The EE23 is optimized for reliable and cost effective use in industrial applications. In addition to highly accurate measurement of relative humidity (RH) and temperature (T), the sensor also calculates the dew point (Td) and the frost point temperature (Tf).

**Measurement Performance**

The EE23 employs high-end E+E humidity sensing elements manufactured in state-of-the-art thin film technology, which are the prerequisite for outstanding 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 EE23 tackles even challenging industrial applications.

**Outputs and Power Supply**

The measured data is available on two voltage or current outputs as well as on the display. Additional features like alarm (relay) output and integrated supply module 100…240V AC facilitate the use of the EE23 in a wide range of applications.

**Easy Installation and Service**

The modular, three parts design of the IP65 / NEMA 4 enclosure, available in polycarbonate or metal, facilitates easy installation, service and replacement.

The enclosure consists of the back cover with the terminals for wiring, the pluggable active part with the electronics and the probe, and the front cover. Once installed, the active part of EE23 can be plugged on and off without rewiring. The plastic enclosure is appropriate also for mounting onto DIN rails.

**Remote Probe and Accessories**

The remote probe with cable length up to 20m (65.6 ft) together with a wide choice of accessories such as mounting flanges or brackets, drip water protection or radiation shield allow for easy integration of the EE23 into any measurement task.

**User Configurable**

The user can easily perform a two-point humidity and temperature adjustment. The analogue and alarm outputs can be freely configured.

### Features

- Temperature range -40...180 °C (-40...356 °F)
- Outstanding long term stability
- Calculation of dew point and frost point temperature
- Easy mounting and maintenance
- Alarm output
- Inspection certificate according to DIN EN 10204 – 3.1

### Protective Sensor Coating

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

#### Measurands

**Relative Humidity**

**Working range**: 0...100% RH

**Accuracy**\(^1\) (including hysteresis, non-linearity and repeatability, traceable to intern. standards, administrated by NIST, PTB, BEV...)

<table>
<thead>
<tr>
<th>Temperature Range</th>
<th>Accuracy 1)</th>
<th>Humidity Range</th>
<th>± (1.3 + 0.3%*mv) % RH</th>
<th>± (1.8 + 0.3%*mv) % RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>-15...40°C (5...104°F)</td>
<td>≤90% RH</td>
<td>EE23-T1/2/T4/T5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-15...40°C (5...104°F)</td>
<td>&gt;90% RH</td>
<td>EE23-T6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-25...70°C (-13...158°F)</td>
<td>≤90% RH</td>
<td>EE23-T1/2/T4/T5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-40...180°C (-40...356°F)</td>
<td>&gt;90% RH</td>
<td>EE23-T6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Temperature dependence electronics**: typ. ± 0.015% RH/°C

**Response time** \( t_{90} \) with metal grid filter at 20 °C (68 °F) < 15 sec.

**Temperature**

**Probe working range**

<table>
<thead>
<tr>
<th>Temperature Range</th>
<th>Accuracy</th>
<th>Humidity Range</th>
<th>± 1.3% RH</th>
<th>± 1.8% RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>-15...40°C (5...104°F)</td>
<td>≤90% RH</td>
<td>EE23-T1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-15...40°C (5...104°F)</td>
<td>&gt;90% RH</td>
<td>EE23-T6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-25...70°C (-13...158°F)</td>
<td>≤90% RH</td>
<td>EE23-T1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-40...180°C (-40...356°F)</td>
<td>&gt;90% RH</td>
<td>EE23-T6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Output Scale Span**

