

# EE210

## Humidity and Temperature Transmitter for Demanding Climate Control Applications

The EE210 transmitter by E+E Elektronik meets the highest requirements in demanding climate control applications. Besides highly accurate measurement of relative humidity and temperature, EE210 calculates dew point temperature, absolute humidity and mixing ratio.

EE210 is available as wall or duct mounted as well as with remote probe. The enclosure minimizes installation costs and provides outstanding protection against contamination and condensation. All measured and calculated values are available on the Modbus RTU interface; two of the measured and calculated values are available on the analogue voltage or current outputs, while up to three values can be shown simultaneously on the optional display.

Excellent performance of EE210 in polluted, aggressive environment is ensured by the combination of completely protective encapsulated measurement electronics inside the sensing probe and the long-term stable HCT01 sensor with E+E proprietary coating.

With an optional configuration kit the user can setup, the Modbus interface parameters, the output scaling and perform one or two point adjustment for humidity and temperature.



EE210

### Features

**Appropriate for US mounting requirements**

- » Knockout for 1/2" 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

**Bayonet Screws**

- » Open/closed with a 1/4 rotation

**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

**Display**

- » Selectable display layout
- » Measurands freely selectable

**Smooth cover surface**

- » No accumulation of dust in protruding edges

**Watertight cable outlet**

### Applications

- agriculture
- stables, incubators, hatcheries
- green houses
- storage rooms, cooling chambers
- indoor pools
- demanding climate control

## Technical Data

### Measured Values

#### Relative Humidity

Sensor	E+E Sensor HCT01-00D	
Analog output 0...100% RH	0-5 V	-1 mA < I <sub>L</sub> < 1 mA
	0-10 V	-1 mA < I <sub>L</sub> < 1 mA
	4-20 mA (two-wire)	R <sub>L</sub> ≤ 500 Ohm

Working range 0...100% RH

RH accuracy (incl. hysteresis, non-linearity and repeatability)

Wall & duct version:

-15...40°C (5...104°F)	≤90% RH	±(1.3 + 0.003*measured value) % RH
-15...40°C (5...104°F)	>90% RH	± 2.3% RH
-40...60°C (0...140°F)		±(1.5 + 0.015*measured value) % RH

Remote probe version

at 20°C (68°F) ±2.5% RH

#### Temperature

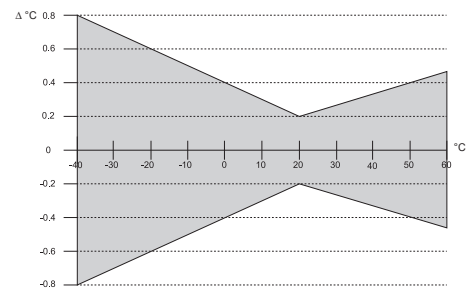
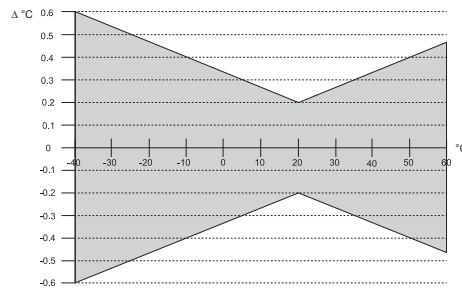
Sensor Pt1000 (tolerance class B, DIN EN 60751) integrated in HCT01

Analog output <sup>1)</sup>	0-5 V	-1 mA < I <sub>L</sub> < 1 mA
	0-10 V	-1 mA < I <sub>L</sub> < 1 mA
	4-20 mA	R <sub>L</sub> ≤ 500 Ohm

