

EE260

Heated Humidity and Temperature Probe for Meteorological Applications

The EE260 probe is optimized for accurate and reliable relative humidity (RH) and temperature (T) measurement in meteorology and demanding outdoor applications.

Innovative, Compact Design

The design of the EE260 integrates a heated humidity sensing head and an additional T sensing element into one single compact probe. The device is thus compatible with rotation symmetric radiation shields.

Measurement Performance

The dual heating system prevents condensation on the RH sensing element, on the probe head and on the filter cap, which leads to very short response time and fast recovery after condensation. Furthermore, it enables precise RH measurement even under continuously high humidity and condensing conditions.

Versatility

Besides the measurement of RH and T, the EE260 calculates other humidity related quantities like dew point temperature (Td), absolute humidity (dv) and mixing ratio (r).

Reliability, IP67 Protection Class

The proprietary E+E coating protects the RH sensing element and its leads against corrosive and electrically conductive pollution. The encapsulated electronics are optimally protected against environmental influences.

Analogue Outputs and Digital Interface

The EE260 features two freely configurable and scalable voltage outputs as well as an RS485 interface with Modbus RTU protocol. The measured data is available at the analogue and digital interfaces simultaneously.

User Configurable and Adjustable

An optional configuration adapter and the free PCS10 Product Configuration Software facilitate the configuration and adjustment of the EE260.



EE260 with radiation shield

Features

Measurands

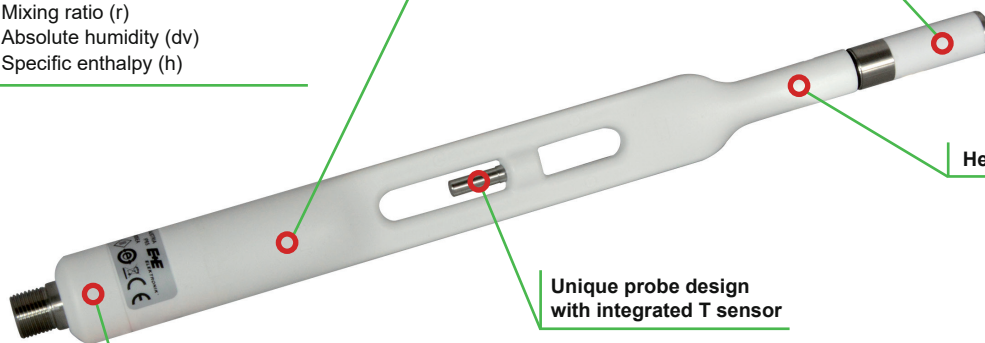
- » Relative humidity (RH)
- » Temperature (T)
- » Dew point temperature (Td)
- » Frost point temperature (Tf)
- » Wet bulb temperature (Tw)
- » Water vapour partial pressure (e)
- » Mixing ratio (r)
- » Absolute humidity (dv)
- » Specific enthalpy (h)

Electronics

- » Fully encapsulated
- » Two voltage outputs
- » RS485 interface with Modbus RTU protocol
- » User configurable and adjustable

RH and T sensing element

- » Heated
- » Protected by
 - E+E proprietary coating
 - PTFE membrane filter on stainless steel body



Heated probe head

Unique probe design with integrated T sensor

Enclosure

- » IP67
- » Flexible thermoplastic elastomer
- » UV resistant and T stable
- » M12x1 connector, 8 poles, stainless steel

Inspection certificate according DIN EN 10204-3.1

Protective Sensor Coating

The E+E proprietary sensor coating is a protective layer applied to the sensing elements, their leads and soldering points. The coating substantially extends sensor lifetime and ensures optimal measurement performance in corrosive environment (salts, off-shore applications). Additionally, it improves the sensors' long term stability in dusty, dirty or oily applications by preventing stray impedance caused by deposits on the active sensor surface or on the electrical connections.

