

EE160

HVAC Humidity and Temperature Sensor

The EE160 is optimized for cost effective, accurate measurement of relative humidity (RH) and temperature (T) in building automation.

Reliable

Best long-term stability even in polluted or aggressive environment is ensured by the encapsulated measurement electronics inside the probe and E+E proprietary protection of the sensing element.

Versatile

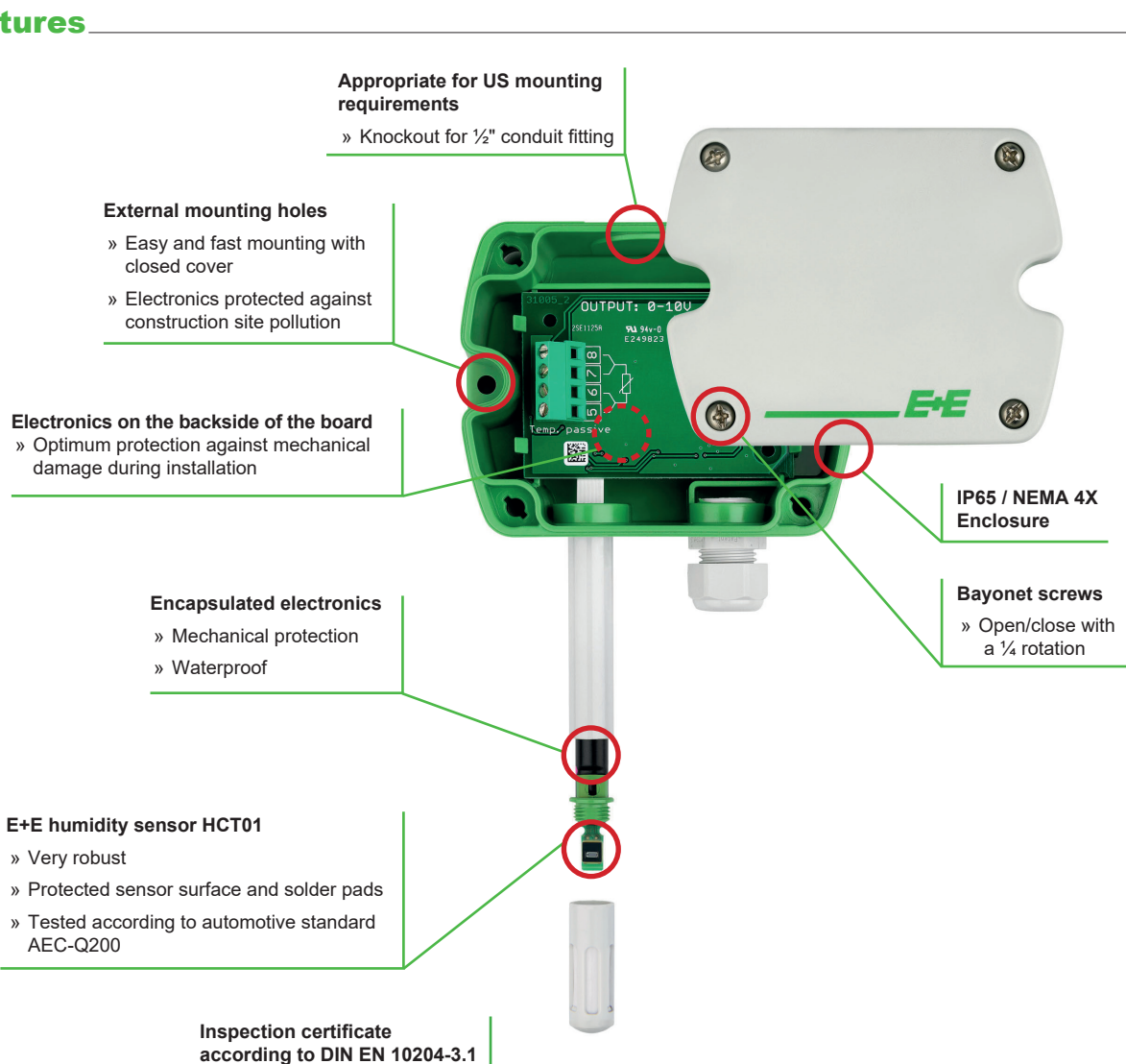
The measured data is available on two voltage or current (2-wire) outputs, or on the RS485 interface with BACnet MS/TP or Modbus RTU protocol. Additionally, the EE160 features a passive T output.

