Ac coupled solar

Ac coupled solar

Already familiar with the concepts of AC-coupling and regulating PV inverter output power by frequency shifting? Skip to the requirements and limitations:

When the Multi or Quattro is connected to the grid, this excess PV inverter power will automatically be fed back to the grid.

When the Multi or Quattro is operating in inverter-mode, disconnected from its AC input, it will create a local grid: a micro-grid. The PV Inverter will accept this micro-grid and will therefore operate even during a black-out. The PV power can even be used to charge the batteries: when there is more PV power available than used by the loads, the power will automatically run through the inverter in reverse direction and charge the batteries. It is necessary to regulate that power to prevent overcharging the batteries as well as overloading the inverter/charger. This is where 'frequency shifting' comes in to the picture, see next section.

Frequency shifting is used to regulate the output power of a Grid-tie PV Inverter, or Grid-tie Wind inverter, by changing the frequency of the AC. The MultiPlus (or Quattro) will automatically control the frequency to prevent over charging the battery. See also the chapter 'Example & background'.

The max PV power must be equal or less than the VA rating of the inverter/charger

In both grid-connected and off-grid systems with PV inverters installed on the output of a Multi, Inverter or Quattro, there is a maximum of PV power that can be installed. This limit is called the factor 1.0 rule: 3.000 VA Multi >= 3.000 Wp installed solar power. So for a 8.000 VA Quattro the maximum is 8.000 Wp, for two paralleled 8000 VA Quattros the maximum is 16.000 Wp, etc.

To understand the background, consider the following situation: the PV inverter is at full power, supplying a big load. The Multi is in inverter mode. Then, suddenly and at once, this load is switched off. At that moment the PV inverter will continue operating at full power until the AC frequency has been increased. Increasing this frequency will take a very short time, but during that time all power will be directed into the batteries as there is no other place for it to go. This causes the following:

It is no problem to overpower the grid inverter by installing more solar panels. Some people do this to increase the generated solar power in winter time or rainy weather. Refer to the PV Inverter datasheet to maximum allowed installed PV power. Two times the inverter nameplate rating or even more is not uncommon!

Another question frequently asked is how can this factor be 1.0? Since the charger inside a 3000 VA Multi is not 3000 VA but closer to 2000 VA? The explanation lies in the fact that it will regulate. In other words: when there is too much power coming in, causing the charge current to exceed the limit, it will increase the output

frequency again and will keep regulating the AC output frequency to charge with the limit.

An example, a 3000 VA Multi, with 3000 W of solar power coming out of a PV inverter:

The mentioned 3000 Wp and 8000 Wp is the Watt-peak which can be expected from the solar system. So for an oversized PV array, where the total Watt-peak installed PV panels exceeds the power of the PV Inverter, you take the Wp from the inverter. For example 7000 Wp of solar panels installed, with an 6000 Watt PV grid inverter, the figure to be used in the calculations is 6000 Wp.

And for an undersized PV array, where the total Wp of installed PV panels is less than the installed PV grid inverter, you use the Wp from the PV panels in your calculation.

Contact us for free full report

Web: https://www.kary.com.pl/contact-us/
Email: energystorage2000@gmail.com
WhatsApp: 8613816583346