

ABS Alaskan, Inc.

WHICH SOLAR PANEL SIZE IS RIGHT FOR MY YC500A MICRO-INVERTER?

To achieve the most cost effective solar PV system, you want to achieve the maximum benefit from all of the components. The cost for the components is fixed. So the more power you can produce from the system, the more benefit you get and the more quickly the system pays for itself. Part of this process is selecting the best PV panel to inverter ratio.

The APsystems YC500A micro-inverter is a two-channel inverter that will handle two solar PV panels – one on each channel. (Note that these channels operate completely independent of each other. So what happens with one panel does not affect the other panel at all.) Each PV panel channel has a 250 watt capacity. That is, the most power that can pass from the PV panel to the inverter on that channel is 250 watts.

At first glance one would intuitively think that the logical choice for a solar PV panel size is 250 watts. Not necessarily so. Take a look at the diagram below. The rating for PV panels is what they can produce at “full light” conditions (designated as 1000 watts/sq meter of surface). Panel production at anything less than full light conditions is something less than their rated capacity.

There are a number of conditions that must be present to achieve “full light” conditions. For this paper it is sufficient to say that the solar PV panels will only see “full light” conditions a small percentage of the time. The majority of the time they will be operating at less than full capacity.

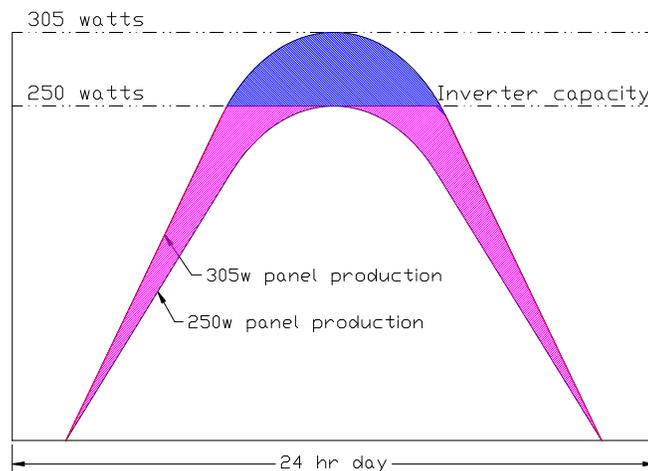
Take another look at the diagram. On the diagram we have drawn out representative power curves for two solar PV panels – a 250 watt panel and a 305 watt panel. There is a horizontal line showing the 250 watt peak (which is also the maximum capacity of the inverter’s PV panel channel) and a horizontal line showing the 305 watt peak.

Here is the important part. The blue shaded area is the amount of power from the 305 watt PV panel that will be lost. The area shaded in magenta is production that would be lost from the 250 watt PV panel.

To determine which size of PV panel will best optimize your YC500A micro-inverter, evaluate all of the factors that would tend to limit the ability of the solar panel to reach “full light conditions” and peak power production.

- Local shading at various times of the day from trees, buildings, etc
- Shading from geographic features – mountains, etc
- Cloudy or foggy conditions – if you live along the coast and have a lot of foggy weather or cloudy days
- Orientation of the solar PV array – will the PV panels be oriented within 15° of solar south
- Angle of the PV panels – can the panels be mounted at a tilt angle that will optimize the amount of direct light exposure (generally about equal to your latitude)
- Hot climate – PV panel production will degrade in hot conditions

If you anticipate several of these limiting factors might apply to your situation, the larger PV panel might be the better choice. Note, though, that with either size PV panel, a properly installed system will do very well. So give it some thought and go with your instincts.



POWER PRODUCTION COMPARISON
FOR YC500A MICRO-INVERTER
250 WATT PANEL vs 305 WATT PANEL
(Representative curves for illustration)