Photovoltaic inverter efficiency test

What is a test protocol for inverter efficiency?

Sandia National Laboratories and BEW have worked together to develop a test protocol to measure inverter efficiency as a function of AC output power and DC voltage. This protocol has been adopted by the California Energy Commission (CEC) and any inverter used in a CEC approved PV system must be tested by an independent lab to this protocol.

How do you test a PV inverter?

To test a PV inverter according to IEC 62093,identify a suite of accelerated tests to identify potential reliability weaknesses. Develop recommendations for how the tests are to be performed,including sample size,environmental test conditions,duration,power and monitor,etc. Provide a baseline for comparison of reliability performance between PV inverter manufacturers.

Can a PV inverter predict reliability?

With this in mind,this report showcases and describes an approach to help assess and predict the reliability of PV inverters. To predict reliability,thermal cyclingis considered as a prominent stressor in the inverter system.

Do inverters need to be tested?

This protocol has been adopted by the California Energy Commission (CEC) and any inverter used in a CEC approved PV system must be testedby an independent lab to this protocol. The CEC lists test results for thousands of inverters on its webpage. An example of a CEC test result is illustrated in the following figure.

Why is a PV inverter model important?

The inverter model, particularly when coupled with an accurate array performance model, provides significant improvements in the ability to analyze PV system performance, monitor inverter and array performance, and diagnose causes of system performance degradation.

What is PV inverter research?

This research also develops models and methods to compute the losses of the power electronics switches and other components in a PV inverter. The losses are then used to estimate the junction and heat sink temperatures of the power semiconductors in the inverter.

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