E+E ELEKTRONIK® Ges.m.b.H.

YOUR PARTNER IN SENSOR TECHNOLOGY

EE160

Humidity and Temperature Transmitter for HVAC Applications

Specially designed for HVAC, the EE160 sensor by E+E Elektronik is a costeffective, highly accurate and reliable solution for measuring relative air humidity and temperature. The enclosure minimizes installation costs and provides outstanding protection against contamination and condensation, thus ensuring flawless operation.

The EE160 employs the new humidity/temperature E+E sensor element HCT01 with excellent long term stability and resistance against pollutants. In combination with a long calibration experience, the EE160 provides a measurement accuracy of ±2.5 % RH and is available for wall or duct-mounted with current, voltage BACnet MS/TP or Modbus RTU output.

EE160

A configurator makes it possible to freely select the scaling of the temperature output and configure the RS485 parameters. The configurator software, which is free of charge, allows additionally for an on-site adjustment of the humidity and temperature.

Features

Appropriate for US mounting requirements
 » Knockout for ½" conduit fitting

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

Electronics on the underside of the PCB
 » Optimum protection against mechanical damage during installation

Cast Electronics
 » Mechanical protection
 » Condensation-resistant

E+E Humidity sensor HCT01
 » Long-term stability
 » Protected RH sensor surface
 » Protected solder pads
 » Tested according to automotive standard AEC-Q200

Protective sensor coating

The E+E proprietary sensor coating is a hygroscopic 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.
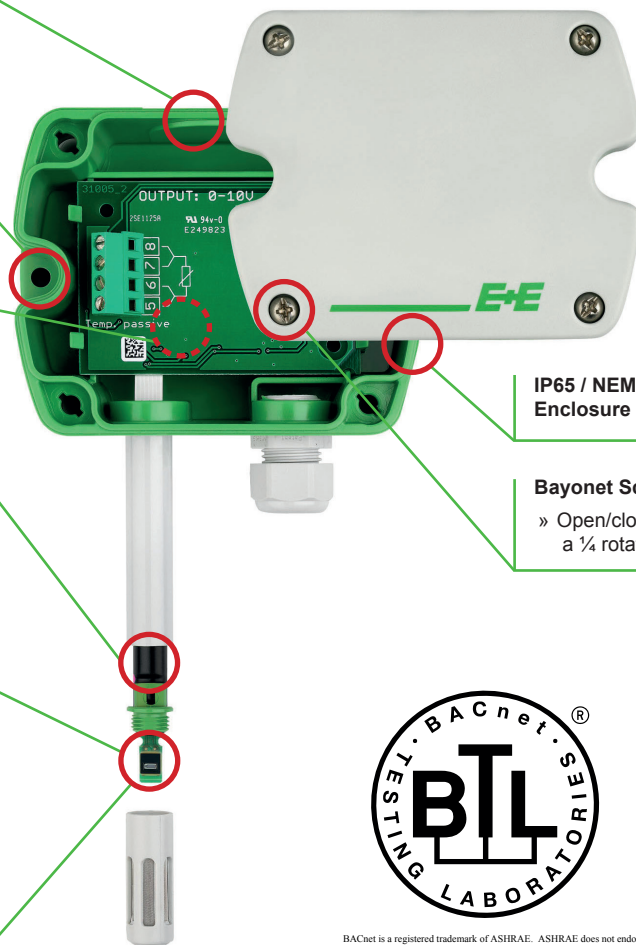
IP65 / NEMA 4 Enclosure

Bayonet Screws
 » Open/closed with a ¼ rotation

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Technical data

Measured values

Relative Humidity

Sensor	E+E Sensor HCT01-00D
Working range	10...95 % RH
Accuracy 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	$-1 \text{ mA} < I_L < 1 \text{ mA}$ or
(RH: 0...100%; T: see ordering guide)	4-20 mA (two-wire)	$R_L < 500$ Ohm
Digital output	RS485 (BACnet MS/TP or Modbus RTU) max. 32 EE160 in one bus	
Passive T-sensor		
4-wire	see ordering guide	

