

Limitations of Carbon Monoxide Detectors

Manufacturer recommends that carbon monoxide (CO) detectors be located throughout a protected premise following the recommendations of the current edition of the National Fire Protection Association Standard 720, National Fire Alarm Code (NFPA 720), manufacturer's recommendations, and state and local codes. While carbon monoxide detectors are designed to provide warning against carbon monoxide, they do not guarantee warning or protection against carbon monoxide. Any alarm system with carbon monoxide detectors is subject to compromise or failure to warn for a variety of reasons. For example:

- Molecules of carbon monoxide may not reach the sensing chambers of the carbon monoxide detector because:

- Barriers such as closed or partially closed doors, walls, or chimneys may inhibit flow.
- Molecules of carbon monoxide may be blown away from detectors by air outlets.

In general, carbon monoxide detectors on one level of a structure cannot be expected to sense carbon monoxide developing on another level.

- The amount of carbon monoxide present may be insufficient to alarm carbon monoxide detectors. Carbon Monoxide detectors are designed to alarm at various levels of carbon monoxide density, or ppm (parts per million). If such ppm levels are not created by developing carbon monoxide at the location of detectors, the detectors will not go into alarm.
- Carbon monoxide detectors are subject to false alarms and nuisance alarms. For example, a carbon monoxide detector located too close to a fuel burning appliance may go into nuisance alarm during normal operation of the appliance. If the location of a carbon monoxide detector causes an abundance of false alarms or nuisance alarms, do not disconnect the carbon monoxide detector; call a professional to analyze the situation and recommend a solution.
- Warning devices (including horns, sirens, bells, and sounders on carbon monoxide detectors) may not alert people or wake up sleepers who are located on the other side of closed or partially open doors. A warning device that activates on a different floor or level of a dwelling or structure is less likely to awaken or alert people. Even persons who are awake may not notice the warning if the alarm is muffled by noise from a stereo, radio, air conditioner or other appliance, or by passing traffic. Audible warning devices may not alert the hearing-impaired (strobes or other devices should be provided to warn these people). Any warning device may fail to alert people with a disability, deep sleepers, people who have recently used alcohol or drugs, or people on medication or sleeping pills.

- Please note that:

i) Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.

ii) Carbon monoxide detectors may be installed as part of a fire alarm system. Studies have shown that certain people, even when they hear a fire alarm signal, do not respond or comprehend the meaning of the signal. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct on the proper reaction to alarm signals.

iii) In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

- Telephone lines needed to transmit alarm signals from a premises to a central station may be out of service or temporarily out of service. For added protection against telephone line failure, backup radio transmission systems are recommended.
- System components, though designed to last many years, can fail at any time. As a precautionary measure, it is recommended that carbon monoxide detectors be checked, maintained, and replaced per manufacturer's recommendations.
- System components will not work without electrical power. If system batteries are not serviced or replaced regularly, they may not provide battery backup when AC power fails.
- Environments with high air velocity or that are dusty or dirty require more frequent maintenance.

In general, fire alarm systems with carbon monoxide detectors will not work without power and will not function properly unless they are maintained and tested regularly.

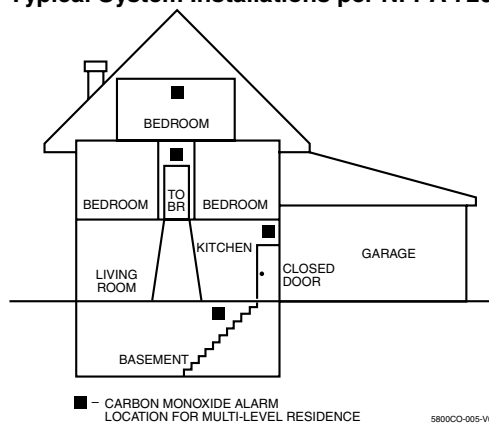
Requirements and recommendations for proper use of household carbon monoxide warning equipment:

Early carbon monoxide (CO) detection is best achieved by the installation and maintenance of carbon monoxide detection equipment in all rooms and areas of the house or building in accordance with the requirements and recommendations of the current edition of the National Fire Protection Association Standard 720, National Fire Alarm Code (NFPA 720), the manufacturer's recommendations, and State and local codes. For specific requirements, check with the local Authority Having Jurisdiction (ex. Fire Chief) for carbon monoxide detectors.

Requirements and Recommendations include:

- A carbon monoxide alarm or detector should be installed in any family living unit containing a fuel-burning appliance or fireplace or having an attached garage.
- A carbon monoxide alarm or detector should be centrally located outside of each separate sleeping area in the immediate vicinity of the bedrooms. Where bedrooms are separated and the audibility of the alarm or detector to occupants within the bedroom area could be seriously impaired, more than one unit could be needed. Each alarm or detector should be located on the wall, ceiling, or other location as specified in the installation instructions that accompany the unit.

Typical System Installations per NFPA 720



- In a household occupied by one or more hearing impaired persons, each initiating device should cause the operation of a visible alarm signal(s) in accordance with NFPA 720, section 2-3.2.3. The responsibility for compliance should be that of the householder.
- Carbon monoxide detectors may be connected to a fire alarm system. All fire alarm systems require notification devices, including sirens, bells, horns, and/or strobes. In residential applications, each automatic alarm initiating device when activated shall cause the operation of an alarm notification device that shall be clearly audible in all bedrooms over ambient or background noise levels (at least 15dB above noise) with all intervening doors closed. •

- To keep your carbon monoxide detectors in excellent working order, ongoing maintenance is required per the manufacturer's recommendations and UL and NFPA standards. At a minimum the requirements of Chapter 2, Section 2-5 of NFPA 720 shall be followed. Maintenance should be performed annually by authorized personnel only.
- The most common cause of an alarm system not functioning when a heightened level of carbon monoxide occurs is inadequate maintenance. As such, the alarm system should be tested weekly to make sure all sensors and transmitters are working properly.
- Although designed for long life, fire alarm devices including carbon monoxide detectors may fail at any time. It is recommended that residential carbon monoxide detectors shall be replaced per the manufacturer's recommendations.
- Any carbon monoxide detector, fire alarm system or any component of that system which fails shall be repaired or replaced immediately.

Some Sources of Transient CO Conditions

1. Excessive spillage or reverse venting of fuel burning appliances caused by:
 - i. Outdoor ambient conditions such as wind direction and/or velocity, including high gusts of wind; heavy air in the vent pipes (cold/humid air with extended periods between cycles).
 - ii. Negative pressure differential resulting from the use of exhaust fans.
 - iii. Simultaneous operation of several fuel burning appliances competing for limited internal air.
 - iv. Vent pipe connection vibrating loose from clothes dryers, furnaces, or water heaters.
 - v. Obstructions in or unconventional vent pipe designs which amplify the above situations.
2. Extended operation of unvented fuel burning devices (range, oven, fireplace, etc.).
3. Temperature inversions which can trap exhaust gasses near the ground.
4. Car idling in an open or closed attached garage, or near a home.



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