EE850

CO_2, Humidity and Temperature Duct Sensor

The EE850 combines CO_2, relative humidity (RH) and temperature (T) measurement in an innovative enclosure. It is ideal for demand controlled ventilation and building automation. Due to the CO_2 measuring range up to 10 000 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 CO_2 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 CO_2 and T factory adjustment procedure leads to excellent CO_2 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 CO_2 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.

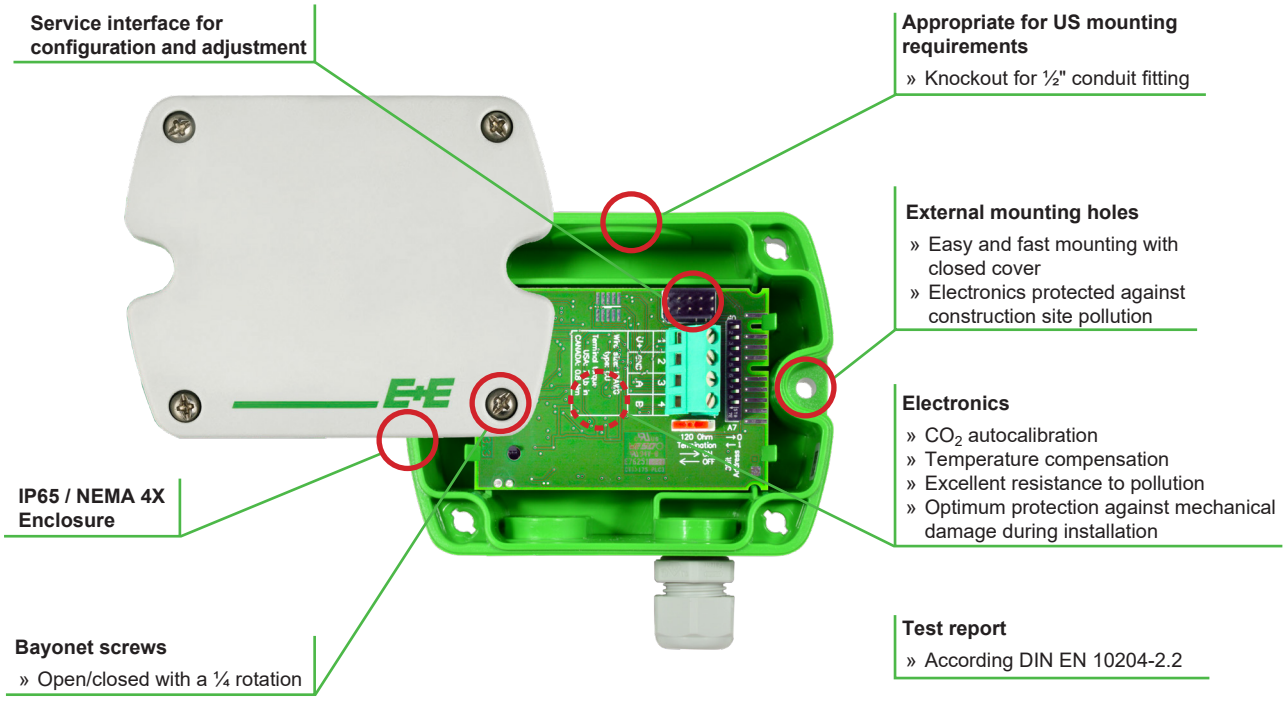
Analogue, Digital and Passive T Outputs

The CO_2, 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 ratio (r), water vapor partial pressure (e) or enthalpy (h).

Easy configuration and Adjustment

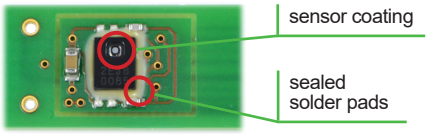
An optional adapter and the free EE-PCS configuration software facilitate the configuration and adjustment of the EE850.

Features



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

CO_2		
Measurement principle	Dual wavelength non-dispersive infrared technology (NDIR)	
Measuring range	0...2 000 / 10 000 ppm	
Accuracy at 25 °C (77 °F)	0...2 000 ppm:	< ± (50 ppm + 2% of measured value)
and 1013 mbar (14.7 psi)	0...10 000 ppm:	< ± (100 ppm + 5% of measured value)
Response time t_{63}	< 100 s at 3 m/s (590 ft/min) air speed in the duct	
Temperature dependency, typ.	± (1 + CO_2 concentration [ppm] / 1 000) ppm/°C, for -20...45 °C (-4...113 °F)	
Calibration interval[1)]	> 5 years	
Measuring interval	Approx. 15 s	
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 s	
Relative Humidity		
Working range	0...95 %RH	
Accuracy at 20 °C (68 °F)	± 3 %RH (20...80 %RH)	
Response time t_{63}	< 10 s	

