

ABSTRACT

This work presents some contributions involving control algorithms for active and hybrid filters connected in 3 or 4-wire three-phase electrical grids. In relation to the control algorithms for active filters, the contribution results from the extension involving the concepts of selective harmonic filtering to compensate unbalanced and harmonic currents in a 4-wire three-phase electrical grid. These algorithms derive from the instantaneous power theory (pq theory) together with a synchronizing PLL-circuit. It is important to comment that these algorithm do not use the currents consumed by the loads, i.e, only the voltages at the point common coupling (PCC) are used to determine the reference harmonic currents. Only the output converter currents were used as a feedback to the PWM control. These algorithms were also employed in a hybrid filter to compensate harmonic currents in a 3-wire three-phase electrical grid. Finally, some improvements on these control algorithms were done, such that the output converter currents used as a feedback of the PWM control were eliminated. Simulations results were provided in order to analyze the behaviour of the active and hybrid filters in the aforementioned conditions.

Keywords: Active Power Filter. Hybrid Power Filter. Instantaneous Power Theory. Power Quality. Harmonic Compensation.