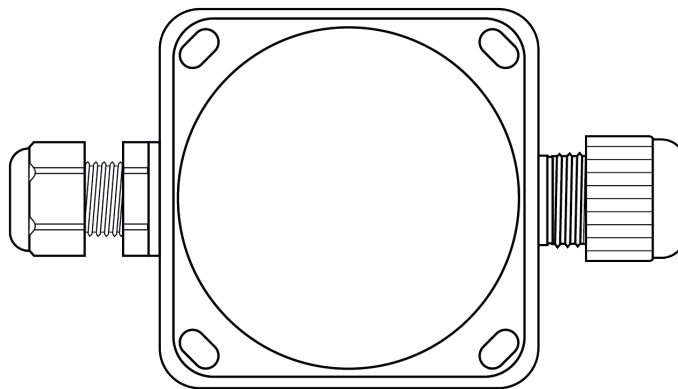


# User Manual

## Housing temperature transmitter 4-20 mA

Article number: 807001 0012



KS / 01.07.2024

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Please find our whole temperature probe and transmitter portfolio in our webshop at: [www.testo-sensor.shop](http://www.testo-sensor.shop)

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Amtsgericht Freiburg HRB 706025 | Umsatzsteuer-ID.: DE274417683

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## 1. General

- The product described in the operating instructions is manufactured according to the current state of the art. All components are subject to strict quality and environmental criteria during manufacture. Our management systems are certified according to ISO 9001 and ISO 14001. The GTC in the sales documents apply.
- These operating instructions are an important part of the product. It must be available to qualified personnel and must be carefully read and understood before starting any work. Please be sure to comply with all the safety and handling instructions given. In particular, observe the local accident prevention regulations and general safety regulations applicable to the area of use of the unit.
- The manufacturer's liability expires in the event of damage caused by improper use, non-observance of the instructions, use of insufficiently qualified personnel and unauthorised modifications to the unit
- Subject to technical changes.

### 1.1. Security

**WARNING! Before installation, commissioning and operation, please make absolutely sure that the correct product has been selected with regard to design and specific measuring conditions. Failure to do so may result in serious personal injury and/or damage to property.**

- The selection of the products and, in particular, the determination of their suitability for a specific purpose are the sole responsibility of the purchaser, who must also ensure that incorrect planning, operation or installation does not cause any further damage and that compliance with the relevant construction and safety guidelines is observed and guaranteed.
- No liability or warranty is expressly accepted for damage caused by incorrect planning, operation, installation or malfunction of the units.
- The technical data and connection conditions in the supplied installation and operating instructions apply exclusively.
- Please contact us if you need to know more about the specification you require.

### 1.2. Intended use

- For the intended use of the product, please refer to the technical data and the commissioning instructions in the operating instructions. The unit is designed and built exclusively for the intended use described there and may only be used accordingly. The technical specifications must be observed. Claims due to improper use are excluded.
- This device must not be used for safety-relevant tasks, such as monitoring or protecting persons against danger or injury, as an emergency stop switch on systems or machines, etc.
- This product has been developed, qualified and manufactured to the highest quality standards. Application-specific environmental or stress conditions can influence the behaviour and lead to deviations from the specifications in the data sheet. To avoid this, we recommend application-specific advice.

**Application-specific environmental or stress conditions can be in particular:**

- Ingress of humidity, which can lead to falsification of measured values
- Vibration, which causes high acceleration forces
- UV irradiation, which can lead to embrittlement of the cable insulation
- Tensile forces acting on the cable, which can damage the probe's internal structure
- Insufficient thermal coupling to the measured medium, with increased response times as a result
- impact with excessively high temperatures, which can change or destroy the built-in measuring resistor or electronic components
- corrosion at the cable ends or the connector contacts, so that measured value falsifications can occur.

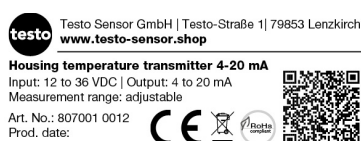
### 1.3. Personnel qualification

**WARNING! - Risk of injury due to insufficient professional qualification! Improper handling can lead to considerable personal injury and damage to property.**

- The activities described in these operating instructions may only be carried out by adequately qualified personnel. Special operating conditions may require additional, appropriate knowledge, e.g. about aggressive media, possible dangers or country-specific regulations, standards or guidelines. Please keep unqualified personnel away from the danger areas.

