

电力电子与电力传动

400 Hz 逆变电源新型多环控制系统

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摘要:

提出一种基于单极性倍频正弦脉宽调制(sine pulse width modulation, SPWM)调制方式的新型多环控制逆变电源控制系统。通过对组合式400 Hz三相逆变电源系统中相位不平衡的分析, 提出一种基于相位反馈的多环控制策略; 针对大功率逆变电源系统输出电压谐波含量较高的问题, 将新型多环控制策略与单极性倍频SPWM调制方式相结合, 并给出上述控制系统在DSP中的实现方法。该控制系统能够实现相位自动调整, 并将输出电压谐波含量控制在2%之内。最后通过系统仿真对比实验证明该控制系统的先进性, 并通过实验验证该系统的正确性。

关键词: 逆变电源 相位反馈 多环控制 单极性倍频 SPWM调制

Novel Multiple-loop Control System for 400 Hz Inverter

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Abstract:

A novel multiple-loop control system in 400 Hz inverter of power supply based on unipolar sine pulse width modulation (SPWM) was proposed. The reasons of imbalance in three-phase combined inverter power system were analyzed, and a new control strategy was presented. In order to reduce the THD of high power inverter system output voltage, unipolar SPWM modulation was added with this new control strategy. Above-mentioned inverter power system controller was realized with DSP. The inverter system has a lot of merit characteristics such as phase self regulation and low output harmonic contents. The simulation and experimental results indicate the advantages and the correctness of this novel inverter power system were proved.

Keywords: inverter source phase feedback multiple-control unipolar SPWM modulation

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