

What if the number of inverters operating in parallel exceeds 2?

However, if the number of inverters operating in parallel exceeds two, the design method proposed in this paper will face technical challenges; for example, the circulating current paths between multiple inverters are significantly complex, making it difficult to ensure that the circulating currents remain stable.

How does circulating current affect a parallel-connected inverter?

However, when the inverters share a common DC source and AC bus, a circulating current is generated, which causes output current distortion and system power losses. These harmonic components of circulating current influence the inverter life cycle, and it can limit the power rating of the total parallel-connected inverter.

What are the types of circulating current in parallel inverters?

There are two types of circulating current in parallel inverters: low-frequency and high-frequency circulating current. The low-frequency circulating current is parameter related, such as imperfect symmetry in hardware and dependent control of parallel inverter dead time [18,19].

Can a parallel inverter reduce circulating current amplitude?

The data indicate that under various usage scenarios, that is, for different modulation indices, the method presented in this paper can significantly reduce the circulating current amplitude during parallel inverter operation, with a maximum reduction of up to 44 % and an average reduction of 32 %.

Why do parallel inverters have overlapping regions near the zero-crossing point?

These two signals had overlapping regions near the zero-crossing point, which reduced the common mode voltage and circulating currents. The common mode voltage of each inverter is distributed more equally in a carrier cycle, and thus the circulating currents of paralleled modules are mitigated.

What is integrated paralleling in a three-level inverter?

Compared with traditional interleaved paralleling, the integrated paralleling of three-level inverters can further reduce the output harmonics. Moreover, a well-designed switching sequence ensures that the average circulating current is zero, which provides a superior and feasible solution to satisfy the demands of high-power operations.

Abstract: In medium/high power applications, including smart transformers, active power filters, and wind turbines, three-level neutral-point-clamped (NPC) inverters proved to be a reliable ...

This paper proposes a novel software synchronization method for multi-inverter parallel systems, eliminating the need for additional hardware. First, a parallel inverter system is modelled, and ...

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