MULTIFUNCTION INDUSTRIAL TRANSMITTER FOR TEMPERATURE / HUMIDITY / DEW POINT...

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.

For use in harsh industrial environments all models of the EE23 are available in a robust metal housing.

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

- **Model A / B:** wall / duct mounting
- **Model C:** remote sensing probe has a working temperature range -40…120°C (-40…248°F)
- **Model F:** wall mounting version with rear cable outlets is dedicated for clean room applications. Connection cables do not disturb the cleaning process.
- **Model G:** version with optional radiation shield is dedicated for outdoor and meteorological applications.
- **Model H:** with remote miniature probe for concealed mounting (e.g. in museums) or in tight spaces.

The high quality HC series humidity sensor elements and newest microprocessor technology are the guarantee for:
- best accuracy over the whole working range
- display and output of relative humidity, temperature, dew point and frost point temperature
- small hysteresis
- excellent long term stability
- 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.

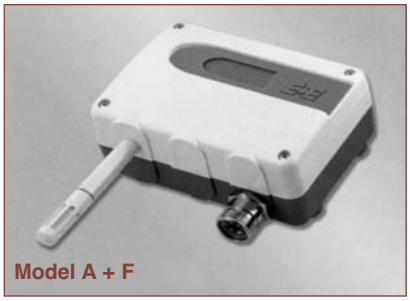
Optionally the transmitters are available with passive temperature sensor elements with a free choice of the sensor type.

One can very easily perform a two point humidity adjustment on site buy 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.

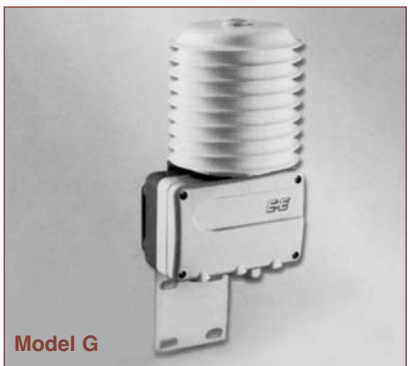
Further options are the integrated display, cable outlets via connectors, sensor coating and an hygrostate output for control and alarm purposes.

Humidity / Temperature Transmitter for Industrial Applications
Calculation of Dew Point and Frost Temperature


Model A + F


Model B


Model C


Model G

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


Model H

NEW

MULTIFUNCTION INDUSTRIAL TRANSMITTER FOR TEMPERATURE / HUMIDITY / DEW POINT...

Typical Applications

High and HVAC
Climate chambers
Process technology
Dryers
Meteorology
Clean rooms
Green houses
Stocks

Features

Temperature range -40…120°C (-40…248°F)
Calculation of dew point / frost point temperature
Two point humidity and temperature calibration
Very easy mounting and maintenance
On site calibration
Best accuracy over whole temperature range
Remote sensing probe up to 20m (65.6ft)
Alarm output

Field Calibration

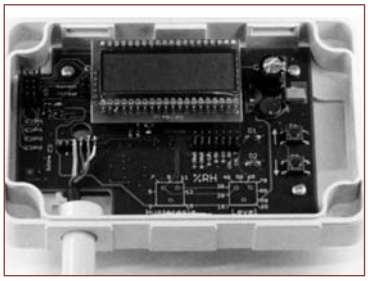
The three modules housing design allows a fast and easy dismounting of the EE23 for humidity fields calibration. No interruption of the measurement is necessary for loop calibration which is essential for the calibration procedure recommended by FDA (Food and Drug Administration).

