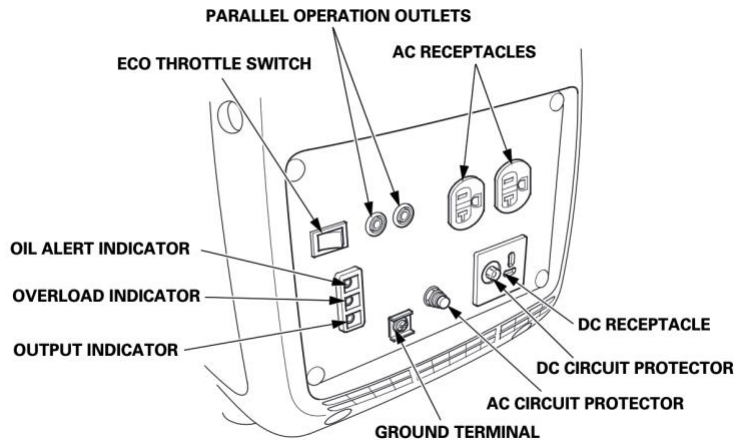


Posse+Plus, Wood County Texas

Portable and Stand-by Generators

Portable Generators



Portable generators are designed to be movable to where electrical power is needed. They also include AC and DC receptacles to plug an appliance directly into the generator. Portable generators are intended to run a couple small appliances at a time. While they could be suitable to operate electronics, and appliances such as refrigerators and small window air conditioners they are not suitable for central air conditioners, water heaters, and stoves.

Standby Generators



Standby generators are usually permanently installed on a concrete slab. They are also permanently connected to the electrical utility wiring to the building through a transfer switch. The transfer switch connects the generator to the building wiring when there is an electrical utility power failure.

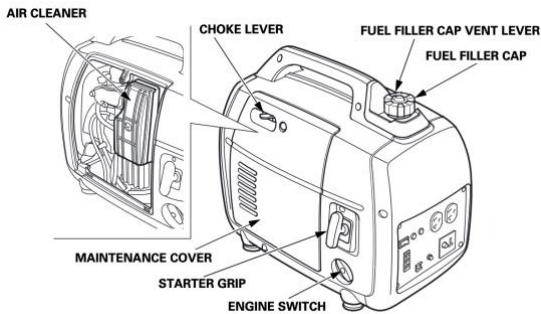
The transfer switch also makes sure the electrical power produced by the generator cannot connect to the electrical utility power lines during outages which would put the utility workers at risk of electrocution.

The cost of standby generators and their installation is many times the cost of portable generators. It includes the cost of installing a concrete slab, the cost of installing a fuel storage tank or connecting to a natural gas line, purchasing and installing a transfer switch, and the cost of connecting the electrical lines.

Standby generators can be sized to operate every electrical device in a home including central air conditioners, electric water heaters, and electric stoves.

Water-cooled standby generators are designed for longer run times (months to years) than air-cooled generators (hours to days or weeks).

Fuel Types



Portable generators typically use either gasoline or propane. There are also dual-fuel generators that can use either one. A few models run on diesel.



Gasoline powered portable generators have a built-in gas tank and propane powered portable generators rely on portable propane tanks.

Standby generators typically use propane, natural gas, or diesel. When using propane or diesel a permanent storage tank for fuel must be installed along with a fuel line between the storage tank and the generator.

Pro's and Con's of Different Fuels



Gasoline is readily available from filling stations. During power outages however filling stations can also be without electrical power making them unavailable for supplying gasoline.

Gasoline should be stored on site in portable containers and treated for long term storage with a fuel stabilizer such as STA-BIL.

Propane does not require any additives for storage. Propane generators require less maintenance than gasoline generators. Portable containers are easy to store and readily available from hardware and grocery stores. During power outages these stores may be without electrical power themselves limiting portable propane availability. Several propane containers should be stored on site with the portable generator.



Full propane tanks can store enough propane to supply a generator through most power outages. Propane tanks can be dedicated to the exclusive use by the generator or also be used for stoves, water heaters, dryers, and furnaces.

Propane tanks need to be monitored to make sure they are full enough to supply a generator during a power failure.

Propane tank sizes include 120-gallon tanks, 250-gallon tanks, 500-gallon tanks, and 1,000-gallon tanks. For safety purposes they cannot be filled beyond 80% capacity.



A propane tank gauge is installed on each propane tank. It measures “Percent Total Volume.” If the reading on the gauge is 60 it means the propane tank is 60 percent full.

