# GROUND FAULT CIRCUIT INTERRUPTER (GFCI)

**An electrical outlet used in a wet area must be protected by a GFCI device to prevent electrical shock, per the National Electrical Code (NEC).**

## GFCI DEVICES

A ground fault circuit interrupter (GFCI) is an electrical safety device that shuts off power when it detects an imbalance in the electrical current flowing through it. A GFCI ensures that the worst shock from being exposed to electricity is at most a 5 milliampere (mA) of current. This can be painful but should not be fatal because the GFCI will create a ground fault, in which the current will flow directly to the ground.

**Wet areas** (areas where a water source is present) such as bathrooms, kitchens, laundry rooms, and laboratories are required to have GFCI receptacles/outlets or circuits. Wet objects/surfaces conduct electricity easily, and can connect your body to a ground potential, thus increasing your chances of receiving a shock from a ground fault.

**Electrical equipment used outdoors**, including extension cords and temporary lights (drop lights, shop lights, decorative lights) must be directly plugged into a GFCI-protected outlet designed for this use or an adapter intended for outdoor locations.

### QUICK FACTS

**> GFCI devices have played a key role in reducing electrocutions.**

**> GFI** stands for ground fault interrupter, while **GFCI** stands for ground fault circuit interrupter. GFCI is more commonly used; GFI is an older term for the same technology.

## RECEPTACLES/OUTLETS

A GFCI outlet (shown at right) is installed by an electrician; it replaces 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 downstream in the branch circuit.


Receptacle GFCI

## PORTABLE GFCI ADAPTERS/DEVICES

Many existing buildings, especially older ones, may not have GFCI devices or receptacle-type GFCIs. GFCI adapters are an effective way to improve safety.


Outlet adaptor GFCI

An Underwriters Laboratory (UL)-rated, or equivalent testing laboratory-rated, **GFCI outlet adapter** can be plugged into a grounded receptacle to provide protection against ground faults whenever an electrical product is plugged into the adapter.

The GFCI outlet adapter is a cheap and easy way to have GFCI protection. It can be purchased on Amazon or at another retailer.

Another type of portable GFCI is a GFCI extension cord.

## CIRCUIT BREAKERS

In buildings equipped with circuit breakers (not fuses), a circuit breaker GFCI may be installed by electricians in a panel box to protect selected circuits, as opposed to individual outlets. The circuit breaker GFCI will shut off electricity in the event of a "ground-fault," and will trip during a short circuit or overload.

Circuit breaker GFCI

This protection covers the wiring and **all outlets**, **lighting fixtures and appliances** served by the branch circuit protected by the GFCI in the panel box.

Given that all items connected to a GFCI circuit are impacted by trips in the circuit, it is important to assess any potential risk created by a tripped GFCI circuit breaker. This may include the unintended shutdown of equipment necessary for protection from hazards, due to a fault in an individual outlet or device.

## WHAT YOU CAN DO

Assess the areas in which you work. If you notice electrical outlets that do not appear to have GFCI protection within 6 feet of sinks, showers, eyewashes, or other wet areas, contact your facilities manager who can determine if protection is provided by GFCI circuit breakers installed at the branch circuit (panel box), or if a GFCI receptacle needs to be installed at your location. If GFCI circuit breakers are installed at the branch circuit (panel box), refer to the Circuit Breakers section above to determine if that is appropriate for your workspace.

## MORE INFORMATION

For more information about electrical safety, please refer to the EH&S Electrical Safety webpage.

For electrical safety training options, please refer to the EH&S Training webpage.

**Contact EH&S at (206) 543-7388 with questions.**