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THREE PORT DC-DC CONVERTER FOR RENEWABLE ENERGY SYSTEMS

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SYNOPSIS

Design of a cost effective and efficient system is the critical need in the Photovoltaic systems. Since the energy has to be effectively utilized, combination of a storage device with renewable energy systems is the feasible solution to obtain uninterrupted power. For the effective sharing of power from the Photovoltaic system and the storage device to the load, a three port DC-DC converter is proposed. The Standalone PV system along with a rechargeable battery set is given as an input to the converter and the output port is connected to the load. The panel input is unidirectional whereas the battery port is bidirectional. The use of multiport converters have the advantages of usage of less components, low cost, compact size and better dynamic performance. In order to maximize the power output from the PV panel, maximum power point tracking (MPPT) is employed. The control scheme of the proposed converter employs ARDUINO based controller that decides the various modes of operation. Simulation results are verified by MATLAB/SIMULINK. Hardware results are presented to verify the performance of the proposed three-port converter.