

EE23 Series

The EE23 series stands for multifunctionality, highest accuracy, easy mounting and service.

The new IP65 water proof housing concept is based on three modules:

- back module with connectors
- middle module which accommodates the electronics
- cover module with optional display

It offers easy installation and the possibility for fast exchange of the sensor unit for service purposes.

The EE23 can be employed in all common applications by choosing the appropriate housing combination.

- A and B versions are dedicated for wall or duct mounting.
- C version with the remote sensing probe has a working temperature range $-40...120$ degC ($-40...248^{\circ}$ F)
- F wall mounting version with rear cable outlets is dedicated for clean room applications. Connection cables do not disturb the cleaning process.
- G version with optional radiation shield is dedicated for outdoor and meteorological applications.

The high quality HC series humidity sensor elements and newest microprocessor technology are the guarantee for best accuracy, excellent long term stability, small hysteresis and highest resistance to pollutants.

Easy configuration of the humidity and temperature outputs is made possible by the innovative design of the EE23 electronics. One can select between various current or voltage output signals.

Optionally the transmitters are available with passive temperature sensor elements with a free choice of the sensor type.

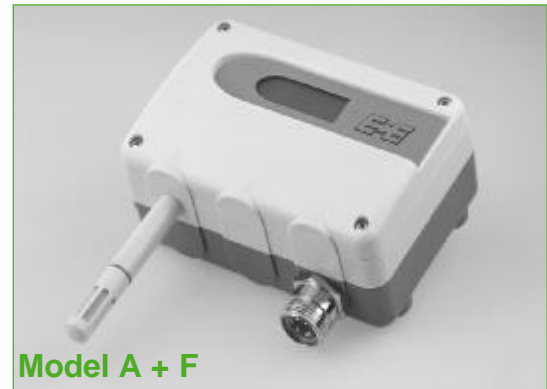
An optional hygrostate output for control and alarm purposes completes the wide range of offerings.

One can very easily perform a two point humidity adjustment on site by using two push buttons and an optional display.

The three modules concept makes it also possible to perform a loop calibration according to FDA (Food and Drug Administration) recommendations.

Further options are the integrated display and cable outlets via connectors.

Multifunctional Humidity & Temperature Transmitter



Model A + F



Model B



Model C



Model G

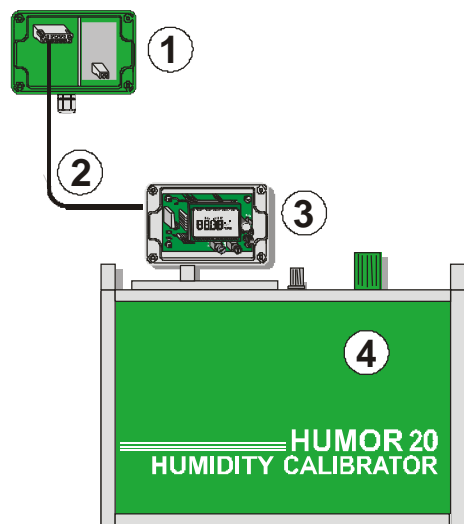
(radiation shield is not included in the scope of supply)

Field calibration

The three modules housing design allows a fast and easy dismounting of the EE23 for humidity field calibration. No interruption of the measurement is necessary for loop calibration which is essential for the calibration procedure recommended by FDA (Food and Drug Administration).

- ① EE23 back module mounted on the wall
- ② EE23 extension cable (can be ordered separately)
- ③ EE23 middle module mounted in the calibrator
- ④ Humidity reference system (e.g. HUMOR 20)

Utilization of the extension cable enables the user to perform full loop calibration as recommended by FDA.



Two Point Adjustment

With an easy routine the user can perform a fast and accurate two point adjustment of relative humidity.



Display

The actual measured data can be indicated on the optional integrated display. It is possible to choose between relative humidity (RH), temperature (T) or both.



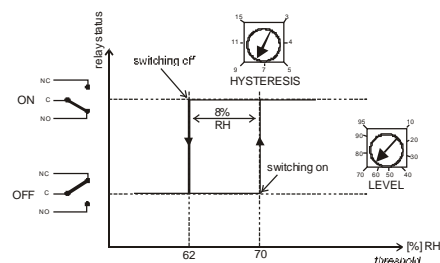
Configuration

The configuration kit consists of the hardware interface module and the communication software. Individual adjustments of the analogue outputs, the temperature output scaling and the display mode can be set by software.



