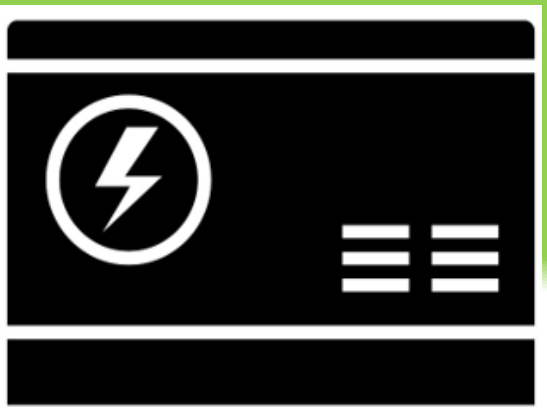
Standby Generator Toolkit



Although the following generator guide will give you some idea of backup generator needs, you should ALWAYS hire a professional to calculate your electrical load and installation needs. There is no single sizing solution for all homes. The size and power of the generator is determined by a variety of factors including the size of your home, the type of fuel preferred, and the wattage requirements of your appliances. Do not forget to also take into consideration load growth, seasonal changes, and different types of home heating, water, refrigeration, and other needs.
It is important to size a generator correctly. Too small of a generator for a large load can damage the generator and/or the equipment or appliances that are connected to it. Too large of a generator will cost you more by using more fuel and will be less efficient when loaded lightly. This will also typically have a larger installation bill.

SAFETY

Generators must be installed according to codes set by the National Fire Prevention Association (NFPA), as well as state and local codes to operate safely and efficiently. A transfer switch or similar device is required by code to ensure the safety of both utility crews working on the outage and to prevent damage to electrical systems within the home.

A List of Local Electricians who can assist is located at the end of this toolkit.

Transfer Switches

Transfer switches make it possible to switch between utility and generator power. Depending upon the application, the transfer switch will either work automatically or manually. Here are examples of both:

Automatic Transfer Switches:
Generlink- 30Amp Meter Mounted with Surge Protection

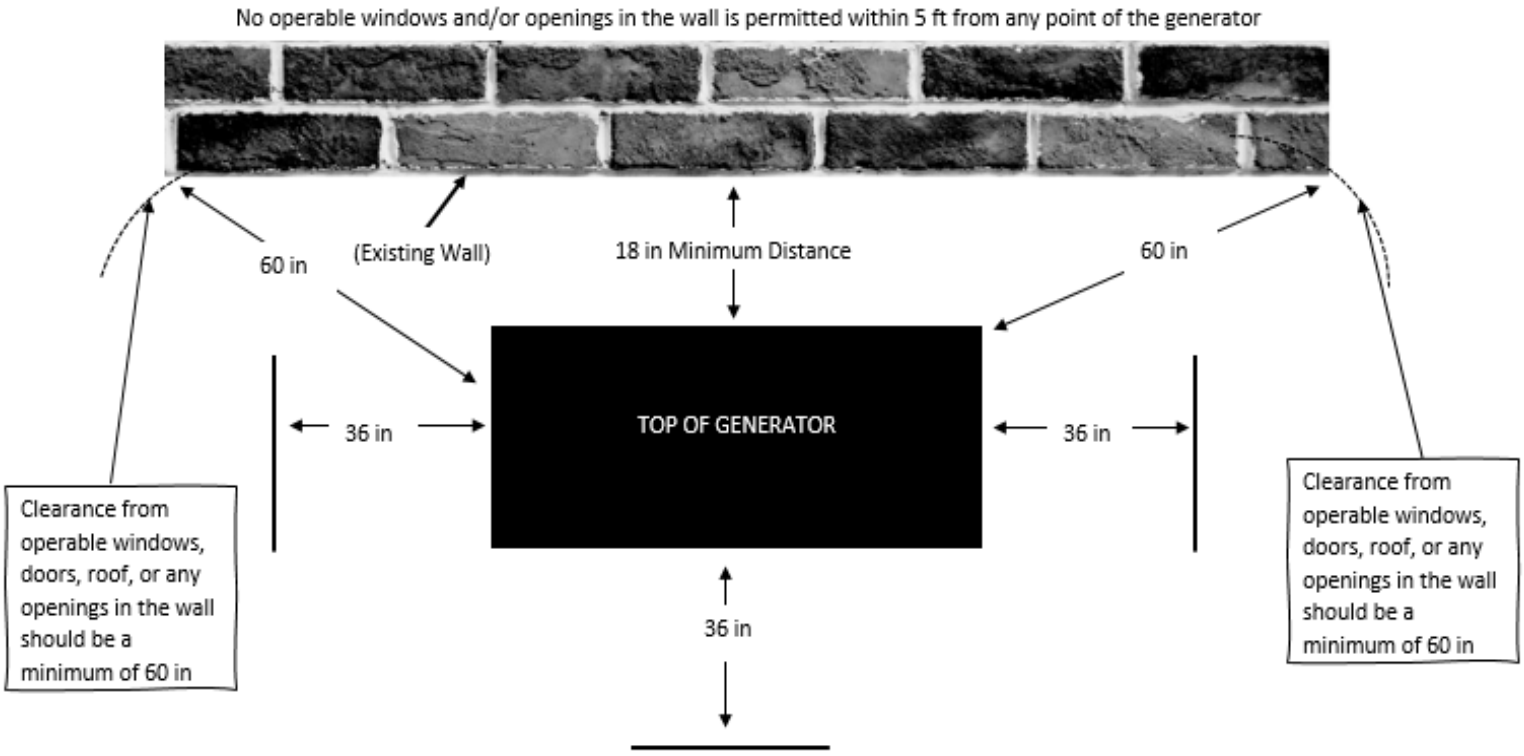
Generac- 100 Amp Automatic Service Entrance Rated

