



## PROPER PLACEMENT OF CARBON MONOXIDE (CO) DETECTORS



Proper placement of a carbon monoxide (CO) detector is important. If you are installing only one carbon monoxide detector, the Consumer Product Safety Commission (CPSC) recommends it be located near the sleeping area, where it can wake you if you are asleep. Additional detectors on every level and in every bedroom of a home provide extra protection against carbon monoxide poisoning.

Homeowners should remember not to install carbon monoxide detectors directly above or beside fuel-burning appliances, as appliances may emit a small amount of carbon monoxide upon start-up. A detector should not be placed within fifteen feet of heating or cooking appliances or in or near very humid areas such as bathrooms.

When considering where to place a carbon monoxide detector, keep in mind that although carbon monoxide is roughly the same weight as air (carbon monoxide's specific gravity is 0.9657, as stated by the EPA; the National Resource Council lists the specific gravity of air as one), it may be contained in warm air coming from combustion appliances such as home heating equipment. If this is the case, carbon monoxide will rise with the warmer air.

Installation locations vary by manufacturer. Manufacturers' recommendations differ to a certain degree based on research conducted with each one's specific detector. Therefore, make sure to read the provided installation manual for each detector before installing.



The International Association of Fire Chiefs recommends a carbon monoxide detector on every floor of your home, including the basement. A detector should be located within 10 feet of each bedroom door and there should be one near or over any attached garage. Each detector should be replaced every five to six years.

CO detectors do not serve as smoke detectors and vice versa. However, dual smoke/CO detectors are also sold. Smoke detectors detect the smoke generated by flaming or smoldering fires, whereas CO detectors can alarm people about faulty fuel burning devices to prevent carbon monoxide poisoning. Carbon monoxide is produced from incomplete combustion of fossil fuels. In the home CO can be formed, for example, by open flames, space heaters, water heaters, blocked chimneys or running a car inside a garage.

Since CO is colorless, tasteless and odorless (unlike smoke from a fire), detection and prevention of carbon monoxide poisoning in a home environment is impossible without such a warning device. In North America, some state, provincial and municipal governments require installation of CO detectors in new units - among them, the U.S. states of Illinois, Massachusetts, Minnesota, New Jersey, and Vermont, the Canadian province of Ontario, and New York City.

According to the 2005 edition of the carbon monoxide guidelines, NFPA 720, published by the National Fire Protection Association, sections 5.1.1.1 and 5.1.1.2, all CO detectors 'shall be centrally located outside of each separate sleeping area in the immediate vicinity of the bedrooms,' and each detector 'shall be located on the wall, ceiling or other location as specified in the installation instructions that accompany the unit.'

When carbon monoxide detectors were introduced into the market, they had a limited lifespan of 2 years. However, technology developments have increased this and many now advertise 5 or even 6 years. Newer models are designed to signal a need to be replaced after that time span although there are many instances of detectors operating far beyond this point.

Although all home detectors use an audible alarm signal as the primary indicator, some versions also offer a digital readout of the CO concentration, in parts per million. Typically, they can display both the current reading and a peak reading from memory of the highest level measured over a period of time.

The digital models offer the advantage of being able to observe levels that are below the alarm threshold, learn about levels that may have occurred during an absence, and assess the degree of hazard if the alarm sounds. They may also aid emergency responders in evaluating the level of past or ongoing exposure or danger of carbon monoxide poisoning.

Battery-only carbon monoxide detectors tend to go thru batteries more frequently than expected. Plug-in detectors with a battery backup (for use if the power is interrupted) provide less battery-changing maintenance.

Some CO detectors are available as system-connected, monitored devices. System-connected detectors, which can be wired to either a security or fire panel, are monitored by a central station. In case the residence is empty, the residents are sleeping or occupants are already suffering from the effects of CO, the central station can be alerted to the high

concentrations of CO gas and can send the proper authorities to investigate possible carbon monoxide poisoning.

If CO does find its way into your home, the levels may build, creating a dangerous situation. In the UL2034 Standard, Underwriters Laboratories specifies response times for CO alarms as follows:

- At 70 parts per million: Unit must sound alarm within 60-240 minutes.
- At 150 parts per million: Unit must sound alarm within 10-50 minutes.
- At 400 parts per million: Unit must sound alarm within 4-15 minutes.

## **WHAT TO DO IF YOUR CARBON MONOXIDE DETECTOR ALARMS**

Carbon monoxide is a by-product of combustion, present whenever fuel is burned. Common household appliances such as gas or oil furnaces, clothes dryers, water heaters, ovens and ranges produce it. A charcoal grill operating in an enclosed area, a fire burning in a fireplace or a car running in an attached garage also produce carbon monoxide.

