

Datasheet HTP201

Humidity and Temperature Probe
with Analogue Outputs



HTP201

Humidity and Temperature Probe with Analogue Outputs

With its outstanding price performance ratio, HTP201 is the perfect solution for cost effective and reliable measurement of relative humidity (RH) and temperature (T) in most various industries.

Outstanding Measurement Performance with Patented Sensor Technology

The E+E RH/T sensing element with proprietary protection and sealed solder pads ensures excellent long-term performance of the HTP201 over the entire working range and even in dusty and dirty environment. Innovative PCB design inside the probe reduces self-heating relevantly.

Versatility and Robustness

Excellent protection against external influences is ensured by the combination of completely encapsulated electronics and the long-term stable E+E RH/T sensing element. Its IP65 stainless steel or polycarbonate enclosure and integrated cable or a threaded connector make it a versatile probe tackling even challenging applications.

Analogue Outputs

The RH and T measured data is available on two analogue outputs for voltage (0 - 1 V, 0 - 5 V or 0 - 10 V) or current (4 - 20 mA). In addition, the HTP201 has a passive T output (4-wire), a wide temperature and supply voltage range, making it a universally applicable probe.



HTP201 voltage version with stainless steel enclosure and stainless steel sinter filter



HTP201 current version with cable, polycarbonate enclosure and metal grid filter

Features

Measurement performance

- High RH/T accuracy
- Excellent long term stability
- Wide T range: - 40...+80 °C (- 40...+176 °F)
- T compensation
- Very low self-heating

Mechanical construction

- Stainless steel or polycarbonate enclosure
- Encapsulated electronics
- IP65

E+E RH / T sensing element

- Protected by E+E proprietary coating
- Patented sensor technology
- Sealed solder pads
- Very robust

Outputs

- Two analogue outputs
- 0 - 1 / 5 / 10 V
- 4 - 20 mA
- T passive output optional

Connection

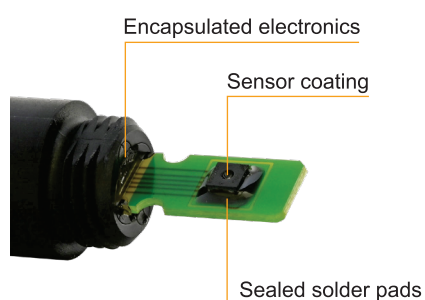
- M12x1 Connector
- Flexible cable with
1.5 / 3 / 5 m (4.9 / 9.8 / 16.4 ft)



Features

Protective Sensor Coating

The E+E proprietary sensor coating is a protective layer applied to the active surface of the sensing element. 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.



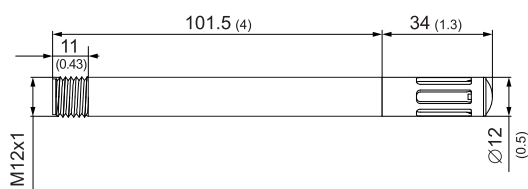
Sensing head with sensor coating and underfiller

Dimensions

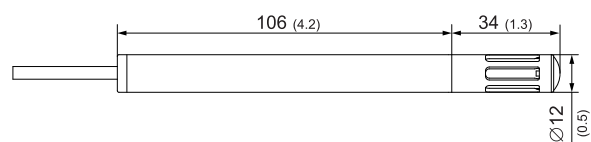
Values in mm (inch)

Voltage versions

With connector (Type E9)

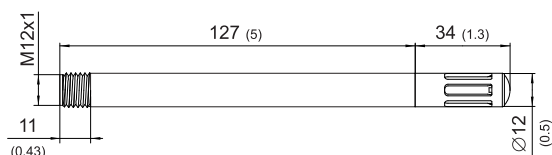


With cable (Type E8)

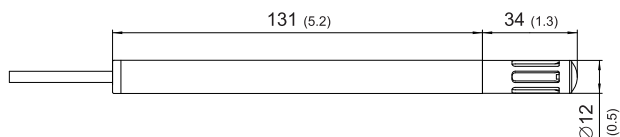


Current versions

With connector (Type E9)



With cable (Type E8)



