



Carbon Monoxide Detector with Transmitter Model 350

Description:

The Model 350 is a self-contained carbon monoxide (CO) detector with an integral sounder and transmitter. The detector complies with UL 2075 and is designed to provide protection in dwellings. It is fully supervised for tamper, low battery, sensor end of life, sensor open circuit, RF signal integrity and has a built in gas test feature. The CO detector is powered by a single 3 volt lithium battery as listed under the specifications section of this manual and the label on the product. The Model 350 is intended to be used with CWSI Fire Alarm Control Panels. Refer to the control panel manual for compatibility details.

IMPORTANT: CO detectors must be tested and maintained regularly following NFPA 720 requirements. At a minimum, cleaning should be performed annually.

Programming:

The 350 must be enrolled into the CWSI Fire Alarm Control Panel before installing the device. **The Model 350 will not report Alarms, Supervisory or trouble signals unless it is enrolled into a compatible control panel.** The CO detector can be enrolled at the control panel or any enrolled repeater. Place the FACP in enrollment mode then install the battery in the CO detector observing polarity. The model 350 serial number will be displayed on the FACP. Refer to the control panel installation instructions for further details on enrollment and transmitter programming options. After the model 350 is enrolled, remove the battery and reinstall it only at the transmitters intended mounting location.

Installation:

Select an accessible location that is not prone to tampering or accidental damage. **The Model 350 must be installed and maintained in accordance with the National Fire Protection Association's Standards (NFPA), the National Electrical Code and all local fire and electrical requirements.** The mounting surface should be relatively flat and capable of accepting screws or anchors. The CO detector is to be installed in an indoor dry location. Exposure to weather or corrosive conditions may damage the detector. CO detectors are not to be used with detector guards unless the combination has been evaluated and found suitable for that purpose. The mounting position on a wall should be no less than 48" from the floor and more than 6" from the ceiling. The mounting position on a ceiling should be at least 12" from any wall. **Perform the signal test described in this manual prior to and after permanently mounting the detector. Note:** If the detector is mounted to a removable ceiling tile, the tile must be secured with the appropriate fasteners to prevent tile removal or mount the detector across a ceiling panel support as shown in figure 1. First install the mounting base using the screws supplied. Install the battery in the battery holder. The polarity is marked on the holder. Attach the detector to the base by turning the detector in a clockwise direction until it clicks into place. Wait for the green and red LED's to indicate standby condition (green blinks every 10s and red off) then perform the signal test and fully test the detector for alarm as described in **Alarm Testing**.



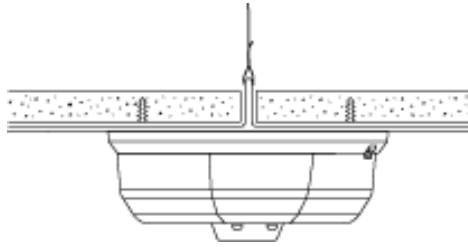


Figure 1 Proper Mounting to Ceiling Tile

Tamper-Resistant Feature

The CO detector includes a tamper-resistant feature that prevents removal from the mounting base without the use of a tool. To engage the tamper-resistant feature, cut the small plastic tab located on the mounting base (Figure 2), and then install the detector. To remove the detector from the base once it has been made tamper resistant, use a small screwdriver to depress the square tamper release tab, located on the skirt of the mounting base, and turn the detector counterclockwise.

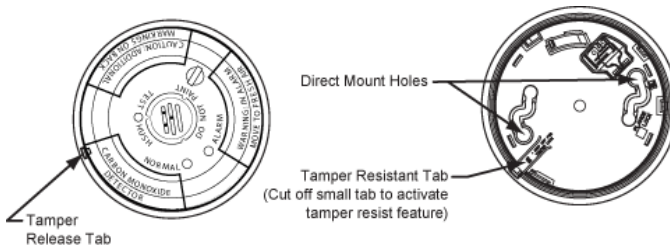


Figure 2 Tamper Resistant Feature

Cautions:

1. Make sure the battery is firmly installed in the CO detector battery compartment.
2. The detector must be secured tightly to the wall, so as to not be dislodged.
3. Test the detector after any service, battery change or as often as local or national codes dictate.