General

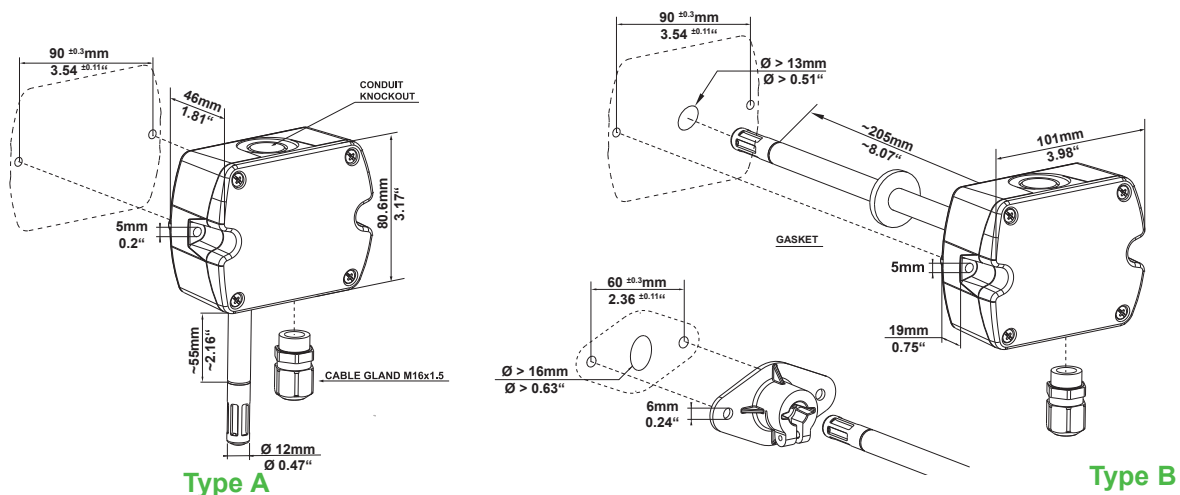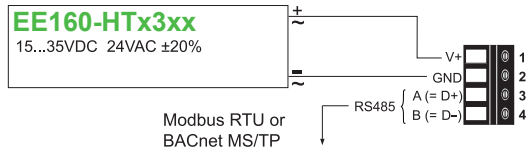|		
Power supply		
for 0 - 10 V / RS485	15 - 35V DC or 24V AC ±20 %	
for 4 - 20 mA	$10V + R_L \times 20 \text{ mA} < U_v < 35V$ DC	
Current consumption		
Analogue	with DC power supply typ. 5 mA	
	with AC power supply typ. 13 mA_{eff}	
Digital	with DC power supply typ. 15 mA	
	with AC power supply typ. 25 mA_{eff}	
Connection	Screw terminals, max. 1.5 mm^2	
Housing material	Polycarbonate, UL94V-0 approved	
Protection class	IP65 / NEMA 4	
Cable gland	M16 x 1.5	
Sensor protection	membrane filter	
Electromagnetic compatibility	EN61326-1	
	EN61326-2-3	
Temperature ranges	Operating temperature: -40...60 °C (-40...140 °F)	
	Storage temperature: -20...60 °C (-4...140 °F)	

CE

Dimensions (mm)

Type A

Type B

Connection diagram

EE160-HT3xxx
15...35VDC 24VAC ±20%

output 0...10V

V+ 1
GND 2
RH 3
T 4

EE160-HT6xxx
20...35VDC R$_L$<500 Ohm
11...35VDC R$_L$<50 Ohm

output 4...20 mA

V+ 1
RH 2
T 3

EE160-HTx3xx
15...35VDC 24VAC ±20%

Modbus RTU or BACnet MS/TP

V+ 1
GND 2
RS485 { A (= D+) 3
B (= D–) 4
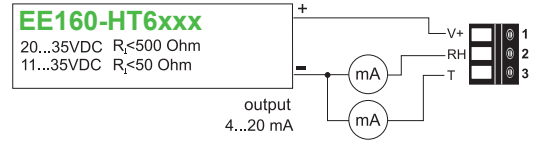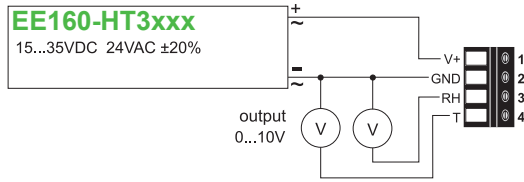
T-passive connection for HT3xxx/HT6xxx

8 T passive
7 T passive
6 T passive
5 T passive

Ω
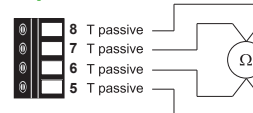
Ordering Guide

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 filter	**(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	
temperature	**(Tx)**	°C				°F		metric	**(M)**
		-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 output 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) availbale at www.epluse.com/EE160
5) Only for BACnet

Order example

Analogue output
EE160-HT6xAPAB-Tx003M

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

Digital output
EE160-HTx3xPBB-1AE1N

Model:	humidity + temperature transmitter
Output:	RS485
Type:	duct mount
Filter:	membrane filter
Protocol:	Modbus
Baudrate:	9600
Parity:	even
Stopbits:	1
Unit:	non-metric

Accessories

Product configuration adapter	see data sheet EE-PCA
Product configuration software	EE-PCS (free download: www.epluse.com/EE160)
Power supply adapter	V03 (see data sheet Accessories)
Protection cap for 12 mm probe	HA010783

Scope of supply

Model	EE160 Wall mount (Type A)	EE160 Duct mount (Type B)	Additionally for all EE160 with RS485 interface
EE160 Transmitter according ordering guide	✓	✓	
Cable gland	✓	✓	✓
Mounting kit	✓	✓	
Mounting flange		✓	
Inspection certificate according to DIN EN10204 - 3.1	✓	✓	
Quick Guide - EE160 RS485 Setup			✓