

## PDEOZE PowerContainer

# Multiple parallel connections of grid-connected inverters



## Overview

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What are the design guidelines for parallel grid connected inverters?

Three parallel grid-connected inverters are considered as a case study. Then, the control system design guidelines are suggested based on multivariable control theory with considering the proposed grid voltage feedforward method and coupling effect among inverters.

What is grid-connected current of inverters in parallel operation?

Hou et al. point out that the grid-connected current of inverters in parallel operation consists of three parts, namely the average current, ZSCC and differential circulating current and a decomposed current control scheme is proposed to minimise the differential current from equivalent circuit models.

How are multiple inverters connected to a grid?

Then multiple inverters are connected to the grid through the Point of Common Coupling (PCC) point. The modal analysis method is applied to identify its existing resonance frequency. Figure 3 shows the topology of a single-phase LCL grid-connected inverter.

Why do multi-parallel grid-connected inverters influence each other?

A main challenge is encountered when multi-parallel grid-connected inverters are coupled through grid impedance  $Z_g$ . In Fig. 1, the voltage of Point of Common Coupling (PCC),  $V_{pcc}$ , is shared by all inverters and can be modified by their injected currents. Therefore, all inverters influence each other due to grid impedance existence.

Why is multi-inverter parallel system more sensitive to grid impedance?

Besides, when multiple inverters are connected into the grid in parallel, the coupling relationship between inverters is established through grid impedance. That is, multi-inverter parallel system is more sensitive to grid impedance.

Does a weak grid affect the control performance of a grid-connected inverter?

However, the impedance variation characteristics of the weak grid will have serious and negative effect on the control performance of the grid-connected inverter , . Besides, when multiple inverters are connected into the grid in parallel, the coupling relationship between inverters is established through grid impedance.

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