

GENTEX
CORPORATION

A Smarter Vision®

CO1209 SERIES

ELECTROCHEMICAL CARBON MONOXIDE (CO) ALARM



ELECTROCHEMICAL TYPE SINGLE/MULTIPLE STATION CARBON MONOXIDE ALARM, AC POWERED, WITH BATTERY BACK-UP & TANDEM WIRE CONNECTION

Installation Instructions - Owner's/User's Information Manual -READ CAREFULLY AND SAVE

INTRODUCTION CO1209 SERIES

The CO1209 electrochemical carbon monoxide (CO) alarm is for use as an evacuation device in all dwelling units. The device has a solid state piezo signal to warn and alert the occupants to the presence of carbon monoxide.

Your CO alarm is designed to detect abnormal amounts of carbon monoxide gas, only. Consequently, it is uncommon for household sources of combustion, including properly functioning household appliances, to produce sufficient levels of CO to cause an alarm.

BASIC SAFETY INFORMATION

⚠ Dangers, Warnings, Cautions and notices alert you to important operating procedures or to potentially hazardous situations. Pay special attention to these items.

WARNING!

- This CO alarm is listed for use in single-family and multi-family residences, along with hotel, motels and other dwelling units.
- This CO alarm will only indicate the presence of increased levels of carbon monoxide gas at the sensor. Increased levels of carbon monoxide gas may be present in other areas.
- This CO alarm must receive continuous 120VAC, 60Hz, pure sine wave electrical power. (battery is meant for emergency back-up only). In order for the emergency battery back-up to work, a new battery must be properly installed (see BATTERY INSTALLATION section).
- NEVER ignore your CO alarm if it sounds. Refer to IF YOUR CO ALARM SOUNDS section for more information. Failure to do so can result in serious injury or death.
- Test this device once a week. If the device ever fails to test correctly, replace immediately! If the device is not working properly, it can not alert you to a problem.
- This product is intended for use in indoor locations of family dwelling units. It is not designed to measure CO levels in compliance with Occupational Safety and Health Administration (OSHA) commercial or industrial standards. Individuals with medical conditions that may make them more sensitive to carbon monoxide may consider using warning devices which provide audible and visual signals for carbon monoxide concentrations under 30 ppm. For additional information on carbon monoxide and your medical condition, contact your physician.

MODELS

(SEE BACK OF CO ALARM FOR EXACT MODEL)

CO1209.....120VAC, 60Hz
CO1209F.....120VAC, 60Hz with Form A/Form C auxiliary relay contact

NOTICE: In the event AC Power fails, a 9VDC battery will provide proper alarm operation for a minimum of 24 hours.

HOW THE CO ALARM WORKS

GENERAL INFORMATION

NOTICE: CO problems can occur at any time.

When fully powered, the device samples the air and takes a new reading about every 30 seconds. A microchip inside the unit stores each reading and remembers the levels of CO it has been exposed to over time. The CO alarm will sound when it has been exposed to a critical level of CO (measured in parts per million or ppm) within a specified time (measured in minutes). This CO alarm features a permanently installed sensor, an indicator light and an 85dBa, temporal 4 alarm horn. It also has a reset feature to temporarily

quiet the alarm horn. If critical levels of CO remain, the alarm will re-activate and sound.

NOTICE: MALFUNCTION WARNING This unit performs a self-diagnostic test. If the alarm malfunctions it should be replaced immediately. See IF THE CO ALARM IS NOT OPERATING PROPERLY for more information.

HOW TO TELL IF THE CO ALARM IS WORKING PROPERLY

- Your device is provided with an alarm horn and flashing red Light Emitting Diode (LED) indicator, which flashes every 15-30 seconds, and a green AC power on LED and red LED for CO.

WHAT YOU CAN DO TO MAKE YOUR FAMILY SAFE FROM CARBON MONOXIDE (CO)

- Install CO alarms properly following the instructions in this manual. Keep your units clean. Test your CO alarm weekly and replace when it no longer functions.**
As with any electronic product, CO alarms have a limited life, it is recommended that CO alarms be replaced every five (5) years. CO alarms that don't work cannot protect you.
- Develop a family escape plan and practice it with your entire family, especially small children.**
 - Draw and post a floor plan of your home and find ways to exit from each room.
 - Teach children what the CO alarm signal means, and that they must be prepared to leave the residence by themselves if necessary.
 - Decide on a meeting place a safe distance from your house and make sure that all your children understand that they should go and wait for you if there is a CO alarm.
 - Hold CO drills at least every 6 months to make sure that everyone, even small children, know what to do to escape safely.
 - Know where to go to call the fire department from outside your residence.

WHAT TO DO IF THERE IS A CO EMERGENCY IN YOUR HOME

If you have prepared family escape plans and practiced them with your family, you have increased their chances of escaping safely. Review the following rules with your children when you have CO drills so everyone will remember them in a real CO emergency. If alarm should sound:

- a. Don't panic; stay calm. Your safe escape may depend on thinking clearly and remembering what you have practiced.
- b. Open windows or doors. Opening windows or doors can significantly reduce CO levels.
- c. Get out of the house following a planned escape route as quickly as possible. Do not stop to collect anything or to get dressed.
- d. Meet at your prearranged meeting place after leaving the house.
- e. Call the Fire Department as soon as possible from outside your house. Give the address and your name.
- f. Never re-enter the building while the device is in alarm.

Contact your local Fire Department for more information on making your home safer from CO and about preparing your family's escape plans.

NOTE: Current studies have shown CO alarms may not awaken all sleeping individuals, and that it is the responsibility of individuals in the household

that are capable of assisting others to provide assistance to those who may not be awakened by the alarm sound, or to those who may be incapable of safely evacuating the area unassisted.

WHAT THIS CO ALARM CAN DO

This CO alarm is designed to sense carbon monoxide gas entering its sensing element. It does not sense smoke, heat or flames.

When properly located, installed, and maintained, this CO alarm is designed to provide early warning of potential increased levels of carbon monoxide gas at a reasonable cost. This device monitors the air and when it senses CO, activates its built-in alarm horn. It can provide precious time for you and your family to escape from your residence before a CO poisoning occurs. Such an early warning, however, is possible only if the CO alarm is located, installed, and maintained as specified in this User's Manual.

