

OPERATING AN AIR CONDITIONER FROM A GENERATOR

Question: My wife and I like to boondock and are considering the purchase of a portable generator. We would utilize it primarily for appliances (microwave, TV, hair dryer, etc.), but would like the option of powering the A/C unit when necessary. The Yamaha site claims that the EF2400iSHC will power most 13,500 BTU air conditioners. Can I safely assume that it will operate our Dometic Penguin (13,500 BTU) A/C unit? I have run this A/C on a dedicated 20 amp landline from our home with absolutely no problems. Any advice you can offer will be greatly appreciated.

Answer: Sorry, but that unit is just too small. The maximum rating is 2400 watts with a rated operating wattage of about 2160 (90% less). The start wattage of a 13500 BTU Penguin is about 2800 watts. On a really hot day you could require closer to 2900 watts of start power.

Figure (1) provides the maximum ratings for several different size Yamaha generators. The Yamaha energy needs wattage sizing chart, provides the start and run power requirements for 13,500 BTU A/C units.

<http://www.yamaha-motor.com/outdoor/generator/sizing.aspx>

The Penguin install manual has a chart. Figure (2) which recommends the use of a 3.5 KW generator which is a little overkill. However, you will most likely be using other appliances on occasion and you should not purchase a generator that will just make the power level needs for the AC. Even though you are fine for the run level wattage, remember the compressor cycles on and off which means you are constantly requiring the starting power level.

Honda also recommends a 2800 watt capable generator for starting with 1800 watts required for running. Their wattage estimation guide can be seen at:

http://www.hondapowerequipment.com/products/generators/content.aspx?asset=gg_wattage

As a minimum you need the 2800 watt unit for the air conditioner. However, if you are going to really provide portable 120 volt power than you should provide for the occasional use of a toaster, coffee maker, microwave etc. that will operate along with the A/C. I would therefore recommend the 3000 watt generator which will easily handle your air conditioning and some simultaneous other needs.

Since these are rather large and heavy (130-150 lbs.) many campers bolt these into their tow truck beds. Another approach is to purchase a 2000 watt unit for use on most camping trips. You can add a second unit when you want to provide for air conditioning. These run about 45 lbs. and are much easier to handle. You need a special cable which synchronizes the two generators so they properly balance the load.

A dedicated 20 amp shore supply is marginal for your air conditioner on startup. However, if your line voltage is high (close to 125-130 volts) your circuit breaker can usually handle a few amps over 20 for a short period start up. Once started it would

drop back to 16 or 17 amps and run fine. Generators are not so tolerant. Howard
Response: Howard: Thank you so much for taking the time to explain reality to me and keeping me from making a costly mistake! Initially, I intended to purchase a Honda EU2000iA for regular use. If and when we were worried about needing A/C in a remote camp, I could purchase the companion unit and the appropriate connecting cables. Then, I was sitting around a campfire bull session during a recent rally where several fellow campers stated that the 2400W Yamaha could power the A/C on our trailers, as long as you didn't use any other 120V equipment when the compressor was running. After thinking about this for several days, I realized that I needed to consult the Guru as I don't have enough knowledge about electricity to make an accurate decision when there might not be any margin for error. We are currently on the road and will be back at our home in Virginia next week - I'll purchase the Honda then.

See Figures 1 and 2 below...

	Inverter EF2800i		
MSRP*	\$1,479	\$1,699	\$2,199 EF3000iSE \$2,469 EF3000iSEB
Specifications			
Continuous Operation at 1/2 Rated Load	Spec Not Available	15 hr	Spec Not Available
Continuous Operation at 1/4 Rated Load	8.6 hr	Spec Not Available	19 hr
DC Output	Spec Not Available	8.3 amps @ 12V	12 amps @ 12V
Displacement	171cc	171cc	171cc
Dry Weight	75 lb	68 lb	149.9 lb. / 154.3 lb (EF3000iSEB)
Engine	OHV, air-cooled, single cylinder, 4-stroke	OHV, air-cooled, single cylinder, 4-stroke	OHV, Air-Cooled, Four-Stroke, Single Cylinder
Fuel Tank Capacity	1.6 gal	2.6 gal	3.4 gal
Ignition System	Spec Not Available	Spec Not Available	Electric w/Recoil & Auto Decompressor
Maximum AC Output	2400 watts	2800 watts	3000 watts (+500 watts boost on EF3000iSEB)
Noise Level	53 - 60 dBA	64 dBA - 67 dBA	53 -60 dBA
Overall Height	18.2 in	16.7 in	21.9 in
Overall Length	20.8 in	19.2 in	26.8 in
Overall Width	16.5 in	15.6 in	17.5 in
Rated / Maximum AC Current	16.7 / 20 amps @ 120V	20.8 / 23.3 amps @ 120V	23.3 / 25 amps @ 120V
Rated AC Output	2000 watts	2500 watts	2800 watts
Type	Brushless, Inverter AC Generator	Brushless, Inverter	Brushless, Inverter
Warranty	3 Years Limited Warranty	3 Years Limited Warranty	3 Years Limited Warranty

Figure 1

SPECIFICATIONS

Model No.	Nominal Capacity (BTU/Hr) Cooling	Electrical Rating Amps	Water Wtrts	Compressor Rated Load Amps	Compressor Locked Rotor Amps	Fan Motor Rated Load Amps	Fan Motor Locked Rotor Amps	SCFM-High Speed Max./Min. W.C.	Total Stats. Max./Min.	Refrigerant R-22 (Oz.)	Minimum Wire Size*	AC Circuit Protection ** User Supplied	Installed Weight (Pounds)	Minimum Generator Size** (kW/2Units)		
020915331	13,500	120VAC 60 Hz 1 Phase	150	124	600	3.5	100	335/250	.012/0.05	90.5	12 AWG Copper Up To 24'	20Amp	65	3.5kW/5.8kW		
020915336	13,500		150	124	600	3.5	100	335/250	.012/0.05	90.5		20Amp	65	3.5kW/5.8kW		
020925331	13,500		150	124	600	3.5	100	335/250	.012/0.05	90.5		20Amp	65	3.5kW/5.8kW		
020925336	13,500			124	600	3.5	100	335/250	.012/0.05	90.5		20Amp	65	3.5kW/5.8kW		
020925321	15,000			120	610	3.3	82	300/250	.012/0.05	200		20Amp	65	3.5kW/5.8kW		
020925326	15,000			120	610	3.3	82	300/250	.012/0.05	200		20Amp	65	3.5kW/5.8kW		
030915331	13,500			124	600	3.5	100	335/250	.012/0.05	23.5		20Amp	65	3.5kW/5.8kW		
030915336	13,500			124	600	3.5	100	335/250	.012/0.05	23.5		20Amp	65	3.5kW/5.8kW		
030915321	15,000			120	610	3.3	82	335/250	.012/0.05	200		20Amp	65	3.5kW/5.8kW		
030915326	15,000			120	610	3.3	82	335/250	.012/0.05	200		20Amp	65	3.5kW/5.8kW		

* For wire length over 24 ft., consult the National Electric Code for proper sizing.

** Dometic Corporation gives GENERAL guidelines for generator requirements. These guidelines come from experiences people have had in actual applications. When sizing the generator, the total power usage of your recreational vehicle must be considered. Keep in mind generators lose power at high altitude and from lack of maintenance.

*** CIRCUIT PROTECTION: Time Delay Fuse or HACR Circuit Breakers Required.

Figure 2