

ABSTRACT

This research has tested the specifications and performance of a 120WP portable solar cell system with a panel efficiency value of 22.1%, and a 12V 55Ah deep cycle VRLA battery. The testing process was carried out by charging and discharging the battery for 3 cycles for 12 days. Discharging the battery is done by using a varied load in the form of a 10W 10 Ω resistor as many as 4 pieces assembled parallel to 40W, 40W solder, and 5W hot glue. In the first cycle discharge test the measured power was 6.2Wh and had a decrease in battery percentage of 10% per hour. In the second cycle discharge using solder and glue gun loads, the measured power was 45W with the power measured on the watt meter of 42.32Wh, with a decrease in battery percentage of 6% per hour. In the third cycle discharge using a 40W solder load, the power measured on the watt meter is 34.17Wh, with a decrease in battery percentage of 7% per hour. While testing battery charging with 120WP portable solar panels with an efficiency value of 22.1%. In the first cycle of battery charging, the battery percentage increase rate is 4% per hour with cloudy weather conditions. In the second cycle battery charging the percentage increase in battery by 5% per hour, with sunny weather conditions. In the third cycle battery charging the battery percentage increases by 4% per hour, with cloudy weather conditions.

Keywords: portable solar cell systems, deep cycle VRLA batteries.