

# EE22 Series

## Humidity / Temperature Transmitter with interchangeable probes

Unique for the EE22 series are the interchangeable sensing probes with connector.

The calibration data is stored in the probes, which are therefore interchangeable and probe replacement does not affect the performance of EE22.

The outstanding accuracy over the entire temperature range is based on very precise calibration methods and on the latest microprocessor technology. Well-proven E+E humidity sensor elements ensure excellent long-term stability.

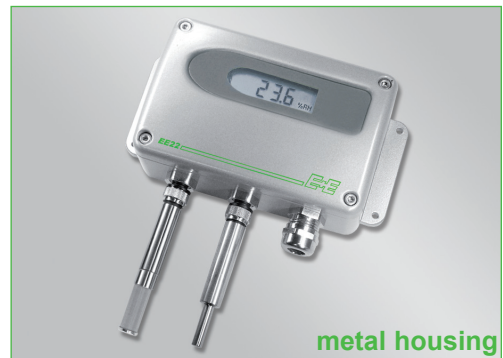
For high temperature applications (up to +80°C / +176°F) or in case of limited space availability, the sensing probes can be connected to EE22 housing with cables (2m, 5m or 10m / 6.6ft, 16.4ft or 32.8ft) without any repercussions for the overall accuracy of the instrument.

Voltage 0 - 1 / 10V or current 4 - 20mA (2 wire) outputs are available, of which the temperature output can be scaled according to the application (see ordering guide).

EE22 is suitable for direct wall mounting and for installation on rails according to DIN EN 50022.

The optional display indicates the actual RH and T values.

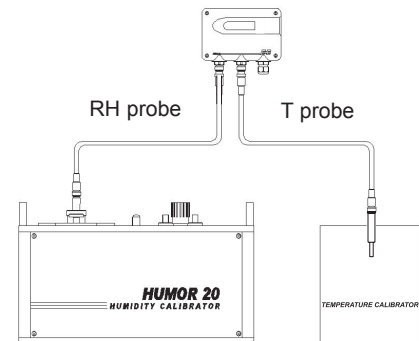
Duct mounting can be done easily with the optional duct mounting kit.



### Field calibration of humidity and temperature

In the pharmaceutical and biotechnology industry a Loop-Calibration of the RH and T outputs, recommended by the FDA (Food and Drug Administration), can easily be performed utilizing separate RH and T probes (Type: EE22-xFTx2x).

The RH and T outputs can be adjusted with push buttons on the printed circuit board.



### Reference probes

As useful accessories reference probes (incl. test report) representing fixed humidity and temperature values are available.

They shall be installed instead of the measuring probes to check function and accuracy of the evaluation unit.

One probe simulates high humidity and low temperature, the other low humidity and high temperature, to check the upper and lower end of both analogue outputs.



### Typical Applications

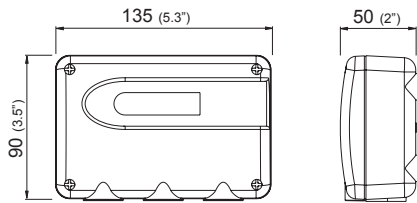
- pharmaceutical industry
- clean rooms
- storage rooms
- green houses
- cooling chambers

### Features

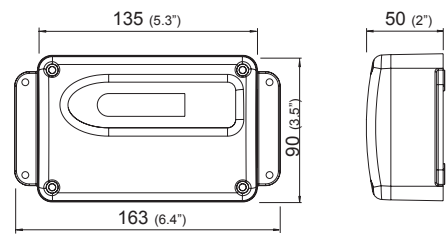
- interchangeable probes
- remote sensing probe up to 10m (32.8ft)
- measuring range 0...100% RH / -40...80°C (-40...176°F)
- optional display
- traceable calibration
- cost saving, easy loop-calibration of RH and T probes

## Housing dimensions (mm)

### polycarbonate housing



### metal housing



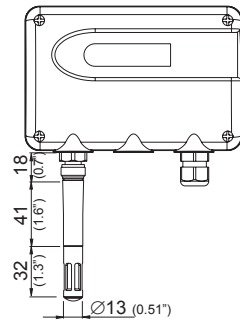
For use in harsh industrial environments all models of EE22 series are available in a robust metal housing.

