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

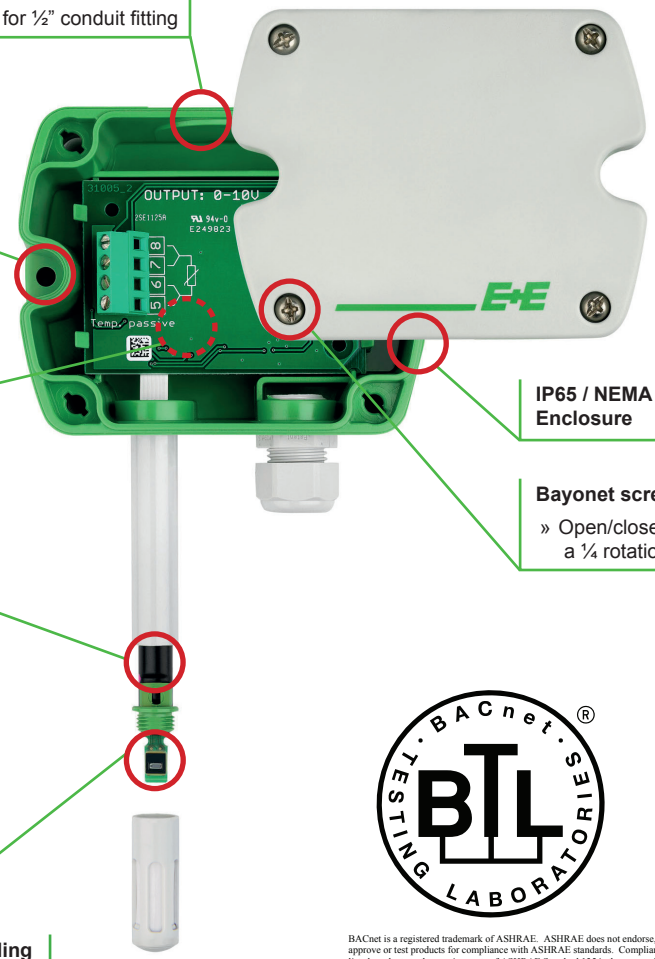
External mounting holes
» Easy and fast mounting with closed cover
» Electronics protected against construction site pollution

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

Test report according to DIN EN 10204 – 3.1



IP65 / NEMA 4 Enclosure

Bayonet screws
» Open/close with a ¼ rotation

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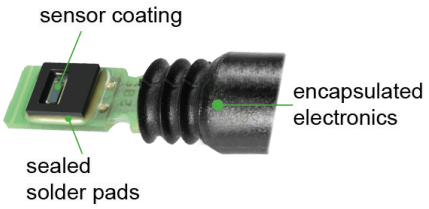
Protective Sensor Coating

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



Technical Data

Measurands

Relative humidity	
Sensor	E+E Sensor HCT01-00D
Working range	10...95 % RH
Accuracy[1] at 20 °C	±2.5 % RH
Temperature dependency	typ. ±0.03 % RH/°C
Temperature	
Sensor	Pt1000 (tolerance class B, DIN EN 60751)
T-Accuracy at 20 °C	±0.3 °C

Outputs

Analogue output	0-10 V	-1 mA < I_L < 1 mA or
(RH: 0...100%; T: see ordering guide)	4-20 mA (two-wire)	R_L < 500 Ohm
Digital interface	RS485 (BACnet MS/TP or Modbus RTU) max. 32 unit load devices in one bus	
Passive T-sensor	4-wire connection, see ordering guide	

General

Power supply

for 0 - 10 V / RS485	15 - 35V DC or 24V AC ±20 %
for 4 - 20 mA	10V + R_L x 20 mA < U_V < 35V DC

