

Bulletin 26-18-12
Arc fault circuit interrupter (AFCI) and ground fault circuit interrupter (GFCI) in a dwelling unit
Rule 26-656 and 26-722

Issued October 2019
Supersedes Bulletin 26-18-11

Scope

- (1) Definitions
 - (a) Dwelling unit
 - (b) Cooking facility
- (2) AFCI protection
- (3) GFCI protection

(1) Definitions

(a) Dwelling unit

With the introduction of the AFCI, there has been confusion as to what is meant by “dwelling unit.”

A dwelling unit is one or more rooms, for the use of one or more persons, as a housekeeping unit with cooking, eating, living, and sleeping facilities.

Examples of dwelling units:

- single dwelling complete with cooking, eating, living, and sleeping facilities such as detached house, one unit of row housing or one unit of semi-detached, duplex, triplex or quadruplex
- an apartment unit complete with cooking, eating, living, and sleeping facilities
- a condominium unit complete with cooking, eating, living, and sleeping facilities
- a self-contained suite or unit in a motel or hotel complete with cooking, eating, living, and sleeping facilities
- a self-contained student dormitory unit consisting of cooking, eating, living, and sleeping facilities
- a self-contained unit in a long term care facility consisting of cooking, eating, living, and sleeping facilities
- a self-contained, housekeeping rental cabin

Examples of non-dwelling units:

- Institutional facility such as a hospital, nursing home, long term care facility, etc.
- prison
- Facilities containing only living and sleeping facilities such as motel and hotel rooms, etc.

Rationale

The Ontario Electrical Safety Code (OESC) defines a dwelling unit as “one or more rooms for the use of one or more persons as a housekeeping unit with cooking, eating, living, and sleeping facilities.”

The intent of this requirement is to protect all branch circuits that supply receptacles in the sleeping facilities of dwelling units, and to provide additional protection for sleeping people against possible fire.

Question 1

Is a building intended as housing for seasonal agriculture workers, in the form of a “Bunkhouse”, considered a dwelling unit?

Answer 1

No.

Rationale 1

As defined by Foreign Agriculture Resource Management Services (FARMS) Ontario, bunkhouses and family housing are defined differently.

- FARMS Ontario defines a Bunkhouse as a building that includes individual bunks and may contain a common kitchen to service all staff and it is not intended to be used as a dwelling unit.
- FARMS Ontario definition of Family Housing matches OESC definition of a single dwelling, so when a building is intended for Family Housing for seasonal workers, all requirements for a single dwelling unit including AFCI requirements shall apply.

(b) Cooking facility

A cooking facility shall have a range (electric or gas supply). Hot plates and microwaves do not constitute a cooking facility.

(2) AFCI protection

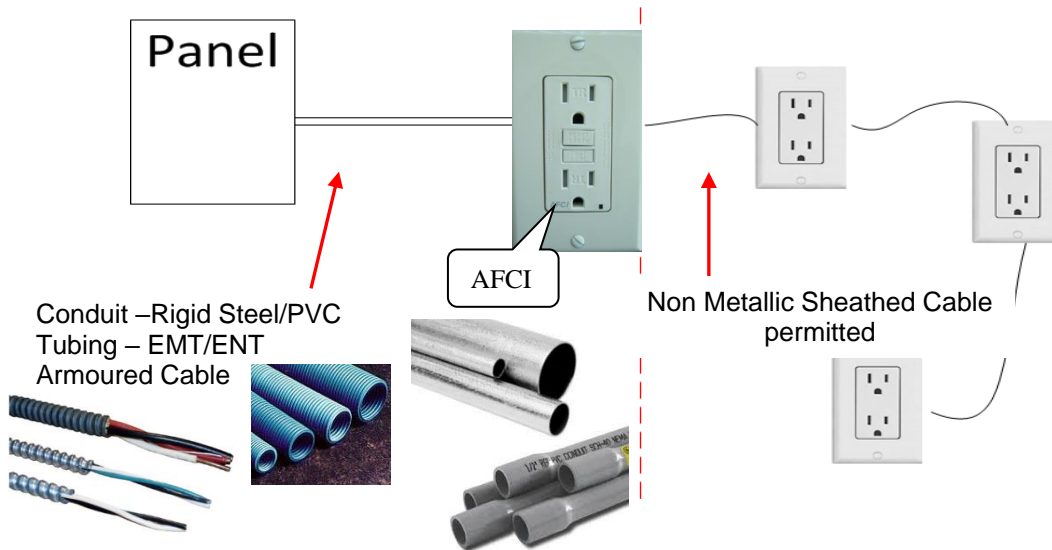
Background

Prior to the 2015 OESC, the only type of AFCI device mandated was the Branch AFCI breaker. Branch AFCI breakers only provide arcing protection against parallel faults and are no longer permitted by the OESC. The OESC now requires a **Combination type AFCI**; a device that provides both series and parallel arc fault protection to the entire branch circuit wiring, including cord sets and power supply cords connected to the outlets, against the unwanted effects of arcing. CAFI type breakers are marked as “Combination Type Arc-Fault Circuit-Interrupter” or “Combination Type AFCI”.