**Code "M" in the ordering guide indicates a metal housing for the EE22 evaluation unit, as well as for the interchangeable probe(s).**

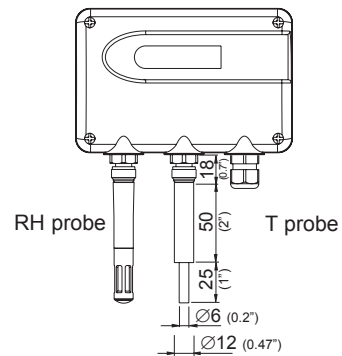
The smooth surface and the rounded outlines allow for the use in clean room applications.

## Probe dimensions (mm)

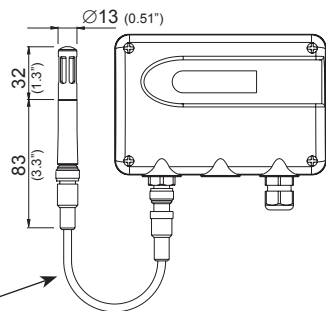
### with one RH&T probe EE22-xFTx1x



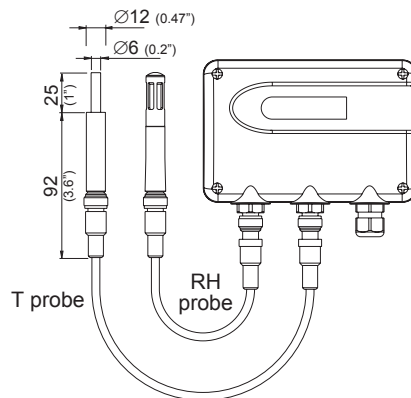
### with two separate probes for RH and T EE22-xFTx2x



### with one remote RH&T probe EE22-xFTx1x +HAxxxx

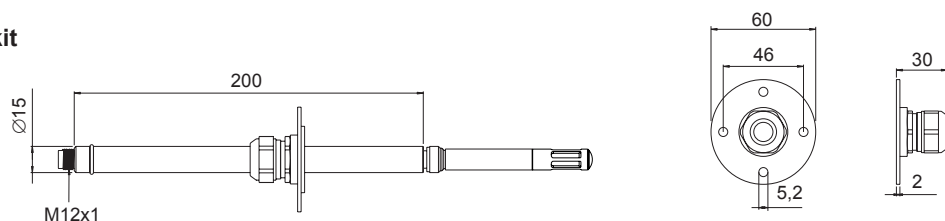


### with two remote separate probes for RH and T EE22-xFTx2x +2x HAxxxx



cable length	ordering code
2m (6.6ft)	HA010801
5m (16.4ft)	HA010802
10m (32.8ft)	HA010803

### duct mounting kit HA010209



## Technical Data

### Measuring values of sensing probe

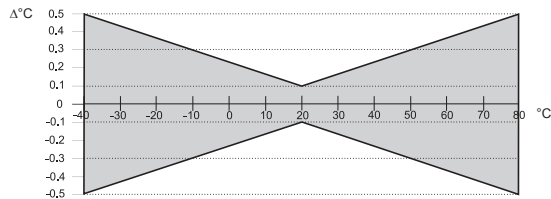
#### Relative Humidity

Sensor element <sup>1)</sup>	HC105		
Working range <sup>1)</sup>	0...100% RH		
Accuracy <sup>2)</sup> (including hysteresis, non-linearity and repeatability, traceable to international standards, administrated by NIST, PTB, BEV...)	-15...40°C (5...104°F)	≤90% RH	± (1.5 + 0.5%*mv) % RH
	-15...40°C (5...104°F)	>90% RH	± 2.5% RH
	-40...80°C (-40...176°F)		± (1.7 + 1.5%*mv) % RH
Temperature dependence of electronics	typ. ± 0.006% RH/°C		
Response time with metal grid filter	< 15s (at 20°C / t <sub>90</sub> )		

