

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room temperature measuring transducer **THERMASGARD® RTMxx** with active output, temperature range (0...+50 °C / +32...+122 °F), in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, optionally with potentiometer and/or display.

The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I) with 2-wire connection and I output is available.

This room temperature sensor is used to detect temperatures in closed dry rooms such as flats, in offices and business facilities. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA	
RTM - I	
Power supply:	15...36V DC, depending on working resistance, residual ripple stabilised ±0.3V
Working resistance:	$R_B \text{ (Ohm)} = (U_B - 14V) / 0.02A$
Connection type:	2-wire connection
Output:	4...20mA
RTM - A (AOS)	
Power supply:	24V AC / DC (± 10%)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ for AOS I variant $R_L > 15 \text{ kOhm}$ for AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10V / 4...20mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0W / 24V DC; < 2.2VA / 24V AC
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	0...+50 °C / +32...+122 °F (other ranges optional) with manual zero point correction (± 10K)
Sensor:	digital temperature sensor
Deviation, temperature:	typically ± 0.2K at +25 °C / ± 0.4 °F at +77 °F
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimensions:	85 x 85 x 27 mm / 3.35 x 3.35 x 1.06 in (Baldur 1)
Electrical connection:	0.14 - 1.5 mm ² / 24-16 AWG, via terminal screws
Installation:	wall mounting or on in-wall flush box Ø55 mm / 2.17 in, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Ambient temperature:	measuring transducer -30...+70 °C / -22...+158 °F
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 30 (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Control element:	potentiometer , with angle of rotation limiter, the standard marking is a swelling arrow with centre position, unfilled (others upon request)
Optional:	Two-line display with illumination , cutout 36 x 15 mm / 1.4 x 0.6 in (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

THERMASGARD® Room temperature measuring transducers (with display and/or potentiometer)						
Type / WG01	Output Temperature active	Output Temperature passive	Output Potentiometer active	Poti	Display	Item No.
RTM - I	(2-wire)					
RTM-I LCD	4...20mA	(optional)	–	■		1101-41A2-2000-200
RTM - A	(AOS)					
RTM-A LCD	0-10V / 4...20mA	(optional)	–	■		1101-41AE-2000-200
RTM-A P LCD	0-10V / 4...20mA	(optional)	0-10V / 4...20mA	●	■	1101-41AE-2004-346
RTM-A P	0-10V / 4...20mA	(optional)	0-10V / 4...20mA	●		1101-41AE-0004-346
RTM-A P Pt1000	0-10V / 4...20mA	Pt1000	0-10V / 4...20mA	●		1101-41AE-0054-346
Automatic Output Switching:	patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10V or 4...20mA.					
Measuring range:	0...+50 °C / +32...+122 °F (permanently set)					
Extra charge:	other measuring ranges optional additional passive sensor (pin 5/6) optionally upon request					
Potentiometer:	the standard marking is a swelling arrow with centre position, (–•+), unfilled optionally wedge-shaped without centre position (–...+) or with marking points (–3K...+3K) – special print upon request					

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room temperature measuring transducer **THERMASGARD® RTM 1**, with eight switchable measuring ranges (max. $-20\dots+150\text{ }^{\circ}\text{C}$ / $-4\dots+302\text{ }^{\circ}\text{F}$), active output, in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. Optionally available as a design with vandal-proof housing made of stainless steel (top and base screwed together).

The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA.

The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

This room temperature sensor is used to detect temperatures in closed dry rooms such as flats, in offices and business facilities. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

RTM 1 - I	
Power supply:	15...36V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{V}$
Working resistance:	R_B (Ohm) = $(U_B \cdot 14\text{V}) / 0.02\text{A}$
Connection type:	2-wire connection
Output:	4...20mA

