

Three common GFCIs are:

Receptacle Type: This type of GFCI is used in place of the standard duplex receptacle. It fits into the standard outlet box and protects you against “ground faults” whenever an electrical product is plugged into the outlet. Most receptacle-type GFCIs can be installed so that they also protect other electrical outlets farther down stream in the branch circuit.

Circuit Breaker Type: In buildings equipped with circuit breakers (not fuses), a circuit breaker GFCI may be installed in a panel box to protect selected circuits. The circuit breaker GFCI will shut off electricity in the event of a “ground-fault”, and it will trip when a short circuit or overload occurs. This protection covers the wiring and each outlet, lighting fixture, heater, etc, served by the branch circuit protected by the GFCI in the panel box.

Portable Type: Where permanent GFCIs are not practical, portable GFCIs may be used. One type contains the GFCI circuitry in a plastic enclosure with plug blades in the back and receptacle slots in the front. This is plugged into a receptacle, and then the electrical product is plugged into the GFCI. Another type of portable GFCI is an extension cord combined with a GFCI.



Portable Type GFCI

Regulations require the use of GFCIs in the workplace, but even if they didn't, you don't want to get zapped.



Circuit Breaker Type GFCI



DEVELOPED BY THE MAINTENANCE AND
ALTERATIONS AND CAMPUS ENGINEERING
& OPERATIONS DIVISIONS OF FACILITIES
SERVICES

05/04

Ground Fault Circuit Interrupters (GFCIs)

*“Better a thousand times
careful than once dead”*

-Proverb

Ground Fault Circuit Interrupters (GFCI's)

What is a GFCI? A GFCI is a Ground Fault Circuit Interrupter. The GFCI is a fast-acting circuit breaker that senses small imbalances in an electrical circuit caused by the electrical current leaking to ground. If this imbalance occurs, the GFCI shuts off the electricity within a fraction of a second.

How it works: The GFCI continually matches the amount of current going to an electrical device against the amount of current returning from the device along the electrical circuit path. Whenever the amount "going" differs from the amount "returning" by approximately 5 milliamps, the GFCI interrupts the electric power by closing the circuit within as little as 1/40 of a second.



Receptacle Type GFCI

What a GFCI Can and Cannot do: A GFCI *does provide protection against the grounding fault* which is the most common form of electrical shock hazard. A grounding fault occurs when a "hot" wire comes into contact with a grounded enclosure. If you happen to be in contact with the grounded enclosure of an electrical tool when a ground fault occurs, you will be subject to a shock unless a GFCI device is in use, and functioning as intended. The **GFCI will not protect you from line-to-line contact hazards** (i.e., holding two "hot" wires or a hot and a neutral wire in each hand).

Where are GFCIs needed?

Any 120-volt, single phase, 15- and 20-ampere receptacle outlet being used on a construction site (not a part of the permanent wiring of the building or structure) must have a GFCI.

Since extension cords are not part of permanent wiring, any electrical tools or equipment plugged into extension cords must be protected by a GFCI.

GFCIs must always be used in wet environments – both **indoors** (ex: around sinks or wet floors) and **outside**. When a cord connector is wet, current leakage can occur to the

grounding conductor and shock anyone who touches the connector, if they provide a path to ground.

Testing and Inspection

The employee who uses the GFCI must test and inspect it prior to use. Testing includes:

- ✓ visual inspection for obvious defects and broken parts
- ✓ press the reset button, then the test button to be sure that the device trips
- ✓ verify that there is no voltage at the outlet (use a volt meter, load device or trouble light)
- ✓ press reset and verify that power is restored.

If the device fails any of the above steps, don't use it. Red tag the item. Report the problem to your supervisor. Always follow the manufacturer's instructions for testing.

Always inspect tools and equipment for damage prior to use. If damage is found – DON'T USE IT!