Technical Data

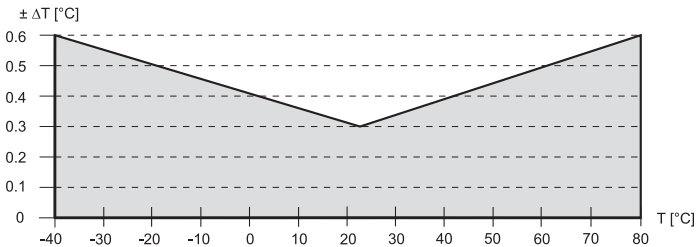
Measurands

Relative humidity (RH)

Measuring range	0...100 %RH
Accuracy ¹⁾ @ 24 V DC, air velocity >0.2 m/s (>39 ft/min), incl. hysteresis, non-linearity and repeatability, current version R _L =250 Ω	
23 °C (0...100 %RH)	±2.5 %RH
0...40 °C (0...100 %RH)	±3 %RH
-20...80 °C (0...100 %RH)	±4 %RH
-40...-20 °C (0...100 %RH)	±5 %RH

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).

Temperature (T)

Measuring range	-40...+80 °C (-40...+176 °F)																														
Accuracy Incl. hysteresis, non-linearity and repeatability	 <table border="1"><caption>Temperature Accuracy Data</caption><thead><tr><th>T [°C]</th><th>±ΔT [°C]</th></tr></thead><tbody><tr><td>-40</td><td>0.6</td></tr><tr><td>-30</td><td>0.5</td></tr><tr><td>-20</td><td>0.4</td></tr><tr><td>-10</td><td>0.35</td></tr><tr><td>0</td><td>0.3</td></tr><tr><td>10</td><td>0.3</td></tr><tr><td>20</td><td>0.3</td></tr><tr><td>23</td><td>0.3</td></tr><tr><td>30</td><td>0.35</td></tr><tr><td>40</td><td>0.4</td></tr><tr><td>50</td><td>0.5</td></tr><tr><td>60</td><td>0.55</td></tr><tr><td>70</td><td>0.6</td></tr><tr><td>80</td><td>0.6</td></tr></tbody></table>	T [°C]	±ΔT [°C]	-40	0.6	-30	0.5	-20	0.4	-10	0.35	0	0.3	10	0.3	20	0.3	23	0.3	30	0.35	40	0.4	50	0.5	60	0.55	70	0.6	80	0.6
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70	0.6																														
80	0.6																														

Outputs

Analogue

RH 0...100 % T -40...+60/80 °C (see ordering guide)	
Output	0 - 1 V (-0.1 mA < I _L < 0.1 mA)
Output	0 - 5 V (-0.2 mA < I _L < 0.2 mA)
Output	0 - 10 V (-1.0 mA < I _L < 1.0 mA)
Output	4 - 20 mA (2-wire) R _L ≤ 500 Ω

I_L = load current
R_L = load resistance

T Sensor Passive

With Model M6 only (RH + T passive)	4-wire-connection, T sensor according to ordering guide
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Technical Data

General

<div>Power supply class III</div> <div>USA & Canada: Class 2 supply necessary, max. voltage 30 V DC</div>	<div>Output 0 - 1 V</div> <div>Output 0 - 5 V</div> <div>Output 0 - 10 V</div> <div>Output 4 - 20 mA</div>	<div>3.6 - 30 V DC</div> <div>10 - 30 V DC</div> <div>15 - 30 V DC</div> <div>9 V + R_L * 20 mA < V+ < 28 V DC</div>	<div>R_L = load resistance</div>
<div>Current consumption, typ.</div>	<div>Voltage versions</div> <div>Current versions</div>	<div>1.5 mA</div> <div>According to output current</div>	
<div>Electrical connection</div>	<div>Plug versions</div> <div>Cable versions</div>	<div>Plug M12x1, 4 poles</div> <div>Cable 1.5 m (4.9 ft) / 3 m (9.8 ft) / 5 m (16.4 ft), PVC</div> <div>Ø4.3 mm, 4 x 0.25 mm² for RH + T with voltage output</div> <div>Ø4.3 mm, 3 x 0.25 mm² for RH + T with current output</div> <div>Ø4.8 mm, 6 x 0.14 mm² for RH + T passive with current output</div>	
<div>Storage conditions</div>		<div>-40...+80 °C (-40...+176 °F)</div> <div>0...95 %RH, non-condensing</div>	
<div>Material</div>	<div>Enclosure</div> <div>Probe cable (cable versions)</div>	<div>Polycarbonate (PC) or stainless steel 1.4404</div> <div>Polyvinyl chloride (PVC)</div>	
<div>Protection rating</div>		<div>IP65</div>	
<div>Electromagnetic compatibility¹⁾</div>		<div>EN 61326-1</div> <div>FCC Part15 Class B</div>	<div>EN 61326-2-3</div> <div>ICES-003 Class B</div> <div>Industrial environment</div>
<div>Shock and vibration</div>		<div>Tested according to EN 60068-2-64 and EN 60068-2-27</div>	
<div>Conformity</div>		<div><div>CE</div><div>UK CA</div></div>	