#### Temperature

Sensor element	Pt1000 (tolerance class A, DIN EN 60751)
Working range sensing probe	fixed sensing probe: -40...60°C (-40...140°F) remote sensing probe: -40...80°C (-40...176°F)

Accuracy  
(at 20°C: ±0,1°C)



Temperature dependence of electronics	typ. ± 0.007°C/°C	
Response time	with combined RH/T probe:	t <sub>63</sub> : typ. < 3min
	with separated RH and T probes:	t <sub>63</sub> : typ. < 6min

### Outputs

0...100% RH/ xx...yy°C <sup>3)</sup> (temperature output scale according to Txx ordering code)	0 - 1V 0 - 10V 4 - 20mA (two wire)	-0.5mA < I <sub>L</sub> < 0.5mA -1mA < I <sub>L</sub> < 1mA R <sub>L</sub> < 500 Ohm
Temperature dependence of analogue outputs	max. 0.2 $\frac{mV}{°C}$ resp. 1 $\frac{\mu A}{°C}$	

### General

Supply voltage	for 0 - 1V output: 10 - 35V DC or 9 - 29V AC		
	for 0 - 10V output: 15 - 35V DC or 15 - 29V AC		
	for 4 - 20mA output: 10 - 35V DC		
Load resistor for 4 - 20mA output	R <sub>L</sub> < $\frac{U_v - 10V}{0.02 A}$ [Ω]		
Current consumption	typ. 10mA for DC supply	typ. 20mA <sub>eff</sub> for AC supply	
Electrical connection	screw terminals max. 2.5mm <sup>2</sup>		
Cable gland	M16x1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39") (optional connector; type: Lumberg, RSF 50/11)		
Sensor protection	membrane filter, PTFE filter, metal grid filter (polycarbonate), metal grid filter (stainless steel)		
Material	housing: PC or Al Si 9 Cu 3	probe: PC or stainless steel	
Protection class of housing	IP65; Nema 4		
Electromagnetic compatibility	EN61326-1	EN61326-2-3	ICES-003 ClassB FCC Part15 ClassB
Working temperature range of probe	-40...60°C (-40...140°F) / 80°C (176°F) for remote sensing probe		
Working temperature range of electronics	-40...60°C (-40...140°F)		
Storage temperature range	-40...60°C (-40...140°F)		

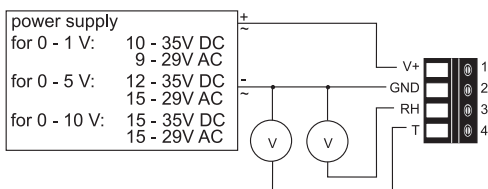
1) Refer to working range of humidity sensor HC105

2) 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).