Do NOT Install Detectors in the Following Areas:

- In an area where cross-interference gasses are present. Cross interference gasses include but are not limited to: Methane, Butane, Heptane, Ethyl Acetate, Isopropyl Alcohol, Carbon Dioxide, Ammonia, Ethanol, Toluene, Trichloroethane and Acetone.
- Within 10 feet of a flame fueled appliance.
- In any area that is out of the detectors environmental specification range.
- In wet or excessively humid areas, or next to bathrooms with showers.
- In dusty, dirty, or insect-infested areas.
- Near fresh air inlets or returns or excessively drafty areas.

Consult NFPA 720, the local Authority Having Jurisdiction (AHJ), and/or applicable codes for specific information regarding the spacing and placement of CO detectors. Refer to technical bulletin part number CWSI-IM-350-TB-Rev B for more information.

Operation:Led status indicators and Sounder

The 350 detector is equipped with two LED's status indicators and a sounder to provide local visual and audible indication of the detector's status. The table below explains the LED and sounder functions.

LED Status and Sounder Operation

Condition	Green LED	Red LED	Sounder	Transmitted Signal to FACP
Power up	Blink every 10s for 40s	Blink every 10s for 40s	Off	Power Up Reset [▲]
Standby	Blink every 10s	Off	Off	Test (check in) every 90s
Alarm	Off	Blink once a second	Temporal 4 pattern	Alarm ^{▲▲}
Test Switch Pressed (normal standby)	Off	Blink once a second	Temporal 4 pattern	Alarm ^{▲▲}
Test Switch pressed (in alarm)	Off	Blink once a second	Silenced for 5 minutes*	Alarm ^{▲▲}
Low Battery	Off	Blink every 45s	Chirp every 45s**	Low Battery Trouble ^{▲▲▲}
Test Switch pressed (in low batt)	Off	Blink every 45s	Silenced for 12 hours	Low Battery Trouble ^{▲▲▲}
Cell Health Fault	Off	Blink every 5s	Chirp every 45s	Tamper/Maint Trouble ^{▲▲▲}
Cell End of Life	Off	Blink every 10s	Chirp every 45s	Tamper/Maint Trouble ^{▲▲▲}
Tamper	Blink every 10s	Off	Off	Tamper/Maint Trouble ^{▲▲▲}

Table 1

*Only if the detected CO level is below 350ppm.

**Low Battery chirp begins 7 days after initial low battery trouble on the control panel.

▲Within 30 seconds of installing a good battery.

▲▲Indication on FACP within 10 seconds then repeated every 60 seconds.

▲▲▲Indication on FACP within 200 seconds then repeated every 90 seconds.

Alarm Operation:

When the detector senses CO the Green LED extinguishes, the Red LED blinks once a second, the internal sounder turns on in the temporal 4 pattern and the following occurs:

1. An initial alarm signal is transmitted.
2. A 60 second delay occurs. If during this delay the detectors alarm condition is cleared, a restore signal is sent ending the alarm cycle.
3. The continued alarm condition causes a repeat alarm transmission.
4. Another 60 second delay as in step 2 occurs.
5. Step 4 repeats at 60 second intervals until the detectors alarm condition is cleared.

Alarm/Gas Testing

Detectors must be tested after installation and following maintenance or battery replacement. **NOTE: Before testing, notify the proper authorities that maintenance is being performed and the system will be temporarily out of service.** Place the control panel in test to prevent any unwanted alarms. Perform the test below to properly test the 350 detector. If a detector fails any of the tests below, it should be cleaned as outlined in the Maintenance section. If the detector still fails, it should be replaced.

