

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. A version with analogue RH and passive T output is also available. 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 several colors and 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.



EE10

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

Accuracy¹⁾ at 20 °C (68 °F) and $U_v=24$ 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

typical 0.06 % RH / °C (0.03 % RH / °F)

Temperature

Accuracy¹⁾ at 20 °C (68 °F) and $U_v=24$ 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

Analogue

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

0-10 V

-1 mA < I_L < 1 mA

4-20 mA (two wires)

$R_L < (U_v - 10) / 0.02 < 500$ Ohm

Digital Interface

Protocol

RS485 with max. 32 devices on one bus

Modbus RTU or BACnet MS/TP

Temperature passive

please see ordering guide

General

Voltage supply (U_v)

0 - 10 V

15 - 40 V DC or 24 V AC ±20%

4 - 20 mA

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

RS485

15 - 35 V DC or 24 V AC ±20%

Current consumption

Analogue (0-10 V, 4-20 mA)

for DC supply: typ. 4 mA / for AC supply: typ. 15 mA_{eff}

Digital (RS485)

for DC supply: typ. 9 mA / for AC supply: typ. 20 mA_{eff}

Electrical connection

screw terminals max. 1.5 mm² (AWG 16)

Housing (polycarbonate)

US Version: UL94V-0 approved / EU Version: UL94HB approved

Protection class

IP30

Display

for EE10-M1

Humidity / Temperature alternating

for EE10-M6

Humidity

CE compatibility according

EN61326-1

EN61326-2-3



Temperature working range

-5...55 °C (23...131 °F)

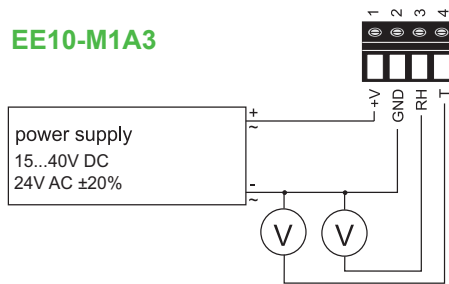
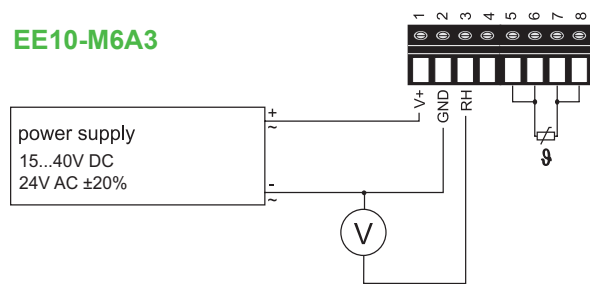
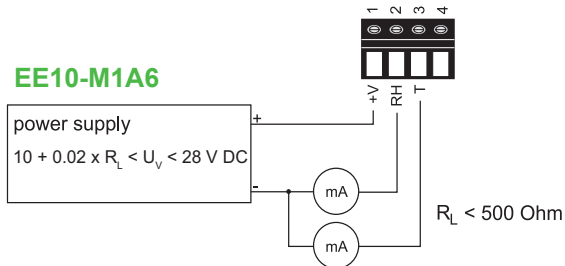
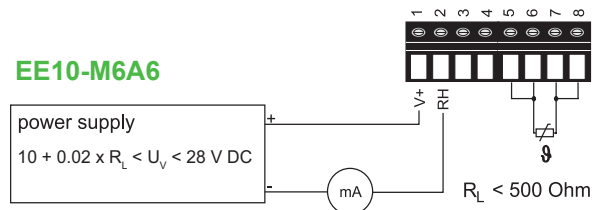
Temperature storage range

-25...60 °C (-13...140 °F)

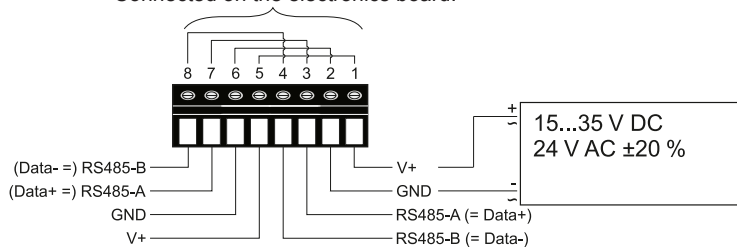
¹⁾ Traceable to intern. standards, administrated by NIST, PTB, BEV...

