

250-CO SafeAir Carbon Monoxide Detector Installation Sheet

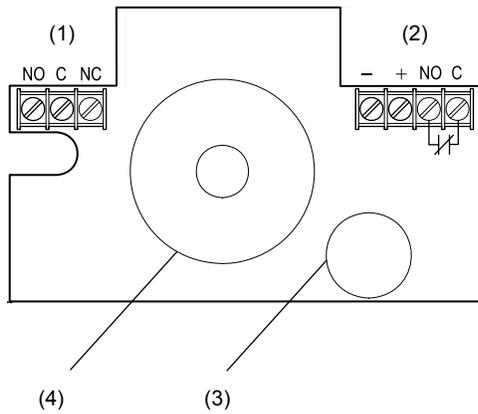
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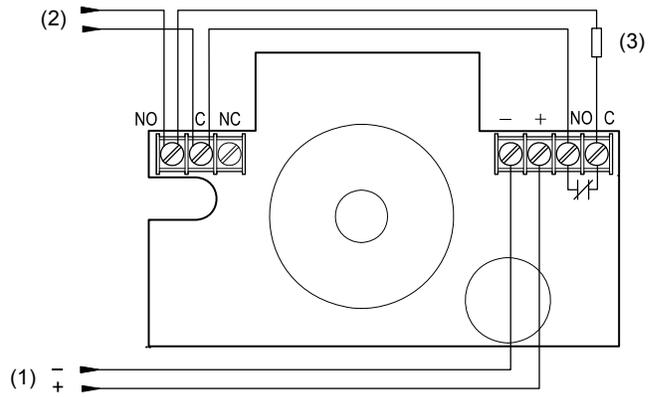
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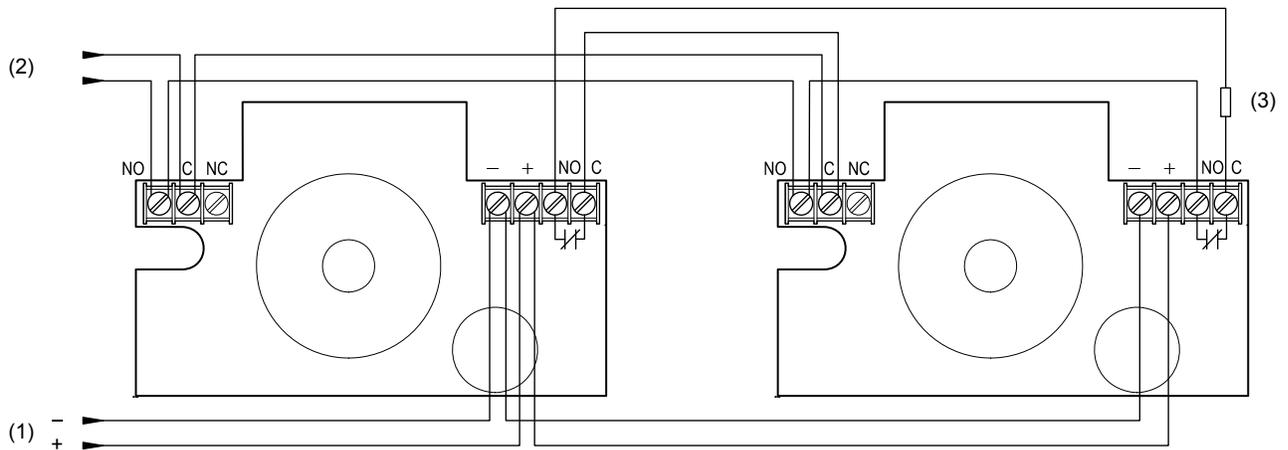
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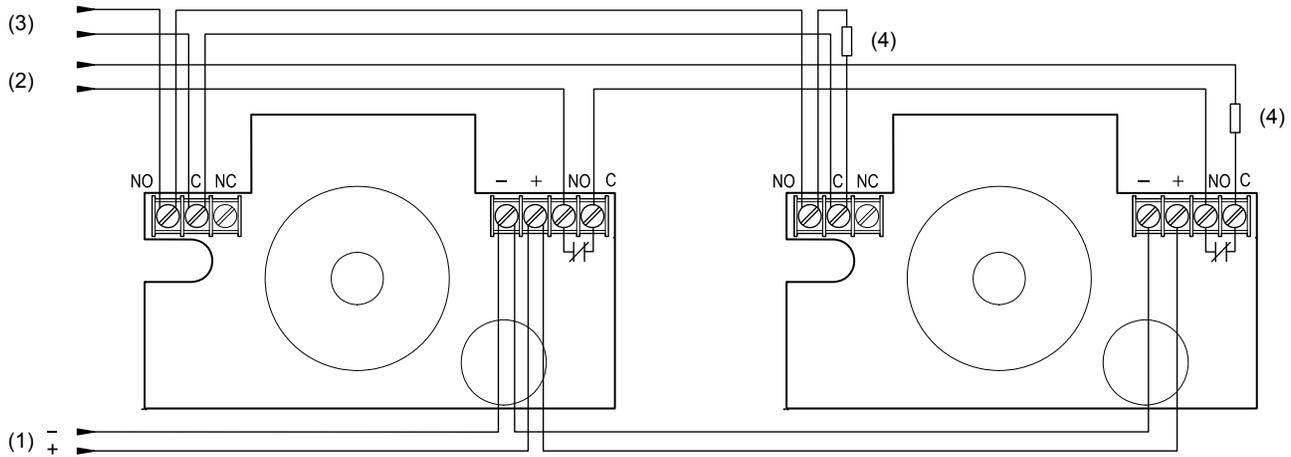
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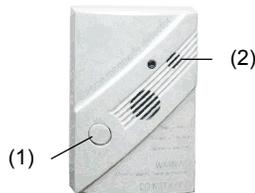
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Carbon monoxide alarm procedure