This CO alarm is designed for use within single residential living units only; that is, it should be used inside a single-family home or one apartment of a multi-family building. In a multi-family building, the device may not provide early warning for residents if it is placed outside of the residential units, such as on outside porches, in corridors, lobbies, basements, or in other apartments. In multi-family buildings, each residential unit should have CO alarms to alert the residents of that unit. Devices designed to be interconnected should be interconnected within one family residence only; otherwise, nuisance alarms will occur when a CO alarm in another living unit is tested.

NOTICE: GENERAL LIMITATIONS OF CO ALARMS

This CO alarm is intended for all dwelling units. It is not intended for use in industrial applications where Occupational Safety and Health Administration (OSHA) requirements for carbon monoxide detectors must be met.

CO alarms will not work without power. A battery must be connected to the CO alarm to maintain proper device operation if AC power supply is cut off by an electrical fire, an open fuse or circuit breaker, or for any other reason. In the event of AC power failure, the battery will supply power for a minimum of 24 hours.

CO alarms may not awaken all individuals. If children and others do not readily awaken to the sound of the CO alarm or if there are infants or family members with mobility limitations, make sure that someone is assigned to assist them in the event of an emergency.

CO alarms for solar or wind energy users and battery back-up power systems: AC powered CO alarms should only be operated with true or pure sine wave inverters. Operating this CO alarm with most battery powered UPS (uninterruptible power supply) products or square wave or "quasi sine wave" inverters will **damage the alarm**. If you are not sure about your inverter or UPS type, please consult with the manufacturer to verify.

This CO alarm will not sense carbon monoxide that does not reach the sensor. This CO alarm will only sense CO at the sensor. CO may be present in other areas. Doors or other obstructions may affect the rate at which CO reaches the alarm. For this reason, if sleeping room doors are usually closed at night, we recommend you install an alarm in each sleeping room and in the hallway of each sleeping area.

CO alarms may not sense CO on another level of the residence. For example, an alarm on the second floor, near the bedrooms may not sense CO in the basement. For complete coverage, it is recommended that an alarm be installed on each level and tandem interconnected.

CO alarms may not be heard. The alarm decibel rating meets or exceeds current UL Standards of 85dBA at 10 feet (3 meters). However if the device is installed outside the sleeping area, it may not awaken a sound sleeper, one who has recently used drugs or has been drinking alcoholic beverages. This is especially true if the door is closed or only partially open. Even persons who are awake may not hear the sounding alarm if the sound is blocked by distance or closed doors. Noise from traffic, stereo, radio, television, air conditioner, or other appliances may also prevent alert persons from hearing the alarm horn. This device is not intended for people who are hearing impaired.

CO alarms are not a substitute for life insurance. Though these CO alarms warn against increasing CO levels, Gentex Corporation does not warrant or imply in any way that they will protect lives from CO poisoning. Homeowners and renters must still insure their lives.

CO alarms have a limited life. Although the CO alarm and all of its components have passed many stringent tests and are designed to be as reliable as possible, any of these parts could fail at any time. Therefore, you must test your CO alarm weekly.

CO alarms are not foolproof. Like all other electrical devices, CO alarms have limitations. They can only detect CO that reaches their sensors. They may not give early warning to rising CO levels if the CO is coming from a remote part of the home, away from the alarm. CO alarms may not alarm when a large influx of CO is introduced into the house. An example of a possible source of a large in-rush of CO is a generator running in an attached, enclosed garage and the door to the connected residence is opened.

NOTICE: The horn in your CO alarm meets or exceeds current audibility requirements of Underwriters Laboratories. However, if the **CO alarm is located outside a bedroom, it may not wake up a sound sleeper**, especially if the bedroom door is closed or only partly open. If the CO alarm is located on a different level of the residence than the bedroom, it is even less likely to awaken people sleeping in the bedroom. In such cases, the National Fire Protection Association recommends that the CO alarms be interconnected so that a unit on any level of the residence will sound an alarm loud enough to awaken sleepers in closed bedrooms. This can be done by employing a systematic approach by interconnecting CO alarms together, or by using radio frequency transmitters and receivers.

⚠ WARNING WHAT YOU NEED TO KNOW ABOUT CO

WHAT IS CO? Carbon Monoxide (CO) is an invisible, odorless, tasteless gas produced when fossil fuels do not burn completely or are exposed to heat (usually fire). Electrical appliances typically do not produce CO.

These fuels include: wood, coal, charcoal, oil, natural gas, gasoline, kerosene and propane.

Common appliances are often sources of CO. If they are not properly maintained, are improperly ventilated, or malfunction, CO levels can rise quickly. CO is a real danger now that homes are more energy efficient. "Air-tight" homes with added insulation, sealed windows and other weatherproofing can 'trap' CO inside.

SYMPTOMS OF CO POISONING: These symptoms are related to CO POISONING and should be discussed with ALL household members.

EXPOSURE	SYMPTOMS OF CO POISONING
Mild	Slight headache, nausea, vomiting, fatigue (flu-like symptoms)
Medium	Throbbing headache, drowsiness, confusion, rapid heart rate
Extreme	Convulsions, unconsciousness, heart and lung failure. Exposure to carbon monoxide (CO) can cause brain damage and death

⚠ WARNING Some individuals are more sensitive to CO than others, including people with cardiac, respiratory or other health problems, infants, young children, pregnant women and elderly people can be more quickly and severely affected by CO. People sensitive to CO should consult their doctors for advice on taking additional precautions.

FINDING THE SOURCE OF CO AFTER AN ALARM

Carbon monoxide is an odorless, invisible gas, which often makes it difficult to locate the source of CO after an alarm. A few factors that can make it difficult to locate sources of CO include:

- House well ventilated before the investigator arrives.
- Problem caused by "backdrafting".
- Transient CO problem caused by special circumstances.

Because CO may dissipate by the time an investigator arrives, it may be difficult to locate the source of CO. **Gentex Corporation shall not be obligated to pay for any carbon monoxide (CO) investigation or service call.**

HOW CAN I PROTECT MY FAMILY?

A CO alarm is an excellent way of protection. It monitors the air and sounds a loud alarm before carbon monoxide (CO) levels become threatening for average, healthy adults.

