

Installation Guide

Mounting

SAE-1101 and 1102 Space Mount

Install the unit at least five feet from floor of the area to be controlled. Do not install doors, opening windows, supply air diffusers or other known air disturbances.

1. Remove the cover by loosening, and removing, the screws located at the corners of the cover.
2. Remove a knockout from the top or bottom for wiring.
3. Attach the unit directly on a standard electrical box or directly to a wall using the existing holes.



Complete wiring per *Wiring Section* and replace cover.

SAE-1151 and 1152 Duct Mount:

Choose a mounting location in a straight section of a return air duct. Mount at least 5 feet from corners and other items that may cause disturbances in the air flow. Avoid vibration areas or areas of rapid temperature change.

1. Cut a 3/4" hole in duct for the air sampling tube.
2. Remove the cover by loosening, and removing, the screws located at the corners of the cover.
3. Remove a knockout from top or bottom for wiring.
4. Insert sampling tube into the duct and use the foam plug (included) to prevent air infiltration.
5. Center the sensor over the hole in the ductwork .
6. Attach the unit to the ductwork by threading four screws through the self-sealing rubber gaskets on the back of the housing.

Complete wiring per *Wiring Section* and replace cover.

Wiring

Use 22 AWG shielded wiring for all connections. Do not locate device wires in the same conduit with wiring used to supply inductive loads.

1. Connect the positive DC voltage or the hot side of the AC voltage to the terminal marked PWR.
2. Connect the power supply common to the terminal marked COM. This device is reverse voltage protected and will not operate if connected backwards

Wiring Continued

NOTE: The Detector has a half-wave type power supply. The power supply common is the same as the output signal common. Therefore, several units may be connected to one power supply and the output signals all share the same signal common.

CAUTION: Use caution when grounding the secondary of an AC transformer or when wiring multiple devices to ensure that the circuit ground point is the same on all devices and the controller.

See Application Note AN0604D

The analog output signals are available on the +OUT and -OUT terminals (consult wiring diagrams).

1. Jumper to select an output

- ◆ 4 to 20 mA (active or passive output)
 - √ Active Mode does not require a loop power supply.
 - √ Passive Mode requires a loop power supply. Output signal will operate the same as a loop powered device.
- ◆ Use a second jumper to select voltage output range 0 to 5, or 0 to 10 VDC.

CAUTION: DO NOT connect to a powered input or device, damage will result.

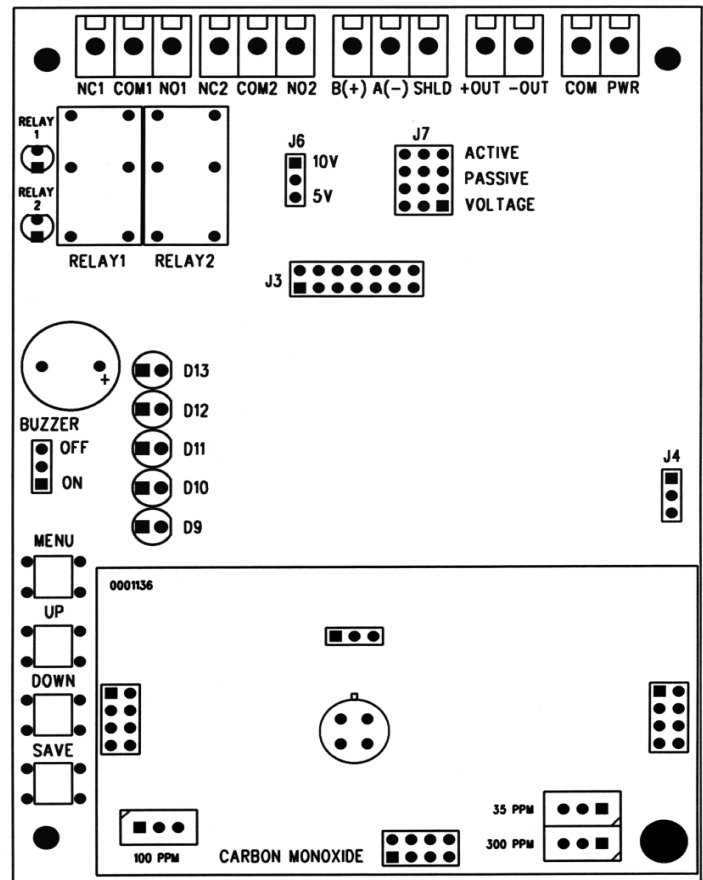
2. Check the controller's Analog Input to determine the proper connection BEFORE applying power.

