

EE431

Duct and Immersion Temperature Sensor

The EE431 duct and immersion sensor measures reliably the temperature (T) in air and liquids 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, EE431 features a wide choice of sensing elements for passive T measurement.

Easy Installation

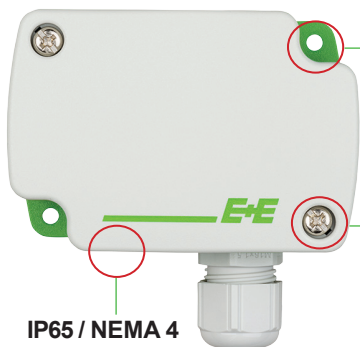
The device can be mounted either with the plastic mounting flange or via external mounting holes at the enclosure. The innovative immersion well is dedicated for measurement in liquids and allows for fast and safe replacement of the sensor. The EE431 with RS485 interface is appropriate for daisy-chain wiring.

Configurable and Adjustable

An optional adapter and the free EE-PCS Product Configuration Software facilitate the setup and adjustment of the EE431.



Features



External mounting holes

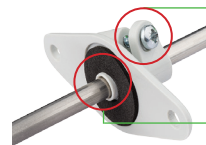
- » Mounting with closed cover
- » Protection against construction site pollution

Bayonet screws

- » Open/closed with a ¼ rotation

IP65 / NEMA 4

Mounting flange



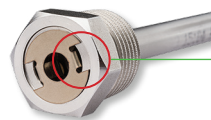
Clamp ring

- » No direct screwing onto probe
- » Inclined screw for easy installation

Special sealing

- » Foam gasket for good tightness
- » No scratching of probe due to alignment notch

Immersion well



Innovative mounting spring

- » For securing the probe inside the well
- » No fastening screw, no tools required



Test report according to
 DIN EN 10204 – 2.2

Technical Data

Active Output

Operating temperature	probe duct sensor:	-40...+110 °C (-40...+230 °F)
	probe immersion sensor:	-40...+150 °C (-40...+302 °F)
	electronics:	-40...+70 °C (-40...+158 °F)
Sensing element	Pt1000 class A, DIN EN60751	
Analogue output	0-10 V	-1 mA < I _L < 1 mA
	4-20 mA (two-wire)	R _L < 500 Ω
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)	
	±0.2 °C (±0.36 °F) at 20 °C (68 °F) (optional only for analogue output)	
Supply voltage (Class III) ⚡	15-35 V DC or 24 V AC ±20%	for RS485 and 0-10 V output
	10 V DC + R _L x 20 mA < V+ < 35 V DC	for 4-20 mA output

Current demand (typ.) analogue RS485	5 mA (DC) / 12 mA _{eff} (AC) 3.5 mA (DC) / 12 mA _{eff} (AC)
Electromagnetic compatibility	EN61326-1, EN61326-2-3 industrial environment

Passive Output

Operating temperature (probe)	-40...+110 °C (-40...+230 °F) -40...+150 °C (-40...+302 °F) for immersion sensor with Pt and Ni T-sensors
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T sensing elements	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
	NTC1.8k	R ₂₅ : 1.8 kΩ ± 0.2 K	B _{25/85} : 3500 K ± 1.0 %	-
	NTC2.2k	R ₂₅ : 2.252 kΩ ± 0.2 K	B _{25/85} : 3977 K ± 0.3 %	-
	NTC10k B3950	R ₂₅ : 10 kΩ ± 0.5 %	B _{25/85} : 3989 K (B _{25/50} : 3950 K ± 1.0 %)	-
	NTC10k B3435	R ₂₅ : 10 kΩ ± 1 %	B _{25/85} : 3435 K	-
	KTY81-210	R ₂₅ : 1980-2020 Ω	-	-
	Ni1000 TK6180 DIN B	R ₀ : 1000 Ω	TC: 6180 ppm/K	DIN 43760
	Ni1000 TK5000 DIN B	R ₀ : 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

