

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.

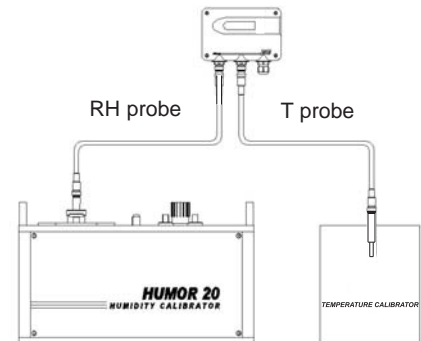
Duct mounting can be done easily with the optional duct mounting kit.



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

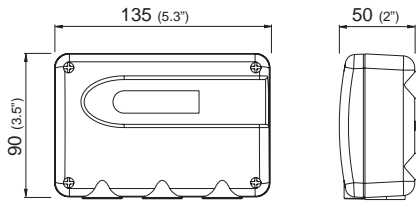
- pharmaceutical industry
- clean rooms
- storage rooms
- green houses
- cooling chambers

Features

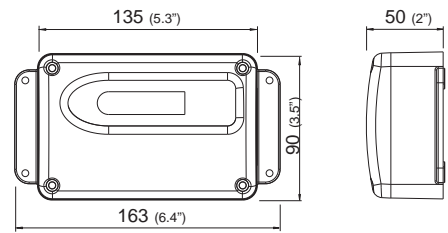
- interchangeable probes
- remote sensing probe up to 10m (32.8ft)
- measuring range 0...100% RH / -40...80°C (-40...176°F)
- optional display
- traceable calibration
- cost saving, easy loop-calibration of RH and T probes

Housing dimensions (mm)

polycarbonate housing



metal housing



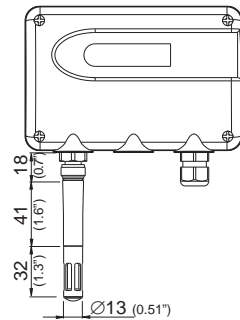
For use in harsh industrial environments all models of EE22 series are available in a robust metal housing.

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

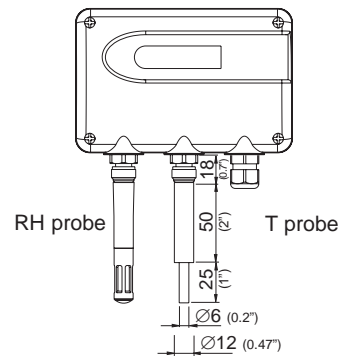
The smooth surface and the rounded outlines allow for the use in clean room applications.

Probe dimensions (mm)

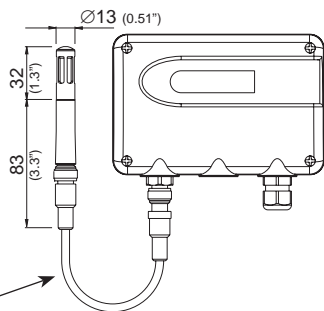
with one
RH&T probe
EE22-xFTx1x



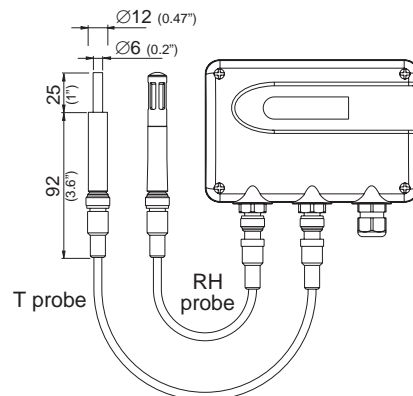
with two separate
probes for
RH and T
EE22-xFTx2x



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

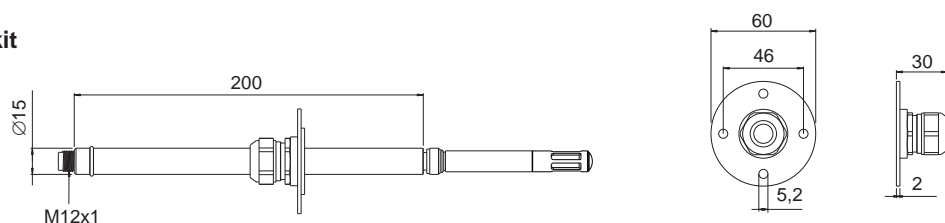


with two remote
separate probes
for RH and T
EE22-xFTx2x
+2x HAxxxx



| 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

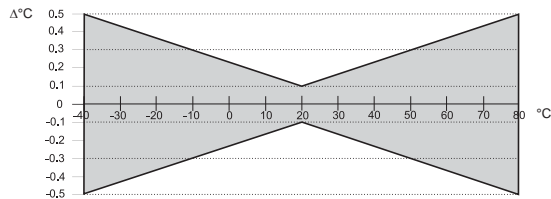
Relative Humidity

| | | | |
|--|------------------------------------|------------------------|--|
| 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 | 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) | | |

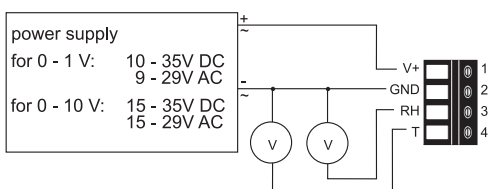
1) Refer to working range of humidity sensor HC105

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).

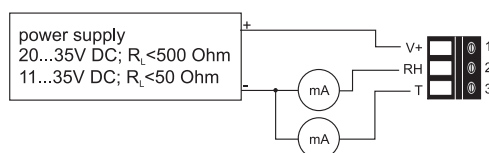
3) Refer to ordering guide

Connection Diagram

EE22-FT1,3xx



EE22-FT6xx



Ordering Guide

Position 1 - Transmitter

EE22-

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|-----------------------|---------------|----------------|----------------|----------------|-----------------|--------------|--------------|---------------|--------------|----------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|----------------|--|
| Hardware Configuration | | | | | | | | | | | | | | | | | | | | | | | |
| Housing | metal housing polycarbonate housing | M P | | | | | | | | | | | | | | | | | | | | | |
| Type | humidity + temperature | FT | | | | | | | | | | | | | | | | | | | | | |
| Output | 0-1V 0-10V 4-20mA | 1 3 6 | | | | | | | | | | | | | | | | | | | | | |
| Model | wall mounting - cable gland M16x1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39") wall mounting - rear cable outlet | A F | | | | | | | | | | | | | | | | | | | | | |
| Probe | 1 probe RH&T 2 separate probes for RH and T | 1 2 | | | | | | | | | | | | | | | | | | | | | |
| Filter | membrane filter stainless steel sintered filter PTFE filter metal grid filter (polycarbonate) metal grid filter (stainless steel) | 1 3 5 6 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 | <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 page 165 |
| -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

| | | |
|---------------------|---|----------------------------------|
| Cable length | 2m (6.6ft) 5m (16.4ft) 10m (32.8ft) | HA010801 HA010802 HA010803 |
|---------------------|---|----------------------------------|

Accessories / Replacement Parts

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

- | | |
|---|--|
| - 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)