

PROPOSED CHANGE: Carbon Monoxide Detectors and Alarms

CHANGE NUMBER: BCBC2018-R205-CO

CODE REFERENCE: British Columbia Building Code 2018 - Part 3 and Part 9 of Division B

DESCRIPTION OF THE PROPOSED AMENDMENT:

New requirements for carbon monoxide detectors and alarms in assembly, business and personal services, and mercantile occupancies.

PROBLEM/BACKGROUND/RATIONALE FOR CHANGE:

Carbon monoxide is undetectable to human senses and presents a significant risk to the health and safety of building occupants. The current BC Building Code (BCBC) requirements are based on the model National Building Code of Canada (NBC) and only addresses the risk of carbon monoxide in residential buildings. There is a need to notify occupants of commercial buildings when there is a risk of carbon monoxide poisoning, so they may evacuate.

JUSTIFICATION/EXPLANATION:

Carbon monoxide poisoning presents potentially lethal health and safety risks to occupants in any building that is served by a fuel-fired appliance or where the building is adjacent to or contains a storage garage. The proposed changes expand requirements for carbon monoxide detectors (those interconnected with a building fire alarm system) and carbon monoxide alarms (stand-alone devices or interconnected with smoke alarms, not part of a fire alarm system). The Building and Safety Standards Branch is working with Codes Canada to develop further requirements related to carbon monoxide.

The proposed requirements require a carbon monoxide alarm in assembly (e.g., schools and churches), business and personal services (e.g., offices), and mercantile occupancies (e.g., retail stores) where they are served by a fuel-fired appliance or where they are adjacent to a storage garage. Due to current limitations of available Canadian products and standards for carbon monoxide alarms, the option to use residential carbon monoxide alarms in other occupancies is proposed. Many assembly, business and personal services, and mercantile occupancies do not contain more severe interior environmental conditions than a typical residential building, so these alarms are a reasonable option in such cases. Flexibility has been provided in the proposed code changes to use other types of carbon monoxide alarms that are designed in accordance with good engineering practice, such as those that conform to American product standards, or those commonly accepted for use by industry, such as carbon monoxide monitoring and alarm devices often used in parking garages.

The option has also been provided to use carbon monoxide detectors connected to a fire alarm system in some cases. A new edition of CAN/ULC-S524 "Standard for the Installation of Fire Alarm Systems," is proposed to be referenced in addition to the currently referenced version in the BCBC, as the newer version contains requirements for the connection of carbon monoxide detectors.

A minor change is proposed to residential carbon monoxide alarm requirements to remove specific installation instructions in favour of the manufacturer's recommended height and installation specifications. This will provide greater flexibility to allow the installation of more types of carbon monoxide alarms than are currently available.

2018 PROPOSED BRITISH COLUMBIA BUILDING CODE LANGUAGE:

(changes shown in green text, deletions in red text with strikethrough)

Table 1.3.1.2.

NFPA	720-2015	Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment	6.9.3.1.(6) 9.32.4.2.(7)
ULC	CAN/ULC-S524-14 or 19	Installation of Fire Alarm Systems	3.1.8.11.(3) 3.1.8.14.(3) 3.2.4.5.(1) 3.2.4.19.(4) 3.2.4.20.(8) 3.2.4.20.(13) 9.10.19.4.(3) 9.10.19.6.(2) A-3.2.4.7.(4) A-3.2.4.18.(8) and (9) A-3.2.4.20.(8)

6.9.3. Carbon Monoxide Alarms

6.9.3.1. Carbon Monoxide Alarms

1) This Article applies to every *building* that contains an *assembly occupancy*, a *care occupancy*, a *residential occupancy*, a *business and personal services occupancy*, or a *mercantile occupancy* ~~with individual suites, or a care occupancy containing sleeping rooms not within a suite~~, and that ~~also contains~~

- a) is served by a fuel-burning *appliance*, ~~or~~
- b) may be exposed to migration of carbon monoxide from a fuel-burning *appliance*, or
- ~~b~~c) contains a *storage garage*.

2) Carbon monoxide (CO) alarms ~~installed in a residential occupancy or a care occupancy~~ as required by this Article shall

- a) conform to CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices,"
- b) be equipped with an integral alarm that satisfies the audibility requirements of CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices,"
- c) have no disconnect switch between the overcurrent device and the CO alarm, where the CO alarm is powered by the electrical system serving the *suite* (see Note A-6.9.3.1.(2)(c)), and
- d) be ~~mechanically fixed at a height above the floor~~ installed as recommended by the manufacturer.

3) ~~Except as permitted by Sentence (9), ~~W~~where~~ a fuel-burning *appliance* is installed in a *suite of residential occupancy* or in a *suite of care occupancy*, a CO alarm shall be installed

- a) inside each bedroom, or
- b) outside each bedroom, within 5 m of each bedroom door, measured following corridors and doorways.

4) ~~Except as permitted by Sentence (9), ~~W~~where~~ a fuel-burning *appliance* is installed ~~in a residential occupancy or a care occupancy and is located~~ in a *service room* that is not in a *suite of residential occupancy* nor in

a *suite of care occupancy*, a CO alarm shall be installed

a) either inside each bedroom, or if outside, within 5 m of each bedroom door, measured following corridors and doorways, in every *suite of residential occupancy* or *suite of care occupancy* that

- i) shares a wall or floor/ceiling assembly with the *service room*, ~~and~~or
 - ii) may be exposed to migration of carbon monoxide from a fuel-burning *appliance*, and
- b) in the *service room*.

