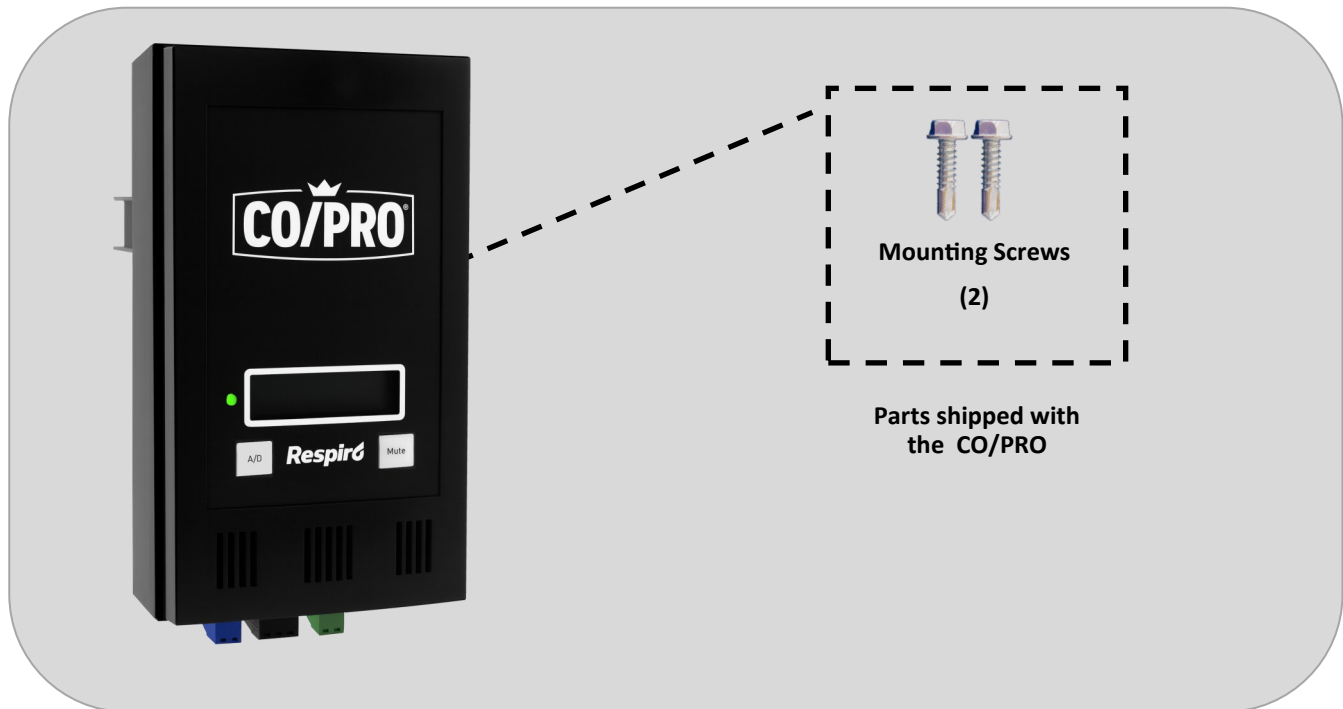


# CO/PRO<sup>®</sup>

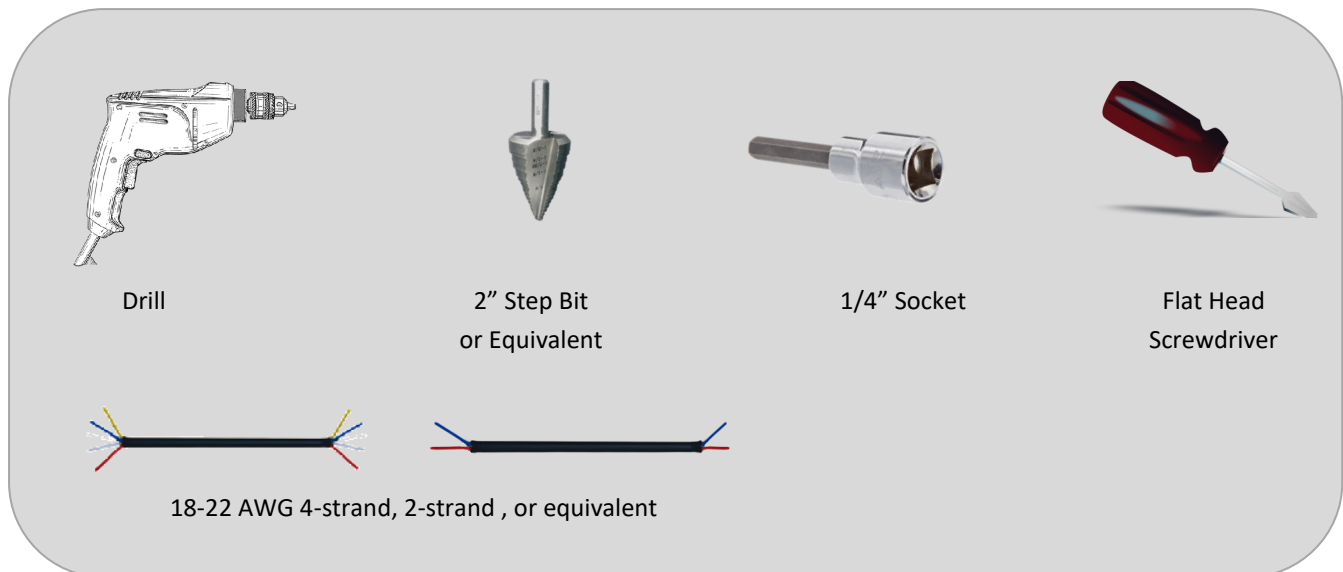
## Installation Guide

The latest installation guides can be found on the Resources page on the Respiro-USA.com website.

### A. Included Parts



### B. Necessary Tools—Not Included



## CO/PRO—General Information/Intended Use

The CO/PRO attaches to furnaces and water heaters and turns them off when 25 ppm of carbon monoxide (CO) is detected.

- There can be multiple sources for carbon monoxide inside a home. The CO/PRO is NOT a replacement for, nor does it supersede, a state's requirement for carbon monoxide detectors.
- The CO/PRO only monitors appliances for the presence of carbon monoxide (CO) gas to avoid hazardous build-up. It is not a life-safety device. The CO/PRO is not designed, certified, sold, or authorized in applications where failure of this device could result in personal injury or death.
- The CO/PRO is equipped with two sensors—one for measuring CO in the ambient air and one for measuring CO in the HVAC duct air. The CO/PRO tests the duct sensor daily to determine the end-of-life for both CO sensors and the product.
- Do NOT install in areas where there is turbulent or moving air as it may prevent CO from reaching the CO/PRO's sensors.
- Do not install in areas where the temperature is above 158F/70C or less than 68F/20C, or in very high humidity areas.
- The CO sensors are not replaceable and the entire unit should be replaced if a sensor fails.
- The CO/PRO must be mounted in the vertical orientation.
- The CO/PRO must be installed by a qualified and licensed electrician, HVAC, or plumbing professional. All wiring must comply with the National Electric Code (NEC) and local codes.
- Do NOT run wiring for the CO/PRO in the same conduit as AC power or with wiring used to supply highly inductive loads, such as motors, contractors, and relays.
