

SolarTech Power Solutions

Three-phase inverter circulating current



Overview

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].

How circulating current flows between inverters?

The circulating current flows between the inverters when the reference voltages differ according to the dead time, imperfect symmetry in hardware, and dependent control of parallel inverters. Different zero-sequence voltages V_{zsv1} and V_{zsv2} are injected into each module based on the discrepancy of the reference voltages from Eq. (10).

What are the problems of a three-phase inverter?

Another issue of the three-phase inverter is the common-mode voltage (CMV), which is excited by the switching behavior of the power semiconductor devices .

What causes circulating current in a parallel inverter?

The circulating current is generated by differences in each inverter, such as hardware parameters and control process. The circulating current deteriorates the output current quality and degrades the reliability of the parallel system [12-15].

Can two three-phase inverters share the same DC input link?

The study has been carried out on a system consisting of two three-phase inverters sharing the same DC input link and connected in parallel to a balanced three-phase resistive load without galvanic isolation, as shown in Fig. 1. The inverters are VSI [2,17], with SVPWM modulation [9,15,21,28,32-33].

What are the problems with parallel 3p2l inverters?

Another problem is the common-mode voltage (CMV), which causes electromagnetic interference and threatens the safe operation of the system. There exists interconnection between these two issues in the paralleled 3P2L inverters. To suppress the CMV and circulating current simultaneously, an improved control method is presented.

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