

# EE471

## Temperature Sensor with Remote Probe

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

### Analogue, Digital and Passive Outputs

The T measured data is available on the voltage or current output, as well as on the RS485 interface with Modbus RTU or BACnet MS/TP protocol. In addition, EE471 features a wide choice of sensing elements for passive T measurement.

### Easy Installation

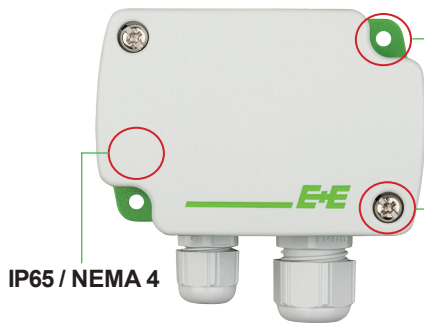
The design with remote probe is appropriate for installations where electronic shall be protected against high temperature or strong vibrations. Product specific information for the remote probe is printed all along the cable. The innovative immersion well is dedicated for measurement in liquids and allow for fast and safety replacement of the sensor.

### Configurable and Adjustable

An optional adapter and the free EE-PCS Product Configuration Software facilitate the setup and adjustment of the EE471.



## Features



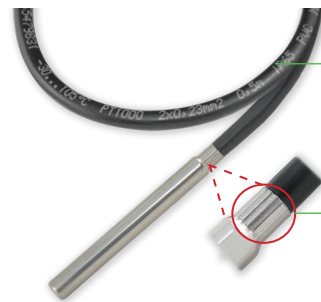
### External mounting holes

- » Mounting with closed cover
- » Protection against construction site pollution

### Bayonet screws

- » Open/closed with a ¼ rotation

IP65 / NEMA 4



### Product-specific information

IP67 cable outlet  
(star pressing of the sensor sleeve)

Test report according to  
DIN EN 10204 – 2.2



## Technical Data

### Active Output

Operating temperature		remote probe: -30...+105 °C (-22...+221 °F)	
		electronics: -30...+70 °C (-22...+158 °F)	
Sensing element		Pt1000 class A, DIN EN60751	
Analogue output		0-10 V	-1 mA < I <sub>L</sub> < 1 mA
		4-20 mA (two-wire)	R <sub>L</sub> < 500 Ω
			R <sub>L</sub> = load resistance
Digital interface		RS485 with max. 32 unit load devices on one bus	
Protocol		Modbus RTU or BACnet MS/TP	
Accuracy		±0.3 °C (±0.54 °F) at 20 °C (68 °F)	
Supply voltage (Class III)	◆	15-35 V DC or 24 V AC ±20%	for RS485 and 0-10 V output
		10 V DC + R <sub>L</sub> x 20 mA < V+ < 35 V DC	for 4-20 mA output
Current demand (typ.)	analogue	5 mA (DC) / 12 mA <sub>eff</sub> (AC)	
	RS485	3.5 mA (DC) / 12 mA <sub>eff</sub> (AC)	
Electromagnetic compatibility		EN61326-1, EN61326-2-3 industrial environment	

## Passive Output

Operating temperature	-30...+105 °C (-22...+221 °F)			
T sensing elements	Sensor Type	Nominal Resistance	Sensitivity	Standard
	Pt100 DIN B	R <sub>0</sub> : 100 Ω	TC: 3.850 x 10 <sup>-3</sup> /°C	DIN EN 60751
	Pt1000 DIN B	R <sub>0</sub> : 1000 Ω	TC: 3.850 x 10 <sup>-3</sup> /°C	DIN EN 60751
	NTC1.8k	R <sub>25</sub> : 1.8 kΩ ± 0.2 K	B <sub>25/85</sub> : 3500 K ± 1.0 %	-
	NTC2.2k	R <sub>25</sub> : 2.252 kΩ ± 0.2 K	B <sub>25/85</sub> : 3977 K ± 0.3 %	-
	NTC10k B3950	R <sub>25</sub> : 10 kΩ ± 0.5 %	B <sub>25/85</sub> : 3989 K (B <sub>25/50</sub> : 3950 K ± 1.0 %)	-
	NTC10k B3435	R <sub>25</sub> : 10 kΩ ± 1 %	B <sub>25/85</sub> : 3435 K	-
	KTY81-210	R <sub>25</sub> : 1980-2020 Ω	-	-
	Ni1000 TK6180 DIN B	R <sub>0</sub> : 1000 Ω	TC: 6180 ppm/K	DIN 43760
	Ni1000 TK5000 DIN B	R <sub>0</sub> : 1000 Ω	TC: 5000 ppm/K	DIN 43760
Measurement current typ.	< 1 mA (according technical data of the specific T-sensing element)			
T-Sensor connection	two-wire, wire resistance see additional information below			

## General

Insulation resistance (remote probe)	> 100 MΩ at 20 °C (68 °F)
Response time τ <sub>63</sub>	< 1 min, at 3 m/s (590 ft/min) air velocity < 30 s, with immersion well in liquid water bath
Sensor sleeve material	stainless steel (1.4571 / 316Ti)
Cable material	PVC
Electrical connection	screw terminal, 2x max. 2.5 mm <sup>2</sup> (0.004 in <sup>2</sup> )
Enclosure material	polycarbonate, UL94-V0 approved
Protection class	IP65 / NEMA 4 (enclosure), IP67 / NEMA 4 (remote probe)
Cable gland	M16x1.5, M12x1.5, UL94-V2
Storage temperature	-30...+70 °C (-22...+158 °F)
Working and storage humidity	5...95 % RH, non condensing