Alarm Output

Simple control applications can be solved by the optional alarm output of the EE23. The user can set threshold and hysteresis by potentiometers.



Typical Applications

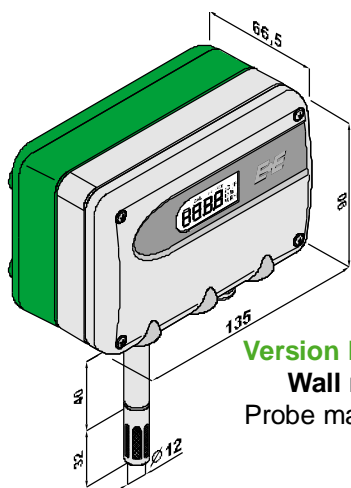
high end HVAC
 climate chambers
 process technology
 dryers
 meteorology
 clean rooms
 green houses
 stocks

Features

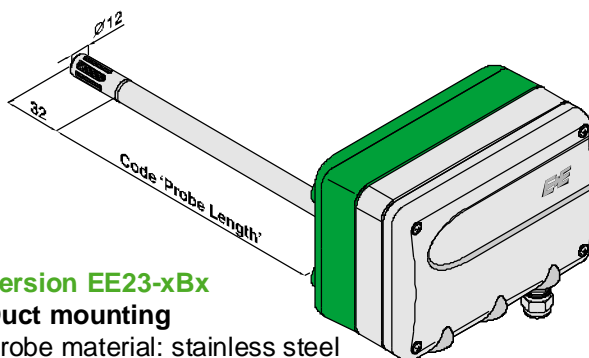
temperature range -40...120degC (-40...248°F)
 very easy mounting
 fast and easy service and replacement
 on site calibration
 best accuracy over whole temperature range
 remote sensing probe up to 10m (32.8ft)
 alarm output

Dimensions (mm)

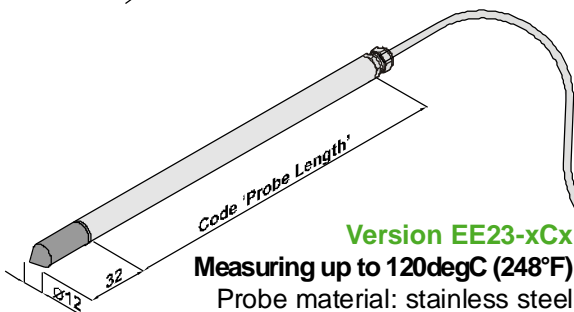
1 mm = 0.03937 inch / 1 inch = 25.4 mm



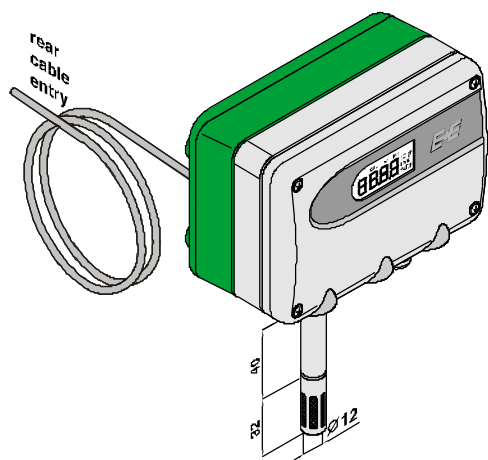
Version EE23-xAx
 Wall mounting
 Probe material: PC



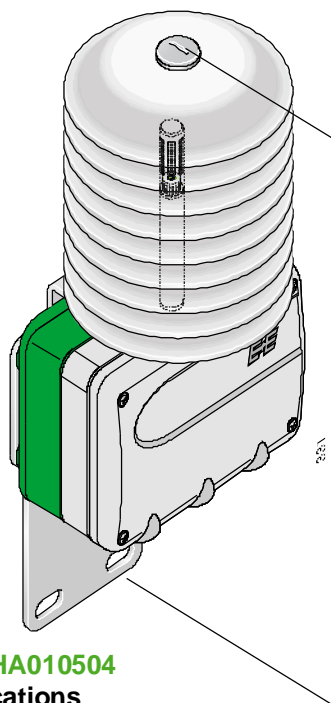
Version EE23-xBx
 Duct mounting
 Probe material: stainless steel