- Proper supply voltage and wiring connections are important to a successful installation. Ignoring the directions may damage the product and void the warranty.
- The CO/PRO's connectors support Respiro recommendation of using twisted pair of at least 22AWG.
- CO is a deadly gas created by fossil fuel burning sources. The CO/PRO is not designed to detect smoke, fire, or any gas other than carbon monoxide.
- The CO/PRO monitors for the presence and concentration of carbon monoxide at 25 ppm (parts per million.)
- The CO/PRO must be installed at a minimum of 6 feet from the furnace to a location where the temperature in the ventilation is 158°F (70°C) or less. Failure to do so will void the warranty.
- Do not attempt to open, repair, or modify any portion of this device.
- The carbon monoxide sensor's useful lifespan has been rated up to 10 years. The actual lifespan of each sensor will vary by the environment which it operates in and can be impacted by temperature, humidity, dust, CO exposure, and other factors.
- Furnace air filter must be changed regularly to ensure the air is free of dust. Dust can impact the CO/PRO's ability to detect CO.
- Each CO sensor has been calibrated at the factory. From 0—25ppm, the accuracy of the CO sensor is +/- 5ppm.
- This installation guide may be updated periodically. The latest guide can be found at [www.Respiro-USA.com/resources](http://www.Respiro-USA.com/resources).
- The type of furnace, it's rated CFM, the duct size and configuration, and the location of the CO/pro can affect CO detection times.
- The CO sensors have an accuracy of +/- 5 ppm and the unit may display 0-5 ppm. Always validate CO readings with an independent CO monitor.
- The CO/PRO's BLUE connector is associated with the ambient CO sensor and can be connected to an alarm panel or a water heater, not both. It will change to an open circuit to provide an alert to when CO has been detected in the ambient air.

