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in sensor
technology.

+ 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 makes 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

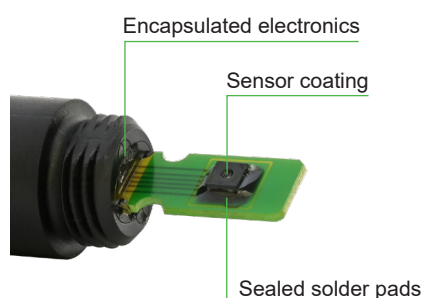
Connection

- 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

Accredited Traceable Calibration Certificate



Internationally recognised certificates for the calibration of measuring instruments from accredited laboratories document the traceability of the measurements to the International System of Units (SI). The E+E Elektronik calibration laboratory offers two levels of traceable calibrations.

- As a Designated Institute (DI) of the Republic of Austria, the E+E calibration laboratory maintains Austria's national measurement standards for humidity, dew point temperature, air velocity and CO₂. This authorises the E+E calibration laboratory to issue calibration certificates at the level of a National Metrological Institute (NMI).
- The E+E calibration laboratory is accredited by Akkreditierung Austria in accordance with DIN EN ISO/IEC 17025 with the identification number 0608. This allows the laboratory to issue ISO 17025 certificates for the measurands humidity, temperature, dew point temperature, air velocity, flow, pressure and CO₂.

Visit www.eplusecal.com for detailed information on calibration and to enquire a certificate of accredited traceable calibration for the HTP201 from the Designated Institute.

ISO 9001 Calibration Certificate

An ISO 9001 calibration certificate documents the comparative measurement of a device against high quality reference equipment (factory level standard). The comparison is performed in accordance with internal procedures that comply with ISO 9001 and provides information on the specimen's measuring accuracy. The reference equipment is traceable to national standards, however, the calibration process is not accredited. Therefore, an ISO 9001 calibration is neither traceable nor internationally comparable.

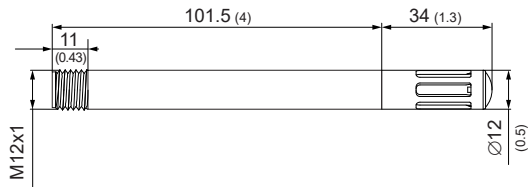
Visit www.epluse.com/iso9001cal for detailed information on calibration and to enquire an ISO 9001 calibration certificate.

Dimensions

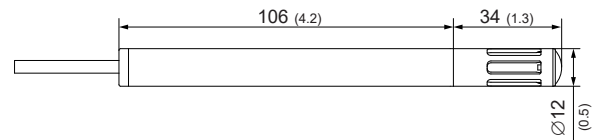
Values in mm (inch)

Voltage versions

With connector (Type E9)

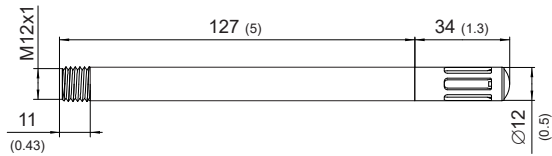


With cable (Type E8)

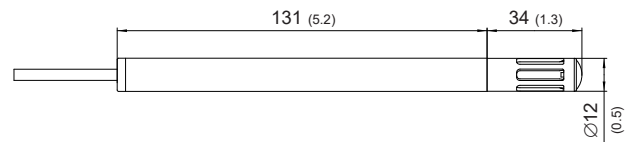


Current versions

With connector (Type E9)



With cable (Type E8)



Technical Data

Measurands

Relative humidity (RH)

Measuring range	0...100 %RH
Accuracy¹⁾ @ 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 a coverage 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	<p>The graph shows the temperature accuracy (±ΔT in °C) as a function of temperature (T in °C). The x-axis ranges from -40 to 80 °C, and the y-axis ranges from 0 to 0.6 °C. The accuracy is highest at the extremes (-40°C and 80°C) and lowest at 20°C.</p> <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>30</td> <td>0.35</td> </tr> <tr> <td>40</td> <td>0.4</td> </tr> <tr> <td>50</td> <td>0.45</td> </tr> <tr> <td>60</td> <td>0.5</td> </tr> <tr> <td>70</td> <td>0.55</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	30	0.35	40	0.4	50	0.45	60	0.5	70	0.55	80	0.6
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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

