

电力电子与电力传动

一种基波串联谐振式混合型有源滤波器

汤赐¹; 罗安¹; 唐杰¹; 罗绍屏¹

湖南大学电气与信息工程学院¹

收稿日期 2007-1-30 修回日期 网络版发布日期 2008-3-25 接受日期

摘要

提出一种基波串联谐振式混合型有源滤波器, 利用大容量无源滤波器实现谐波抑制和无功补偿; 采用有源滤波器改善系统滤波效果并阻尼无源滤波器与系统阻抗之间的串、并联谐振。在介绍该混合型有源滤波器的拓扑结构和主要特点的基础上, 分析基于检测电网电流控制策略时的工作原理; 研究谐波参考信号的产生及其跟踪控制算法; 讨论基于DSP的数字化控制器实现问题。相关实验结果及工程应用效果均证明该基波串联谐振式混合型有源滤波器对于同时进行谐波抑制和无功补偿的可行性。

关键词 [串联谐振](#) [混合型](#) [有源滤波器](#) [无源滤波器](#) [谐波参考信号](#) [电流跟踪控制](#)

分类号 [TM 72](#)

A Hybrid Active Power Filter With Series Resonance Circuit Turned at Fundamental Frequency

LUO An TANG Jie LUO Shao-ping

Abstract

A novel hybrid active power filter (HAPF) with series resonance circuit turned at fundamental frequency is proposed, which is composed of high-capacity passive power filters (PPFs) for harmonic currents suppression as well as reactive power compensation and an active power filter (APF) for improving filtering performance as well as overcoming resonance problem due to PPFs. The system configuration and some main characteristics of the proposed HAPF are discussed. The principle of operation based on detecting grid current control is analyzed. Then the extraction of harmonic reference currents and its tracking control algorithm are addressed. The system realization of digital controller based on DSP is presented. Finally the results of experiment and industrial application are given to verify the feasibility of HAPF presented for harmonic currents suppression and reactive power compensation.

Key words [series-resonant](#) [hybrid](#) [active filter](#) [passive power filter](#) [harmonic reference currents extraction](#) [current tracking control](#)

DOI:

通讯作者 汤赐 tangci2679@126.com; tangci@hotmail.com

作者个人主页 汤赐 罗安 唐杰 罗绍屏

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF \(374KB\)](#)

▶ [\[HTML全文\]\(OKB\)](#)

▶ [参考文献\[PDF\]](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

相关信息

▶ [本刊中 包含“串联谐振”的 相关文章](#)

▶ 本文作者相关文章

· [汤赐](#)

· [罗安](#)

· [唐杰](#)

· [罗绍屏](#)