60 percent full on a 120-gallon tank means it still has 72 gallons in the tank. A 250-gallon tank would still contain 150 gallons. A 500-gallon tank would still contain 300 gallons. A 1,000-gallon tank would still contain 600 gallons.

It is usually recommended to refill a tank when it reaches a low of 20% but if is being used for a standby generator consider refilling the tank when it falls below the 50% level.

Gauge Reads	120-Gallon Tank	250-Gallon Tank	500-Gallon Tank	1,000-Gallon Tank
80%	96	200	400	800
70%	84	175	350	700
60%	72	150	300	600
50%	60	125	250	500
40%	48	100	200	400
30%	36	75	150	300
20%	24	50	100	200
10%	12	25	50	100



Diesel generators get better fuel efficiency than gasoline generators and engines tend to last longer. They do not need spark plugs that would require replacement however they may need more frequent oil changes. Diesel storage is already common for use in buildings with farm machinery and transport equipment. Diesel generators can often use existing storage tanks.

Long term storage of diesel requires an additive like PRI-D to prevent algae growth.

Natural gas generators do not require a storage tank but may be subject to low gas pressures during extreme weather conditions. They require less maintenance than gasoline generators.

PTO driven generators should be considered when a tractor is available. These generators are often cheaper than other generators because they do not require a built-in engine however, they tie up the use of a tractor during operation.



Winco W15PTOS - 15 kW Tractor-Driven PTO Generator (515/540 RPM)

Model: 99840-004



Recommended

★★★★☆ (28) [Write A Review](#) | [Q&A \(5\)](#)

\$2,741.60

Sizing Generators

Sizing generators is mostly dependent on the wattage of the electrical loads that will be supplied in an emergency.

Portable generators will be sized to the largest combination of loads in terms of wattage that it will be supplying. If the generator has two places to plug in 120-volt cords then it is reasonable to assume it could be used for two different appliances simultaneously if sized properly. Portable generators may have receptacles for 240-volt appliances.

For example, if the portable generator was needed to run a refrigerator and a small window air conditioner the combined wattage would be added together and the portable generator would be sized accordingly. The wattage can be obtained from the manufacturer's data plate on the appliances or can be estimated by using charts like the ones on pages 8 and 9.

Appliances that include motors like refrigerators and window air conditioners have starting watts that are significantly greater than the running watts. Appliances such as lights and heaters do not have starting watts that are higher than the running watts.

The chart on page 8 estimates that a refrigerator has 400-800 running watts and 1,200-2,300 starting watts. It also estimates that a window air conditioner has 1,000 to 2,000 running watts and 2,300 to 8,000 starting watts.

If the generator is being sized for a large refrigerator and a small window air conditioner, use the larger numbers, 800 running watts and 2,300 starting watts for the refrigerator and the smaller 1,000 running watts and 2,300 starting watts for the window air conditioner.

The generator has to be sized at least large enough for the combined running watts or the largest starting watts depending on which is larger. A portable generator may have two separate wattage ratings. One for running watts and another rating for starting watts.

Combined running watts is $800 + 1,000 = 1,800$ watts. Both starting watts are the same at 2,300 watts. Start up watts often only last a fraction of a second and do not occur simultaneously. Since the starting watts at 2,300 is greater than the running watts at 1,800 the generator sizing should be based on 2,300 starting watts. To be safe the 2,300 watts should be multiplied by 1.25 for adequate sizing. $2,300 \times 1.25 = 2,875$ watts. A generator rated for at least 2,875 watts should be selected. It also has to match the appliance voltage, 120 or 240 volts.



GENMAX Portable Generator, 3200W Ultra-Quiet Gas Engine & RV Ready, EPA Compliant, Eco-Mode Feature, Ultra Lightweight for Backup Home Use & Camping (GM-3200i)

Visit the GENMAX Store
 4.1 ★★★★★ 308 ratings | Search this page
 50+ bought in past month

-18% \$489⁹⁹

List Price: \$599.99

Or \$40.83 /mo (12 mo). Select from 2 plans

prime

Pay \$489.99 \$488.03 after using available Amazon Visa rewards points.

Delivery & Support

Select to learn more



Generac 7153 GP3300i 3,300-Watt Gas-Powered Portable Inverter Generator - Lightweight Design USB Ports for Mobile Device Charging - COsense Technology - CARB Compliant, Orange/Black

Visit the Generac Store
 4.5 ★★★★★ 3,377 ratings

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\$878⁹⁷

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prime One-Day

With Amazon Business, you would have saved \$101.67 in the last year. Create a free account and save up to 3% today.

Pay \$878.97 \$877.01 after using available Amazon Visa rewards points.

