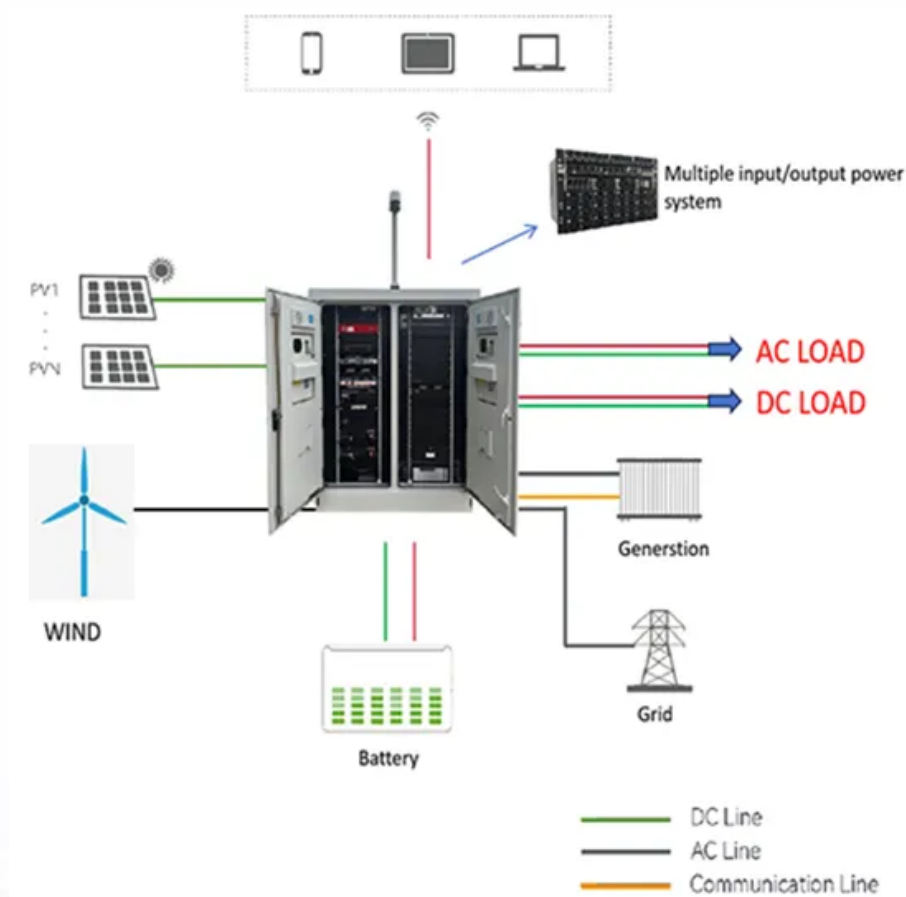


SolarInvert Energy Solutions

Three-phase push-swap inverter topology



Overview

What are the three-phase inverter topologies?

The three-phase inverter topologies can be divided into three groups: the three-phase three-wire inverters, the three-phase four-wire inverters and the multilevel inverters. In this paper, an overview of the aforementioned topologies is given.

What are the topologies of inverters?

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What is a three-phase three-wire inverter?

Using the three-phase three-wire topology, only two parameters can be controlled, which is disadvantageous in case active power filtering functions are desired . The second group of inverters are the four-wire transformerless inverters which are usually more preferable.

What type of inverter is used in a three-phase motor drive system?

Two-level inverter configurations that can be used in three-phase motor drive systems include the three-phase bridge in-verter with wye or delta connected machines, and sets of single-phase full-bridge (H-bridge) inverters for machines with open-ended windings. The former is far more common .

What is a multilevel topology vs a two-level inverter?

Multilevel topologies have smaller passives that offer as much as a 50% reduction in size for a three-level inverter vs. a two-level inverter. They enable FETs with significantly lower switching and conduction losses, which improves efficiency by using FETs with half the blocking voltage for the same DC bus voltage.

Which topology is optimized for a three-level T-type inverter?

This topology is optimized even when selecting the same power switches. For a three-level T-type inverter with a power rating of 11 kVA, we selected SiC devices with an $R_{DS(on)}$ of 75 m Ω and a blocking voltage of 1.2 kV for Q1 and Q2, and 60 m Ω and 650 V for Q3 and Q4 (see Figure 40).

Three-phase push-swap inverter topology



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Three-Phase Inverters

For three-phase applications including motor drives, UPSs, and grid-tied solar inverters, the three-phase full-bridge inverter topology is a frequently used design.

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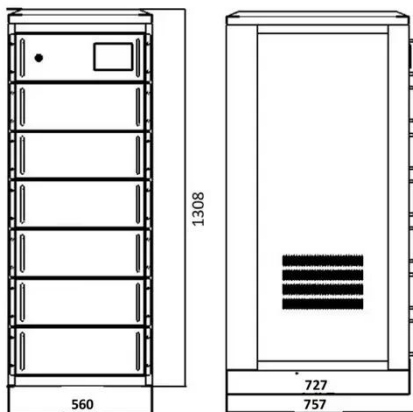
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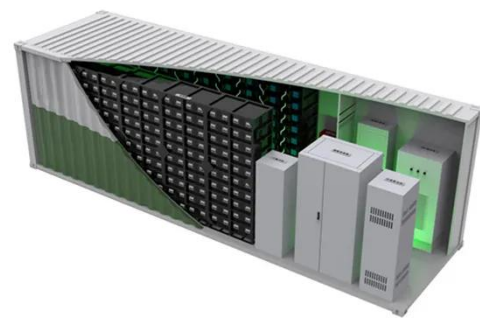
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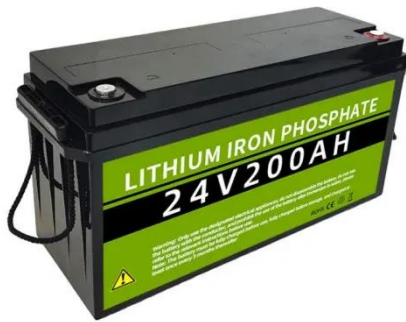
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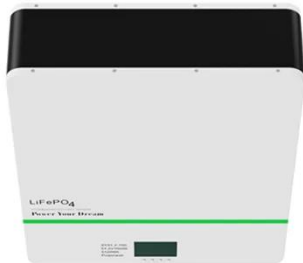
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