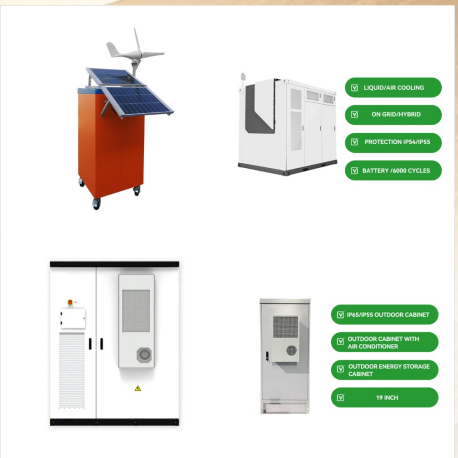

Isolated bidirectional DC-to-three-phase AC converter for integration of renewable energy sources to electric grid ISSN 1755-4535 Received on 4th October 2018 Revised 26th March 2019 Accepted on 15th April 2019 E-First on 28th ???

Bidirectional converters have often been used in numerous applications like DC microgrids, renewable energy, hybrid energy storage systems, electric vehicles, etc.The paper proposes a novel multi-port high-gain (NMPHG) bidirectional DC???DC converter that supports DC microgrid (DC-MG) applications.

A three-port bidirectional DC-DC converter for grid-interactive renewable energy source system applications. The three-phase topology is suitable for residential power requirements. The control of the backup battery system and the renewable energy source system are naturally decoupled. In addition, the port interface with the renewable energy is current type, which can implement ???

BIDIRECTIONAL DC-DC CONVERTER FOR RENEWABLE ENERGY SOURCES

1.1. Motivation. Amid the growing global energy crisis, microgrids are seen as a crucial strategy for tackling energy issues. This research study focuses on improving the smooth operation of DC microgrids by utilizing an efficient DC-DC boost converter for solar PV and FC plants, along with a bidirectional buck-boost converter for integrating BESS into the microgrid.

1 Introduction. Renewable energy sources are being used the most throughout the world. Some types of these sources cannot be connected to the network directly, as is the case with fuel cells [1, 2], PV systems [3, 4].These sources produce electrical energy in the form of DC that can be stored in batteries, and can then be used in AC form using inverters [5, 6].

The extinction of natural resources has made the renewable energy resources more prominent, and the power generation from the renewable energy resources like solar and wind which are readily and easily available is becoming popular and implemented. (2011) Comparison of three isolated bi-directional DC-DC converter topologies for a backup

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Energy storage devices are essential to power distribution networks since renewable energy sources are intermittent. DC???DC bidirectional converters are used between low-voltage storage devices and high-voltage electrical loads because storage device output voltages vary and are typically lower than the supposed load voltage.

The bidirectional power flow in most of the existing four-port converters is achieved on the battery port located on the low voltage side, i.e., the battery is charged by the energy sources and discharged to the dc link on the high voltage side. The lack of the bidirectional power flow at the dc link prevents them from managing the power at the system level. In this article, a ???

Innovations in Extreme Fast Charging (EFC) offer promising solutions in this regard. By harnessing renewable energy sources and employing sophisticated multiport converters, EFC systems can meet the evolving demands of EV refueling. reliability, and etc. There are a variety of non-isolated bi-directional DC-DC converters mentioned in the

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Bidirectional DC???DC converters play a vital role in power flow control among different energy sources like super capacitors, batteries, etc. Electric vehicle power train using hybrid energy sources like fuel cells, batteries, and super capacitors plays a major role in pollution-free environment [].To integrate hybrid energy sources to electric vehicle, an ???

Use Case of Bi-Directional Converters 5 Super Chargers Vehicle to Grid VEHICLE DC HOME Battery AC/DC Bi-Directional -DC VEHICLE Bi-Directional AC/DC ???Helps reduce peak demand tariff. ???Reduces load transients. ???Needs Bi-Directional DC-DC stage ???V2G needs "Bi-Directional" Power Flow. ???Ability to change direction of power transfer

Design of a bidirectional DC/DC converter for a hybrid electric drive system with dual-battery storing energy Krishnaswami, H., and Mohan, N. (2009). Three-port series-resonant DC???DC converter to interface renewable energy sources with bidirectional load and energy storage ports. IEEE Trans. Power Electron. 24 (10), 2289???2297. doi:10.

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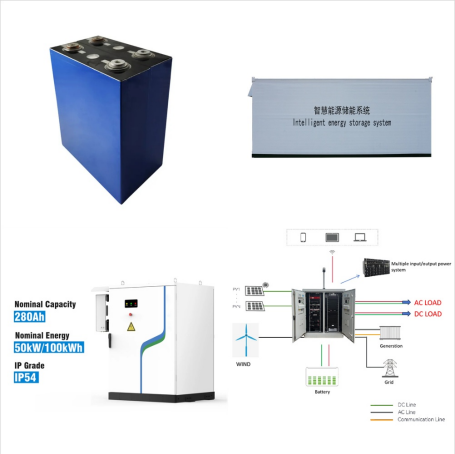

Demand for high-efficient isolated DC/DC converters to achieve energy transfer among renewable energy sources, energy storage elements, and loads is increasing because of renewable energies" increasing market penetration. Traditional converters pose significant challenges due to the wide voltage range operation nature of these components.

