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# + Datasheet HTS201

Room Sensor for Relative Humidity  
and Temperature



# HTS201

## Room Sensor for Relative Humidity and Temperature

HTS201 is dedicated for accurate and reliable measurement of relative humidity (RH) and temperature (T) in residential and commercial building automation.

### Outstanding Measurement Performance with Patented Sensor Technology

The E+E RH/T sensing element with proprietary protection ensures excellent long-term performance of the HTS201 over the entire working range and even in dusty and dirty environment. The innovative enclosure avoids false air ingress and significantly reduces self-heating.

### Outputs and Digital Interface

The RH and T measured data is available either on two analogue outputs, or on the digital RS485 interface with Modbus RTU or BACnet MS/TP protocol. Additionally, the dewpoint temperature Td is available via Modbus RTU and BACnet MS/TP.

### Functional Design, Cost-saving Installation

The elegant enclosure is available in two sizes according to regional standards and features an optional display. The back cover contains just the push-in spring terminals and can be mounted and wired without the front cover containing the electronics. Thus, the active part of the device is not exposed to construction site pollution and can be simply snapped onto the back cover right before commissioning. Besides, the active part can be replaced without tools within seconds.

### Configuration

The digital version with RS485 interface can be set up and configured via PC with the free PCS10 Product Configuration Software and an optional configuration adapter..



HTS201 in US format with display



HTS201 in EU format without display

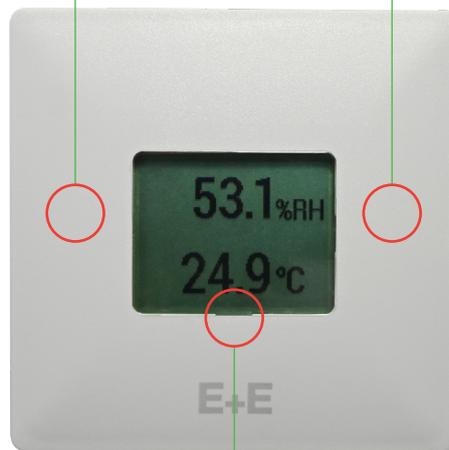
# Features

## Measurement performance

- High RH/T accuracy
- Excellent long term stability
- State-of-the-art E+E RH/T sensing element
  - Protected by E+E proprietary coating
  - Patented sensor technology

## Enclosure and connection

- Innovative design avoids false air ingress
- Time saving installation and wiring
  - Snap-on without tools
  - Push-in spring terminals
  - All electronics inside the front cover
- Smooth cover surface
  - Dust repellent
  - Easy cleaning
- EU and US format
- UL94HB approved enclosure material



## Outputs

- Two analogue outputs
  - 0 - 10 V
  - 4 - 20 mA
- RS485 interface with
  - Modbus RTU
  - BACnet MS/TP
- Large graphic display

## Inspection certificate

According to DIN EN 10204-3.1  
available via [E+E certificate service](#)

# Features

## Protective Sensor Coating

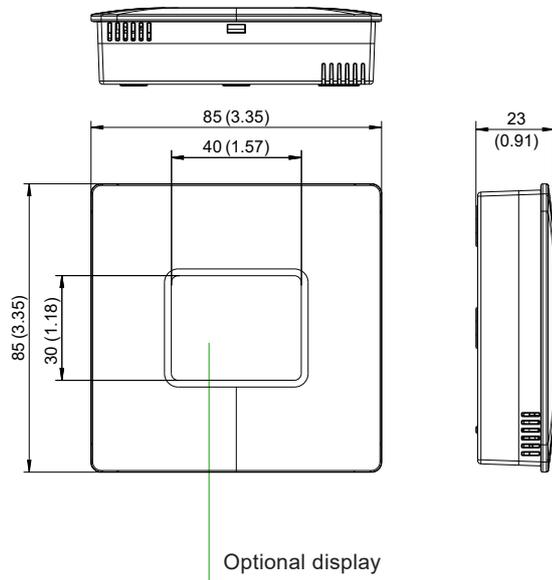
The E+E proprietary sensor coating is a protective layer applied to the active surface of the sensing element. The coating substantially extends sensor lifetime and ensures optimal measurement performance in corrosive environment (salts, off-shore applications). Additionally, it improves the sensors'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

# Dimensions

Values in mm (inch)