NOTICE: A CO alarm is not a substitute for proper maintenance of home appliances.

To help prevent CO problems and reduce the risk of CO poisoning:

- Clean chimneys and flues yearly. Keep them free of debris, leaves, and nests for proper air flow. Also, have a professional check for rust and corrosion, cracks or separations. These conditions can prevent proper air movement and cause backdrafting. Never cap or cover a chimney in any way that would block air flow.
- Test and maintain all fuel-burning equipment annually. Many local gas or oil companies and HVAC companies offer appliance inspections for a nominal fee.
- Make regular visual inspections of all fuel-burning appliances. Check appliances for excessive rust and scaling. Also check the flame on the burner and pilot lights. The flame should be blue. A yellow flame means fuel is not being burned completely and CO may be present. Keep the blower door on the furnace closed. Use vents or fans when they are available on all fuel-burning appliances. Make sure appliances are vented to the outside. Do not grill or barbecue indoors, in garages or on screen porches.
- Check for exhaust backflow from CO sources. Check the draft hood on an operating furnace for a backdraft. Look for cracks on furnace heat exchangers.
- Check the house or garage on the other side of shared wall.
- Keep windows and doors open slightly. If you suspect that CO is escaping into your home, open a window or door. Opening windows or doors can significantly reduce CO levels.

POTENTIAL SOURCES OF CO IN RESIDENTIAL DWELLINGS

Fuel-burning appliances like: portable heater, gas or wood burning fireplace, gas kitchen range or cooktop, gas clothes dryer, portable generators.

Damaged or insufficient venting: corroded or disconnected water heater vent pipe, leaking chimney pipe or flue, or cracked heat exchanger, blocked or clogged chimney opening.

Improper use of appliance/device: operating a barbecue grill, portable generator or vehicle in an enclosed area (like a garage or screened porch), or even your home.

Figure 1

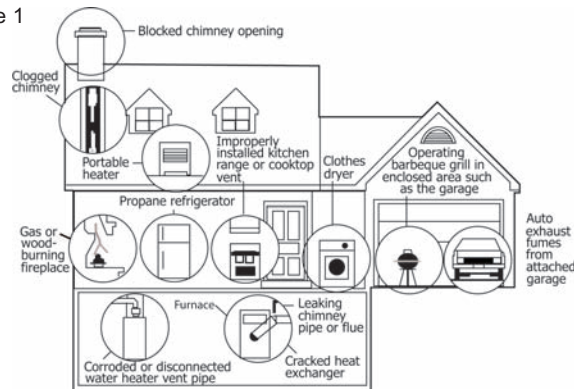


Figure 1: POTENTIAL SOURCES OF CO IN HOME.

Transient CO Problems: transient or on-again-off-again CO problems can be caused by outdoor conditions and other special circumstances.

The following conditions can result in transient CO situations:

- 1) Excessive spillage or reverse venting of fuel appliances caused by outdoor conditions such as:
 - Wind direction and/or velocity, including high, gusty winds. Heavy air in vent pipes (cold/humid air with extended periods between cycles).
 - Negative pressure differential resulting from the use of exhaust fans.
 - Several appliances running at the same time competing for limited fresh air.
 - Vent pipe connections vibrating loose from clothes dryers, furnaces or water heaters.
 - Obstructions in or unconventional vent pipe designs which can amplify the above situations.
- 2) Extended operation of unvented fuel burning devices (range, oven, fireplace)
- 3) Temperature inversions, which can trap exhaust close to the ground.
- 4) Car idling in an open or closed garage or near a home.
- 5) Portable generator used in an open or closed garage or near a home.

These conditions can come and go, they are also hard to recreate during a CO investigation.

PLACEMENT OF CO ALARMS

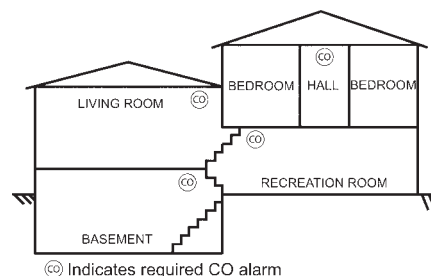
THIS EQUIPMENT SHOULD BE INSTALLED IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION'S STANDARD 720 (National Fire Protection Association, Batterymarch Park, Quincy, MA 02269).

For your information, the National Fire Protection Association's Standard 720, reads as follows:
NFPA 720, 2009 Edition, Chapter 9, Section 9.4.1.1 Where required by applicable laws, codes or standards for a specific type of occupancy, approved single and multiple-station CO alarms shall be installed as follows:

- 1) Outside of each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms.
- 2) On every occupiable level of a dwelling unit, including basements, excluding attics and crawl spaces.
- 3) Other locations where required by applicable laws, codes or standards.

The installation of additional CO alarms should result in a higher degree of protection. Adding alarms to rooms that are normally closed off from the required alarms increases the escape time because the CO levels do not need to build to the higher level necessary to force CO out of the closed room to the required alarms. As a consequence, it is recommended that the householder consider the installation of additional CO protection devices. However, it should be understood that NFPA 720 does not require additional CO alarms over and above those called for in Figures 2, 3, 4 and 5 where required CO alarms are shown.

Figure 2



Ⓢ Indicates required CO alarm

Figure 2: A CO ALARM MUST BE LOCATED ON EVERY LEVEL OF DWELLING UNIT, INCLUDING BASEMENT AND OUTSIDE SLEEPING AREAS.

Where to Locate the Required CO Alarms. The major threat from CO in a dwelling unit occurs at night when everyone is asleep. Persons in sleeping areas can be threatened by CO levels in the remainder of the unit; therefore, CO alarms are best located between the bedroom areas and the rest of the unit as shown in Figure 3.

Figure 3

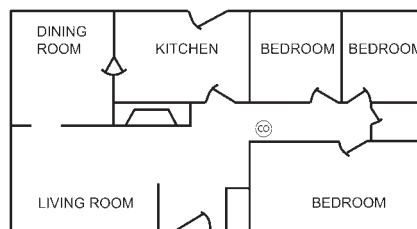


Figure 3: A CO ALARM MUST BE LOCATED BETWEEN THE SLEEPING AREA AND THE REST OF THE DWELLING UNIT.

