

Arc-Fault Circuit-Interrupter Protection in Dwellings

2023 National Electrical Code Requirements NEW YORK ELECTRICAL INSPECTION AGENCY 585.436.4460 www.NYEIA.com

The 2023 National Electrical Code (2023 NEC) requires Arc-Fault Circuit-Interrupter (AFCI) protection in multiple areas of a dwelling unit, which can often be confusing. The following section outlines the approved types of AFCI protection and the specific locations where they are required.

Section 210.12 (B) in the 2023 NEC states that all 120-volt, single-phase, 10-, 15-, and 20-ampere branch circuits supplying all outlets (which include: receptacles, lighting circuits, switches, smoke alarms, dishwashers, refrigerators, etc.) must be AFCI protected in the following dwelling unit locations:

Kitchens, Family Rooms, Dining Rooms, Living Rooms, Parlors, Libraries, Dens, Bedrooms, Sunrooms, Recreation Rooms, Closets, Hallways, Laundry Areas, and Similar Rooms and Areas (Including finished basements). AFCI device must be in a readily accessible location and shall be by any of following the six (6) ways:

- 1) Combination AFCI breaker protecting the entire circuit at the panel,
- 2) Branch Feeder AFCI breaker protecting the entire circuit at the panel with a listed outlet branch-circuit (OBC) type AFCI receptacle at the first outlet and marked at the first outlet,
- 3) Supplemental AFCI breaker (currently nonexistent) protecting the entire circuit at the panel with an AFCI receptacle at the first outlet. Wiring must be continuous from the panel to the first AFCI receptacle and marked at the first outlet box that it is the first outlet of the circuit. The maximum length of the branch circuit wiring must not exceed 50ft for #14 AWG conductors and 70ft for #12 AWG conductors,
- 4) System Combination Type AFCI (currently nonexistent) Combination AFCI receptacle located at the first outlet. Wiring must be continuous from the panel to the first AFCI receptacle and marked at the first outlet box that it is the first outlet of the circuit. The maximum length of the branch circuit wiring must not exceed 50ft for #14 AWG conductors and 70ft for #12 AWG conductors,
- 5) Metal conduit or Armored cable to the first AFCI receptacle, or
- 6) Conduit encased in concrete with an AFCI receptacle.

Section 406.4 (D)(4) in the 2023 NEC states that where a receptacle outlet is supplied by a branch circuit that requires AFCI protection as specified elsewhere in this Code (areas of the house listed above) a replacement receptacle at this outlet shall be protected by one of the following:

- (1) A listed outlet branch-circuit (OBC) type AFCI receptacle
- (2) A receptacle protected by a listed OBC type AFCI type receptacle
- (3) A receptacle protected by a listed combination type AFCI type circuit breaker

~ CLARIFICATION ~

Branch/Feeder AFCI Protection – Only protects against parallel arcing conditions
Combination AFCI Protection – Protects against Parallel Arcs and Series Arcs

Note: “Combination” AFCI protection does **NOT** mean AFCI + GFCI protection. Instead, it refers to the ability to detect **both** parallel and series arcs. The first generation of AFCI breakers could only detect parallel arcing, while modern combination-type AFCI breakers can detect both.

- **Parallel Arc** – Occurs between the hot and neutral or ground, or between neutral and ground. Often caused by damage such as a staple driven too tightly into a cable, creating an arc between conductors.
- **Series Arc** – Occurs across a break in a single conductor (hot or neutral). Most commonly associated with loose connections or damage to an individual wire.

PLEASE CONTACT YOUR LOCAL INSPECTOR IF YOU HAVE ANY QUESTIONS
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