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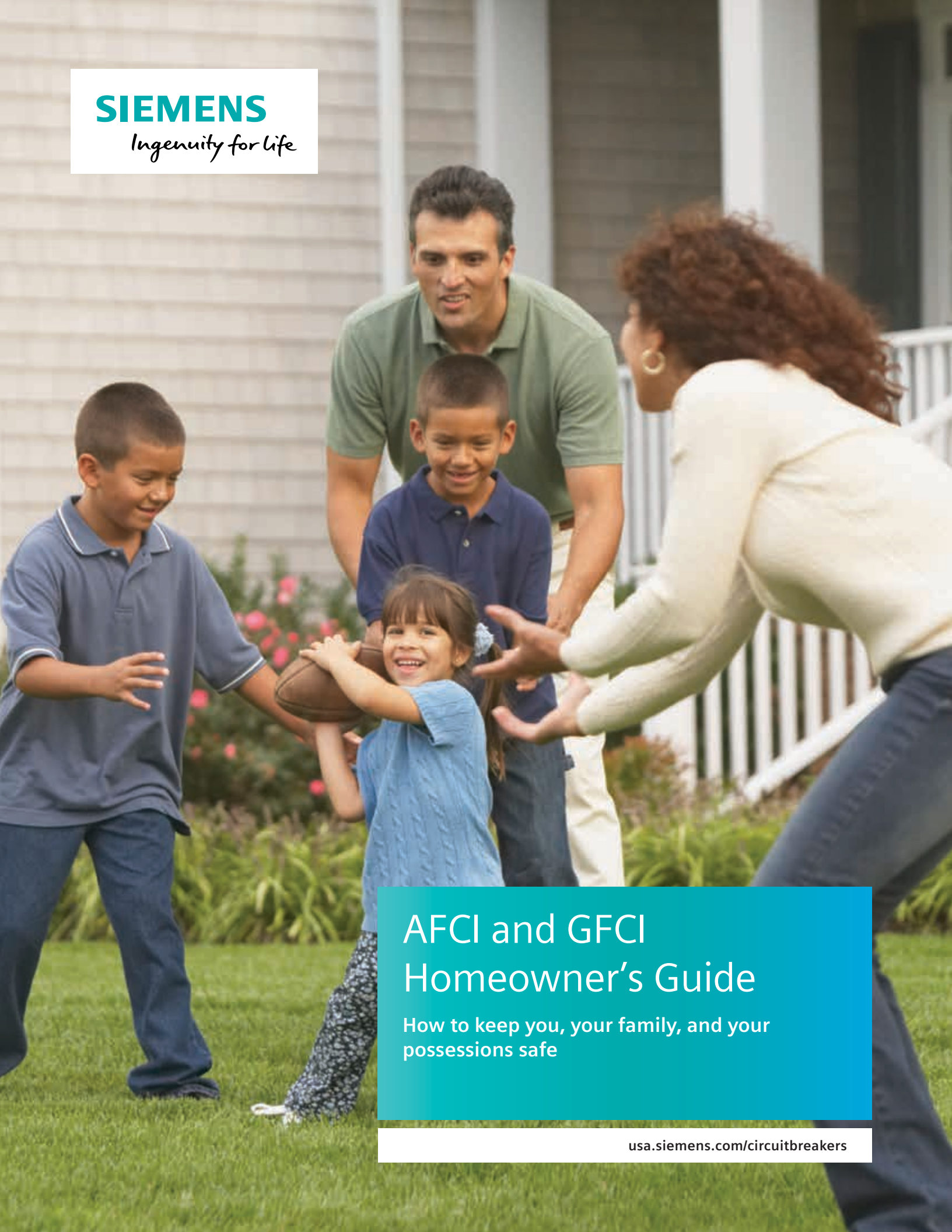


AFCI and GFCI Homeowner's Guide

How to keep you, your family, and your possessions safe

usa.siemens.com/circuitbreakers

Congratulations on the purchase of your new home.

This guide will help you understand the importance of arc fault circuit interrupters (AFCIs) and ground fault circuit interrupters (GFCIs) that are located in your load center. For over 160 years, Siemens has produced excellent performing electrical products in the market that provide increased levels of safety. With its long history of engineering and innovation, AFCIs and GFCIs are examples of how Siemens implements advanced technology to ensure the well-being of individuals. This technology is thoroughly tested to guarantee performance and reliability.