¿ EE23 back module mounted on the wall
¡ EE23 extension cable (can be ordered separately)
¬ EE23 middle module mounted in the calibrator
Humidity reference system (e.g. HUMOR 20)

Utilization of the extention cable enables the user to perform full

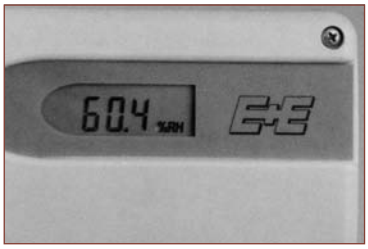
NEW Two Point Adjustment

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



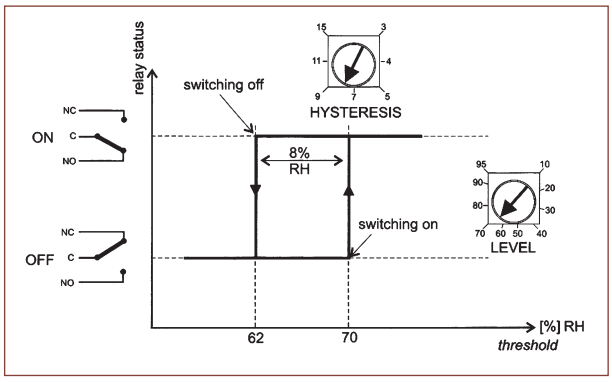
Display

The actual measured data can be indicated on the optional integrated display. It is possible to choose between relative humidity (RH), temperature (T), dew point (Td), frost point (Tf) or an alternating display of two values.



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.

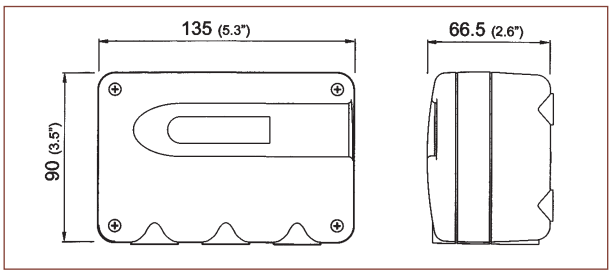


MULTIFUNCTION INDUSTRIAL TRANSMITTER FOR TEMPERATURE / HUMIDITY / DEW POINT...

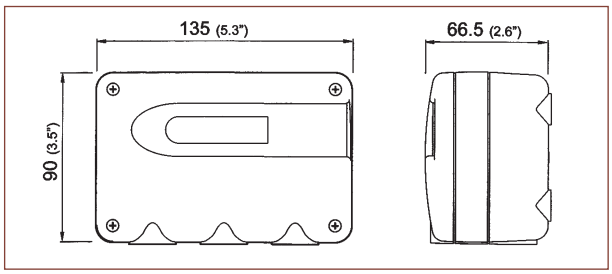
Dimensions in mm

Housing:

Polycarbonat housing

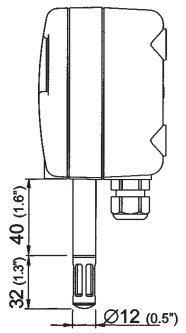


NEW Metal housing

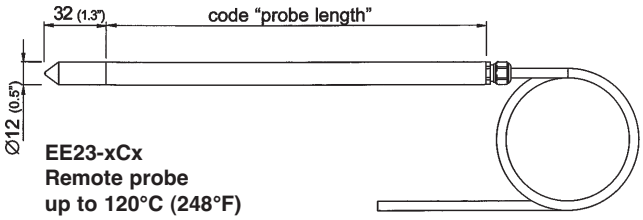


For use in harsh industrial environments all models of the EE23 are available in a robust metal housing.
The very smooth surface and the rounded outlines allow for the use in clean rooms as well.

