中国电机工程学报 2007 27 (4): 107-111 ISSN: 1000-3673 CN: 11-2410/TM

电力系统

# 模数混合分布式逆变器并联控制方法

何中一[1];邢岩[2];付大丰[1,1]

南京航空航天大学自动化学院 航空电源重点实验室，南京，[1]

收稿日期 2005-11-11 修回日期 网络版发布日期 2007-4-12 接受日期

摘要
提出了逆变器并联运行系统一种新的分布式无主从控制策略，同步控制和均流控制解耦。前者以数字方式实现，后者基于数字和模拟混合电路实现；各并联逆变器模块之间同时实现完全电气隔离和瞬时值均流，并允许任一模块热插拔。注重分析了输出电压有效值调节在并联系统中的特性以及与均流调节的相互耦合和不利影响，提出将环流信号引入有效值调节环路，有效地改善了并联系统的均流特性和稳压特性。理论分析和实验结果证明了控制方法的有效性和工程可实现性。

关键词 PWM逆变器 不间断电源 控制 均流 冗余系统

分类号 TM464



# Distributed Hybrid Current Sharing Control for Inverters in Parallel Operation

Abstract
A novel distributed control scheme for inverters in parallel operation is proposed, where the synchronization control and current sharing control are decoupled by local feedback, the former is realized in digital manner, and the latter is implemented by digital and analog circuits. All the inverter modules are completely electrically-isolated, the instantaneous current sharing is realized, and the hot-swap of any module is permissible. The control characteristics of the root-mean-square voltage regulator of each inverter module in parallel operation are researched, as well as the coupling effect between root-mean-square voltage regulator and current sharing performance. Its bad influence on current sharing is compensated by applying the circulating current to adjust the amplitude of the sinusoidal voltage reference signal, improving the current sharing performance and output voltage precision of the parallel system effectively. Theoretic analysis and experimental results are presented to demonstrate the validity and feasibility of the proposed control scheme.

Key words PWM inverter uninterruptible power supply control current sharing redundant system

DOI:

通讯作者 邢岩 xingyan@tsinghua.org.cn;xingyan@nuaa.edu.cn

作者个人主页 何中一 邢岩 付大丰