E+E

your partner
in sensor
technology.

Datasheet TES201

Room Sensor for Temperature

Modbus

BACnet

www.epluse.com

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 elctronics. Thus, the active part of the device is not exposed to construction site pollution and ca 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

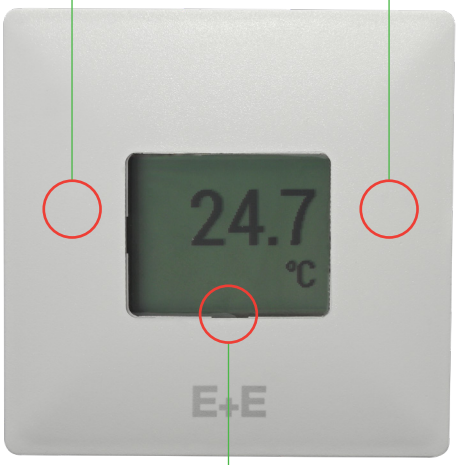
Features

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

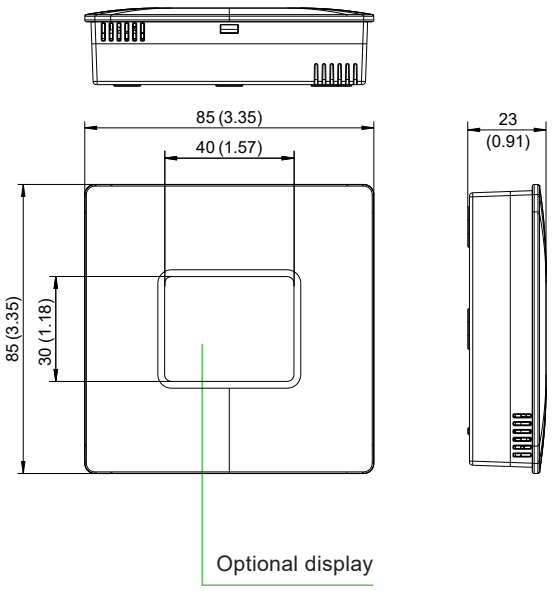
According to DIN EN 10204-3.1
available via E+E Certificate Service

Dimensions

Values in mm (inch)

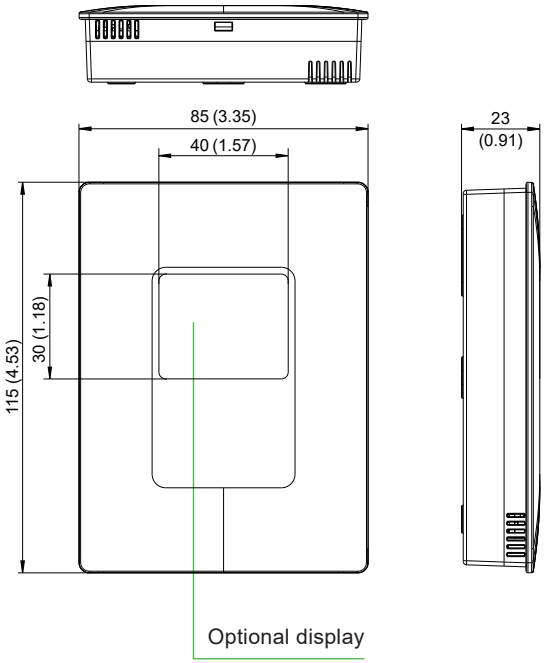
Enclosure

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 9 600, 19 200 and 38 400 FLOAT32 and INT16
Protocol **Factory settings** **Supported Baud rates**[1)]	BACnet MS/TP BACnet address 45 9 600, 19 200, 38 400, 57 600, 76 800 and 115 200

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 (RL < 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** **Storage**	 0…100 %RH non-condensing 0…95 %RH non-condensing		
Temperature range, operation and storage **without display** **with display**	 -30...+60 °C (-22...+140 °F) -20...+60 °C (-4...+140 °F)		
Enclosure **Material** **Protection rating**	 PC (Polycarbonate), RAL 9003 (signal white), UL94 HB approved 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	CE UKCA		
Configuration[1)]	PCS10 Product Configuration Software (free download) and optional configuration adapter		

1) With digital versions only.

Ordering Guide

	Feature	Description	Code	
			TES201-	
Hardware Configuration	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]	SAL*Value*	
	Output scaling high	50	No code	
		Value[1]	SAH*Value*	
Setup Digital Interface	Protocol	Modbus RTU[2]		P1
		BACnet MS/TP[3]		P3
	Baud rate	9 600 (usual for Modbus)		BD5
		19 200		BD6
		38 400 (ususal for BACnet)		BD7
		57 600 (for BACnet MS/TP only)		BD8
		76 800 (for BACnet MS/TP only)		BD9
		115 200 (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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