

# EE212

## Modular Humidity/Temperature Sensor

The EE212 humidity (RH) and temperature (T) sensor with interchangeable sensing module is optimized for demanding climate control applications in most various industries.

### Versatility

The EE212 is available for wall or duct mount versions and features two analogue outputs and optional graphic display. Besides the accurate RH and T measurement, the sensor calculates various humidity related parameters such as dew point temperature, absolute humidity and mixing ratio.

### Outstanding Reliability

The proprietary coating of the E+E sensing element, the wide choice of filter caps and the IP65/NEMA 4 enclosure ensure excellent long-term performance of EE212 even under challenging working conditions. Easy on-site replacement of the sensing module minimizes the down-time for maintenance purposes in heavily polluted or aggressive environment.

### Interchangeable, Robust Sensing Module

The injection-moulded sensing module inside the sensing head is mechanically highly stable, easy to handle and requires no tools for replacement. The electronics inside the module is encapsulated and therefore best protected against condensation.

### User Configurable and Adjustable

The free EE-PCS Product Configuration Software and an optional adapter cable facilitate the configuration and adjustment of the EE212. The configuration includes the measurands assignment (two on the outputs and up to three on the display), the output scale and the display settings.



## 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/close with a 1/4 rotation

**Inspection certificate according to DIN EN 10204-3.1**

**Display**

- » Configurable display layout
- » Measurands freely selectable

**Smooth cover surface**

- » No accumulation of dust in protruding edges

**Enclosure**

- » IP65 / NEMA 4
- » Protection against contamination and condensation
- » Minimal installation costs

**EE212M calibrated sensing module**

- » State-of-the-art E+E RH/T sensing element with proprietary coating and sealed solder pads
- » High mechanical stability
- » Easy handling

## Protective Sensor Coating

The E+E proprietary sensor coating is a hygroscopic layer applied to the active surface of the sensing element. The coating substantially extends 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

### Measurands

#### Relative Humidity

Working range 0...100 % RH

Accuracy<sup>1)</sup> (incl. hysteresis, non-linearity and repeatability)

@ 23 °C (73 °F)

-15...60 °C (5...140 °F)

-40...-15 °C (-40...5 °F)

$\pm(1.5 + 0.005 \cdot mv)$  %RH

$\pm(1.8 + 0.007 \cdot mv)$  %RH

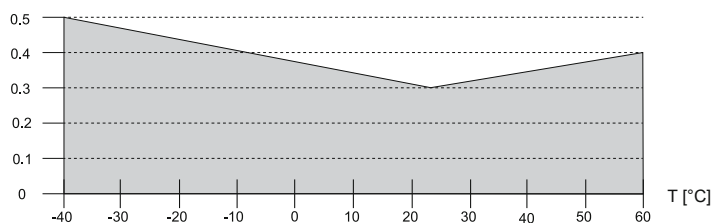
Additional uncertainty  $\pm 0.125$  %RH/°C<sup>2)</sup>

mv = measured value

#### Temperature

Accuracy

$\pm \Delta T$  [°C]



### Outputs

#### Analogue output

0 - 5 V / 0 - 10 V

-1 mA < I<sub>L</sub> < 1 mA

4 - 20 mA (2-wire)

R<sub>L</sub> ≤ 500 Ω

0 - 20 mA (3-wire)

R<sub>L</sub> ≤ 500 Ω

### General

Power supply class III 

for 4 - 20 mA (2-wire)

$(10 \text{ V} + R_L \times 20 \text{ mA}) < V_+ < 30 \text{ V DC}$

for 0 - 20 mA (3-wire)

