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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

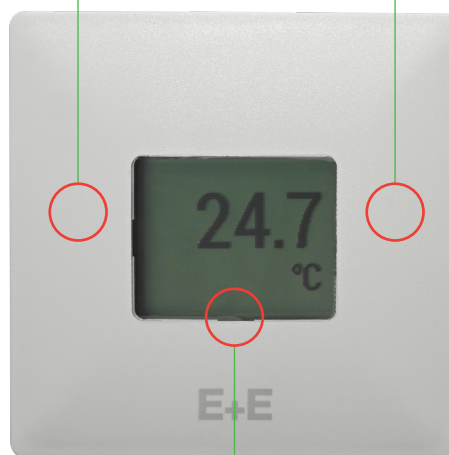
# Features

## 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

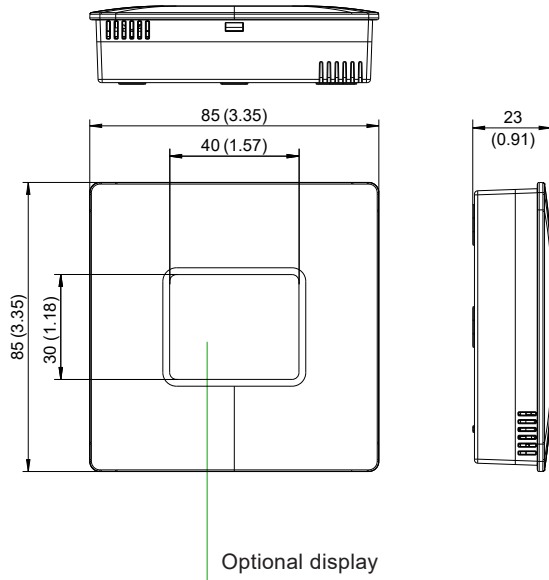
According to DIN EN 10204-3.1  
available via [E+E Certificate Service](#)

# Dimensions

Values in mm (inch)

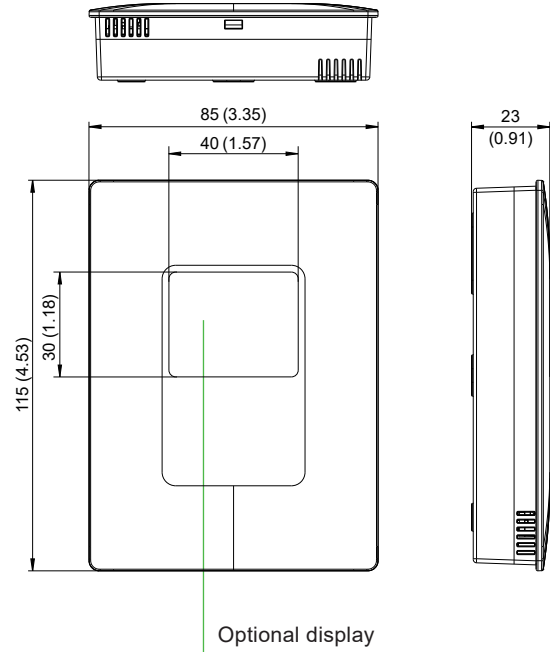
## Enclosure

EU format



## Enclosure

US format



# Technical Data

## Measurands

### Temperature (T)

Measuring range	-30...+60 °C (-22...+140 °F)				
Accuracy <sup>1)</sup>	<table border="0"> <tr> <td style="text-align: center;"><b>0 - 10 V, RS485</b></td> <td>±0.25 °C (±0.14 °F)</td> </tr> <tr> <td style="text-align: center;"><b>4 - 20 mA</b></td> <td>±0.38 °C (±0.21 °F)</td> </tr> </table>	<b>0 - 10 V, RS485</b>	±0.25 °C (±0.14 °F)	<b>4 - 20 mA</b>	±0.38 °C (±0.21 °F)
<b>0 - 10 V, RS485</b>	±0.25 °C (±0.14 °F)				
<b>4 - 20 mA</b>	±0.38 °C (±0.21 °F)				
Temperature dependency of electronics, typ.	0.006 K/K				
Factory calibration uncertainty <sup>2)</sup> @ 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 <sub>L</sub> < 1 mA R <sub>L</sub> < 500 Ω	I <sub>L</sub> = load current R <sub>L</sub> = load resistance
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### Digital