WARNING: The carbon monoxide (CO) alarm indicates the presence of CO, which can kill you. If the alarm signal sounds four times, pauses for five seconds, and then repeats the pattern:

1. Press the Test/Hush button at the detector or at the control panel.
2. Move to fresh air immediately — outdoors or by an open door or window. Check that all persons are accounted for. Do not reenter the premises or move away from the open door or window until emergency services responders have arrived, the premises have been aired out, and your detector remains in normal condition.

3. Call emergency services, the fire department, or 911:

Phone:

4. After following steps 1 to 3, if your detector reactivates, repeat steps 1 to 3 and call a qualified appliance technician to check for sources of CO from fuel-burning equipment and appliances, and to inspect for proper operation of this equipment.

Phone:

5. If problems are found during this inspection, have the equipment serviced immediately. Note any combustion equipment not inspected by the technician and consult the manufacturer directly for more information about CO safety for the equipment. Make sure that motor vehicles are not, and have not been operating in an attached garage or adjacent to the premises.

Information about carbon monoxide

WARNINGS

- Read these installation instructions in their entirety before proceeding. Leave these instructions with the owner/user of this CO detection equipment.
- This product is intended for use in indoor locations of dwelling units. It is not designed to comply with Occupational Safety and Health Administration (OSHA) commercial or industrial standards.
- The detector only indicates the presence of CO gas at the detector. Carbon monoxide gas may be present in other areas.
- Failure to properly install, test, and maintain a CO detector may cause it to fail, potentially resulting in loss of life.
- Installation of this detector is not a substitute for proper installation, use, and maintenance of fossil fuel-burning appliances, including appropriate ventilation and exhaust systems.
- To reduce the risk of CO poisoning, test the detector operation when not in use for 10 days or more.
- This detector does not operate without electrical power. As fires frequently cause power interruption, discuss further safeguards with the authority having jurisdiction (AHJ).
- Do not paint the detector.

Notes

- Regulatory code may require that the system generate a three-pulse temporal code (TC3) for fire alarms and a four-pulse temporal code (TC4) for CO alarms.
- The CO sensor is calibrated at the factory. CO sensitivity is set to conform to UL 2034 requirements and cannot be changed by the user. See "Regulatory information" on page 7 for specific sensitivity values.
- Connect this detector only to a UL Listed control panel capable of differentiating between alarm signals (fire, burglary, CO, etc.) and providing distinct identification for each.
- To reduce the likelihood of nuisance alarms, ventilate accommodation spaces when using household cleaning supplies or similar contaminants. If a detector has been exposed to such contaminants, test it promptly afterwards.