1) Analogue output 0 - 1 V is not protected against surge.

Ordering Guide

Feature	Description	Code		
Hardware Configuration		HTP201-		
	Model	RH + T	M1	-
		RH + T passive	-	M6
	Enclosure	Polycarbonate (PC)	No code	
		Stainless steel	HS2	-
	Analogue output	0 - 1 V	A1	A1 -
		0 - 5 V	A2	A2 -
		0 - 10 V	A3	A3 -
		4 - 20 mA	-	A6 A6
	T sensor passive	Pt100 DIN A	-	TP1
		Pt1000 DIN A	-	TP3
		NTC10k, B3950 K	-	TP5
	Filter	Membrane, polycarbonate body	No code	
		Metal grid, polycarbonate body	F3	
		Stainless steel sintered	F4	
		Stainless steel - metal grid	F9	-
	Electrical connection	Cable	E8	
		M12 connector, 4 poles	E9	-
	Connection cable length ¹⁾	1.5 m (4.9 ft)	KL150	
		3 m (9.8 ft)	KL300	
		5 m (16.4 ft)	KL500	
T Scale	T scaling low	-40 °C	No code	
	T scaling high	60 °C	No code	
		80 °C	SBH80	

1) Only in combination with the cable version

Order Example

HTP201-M1A3E8KL150

Feature	Code	Description
Model	M1	RH + T
Enclosure	No code	Polycarbonate (PC)
Analogue output	A3	0 - 10 V
Filter	No code	Membrane, polycarbonate body
Electrical connection	E8	Cable
Connection cable length	KL150	1.5 m (4.9 ft)
T scaling low	No code	-40 °C
T scaling high	No code	60 °C

Order Example

HTP201-M1HS2A1F9E9SBH80

Feature	Code	Description
Model	M1	RH + T
Enclosure	HS2	Stainless steel
Analogue output	A1	0 - 1 V
Filter	F9	Stainless steel - metal grid
Electrical connection	E9	M12 connector, 4 poles
T scaling low	No code	-40 °C
T scaling high	SBH80	80 °C

Accessories

For further information see datasheet [Accessories](#).

Accessories	Code
M12x1 connector, 4 pole socket, for self assembly	HA010707
Connection cable, 5 pole, M12x1 plug/socket, shielded, 2 m (6.6 ft) / 5 m (16.4 ft) / 10 m (32.8 ft)	HA010816/HA010817/HA010818
Connection cable, 5 pole, M12x1 socket/free ends, shielded, 1.5 m (4.9 ft) / 5 m (16.4 ft) / 10 m (32.8 ft)	HA010819/HA010820/HA010821
Plastic mounting flange Ø12 mm (0.47") black	HA010214
Stainless steel flange Ø12 mm	HA010201
Wall mounting clip Ø12 mm (0.47")	HA010211
Stainless steel wall mounting clip Ø12 mm (0.47")	HA010225
Protection cap for Ø12 mm (0.47") probe	HA010783
Radiation shield with fixed clamping ring (M20x1.5)	HA010502
Drip water protection	HA010503

