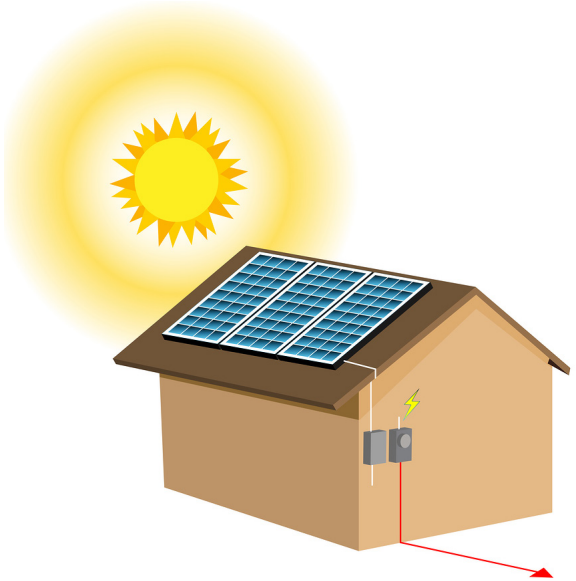
Optimising Inverter Power Relative to Module Rating



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Why Use the Segen Designer

The selection of suitable inverters to match the module type and rating has a lot of science and complex calculations behind it. Segen's online quoting and designer software automates this process with a good degree of accuracy.

Some manufacturers' inverter matching tools will include options which will work but are not recommended as the design aim is biased towards selling inverters and not always maximising system yield/minimising cost. Segen sells a wide range of inverters from multiple manufacturers, so the online quoting and design tools have been built to recommend the best impartial solutions.

Inverter Rating vs. Module Rating

Solar inverters have a nominal or rated AC power as specified by the manufacturer. Solar Modules have a rated DC power at Standard Test Conditions (typically 1000W/M^2 and 1 bar of pressure).

There are a number of factors suggesting that to optimise a PV system, the inverter rating should be significantly less than the module rating. Research indicates that in the UK an inverters rated AC power should be between 75% and 90% of the module rating at STC. Larger inverters may function perfectly well but may operate most of the time at lower efficiency and will cost more for little or no benefit.

Factors Taken into Account by Segen's Software:

- At normal operating cell temperature, typically 50 degrees centigrade, the module rating will be reduced by about 10% due to the rise in temperature.
- There will be a reduction in power between the DC input and the AC output depending on the inverters efficiency.
- The manufacturer specified limits for minimum and maximum DC voltage, current and power at the extremes of low and high temperature.

Range of Inverters Supported.

The quoting tool targets a range of inverter rating between 75% and 110% for a typical 95% efficient inverter. Due to the limited range of options for very small inverters this range is increased to up to 125% for very small inverters. The exact range is dependent on the inverter rating and efficiency.

Only inverters which fully match all the minimum and maximum voltage, current and power limits are shown. The designer software will show inverters from a wider range, typically 70% - 115%, but will highlight in orange or yellow inverters at the lower and higher ends of the band, indicating that they may not be ideal solutions.

Example Small System

A system with 6 X 250W Poly modules with a total rated power of 1.5kp will match inverters with an AC rated power between 1.3kW and 1.8kW. Typically the 1.3kW sized inverters will perform best and be the lowest cost, but where the only inverter from your chosen manufacturer is larger, e.g. 1.8kW, this can be used and will work but may not be the most cost effective option.

Example Large System

With larger systems, e.g. 16 X 250W Poly modules the range offered is less at between 3.6kW and 4.2kW as there are many options from all the manufacturers suitable for a 4kWp system with to need to choose an over rated inverter.

Sometimes customers will expect to get a 4kW inverter with a 4kWp solar PV system and it is tempting for the installer to give the customer what they want, but rarely will this be the best solution in terms of cost or yield.

Segen's online software has been extensively tested and can be relied upon to recommend a good solution for any of the modules and inverter combinations that Segen sells.

For full training on placing your order with Segen, please call your Account Manager who will be happy to arrange a session