

Installing the Sensor

!WARNING!

Before performing service or maintenance operations on the systems, turn OFF main power switches to the unit. Electric shock can cause personal injury. Please read and follow the wiring instructions precisely; miswiring may cause permanent damage to the product.

Basic Installation

1. Separate the case into its front and rear sections.
2. Secure the rear section of the case to the wall or junction box using the supplied screws, and make necessary wire connections.
3. Select Voltage or Current output option and Voltage range (0-10 V or 0-5 V) using the SW1 as shown on the internal label (Figure 1) and Table 1.

Note: SW1 controls both CO₂ and Temperature outputs simultaneously.

Factory default setting is Voltage outputs 0-10V.

Table: 1
Voltage and Current Output Options

Switch #1	Switch #2	Configuration
Down, Low	Down, Low	Factory default setting CO ₂ 0-10 V / 0 - 2000 ppm Temperature 0-10 V/ 0 - 50 °C
Up, High	Up, High	CO ₂ 0-5V/ 0 - 2000 ppm Temperature 0-5 V/ 0 - 50°C
Down, Low	Down, Low	CO ₂ 4-20 mA/ 0 - 2000 ppm Temperature 4-20 mA/ 0 - 50°C
Up, High	Up, High	RESERVED

4. Mount the Controller on the base by aligning the top clips and then securing to the bottom clips. Secure the Ventostat with the supplied set screw. A one-minute stabilization warm up will take place.

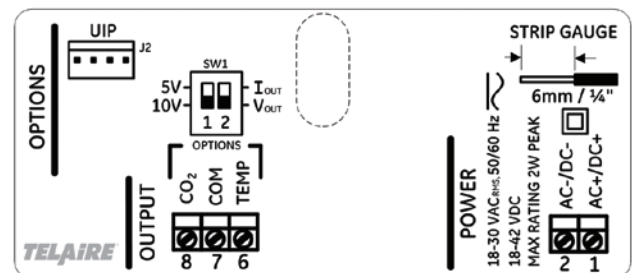
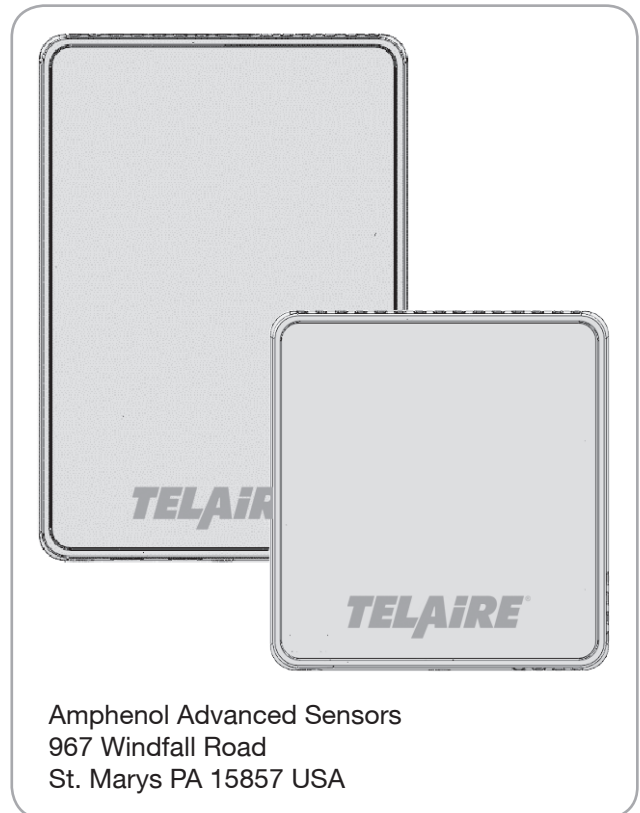


Figure 1: Internal Label

Amphenol

Advanced Sensors

T5100 Wiring Diagrams

!WARNING!

