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technology.



Datasheet EE451

**Wall-mounted Temperature Sensor
for Indoor and Outdoor**



EE451

Wall-mounted Temperature Sensor for Indoor and Outdoor

The EE451 wall-mounted sensor reliably measures the temperature (T) indoors and outdoors in building automation, HVAC and process control.

Analogue, Digital and Passive Outputs

The measured data is available at the voltage or current output, as well as on the RS485 interface with Modbus RTU protocol. Additionally, EE451 features a wide choice of sensing elements for passive temperature measurement. An optional display is available for the EE451 with analog output.

Easy Installation

The compact and robust design allows easy and quick installation as well as unbiased measurement of the ambient temperature.

Configurable and Adjustable

An optional adapter /stick and the free Product Configuration Software facilitate the setup and adjustment of the EE451.



EE451 with active output



EE451 with passive output



EE451 with active output and display

Features

LC display (optional)

- 38 x 20 mm (1.5 x 0.8")

External mounting holes

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

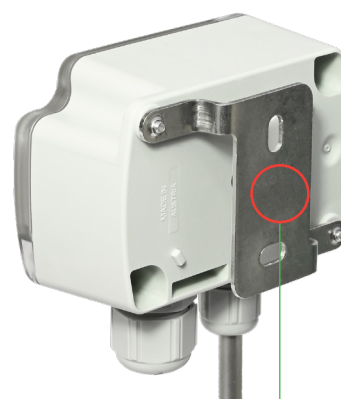


Bayonet screws

- Open/close with a ¼ rotation

Enclosure

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



Mounting bracket

- Distance to wall for correct measurement of ambient temperature

Test report

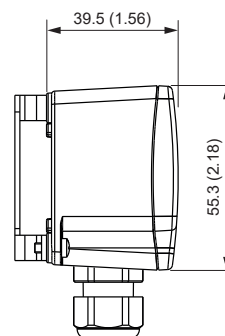
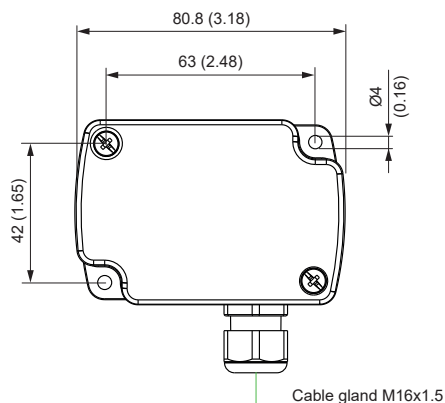
According to DIN EN 10204-2.2

Dimensions

Values in mm (inch)

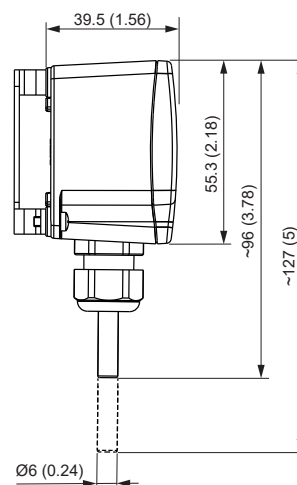
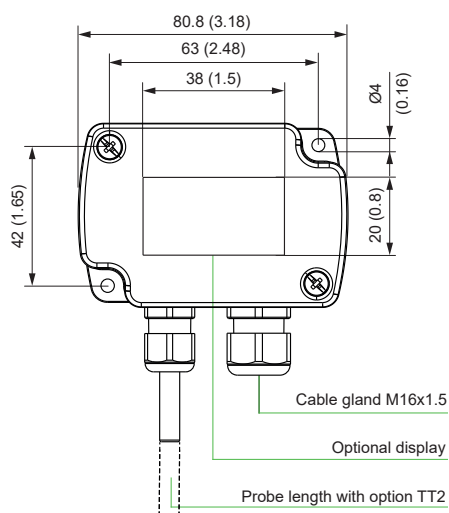
Passive Output

