

# EE872

## Modular CO<sub>2</sub> Probe for Demanding Applications

The EE872 probe, with a measurement range up to 5 % CO<sub>2</sub> (50 000 ppm), is suitable for use even in harsh and demanding environment as in agriculture, life stock barns, hatchers, incubators or green houses.

### Outstanding Accuracy

A multi-point CO<sub>2</sub> and temperature (T) adjustment procedure leads to excellent CO<sub>2</sub> measurement accuracy over the entire T working range of -40...60 °C (-40...140 °F), which is ideal for agriculture or outdoor use.

### Long Term Stability

EE872 incorporates the E+E dual wavelength NDIR CO<sub>2</sub> sensor, which automatically compensates for ageing effects and is highly insensitive to pollution.

### Pressure and Temperature Compensation

The active compensation with on-board sensors leads to best CO<sub>2</sub> measurement accuracy independently of temperature, altitude or weather conditions.

### Interchangeable CO<sub>2</sub> Sensing Module

The modular design of the EE872 allows for easy replacement of the pluggable digital sensing unit.

### Reliable in Harsh and Condensing Environment

Due to its heated sensing module, the EE872 is suitable for high humidity and condensing environment. The IP65 enclosure and the replaceable filter offer excellent protection in polluted environment. With a special filter cap, the EE872 is also appropriate for applications with periodical H<sub>2</sub>O<sub>2</sub> sterilization.

### Analogue Output or RS485 Interface

The CO<sub>2</sub> measured data is available simultaneously on the analogue voltage and current outputs or on the RS485 interface with Modbus RTU protocol.

### User Configurable and Adjustable

The free EE-PCS Product Configuration Software together with an optional adapter cable facilitates the configuration and adjustment of the EE872.



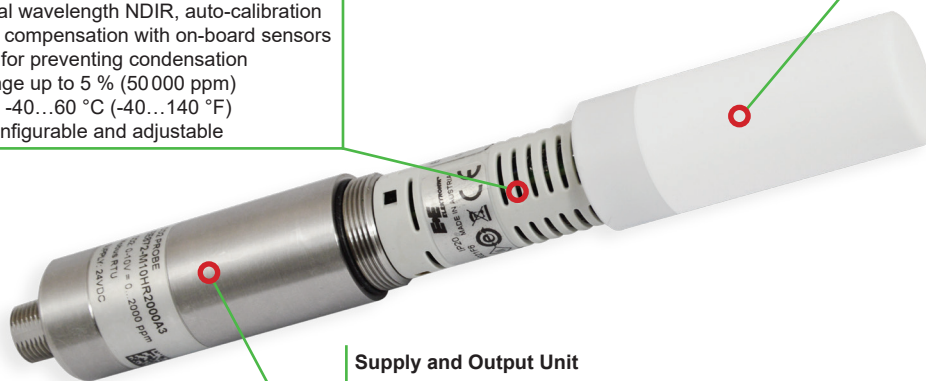
## Features

### CO<sub>2</sub> Sensing Module (replaceable)

- » Pluggable and interchangeable
- » E+E dual wavelength NDIR, auto-calibration
- » T and p compensation with on-board sensors
- » Heated for preventing condensation
- » CO<sub>2</sub> range up to 5 % (50 000 ppm)
- » T range -40...60 °C (-40...140 °F)
- » User configurable and adjustable

### Filter Cap

- » PTFE
- » Catalytic for H<sub>2</sub>O<sub>2</sub> sterilisation
- » Replaceable



### Supply and Output Unit

- » Voltage and current output
- » Modbus RTU
- » IP65 protection class
- » Stainless steel or plastic enclosure
- » M12 stainless steel connector
- » User configurable

### Test Report

- » According DIN EN 10204 - 2.2

## Technical Data

### Measurand

CO <sub>2</sub> measurement principle	Dual wavelength non dispersive infrared (NDIR)
Measurement range	0...2000 ppm: < ± (50 ppm + 2 % mv) <i>mv = of the measured value</i>
Accuracy at 25 °C (77 °F) and 1013 mbar (14,69 psi)	0...5000 ppm: < ± (50 ppm + 3 % mv) 0...10000 ppm: < ± (100 ppm + 5 % mv)
	0...3 %: < ± (1.5 % from full scale + 2 % mv)
	0...5 %: < ± (1.5 % from full scale + 2 % mv)
Response time $t_{63}^{1)}$	90 s
T dependency, typ. (-20...45 °C) (-4...113 °F)	± (1 + CO <sub>2</sub> concentration [ppm] / 1000) ppm/°C, for CO <sub>2</sub> <10000 ppm -0.3 % mv / °C, for CO <sub>2</sub> > 10000 ppm
Residual pressure dependency <sup>2)</sup> (-20...45 °C) (-4...113 °F)	0.014 % mv / mbar (ref. to 1013 mbar)
Measurement interval	15 s (user adjustable from 15 s to 1 h)
Long term stability, typ. at 0 ppm CO <sub>2</sub>	20 ppm / year

