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technology.



Datasheet EE471

Temperature Sensor with Remote Probe



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 optimised 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



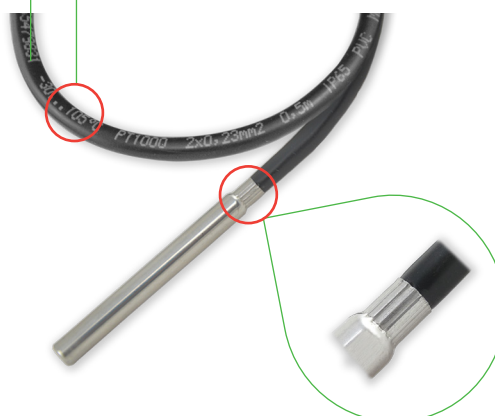
Bayonet screws

- Open/close with a 1/4 rotation

Remote probe

Cable

- Product specific information



Star pressing

- Protection rating: IP67/NEMA 4

Test report

According to DIN EN 10204-2.2

Features

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 traceable calibrations.

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 EE471 from the E+E Elektronik calibration laboratory.

ISO 9001 Calibration Certificate

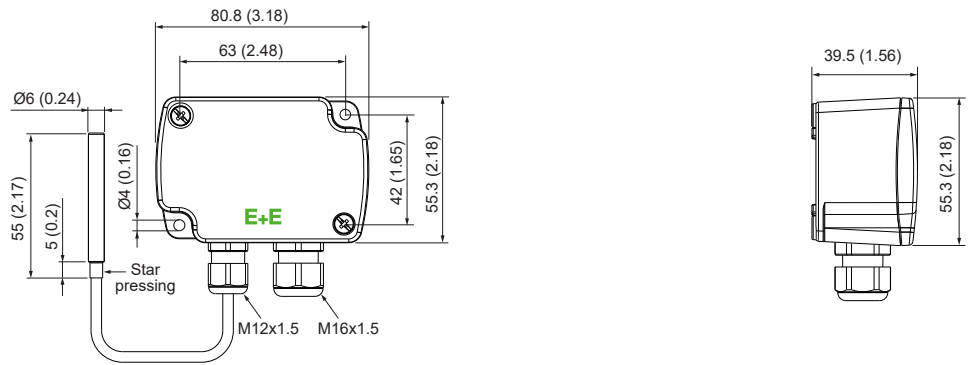
An ISO 9001 calibration certificate documents the comparative measurement of a device against high quality reference equipment (factory level standard). The comparison is performed in accordance with internal procedures that comply with ISO 9001 and provides information on the specimen's measuring accuracy. 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

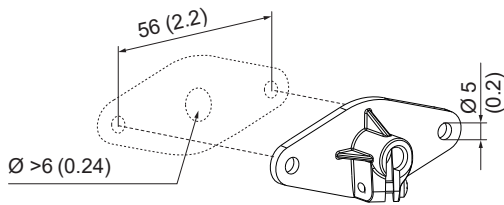
Values in mm (inch)

Enclosure

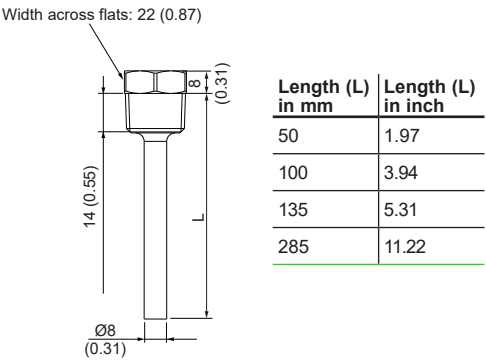


Mounting accessories

Mounting flange
(not included in the scope of supply)



Immersion well
(not included in the scope of supply)



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 : 1000 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
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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 9600, 19200 and 38400 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 for output 4 - 20 mA		15 - 35 V DC or 24 V AC $\pm 20\%$ 10 V DC + $R_L \times 20 \text{ mA} < V+ < 35 \text{ V DC}$ R_L = load resistance
Current consumption, typ.	Analogue RS485	5 mA (DC) / 12 mA _{rms} (AC) 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 Immersion sensor in liquid water bath		<1 min <30 s
Humidity working range		5...95 %RH, non-condensing
Temperature working range	Remote probe Electronics	-30 °C...+105 °C (-22...+221 °F) -30 °C...+70 °C (-22...+158 °F)
Storage conditions		-30 °C...+70 °C (-22...+158 °F) 5...95 %RH, non-condensing
Material	Enclosure Cable Sensor sleeve	Polycarbonate (PC), UL94 V-0 approved Polyvinylchloride (PVC) Stainless steel (1.4571 / 316Ti)
Protection rating	Enclosure Remote probe	IP65 / NEMA 4X IP67 / NEMA 4
Electromagnetic compatibility		EN 61326-1 EN 61326-2-3 Industrial environment FCC Part15 Class B ICES-003 Class B
Conformity		 

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 ($R \geq 1000 \Omega$) the temperature offset is negligible.

