Abstract

This paper proposes a simple, cost effective and efficient brushless DC (BLDC) motor drive for solar photovoltaic (SPV) array fed water pumping system. The importance of using a maximum power point tracking (MPPT) algorithm is demonstrated to ensure that a PV system provides the most energy possible. Two different maximum power point tracking (MPPT) algorithms are introduced. A boost converter is used in order to extract the maximum available power from the SPV. An appropriate control of boost converter through the Perturb & Observe maximum power point tracking (PO-MPPT) algorithm offers soft starting of the BLDC motor. Increment conductance is used and compared with the PO-MPPT. The speed control of BLDC motor is performed by PWM (Pulse Width Modulation) control of the voltage source inverter (VSI) using DC link voltage regulator. A Matlab/ Simulink models of the solar panel, dc to dc boost converter, and control algorithms are validated.

References


6. Chighali Ould Ehssein, Abdellahi Ba1, Ne Ould, Dah, Mamadou Ibrahima Lam and Diakité Amadou1, Aroudam El Hassan, 2018 “Monitoring a maximum power point tracking photovoltaic pumping system”, The 9th International Renewable Energy Congress (IREC).


Index Terms

Computer Science

Circuits and Systems
Keywords

Solar PV, maximum power point tracking (MPPT) algorithms, BLDC motor, DC –DC boost converter.