

EE80 CO₂ + Temp Transmitter (With Humidity Option)

Key Features

- Maintenance free, internal self-calibration feature utilizing a unique dual source approach.
- Accurate On-board Temperature and Humidity Measurement Option in wall Mount Units (EE80).
- Case features an easily installed sub base with snap on cover for easy installation and replacement (EE80).
- Duct sampling probe can easily be inserted to a depth of up to 8".
- Options for 0-5V, 0-10V or 4-20mA outputs.

Overview

EE80 Wall Mount: The EE80 is a quality designed and manufactured sensor (ISO9001) that can incorporate CO₂, temperature and humidity measurement in a single device. Most other CO₂ sensors are unable to measure temperature and humidity in the same device because of the heat produced by the infrared sensor used to measure CO₂. The EE80 eliminates this heat interference by reducing the flash rate of the incandescent light source inside the sensor (which significantly reduces heat production).

All EE80 sensors incorporate temperature measurement with the option of adding relative humidity measurement at the time of purchase or as an accessory to be added later.

The EE80 is available with 0-5, 0-10 and 4-20 mA outputs (output requirement must be specified at time of order). Measurement ranges of 0-2,000 ppm or 0-5,000 ppm are also available.



EE85 Duct Mount: The EE85 utilizes the same sensing element incorporated in the EE80, packaged into an aspiration probe design. The duct probe is designed to only measure CO₂. Like the EE80, units can be order with one of three output options (0-5V, 0-10V or 4-20 mA) and one of two measurement ranges (0-2000 ppm or 0-5000 ppm).

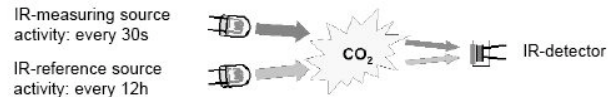
The EE85 features a mounting flange that can be secured to the outer duct wall and allows for the adjustment of the sampling depth of the sensor.



Self-Calibration Feature

The EE80 and EE85 are designed to be self-calibrating and have no external means of adjustment. Aging of the infrared light source is the primary source of sensor drift in all CO₂ Sensors. Generally, the most significant drift occurs over the first few months of use.

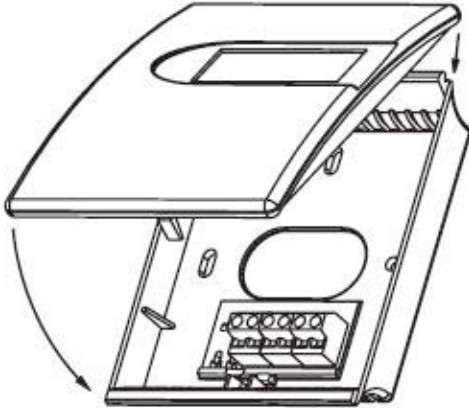
The EE80 utilizes a dual light source approach to compensate for sensor drift. The primary light source in the EE80, that is used to derive the CO₂ measurement flashes once every 30 seconds. This is in contrast to most other commercially available CO₂ sensors that flash every 2 to 5 seconds. By reducing the duty cycle or flash rate like this, the amount of drift is reduced.



The second bulb in the sensor is flashed every 12 hours and is used as a reference value. Because this bulb is flashed so infrequently, the drift has been calculated as negligible. As a result the sensor adjusts its calibration on an ongoing basis, based on the signal provided by the reference light source. Before being installed in the product the light bulbs are also aged to characterize their stability and to burn out the most significant drift. The product is rated for a 15 year life and should not require calibration over that period.

EE80 Wall Mount Installation

The EE80 is provided with mounting screws and countersinks to allow easy mounting to any type of wall surface. If mounted on a US type single gang electrical J box, the EE80 will not cover the box and a back plate will be necessary (*Available from AirTest Technologies 888-855-8880*).