### 1.4. Signage, safety labels, type plate

Our products are marked with a label as follows. (Exemplary representation)



## 2. Transport, packaging and storage

### 2.1. Transport, packaging and storage

- Transport: Please inspect the unit for any transport damage immediately after delivery. Please notify us immediately of any obvious damage.
- Packaging: Please remove the packaging only immediately before assembly and keep it, as the packaging provides optimum protection during transport.
- Storage: Please refer to the data sheet for permissible temperature and ambient humidity conditions.

#### The following influences are to be avoided:

- Direct sunlight or proximity to hot objects.
- Mechanical vibration, mechanical shock (hard impact)
- Exposure to soot, steam, dust or corrosive gases
- Explosive environment, flammable atmospheres

### 2.2. Original packaging

**Please store the unit in the original packaging in a place that meets the conditions listed above. If the original packaging is not available, please pack and store the unit as follows**

- Wrap the unit in an antistatic plastic sheet.
- Place the unit with the insulation material in the packaging.
- For longer storage (more than 30 days), add a bag of desiccant to the packaging.

## 3. Commissioning

### 3.1. Assembly

- The units may only be connected in a de-energised state, only to safety extra-low voltages and only by suitably qualified personnel. The installation instructions in the data sheet must be observed.
- Please observe the safety regulations of the VDE, the federal states, their monitoring bodies, the TÜV and the local EVU.
- Please observe EMC guidelines to prevent damage, faults on the unit or measured value deviations.

### 3.2. Requirements for achieving the protection class (IP 65)

- Only use the cable gland in the specified clamping range (select the cable Ø to match the cable gland).
- Do not use the lower clamping area when using very soft cable types.
- Only use round cables (a slightly oval cross-section may also be suitable).
- Do not twist the cable.
- Multiple opening/closing is possible, but can have a negative effect on the protection class.
- For cables with pronounced cold flow behaviour, please tighten the screw connection if necessary.

### 3.3. Drilling template:

You will find the drilling template, if available, in the technical data. .

### 3.4. Pin assignment and configuration of input and output by means of DIP switches

- The units are designed for operation on safety extra-low voltages (SELV). For the electrical connection of the units, the technical data of the units apply. You will find the pin assignment and the configuration of input and output by means of DIP switches in our data sheet on the website.
- The output voltage follows linearly to the temperature signal applied to the input and provides a proportional output signal of 0 -10 V.
- Applying the power supply to the output will destroy the unit.
- With the transmitter with 4...20 mA, display and evaluation elements are connected in series in the current loop.
- The transmitter limits the flowing current depending on the input signal. The 4 mA are used for the transmitter's own power supply.

### 3.5. Maintenance

The product is maintenance-free. Repairs may only be carried out by the manufacturer or by qualified personnel.

### 3.6. Disposal

The product is to be classified as electrical and electronic equipment, so that it must be disposed of as electrical / electronic waste. Alternatively, you can return the product to us for proper disposal. The product should not be disposed of as household waste. Special treatment for special components may be legally mandatory and ecologically sensible. Please also observe the local legislation applicable to disposal.

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## 4. Technical data and assembly instructions

### Housing temperature transmitter 4-20 mA

Article number: 807001 0012

The Testo Sensor housing transmitter is suitable for universal connection of resistance sensors and thermocouples. Resistance-based temperature probes (Pt100 / Pt1000 ) in two-, three- and four-wire technology as well as thermocouples can be connected. The transmitter provides an output signal of 4 to 20 mA. It is the ideal link between the temperature probe and your control system. Thanks to the innovative plastic housing with a tool-free rotary cover lock and the good use of space inside the transmitter, installation is quick and easy. Whether for a retrofit or new installation, our housing transmitter is optimally designed for use in plant and machine construction and features high accuracy, reliability, long-term stability and its robust product design.