## Warranty

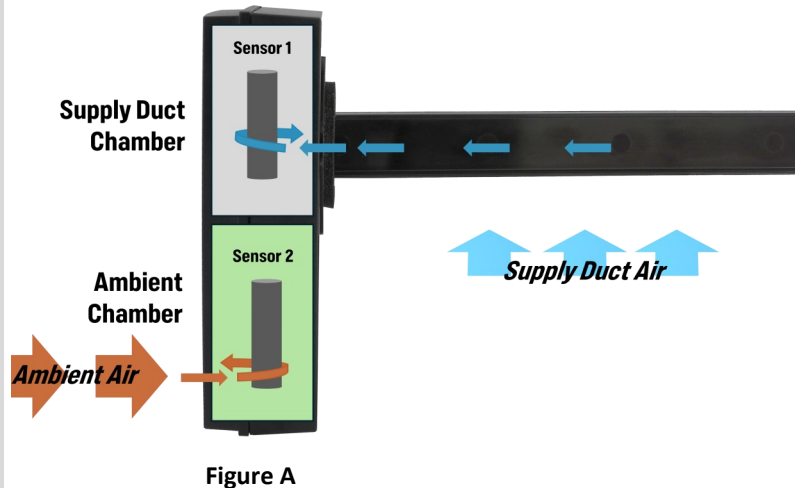
The CO/PRO is warranted for one (1) year. The warranty is extended to two (2) years if the product is registered within thirty (30) days of purchase. A copy of the full warranty can be found at [www.Respiro-USA.com](http://www.Respiro-USA.com).

## Product Registration

Product registration within thirty (30) days of installation is required for the two (2) warranty to be in effect. Not registering the device within thirty days of the installation date limits the product and sensor(s) warranty to one (1) year from the time of purchase. Register the CO/PRO by scanning the QR code on the inside of the cover or on the [Respiro-USA.com](http://Respiro-USA.com) website.

## CO/PRO Overview

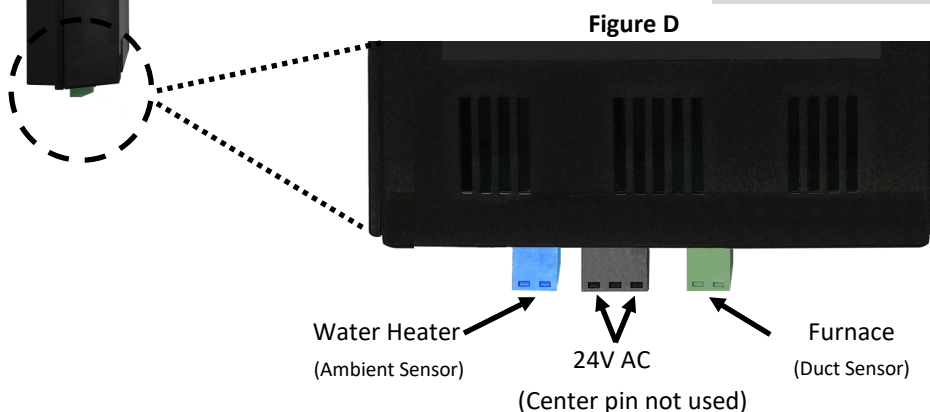
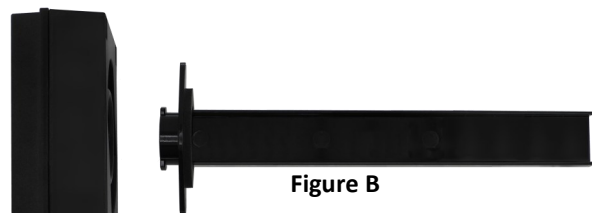
The CO/PRO 3 had two carbon monoxide sensors for monitoring CO in both the supply duct and the ambient air simultaneously. This is accomplished via two independent chambers inside the CO/PRO's housing: one for the supply duct air and the second chamber for ambient air. When 25 ppm of CO is detected by the duct sensor, the normally closed (NC) relay associated with the green connector (duct) opens its connection, cutting off power to the furnace. When 25 ppm of CO is detected by the ambient sensor, both relays associated with the blue (ambient) and green (duct) connectors open their contacts, cutting off power to the furnace and water heater. When CO levels decrease to 15 ppm or less, the CO/PRO reapplies power to these connectors. Tankless water heaters are currently not supported.