Digital interface	RS485 (TES201 = 1 unit load)
Protocol Factory settings Supported Baud rates <sup>1)</sup> 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 <sup>1)</sup>	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	<b>0 - 10 V, RS485</b> <b>4 - 20 mA (2-wire)</b>		15 - 35 V DC or 24 V AC ±20 % 10 + 0.02 x R <sub>L</sub> < V+ < 35 V DC (R <sub>L</sub> < 500 Ω)	R <sub>L</sub> = load resistance
Current consumption, typ.	<b>@ 24 V DC</b>	<b>@ 24 V AC</b>		
<b>0 - 10 V</b>	6 mA	14 mA <sub>rms</sub>		
<b>4 - 20 mA</b>	Acc. to output current			
<b>RS485</b>	5 mA	12 mA <sub>rms</sub>		
Electrical connection	Push-in spring terminals max. 1.5 mm <sup>2</sup> (AWG 16)			
Display	1.8" LCD, dot-matrix, 1 line, visible area 38 x 31 mm (1.5" x 1.2")			
Humidity range	<b>Operation</b>	0...100 %RH non-condensing		
	<b>Storage</b>	0...95 %RH non-condensing		
Temperature range, operation and storage	<b>without display</b>	-30...+60 °C (-22...+140 °F)		
	<b>with display</b>	-20...+60 °C (-4...+140 °F)		
Enclosure	<b>Material</b>	PC (Polycarbonate), RAL 9003 (signal white), UL94 HB approved		
	<b>Protection rating</b>	IP30		
Electromagnetic compatibility	EN 61326-1 FCC Part15 Class B	EN 61326-2-3 ICES-003 Class B	Industrial environment	
Shock and vibration	Tested according to EN 60068-2-64 and EN 60068-2-27			
Conformity	 			
Configuration <sup>1)</sup>	PCS10 Product Configuration Software ( <a href="#">free download</a> ) 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 <sup>1)</sup>	SALValue		
Output scaling high	50	No code			
	Value <sup>1)</sup>	SAHValue			
Setup Digital Interface	Protocol	Modbus RTU <sup>2)</sup>	P1		
		BACnet MS/TP <sup>3)</sup>	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](http://www.epluse.com/tes201).

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

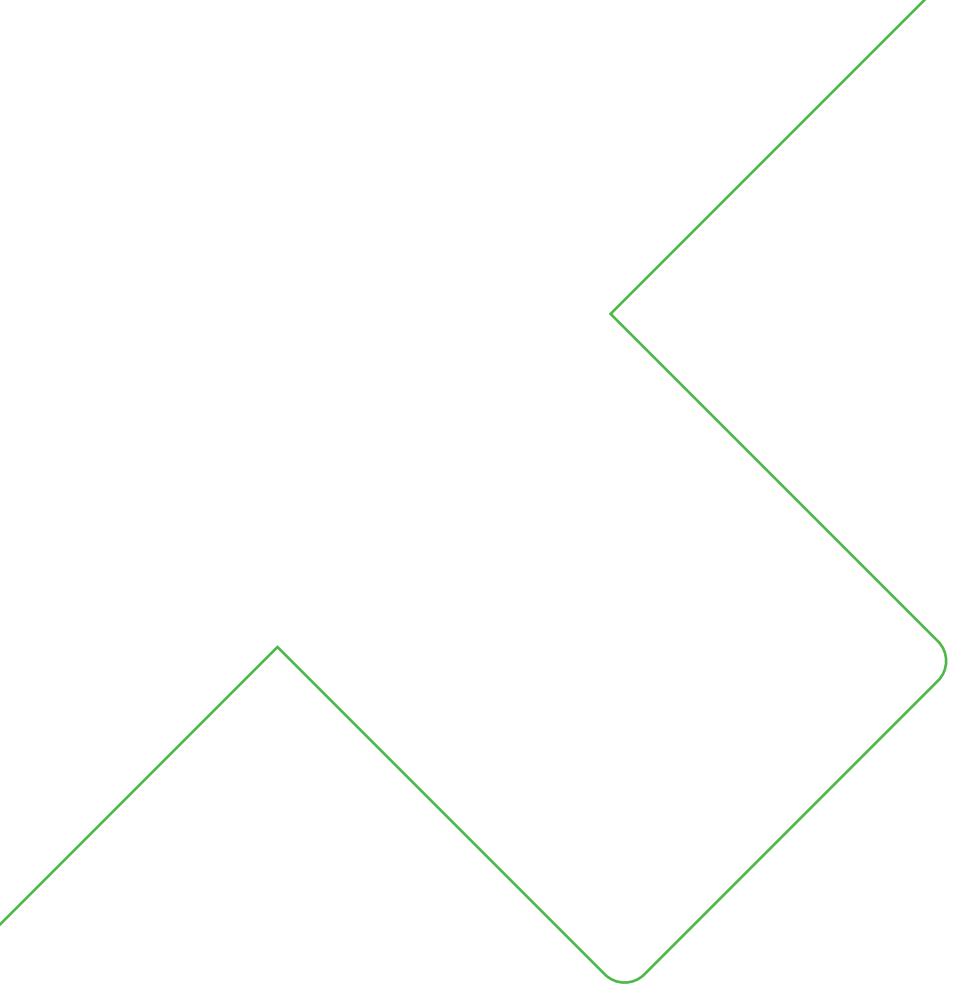
## TES201-M3J3D1P3BD7

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
<b>E+E Product Configuration Software</b> (Free download from <a href="http://www.epluse.com/pcs10">www.epluse.com/pcs10</a> )	PCS10
USB Configuration Adapter for TES201 digital	HA011066



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