-	EZS G3/4"	170 steel conical
STBS14S	rigid	STB	20°C .. 500°C	-	UZO G1/2"	8 x 200 CrNi
STBS15S	rigid	STB	20°C .. 500°C	-	UZ G1/2"	8 x 200 CrNi



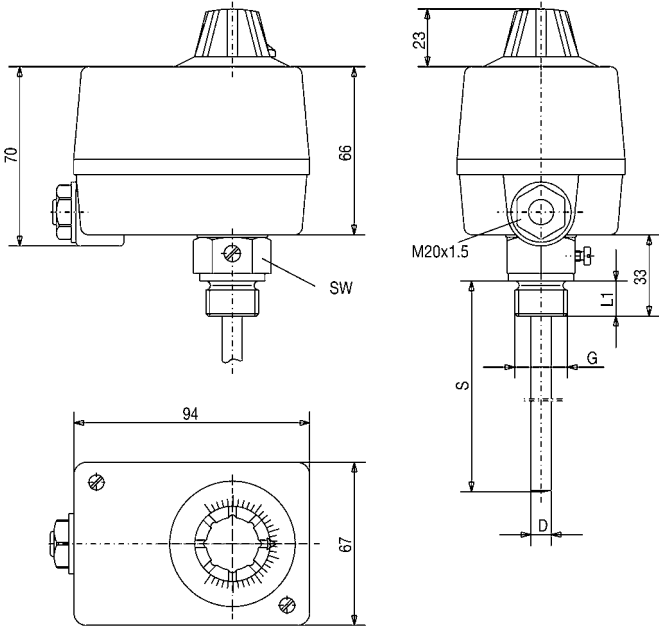
Table 2

Version Code	Shaft	Function	Control range in °C	Hysteresis in %	Capillary in mm	Process connection	Sensor Ø x length [mm]
TRF01	flexible	TR	-10°C...+40°C	3-4	1000	A	6 x 185
TRF04	flexible	TR	0°C...100°C	3-4	1000	A	6 x 107
TRF05	flexible	TR	20°C...150°C	3-4	1000	A	6 x 88
TRF06	flexible	TR	50°C...300°C	3-4	1000	A	6 x 63
TRF07	flexible	TR	20°C...500°C	5	1000	A	6 x 148
TWF01	flexible	TW	0°C...50°C	3-4	1000	A	6 x 185
TWF04	flexible	TW	0°C...100°C	3-4	1000	A	6 x 107
TWF05	flexible	TW	0°C...100°C	3-4	2000	A	6 x 107
TWF06	flexible	TW	20°C...150°C	3-4	1000	A	6 x 88
TWF07	flexible	TW	20°C...150°C	3-4	2000	A	6 x 88
TWF08	flexible	TW	50°C...200°C	3-4	1000	A	6 x 101
TWF10	flexible	TW	50°C...300°C	3-4	1000	A	6 x 63
TWF11	flexible	TW	50°C...300°C	3-4	2000	A	6 x 63
TWF12	flexible	TW	20°C...500°C	5	1000	A	6 x 148
TWF13	flexible	TW	20°C...500°C	5	2000	A	6 x 148
STWF01	flexible	STW	20°C...500°C	7	4000	ES G3/4"	200
STBF02	flexible	STB	30°C...110°C	-	1000	A	6 x 108
STBF03	flexible	STB	30°C...110°C	-	2000	A	6 x 108
STBF05	flexible	STB	20°C...150°C	-	1000	A	6 x 77
STBF06	flexible	STB	20°C...150°C	-	2000	A	6 x 77
STBF07S	flexible	STB	20°C...150°C	-	1000	A	6 x 77
STBF08	flexible	STB	50°C...200°C	-	2000	A	6 x 85
STBF09S	flexible	STB	50°C...200°C	-	1000	A	6 x 85
STBF11	flexible	STB	50°C...300°C	-	1000	A	6 x 55
STBF12	flexible	STB	50°C...300°C	-	2000	A	6 x 55
STBF13S	flexible	STB	50°C...300°C	-	1000	A	6 x 55
STBF14	flexible	STB	20°C...500°C	-	1000	A	6 x 127
STBF15S	flexible	STB	20°C...500°C	-	1000	A	6 x 127
STBF16S	flexible	STB	20°C...500°C	-	2000	A	6 x 127
STBF17S	flexible	STB	20°C...500°C	-	4000	ES G3/4"	200