<table>
<thead>
<tr>
<th>Humidity</th>
<th>from</th>
<th>up to</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH</td>
<td>0</td>
<td>100</td>
<td>EE23-T1</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100</td>
<td>EE23-T2/T6</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100</td>
<td>EE23-T4</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100</td>
<td>EE23-T5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature</th>
<th>from</th>
<th>up to</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-40 (-40)</td>
<td>60 (140)</td>
<td>EE23-T1</td>
</tr>
<tr>
<td></td>
<td>80 (176)</td>
<td>120 (248)</td>
<td>EE23-T4</td>
</tr>
<tr>
<td></td>
<td>180 (356)</td>
<td>°C (°F)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dew point temperature</th>
<th>from</th>
<th>up to</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Td</td>
<td>-40 (-40)</td>
<td>60 (140)</td>
<td>EE23-T1</td>
</tr>
<tr>
<td></td>
<td>80 (176)</td>
<td>100 (212)</td>
<td>EE23-T4</td>
</tr>
<tr>
<td></td>
<td>100 (212)</td>
<td>°C (°F)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frost point temperature</th>
<th>from</th>
<th>up to</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tf</td>
<td>-40 (-40)</td>
<td>0 (32)</td>
<td>EE23-T1</td>
</tr>
<tr>
<td></td>
<td>0 (32)</td>
<td>0 (32)</td>
<td>EE23-T6</td>
</tr>
<tr>
<td></td>
<td>0 (32)</td>
<td>°C (°F)</td>
<td></td>
</tr>
</tbody>
</table>

**Outputs**

**Supply voltage**

- for 0 - 1 V / 0 - 5 V outputs: 10.5 - 35V DC or 12 - 28V AC
- for 0 - 10 V / 0 - 20 mA / 4 - 20 mA outputs: 15.0 - 35V DC or 15 - 28V AC
- 100...240V AC, 50/60Hz supply module (optional)

**Current consumption for voltage output**

- for DC supply: \( \leq 25 \text{ mA} \) (with alarm module \( \leq 35 \text{ mA} \))
- for AC supply: \( \leq 45 \text{ mA}_{ac} \) (with alarm module \( \leq 70 \text{ mA}_{ac} \))

**Current consumption for current output**

- for DC supply: \( \leq 55 \text{ mA} \) (with alarm module \( \leq 65 \text{ mA} \))
- for AC supply: \( \leq 100 \text{ mA}_{ac} \) (with alarm module \( \leq 120 \text{ mA}_{ac} \))

**Enclosure / protection class**

- PC or Al Si 9 Cu 3 / IP65, NEMA 4

**Cable gland**

- M16x1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39")

**Electrical connection**

- screw terminals max. 1.5 mm² (AWG 16)

**Working temperature range of electronics**

-40...60°C (-40...140°F)

**Working temperature range with display**

-30...60°C (-22...140°F)

**Storage temperature range**

-40...60°C (-40...140°F)

**CE compatibility according**

- EN61326-1
- EN61326-2-3
- ICES-003 Class B
- Industrial Environment
- FCC Part15 Class B

**Alarm Module**\(^2\)

**Output**

- SPDT-Switch max. 250V AC/8A or 28V DC/8A

**Setting range**

- threshold: 10...95% RH
- hysteresis: 3...15% RH

**Setting accuracy**

- ± 3% RH

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1) 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).

2) only for models T1, T2, T4 and T6.
### Accessories (Additional information see data sheet “Accessories”)

- Mounting flange: HA010201
- Mounting flange 5mm for model T6 only: HA010208
- Bracket for installation onto mounting rails*: HA010203
- Drip water protection: HA010503
- Radiation shield: HA010502
- Calibration set (see data sheet „Calibration Kit“): HA0104xx
- Stainless steel wall mounting clip Ø12 mm (0.5“): HA010225

*Note: Only for plastic enclosure

### Enclosure:
- Polycarbonate (PC)
  - Dimensions in mm (inch):
    - Width: 135 (5.3“)
    - Height: 66.5 (2.6“)
  - Probe material: PC

- Metal
  - Dimensions in mm (inch):
    - Width: 135 (5.3“)
    - Height: 66.5 (2.6“)

### Probes:
- **EE23-T1**
  - Probe material: PC
  - Dimensions in mm (inch):
    - Probes: 60 (2.3“)
    - Cable: 90 (3.5“)
  - Code: "probe length"

- **EE23-T2**
  - Probe material: stainless steel
  - Dimensions in mm (inch):
    - Probes: 60 (2.3“)
    - Cable: 90 (3.5“)
  - Code: "probe length"

