

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.

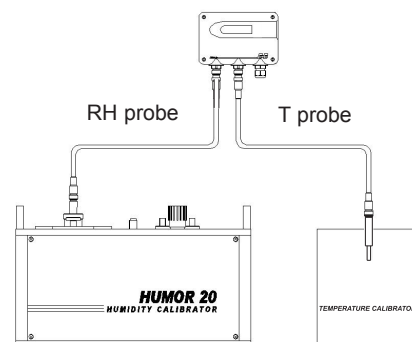
Duct mounting can be done easily with the optional duct mounting kit.



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

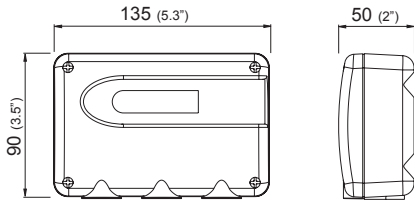
pharmaceutical industry
clean rooms
storage rooms
green houses
cooling chambers

Features

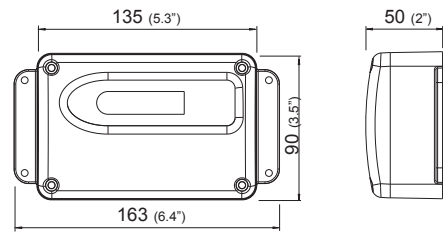
interchangeable probes
remote sensing probe up to 10m (32.8ft)
measuring range 0...100% RH / -40...80°C (-40...176°F)
optional display
traceable calibration
cost saving, easy loop-calibration of RH and T probes

Housing dimensions (mm)

polycarbonate housing



metal housing



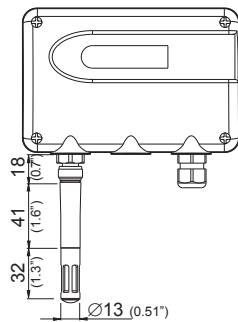
For use in harsh industrial environments all models of EE22 series are available in a robust metal housing.

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

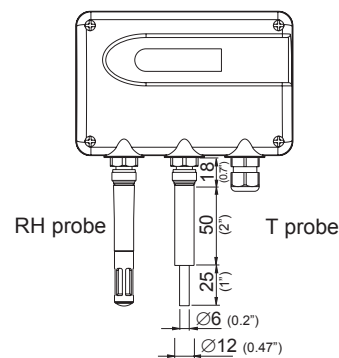
The smooth surface and the rounded outlines allow for the use in clean room applications.

Probe dimensions (mm)

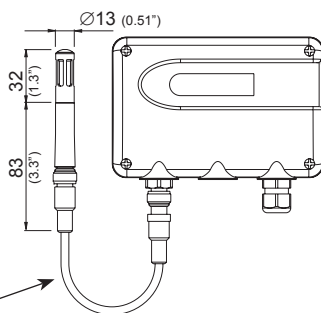
with one
 RH&T probe
 EE22-xFTx1x



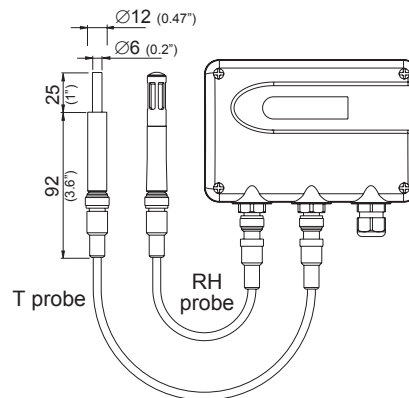
with two separate
 probes for
 RH and T
 EE22-xFTx2x



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

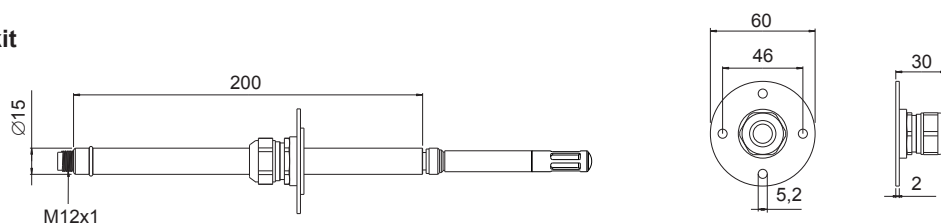


with two remote
 separate probes
 for RH and T
 EE22-xFTx2x
 +2x HAxxxx



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

duct mounting kit
 HA010209

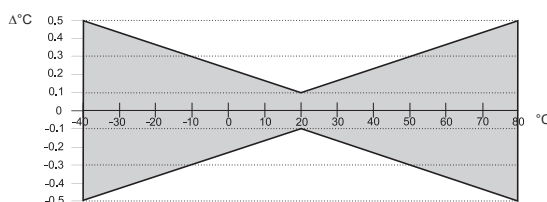


Technical Data

Measuring values of sensing probe

Relative Humidity	
Sensor element ¹⁾	HC105
Working range ¹⁾	0...100% RH
Accuracy ²⁾ (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 ₉₀)
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 ₆₃ : typ. < 3min with separated RH and T probes: t ₆₃ : typ. < 6min

Outputs

0...100% RH/ xx...yy°C ³⁾ (temperature output scale according to Txx ordering code)	0 - 1V 0 - 10V 4 - 20mA (two wire)	-0.5mA < I _L < 0.5mA -1mA < I _L < 1mA R _L < 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 _L < $\frac{U_V - 10V}{0.02 A}$ [Ω]	
Current consumption	typ. 10mA for DC supply	typ. 20mA _{eff} for AC supply
Electrical connection	screw terminals max. 2.5mm ²	
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 Industrial Environment	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

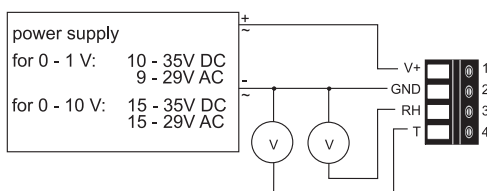
2) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

3) Refer to ordering guide

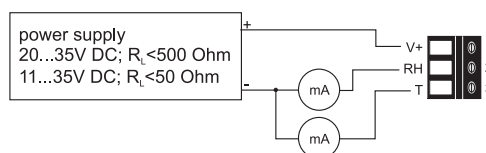


Connection Diagram

EE22-FT1,3xx



EE22-FT6xx



Ordering Guide

Position 1 - Transmitter

EE22-

Hardware Configuration				
Housing	metal housing			M
	polycarbonate housing			P
Type	humidity + temperature			FT
Output	0-1V			1
	0-10V			3
	4-20mA			6
Model	wall mounting - cable gland M16x1.5	cable Ø 4.5 - 10 mm (0.18 - 0.39")		A
	wall mounting - rear cable outlet			F
Probe	1 probe RH&T			1
	2 separate probes for RH and T			2
Filter	membrane filter			1
	stainless steel sintered filter			3
	PTFE filter			5
	metal grid filter (polycarbonate)			6
	metal grid filter (stainless steel)			9
Display	without display			
	with display			D07
Plug	without plug			
	1 plug for power supply and outputs			C03
Sensor coating	without coating			
	with coating			HC01
Software Configuration				
T-Unit	°C			
	°F			E01
Scaling of T-output in °C or °F	-40...60 (T02)	0...120 (T16)	-20...50 (T48)	Select according to Ordering Guide (Txx) Other T-scaling refer to page 146
	-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				
Cable length	2m (6.6ft)			HA010801
	5m (16.4ft)			HA010802
	10m (32.8ft)			HA010803

Accessories / Replacement Parts

(For further information see data sheet "Accessories", page 138)

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

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)