For dual monitoring applications, the duct tube will be inserted into a hole drilled into the duct and mounted into position using two screws in a vertical orientation as shown in Figure B (see detailed instructions). Both the green (duct/furnace) and blue connectors (ambient/water heater) will be used (see Figure D).

For monitoring just the ambient air (i.e., water heater or boiler operations), the duct tube "I-beam" portion can be cut off, leaving just the wall mount component (see Figure C). Only the blue connector will be used in this configuration.

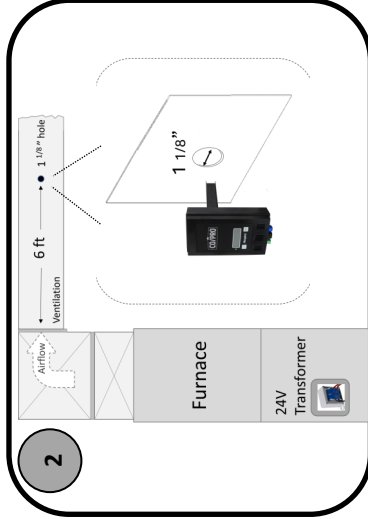
For installations that only require monitoring the CO levels in the supply duct, use just the green connector. However, the connectors for the ambient air can be used for monitoring the ambient air and connected to a home alarm system. The closed contact relay is a normally closed (NC) relay that opens when CO is detected in the ambient air.



