



# GLOBAL SAFETY MANUAL

## *Generator Safety* *It's Your Responsibility*



*If Knowledge  
Is Power, Then Know  
Your Power*

# INTRODUCTION

This booklet is a safety outline providing general guidelines for operating a generator. It is important to note that before you start you should thoroughly read and understand the operation manual for your generator. Following all the manufactures' recommendations is necessary for optimal performance of your generator. Be sure you understand everything before hooking up the generator.

Generators are useful when temporary or remote power is needed, and are commonly used during restoration and recovery efforts following disasters such as hurricanes, tornadoes, floods, ice storms, brownouts, and other such inconvenience which have been known to cause major, long-term outage emergencies. Don't let a weather disaster turn into your personal disaster. The best time to purchase a generator is now, before disaster strikes.

Improper installation and usage of a generator can damage or destroy appliances, cause fires or carbon monoxide poisoning. Generators have even been the cause of death to emergency workers trying to restore power as well as those unaware of the general safety that is required when owning and operating generators. **Being aware of the safety requirements when using an emergency generator to transfer your power needs is your responsibility. Generators with full panel GFCI or 240-volt GFCI is non-compatible.**

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# **HAZARDS ASSOCIATED WITH GENERATORS:**

**Incorrect generator use can lead to:**

- **Electrocution from improper installation**
- **Carbon monoxide poisoning from the toxic engine exhaust**
- **Fire from improperly refueling or inappropriately storing the fuel**

# SHOCK AND ELECTROCUTION

The electricity created by a generator has the same hazards as normal utility-supplied electricity. It also has some additional hazards because generator users often bypass safety devices (such as circuit breakers) that are built into electrical systems.

## Avoid Electrocution

- **NEVER attempt to back-feed a generator during a power outage.** Attaching a generator directly without the installation of a proper transfer switch puts not only the utility workers in danger, but the homeowner as well. Only a UL listed transfer switch is acceptable to use when powering a house, boat, or motor home with a generator.
- If you are planning on having your generator connected to house wiring, it is vital that you have a qualified electrician or your utility company (depending on the requirements for your area) properly install a transfer switch to avoid such back-feeding, and create a safe environment for everyone involved.
- **Keep the generator dry!** Do not use in rain or wet conditions. **Never** manipulate a generator's electrical components if you are wet or standing in water. Operate it on a dry surface under an open canopy-like structure. If equipment has been submerged in water do not use until it has been dried out and properly evaluated. Do not operate or store the generator in wet or damp conditions or highly conductive locations such as metal decking or steel work.



- Make sure a generator is properly grounded and the grounding connections are tight. If improperly grounded, the entire generator could become electrically charged, causing electrocution.
- Voltage levels may fluctuate from portable generators, which can cause damage to your electrical appliances. Be sure to start the largest motor or appliance first. Turn off all appliances powered by the generator before shutting down the generator.

# USE THE RIGHT EXTENSION CORD



Plug appliances directly into the generator or use a heavy-duty outdoor extension cord appropriately rated in watts or amps at least equal to the sum of the connected appliance loads. Undersized cords can overheat. Make sure the entire extension cord is fully intact and free of cuts or tears and the plug has all three prongs, especially a grounding pin.

- Use only UL-listed, three prong extension cords for 120Volt outlets. Be sure the extension cord is the proper size (wire-gauge) to handle the electric load that will be plugged into it. **A HOT CORD IS AN OVERLOADED CORD.**
- For 120Volt applications use a Ground Fault Circuit Interrupter (GFCI) when plugging an appliance directly into a generator
- Keep all extension cords out of the way or securely taped down to avoid tripping hazards.
- **NEVER** run extension cords under carpeting or other potentially combustible materials. Heat can build up in such areas and pose a fire danger.

# CARBON MONOXIDE

Generators emit carbon monoxide. It is a colorless, odorless, tasteless gas found in the exhaust fumes of an operating engine. Nearly 300 people die every year from carbon monoxide (CO) poisoning and thousands of others become ill or seek medical attention. **Many people have died from CO poisoning because their generator was not adequately ventilated.**

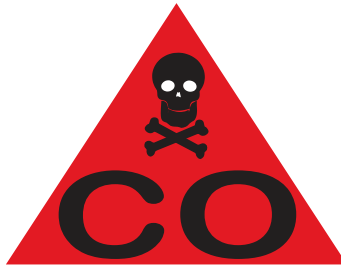
- Breathing lower levels of CO can cause fatigues and increase chest pain in people with chronic heart disease.
- Breathing higher levels of CO can cause flu-like symptoms, such as headaches, dizziness, and weakness as well as sleepiness, nausea, fatigue, vomiting, confusion, and disorientation.
- Breathing very high levels of CO causes loss of consciousness and death.