Manual Transfer Switches:
Generlink- 40Amp With Surge Protection
Generac- Whole House 100A Utility / 30A Generator
Simple Panel Interlock and cord- Generator Interlock 100 or 125 Amp Panel

30 Amp Generator Cord and Power Inlet

Location Requirements

Location is often overlooked when installing a generator. The location can determine the generator size, transfer switch location, fuel type, and fuel capacity. Generators should NEVER be located indoors. NFPA 37 section 4 specifies generator clearances for outdoor installation, see figure below.



PLACEMENT CONSIDERATIONS

- Air inlet obstruction
- Exhaust precautions
- Rising water levels
- Maintenance and servicing accessibility
- Water spraying, saturating, or swamping
- Underground or covered services
- Fuel supply and pipe length
- Transfer switch proximity
- Level Surface and/or Prevailing winds

Running Watts vs. Starting Watts

Running Watts: Power that the generator can supply all the time. Also called rated watts or continuous watts.

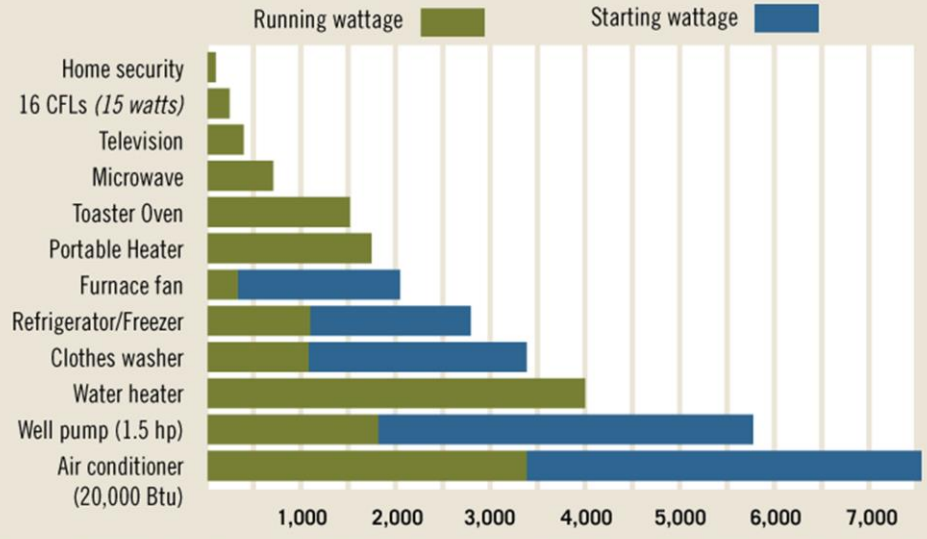
Starting Watts: Extra watts needed for two or three seconds to start motor-driven products like a refrigerator or circular saw. This is the maximum wattage the generator can produce. Starting watts are also called inrush current, surge watts or peak watts.

