



# BULLETIN: 2017-1

**SUBJECT:** Carbon Monoxide Detection Installation - All Use Groups

**REFERENCE:** N.J.A.C. 5:70-4.3(a), N. J. A. C. 5:70-4.9(d)  
and N.J.A.C 5:70-4.19(d)

**ISSUE DATE:** December 12, 2017

This Bulletin supersedes Bulletin 2003-3.

This document is being issued to provide guidance on the installation of carbon monoxide (CO) detection under the Uniform Fire Code (UFC). Provisions for the installation of CO detection were first introduced in the UFC in 2003 for use groups R-1, R-2, R-3, R-4 and I-1. Effective September 3, 2017, the requirement to have CO detection installed in buildings that have fuel-fired equipment or attached garages (other than garages that meet the definition of an open parking structure) has been extended to all buildings. There have been questions about how the new rules should be applied.

### **Relationship to the Uniform Construction Code:**

The Uniform Construction Code (UCC) has contained requirements for Carbon Monoxide detection in use groups R-1, R-2, R-3, R-4 and I-1 since 1999. Recent amendments to the UCC have paralleled the changes to the UFC in terms of scope. In other words, all use groups are now required to have CO detection where there is fuel-fired equipment or an attached garage that would not qualify as an open parking structure. However, the locations where CO detection is required under the UCC do not match the locations in the UFC exactly. This creates a question about how the UFC requirements apply to buildings that were approved under the Uniform Construction Code with CO detection provided.

The Korman Parks Law (P.L. 2015, c. 146), which is the basis for the June 2017 rule adoption of the CO detection requirements in the Uniform Fire Code and Uniform Construction Code, contains a provision that states that buildings that met the 1999 CO detector law do not need to meet the UFC requirements under the Korman Parks Law. This means that buildings of

Use Group R-1, R-2, R-3, R-4 or I-1 that comply with the Uniform Construction Code CO regulations of August 16, 1999 are not required to comply with the Uniform Fire Code. Further any buildings that has Carbon Monoxide detection that complied with the UCC at the time of construction, is not required to comply with the provisions of the Uniform Fire Code.

**Where required:**

Under the UFC, the location for detection varies based on use group. A list of locations where CO detection is required based on the use group is provided below.

**For Use Group R-3 or R-4 as defined in the UFC (One-and Two-Family Dwellings)** If the building contains a fuel-fired appliance or has an attached garage, CO alarms are required in the vicinity of the bedrooms. These alarms may be battery-operated, plug-in or hard-wired type.

**For use Groups R-1, R-2 or I-1** If the building contains a fuel-fired appliance or has an attached garage (open parking structures as defined in the building code do not count as attached garages), the owner has three options:

*Option 1.* Provide CO alarms in every dwelling unit (for R-2 buildings) or every sleeping unit for (I-1 and R-1) buildings. These alarms may be battery operated, plug in or hard-wired type.

*Option 2.* The owner can elect to **not** provide CO alarms in every unit if the building meets the following conditions:

- a) Any dwelling unit or guest room that contains a fuel-fired appliance or communicates with an attached garage must be provided with a CO alarm.
- b) Any dwelling unit or guestroom that is connected to the fuel-fired appliance or the space containing a fuel-fired appliance or an attached garage via an air passageway, such as shafts or ductwork is required to have a CO alarm. In other words, when there is a pathway from the source of the CO to the dwelling unit or guestroom through ductwork, plenums or shafts, the dwelling unit or guestroom needs a CO alarm.
- c) Any dwelling unit that is located either on the floor in which the fuel-fired appliance or attached garage is located or one floor above or one floor below the floor where the fuel-fired appliance or attached garage is located needs to be provided with CO alarms.
- d) Units other than those described above do not require protection if a common area detection system is provided. Common area detectors must be connected to a supervised signaling station and must be installed in all the following locations:
  - (1) Any room that is adjacent to the room or space containing the fuel-fired appliance or the attached garage needs to be provided with a detector, even if that room or space is not part of a dwelling or guest room. For example, if there is an office or a meeting room or a gym located next to the boiler room, those areas need detectors.