Delivery & Support



Honda Power Equipment EU3000IS1AN 3000W 120V Portable Home Gas Power Generator

Brand: Honda
 4.4 ★★★★★ 59 ratings

50+ bought in past month

\$1,999⁰⁰

Or \$166.58 /mo (12 mo). Select from 2 plans

Pay \$1,999.00 \$1,997.04 after using available Amazon Visa rewards points.

Delivery & Support

Select to learn more



Ships from Jacks Small Engines



Non-returnable. Transportation of this item is subject to...



Customer Support

Open frame generators are often cheaper but are louder than enclosed inverter generators.



📌 WEN GN400i RV-Ready 4000-Watt Open Frame Inverter Generator, CARB Compliant, Black/ orange

Brand: WEN
4.5 ★★★★★ 1,035 ratings
50+ bought in past month

\$402⁹⁹

Or \$33.58 /mo (12 mo). Select from 2 plans
✓prime

Pay \$402.99 \$401.03 after using available Amazon Visa rewards points.

Delivery & Support

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🚚 Non-returnable. Transportation of this item is subject to...
🎧 Customer Support

Refrigerators and freezers can often maintain temperatures to keep food frozen with 2-3 hours of run time daily if door openings are kept to a minimum. A portable generator can be rotated between different appliances throughout the day. A refrigerator could be connected to the portable generator for three hours then disconnected. A freezer could then be connected for the next three hours. A portable electric heater, window air conditioner, or well pump could be connected after the freezer. These connections require at least one long heavy-duty extension cord connecting the generator located outdoors to the appliance. **Generators produce carbon monoxide and should never be operated inside a building.**

Standby generators are sized to power larger electrical appliances than portable generators. Standby generators can be sized to run every electrical load in a home or can use load shedding to automatically select certain appliances to operate during electrical utility failure while selecting other appliances to remain off. This allows a smaller standby generator to be used.

An example of load shedding would be to choose to operate central air conditioning but not an electric hot water heater during an electric utility failure.

In a 1,500 square foot house a 5-8 kilowatt standby generator could power appliances like a coffee maker, refrigerator, microwave oven, 1-2 ton air conditioner, lighting, televisions, electric stove, toaster, and chargers. Load shedding could be used to eliminate power to an electric water heater and electric dryer. If an electric water heater and electric dryer is added consider installing an 8-10 kilowatt standby generator.

In a 2,000 square foot house an 10-12 kilowatt standby generator would power appliances like a coffee maker, refrigerator, microwave oven, 3 ton air conditioner, lighting, televisions, electric stove, toaster, and chargers. If an electric water heater and electric dryer is added consider installing an 12-15 kilowatt standby generator.

The above sizing exercises are rough estimates. Generally speaking, a standby generator needs to be installed by a professional. The professional installer can perform sizing calculations specifically for the house and more accurately size the standby generator.



Standby Generator, 7.5kW | With 8-Circuit Transfer Switch

Base Model/SKU: G006998_
Model Number: G0069981

Starting at:
\$2,049.00



Standby Generator, 10kW | With 16-Circuit Transfer Switch | WiFi Enabled

Base Model/SKU: G007172_
Model Number: G0071720

Starting at:
\$3,393.00



Standby Generator, 18kW | With Whole House Switch | WiFi Enabled

Base Model/SKU: G007228_
Model Number: G0072280

Starting at:
\$5,859.00



Standby Generator, 22kW | With Whole House Switch | WiFi Enabled

Base Model/SKU: G007043_
Model Number: G0070430

Starting at:
\$6,379.00



Guardian Standby Generator, 24kW | With Whole House Switch | WiFi Enabled

Base Model/SKU: G007210_
Model Number: G0072101

Starting at:
\$6,629.00



Standby Generator, 26kW | With Whole House Switch | WiFi Enabled

Base Model/SKU: G00729_
Model Number: G0072910

Starting at:
\$7,249.00

A quick ball park estimate for the total cost of purchasing and installing a standby generator would be to multiply the price of the generator by 2. For example, a 10 kilowatt standby generator with a 16 circuit transfer switch would have an estimated total cost of $\$3,393 \times 2 = \$6,786$.

This would not include the cost of installing a fuel (propane and diesel) storage tank. It is often much cheaper to rent a tank from the fuel supplier than buying a tank. When renting a tank, a commitment is made to the supplier for all future purchases of fuel.