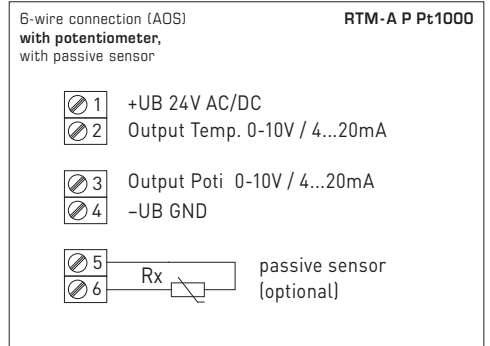
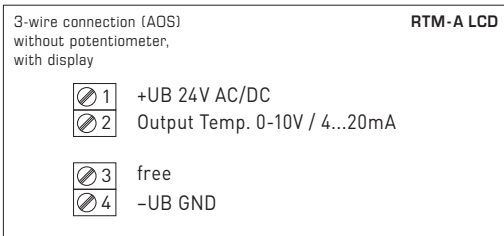
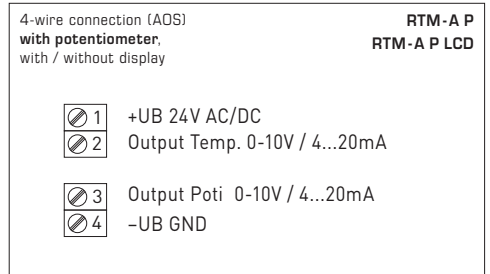
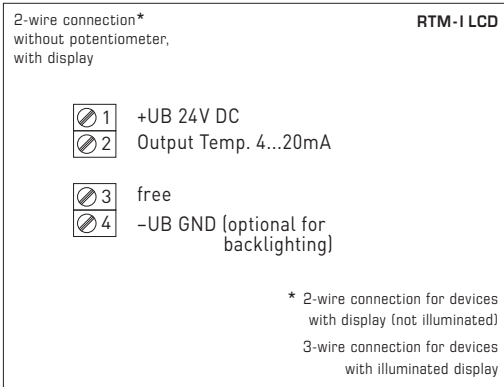
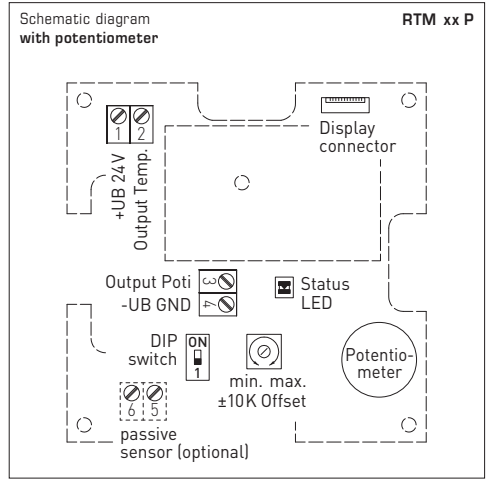
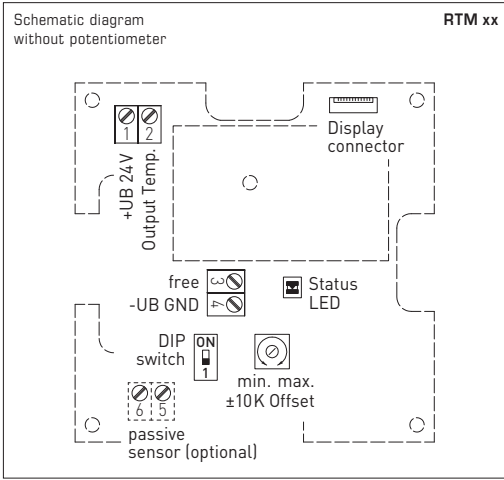
RTM 1 - A (AOS)	
Power supply:	24V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25\dots450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10V / 4...20mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1,0\text{W} / 24\text{V DC}$; $< 2,2\text{VA} / 24\text{V AC}$
Measuring ranges:	multi-range switching with 8 measuring ranges see table (other ranges optional) with manual zero point correction ($\pm 10\text{K}$)
Sensor:	Pt1000, DIN EN 60751, class B
Deviation, temperature:	typically $\pm 0.2\text{K}$ at $+25\text{ }^{\circ}\text{C}$ / $\pm 0.4\text{ }^{\circ}\text{F}$ at $+77\text{ }^{\circ}\text{F}$
Housing:	plastic, material ABS, colour pure white (similar to RAL9010), optional stainless steel V2A (1.4301)
Housing dimensions:	$85 \times 85 \times 27\text{ mm} / 3.35 \times 3.35 \times 1.06\text{ in}$ (Baldur 1) $75 \times 75 \times 25\text{ mm} / 2.95 \times 2.95 \times 0.98\text{ in}$ (stainless steel)
Electrical connection:	$0.14 - 1.5\text{ mm}^2 / 24 - 16\text{ AWG}$, via terminal screws on circuit board
Installation:	wall mounting or on in-wall flush box $\emptyset 55\text{ mm} / 2.17\text{ in}$, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Ambient temperature:	measuring transducer $-30\dots+70\text{ }^{\circ}\text{C}$ / $-22\dots+158\text{ }^{\circ}\text{F}$
Permitted humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 30 (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU

THERMASGARD® Room temperature measuring transducers with multi-range switching (without display)

Type / WGD1	Output	Features	Item No.
RTM1-I (2-wire)			
RTM1-I	4...20mA	–	1101-41A2-0000-200
RTM1-I VA	4...20mA	Stainless steel housing V2A (1.4301)	1101-4152-0000-200
RTM1-A (3-wire AOS)			
RTM1-A	0-10V / 4...20mA	–	1101-41AE-0000-200
RTM1-A VA	0-10V / 4...20mA	Stainless steel housing V2A (1.4301)	1101-415E-0000-200
Automatic Output Switching:	patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10V or 4...20mA.		
Measuring range:	multi-range switching with 8 switchable measuring ranges (see DIP table) $0\dots+50\text{ }^{\circ}\text{C} / +32\dots+122\text{ }^{\circ}\text{F}$ (default), max. $-20\dots+150\text{ }^{\circ}\text{C}$ / $-4\dots+302\text{ }^{\circ}\text{F}$		
Extra charge:	other measuring ranges optional additional passive sensor (pin 4/5) optionally upon request		

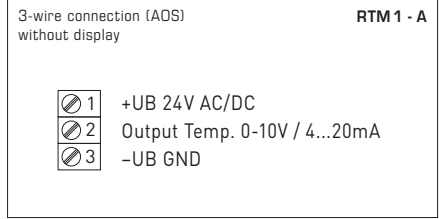
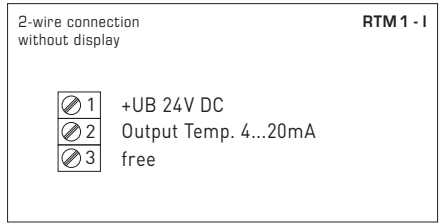
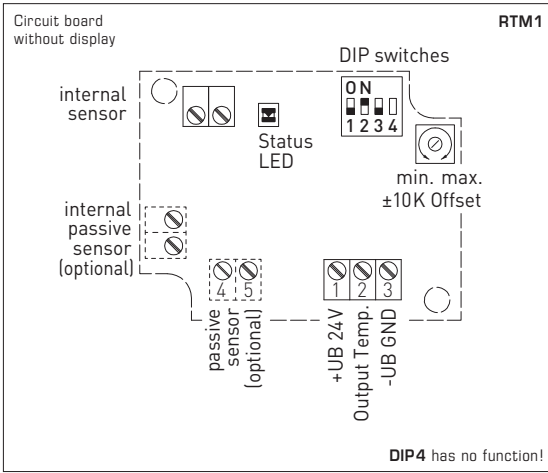


Readout in the display (switchable)		DIP 1
Imperial	[°F]	ON
SI (default)	[°C]	OFF



Readout in the display
Temperature [°C] → [°F]

The display value depends on the set unit system (DIP1).



Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3	Measuring ranges [°F] (adjustable)
-20...+ 150 °C	ON	ON	ON	-4...+ 302 °F
-50... + 50 °C	OFF	ON	ON	-58...+ 122 °F
-20... + 80 °C	ON	OFF	ON	-4...+ 176 °F
-30... + 60 °C	OFF	OFF	ON	-22...+ 140 °F
0... + 40 °C	ON	ON	OFF	32...+ 104 °F
0... + 50 °C (default)	OFF	ON	OFF	32...+ 122 °F (default)
0...+ 100 °C	ON	OFF	OFF	32...+ 212 °F
0...+ 150 °C	OFF	OFF	OFF	32...+ 302 °F



Automatic Output Switching

**Patented analogue interface for automated output switching
(Patent no. DE 10 2015 015 941 B4)**

Switching on the AOS unit will automatically analyse the network connected to the outputs and set the relevant output type U or I. Outputs that are not connected are detected as voltage outputs.

Network resistance > 15 kOhm => U output 0-10 V
 Network resistance < 450 Ohm => I output 4...20 mA

The following applies to units with AOS multiple output:
 if one of the outputs is detected as a current output,
 all outputs are configured together as output type I.
 Combined operation as current and voltage output is not possible.
 The status LED indicates the detected output type.

Status-LED

The status LED on the PCB shows the current operating mode of the unit:

TMxx - A (AOS)

redblinking.....unit switching on
greensteady light ...U output 0-10 V
orangesteady light ...I output 4...20 mA

TMxx - I (2-wire I)

yellowblinking.....unit switching on
yellowsteady light ...I output 4...20 mA

Offset potentiometer

A potentiometer on the PCB is used to adjust the offset manually. When the system is delivered, the potentiometer is in centre position and lacquer-sealed.

Range of adjustment: approx. ± 10 K

Readout in the display

Standard display

As standard, the first line indicates the actual temperature at the unit. The value indicated depends on the system of units set (DIP 4).

°CSI (default)

°FImperial

Internal diagnostics

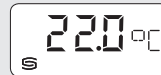
Sensor breakage or sensor short circuit are detected by the unit and indicated in the display.

Err 1Sensor breakage

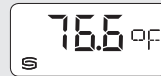
Err 2Sensor short circuit

Display and internal diagnostics

**THERMASGARD®
Measuring transducer with display**



Temperature
[°C]



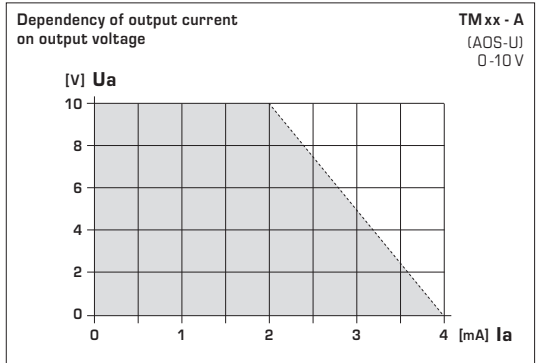
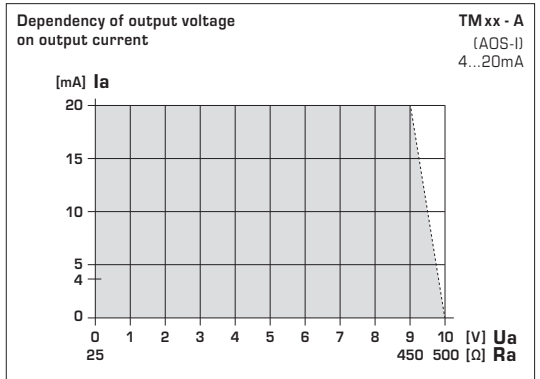
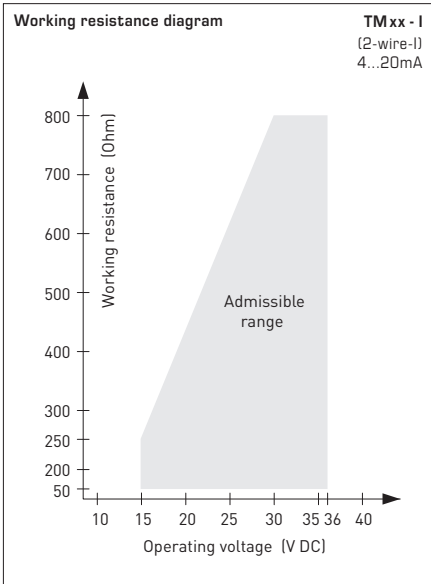
Temperature
[°F]



Sensor breakage



Sensor short circuit



TEMPERATURE RANGES:

When selecting measuring transducer ranges, it is necessary to ensure that the maximum temperatures permissible for sensor/housing are not exceeded!

