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Datasheet TES201

Room Sensor for Temperature



TES201

Room Temperature Sensor

The TES201 accurately measures room temperature (T) in residential and commercial HVAC systems.

Outputs and Digital Interface

The measured data is available either on the analogue output or on the RS485 interface with Modbus RTU or BACnet MS/TP protocol.

Functional Design, Cost-saving Installation

The elegant enclosure is available in two sizes according to regional standards and features an optional display. With its innovative design of sensor positioning, the effect of false air ingress is minimized. The back cover contains just the push-in spring terminals and can be mounted and wired without the front cover containing the electronics. Thus, the active part of the device is not exposed to construction site pollution and can be simply snapped onto the back cover right before commissioning. Besides, the active part can be replaced without tools within seconds.

Configuration

The digital version with RS485 interface can be set up and configured via PC with the free PCS10 Product Configuration Software and an optional configuration adapter.



TES201 in US format with display



TES201 in US format with display

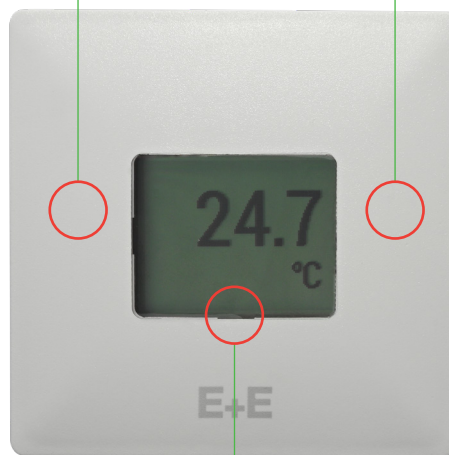
Features

Measurement performance

- High T accuracy
- Excellent long term stability
- State-of-the-art E+E T sensing element
 - Patented sensor technology

Enclosure and connection

- Innovative design avoids false air ingress
- Time saving installation and wiring
 - Snap-on without tools
 - Push-in spring terminals
 - All electronics inside the front cover
- Smooth cover surface
 - Dust repellent
 - Easy cleaning
- EU and US format
- UL94HB approved enclosure material



Outputs

- Analogue output
 - 0 – 10 V
 - 4 – 20 mA
- RS485 interface with
 - Modbus RTU
 - BACnet MS/TP
- Large graphic display

Inspection certificate

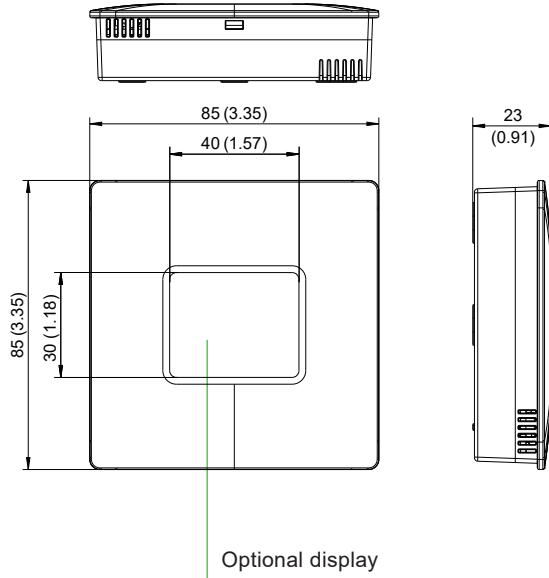
According to DIN EN 10204-3.1
 available via [E+E Certificate Service](#)

Dimensions

Values in mm (inch)

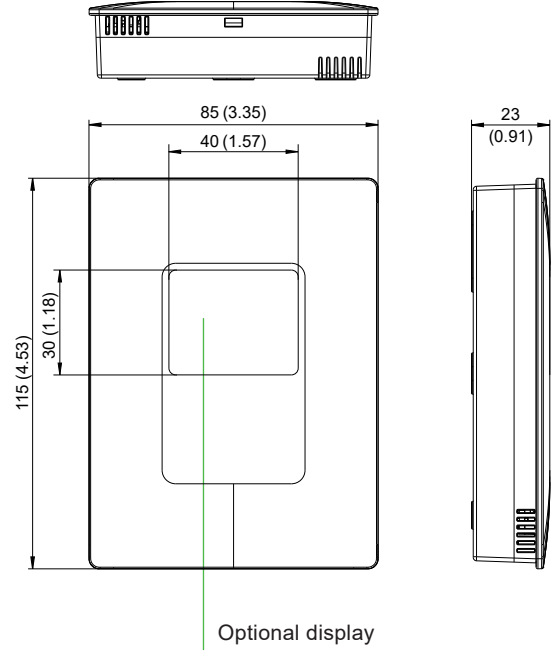
Enclosure

EU format



Enclosure

US format



Technical Data

Measurands

Temperature (T)

| | |
|--|--|
| Measuring range | -30...+60 °C (-22...+140 °F) |
| Accuracy ¹⁾ | 0 - 10 V, RS485 4 - 20 mA ±0.25 °C (±0.14 °F) ±0.38 °C (±0.21 °F) |
| Temperature dependency of electronics, typ. | 0.006 K/K |
| Factory calibration uncertainty ²⁾ @ 23 °C (73 °F) | ±0.1 °C (±0.056 °F) |