Outputs

Analogue		
CO_2: 0...2000 / 10000 ppm	0 - 10 V	-1 mA < I_L < 1 mA
	4 - 20 mA	R_L < 500 Ohm
T scale: according ordering guide **RH** scale: 0...100 %RH	0 - 10 V	-1 mA < I_L < 1 mA
Digital Interface Protocol	RS485 (EE850 = 1/10 unit load) Modbus RTU or BACnet MS/TP	
Passive temperature, 2-wire	T sensor type according ordering guide	
Wire resistance (terminal - sensor), typ.	0.4 Ohm	

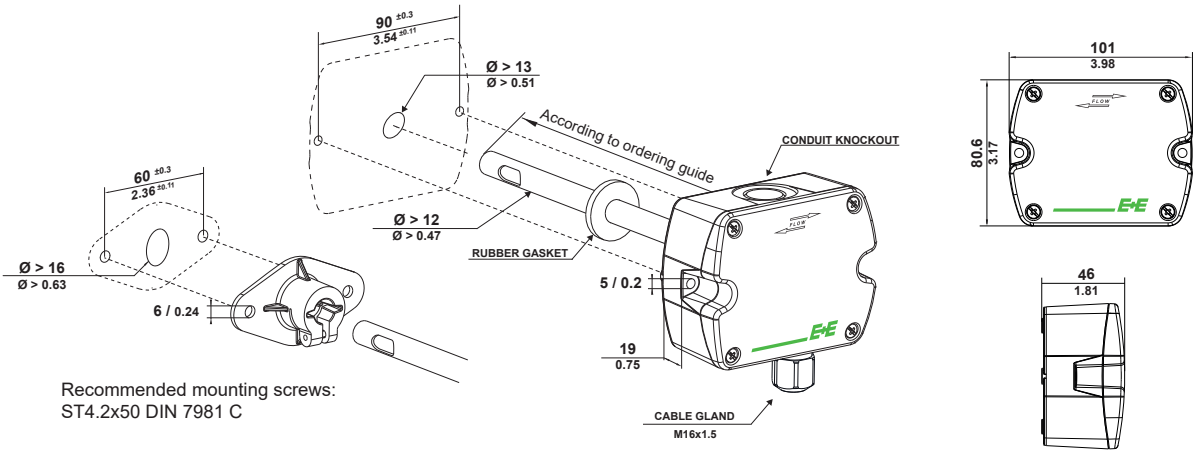
General

Power supply class III [2)]	24 V AC ± 20 %	15 - 35 V DC
Current consumption, typ.	typ. 15 mA + output current	
Current peak, max.	350 mA for 0.3 s (analogue output) 150 mA for 0.3 s (RS485 interface)	
Minimum air speed in the duct	1 m/s (196 ft/min)	
Enclosure material	Polycarbonate, UL94V-0 approved	
Protection rating	Enclosure: IP65 / NEMA 4X Probe: IP20	
Cable gland	M16 x 1.5	
Electrical connection	Screw terminals max. 2.5 mm² (AWG 14)	
Electromagnetic compatibility	EN 61326-1 EN 61326-2-3 Industrial Environment FCC Part 15 ICES-003 Class B	UK CA CE
Working and storage conditions	-20...60 °C (-4...140 °F)	0...95 %RH (non-condensing)

1) under normal operating conditions
2) USA & Canada class 2 supply required, max. supply voltage 30 V DC

Dimensions

Values in mm / inch



Recommended mounting screws:
ST4.2x50 DIN 7981 C

Ordering Guide

			EE850-		
Hardware configuration	**Model**	CO_2	M10		
		CO_2 + T		M11	
		CO_2 + T + RH			M12
	CO_2 range	0...2 000 ppm		HV1	
		0...10 000 ppm		HV3	
	Analogue output	0-10 V	A3	A3	A3
		4-20 mA	A6		
		RS 485	J3	J3	J3
	T sensor passive[1]	none		no code	
		Pt1000A		TP3	
	Probe length	50 mm	L50		
		200 mm	no code	no code	no code
Setup analgoue 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	
		BACnet MS/TP[3]		P3	
	Baud rate	9600		BD5	
		19200		BD6	
		38400		BD7	
		57600[4]		BD8	
		76800[4]		BD9	
		115200[4]		BD10	

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) Product Implementation Conformance Statement (PICS) available at www.epluse.com/ee850.
4) Only for BACnet MS/TP.
5) Not with analogue output A3 and A6.

Ordering Examples

EE850-M12HV1A3MB2SBL32SBH140

Model:	CO_2 + T + RH
CO_2 range:	0...2 000 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-M10HV1A6L50

Model:	CO_2
CO_2 range:	0...2 000 ppm
Output:	4 - 20 mA
Probe length:	50 mm

EE850-M12HV3J3P1BD6

Model:	CO_2 + T + RH
CO_2 range:	0...10 000 ppm
Output:	RS485
Probe length:	200 mm
Protocol:	Modbus RTU
Baud rate:	19 200

Accessories

(for further information, see data sheet “Accessories“)

Configuration adapter cable	HA011066
E+E Product configuration software (free download: www.epluse.com/ee850)	EE-PCS
Power supply adapter	V03

Support Literature

www.epluse.com/ee850