Special features		
Inputs and outputs		
Input: various resistance sensors and thermocouples	<p>werkzeugfreie Montage durch innovativen Drehdeckelverschluss tool-free assembly due to innovative rotary lid lock</p> <p>Eingang: Pt100 / Pt 1000 Thermoelement Typ J, K, N, S oder T</p> <p>Input: Pt100 / Pt 1000 Thermocouple type J, K, N, S or T</p> <p>Ausgang: 4 - 20 mA Output: 4 - 20 mA</p>	
Output: 4 to 20 mA		
Accuracy and Long-term stability		
Accuracy: high measuring accuracy		
Long-term stability: long service life with flexible application possibilities		
Alarm function		
Sensor break monitoring		
Sensor short-circuit monitoring		
Measuring range monitoring		
Design		
compact, robust, vibration and shock resistant design		
Parametrization		
Simple and super-fast parametrization thanks to preset dip switches		

Input	Circuit diagram Output		
You can connect different temperature probes to the input of the transmitter and then configure them via DIP switches. Please order the probes separately, we feel free to advise you if you have any questions.			
Resistance sensors			
Measuring element	Norm	Configurable measuring range	Accuracy *1
Pt100	IEC 60751	-200 °C to +850 °C   -328 °F to +1562 °F	±0.3 °C + 0.1 %
Pt1000	IEC 60751	-200 °C to +850 °C   -328 °F to +1562 °F	±0.3 °C + 0.1 %
Connection type	2-wire, 3-wire and 4-wire   *1 of the measuring span		
Input Thermocouple			
Measuring element	Norm	Configurable measuring range	Accuracy *1
Type K (NiCr-Ni)	IEC 60584	-200 °C to +1350 °C   -328 °F to +2462 °F	±0.3 °C + 0.1 %
Type J (Fe-CuNi)	IEC 60584	-200 °C to +1000 °C   -328 °F to +1832 °F	±0.3 °C + 0.1 %
Type T (Cu-CuNi)	IEC 60584	-200 °C to +400 °C   -328 °F to +752 °F	±0.3 °C + 0.1 %
Type N (NiCrSi-NiSi)	IEC 60584	-100 °C to +1300 °C   -148 °F to +2372 °F	±0.3 °C + 0.1 %
Type S (Pt10Rh-Pt)	IEC 60584	-50 °C to +1750 °C   -58 °F to +3182 °F	±0.3 °C + 0.1 %

Input impedance: >10 MΩ | Max. wire loop resistance: 500 Ω (incl. thermocouple) | Cold Junction Compensation: Internal by means of NTC 5K (-40 °C - 85 °C ±0.2 °C) | \*1 of the measuring span

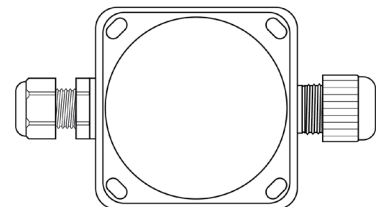
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Output		Circuit diagram Output
Output type	analog, temperature linear for RTD & TC	
Output signal	4 to 20 mA	
Parametrization / Scaling	Configurable via DIP-Switch	
Resolution	16 bit dac	
Accuracy (°C)	0,1	
Load	500 Ω at 24 VDC	
Connection type	2-wire	

Sensor monitoring & sensor error		Measured values outside the measuring range	
Sensor failure effects	according to NAMUR NE43	Sensor Status	4 - 20 mA
<b>Alarms</b>		Min. measured value	4 mA
Sensor error	4 - 20 mA	Max. measured value	20 mA
Sensor Status	3,6 mA	Underrange	3,8 mA
Sensor short circuit	21 mA	Overrange	20,5 mA
<b>Time response</b>		<b>Accuracy and stability</b>	
Closing time (s)	≤ 5	<b>Cold junction compensation</b>	
Signal attenuation (s)	0 – 30	Cold Junction Compensation	±0,3 – 0,5 °C (NTC 5K)
Measuring cycle (s)	<0,25 ( <4 Hz )	Temperature influence	±0,01 °C per °C
Response time	Depending on sensor type		