- **EE23-T4 / EE23-T5**
  - Probe material: stainless steel
  - Dimensions in mm (inch):
    - Probes: 60 (2.3“)
    - Cable: 90 (3.5“)
  - Code: "probe length"

- **EE23-T6**
  - Probe material: stainless steel
  - Dimensions in mm (inch):
    - Probes: 60 (2.3“)
    - Cable: 90 (3.5“)
  - Code: "probe length"
## Hardware Configuration

<table>
<thead>
<tr>
<th>Model</th>
<th>T1</th>
<th>T2</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>wall mount</td>
<td>duct mount</td>
<td>remote probe up to 120 °C (248 °F)</td>
<td>remote probe up to 180 °C (356 °F)</td>
<td>miniature probe</td>
</tr>
</tbody>
</table>

| Enclosure | polycarbonate (no code) | metal (Al Si 9 Cu 3) | F3 | F3 | F3 | F3 |
| Filter | plastic - metal grid (up to 120 °C / 248 °F) | stainless steel sintered | PTFE | stainless steel grid (up to 180 °C / 356 °F) | \(\text{H}_2\text{O}\) | F12 | F12 | F12 | F12 |
| Wall mount | T1 | F5 | F5 | F5 | F5 | F5 | F5 | F5 | F5 | F5 |
| Duct mount | T2 | F5 | F5 | F5 | F5 | F5 | F5 | F5 | F5 | F5 |
| Remote probe up to 120 °C (248 °F) | T4 | no code | no code | no code | no code | no code | no code | no code | no code | no code |
| Remote probe up to 180 °C (356 °F) | T5 | no code | no code | no code | no code | no code | no code | no code | no code | no code |
| Miniature probe | T6 | no code | no code | no code | no code | no code | no code | no code | no code | no code |

### Cable Length

- 2 m (6.6 ft)
- 5 m (16.4 ft)
- 10 m (32.8 ft)
- 20 m (65.6 ft)
- 40 mm (1.57″)
- 65 mm (2.55″)
- 200 mm (7.87″)
- 400 mm (15.75″)

### Probe Length

- 40 mm (1.57″)
- 65 mm (2.55″)
- 200 mm (7.87″)
- 400 mm (15.75″)

### Optional Feature

- LC Display
- Alarm outputs for RH
- Sensor coating
- Integrated power supply

### Electrical Connection

- Cable glands
- 1 plug for power supply and outputs

### Output Signal

- 0-1 V
- 0-5 V
- 0-10 V
- 0-20 mA
- 4-20 mA

### Output 1

- Relative humidity RH [%]
- Other measurand (xx see measurand code below)

### Scaling 1 low

- 0
- 100

### Scaling 1 high

- no code
- no code

### Temperature T [°C]

- no code
- no code

### Output 2

- Temperature T [°F]
- Other measurand (xx see measurand code below)

### Scaling 2 low

- no code
- no code

### Scaling 2 high

- no code
- no code

### Display Mode

- Measurand output 1+2 alternating
- Measurand output 1
- Measurand output 2

### Measurand Code

<table>
<thead>
<tr>
<th>XX</th>
<th>%</th>
<th>°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative humidity</td>
<td>10</td>
<td>52</td>
</tr>
<tr>
<td>Temperature</td>
<td>50</td>
<td>65</td>
</tr>
</tbody>
</table>

### Order Example

**Type:** remote probe up to 120 °C (248 °F)
**Enclosure:** metal (Al Si 9 Cu 3)
**Filter:** plastic - metal grid
**Cable length:** 2 m (6.6 ft)
**Probe length:** 200 mm (7.87″)
**Electrical connection:** cable glands
**Optional feature:** LC Display

**Output Signal:** 0-5 V
**Output 1:** relative humidity [%]
**Scaling 1 low:** 0
**Scaling 1 high:** 100
**Temperature T [°F]:** 50
**Display mode:** measurand output 1+2 alternating

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