

# TECHNICAL INSTRUCTIONS

## Carbon Monoxide Detector Kit 58092 Installation Instructions

**This document provides instructions for installing the Carbon Monoxide Detector distributed by AERCO.**



CO Detector  
P/N 61035



120 - 24 VAC  
Transformer  
P/N 62010

### Disclaimer

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## 1. INTRODUCTION

In an effort to provide its customers with complete solutions, AERCO is making a Carbon Monoxide (CO) Detector available as an option to all customers. This unit, the Macurco CM-6, is a low voltage, dual relay Detector capable of displaying from 0 to 200 ppm (parts per million) of Carbon Monoxide.

The Detector can be configured in a variety of ways to suite the customer's needs and the conditions of the site. It can be operated as a stand-alone device, providing an audible alarm if CO levels rise above a configurable setpoint (a CO concentration deemed to be unsafe). It can also be wired directly into the boiler's Control Panel, enabling it to shut down the boiler if CO levels rise above the setpoint. There are two common variations of this option:

- **Option 1** – The Detector shuts down the boiler and the boiler remains off, even if the CO level falls below the setpoint, until the Detector is reset manually; manual intervention is required.
- **Option 2** – The Detector shuts down the boiler, but the Detector resets itself automatically as soon as the CO level falls below the setpoint; the boiler therefore restarts *without* manual intervention.

Neither option is required and other options are available. AERCO does not recommend any one configuration. This document describes how to install the CO Detector and configure it for both Option 1 and 2. They are simply offered here as common configurations that will work with AERCO boilers.

The Detector is powered by a 120 to 24 VAC Transformer (included with this kit), which is plugged into any convenient 120V outlet in the vicinity of the Detector.

The Detector is mounted to an unused standard 4 inch square electrical box, and becomes the cover for the box. The electrical box is just used as a mounting surface for the detector; the Detector does not receive electrical power from it. As a result, the electrical box does not need to be connected to the building's electrical system. It is the customer's responsibility to provide this power box and the wires necessary to connect the Detector to the Transformer.

The room in which the Detector is mounted must have an ambient temperature between 0°F and 125°F. Depending on air movement within the room, the Detector can cover a room of approximately 5000 square feet.

## 2. PARTS LIST

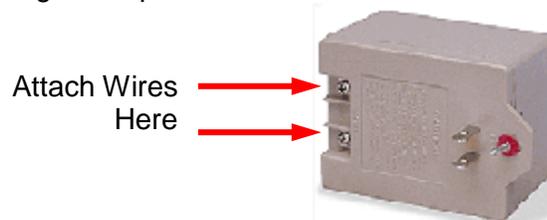
This kit includes the following parts:

**Table 1: Contents of Carbon Monoxide Detector Kit 58092**

| Item | Part No. | Quantity | Description              |
|------|----------|----------|--------------------------|
| 1    | 61035    | 1        | MACURCO CM-6 CO DETECTOR |
| 2    | 62010    | 1        | 120-24 VAC TRANSFORMER   |