Ambient temperature for measuring transducers:
-30...+70 °C / -22...+158 °F

Apparent ohmic resistance = see load resistance diagram

SUPPLY VOLTAGE

For operating voltage reverse polarity protection, a one-way rectifier or reverse polarity protection diode is integrated in this device variant. This internal one-way rectifier also allows operating 0-10V devices on AC supply voltage.

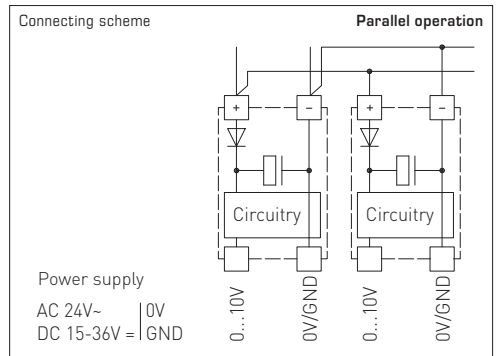
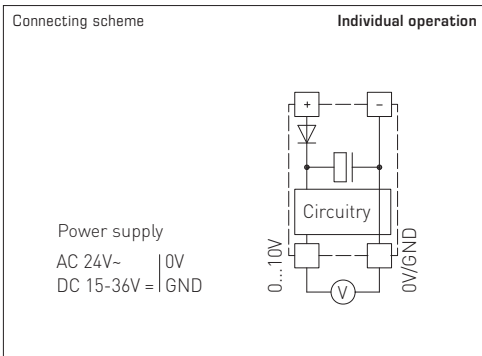
The output signal is to be tapped by a measuring instrument. Output voltage is measured here against zero potential (0V) of the input voltage!

When this device is operated on **DC supply voltage**, the operating voltage input UB+ is to be used for 15...36V DC supply and UB- or GND for ground wire!

When several devices are supplied by one 24V **AC voltage supply**, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (-) (= reference potential) are connected together (in-phase connection of field devices). All outputs of field devices must be referenced to the same potential!

In case of reversed polarity at one field device, a supply voltage short-circuit would be caused by that device. The consequential short-circuit current flowing through this field device may cause damage to it.

Therefore, pay attention to correct wiring!



Installation and Commissioning

Devices are to be connected under dead-voltage condition. Devices must only be connected to safety extra-low voltage. Consequential damages caused by a fault in this device are excluded from warranty or liability. These devices must be installed and commissioned by authorised specialists. The technical data and connecting conditions shown on the device labels and in the mounting and operating instructions delivered together with the device are exclusively valid. Deviations from the catalogue representation are not explicitly mentioned and are possible in terms of technical progress and continuous improvement of our products. In case of any modifications made by the user, all warranty claims are forfeited. Operating this device close to other devices that do not comply with EMC directives may influence functionality. This device must not be used for monitoring applications, which serve the purpose of protecting persons against hazards or injury, or as an EMERGENCY STOP switch for systems or machinery, or for any other similar safety-relevant purposes.

Dimensions of housing or housing accessories may show slight tolerances on the specifications provided in these instructions. Modifications of these records are not permitted.

In case of a complaint, only complete devices returned in original packing will be accepted.