Ordering Guide

Feature		Description	Code		
Hardware Configuration			EE471-		
	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)	SALValue		
	Output (T) scaling high	50	No code		
		Value (within the working range)	SAHValue		
	Protocol	Modbus RTU ²⁾		P1	
	Baud rate	9600		BD5	
		19200		BD6	
		38400		BD7	
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) 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

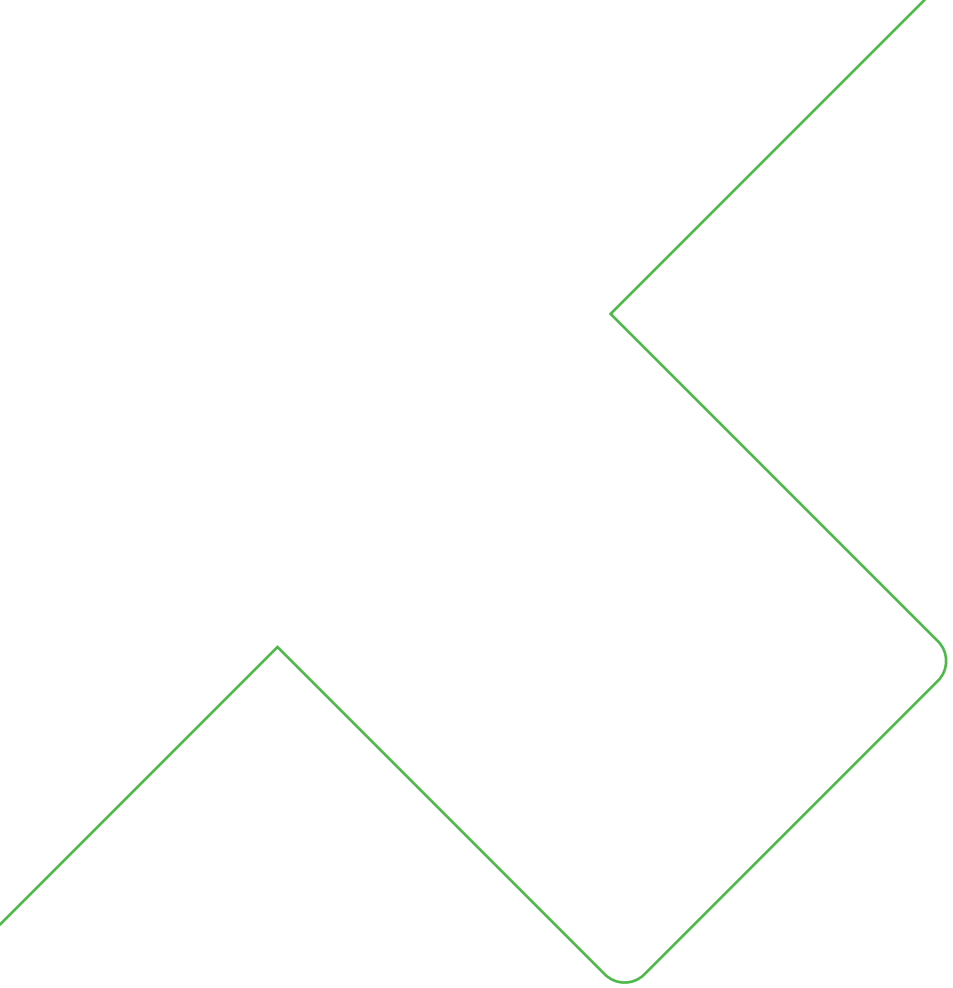
EE471-M7TP4K5

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				
EE-PCA connection cable for version with analogue output	HA011065				
USB-C configuration stick for version with digital output	HA011070				
E+E Product Configuration Software (free download: www.epluse.com/configurator)	EE-PCS				
Power supply adapter 24 V DC	V03				
Conduit Adapter US, M16x1.5 - 1/2", plastic	HA011110				
Plastic mounting flange for probes with Ø6 mm (0.24"), with alignment notch	HA401101				
Cable gland polycarbonate (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	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	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



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