

# 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

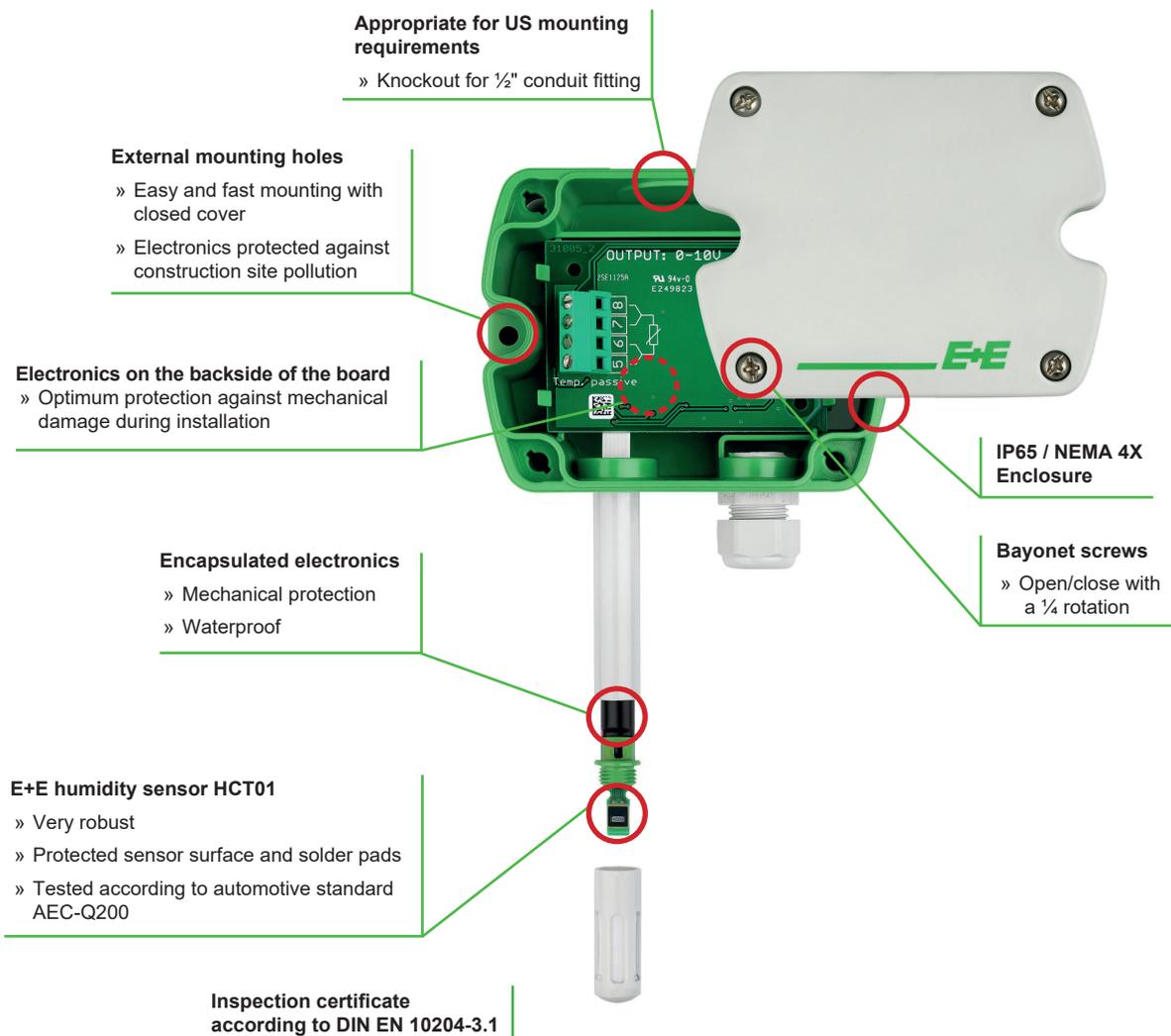
EE160 is available for wall or duct mount. The IP65 / NEMA 4X enclosure minimizes installation costs and provides outstanding protection against contamination and condensation.