In dwelling units with more than one bedroom area or with bedrooms on more than one floor, more than one CO alarm is required, as shown in Figure 4.

Figure 4

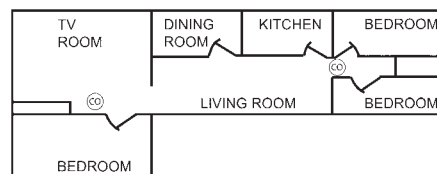


Figure 4: IN DWELLING UNITS WITH MORE THAN ONE SLEEPING AREA, A CO ALARM MUST BE PROVIDED TO PROTECT EACH SLEEPING AREA.

In addition to CO alarms outside of the sleeping areas, NFPA 720 requires the installation of a CO alarm on each additional level of the dwelling unit, including the basement. These installations are shown in Figure 5. The living area CO alarm should be installed in the living room or near the stairway to the upper level, or in both locations. The basement CO alarm should be installed in close proximity to the stairway leading to the floor above. Where installed on an open-joisted ceiling, the CO alarm should be placed on the bottom of the joists. The CO alarm should be positioned relative to the stairway so as to intercept CO coming from the basement before CO enters the stairway.

Figure 5

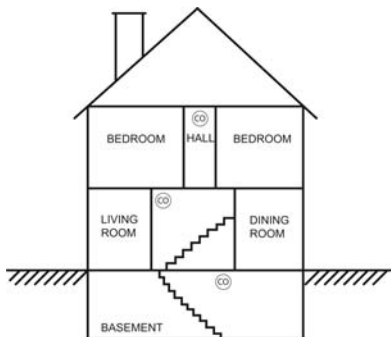


Figure 5: A CO ALARM MUST BE LOCATED ON EACH LEVEL.

Are More CO Alarms Desirable? The required number of CO alarms might not provide reliable early warning protection for those areas separated by a door from the areas protected by the required CO alarms. For this reason, the use of additional CO alarms for those areas for increased protection is recommended. The additional areas include the basement, bedrooms, dining room, furnace room, utility room, and hallways not protected by the required CO alarms. The installation of CO alarms in kitchens, attics (finished or unfinished), or garages is not normally recommended, because these locations occasionally experience conditions that can result in improper operation.

IMPORTANT CONSIDERATION

NFPA states the following for replacement of CO alarms:

NFPA 720, 2009 Edition, Chapter 8, Section 8.10.2 states: Alarms shall be replaced when either the end-of-life signal is activated or the manufacturer's replacement date is reached. Alarms shall also be replaced when they fail to respond to operability tests.

MOUNTING LOCATION

CO alarms can be installed and mounted on the wall or ceiling with equal efficiency in either location. However, the CO alarm must be mounted in such a way as not to interrupt device function by jarring or vibration.

- Ceiling location - CO alarm should be mounted as close as possible to the center of a hallway or room. If this is not possible, the edge of the CO alarm should be at least 4 inches from any wall.
- Wall location - locate the top of the CO alarm at least 4 inches and not more than 12 inches from the ceiling.

Figure 6

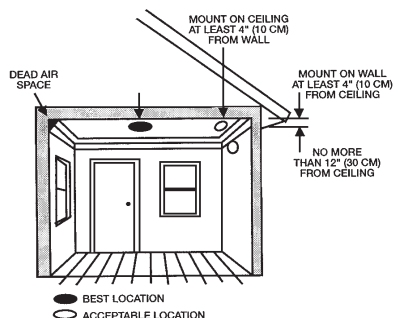


Figure 6: RECOMMENDED CO ALARM MOUNTING LOCATIONS

Figure 7



Figure 7: RECOMMENDED CO ALARM LOCATION IN ROOMS WITH SLOPED, GABLED, OR PEAKED CEILINGS.

The placement of the CO alarm is critical if maximum speed of CO detection is desired. Thus, a logical location for a CO alarm is the center of the ceiling. At this location, the device is closest to all areas of the room.

WHERE CO ALARMS SHOULD NOT BE INSTALLED DO NOT INSTALL THIS CO ALARM:

- In garages, kitchens, furnace rooms, or in any extremely dusty, dirty or greasy areas.
- Closer than 15 feet (4.6 meters) from a furnace or other fuel burning heat source or fuel burning appliance like a water heater.
- Within 5 feet (1.5 meters) of any cooking appliance
- Near any type of diaper pails or receptacle.
- Near animal litter boxes, cages or kennels.
- In extremely humid areas. This alarm should be at least 10 feet (3 meters) from a bath or shower, sauna, humidifier, vaporizer, dish washer, laundry room, utility room or other source of high humidity.
- In areas where temperature is colder than 40°F (4°C) or hotter than 100°F (38°C). These areas include non-air conditioned crawl spaces, unfinished attics, uninsulated or poorly insulated ceilings, porches and garages.
- In turbulent air, like near ceiling fans, heat vents, air conditioners, fresh air returns, or open windows. Blowing air may prevent CO from reaching the sensors.
- In direct sunlight

WARNING

IMPORTANT SAFETY MESSAGES

- This CO alarm is designed for use inside a single or multi-family dwelling. It is not meant to be used in common lobbies, hallways, or basements of multi-family buildings unless working alarms are also installed in each family living unit. CO alarms in common areas may not be heard from inside individual family living units.
- This CO alarm is not a suitable substitute for complete detection systems in places which house many people like hotels or dormitories, unless a CO alarm is also placed in each unit.
- DO NOT use this CO alarm in warehouses, industrial or commercial buildings, special-purpose non-residential buildings or airplanes. This CO alarm is specifically designed for residential use and may not provide adequate protection in non-residential applications.

WARNING Never disconnect an AC CO alarm to silence a nuisance alarm. Open a window or fan the air around the CO alarm. The alarm will automatically turn off when the CO in the air is completely gone. Do not stand close to the CO alarm. The sound produced by the CO alarm is loud because it is designed to awaken you in an emergency. Prolonged exposure to the horn at a close distance may be harmful to your hearing.

INSTALLATION CO1209 SERIES

NOTICE: New Construction: DO NOT attach CO alarm until AFTER sanding, painting, and other dust creating situations are finished and cleaned up.