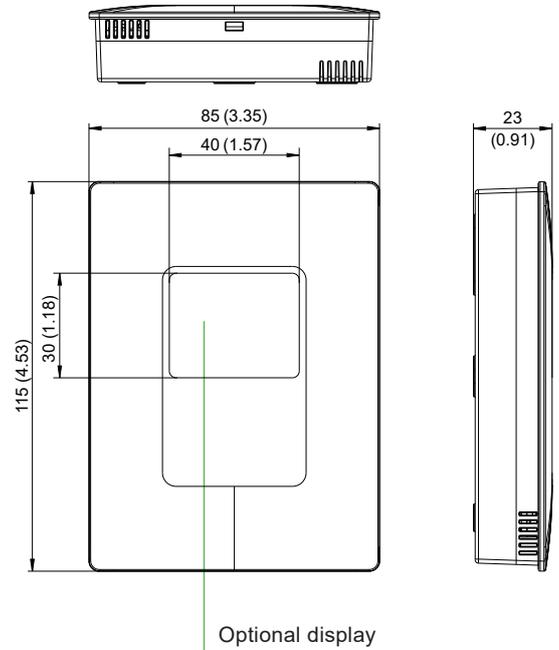
## Enclosure

EU format



## Enclosure

US format



# Technical Data

## Measurands

### Relative Humidity (RH)

<b>Measuring range</b>	0...100 %RH, non-condensing	
<b>Accuracy<sup>1)</sup></b> incl. hysteresis, non-linearity and repeatability <b>0...100 %RH</b>	$\pm(2 + 0.003 * mv) \%RH$	mv = measured value
<b>Temperature dependency of electronics, typ.</b>	0.008 % RH/°C (0.004 %RH/°F)	
<b>Factory calibration uncertainty<sup>2)</sup></b> @ 23 °C (73 °F) <b>0...90 %RH</b> <b>&gt;90...100 %RH</b>	$\pm(0.7 + 0.003 * mv) \%RH$ $\pm 1 \%RH$	mv = measured value

1) Defined against E+E calibration reference at 23 °C (73 °F). With supply voltage 24 V DC, 0.2 m/s (39.4 ft/min) medium flow and load resistor 250 Ω for version with current output.

2) Defined at with an enhancement factor k=2, corresponding to a confidence level of 95 %.

### Temperature (T)

<b>Measuring range</b>	-30...+60 °C (-22...+140 °F)	
<b>Accuracy<sup>1)</sup></b> <b>0 - 10 V, RS485</b> <b>4 - 20 mA (2-wire)</b>	$\pm 0,25\text{ °C } (\pm 0.14\text{ °F})$ $\pm 0,38\text{ °C } (\pm 0.21\text{ °F})$	
<b>Temperature dependency of electronics, typ.</b>	0.006 K/K	
<b>Factory calibration uncertainty<sup>2)</sup></b> @ 23 °C (73 °F)	$\pm 0.1\text{ °C } (\pm 0.056\text{ °F})$	

1) Defined @ 23 °C (73 °F) against E+E calibration reference. With supply voltage 24 V DC, 0.2 m/s (39.4 ft/min) medium flow and load resistor 250 Ω for version with current output.

2) Defined with an enhancement factor k=2, corresponding to a confidence level of 95 %.

### Calculated Physical Quantity

		from	up to	unit
<b>Dew point temperature</b>	Td	-30 (-22)	60 (140)	°C (°F)

## Outputs

### Analogue

<b>T: acc. to ordering guide</b> <b>RH: 0...100 %</b>	0 - 10 V 4 - 20 mA (2-wire)	-1 mA < I <sub>L</sub> < 1 mA R <sub>L</sub> < (V+ - 10) / 0.02 < 500 Ω	I <sub>L</sub> = load current R <sub>L</sub> = load resistance
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### Digital

<b>Digital interface</b>	RS485 (HTS201 = 1 unit load)
<b>Protocol</b> <b>Factory settings</b> <b>Supported Baud rates<sup>1)</sup></b> <b>Measured data type</b>	Modbus RTU Baud rate according to ordering guide, 8 data bits, parity even, 1 stop bit, Modbus address 45 9600, 19200 and 38400 FLOAT32 and INT16
<b>Protocol</b> <b>Factory settings</b> <b>Supported Baud rates<sup>1)</sup></b>	BACnet MS/TP BACnet address 45 9600, 19200, 38400, 57600, 76800 and 115200

1) Ex works: see ordering guide.

