What is an Arc Fault Circuit Interrupter?

An arc fault circuit interrupter, or AFCI, is designed to detect dangerous electrical arcs and disconnect power to the circuit before a fire starts. They contain current and temperature sensors as well as a microprocessor that can distinguish arc faults caused by unintentional electrical hazards.

An arc fault is the unintentional flow of electricity between two separate wires. This electrical discharge can create enough heat to further break down electrical insulation and start a fire, especially if nearby objects are flammable, such as a wooden floor, wall or piece of furniture. For instance, an arcing fault might occur in a power cord that has been damaged (for example, crushed beneath a piece of furniture). The damaged insulation could enable electricity to jump across to a neighboring wire within the cord and build up enough heat to start a fire. Arcing faults can also occur in power cords where the insulation has cracked due to age – or in electrical wires inside a wall that have been accidentally pierced by a nail.

According to the Electric Safety Foundation International, arcing faults are responsible for 30,000 home fires each year in the United States. These types of fires can be prevented by installing AFCIs. In new homes, AFCIs are now required in the living room, bedrooms and dining room.

There are three types of AFCIs. The most common, a branch AFCI, replaces standard circuit breakers in your home’s service panel. Branch AFCIs can detect an arc-fault in the circuit from the panel to the outlet and thus will shut off electricity to that branch circuit. Outlet AFCIs provide arc-fault protection to devices plugged into that outlet. Combination AFCIs are a more advanced technology that can detect additional kinds of faults, such as an arc within a single wire due to a loose connection.

Does your home have AFCIs?

You can check to see if your home has AFCIs by looking at the outlets and the circuit breakers. An AFCI outlet and circuit breakers will be labeled as such and have a TEST button on them. AFCIs are not to be confused with ground fault circuit interrupters (GFCIs), which also have a TEST button. GFCIs are another type of electrical safety device that detect current imbalances caused by a current leak, which can occur in the case of electric shock. They are required in bathrooms and kitchens and are often installed in other locations with water exposure, because moisture increases the risk of electric shock.

GFCIs protect people from electrical shock and AFCIs protect structures from fires. If you have AFCIs installed, they can be tested by pushing the TEST button. If the circuit trips, then the AFCI is working. To reset the AFCI, first turn the breaker to the OFF position. Then you will need to flip the breaker back to ON. If the circuit does not trip, the AFCI should be replaced. AFCIs can be installed by a licensed electrician and typically cost less than $50.

For more information about AFCIs and other electrical safety devices, visit the Electrical Safety Foundation International’s website www.esfi.org.