

**NC Department of Insurance  
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**Carbon Monoxide Alarms**

**Code:** 2018 Residential Code

**Date:** April 10, 2019  
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**Section:** R315

The 2018 NC Residential Code, Section R315 requires the installation of carbon monoxide alarms in new and existing one-and-two-family dwellings and townhouses as follows:

**SECTION R315  
CARBON MONOXIDE ALARMS**

**R315.1 General.**

Carbon monoxide alarms shall comply with Section R315.

**R315.1.1 Listings.**

Carbon monoxide alarms shall be *listed* in accordance with UL 2034. Combination carbon monoxide and smoke alarms shall be *listed* in accordance with UL 2034 and UL 217.

**R315.2 Where required.**

Carbon monoxide alarms shall be provided in accordance with Sections R315.2.1 and R315.2.2.

**R315.2.1 New construction.**

For new construction, carbon monoxide alarms shall be provided in dwelling units where either or both of the following conditions exist.

1. The *dwelling unit* contains a fuel-fired appliance or fireplace.
2. The *dwelling unit* has an attached garage with an opening that communicates with the dwelling unit.

**R315.2.2 Alterations, repairs and additions.**

Where *alterations*, repairs or *additions* requiring a building permit occur, or where one or more sleeping rooms are added or created in existing dwellings, or where fuel-fired appliances or fireplaces are added or replaced, the individual *dwelling unit* shall be equipped with carbon monoxide alarms located as required for new *dwellings*.

**Exceptions:**

1. Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, or the installation of a fuel fired appliance

that cannot introduce carbon monoxide to the interior of the dwelling, is exempt from the requirements of this section.

2. Deleted.

### **R315.3 Location.**

Carbon monoxide alarms in *dwelling units* shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms. Where a fuel-burning *appliance* is located within a bedroom or its attached bathroom, a carbon monoxide alarm shall be installed within the bedroom.

### **R315.4 Combination alarms.**

Combination carbon monoxide and smoke alarms shall be permitted to be used in lieu of carbon monoxide alarms.

### **R315.5 Power source.**

Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and, where primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

#### **Exceptions:**

1. Carbon monoxide alarms shall be permitted to be battery operated where installed in buildings without commercial power.
2. Carbon monoxide alarms installed in accordance with Section R315.2.2 shall be permitted to be battery powered.

### **R315.6 Carbon monoxide detection systems.**

Carbon monoxide detection systems shall be permitted to be used in lieu of carbon monoxide alarms and shall comply with Sections R315.6.1 through R315.6.4.

#### **R315.6.1 General.**

Household carbon monoxide detection systems shall comply with NFPA 720. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

#### **R315.6.2 Location.**

Carbon monoxide detectors shall be installed in the locations specified in Section R315.3. These locations supersede the locations specified in NFPA 720.

#### **R315.6.3 Permanent fixture.**

Where a household carbon monoxide detection system is installed, it shall become a permanent fixture of the occupancy and owned by the homeowner.

#### **R315.6.4 Combination detectors.**

Combination carbon monoxide and smoke detectors shall be permitted to be installed in carbon monoxide detection systems in lieu of carbon monoxide detectors, provided that they are *listed* in accordance with UL 2075 and UL 268.

Implementation and enforcement of the above code section has generated a number of questions. Included below is a list of the most significant questions and the DOI, Engineering Division's response:

**Question 1:**

What work and/or permit issuance triggers the installation of carbon monoxide alarms in an existing residence?

**Answer:**

Compliance with R315.2 is triggered by any of the following:

1. The issuance of a permit, requiring compliance with the NC Residential Code, for interior alterations or repairs, or
2. The issuance of a permit, requiring compliance with the NC Residential Code, for a building addition, or
3. The issuance of any permit (building or trades) for the installation and/or replacement of a fuel-fired appliance, or
4. The addition or creation of one or more sleeping rooms

**Question 2:**

Relative to the addition or creation of one or more sleeping rooms:

1. Does this mean that if a homeowner converts an existing room from a study or some other use into a bedroom, which does not require a building permit, that the installation of a carbon monoxide detector is required?