WIRING/GENERAL

1. Use U.L. Listed cable with Class 1 insulation.
2. Observe local code requirements. Use box connector to anchor cable to outlet box.
3. Metal outlet boxes must be grounded to earth ground.
4. **NOTICE:** Use only Duracell MN 1604 battery with the CO1209 Series CO alarms. Available at many retail stores.

WARNING Turn off electricity to prevent SHOCK and damage to CO alarm. Be sure the power line to the CO alarm is not controlled by any on/off switch, or other type of switch, other than a fuse or circuit breaker.

NOTICE: Ensure that all fluorescent lighting fixtures are properly grounded.

NOTE: The wiring to be used shall be in accordance with the provisions of Article 210 of the National Electrical Code, ANSI/NFPA 70. Wire installation should be performed only by a licensed electrician.

MOUNTING OUTLET BOX

Use a 2" x 3" switch box or a 4" square or octagon junction box. Mount a box for each CO alarm. If wall mounting is desired, be sure the box screws are oriented to upper right and lower left corners. Be sure to use supplied Mounting Plate.

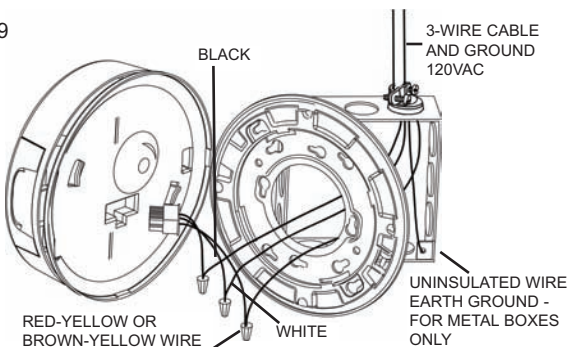
WIRING ONE ALARM

1. Run a minimum of 16 gauge, 2-conductor cable, plus ground (3 wires) to the junction box from a power supply. CO alarms shall be connected to their own dedicated circuit. Use UL Listed Class 1 wire.

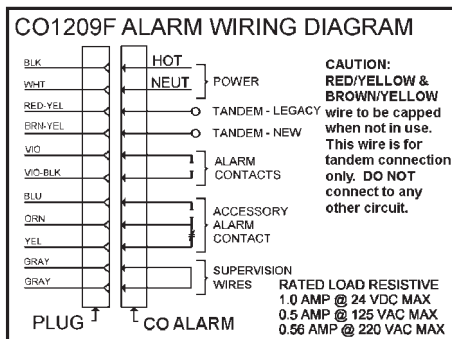
NOTE: The wiring to be used shall be in accordance with the provisions of Article 300.3(b) 210 of the National Electrical Code, ANSI/NFPA 70 as well as Article 210.

2. Make wire connections to the supplied plug-in connector as follows: black to black, white to white, and connect the ground wire to the metal outlet box.

Figure 9



NOTE: RED-YELLOW WIRE AND BROWN-YELLOW WIRE: The red-yellow wire and brown-yellow wire from the CO alarm is for tandem connection only. DO NOT USE, AND DO NOT REMOVE INSULATION CAP UNLESS CONNECTING ANOTHER CO ALARM, SMOKE/CO ALARM OR SMOKE ALARM.



WIRING TWO OR MORE ALARMS

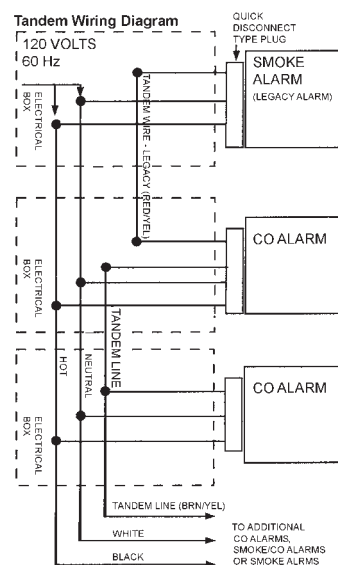
Tandem Installation

NOTE: All CO alarms in a tandem installation must be controlled by the same fuse or circuit breaker. Otherwise tandem units will not operate. Tandem will operate in the event of AC power failure if battery is connected to the CO alarm.

LIMITATIONS: A maximum of 12 CO alarms (CO1209) may be connected together. Do not exceed 125 feet between each device. Do not exceed 1125 feet between first and last CO alarm.

Wire used for interconnection shall be in accordance with article 760 of the latest edition of National Electrical Code (NFPA 70) and must not exceed a resistance of 10 ohms.

Figure 10



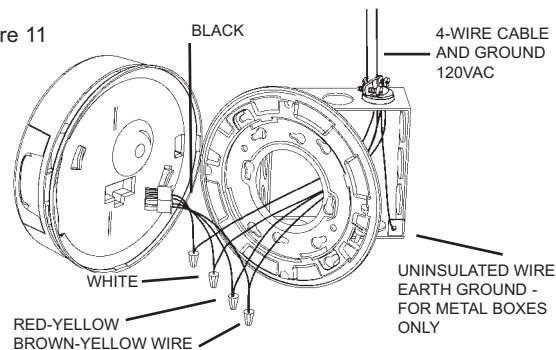
LIMITATIONS:
 Maximum of 12 CO alarms may be connected together. Do not exceed 125 feet between each CO alarm. Do not exceed 1125 feet between the first and last CO alarm.

1. Run a minimum of 16 gauge, 3-conductor cable, plus ground (4 wires) to the first junction box from a power supply and between all CO alarms that are to be connected together. Use UL Listed Class 1 wire.

NOTE: When using both tandem connections, 4-conductor cable, plus ground (5 wires) will be used.

2. Make wire connections to the supplied plug-in connector as follows: black to black, white to white, 3rd conductor to the red/yellow wire for legacy Gentex products or the brown/yellow wire for new. The red/yellow wire or brown/yellow wire should be stripped to make the connection. Connect ground wire between metal outlet boxes.