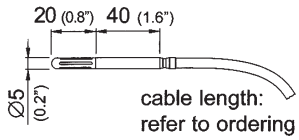
Models:



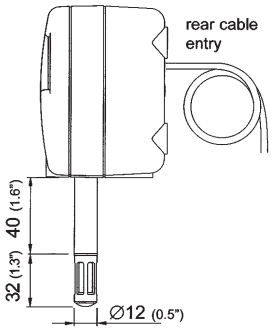
EE23-xAx
Wall mounting
Probe material:
PC or stainless steel



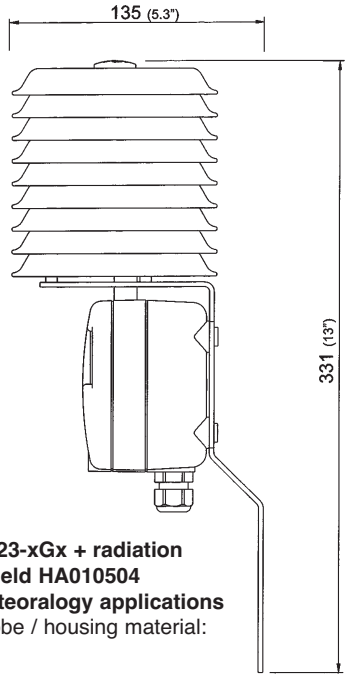
EE23-xCx
Remote probe
up to 120°C (248°F)
Probe material: stainless steel



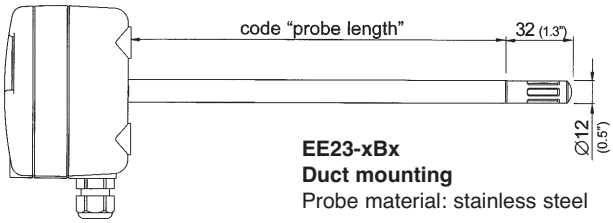
EE23-xHx
Remote miniature probe
Probe material: stainless steel



EE23-xFx
Wall mounting with rear cable outlet
Probe material:
PC or stainless steel



EE23-xGx + radiation Shield HA010504
Meteoralogy applications
Probe / housing material:
PC



EE23-xBx
Duct mounting
Probe material: stainless steel

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Technical Data EE23

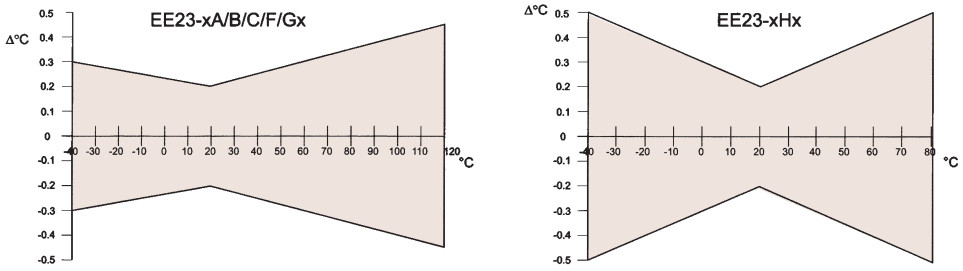
Measuring Quantities

Relative Humidity

Humidity sersor [1]	EE23-xA/B/C/F/Gx	HC1000-200	
	EE23-xHx	HC105	
Working range [1]		0…100% RH	
Accuracy incl.hysteresis and nonlinearity with			
-special calibration against certificate 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 electronic		typ. 0.06% RH /°C	(typ. 0.03% RH /°F)
Temperature dependence sensing probe		typ. 0.03% RH /°C	(typ. 0.03% RH /°F)
Response time with metal grid filter at 20°C / t_{90}			< 15 sec.

Temperature

Temperature sensor element	EE23-xA/B/C/F/Gx		Pt1000 (class A, DIN EN 60751)
	EE23-xHx		Pt1000 (class B, DIN EN 60751)
Working range sensing head	EE23-xAx	-40…60°C (-40…140°F)	EE23-xBx -40…80°C (-40…176°F)
	EE23-xCx	-40…120°C (-40…248°F)	EE23-xFx -40…60°C (-40…140°F)
	EE23-xGx	-40…60°C (-40…140°F)	EE23-xHx -40…80°C (-40…176°F)
Accuracy (typ.)			