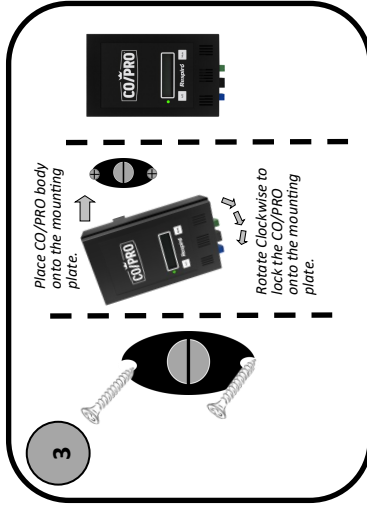
# INSTALLATION GUIDE—FURNACE



**Step 1**—Turn off the power for all devices (furnace, boiler, water heater).



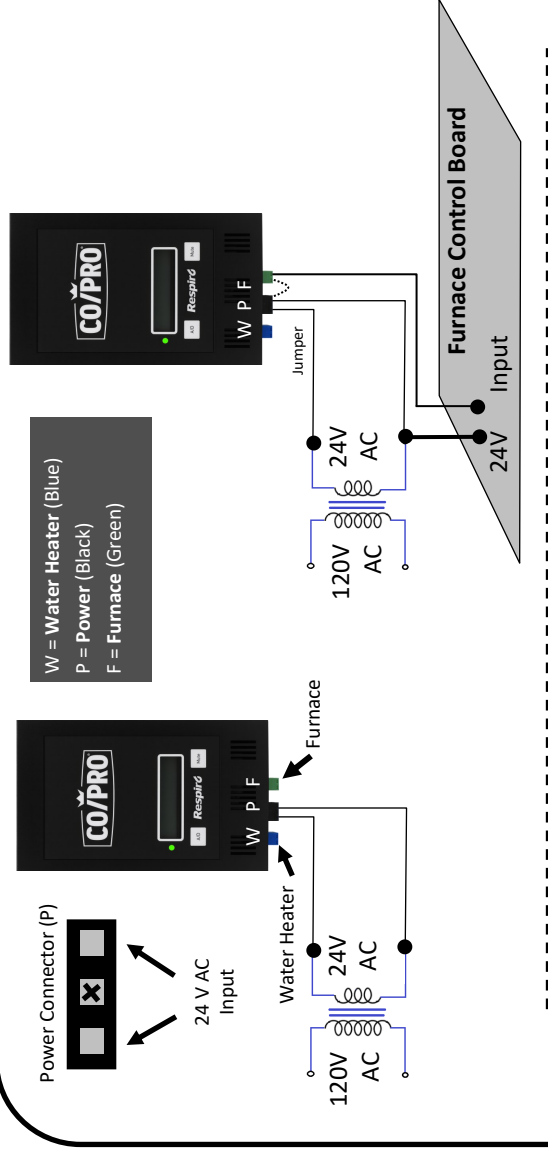
**Step 2**—Drill a 1 1/8 inch hole in the ventilation 6ft from the furnace.



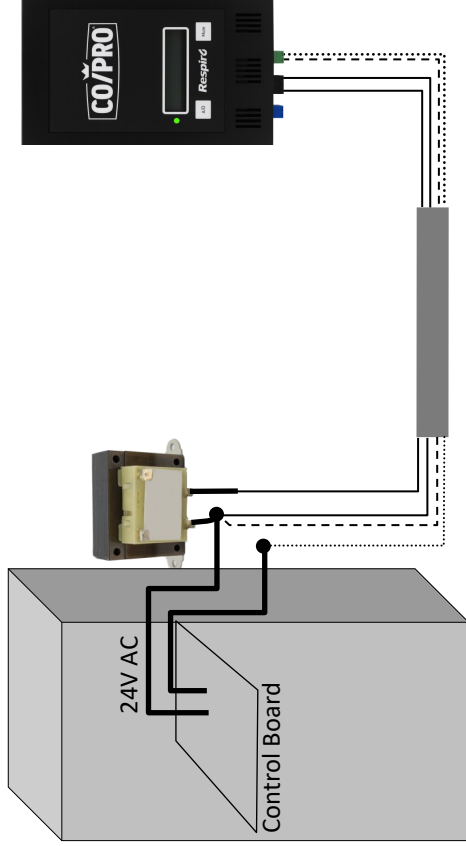
**Step 3**—Insert the duct tube into the hole and secure the mounting plate to the duct using the supplied screws.

## 4a 24V AC Electrical Connection

## 4b Furnace Electrical Connection



## 4b Wiring Diagram



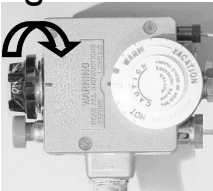

**Step 4**— Use an existing or new 120/24 VAC transformer to bring 24V (AC) to power the CO/PRO. On the 24V side of the transformer, cut one of the 24V power wires going to the control board and connect it to the Furnace connector as shown above. The CO/PRO routes power to the furnace's control board during normal operation and

Go to **Step 5**.

# INSTALLATION GUIDE—WATER HEATER

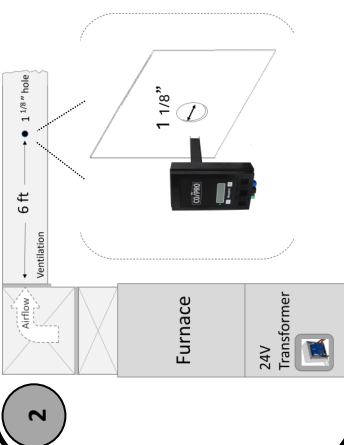
1

**CAUTION**



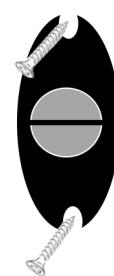
**Step 1**—Turn off the power for all devices (furnace, boiler, water heater).