Mounting bracket included in the scope of supply

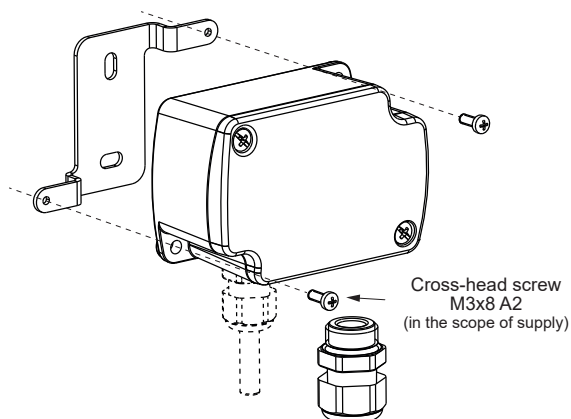


Active Output

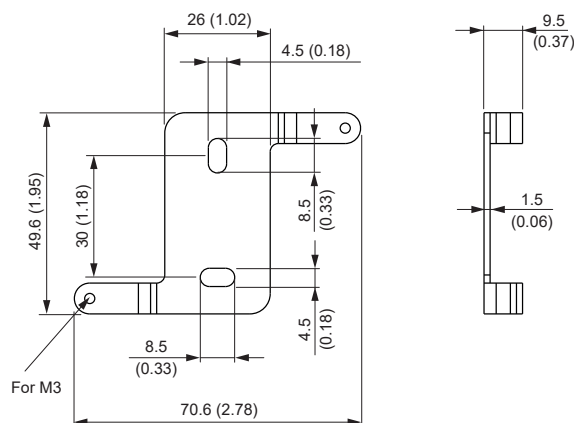
Mounting bracket included in the scope of supply



Mounting



Mounting Bracket



Technical Data

Measurands

Temperature (T) - Active

Measuring range	-40 °C...+70 °C (-40...+158 °F)
Accuracy @ 20 °C (68 °F)	±0.3 °C (±0.54 °F)
Optional for analogue output	±0.1 °C (±0.18 °F) ¹⁾

1) Uncertainty of factory calibration @ 20 °C (68 °F) ±0.1 °C (±0.18 °F). Not available for display version.

Temperature (T) - Passive

Measuring range	-40 °C...+70 °C (-40...+158 °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
NTC10k B3950	R ₂₅ : 10 kΩ ±0.5 %	B _{25/85} : 3989 K (B _{25/50} : 3950 K ± 1.0 %)	-
NTC20k B4286	R ₂₅ : 20 kΩ ± 0.2 °C	B _{25/85} : 4286 K (B _{25/85} : 4286 K ± 1.0 %)	-
Ni1000 TK6180 DIN B	R ₀ : 1000 Ω	TC: 6 180 ppm/K	DIN 43760
Ni1000 TK5000 DIN B	R ₀ : 1000 Ω	TC: 5 000 ppm/K	DIN 43760

Outputs

Analogue

Analogue output	0 - 10 V 4 - 20 mA (2-wire)	-1mA < I _L < 1 mA R _L ≤ 500 Ω	I _L = load current R _L = load resistance
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Digital

Digital interface	RS485 (EE451 = 1 unit load)
Protocol Factory settings Supported Baud rates Measured data types	Modbus RTU Baud rate see order information, 8 data bits, parity even, 1 stop bit, Modbus address 66 9600, 19200 and 38400 FLOAT32 and INT16

T Sensor Passive

Sensor connection	2-wire connection
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 0 - 10 V, RS485 4 - 20 mA		15 - 35 V DC or 24 V AC $\pm 20\%$ $10\text{ V DC} + R_L \times 20\text{ mA} < V+ < 35\text{ V DC}$ R_L = load resistance	
Current consumption @ 24 V	Voltage output	DC supply max. 1.2 mA AC supply max. 4.6 mA _{rms}	With display max. 2.1 mA With display max. 7 mA _{rms}
	Current output	According to output current	According to output current
	Digital interface	DC supply typ. 3.5 mA AC supply typ. 12 mA _{rms}	
Electrical connection		Screw terminals, max. 2.5 mm ² (AWG14)	
Cable glands		M16x1.5/UL94 V-2	
LC-display		Available for output A3 and A6 1 line, unit according selected measurand Without backlight Visible area 38 mm x 20 mm (1.5" x 0.8")	
Humidity working range		5...95 %RH, non-condensing	
Temperature working range	Without display	-40...+70 °C (-40...+158 °F)	
	With display	-20...+50 °C (-4...+122 °F)	
Storage conditions	Without display	-30...+70 °C (-22...+158 °F) 5...95 %RH, non-condensing	
	With display	-20...+50 °C (-4...+122 °F) 5...95 %RH, non-condensing	
Mounting bracket material		Stainless steel (1.4301 / 304)	
Enclosure Material Protection rating		Polycarbonate (PC), UL94 V-0 approved IP65/NEMA 4X	
Electromagnetic compatibility		EN 61326-1 FCC Part15 Class B	EN 61326-2-3 ICES-003 Class B Industrial environment
Conformity		 	
Configuration and adjustment	Analogue	PCS10 Product Configuration Software (free download: www.epluse.com/pcs10) and configuration adapter.	
	Digital	EE-PCS Configuration Software (free download: www.epluse.com/configurator) and USB-C configuration stick.	

Ordering Guide

Feature		Description	Code		
Hardware Configuration			EE451-		
	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
		Ni1000, TK6180 DIN B			TP9
		NTC 10k, B3950			TP11
		Ni1000, TK5000 DIN B			TP19
	Accuracy	±0.3 °C (±0.54 °F)	No code		
±0.1 °C (±0.18 °F) ²⁾		TT2			
Display	Without display	No code			
	Display		D1		
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 ³⁾		P1	
	Baud rate	9600		BD5	
		19200		BD6	
		38400		BD7	

1) Other passive sensor types are available on request for a minimum order quantity of 500 pcs.

