

RAINBOW POWER COMPANY LTD

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 Course Info

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Next course is on the weekend 24th-25th March. 2007

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Inverter FAQ

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Choosing an Inverter

Selecting an inverter to meet your needs is a major decision. Inverters are quite costly and we tend to become very dependent on our power sources. In some cases, your entire house, including your lights and fridge may be powered from it. Before we go into the choice of an inverter, I'd suggest that we almost always recommend using a DC fridge (and not an AC one) through your inverter. We often suggest that some or all of your lights be run straight off the battery bank.

Lately there has been quite a proliferation of economical imported inverters coming into the country. We get asked for a price and often a customer says they can get 'something bigger for half the price'. Like a lot of things in life 'you get what you pay for' and 'if it is too good to be true, it probably isn't'.

In selecting an inverter to meet your needs, a solar designer will look at the type of loads you have - their wattage, power factor, continuous and surge power requirements. S/he will also assess whether or not a cheaper modified square wave inverter would do the job. Once this determination is made, a specific model inverter needs to be chosen. What are some of the things one should consider?

WATTAGE: This is usually the first and often only thing that an uninformed person may look at. Biggest is not necessarily best! In Australia, inverters are usually given a continuous, intermittent (30 minute), and surge rating. Be wary of inverter specifications that don't give you such ratings. We've seen some imported units with the surge rating in huge print and the continuous rating in the fine print. Large inverters will be less efficient on very small loads than smaller inverters. Lightweight inverters with no transformer generally do not have much surge ability.

OUTPUT WAVE SHAPE: A true sine wave is best. Cheaper inverters don't mention it, or are termed modified square or sine wave. Many appliances including fans, washing machines, stereos, digital clocks and timers, will not work satisfactorily on this type of inverter. Many items will run slower, or hotter or noisier on square wave type inverters.

FREQUENCY AND DISTORTION: Good inverters typically hold their frequency to within .01% and have less than 4% harmonic distortion.

AUTOSTART: Does the inverter have a standby/autostart mode? This typically reduces the DC load to about 0.05 Amps when there is no load on. I've seen cheaper inverters drawing 2 Amps continuously with no loads on! Is the demand start sensitivity adjustable in case you want it to start up with say one fluoro light?

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MINIMUM INPUT CURRENT: How much power does the inverter use if it is on 'run' mode to run or detect a very small load? A good inverter might only use 0.6 Amps.

INPUT VOLTAGE: A battery on a solar system may typically vary from as low as perhaps 10 volts up to 15.5 volts when the solar is 'equalizing'. Our good inverters will generally operate between 10 to 16 volts.

OUTPUT VOLTAGE: Will it maintain its AC voltage to 3-5%?

EFFICIENCY: How efficient is the inverter? Does the specification just give you one 'peak efficiency' or does it show you a graph with small 50-100 Watt loads up to its rated power?

SAFETY: Does the inverter meet all relevant safety standards? In Australia these would include AS 3100 and AS 3108 and 'C Tick' with respect to low radio frequency interference. Can your electrician install it through a 'safety switch' ('MEN' compatible).

DISPLAYS: Does the inverter identify common faults such as low and high battery, overload, over temperature, etc?

WARRANTY: How long is the warranty? Our good inverters come with a 5-year warranty. Where do you have to return it to for warranty? For example, Australia is a big country. Are there service agents in most states?

CONCLUSION: The choice of an appropriate inverter is an important and complex choice. Consider carefully the recommendations of an experienced solar designer and think twice about buying the cheapest products you can find!

Heavy loads not usually run on an inverter

Because of the high capital cost of Renewable Energy products like solar panels, appliances that use a very large amount of power are usually excluded from such systems. Some examples are large electric stoves and ovens, air conditioners, pool pumps and cool rooms. If such items are required, then a diesel hybrid or back-up system is usually suggested.

However, solar power is cost effective for running most other appliances in a rural house. Lighting, TV, computer, washing machine, VCR, efficient fridges, ceiling fans, FAX, bread oven, microwave oven, coffee maker, toaster, blender, sewing machine etc are often run off a solar system.

Radio Frequency Interference from Inverters

For many years, Radio Frequency Interference (RFI) has been an annoying problem for owners of Inverters. RFI in a domestic situation may produce noise or interference on a radio or TV receiver. Most of the problems with RFI in a Remote Area Power Supply (RAPS) installation involve AM radio reception.

Considerable development time has resulted in a reduction of RFI produced by a Selectronic Inverter to a level which complies with C- tick requirements. Compliance to this standard mean RFI is low, but how well the inverter performs in a particular installation can vary. Below are some suggestions to help reduce the effects of RFI in your installation.

It is recommended that the power system including the inverter is housed at least 15 metres from the home.

Ensure a good earth stake is placed as close to the inverter as possible.

Avoid running DC cables into the home, if at all possible. If this cannot be avoided, run DC and AC in separate conduits separated by as much distance as practicable. All DC wiring should also be kept as short as possible.

To further reduce the effects of RFI, it is important that your AM radio has good signal strength. This will enable your radio to reject any noise being produced by your inverter, regulator, controllers or DC lighting. If possible, try moving the radio around to improve the signal strength or use an external aerial. Some of today's building materials such as steel roofs and foil insulation may form a barrier to incoming radio signals. If an external aerial is required, it should be on the outside of the home, mounted as high as practicable and as far from the battery shed as possible. Connection from the aerial to the radio should be via a low loss coaxial cable.

Please note: This aerial must be an AM radio type; a TV aerial will not work.

If your inverter is to be installed in a mobile home or similar, try to keep your inverter at least 1 metre away from your radio or audio equipment - the further the better.
(from Selectronic Inverter Manual)

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