Symptoms of CO poisoning

The following symptoms related to CO poisoning should be discussed with all occupants of the protected site.

Mild exposure: Slight headache, nausea, vomiting, fatigue, runny nose, sore eyes (often described as "flu-like" symptoms).

Medium exposure: Severe throbbing headache, dizziness, drowsiness, confusion, fast heart rate.

Extreme exposure: Unconsciousness, brain damage, convulsions, cardiorespiratory failure, death.

Many cases of reported CO poisoning indicate that while victims are aware they are not well, they become so disorientated that they are unable to save themselves by either exiting the building or calling for assistance. Young children and pets may be the first affected.

CO sources

The CO sensor in this detector is designed to detect carbon monoxide gas from *any* source of combustion. It is not intended to detect fire, smoke, or any other gas. Potential CO sources include fuel-fired appliances (e.g., space heater, furnace, water heater, range, oven, clothes dryer); other sources of combustion (e.g., kerosene-burning stove or heater, or gas log fireplace); or internal combustion engines.

In addition, excessive exhaust spillage or reverse venting of fuel-burning appliances can produce dangerous transient levels of CO. This can be caused by external conditions:

- Wind direction, velocity, or a combination of both, including high gusts of wind or insufficient draft in vent pipes
- Temperature inversions that can trap exhaust gases near the ground
- Negative pressure differential resulting from the use of exhaust fans
- Simultaneous operation of several fuel-burning appliances competing for limited internal air
- Vent pipe connections vibrating loose from dryers, furnaces, or water heaters

- Obstructions in vent pipes or unconventional vent pipe designs which can amplify the above situations
- Poorly designed or maintained chimneys and/or vents
- Extended operation of unvented fossil fuel-burning devices (range, oven, fireplace, etc.)
- Idling cars in an open or closed attached garage, or near the premises

General limitations of CO detectors

This detector is designed to protect individuals from the acute effects of CO exposure. It will not fully safeguard individuals with specific medical conditions. People with special medical problems should consider using specialized detection devices with less than 30 ppm (parts per million) alarming capabilities. If in doubt, consult a medical practitioner.

If the unit is in trouble or at the end of its life, it may not sense CO and cannot be relied upon to monitor CO levels. Replace the CO module every six years from the date of manufacture or when the control panel indicates a sensor end-of-life condition, whichever comes first.

A detector installed outside a bedroom may not awaken a sleeper. Normal noise due to stereos, television, etc. may also prevent the detector from being heard if distance or closed or partly closed doors muffle the sounder. This unit is not designed for the hearing impaired.

CO detectors are not a substitute for life safety. Though these detectors will warn against increasing CO levels, we do not warrant or imply in any way that they will protect lives from CO poisoning. They should only be considered as an integral part of a comprehensive safety program.

Detector locations

Selecting a suitable location is critical to the operation of CO detectors. Figure shows appropriate detector locations.

Install detectors according to applicable codes and standards. Place wall-mounted detectors at least 5 ft. (1.5 m) up from the floor. For ceiling mounted applications, place detectors at least 1 ft. (0.3 m) from any wall. For combination detectors, follow the spacing requirements for each sensor. Refer to the control panel's application bulletin for the sensor spacing requirements.

The recommended CO detector locations are:

- Outside each separate sleeping area in the immediate vicinity of the bedrooms (including areas such as hotel rooms and dorm rooms)
- On every occupiable level of a dwelling unit, including basements, but excluding attics and crawl spaces
- Centrally located on every habitable level of the building and in every HVAC zone based on an engineering evaluation considering potential sources and migration of carbon monoxide
- On the ceiling in the same room as permanently installed fuel-burning appliances
- In any area required by local building codes, legislation, or the authority having jurisdiction

- In a suitable environment per the detector specifications (see “Specifications” on page 7 for details)
- On a firm, permanent surface

Do not install the CO detector:

- Within 5 ft. (1.5 m) of any cooking appliance
- Within 10 ft. (3 m) of a fuel-burning appliance
- Near air conditioners, heating registers, or any other ventilation source that may interfere with CO gas entering the detector
- Where furniture or draperies may obstruct the airflow
- In a recessed area

Description

The 250-CO SafeAir Carbon Monoxide Detector detects carbon monoxide gas, monitors the levels of CO gas, and gives early warning when potentially dangerous levels exist. It does not detect fire, smoke, or any other gases.