1) Defined @ 23 °C (73 °F) against E+E calibration reference. With supply voltage 24 V DC, 0.2 m/s (39. 4 ft/min) medium flow and load resistor 250 Ω for version with current output.
 2) Defined with an enhancement factor k=2, corresponding to a confidence level of 95 %.

Technical Data

Outputs

Analogue




| | | | |
|---------------------------|--------------------------------|---|---|
| T: acc. to ordering guide | 0 - 10 V 4 - 20 mA (2-wire) | -1 mA < I _L < 1 mA R _L < 500 Ω | I _L = load current R _L = load resistance |
|---------------------------|--------------------------------|---|---|

Digital

| | |
|--|--|
| Digital interface | RS485 (TES201 = 1 unit load) |
| Protocol Factory settings Supported Baud rates ¹⁾ Measured data type | Modbus RTU Baud rate see ordering guide, parity even, 1 stop bit, Modbus address 45 9600, 19200 and 38400 FLOAT32 and INT16 |
| Protocol Factory settings Supported Baud rates ¹⁾ | BACnet MS/TP BACnet address 45 9600, 19200, 38400, 57600, 76800 and 115200 |

1) Ex works: see ordering guide.

General

| | | | | |
|---|---|---|---|----------------------------------|
| Power supply class III  USA & Canada: Class 2 supply necessary, max. voltage 30 V DC | 0 - 10 V, RS485 4 - 20 mA (2-wire) | | 15 - 35 V DC or 24 V AC ±20 % 10 + 0.02 x R _L < V+ < 35 V DC (R _L < 500 Ω) | R _L = load resistance |
| Current consumption, typ. | | @ 24 V DC | @ 24 V AC | |
| | 0 - 10 V | 6 mA | 14 mA _{rms} | |
| | 4 - 20 mA | Acc. to output current | | |
| | RS485 | 5 mA | 12 mA _{rms} | |
| Electrical connection | Push-in spring terminals max. 1.5 mm ² (AWG 16) | | | |
| Display | 1.8" LCD, dot-matrix, 1 line, visible area 38 x 31 mm (1.5" x 1.2") | | | |
| Humidity range | Operation | 0...100 %RH non-condensing | | |
| | Storage | 0...95 %RH non-condensing | | |
| Temperature range, operation and storage | without display | -30...+60 °C (-22...+140 °F) | | |
| | with display | -20...+60 °C (-4...+140 °F) | | |
| Enclosure | Material | PC (Polycarbonate), RAL 9003 (signal white), UL94 HB approved | | |
| | Protection rating | IP30 | | |
| Electromagnetic compatibility | EN 61326-1 | EN 61326-2-3 | Industrial environment | |
| | FCC Part15 Class B | ICES-003 Class B | | |
| Shock and vibration | Tested according to EN 60068-2-64 and EN 60068-2-27 | | | |
| Conformity |   | | | |
| Configuration ¹⁾ | PCS10 Product Configuration Software (free download) and optional configuration adapter | | | |

1) With digital versions only.

Ordering Guide

| | Feature | Description | Code | | |
|-------------------------|---------------------|--------------------------------|----------|----|--|
| Hardware Configuration | | | TES201- | | |
| | Model | T | M3 | | |
| | Output | 0 - 10 V | A3 | | |
| | | 4 - 20 mA (2-wire) | A6 | | |
| | | RS485 | | J3 | |
| | Display | Without display | No code | | |
| Display | | D1 | | | |
| Design | EU format | No code | | | |
| | US format | RG2 | | | |
| Setup Analogue | Output measurand | Temperature [°C] | No code | | |
| | | Temperature [°F] | MA2 | | |
| | Output scaling low | 0 | No code | | |
| | | Value ¹⁾ | SALValue | | |
| Output scaling high | 50 | No code | | | |
| | Value ¹⁾ | SAHValue | | | |
| Setup Digital Interface | Protocol | Modbus RTU ²⁾ | P1 | | |
| | | BACnet MS/TP ³⁾ | P3 | | |
| | Baud rate | 9600 (usual for Modbus) | BD5 | | |
| | | 19200 | BD6 | | |
| | | 38400 (usual for BACnet) | BD7 | | |
| | | 57600 (for BACnet MS/TP only) | BD8 | | |
| | | 76800 (for BACnet MS/TP only) | BD9 | | |
| | | 115200 (for BACnet MS/TP only) | BD10 | | |
| | Units | Metric (SI) | No code | | |
| | | Non-metric US/GB | U2 | | |

1) -35 °C (-31 °F) < T scaling low < 20 °C (68 °F), 25 °C (77 °F) < T scaling high < 70 °C (158 °F), T scaling high - T scaling low > 20 °C (36 °F).