Version EE23-xCx
 Measuring up to 120degC (248°F)
 Probe material: stainless steel



Version EE23-xFx
 Wall mounting with rear cable entry
 Probe material: PC



Version EE23-xGx
 + radiation shield HA010504
 Meteorology applications
 Probe material: PC

Technical Data EE23

Measured quantities

Relative humidity

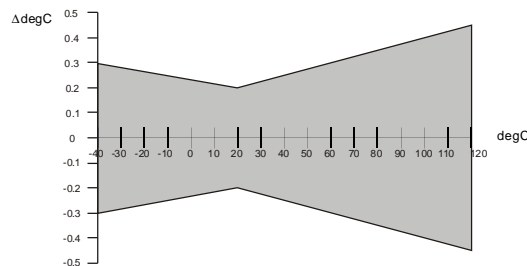
Humidity sensor ¹⁾	HC1000-200	
Working range ¹⁾	0...100% RH	
Accuracy incl. hysteresis and nonlinearity with		
- special calibration against certified standards	± 1% RH (0...90% RH)	± 2% RH (90...100% RH)
- standard calibration	± 2% RH (0...90% RH)	± 3% RH (90...100% RH)
Temperature dependence electronics	typ. 0.06% RH / degC	(typ. 0.03% RH / °F)
Temperature dependence sensing probe	typ. 0.03% RH / degC	(typ. 0.02% RH / °F)
Response time with metal grid filter at 20 degC / t ₉₀	< 15 sec.	

Temperature

Temperature sensor element	Pt1000 (class A, DIN EN 60751)		
Working range sensing head	EE23-xAx	-40...60 degC (-40...140°F)	EE23-xBx -40...80 degC (-40...176°F)
	EE23-xCx	-40...120 degC (-40...248°F)	EE23-xFx -40...60 degC (-40...140°F)
	EE23-xGx	-40...60 degC (-40...140°F)	

Accuracy (typ.)

-40...120 degC (-40...248°F)



Temperature dependence of electronics	typ. 0.005 degC/degC (°F/°F)	
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Outputs

0...100% RH / xx...yy degC ³⁾	0 - 5 V	-1 mA < I _L < 1 mA
(temperature output scale adjustable by E+E or with configuration kit)	0 - 10 V	-1 mA < I _L < 1 mA
	0 - 20mA	R _L < 350 Ohm
	4 - 20 mA	R _L < 350 Ohm

General

Supply voltage		
for 0 - 5 V outputs	10.5V DC - 28V DC	or 12V AC - 28V AC
for 0 - 10 V, 0 - 20 mA and 4-20 mA outputs	15.0V DC - 28V DC	or 15V AC - 28V AC
Current consumption for voltage output		
for DC supply ≤ 25 mA	with alarm module: for DC supply	≤ 35 mA
for AC supply ≤ 35 mA _{eff}	for AC supply	≤ 60 mA _{eff}
Current consumption for current output		
for DC supply ≤ 50 mA	with alarm module: for DC supply	≤ 60 mA
for AC supply ≤ 90 mA _{eff}	for AC supply	≤ 110 mA _{eff}
Housing / protection class	PC / IP65; Nema 4	
Cable gland ²⁾	M16x1.5 cable Ø 4.5 - 10 mm (0.18 - 0.39 inch)	
Electrical connection	screw terminals max. 1.5 mm ² (AWG 16)	
Sensor protection	sintered stainless steel filter, PTFE or metal grid filter	
Working temperature range of electronics	-40...60 degC (-40...140 °F)	
Working temperature range with display	-30...60 degC (-22...140 °F)	
Storage temperature range	-40...60 degC (-40...140 °F)	

¹⁾ Refer to the working range of the humidity sensor, page 22.

²⁾ Connection plugs refer to ordering guide, page 23.