The built-in sounder is a supplementary alarm notification device. The control panel is considered the primary alarm notification device.

The 250-CO detector meets UL 2075 *Standard for Gas and Vapor Detectors and Sensors*. To meet the requirements of CAN/CSA-6.19 *Residential Carbon Monoxide Alarming Devices*, use the 250-CO-EF Carbon Monoxide Detector.

Alarms and Signals

The 250-CO unit produces sounds other than the alarm signal and provides a multicolored LED to indicate the detector status. Use Table 1 below to determine the status of the detector.

Distinct 85 dB temporal-four alarm: The 85 dB sounder provides a distinctive temporal-four alarm notification that is easy to differentiate from smoke detector notification devices. The alarm beeps four times, pauses five seconds, and then repeats the pattern.

Sensor end-of-life indicator: The detector uses both a flashing amber LED and intermittent sounder chirps to indicate that the detector needs replacing. The detector also signals a trouble condition when the CO sensor reaches end of life. As soon as possible, replace a detector that reaches end of life because it may no longer detect carbon monoxide accurately.

Common trouble relay: When connected to a listed control panel, the trouble relay can report a trouble condition locally at the panel and optionally at the central station, if the system is monitored. The trouble relay opens to indicate a trouble condition upon lost power, CO sensor cell trouble, or cell end of life.

Table 1: Detector status indications

Status	LED	Sounder	Description
Safe air	Green, 1 pulse every 15 seconds	No sound	The detector has power and is functioning properly.
Alarm	Red, pulses with sounder	Sounds four rapid beeps every five seconds or every minute after five minutes in the alarm state	Dangerous levels of CO are present. Evacuate the premises. Press the test/hush button to silence the sounder for five minutes. Activates the alarm relay. If connected, the alarm panel activates.
Trouble	Amber, pulses with sounder	Sounds one rapid beep every 45 seconds	There is a problem with the detector and the detector is not working properly. Contact the service company to correct the trouble and replace the detector, if necessary. Press the test/hush button to silence the detector for nine hours. Activates the trouble relay.
End of sensor life	Amber, pulses with sounder	Sounds one rapid beep every 15 seconds	The sensor is no longer working. Replace the detector as soon as possible. Press the test/hush button to silence the detector for 36 hours. Activates the trouble relay.
Loss of power	No LED	No sounder	Activates the trouble relay.

Figures

Figure 1: 250-CO

Figure 2: Detector locations

-  Recommended CO detector location

Figure 3: 250-CO components

- (1) Alarm relay
- (2) Terminals “-” and “+” are for power; terminals “NO” (normally open) and “C” (common) are the common trouble relay shown in the normal state for this detector
- (3) Sensor
- (4) Sounder

Figure 4: Single device, single zone configuration

- (1) Power (see Specifications)
- (2) Alarm initiating device circuit (IDC) (normally open)
- (3) End-of-line device (provided by the life safety system)

Note: Relay is shown in the normal state for this detector.

Figure 5: Multiple devices, single zone configuration

- (1) Power (see Specifications)
- (2) Alarm IDC (normally open)
- (3) End-of-line device (supplied by life safety system)

Note: Relay is shown in the normal state for this detector.

Figure 6: Multiple devices, separate alarm, trouble zone configuration

- (1) Power (see Specifications)
- (2) Alarm IDC (normally open)
- (3) Supervisory IDC (normally open)
- (4) End-of-line device (provided by the life safety system)

Note: Relay is shown in the normal state for this detector.

Figure 7: 250-CO features

- (1) Test/hush button
- (2) Sensor port

Installation

WARNING: Potential loss of life. Failure to properly install, test, and maintain a CO detector may cause it to fail. Connect the CO detector only to a zone that is dedicated exclusively to CO detection and that is monitored 24 hours a day. Do not connect to an initiating circuit with fire or security devices.

The 250-CO SafeAir Carbon Monoxide Detector is a four-wire device designed to use a Class 2 output from a control panel listed to the ANSI/UL 985 or 864 standards or auxiliary power supply.

All wiring must conform to the NFPA 70 *National Electric Code*, ANSI/UL 2075 *Standard for Gas and Vapor Detectors and Sensors*, NFPA 720 *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*, applicable codes, and the local AHJ.