- (2) In a common area such as a hall or corridor on the floor that the fuel-burning appliance is located and in any common area that is within two floors above or within two floors below that floor.
- (3) In the vicinity of any shaft such as a stair tower, ventilation shaft or elevator shaft on the level of the fuel-burning appliance.

*Option 3.* The owner can elect to provide a monitored CO system, in which case detectors are only required in rooms where a fuel-burning appliance is located or in the room(s) adjacent to the attached garage.

The term “in the vicinity of” is used but not defined. The code requires the detection to be located in the vicinity of sleeping areas (4.9(d)2) and also, when using a building coverage system that monitors common areas, the code requires detection in the vicinity of shafts (4.9(d)2i(3)(B)). In the context of bedrooms, the intent is to alert occupants of a possible hazardous condition in the area outside the bedrooms before the hazard enters those rooms. In the context of being in the vicinity of the air shafts, the detection must be positioned so that it will detect CO as it is being drawn into the shaft. The appendix to NFPA 720 describes in the vicinity of as within 10 feet.

**For all other use groups:**

Protection at the source - Carbon monoxide detection is required to be installed in the immediate vicinity of all sources of carbon monoxide. Sources of carbon monoxide are not defined in the UFC. Sources would include any process equipment that burns fuel, generators, any fuel-burning appliances as well as any portion of the HVAC system which could deliver carbon monoxide from the appliance to other spaces within the building. There are specific cases where the UFC exempts the installation of carbon monoxide detectors. These include:

-Repair garages and similar spaces where carbon monoxide can be expected as part of the normal function of the space. If there are spaces adjacent to the repair garage portion of the occupancy, they need to be provided with detection.

-In the immediate area of large drop battery charging. (These are areas where industrial powered trucks or equipment leave large batteries for charging) When there are occupied areas adjacent to the battery charging operation they need to be provided with detection.

-In unconditioned spaces where the temperature is outside of the listing of the device or spaces that contain contaminants that might adversely affect the operation of the detection. In these cases, alternate protection should be considered, such as locating detectors/alarms in the conditioned spaces adjacent to the location of the source of CO.

In addition to providing detection at the source, the following additional areas need to be protected by 5:70 – 4.9(d)3i(4):

- Spaces adjacent to the source of carbon monoxide.

-Detection is needed in the immediate vicinity of any shaft, including but not limited to, stair towers, elevator shafts and ventilation shafts at the level of the potential source of carbon monoxide.

-Detection is needed in the room at the first register or grill off the main duct trunk(s) from the HVAC equipment that is a potential source of carbon monoxide.

-Detection is required in any story that is within two stories of a source of carbon monoxide.

As stated in the rule, a CO detector or alarm must be provided near each source of carbon monoxide and the alarm must provide sound at a level that is 15dB above ambient sound. Building owners have a choice of simply locating an alarm near each source of CO, provided that the alarm provides at least 15dB above ambient sound in these areas. Placement of the alarms should be considered in order to meet the sound threshold requirement.

Certain industrial and storage areas require special consideration. In warehouses, where internal combustion engine forklifts are used continuously, the source of CO is expected as a normal use of the space. Those uses should be treated similar to repair garages, and detection is required in occupied spaces that are adjacent to the area where the forklifts operate. In manufacturing facilities or other uses where ambient noise levels are high, alternatives to the requirement for alarms that are 15dB above ambient may be necessary. When ambient noise is at or greater than 105 dB, alternatives such as visual alarms should be considered.

#### **Detectors and Alarms:**

Carbon monoxide detectors must be listed in accordance with UL 2075. Carbon monoxide systems must comply with these rules and NFPA 720. Carbon monoxide detection systems must provide auditory and visual notification at the detector, control panel and remote annunciator. Combination fire and carbon monoxide detection systems are permitted.

Carbon monoxide alarms must comply with UL 2034. Carbon monoxide alarms may be battery-operated, plug-in, or hard-wired.

There is no requirement for fire department notification or building evacuation. These items should be part of the building owner's emergency preparedness plan.

The UFC Bulletin 2003-3, Alternative #2 clearly provides guidance for detector locations that does provide appropriate CO protection not supported by the newly adopted rules that should be considered by the fire official through the variance request process.

The installation of a new hard-wired CO detection system, or modification to an existing system would require a UCC permit.