

How to operate a portable generator safely

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ou can use a portable generator to supply electricity to your appliances if an emergency exists during a power outage. But if used improperly they can kill you and the people who are restoring power to your building. They also can damage the appliances you connect.

Home emergency generators are usually powered by gasoline, which must be properly handled as well.

Generator sizes vary. Common units can be from 8 to 20 horsepower and capable of handling from 4,000 to 25,000 watts (including starting surge requirements). Prices may range from \$800 to \$7,000.

Connecting a generator to the main electrical supply for your house requires the services of a qualified, licensed electrician. Installing the connection and switch can cost \$600 to \$1,000.

Before connecting the generator to your household circuit, notify your electric cooperative.

EXTENSION CORDS

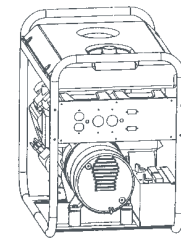
When using an appliance or tool at a considerable distance from the generator, a 3-wire extension cord that has a 3-blade grounding plug and a 3-slot receptacle that accepts the tools plug should be used. A cord of adequate size must be used.

WARNING:

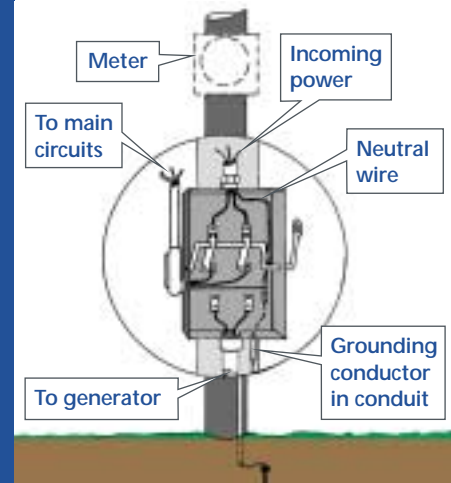
If you connect a portable electric generator to the main electrical supply coming into the house, the electrical generator could feed back into your electric cooperative's system and electrocute workers who are repairing the electrical lines.

To avoid back-feeding of electricity into utility systems, you must have a qualified, licensed electrician install a double-pole, double-throw transfer switch (see illustration) between the generator and utility power in compliance with all state and local electrical codes. (A minimum of 10-gauge wiring must be used.)

Your generator might not be large enough to handle the load of all the lights, appliances, TV, etc. at one time. To prevent dangerous overloading, calculate wattage requirements correctly (see chart below).



A Typical Portable Generator Intended for Residential Emergency Use



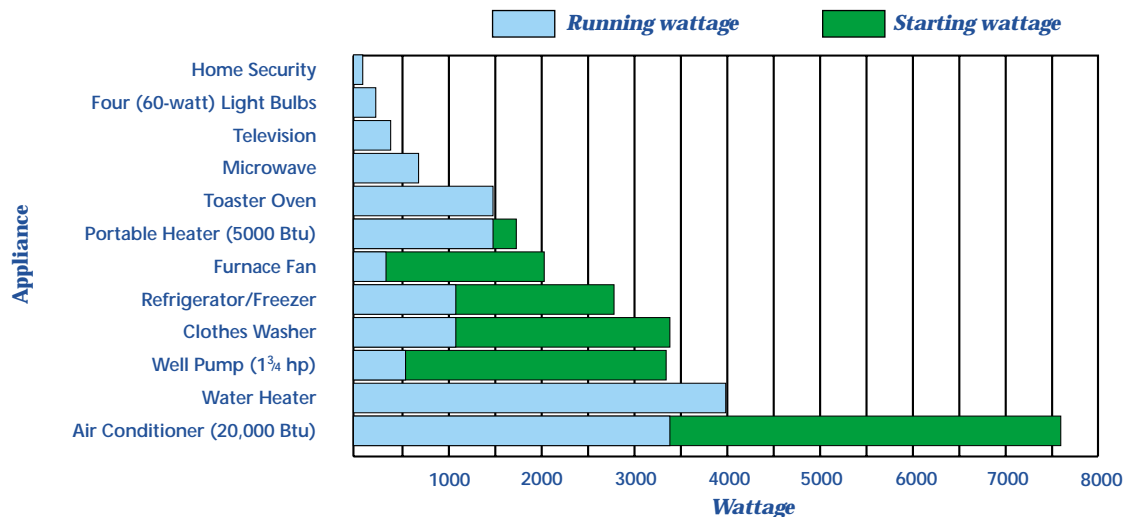
Typical Double Pole, Double Throw Transfer Switch Installation for 120/240 V, Single-Phase Service

DETERMINING WATTAGE REQUIREMENTS

Never exceed the rated capacity of your generator. Overloading can cause serious damage to the generator or appliances. Before operating a generator, list all of the appliances that are going to operate at the same time. Then determine the starting wattage requirements and the running wattage requirements. The starting load lasts only for a few seconds, but is very important when figuring your total

wattage to be used. Your generator must be rated to handle the total wattage.

