Electrical Safety

Ground Fault Protection

A GFCI is designed to stop the current before sever bodily harm or death!

A ground-fault circuit interrupter (GFCI or GFI) is a protection device designed to protect people against electric shock. GFI'S are installed in areas where an appliance with (water or moisture) could cause a hazard to a person. Kitchens, bathrooms, basements, garages, pools and spas, and other outdoors areas are all are required to have GFI protection.

Ground Fault Breaker

The National Electric 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 the values established for a Class A device.

NOTE: A Class a ground-fault interrupters trip when the current to ground is 6mA. Or higher and do not trip when the current to ground is less than 4mA.

HOW A GFI WORKS

The current flow to an electrical load should be equal to current flowing from the load. When the current exceeds specific values the circuit is switched off before sever bodily harm, in a few hundredths of a second.

A GFI monitors the imbalance of amperage between the circuit's hot and neutral conductor. It does not monitor the grounding conductor, and so it will still operate in a circuit without a ground. This provides protection for outlets in older homes without a ground.

TEST FOR PROTECTION

A GFI can stop providing protection but still proved power to appliances. The relay switch remains closed, and the device continues to provide power with no protection. Test Buttons on GFI receptacles and GFI breakers should be checked in accordance with the manufactures specifications.

WARNING:

Never touch the hot and neutral together even on a GFI circuit- DEATH or SEVER BODLY HARM could result.

Electrical Safety

Arch Fault Protection

The "AFCI" is an arc fault circuit interrupter. AFCIs are electrical devices designed to protect against fires caused by arcing faults in home electrical wiring. Arch Fault protection will be required for any 15 or 20 amp branch circuit to bedrooms, family rooms, dining rooms, living rooms, parlors, libraries, dens, sun rooms, recreation rooms, closets, hallways, or similar room areas for new construction. This National Electrical Code change is new in 2008 and will subject to local code enforcement.

Arcing faults often occur in damaged or old cords get deteriorated. Some causes of damaged and deteriorated wiring include puncturing of wire insulation from nails or staples. Poorly installed outlets or switches with loose connections, cords under rugs or doorway thresholds, furniture pushed against plugs and cords, natural aging, and cord exposure to sunlight and heat.

Conventional circuit breakers only respond to overloads and short circuits: so they do not protect against arcing conditions that produce erratic current flow. An AFCI is selective so that normal arcs do not cause it to trip. The AFCI circuitry continuously monitors current flow through the AFCI. AFCIs use unique current sensing circuitry to discriminate between normal and unwanted arcing conditions. Once an unwanted arcing condition is detected, the control circuitry in the breaker will de-energize the circuit.

Electrical Safety

Power Surges

Internal Power Surges -Every time a motor starts the flow of electricity can spike up to four times the running current. The refrigerator, air conditioner, washer and other appliances cause power surges in your homes electrical system. Every home has appliances starting and stopping interrupting the voltage flow. These surges can gradually damage sensitive microprocessors in our electronics and other appliances.

External Power Surges – The power grid and power generation is extremely complex and many events can occur that disrupt power distribution. Electricity travels for miles through transmission lines to substations then through distribution lines to your home. Faulty equipment, downed power lines, ice storms, and lightning can have catastrophic potential to damage sensitive electronics.

Protecting Your Home – Lightning can produce millions of volts and can travel through the ground entering your home through electrical, phone and cable lines. 40 Percent of all computer crashes are a result of surges. During a lightning storm unplug your expensive electronics. Surge protection devices will fail with a million volt lighting strike. The cost of protecting your Home Theater or home office with critical data is worth the investment.

Your home should have multiple surge protection devices. The service entrance were power enters your home is often over looked. A combination device that protects the 120/240 volt system including phone and cable is your first line of defense from external surges. These devices mount next to your breaker box, cost range about $150.00 plus installation.

UPS - Uninterrupted Power Supply is the ultimate for power quality and protection. The UPS has a battery backup giving you enough time to safely shut down computers and other electronics in the event of a power outage. In the event of a near lightning strike the UPS could be destroyed but would offer a second layer of protection. A UPS systems starting cost are about $200.00 and just plugs in.

Electrical Safety

Emergency Power

Power outages can leave your home without power for lighting, heating, cooking, refrigeration, and pumping water. In the event of prolonged power outage pipes could freeze and food could spoil. You can protect your home and family with a portable generator that can be directly connected to the electrical system in your home. However, the generator needs to be properly sized for the load demanded. If the load is too great, voltage will drop and it may cause significant damage motors and other vital internal equipment. To guard against this damage, a **transfer switch** disconnects predetermined critical circuits from the power company. This switch also prevents power from accidentally feeding back into utility lines where it could injure utility workers servicing power lines. A transfer switch also protects your generator from serious damage if normal power is restored.

NOTE: **Improper connection of a portable generator and transfer switch system would make you liable in the case of accident, injury or electrocution.**

Transfer Switch

The maximum and rated power of the generator also needs to be taken into consideration. This is important depending on what circuits you want to run off of your generator. Resistive loads such as lighting, toaster oven, and coffee maker are constant. For example a 100 watt light bulb draws 100 watts. Reactive loads such as water pump, sump pump, or refrigerator use approximately 3 times the running wattage for start up. Appliances and tools with motors draw more current on start up.

In addition to the safety features a transfer switch provides it allows a small portable generator to do a big job. Circuit Loads can be switched as needed. A toaster oven or microwave could be used to cook, then that circuit is turned off and another circuit can be turned on such as the TV and DVD player.

Electrical Safety

Smoke Alarms

Smoke Alarms save lives. Unfortunately in the United States one person will die every three hours in a fire. In 2006 over 13,000 people were injured by fire. If a smoke alarm is over 10 years old it should be replaced. There are two basic types of alarms, Ionization and Photo Electric. Better alarms contain both types of sensors for maxim protection.

Ionization smoke alarms are better for detecting fast burning flame fires that spread quickly. Photoelectric smoke alarms are better for detecting slow smoldering fires. These alarms are more expensive than the more common ionization units. The best protection is to have a combination unit with both type of sensors or at least one of each type in your home. The smoke and toxic fumes often overtake one's ability to escape before the flames.

Most alarms are battery operated; batteries should be changed every year. It is suggested to change the battery the same day each year, for example the first day of fall. Some battery units have 10 year life and are disposable. Hardwired wire alarms are often connected to a lighting circuit to prevent the alarms from be disconnected by shutting off the circuit breaker in the event of a false alarm or over cooked meal. The alarm circuit could remain off if it was the only load on a circuit, if forgotten. Hardwire alarms can have a battery back up in the event of a power failure. Newer homes have interconnected alarms so if one alarm detects smoke they all sound. New wireless technology offers interconnection protection with both battery and hardwires options. Special alarms for hearing and sight impaired persons are available that vibrate or strobe.

PLACEMENT

The best placement is to have a smoke alarm on every level of your home. Significant smoke and toxic fumes can build up on another level before alarms sound. Each bedroom should have an alarm and adjacent hallways. Closed bedroom doors can keep smoke out. Alarms should be placed at least 3 feet away from heating vents, kitchen, and bathroom doorways; hot air blowing and steam can affect detection. Kitchens and Garages are locations that would have false alarms from cooking car exhaust.