

EE441

Strap-on Temperature Sensor

The EE441 strap-on sensor measures reliably the temperature (T) on round ducts and pipes and is optimized for heating systems (warm and cold water pipes) or solar collectors.

Analogue, Digital and Passive Outputs

The T measured data, is available on the voltage or current output, as well as on the RS485 interface with Modbus RTU or BACnet MS/TP protocol. In addition, EE441 features a wide choice of sensing elements for passive T measurement.

Easy Installation

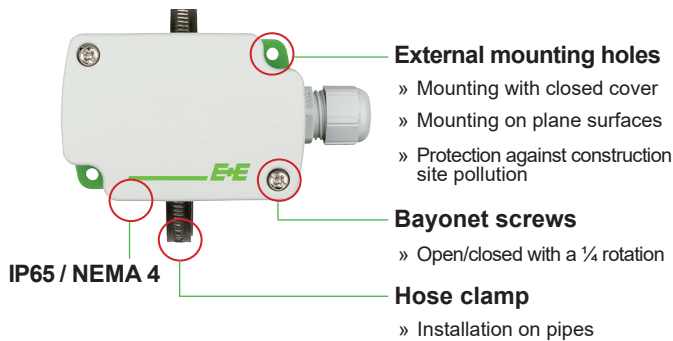
The compact enclosure and the stainless steel hose clamp allow for easy and fast installation on pipes with diameter from 25 to 175 mm (0.98"…6.89").

Configurable and Adjustable

An optional adapter and the free EE-PC Product Configuration Software facilitate the setup and adjustment of the EE441.



Features



Test report according to
DIN EN 10204 – 2.2



Technical Data

Active Output

| | | | |
|-------------------------------|---|---|----------------------------------|
| Operating temperature | -40...+70 °C (-40...+158 °F) | | |
| Sensing element | Pt1000 class A, DIN EN60751 | | |
| Analogue output | 0-10 V | -1 mA < I _L < 1 mA | |
| | 4-20 mA (two-wire) | R _L < 500 Ω | R _L = load resistance |
| Digital interface | RS485 with max. 32 unit load devices on one bus | | |
| Protocol | Modbus RTU or BACnet MS/TP | | |
| Accuracy | ±0.3 °C (±0.54 °F) at 20 °C (68 °F) | | |
| Supply voltage (Class III) | 15-35 V DC or 24 V AC ±20% | for RS485 and 0-10 V output | |
| | 10 V DC + R _L x 20 mA < V+ < 35 V DC | for 4-20 mA output | |
| Current demand (typ.) | analogue | 5 mA (DC) / 12 mA _{eff} (AC) | |
| | RS485 | 3.5 mA (DC) / 12 mA _{eff} (AC) | |
| Electromagnetic compatibility | EN61326-1, EN61326-2-3 industrial environment | | |

Passive Output

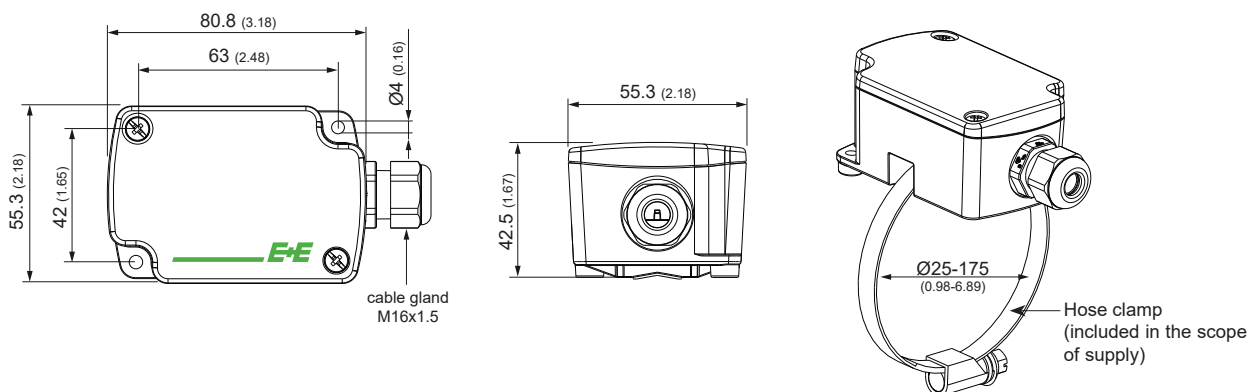
| | | | | |
|--------------------------------------|---|------------------------------------|---|--------------|
| Operating temperature (contact area) | -40...+110 °C (-40...+230 °F) | | | |
| T sensing elements | Sensor Type | Nominal Resistance | Sensitivity | Standard |
| | Pt100 DIN B | R ₀ : 100 Ω | TC: 3.850 x 10 ⁻³ /°C | DIN EN 60751 |
| | Pt1000 DIN B | R ₀ : 1000 Ω | TC: 3.850 x 10 ⁻³ /°C | DIN EN 60751 |
| | NTC1.8k | R ₂₅ : 1.8 kΩ ± 0.2 K | B _{25/85} : 3500 K ± 1.0 % | - |
| | NTC2.2k | R ₂₅ : 2.252 kΩ ± 0.2 K | B _{25/85} : 3977 K ± 0.3 % | - |
| | NTC10k B3950 | R ₂₅ : 10 kΩ ± 0.5 % | B _{25/85} : 3989 K (B _{25/50} : 3950 K ± 1.0 %) | - |
| | NTC10k B3435 | R ₂₅ : 10 kΩ ± 1 % | B _{25/85} : 3435 K | - |
| | KTY81-210 | R ₂₅ : 1980-2020 Ω | - | - |
| | Ni1000 TK6180 DIN B | R ₀ : 1000 Ω | TC: 6180 ppm/K | DIN 43760 |
| | Ni1000 TK5000 DIN B | R ₀ : 1000 Ω | TC: 5000 ppm/K | DIN 43760 |
| Measurement current typ. | < 1 mA (according technical data of the specific T-sensing element) | | | |