Other Considerations

All generators require maintenance. Changes of oil, oil filters, spark plugs, and air filters are common. Electric start generators also have a startup battery that needs to be maintained and occasionally replaced. Be sure to store maintenance supplies. Generators are noisy. Enclosed portable inverter generators are less noisy than open frame generators. Ideally standby generators should be rated to emit between 60 to 62 decibels at a 25% load. Do not choose a standby generator rated higher than 80 decibels at a 25% load.

Kind of Equipment	Horsepower (Hp)	Running Watts (W)	Starting Watts (W)	Total Load to be run on the Generator
Essential				
Lighting		100-2000		
Refrigerator	1/4 - 1/2	400-800	1200-2300	
Freezer	1/4 - 1/2	600-1000	1200-2300	
Furnace, stoker	1/4	400	1200	
Furnace, oil burner	1/6	300	1000	
Furnace, hot water circ pump	1/6 - 1/4	300 - 400	1000 - 1200	
Furnace, blower	1/4 - 1/2	400-600	1200-2300	
Hot water heater - electric		4500		
Portable electric heater		600 - 1500		
Microwave oven		800 - 1600		
Car headbolt heater		600 - 1500		
Well pump				
Water pump	1/2 - 2	800 - 2500	2300 - 8000	
Optional				
Toaster		1200 - 1500		
Mixer		150		
Coffeemaker		1000 - 1500		
Electric iron		500 - 1500		
Electric range		3000 - 10,000		
Electric clothes dryer - blower	1/6	500	1000	
Electric clothes dryer - heater		4000		
Window air conditioner	1/2 - 2	1000 - 2000	2300 - 8000	
Central air	2 - 5	2000 - 5000	8000 - 18,000	
Electric fan		75 - 300		
Water heater		1000 - 5000		
Kitchen ventilator		150		
Television		200 - 600		
Nintendo		20		
Dishwasher - wash only	1/6	300	1000	
Dishwasher - heater		1500		
Washing machine	1/4 - 1/2	400	1200 - 2300	
Sewing machine		200 - 500		
Sweeper	1/4	400 - 1500	1200	
Motors				
	1/6	215	1000	
	1/4	300	1200	
	1/3	400	1600	
	1/2	575	2300	
	3/4	835	3345	
	1	1000	4000	
	1 1/2	1500	6000	
	2	2000	8000	
	3	3000	12,000	
	5	4500	18,000	
	7 1/2	7000	28,000	
	10	9000	36,000	
Total				

How much power do you need?

DEVICE	RUNNING WATTS	ADDITIONAL STARTING WATTS	GENERATOR SIZE
Laptop computer	225	-	Minimum starting watts for your needs ↓ 3000 starting watts
Blender	400	450	
Flat-screen TV	150	-	
Box fan	200	-	
Cell phone battery charger	25	-	
Outdoor light string	250	-	
Inflator pump	50	150	
Slow cooker	250	-	
Microwave - 1000 Watts	1000	-	
Total	2550	+ 450 =	