- **On the appliance nameplate, look for LRA (Locked Rotor Amps). This is the current you can expect under starting conditions when full voltage is applied. Multiply the LRA by the voltage to get your starting wattage.**
- **Another way to find starting wattage or inrush current is to get a good quality clamp amp meter that can measure the inrush current. Simply attach the amp meter to the appropriate wire, select the "inrush" function of your amp meter, and start your appliance to get a reading. Multiply the amps by the voltage to get the wattage.**

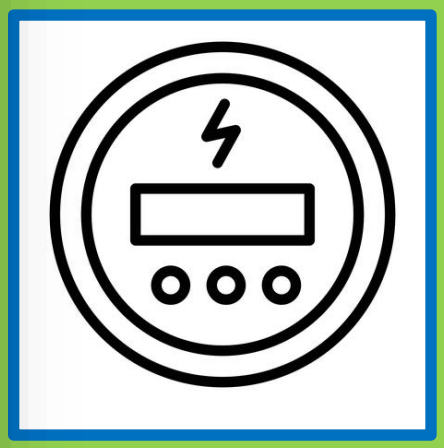
The Right **Portable Generator** for the Job

Before purchasing or operating a portable generator, make a list of the appliances you will need to run at the same time. Find both starting and running wattage requirements on appliance nameplates or in owner's manuals; add them up to determine the total wattage your generator should handle.