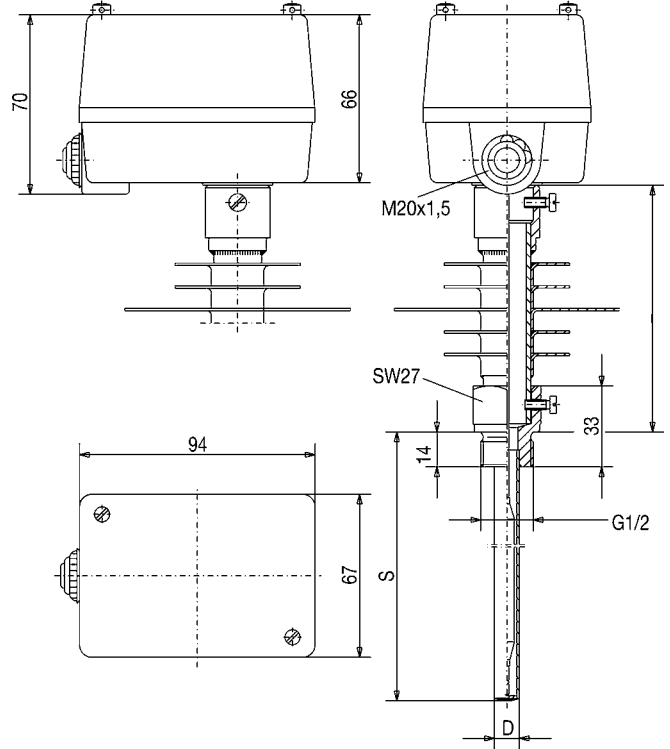


Dimensions in mm:

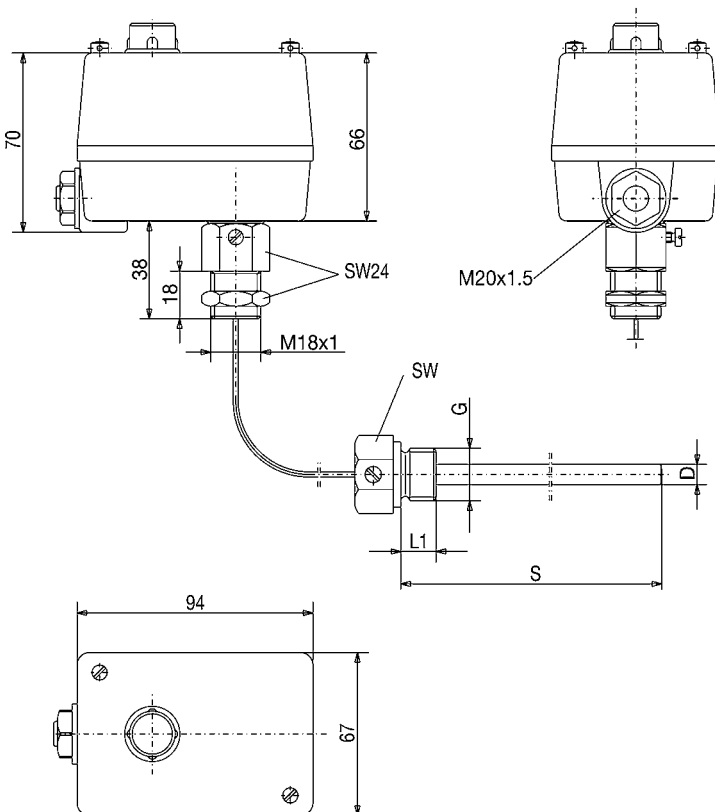
TR with sleeve „U“



TW/STW with sleeve „UZ“



STB, flexible, with sleeve „U“





IR-03

Compact Infrared Thermometer



Features

/ Compact, with integrated sensor

/ Low cost

/ IP 65 (NEMA 4)