To overcome the issue of renewable energy sources, a secondary power storage system is used as an inverter battery backup system [[12], [13], [14]].Therefore, flexibility in energy saving is improved compared to power quality improvement based on load regulation [15].The inverter-based power system is either individually connected or grid-related, where a part of ???

? This paper introduces a groundbreaking high-gain dc-dc converter using a Triple-winding Coupled Inductor (TCI) combined with a voltage multiplier cell, eliminating the need for ???

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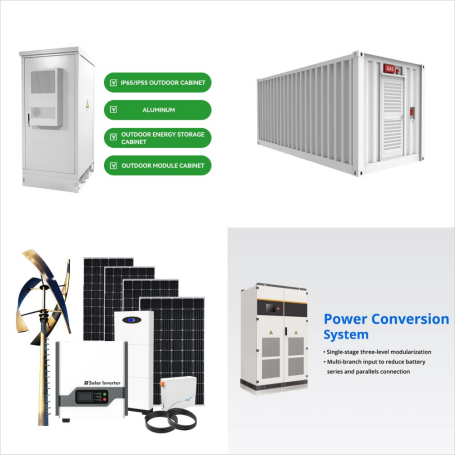
In addition, each modified bidirectional DC???DC converter has been compared from a renewable-energy-based power-generation-source perspective. The comparison results presented in this study are intended to serve as a reference for designing and constructing a new non-isolated bidirectional DC???DC converter based on the buck???boost architecture.

These converters are connected between the renewable energy source and the DC bus, enabling dynamic voltage matching, bidirectional power flow, and maximum power point tracking. Consequently, the design and selection of DC???DC converters for renewable energy applications should be based on factors such as voltage gain range, conversion



This paper presents a quasi-Z-source based isolated bidirectional DC-DC converter (qZIBDC) for renewable energy applications. The converter utilizes a dual active bridge circuit with a quasi ???

BIDIRECTIONAL DC-DC CONVERTER FOR RENEWABLE ENERGY SOURCES

Figure 6.1 shows the basic topology of the proposed bidirectional interleaved switched capacitor DC???DC converters. The topology of the converter consists of five switches S 1, S 2, S 3, S 4 and S 5, capacitors C 1, C 2, C 3 and inductors L 1 and L 2.The input voltage and current are represented as V low and I low, respectively.The output voltage and current are ???

A thorough review on non-isolated bidirectional dc???dc converters for ESDs is presented in [], where several topologies are analyzed in detail.A qualitative comparison among some popular approaches is also presented in Table 1 in terms of component count and behavior of the battery current in boost mode. For high-power applications, the bidirectional interleaved converter ???

Multiport converters gain prominent importance in electric vehicle (EV) and DC micro-grid applications for their capability to integrate multiple renewable power sources and energy storage systems. The stored energy in the battery balances the load demand during intermittent power generation from the photovoltaic (PV) source. However, charging the ???

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The proposed SCBDC converter is depicted schematically in Fig. 1 consists of five switching devices (S 1 ???S 2 ???S 3 ???S 4 ???S 5), three inductors (L 1 ???L 2 ???L 3), and three capacitors (C 1 ???C 2 ???C 3).The presented converter can operate in either Charging (buck) or Discharging (boost) mode, depending on the energy flow direction: in charging mode, the ???

1 Introduction. Bidirectional dc???dc converters are used to transfer power between two dc sources in either direction. These converters are widely used in applications such as hybrid electric vehicle energy systems [1, 2], fuel cell hybrid systems [3, 4], renewable energy sources [5, 6] and battery charger systems [7-9] these applications, the output voltage ripple (OVR) has ???

In renewable energy and EV applications, power electronics is a key technology that connects various energy sources to various loads. For example, energy storage devices in renewable energy and EVs (PHEV/EV) require a bidirectional DC/DC converter as ???

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The conventional TAB bidirectional DC-DC converter has been shown in Fig. 2 consists of three ports with three power electronic semiconductor switches based full-bridge inverters having three-winding high-frequency transformer for interfacing and providing isolation among the three different sections of source, load, and energy storage bank, or combination of ???

In conclusion, considering the dynamic performances and durability of FC and power battery, most NEV adopt HESS. Firstly, the FC or power battery provides the average power required by the powertrain, the SC provides the peak power or the power required for dynamic transition, and the DC???DC converter realizes the power distribution of multiple energy ???

This article proposes a nonisolated bidirectional dc???dc converter based on the ?? type resonant network for renewable energy sources. The circuit consists of a front-stage boost inverter, a CLC resonant network and a poststage voltage doubled rectifier. The proposed converter has simple structure and smaller volume without conventional transformer, easier to achieve modularity ???

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Topologies of the multi-port converter to connected renewable energy sources. In recent years, the DC-DC converter has attracted the attention of various research and multi-port topology of researchers. These MPC will be divided into three categories: non-isolated topologies, completely isolated topology, and partially or semi-isolated topologies.

Bidirectional DC???DC converters play a crucial role in enabling the transfer of energy between low-voltage and high-voltage sides, a fundamental requirement in applications like vehicle-to-grid and grid-to-vehicle scenarios. The motivation behind the application of common ground converters is the quest for enhanced reliability and safety while also seeking to prevent ???