# Technical Data

## General

<b>Power supply</b> class III  USA & Canada: Class 2 supply necessary, max. voltage 30 V DC  <b>0 - 10 V, RS485</b> <b>4 - 20 mA (2-wire)</b>	15 - 35 V DC or 24 V AC $\pm 20\%$ $10 + 0.02 \times R_L < V+ < 35\text{ V DC}$ ( $R_L < 500\ \Omega$ )		$R_L = \text{load resistance}$
<b>Current consumption, typ.</b>	<b>@ 24 V DC</b>	<b>@ 24 V AC</b>	
	<b>0 - 10 V</b>	6 mA	14 mA <sub>rms</sub>
	<b>4 - 20 mA</b>	Acc. to output current	
	<b>RS485</b>	5 mA	12 mA <sub>rms</sub>
<b>Electrical connection</b>	Push-in spring terminals max. 1.5 mm <sup>2</sup> (AWG 16)		
<b>Display</b>	1.8" LCD, dot-matrix, 2 lines, visible area 38 x 31 mm (1.5" x 1.2")		
<b>Humidity range</b>	<b>Operation</b>	0...100 %RH non-condensing	
	<b>Storage</b>	0...95 %RH non-condensing	
<b>Temperature range, operation and storage</b>	<b>without display</b>	-30...+60 °C (-22...+140 °F)	
	<b>with display</b>	-20...+60 °C (-4...+140 °F)	
<b>Enclosure</b>	<b>Material</b>	PC (Polycarbonate), RAL 9003 (signal white), UL94 HB approved	
	<b>Protection rating</b>	IP30	
<b>Electromagnetic compatibility</b>	EN 61326-1 FCC Part15 Class B	EN 61326-2-3 ICES-003 Class B	Industrial environment
<b>Shock and vibration</b>	Tested according to EN 60068-2-64 and EN 60068-2-27		
<b>Conformity</b>	 		
<b>Configuration<sup>1)</sup></b>	PCS10 Product Configuration Software ( <a href="#">free download</a> ) and optional configuration adapter		

1) With digital versions only.

# Ordering Guide

Feature	Description	Code		
Hardware Configuration		HTS201-		
	Model	M1		
	Output	0 - 10 V	A3	
		4 - 20 mA (2-wire)	A6	
		RS485		J3
	Display	Without display	No code	
Display		D1		
Design	EU format	No code		
	US format	RG2		
Setup Analogue	Output 1 measurand	No code		
	Output 2 measurand	Temperature T [°C]	No code	
		Temperature T [°F]	MB2	
	Output 2 scaling low	0	No code	
		Value <sup>1)</sup>	SBL Value	
	Output 2 scaling high	50	No code	
Value <sup>1)</sup>		SBH Value		
Setup Digital Interface	Protocol	Modbus RTU <sup>2)</sup>	P1	
		BACnet MS/TP <sup>3)</sup>	P3	
	Baud rate	9600 (common for Modbus)	BD5	
		19200	BD6	
		38400 (common for BACnet)	BD7	
		57600 (for BACnet MS/TP only)	BD8	
		76800 (for BACnet MS/TP only)	BD9	
		115200 (for BACnet MS/TP only)	BD10	
	Units	Metric (SI)	No code	
		Non-metric (US/GB)	U2	

1) -35 °C (-31 °F) < T scaling low < 20 °C (68 °F), 25 °C (77 °F) < T scaling high < 70 °C (158 °F), T scaling high – T scaling low > 20 °C (36 °F).

2) Factory setting: Even parity, 1 stop bit. Modbus Map see User Manual at

3) Factory setting: No parity, 1 stop bit. Product Implementation Conformance Statement (PICS) available at

## Order Example

### HTS201-M1A3D1

Feature	Code	Description
Model	M1	RH + T
Output	A3	0 - 10 V
Display	D1	With display
Design	No code	EU format
Output 1 measurand	No code	RH [%]
Output 2 measurand	No code	°C
Output 2 scaling low	No code	0
Output 2 scaling high	No code	50

# Order Example

## HTS201-M1J3P3BD7

Feature	Code	Description
Model	M1	RH + T
Output	J3	RS485
Display	No code	Without display
Design	No code	EU format
Protocol	P3	BACnet MS/TP
Baud rate	BD7	38400
Units	No code	Metric (SI)

## Accessories

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

Description	Code
E+E Product Configuration Software (Free download from	PCS10
USB Configuration Adapter for HTS201 digital	HA011066