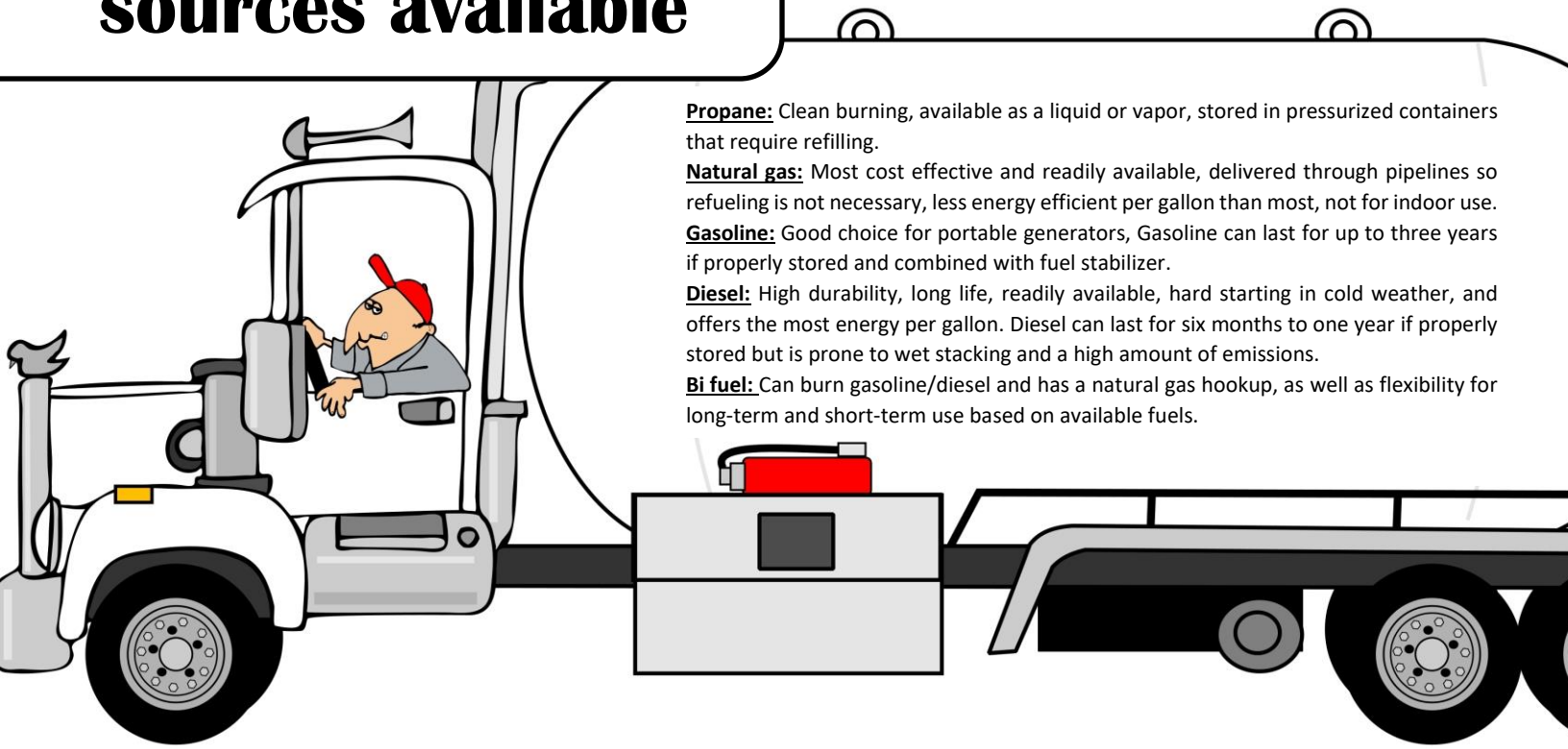
Sample running wattages, as compared to spiked starting wattages:



Sources: North Carolina Association of Electric Cooperatives; National Rural Electric Cooperative Association



Determine fuel sources available



Propane: Clean burning, available as a liquid or vapor, stored in pressurized containers that require refilling.

Natural gas: Most cost effective and readily available, delivered through pipelines so refueling is not necessary, less energy efficient per gallon than most, not for indoor use.

Gasoline: Good choice for portable generators, Gasoline can last for up to three years if properly stored and combined with fuel stabilizer.

Diesel: High durability, long life, readily available, hard starting in cold weather, and offers the most energy per gallon. Diesel can last for six months to one year if properly stored but is prone to wet stacking and a high amount of emissions.

Bi fuel: Can burn gasoline/diesel and has a natural gas hookup, as well as flexibility for long-term and short-term use based on available fuels.

Generator Sizing Instructions

There is not a single correct sizing solution. The following are several methods that, when mixed with good judgement, should result in an appropriately sized generator. Remember to consider load growth, seasonality, and effects of starting motors.

Remember: Never add Amps when sizing a generator. Convert Amps to kW and add kW to determine the required generator size. Adding Amps without properly accounting for the power factor and/or mixing voltages will result in improperly sizing the generator.

Partial House (Essentials) Load Summation Method

Make a list of all items you wish to power at the same time during an outage. Be realistic but inclusive.

1. Using the Wattage Chart below, fill in the running watts and starting watts requirements on the 'You Power Needs' section. (See example below)
2. Add the Running Watts of the items you wish to power. Enter this number in the 'Total Running Watts' column.
3. Select the individual item with the highest number of starting watts. Take this one number, add it to you Total Running Watts, and enter it in the Total Starting Watts box.