/ 4...20 mA analog output

/ Constructed of

304 stainless steel

/ Temperature range up to 500°C

/ 24V DC power

Description:

The IR-02 infrared thermometer is a pyrometer with a thermopile detector. It utilizes the spectral region of 8 to 14 micrometers so as to measure temperatures in the range of 0...+500°C at a distance ratio of 20:1 without contacting. The radiation of the object of measurement in this wavelength is constantly compared with the radiation of the sensor's surroundings and the current value of the object's surface temperature is delivered to the output of the IR-03 within at least 500 milliseconds. A 4...20 mA signal proportional to the temperature is available in 2-wire system.

Application:

Non-contacting infrared thermometers are used in the industry whenever it is not possible to attach a conventional temperature sensor due to high temperature of the object being measured or due to its geometrical characteristics. Pyrometers recognize only surface temperatures; they are free from repercussions and can measure even objects of small specific heat capacity or less thermal conduction such as plastic or various types of glass. The dynamics are solely determined by the evaluation electronics, with the result that fast changing conditions of temperature can be captured. Typical applications are found, for example in the glass, paper and plastic industries as well as in Research & Development activities.



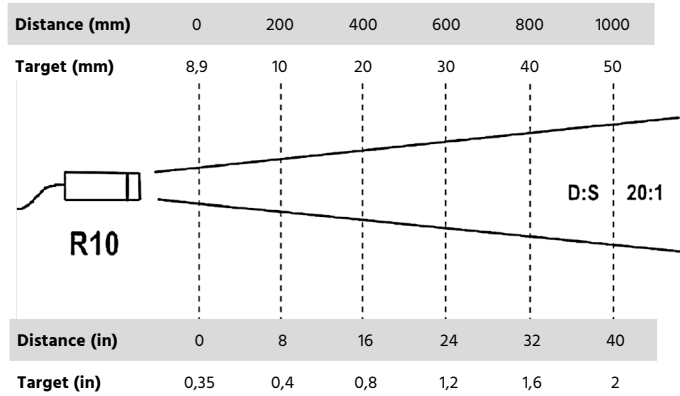
Technical Spezifikationen:

Range /	0° ..500°C
D:S Ratio /	20:1
Spectral range /	8 ..14µm
Emissivity /	0,95 fixed
Accuracy /	0° to 500°C: ± 1% of reading or ±2°C, whichever is greater
Repeatability /	1% or ±1°C
Resolution /	120 µA, 0,3°C
Response time /	500 ms
Ambient /	0° ..50°C
with air cooling	0° ..90°C
with water cooling	0° ..200°C
Storage /	-20° ..70°C
Relative humidity/	10% ..95% none-condensing
Hausing material /	304 stainless steel
Dimensions	18 x 120 mm / thread M18 x 1
Weight	270 g

Electrical Spezifikationen:

Output /	4 ..20 mA, 2-wire
Wiring /	3 m PVC-Kabel
Supply /	24 V DC
Protection Class /	IP65 (NEMA 4)

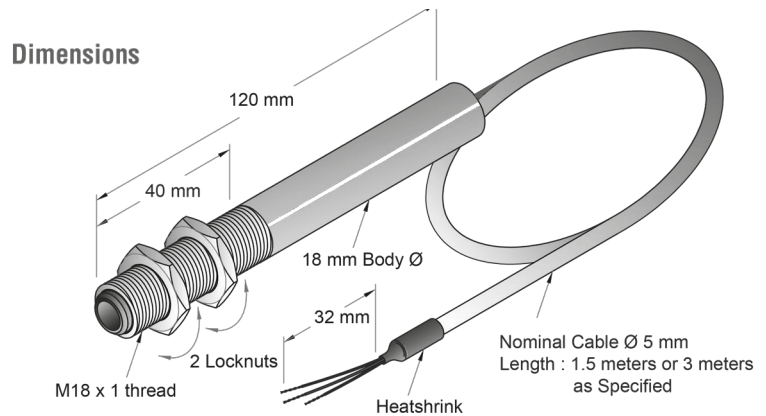
Optics:



Ordering Codes:

Order number	IR-03. 1
IR-03 Compact Infraredthermometer	
Option /	
0 = none	
1 = fixed 90° mounting bracket	
2 = compact air purge collar	
3 = air/water cooling jacket	

Dimensions in mm:





IR-04

Infrared Thermometer

Description:

The IR-04 series infrared thermometers measure temperatures in the range of -32°C to $+1500^{\circ}\text{C}$ at a distance ratio from 8:1 to 50:1 without contact to the object. The radiation of the object of measurement is constantly compared with the radiation of the sensor's surroundings and the current value of the object's surface temperature is displayed by the IR-04 within at least 500 milliseconds. An additional thermocouple probe can be attached to the IR-04 for measuring inside objects or fluids. The thermocouple can also be used to measure the emissivity of the target and automatically corrects the measurement accordingly. A version with USB adapter and data logging software can be used for easily recording the measured values or for stationary use over time, in intervals from 1 second to 999 hours. A tripod is optionally available. The data can be stored in a text file to be used with programs such as Excel™, Access™ or Word™ for further analysis, graphing and reports. All handheld devices use a 9 V battery as power source, offering continuous measuring up to 16 hours.

Features

/ For temperatures up to 1500°C

/ Very robust

/ Ranges up to 50:1 (D:S ratio)

/ Memory log

/ Continuous reading

/ USB connector

Application:

Handheld infrared thermometers are used in the industry whenever a quick measuring is needed. Because of their range and versatility, they can be used to measure the surface temperature of very hot and hard to reach objects from a safe distance. An additional probe expands the range of application even further, as well as various configuration options, like adjustable emissivity. The probe can be used for cooling chain testing in the food industry or automotive maintenance. The IR-04s recognize surface temperatures; they are free of repercussions and can measure even objects of small specific heat capacity or less thermal conduction such as plastic or various types of glass. The dynamics are solely determined by the evaluation electronics, with the result, that fast changing conditions of temperature can be captured.



Standard Thermometers:

Model	IR-04.85	IR-04.115	IR-04.115P	IR-04.125
Description	Close range (< 600mm)	Mid temperature, mid range (< 1000 mm)	Mid temperature, mid range (< 1000 mm), extended features	High temperature, mid range (< 1000 mm), extended features, probe*
Temperature range	-4°...+619°F -20°...+326°C	-25°...+999°F -32°...+535°C	-25°...+999°F -32°...+535°C	-25°...+1400°F -32°...+760°C
Distance to spot ratio	8:1	12:1	12:1	12:1
Spectral range	5...14µm	5...14µm	5...14µm	5...14µm
Emissivity	Fixed at 0.95	Fixed	Adjustable 0.10 to 1.00	Adjustable 0.1 to 1.0
Accuracy	± 2% of reading or 2°C whichever is greater	± 5.4°F (± 3°C) -25°...-4°F (-32°...-20°C) ± 3,6°F (± 2°C) -4°...+212°F (-20°...+100°C) ± 2% 212°...999°F (100°...535°C)	± 5°F (± 3°C) -25°...-4°F (-32°...-20°C) ± 3,6°F (± 2°C) -4°...+212°F (-20°...+100°C) ± 2% > 212°F (100°C)	± 5°F (± 3°C) -25°...-4°F (-32°...-20°C) ± 3,6°F (± 2°C) -4°...+212°F (-20°...+100°C) ± 2% > 212°F (100°C)
Repeatability	± 2°F (± 1°C)	± 2°F (± 1°C)	± 2°F (± 1°C)	± 2°F (± 1°C)
Resolution	0.1°F (0.1°C)	0.1°F (0.1°C)	0.1°F (0.1°C)	0.1°F (0.1°C)
Response time	500 ms.	500 ms.	500 ms.	500 ms.
Operating temperature	32°...122°F (0...50°C) 10 - 90% RH	32°...122°F (0...50°C) 10 - 90% RH	32°...122°F (0...50°C) 10 - 90% RH	32°...122°F (0...50°C) 10 - 95% RH
Storage temperature	14°...140°F (-10°...60°C)	14°...140°F (-10°...60°C)	14°...140°F (-10°...60°C)	14°...140°F (-10°...60°C)
LCD backlight	Yes	Yes	Yes	Yes
Dual display	NA	NA	NA	Yes
°F & °C Selectable	Yes	Yes	Yes	Yes
Laser sight switchable	User selectable, class II laser, less than 1mW			
Auto power off	Automatically after approx. 6 seconds			
Max/Min/Avg/ΔT	No	No	Yes	Yes
Auto measuring	No	No	Yes	Yes
Audible alarm	No	Yes	Yes	Yes
10 Point memory	No	No	Yes	Yes
Electronic trigger lock	No	Yes	Yes	Yes
Tripod mount	Yes	No	No	Yes
USB data output	No	No	No	No
Type K thermocouple	No	No	No	Yes
Operating software	No	No	No	No
Power supply	9V Battery	9V Battery	9V Battery	9V Battery
Battery life (laser off)	16 hrs for continuous operation	15 hrs for continuous operation		15 hrs for continuous operation
Dimensions	5.9 x 5.2 x 1.8" (150 x 133 x 45 mm)	6.8 x 3.6 x 1.8" (173 x 93 x 45 mm)		7.09 x 5.12 x 1.57" (180 x 130 x 40 mm)
Weight (with battery)	4.7 oz (135 g)	7.8 oz (220 g)	7.8 oz (220 g)	6.87 oz (195 g)
Included accessories	User manual, 9V battery	User manual, 9V battery, soft pouch		User manual, 9V battery, carrying case

*different kinds of probes are available, depending on the application. Please specify the desired use when ordering.



High-Temperature Thermometers:

Model	IR-04.135	IR-04.215	IR-04.235
Description	High temperature, long range (< 1500 mm), extended features	High temperature, extra long range (> 1500 mm), extended features, USB, probe*	extra high temperature, extra long range, extended features
Temperature range	-58°...+1832°F -50°...+1000°C	-58°...+1832°F -50°...+1000°C	-58°...+2732°F -50°...+1500°C
Distance to spot ratio	30:1	50:1	50:1
Spectral range	8 to 14µm	8 to 14µm	8 to 14µm
Emissivity	Adjustable 0.10 to 1.00	Adjustable 0.10 to 1.00	Adjustable 0.10 to 1.00
Accuracy	± 5.4°F (± 3°C) -58...-4°F (-50...-20°C) and ± 3.6°F (± 2°C) -4...+212°F (-20...+100°C) and ± 2% > 212°F (100°C)		
Repeatability	± 2°F (± 1°C)	± 2°F (± 1°C)	± 2°F (± 1°C)
Resolution	0.1°F (0.1°C)	0.1°F (0.1°C)	0.1°F (0.1°C)
Response time	500 ms.	500 ms.	500 ms.
Operating temperature	32...122°F (0...+50°C) 10 - 90% RH	32...122°F (0...+50°C) 10 - 90% RH	32...122°F (0...+50°C) 10 - 90% RH
Storage temperature	14...140°F (-10...+60°C)	14...140°F (-10...+60°C)	14...140°F (-10...+60°C)
LCD backlight	Yes	Yes	Yes
Dual display	Yes	Yes	Yes
°F & °C Selectable	Yes	Yes	Yes
Laser sight switchable	User selectable, class II laser, less than 1mW		
Auto power off	Automatically after approx. 6 seconds	Automatically after approx. 30 seconds	Automatically after approx. 6 seconds
Max/Min/Avg/ΔT	Yes	Yes	Yes
Auto measuring	Yes	Yes	Yes
Audible alarm	Yes	Yes	Yes
10 Point memory	Yes	Yes	Yes
Electronic trigger lock	Yes	Yes	Yes
Tripod mount	Yes	Yes	Yes
USB data output	No	Yes	No
Type K thermocouple	No	Yes	No
Operating software	No	Software included	No
Power supply	9V Battery	9V Battery	9V Battery
Battery life (laser off)	15 hrs for continuous operation	15 hrs for continuous operation	15 hrs for continuous operation
Dimensions	7.9 x 5.0 x 1.9" (200 x 127 x 47mm)	7.9 x 5.0 x 1.9" (200 x 127 x 47mm)	6.7 x 5.2 x 1.8" (200 x 132 x 45mm)
Weight (with battery)	12.7 oz (360 g)	12.7 oz (360 g)	11.6 oz (330 g)
Included accessories	User Manual, 9V Battery, Carrying Case, and Wrist Strap	User Manual, 9V Battery, Carrying Case, Wrist Strap & Software	User Manual, 9V Battery, Carrying Case, and Wrist Strap

