EE072

Humidity and Temperature Probe with Modbus RTU

The EE072 probe meets the highest requirements of demanding process and climate control applications such as in agriculture, life stock, food, pharma or clean rooms. Besides the measurement of relative humidity (RH) and temperature (T) the EE072 calculates all other humidity related parameters.

Measurement Performance

The high-end E+E humidity sensing element manufactured in state-of-the-art thin film technology stands for outstanding measurement accuracy.

Long-Term Stability

The E+E proprietary coating protects the sensing element against corrosive and electrically conductive pollution. The combination of robust sensing head and fully encapsulated electronics leads to outstanding performance even in harsh and condensing environment.

Versatile and Reliable

With its IP65 stainless steel or polycarbonate enclosure and the wide choice of filter caps the EE072 tackles even challenging industrial applications.

Easy Installation

The M12x1 connector and the RS485 interface with Modbus RTU protocol facilitate the design-in of EE072 and minimize installation costs.

Configurable and Adjustable

The setup and adjustment of the EE072 can be easily performed with an optional adapter and the free EE-PCS Product Configuration Software.

Features

Measurement performance

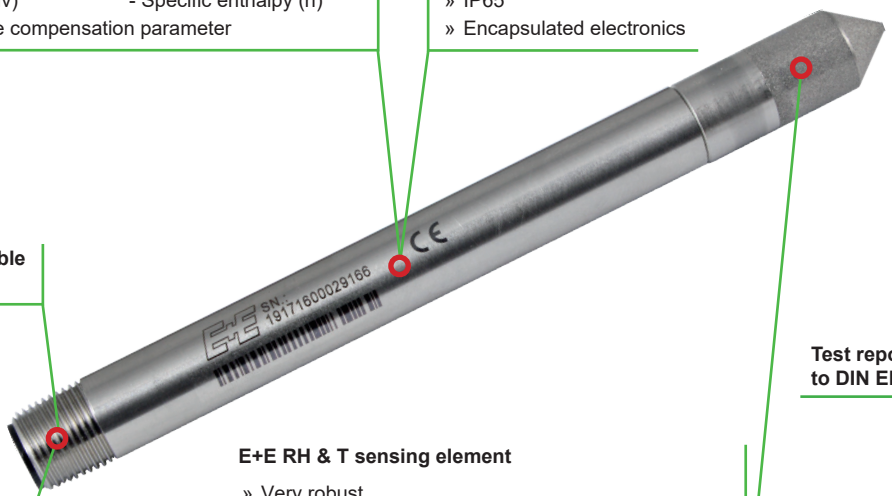
- » High RH & T accuracy
- » Temperature compensation
- » Calculated variables
  - Dew point (Td)
  - Wet bulb temperature (Tw)
  - Water vapour partial pressure (e)
  - Absolute humidity (dv)
  - Frost point (Tf)
  - Ice bulb temperature (Ti)
  - Mixture ratio (r)
  - Specific enthalpy (h)
- » Configurable pressure compensation parameter

Mechanical construction

- » Stainless steel or polycarbonate enclosure
- » IP65
- » Encapsulated electronics

User configurable and adjustable

- » Free configuration software



Test report according to DIN EN 10204 – 3.1

E+E RH & T sensing element

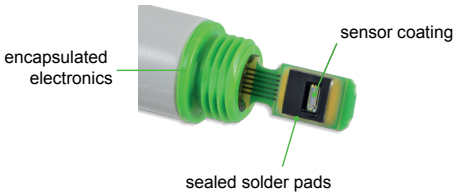
- » Very robust
- » E+E proprietary coating
- » Sealed solder pads
- » Tested according to automotive standard AEC-Q200

Connection

- » RS485 with Modbus RTU
- » M12x1 connector

Protective Sensor Coating

The E+E proprietary sensor coating is a permeable layer applied to the active surface of the HCT01 sensing element. The coating extends substantially the life-time and the measurement performance of the E+E sensor in corrosive environment (salts, off-shore applications). Additionally it improves the sensor's long term stability in dusty, dirty or oily applications by preventing stray impedances caused by deposits on the active sensor surface.