EXAMPLE

DESCRIPTION	RUNNING WATTS	ADDITONAL STARTING WATTS
1. Refrigerator/Freezer	700	2200
2. Furnace Fan Blower – 1/2 HP	800	2300
3. Washing Machine	1150	2250
4. Range Oven/Stove Top	8000	0
5. Sump Pump 1/3 HP	800	1300
6. Well Pump 1/2 HP	1050	2100
7.		
	TOTAL RUNNING WATTS	HIGHEST ADDITIONAL STARTING WATTS
	12500	2300
TOTAL RUNNING WATTS + HIGHEST ADDITIONAL STARTING WATTS =		
TOTAL STARTING WATTS NEEDED		14800

With this example, you need a generator that produces at least 12,500 Total Running Watts and 14,800 Total Starting Watts

I need a generator that produces at least _____ total running watts and _____ total starting watts.

YOUR POWER NEEDS

DESCRIPTION	RUNNING WATTS	ADDITONAL STARTING WATTS
1.		
2		
3.		
4.		
5.		
6.		
7.		
	TOTAL RUNNING WATTS	HIGHEST ADDITIONAL STARTING WATTS
TOTAL RUNNING WATTS + HIGHEST ADDITIONAL STARTING WATTS =		
TOTAL STARTING WATTS NEEDED		

Wattage Chart

DESCRIPTION	RUNNING WATTS	ADDITONAL STARTING WATTS
ESSENTIALS		
Light - 60 watt	60	0
Deep Freezer	500	1500
Sump Pump 1/3 HP	800	1300
Well Pump 1/2 HP	1000	2100
Electric Water Heater	4000	0
General Lighting & Receptacles per 1000sq ft	3000	0
HEATING / COOLING		
Space Heater	1800	0
Furnace Fan Blower – 1/2 HP	800	2300
Furnace Fan Blower – 1/3 HP	700	1400
Window AC – 10,000 BTU	1200	3600
Window AC – 12,000 BTU	3250	9750
Central AC – 10,000 BTU	1500	4500
Central AC – 24,000 BTU	3800	11400
Heat Pump	4700	4500
Electric Heat per 1000ft^2	12000	0
LAUNDRY ROOM		
Washing Machine	1150	2250
Clothes Dryer – Electric	5400	6750
Clothes Dryer – Gas	700	1800
KITCHEN		
Refrigerator/Freezer	700	2200
Microwave Oven – 625 Watts	625	0
Microwave Oven – 1000 Watts	1000	0
Coffee Maker	1000	0
Electric Stove – 8 in. Element	2100	0
Dishwasher – Hot Dry	1500	0
Range Oven/Stove Top	8000	0
OTHER		
1/2 HP Garage Door Opener	875	2350

* The wattages listed in our reference guide are based on estimated wattage requirements. For exact wattages, check the data plate or owner's manual on the item you wish to power.

Whole House – Measurement Method:

Connect a recording ammeter or power meter that can measure the maximum peak kW demand continuously over a thirty-day period. The maximum kW demand should be taken while the building is occupied and should include the larger of the heating or cooling loads.

The peak kW demand should be multiplied by 125%

*Calculated kW demand = Peak kW demand * 125%*

Size the generator to the next standard size.

Whole House – Billing History Method:

Using a year's worth of electric bills, size the generator to 25% larger than the largest peak demand. Peak demand is simply the average electrical usage that has occurred over a 15-minute period.

You can find your peak demand one of three ways:

1. Website, by logging onto your account www.fallriverelectric.com />My Usage>Select a year's worth of data>Change the chart to 'Peak Demand.'
2. On your monthly bill, your peak demand is listed for that billing period.

DEMAND:	READING
	12.930

3. Call one of our friendly member service representatives at (800) 632-5726 and request your demand for the year.

The EASY Way – Home Standby Generator Sizing Calculators:

Generac

https://www.generac.com/for-homeowners/home-backup-power/build-your-generator

Briggs & Stratton

https://www.briggsandstratton.com/na/en_us/buying-guides/standby-generators/choosing-standby-generator.html

Kohler

http://www.kohlerpower.com/home/home-generators/selector#your-home

Whole-Home Generators:

Generac Standby Generators:

Standby 10kW Wifi Enabled

Standby 14kW Wifi Enabled

Generator/Transfer Switch Combination Offers:

10kW with 16-Circuit Transfer Switch

Standby 14kW with 16-Circuit Transfer Switch

FALL RIVER
RURAL ELECTRIC COOPERATIVE
Where Service Matters

Safety Reminder:

Whichever generator/transfer switch you choose, please keep the safety of your family and the utility works out working on the outage in mind. Use an electrician to properly install a safety transfer switch. Never try to wire a generator directly into an electrical panel!