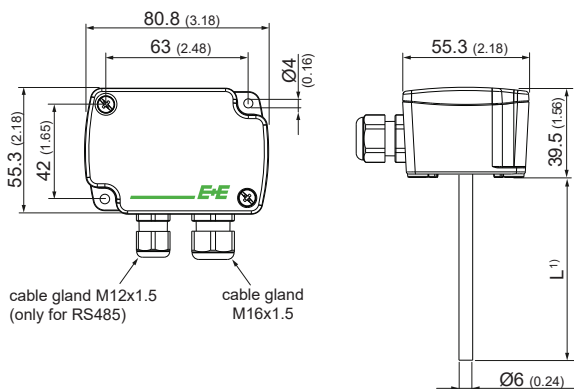
General

Insulation resistance (probe)	> 100 MΩ at 20 °C (68 °F)
Response time τ ₆₃	< 1 min, duct sensor at 3 m/s (590 ft/min) air velocity < 30 s, immersion sensor in liquid water bath
Probe material	stainless steel (1.4571 / 316Ti)
Enclosure material	polycarbonate, UL94-V0 approved, T-range: -40...+110 °C (-40...+230 °F)
Protection class	IP65 / NEMA 4
Cable gland	M16x1.5, M12x1.5, UL94-V2
Electrical connection	screw terminals, max. 2.5 mm ² (0.004 in ²)
Storage temperature	-30...+70 °C (-22...+158 °F)
Working and storage humidity	5...95 % RH, non condensing

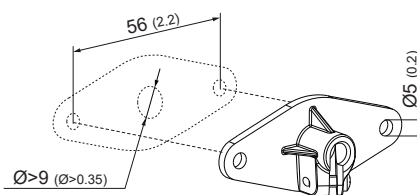
Immersion well

Material	brass nickel-plated stainless steel (tube: 1.4571 / 316Ti, mounting thread: 1.4404 / 316L)				
Pressure rating	15 bar (218 psi), brass 25 bar (363 psi), stainless steel				
Max. flow speed	50 mm (1.97")	100 mm (3.94")	135 mm (5.31")	285 mm (11.22")	
	brass	26 m/s (5118 ft/min)	12 m/s (2362 ft/min)	6 m/s (1181 ft/min)	1 m/s (197 ft/min)
	stainless steel	29 m/s (5708 ft/min)	15 m/s (2953 ft/min)	9 m/s (1771 ft/min)	2 m/s (394 ft/min)

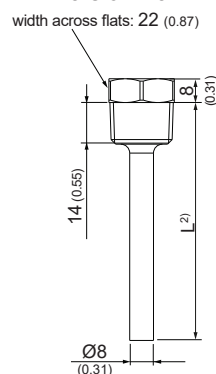
Dimensions mm (inch)



Plastic mounting flange



Immersion well



¹⁾ According to ordering guide „Probe length“
²⁾ According to ordering guide „Immersion well“

Ordering Guide

Position 1 - Temperature Sensor

		EE431-			
		M3		M7	
Hardware Configuration	Model	active			
		passive			
	Output	0-10 V	A3		
		4-20 mA	A6		
		RS485		J3	
	T-sensor passive (see www.epluse.com/R-T_Characteristics)	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		
Probe length	65 mm (2.56")		L65		
	115 mm (4.53")		L115		
	150 mm (5.91")		L150		
	300 mm (11.81")		L300		
Accuracy	±0.3 °C	no code			
	±0.2 °C	TT2			
Setup Outputs	Unit	°C	no code		
		°F	MA2		
	Scale T low	0	no code		
		value (within working range)	SAL value		
	Scale T high	50	no code		
		value (within working range)	SAH value		
Protocol	Modbus RTU ¹⁾		P1		
	BACnet MS/TP ²⁾		P3		
Baud rate	9.600		BD5		
	19.200		BD6		
	38.400		BD7		
	57.600 ³⁾		BD8		
	76.800 ³⁾		BD9		

1) Factory setting: Even parity, Stopbits 1. Modbus Map and communication setting: see User Guide and Modbus Application Note at www.epluse.com/ee431

2) Factory setting: No parity, Stopbits 1. Product Implementation Conformance Statement (PICS) available at www.epluse.com/ee431

3) Only for BACnet MS/TP

Position 2 - Mounting Accessories

Plastic mounting flange HA401101

Immersion well: R¹/₂" 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: 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

Position 1:**EE431-M3J3L300P3BD7**

Model: active
Output: RS485
Probe length: 300 mm
Protocol: BACnet MS/TP
Baud rate: 38.400

Position 2:**HA400113**

Immersion well: ½" NPT, brass, 285 mm (11.22")

Position 1:**EE431-M7TP11L65**

Model: passive
T-sensor passive: NTC 10k, B3950
Probe length: 65 mm (2.56")

Position 2:**HA400201**

Immersion well: R½" ISO, stainless steel, 50 mm (1.97")

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"

[see data sheet EE-PCA](#)

[HA011066](#)

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

[V03](#) (see data sheet Accessories)

[HA011110](#)