NOTE: The analog output signal is typically connected directly to the Building Automation System (B.A.S.) and used as a control parameter or for logging purposes.

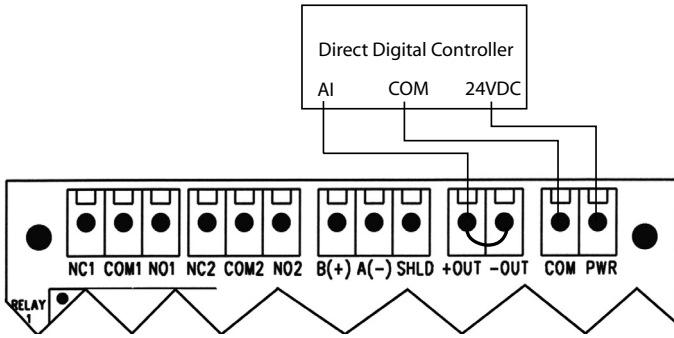
Two optional signals are the relay outputs available on the NO1, NO2, COM1, COM2, NC1 and NC2 terminals. The Relay Com terminals are **NOT** connected to signal or power supply, COMMON terminal or to each other.

The relay outputs are completely isolated and include both Normally Open (NO) and Normally Closed (NC) signals. These signals can be used to directly control alarms, ventilation fans or may be connected to a digital input of the B.A.S. for Status monitoring.

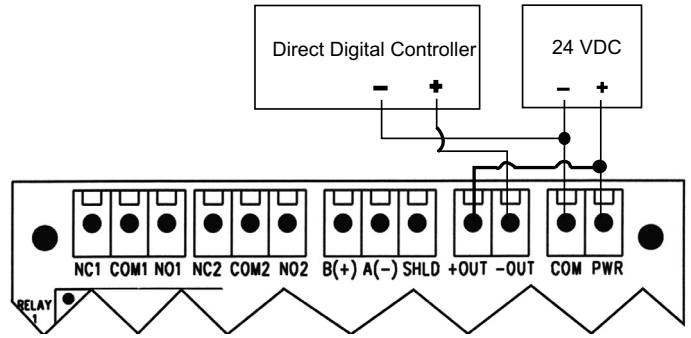
** See Application Note AN0504L



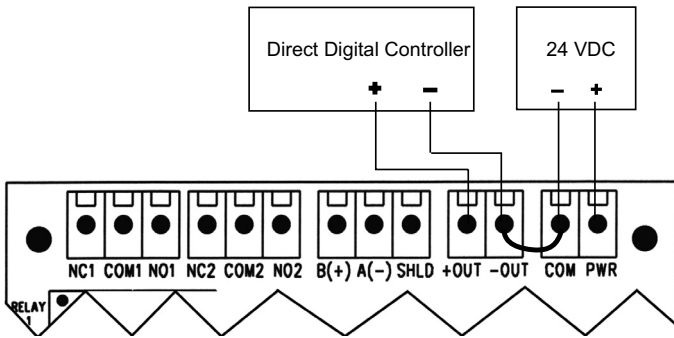
Wiring Continued



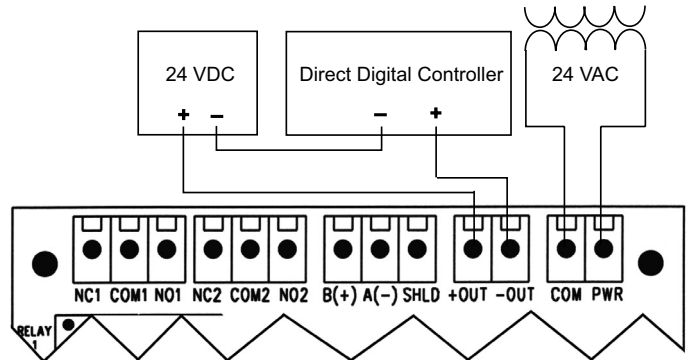
24 VDC Supply, 4 to 20 mA
Active, 3- Wire



