

# PHOTOVOLTAIC BOILER

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## ABSTRACT

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This project is about photovoltaic boiler. The aim of this project is to show that by using a suitable photovoltaic, the water can be boiled. The theory behind this project is converting the solar energy into electrical energy. Then the electrical energy will be converted back to heat energy. The possible heat released is from 100W to 600W without any load. When loaded with water, the wattage might drop significantly. As the volume of the water is increased, the wattage will continue decreasing. As a result a certain limit of volume must be specified in this project.

To increase the wattage, it is important to select a proper photovoltaic cell. In this project, the photovoltaic with 200W output power is selected. The photovoltaic cells are combined to form a panel which is called a solar panel. Each photovoltaic cell can generate 1 W of output power. Therefore, to achieve 200W, 200 units of photovoltaic cells are used. The solar panel is then connected to solar charger circuit. The electrical energy produced by the panel varies according to the strength of the solar. As the intensity of the solar is increased, the voltage generated at the output of the panel is increased. Similarly, when the intensity of the solar is weak, the output voltage produced will be less.

In total there are 4 main circuit involved in this project which are the battery charger circuit, the inverter circuit, the LCD circuit and the power switching circuit. The battery charger circuit received the power from the solar panel and charges the battery used. The solar panel is capable to produce up to 18V of voltage. This solely depends on the intensity of the sunlight during the day which means the output of the solar panel might fluctuate according to the heat provided. Since the battery charger receives variety input voltage from the solar panel, the charger amplifies the DC voltage and uses this voltage to charge the 12V 7AH DC battery. By designing a suitable DC to AC converter, 12V DC is converted into 240V AC. Finally, the 240V AC is supplied to the boiler or the load.