If you or others experience any of these symptoms and have reason to suspect carbon monoxide poisoning, **immediately leave the area and seek fresh air.** Obtain medical treatment if necessary. Do not re-enter the area until it is determined to be safe by trained and properly equipped personnel. Contact EHS to monitor for CO.

**\*The most common improper placement of portable generators that result in injury or death is in crawl spaces, basements, attached garages, or within or in close proximity to the home! Opening doors and windows or using fans will not prevent carbon monoxide buildup in the home.**

# TO AVOID CARBON MONOXIDE POISONING:

- **Never** use a generator indoors, or in enclosed spaces such as garages, crawl spaces, and basements. **Open windows and doors will NOT prevent CO from building up when a generator is located in an enclosed space!**
- Only operate the generator **OUTDOORS** in a well-ventilated, dry area away from air intakes (windows, doors, vents). Make sure the generator has at least 3-4 feet of clear space on all sides and above to ensure proper ventilation
- Install battery-operated or plug-in (with battery backup) carbon monoxide alarms in your home, following the manufacturer's instructions. Test batteries frequently and replace when needed.



# FIRE HAZARDS

Generators become hot while running and remains hot for several hours after you stop using it. Ensure there is a fully charged fire extinguisher (minimum rating of 10A:80BC) present at each generator location. Before refueling, shut down the generator and allow it to cool for a minimum of two minutes. The generator fuel is extremely flammable and will ignite if it comes in contact with a hot generator.

- **NEVER refuel a generator when it is running.**
- Prior to putting it away, **allow the generator to cool completely** before returning it to its adequate storage place. Handling a hot generator can cause burns not to mention the damages it can cause when stored before it has completely cooled: fire, melting nearby materials such as plastic, as well as floor damage. You never want to return a generator to its storage place without cooling it completely.
- Never operate a generator near combustible materials.
- Generator fuels such as gasoline or kerosene can ignite when spilled on hot engine parts.





# HANDLE FUEL CAREFULLY

- Gasoline and other fuels should be stored and transported in approved containers that are properly designed and marked for their contents and vented
- Keep fuel containers away from flame producing and heat generating devices (the generator, water heaters, cigarettes, lighters, and matches)
- **Do not smoke around fuel containers.** Escaping vapors or vapors from spilled materials can travel long distances to ignition sources.
- Do not store generator fuels in your home. Store fuels away from living areas
- Check the engine oil level every time you refuel.
- Use the type of fuel recommended in the generator instructions or on its label. The most common are:
  - o Liquid Propane
  - o Diesel
  - o Gasoline
  - o Kerosene



# ADDITIONAL CONSIDERATIONS

- Generators with full panel GFCI or 240-volt GFCI is non-compatible.
- Turn off all appliances powered by the generator before shutting down the generator.
- Generators should always be placed outdoors at a safe distance; it is recommended at least 10-15 feet away from air intakes, windows or doors.
- Don't restrict airflow around the generator, allow for adequate cooling. It is recommended to allow at least 3-4 feet on all sides and above the generator to maximize ventilation.
- Protect the generator from direct exposure to rain and snow; place it in a dry sheltered weather protected level outside location (an example would be under a canopy or other such functional structures).
- If your transfer switch only switches the two hot lines, you should use a generator with a floating neutral.
- If you illegally connect a generator to your home, and an accident occurs, you run the risk of not being covered under your homeowner's insurance policy.
- **Always keep children and animals away from portable generators at all times!**