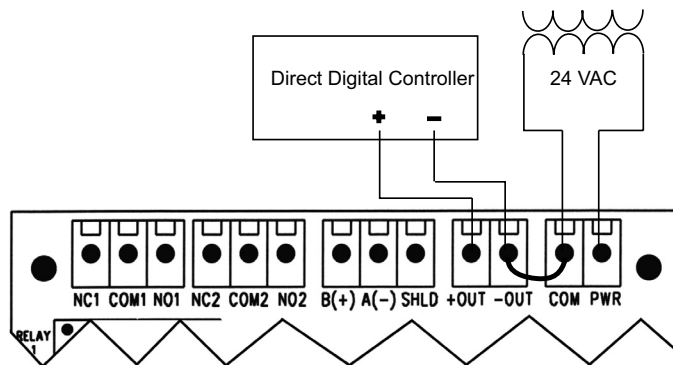
24 VDC Supply, 4 to 20 mA
Passive, 3- Wire



24 VDC Supply, 4 to 20 mA
Active, 4- Wire



24 VDC Supply, 4 to 20 mA
Passive, 4- Wire



24 VAC Supply, 0 to 10 VDC Output

Start-Up

1. Verify that the Carbon Monoxide Transmitter is properly wired and all connections are tight.
2. Apply power. A 200 second warm-up period will begin. The five LEDs will indicate this period by cycling one light at a time.

Operation

The five LEDs are scaled to indicate 100, 150, 200, 250 and 300 ppm.

Example:

If the CO level is 175 ppm then LEDs D9 and D10 will be lit to indicate the ppm level is more than 150 and less than 200 ppm. The measurement range for the electrochemical sensor is 0 to 500 ppm (standard) or 0 to 250 ppm (optional) and the five LEDs are scaled either 100, 200, 300, 400 and 500 ppm or 50, 100, 150, 200 and 250 ppm.

The analog output is proportional to the measured concentration of CO. The signal type must be selected during installation via two jumpers on the PCB. One jumper selects either 4-20 mA active, 4-20 mA passive or voltage output and if voltage is selected then the other jumper determines the full scale value as either 5 or 10 VDC.

Two optional relays are used to indicate alarm conditions. The trip point, hysteresis and delay time of each relay can be programmed.

Example:

The first relay defaults to 50 ppm trip point, 10 ppm hysteresis and 2 minute delay time. All of these values can be changed via the menu. In this case a timer is started when the CO level exceeds 50 ppm (the trip level). If the level drops below 50 ppm before 2 minutes (the delay time) has expired then the relay is not activated. If the CO level exceeds 50 ppm for 2 minutes then the relay is activated.

The relay will remain activated until the CO level drops below 40 ppm (trip level – hysteresis). This relay can be used to signal a “low alarm”. The second relay operates in the same manner and has independently programmable trip point, hysteresis and delay time. This relay can be used to signal a “high alarm”.

The optional buzzer trip point and delay time can be programmed similarly to the relays to indicate an alarm condition. When the trip point is exceeded for a time longer than the delay time, then the buzzer will sound until the CO level falls below the trip point. The buzzer can be disabled by moving the “Buzzer” jumper to the OFF position.

Menu Configuration

Menu is controlled by using the four buttons on the circuit board (MENU, SAVE, UP and DOWN). Press <MENU> to step through the selections. Use the <UP> and <DOWN> keys to make changes. No values are saved or changed until you press the <SAVE> key. The <SAVE> key saves the current setting to memory, exits the configuration menu, and returns to normal operation.

Press <MENU>

- 1. RESTORE DEFAULTS:** All 5 LEDs flash to indicate this mode. Press the <SAVE> key to restore all factory defaults to their original settings.

Press <MENU>

- 2. BUZZER TRIP=150:**

D9 and D10 flash three times to indicate this mode. The trip level is shown on the LEDs as a 5 bit binary number with D9 being the Least Significant Bit.

Example: 100 ppm = 00000
 110 ppm = 00001
 400 ppm = 11110.

The factory default for the buzzer trip level is 150 ppm.

Press <MENU>

- 3. BUZZER DEL=5MIN:**

D9 and D11 flash three times to indicate this mode.

No LEDs lit = 0 minutes
D9 lit = 1 minute
D10 lit = 2 minutes, etc.

Press <MENU>

- 4. RELAY 1 TRIP=50**

D9 and D12 flash three times to indicate this mode. The trip level is shown on the LEDs as a 5 bit binary number with D9 being the Least Significant Bit.