T-sensor connection two-wire

General

| | |
|------------------------------|---|
| Insulation resistance | > 100 MΩ at 20 °C (68 °F) |
| Response time τ_{63} | < 1 min |
| Enclosure material | polycarbonate, UL94-V0 approved, T-range: -40...+110 °C (-40...+230 °F) |
| Protection class | IP65 / NEMA 4 |
| Cable gland | M16x1.5, UL94-V2 |
| Electrical connection | screw terminal, max. 2.5 mm ² (0.004 in ²) |
| Hose clamp material | stainless steel (corr. 1.4301 / 304) |
| Storage temperature | -30...+70 °C (-22...+158 °F) |
| Working and storage humidity | 5...95 % RH, non condensing |

Dimensions mm (inch)



Ordering Guide

| | | EE441- | | |
|------------------------|---|----------------------|-----|---------|
| | | M3 | | M7 |
| Hardware Configuration | Model | active | | |
| | | passive | | |
| | Output | A3 | | |
| | | A6 | | |
| | | J3 | | |
| Setup Outputs | T-sensor passive (see www.epluse.com/R-T_Characteristics) | Pt100 DIN B | | TP2 |
| | | Pt1000 DIN B | | TP4 |
| | | NTC 1.8k | | TP7 |
| | | Ni1000, TK6180 DIN B | | TP9 |
| | | NTC 10k, B3950 | | TP11 |
| | | KTY81-210 | | TP13 |
| | | NTC 10k, B3435 | | TP14 |
| | | Ni1000, TK5000 DIN B | | TP19 |
| | | NTC 2.2k | | TP21 |
| | | Unit | °C | no code |
| | °F | MA2 | | |
| Scale T low | 0 | no code | | |
| | value (within working range) | SAL value | | |
| Scale T high | 50 | no code | | |
| | value (within working range) | SAH value | | |
| Protocol | Modbus RTU ¹⁾ | | P1 | |
| | BACnet MS/TP ²⁾ | | P3 | |
| Baud rate | 9.600 | | BD5 | |
| | 19.200 | | BD6 | |
| | 38.400 | | BD7 | |
| | 57.600 ³⁾ | | BD8 | |
| | 76.800 ³⁾ | | BD9 | |

1) Factory setting: Even parity, Stopbits 1. Modbus Map and communication setting: see User Guide and Modbus Application Note at www.epluse.com/ee441

2) Factory setting: No parity, Stopbits 1. Product Implementation Conformance Statement (PICS) available at www.epluse.com/ee441

3) Only for BACnet MS/TP

Order Example

EE441-M3J3P3BD7

Model: active
Output: RS485
Protocol: BACnet MS/TP
Baud rate: 38.400

EE441-M7TP11

Model: passive
T-sensor passive: NTC 10K, B3950

Accessories

Product configuration adapter

- for analogue output

- for digital output - USB configuration adapter

[see data sheet EE-PCA](#)

[HA011066](#)

Product configuration software

[EE-PCS](#) (free download: www.epluse.com/configurator)

Power supply adapter

[V03](#) (see data sheet Accessories)

Conduit adapter, M16x1.5 to 1/2"

[HA011110](#)