Influence of the sensor cable	
RTD and resistance (2-wire)	In two-wire circuits, the inherent resistance of the connecting lead adds to the resistance value of the measuring resistor (thermistor or Pt) and thus falsifies the measurement result. For this reason, we recommend the two-wire technique in conjunction with small-resistance measuring resistors only if you can use comparatively short connecting leads, i.e. small-resistance connecting leads.
RTD and resistance (3-wire)	Negligible, with equal wire resistance
RTD and resistance (4-wire)	Negligible
Thermocouples and Voltage	Negligible
<b>Further data</b>	
Supply voltage influence	Within specified limits

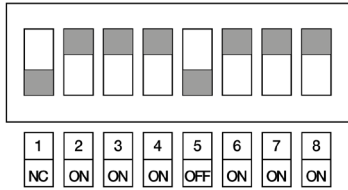
Ambient conditions	
Ambient Temperatur	Storage: -20 °C to +70 °C (housing) Operating: -20 °C to +70 °C (housing)
Humidity (%rH)	0 to 98 (non-condensing)
Protection	Housing IP65
<b>EMC</b>	
Standard	Directive: 2014/30/EU   Harmonized standards: EN 61326-1:2013
<b>Type</b>	
Dimensions (mm)	105 x 60 x 34 (see drawing)
Material   Flammability	ABS white RAL 9010 UV resistant, RoHS compliant
Mounting	Enclosed mounting kit (housing)
Connection	Single wires, max. 1,5 mm <sup>2</sup> , AWG 16
Weight (g)	68



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**Factory settings**

Temperaturtransmitter für Kabelfühler (RTD Sensoren)  
 Werkseinstellungen: Sensor Pt100 Skalierung: 0 .. 100 °C  
 Temperature transmitter for cable probes (RTD sensors)  
 Factory settings: Sensor Pt100 Scaling: 0 ... 100 °C



**Factory configuration**

Input	Pt100
Scaling	0 °C to +100 °C

**General data**

Isolation	none
Supply Voltage (VDC)	12 to 36, polarity protected

**Delivery**

Transmitter, Instruction manual, individually packed in PE bag

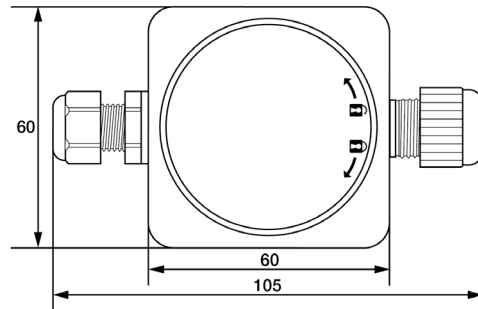
**Matching accessories**

Designation	Order no.
DIN rail power supply	On request
Table power supply	On request
Matching cable probe	in the Webshop: testo-sensor.shop
Matching Screw-in probes	in the Webshop: testo-sensor.shop
Suitable contact probes	in the Webshop: testo-sensor.shop
Matching connection cables	in the Webshop: testo-sensor.shop

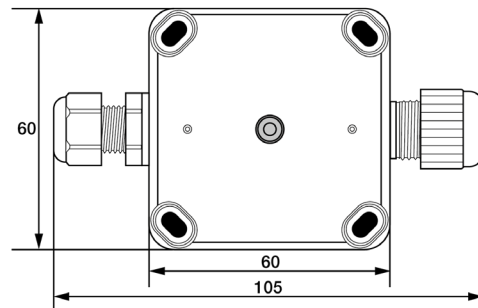
**Technical drawing**

All dimensions in mm

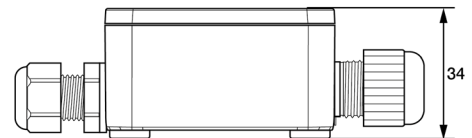
**Front view**



**Rear view**



**Side view**



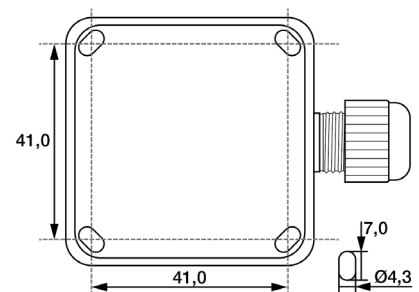
**Mounting**

Thanks to the four slotted holes, the housing can be easily mounted to the wall. The openings for the screws are located outside the protective space for the electronics, so there is no need for sealing. With the cable compression glands, sealing to the probe or data cable is guaranteed even for different diameters.