Warning: This test will cause an alarm signal to be transmitted. This test will only function if the detector is operating within its proper sensitivity limits and is not in a trouble condition. The purpose of this test is to check the functionality of the sensor and circuitry. The model 350 has a functional gas test mode which can be used to verify the detector's ability to sense carbon monoxide gas. To perform the alarm/functional gas test, follow the steps below:

1. Locate the recessed detector test switch located on the detector cover (Figure 3).
2. With a small screwdriver, depress and hold the recessed "Test" switch for approximately 2 seconds. The detector will temporarily sound in alarm and the red LED will illuminate.
3. An Alarm signal will be annunciated at the control panel.
4. Within a few seconds the green LED will start to blink rapidly indicating the detector is in functional test mode awaiting gas entry.
5. Spray a very small amount of **Solo brand C6 canned CO** into one of the 3 small gas entry holes located on the top center of the detector (figure 3).
6. Upon successful gas entry and if functioning properly, the detector will alarm by sounding in a Temporal 4 pattern with the red LED blinking.
7. The alarm condition at the detector will time out in 20 to 60 seconds or when the CO gas has cleared.
8. If gas entry is unsuccessful, the test will time out after 27 seconds.
9. When testing of the CO detector(s) is completed, remove the panel from test mode and notify the proper authorities when the system is back in service.

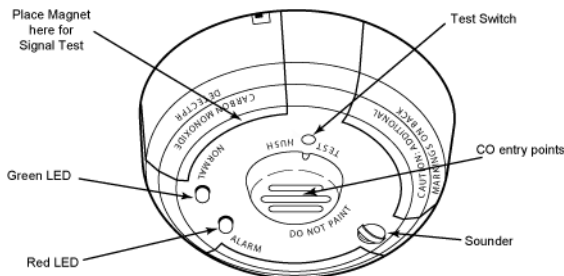


Figure 3 LEDs, Sounder, Test Switch and Signal Test Locations

Signal Test:

The test must be performed while the CO detector is held in its intended mounting location. Install a battery in the CO detector. Initiate the test by placing a strong magnet on the CO detector housing at the location shown in figure 3. The piezo sounder on the rf transmitter inside the detector will beep once. A delay of up to 15 seconds will occur followed by either one or two beeps. One beep indicates an unacceptable location and two beeps indicate an acceptable location. If only one beep is heard then relocate the model 350 mounting

position closer to the nearest repeater or control panel and perform the test again. Continue this procedure until 2 beeps are achieved. Do not mount the CO detector unless 2 beeps are heard when performing 5 consecutive signal tests. This test **must** be performed before and after transmitter installation. Note: A CWSI model AR-3(A), AR-5 repeater or control panel must be powered up, installed and enrolled before running this test.

Test Switch Functions:

This switch has multiple functions and is located in an opening on the detector housing as shown in figure 3. To activate the recessed switch insert a small tool (0.18" □ max.) into the test switch opening; push and hold for 3 seconds. **Warning: Pressing this switch WILL cause an alarm at the control panel.**

The functions of the Test Switch are:

1. Test the functionality of the detectors circuitry when pressed while the detector is in standby.
2. Silence the low battery chirp for 12 hours if pressed during low battery.
3. Silence the sounder for 5 minutes if pressed while the detector is in Alarm.

Low battery:

The model 350 CO detector tests for a low battery condition every 65 minutes. The battery voltage has to be at or below 2.7V nominally for two consecutive low battery tests before a low battery trouble condition is transmitted. When a low battery is detected the green LED will turn off, the red LED will blink every 45 seconds, and a low battery trouble signal will be transmitted and repeated every 90 seconds. The sounder will begin to chirp if the low battery signal exists for 7 days. Pressing the CO detector test button will silence the sounder chirp for 12 hours. If more than one type of trouble exists, all will be repeated in increments of 90 seconds. Always replace the battery with a new one. Refer to the Battery Installation and Replacement section for instructions on battery replacement.

Battery Installation and Replacement:

Warning: Always install a new battery of one of the approved types as listed in the Specifications section of this manual and the product label. When a battery is first inserted, a low battery test is performed. If the battery passes the test, the LED's should indicate normal standby. If the battery does not pass this test, the detector will transmit a Tamper/Maint signal and the LEDs will not blink at all. In this case a fresh battery should be installed.

To replace the battery:

1. Place the Control Panel in Test mode to prevent any unwanted alarms.
2. Remove the detector from its mounting base by twisting the detector counterclockwise. Remove the battery and dispose of properly. If the Tamper Resistant feature was implemented during installation then follow the instructions under that section for removing the detector.
3. To insure proper power down sequence, wait a minimum of 20 seconds before installing a new battery.
4. Install a new approved 3 volt lithium battery in the battery compartment following the polarity diagram inside the compartment. A power up reset trouble signal should be indicated on the Control Panel within 30 seconds. A tamper trouble will also be indicated if the smoke alarm is not attached to the base.
5. Reinstall the CO detector onto the mounting base by turning the detector clockwise.

