This paper discusses a shunt active filter intended for installation on a power distribution system. The active filter has an additional capability to regulate the distribution line voltage by means of adjusting reactive power. Theoretical analysis investigates the dynamic performance of combined harmonic damping and voltage regulation. As a result, harmonic damping makes it possible to improve the stability of the control loop for voltage regulation, and the combined harmonic damping. The system with control scheme is implemented in Matlab/Simulink. The simulation results are shown to verify the effectiveness of the combined harmonic damping and voltage regulation.

**Index Terms**

Computer Science Wireless Networks

**Key words**

Distributed generators  
Power distribution  

systems  

Shunt active filters  

Voltage regulation  

Hysteresis current control  

D-Q reference frame theory