According to the Journal of the American Medical Association (JAMA), carbon monoxide is the number one cause of poisoning deaths in the U.S.A. Making sure furnaces, other potential carbon monoxide sources are properly vented, and in good working condition, along with owning a UL listed carbon monoxide detector, could become a matter of life and death.

Nevertheless, what do you do and who do you call when your carbon monoxide detector goes into alarm?



If the alarm goes off, immediately move to a location that has fresh air. Do a head count to be sure all persons are accounted for. Call the fire department. Do not re-enter the premises until it has been aired out and the problem corrected.

To identify the source/s of carbon monoxide, have a professional check the following:

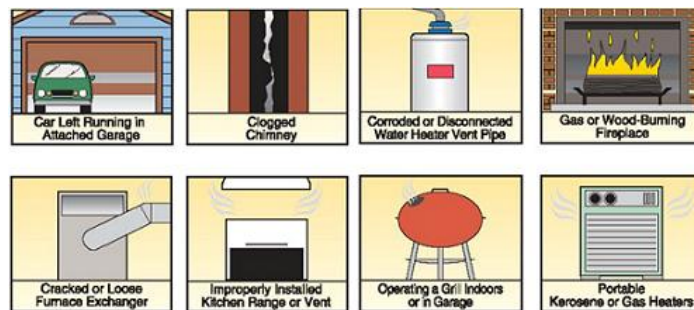
- Gas or oil furnaces are frequently the source of carbon monoxide leaks. Measure concentrations of carbon monoxide in flue gases. Check all connections to flue pipes and venting systems for cracks, gaps, rust, corrosion or debris. Check the filters and filtering systems for dirt and blockages. Check the combustion chamber and heat exchanger for cracks, holes, metal fatigue or corrosion.
- Check furnace flame, burners and ignition systems. A predominately yellow, flat, lazy-looking flame in a natural gas furnace indicates fuel is not burning efficiently and is thus releasing higher than usual levels of carbon monoxide. Oil furnaces with a similar problem produce an 'oil' odor, but remember you can't smell, see or taste carbon monoxide.

- Chimneys and venting systems must be carefully checked for blockages caused by debris, animal nests, cracks, holes or cave-ins. A blocked chimney or venting system can force dangerous gases back into your home.
- Venting and fan systems on all fuel-burning appliances must be inspected for proper installation to assure carbon monoxide is vented out rather than in. Don't forget gas water heaters, clothes dryers, space heaters or wood burning stoves.
- Inspect fireplaces for blocked or bent chimneys or flues, soot and debris or holes in the chimney that could release carbon monoxide exhaust back into the home.
- Stove pilot lights in a closed-up home can be a source of carbon monoxide build-up if not operating properly because they are not vented to the outside. Check to be sure that they are operating properly.
- Fireplace pilot lights can also produce carbon monoxide and should be checked regularly.
- Never burn charcoal inside no matter how much you want to recapture summer and never use your gas stove as a heater. Keep the oven door closed and use it for cooking only.
- Never leave a car running in an attached garage even if the garage door is open.

Taking time to understand the characteristics of carbon monoxide and how the Underwriters Laboratories, Inc. (UL) listed carbon monoxide detectors work could save your life.

CO is produced when any fuel is incompletely burned because of insufficient oxygen. Wood fires and charcoal grills produce large amounts of CO. Malfunctioning heating systems also produce CO.

Carbon monoxide is colorless and odorless. There is only one safe and reliable way to detect carbon monoxide in your home -- install a carbon monoxide alarm.



## **HOW CARBON MONOXIDE AFFECTS YOU**

CO combines with hemoglobin, the oxygen-carrying agent in the red blood cells. When oxygen is robbed from the brain and other organs, death can result. In addition, up to 40 percent of survivors of severe CO poisoning develop memory impairment and other serious illnesses.

Many cases of reported carbon monoxide poisoning indicate that victims are aware they are not well but become so disoriented that they are unable to save themselves.

## **HOW TO PREVENT CARBON MONOXIDE POISONING**

The Consumer Product Safety Commission recommends every residence with fuel-burning appliances be equipped with at least one UL Listed CO alarm.

In addition, take the following measures:

- Make sure appliances are installed and operated according to manufacturer's instructions.
- Have the heating system, chimney and vents inspected and serviced annually.
- Examine vents and chimneys regularly for improper connections, cracks, rust or stains.
- Make sure to read your CO alarm's user's guide and keep it near your CO alarm for quick reference.