5) Except as permitted by Sentence (9), ~~F~~or each *suite of residential occupancy* or *suite of care occupancy* that shares a wall or floor/ceiling assembly with a *storage garage* or that is adjacent to an attic or crawl space to which the *storage garage* is also adjacent, a CO alarm shall be installed

a) inside each bedroom, or

b) outside each bedroom, within 5 m of each bedroom door, measured following corridors and doorways.

6) CO alarms installed in an *assembly occupancy*, a *business and personal services occupancy*, or a *mercantile occupancy* as required by this Article shall conform to

- a) CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices," notwithstanding the scope of that standard,
- b) NFPA 720, "Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment," or
- c) good engineering practice.

(See Note A-6.9.3.1.(6) in Appendix A)

7) Except as permitted by Sentence (9), where a fuel-burning *appliance* serves an *assembly occupancy*, *business and personal services occupancy*, or *mercantile occupancy*, a CO alarm shall be installed in

- a) each *suite* that may be exposed to migration of CO from a fuel-burning *appliance*,
- b) each room or space used as an *assembly occupancy* that may be exposed to migration of carbon monoxide from a fuel-burning *appliance*, and
- c) the room or space in which the fuel-burning *appliance* is located.

8) Except as permitted by Sentence (9), for each *suite of assembly occupancy*, *business and personal services occupancy*, or *mercantile occupancy* that shares a wall or floor/ceiling assembly with a *storage garage*, that is adjacent to an attic or crawl space to which the *storage garage* is also adjacent, or that may be exposed to migration of carbon monoxide from a *storage garage*, a CO alarm shall be installed in

a) each *suite*, and

b) each room or space used as an *assembly occupancy*.

9) CO detectors are permitted to be installed in lieu of CO alarms required by this Article provided the CO detectors

- a) sound audible signals only within the location they serve, as described in Sentences (3) to (5), (7) and (8),
- b) are installed in conformance with CAN/ULC-S524, "Installation of Fire Alarm Systems," and
- c) form part of the fire alarm system.

A-6.9.3.1.(6) - Although the scope of CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices," is limited to carbon monoxide alarms for residential applications, their use may be appropriate in some other locations where they are not subject to excessive contaminants or risk of damage, such as in classrooms in assembly occupancies, or in business and personal services or mercantile occupancies. The designer is also given the option to select a carbon monoxide alarm that conforms either to NFPA 720, "Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment," or to good engineering practice. For example, some carbon monoxide alarm devices used in storage garages may be suitable for use in other applications.

9.32.1.1. Application

1) Except as required by Article 9.32.4.2., this Section applies to the ventilation of rooms and spaces in *residential occupancies* by natural ventilation and to self-contained mechanical ventilation systems serving only one *dwelling unit*.

9.32.4.2. Carbon Monoxide Alarms

(See Note A-9.32.4.2.)

1) This Article applies to every *building* that contains a *residential occupancy*, a *business and personal services occupancy*, or a *mercantile occupancy* and that **also contains**

- a) is served by a fuel-burning *appliance*, ~~or~~
- b) may be exposed to migration of carbon monoxide from a fuel-burning *appliance*, or
- ~~b~~c) contains a *storage garage*.

2) Carbon monoxide (CO) alarms installed in a *residential occupancy* required by this Article shall

- a) conform to CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices,"
- b) be equipped with an integral alarm that satisfies the audibility requirements of CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices,"
- c) have no disconnect switch between the overcurrent device and the CO alarm, where the CO alarm is powered by the *dwelling unit's* electrical system, and
- d) be ~~mechanically fixed at a height~~ installed as recommended by the manufacturer.

3) Where a room in a *residential occupancy* contains a solid-fuel-burning *appliance*, a CO alarm conforming to CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices," shall be mechanically fixed

- a) at the manufacturer's recommended height where these instructions specifically mention solid-fuel-burning *appliances*, or
- b) in the absence of specific instructions related to solid-fuel-burning *appliances*, on or near the ceiling.

4) Where a fuel-burning *appliance* is installed in a *suite of residential occupancy*, a CO alarm shall be installed

- a) inside each bedroom, or
- b) outside each bedroom, within 5 m of each bedroom door, measured following corridors and doorways.

5) Where a fuel-burning *appliance* is installed in a *residential occupancy* and is located in a *service room* that is not in a *suite of residential occupancy*, a CO alarm shall be installed

- a) either inside each bedroom, or if outside, within 5 m of each bedroom door, measured following corridors and doorways, in every *suite of residential occupancy* that shares a wall or floor/ceiling assembly with the *service room*, and
- b) in the *service room*.

6) For each *suite of residential occupancy* that shares a wall or floor/ceiling assembly with a *storage garage* or that is adjacent to an attic or crawl space to which the *storage garage* is also adjacent, a CO alarm shall be installed

- a) inside each bedroom, or
- b) outside each bedroom, within 5 m of each bedroom door, measured following corridors and doorways.

7) CO alarms installed in a *business and personal services occupancy*, or a *mercantile occupancy* as required by this Article shall conform to

- a) CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices," notwithstanding the scope of that standard,
- b) NFPA 720, "Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment," or
- c) good engineering practice.

(See Note A-6.9.3.1.(6) in Appendix A)

8) Except as permitted by Sentence (9), where a fuel-burning *appliance* serves a *business and personal services occupancy*, or *mercantile occupancy*, a CO alarm shall be installed in

- a) each *suite* served by the fuel-fired appliance, and
- b) the room or space in which the fuel-burning *appliance* is located.

9) For each *suite* of *business and personal services occupancy*, or *mercantile occupancy* that shares a wall or floor/ceiling assembly with a *storage garage*, that is adjacent to an attic or crawl space to which the *storage garage* is also adjacent, or that may be exposed to migration of carbon monoxide from a *storage garage*, a CO alarm shall be installed in each *suite*.

Proposed Code Change