15 - 35 V DC<sup>3)</sup> or 24 V AC ±20 %

for 0 - 5 V / 0 - 10 V

Current consumption at 24 V

Voltage output

DC supply max. 12 mA;

with display max. 23 mA

AC supply max. 34 mA<sub>rms</sub>;

with display max. 49 mA<sub>rms</sub>

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<sub>rms</sub>;

with display max. 84 mA<sub>rms</sub>

Display

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

Electrical connection

Screw terminals, max. 1.5 mm<sup>2</sup>

Enclosure material

Polycarbonate, UL94V-0 (with Display UL94HB) approved

Protection rating

IP65/NEMA 4

Cable gland

M16 x 1.5

Electromagnetic compatibility

EN 61326-1:2013

EN 61326-2-3:2013

Industrial Environment

FCC Part15 ClassA

ICES-003 ClassA



Temperature ranges

Working: -40...60 °C (-40...140 °F)

without display

Storage: -40...60 °C (-40...140 °F)

Temperature ranges

Working: -20...50 °C (-4...122 °F)

with display

Storage: -20...60 °C (-4...140 °F)

1) Traceable to international 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).

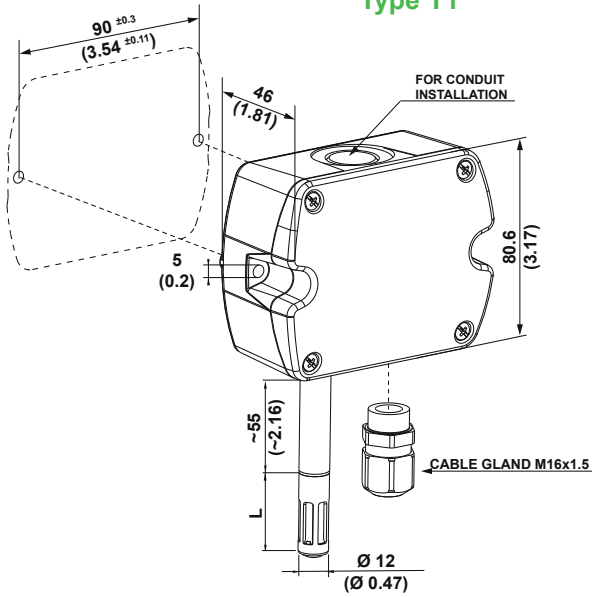
2) Deviating from -15 °C (5 °F)

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

## Dimensions

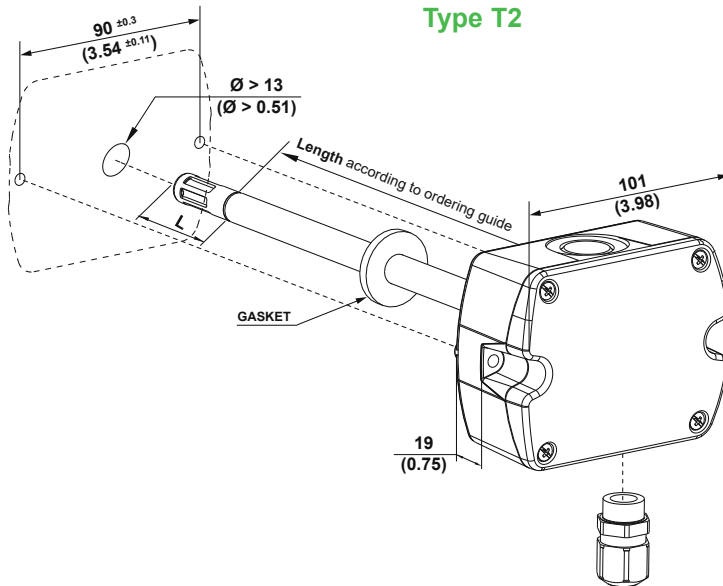
Values in mm (inch)

