

Information Bulletin

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Ground Fault Circuit Interrupters (GFCI)

The National Electrical Code defines a GFCI as a device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

Ground Fault Circuit Interrupters are designed to shut power off if there is a very small leak of electricity (a ground fault). Normal outlets are shut off by a fuse or breaker if more than 15 amps are flowing through the outlet. People can be killed by 1 amp or less, GFCIs shut off the flow of electricity if a leak as small as .005 amp occurs. The GFCI does not protect the person from receiving a shock, but it does limit the time the hazard exists, usually about 30/1000 of a second.

A GFCI detects a leak by comparing how much electricity is passed through a wire versus what is sent back through a different wire. When everything is working correctly, the current flow is the same. If electricity is leaking out, it may be going through a ground wire or through part of the house. Electricity will follow the path of least resistance. If a person comes in contact with a leaky electrical system, they may present a better route to ground for electricity. If there is no GFCI installed in the circuit, it can be fatal. A GFCI would detect the leak and the power would be shut off.

There are a multitude of receptacle locations for which the National Electrical Code (NEC) requires GFCI protection. GFCIs must be installed in commercial and industrial buildings for the following locations:

- Bathrooms
- Rooftops
- All temporary power for new or remodel construction
- Commercial garages, diagnostic equipment, electric hand tools, portable lighting devices
- Health care facilities for wet locations
- Elevator machine rooms, pits and car tops
- Vehicle charging

The NEC also has specific requirements for dwelling units, swimming pools, mobile homes, recreational vehicles, spas/hot tubs and marinas. All installations should be made in compliance with NEC specifications as well as applicable state and local regulations. GFCIs may be added to any electrical system. GFCIs are more expensive than regular outlets, however they ensure safe and effective protection against a potentially fatal electrical shock.