

عنوان مقاله:

Active Harmonic Compensation and Stability Improvement in High-Power Grid-Connected Inverters Using Unified Power Quality Conditioner

محل انتشار:

مجله الکترونیک صنعتی، کنترل و بهینه سازی، دوره 6، شماره 3 (سال: 1402)

تعداد صفحات اصل مقاله: 13

نویسندگان:

Elham Samavati - *University of Kashan*

Hamid Reza Mohammadi - *University of Kashan*

خلاصه مقاله:

Multifunctional features of grid-connected inverters can be used for harmonic compensation of local load voltage and grid-injected current. But, in high-power grid-connected inverters, there is a challenge due to low switching frequency. On the other hand, simultaneous compensation of local load voltage and grid-injected current harmonics is an important issue in grid-connected inverters. Using a Unified Power Quality Conditioner (UPQC) at the Point of Common Coupling (PCC), an improved active harmonic compensation method is proposed which is appropriate for high-power low-frequency grid-connected inverters. The UPQC operates as a combination of a negative shunt virtual admittance and a negative series virtual impedance at the PCC. It suppresses the disturbances caused by local load variation and grid impedance change. Using a low-power, high-frequency UPQC, local load voltage and grid-injected current harmonics up to higher-order components are simultaneously compensated despite grid impedance changes and nonlinear local load variations. The control system is designed according to the impedance-based stability criterion to ensure the system's stability. The theoretical results are validated using different case study simulations in .MATLAB/Simulink software.

کلمات کلیدی:

United Power Quality Conditioner (UPQC), Grid-Connected Inverter, Weak Grid, Impedance-Based Stability Criterion, Nonlinear Load

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1806548>

