

EE210 Outdoor

Humidity and Temperature Sensor for Outdoor and Meteorological Applications

The EE210 Outdoor sensor meets the highest requirements in demanding outdoor applications. It measures accurately the relative humidity (RH) and temperature (T), and calculates all other RH related parameters such as dew point, frost point or specific enthalpy.

The excellent performance of EE210 Outdoor in polluted environment rests on the combination of completely encapsulated measurement electronics inside the sensing probe and long-term stable HCT01 sensing element with the E+E proprietary protective coating.

Two of the measured and calculated values are available on the analogue voltage or current outputs. With an optional configuration kit the user can set the output scaling and perform one or two point adjustment for humidity and temperature.

The appropriate HA010501 radiation shield is suitable for mounting onto a wall or a mast. It protects the sensing probe from solar radiation and precipitations while providing natural ventilation for a short RH and T response time.



Features

E+E sensing element HCT01

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

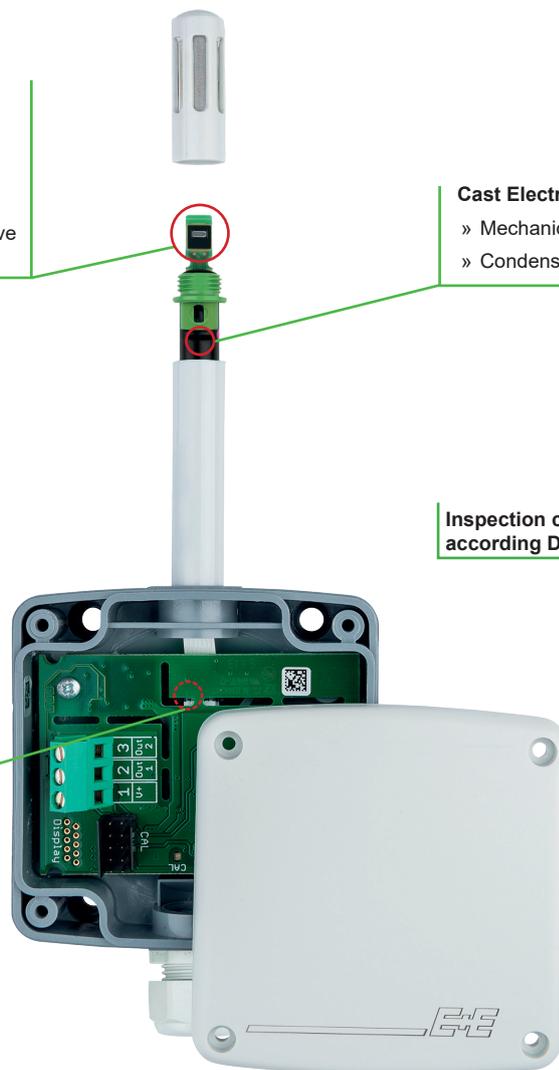
Cast Electronics

- » Mechanical protection
- » Condensation-resistant

Inspection certificate according DIN EN 10204 – 3.1

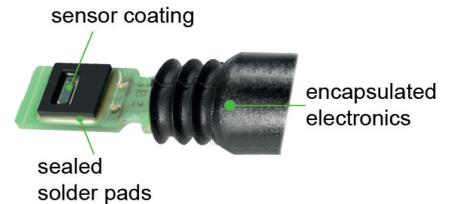
Electronics on the underside of the PCB

- » Optimum protection against mechanical damage during installation



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.



Technical Data

Measured Values

Relative Humidity

Working range 0...100 % RH

RH accuracy ¹⁾²⁾

-15...40 °C (5...104 °F) ≤ 90 % RH ± (1.6 + 0.005*measured value) % RH

-15...40 °C (5...104 °F) ≥ 90 % RH ± 3 % RH

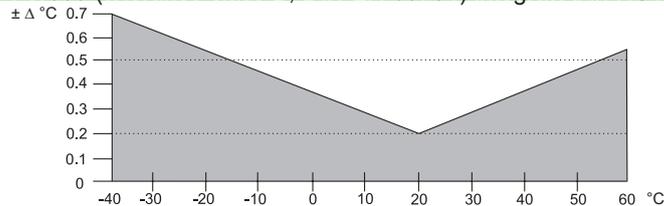
-40...60 °C (0...140 °F) ± (2.3 + 0.008*measured value) % RH

Temperature dependence electronics 0.06 % RH/°C

Temperature

Sensor Pt1000 (tolerance class B, DIN EN 60751) integrated in HCT01

T-accuracy ¹⁾



Outputs

Analogue Output

(RH: 0...100 %; T: see ordering guide)

0-10 V

-1 mA < I_L < 1 mA

4-20 mA (two-wire)