T5100-LED products have two terminal pins that are connected inside the sensor to a common/ground: pin #7 on the I/O terminal blocks and pin #2 on the power block. Do NOT connect positive (hot) 24 VAC power line to terminal number #2 of the terminal block.

Caution!

The T5100-LED products are either 3-wire or 4-wire type configurations, powered by either AC or DC voltage. They are not 2-wire or loop-powered devices. Wiring the units as 2-wire or loop-powered devices will irreparably damage the sensors and void the warranty.

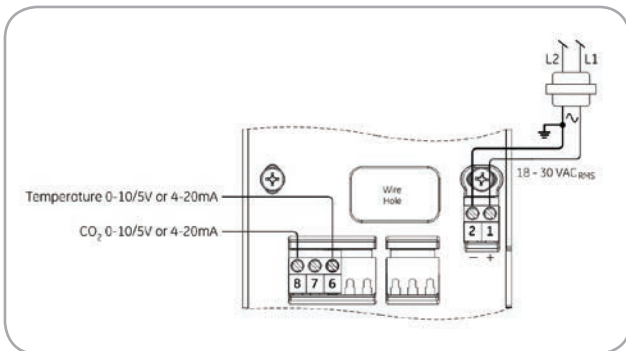


Figure 2: Wiring for 3-Wire System AC Power

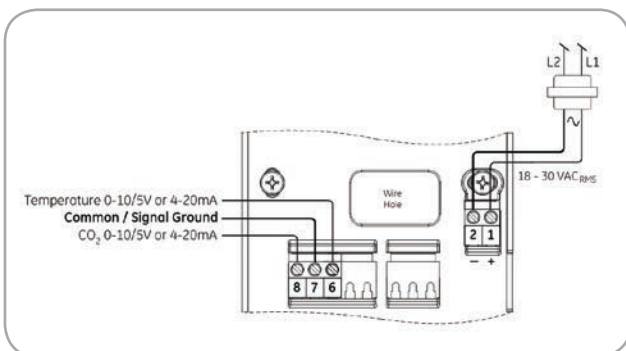


Figure 3: Wiring for 4-Wire System AC Power

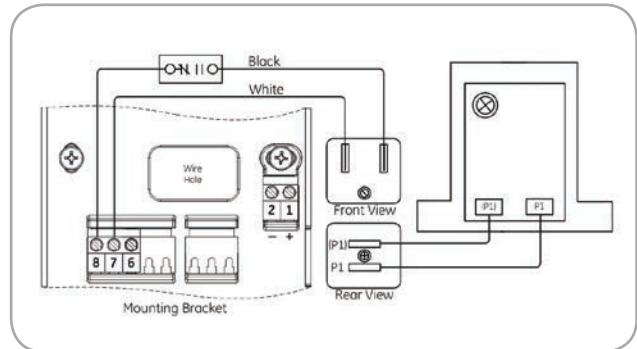


Figure 4: Wiring for CO₂ Sensor Voltage Output

LED Display

The T5100-LED has a 5-color LED display that shows the approximate CO₂ concentration. From left to right, the display shows:

- Blue <800 ppm
- Green 800-1200 ppm
- Yellow 1200-1500 ppm
- Red >1500 ppm
- Two red >2000 ppm

Sensing Duct CO₂ Concentrations

Duct-Mounting the Enclosures

T5100-LED products can be installed inside the return air ductwork, if needed. As an alternative, please consider the T8031 unit. When mounting these products inside the ductwork, seal the hole around the wires and leave the duct insulation in place to prevent condensation which may damage the sensor.

Accessory Enclosures

Model T1508

Duct Mount Enclosure (Aspiration Box)

The T5100 units can be installed inside a Model 1508 Duct Mount Enclosure.