Steps:

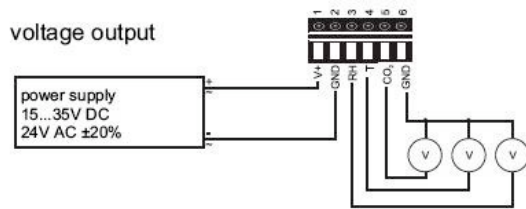
1. Remove the sensor from the packaging and note that a template is provide in the box for positioning mounting screws on the wall.
2. Using the template described above, mark, drill and install countersinks to mount the transmitter where power and signal wiring will be located.

If mounting to a existing single gang electrical box, mount the back plate (ordered separately) on the electrical box. Prior to mounting the back plate, caulk and seal any openings in the box, including conduit to insure air and CO₂ from inside the wall will not affect the sensor readings.

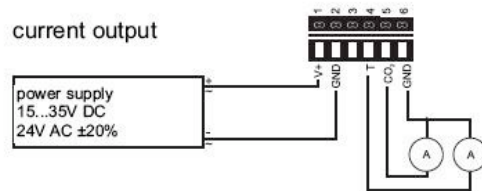
3. Separate the cover of the sensor from the sub base by depressing the white tab located on the bottom-center of the enclosure. The transmitter cover will hinge open from the top.
4. Double check the label on the inside of the cover plate to ensure the sensor has the measurement range, output and temperature units °F or °C you are expecting.
5. Affix the sub base to the wall using the screws provided and countersinks already installed in the wall. Make sure wires are pulled through the pulled through the wiring hole in the sub-base.
6. Attach the appropriate wires to the terminals marked on the sub base.
7. Place the cover on the sub base by hinging the top of the cover on the top of the sub base and the press down. The connection pins in the cover should seat in the terminal blocks on the sub base.

EE80 Wiring

voltage output



current output



EE80 Commissioning

For commissioning purposes it is recommended that the sensor be compared to a recently calibrated handheld unit such as the PT9250 from AirTest Technologies Inc.

Link: <http://www.airtesttechnologies.com>

The hand held unit should be turned on for at least 15 minutes before the measurement. The EE80 should also have been powered up for at least 15 minutes. Ideally the space should have minimal occupancy prior to and during the commissioning process (to avoid transitions and spikes in CO₂ readings).

Place or hold the hand held CO₂ monitor near the sensor for a period of 10 minutes or until the readings on the hand held have appeared to stabilized. Be careful not to breathe in the vicinity of the sensor.

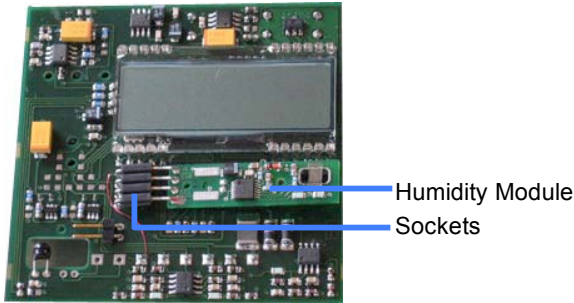
Adding Humidity Measurement Capability

It is possible to add humidity measurement capability in the field to an EE80 that previously only measured CO₂ and temperature. Note: the analog output will have the same characteristics as the CO₂ and Temperature output (e.g. 0-5V, 0-10V or 4-20mA). The humidity plug in module is part no HA011003 and includes a plug in humidity sensor and additional output terminal that must be installed on the sub base.

Steps:

1. When handling any electrical components make sure you are grounded using a grounding wrist strap or other method.
2. Separate the EE80 cover from the base and then using a screwdriver, carefully remove the circuit board from the cover plate by separating the board from the retainer tabs on either side of the circuit board. Turn the board over so that the black CO₂ sensing element and connection pins are facing downwards
3. Remove the protective tape from the back of the humidity module to reveal the adhesive coating.

4. Plug the four-pin humidity module into the sockets located on the lower half of the board with the adhesive side of the module facing the board.
5. Once the module pins are seated in the sockets, press the module into the board so that the adhesive will secure the module in place.



6. Reinstall the board into the EE 80 cover ensuring that the humidity sensor side is facing the front of the cover.
7. Install the additional output terminal strip in the sub-base of the EE80 by inserting the top of the terminal strip edge into the slit at position 3, ensuring it is flush to the existing terminal strip. Press down on the terminal strip until it snaps into the lower terminal strip retainer.
8. Check to ensure the new terminal strip will align with the connection pins on the cover of the EE80.