### Type T1



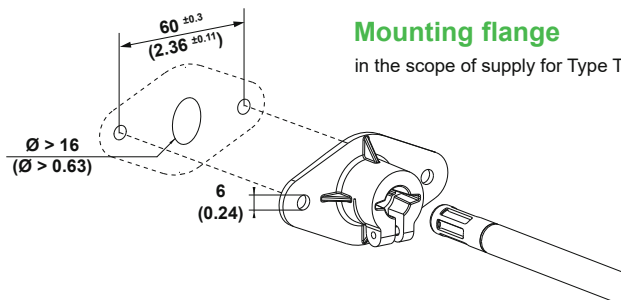
L = filter cap	mm (inch)
Membrane	34 (1.4)
Stainless steel	33 (1.3)

### Type T2



### Mounting flange

in the scope of supply for Type T2



## Ordering Guide

		EE212-	
		T1	T2
Hardware Configuration	Type	Wall mount Duct mount	
	Probe length	50 mm (2") 200 mm (4")	L50 L200
	Output	0 - 5 V 0 - 10 V 0 - 20 mA (3-wire) 4 - 20 mA (2-wire)	A2 A3 A5 A6
	Filter	Membrane Metal grid Stainless steel sintered	F2 F3 F4
	Display <sup>1)</sup>	No Display Without backlight <sup>2)</sup> With backlight <sup>3)</sup>	no code D1 D2
	Setup Analogue Outputs	Output 1	Relative humidity RH [%] Temperature T [°C] Temperature T [°F] Other measurand (xx see measurand code below)
Scaling 1 low		0 Value	no code SALValue
Scaling 1 high		100 Value	no code SAHValue
Output 2		Temperature T [°C] Temperature T [°F] Other measurand (xx see measurand code below)	no code MB2 MBxx
Scaling 2 low		-40 Value	no code SBLValue
Scaling 2 high		60 Value	no code SBHValue

1) Factory setup: the display shows the measurands selected for output 1 and output 2.

2) Not with output A5.

3) Not with output A6.

## Measurand Code

For Output 1 and 2 in the Ordering Guide

Measurand code		MAxx / MBxx
Temperature T	[°C] [°F]	1 2
Relative humidity	[%]	10
Water vapor partial pressure e	[mbar] [psi]	50 51
Dew point temperature Td	[°C] [°F]	52 53
Wet bulb temperature Tw	[°C] [°F]	54 55

Measurand code		MAxx / MBxx
Absolute humidity dv	[g/m³] [g/ft³]	56 57
Mixing ratio r	[g/kg] [g/lb]	60 61
Specific enthalpy h	[kJ/kg] [BTU/lb]	62 64
Frost point temperature Tf	[°C] [°F]	65 66

## Order Examples

### EE212-T2L200A3F4D2

Type: Duct mount  
Probe length: 200 mm (4")  
Output: 0 - 10 V  
Filter: Stainless steel sintered  
Display: With backlight  
Output 1: Relative humidity  
Scaling 1: Low: 0 %RH  
High: 100 %RH  
Output 2: Temperature [°C]  
Scaling 2: Low: -40 °C  
High: 60 °C

### EE212-T1A6F2D1MB60SBL0SBH400

Type: Wall mount  
Output: 4 - 20 mA  
Filter: Membrane  
Display: Without backlight  
Output 1: Relative humidity  
Scaling 1: Low: 0 %RH  
High: 100 %RH  
Output 2: Mixing ratio [g/kg]  
Scaling 2: Low: 0 g/kg  
High: 400 g/kg

## Ordering Guide EE212M Sensing Module (Spare Part)

<b>Packaging</b>	Single packed	<b>EE212M-</b>
	Multipackage (Tray) <sup>1)</sup>	PK4 PK6

1) Minimum order quantity: 10 pcs

## Order Examples Sensing Module

**EE212M-PK4**

Packaging: Single packed

## Accessories

(For further information, see datasheet "Accessories")

USB Configuration Adapter	HA011066
Product Configuration Software	EE-PCS (free download: <a href="http://www.epluse.com/Configurator">www.epluse.com/Configurator</a> )
Power supply adapter	V03
Protection cap for 12 mm probe	HA010783