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Datasheet EE471

Temperature Sensor with Remote Probe

Modbus

www.epluse.com

EE471

Temperature Sensor with Remote Probe

The EE471 temperature sensor with remote probe reliably measures the temperature (T) in applications with space restrictions and is optimized for building automation, HVAC and process control.

Analogue, Digital and Passive Outputs

The measured data of the temperature is available at the voltage or current output, as well as on the RS485 interface with Modbus RTU protocol. In addition, EE471 features sensing elements for passive T measurement.

Easy Installation

The design with remote probe is appropriate for installations where electronic shall be protected against high temperature or strong vibrations. Product specific information for the remote probe is printed all along the cable. The optionally available, innovative immersion well is suitable for measurement in liquids and allows the sensor to be replaced quickly and safely.

Configurable and Adjustable

An optional adapter / stick and the free EE-PCS Configuration Software facilitates the setup and adjustment of the EE471.

EE471 temperature sensor with remote probe

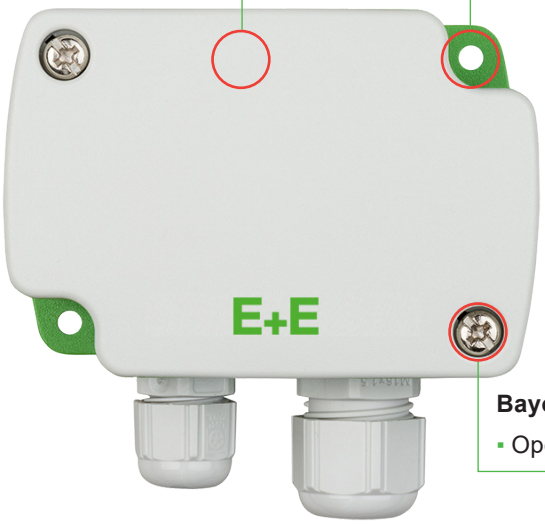
Features

Enclosure

- Protection rating: IP65 / NEMA 4X
- PC (Polycarbonate)

External mounting holes

- Mounting with closed cover
- Protection against construction site pollution
- Easy and fast mounting



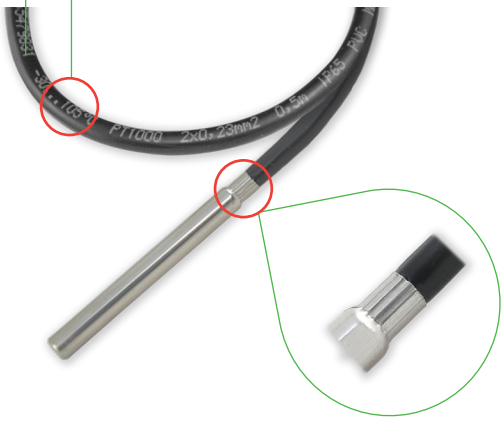
Bayonet screws

- Open / close with a ¼ rotation

Remote probe

Cable

- Product specific information



Star pressing

- Protection rating: IP67 / NEMA 4

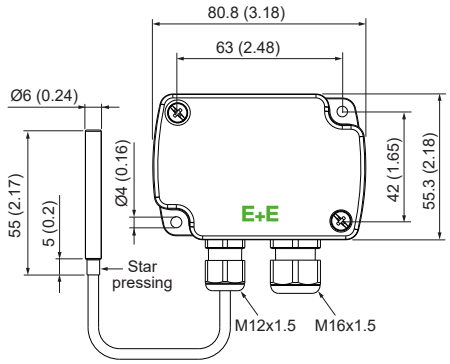
Test report

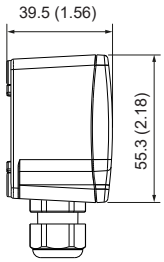
According to DIN EN 10204-2.2

Dimensions

Values in mm (inch)

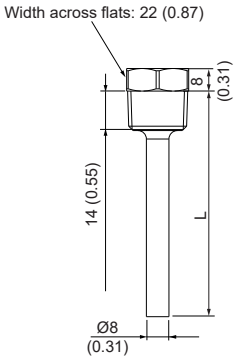
Enclosure





Immersion well

(not included in the scope of supply)



Length (L) in mm	Length (L) in inch
50	1.97
100	3.94
135	5.31
285	11.22

Technical Data

Measurands

Temperature (T) - Active

Measuring range	**Remote probe**	-30 °C…+105 °C (-22...+221 °F)
Accuracy @ 20 °C (68 °F)		±0,3 °C (±0.54 °F)

Temperature (T) - Passive

Measuring range		-30 °C…+105 °C (-22...+221 °F)		
Sensor type		**Nominal resistance**	**Sensitivity**	**Standard**
	Pt100 DIN B	R_0: 100 Ω	TC: 3,850 x 10^{-3}/°C	DIN EN 60751
	Pt1000 DIN B	R_0: 1 000 Ω	TC: 3,850 x 10^{-3}/°C	DIN EN 60751

Outputs

Analogue

Analogue output	0 - 10 V 4 - 20 mA (2-wire)	0 < I_L < 1 mA R_L ≤ 500 Ω	I_L = load current R_L = load resistance

Digital

Digital interface	RS485 (EE471 = 1 Unit Load)
Protocol **Factory settings** **Supported Baud rates** **Measured data types**	Modbus RTU Baud rate see order information, parity even, 1 stop bit, Modbus address 66 9 600, 19 200 and 38 400 FLOAT32 and INT16

T Sensor Passive

Sensor connection	2-wire connection, wire resistance see section “Additional Information”
Measuring current, typ.	<1 mA (according to technical data of the specific T sensing element)