**Answer:** Technically all work must comply with the requirements of the codes and the installation of the alarms would be required. However, since a permit was not issued, there is no way that the local inspections department can verify compliance.

2. Does this mean that if a homeowner finishes off a previously unfinished space in the homeowner's dwelling for a bedroom, doing the work himself without getting a permit (the HVAC and electrical may have been installed earlier), that the installation of a carbon monoxide detector is required?

**Answer:** Technically all work must comply with the requirements of the codes and the installation of the alarms would be required. However, since a permit was not issued, there is no way that the local inspections department can verify compliance.

**Question 3:**

Is there a special permit for this device or is it lumped with any permit that would trigger the installation as stipulated in R315.2?

**Answer:**

There are no requirements to issue a special permit for compliance with the code amendment. Each jurisdiction should decide individually how to best handle enforcement. The DOI feels that most of the devices will be either plug-in or battery-powered units, for retrofits, that could be inspected without a separate permit. If it as a hard-wired device, then an electrical permit is appropriate.

**Question 4:**

When the permit is issued for the installation of appliances, equipment, fixtures or devices covered by the trade codes (such as the renovation of a bathroom that encompasses only plumbing fixtures with no building related issues, or the change out of an electrical panel) would the requirements of R315.2 apply?

**Answer:**

If there are no building related issues and a building permit (requiring compliance with the NCRC) is not issued, and no fuel-fired appliance is being installed or replaced, the requirement for carbon monoxide alarms is not triggered. How the local jurisdiction chooses to enforce this (compliance verification by certified building inspector or certified trades inspector) is strictly up to the jurisdiction.

**Question 5:**

Can a mechanical or plumbing inspector do the inspection on the carbon monoxide installation or does it require a certified building inspector?

**Answer:**

For either plug-in or battery-powered units there is little in the Code to inspect other than the location “in the vicinity of the bedrooms” and compliance with UL 2034. The manufacturer’s instructions will be onsite with the device. The mechanical or plumbing inspector should be able to inspect those items, but that is the local jurisdiction’s decision as referenced in answer 5 above. If it is a hard-wired device, then an electrical permit is appropriate.

**Question 6:**

If I am an electrical contractor installing an electric fence in the yard of an existing dwelling, would I be required to install carbon monoxide alarms in the dwelling?

**Answer:**

No. In this case, there are no building related issues and a building permit (requiring compliance with the NCRC) is not being issued; therefore, the requirement for carbon monoxide alarms is not triggered.

**Question 7:**

I have an inspection for the replacement of an electric water heater (the permit was requested by the plumber for his protection) and per the new GS this replacement does not require the issuance of a permit. Would this installation evoke the requirement for carbon monoxide alarms given that it is not “required by the Residential Code?”

**Answer:**

No. If there are no building related issues and a building permit (requiring compliance with the NCRC) is not issued and a fuel-fired appliance is not being installed, the requirement for carbon monoxide protection is not triggered.

**Question 8:**

For existing dwellings, would it be safe to say the carbon monoxide alarm requirements will be triggered for permits issued for Residential Building Code standards (as regulated by the NC Residential Code) and for trade permits issued for the installation/replacement of fuel-fired appliances and all other permits, that may be issued, would not require the installation of these alarms?

**Answer:**

See the answer to Question 1 above.

**Question 9:**

Is a carbon monoxide alarm required for fuel-fired appliances installed outdoors?

**Answer:**

Fuel-fired appliances located on the exterior of a dwelling structure shall be installed in accordance with its listing and the manufacturer's installation instructions and does not trigger compliance with the carbon monoxide alarm requirements of the NC Residential Code, Section R315.2. The exception to this is the exterior installation fuel-fired hot air furnaces which could conceivably introduce carbon monoxide to the dwelling interior through connected ducts.

**Keywords:**

detectors, fuel-fired