

EE850

CO₂, Humidity and Temperature Duct Sensor

The EE850 combines CO₂, relative humidity (RH) and temperature (T) measurement in an innovative enclosure. It is ideal for demand controlled ventilation and building automation. Due to the CO₂ measuring range up to 10000 ppm and T working range -20...60 °C (-4...140 °F), the EE850 can be employed also in demanding climate and process control.

Long Term Stability

The EE850 incorporates the E+E dual wavelength NDIR CO₂ sensor, which compensates for ageing effects, is highly insensitive to pollution and offers outstanding long term stability. The RH sensing element is protected against dust, dirt and corrosion by the E+E proprietary coating.

High Measurement Accuracy

A multiple point CO₂ and T factory adjustment procedure leads to excellent CO₂ measurement accuracy over the entire T working range.

Functional Design

Installed into a duct, a small amount of air flows through the divided probe to the CO₂ sensing cell located inside the transmitter enclosure and back into the duct. The RH and T sensing elements are placed inside the probe. The functional enclosure facilitates easy and fast mounting of the transmitter with closed cover.

Analogue, Digital and Passive T Outputs

The CO₂, RH and T measured data as well as the calculated dew point temperature (Td) are available on various analogue outputs. Additionally, the RS485 interface with Modbus RTU or BACnet MS/TP protocol supplies also other parameters such as absolute humidity (dv), mixing ration (r), water vapor partial pressure (e) or enthalpy (h).

Easy configuration and Adjustment

An optional adapter and the free EE-PCS configuration software facilitates the configuration and adjustment of the EE850.



Features

Service interface for configuration and adjustment

Appropriate for US mounting requirements
 » Knockout for 1/2" conduit fitting

External mounting holes
 » Easy and fast mounting with closed cover
 » Electronics protected against construction site pollution

Electronics
 » CO₂ autocalibration
 » Temperature compensation
 » Excellent resistance to pollution
 » Optimum protection against mechanical damage during installation

IP65 / NEMA 4 Enclosure

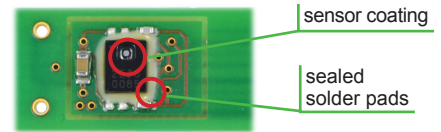
Bayonet screws
 » Open/closed with a 1/4 rotation

Test report
 » According DIN EN 10204 - 2.2

Protective Sensor Coating

The E+E proprietary sensor coating is a hygroscopic layer applied to the active surface of the RH sensing element. The coating extends substantially the life-time and the performance of the E+E sensor in corrosive environment.

Additionally, it improves the long term stability in dusty and dirty applications by preventing stray impedances caused by deposits on the active sensor surface.



EEH210 RH and T digital sensor, located inside the sensing probe.

Technical Data

Measurands

CO₂

Measurement principle	dual wavelength non-dispersive infrared technology (NDIR)
Measuring range	0...2000 / 5000 / 10000 ppm
Accuracy at 25 °C (77 °F) and 1013 mbar (14.7 psi)	0...2000 ppm: < ± (50 ppm +2% of measured value) 0...5000 ppm: < ± (50 ppm +3% of measured value) 0...10000 ppm: < ± (100 ppm +5% of measured value)
Response time t_{63}	< 100 seconds at 3 m/s (590 ft/min) air speed in the duct
Temperature dependency	typ. ± (1 + CO ₂ concentration [ppm] / 1000) ppm/°C, for -20...45 °C (-4...113 °F)
Calibration interval ¹⁾	> 5 years
Measuring interval	approx. 15 seconds

Temperature

Working range	-20...60 °C (-4...140 °F)
Accuracy at 20 °C (68 °F)	±0.3 °C (±0.54 °F)
Response time t_{63}	< 50 seconds

Relative Humidity


Working range	0...95 % RH
Accuracy at 20 °C (68 °F)	± 3 % RH (20...80 % RH)
Response time t_{63}	< 10 seconds

Outputs

Analogue

CO ₂ : 0...2000 / 5000 / 10000 ppm	0-5 V / 0-10 V 4-20 mA	-1 mA < I _L < 1 mA R _L < 500 Ohm
T scale: according ordering guide RH scale: 0...100 % RH	0 - 5 V / 0 - 10 V	-1 mA < I _L < 1 mA
Digital Interface Protocol	RS485 with max. 32 devices on one bus Modbus RTU or BACnet MS/TP	
Passive temperature, 2-wire Wire resistance (terminal - sensor)	T sensor type according ordering guide typ. 0.4 Ohm	

