

A NOVEL PWM CASCADED MULTILEVEL INVERTER TYPE SERIES ACTIVE FILTER FOR POWER QUALITY IMPROVEMENT IN DISTRIBUTION SYSTEMS

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Abstract

Active filtering of electric power has now become amateur technology for harmonic and reactive power compensation in two-wire, Five-wire and four-wire ac power networks with non-linear loads to improve power quality. Active Filters (AF) can be classified based on converter type and topology. The converter type can be either CSI or VSI bridge structure. The topology can be shunt, series or a combination of both. Voltage fed PWM inverter as AF is lighter, cheaper and expandable to multilevel version to enhance the performance. Shunt AF cannot be used in multilevel or multistep modes to improve performance in higher ratings. Therefore, a novel Series AF is proposed here which is designed using Cascaded Five Level PWM based VSI to compensate the voltage sag during the presence of non-linear loads. The simulation of proposed active filter is done using MATLAB/SIMULINK and the simulation results are presented in this paper. The analysis is done for standard Indian distribution voltage which is 11KV.

Keywords: Active power filters, Multilevel Inverter, Power Quality, Active Power Quality Conditioners, Cascaded Multilevel Inverter.

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