T-accuracy

wall & duct

remote probe



### General

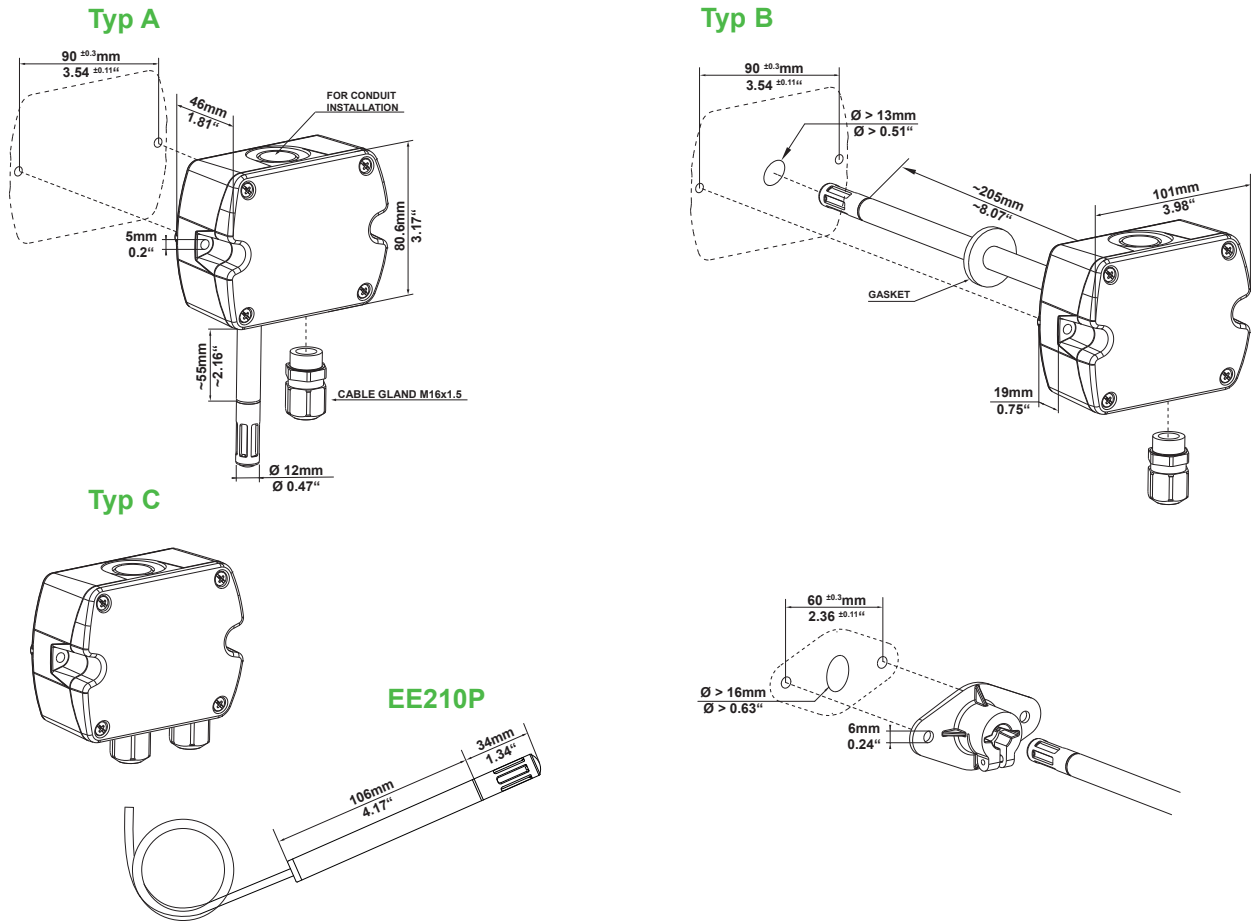
Power supply	for 0-5 V / 0-10 V	15 - 35V DC <sup>2)</sup> or 24V AC ±20%
	for 4-20 mA	10V + R <sub>L</sub> x 20 mA < V+ < 30V DC
Current consumption		
Voltage output		DC supply typ. 3.3mA; with display typ. 3.6mA
		AC supply typ. 34mA; with display typ. 37mA
Current output		DC supply max. 40mA
Digital interface		DC supply typ. 5mA; with display typ. 19mA
		AC supply typ. 52mA; with display typ. 118mA
Connection		Screw terminals, max. 1.5 mm <sup>2</sup>
Housing material		Polycarbonate, UL94V-0 (with Display UL94HB) approved
Protection class		IP65
Cable gland		M16 x 1,5
Probe cable (type C)		PVC, Ø 4.3mm, 4 x 0.25 mm <sup>2</sup>
Sensor protection		E+E Coating
Electromagnetic compatibility		EN61326-1 EN61326-2-3
Temperature ranges		Industrial Environment
	Operating temperature:	-40...60°C (-40...140°F)
	Storage temperature:	-40...60°C (-40...140°F)
Temperature ranges with display		
	Operating temperature:	-20...50°C (-4...122°F)
	Storage temperature:	-20...60°C (-4...140°F)



<sup>1)</sup> Output scaling see Ordering Guide

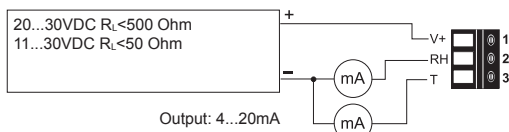
<sup>2)</sup> USA & Canada: class 2 supply required, max. supply voltage 30V