2) Uncertainty of factory calibration at 20 °C ±0.1 °C (68 °F ±0.18 °F). The probe length for this configuration is 76.5 mm (3.01").

3) Factory settings: Parity even, stop bit 1. Modbus Map and communication setting: see User Guide and Modbus Application Note at www.epluse.com/ee451.

Order Examples

EE451-M3J3P1BD5

Feature	Code	Description
Model	M3	Active
Output	J3	RS485
Protocol	P1	Modbus RTU
Baud rate	BD5	9600

Order Examples

EE451-M3A3D1

Feature	Code	Description
Model	M3	Active
Output	A3	0 - 10 V
Display	D1	Display
Output (T) measurand	No code	Temperature [°C]
Output (T) scaling low	No code	0
Output (T) scaling high	No code	50

EE451-M3A6TT2

Feature	Code	Description
Model	M3	Active
Output	A6	4 - 20 mA
Accuracy	TT2	±0.1 °C (±0.18 °F)
Display	No code	Without display
Output (T) measurand	No code	Temperature [°C]
Output (T) scaling low	No code	0
Output (T) scaling high	No code	50

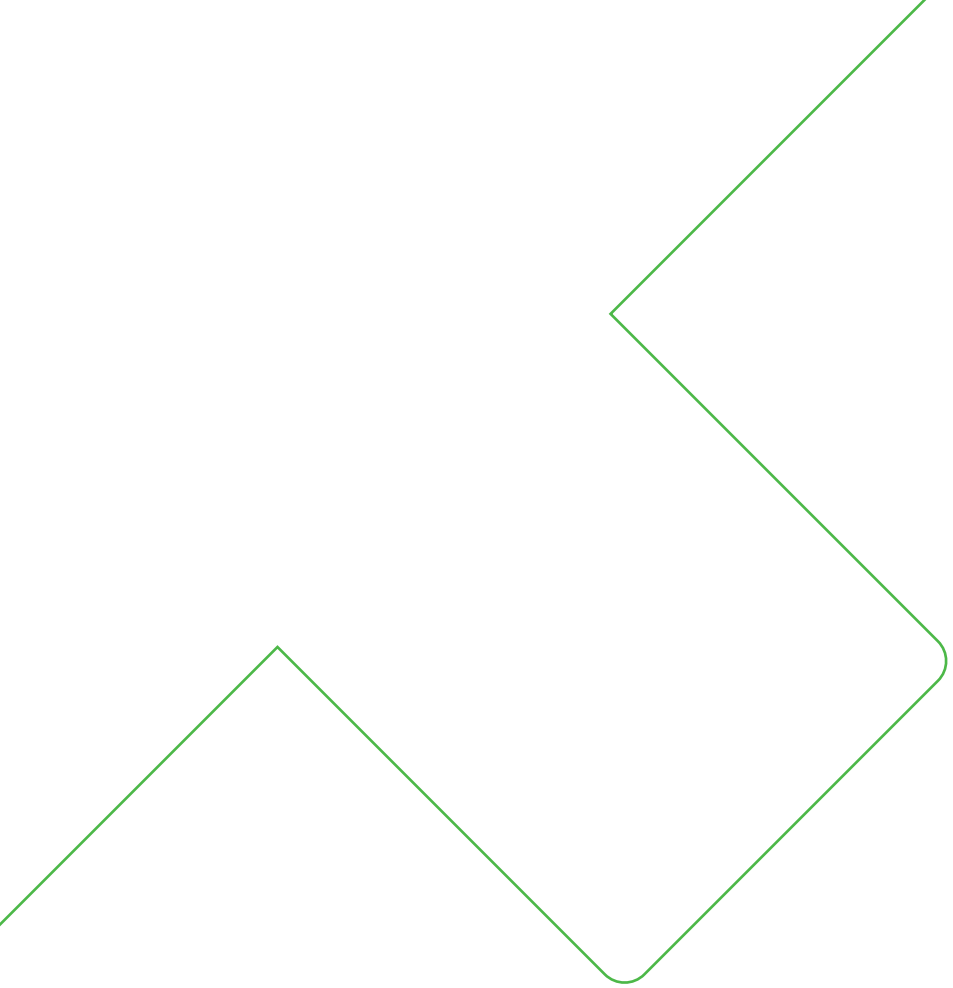
EE451-M7TP11

Feature	Code	Description
Model	M7	Passive
T sensor passive	TP11	NTC 10k, B3950

Accessories

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

Description	Code
USB configuration adapter for EE451 with analogue output	HA011023
USB-C configuration stick for EE451 with digital interface	HA011070
E+E Product Configuration Software for digital output (Free download: www.epluse.com/configurator)	EE-PCS
E+E Product Configuration Software for analogue output (Free download: www.epluse.com/pcs10)	PCS10
Power supply adapter	V03
Conduit Adapter, M16x1.5 auf 1/2"	HA011110



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