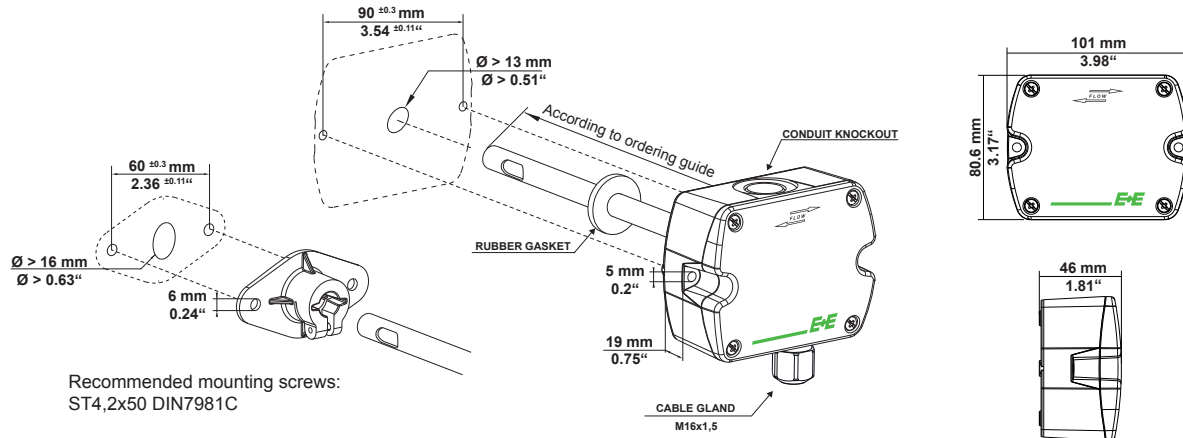
General

Power supply class III 	24 V AC/DC ± 20 % 15-35 V DC
Current consumption average peak	typ. 15 mA + output current max. 350 mA for 0.3 seconds
Minimum air speed in the duct	1 m/s (196 ft/min)
Enclosure material	polycarbonate, UL94V-0 approved
Protection class	enclosure: IP65 / NEMA 4 probe: IP20
Cable gland	M16 x 1.5
Electrical connection	screw terminals max. 2.5 mm ² (AWG 14)
Electromagnetic compatibility	EN61326-1 EN61326-2-3 Industrial Environment FCC Part 15 ICES-003 ClassB
Working and storage conditions	-20...60 °C (-4...140 °F) 0...95 % RH (non-condensing)

1) under normal operating conditions



Dimensions (mm/inch)



Ordering Guide

		EE850-			
		M10	M11	M12	
Hardware configuration	Model	CO ₂ CO ₂ + T CO ₂ + T + RH			
	CO ₂ range	0...2000 ppm	no code	no code	no code
		0...5000 ppm	HR5000	HR5000	HR5000
		0...10000 ppm	HR1	HR1	HR1
	Output	0-5 V	A2	A2	A2
		0-10 V	A3	A3	A3
4-20 mA		A6			
RS 485		J3	J3	J3	
T sensor passive ¹⁾	Pt1000A		TP3		
	NTC10k		TP5		
	Ni1000, TK6180		TP9		
Probe length	50 mm	L50	no code	no code	
	200 mm	no code	no code	no code	
Setup analogue outputs ¹⁾	Temperature	T [°C]		no code	no code
		T [°F]		MB2	MB2
	Scale T low	0		no code	no code
		value - within the range -20...60 °C (-4...140 °F)		SBL value	SBL value
	Scale T high	50		no code	no code
		value - within the range -20...60 °C (-4...140 °F)		SBH value	SBH value
	Relative humidity / dew point	RH [%]			no code
		Td [°C]			MC52
		Td [°F]			MC53
Scale RH/Td low	0			no code	
	value - for Td: within the range -20...60 °C (-4...140 °F)			SCL value	
Scale RH/Td high	100			no code	
	value - for Td: within the range -20...60 °C (-4...140 °F)			SCH value	
Setup RS485 ⁵⁾	Protocol	Modbus RTU ²⁾	P1	P1	P1
		BACnet MS/TP ³⁾	P3	P3	P3
	Baud rate	9600	BD5	BD5	BD5
		19200	BD6	BD6	BD6
		38400	BD7	BD7	BD7
		57600 ⁴⁾	BD8	BD8	BD8
76800 ⁴⁾	BD9	BD9	BD9		

1) Not with RS485 output (J3) / T-Sensor details see www.epluse.com/R-T_Characteristics.

2) Factory setting: Even Parity, Stopbits 1; Modbus Map and communication setting: See User Guide and Modbus Application Note at www.epluse.com/ee850.

3) Factory setting: No Parity, Stopbits 1; Product Implementation Conformance Statement (PICS) available at www.epluse.com/ee850.

4) Only for BACnet MS/TP.

5) Not with analogue output A2, A3 and A6.

Ordering Examples

EE850-M12HR5000A3MB2SBL32SBH140

Model: CO₂ + T + RH
 CO₂ range: 0...5000 ppm
 Output: 0-10 V
 Probe length: 200 mm
 Temperature: T [°F]
 Scale T low: 32 °F
 Scale T high: 140 °F
 RH/Td: RH [%]
 Scale RH low: 0 %
 Scale RH high: 100 %

EE850-M10A6L50

Model: CO₂
 CO₂ range: 0...2000 ppm
 Output: 4-20 mA
 Probe length: 50 mm

EE850-M12HR1J3P1BD6

Model: CO₂ + T + RH
 CO₂ range: 0...10000 ppm
 Output: RS485
 Probe length: 200 mm
 Protocol: Modbus RTU
 Baud rate: 19200
 Unit: metric-SI

Accessories (see data sheet „Accessories“)

Configuration adapter cable
 E+E Product configuration software
 Power supply adapter

HA011066
 EE-PCS (free download: www.epluse.com/ee850)
 V03

Support Literature

www.epluse.com/ee850