Technical Data

Measurands

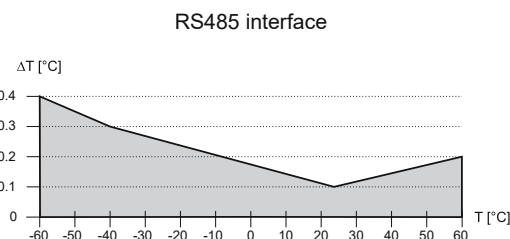
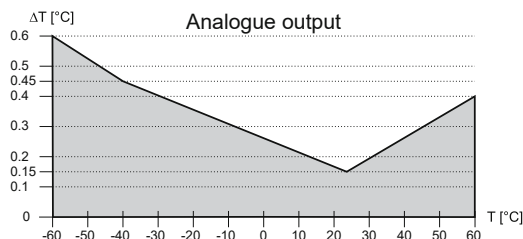
Relative humidity

Measuring range	0...100 %RH	
Sensing element	E+E HMC01, heated	
Response time t_{90} at 20 °C (68 °F)	< 15 s	
Accuracy ¹⁾ (incl. hysteresis, non-linearity and repeatability)		
-15...40 °C (5...104 °F) for RH ≤ 90 %	± (1.3 + 0.3 % *mv) %RH	mv = measured value
-15...40 °C (5...104 °F) for RH > 90 %	± 2.0 %RH	
-25...60 °C (-13...140 °F)	± (1.4 + 1 % *mv) %RH	
-40...-25 °C (-40...-13 °F)	± (1.5 + 1.5 % *mv) %RH	

Temperature

Measuring range	-60...60 °C (-76...140 °F)
Temperature sensor	Pt100 1/3 DIN B
Response time, typ. ²⁾	$t_{63} \leq 20$ s

Accuracy



Outputs³⁾

Analogue	0 - 1 V / 0 - 2.5 V / 0 - 5 V / 0 - 10 V
Freely selectable and scalable	$0 < I_L < 1$ mA
Digital interface	RS485 (EE260 = 1 unit load)
Protocol	Modbus RTU
Factory settings ⁴⁾	Baud rate 9600, parity even, 1 stop bit, Modbus address 235
Supported baud rates	9600, 19200, 38400, 57600, 76800 and 115200
Data types for measured values	FLOAT32 and INT16 registers

General

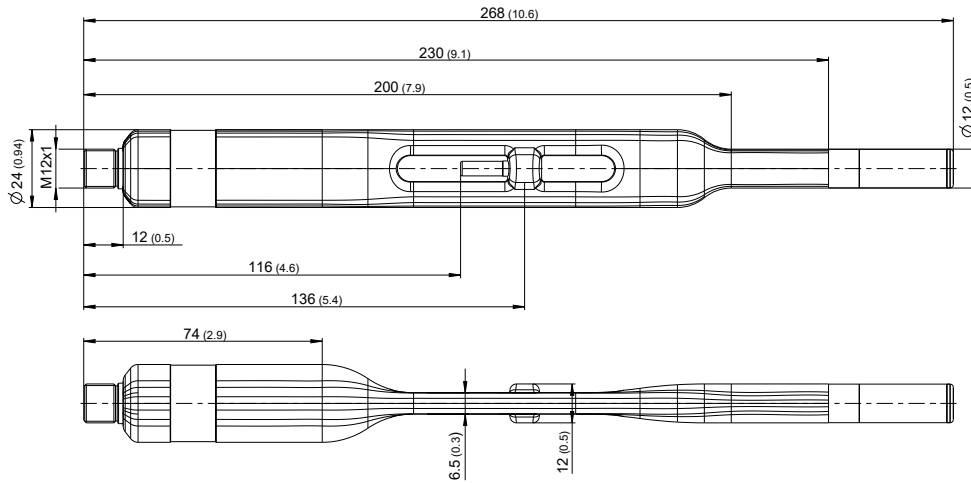
Supply voltage	7 - 30 V DC
Power consumption, typ.	300 mW (25 mA @ 12 V DC, heating included)
Electrical connection	M12x1, 8 poles, stainless steel 1.4404
Filter	PTFE membrane, stainless steel body
Protection rating	IP67
Enclosure material	Thermoplastic elastomer, UV resistant and T stable
Electromagnetic compatibility ⁵⁾	EN 61326-1 EN 61326-2-3 FCC Part15 Class A ICES-003 Class A
Operating and storage conditions	-60...60 °C (-76...140 °F) 0...100 %RH (operation) 0...95 %RH non-condensing (storage)



