

# HOW TO CHOOSE THE RIGHT GENERATOR OR INVERTER FOR YOUR NEEDS

WHEN PURCHASING A GENERATOR OR INVERTER, IT'S VERY IMPORTANT THAT YOU SELECT ONE THAT'S CAPABLE OF MEETING OR EXCEEDING YOUR POWER REQUIREMENTS, OTHERWISE YOU COULD BE DISAPPOINTED. PLEASE TAKE A FEW MINUTES AND READ THE INFO BELOW. IT WILL HELP YOU TO MAKE A WISE AND INFORMED PURCHASE THAT YOU WILL BE SATISFIED WITH FOR YEARS TO COME.

Power output and quality are at the top of most people's list, but you should also consider noise levels, fuel efficiency, run times, physical size and portability too. And let's not forget price.

## THE FIRST STEP IS MATCHING YOUR MAXIMUM ANTICIPATED POWER NEEDS TO A UNIT'S RATED OUTPUT. MAXIMUM AC OUTPUT

The maximum output of a Yamaha generator or inverter is measured in watts and is represented in the model name. For example, our EF1000iS produces a maximum output of 1,000 watts. The unit can only operate at its maximum output for 15 to 30 minutes. It is not meant to operate at its maximum output on a continuous or longer term basis.

## RATED AC OUTPUT

The rated, or running output of an generator or inverter is the amount of power (watts) it can supply during continuous longer -term operation. The rated output of a Yamaha generator or inverter is approximately 10% less than its maximum output. For example, our EF1000iS has a rated or continuous output of 900 watts.

## GENERATOR'S SURGE OUTPUT

The starting requirements of devices utilizing electric motors (i.e. air compressors, sump pumps, power tools, etc.), may be significantly higher than the actual wattage required to run them during continuous operation. This is very important factor to consider when estimating your power needs. In most cases, a Yamaha generator or inverter will allow for a short period of "over generation" power (less than 3 seconds) to help with the initial start-up. If the initial start up draw lasts longer than 2 to 3 seconds, then you should consider a more powerful unit or a unit with Yamaha's Boost Technology; like the EF3000iSEB.

Sample Chart

DEVICE/ APPLICATION	RUNNING WATTAGE
Coffeemaker	850
Toaster	1,100
Light Bulb (100W)	100
10% Correction Factor	205
<b>TOTAL</b>	<b>2,255</b>

## DETERMINING YOUR POWER NEEDS

If you are unaware of the power requirements of the devices you will be using, refer to the Application Guide. This guide will help you find the approximate amount of power you will need. The most accurate way to determine power requirements, is to check the appliance with a load tester (see Generator / Inverter accessories), check the owner's manual, the identification plate on the product or contact the manufacturer.

## TAKE IT STEP-BY-STEP

Follow these important steps when determining your power needs:

1. Identify the wattage requirements for the items you want to power and don't forget the initial start-up draw. If the power requirement is given in amps, multiply the amps by volts to derive the required watts.  
 $\text{Amps} \times \text{Volts} = \text{Watts}$
2. Add up the required watts of all the items you expect to operate at the same time (simultaneously). Unfortunately, it is not uncommon for devices to use more or less than the wattage listed by the manufacturer. We recommend you add a 10% correction factor to your total power requirements to help offset this uncertainty.
3. The total watts derived in step 2 will determine the size of Yamaha generator or inverter you need. For example, if you only intend to use a coffeemaker, a toaster and a 100-watt light bulb simultaneously, as shown in the Sample Chart, the combined maximum power requirement would be 2,050 watts then add the 10% correction factor ( $2,050 + 10\% = 2,255$

watts). Make sure you have accounted for the start-up draw too. Based on this example, you should be looking for a model that can produce a continuous rated output of 2,255 watts, which would be the EF2600 in the generator series or an EF2800i in the inverter series.





## GENERATORS VS. INVERTERS

Ok, so you have figured out your power needs, now it is time to decide between a generator or an inverter. Generators produce and take power directly from their alternators. This power often has fluctuations and is not as clean as an inverter's power. An inverter also takes its power from its alternator but then electronically "cleans" the power, producing a pure sine wave that is as clean or cleaner than the power you get from a household receptacle.

Generators are great for powering "simple" power tools, lights, space heaters, etc. Inverters are designed to power more sophisticated electronics like TVs, computers and microwave ovens. Inverters are always recommended when powering sensitive electronics that use microprocessors.

