The EE310 is optimized for best reliability in industrial applications up to 180 °C (356 °F) and 20 bar (290 psi). In addition to highly accurate measurement of the relative humidity (RH) and temperature (T), the device calculates all other humidity related parameters.

**Measurement Performance**
The EE310 employs high-end E+E humidity sensing elements manufactured in state-of-the-art thin film technology, which are the prerequisite for outstanding measurement accuracy.

**Long-Term Stability**
The E+E proprietary coating protects the sensing elements against corrosive and electrically conductive pollution, which leads to outstanding long-term stability even in harsh environment. With the appropriate choice of filter cap, the EE310 tackles even challenging industrial applications.

**Versatility**
The EE310 is available for wall or duct mount as well as with remote probe. It features an IP65 / NEMA 4 polycarbonate or stainless steel enclosure which facilitates installation and maintenance. The enclosure can accommodate a 100…240 V AC supply unit or various interface modules.

**Display and Outputs**
The measured data is available on two analogue outputs, on the RS485 (Modbus RTU) or Ethernet-PoE (Modbus TCP) interface and on the alarm (relay) outputs.
The TFT colour display shows simultaneously up to four measurands and offers extensive setup and diagnosis features. The data logging function saves up to 20000 measured values for each physical quantity. The logged data can be displayed graphically directly on the device or easily downloaded over the USB interface.

**Configurable and Adjustable**
The configuration and the RH and T adjustment of the EE310 can be performed either using the display and the push buttons or with the free EE-PCS Product Configuration Software via the USB interface.

**Features**

**3.5” TFT Colour Display**
- shows up to 4 measurands simultaneously
- layout and measurands freely selectable
- data logger for 20,000 values per measurand
- logged data shown graphically
- diagnosis functions
- intuitive device setup with push buttons

**Probe**
- working range up to 180°C (356 °F) and 20 bar (290 psi)
- protective coating for sensing elements
- pluggable versions available

**Enclosure**
- IP65 / NEMA 4 protection class
- polycarbonate or stainless steel
- easy mounting and service

**Outputs**
- 2 analogue outputs current / voltage
- error indication according NAMUR
- Modbus RTU / Modbus TCP
- 2 alarm outputs
  - configurable via display or software

**USB Service Interface**
- configuration, adjustment and firmware update
- download logged data
- 4 status LEDs

**Inspection certificate**
» According DIN EN 10204 - 3.1

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Protective sensor coating (option C1)

The E+E proprietary sensor coating is a protective layer applied to the active surface and leads of the sensing elements. The coating substantially extends the lifetime 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.

Dimensions in mm (inch)

<table>
<thead>
<tr>
<th>ENCLOSES</th>
<th>PROBES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Polycarbonate</strong></td>
<td><strong>Stainless steel</strong></td>
</tr>
<tr>
<td>180 (7.09&quot;)</td>
<td>218 (8.58&quot;)</td>
</tr>
<tr>
<td>168 (6.61&quot;)</td>
<td>200 (7.87&quot;)</td>
</tr>
<tr>
<td>163 (6.42&quot;)</td>
<td>186 (7.32&quot;)</td>
</tr>
<tr>
<td>110 (4.33&quot;)</td>
<td></td>
</tr>
<tr>
<td>71 (2.80&quot;)</td>
<td>73 (2.87&quot;)</td>
</tr>
<tr>
<td>54 (2.13&quot;)</td>
<td>53 (2.09&quot;)</td>
</tr>
<tr>
<td>71 (2.80&quot;)</td>
<td>73 (2.87&quot;)</td>
</tr>
<tr>
<td>6.5 (0.25&quot;)</td>
<td>6.5 (0.25&quot;)</td>
</tr>
<tr>
<td>5.1 (0.20&quot;)</td>
<td>5.1 (0.20&quot;)</td>
</tr>
</tbody>
</table>

**PROBES**

T1: Wall mount

T2: Duct mount

T5: Remote probe up to 180 °C (356 °F)

T10: Pressure tight probe up to 20 bar (300 psi)

**Technical Data**

**Measurands**

<table>
<thead>
<tr>
<th>Relative humidity (RH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working range</td>
</tr>
<tr>
<td>Accuracy</td>
</tr>
<tr>
<td>Temperature dependence of electronics</td>
</tr>
<tr>
<td>Response time</td>
</tr>
</tbody>
</table>

**ENCLOSURES**

**PROBES**

T1: Wall mount

T2: Duct mount

T5: Remote probe up to 180 °C (356 °F)

T10: Pressure tight probe up to 20 bar (300 psi)

1) Refer to ordering guide
2) L = filter length; refer to data sheet "Accessories"
Temperature (T)

Working range sensing probe:
- T1, wall: -40...60 °C (-40...140 °F)
- T2, duct: -40...80 °C (-40...176 °F)
- T5, remote: -40...180 °C (-40...356 °F)
- T10, pressure tight: -40...180 °C (-40...356 °F)

Accuracy:

- Temperature dependence of electronics typ. ± 0.005°C/°C

Calculated parameters:

<table>
<thead>
<tr>
<th>Temperature dependence of electronics</th>
<th>typ. ± 0.005°C/°C</th>
</tr>
</thead>
</table>

Outputs:

- Two analogue outputs:
  - 0 - 1 / 5 / 10 V
  - -1 mA < I < 1 mA
  - freely selectable and scalable
  - 4 - 20 mA 3-wire R_L < 500 Ohm
  - 0 - 20 mA 3 wire R_L < 500 Ohm

Digital interface / protocol:

- Option J3: RS485 / Modbus RTU, max. 32 unit load devices on one bus (EE310 = 1 unit load; factory settings: 9600 bps, parity even, stop bit 1 / slave-ID 231)
- Option J4: Ethernet-PoE with Modbus TCP