Ordering Codes:

*different kinds of probes are available, depending on the application. Please specify the desired use when ordering.

Order number

IR-04. 115

IR-04 Infrared Thermometer

Model - see table /

85, 115, 115P, 125, 135, 215, 235





RF-01N

Transmitter for relative humidity and temperature of Gases

Description:

A capacitance-based polymer sensor is used to measure relative humidity in the RF-01N. Polymer sensors consist of two electrodes separated by a film of thermoset polymer that absorbs or releases water as the relative humidity of the gas that surrounds the sensor changes. Capacitance measurements of the polymer film are used to determine the relative humidity. Polymer sensors can measure relative humidity from 0...100%, respond rapidly and exhibit no drift. Capacitance sensors are unaffected by most contaminants and are not damaged by freezing or inundation by water. Sophisticated integrated circuits provide a high level, fully conditioned and temperature compensated 4...20 mA or 0...10 VDC output signal. A temperature sensor is also integrated in the dual output combined humidity/temperature version transmitters.

Application:

The RF-01N is a two-wire transmitter with a 4...20 mA loop powered output or 0...10 VDC output. The sensor recovers rapidly from 100% saturation and is calibration free. The polymer capacitance sensor is not affected by condensation, fog, high humidity or contaminants. The RF-01N provides a stable, repeatable, and accurate means of measuring humidity only or both temperature and humidity in the harshest of environments. The combined humidity/temperature version provides dual 4...20 mA or 0...10 VDC output signals to control both humidity and temperature with one sensor which reduces installation costs. The duct mount version is also available with an optional alpha-numeric LCD display to provide local indication of humidity and temperature simultaneously. Typical applications are monitoring of humidity and temperature such as exhaust, outside air and supply air.



Features

/ Duct mount or outdoor installation

/ Long term stability

/ Accuracy 2%, 3% or 5%

/ Recovers rapidly from

100% saturation

/ Analog output for humidity and optional for temperature

/ Local alpha-numeric display for duct mount models (optional)



Versions:

RF-01N Transmitter for relative humidity and temperature of Gases

The series RF-01N for relative humidity and temperature can be supplied as an outside air model or as a duct mount model. To protect the sensor from damage caused by particle bombardment and damaging deposits or even dust portions both models can be supplied fitted with a sintered filter. Duct mount models are available with an optional 2-line alpha numeric LCD-display.