Inverters are normally lighter, smaller and more easily transported than a comparable generator (inverters have more compact alternators making them smaller & lighter). Also, inverters are often quieter, because they operate at lower rpms thanks to features like Yamaha's Smart Throttle that varies engine rpm to match load. Noise levels are also an important factor to consider during your

purchase. Inverters may have a longer run times as well. Generators on the other hand, operate at higher rpms due to their synchronous design (synchronous generators generally run at steady 3,600 rpm regardless of load) and are usually larger and more bulky. One of the key advantages to a "traditional" generator is cost; generators are usually less expensive than an inverter.

So which type is right for you? You'll have to look at your application and your budget. Inverters should always be used when powering sensitive electronics which use microprocessors. But if clean power is not a concern, then a less expensive "traditional" generator could be your best choice.

### WARNINGS

Never operate a generator or inverter indoors as they produce potentially lethal poisonous carbon monoxide gases.

Never connect any generator or inverter to a house or building's electrical system unless a certified isolation switch has been installed by a licensed electrician and all components and connections comply with all applicable codes and laws.



### 3-YEAR LIMITED WARRANTY\*

Yamaha offers a standard 3-year limited warranty on all generators. Standard. No extra fees. At Yamaha we stand behind our products, providing you peace of mind.

\* 3-year limited warranty on all generators for personal or commercial use (except EF1000IS, 2-year for commercial). Water pumps and pressure washer receive 3-year warranty for personal use and 1-year for commercial. See dealer for details. Due to Yamaha's ongoing commitment to product improvement, we reserve the right to change without notice.



## APPLICATION CHART

APPLIANCES	APPROX. RUNNING WATTAGE	APPROX. STARTING WATTAGE
DVD Player	25	25
VCR	50	50
Radio	100	100
Portable Fan	150	200
Laptop Computer	250	250
Television	350	350
Dehumidifier	500	700
Small Refrigerator	500	1,000
Microwave	700	950
Coffeemaker	850	850
Clothes Iron	1,250	1,250
Kettle or Toaster	1,100 – 1,600	1,100 – 1,600
Washing Machine	750	2,300
Clothes Dryer: Gas	700	1,800
Clothes Dryer: Electric	5,750	1,800
Refrigerator or Freezer	700	2,200
Sump Pump (1/3 horsepower)	800	1,300
Electric Range Oven	2,100	2,100

HEATING & COOLING	APPROX. RUNNING WATTAGE	APPROX. STARTING WATTAGE
WATER HEATER, ROOM HEATER, FURNACE FAN, GAS OR FUEL OIL FURNACE		
1/8 horsepower	300	500
1/6 horsepower	500	750
1/4 horsepower	600	1,000
2/5 horsepower	700	1,400
3/5 horsepower	875	2,350
CENTRAL AIR CONDITIONER		
10,000 BTU	1,500	2,200
20,000 BTU	2,500	3,300
24,000 BTU	3,800	4,950
32,000 BTU	5,000	6,500
40,000 BTU	6,000	6,700
RV AIR CONDITIONER		
13,500 BTU	1,800	2,800

WORKSHOP	APPROX. RUNNING WATTAGE	APPROX. STARTING WATTAGE
Jigsaw	300	450
Circular Saw	800 – 1,800	1,200 – 3,000
Table Saw	1,500 – 1,800	3,000 – 4,500
Chain Saw	900	1,200
Disc Grinder	2,000	4,000
Electric Weed Trimmer	500	800
Power Hand Drill	350 – 600	350 – 600
Electric Welder (100 Amps)	3,600	3,600
Shop Vacuum	900	900
Air Compressor		
1/2 horsepower	1,000	2,000
1 horsepower	1,500	4,500
1 1/2 horsepower	2,200	6,000
Air Conditioner (13,500 BTU)	1,800	2,800
Refrigerator or Freezer	700	2,200
Sump Pump (1/2 horsepower)	1,050	2,050
Electric Range Oven	2,100	2,100

Values are estimated for reference only, check your equipment or appliance for actual power requirements.

**WARNINGS** Never operate a generator or inverter indoors as they produce potentially lethal poisonous carbon monoxide gases. Never connect any generator or inverter to a house or building's electrical system unless a certified isolation switch has been installed by a licensed electrician and all components and connections comply with all applicable codes and laws.