2) Factory setting: Parity even, 1 stop bit. Modbus Map see User Manual at www.epluse.com/tes201.

3) Factory setting: No parity, 1 stop bit. Product Implementation Conformance Statement (PICS) available at www.epluse.com/tes201.

Order Examples

TES201-M3A6RG2

| Feature | Code | Description |
|---------------------|---------|--------------------|
| Model | M3 | T |
| Output | A6 | 4 - 20 mA (2-wire) |
| Display | No code | Without display |
| Design | RG2 | US format |
| Output measurand | No code | Temperature [°C] |
| Output scaling low | No code | 0 |
| Output scaling high | No code | 50 |

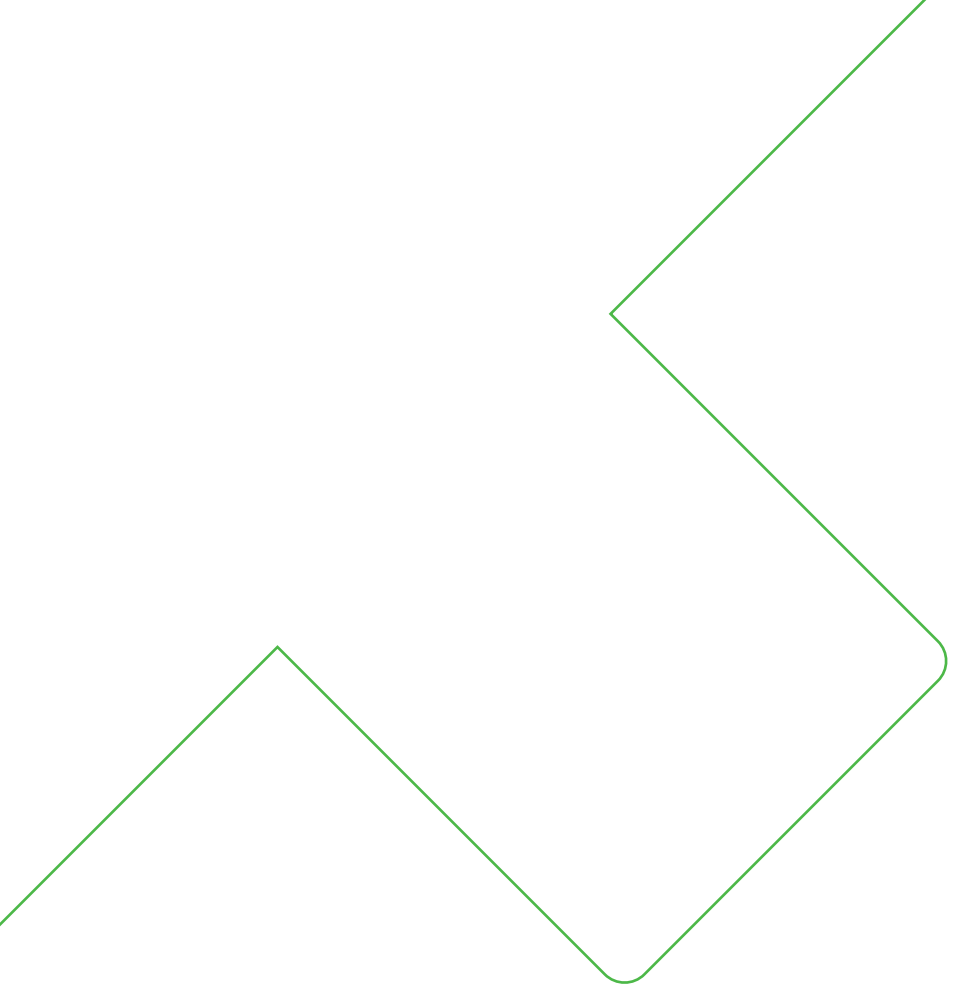
TES201-M3J3D1P3BD7

| Feature | Code | Description |
|-----------|---------|--------------|
| Model | M3 | T |
| Output | J3 | RS485 |
| Display | D1 | Display |
| Design | No code | EU format |
| Protocol | P3 | BACnet MS/TP |
| Baud rate | BD7 | 38 400 |
| Units | No code | Metric (SI) |

Accessories

For further information see datasheet [Accessories](#).

| Description | Code |
|---|----------|
| E+E Product Configuration Software (Free download from www.epluse.com/pcs10) | PCS10 |
| USB Configuration Adapter for TES201 digital | HA011066 |



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