6. The LED's should indicate Power up and then Normal Standby conditions as shown in the LED status and sounder table.

7. Test the detector for alarm operation as described in the **Alarm Testing** section of this manual.

8. If the detector does not function as described in items 6+7 then start over at step 2. If it still doesn't operate correctly then replace the detector.

9. Remove the panel from test mode.

Power Up Reset:

The Models 350 will report this trouble within 30 seconds when powered up. This is normal. If a power up reset occurs anytime after the initial indication then the transmitter is malfunctioning. Replace the detector.

Test Failure:

The Model 350 transmits a periodic test signal to the FACP. This trouble condition will be displayed within 200 seconds on the control panel if it does not receive the test transmission. The detector may be out of reception range of a repeater or control panel or the detector may have an internal problem. Perform the signal test described in this manual to determine if there is a reception problem. Note: This trouble is self-restoring on CP-3500D and newer FACP's.

Tamper:

The Models 350 contain a built in contact that will cause a Tamper/Maint signal to be transmitted if the detector is removed from its mounting position. Upon detector removal, a tamper signal is transmitted and repeated every 90 seconds until the detector is mounted on its base. Where more than one type of trouble exists, all will be repeated in increments of 90 seconds. Note: This trouble is self-restoring on CP-3500D and newer FACP's.

CO Trouble / Sensor End of Life:

The Models 350 monitor the CO sensing element for open circuit and end of life. If a sensing element open circuit is detected the Green LED will extinguish and the Red LED will flash every 5 seconds. If the sensing element end of life is reached the Green LED will extinguish and the Red LED will flash every 10 seconds. The detector sounder will chirp every 45 seconds and transmit a Tamper/Maint signal if either fault occurs. The signal will be repeated every 90 seconds until the condition is corrected. Replace the detector.

Maintenance

Perform maintenance yearly at a minimum. **Warning: Never remove the tamper proof screws attaching the detector cover to the chassis containing the circuit boards. The sensing element cannot be cleaned. Never expose the detector to aerosol products such as furniture polish, paint or varnish that can coat the CO sensing element and render it inoperative.**

NOTE: Before performing maintenance on the detector, notify the proper authorities that maintenance is being performed and the system will be temporarily out of service. Place the control panel in test mode to prevent any unwanted alarms.

The battery must be removed from the detector before performing maintenance of any kind.

1. Place the Control Panel in Test mode to prevent any unwanted alarms.

2. Remove the detector by turning counterclockwise and remove the battery.

3. Clean the detector housing using a cloth moistened with water. Make sure the holes on the detector cover are clear of debris. **Never use cleaning agents to clean the detector.**
4. Reinstall the battery.
5. Reinstall the CO detector onto the mounting base by turning the detector clockwise.
6. Test the detector for alarm operation as described in the **Alarm Testing** section of this manual.
7. If the detector does not function as described in item 10 then start over at step 2. If it still doesn't operate correctly then replace the detector.
8. Remove the panel from test mode.

Specifications:

- Battery Type: 3 Volt Lithium; Panasonic CR123A.
- Battery Life: 12 Months Minimum
- Battery Replacement: Upon Low battery report and/or during annual maintenance.
- Average Standby Current: 32.8ua
- Average Alarm Current: 35ma
- Tamper Switch: On base
- Sounder: 85db at 10' temporal 4 pattern.
- Reset: Automatic
- Sensitivity: Listed to UL-2075 Evaluated to UL-2034
- Low battery threshold: 2.7V
- Operating Temperature Range: 32°F to +100°F.
- Operating Humidity Range 15% to 95% RH.
- Maximum Operating Altitude 6000ft. above sea level
- Testing: Follow this manual and NFPA 720 or local requirements.
- Transmission: In compliance with FCC part 15 for reception on equipment manufactured by Tyco Fire & Security GmbH
- Test Transmission: Every 90 seconds
- Mounting base diameter 5.30"
- Weight 7.0 oz. without battery

FCC Statement

Important: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Disclaimer

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