General:

- Power supply class III (EU) / class 2 (NA):
  - 8...35 V DC
  - 12...30 V AC
  - 100...240 V AC, 50/60 Hz with option AM3

- Current consumption at 24 V DC/AC (typ.):
  - 15 mA / 40 mA_{nom} for 2 voltage outputs
  - 35 mA / 100 mA_{nom} for 2 current outputs
  - 50 mA / 150 mA_{nom} additional for display
  - 30mA / 90 mA_{nom} additional for Ethernet

- Pressure range for pressure tight probe:
  - 0.01...20 bar (0.15...300 psi)

- Probe material:
  - stainless steel 1.4404 / AISI 316L

- Enclosure material:
  - polycarbonate, UL94-V0 approved or stainless steel 1.4404 / AISI 316 L

- Protection class:
  - IP65 / NEMA 4

- Cable glands for polycarbonate enclosure:
  - M16 x 1.5, for cable Ø 3 - 7 mm (0.12 - 0.28")

- Electrical connection:
  - screw terminals max. 1.5 mm² (AWG 16)

- Working and storage temperature range of electronics:
  - -40...60 °C (-40...140 °F) without display
  - -20...50 °C (-4...122 °F) with display

- Electromagnetic compatibility:
  - EN61326-1
  - IECES-003 ClassA
  - FCC Part15 ClassA

- Two alarm outputs:
  - changeover contact
  - 250 V AC / 6 A
  - 28 V DC / 6 A

- System requirements for EE-PCS software:
  - Windows XP or higher; USB port

---

1) Traceable to intern. standards, administered 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).

Accuracy is specified for all models with an airflow > 0.0 m/s, except for Models T1 with an airflow > 0.2 m/s.

2) Appropriate for outdoor use, wet location, degree of pollution 2, overvoltage category II, altitude up to 3000 m (9843 ft).
# Ordering Guide

<table>
<thead>
<tr>
<th>Component</th>
<th>EE310</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware configuration</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>wall mount</td>
</tr>
<tr>
<td>Enclosure</td>
<td>polycarbonate</td>
</tr>
<tr>
<td>Filter</td>
<td>plastic - metal grid (up to 120 °C / 248 °F)</td>
</tr>
<tr>
<td><strong>Cable length</strong> (incl. probe length)</td>
<td>0.5 m (1.64 ft)</td>
</tr>
<tr>
<td><strong>Probe length</strong></td>
<td>65 mm (2.56&quot;)</td>
</tr>
<tr>
<td><strong>Process connection</strong></td>
<td>1/2&quot; ISO thread</td>
</tr>
<tr>
<td><strong>Electrical connection</strong></td>
<td>cable glands</td>
</tr>
<tr>
<td><strong>Optional features</strong></td>
<td>3.5&quot; TFT display with integrated data logger</td>
</tr>
<tr>
<td><strong>Setup - analogue outputs</strong></td>
<td>0-1 V</td>
</tr>
<tr>
<td><strong>Scaling 1 low</strong></td>
<td>0</td>
</tr>
<tr>
<td><strong>Scaling 1 high</strong></td>
<td>no code</td>
</tr>
<tr>
<td><strong>Scaling 2 low</strong></td>
<td>no code</td>
</tr>
<tr>
<td><strong>Scaling 2 high</strong></td>
<td>no code</td>
</tr>
</tbody>
</table>

### Measurand Code for output 1 and 2 in the ordering guide

<table>
<thead>
<tr>
<th>Measurand</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>relative humidity RH</td>
<td>MAxx</td>
</tr>
<tr>
<td>absolute humidity dv</td>
<td>g/m³</td>
</tr>
<tr>
<td>wet bulb temperature Tw</td>
<td>°C</td>
</tr>
<tr>
<td>water vapour partial pressure e</td>
<td>psi</td>
</tr>
<tr>
<td>specific enthalpy h</td>
<td>kJ/kg</td>
</tr>
<tr>
<td>Mixing ratio r</td>
<td>g/kg</td>
</tr>
</tbody>
</table>

1) Only with polycarbonate enclosure.
2) Combination of alarm output (AM2), Ethernet module (J4) and integrated power supply (AM3) is not possible.
3) Integrated power supply includes 2 plugs for power supply and outputs, other plug options are not possible.
4) Both analogue outputs shall be either voltage or current.

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Order Example

EE310-T5D2J3C1GA3GB3SBL-40SBH180

Type: T5  remote probe up to 180 °C (356 °F)
Enclosure: no code  polycarbonate
Filter: no code  stainless steel sintered filter
Cable length: no code  2 m (6.6')
Probe length: no code  200 mm (7.87')
Electrical connection: no code  cable glands
Optional features: D2  3.5" TFT display with integrated data logger
                    J3  RS485 module - Modbus RTU
                    C1  sensor coating

Output 1: no code  relative humidity %
Output Signal 1: GA3  0-10 V
Scaling 1 low: no code  0
Scaling 1 high: no code  100
Output 2: no code  temperature T [°C]
Output Signal 2: GB3  0-10 V
Scaling 2 low: SBL-40 -40
Scaling 2 high: SBH180 180

Accessories (see data sheet "Accessories")

Mounting flange stainless steel  HA010201
Drip water protection  HA010503
Bracket for installation onto mounting rails1)  HA010203
Mounting bracket for remote probe  HA010211
Humidity calibration kit  see data sheet „Humidity calibration kit“
Stainless steel wall mounting clip Ø 12 mm (0.5")  HA010225

1) For polycarbonate enclosure only. Two pieces are necessary for each EE310.