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谐波及无功电流检测低通滤波器的优化设计方法

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摘要: 针对电网中谐波电流较小且主要为奇次谐波的特点, 对现有的谐波及无功低通滤波器设计方法进行分析, 阐述 i_p-i_q 谐波检测算法基本工作原理, 对其频域特性进行分析, 提出将N/2阶均值滤波和二阶巴特沃斯滤波器相结合的设计方法。研究表明: 所提出的设计方法性能优良, 能够显著提高谐波及无功电流检测的稳态精度和动态响应速度; 仿真实验结果证明了该方法的正确性与有效性。

关键字: 谐波; 无功功率; 频域; 低通滤波器

An optimal design of low-pass filter in detection harmonic and reactive currents

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Abstract: Based on harmonic current in the grid, the frequency domain was analyzed after explaining the basic working principle of i_p-i_q harmonic detection, and a novel detection filter combining synthetically Butterworth Filter to N/2 average low-pass filter was put forward. The results show that the method can make instantaneous harmonic and reactive current detection of low-pass filter can be optimized; accuracy and dynamic response are improved significantly, and also this proposed method is accurate and effective.

Key words: harmonics; reactive power; frequency domain; low-pass filter

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