Functional Design

EE160 is available for wall or duct mount. The IP65 / NEMA 4X enclosure minimizes installation costs and provides outstanding protection against contamination and condensation.

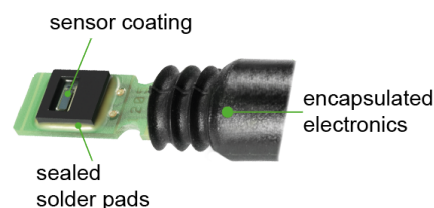
Comfortable Configuration and Adjustment

With an optional configuration adapter and the free EE-PCS Product Configuration Software, the user can set the RS485 interface parameters, the output scaling and perform one or two point adjustment for RH and T.



Protective Sensor Coating

The E+E proprietary sensor coating is a protective layer applied to the active surface of the sensing element. The coating substantially extends sensor lifetime and ensures optimal measurement performance in corrosive environment (salts, off-shore applications). Additionally, it improves the sensors' long term stability in dusty, dirty or oily applications by preventing stray impedance caused by deposits on the active sensor surface.



Technical Data

Measurands

Relative humidity

| | |
|---------------------------------|----------------|
| Accuracy ¹⁾ at 20 °C | ±2.5 %RH |
| Temperature dependency, typ. | ±0.03 %RH / °C |

Temperature

| | |
|-------------------|--------------------|
| Accuracy at 20 °C | ±0.3 °C (±0.54 °F) |
|-------------------|--------------------|

Outputs

Analogue

| | |
|---------------------------------------|---|
| 0 - 10 V | 0 < I _L < 1 mA or |
| (RH: 0...100%; T: see ordering guide) | 4 - 20 mA (2-wire) R _L < 500 Ω |

Digital interface

| | |
|--------------------------------|---|
| Protocol | RS485 (EE160 = 1 unit load) |
| Factory settings | Modbus RTU or BACnet MS/TP |
| | 9600 Baud, parity even, 1 stop bit, |
| | Modbus address 245 |
| | BACnet address 2 |
| Supported baud rates | 9 600, 19 200, 38 400, 57 600, 76 800 and 115 200 |
| Data types for measured values | FLOAT 32 bit und INTEGER 16 bit Register |
| Passive T sensor | 4-wire connection, see ordering guide |

General

Power supply class III  (EU) / class 2 (NA)²⁾

| | |
|----------------------|--|
| for 0 - 10 V / RS485 | 15 - 35 V DC or 24 V AC ±20 % |
| for 4 - 20 mA | 10 V + R _L x 20 mA < U _V < 35 V DC |

| Current consumption, typ. | 4 - 20 mA output | 0 - 10 V output | RS485 |
|---------------------------|------------------|----------------------|----------------------|
| 24 V DC supply | max. 40 mA | 5 mA | 5 mA |
| 24 V AC supply | - | 13 mA _{rms} | 15 mA _{rms} |

| | |
|-------------------------------|--|
| Electrical connection | Screw terminals, max. 1.5 mm ² |
| Enclosure | Polycarbonate, UL94 V-0 approved |
| Protection rating | IP65 / NEMA 4X |
| Cable gland | M16x1.5 |
| Electromagnetic compatibility | EN 61326-1 Industrial Environment FCC Part15 ClassA ICES-003 ClassA |
| Working range | -40...60 °C (-40...140 °F) / 10...95 %RH |
| Storage conditions | -20...60 °C (-4...140 °F) / 10...90 %RH, non-condensing |

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

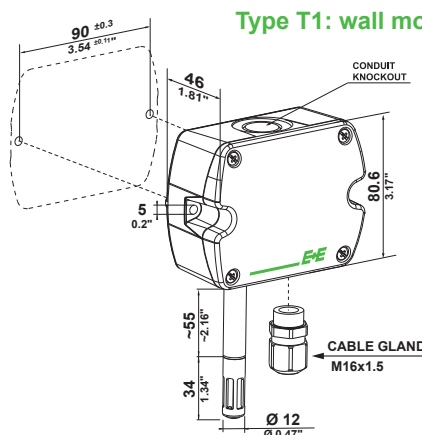
The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation).