³⁾ Refer to ordering guide, page 23.

CE compatibility according

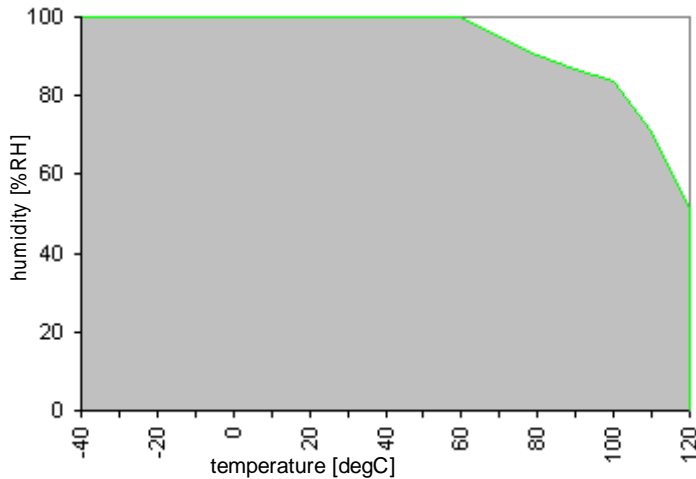
EN61000-6-2 FCC Part15 ClassB
 EN50081-1 EN61010-1 ICES-003 ClassB



Alarm Module - optional

Output	SPDT-Switch up to 250V AC/8A or 28V DC/8A	
	threshold	hysteresis
Setting range	10...95% RH	3...15% RH
Setting accuracy	± 3% RH	

Humidity Sensor - Working Range



The working range of the humidity sensor element is shown in terms of humidity / temperature limits.

Although the sensors would not deteriorate beyond the limits, their performance can only be specified within the limits of the working range.

-40...120 degC (-40...248°F)

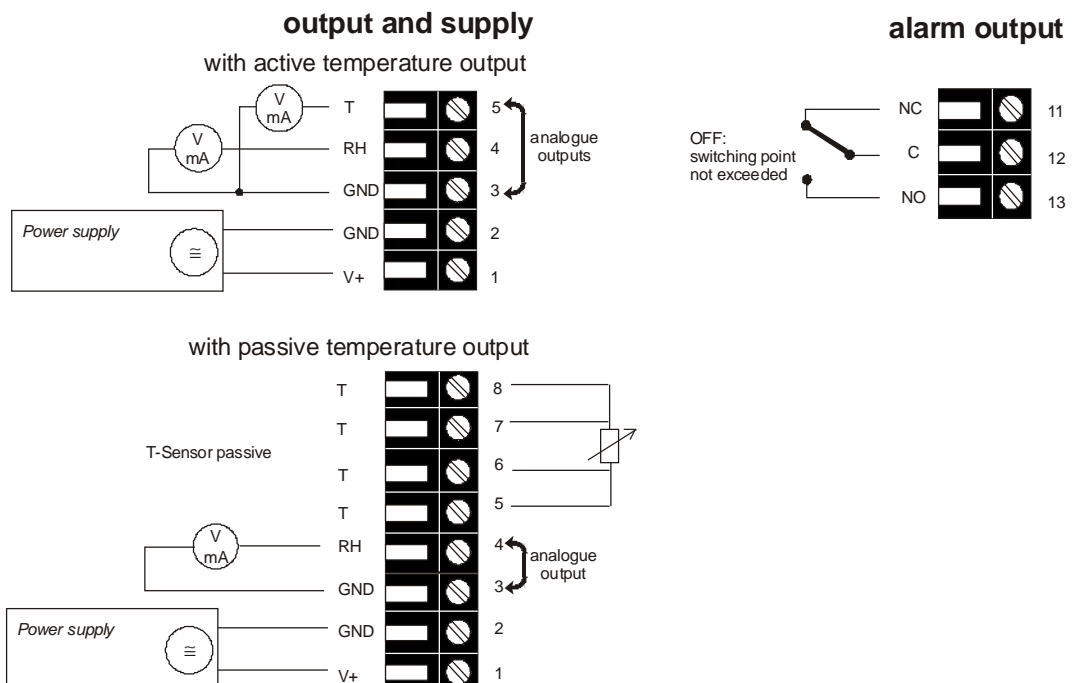
Sensor Coating

Operation in heavily polluted and/or corrosive environments is typical for many industrial processes and can lead to drift or damage of the humidity sensor and thus to false measured values. The unique protective coating developed by E+E for the sensing probe (ordering code: - HC) brings a significant improvement on the long-term stability of the transmitter in very dirty and aggressive environments.