Mounting material for the installation of the transmitter (screws and dowels) are included with the transmitter as free accessories. A large assortment of temperature probes and connecting cables is also available as an option.

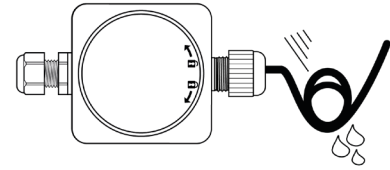
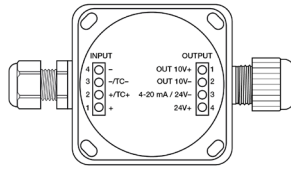
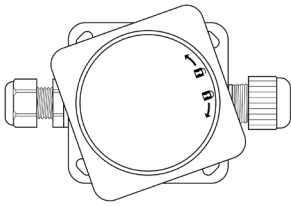
Important: To prevent measuring errors, the connecting screws for fastening the connecting cable must be firmly tightened.

**Drilling template**



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**Mounting**



Open the rotary cover.

Connect the required measuring element to the input according to the assignment plan. (Suitable measuring element NOT included in the scope of delivery, can be found in our store.) You can then parameterize input and output via the DIP switches.

Please lay cables with reserve loop and in such a way that no water can penetrate into the sensor head. This allows you to extend the probe without disconnecting the electrical connection.

**Pin assignment input and output**

Input RTD sensors	Pt1000 2w Pt100 2w	<p>Dip-Schalter auf „ON“ Set dip switch on</p>	Pt1000 3w Pt100 3w	Pt1000 4w Pt100 4w	Output 4-20 mA   24V
	4 ○ 3 ○ ws wh 2 ○ rt rd 1 ○		4 ○ rt rd 3 ○ rt rd 2 ○ ws wh 1 ○	4 ○ rt rd 3 ○ rt rd 2 ○ ws wh 1 ○ ws wh	
Input thermocouples	TC Type J	TC Type K	TC Type N	TC Type S	Output
	4 ○ 3 ○ ws wh 2 ○ sw bl 1 ○	4 ○ 3 ○ ws wh 2 ○ gn gn 1 ○	4 ○ 3 ○ ws wh 2 ○ rs pk 1 ○	4 ○ 3 ○ ws wh 2 ○ rt rd 1 ○	

With the DIP switches of the transmitter you can configure the transmitter according to your needs. DIP switch 1 is not assigned. Just leave it in the position. With DIP switches 2-4 you can define which measuring element you have connected to the input. Switches 5-8 are used to set the scaling and the measuring range. For the exact configuration please refer to the adjacent table.

**Einstellen der Skalierung via DIP-Schalter  
Setting the scaling range via DIP switch**

Setting the input signal

off	on	on	on	
Bit 1	Bit 2	Bit 3	Bit 4	Sensor
nc	on	on	on	Pt100
	off	on	on	Pt1000
	on	off	on	TE Type K
	off	off	on	TE Type J
	on	on	off	TE Type T
	off	on	off	TE Type N
	on	off	off	TE Type S
	off	off	off	Pt100

Setting the measuring range (0 .. 250 °C)

on	on	on	on	Scaling Range
Bit 5	Bit 6	Bit 7	Bit 8	
on	on	on	on	0 .. +50°C
off	on	on	on	0 .. +100°C
on	off	on	on	0 .. +150°C
off	off	on	on	0 .. +200°C
on	on	off	on	0 .. +250°C
off	on	off	on	0 .. +400°C
on	off	off	on	0 .. +600°C
off	off	off	on	0 .. +800°C
on	on	on	off	0 .. +1.000°C
off	on	on	off	0 .. +1.200°C
on	off	on	off	-20 .. +50°C
off	off	on	off	-20 .. +120°C
on	on	off	off	-30 .. +70°C
off	on	off	off	-50 .. +50°C
on	off	off	off	-50 .. +150°C
off	off	off	off	-200 .. +50°C

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