1) 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).
 2) At air speed > 15 m/s
 3) The EE260 simultaneously features two analogue voltage outputs and the RS485 interface.
 4) Find more details about communication setting in the User Manual and the Modbus Application Note at www.epluse.com/ee260.
 5) Compliance with EN61000-4-3 and EN 61000-4-6: Electromagnetic interferences may cause additional deviations <2 %RH.

Dimensions

Values in mm (inch)



Ordering Guide

		EE260-	
Configuration	Model	RH + T	M1
	Output signal¹⁾	0 - 1 V	GA1
		0 - 2.5 V	GA8
		0 - 5 V	GA2
		0 - 10 V	no code
			no code
	Output 1 measurand	Relative humidity [% RH] Other measurand (xx see measurand code below)	no code MAxx
	Scaling 1 low	0	no code
		Value	SALvalue
	Scaling 1 high	100	no code
Value		SAHvalue	
Output 2 measurand	Temperature [°C] Other measurand (xx see measurand code below)	no code MBxx	
Scaling 2 low	-40	no code	
	Value	SBLvalue	
Scaling 2 high	60	no code	
	Value	SBHvalue	

1) Applies to both outputs

Measurand code		MAxx / MBxx
Temperature	[°C]	1
	[°F]	2
Relative humidity	[%]	10
Water vapor partial pressure e	[mbar]	50
	[psi]	51
Dew point temperature Td	[°C]	52
	[°F]	53
Wet bulb temperature Tw	[°C]	54
	[°F]	55

Measurand code		MAxx / MBxx
Absolute humidity dv	[g/m ³]	56
	[g/ft ³]	57
Mixing ratio r	[g/kg]	60
	[g/lb]	61
Specific enthalpy h	[kJ/kg]	62
	[BTU/lb]	64
Frost point temperature Tf	[°C]	65
	[°F]	66

Ordering Examples

EE260-M1

Model: RH + T
 Output signal: 0 - 10 V
 Output 1 measurand: relative humidity [%RH]
 Output 1 scaling range: low 0
 high 100
 Output 2 measurand: temperature [°C]
 Output 2 scaling range: low -40
 high 60

EE260-M1GA8MB2SBL20SBH120

Model: RH + T
 Output signal: 0 - 2.5 V
 Output 1 measurand: relative humidity [%RH]
 Output 1 scaling range: low 0
 high 100
 Output 2 measurand: temperature [°F]
 Output 2 scaling range: low 20
 high 120

Accessories

(for further information, see data sheet "Accessories")

Radiation shield, artificially ventilated
Modbus configuration adapter¹⁾
EE260 configuration cable¹⁾
E+E Product Configuration Software
(Free download: www.epluse.com/pcs10)
M12x1 connector, 8 pole socket
Connection cable, 8 poles, M12x1 – free ends
 1.5 m (4.9 ft)
 3 m (9.8 ft)
 5 m (16.4 ft)
 10 m (32.8 ft)
Wall mounting clip Ø25 mm
Protection cap M12 female connector
Protection cap M12 male connector
1) Both accessories are necessary for configuration

HA010511
HA011018
HA011020
PCS10

HA010704

HA010322
HA010323
HA010324
HA010325
HA010227
HA010781
HA010782