## Dimensions (mm/inch)

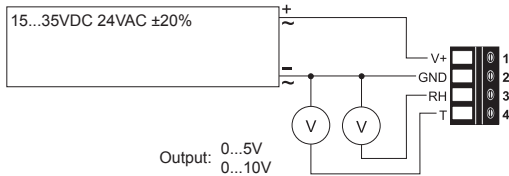


## Connection Diagram

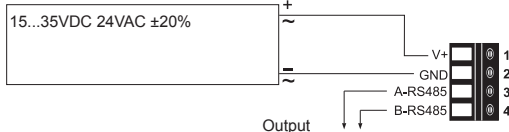
### EE210-HT6



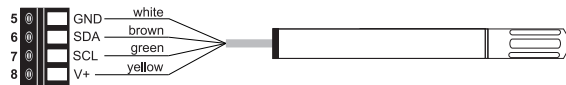
### EE210-HT3



### EE210-HTx3



### EE210P (for EE210-HT6 Type C)



## Ordering Guide

MODEL	ANALOGUE <sup>1)</sup>	DIGITAL <sup>1)</sup>	HOUSING	TYPE	DISPLAY <sup>3)</sup>	FILTER (Type A and B)
humidity + temperature (HT)	0-5V (2) 0-10V (3) 4-20mA (6) none (x)	RS485 (3) none (x)	standard (P)	wall mount (A) duct mount (B) remote probe (C) <sup>2)</sup>	display (D) none (x)	membrane (B) stainless steel sintered (D)
<b>EE210-</b>						

1) a combination of analog and digital version is not possible 2) The EE210P probe has to be ordered as separate position; for the moment available only for 4-20mA version

### Analogue outputs setup

OUTPUT 1	SCALING 1 <sup>5)</sup>	OUTPUT 2	SCALING 2 <sup>5)</sup>	UNIT
relative humidity <sup>4)</sup> (Uw)	-40...60 (002)	relative humidity <sup>4)</sup> (Uw)	-40...60 (002)	metric (M)
temperature (Tx)	-10...50 (004)	temperature (Tx)	-10...50 (004)	non-metric (N)
dew point temperature (TD)	0...50 (004)	dew point temperature (TD)	0...50 (004)	
frost point temperature (TF)	0...100 (005)	frost point temperature (TF)	0...100 (005)	
water vapour partial pressure <sup>4)</sup> (Ex)	32...122 (076)	water vapour partial pressure <sup>4)</sup> (Ex)	32...122 (076)	
mixing ratio <sup>4)</sup> (Rx)	-40...140 (084)	mixing ratio <sup>4)</sup> (Rx)	-40...140 (084)	
absolute humidity <sup>4)</sup> (DV)		absolute humidity <sup>4)</sup> (DV)		
specific enthalpy <sup>4)</sup> (Hx)		specific enthalpy <sup>4)</sup> (Hx)		

3) Factory setup:  
For analogue output versions the display shows the measurands selected for output 1 and output 2.  
For digital output versions the display shows RH and T.

4) Factory Scaling

relative humidity	0...100% RH	
water vapour partial pressure	0...200mbar	0...3psi
mixing ratio	0...425g/kg	0...2900gr/lb
absolute humidity	0...150g/m <sup>3</sup>	0...60gr/ft <sup>3</sup>
specific enthalpy	0...400kJ/kg	0...200BTU/lb

5) For Tx, TD und TF:  
other scaling upon request

### Digital output setup<sup>6)</sup>

PROTOCOL	BAUDRATE	PARITY	STOPBITS	UNIT
modbus (1)	9600 (A)	odd (O)	1 stopbit (1)	metric (M)
	19200 (B)	even (E)	2 stopbit (2)	non-metric (N)
	38400 (C)	no parity (N)		

6) Modbus Map and setup instructions:  
See User Guide and Modbus Application Note at [www.epluse.com/EE210](http://www.epluse.com/EE210)

### Remote probe for EE210 Type C:

MODEL	CABLE LENGTH	FILTER
humidity + temperature (HT)	1.5 m (C) 3 m (E)	membrane (B) stainless steel sintered (D)
<b>EE210P</b>		

## Order Examples

### Type A and B

#### EE210-HT3xPAxB-UwTx005M

Model: Humidity+Temperature Transmitter  
Analog output: 0-10V  
Housing: standard  
Type: wall mount  
Display: none  
Filter: membrane

Output scaling 1: relative humidity  
Scaling 1: 0...100% RH  
Output scaling 2: temperature  
Scaling 2: 0...100°C  
Unit: metric

### Type C

#### Position 1:

#### EE210-HT6xPCx-UwTx005M

Model: Humidity+Temperature Basic Device  
Analog output: 4-20mA  
Housing: standard  
Type: remote probe (Pos. 2)  
Display: none

Output scaling 1: relative humidity  
Scaling 1: 0...100% RH  
Output scaling 2: temperature  
Scaling 2: 0...100°C  
Unit: metric

#### Position 2:

#### EE210P-HTCB

Model: Humidity+Temperature Probe  
Cable length: 1.5 m  
Filter: membrane

## Accessories

Configurations kit consisting of:  
- Product configuration adapter  
- Product configuration software  
- Connection cable for EE-PCA

EE-PCA (data sheet EE-PCA)  
EE-PCS (free download: [www.epluse.com/EE210](http://www.epluse.com/EE210))  
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