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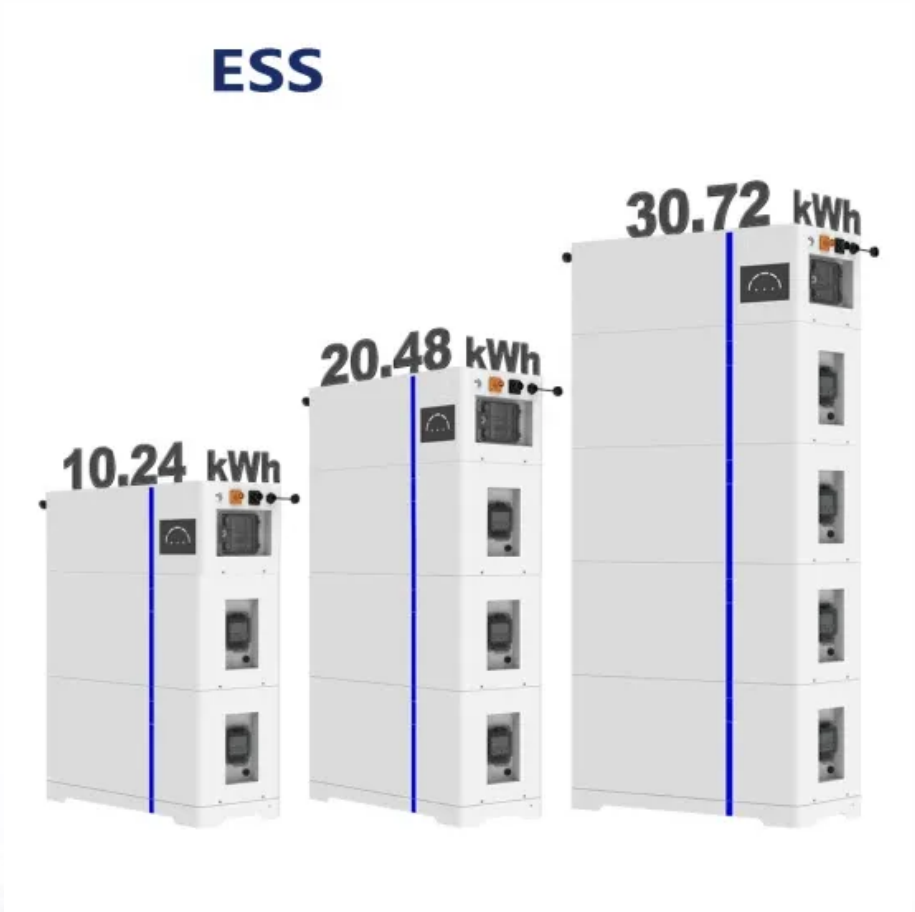
Inverter grid-connected current oscillation



Overview

How to eliminate output power oscillation of grid-connected inverter under unbalanced grid voltage?

At present, the main methods to eliminate the output power oscillation of grid-connected inverter under unbalanced grid voltage can be divided into two categories: the first type is to improve the control strategy; the second one is to change the topology of the inverter.

Why do inverter control systems oscillate?

These oscillations are often driven by the interactions between inverter control systems, specifically the PLL, and grid impedance, necessitating advanced solutions to ensure stable operation in high renewable energy penetration scenarios [5, 6].

How to solve the problem of harmonic oscillation between inverter and power grid?

To solve the problem of harmonic oscillation between the inverter and the power grid, many researchers are constantly devoted to modelling the harmonic oscillation mechanism, and the stability problem caused by harmonic oscillation is analysed by the corresponding stability analysis method based on the established model.

Do grid-following and grid-forming inverters have a new oscillation phenomenon?

The dynamic equations of FOs in GFM converters are derived analytically. The key parameters influencing FOs in GFM converters and their impact patterns are analyzed. This paper identifies a new oscillation phenomenon in hybrid systems composed of grid-following (GFL) and grid-forming (GFM) inverters.

What if a grid-connected inverter is unbalanced?

Author to whom correspondence should be addressed. Under unbalanced grid

voltage faults, the output power oscillation of a grid-connected inverter is an urgent problem to be solved. In the traditional topology of inverters, it is impossible to eliminate power oscillation and simultaneously maintain balanced output current waveform.

What is a grid connected inverter?

1. Introduction The grid-connected inverter is the vital interface module for distributed generation (DG) systems, including wind power generation, photovoltaic power generation, to be connected to the grid. It can directly determine the value and direction of current and power and is crucial for the safe operation of the grid [1, 2].

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