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

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		
Accredited Traceable Calibration Certificate in accordance with DIN EN ISO/IEC 17025		see www.eplusecal.com			
ISO 9001 Calibration Certificate		see www.epluse.com/iso9001cal			

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

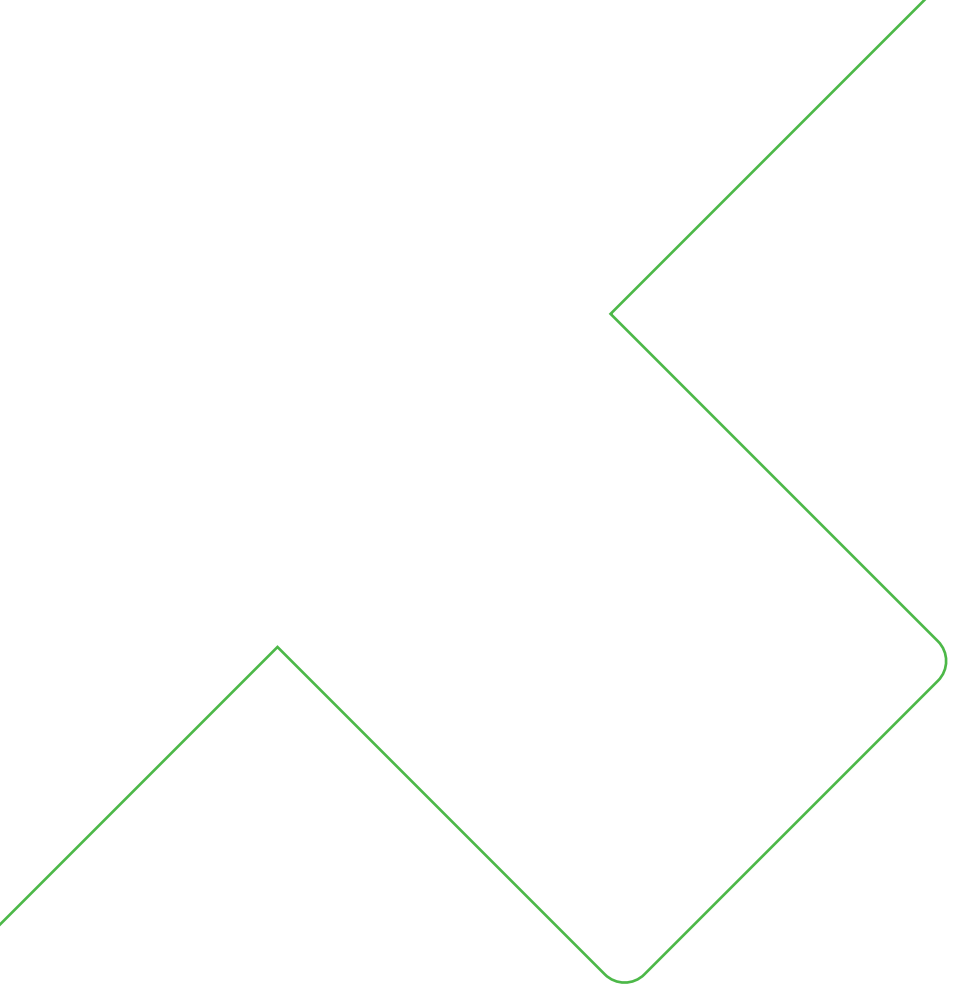
HTP201-M1HS2A1F9E9SBH80

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, shielded, 5 poles, M12x1 plug ↔ socket	2 m (6.6 ft) HA010816 5 m (16.4 ft) HA010817 10 m (32.8 ft) HA010818
Sensor connection cable, shielded, 5 poles, M12x1 socket ↔ wire ferrules	1.5 m (4.9 ft) HA010819 5 m (16.4 ft) HA010820 10 m (32.8 ft) HA010821
Plastic mounting flange, Ø12 mm (0.47"), black	HA010214
Stainless steel mounting flange, Ø12 mm (0.47")	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, RAL 6018	HA010783
Radiation shield with fixed clamping ring M20x1.5	HA010502
Drip water protection	HA010503



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