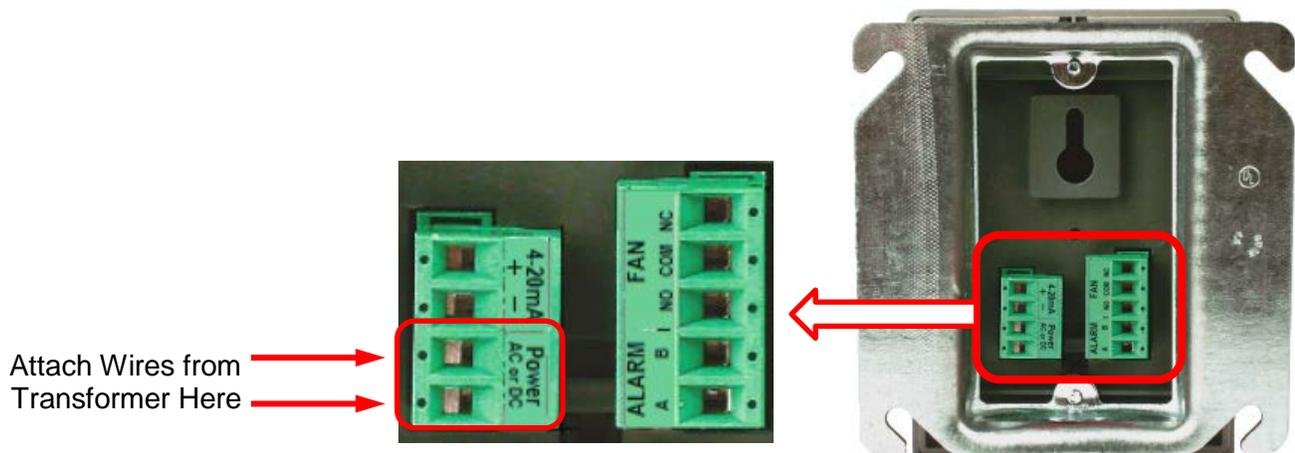
### 3. INSTALLATION INSTRUCTIONS

1. Position the 120-24 VAC Transformer (P/N 62010, included with the kit), in the vicinity of any available 120V power outlet. Do **NOT** plug it in; you will plug it in only **after** all electrical connections have been made.
2. Decide on the location of the CO Detector in the boiler room and mount a standard 4 inch square electrical power box to a wall or column in that location. It is typically a central area of the room with good air movement, about 5 feet above the floor, not in a corner or an area with stagnant air. It can also be mounted on a ceiling; if the ceiling is peaked or sloped, the power box should be mounted 3 feet below the highest point in the room.
3. Remove one of the power box knock outs and install a protective grommet in the opening.
4. Attach wires to both connectors on the Transformer, and then run those wires through the opening in the power box.



**Figure 1. The 120-24 VAC Transformer**

5. Attach the two wires from the previous step to the two **Power AC** terminals on the back of the detector.



**Figure 2. CO Detector – Rear View**

#### NOTE

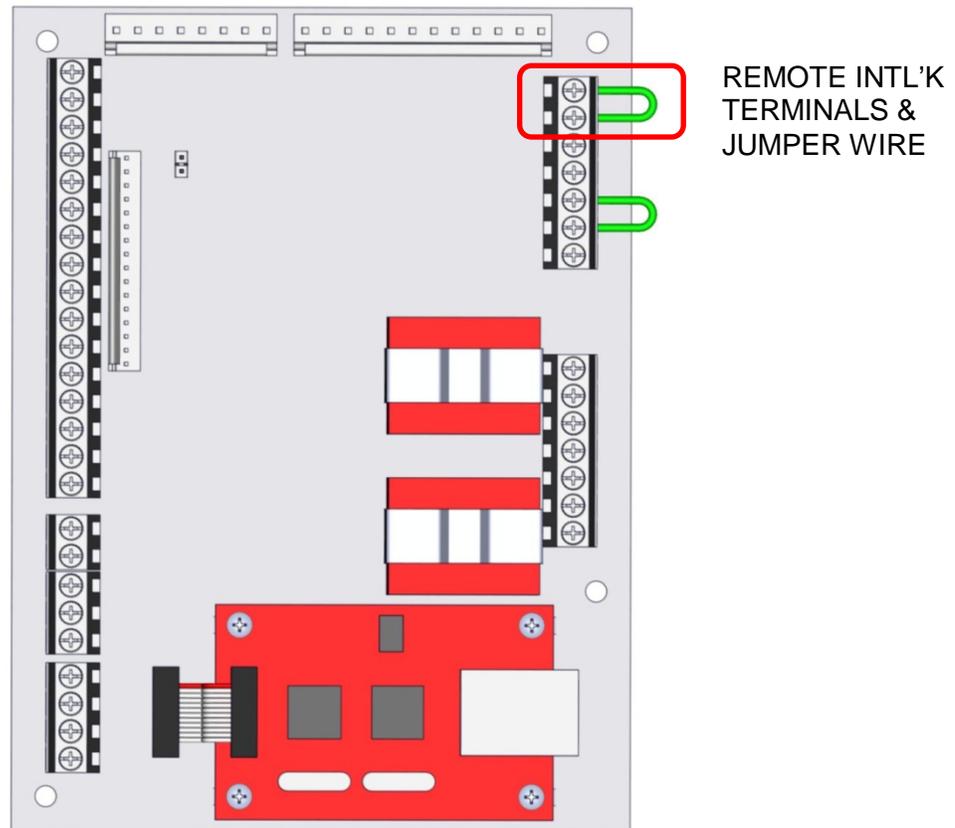
Complete Steps 6 through 11 only if you want to connect the CO Detector directly to the boiler, to enable automatic shutdown of the boiler if CO concentrations rise above the configurable setpoint.