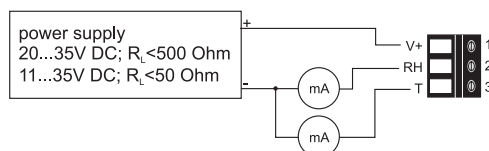
3) Refer to ordering guide

## Connection Diagram

### EE22-FT1,3xx



### EE22-FT6xx



## Ordering Guide

### Position 1 - Transmitter

### EE22-

<b>Hardware Configuration</b>																							
<b>Housing</b>	metal housing polycarbonate housing	M P																					
<b>Type</b>	humidity + temperature	FT																					
<b>Output</b>	0-1V 0-10V 4-20mA	1 3 6																					
<b>Model</b>	wall mounting - cable gland M16x1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39") wall mounting - rear cable outlet	A F																					
<b>Probe</b>	1 probe RH&T 2 separate probes for RH and T	1 2																					
<b>Filter</b>	membrane filter stainless steel sintered filter PTFE filter metal grid filter (polycarbonate) metal grid filter (stainless steel)	1 3 5 6 9																					
<b>Display</b>	without display with display	D07																					
<b>Plug</b>	without plug 1 plug for power supply and outputs	C03																					
<b>Sensor coating</b>	without coating with coating	HC01																					
<b>Software Configuration</b>																							
<b>T-Unit</b>	°C °F	E01																					
<b>Scaling of T-output in°C or °F</b>	<table border="0"> <tr> <td>-40...60 (T02)</td> <td>0...120 (T16)</td> <td>-20...50 (T48)</td> </tr> <tr> <td>-10...50 (T03)</td> <td>-30...60 (T20)</td> <td>-40...176 (T80)</td> </tr> <tr> <td>0...50 (T04)</td> <td>0...80 (T21)</td> <td>0...140 (T85)</td> </tr> <tr> <td>0...60 (T07)</td> <td>-40...80 (T22)</td> <td>0...176 (T86)</td> </tr> <tr> <td>-30...70 (T08)</td> <td>-20...80 (T24)</td> <td>32...120 (T90)</td> </tr> <tr> <td>-10...70 (T11)</td> <td>-20...60 (T25)</td> <td>32...140 (T91)</td> </tr> <tr> <td>-40...120 (T12)</td> <td>-30...50 (T45)</td> <td>32...132 (T96)</td> </tr> </table>	-40...60 (T02)	0...120 (T16)	-20...50 (T48)	-10...50 (T03)	-30...60 (T20)	-40...176 (T80)	0...50 (T04)	0...80 (T21)	0...140 (T85)	0...60 (T07)	-40...80 (T22)	0...176 (T86)	-30...70 (T08)	-20...80 (T24)	32...120 (T90)	-10...70 (T11)	-20...60 (T25)	32...140 (T91)	-40...120 (T12)	-30...50 (T45)	32...132 (T96)	Select according to Ordering Guide (Txx)  Other T-scaling refer to data sheet "T-Scalings"
-40...60 (T02)	0...120 (T16)	-20...50 (T48)																					
-10...50 (T03)	-30...60 (T20)	-40...176 (T80)																					
0...50 (T04)	0...80 (T21)	0...140 (T85)																					
0...60 (T07)	-40...80 (T22)	0...176 (T86)																					
-30...70 (T08)	-20...80 (T24)	32...120 (T90)																					
-10...70 (T11)	-20...60 (T25)	32...140 (T91)																					
-40...120 (T12)	-30...50 (T45)	32...132 (T96)																					

### Position 2 - Probe cable

<b>Cable length</b>	2m (6.6ft) 5m (16.4ft) 10m (32.8ft)	HA010801 HA010802 HA010803
---------------------	---	----------------------------------

## Accessories / Replacement Parts

(For further information see data sheet "Accessories")

- |   |  |
|---|--|
| - Replacement probe RH&T in polycarbonate (EE07-PFTx) | - Probe cable 2m (6.6ft) / 5m (16.4ft) / 10m (32.8ft) (HA0108xx) |
| - Replacement probe T in polycarbonate (EE07-PTx)     | - Bracket for rail installation* (HA010203)                      |
| - Replacement probe RH&T in metal (EE07-MFTx)         | - External supply unit (V02)                                     |
| - Replacement probe T in metal (EE07-MT)              | - RH calibration set (HA0104xx)                                  |
| - Display + housing cover in metal (D07M)             | - Reference probes (HA010403)                                    |
| - Display + housing cover in polycarbonate (D07P)     | - Filter caps (HA0101xx)   |
| - Duct mounting kit (HA010209)                        |  |

\*Note: Only for plastic housing, not for metal housing

## Order Example

### Position 1 - Transmitter:

#### EE22-MFT3A26C03/T07

housing: metal housing  
type: humidity + temperature  
output: 0-10V  
model: wall mounting - cable gland M16x1.5  
probe: 2 separate probes for RH and T  
filter: metal grid filter (polycarbonate)  
display: without display  
plug: 1 plug for power supply and outputs  
sensor coating: without coating  
T-Unit: °C  
scaling of T-output: 0...60°C

### Position 2 - Probe cable:

#### 2x HA010802

cable length: 2x 5m (2x 16.4ft)