EE 80 Maintenance

There are no user serviceable or user adjustable components on the sensor. Given the unit incorporates the dual source, self-calibration method described previously, no calibration adjustment should be required for the life of the sensor.

A good check ongoing check of CO₂ sensor accuracy is to monitor readings through the building control system and determine if consistent baseline levels are occurring on nights and weekends. Some building owners actually check their CO₂ readings during an intentional purge or economizer cycle where it can be assured that inside levels will be similar to outside levels.

If a sensor appears to be out of calibration use the commissioning process described above to check the transmitter. If it is felt that some adjustment is necessary to the unit, a calibration offset can be applied at the building control system to represent the difference in readings between a handheld measurement and the transmitter. In most cases this should not be required.

EE80 Troubleshooting

The EE80 incorporates a self-diagnostic features that will put the sensor into a fault mode if a malfunction is detected. A fault mode occurs when a minimum or maximum value is indicated on the output. If the unit malfunctions it must be replaced, as there are no user serviceable parts in the transmitter.

EE80 Specifications

Carbon Dioxide

Measurement Principle: Non-Dispersive Infrared Technology (NDIR)_Sensor E+E Dual Source Infrared System

Working range: 0 – 2000 ppm, 0 – 5000 ppm

Accuracy at 20°C (68°F) and 1013mbar: 0 2000ppm:

Response time t_{90} : < 90 sec

Temperature dependence: typ. 2ppm CO₂ /°C

Long term stability: typ.20 ppm/yr

Sample rate: ca. 0.5 min

Relative Humidity (only for versions with voltage output)

Measurement principle: capacitive

Sensor element: HC103

Working range: 10 ... 90% RH

Accuracy at 20°C (68°F): ±3% RH (30 ... 70% RH)

±5% (10 ... 90% RH)

Temperature

Accuracy at 20°C (68°F): ±0.3°C (±0.54°F), current output version ±0.7°C(1.26°F)

Outputs

0...2,000/5000ppm/ 0-100% RH/ 0-50°C (32...120°F):
0-5V (-1mA < I_L < 1mA), 0-10V (-1mA < I_L < 1mA), 4-20 mA (R_L < 5—Ohm)

General

Supply Voltage SELV: 24 VAC±20% or 15-35VDC

Power Requirements: < 3 W

Warm up time: < 5 minutes

Display: LCD Display alternating CO₂ ppm / T (°C or °F) / RH (%RH)

Electrical Connection: screw terminal max 1.5 mm (AWG16)

Working Temperature Range: 0-90% RH (non condensing)/ -5 to 55°C (23 to 131°F)

Storage Temperature Range: 0-90% RH (non condensing)/ -20 to 60°C (-4 to 140°F)

Models

Format: EE80-Range-Model-Output-Display-TUnit-TScale
Example: **EE80-CT-2-D04-E01**

Range Options:

- 2 – 0-2000 ppm
- 5 – 0-5000 ppm

Model Options:

- CT – CO₂ and Temperature
- CTF – CO₂, Temperature and Humidity
- Note: Humidity not available with 4-20mA Output

Output Options:

- 2 - 0-5 V
- 3 - 0-10 V
- 5 – 4-20 mA

Display Options:

- " " - No Display (blank)
- D04 - Display

TUnit Options(Temperature Units):

- " " - °C (blank)
- E01 - °F

TScale Options:

- " " - 0-50°C (32-122°F) or
- Specify

Warranty

The EE80 is warranted against defects in material or workmanship for a period of two years from date of purchase. The warranty does not cover calibration drift, use beyond the stated specifications or mishandling resulting in damage to the unit.

If you believe an EE80 has a defect in workmanship, contact AirTest Technologies to describe your problem to determine if it qualifies for replacement (604 517-3888). Replacement units may be factory-reconditioned units.

Do not send units requiring repair or replacement to AirTest without first obtaining an RMA number. Packages received without a RMA number will be returned to the sender unopened.

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