Technical Data

General

Power supply class III USA & Canada: Class 2 supply necessary, max. voltage 30 V DC		
for output RS485 and 0 - 10 V	15 - 35 V DC or 24 V AC ±20 %	
for output 4 - 20 mA	10 V DC + R_L x 20 mA < V+ < 35 V DC	R_L = load resistance
Current consumption, typ. **Analogue**	5 mA (DC) / 12 mA_{rms} (AC)	
RS485	3.5 mA (DC) / 12 mA_{rms} (AC)	
Electrical connection	Screw terminals 2x max. 2.5 mm^2 (AWG14)	
Cable glands	M16x1.5 / M12x1.5 / UL94 V-2	
Insulation resistance (remote probe) @20 °C (68 °F)	>100 MΩ	
Response time t_{63}		
Duct sensor at 3 m/s (590 ft/min) air velocity	<1 min	
Immersion sensor in liquid water bath	<30 s	
Humidity working range	5…95 %RH, non-condensing	
Temperature working range **Remote probe**	-30 °C…+105 °C (-22...+221 °F)	
Electronics	-30 °C...+70 °C (-22...+158 °F)	
Storage conditions	-30 °C…+70 °C (-22...+158 °F) 5…95 %RH, non-condensing	
Material **Enclosure**	Polycarbonate (PC), UL94 V-0 approved	
Cable	Polyvinylchloride (PVC)	
Sensor sleeve	Stainless steel (1.4571 / 316Ti)	
Protection rating **Enclosure**	IP65 / NEMA 4X	
Remote probe	IP67 / NEMA 4	
Electromagnetic compatibility	EN 61326-1 EN 61326-2-3 Industrial environment FCC Part15 Class A ICES-003 Class A	
Conformity	CE UKCA	

Additional Information

Wire Resistance / Temperature Offset

(relevant only for passive output EE471-M7)

Probe cable length	Wire resistance	Temperature offset for Pt100*)
0.5 m (1.64 ft)	0.086 Ω	0.22 °C (0.396 °F)
2 m (6.56 ft)	0.344 Ω	0.88 °C (1.584 °F)
3 m (9.84 ft)	0.516 Ω	1.32 °C (2.376 °F)
5 m (16.4 ft)	0.860 Ω	2.2 °C (3.960 °F)
10 m (32.8 ft)	1.72 Ω	4.4 °C (7.920 °F)

*) For high-resistance T sensors (R ≥ 1000 Ω) the temperature offset is negligible.

Ordering Guide

	Feature	Description	Code		
			EE471-		
Hardware Configuration	**Model**	Active	M3		
		Passive			M7
	Output	0 - 10 V	A3		
		4 - 20 mA	A6		
		RS485		J3	
	T sensor passive[1] (R-T-characteristics see www.epluse.com/ee451)	Pt100 DIN B			TP2
		Pt1000 DIN B			TP4
	Probe cable length	0.5 m (1.6 ft)	K0.5		
		2 m (6.6 ft)	K2		
		3 m (9.8 ft)	K3		
		5 m (16.4 ft)	K5		
		10 m (32.8 ft)	K10		
Software Setup - Outputs	**Output (T) measurand**	Temperature [°C]	No code		
		Temperature [°F]	MA2		
	Output (T) scaling low	0	No code		
		Value (within the working range)	SAL*Value*		
	Output (T) scaling high	50	No code		
		Value (within the working range)	SAH*Value*		
	Protocol	Modbus RTU[2]		P1	
	Baud rate	9600		BD5	
		19200		BD6	
		38400		BD7	

1) Other passive sensor types are available on request from a minimum order quantity of 500 pcs.
2) Factory settings: Parity even, stop bit 1. Modbus Map and communication setting: see User Guide and Modbus Application Note at www.epluse.com/ee471.

Order Examples

EE471-M3J3K3P1BD5

Feature	Code	Description
Model	**M3**	Active
Output	**J3**	RS485
Probe cable length	**K3**	3 m (9.8 ft)
Protocol	**P1**	Modbus RTU
Baud rate	**BD5**	9600

EE471-M7TP4K5

Feature	Code	Description
Model	**M7**	Passive
T sensor passive	**TP4**	Pt1000 DIN B
Probe cable length	**K5**	5 m (16.4 ft)

Accessories

For further information see datasheet Accessories.

Description		Code			
Product configuration adapter for analogue output		**See datasheet EE-PCA**			
USB-C configuration stick for digital output		**HA011070**			
E+E Configuration Software (free download: www.epluse.com/configurator)		**EE-PCS**			
Power supply adapter		**V03**			
Conduit Adapter, M16x1.5 auf 1/2"		**HA011110**			
Mounting flange		**HA401101**			
Cable gland (M12x1.5; -40...+100 °C (-40... +212 °F); UL94-V0)		**HA403101**			
Hose clamp (for pipe mounting of remote probe)		**HA402101**			
Hose clamp bundle, metal, 330 mm (13"), 5 pcs.		**HA402102**			
Immersion well - thread R ½" ISO[1)]	**Length in mm (inch)**	**50 (1.97")**	**100 (3.94")**	**135 (5.31")**	**285 (11.22")**
	Brass	**HA400101**	**HA400104**	**HA400102**	**HA400103**
	Stainless steel	**HA400201**	**HA400204**	**HA400202**	**HA400203**
Immersion well - thread ½" NPT[1)]	**Length in mm (inch)**	**50 (1.97")**	**100 (3.94")**	**135 (5.31")**	**285 (11.22")**
	Brass	**HA400111**	**HA400114**	**HA400112**	**HA400113**
	Stainless steel	**HA400211**	**HA400214**	**HA400212**	**HA400213**

1) For further information see datasheet www.epluse.com/ee431.

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