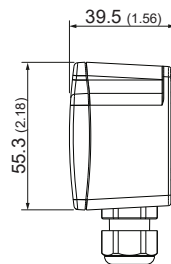
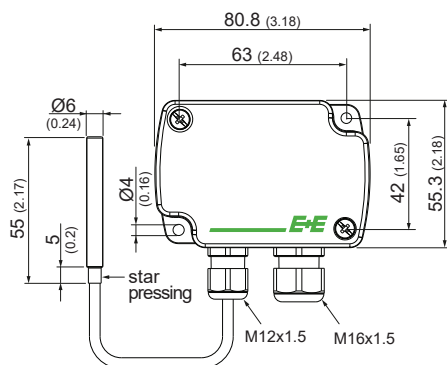
## Additional Information

### Wire Resistance / Temperature Offset (relevant only for passive output EE471-M7)

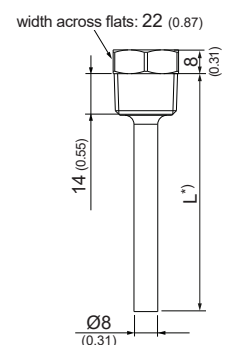
Cable length	Wire resistance	Temperature offset for Pt100 <sup>1)</sup>
0.5 m (1.64 ft)	0.086 Ω	0.22 °C (0.396 °F)
2 m (6.56 ft)	0.344 Ω	0.88 °C (1.584 °F)
3 m (9.84 ft)	0.516 Ω	1.32 °C (2.376 °F)
5 m (16.4 ft)	0.860 Ω	2.2 °C (3.960 °F)
10 m (32.8 ft)	1.72 Ω	4.4 °C (7.920 °F)

<sup>1)</sup> For high-resistance T-sensors (R ≥ 1000 Ω) the temperature offset is negligible.

## Dimensions mm (inch)



### Immersion well



<sup>1)</sup> According to ordering guide

## Ordering Guide

### Position 1 - Temperature Sensor

		EE471-		
<b>Model</b>	active	M3		M7
	passive			
		A3		
<b>Output</b>	0-10 V	A6		
	4-20 mA		J3	
	RS485			
<b>Hardware Configuration</b>	<b>T-sensor passive</b> (see <a href="http://www.epluse.com/R-T_Characteristics">www.epluse.com/R-T_Characteristics</a> )	Pt100 DIN B		TP2
		Pt1000 DIN B		TP4
		NTC 1.8k		TP7
		Ni1000, TK6180 DIN B		TP9
		NTC 10k, B3950		TP11
		KTY81-210		TP13
		NTC 10k, B3435		TP14
		Ni1000, TK5000 DIN B		TP19
NTC 2.2k		TP21		
<b>Cable length</b>	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	
<b>Unit</b>	°C	no code		
	°F	MA2		
<b>Scale T low</b>	0	no code		
	value (within working range)	SAL value		
<b>Scale T high</b>	50	no code		
	value (within working range)	SAH value		
<b>Protocol</b>	Modbus RTU <sup>1)</sup>		P1	
	BACnet MS/TP <sup>2)</sup>		P3	
<b>Baud rate</b>	9.600		BD5	
	19.200		BD6	
	38.400		BD7	
	57.600 <sup>3)</sup>		BD8	
	76.800 <sup>3)</sup>		BD9	

1) Factory setting: Even parity, Stopbits 1. Modbus Map and communication setting: see User Guide and Modbus Application Note at [www.epluse.com/ee471](http://www.epluse.com/ee471)

2) Factory setting: No parity, Stopbits 1. Product Implementation Conformance Statement (PICS) available at [www.epluse.com/ee471](http://www.epluse.com/ee471)

3) Only for BACnet MS/TP

### Position 2 - Mounting Accessories

Plastic mounting flange HA401101

Immersion well: R $\frac{1}{2}$ " ISO:

length (L)	50 mm (1.97")	100 mm (3.94")	135 mm (5.31")	285 mm (11.22")
brass	HA400101	HA400104	HA400102	HA400103
stainless steel	HA400201	HA400204	HA400202	HA400203

Immersion well:  $\frac{1}{2}$ " NPT:

length (L)	50 mm (1.97")	100 mm (3.94")	135 mm (5.31")	285 mm (11.22")
brass	HA400111	HA400114	HA400112	HA400113
stainless steel	HA400211	HA400214	HA400212	HA400213

## Order Example

### EE471-M3J3K3P3BD7

Model: active  
 Output: RS485  
 Cable length: 3 m (9.8 ft)  
 Protocol: BACnet MS/TP  
 Baud rate: 38.400

### EE471-M7TP11K5

Model: passive  
 T-sensor passive: NTC 10k, B3950  
 Cable length: 5 m (16.4 ft)

## Accessories

Product configuration adapter

- for analogue output
- for digital output - USB configuration adapter

Product configuration software

Power supply adapter

Conduit adapter, M16x1.5 to 1/2"

Cable gland (M12x1.5, -40 °C...+100 °C / -40 °F... +212 °F, UL94-V0)

Hose clamp (for pipe mounting of remote probe)

For further information please see datasheet EE441.

see data sheet EE-PCA

HA011066

EE-PCS (free download: [www.epluse.com/configurator](http://www.epluse.com/configurator))

V03 (see data sheet Accessories)

HA011110

HA403101

HA402101

## Mounting with Immersion Well



1. The spring inside the well must be removed and replaced by a standard M12x1.5 cable gland (not included in the scope of supply).

2. Insert the remote cable sensor and fix it by fastening the cable gland.

Please observe the operating temperature range of the cable gland!