

SOLAR CELL INSTALLATION DESIGN TO DRIVE 12V DC WATER PUMP

Name : Swanjeger Nainggolan
Nim : 2103201136
Supervisor : Reinaldi Teguh Setyawan, S.T.,M.T.

ABSTRACT

Some rural areas are still experiencing difficulties in meeting their daily needs, especially in communities that are quite far from sources of electricity and also sources of water. The increasing number of population resulted in the need for water and electricity to increase from year to year. In meeting the water needs of the community, several obstacles often occur, for example, to reach a spring, one has to walk and pass through quite difficult terrain. To bring water to the settlements is very difficult, because you have to use a large source of electrical energy to drive the water pump. From these problems a Solar Cell Installation tool was designed to drive a 12 V DC Water Pump. The research method uses a 12 V water pump with a power of 180 W with a source of electrical energy from a 120 WP solar panel of 2 panels. The results of the design use an on/off switch, wattmeter, power cable and also use a ¾ inch pipe to lift water from the drilled well and deliver water to the water container. Then the total head loss of all pipes is 0.5173 M, the total pump head is 2 M. The total power required is 229.29 W to drive the water pump. After the water pump machine was tested for 5 hours for 2 days, it was found that the average voltage of the first day was 486.31 V, the electric current was 295.25 A and the power was 3883.47 W. The second day, the average voltage was 507.87 V, an electric current of 353.88 A and a power of 4111.6 W. The water discharge produced by a dc water pump with a voltage of 12 v is 17 L/M.

Keywords : Water pump, solar cell, pump head, electrical energy