Abstract

This paper, a new general method based on the power balance principle is proposed in order to generate the reference active source currents for an unbalanced 3-phase 3-wire system. This method is based on the zero sequence component expression of a three unbalanced per-phase powers set, The instantaneous total power can be computed from AC or DC side. A first order Fourier series decomposition is then applied to obtain Fourier coefficients. The latters are used *to* derive the purphase powers, from which the active power currents references are deduced. The performance of the proposed algorithm is tested and validated first on an AC to DC six switch active rectifier, then to a shunt active power filter. The results show the efficiency of the proposed algorithm in terms of reference currents generation as well as for harmonics and reactive power compensation for balanced and unbalanced supply systems.

Key words*: 3-phase 3-wire systems, reference active source currents, unbalanced system, power conservation law, harmonic compensation, power factor correction.