EE210

Humidity and Temperature Transmitter
for Demanding Climate Control

The EE210 transmitter by E+E Elektronik meets the highest requirements in demanding climate control applications. Besides the accurate measurement of relative humidity (RH) and temperature (T), EE210 calculates various RH related parameters such as dew point, temperature, absolute humidity and mixing ratio. All measured and calculated values are available on the BACnet MS/TP or Modbus RTU interface, two of them 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 or aggressive environment is ensured by the encapsulated measurement electronics inside the sensing probe and the long-term stable HCT01 sensor with E+E proprietary coating.

EE210 is available as wall or duct mounted version as well as with remote probe. The IP65 / NEMA 4 enclosure minimizes installation costs and provides outstanding protection against contamination and condensation.

With an optional configuration kit, the user can set the RS485 interface parameters, the output scaling and perform one or two point adjustment for RH and T.

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

**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
- Bayonet Screws
  - Open/closed with a ¼ rotation
- Cast Electronics
  - Mechanical protection
  - Condensation-resistant
- E+E Humidity sensor HCT01
  - Long-term stability
  - 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.
Measured Values

Relative Humidity (RH)

Sensor: E+E Sensor HCT01-00D
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 (-40...140 °F) ±(1.5 + 0.015*measured value) % RH

Remote probe version:
at 20 °C (68 °F) ±2.5 % RH

Temperature (T)

Sensor: Pt1000 (tolerance class B, DIN EN 60751) integrated in HCT01
T-accuracy:
wall & duct
-40...60 °C (-40...140 °F) ±2.5 % RH
Remote probe
-40...60 °C (-40...140 °F) ±2.5 % RH at 20 °C (68 °F)

Outputs

Analogue output:
0-5 V / 0-10 V -1 mA < IL < 1 mA
4-20 mA (2-wire) R, ≤ 500 Ohm
0-20 mA (3-wire) R, ≤ 500 Ohm

Digital output:
RS485 (BACnet MS/TP or Modbus RTU), max. 32 EE210 in one bus

General

Power supply:
for 4-20 mA, 2-wire: 10 V + R, x 20 mA < V+ < 30 V DC
for 0-20 mA, 3-wire: 15-35 V DC or 24V AC ±20 %

Current consumption at 24 V:
Voltage output: DC supply max. 12 mA; with display max. 23 mA
AC supply max. 34 mA; with display max. 49 mA

Current output:
2-wire: DC supply max. 40 mA; with display max. 40 mA
3-wire: DC supply typ. 33 mA; with display max. 44 mA
AC supply typ. 65 mA; with display max. 84 mA

Digital interface:
DC supply typ. 5 mA; with display max. 20 mA
AC supply typ. 15 mA; with display max. 35 mA

Display:
1, 2 or 3 lines, user configurable, optional with backlight

Connection:
Screw terminals, max. 1.5 mm²

Housing material:
Polycarbonate, UL94V-0 (with Display UL94HB) approved

Protection class:
IP65 / NEMA 4

Cable gland:
M16 x 1.5

Probe cable (type C):
PVC, Ø 4.3 mm, 4 x 0.25 mm², Length: 1.5 or 3 m (4.9 or 9.8 ft)

Sensor protection:
E+E Coating

Electromagnetic compatibility:
EN61326-1, EN61326-2-3

Temperature ranges:
Operating: -40...60 °C (-40...140 °F) (-40...80 °C for remote probe EE210P)
Storage: -40...60 °C (-40...140 °F)

Temperature ranges with display:
Operating: -20...50 °C (-4...122 °F) (-40...80 °C for remote probe EE210P)
Storage: -20...60 °C (-4...140 °F)
Dimensions (mm/inch)

Typ A

Typ B

Typ C

Connection Diagram

EE210-HT2/3/5

15...35 V DC
24 V AC ±20 %
Output: 0...5 V
0...10 V
0...20 mA

EE210-HT6

20...30 V DC Rs<500 Ohm
11...30 V DC Rs<50 Ohm
Output: 4...20 mA

EE210-HTx3

15...35 V DC
24 V AC ±20 %
Output: Modbus RTU or
BACnet MS/TP

EE210P remote probe (for HT6/HTx3)

white
green
yellow
brown
Ordering Guide

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT</th>
<th>TYPE</th>
<th>PROBE LENGTH</th>
<th>DISPLAY</th>
<th>FILTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE210-</td>
<td>humidity + temperature</td>
<td>wall mount</td>
<td>50 mm, 1.97&quot;</td>
<td>without backlight</td>
<td>membrane</td>
</tr>
<tr>
<td></td>
<td>0-5 V</td>
<td>duct mount</td>
<td>200 mm, 7.87&quot;</td>
<td>with backlight</td>
<td>stainless steel sintered</td>
</tr>
<tr>
<td></td>
<td>0-10 V</td>
<td>remote probe</td>
<td>Type A and C</td>
<td>none</td>
<td>for type C</td>
</tr>
<tr>
<td></td>
<td>0-20 mA (3-wire)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>4-20 mA (2-wire)</td>
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<td></td>
<td>RS85</td>
<td></td>
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</table>