Notes regarding mechanical mounting and attachment:

Mounting shall take place while observing all relevant regulations and standards applicable for the place of measurement (e.g. such as welding instructions, etc.). Particularly the following shall be regarded:

- VDE / VDI directive technical temperature measurements, measurement set-up for temperature measurements.
- The EMC directives must be adhered to.
- It is imperative to avoid parallel laying of current-carrying lines. We recommend to use shielded cables with the shielding being attached at one side to the DDC / PLC. Before mounting, make sure that the existing thermometer's technical parameters comply with the actual conditions at the place of utilization, in particular in respect of:
 - Measuring range
 - Permissible maximum pressure, flow velocity
 - Oscillations, vibrations, shocks are to be avoided (< 0.5 g)

General notes

Our "General Terms and Conditions for Business" together with the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" (ZVEI conditions) including supplementary clause "Extended Retention of Title" apply as the exclusive terms and conditions.

In addition, the following points are to be observed:

- These instructions must be read before installation and putting in operation and all notes provided therein are to be regarded!
- Devices must only be connected to safety extra-low voltage and under dead-voltage condition. To avoid damages and errors the device (e.g. by voltage induction) shielded cables are to be used, laying parallel with current-carrying lines is to be avoided, and EMC directives are to be observed.
- This device shall only be used for its intended purpose. Respective safety regulations issued by the VDE, the states, their control authorities, the TÜV and the local energy supply company must be observed. The purchaser has to adhere to the building and safety regulations and has to prevent perils of any kind.
- No warranties or liabilities will be assumed for defects and damages arising from improper use of this device.
- Consequential damages caused by a fault in this device are excluded from warranty or liability.
- These devices must be installed and commissioned by authorised specialists.
- The technical data and connecting conditions of the mounting and operating instructions delivered together with the device are exclusively valid. Deviations from the catalogue representation are not explicitly mentioned and are possible in terms of technical progress and continuous improvement of our products.
- In case of any modifications made by the user, all warranty claims are forfeited.
- This device must not be installed close to heat sources (e.g. radiators) or be exposed to their heat flow. Direct sun irradiation or heat irradiation by similar sources (powerful lamps, halogen spotlights) must absolutely be avoided.
- Operating this device close to other devices that do not comply with EMC directives may influence functionality.
- This device must not be used for monitoring applications, which serve the purpose of protecting persons against hazards or injury, or as an EMERGENCY STOP switch for systems or machinery, or for any other similar safety-relevant purposes.
- Dimensions of housing or housing accessories may show slight tolerances on the specifications provided in these instructions.
- Modifications of these records are not permitted.
- In case of a complaint, only complete devices returned in original packing will be accepted.

Commissioning is mandatory and may only be performed by qualified personnel!

These instructions must be read before installation and commissioning and all notes provided therein are to be regarded!

CONNECTING CONDITIONS

Output: 0 - 10 V

The output voltage follows linear to the temperature signal applied at the input terminals and generates a proportional output signal of 0 - 10 V. The voltage outputs are short-circuit proof against ground wire. Applying voltage supply to the output terminals will destroy the device.

Output: 4 ... 20 mA

In case of the 4 ... 20 mA measuring transducer, display and evaluating elements are connected in series in the current loop. The measuring transducer thereby limits the flowing current in variance of the input signal. 4 mA are for the measuring transducer's internal current consumption. The apparent ohmic resistance can either be connected in the plus or minus path of the measuring transducer. In case of an apparent ohmic resistance in the plus path, power supply and resist.

SAFETY REGULATIONS

These devices shall only be used for their intended purpose. Respective safety regulations issued by the VDE, the states, their control authorities, the TÜV and the local energy supply company must be observed. The buyer has to ensure adherence to the building and safety regulations and has to avoid all dangers of any kind. We do not assume any warranty for faults or damages arising or resulting from improper use of our equipment or from non-observance of operating instructions. These instruments must be installed by authorised specialists only!

Preferably shielded cables should be used in order to prevent damages/errors. It is imperative to avoid laying parallel with current-carrying lines. EMC directives must be adhered to.

Notes on commissioning:

This device was calibrated, adjusted and tested under standardised conditions. When operating under deviating conditions, we recommend performing an initial manual adjustment on-site during commissioning and subsequently at regular intervals. **Commissioning is mandatory and may only be performed by qualified personnel!**