The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement)

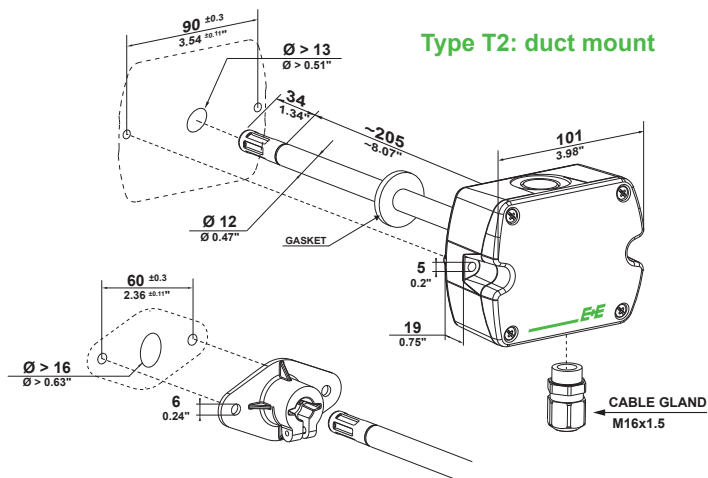
2) USA & Canada class 2 supply required, max. supply voltage 30 V DC.

Dimensions

Values in mm (inch)



Type T1: wall mount



Type T2: duct mount

Ordering Guide

| | | | EE160- | | |
|------------------------|--------------------------------|--|---------------------|--------------------------|---|
| Hardware configuration | Model | RH + T RH + T + T passive | M1 | M8 | M1 |
| | Type | Wall mount Duct mount | T1 T2 | | |
| | Output | 0 - 10 V 4 - 20 mA RS485 | A3 A6 | | J3 |
| | T sensor passive ¹⁾ | Pt100 DIN A Pt1000 DIN A NTC10k Ni1000, TK6180 | | TP1 TP3 TP5 TP9 | |
| | Filter | Membrane | no code | | |
| Setup analogue outputs | Relative humidity | RH, 0... 100 % | no code | | |
| | Temperature ²⁾ | T [°C] T [°F] | no code MB2 | | |
| | Scale T low | -40 Value | no code SBLValue | | |
| | Scale T high | 60 Value | no code SBHValue | | |
| Setup RS485 | Protocol | Modbus RTU ³⁾ BACnet MS/TP ⁴⁾ | | | P1 P3 |
| | Baud rate | 9600 19200 38400 57600 ⁵⁾ 76800 ⁵⁾ 115200 ⁵⁾ | | | BD5 BD6 BD7 BD8 BD9 BD10 |
| | Units ²⁾ | Metric (SI) Non-metric (US/GB) | | | no code U2 |

1) With Model M8 only / T sensor. Details see

2) Can not be changed with EE-PCS

3) Modbus map and configuration guide see user manual or Modbus application note at

4) Product Implementation Conformance Statement (PICS) available at

5) For BACnet MS/TP only

Order Examples

EE160-M8T1A6TP1SBL-10SBH50

Model: RH + T + T passive
Type: Wall mount
Output: 4 - 20 mA
Passive T Sensor: Pt100 DIN A
Filter: Membrane
Output RH: 0...100 %RH
Output T: T [°C]
Scale T low: -10
Scale T high: 50

EE160-M1T2J3P1BD5U2

Model: RH + T
Type: Duct mount
Output: RS485
Filter: Membrane
Protocol: Modbus RTU
Baudrate: 9600
Units: Non-metric

Accessories

(for further information, see data sheet "Accessories")

| | |
|--|----------------------|
| Product configuration software | EE-PCS |
| Power supply adapter | V03 |
| Protection cap for 12 mm probe | HA010783 |
| USB configuration adapter for EE160-M1TxJ3 (RS485) | HA011066 |
| Product configuration adapter for EE160-MxTxAx (analogue output) | see datasheet EE-PCA |