Anologue outputs (2x, 3x, 6x) setup

<table>
<thead>
<tr>
<th>OUTPUT 1</th>
<th>SCALING 1</th>
<th>OUTPUT 2</th>
<th>SCALING 2</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>relative humidity</td>
<td>(Uw)</td>
<td>-40...50</td>
<td>(Uw)</td>
<td>-40...60</td>
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<tr>
<td>temperature</td>
<td>(Tx)</td>
<td>-10...50</td>
<td>(Tx)</td>
<td>-10...50</td>
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<tr>
<td>dew point temperature</td>
<td>(TD)</td>
<td>0...50</td>
<td>(TD)</td>
<td>0...50</td>
</tr>
<tr>
<td>frost point temperature</td>
<td>(TF)</td>
<td>0...100</td>
<td>(TF)</td>
<td>0...100</td>
</tr>
<tr>
<td>water vapour partial pressure</td>
<td>(Ex)</td>
<td>32...122</td>
<td>(Ex)</td>
<td>32...122</td>
</tr>
<tr>
<td>mixing ratio</td>
<td>(Rx)</td>
<td>-40...140</td>
<td>(Rx)</td>
<td>-40...140</td>
</tr>
<tr>
<td>absolute humidity</td>
<td>(DV)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>specific enthalpy</td>
<td>(Hx)</td>
<td></td>
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</table>

Digital output (x3) setup

<table>
<thead>
<tr>
<th>PROTOCOL</th>
<th>BAUDRATE</th>
<th>PARITY</th>
<th>STOPBITS</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus RTU</td>
<td>(1) 9600</td>
<td>(A) odd</td>
<td>(1) 1 stopbit</td>
<td>metric</td>
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<tr>
<td>BACnet MS/TP</td>
<td>(3) 19200</td>
<td>(B) even</td>
<td>(2) 2 stopbit</td>
<td>non-metric</td>
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<tr>
<td></td>
<td>38400</td>
<td>(C)</td>
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<td></td>
<td>57600</td>
<td>(D)</td>
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<td>76800</td>
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<td>115200</td>
<td>(F)</td>
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Remote probe for EE210 Type C:

<table>
<thead>
<tr>
<th>MODEL</th>
<th>CABLE LENGTH</th>
<th>FILTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>humidity + temperature</td>
<td>1.5 m (4.9 ft)</td>
<td>membrane</td>
</tr>
<tr>
<td></td>
<td>3 m (9.8 ft)</td>
<td>stainless steel sintered</td>
</tr>
</tbody>
</table>

Order Examples

Type A and B

**EE210-HT3xPAxEB-UwTx005M**
- Model: Humidity+Temperature
- Output: 0-10 V
- Type: wall mount
- Display: with backlight
- Filter: membrane
- Output scaling 1: relative humidity
- Outputscaling 2: temperature
- Scaling 1: 0...100 % RH
- Scaling 2: 0...100 °C
- Unit: metric

Type C

**Position 1:**
- Model: Humidity+Temperature Basic Device
- Output: 4-20 mA
- Type: remote probe (Pos. 2)
- Display: none
- Output scaling 1: relative humidity
- Output scaling 2: temperature
- Scaling 1: 0...100 % RH
- Scaling 2: 0...100 °C
- Unit: metric

**Position 2:**
- Model: Humidity+Temperature Probe
- Cable length: 1.5 m
- Filter: membrane
### Scope of supply

<table>
<thead>
<tr>
<th></th>
<th>Wall mount (Type A)</th>
<th>Duct mount (Type B)</th>
<th>Remote version (Type C)*</th>
<th>EE210-P Remote probe* for Type C</th>
<th>Additionally for models with RS485 interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE210 according ordering guide</td>
<td>✓</td>
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<tr>
<td>Cable gland</td>
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<td>Mounting kit</td>
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<td>Mounting flange</td>
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<td>Quick Guide - EE210 RS485 Setup</td>
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* EE210-P is not included in the Scope of Supply of the EE210 Type C

### Accessories

- **Product configuration adapter**: see data sheet EE-PCA
- **Product configuration software**: EE-PCS (free download: www.epluse.com/EE210)
- **Power supply adapter**: V03 (see data sheet Accessories)
- **Protection cap for 12 mm probe**: HA010783