Electricians in Fall River's Service Territory

COMPANY	PHONE NUMBER	CONTACT NAME	EMAIL	WEBSITE
3G ELECTRIC	208-313-7413	RYAN WEBSTER	RYAN@3GELECTRICLLC.COM	
98 ELECTRIC	208-787-0098	SCOTT WUSIHICH	SCOTT@98ELECTRIC.COM	https://www.98electric.com
ARMSTRONG ELECTRIC	208-313-5207	VERN ARMSTRONG	VERNTERRI@SILVERSTAR.COM	
COX ELECTRIC	208-807-0227	JACE COX	JACE@COXELECTRICID.COM	https://coxelectricid.com
CUTTING EDGE	208-552-0387	KEN	office.cuttingedgeelectric@gmail.com	https://www.cuttingedgeelectric.net/
DC ELECTRIC INC	208-552-1911	STEVE	steve@d-c-electric.com	https://www.d-c-electric.com/
ELECTRIC FALLS	208-419-3613	DUSTIN THURMAN	dustin@electricfalls.com	https://www.electricfalls.com/
ELEVATE ELECTRIC	208-357-6513	MATT	MATT@ELEVATEELECTRIC.COM	https://elevateelectricllc.net/
FIRST CALL JEWEL	208-522-7777	MATT	MATT@FIRSTCALLJEWEL.COM	https://firstcalljewel.com/electrical/generators/
GL EDWARDS ELECTRIC	208-403-9614	LEROY EDWARDS		
GRIZZLY ELECTRIC	208-201-5658	NIC MARLAR	NBMARLAR78@LIVE.COM	
HALE ELECTRIC	208-227-3895	KONNOR HALE	KONNOR.HALE@HALEELECTRICLLC.COM	https://haleelectricllc.com/
LEGACY ELECTRIC	208-359-0672	RYAN LEISHMAN	ryanleishman@msn.com	https://legacyelectricidaho.com
LEISHMAN ELECTRIC INC	208-356-3770	TODD LEISHMAN	leishmanelectric@yahoo.com	
LP ELECTRIC SERVICES	508-397-9018	PALO	Palo312@hotmail.com	https://www.lpelectricservices.com
LUCEY ELECTRIC	208-354-8288	JERRY LUCEY	OFFICE@LUCEYELECTRIC.COM	
MOUNTAIN VALLEY ELECTRIC	208-228-5304	MATT RINGEL	brieann@mveteam.com	https://www.mountainvalleyelectric.com
NEPHI'S ELECTRIC	208-313-2883	TEANCOME GIBSON	NEPHIELECTRIC@YAHOO.COM	https://www.nephiselectric.com
PERCISION ELECTRICAL	208-604-5986	JOE	info@pes-electric.com	https://pes-electric.com
PLATINUM ELECTRIC	208-403-3040	SPENCER PENA	GoPlatinumElectric@gmail.com	https://www.platinumelectricidaho.com
SAGE ELECTRIC	208-351-5708	BOB GRAUE	jgsage@gmail.com	
SERMON SERVICE AND ELECTRIC	208-538-9284		INFO@SERMONID.COM	https://sermonserviceandelectric.com/
WEST POINTE ELECTRIC LLC	855-973-5500	TRAVIS FOLEY	info@wpellc.biz	https://www.wpellc.biz
WHEELER ELECTRIC INC	208-522-1906	JAKE NORMAN	INFO@WHEELERELECTRIC.COM	https://www.wheelerelectric.com
WYDAHO ELECTRICAL	208-513-0199	JAKE TAYLOR	wydahoelectrical@outlook.com	https://www.wydahoelectrical.com