

Thesis Title	Improvement of 3-D Vector Control of Active Power Filters
Thesis Credits	12
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Degree of Study	Master of Engineering
Department	Electrical Engineering
Academic Year	2001

Abstract

In this thesis, the study of an active power filter 3 phase 4 wires is presented. The active power filter applies the 3-D vector control method to maintain the waveform of the current flowing through the inductance of the active power filter to be sinusoidal in order to decrease the total harmonic distortion. The control of the active power filter is done by transforming the voltage and current quantities in the three-phase system into vector quantities in 3-D and uses 4 switches to control the input voltage of the rectifier in each phase.

In addition, this thesis also proposes a method to reduce the number of switches from 4 to 3, with which the input voltage of the rectifier circuit in each phase can still be fully controlled. The proposed method deletes the 4th switch and then connects the star point of the other three switches to the neutral directly. The simulation result using Matlab/ Simulink and the experimental result using digital signal processing to control the 3 phase 4 wires active power filter are then compared. The results show that the current flowing through the inductance of the active power filter can be controlled to become sinusoidal if the input voltage of the rectifier circuit lags the power system voltage within a few degrees.