

ABSTRACT

One of the renewable energy sources that are being widely used in Indonesia is solar energy. Where the number is unlimited, especially in Indonesia with its territory in the tropics and crossing the equator provides great potential. However, there are many shortcomings in the use of solar panels in the form of very low power output. There are several factors that cause the low output power of solar panels to supply power requirements in portable field measuring instruments. Therefore, in this research it is necessary to develop a design to connect field measuring instrument devices to portable electrical resources.

This study examines the specifications and performance of the 120WP portable solar cell system with 22.1% efficiency solar panels and 12V 55A deep cycle VRLA batteries. The test was conducted by charging and discharging the battery in 3 cycles over 12 days.

The results of charging the battery using a 120WP solar panel with an efficiency of 22.1%. The battery percentage increase during charging reaches 4% per hour in the first cycle (cloudy weather), 5% per hour in the second cycle (sunny weather), and 4% per hour in the third cycle (cloudy weather). In the first cycle discharge test showed a rated power of 6.2Wh with a 10% decrease in battery percentage per hour. In the second cycle discharge with soldering and firing glue loads, the rated power reaches 45W with a power of 32.32Wh and a battery percentage decrease of 6% per hour. At third cycle discharge with a solder load of 40W, the rated power is 34.12Wh with a 7% battery percentage decrease per hour.

Keywords : Portable Solar Cell System, VRLA deep cycle Battery