### Outputs

<b>Analogue</b>	0 - 5 V / 0 - 10 V 0 - 20 mA / 4 - 20 mA (3-wire)	-1 mA < I <sub>L</sub> < 1 mA R <sub>L</sub> ≤ 500 Ohm R <sub>L</sub> = load resistance
<b>Digital interface</b>	RS485, max. 32 unit load devices on one bus (EE872 = 1/10 unit load)	
Protocol	Modbus RTU	

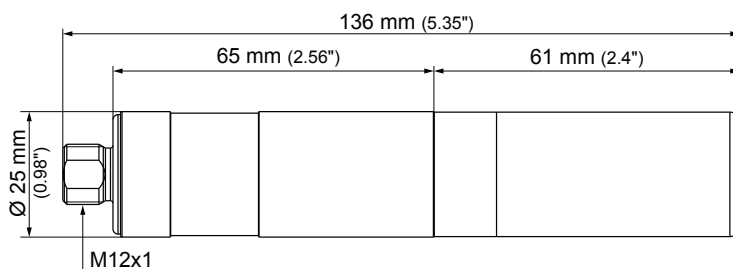
### General

Supply voltage	15 - 35 V DC for current output 12 - 30 V DC for voltage output and RS485 interface
Average current consumption at 12 V DC and 15 s measurement interval	45 mA for 20 mA output current 25 mA for voltage output and RS485 interface
Peak current	max. 200 mA
Enclosure material	plastic (PET), UL94HB approved or stainless steel 1.4404
Filter cap material	PTFE, UL94V-0 approved
Protection class	IP65
Electrical connection	M12 x 1, stainless steel 1.4404
Electromagnetic compatibility (Industrial environment)	EN61326-1 EN61326-2-3
Operating and storage conditions	-40...60 °C (-40...140 °F) 700...1100 mbar (10.15...15.95 psi) 0...100 % RH (operation, with enabled heating) 0...95 % RH non condensing (storage)



1) With data averaging algorithm for smooth output signal. Faster response time available upon request.  
2) The pressure dependency of a device without pressure compensation: 0.14 % mv / mbar.

## Dimensions (mm/inch)



## Ordering Guide

		EE872-
Hardware Configuration	Model	CO <sub>2</sub>
	CO <sub>2</sub> range	0...2000 ppm
		0...5000 ppm
		0...1 % (10000 ppm)
		0...3 % (30000 ppm)
0...5 % (50000 ppm)		
Probe material	plastic	
	stainless steel	
Filter	PTFE	
	H <sub>2</sub> O <sub>2</sub>	
Software Setup	Output <sup>1)</sup>	output 1: 0-10 V, output 2: 4-20 mA
		output 1: 0-5 V, output 2: 0-20 mA
		Modbus RTU <sup>2)</sup>
		M10
		HV1
		HV2
		HV3
		HV5
		HV6
		no code
		PM2
		no code
		F12
		GA7
		GA11
		P1

1) EE872 features simultaneously a voltage and a current output or RS485 interface with Modbus RTU protocol.

2) Factory setting: baud rate 9600, even parity, 1 stop bit Modbus map see User Guide at [www.epluse.com/ee872](http://www.epluse.com/ee872)

## Ordering Examples

### EE872-M10HV1GA7

Model: CO<sub>2</sub>  
 CO<sub>2</sub> range: 2000 ppm  
 Probe material: plastic  
 Filter: PTFE  
 Output: output 1: 0-10 V,  
 output 2: 4-20 mA

### EE872-M10HV6PM2F12P1

Model: CO<sub>2</sub>  
 CO<sub>2</sub> range: 0...5 %  
 Probe material: stainless steel  
 Filter: H<sub>2</sub>O<sub>2</sub>  
 Output: Modbus RTU  
 Baud rate: 9600  
 Parity: even  
 Stop bits: 1

## Ordering Guide EE872S Sensing Module (Spare Part)

		EE872S-
Model	CO <sub>2</sub>	M10
CO <sub>2</sub> range <sup>1)</sup>	0...2000 ppm	HV1
	0...5000 ppm	HV2
	0...1 % (10000 ppm)	HV3
	0...3 % (30000 ppm)	HV5
	0...5 % (50000 ppm)	HV6

1) The CO<sub>2</sub> range of the EE872S must be the same as of the original EE872 probe.

## Ordering Example Sensing Module

### EE872S-M10HV1

Model: CO<sub>2</sub>  
 CO<sub>2</sub> range: 2000 ppm

## Accessories (For further information see data sheet "Accessories")

Mounting flange	HA010226
Wall mounting clip Ø 25 mm	HA010227
M12x1 flanged coupling with 50 mm (1.97") stranded wire	HA010705
Modbus configuration adapter	HA011018
E+E Product Configuration Software (Download: <a href="http://www.epluse.com/Configurator">www.epluse.com/Configurator</a> )	EE-PCS
Connection cable M12 - flying leads (1.5 m (59.06") / 5 m (196.85") / 10 m (393.70"))	HA010819/20/21
T-coupler M12 - M12	HA030204
M12 cable connector for self assembly	HA010707
Protection cap / calibration adapter	HA010785
Protection cap for the M12 cable socket	HA010781
Protection cap for the M12 plug of EE872	HA010782