How do AFCIs and GFCIs protect my family?

AFCIs and GFCIs will shut down, or trip, a branch circuit when certain conditions have been met. Unlike typical thermal magnetic circuit breakers, AFCIs monitor the circuit for arc faults, an unintentional electrical discharge that ignite surrounding materials like wood or insulation. Arc faults are difficult to detect because they are often intermittent and occur in hidden locations, such as behind drywall and in the attic. AFCIs search for arcing conditions before tragedy strikes.

GFCIs protect against electrical shock that result from ground faults. Ground faults occur when electrical current in devices stray outside of its normal path. A human body can become part of this circuit, which results in an electrical shock. GFCIs analyze the amount of current entering and exiting from the circuit and will trip when the difference is greater than a certain value.

Dual Function Circuit Breaker combines GFCI and AFCI, protecting against both Arc Faults and Ground Faults. This, along with the new Self Test & Lockout feature, makes it the first in class in electrical safety for homeowners. The new Self Test and Lockout feature enables the breaker to automatically and continuously test itself to ensure it is working properly. If it detected that the device has been compromised, the device trips itself and locks out the homeowner from resetting the device. This effortless system guarantees that only the best protection is given to your home at all times.

AFCI | AFCI | GFCI | Dual Function AFCI/GFCI

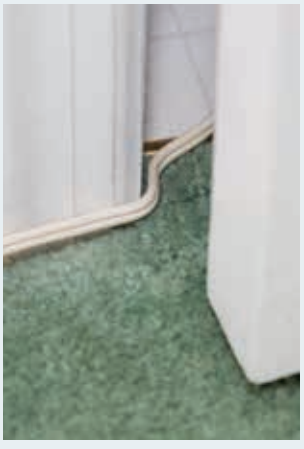
Where can arc faults occur?

Arc faults can occur from the following conditions:

Damaged power supply cord

Damaged wiring

Pierced wiring



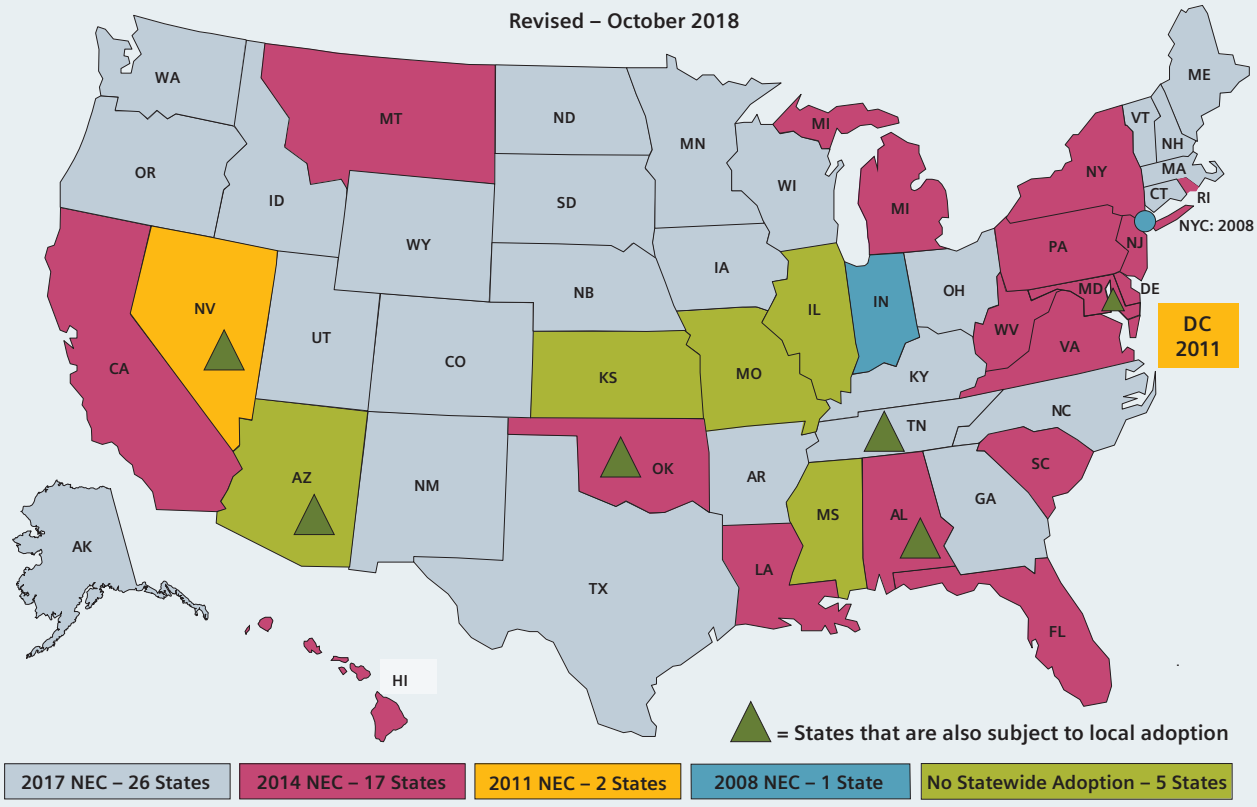
Negligence

Where AFCIs and GFCIs are required.

States or jurisdictions within the state determine which edition of the National Electrical Code® (NEC) to enforce. Contact your local authorities to inquire about which edition of the code your local jurisdiction has adopted. As a rule of thumb, AFCIs are required to be in all dwelling areas, i.e. bedrooms, family rooms, living rooms, parlors, libraries, dens, sun rooms, recreation rooms, and closets. GFCIs are required to be in all rooms that water may be present, i.e. bathrooms, kitchens, laundry rooms, and garages.

NEC Adoption by State

Revised – October 2018



Note: Earlier editions of the NEC may be enforced in states with no statewide adoption or that are subject to local adoption.

- AFCI required
- GFCI required

Example Floorplan
Here is a representation of the locations AFCIs and GFCIs are mandated by the 2011 version of the NEC for new and renovated homes. Combination type AFCIs are located in all dwelling units, and GFCIs are located in all other rooms.

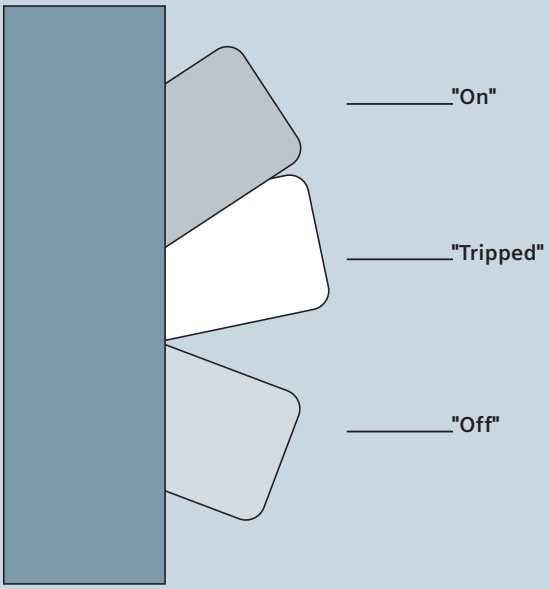
Reduce chances of an arc fault occuring in your home

What more can I do to reduce the chances of an arc fault?

There are several preventive factors that homeowners can take in order to decrease the chance of an arc fault occurring.

- All connections between the light socket and the light bulb base should be tight. An arc can occur in a loose connection, which will cause the AFCI breaker to trip.
- Beware that the circuit is not overloaded with an excessive amount of electronics. The breaker is only able to support a specified amount of wattage, and if exceeded, the breaker will trip.
- Make sure furniture is not on or pushing against electrical wires.
- All devices in the home should be Underwriters Laboratories (UL) listed, or equivalent, and comply with part 15 of the FCC regulations, or they could possibly cause the AFCI to trip.
- Always use a qualified, licensed electrician for wiring electrical projects.
- If any blackened plugs, damaged wires, or noisy circuit breakers are discovered, an electrical problem has occurred and the homeowner should call an electrician.
- It is also suggested to protect electronics with high quality surge protectors. Surge protectors protect the electronics from times of high electrical surges, like thunderstorms.

Operating handle positions



What happens if a breaker trips?

A breaker will trip if a problem within the branch circuit occurred. The homeowner should not perform the troubleshooting required to fix the problem, but by using the LED indicator technology on all AFCIs, the homeowner can inform the electrician the reason the breaker tripped.