Temperature dependence of electronics	typ. ± 0.005°C/°C

Outputs

0.100% RH / xx…yy°C [3]	0 – 5V	-1mA < I_L < 1mA
(temperature output scale adjustable by	0 – 10V	-1mA < I_L < 1mA
E+E or with configuration kit)	0 – 20mA	R_L < 350 Ohm
	4 – 20mA	R_L < 350 Ohm

General

Supply voltage		
for 0 – 5 V outputs	10.5 V DC - 28V DC	or 12V AC - 28V AC
for 0 – 10 V, 0-20 mA and 4-20 mA outputs	15.0 V 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 or Al Si 9 Cu 3 / IP65; Nema 4	
Cable gland [2]	M16x1.5	cable ø 4.5 - 10 mm (0.18 - 0.39")
Electrical connection	Screw terminals max. 1.5mm^2 (AWG 16)	
Working temperature range of electronics	-40…60°C (-40…140°F)	
Working temperature range with display	-30…60°C (-22…140°F)	
Storage temperature range	-40…60°C (-40…140°F)	
CE compatibility according	EN61000-6-2	FCC part15 Class B
	EN50081-1	EN61010-1 ICES-003 Class B

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	

[1] Refer to the working range of the humidity sensor.
[2] Connection plugs refer to ordering guide.
[3] Refer to ordering guide.

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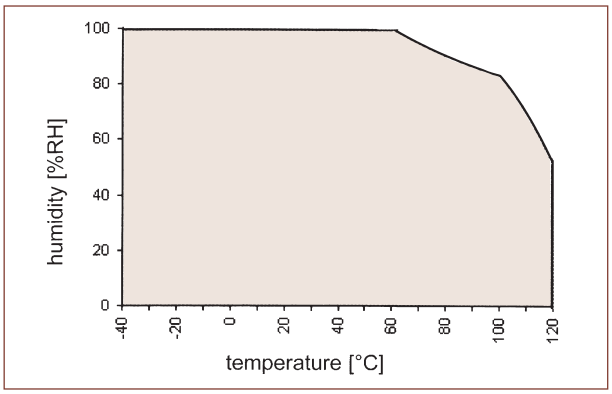
Humidity Sensor - Working Range



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.

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.

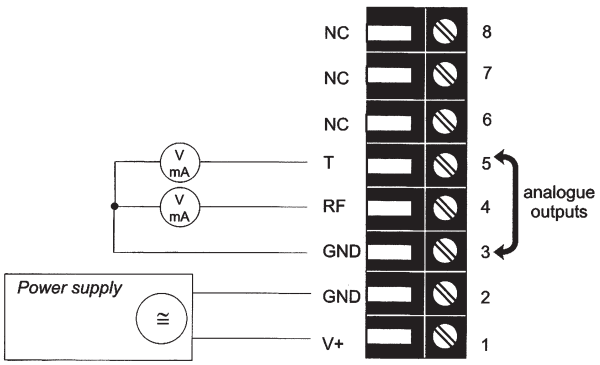
High Humidity Calibration

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

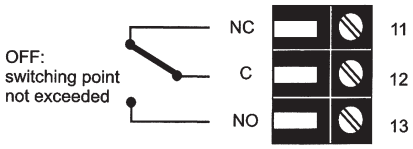
Connecting Diagram

output and supply

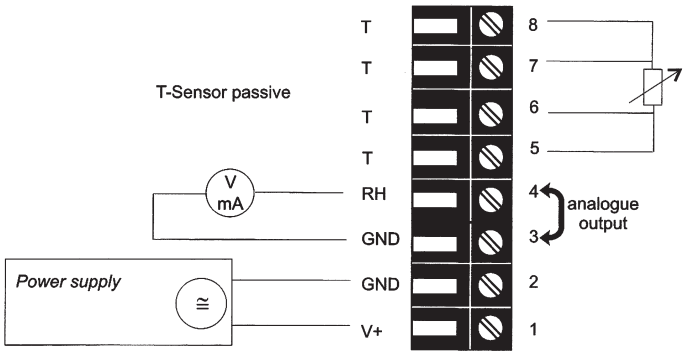
with active temperature output



alarm output



with passive temperature output



MULTIFUNCTION INDUSTRIAL TRANSMITTER FOR TEMPERATURE / HUMIDITY / DEW POINT...