Options:

LCD-Display: 2-line alpha numeric LCD, 8 characters / line, display resolution: 0.1 % RH; 0.1°C (for duct mount only)

PT100 / PT1000: RTD temperature sensor DIN Class B; ± 0.3°C at 0°C, (Option only for models with a single humidity output signal)

Ordering Codes:

Order number	RF-01N.	1.	2.	1.	1
RF-01N Temp. and Humidity Transmitter					
Version /					
1 = Duct mount					
1a = Duct mount with sintered filter					
2 = Outside air model					
2a = Outside air model with sintered filter					
Accuracy humidity sensor /					
2 = 2 % accuracy					
3 = 3 % accuracy					
5 = 5 % accuracy					
Output signal /					
1 = 4...20 mA, humidity					
2 = 4...20 mA, humidity and temperature					
3 = 0...10 VDC, humidity					
4 = 0...10 VDC, humidity and temperature					
Options /					
0 = none					
1 = LCD display (Duct mount only)					
2 = temperature sensor PT100 DIN class B *					
3 = temperature sensor PT1000 DIN class B *					

* Option only for models with a simple humidity output signal !

Technical Specifications:

Humidity sensor /	Capacitance polymer
Relative Humidity range /	0...100 % RH
Accuracy:	± 2 % for 10...90 % RH at 25°C or ± 3 % for 20...80 % RH at 25°C or ± 5 % for 20...80 % RH at 25°C depending on the sensor
Temperature sensor /	RTD
Accuracy:	DIN Class B; ± 0.3°C at 0°C
Hysteresis /	± 1 %
Repeatability /	± 0.1 %
Temperature limits /	-40...+60°C (-40...+140°F)
Storage temp. /	-40...+80°C (-40...+176°F)
Compensated temperature range /	-20...+60°C (-4...+140°F)
Response time /	15 seconds
Drift /	< 1 % RH / year
Enclosure rating /	IP66 for Duct mount (housing only) IP66 for OSA mount
Housing material /	Duct mount model: PBT Outside air model: Polycarbonate
Weight /	Duct mount model: 0.3 kg Outside air model: 0.45 kg
Agency approvals /	CE

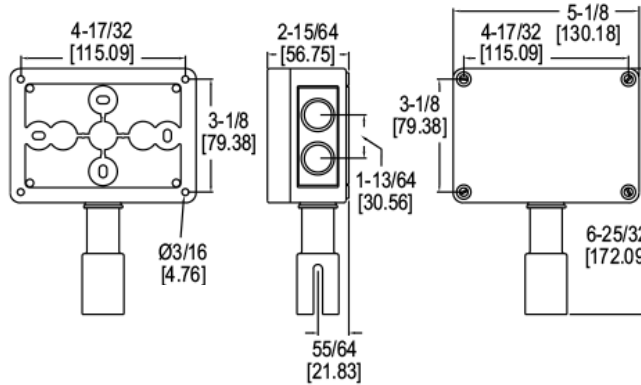
Electrical Specifications:

Supply voltage /	10...35 VDC
Output signal /	1x output: 4...20 mA for humidity 2x outputs: 4...20 mA for humidity and temperature
or Output signal /	1x output: 0...10 VDC @ max. 5 mA for humidity 2x outputs: 0...10 VDC @ max. 5 mA for humidity and temperature measurement
Electrical connection /	removable screw terminal block

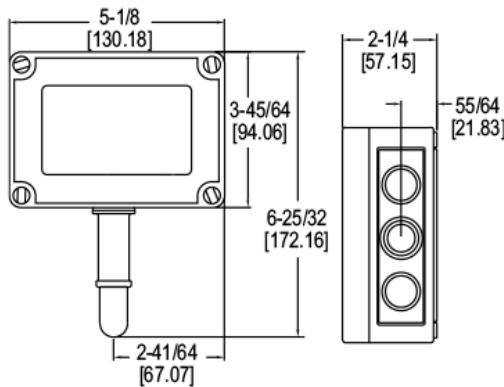


Dimensions in mm:

Outside air model [mm]



Outside air model with sintered filter for polluted gases [mm]



Duct mount model (top without / bottom with sintered filter [mm])

