



Ground Fault Circuit Interrupters

What is a ground fault and how does a ground fault circuit interrupter (GFCI) work?



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WHAT IS A GROUND FAULT?

A ground fault is an unintentional electrical path between a power source and a grounded surface. Ground faults most often occur when equipment is damaged or defective, such that live electrical parts are no longer adequately protected from unintended contact. If your body provides a path to the ground for this current, you could be burned, severely shocked or electrocuted.



WHAT IS A GFCI

A ground fault circuit interrupter, called a GFCI or GFI, is an inexpensive electrical device that can either be installed in your electrical system or built into a power cord to protect you from severe electrical shocks. GFCIs have played a key role in reducing electrocutions. Greater use of GFCIs could further reduce electrocutions and mitigate thousands of electrical burn and shock injuries still occurring in and around the home each year.

Ground fault protection is integrated in GFCI receptacles and GFCI circuit breakers for installation into your electrical system, especially for circuit outlets in particularly vulnerable areas such as where electrical equipment is near water. Portable GFCIs are also available to provide on the spot ground fault protection even if a GFCI is not installed on the circuit.

The GFCI is designed to protect people from severe or total electric shocks but because a GFCI detects ground faults, it can also prevent some electrical fires and reduce the severity of other fires by interrupting the flow of electric current.

HOW DO THEY WORK?

A GFCI constantly monitors current flowing through a circuit. If the current flowing into the circuit differs by a very small amount (as little as 0.006 amperes) from the returning current, the GFCI interrupts power faster than a blink of an eye to prevent a lethal dose of electricity. GFCIs are designed to operate before the electricity can affect your heartbeat. A GFCI works even on two-slot receptacles.

Here's an example: A bare wire inside an appliance touches its metal case. The case is then charged with electricity. If you touch the appliance with one hand while another part of our body is touching a grounded metal object, such as a water faucet, you will get shocked. If the appliance is plugged into an outlet protected by a GFCI, the power will be shot off before a fatal shock can occur.

WHERE ARE THEY REQUIRED TO BE INSTALLED?

The circuits that require GFCI protection are designated by the 2009 International Residential Code and the 2008 National Electrical Code:

- Kitchen and bathroom receptacles
- Garage and accessory building receptacles
- Outdoor receptacles
- Unfinished basement and crawl space receptacles
- Laundry, utility and bar sink receptacles
- Boat hoists and boathouse receptacles
- Electrically heated floors