Figure 11



NOTES ON TANDEM INTERCONNECTING MODELS

- **DO NOT** connect Gentex CO alarms to other manufacturers' CO alarms.
- No more than 12 Gentex models CO1209 may be tandem interconnected.
- All units connected in tandem **MUST** get their power from the same circuit, that is, all CO alarms in tandem must be controlled by the same fuse or circuit breaker.
- After installation, to verify proper working conditions, all horns must sound in this system.
- When tandem interconnecting CO1209 Series to additional CO1209 Series, GN-503 Series or GN-403 Series and the smoke alarm horn sounds but are not synchronized and the CO horn does not sound the red/yellow wire has been used. Use brown/yellow wire.
- Use red/yellow wire to tandem interconnect CO1209 alarms to Gentex legacy products. Legacy products include 9120/9123 Series, 7100/7103 Series, 710CS/713CS Series, 7109CS/7139CS Series, GN-200/GN-203 Series and GN-300/GN-303 Series.
- Use brown/yellow wire to tandem interconnect CO1209 Series alarms to additional CO1209 Series alarms, GN-403 Series and GN-503 Series.
- If the red/yellow wire is used to interconnect the GN-503 Series to additional GN-503 Series, GN-400/GN-403 Series and CO1209 Series, the units will not be tandem interconnected. The brown/yellow wire **MUST** be used.

- Do not tandem using both the red/yellow wire and brown/yellow wire. Only 1 tandem interconnect wire is needed between units.

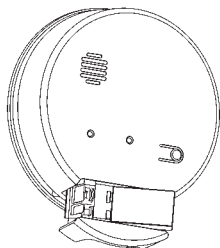
CAUTION: Failure to observe any of the conditions set forth may cause system malfunction and damage to the alarm.

BATTERY INSTALLATION

1. Locate side mounted battery drawer.
2. Open battery drawer by firmly pulling on side lip, then sliding battery drawer open.
3. Insert battery into drawer, terminal side first. Take care to make sure the appropriate terminal is aligned correctly, (+) terminal on battery to (+) terminal on alarm metal contact and (-) terminal on battery to (-) terminal on the alarm metal contact.
4. Rotate battery into drawer and close drawer. Note: the battery drawer will not close if the battery is installed incorrectly.
5. Slide battery drawer shut until it is snapped into place.
6. Use only Duracell MN 1604 battery with the CO1209 CO alarm.

NOTE: Units with battery back-up will not provide power or transmit an alarm to other AC only units in the event of an AC power failure. All battery back-up units in tandem with good batteries will operate normally during an AC power failure a minimum of 24 hours.

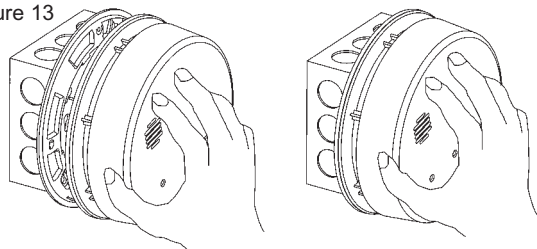
Figure 12



MOUNTING: PLATE & CO ALARM

1. Lace the connector through the provided mounting plate and secure the plate to the junction box.
2. Plug the wire connector into the CO alarm base.

Figure 13

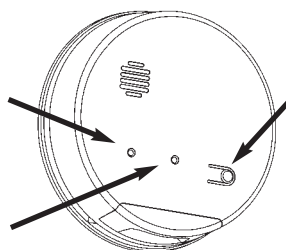


3. Place device up to mounting plate, rotating it clockwise until device firmly snap locks into place. Keep CO alarm parallel to the mounting plate so tabs on plate seat correctly into device.
4. Remove dust-cover after all construction is complete. Dust-cover must be removed prior to power being supplied to the CO alarm. If the dust-cover is not removed, operation of CO alarm will be inhibited.

Figure 14

POWER ON
INDICATOR

CO INDICATOR



PUSH BUTTON
FOR SELF TEST.
PUSH BUTTON
AND HOLD UNTIL
DEVICE ALARMS
FOR
FUNCTIONAL
TEST

NOTE: Remove dust-cover before operating CO alarm

5. Press and release button for self test feature. Results of test:
 - Alarm is silent - CO Alarm is in good working condition
 - 1 Chirp - Low battery. Replace battery following instructions in Battery Installation Section
 - 2 Chirps - CO Alarm has become dirty or defective or there is a large influx of CO. Clean (refer to Maintenance Section or warranty return).
 - 3 Chirps - CO Alarm is at end of life and must be replaced.

CHECKOUT & TROUBLESHOOTING

1. Supply house power to the CO alarm, green indicator will be on. The red indicator light should flash approximately every 15-30 seconds, showing that the CO alarm is operating properly.
2. If red light is not flashing or the green LED is not on:
 - a. Check that AC power is working.
 - b. Check that the battery is installed.
 - c. Push test button. Alarm will go into self test mode.
 - d. Check the connector plug and wire connections. NOTE: Be sure you turn off power before checking wire connections.
 - e. If the power supply and wiring check out, but the red light does not flash or the green LED is still off, return the unit to the manufacturer. See TO RETURN A CO ALARM section.
3. When powering up devices in a tandem installation and all the alarms sound immediately, inspect all devices for a solid green LED. Verify wiring of units, if wiring checks and problem remains the devices with flashing red LED are the trouble units and should be replaced.

IF YOUR CO ALARM SOUNDS

Actuation of the CO alarm (temporal 4 tone) indicates the presence of carbon monoxide (CO) which can kill you. If the CO alarm sounds, do not ignore the unit!

Enclosed with the unit are two (2) labels to add the telephone numbers of the emergency service provider and a qualified technician. Once CO alarm is installed, place one (1) label next to the CO alarm and place the other label near the fresh air source at your prearranged meeting place after leaving the house.

IF THE ALARM SIGNAL SOUNDS:

1. Operate the Test/Reset button. While the alarm has been reset, the device will continue to monitor the air for the presence of CO. If the alarm sounds again after 5 minutes there are CO levels that are potentially dangerous.
2. Call emergency services, fire department or 911. Write the number of your local emergency service here:

3. Immediately move to fresh air - outdoors or by an open door or window. Meet at prearranged meeting place after leaving the house. Verify all persons are accounted for. Do not re-enter premises or move away from the fresh air until the emergency responder has arrived, the premise has been aired out and the CO alarm remains in normal condition.
4. After following steps 1-3, if the CO alarm reactivates within a 24-hour period, repeat steps 1-3 and call a qualified appliance technician to investigate for sources of CO from fuel-burning equipment and appliances as well as inspect for proper operation of this equipment. If problems are identified during this inspection have the equipment serviced immediately. Note any combustion equipment not inspected by the technician and consult the manufacturers' instructions, or contact the manufacturers directly for more information about CO safety and this equipment. Make sure that motor vehicles are not and have not been operating in an attached garage or adjacent to the residence. Write down the number of a qualified appliance technician here:

WARNING

"ALARM - MOVE TO FRESH AIR"

If you hear the CO alarm horn and the red light is flashing, move everyone to a source of fresh air. DO NOT unplug the alarm!

