Portable Electric Generator Safety Tips

Portable electric generators offer great benefits when outages affect your home. Below are guidelines for safely connecting and operating portable generators.

Don't connect your generator directly to your home's wiring. Connecting a portable electric generator directly to your household wiring can be deadly to you and others. A generator that is directly connected to your home's wiring can 'back feed' onto the power lines connected to your home.

Utility transformers can then "step-up" or increase this back feed to thousands of volts—enough to kill a utility lineman making outage repairs a long way from your house. You could also cause expensive damage to utility equipment and your generator. The only safe way to connect a portable electric generator to your existing wiring is to have a licensed electrical contractor install a transfer switch. The transfer switch transfers power from the utility power lines to the power coming from your generator.

Never plug a portable electric generator into a regular household outlet.
Plugging a generator into a regular household outlet can energize "dead" power lines and injure neighbors or utility workers. Connect individual appliances that have their outdoor-rated power cords directly to the receptacle outlet of the generator, or connect these cord-connected appliances to the generator with the appropriate outdoor-rated power cord having a sufficient wire gauge to handle the electrical load.

Don't overload the generator.
Do not operate more appliances and equipment than the output rating of the generator. Overloading your generator can seriously damage your valuable appliances and electronics. Prioritize your needs. A portable electric generator should be used only when necessary, and only to power essential equipment.

Never use a generator indoors or in an attached garage.
Just like your automobile, a portable generator uses an internal combustion engine that emits deadly carbon monoxide. Be sure to place the generator where exhaust fumes will not enter the house. Only operate it outdoors in a well-ventilated, dry area, away from air intakes to the home, and protected from direct exposure to rain and snow, preferably under a canopy, open shed or carport. A carbon monoxide detector would be a good investment when using any combustion engines near the home.

Use the proper power cords.
Plug individual appliances into the generator using heavy-duty, outdoor-rated cords with a wire gauge adequate for the appliance load. Overloaded cords can cause fires or equipment damage. Don't use extension cords with exposed wires or worn shielding. Make sure the cords from the generator don't present a tripping hazard. Don't run cords under rugs where heat might build up or cord damage may go unnoticed.

Read and adhere to the manufacturer's instructions for safe operation.
Don't cut corners when it comes to safety. Carefully read and observe all instructions in your portable electric generator's owner manual.

To prevent electrical shock, make sure your generator is properly grounded.
Consult your manufacturer's manual for correct grounding procedures.

Do not store fuel indoors or try to refuel a generator while it's running.
Gasoline (and other flammable liquids) should be stored outside of living areas in properly labeled, non-glass safety containers. They should not be stored in a garage if a fuel-burning appliance is in the garage. The vapor from gasoline can travel invisibly along the ground and be ignited by pilot lights or electric arcs caused by turning on the lights. Avoid spilling fuel on hot components. Put out all flames or cigarettes when handling gasoline. Always have a fully charged, approved fire extinguisher located near the generator. Never attempt to refuel a portable generator while it's running.

Turn off all equipment powered by the generator before shutting down your generator.

Avoid getting burned.
Many generator parts are hot enough to burn you during operation. Keep children away from portable electric generators at all times.

How big a generator do you need?

To determine the size generator needed to supply your electrical demand, add the wattage requirements for the tools and appliances you expect to operate at one time from the table below.

Determining Electrical Load for Generators

Remember 1 KW = 1000 watts 2 kW = 2000 watts etc. The formula for finding wattage is: Volts x Amps = Watts. Example: an appliance nameplate states 3 amps at 120 volts. 3 amps x 120 volts = 360 watts.

Wattage of Typical Home Appliances

Electric Motor Wattage

Electric motors present a special problem. They require up to three times their rated wattage to start. Example: an electric motor name plate states 5 amps at 120 volts, 5 amps x 120 volts = 600 watts. Multiply this by 3. This will show the starting watts needed. 600 watts x 3 = 1800 watts to start.
Some motor nameplates will show starting watts higher in some case 9 times higher, check the nameplate.

Always use starting watts, not running watts, when figuring electrical load.

Starting Watts

Motor HP Rating	Approximate Running Watts	Universal Motors (small appliances)	Repulsion Induction Motors	Capacitor Motors	Split Phase Motor
1 / 8	275	400	600	850	1200
1 / 4	400	500	850	1050	1700
1 / 3	450	600	975	1350	1950
1 / 2	600	750	1300	1800	2600
3 / 4	850	1000	1900	2600	NA
1	1000	1250	2300	3000	NA
1.5	1600	1750	3200	4200	NA
2	2000	2350	3900	5100	NA
3	3000	NA	5200	6800	NA

Safety First

Starting Watts

Application / Equipment	Running / Rated Watts	Starting / Surge Watts
Light Bulb (100w)	100	100
Radio AM / FM	50-200	50-200
Radio, CB	50	50
Fan	200	600
Television	300-400	300-400
Microwave Oven	700	1000
Air Conditioner (12,000 BTU)	3250	5000
Furnace Fan (1 / 3 hp blower motor)	600	1800
Vacuum cleaner	600	750
Sump pump (1 / 3 hp)	700	2100
Refrigerator / freezer	800	2400
Deep Freezer	500	1500
Circular saw	1000-2500	2300-4600
Circular saw 6"	800	1000
Floodlight	1000	1000
Drill 1 / 2" Electric	1000	1250
Toaster	1200	1200
Coffee maker	1200	1200
Skillet	1200	1200
Chain saw 14" Electric	1200	1500
Water well pump (1 / 2 hp)	1000	3000
Hot plate / range (per burner)	1500	1500
Table saw 10"	2000	6000
Water heater (storage type)	5000	5000
12V DC Battery Charger	120	120