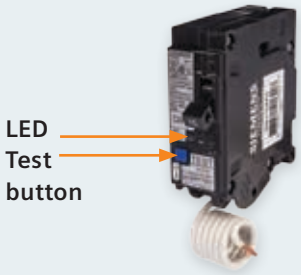
Regardless of whether the breaker is an AFCI or GFCI, in order to turn it back on after being tripped, first flip the handle from the "TRIPPED" position to the "OFF" position. Then, flip the handle to the "ON" position. If the breaker is an AFCI, the LED indicators will inform the condition of the last trip. The figure on the next page displays the trip condition depending on the LEDs illuminated. The fault stays in the memory of the AFCI for 30 days.

The last known trip conditions can be cleared by the following process for both 1- and 2-pole breakers.

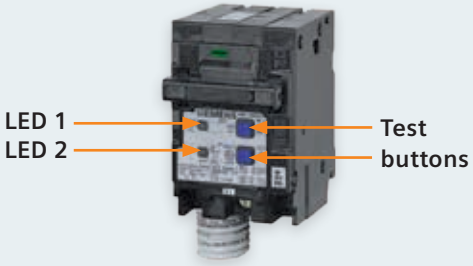
1. Turn the AFCI to the "OFF" position.
2. Press and hold the blue Push-to-Test button(s).
3. Turn the AFCI to the "ON" position.
4. Release the Push-to-Test button(s) within 3 seconds.

LED Trip Indicators

LED indicator	Last known trip condition
Off	Overcurrent or Short Circuit
On	Arc or Arc-to-ground fault



LED indicators		Last known trip condition
1	2	
Off	Off	Overcurrent or Short Circuit
On	Off	Arc or Arc-to-ground fault (leg A)
Off	On	Arc or Arc-to-ground fault (leg B)



There are "testers" marketed to test the functionality of AFCIs and GFCIs, but they are not endorsed by either the Underwriters Laboratories (UL) or National Electrical Manufacturers Association (NEMA) because the "testers" do not create genuine arcing conditions. The only way to properly test an AFCI or GFCI is to use the "Push-to-Test" button located on the device. It is recommended by UL to test all AFCIs and GFCIs monthly to ensure the device is working correctly.

Did you know?

In 2009, an estimated 44,800 home electrical fires occurred, resulting in 472 civilian deaths, 1,500 civilian injuries, and $1.6 billion in property damage. AFCIs help prevent such fires.①

An average of 355 electrocutions occurred each year because of consumer products between 2006-2008. GFCIs prevent these accidents from happening.②

Source:

① "Home Electrical Fires," National Fire Protection Association, January 2012

② "Electrocutions Associated with Consumer Products: 2008," U.S. Consumer Product Safety Commission, January 2012

National Electrical Code® Progression

The need for AFCI has been established by various respected organizations. Requirements are already in place to mandate the use of the Combination Type AFCI. These Combination Type AFCIs provide the maximum protection available today for reducing the possibly catastrophic effects of arcing faults.

1999 NEC®

- Listed AFCI future requirement in Code
  - Allows Branch/Feeder AFCI
- January 1, 2002: bedroom receptacles

2002 NEC®

- Listed AFCI in ALL bedroom circuits
  - Allows Branch/Feeder AFCI

2005 NEC®

- Combination Type AFCI in bedroom circuits
- Branch/Feeder AFCI permitted until January 1, 2008

2008 NEC®

- Combination Type AFCI
- Expand to 1 pole, 15-20A circuits installed in bedrooms, family rooms, living rooms, parlors, libraries, dens, sun rooms, recreation rooms, closets or similar rooms.

2011 NEC®

- Combination Type AFCI
- 15-20A circuits installed in family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms,closets, hallways, or similar rooms or areas.

2014 NEC®

- Combination Type AFCI and Dual Function AFCI/GFCI
- All 120-volt, single-phase, 15-20A branch circuits supplying outlets or devices installed in dwelling unit kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, laundry areas or similar rooms or areas.

2017 NEC®

- Combination Type AFCI and Dual Function AFCI/GFCI
- All 120-volt, single-phase, 15-20A branch circuits supplying outlets or devices installed in dwelling unit kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, laundry areas or similar rooms or areas.

Notes

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