

# 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  $U_v=24$  V DC

Analogue (0 - 10 V, 4 - 20 mA)  $\pm 2$  % RH (40...60 % RH)  $\pm 3$  % RH (10...90 % RH)

Digital (RS485)  $\pm 3$  % RH (30...70 % RH)  $\pm 5$  % 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  $U_v=24$  V DC Output A3:  $\pm 0.25$  °C ( $\pm 0.45$  °F) Output A6:  $\pm 0.4$  °C ( $\pm 0.72$  °F)

Output J3:  $\pm 0.3$  °C ( $\pm 0.54$  °F)

#### Output

Analogue

(RH: 0...100 % RH / T: see ordering guide)

0 - 10 V

$-1 \text{ mA} < I_L < 1 \text{ mA}$

4 - 20 mA (2-wire)

$R_L < (U_v - 10) / 0.02 < 500 \Omega$

Digital Interface

RS485 with max. 32 devices on one bus

Protocol

Modbus RTU or BACnet MS/TP

#### General

Voltage supply ( $U_v$ ), class III 

0 - 10 V

15 - 40 V DC<sup>2)</sup> or 24 V AC  $\pm 20$  %

4 - 20 mA

$10 + 0.02 \times R_L < U_v < 28$  V DC ( $R_L < 500 \Omega$ )

RS485

15 - 35 V DC<sup>2)</sup> or 24 V AC  $\pm 20$  %

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

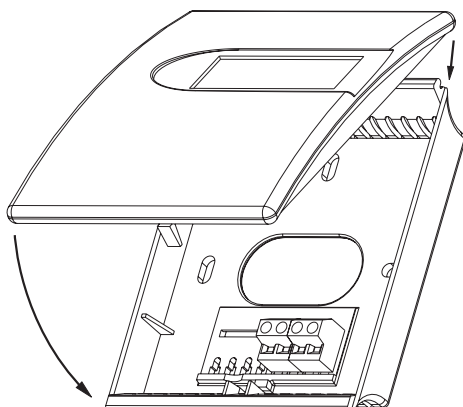
-25...60 °C (-13...140 °F)

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-               |          |
|---------------------|------------------------|-------------------------------|---------------------|----------|
| Output Setup        | Analogue<br>M1A3, M1A6 | Model                         | RH + T              | M1       |
|                     |                        | Output                        | 0 - 10 V            | A3       |
|                     |                        |                               | 4 - 20 mA           | A6       |
|                     |                        |                               | RS485               | J3       |
|                     |                        | Display                       | Without display     | no code  |
|                     |                        |                               | With display        | D1       |
|                     | Enclosure              | EU-Standard (RAL9003/RAL7035) | no code             |          |
|                     |                        | US (RAL9003/RAL7035)          | RG2                 |          |
|                     | Digital<br>J3          | Temperature Unit              | T [°C]              | no code  |
|                     |                        |                               | T [°F]              | MB2      |
|                     |                        | Scale T low                   | 0                   | no code  |
|                     |                        |                               | Value <sup>1)</sup> | SBLValue |
|                     |                        | Scale T high                  | 50                  | no code  |
| Value <sup>1)</sup> |                        |                               | SBHValue            |          |
| Protocol            |                        | Modbus RTU <sup>2)</sup>      | P1                  |          |
|                     |                        | BACnet MS/TP <sup>3)</sup>    | P3                  |          |
| Unit                |                        | Metric (SI)                   | no code             |          |
|                     | Non-metric US/GB       | U2                            |                     |          |
|                     | Baud rate              | 9600 (usual for Modbus)       | BD5                 |          |
|                     |                        | 19200                         | BD6                 |          |
|                     |                        | 38400 (usual for BACnet)      | BD7                 |          |
| 57600 <sup>4)</sup> |                        | BD8                           |                     |          |
| 76800 <sup>4)</sup> | BD9                    |                               |                     |          |

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                         |