

Solar & Wind Power Solutions

Inverters - Why They Need Protection and How To Protect Them

This and subsequent articles will provide greater details about solar and wind energy generation systems. At the heart of these systems is the inverter. The DC to AC Power Inverter serves the purpose of converting the DC power generated by the solar panels or wind turbine into usable AC power that is synchronized with the grid power (on a Grid Tie System) or used directly to power the electrical system in a stand alone or battery storage system.

The power inverters are loaded with sensitive electronics. The purpose of the electronics is to, among other things, synchronize the AC power to be in phase with the grid supplied power. It is understood and proven, by real world application, that the inverter is one of the leading failure points of a solar or wind energy system.

Because of inverter failures, the use of surge protective devices, in conjunction with solar and wind energy generation systems, is growing quickly in popularity. With the inverter at the heart of the structure, the continued operation of the inverter is critical to this method. If the inverter fails, the energy generation system is left useless until repaired.

This is where Surge Suppression Incorporated (SSI) comes into play. With the exclusive SG product line, SSI has products designed specifically to protect the sensitive AC to DC power inverters. SSI recommends a systems or layered approach when protecting energy generation systems. Providing protection at the utility supplied service equipment is the first crucial step to protecting a home or facility from externally generated surge events such as lightning (induced or direct) and power production switching events. These typically represent about 20% of all surge activity. However, these events can be catastrophic depending on the magnitude and proximity of the event. Installing one of SSI's premier products on the service equipment will aid in reducing even the strongest surges to a level that ensures the most sensitive loads are protected.

Utilizing one of our surge suppression experts to provide guidance on all of your protection needs is the key to providing the kind of coverage you need to protect your investment. Our staff is professionally trained in the various aspects of surge suppression. Contact SSI at freesurvey@surgesuppression.com to provide your contact information. Our expert problem solvers will contact you to provide options on a complete surge suppression system for your home or facility.

Once a surge protective device has been specified for the service equipment, our team will evaluate the rest of your electrical system; including sub and distribution panels, telephone, security, data transmission and individual equipment surge protection needs.

Looking further into the Solar & Wind System and passed the service equipment, the next component is the DC to AC Power Inverter. The inverter needs to be protected at the output (AC) as well as the input (DC). It requires this level of protection due to the sensitivity of its internal electronics.

The input protection goes between the solar panels or wind turbine and the inverter. Surge protection is recommended at this location to prevent induced surges from coming into the inverter causing damage or destruction. Common sources of surges on the solar panels and wind turbines can be direct lightning events, close proximity lightning events and even induced surges coming from cloud to cloud lightning events and atmospheric charge redistribution commonly found during electrical storms.

These events, if not addressed through the use of surge protective devices, could damage the inverter from the input side of the equipment. Though it seems unlikely for these events to occur, they are much more common than perceived, as evident by the commonality of inverter failures.

On the output side of the inverter, an additional stage of AC protection is recommended. This second level of surge suppression is provided to protect against the effects of any remnant surge voltage that remains past the service equipment. In some applications, this layer of surge suppression may be omitted. However, this would be at the discretion of the surge suppression system designer. These decisions are commonly based on exposure level to lightning and distance between the service entrance and the inverter.

If the Solar or Wind System has a battery bank, it is necessary to provide surge suppression between the inverter and the battery bank. The life expectancy of the batteries may be significantly reduced by not mitigating the effects of the "spikes" or surges off of the power going into the batteries.

Another, often overlooked, area of need for surge suppression in Solar & Wind Energy Generation Systems is the data communication lines that monitor and control the operation of these systems. If

these controls are not properly protected, there could be expensive repair to control boards and significant energy production downtime while waiting for technicians and replacement parts.

At Surge Suppression Incorporated, our only business is surge suppression. For this reason, we are able to provide the premier products and expertise in surge protection for even the most specialized electrical systems and equipment. Our exclusive SG product line is specifically designed for the application and protection needs to Solar & Wind Power Generation Systems. These systems are designed to save you money by producing electricity from the sun and wind. Don't be hindered and frustrated by repair costs and energy production downtime with your expensive Solar or Wind Energy System! Invest in SSI's SG Products with our industry exclusive 25 year warranty. Contact us at 1-888-987-8877 or freesurvey@surgesuppression.com to get started today.