The 250-CO SafeAir Carbon Monoxide Detector is intended for indoor-dwelling unit applications in both residential and commercial occupancies, including single/multiple family residential occupancies, hotel rooms, dorm rooms, and other areas approved by the authority having jurisdiction (AHJ).

The 250-CO detector can connect to either UL 985 (Household Fire Warning) or UL 864 (Commercial Fire) control panels. It is not intended for use in industrial applications such as gasoline refineries or parking garages, which require different listings.

The 250-COPLT adapter plate

The 250-CO detector has an optional adapter mounting plate. Use the 250-COPLT adapter plate when replacing a 240-COe with a 250-CO to cover the footprint of the 240-COe. To purchase the plate order P/N 250-COPLT-5PKG.

To install the detector without using the adapter plate:

1. Run the 250-CO detector wiring to the detector location.
2. Carefully remove the cover from the detector using a small, flat screwdriver blade in the slot on the left side of the detector cover.
3. The mounting hole pattern is for single-gang spacing. Use the base for a template to mark the two screw hole locations on the mounting surface or mount on a single-gang box (not provided). The unit can be mounted vertically or horizontally.
4. Install two screws on the marks. If necessary, use wall anchors.
5. Line up the base with the screws, pull the wires through the square holes, and then slide the base over the screws. For surface wiring, pull the wires through the wiring channel at the bottom of the base.
6. Strip 3/8 in. of insulation from each wire.
7. Determine the correct wiring, and then insert the wires under the appropriate screw terminals. See "Wiring" and Figure 4 to Figure 6.
8. Tighten both screws to secure the base to the wall.
9. Replace the detector cover.
10. Apply power. The LED should flash green for approximately four seconds, and then pulse green.
11. Test in accordance with "Testing" on page 6.

To install the detector using the adapter plate:

1. Run the 250-CO detector wiring to the detector location.
2. Using the 250-COPLT wall plate for a template, trace the perimeter of the two square holes on the mounting surface. Also mark the two screw locations.
3. Cut out the two square holes.
4. Install two screws on the marks. If necessary, use wall anchors.
5. Mount the wall plate but do not fully tighten the screws.
6. Carefully remove the cover from the detector using a small, flat screwdriver blade in the slot on the left side of the detector cover.
7. Pull the wires through the square holes on both the wall plate and the 250-CO base. Then slide the detector base over the screws.

8. Strip 3/8 in. of insulation from each wire.
9. Determine the correct wiring, and then insert the wires under the appropriate screw terminals. See "Wiring" and Figure 4 to Figure 6.
10. Tighten both screws to secure the base to the wall plate.
11. Replace the detector cover.
12. Apply power. The LED should flash green for approximately four seconds, and then pulse green.
13. If required by the AHJ or local codes, affix the supplied CO Warning Label (P/N 10634757) in proximity to the detector.
14. Test in accordance with "Testing" below.

Wiring

There are three typical wiring configurations:

- Single device and single zone (Figure 4)
- Multiple devices in a single zone (Figure 5)
- Multiple devices with separate alarm and trouble zones (Figure 6)

Notification

Notification of carbon monoxide detectors should be consistent with NFPA 720 and the local AHJ. Notification zones should be consistent with the emergency plan for the protected premises.

Maintenance

Note: The 250-CO is shipped from the factory as an assembled unit; it contains no user-serviceable parts and should not be disassembled.

Clean the outside of the detector each month with a clean cloth (either dry or dampened with water) to keep openings free from dust and dirt.

Do not paint the detector or expose it to cleaning solutions.

CO detector replacement

The 250-CO SafeAir Carbon Monoxide Detector has a long-life carbon monoxide electrochemical sensor. Replace the detector with a new 250-CO detector after six years from the date of manufacture (found on the product label on the back of the detector) or when the control panel goes into trouble and an audible/visible annunciation occurs signaling "end of life".

Testing

WARNING: To reduce the risk of carbon monoxide poisoning, test alarm operation when not in use for 10 days or more.

Test the detector by pushing the test button after installation and once a week to verify that it is functioning properly. If the detector fails the test, verify all connections, wait briefly then try again. If the detector fails again, replace it.

Notify all persons and facilities that receive alarm and trouble signals before beginning the test (to prevent unnecessary response).

