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Title: Modular shunt active power filter with increased immunity to voltage disturbances of low voltage distribution network

Abstract:

The quality of electrical energy (QEE) is becoming an increasingly common issue with the development of electromobility and renewable energy sources. It affects the proper operation of devices connected to the power grid, as well as the QEE consumed by them. In order to improve QEE, shunt active power filters (APF) are used, whose control algorithms should keep pace with the challenges they face. Improved regulation accuracy is possible thanks to the proposed method of compensating for the influence of current transformers. Increased immunity to network disturbances and operational stability are achieved through an innovative control algorithm. A proprietary communication protocol ensures synchronization for parallel operating APF with increased accuracy compared to the Precision Time Protocol. The developed solutions have been verified experimentally and/or by PLECS simulation.

Keywords:

Shunt active power filter, dc-ac converter, distribution grid