**A GFCI is an inexpensive and very important part of the modern electrical system. It is also one of the most misunderstood. While often thought to be an overload (circuit breaker) device, it is in fact very different. A GFCI is designed to protect people from severe or fatal electric shocks by sensing very small amounts of electrical current.**

**How a GFCI Works**
The GFCI is meant to be a lifesaving device that continually senses imbalances in an electrical circuit. When it senses a ground fault, or current leaking to ground, it is designed to open the circuit within as little as 1/40th of a second. GFCIs can sense imbalances as small as 4 or 5 milliamps between the incoming current and the outgoing current. If your body is providing a path to the ground for this leakage, you could be injured, burned, severely shocked or electrocuted.

Here’s an example of how a GFCI works: Suppose a bare wire inside a power tool touches the outer case, causing the case to become charged with electricity. If you touch the tool with one hand, while the other hand is touching a grounded object, such as a water pipe, you will receive a shock. If the tool is plugged into an outlet protected by a GFCI, however, the power will be shut off before a fatal shock occurs.

**Availability of GFCIs**
There are three common types of ground fault circuit interrupters available:

**Receptacle Type** — This type of GFCI is used in place of a standard duplex receptacle that fits into the standard outlet box. A receptacle type provides ground fault protection whenever an electrical device is plugged into the outlet. To function properly, GFCIs must be wired according to manufacturer’s instructions. If the wires are not connected properly, the device may seem to work, but there will be no ground fault protection.

**Circuit Breaker Type** — A circuit breaker GFCI may be installed in an electrical panel box to give protection to an entire circuit. It serves a dual purpose—it shuts off the electricity in the event of a ground fault and trips the circuit when a short circuit or overload condition occurs. With a circuit breaker type GFCI, the ground fault protection safeguards the wiring, each outlet, lighting fixtures and anything else attached to the particular branch circuit(s) of the GFCI.

**Portable Type** — Where permanent GFCIs are not practical, portable GFCIs may be used. One type contains the GFCI circuitry in a plastic enclosure that can be plugged into an existing outlet. Electrical devices can then be plugged into this GFCI. Another portable type is contained in an extension cord, adding flexibility in using receptacles that are not protected by GFCIs.

[Continued]
**Where GFCIs Should be Installed**

The National Electrical Code® (NEC) requires GFCI protection to be used for most outdoor residential receptacles (since 1973), bathroom receptacles (since 1975), garage wall outlets (since 1978), kitchen receptacles (since 1987), and all receptacles in crawl spaces and unfinished basements (since 1990). EMC also recommends that any and all electrical outlets within 6 feet of any water source (sinks, pools, hot tubs, etc.) be protected by GFCI.

OSHA requires GFCIs on all 120 volt, 15- and 20-amp construction site outlets that are not part of the permanent wiring of the building or structure.

**Note:** GFCIs should be installed by a qualified, licensed electrician.

**Testing GFCIs**

All GFCIs should be tested upon installation and at least once a month to make sure they are working properly.

To test a GFCI receptacle:

1. Plug a night-light, lamp or radio into the outlet and turn on.
2. Press the “TEST” button; the “RESET” button should pop out and the light should go off.
3. If the “RESET” button pops out but the light does not go out, the GFCI has been improperly wired. Contact an electrician to correct the wiring error.
4. If the “RESET” button does not pop out, the GFCI is defective and should be replaced.
5. If the GFCI is functioning properly and the light goes out, press the “RESET” button to restore power to the outlet.

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**For Additional Information**

**Occupational Safety & Health Administration:**
www.osha.gov
- Ground-Fault Protection on Construction Sites

**Consumer Product Safety Commission:**
www.cpsc.gov
- GFCI

**National Fire Protection Association:**
www.nfpa.org
- GFCI

**EMC Tech Sheets:** www.emcins.com