6. Shut down the electrical connection to the boiler, open the front panel and find the boiler's I/O Board.

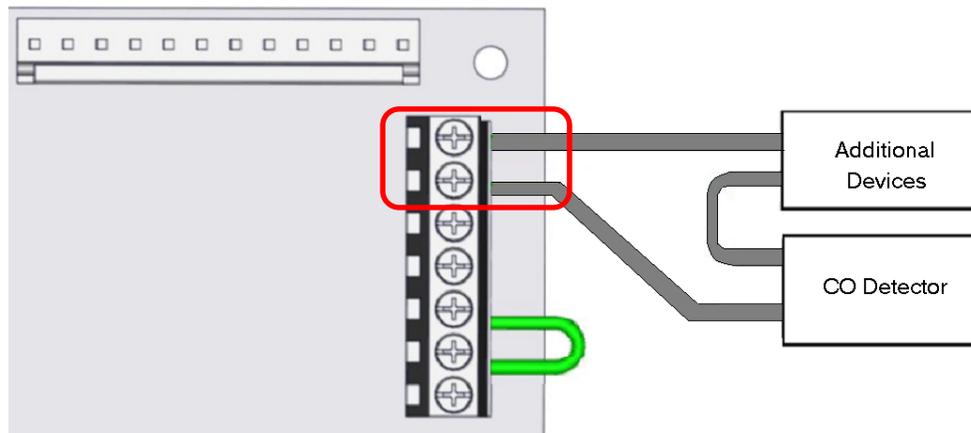
7. Remove the jumper wire from the two **REMOTE INTL'K** terminals, shown below, and attach two wires to those two terminals.

**WARNING**

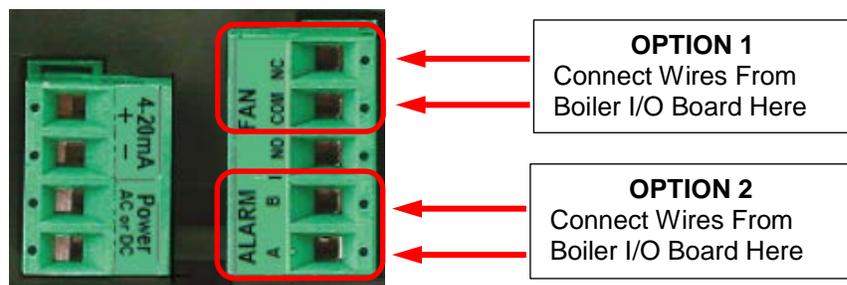
120 VAC are used in the I/O Box.

**Figure 3. Boiler I/O Box Terminals**

8. If the jumper wire is removed from the REMOTE INTL'K terminals, and those terminals are already connected to another device (or devices), you must wire the Detector in series with that device, as shown in Figure 4.

**Figure 4. Boiler I/O Box Alternate Wiring**

9. If there are multiple boilers in the room, wire the detector to each boiler in parallel using the terminals shown in Figures 3 and 4.
10. As mentioned above, the Detector can be configured in a variety of ways. The next step provides instructions for wiring the Detector to the boiler to enable one of two options, depending on how you want the Detector and boiler to react if CO levels rise above the configurable setpoint:
  - **Option 1 – Fan Relay Latching.** The Detector shuts down the boiler; the boiler will not restart until the Detector is reset manually, even if the CO level returns to a safe level. **Manual intervention is required.**
  - **Option 2 – Alarm Relay Option.** The Detector shuts down the boiler; the boiler automatically restarts when the CO level falls back to a safe level; manual intervention is **NOT** required.
11. Run the wires from the **REMOTE INTL’K** terminals through the power box opening, and attach them to the following terminals on the back of the Detector:
  - If you chose Option 1, connect to the **COM & NC** terminals
  - If you chose Option 2, connect to the **Alarm A & Alarm B** terminals



**Figure 5. Connecting the Boiler I/O Box Terminal**

#### **NOTE**

The remaining steps are completed at all sites.

12. Mount the Detector to the front of the power box and tighten the screws to hold it in place.
13. Plug the Transformer into the power outlet.

## **4. OPERATION**

The Detector powers up automatically as soon as power is supplied (there is no On/Off switch). In the event of a power failure, the unit restarts automatically as soon as power is reestablished.

