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 4 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 ½" conduit fitting

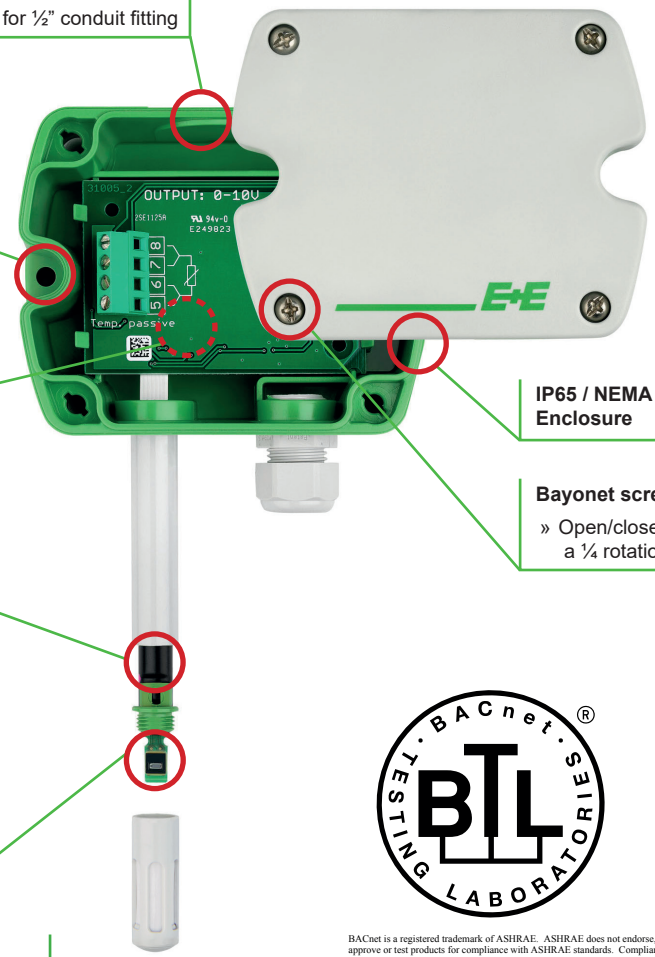
External mounting holes
» Easy and fast mounting with closed cover
» Electronics protected against construction site pollution

Electronics on the underside 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

Inspection certificate according to DIN EN 10204-3.1



IP65 / NEMA 4 Enclosure

Bayonet screws
» Open/close with a ¼ rotation

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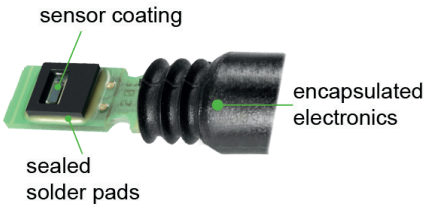
Protective Sensor Coating

The E+E proprietary sensor coating is a hygroscopic layer applied to the HCT01 humidity sensing element. The coating substantially extends sensor life-time and ensures optimal measurement performance in corrosive environment (salts, off-shore applications). Additionally, it improves the long term stability in dusty, dirty or oily applications by preventing stray impedances caused by deposits on the active sensor surface or on the electrical connections.



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 output	0 - 10 V	0 < I_L < 1 mA or
(RH: 0...100%; T: see ordering guide)	4 - 20 mA (2-wire)	R_L < 500 Ohm
Digital interface	RS485 (EE160 = 1 unit load)	
Protocol	Modbus RTU or BACnet MS/TP	
Passive T-sensor	4-wire connection, see ordering guide	

General

Sensing element	E+E HCT01 with E+E proprietary coating
Power supply	
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
24V DC supply	max. 40 mA	5 mA	5 mA
24V AC supply	-	13 mA_{rms}	15 mA_{rms}

Connection	Screw terminals, max. 1.5 mm^2
Housing material	Polycarbonate, UL94V-0 approved
Protection class	IP65 / NEMA 4
Cable gland	M16x1.5
Electromagnetic compatibility	EN 61326-1 EN 61326-2-3
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).

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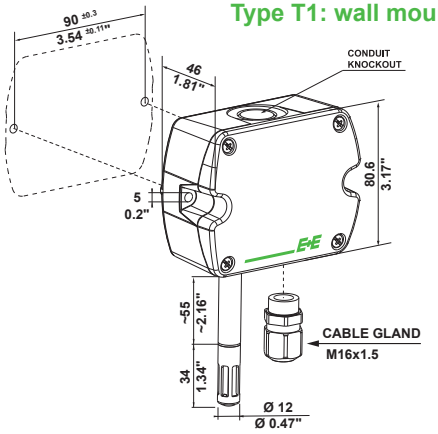
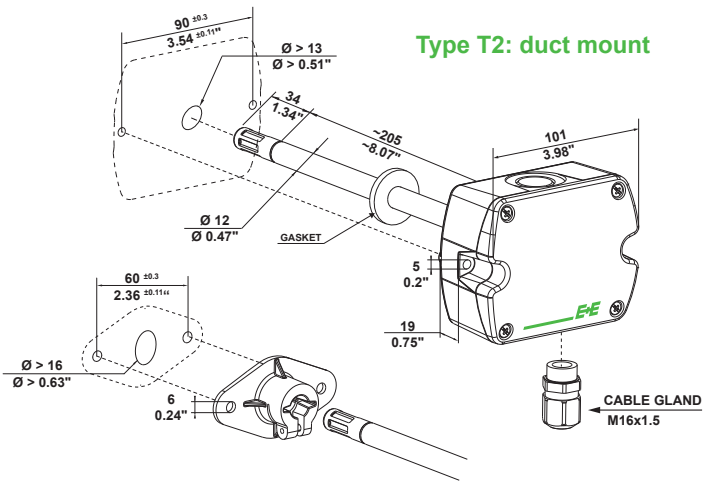
Dimensions

Values in mm (inch)

Type T1: wall mount



Type T2: duct mount



Ordering Guide

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

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