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).

Connection Diagram

EE10-M1A3

EE10-M6A3

EE10-M1A6

EE10-M6A6

EE10-M1J3

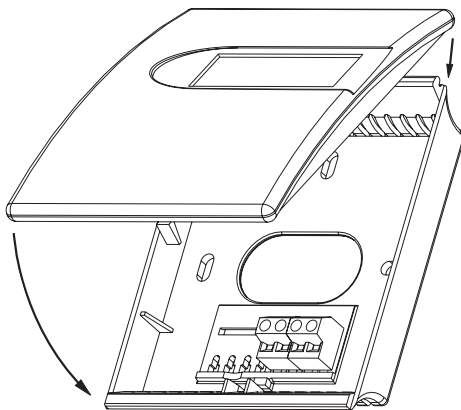
Connected on the electronics board.



The bus address can be set with DIP-Switches on the electronics board.

Screw terminals appropriate for daisy-chain wiring

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

EU-Grey:

Front and back cover: anthracite grey RAL7016

EU-Silver:

Front and back cover: white aluminum RAL9006

Scope of Supply

- EE10 Sensor according to ordering guide
- Mounting materials
- Test report according to DIN EN10204 - 2.2
- Quick user guide (for digital output only)

Ordering Guide

| | | | EE10- |
|--------------|--------------------------------------|---|--|
| | Model | Humidity + Temperature | M1 |
| | | Humidity + Temperature passive | M6 |
| | Output | 0-10 V | A3 |
| | | 4-20 mA | A6 |
| | | RS485 | J3 |
| | T-sensor passive¹⁾ | none | no code |
| | | Pt 100 DIN A | TP1 |
| | | Pt 1000 DIN A | TP3 |
| | | NTC 10k ±1%, B _{25/100} = 3950K | TP5 |
| | | NTC 1.8k | TP7 |
| | | Ni1000, TK6180 | TP9 |
| | | NTC 10k ±0.5%, B _{25/50} = 3950K | TP11 |
| | | NTC 10k ±1%, B _{25/85} = 3435K | TP14 |
| | Display | without display | no code |
| | | with display | D1 |
| | Enclosure | EU-Standard (RAL9003 / RAL7035) | no code |
| | | EU-Grey (RAL7016) | CH74 |
| | | EU-Silver (RAL9006) | CH93 |
| | | US (RAL9003 / RAL7035) | RG2 |
| Output Setup | Analogue M1A3, M1A6 | Temperature Unit | T [°C] T [°F] |
| | | Scale T low | 0 value ²⁾ |
| | | Scale T high | 50 value ²⁾ |
| | Digital J3 | Protocol | Modbus RTU ³⁾ BACnet MS/TP ⁴⁾ |
| | | | P1 P3 |
| | | Unit | metric-SI non-metric |
| | | | no code U2 |
| | | Baud rate | 9600 (usual for Modbus) 19200 38400 (usual for BACnet) 57600 ⁵⁾ 76800 ⁵⁾ |
| | | | BD5 BD6 BD7 BD8 BD9 |

- 1) Only with output A3 and A6. T sensor details at www.epluse.com/R-T_Characteristics. For other passive T sensors please contact E+E.
 2) -5 °C (23 °F) < Scale T low < 20 °C (68 °F). 25 °C (77 °F) < Scale T high < 55 °C (131 °F). Scale T high – Scale T low > 20 °C (68 °F).
 3) Factory setting: Even Parity, Stopbits 1.
 4) Factory setting: No Parity, Stopbits 1.
 5) Only for BACnet MS/TP

Order Examples

EE10-M1A3D1

Model: Humidity + Temperature
 Output: 0-10 V
 T-sensor passive: none
 Display: with display
 Enclosure: EU-Standard (RAL9003 / RAL7035)
 Temperature Unit: °C
 Scale T low: 0 °C
 Scale T high: 50 °C

EE10-M1J3P3BD7

Model: Humidity + Temperature
 Output: RS485
 T-sensor passive: none
 Display: without display
 Enclosure: EU-Standard (RAL9003 / RAL7035)
 Protocol: BACnet MS/TP
 Unit: metric-SI
 Baud rate: 38400

EE10-M6A6TP3

Model: Humidity + Temp. passive
 Output: 4-20 mA
 T-sensor passive: Pt 1000 DIN A
 Display: without display
 Enclosure: EU-Standard (RAL9003 / RAL7035)