2



**Step 2**—Drill a 1 1/8 inch hole in the ventilation 6ft from the furnace.


3




**Step 3**—Insert the duct tube into the hole and secure the mounting plate to the duct using the supplied screws

4

Water Heater



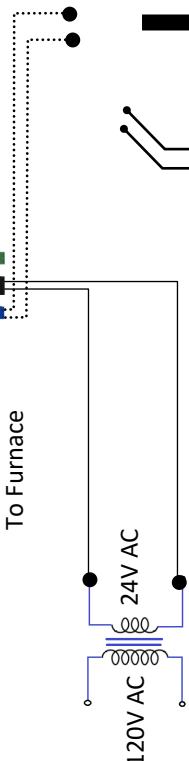
Power Connector (P)




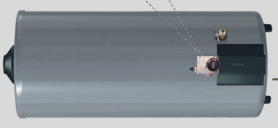
W = Water Heater (Blue)


P = Power (Black)

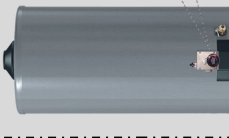
F = Furnace (Green)






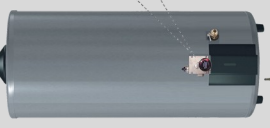








Thermocouple Junction Block




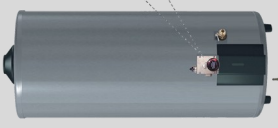





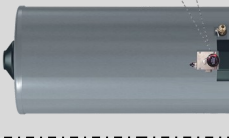


Splice into the Flame sensor High Temp Limit Wire




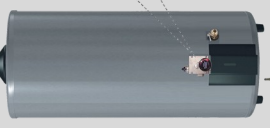








Thermocouple Junction Block







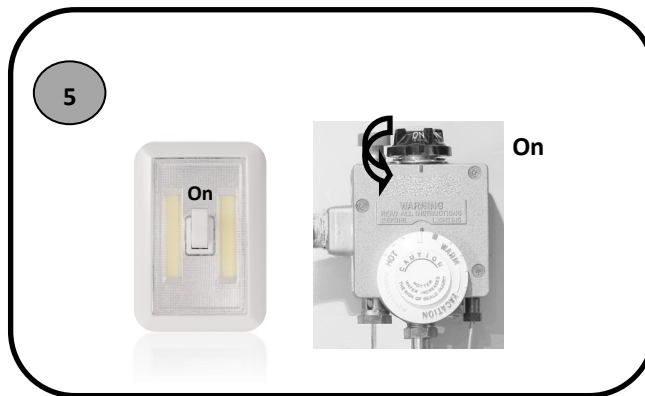


Splice into the Flame sensor High Temp Limit Wire

**Step 4**— Use an existing or new 120/24 VAC transformer to bring 24V (AC) to power the CO/PRO. Manual pilot water heaters require a thermocouple junction block (not included) be inserted between the thermocouple and the water heater's control box (see picture above) to connect to the CO/PRO. For automatic pilot water heaters, splice into the Flame Sensor High Temp wire and connect each end to the CO/PRO.

Go to Step 5.

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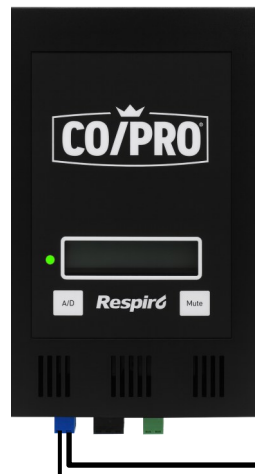


**Step 5**—Turn the power back on to the furnace and water heater and ensure all devices are operating properly.



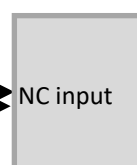
**Step 6**—The CO/PRO will take approximately 1 minute to go through its warm-up process. Once the device is ready, press the “Mute” button for greater than 6 seconds to activate the test mode. Verify that the alarm is working, the red light is flashing, and that all connected devices (furnace and water heater) were powered off by the CO/PRO. When the CO/PRO’s operation has been validated, press the “Mute” button for greater than 6 seconds to put the CO/PRO into its ready state.