Technical Data

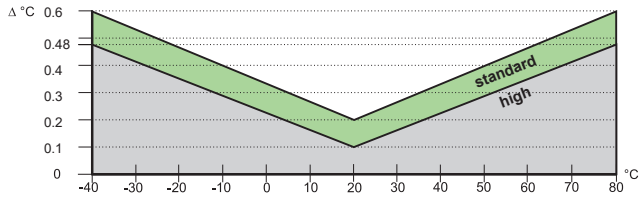
Measurands

Relative humidity

Accuracy [1]		
-15…40 °C (5…104 °F)	± (1.3 + 0.3 % *mv) %RH	for RH ≤90 %
	± 2.3 %	for RH >90 %
-40…80 °C (-40…176 °F)	± (1.5 + 1.5 % *mv) %RH	mv = measured value
Response time	< 15 s with stainless steel grid filter at 20 °C (68 °F) / t_{90}	
Resolution	0.01 %RH	

Temperature

Accuracy [1]



Resolution	0.01 °C

General

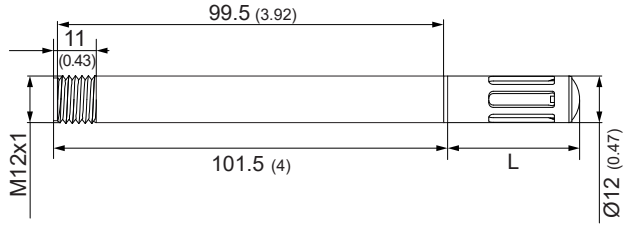
Sensing element	E+E HCT01 with E+E proprietary coating
Measuring interval	1 sec.
Digital interface	RS485, max. 32 unit load devices on one bus (EE072 = 1 unit load)
Protocol	Modbus RTU
Default settings	Baud rate 9600[2], parity even, stopbits 1, slave-ID 234
Supply	10…28 V DC
Current consumption, typ.	3 mA, without termination resistor
Enclosure	Polycarbonate RAL 7035 / Stainless steel 1.4404 / AISI 316
Protection class[3]	IP65
Connector	M12, 4 poles
Electromagnetic compatibility	EN61326-1:2013 EN61326-2-3:2013 Industrial Environment CE
Working range	-40…80 °C (-40... 176 °F) / 0…100 % RH
Storage conditions	-40…80 °C (-40... 176 °F) / 0…90 % RH, non-condensing
Configuration and adjustment	EE-PCS (Product Configuration Software, free download) and Modbus configuration adapater

1) Traceable to intern. 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). The accuracy is defined at a 12 VDC supply, baud rate 9600, without termination resistor, a polling interval of >= 1 second an an airflow > 0.2 ms.

2) Supported baud rates 9600, 19200, 38400, 57600, 76800 and 115200; more details about communication setting: See User Guide and Modbus Application Note at www.epluse.com/ee072

3) The IP65 connection rating applies when plugged into an appropiate M12x1 female connector.

Dimensions in mm (inch)



1) L = filter length; refer to data sheet "Accessories"

Ordering Guide

		EE072
Enclosure	Polycarbonate	HS1
	Stainless steel	HS2
Temperature accuracy	Standard	TT2
	High	TT1
Filter	Membrane	F2
	Metal grid	F3
	Stainless steel sinter	F4
	PTFE	F5
	Stainless steel grid	F9
	H_2O_2	F12
Digital Interface	Modbus RTU	J3

Order Example

EE072-HS2TT2F4J3

Enclosure	stainless steel
Temperature accuracy	Standard
Filter	Stainless steel sinter filter
Digital interface	Modbus RTU

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

- Modbus configuration adapter	HA011018
- E+E Product Configuration Software (Download: www.epluse.com/Configurator)	EE-PCS
- Connection cable M12 - flying leads	
1.5 m (59.06")	HA010819
5 m (196.85")	HA010820
10 m (393.70")	HA010821
- T-coupler M12 - M12	HA030204
- M12 cable connector for self assembly	HA010707
- Protection cap for the M12 cable socket	HA010781
- Protection cap for the M12 plug of EE072	HA010782
- Protection cap for 12 mm probe	HA010783
- Stainless steel mounting flange	HA010201
- Plastic mounting flange	HA010202
- Wall mounting clip	HA010211
- Radiation shield for probes with Ø12mm	HA010502
- Drip water protection	HA010503