Instromart
Sensors & Instrumentation

Datasheet EE260

Heated Humidity and Temperature Probe for Meteorological Applications

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 Rating

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 probe

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)

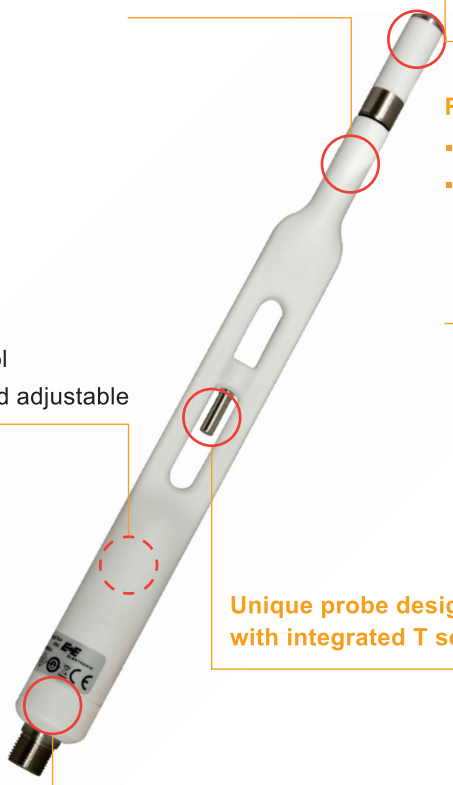
Heated probe head

RH and T sensing element

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

Electronics

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



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 to DIN EN 10204-3.1

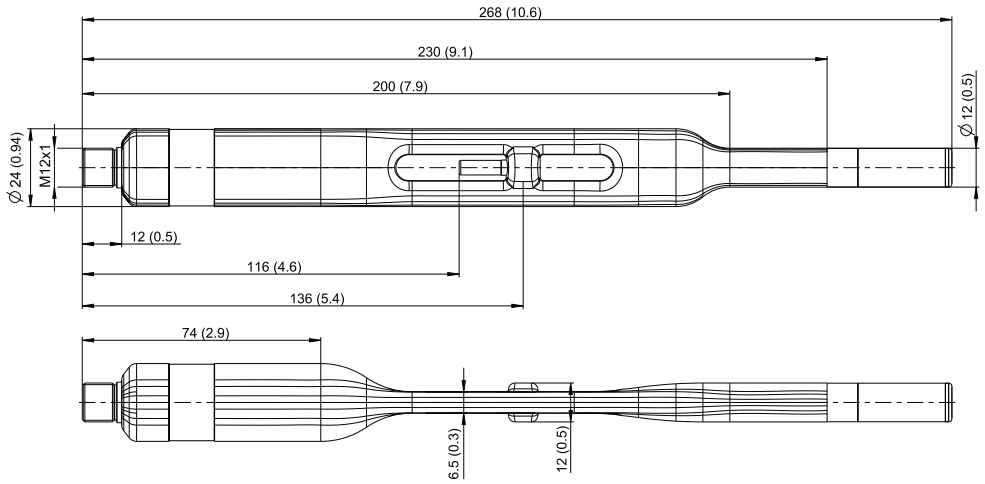
Features

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.

Dimensions

Values in mm (inch)



Technical Data

Measurands

Relative humidity (RH)

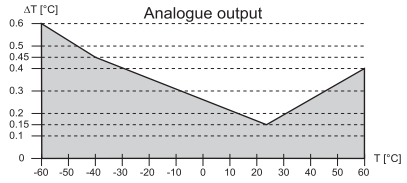
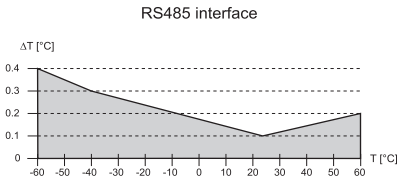
Measuring range	0...100 %RH	
Accuracy[1] (incl. hysteresis, non-linearity and repeatability)		
-15...+40 °C (5…104 °F) for RH ≤ 90 %	±(1.3 + 0.3 % *mv) %RH	mv = measured value
-15...+40 °C (5…104 °F) for RH ≥ 90 %	±2.0 %RH	
-25...+60 °C (-13…+140 °F)	±(1.4 + 1 % *mv) %RH	
-40...-25 °C (-40…-13 °F)	±(1.5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

1) Traceable to international standards, administrated by NIST, PTB, BEV,...
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).

