Abstract

Due to inherent time delays in the control system of Hybrid Active Power Filter with Injection Circuit (IHAPF) and the load harmonic currents changes rapidly and dramatically. In order to
eliminate these harmonic currents, an IHAPF to be used must be able to respond quickly following variable of the harmonic currents. So, this paper proposes a PID-fuzzy control method with time-delay compensation for IHAPF. It is composed of PID-fuzzy controller and π-Smith predictor. The purpose of the fuzzy adjustor is to on-line update parameters of the PID controller, while π-Smith predictor is designed to time delay compensation and make a 180 degree delay between output current of IHAPF and load harmonic current. Compared to other IHAPF control methods, the proposed control method shows the advantages of shorter response time and higher precision. It is implemented in IHAPF model in laboratory. Simulation and experimental results demonstrated the feasibility and validity of the proposed control method.

References


Index Terms

Computer Science

Control Systems

Keywords

Hybrid Active Power Filter

Fuzzy control

π-Smith predictor

PI control

Time delay