All running watts + highest starting watt = Total wattage needed

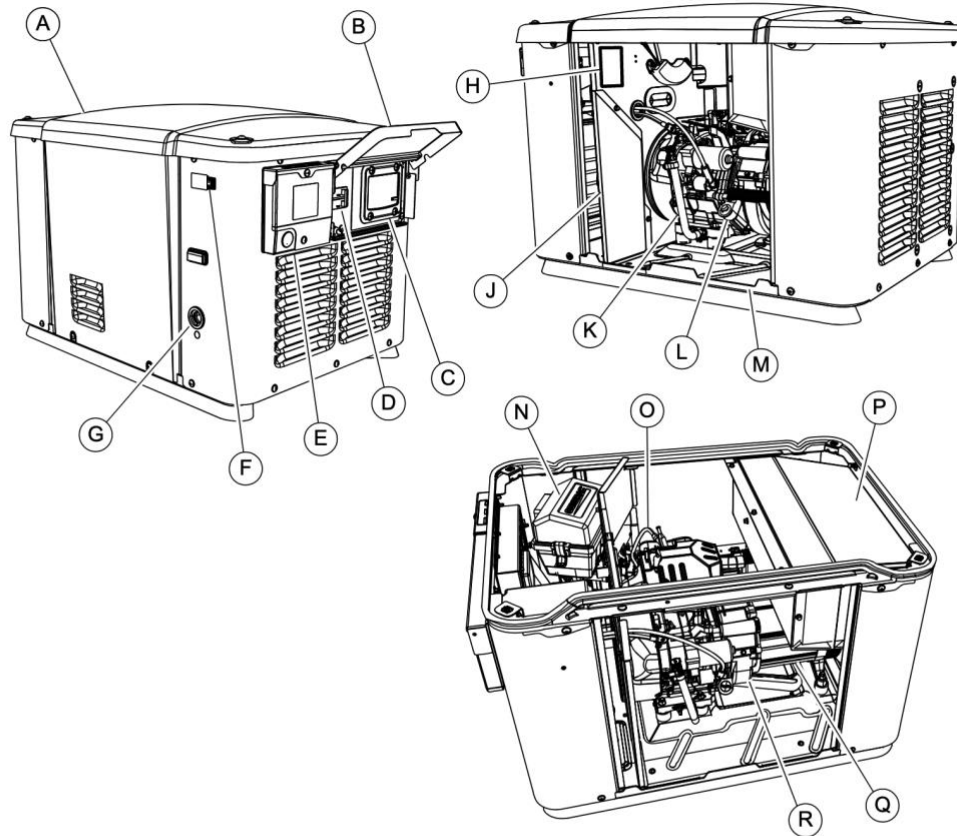
	DEVICE	RUNNING WATTS	ADDITIONAL STARTING WATTS
RECREATION	AM/FM radio	100	-
	Box fan - 20"	200	-
	Blender	400	450
	Cell phone battery charger	25	-
	Flatscreen TV	150	-
	Electric grill	1650	-
	Inflator pump	50	150
	Outdoor light string	250	-
HOUSEHOLD	Slow cooker	250	-
	Coffee maker	1500	-
	Laptop computer	225	-
	Hair Dryer - 1250 watt	1250	-
	Light bulb - 100 watt	100	-
	Microwave - 1000 watt	1000	-
	Security system	500	-
	Television - 27"	500	-
OUTDOORS	Toaster	1200	-
	Space heater	1800	-
	Electric hedge trimmer	400	-
	Electric lawn mower	1200	-
	Electric line trimmer - 9"	350	-
	Electric edger	960	-
	Electric chain saw - 12" (1/2HP)	900	-

*Watts listed are approximate. Check your appliances for actual requirements. Total wattage requirements assumes intermittent starting of devices.

Service Schedule

System Component	Procedure			Frequency
X = Action * = Notify dealer if repair is needed	Inspect	Change	Clean	W = Weekly M = Monthly Y = Yearly
Fuel				
Fuel lines and connections	•			M
Lubrication				
Oil level	•			M or 24 hours of continuous operation
Oil		•		6 M or 100 hours of operation **
Enclosure louvers	•		•	W
Battery				
Remove corrosion; verify dryness	•		•	Y
Clean and tighten battery terminals	•		•	Y
Check charge state	•	•		Y
Electrolyte level (unsealed batteries only)*	•	•		Every 6 M
Engine and mounting				
Air cleaner	•	•	•	3 M / 50 hours - clean 1 Y / 300 hours - replace
Spark plug	•	•		6 M or 100 hours - inspect 1 Y or 300 hours - change
Valve clearance	•			1 Y or 300 hours***
General condition				
Vibration, noise, leakage *	•			M
<p>Contact the nearest Independent Authorized Service Dealer for assistance if necessary.</p> <p>* Contact the nearest Independent Authorized Service Dealer for assistance if necessary.</p> <p>** Change oil after the first 20 hours of operation or 1 month. Continue to check at intervals of 100 hours or 6 months, whichever occurs first. Severe duty oil drain intervals: In cold weather conditions (ambient below 40 °F [4.4 °C]) change engine oil every 6 months or 50 hours of operation to prevent accumulation of water in the oil. If the unit will be operated continuously in hot ambient conditions (ambient above 85 °F [29.4 °C]) or operation in an extremely dusty or dirty environment change the engine oil every 3 months or 50 hours of operation to prevent oil breakdown.</p> <p>*** Check valve clearance after the first 20 hours of operation. Continue to check at intervals of 300 hours.</p>				

Generator Features and Components



005568

Figure 2-1. Features and Components

A	Enclosure lid	G	Fuel connection hole	N	Air box
B	Controller lid	H	Data label	O	Spark plug
C	Control panel	J	Battery access panel	P	Exhaust enclosure
D	Main line circuit breaker	K	Oil drain hose	Q	Alternator
E	Customer connection box	L	Oil fill / dipstick	R	Starter motor
F	Generator emergency shutdown switch	M	Front panel (not shown)		

AC Unit Size (Ton)	Generator Size (kW)
1.5 ton	5-6 kW
2 ton	6.5-8 kW
2.5 ton	8.5-10 kW
3 ton	10.5-12 kW
3.5 ton	12.5-14 kW
4 ton	14-15 kW
5 ton	16-18 kW