2023 International Conference on Circuit Power and Computing Technologies (ICCPCT)

Review of Maximum Power Point Tracking Based Novel Converters Used In EV Applications

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2023 International Conference on Circuit Power and Computing Technologies (ICCPCT) | 979-8-3503-3324-4/23/$31.00 ©2023 IEEE | DOI: 10.1109/ICCPCT58313.2023.10245855

Abstract—**The usage of renewable energy plays a significant part to make a pollution-free environment. The best solution for regulating DC voltage and maximising the performance of RES is to employ DC-DC converters. A Maximum Power Point Tracking (MPPT) controller is used to monitor Photovoltaic (PV) panel's maximum output power. Here, an evaluation is done to identify the most effective controller acting as MPPT with Converter is discussed. An evaluation of several dc-dc converter models took into account a number of factors, including price, the materials utilised, current ripple, and efficiency. Lastly, we demonstrate comparative analysis to find out the most effective conversion for PV-fed applications. From the comparison result, the Artificial Neural Network (ANN) technique obtained better tracking accuracy for MPPT method.**

Keywords— PV, DC-DC Converters, MPPT, Comparative analysis. ANN

I. Introduction

Solar photovoltaic (PV) systems, including decentralised and string configurations, frequently employ a DC-DC transmitter to restrict electricity production to optimize solar power under a wide range of climatic and board situations. The DC-DC converter should offer an extensive variation of output input voltage change ratios as quick voltage and current regulation to provide optimal tracking of power points (MPPT). PV systems frequently use inverter for DC-DC conversion, but the only workable amperage ratios are step-up wattage proportions [1]. A creative Power converter arrangement for photovoltaic (PV) applications that have substantial proposed converter and seamless potential. PV systems are heavily used hybrid renewable energy systems integration. These processes must conquer a number of challenges in order to improve their effectiveness and serviceability. These methodologies differ in a number of ways, which include complexity, cost, and the type of detector required, application, and efficacy [2]. The DC bus is then combined to composite Dc conversion, which control the current and voltage of the output for charging batteries. Because the Medium Voltage (MV) transistor already isolates the entire system, the DC-DC inverters, as discussed, can be a non-isolated controller. This framework is now widely used due to its greater effectiveness. However, the 2-stage rectification system remains, and it is connected to the rest of the framework via a link capacitor for DC power [3].

Other applications of the Partial Power Converter (PPC) principle include wind turbines, which use a double-fed inductive power supply with a direct grid connection to the stator and a significant indirect four dimension dc-dc converter attached between the rotor conductors and the grid. It has been known by various names over the years, including PV Balancers, Voltage Control Compensation, Partial Volume Adapters, and Partial Power Processing Inverter [4]. By using dc conversion, the MPPT, a two stages a grid's connection PV system with configurable dc power, is identified. However, Battery Energy Storage System (BESS) is not present in the system. Because of the abnormality and unpredictability of renewable radiation, the framework and power grid will frequently interact. For a Photovoltaic with BESS, a home energy strategy based on DC bus signalling was suggested. The structure has the potential to improve normality and resource usage [5].

For systems that generate electricity from renewable sources, dc-dc converter is an especially appealing and showing promise conversion. The total output of solar or wind energy conversion systems is significantly different. An input power inverter stage, a multilevel inverter is employed to strengthen AC voltage to satisfy grid requirements for efficient synchronisation. The presence of the 50 Hz transformer, on the other hand, makes it larger, bulkier, and less efficient overall, particularly when exposed to natural conditions [6]. Numerous transformer and capacitors configurations are used in various Dc conversions to obtain higher power output despite rising bloodsucking failures and heavy layout. Multi-port inverters innovations have been shown to effectively use renewable energy sources. A solution for feeding PV energy to high voltage DC buses has been discovered because of its capacity to accept various input sources. This inverters, however, required a large number of inductances and semiconductors, making the circuit expensive and bulky [7].

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