High Humidity Calibration

For applications with a steady climate of > 90%RH we recommend a special high humidity calibration .

Connecting Diagram



Ordering Guide

EE23

Hardware Settings				
Model	humidity + temperature	(FT)	FT	
	humidity	(F)	F	
	humidity + Ptxxx passive (available only for housing type A, F and G)	(FPtxxx)	FPtxxx	
Housing type	wall mounting	(A)	A	
	duct mounting	(B)	B	
	remote probe up to 120 degC (248°F)	(C)	C	
	wall mounting - rear cable entry	(F)	F	
	wall mounting -for meteorology	(G)	G	
Filter	stainless steel filter	(3)	3	
	PTFE filter	(5)	5	
	metal grid filter	(6)	6	
Cable length (only housing type C)	2m (6.6ft)	(02)	02	
	5m (16.4ft)	(05)	05	
	10m (32.8ft)	(10)	10	
Probe length (only housing types B+C)	50mm (1.9 inch)	(2)	2	
	200mm (7.9 inch)	(5)	5	
	400mm (15.8 inch)	(6)	6	
Display (refer to software-code)	no display	(no code)		
	with display	(D03)	D03	
Alarm output (not available for housing type F)	no alarm output	(no code)		
	with alarm output	(SW)	SW	
Connector	standard cable 1 gland M16x1.5; cable Ø 4.5 - 10 mm (0.18 - 0.39 inch)	(no code)		
	2 glands M16x1.5	(C11)	C11	
	1 plug for supply + outputs	(C03)	C03	
	2 plugs for supply + outputs and alarm output	(C09)	C09	
Coating Sensor	no	(no code)		
	yes	(HC01)	HC01	
Calibration	standard calibration	(no code)		
	high humidity calibration	(CA01)	CA01	
Software Settings				
Output	0 - 5V	(2)	2	
	0 - 10V	(3)	3	
	0 - 20mA	(5)	5	
	4 - 20mA	(6)	6	
Temperature unit	degC	(no code)		
	°F	(E01)	E01	
Scaling of T-output in degC or °F	-40...60 (T02)	-40...120 (T12)	-40...248 (T78)	Select according to Ordering Guide (Txx) Other T-scaling refer to page 11
	-10...50 (T03)	20...120 (T15)	0...140 (T85)	
	0...50 (T04)	-30...60 (T20)	0...248 (T87)	
	0...100 (T05)	0...80 (T21)	32...120 (T90)	
	0...60 (T07)	-40...80 (T22)	32...140 (T91)	
	-30...70 (T08)	-20...80 (T24)	32...248 (T93)	
	-30...120 (T09)	-20...60 (T25)	32...132 (T96)	
	-20...120 (T10)	-30...50 (T45)		
	-10...70 (T11)	-20...50 (T48)		
	Display mode	humidity and temperature alternating	(TH)	
humidity		(RH)	RH	
temperature		(TE)	TE	

Accessories

(additional information see data sheet "Accessories", page 58)

Order example

- filter caps (HA0101xx)
- configuration kit (HA010303)
- radiation shield (HA010504)
- external power supply unit (V02)
- display + cover (D03)
- mounting flange (HA010201)
- bracket for installation onto mounting rails (HA010203)
- replacement humidity sensors (FE09)
- drip water protection (HA010503)
- calibration set (HA0104xx)
- extension cable for field calibration (HA010302)

EE23-FTC6025D03/6-T12-TH

model: humidity and temperature
 type of housing: separated sensor probe
 filter: metal grid
 cable length: 2 m (6.6ft)
 probe length: 200 mm (7.9 inch)
 display: yes
 output: 4 - 20 mA
 temperature unit: °C
 scaling of T-output: -40...120 degC
 display mode: humidity/temperature alternating

EE23