NOTICE: Alarms have various limitations. See "General Limitations of CO Alarms" for details.

USING THE RESET FEATURE

WARNING

- The reset feature is for your convenience only and will not correct a CO problem. **ALWAYS** check your home for a potential problem after any alarm. Failure to do so can result in injury or death.
- **NEVER** remove the battery from your alarm to silence the horn; use the reset feature. Removing the battery, removes your protection! See "If Your CO Alarm Sounds" for details on responding to an alarm.

The reset feature is intended to reset the CO alarm while the problem is corrected - **IT WILL NOT CORRECT A CO PROBLEM.**

While the alarm has been reset, the device will continue to monitor the air for the presence of CO.

When CO reaches alarm levels, the alarm will sound a repeating temporal 4 repeating horn pattern - 4 beeps, a pause, 4 beeps, a pause, etc. Press the reset button until the horn becomes silent. The initial reset cycle will last approximately 5 minutes.

NOTE: After initial 5 minute reset cycle, the alarm will re-evaluate present CO levels and respond accordingly. If CO levels remain potentially dangerous, or increase to higher levels, the alarm will sound again.

While the alarm is silenced:

If the CO alarm:	This means:
Is silent for only 5 minutes, then the alarm sounds again	CO levels are still potentially dangerous

If the CO alarm:	This means:
Remains silent after the test button has been pressed	CO levels are dropping

TROUBLESHOOTING GUIDE		
PROBLEM:	THIS MEANS:	ACTION TAKEN:
CO alarm goes back into alarm 5 minutes after the reset button was pressed.	CO levels indicate a potentially dangerous situation.	IF YOU ARE FEELING SYMPTOMS OF CO POISONING, EVACUATE your home and call 911 or the Fire Department. If not, press the reset button again and keep ventilating your home.
Green light is OFF. Red light is not flashing. Unit will not go into test mode when test button is pressed.	Device may not be receiving power. NO AC and no battery in device.	Contact licensed electrical technician for equipment inspection service, immediately.
Alarm sounds 2 quick chirps every 30 seconds.	Device has become dirty or defective or large influx of CO (over 1,000 ppm).	Clean (refer to Maintenance Section) or warranty return.
Alarm sounds 3 quick chirps every 30 seconds.	END OF LIFE SIGNAL. Device needs to be replaced.	Contact Gentex Corporation for replacement information.
Green light is ON and red light is not flashing and Alarm chirps once every 30 seconds	Low or no battery in device AC is powering device	Replace battery (refer to Battery Installation Section) or return to manufacturer
Reset button is pressed. LED's do not flash and device does not go into test mode.	Device is not operating properly.	Contact Gentex Corporation for replacement information.
Any questions that are not answered within this manual, call Gentex Corporation at 1-800-436-8391.		

MAINTENANCE

DO NOT open CO alarm for cleaning. **IF CO ALARM IS OPENED, PRODUCT WARRANTY BECOMES VOID.**

CAUTION: If the device does not work properly, do not try and fix it yourself. This will void your warranty. See "TO RETURN A CO ALARM" for instructions to return CO alarms that do not operate properly. **DO NOT TRY TO FIX IT YOURSELF.**

Gentex recommends CO alarms be tested a minimum of once a week. The test feature of your CO alarm accurately simulates CO conditions and tests the CO alarm's functions as required by Underwriters Laboratories.

NOTICE: Do not cover, tape, or otherwise block the openings of your CO alarm. These openings are designed to allow air to pass through your CO alarm, thus sampling the air around the CO alarm.

NOTICE: CO alarms are not to be used with detector guards unless the combination has been evaluated by a nationally recognized testing laboratory and found suitable for that purpose.

WEEKLY TESTING

Press the test/reset button on the alarm until the alarm sounds. During testing the device will simulate a CO condition in the alarm.

The alarm sequence should last 5-6 seconds. If the device does not go into alarm mode when tested, replace the device immediately.

WARNING

- If the alarm ever fails to test properly, replace it immediately. Products under warranty may be returned to the manufacturer for replacement, see "Limited Warranty."
- **DO NOT** stand close to the device when the alarm is sounding. Exposure at close range could result in hearing damage.
- **Never** use exhaust from vehicle to test CO portion of alarm. Exhaust may cause permanent damage to alarm and voids the warranty.

TO KEEP THE ALARM WORKING PROPERLY:

- Test weekly as described in "Weekly Testing."
- Keep alarm cover clean using soft cloth. **DO NOT** vacuum or use compressed air, water, cleaners or solvents to clean alarm.
- Replace battery immediately if low battery warning is heard. See "Battery Installation" section.

NOTICE: **DO NOT** spray cleaning chemicals or insect sprays directly on or near the alarm. **DO NOT** paint over the alarm.

Doing so may cause permanent damage.

- Household cleaners, aerosol chemicals and other contaminants can affect the sensor. When using any of these materials near the alarm, make sure the room is well ventilated.
- The CO alarm is not washable. **DO NOT** submerge the alarm in water. Water can affect the sensor, causing permanent damage.
- **If your home is being fumigated, disconnect unit temporarily from wire harness and store where it will not be exposed to chemicals or fumes. When fumigation is complete and all traces of fumes clear, re-connect unit back to wire harness and push the reset button.**

UNDERWRITERS LABORATORIES, INC. UL 2034 WHAT LEVELS OF CO CAUSE AN ALARM

UL Standard UL 2034 requires residential CO alarms to sound when exposed to levels of CO and exposure times as described below. CO levels are measured in part per million (ppm) of CO over time (in minutes).

