

Arc Fault Circuit Interrupter

The AFCI breaker performs a different job entirely from GFIs, Ground Fault Interrupter (GFCI) breakers and outlets. A GFI protects a home inspector from becoming part of the circuit and getting a shock. The AFCI breaker protects you and your house from a fire.

According to the U.S.F.A ,during a typical year, home electrical problems account for 26,100 fires and \$1 billion in property losses. About half of all residential electrical fires involve electrical wiring.

Arc fault circuit interrupters (AFCIs) involve a technology that detects arcing-faults in electrical circuits that could cause fires. By recognizing characteristics unique to arcing and functioning to de-energize the circuit when an arc-fault is detected, AFCIs further reduce the risk of fire beyond the scope of conventional fuses and circuit breakers.

Conventional circuit breakers only respond to overloads and short circuits; so they do not protect against arcing conditions that produce erratic, and often reduced current. An AFCI is selective so that normal arcs do not cause it to trip. The AFCI circuitry continuously monitors the current and discriminates between normal and unwanted arcing conditions. Once an unwanted arcing condition is detected, the AFCI opens its internal contacts, thus de-energizing the circuit and reducing the potential for a fire to occur. An AFCI should not trip during normal arcing conditions, which can occur when a switch is opened or a plug is pulled from a receptacle.

The National Electrical Code specifically defines and mandates the installation of AFCIs. In the 1999 edition of the NEC®, Section 210.12 required that dwelling unit bedrooms have AFCIs installed to protect all branch circuits that supply 125-volt, single-phase, 15 and 20-ampere receptacle outlets installed in the dwelling unit bedrooms. This requirement became effective January 1, 2002.

In the 2002 edition, the update of section 210.12 on expanded AFCI protection to all bedroom outlets (lighting, receptacle, smoke alarm, etc.).

The 2005 NEC 210.12 expanded the AFCI requirement to provide for a technology upgrade. While previous generations of product detected parallel arcing, this new device – a combination AFCI – would also detect series arcing, and at lower current levels.

According to 2009 IRC section E3902.11 All branch circuits that supply 120-volt, single phase, 15 and 20 amp outlets installed in family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways and similar rooms or areas shall be protected by a combination type arc-fault circuit interrupter installed to provide protection of the branch circuit.