

一种实用的串并联混合有源电力滤波器

杨华云, 任士焱

华中科技大学 电气与电子工程学院, 湖北省 武汉市 430074

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摘要

设计了一种实用的串并联混合有源电力滤波器, 分析了其结构、工作原理和滤波性能。在该滤波器中, 串联在系统和谐波负载之间的零磁通变流器可自动对基波呈低阻抗、对谐波呈高阻抗, 从而实时检测出剩余谐波电流流过变流器时产生的谐波电压降、实现滤波; 逆变器可产生一个与检测到的谐波电压成正比的电压。通过将耦合变压器与无源电力滤波器串联后并入电网, 减少了流入系统的谐波电流。实验结果验证了该滤波器设计原理的正确性, 表明其能有效降低滤波器有源部分的容量, 具有良好的滤波性能。

关键词 [混合有源电力滤波器](#); [零磁通变流器](#); [谐波抑制](#); [无源电力滤波器](#)

分类号 [TM71](#); [TM614](#)

A Practical Series-Parallel Hybrid Active Power Filter

YANG Hua-yun, REN Shi-yan

School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan 430074, Hubei Province, China

Abstract

The authors design a practical series-parallel hybrid active power filter. In this paper its structure, working principle and filtering performance are analyzed. In this hybrid filter a zero-flux current converter connected in series between power system and harmonic producing load can automatically reveal itself low impedance for power frequency and high impedance for harmonics, thus the harmonic voltage drop across the current converter caused by residual harmonic current can be detected in real-time way, and filtering is implemented; and the inverter can produce a harmonic voltage that is directly proportional to the detected harmonic voltage. By means of connecting the coupling transformer in series with passive filter to power network, the harmonic current flowing into power system is reduced. Experimental results validate the correctness of the design principle of this hybrid active power filter, and it is shown that with this active hybrid filter, the capacity of active part of filter can be effectively reduced and satisfied filtering performance can be provided.

Key words [hybrid active power filter](#); [zero-flux current converter](#); [harmonic suppression](#); [passive power filter](#)

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通讯作者

作者个人主页

杨华云;任士焱

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