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Smart Hybrid Active Power Filter Power Quality Improvement

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Abstract: *Filters are devices that remove undesirable or polluting particles from a required environment. Filters are used to ensure the purity of electrical power in electrical systems. Power filters are used to handle power quality concerns such as power factor, voltage stability, and harmonics. There are two types of filters: passive filters and active filters. The current waveform is injected by the active filter in response to the recognized harmonic in the unit. The active filter is made up of electronic semiconductor switching devices. It takes current from an external source (typically DC) and injects it into the system as a specified current waveform to eliminate harmonics. The ability to give signal gain through amplification and lower output impedance are two major advantages of active filters. Active harmonic filters have seen numerous adjustments and upgrades in their implementation to suit specific applications since its introduction. As a result, series and shunt active filters have been implemented to meet the application's needs. Shunt Active Power Filter as a Smart Impedance with proportional resonant (P + R) controller is presented in this work to reduce current harmonics. The results of a MATLAB simulation model are presented in this paper.*

Keywords: Smart Impedance, Shunt Active Filter, Harmonics, Power Quality, etc.

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