Technical Data

Measurands

Temperature (T)

Measuring range	-60...+60 °C (-76...+140 °F)
Response time t_{63}, typ.[1)]	≤20 s
Accuracy	 

1) @ air speed >15 m/s

Outputs[1)]

Analogue

Freely selectable and scalable outputs	0 - 1 V / 0 - 2,5 V / 0 - 5 V / 0 - 10 V $0 < I_L < 1$ mA I_L = load current

Digital

Digital Interface	RS485 (EE260 = 1unit load)
Protocol **Factory settings[2)]** **Supported Baud rates** **Measured data types**	Modbus RTU 9600 Baud, parity even, 1 stop bit, Modbus address 235 9600, 19200, 38400, 57600, 76800 und 115200 FLOAT32 und INT16

1) The EE260 simultaneously features two analogue voltage outputs and the RS485 interface.
2) Find more details about communication setting in the User Manual and the Modbus Application Note at www.epluse.com/ee260.

General

Power supply class III ⧫III⧫ USA & Canada: Class 2 supply necessary (max. voltage 30 V DC)	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 Probe body	IP67
Enclosure material	Thermoplastic elastomer, UV resistant and T stable
Electromagnetic compatibility[1)]	EN 61326-1 EN 61326-2-3 FCC Part15 class A ICES-003 class A
Operation and storage conditions	-60...+60 °C (-76...+140 °F) 0...100 %RH (operation) 0...95 %RH non-condensing (storage)
Conformity	CE UKCA
Configuration and adjustment	PCS10 Product Configuration Software (free download) and configuration adapter

1) Compliance with EN 61000-4-3 and EN 61000-4-6: Electromagnetic interferencees may cause additional deviations <2 %RH.

Ordering Guide

	Feature	Description	Code
			EE260-
Configuration	**Model**	RH + T	M1
	Output signal[1)]	0 - 1 V	GA1
		0 - 2.5 V	GA8
		0 - 5 V	GA2
		0 - 10 V	No code
	Output 1 measurand	Relative humidity [%RH]	No code
		Other measurand (*xx* see measurand code below)	MA*xx*
	Output 1 scaling low	0	No code
		Value	SAL*Value*
	Output 1 scaling high	100	No code
		Value	SAH*Value*
	Output 2 measurand	Temperature [°C]	No code
		Other measurand (*xx* see measurand code below)	MB*xx*
	Output 2 scaling low	-40	No code
		Value	SBL*Value*
	Output 2 scaling high	60	No code
		Value	SBL*Value*

1) Applies to both outputs

Measurand Code

For Output 1 and 2 in the Ordering Guide

Measurand		Unit	Code
			MAxx / MBxx
Temperature	T	°C °F	1 2
Relative humidity	RH	%	10
Water vapour partial pressure	e	mbar psi	50 51
Dew point	Td	°C °F	52 53
Wet bulb temperature	Tw	°C °F	54 55
Absolute humidity	dv	g/m³ gr/ft³	56 57
Mixing ration	r	g/kg gr/lb	60 61
Specific enthalpy	h	kJ/kg BTU/lb	62 64
Frost point	Tf	°C °F	65 66

Order Example

EE260-M1

Feature	Code	Desciption
Model	M1	RH + T
Output signal	No code	0 - 10 V
Output 1 measurand	No code	Relative humidity [%RH]
Output 1 scaling low	No code	0
Output 1 scaling high	No code	100
Output 2 measurand	No code	Temperature T [°C]
Outout 2 scaling low	No code	-40
Output 2 scaling high	No code	60

EE260-M1GA8MB2SBL20SBH120

Feature	Code	Description
Model	M1	RH + T
Output signal	GA8	0 - 2.5 V
Output 1 measurand	No code	Relative humidity [%RH]
Output 1 scaling low	No code	0
Output 1 scaling high	No code	100
Output 2 measurand	MB2	Temperature T [°F]
Output 2 scaling low	SBL20	20
Output 2 scaling high	SBH120	120

Accessories

For further information see datasheet Accessories.

Accessories	Code
Radiation shield, artificially ventilated	HA010511
Modbus configuration adapter[1)]	HA011018
EE260 configuration cable[1)]	HA011020
E+E Product Configuration Software **(Free download: www.epluse.com/pcs10)**	PCS10
M12x1 connector, 8 pole socket	HA010704
Connection cable, 8 poles, M12x1 – free cable ends **1.5 m (4.9 ft)** **3 m (9.8 ft)** **5 m (16.4 ft)** **10 m (32.8 ft)**	 HA010322 HA010323 HA010324 HA010325
Wall mounting clip Ø25 mm (0.9")	HA010227
Protection cap for M12 socket	HA010781
Protection cap for M12 plug	HA010782

1) Both accessories are necessary for configuration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