

## **DESIGN OF SOLAR INVERTER AND PERFORMANCE ANALYSIS OF INVERTERS USED IN SOLAR ENERGY CONVERSION**

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The constant depletion of the non-renewable resources lead us to shift our focus to renewable energy sources which are not only the future unlimited source of energy, it is also eco-friendly and viable for the environment. Solar energy is the oldest form of Renewable Energy. This paper focuses on the design of Solar Inverter which is required to run AC loads which is mostly used as consumable. The power output of the designed inverter is 250W, input voltage is 12V, Output is 220 V, and 50Hz square wave output. The procedure utilises a solar array simulator, external load and programmable ac power source. This arrangement allows for the determination of the operational characteristics as well as evaluation of performance of the unit under test. Parameters to be evaluated include inverter current and voltage operating range, input output power and energy, conversion efficiency, maximum power point tracking range and accuracy for the static case, as well as MPPT utilization for dynamic cases. Total harmonic distortion for current and voltage, as well as disconnection behaviour under various utility conditions also forms part of the procedure. All tests are to be performed under a variety of irradiance, temperature and load conditions.