Typical current consumption

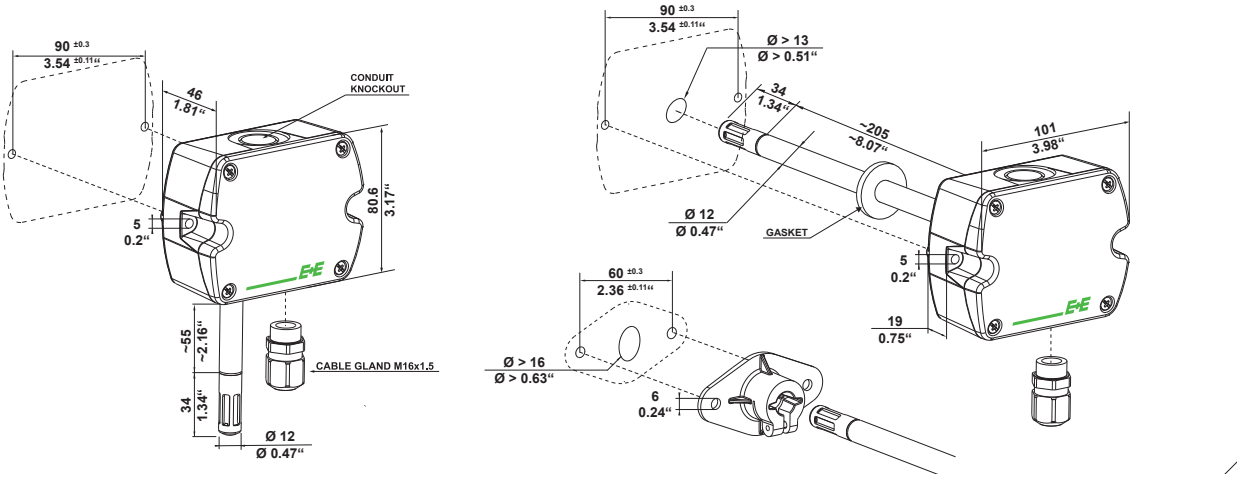
	4 - 20 mA output	0 - 10 V output	RS485
24V DC supply	max. 40 mA	5 mA	5 mA
24V AC supply	-	13 mA_{rms}	15 mA_{rms}

Connection	Screw terminals, max. 1.5 mm²
Housing material	Polycarbonate, UL94V-0 approved
Protection class	IP65 / NEMA 4
Cable gland	M16 x 1.5
Electromagnetic compatibility	EN61326-1 EN61326-2-3
Temperature range	Operation: -40...60 °C (-40...140 °F) Storage: -20...60 °C (-4...140 °F)

CE

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).

Dimensions (mm/inch)



Ordering Guide

Hardware configuration

MODEL		OUTPUT		PASSIVE T-SENSOR[1]		TYPE		FILTER	
humidity + temperature	(HT)	0-10 V	(3x)	Pt 100 DIN A	(A)	wall mount	(PA)	membrane	(B)
		4-20 mA	(6x)	Pt 1000 DIN A	(C)	duct mount	(PB)		
		RS485	(x3)	NTC 10k	(E)				
				Ni1000, TK6180	(J)				
				none	(x)				
EE160-									

Analogue outputs setup

OUTPUT SCALING		SCALING[2]				UNIT	
		°C		°F		metric	(M)
temperature	(Tx)	-20...80	(024)	32...122	(076)	non-metric	(N)
		-40...60	(002)	-40...140	(083)		
		-10...50	(003)	0...140	(085)		
		0...50	(004)	20...120	(015)		

Digital interface setup

PROTOCOL		BAUDRATE		PARITY		STOPBITS		UNIT	
Modbus RTU[3]	(1)	9600	(A)	odd	(O)	1 stopbit	(1)	metric	(M)
BACnet MS/TP[4]	(3)	19200	(B)	even	(E)	2 stopbit	(2)	non-metric	(N)
		38400	(C)	no parity	(N)				
		57600[5]	(D)						
		76800[5]	(E)						
		115200[5]	(F)						

1) Only with output 3x, 6x / T-sensor details see www.epluse.com/R-T_Characteristics
2) Other scaling upon request
3) Modbus Map and setup instructions: See User Guide and Modbus Application Note at www.epluse.com/EE160
4) Product Implementation Conformance Statement (PICS) available at www.epluse.com/EE160
5) Only for BACnet

Order Examples

EE160-HT6xAPAB-Tx003M

Model:	humidity + temperature
Output:	4-20 mA
Passive T-Sensor:	Pt 100 DIN A
Type:	wall mount
Filter:	membrane
Output scaling:	temperature
Scaling:	-10...50 °C
Unit:	metric

EE160-HTx3xPBB-1AE1N

Model:	humidity + temperature
Output:	RS485
Type:	duct mount
Filter:	membrane
Protocol:	Modbus RTU
Baudrate:	9600
Parity:	even
Stopbits:	1
Unit:	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-HTx3 (RS485)	HA011066
Product configuration adapter for EE160-HT3x/6x (analogue output)	see data sheet EE-PCA