Ratings shown here are samples. Wattage requirements vary with different brands of appliances. Be sure to check the name plate on the appliances you plan to use. Always start your largest electric motor first, then plug in other items one at a time.



If you do this	This could happen	Unless you prevent it
1. Attempt to connect generator directly to the electrical system of any building.	1. You can kill or injure a person repairing service lines. The electricity you generate will back feed through the building's electrical system to the outside utility feed lines. Attempting to connect to the incoming utility service could result in electrocution. If your electric cooperative's line crew is restoring electrical service while your generator is connected to the incoming utility service, you could start a fire or seriously damage your building.	1. A qualified, licensed electrician must install a double-pole, double-throw transfer switch to connect the generator to a building's electrical system. This is required by the National Electrical Code. Connection must meet local ordinances. A minimum of 10-gauge wiring must be used.
2. Fail to ground the generator's electrical system adequately.	2. Entire generator could become electrically charged and cause electrocution.	2. Make sure that the unit is connected to an appropriate electrical ground, in accordance with the National Electric Code. Follow instructions supplied with the generator.
3. Operate generator in rain, wet, icy or flooded conditions.	3. Water conducts electricity. If water which comes in contact with electricity to the generator's frame and other surfaces, it will cause an electrical shock to anyone contacting them.	3. Operate generator in a clean, dry, well ventilated area. Make sure your hands are dry.
4. Use worn damaged, undersized or ungrounded extension cords.	4. Contact with worn or damaged extension cords could cause electrocution. Undersize extension cords could overheat wires or attached items, resulting in fire. Use of ungrounded cordsets could prevent operation of circuit breakers and result in electrical shock.	4. Inspect extension cords before use and replace with new if required. Use proper size (wire gauge) cordset for application. Follow instructions supplied with your unit. Always use electrically grounded cordsets.
5. Place generator on or against un-grounded conductive surface, such as a steel walking way or metal roof.	5. Electrical current could leak out and charge conductive surfaces in contact with the generator.	5. Place generator on low conductivity surface such as a concrete slab.
6. Improperly connect appliances or tools to generator.	6. Exceeding the load capacity of the generator by attaching too many items, or items with very high load ratings, could overheat some items or their attachment wiring and cause fire or electrical shock.	6. Understand load ratings. (See sample chart.) Make sure that the total of electrical loads for all attachments does not exceed the load rating of the generator.
7. Operate unit when damaged, or with guards or panels removed.	7. Using a damaged or poorly functioning unit could cause fire or electrocution. Removing guards could expose electrically charged components and result in electrocution.	7. Do not operate generator if it has a mechanical or electrical problem. Do not operate generator with protective guarding removed.
8. Attempt to fill the fuel tank while the engine is running.	8. Gasoline and gasoline vapors can become ignited by coming in contact with hot components such as the muffler, engine exhaust gases or from an electrical spark.	8. Turn engine off and allow it to cool before adding fuel. Make sure there's a fire extinguisher in the immediate area certified to handle gasoline or fuel fires.
9. Expose generator to sparks, fire or hot objects.	9. Cigarettes, sparks, fires or other hot objects can cause gasoline or gasoline vapors to ignite.	9. Add fuel only in a well ventilated area. Make sure there are no sources of ignition near the generator.
10. Improperly store generator fuel.	10. Improperly stored fuel could ignite or get into the hands of children or other unqualified persons.	10. Store fuel in a properly designed container. Store container in secure location to prevent use by others.
11. Fail to ventilate generator by operating in an enclosed area.	11. Obstructing ventilation causes overheating and possible ignition of the materials. You will produce toxic carbon monoxide exhaust fumes from the engine. Breathing exhaust fumes will cause serious injury or death.	11. Operate generator in a clean, dry, well ventilated area. Keep objects away from unit during operation. Do not operate unit in a confined area, such as garages, basements, storage sheds, etc., which lack a steady exchange of air. Never operate unit in a location occupied by humans or animals. Keep children, pets and others away from where it's operating.
12. Tamper with factory set engine speed settings.	12. Tampering with the engine speed adjustment could result in overheating of attachments and could cause a fire.	12. Never attempt to "speed-up" the engine to obtain more performance. Both the output voltage and frequency will be thrown out of standard by this practice, endangering you and the attachments.
13. Operate generator in careless manner.	13. Unsafe operation or maintenance of your generator could lead to serious injury or death to you or others.	13. Review and understand all of the operating instructions and warnings supplied with the unit. Keep children or others away from the generator at all times.