EE850

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 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 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 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**

- **Service interface for configuration and adjustment**
- **Appropriate for US mounting requirements**
  - Knockout for ¼" 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 ¼ rotation
- **Test report**
  - According DIN EN 10204 - 2.2

The EE850 is a CO₂, Humidity and Temperature Duct Sensor suitable for various applications including demand controlled ventilation and building automation.
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.

Technical Data

**Measurands**

**CO₂**
- Measurement principle: dual wavelength non-dispersive infrared technology (NDIR)
- Measuring range:
  - 0...2000 ppm
  - 0...5000 ppm
  - 0...10000 ppm
- Accuracy at 25 °C (77 °F):
  - 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 t₆₃ < 100 seconds at 3 m/s (590 ft/min) air speed in the duct
- Temperature dependency, typ.:
  - ± (1 + CO₂ concentration [ppm] / 1000) ppm/°C, for -20...45 °C (-4...113 °F)

**Temperature**
- Working range: -20...60 °C (-4...140 °F)
- Accuracy at 20 °C (68 °F): ±0.3 °C (±0.54 °F)
- Response time t₆₃ < 50 seconds

**Relative Humidity**
- Working range: 0...95 % RH
- Accuracy at 20 °C (68 °F): ± 3 % RH (20...80 % RH)
- Response time t₆₃ < 10 seconds

**Outputs**

**Analogue**
- CO₂: 0...2000 / 5000 / 10000 ppm
- R₉ < 500 Ohm
- T scale: according ordering guide
- RH scale: 0...100 % RH
- Digital Interface:
  - RS485 with max. 32 devices on one bus
  - 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: 24 V AC ± 20 % 15-35 V DC
- Current consumption, typ.:
  - typ. 15 mA + output current
- Current peak, max.:
  - 350 mA for 0.3 seconds (analogue output)
  - 150 mA for 0.3 seconds (RS485 interface)
- 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 mm² (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
**Ordering Guide**

<table>
<thead>
<tr>
<th>Model</th>
<th>EE850-</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂</td>
<td>M10</td>
</tr>
<tr>
<td>CO₂ + T</td>
<td>HV1</td>
</tr>
<tr>
<td>CO₂ + T + RH</td>
<td>HV2</td>
</tr>
<tr>
<td>CO₂ range</td>
<td>0...2000 ppm</td>
</tr>
<tr>
<td>Output</td>
<td>0-5 V</td>
</tr>
<tr>
<td></td>
<td>0-10 V</td>
</tr>
<tr>
<td></td>
<td>4-20 mA</td>
</tr>
<tr>
<td></td>
<td>RS 485</td>
</tr>
<tr>
<td>T sensor passive 1)</td>
<td>none</td>
</tr>
<tr>
<td>Probe length</td>
<td>50 mm</td>
</tr>
<tr>
<td>Temperature</td>
<td>T [°C]</td>
</tr>
<tr>
<td></td>
<td>T [°F]</td>
</tr>
<tr>
<td>Scale T low</td>
<td>0 value - within the range -20...60 °C (-4...140 °F)</td>
</tr>
<tr>
<td>Scale T high</td>
<td>50 value - within the range -20...60 °C (-4...140 °F)</td>
</tr>
<tr>
<td>Relative humidity / dew point</td>
<td>RH [%]</td>
</tr>
<tr>
<td></td>
<td>Td [°C]</td>
</tr>
<tr>
<td></td>
<td>Td [°F]</td>
</tr>
<tr>
<td>Scale RH/Td low</td>
<td>0 value - for Td: within the range -20...60 °C (-4...140 °F)</td>
</tr>
<tr>
<td>Scale RH/Td high</td>
<td>100 value - for Td: within the range -20...60 °C (-4...140 °F)</td>
</tr>
<tr>
<td>Protocol</td>
<td>Modbus RTU 2)</td>
</tr>
<tr>
<td></td>
<td>BACnet MS/TP 3)</td>
</tr>
<tr>
<td>Baud rate</td>
<td>9600</td>
</tr>
<tr>
<td></td>
<td>19200</td>
</tr>
<tr>
<td></td>
<td>38400</td>
</tr>
<tr>
<td></td>
<td>57600 4)</td>
</tr>
<tr>
<td></td>
<td>76800 4)</td>
</tr>
</tbody>
</table>

1) Not with RS485 output (J3) / T-Sensor details see www.epluse.com/R-T_Characteristics.
4) Only for BACnet MS/TP.
5) Not with analogue output A2, A3 and A6.
Ordering Examples

EE850-M12HV2A3MB2SBL32SBH140
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-M10HV1A6L50
Model: CO₂
CO₂ range: 0...2000 ppm
Output: 4-20 mA
Probe length: 50 mm

EE850-M12HV3J3P1BD6
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

Support Literature
www.epluse.com/ee850