

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

Appropriate for US mounting requirements
 » Knockout for 1/2" conduit fitting

External mounting holes
 » Easy and fast mounting with closed cover
 » Electronics protected against construction site pollution

Electronics on the backside of the board
 » Optimum protection against mechanical damage during installation

Encapsulated electronics
 » Mechanical protection
 » Waterproof

E+E humidity sensor HCT01
 » Very robust
 » Protected sensor surface and solder pads
 » Tested according to automotive standard AEC-Q200

IP65 / NEMA 4X Enclosure

Bayonet screws
 » Open/close with a 1/4 rotation

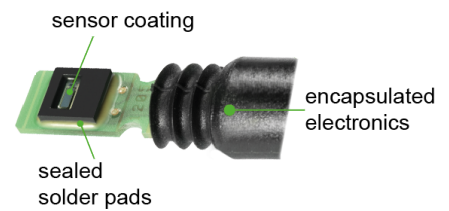
OUTPUT: 0-10V
 PSE175R 34V-0 E249823
 Temp. passive

Inspection certificate according to DIN EN 10204-3.1

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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)
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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) 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  (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	EN 61326-2-3	
	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,...

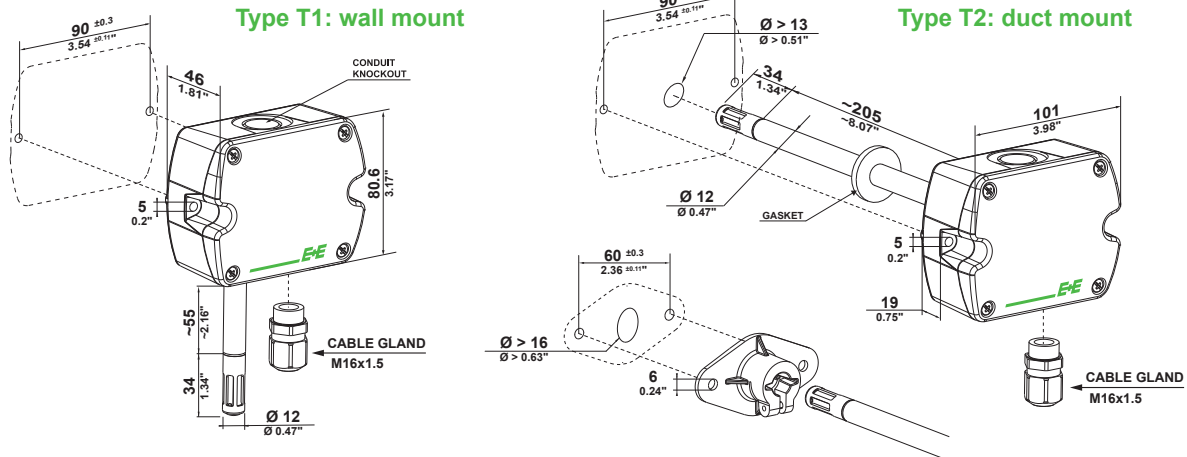
The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation).

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 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 www.epluse.com/R-T_Characteristics

2) Can not be changed with EE-PCS

3) Modbus map and configuration guide see user manual or Modbus application note at www.epluse.com/ee160

4) Product Implementation Conformance Statement (PICS) available at www.epluse.com/ee160

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 (free download: www.epluse.com/ee160)
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