Ordering Guide EE23

		EE23-	EE23-
Hardware Configuration			
Housing	metal housing	M	M
	polycarbonate housing	P	P
Type	humidity + temperature	FT	FT
	humidity	F	
	humidity + Ptxxx passive (available only for housing type A, F and G)	FPtxxx	
Model	wall mounting	A	
	duct mounting	B	
	remote probe up to 120°C (248°F)	C	
	wall mounting - rear cable entry	F	
	wall mounting - for meteorology	G	
	remote miniature probe		H
Filter	membrane filter 5mm		1
	stainless steel sintered filter	3	
	PTFE filter	5	
	metal grid filter	6	
	stainless steel grid filter 5mm		7
Cable length (only housing type C, H)	2m (6.6ft)	02	02
	5m (16.4ft)	05	05
	10m (32.8ft)	10	10
	20m (65.6ft)	20	20
Probe length (only housing types B + C)	50mm (1.9")	2	
	200mm (7.9")	5	
	400mm (15.8")	6	
Display (refer to software-code)	no display		
	with display	D03	D03
Alarm output (not available for housing type F)	no alarm output		
	with alarm output	SW	SW
Connector	standard cable 1 gland M16x1.5; ø 4.5 - 10 mm (0.18 - 0.39")		
	2 glands M16x1.5	C11	C11
	1 plug for supply + outputs	C03	C03
	2 plug for supply + outputs and alarm output	C09	C09
Coating sensor	no		
	yes	HC01	
Calibration	standard calibration		
	high-humidity calibration	CA01	
Software Configuration			
Physical parameters of outputs	relative humidity RH [%] (A) — Output 1	Select according to Ordering Guide (A - D)	
	temperature T [°C or °F] (B) — Output 1		
	dew-point temperature Td [°C or °F] (C) — Output 2	Select according to Ordering Guide (A - D)	
	frost-point temperature Tf [°C or °F] (D) — Output 2		
Type of output signals	0 - 1V (1)	Select according to Ordering Guide (1 - 6)	
	0 - 5V (2)		
	0 - 10V (3)		
	0 - 20mA (5)		
	4 - 20mA (6)		
Temperature unit	°C	E01	E01
	°F		
Scaling of T-output in°C or °F	-40… 60 (T02), -10… 50 (T03), 0… 50 (T04), 0…100 (T05), 0… 60 (T07), -30… 70 (T08), -30…120 (T09), -20…120 (T10), -10… 70 (T11), -40…120 (T12), 20…120 (T15), -30… 60 (T20), 0… 80 (T21), -40… 80 (T22), -20… 80 (T24), -20… 60 (T25), -30… 50 (T45), -20… 50 (T48), -40…248 (T78), 0…140 (T85), 0…248 (T87), 32…120 (T90), 32…140 (T91), 32…248 (T93), 32…132 (T96)	Select according to Ordering Guide (Txx)	
Display mode	humidity and temperature alternating, measured output 1+2 alternating	M12	M12
	humidity, measured output 1	M01	M01
	temperature, measured output 2	M02	M02

Accessories

- Filter caps (HA0101xx)
- Configuration kit (HA010303)
- Radiation shield (HA010504)
- External power supply unit (V02)
- Display + cover (D03)
- Mounting flange (HA010201)
- Mounting flange 5mm (for model H only) (HA010208)
- 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-MFTC6025D03/AC2-T12-M01

Housing:	metal housing
Type:	humidity + temperature
Model:	remote sensor probe
Filter:	metal grid
Cable length:	2 m (6.6ft)
Probe length:	200 mm (7.9")
Display:	yes
Output 1:	rF
Output 2:	Td
Output signal:	0-5V
Scaling of T-output:	-40…120°C
Display mode:	humidity