

What can I run with a solar system?

A common and reasonable question. However the answer is usually “it depends” which is not too helpful.

If you are buying a generator the answer is quite easy to answer. All you have to do is add up the currents of the items you want to run and ensure these do not exceed the maximum current that the generator can produce.

The solar system answer is;

The system will run any load that can be run from a battery system as it is the battery that is providing the energy. The loads can be run as long as there is sufficient energy in the batteries to do so.

The solar system is designed to replace the energy used by the loads. However, this is not done instantly, it takes time. The solar system will produce energy while there is light on it. The amount of energy the solar system produces varies with the weather, the time of year, the time of day, and how far the panel is away from the equator.

The table below gives figures for how much energy on average you can expect to generate from a solar panel per day at different times of year in the central UK. Ah (Amp hours) is the unit of energy used to size batteries.

Size of panel (W)	Summer (Ah)	Spring/Autumn (Ah)	Winter (Ah)
50	15	12	3
70	21	17	4
80	24	20	5
95	28	24	6
135	40	34	8

These figures are calculated taking into inefficiencies in the charging process and the cabling.

Understand that the figures above are **average** figures. Therefore, some days will be below average, some way below average and some above average. In the periods that the panel is producing below average, which in the UK can be quite long especially in winter, it is your battery that will be supplying most of the stored energy produced previously by the solar panel .

If your battery only lasts a day or so you may want to look at increasing the battery capacity.

So where does this leave me with my question?

If you have a 100Ah battery and you know that it would normally run your loads for 2 days then we can work out which panel will be right for you.

Firstly, only about 70% of the 100Ah is usable. Run the battery below this level will shorten the battery life. So that is 70Ah is usable. If your battery is normally charged using a standard alternator you can expect the battery to be charged to about 70% of its full capacity. Alternators are not good battery chargers they are designed to replace the energy used in starting an engine. Therefore, overall only 40% of the battery capacity is usable, or 40Ah.

Therefore, if it takes 2 days to run the battery down you are using about 20Ah of battery capacity. To produce this amount of energy you will need a 70W solar system to meet your demand in summer, an 80W system in spring or autumn, or 340W in winter.

If you have never run the battery down how do we work out your demand. We can calculate how much energy you will use from the Wattage or Current consumption of each item and how long you expect to use each item per day. Provide this information and we will recommend a panel size.

The information we require is as follows;

Type of load (eg TV)	Voltage (12Vdc, 240V ac)	Wattage or Current consumption	Expected hours use per day

Wattage or current consumption for many electrical appliances is given on a plate on the unit with the model name etc.

What if I only use the system at weekends?

For this type of usage we would normally suggest that the batteries are sized to run the loads without any charging happening at all. The solar panel is then sized to ensure that the batteries will be charged by the time the battery is to be used again, say the next weekend or in a fortnight.

But the solar panel manufacturer gives a maximum output of 5A. What does this mean to me?

We often have customers who are obviously trying to rate a solar panel against a generator by looking at the maximum current (I_{MP}) a solar panel is rated at. The maximum solar current that the solar panel can produce should not be considered in the same way that you would look at a generator's output. A solar panel will only produce its maximum output under perfect conditions, sun high in the sky, the panel facing the sun head on, no clouds. At other times the panel can be producing anywhere between zero and the maximum depending on time of day, time of year, weather and how far away from the equator it is.

Therefore, to look at the solar panel current as a way to rate it against a generator is not a good comparison.