### Connecting CO/PRO to an Alarm System

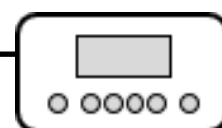


When using the CO/PRO to only monitor the supply air from a furnace, the “blue” connector on the CO/PRO can be connected to an alarm panel that accepts a normally closed (NC) contact. In this configuration, the CO/PRO will “open” the contact when 25 ppm of CO is detected, thereby providing an alert to CO in the ambient air. When the CO level decreases to 15 ppm or less, the alarm will be cleared and the CO/PRO’s contact will return to a normally closed state (NC)

Alarm Panel



Alarm Interface



## LED, Display, and Button Functions

### Display Position 1

**A** = Ambient    **d** = duct

### Display Position 2

**(Blank)** = current CO ppm    **P** = Peak CO ppm

### Function Buttons

**A/D** = Ambient/duct select

**Mute** = Mute alarm, self test



### Display Positions 3 & 4

= CO Level (ppm), range 0-99

### Mute Indicator

**(Blank)** = Audible alarm is active

**■** = Audible alarm is has been muted

### Small Display

= current temperature from the selected sensor (°F)

### Button Function Description

|  |                        |   |
|--|------------------------|---|
|  | Single press (< 1 sec) | Display changes from displaying the current AMBIENT (A) CO sensor's reading to the current DUCT (D) CO sensor's reading.  |
|  | Single press (> 3 sec) | Switches the display from the sensor's current reading to its recorded "Peak" value since the last power cycle, reset, or peak clear. A "P" will appear in the top-right corner. Pressing the A/D button again for more than 3 seconds returns the display to the current CO value. |
|  | Single press (> 6 sec) | Clears the peak value for the selected sensor.  |
|  | Single press (1-5 sec) | Mutes the audible alarm until a power cycle, reset, or until the CO level drops into a non-alarm condition (≤15 ppm) then returns to an alarm condition (>25 ppm).  |
|  | Single press (>6 sec)  | Initiate Test Mode. Used for verifying wiring connections and device functions. Pressing Mute for > 6 seconds takes the device out of Test Mode.  |
|  | Simultaneous (>3 sec)  | Pressing both buttons simultaneously for > 3 seconds causes the device to reset, clears the peak values, and puts the relays back into the CLOSED state.  |
|  | Simultaneous (>6 sec)  | Resets the CO/PRO   |

### LED Color Description

|                                       |  |
|---------------------------------------|--|
| Green (Solid)                         | Device passed self test and is operational   |
| Green (Flashing)                      | Device is in the process of a self-test / CO sensor test   |
| Yellow (Solid)                        | The device is in an alarm state and 15 ppm or less of CO has been detected by the alarming sensor. The device is in the process of evaluating moving to a non-alarm state.           |
| Yellow (Flashing)                     | The device is in a non-alarm state a CO sensor(s) detected 25 ppm or greater of CO gas. The device is in the process of evaluating if it will change to an alarm state.              |
| Alternate Yellow and Green (Flashing) | The device is in a non-alarm state but was previously in an alarm state. Call your HVAC company as soon as possible.   |
| Alternate Yellow and Red (Flashing)   | The device is in an alarm state and was previously in an alarm state. Call your HVAC company as soon as possible.  |
| Red (Single Flashes)                  | The device is in an alarm state. 25 ppm or greater of CO was detected. The furnace or the furnace and water heater have been turned off. Call your HVAC company as soon as possible. |
| Red (Three Flashes)                   | A CO sensor failure has caused the device to fail. Call your HVAC company as soon as possible.   |

### Sensor Failure/Error Codes

|             |  |
|-------------|--|
| <b>AbAd</b> | The <b>A</b> mbient sensor is <b>bAd</b> (failed). Your HVAC company should be contacted as soon as possible |
| <b>dbAd</b> | The <b>d</b> uct sensor is <b>bAd</b> (failed). Your HVAC company should be contacted as soon as possible    |