# Appliance Usage Guide

Equipment	Starting Factor	Running Wattage (avg.)
Water Heater (50 gallon)	1	4500-5000
Portable Heater with fan	2	500-1500
Furnace Fan (Central) - 1/4 HP	3	400
1/3 HP	3	450
1/2 HP	3	600
Computer	1	200
Fax Machine	1	50-1000
Space Heater	1	500-1500
Refrigerator/Freezer	3	750
Home Security System	1	200
Lights	1	40-150
Range w/Oven	1	12200
- Small Burner	1	1300
- Large Burner	1	2400
Garage Door Opener - 1/3 HP	3	750
- 1/2 HP	3	1050
Well Pump - 1/3 HP	3	750
1/2 HP	3	1000
3/4 HP	3	1500
Submersible Sump Pump - 1/2 HP	3	1000
Electric Heat Pump	3	6000
Central A/C 3 ton	3	6000
Dishwasher w/o hot water	2	1200
Television	1	150-400
Radio	1	70-200
Microwave	1	600-1500
Coffee maker	1	750-1200
Toaster	1	1100
Hair Dryer	2	600-1400
Washing Machine w/o Hot Water	2	1000
Clothes Dryer	2	4850
Air Cleaner	2	50
Dehumidifier	2	840
Humidifier	1	177
Vacuum Cleaner	1	800

## Notes to Appliance Usage Guide

The wattages on the Appliance Energy Guide are estimates. The estimated wattage required for your appliances can be easily calculated. (NOTE: 1 kW=1000 watts; 2 kW=2000 watts and so on.) The formula for finding wattage is: Volts x Amps = Watts (running). Always use starting factor when calculating electrical load requirements for your generator. Select the appliances you want to operate and add the starting wattages together to determine if they can all be operated at the same time without exceeding the capacity of your generator. NOTE: individual circuit breakers on your breaker panel may control more than one appliance. Always determine which appliances/loads are connected to specific breakers.

**Do not turn on your home's heat pump or central air conditioning while using GenerLink. The starting wattage for these devices exceeds GenerLink's 30 or 40-amp capacity.**

### Worksheet Instructions

Write down the maximum and continuous wattage output ratings for your generator in the boxes marked A.

From the Appliance Energy Guide, select the appliances that you wish to operate and write them in column B. For each selected appliance, write its corresponding starting factor and run watts in columns C and D respectively.

For each appliance that you have selected, multiply the starting factor by the run watts and write the results or the load watts in column E. NOTE: Only items that start simultaneously should be tallied in column D.

Finally, sum up all of the load wattages for each appliance and lights in column E. Add each appliances load watts and write the number in box G. The number in box G represents the total amount of load you plan to run on your portable generator. Be sure that the total in box G does not exceed the generator size in box A.

Always select a generator that is as large or larger than the estimates for both running and starting wattages.

# SAMPLE WORKSHEET

## SAMPLE WORKSHEET

Generator Size: (Watts)

B Load	C Start Factor	X	D Run Watts	=	E Load Watts
<i>Refrigerator</i>	3	X	1000	=	3000
<i>Sump Pump</i>	2	X	1000	=	2000
<i>Computer</i>	1	X	200	=	200
<i>Fan (central) 1/4 hp</i>	3	X	400	=	1200
<input type="text"/>	<input type="text"/>	X	<input type="text"/>	=	<input type="text"/>
<input type="text"/>	<input type="text"/>	X	<input type="text"/>	=	<input type="text"/>

Lights	Wattage	X	F Number	=	
	60	X	5	=	300
	100	X	1	=	100
	150	X	0	=	0

Total:  G

# WORKSHEET A

Generator Size:  
(Watts)

 A

B	C		D	E
Load	Start Factor	X	Run Watts	= Load Watts

<input type="text"/>	<input type="text"/>	X	<input type="text"/>	= <input type="text"/>
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<input type="text"/>	<input type="text"/>	X	<input type="text"/>	= <input type="text"/>
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<input type="text"/>	<input type="text"/>	X	<input type="text"/>	= <input type="text"/>
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<input type="text"/>	<input type="text"/>	X	<input type="text"/>	= <input type="text"/>
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	F
Lights	Wattage

60	X	<input type="text"/>	= <input type="text"/>
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100	X	<input type="text"/>	= <input type="text"/>
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150	X	<input type="text"/>	= <input type="text"/>
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Total:  G

# NOTES



## a meter collar that makes connecting a portable generator Safe and Easy



- \* GenerLink eliminates dangerous back-feed of electricity onto utility lines and also prevents the utility from feeding into a connected generator.
- \* It is safe, affordable, and installs in 15 minutes.
- \* Is supplied with a 20' GenerLoc power cord.
- \* Gives users access to their entire breaker panel.
- \* Can be used with generators from 4kW to 10kW, 120/240 volts.
- \* Call 1-800-886-3837 to verify your local electrical providers' guidelines.

**visit [www.generlink.com](http://www.generlink.com)**

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