

# EE10

## Humidity and Temperature Room Sensors

EE10 is dedicated for accurate relative humidity (RH) and temperature (T) measurement in residential and commercial HVAC.

The RH and T measured data is available either on two analogue outputs, or on a BACnet or Modbus RTU interface. The measured data corresponding to the active outputs can be read locally on the optional display.

Additional physical quantities are available on the Modbus RTU and BACnet MS/TP interface: absolute humidity, mixing ratio, enthalpy, frost point temperature and water vapor partial pressure.

The stylish enclosure is available in two sizes according to regional standards.

The back cover, which contains only the screw terminals, can be mounted and wired first. The front cover containing the electronics can be simply snapped onto the back cover right before commissioning. Thus the active part of the device is not exposed to construction site pollution and can be replaced without tools within seconds.



### Typical Applications

Building automation  
 Indoor climate control

### Features

High accuracy and long term stability  
 Fast and easy installation  
 Modbus, BACnet or analogue outputs

### Technical Data

#### Measured values

##### Relative Humidity

Working range	0...95 % RH	
Accuracy <sup>1)</sup> at 20 °C (68 °F) and U <sub>v</sub> =24 V DC		
Analogue (0 - 10 V, 4 - 20 mA)	±2 % RH (40...60 % RH)	±3 % RH (10...90 % RH)
Digital (RS485)	±3 % RH (30...70 % RH)	±5 % RH (10...90 % RH)
Temperature dependence, typ.	0.06 % RH / °C (0.03 % RH / °F)	

##### Temperature

Accuracy <sup>1)</sup> at 20 °C (68 °F) and U <sub>v</sub> =24 V DC	Output A3: ±0.25 °C (±0.45 °F)	Output A6: ±0.4 °C (±0.72 °F)
	Output J3: ±0.3 °C (±0.54 °F)	

#### Output

<b>Analogue</b>	0 - 10 V	-1 mA < I <sub>L</sub> < 1 mA
(RH: 0...100 % RH / T: see ordering guide)	4 - 20 mA (2-wire)	R <sub>L</sub> < (U <sub>v</sub> - 10) / 0.02 < 500 Ω
<b>Digital Interface</b>	RS485 with max. 32 devices on one bus	
Protocol	Modbus RTU or BACnet MS/TP	

#### General

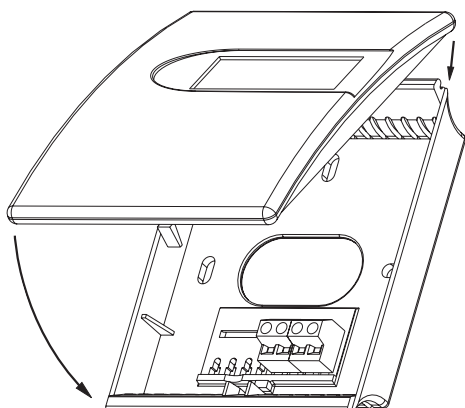
Voltage supply (U <sub>v</sub> ), class III	15 - 40 V DC <sup>2)</sup> or 24 V AC ±20 %	
0 - 10 V	10 + 0.02 x R <sub>L</sub> < U <sub>v</sub> < 28 V DC (R <sub>L</sub> < 500 Ω)	
4 - 20 mA	15 - 35 V DC <sup>2)</sup> or 24 V AC ±20 %	
RS485		
Current consumption, typ.		
Analogue (0 - 10 V, 4 - 20 mA)	DC supply: 4 mA / AC supply: 15 mA <sub>rms</sub>	
Digital (RS485)	DC supply: 9 mA / AC supply: 20 mA <sub>rms</sub>	
Electrical connection	Screw terminals max. 1.5 mm <sup>2</sup> (AWG 16)	
Enclosure (polycarbonate)	US Version: UL94 V-0 approved / EU Version: UL94 HB approved	
Protection rating	IP30	
Display	Humidity / Temperature alternating	
Electromagnetic compatibility	EN 61326-1	EN 61326-2-3 Industrial Environment
	FCC Part 15	ICES-003 Class B
Temperature working range	-5...55 °C (23...131 °F)	
Temperature storage range	-25...60 °C (-13...140 °F)	

1) Traceable to international standards, administrated by NIST, PTB, BEV...

The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

2) USA & Canada: class 2 supply required, max. supply voltage 30 V

## Enclosure



### Dimensions:

EU: W x H x D = 85 x 100 x 26 mm (3.3 x 3.9 x 1")

US: W x H x D = 85 x 136 x 26 mm (3.3 x 5.4 x 1")

### Colour:

EU-Standard, US:

Front cover: signal white RAL9003

Back cover: light grey RAL7035

## Scope of Supply

- EE10 Sensor according to ordering guide
- Mounting materials
- Test report according to DIN EN 10204-2.2
- Quick user guide (for digital output only)

## Ordering Guide

			EE10-
	<b>Model</b>	RH + T	<b>M1</b>
	<b>Output</b>	0 - 10 V	<b>A3</b>
		4 - 20 mA	<b>A6</b>
	<b>Display</b>	RS485	<b>J3</b>
		Without display	<b>no code</b>
	With display	<b>D1</b>	
<b>Enclosure</b>	EU-Standard (RAL9003/RAL7035)	<b>no code</b>	
	US (RAL9003/RAL7035)	<b>RG2</b>	
<b>Output Setup</b>	<b>Temperature Unit</b>	T [°C]	<b>no code</b>
		T [°F]	<b>MB2</b>
	<b>Scale T low</b>	0	<b>no code</b>
		Value <sup>1)</sup>	<b>SBLValue</b>
	<b>Scale T high</b>	50	<b>no code</b>
		Value <sup>1)</sup>	<b>SBHValue</b>
<b>Protocol</b>	Modbus RTU <sup>2)</sup>	<b>P1</b>	
	BACnet MS/TP <sup>3)</sup>	<b>P3</b>	
	Metric (SI)	<b>no code</b>	
	Non-metric US/GB	<b>U2</b>	
<b>Baud rate</b>	9600 (usual for Modbus)	<b>BD5</b>	
	19200	<b>BD6</b>	
	38400 (usual for BACnet)	<b>BD7</b>	
	57 600 <sup>4)</sup>	<b>BD8</b>	
	76 800 <sup>4)</sup>	<b>BD9</b>	

1) -5 °C (23 °F) < Scale T low < 20 °C (68 °F).

2) Factory setting: Even Parity, Stopbits 1.

3) Factory setting: No Parity, Stopbits 1.

4) Only for BACnet MS/TP

25 °C (77 °F) < Scale T high < 55 °C (131 °F). Scale T high – Scale T low > 20 °C (68 °F).

Modbus Map see User Guide at [www.epluse.com/ee10](http://www.epluse.com/ee10)

Product Implementation Conformance Statement (PICS) available at [www.epluse.com/ee10](http://www.epluse.com/ee10)

## Order Examples

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### EE10-M1A3D1

Model: RH + T  
Output: 0 - 10 V  
Display: With display  
Enclosure: EU-Standard (RAL9003/RAL7035)  
Temperature Unit: °C  
Scale T low: 0 °C  
Scale T high: 50 °C

### EE10-M1J3P3BD7

Model: RH + T  
Output: RS485  
Display: Without display  
Enclosure: EU-Standard (RAL9003/RAL7035)  
Protocol: BACnet MS/TP  
Unit: Metric (SI)  
Baud rate: 38400