Model T1552

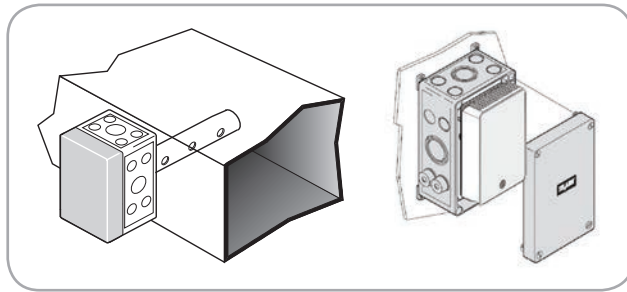
Outside Air Measurement Enclosure

This NEMA-3R weatherproof enclosure includes thermostat and allows installing the sensor in environments with temperatures down to -40°F.

Model T1505

Harsh Environment Enclosure

For extreme environments where the sensor might be subjected to condensation or water spray such as those found in greenhouses or breweries- NEMA-3R rated.



T5100-LED Specifications

CO₂ Sensing Method

Non-dispersive infrared (NDIR) absorption
Gold-plated optics
Patented ABC Logic self calibration algorithm

CO₂ Measurement Range

T5100-LED - Single Channel: 0 to 2000 ppm (0 ppm = 0 V, 4 mA)

CO₂ Accuracy

±30 ppm or 3% of reading, whichever is higher*

*CO₂ accuracy statement excludes standard gas used for calibration that has an accuracy of 2%. In addition, there is a potential digital to analog error of up to 1%.

CO₂ Temperature Dependence

0.2% FS per °C (±0.11% per °F)

CO₂ Pressure Dependence

0.135% of reading per mm Hg

CO₂ Stability

T5100-LED - Single Channel
<2% of FS over life of sensor (15 years)**

CO₂ Warm-up Time

< 2 minutes (operational)
10 minutes (maximum accuracy)

Temperature Measurement Range

0-50°C (32-122°F)

Temperature Accuracy

±1°C from 15 to 30°C (±1.8°F from 59 to 86°F)

Outputs

Analog outputs for CO₂ and Temperature

0 to 5 V, or 0 to 10 V switch selectable (100 output impedance) Or 4 to 20 mA (RL maximum 500)
Voltage and current outputs are not available simultaneously Digital to analog error ±2%

Outputs Update Rate

Every 5 seconds

Power Supply Requirements

18-30 VAC RMS, 50/60 Hz, or 18 to 42 VDC, polarity protected

Power Consumption

Typical 0.7 W at nominal voltage of 24V AC RMS

Operating Conditions

0°C to 50°C (32°F to 122°F)
0 to 95% RH, non-condensing

Storage Conditions

-40°C to 70°C (-40°F to 158°F)

Flammability Classification

UL94 5VA

Certifications

CE, RoHS and REACH compliant

Accessory Enclosures (cont.)

ABC Logic™ Self Calibration System

ABC Logic™ (Automatic Background Calibration) self calibration allows the sensor to continually re-calibrate itself when the indoor concentrations drop to outside levels while the building is unoccupied. Generally a building must be regularly unoccupied for 4 hours or more for this self-calibration system to operate properly. Under these conditions, ABC Logic™ should maintain sensor calibration over the lifetime of the sensor. The ABC Logic™ should be turned OFF where a building is continuously occupied 24 hours per day, or where there could be significant sources of non-occupant related CO₂ such as greenhouses, breweries and other industrial and food processing applications.

Warranty / Other

18 months parts and labor

This product is covered by one or more of the following patents:

5,650,624 / 5,721,430 / 5,444,249 / 5,747,808 /
5,834,777 / 5,163,332 / 5,340,986 / 5,502,308 /
6,344,798 / 6,023,069 / 5,370,114 / 5,601,079 /
5,691,704 / 5,767,776 / 5,966,077 / 6,107,925 /
5,798,700 / 5,945,924 / 5,592,147 / 6,255,653 /
6,250,133 / 6,285,290

Warranty Repairs

Telaire will repair any product that fails to meet the terms provided for in the Return and Warranty Policy Statement. Warranty period shall start from date of manufacture and be based on product category and type of equipment as specified in Table 1: Product Warranty Periods. For all warranty repairs, Telaire will bear all product repair parts, labor, and standard ground shipping charges.

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