Example: 40 ppm = 00000
 50 ppm = 00001
 60 ppm = 00010
 350ppm = 11111.

The factory default for relay 1 trip level is 50 ppm.

Press <MENU>

- 5. RELAY 1 HYST=10**

D9 and D13 flash three times to indicate this mode.

D9 = 10 ppm
D10 = 15 ppm, etc.

The factory default for relay 1 hysteresis is 10 ppm.

Press <MENU>

- 6. RELAY 1 DEL=2MIN**

D10 and D11 flash three times to indicate this mode.

No LEDs lit = 0 minutes
D9 lit = 1 minute
D10 lit = 2 minutes, etc.

The factory default is 2 minutes.

Press <MENU>

- 7. RELAY 2 TRIP=150**

D10 and D12 flash three times to indicate this mode. The trip level is shown on the LEDs as a 5 bit binary number with 9 being the Least Significant Bit.

Example: 100 ppm = 00000
 110 ppm = 00001
 120 ppm = 00010
 400 ppm = 11110

The factory default for relay 2 trip level is 150 ppm.

Press <MENU>

- 8. RELAY 2 HYST=25**

D10 and D13 flash three times to indicate this mode.

D9 = 10 ppm
D10 = 15 ppm, etc.

The factory default for relay 2 hysteresis is 25 ppm.

Menu Configuration Continued

Press <MENU>

9. RELAY 2 DEL=2MIN

D11 and D12 flash three times to indicate this mode.

No LEDs lit = 0 minutes

D9 lit = 1 minute

D10 lit = 2 minutes, etc.

The factory default is 2 minutes.

Press <MENU>

NOTE: Item 10 is only available if the voltage jumper is installed, otherwise the program skips directly to step 11.

10. CALIBRAT 5V x

D11 and D13 flash three times to indicate this mode. The value is shown on the LEDs as a 5 bit binary number. This item allows calibration of the 5 VDC output signal.

Press <MENU>

NOTE: Menu items 11 and 12 are only available if the current jumper is installed, otherwise the program skips directly to step 13.

11. CALIBRAT 4mA x

D12 and D13 flash three times to indicate this mode. The value is shown on the LEDs as a 5 bit binary number.

Press <MENU>

12. CALIBRAT 20mA x

D9 and D10 and D11 flash three times to indicate this mode. The value is shown on the LEDs as a 5 bit binary number.

Press <MENU>

13. MENU QUIT

D9, D11 and D13 flash continuously to indicate this mode. Press the <SAVE> key to exit the menu and return to normal operation.

Test

A special test menu that can be used during setup is available by temporarily shorting pins 1 and 2 on J4 on the Printed Circuit Board.

Short 1-2 on J4 to enter the test menu.

1. RELAY IS OFF

D9 and D10 flash continuously to indicate this mode. If D13 is lit then the relay is 'ON'.

Press <MENU>

2. BUZZER IS OFF

D10 and D11 flash continuously to indicate this mode. If D13 is lit then the buzzer is 'ON'. The buzzer hardware jumper must be set to "Buzzer On" for the buzzer to operate.

Press <MENU>

3. LED IS OFF

D11 and D12 flash three times to indicate this mode. Then all LEDs are turned off.

Press <MENU>

4. SENSOR (SS)

D12 and D13 flash continuously to indicate this mode.

D9 is lit = range of 0-250 ppm

D10 is lit = range of 0-500 ppm

D9 & D10 are lit = range of 0-300 ppm.

This item is factory set to the correct sensor type and should never be changed unless the sensor type is replaced.

Press <MENU>

5. OUTPUT 4mA or OUTPUT 0V

D9, D10 and D11 flash three times to indicate this mode. The output is indicated on the LEDs. This item will test the analog output, either current or voltage depending on the jumper position. Use the <UP> or <DOWN> keys to select as applicable:

4 (D9)

8 (D10)

12 (D11)

16 (D12)

20 mA (D13)

0 (none)

1 (D9)

2 (D10)

3 (D11)

4 (D12)

5 VDC (D13)

Press <MENU>

6. 0 0 **This item is for factory use only.**
0 0 **Use the <SAVE> key to exit the menu.**

Maintenance

No routine maintenance is required. Each component is designed for dependable, long term reliability and performance. Careful installation will also ensure long term reliability and performance.

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