UL 2034 Required Alarm Points¹:

- If the CO alarm is exposed to 400ppm of CO, THE DEVICE MUST ALARM BETWEEN 4 - 15 MINUTES.
- If the CO alarm is exposed to 150 ppm of CO, THE DEVICE MUST ALARM BETWEEN 10 - 50 MINUTES.
- If the CO alarm is exposed to 70 ppm of CO, THE DEVICE MUST ALARM BETWEEN 60 - 240 MINUTES.

The device is designed not to alarm when exposed to a constant level of 30 ppm for 30 days.

¹ Approximately 10% COHb exposure at levels of 10% to 95% Relative Humidity (RH).

WARNING! CO alarms are designed to alarm before there is an immediate life threat. Since CO gas can not be seen or smelled, never assume it is not present.

- ♦ An exposure to 100 ppm of CO for 20 minutes may not affect a healthy adult, after 4 hours of exposure at the same level may cause headache.
- ♦ An exposure to 400 ppm of CO may cause headaches in a healthy adult after 35 minutes and could cause death after 2 hours.

NOTICE: This device measures exposure to CO over time. This device alarms if CO levels reach a certain minimum over an extended amount of time. The device will go into alarm before the onset of symptoms in healthy adults. It is important to have early notification of a potential hazard, while still having the ability to react in time. In many reported cases of CO exposure, victims may be aware that they were not feeling well, but became disoriented and could no longer react well enough to exit the building or get help.

NOTE: Healthy adults may not experience any symptoms of CO exposure when the device alarms, however infants, young children, pregnant women, elderly people, people with cardiac, respiratory or other health related issues may be more quickly and severely affected by CO exposure. If you are experiencing even mild symptoms of CO poisoning, consult a medical professional immediately.

Standards: Underwriters Laboratories, Inc. Single and Multiple Station carbon monoxide alarms UL 2034. For your information, the UL 2034 Standard, reads as follows:

Underwriters Laboratories, Inc UL 2034, Section 1-1.2 *Carbon monoxide alarms covered by these requirements are intended to respond to the presence of carbon monoxide from sources such as, but not limited to, exhaust from internal-combustion engines, abnormal operation from fuel-fired appliances and fireplaces. CO alarms are intended to alarm at carbon monoxide levels below those that could cause a loss of ability to react to the dangers of carbon monoxide exposure.*

This alarm monitors the air at the device and is designed to alarm before CO levels become life threatening. This allows precious time to leave the house and correct the problem. This is only possible if the devices are properly located, installed and maintained as described in this manual.

Gas Detection at Typical Temperature and Humidity Ranges:

This device is not formulated to detect CO levels below 30 ppm typically. UL tested for false alarm resistance to Methane (500 ppm), Butane (300 ppm), Heptane (500 ppm), Ethyl Acetate (200 ppm), Isopropyl Alcohol (200 ppm) and Carbon Dioxide (5000 ppm). Values measure gas and vapor concentrations in parts per million.

Audible Alarm: 85dBA minimum at 10 feet (3 meters).

TO RETURN A CO ALARM

Should you experience problems with your CO alarm, proceed as follows:

1. Turn off electrical power to the CO alarm.
2. Twist the CO alarm counter-clockwise to remove it from its mounting plate.
3. Unplug the connector from the back of the CO alarm. Do not remove the wire connection; leave the connector for your replacement CO alarm.
4. Remove battery from CO alarm. Do not ship CO alarm with battery still in battery drawer.
5. Carefully pack (the manufacturer cannot be responsible for consequential damage) and return to the manufacturer. Include complete details as to exact nature of difficulties being experienced and date of installation.
6. Return to: Gentex Corporation, 10985 Chicago Drive, Zeeland, Michigan 49464. Prior to returning, call Gentex at 800-436-8391 or e-mail FP_RMA@gentex.com to obtain a RMA Number from our return department.

LIMITED WARRANTY

For a period of 12 months from the date of purchase, or a maximum of 18 months from the date of manufacture, Gentex warrants to you, the original consumer purchaser, that your CO Alarm will be free from defects in workmanship, materials, and construction under normal use and service. The CO sensor has a limited warranty period of 5 years from date of installation. If a defect in workmanship, materials, or construction should cause your CO Alarm to become inoperable within the warranty period, Gentex will repair your CO Alarm or furnish you with a new or rebuilt replacement CO Alarm without charge to you except for postage required to return the CO Alarm to us. Your repaired or replacement CO Alarm will be returned to you free of charge and it will be covered under this warranty for the balance of the warranty period.

This warranty is void if our inspection of your CO Alarm shows that the damage or failure was caused by abuse, misuse, abnormal usage, faulty installation, improper maintenance, or repairs other than those performed by us.

ANY WARRANTIES IMPLIED UNDER ANY STATE LAW, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, APPLY ONLY FOR THE WARRANTY PERIOD SPECIFIED ABOVE. PLEASE NOTE THAT SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

GENTEX WILL NOT BE LIABLE FOR ANY LOSS, DAMAGE, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND ARISING IN CONNECTION WITH THE SALE, USE, OR REPAIR OF THIS CO ALARM. PLEASE NOTE THAT SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES. SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

If a defect in workmanship, materials, or construction should cause your CO Alarm to become inoperable within the warranty period, you must return the CO Alarm to Gentex postage prepaid. You must also pack the CO Alarm to minimize the risk of it being damaged in transit. You must also enclose a return address. CO Alarms returned for warranty service should be sent to: Gentex Corporation, 10985 Chicago Drive, Zeeland, MI 49464.

If we receive a CO Alarm in a damaged condition as the result of shipping, we will notify you and you must file a claim with the Shipper.

THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

Important Notice:

These materials have been prepared by Gentex Corporation ("Gentex") for informational purposes only, are necessarily summary, and are not purported to serve as legal advice and should not be used as such. Gentex makes no representations and warranties, express or implied, that these materials are complete and accurate, up-to-date, or in compliance with all relevant local, state and federal laws, regulations and rules. The materials do not address all legal considerations as there is inevitable uncertainty regarding interpretation of laws, regulations and rules and the application of such laws, regulations and rules to particular fact patterns. Each person's activities can differently affect the obligations that exist under applicable laws, regulations or rules. Therefore, these materials should be used only for informational purposes and should not be used as a substitute for seeking professional legal advice. Gentex will not be responsible for any action or failure to act in reliance upon the information contained in this material.