To test the trouble relay:

1. Momentarily disconnect the power supply from the detector and verify that the common trouble relay opens.
2. Verify that the panel reacts correctly to the relay activation.

Test/hush button: (Refer to Figure 7.) Use the test/hush button to test the detector and silence an activated detector. When in alarm, momentarily pushing the test/hush button silences the integral sounder for five minutes. The red alarm light stays on, and if CO is still present after five minutes, the detector once again sounds in the temporal-four pattern. The detector automatically resets when CO is no longer detected.

Three different tests can be performed by pressing the test/hush button. How long the button is pressed determines which tests are performed. See Table 2.

Table 2: Press duration and resulting test

Duration	Test	Description
Short press	Buzzer test only	Generates the temporal-four pattern twice.
Two seconds	Buzzer test	Generates the temporal-four pattern twice.
	Fast CO test	While in the fast CO test mode, a functional carbon monoxide gas test can be performed using a can of CO testing agent [1].
Five seconds	Buzzer test	Generates the temporal-four pattern twice.
	Fast CO test	While in the fast CO test mode, a functional carbon monoxide gas test can be performed using a can of CO testing agent [1].
	Alarm relay test	Activates the alarm relay.

[1] Use the UL-certified "Solo C6" canned CO product from SDI

To test the buzzer:

1. Momentarily press the test/hush button.

The sounder generates four quick beeps, followed by five seconds of silence, and then four quick beeps.

To perform the functional test with CO test spray:

1. Press and hold down the test/hush button until the red LED illuminates (approximately 2 seconds).
2. Wait for the buzzer test to complete.
The red LED flashes every 4 seconds and the green LED flashes every 16 seconds indicating that the device is in fast CO test mode.
3. Direct the UL approved CO testing agent spray to the sensor port of the 250-CO. See Figure 7.
The unit immediately goes into an alarm mode upon sensing the applied gas. The sounder and red LED activate in a temporal-four pattern with a five second pause in between. The alarm relay activates.
If the level of applied CO gas is still significant, the device continues to alarm in this pattern.
4. Exit the fast test mode by either:
 - Pressing the test/hush button until the green LED illuminates (approximately 2 seconds)
 - Waiting five minutes, until the unit automatically exits out of the fast CO test mode

To perform the alarm relay test:

1. Press the test/hush button for approximately 5 seconds to start a test cycle.
2. Wait for the Buzzer test to complete.
3. Verify that the panel reacts correctly to the alarm relay activation.
4. Exit the alarm relay test mode by either:
 - Pressing the test/hush button until the green LED illuminates (approximately 2 seconds)
 - Waiting five minutes, until the unit automatically exits out of the fast CO test mode

Specifications

Input voltage	12 or 24 VDC supplied by control panel or resettable auxiliary power supply
Current consumption	
Normal	20 mA
Alarm	40 mA (75 mA in test)
Alarm relay	150 mA at 33 VDC
Type	Form C
UL rating	Zone
Common trouble relay	150 mA at 33 VDC
Type	Normally opened held closed with power applied
UL rating	Common
Sounder	85 dB
Compatible control panel	Listed to ANSI/UL 985 or 864 standards
Compatible electrical box	2-1/2 in. (64 mm) deep single-gang
Wire size	14 to 22 AWG (0.25 to 2.0 mm ²)

Dimensions (W × L × D)	
Detector	3.1 × 4.6 × 1.3 in. (7.8 × 11.7 × 3.2 cm)
Adapter plate	4.5 × 6.5 × 0.2 in. (11.4 × 16.5 × 0.5 cm)
Weight	
Detector	4.7 oz. (133 g)
Adapter plate	1.6 oz (46 g)
Color	White
Operating environment	
Temperature	32 to 104°F (0 to 40°C)
Relative humidity	0 to 90%, noncondensing

Regulatory information

Manufacturer	Edwards, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202, USA
Year of manufacture	The first two digits of the product serial number (located on the product identification label) are the year of manufacture.
UL rating	Regulated 12 DC, Regulated 24 DC
North American standards	ANSI/UL 2075 This detector has been evaluated to the CO alarm sensitivity limits of ANSI/UL 2034.
Environmental class	Indoor

Contact information

For contact information, see www.utcfireandsecurity.com.