250 ≤ R_L ≤ 500 Ohm

General

Power supply

for 0-10 V

15 - 35 V DC³⁾ or 24 V AC ±20 %

for 4-20 mA

24 V DC ±10 %

Current consumption

Voltage output

DC supply typ. 3.3 mA

AC supply typ. 34 mA

Current output

DC supply max. 40 mA

Electrical connection

Screw terminals, max. 1.5 mm²

Housing material

Polycarbonate

Protection class

IP65

Cable gland

M16 x 1.5

Electromagnetic compatibility

EN61326-1 EN61326-2-3 Industrial Environment

FCC Part 15 Class B ICES-003 Issue 5 Class B



Temperature ranges

Working:

-40...60 °C (-40...140 °F)

Storage:

-40...60 °C (-40...140 °F)

Radiation Shield

Material

Polystyrene

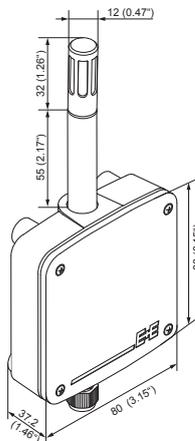
1) At 24 V and 250 Ohm incl. hysteresis, non-linearity and repeatability

2) 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).

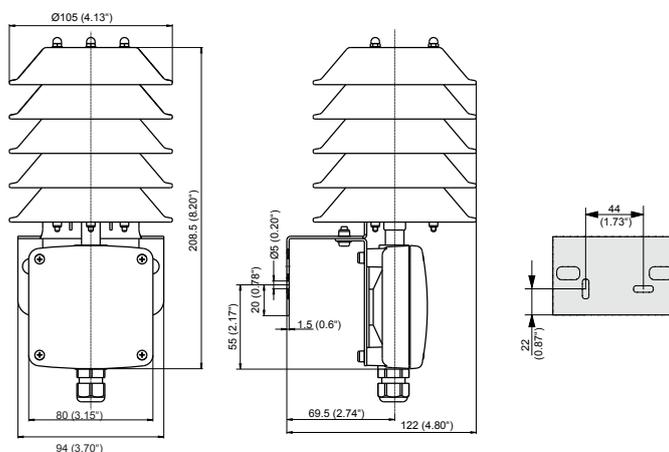
3) USA & Canada: class 2 supply required, max. supply voltage 30 V

Dimensions (mm/inch)

EE210 Outdoor



Radiation shield HA010501 (ordered separately)



Ordering Guide

MODEL	ANALOGUE ¹⁾	TYPE	FILTER
humidity + temperature	(HT) 0-10V 4-20mA	(3x) Outdoor (6x)	(Q) metal grid (C)
EE210-			

Analogue outputs setup

OUTPUT 1	SCALING 1 ²⁾	OUTPUT 2	SCALING 2 ²⁾	UNIT
relative humidity ¹⁾	(Uw) -40...60 (002)	relative humidity ¹⁾	(Uw) -40...60 (002)	metric (M)
temperature	(Tx) -10...50 (003)	temperature	(Tx) -10...50 (003)	non-metric (N)
dew point temperature	(TD) 0...50 (004)	dew point temperature	(TD) 0...50 (004)	
frost point temperature	(TF) 32...122 (076)	frost point temperature	(TF) 32...122 (076)	
specific enthalpy ¹⁾	(Hx) -40...140 (083)	specific enthalpy ¹⁾	(Hx) -40...140 (083)	
water vapour partial pressure ¹⁾	(Ex)	water vapour partial pressure ¹⁾	(Ex)	
mixing ratio ¹⁾	(Rx)	mixing ratio ¹⁾	(Rx)	
absolute humidity ¹⁾	(DV)	absolute humidity ¹⁾	(DV)	
wet bulb temperature	(TW)	wet bulb temperature	(TW)	

1) Factory Scaling

relative humidity	0...100 % RH	
water vapour partial pressure	0...200 mbar	0...3 psi
mixing ratio	0...400 g/kg	0...2800 gr/lb
absolute humidity	0...150 g/m ³	0...60 gr/ft ³
specific enthalpy	-50...400 kJ/kg	-10...190 BTU/lb

2) For Tx, TD, TF and TW;
other scaling upon request

Order Examples

Position 1:

EE210-HT6xQC/UwTx002M

Model: Humidity+Temperature Basic Device
 Analog output: 4-20mA
 Housing: Outdoor
 Filter: metal grid
 Output scaling 1: relative humidity
 Scaling 1: 0...100% RH
 Output scaling 2: temperature
 Scaling 2: -40...60°C
 Unit: metric

Position 2:

HA010501

Radiation shield for EE210 Outdoor

Accessories

USB configuration adapter
 Product configuration software
 Power supply adapter

HA011066
 EE-PCS (free download: www.epluse.com/configurator)
 V03 (see data sheet Accessories)