EE072

Humidity and Temperature Probe with Digital Interface

The EE072 probe meets the highest requirements of demanding process and climate control applications such as in agriculture, life stock, food, pharma, clean rooms, outdoor, artificial snow machines and transportation. 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 standard-compliant digital communication via Modbus RTU or CANopen facilitate the design-in of the sensor 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 PCS10 Product Configuration Software.

Features

Measurement performance

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

SIGMA PLUG-AND-PLAY

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
- » CANopen
- » M12x1 connector

Mechanical construction

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

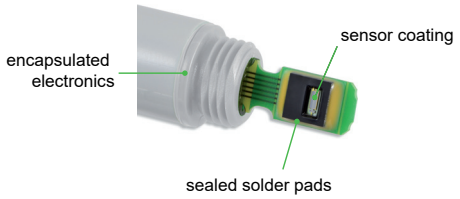
User configurable and adjustable

- » Free configuration software

Inspection certificate according to DIN EN 10204-3.1

Protective Sensor Coating

The E+E proprietary sensor coating is a hygroscopic layer applied to the HCT01 humidity sensing element. The coating substantially extends sensor life-time and ensures optimal measurement performance in corrosive environments (salts, off-shore applications). Additionally, it improves the 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.



E+E Modular Sensor Platform

The EE072 is compatible with the Sigma 05 host device of the E+E Modular Sensor Platform. Together they become a versatile, plug-and-play RH / T modular sensor with analogue outputs and optional display. Besides EE072, Sigma 05 accommodates also other E+E intelligent sensing probes. See www.epluse.com/Sigma05 for further details.

Technical Data

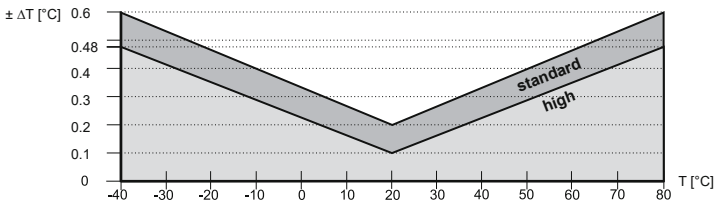
Measurands

Relative humidity

Accuracy[1] (incl. hysteresis, non-linearity and repeatability)		
-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 s
Power supply class III[2]	10 - 28 V DC
Current consumption, typ.	3 mA (RS485, without termination resistor) 8 mA (CAN)

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).
For Modbus, the accuracy is defined at a 12 V DC supply, baud rate 9600, without termination resistor, a polling interval of >= 1 s and a flow velocity of > 0.2 m/s.
For CANopen, the accuracy is defined at a flow velocity of > 0.2 m/s.

2) USA & Canada class 2 supply required.

Enclosure	Polycarbonate RAL 7035 / Stainless steel 1.4404 / AISI 316
Protection rating[3)]	IP65
Electromagnetic compatibility	EN 61326-1:2013 EN 61326-2-3:2013 Industrial Environment FCC Part15 ClassA ICES-003 ClassA
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	PCS10 (Product Configuration Software, free download) and configuration adapter

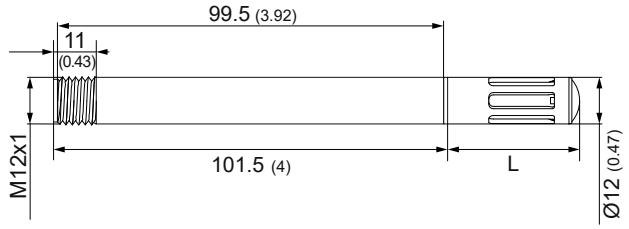
Digital Communication

RS485	
Protocol	Modbus RTU
Connector	M12x1, 4 poles
Default settings	Baud rate 9600[4)], parity even, 1 stop bit, Modbus address 234
CAN	
Protocol / Profile	CANopen / device profile CiA 404
Connector	M12x1, 5 poles, pin assignment according to CiA 303-1
Default settings	Baud rate 125 kBit/s[5)], node ID 64

3) The IP65 rating applies when plugged into an appropiate M12x1 female connector.
4) Supported baud rates: 9600, 19200, 38400, 57600, 76800 and 115200.
For more details about communication setting see User Manual and Modbus Application Note at www.epluse.com/ee072
5) Supported baud rates: 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 MBit/s.
For further information on the configuration see software instruction manual and the EDS file (Electronic Data Sheet).

Dimensions

Values 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	TT2
	High	TT1	
Filter	Membrane, polycarbonate body	F2	
	Metal grid, polycarbonate body	F3	
	Stainless steel sintered	F4	
	PTFE	F5	
	Stainless steel grid, stainless steel body	F9	
	Catalytic for H_2O_2 sterilisation	F12	
Digital Interface	Modbus RTU	J3	
	CANopen		J8

Order Example

EE072-HS2TT1F4J3

Enclosure	Stainless steel
Temperature accuracy	High
Filter	Stainless steel sintered
Digital interface	Modbus RTU

EE072-HS1TT2F3J8

Enclosure	Polycarbonate
Temperature accuracy	Standard
Filter	Metal grid, polycarbonate body
Digital interface	CANopen

Accessories

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

General	
- E+E Product Configuration Software (Download: www.epluse.com/PCS10)	PCS10
- 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
- T-coupler M12 - M12	HA030204
- Wall mounting clip	HA010211
- Radiation shield for probes with Ø12mm	HA010502
- Drip water protection	HA010503
Modbus	
- M12 cable connector for self assembly, 4 pole	HA010707
- Modbus configuration adapter	HA011018
- Connection cable M12 - flying leads	
1.5 m (59.06")	HA010819
5 m (196.85")	HA010820
10 m (393.70")	HA010821
CAN	
- M12 cable connector for self assembly, 5 pole	HA010708
- CAN configuration adapter	HA011021
- Connection cable CAN with 120 Ω termination, M12 / 1.5 m	HA010850