### 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.

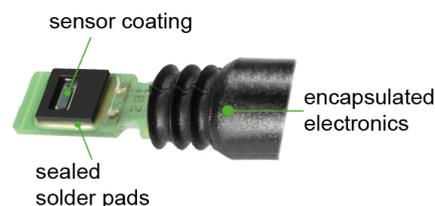


## Features



## 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 <sup>1)</sup> 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 <sub>L</sub> < 1 mA or
(RH: 0...100%; T: see ordering guide)	4 - 20 mA (2-wire) R <sub>L</sub> < 500 Ω

#### Digital interface

RS485 (EE160 = 1 unit load)	
Protocol	Modbus RTU or BACnet MS/TP
Factory settings	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  $\triangleleft$  (EU) / class 2 (NA)<sup>2)</sup>

for 0 - 10 V / RS485 15 - 35 V DC or 24 V AC ±20 %

for 4 - 20 mA 10 V + R<sub>L</sub> x 20 mA < U<sub>V</sub> < 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 <sub>rms</sub>	15 mA <sub>rms</sub>

Electrical connection	Screw terminals, max. 1.5 mm <sup>2</sup>		
Enclosure	Polycarbonate, UL94 V-0 approved		
Protection rating	IP65 / NEMA 4X		
Cable gland	M16x1.5		
Electromagnetic compatibility	EN 61326-1	EN 61326-2-3	UK CA CE
	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,...

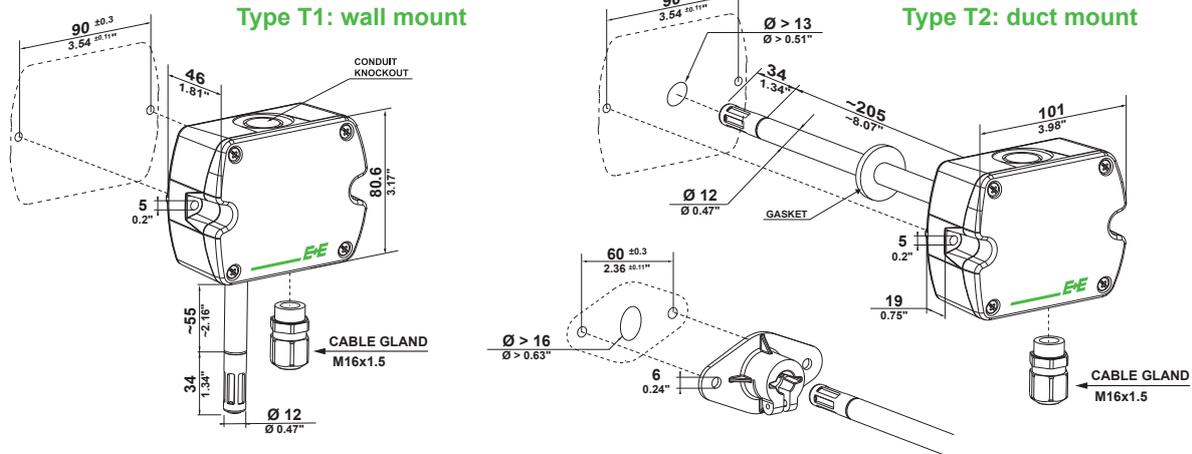
The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation).

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)



## 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 <sup>1)</sup>	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 <sup>2)</sup>		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 <sup>3)</sup> BACnet MS/TP <sup>4)</sup>	P1 P3	
	Baud rate	9600 19200 38400 57600 <sup>5)</sup> 76800 <sup>5)</sup> 115200 <sup>5)</sup>	BD5 BD6 BD7 BD8 BD9 BD10	
	Units <sup>2)</sup>	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