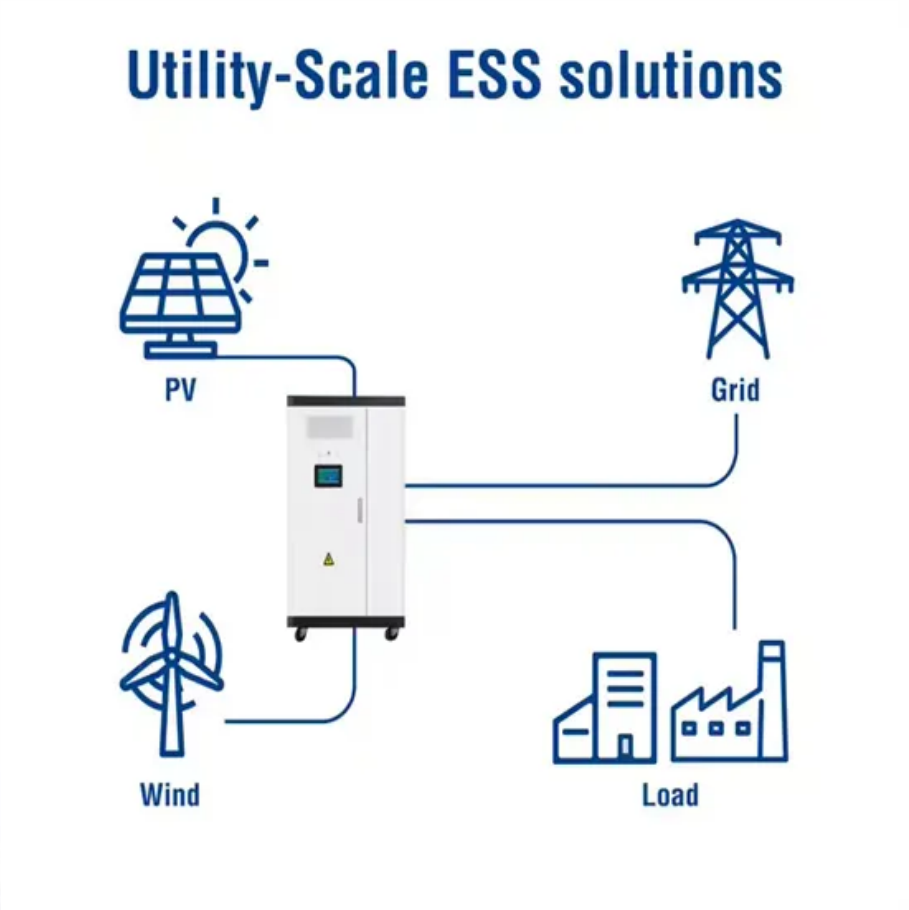
SolarTech Power Solutions

Solar two-stage multifunctional inverter



Overview

Is a quasi-two-stage multifunctional inverter suitable for photovoltaic (PV) applications?

Abstract: A novel quasi-two-stage multifunctional inverter (QMFI) for photovoltaic (PV) applications is proposed in this article. With the help of the quasi-two-stage architecture, part of active power can be directly transferred from PV arrays to the grid or load within a single power conversion stage and hence improve the efficiency.

What is a multifunctional inverter?

Unlike traditional inverters, multifunctional inverters sacrifice their own output current quality to perform cooperative control over the energy quality in the system. However, further discussion is needed on how to allocate power and perform real-time control.

Are two-stage grid-connected inverter topologies suitable for solar PV systems?

Recently, there has been significant research interest in the development of two-stage grid-connected inverter topologies with high-frequency link transformers for solar PV systems.

How to choose a multifunctional inverter?

The rated power of the multifunctional inverter must be considerably higher than the peak power of the PV array to ensure a significant increase in power quality under all environmental conditions. The trial-and-error approach used to select the type and number of the membership functions is time-consuming and labor-intensive.

What is the control strategy of a PV inverter?

The control strategy guarantees the PV inverter to manage and perform its functions simultaneously (active power injection, reactive power

compensation, and current harmonic filtering) without overrating by limiting its output current.

What is a dual-stage inverter for grid-connected applications?

Table 1. The dual-stage inverter for grid-connected applications includes a DC-DC converter to amplify the voltage and a DC-AC inverter to control the current injected into the grid. Figure 3. The DC-DC converter is depicted in Figure 3 together with the DC-AC converter and LCL filter.

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