If the Detector is wired into the boiler (as described in section 3, steps 6 –11) and the CO level goes above the setpoint configured in the Detector (the CO level that triggers the Detector), the Detector will break the circuit between the boiler’s **REMOTE INTL’K** (Remote Interlock) terminals and the boiler will automatically shut down.

Full operating instructions, including configuring the setpoint, are included in a paper manual included with the Detector packaging, and also available online at the Macurco web site:

[http://www.aerionics.info/carbon\\_monoxide.html](http://www.aerionics.info/carbon_monoxide.html).

## 4.1 Configuring the Detector

The next two sections provide instructions for configuring the Detector to enable Options 1 and 2, described in section 3 above. Please note that these instructions are not comprehensive; full instructions are included in the paper manual included with the Detector.

The Detector setpoint is configurable. The appropriate setpoint varies depending on the size of the room, air circulation within the room, room ventilation, the number of sources of carbon monoxide, etc. It is up to the customer to determine the setpoint, based on local codes and their knowledge of the conditions at the site.

### 4.1.1 Option 1 – Configuring the Fan Relay Latching Option

1. Remove the Phillips head screw in the center of the Detector's cover and then remove the cover to expose the **Menu/Next** and **Enter/Test** buttons.
2. In normal mode, push the **Next** button to get to **Con**, the Configuration menu, and then push **Enter** to enter the Con menu.
3. Push **Next** until **FrD** (Fan Relay Delay) appears, then press **Enter**. The default is 3 (minutes).
4. Push **Next** until **0** appears. Press **Enter** *twice* to choose that option and to return to **FrD** in the Con menu.
5. Push **Next** until **FrL** (Fan Relay Latching) appears and then press **Enter**.
6. Push **Next** until **ON** (flashing) appears, then push **Enter** *twice* to choose that option and return to **FrL** in the Con menu.
7. To choose the setpoint for Option 1, push **Next** until **FrS** (Fan Relay Setting) appears, then press **Enter**. The setpoint options are: 15, 25, 35, 50 or 100 ppm
8. Push **Next** until the option that is appropriate for your site appears, and then push **Enter** *twice* to choose that option and return to **FrS** in the Con menu.
9. Push **Next** until **End** appears and then push **Enter** to get back to normal operation.
10. Replace the Detector's cover.
11. With Option 1 enabled, if CO levels exceed the setpoint, you **MUST** intervene to reset the Detector; the boiler will not restart until the Detector is reset. To reset the Detector, power the Detector off and on (unplug/replug), or remove the cover and press the **Menu/Next** and **Enter/Test** buttons simultaneously.

### 4.1.2 Option 2 – Configuring the Alarm Relay Option

1. Remove the Phillips head screw in the center of the Detector's cover and then remove the cover to expose the **Menu/Next** and **Enter/Test** buttons.
2. In normal mode, push the **Next** button to get to **Con**, the Configuration menu, and then push **Enter** to enter the Con menu.
3. Push **Next** until **Arc** (Alarm Relay Configuration) appears, then push **Enter**.
4. If the relay is "nO" (normally open) push **Next** until **nC** (flashing) appears, then push **Enter** *twice* to choose that option (solid) and return to **Arc** in the Con menu.
5. To choose the setpoint for Option 2, push **Next** until **ArS** (Alarm Relay Setting) appears, then press **Enter**. The setpoint options are: 50, 100, 150 or 200 ppm.

6. Push **Next** until the option that is appropriate for your site appears, and then push **Enter** *twice* to choose that option and return to **Ars** in the Con menu.
7. Push **Next** until **End** is displayed then push **Enter** to get back to normal operation.
8. Replace the Detector's cover.

## 5. CALIBRATION

The CO Detector is pre-calibrated at the factory. The manufacturer states that the calibration is good for 7 years. After 7 years, the Detector must be re-calibrated or replaced. The manufacturer provides a Field Calibration Kit, sold separately, which can be used to perform the calibration without removing or replacing the Detector.

The Field Calibration kit and instructions can be ordered from the Macurco web site:  
[http://www.aerionics.info/carbon\\_monoxide.html](http://www.aerionics.info/carbon_monoxide.html)



### Change Log

| Date       | Description            | Changed By  |
|------------|------------------------|-------------|
| 02/05/2014 | Rev A: Initial release | Chris Blair |