In addition to combination type breakers, Outlet branch circuit (OBC) devices are now permitted when:

- the outlet branch circuit type AFCI is installed at the first outlet on the branch circuit; and
- the wiring method for the portion of the branch circuit between the branch circuit overcurrent device and the first outlet is comprised of metal raceway, armoured cable or non-metallic conduit or tubing as shown below in Diagram B1.

Diagram B1 – Wiring method when using outlet branch circuit device



Rationale

Since OBC devices provide limited protection against arcing faults upstream of the OBC device (cannot interrupt parallel arcing faults), the increased wiring methods provide additional mechanical protection to the conductors from damage and also mitigates arcing faults from igniting adjacent combustibles.

Question 2

When a branch circuit originates from a dwelling unit to feed receptacles not installed in or on the dwelling unit (i.e. landscape, garage or shed receptacle) is Arc Fault Protection required

Answer 2

No, these branch circuits are not for the dwelling unit.

Question 3

For a branch circuit containing both lighting and receptacle outlets, is AFCI protection required?

Answer 3

Yes, unless exempted by Rule 26-656 1).

Question 4

Is AFCI protection required for receptacles not specifically exempted in rule 26-656, such as those for a dedicated microwave, dishwasher, or garbage disposal unit?

Answer 4

Yes.

Question 5

When a panelboard located on the exterior of a dwelling feeds adjacent receptacles and no portion of the branch circuit is contained within a dwelling, is AFCI protection required?

Answer 5

No.

Rationale 5

These branch circuits are not within or for the dwelling units.

(3) GFCI protection

Rule 26-722 requires receptacles of **5-15R or 5-20R** configuration installed outdoors of **residential occupancies** and **located within 2.5 m** of finished grade, to be protected by a GFCI of the Class A type. The Rule is not applicable to receptacles other than 5-15R or 5-20R configuration, installed outdoors in residential occupancies.

The Code contains other rules to require GFCI protection for outdoor receptacles in other than residential occupancies, for example: receptacles and equipment around a pool (Rule 68-068 and Bulletin 68-7-*), receptacles for recreational vehicles and mobile homes (Rule 72-110) and receptacles for HVAC equipment located on rooftops (Rule 26-710 and Bulletin 26-27-*).

Question 6

Is GFCI protection required for a receptacle on a porch or balcony in buildings of residential occupancies?

Answer 6

It depends on whether the porch or balcony is enclosed or not and whether the receptacle is at or within 2.5 m of finished grade. All receptacles (5-15R or 5-20R) of residential occupancies installed outdoors and within 2.5 m of finished grade are required to be protected by a GFCI, as required by Rule 26-722.

Question 7

Does the OESC require GFCI protection of receptacles located in a residential carport?

Answer 7

Yes. All receptacles located in a residential carport shall be considered as outdoors and shall be protected by a GFCI of the Class A type, as per Rule 26-722. A carport that has more than 60% of the total perimeter enclosed by walls, doors or windows shall be considered as being a garage and GFCI protection shall not be required for receptacles within.

Note

Requirements for wet location cover plates are explained in Rule 26-708.

Rationale 7

A carport receptacle is not on an interior surface of a building, it is on the exterior surface, facing out and hence, it is outdoors. Webster's dictionary defines a carport as a shelter for an automobile, consisting of a roof extended from the side of a building. The Ontario Building Code states that where a roofed enclosure is used for the storage or parking of motor vehicles and has more than 60% of the total perimeter enclosed by walls, doors or windows, the enclosure shall be considered a garage.

Question 8

Does the OESC require GFCI protection for receptacles installed outdoors, for vehicle block heaters?

Answer 8

No, the OESC does not require a receptacle(s) installed outdoors for vehicle block heater to be protected by GFCI. This includes receptacles installed outdoors in parking lots of residential and non-residential establishments.

Rationale 8

Rule 26-722 exempts outdoor receptacles installed for automobile block heaters in residential occupancies from the GFCI protection requirement. Also, the Code does not contain any other rules to require GFCI protection for outdoor receptacles installed for vehicle block heaters, in other than residential occupancies.