



AFCI PROTECTION

and

GFCI PROTECTION





What is the difference between an AFCI outlet and a GFCI outlet?

The function of a GFCI is to **directly protect people** from the potentially fatal hazards of electric shock that could occur if parts of an electrical appliance or tool they are using become energized due to a ground fault.

The function of an AFCI is to provide **protection against dangerous arc-faults that could initiate an electrical fire**, that would destroy property and potentially injure people.



Does an AFCI outlet provide GFCI protection?

No, an AFCI outlet provides protection against **arc-faults**.

A GFCI outlet provides protection against **ground faults**.

However, they can be used together on the same circuit



GFCI PROTECTION

Limits the amount of current to:

5 mA for People
(.005 Amps)

GFPE PROTECTION

Limits the amount of current to:

30 mA for Equipment
(.030 Amps)



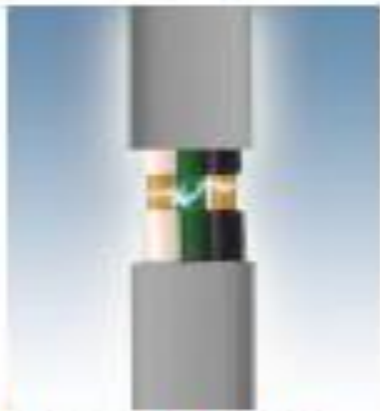


What is an arc-fault?

The UL Standard for AFCIs defines an arc-fault as an unintentional arcing condition in a circuit (wiring).

Arcing creates high intensity heat (may exceed 10,000 degrees Fahrenheit) resulting in burning particles that may over time ignite surrounding material such as wood framing or insulation.

Samples of types of arcing that can occur:



Parallel Arc

Parallel Arcing is wire to wire arcing. This NOT a short. This condition exists because there is High Resistance between the wires that allows an Low Amp arc to continue



Series Arc

Series Arcing is created by a small space or loose connection between one wire. The current "jumps" over the space or loose connection causing an Arc.



What causes an arc-fault?

There is a wide range of conditions that may cause arcing.



Wire Degradation

- Natural degradation through age
- Humidity or heat
- Extended mechanical stress--
Over bending, crushing, etc.
- Voltage at excessive levels--
120 Volts being applied to
Low Voltage wire (12 or 5 Volts)





Physical Damage

- Animals chewing through insulation
- Nails, tacks from construction or picture hanging driven into a wall puncturing or damaging a wire(s)
- Extension or power supply cord damage from sharp bends or furniture pressing on or against cords
- General cord damage
- Poor wiring or connection at devices and junction boxes.





Low Current Arcing

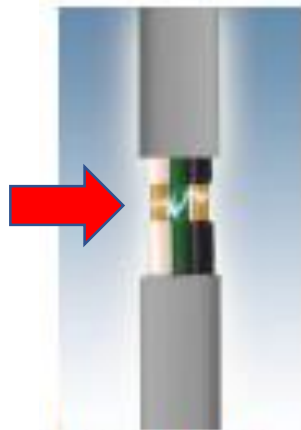
This occurs in the LOW Amp range and is not detected by either the Circuit Breaker or the GFCI device

This arcing current is what will literally "FRY" our controllers, cords, plugs, etc.



Series Arc

The Gap



Parallel Arc







REMEMBER

GFCI Outlets and Breakers protect people from shock and current over 5 milli-Amps to ground or neutral wires from the hot conductor.

GFCIs protect you from fatal shock **NOT** all shocks (Low Level Shocks)

AFCI Outlets and Breakers protect equipment and prevent Arcs that cause fire. Usually limiting current to 30 milli-Amps.

AFCIs **DO NOT** protect you they protect against arcs that may cause fire or equipment damage

