

7 Frequently Asked Questions about Arc Fault Circuit Interrupters



Q What is an arc fault?

A An arc fault is an unintended arc created by current flowing through an unplanned path that can lead to a fire. Each year in the United States, arcing faults are responsible for starting more than 30,000 home fires.

Q How can I protect against arc faults?

A You need an Arc Fault Circuit Interrupter (AFCI). AFCIs help protect people and property against fires resulting from arc faults. There are Combination Arc Fault Circuit Interrupter (CAFCI) circuit breakers and AFCI receptacles (also called Outlet Branch Circuit type AFCIs). A CAFCI circuit breaker detects both series and parallel arc faults. The NEC® requires all AFCIs to be Combination-Type.

Q Does the National Electric Code (NEC) require AFCI protection?

A The answer to this question depends on what edition of the NEC your state or local jurisdiction follow. Most comply to either the NEC 2008 or 2011 editions (the 2014 edition was recently published in the fall of 2013). **Visit nema.org and search for NEC adoption map to find your local requirements.**



2005 Edition: AFCIs are required to be Combination-Type, which responds to both parallel and series arcs (effective January 1, 2008). AFCI protection is required in new home bedrooms.

2008 Edition: Combination AFCI protection is required in all single-phase, 15-amp, and 20-amp non-ground fault circuits supplying power to living areas including living rooms, rec rooms, family rooms, dining rooms, libraries, bedrooms, sun rooms, hallways, closets, and similar areas.

2011 Edition: Branch circuit extensions or modifications, and receptacle replacements (effective January 1, 2014) were added to the 2008 requirement list.

2014 Edition: Expanded CAFCI requirements to kitchens, laundry areas, and dormitories.

[NEC sections 210.12, 406.4, and 550.25]

Q Do CAFCI circuit breakers provide a higher level of protection than an AFCI receptacle?

A YES, a CAFCI circuit breaker provides the highest level of arc fault protection on the market today. It protects against both serial and parallel arcs for the entire circuit. Arc fault receptacles also protect against both types of arc faults, but they do not protect the entire circuit, only a portion of it.



Q How does a CAFCI circuit breaker protect against fires caused by arc faults?

A Unlike standard thermal-magnetic circuit breakers that may not detect dangerous arcs, Combination Arc Fault Circuit Interrupter (CAFCI) circuit breakers detect arcs and shut down a circuit before a fire starts. Advanced electronic technology monitors the circuit for the presence of dangerous arcing conditions. If such conditions are observed, the circuit breaker trips, cutting off the current and voltage to the arc fault, helping to keep people and property safe.



A combination AFCI circuit breaker detects both series and parallel arc faults. The NEC requires all AFCIs to be Combination-Type.

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7 Frequently Asked Questions about AFCI (continued)

Q Which will cost me more to use – a CAFCI circuit breaker or an AFCI receptacle? Which is easier to use?

A Due to the restrictions governing the use of an AFCI receptacle, they typically have a higher installed cost compared to a CAFCI circuit breaker. CAFCI circuit breakers are easy to locate and reset in a home's load center, which is where the homeowner will look first. An AFCI receptacle can be located anywhere around the house, and may even be hidden behind furniture.



Using a CAFCI circuit breaker allows you to avoid this list of restrictions and issues with AFCI receptacle use!

Q Plus, aren't there restrictions where arc fault receptacles are allowed to be used?

A YES. The use of AFCI receptacles is much more restrictive than using the CAFCI circuit breaker but once again, the answer to this question depends on what edition of the NEC your state or local jurisdiction is following. Here is a summary of where the use of AFCI receptacles is restricted to in the 2008, 2011, and 2014 editions:



2008: A receptacle type AFCI is permitted to be used if the portion of the branch circuit between the circuit breaker and the first outlet (a.k.a. the "home run") is run in RMC, IMC, EMT, or Type AC steel armored cable and metal outlet and junction boxes [NEC Section 210.12].

2011: Outlet branch circuit type AFCIs are also permitted to be used if the home run is in listed metal or nonmetallic conduit or tubing encased in not less than 2 inches of concrete. When existing receptacles are replaced in an area that requires AFCI protection, an outlet branch circuit type AFCI may be used (effective January 1, 2014).

2014: An outlet branch circuit type AFCI is also permitted to be used in the first outlet in the branch circuit in the following instances:

- Where the home run is fed from a branch/feeder type circuit breaker AFCI and the first outlet box is marked to indicate that it is the first outlet in the circuit
- Where the home run is fed from a supplemental arc protection circuit breaker, the branch circuit wiring is continuous from the circuit breaker to the outlet branch circuit type AFCI, the maximum length of the home run is 50 ft. for #14, and 70 ft. for #12 wire, and the first outlet box is marked to indicate that it is the first outlet in the circuit
- Where the circuit breaker in the load center and the outlet branch circuit type AFCI together are listed as a system combination AFCI, the branch circuit wiring is continuous from the circuit breaker to the outlet branch circuit type AFCI, the maximum length of the home run is 50 ft. for #14, and 70 ft. for #12 wire, and the first outlet box is marked to indicate that it is the first outlet in the circuit



Considering all the changes in the latest NEC requirements, the potential for error when installing arc fault receptacles couldn't be greater. Make the safe choice and choose CAFCI circuit breakers to:

- > Provide the best protection.
- > Reduce installation cost.
- > Easily meet all code requirements.



Watch the video!

For more information on Square D QO™ and Homeline™ Combination Arc Fault Circuit Breakers, visit www.sereply.com and enter key code **g169u**

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