

电力电子与电力传动

有源滤波器中新型检测滤波器的设计与研究

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摘要

有源电力滤波器是一种可有效补偿电网中的谐波及无功电流的新型电力电子装置, 而有源电力滤波器中的电流检测过程将直接影响其补偿性能。经过分析可知, 检测过程中的低通滤波器对检测的精度和速度有重要影响。为提高电流检测的速度和精度, 该文在分析传统低通滤波器工作特性的基础上设计由1个带阻陷波器和1个低通滤波器串联组成的新型检测滤波器, 具体分析该检测滤波器的动态响应和幅频特性, 并经过仿真和试验进行验证, 该新型检测滤波器可在保证精度的基础上将检测时间缩短到约1/3个基波周期, 这样能提高检测的实时性, 从而能提高有源滤波器的补偿性能。

关键词 [有源滤波器](#) [低通滤波器](#) [检测滤波器](#) [补偿特性](#)

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Design of a Novel Detection Filter of Active Power Filter

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Abstract

Active power filter (APF) is a novel device that can compensate harmonic and reactive current timely and effectively. The detection of harmonic and reactive currents is very important to the compensation performance of APF. In the current detection process, the filter is significant to the detection precision and speed. Based on the analysis of the traditional low pass filter, this paper proposed a novel detection filter. A band stop filter in series with a low pass filter with higher cut-off frequency were in place of a low pass filter with low cut-off frequency to improve the real-time performance of the system. The simulation and experimental results validated that this detection filter can reduce the response time to one third of a fundamental cycle from nearly one cycle. Obviously, the performance of APF can be improved significantly.

Key words [active filter](#) [low pass filter](#) [detection filter](#) [compensation performance](#)

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