

电力电子与电力传动

基于环流阻抗的逆变器并联控制策略

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摘要：目前，多逆变器并联系统大多采用均值均流控制策略。均值均流控制一般采用环流有功及环流无功进行调相、调幅控制。对于无并机电感的逆变器并联系统，通过环流功率对输出参考电压调相、调幅的调节控制关系与逆变器波形控制参数有关。文中提出了环流阻抗概念，并把它应用到并联系统的均流控制中。根据环流阻抗利用环流直接控制输出参考电压的幅值与相位，实现了无并机电感的并联系统的均流控制。文中对并联系统进行分析获取了模块环流阻抗的数学模型。文中研究基于环流阻抗的均流控制调节器设计。实验结果验证了此均流控制策略是可行的且均流效果良好。

关键词：环流阻抗 多逆变器系统 均流 并联运行

Research on a Novel Current-sharing Scheme Based on Circulating Impedance of Multi-inverter Parallel System

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Abstract: At present, most of parallel multi-inverter systems employ the strategy that use circulating active/reactive power to compensate the RMS value and phase of the output voltage reference. When the parallel system is without connection of inductors, the relationship between the circulating active/reactive power and RMS value and phase of the output voltage reference is complex. This paper proposes the concept of circulating impedance, and introduces it into current-sharing control strategy. Based on circulating impedance, the controller uses the circulating current to compensate the RMS value and phase of the output voltage reference, so that the parallel system can implement the current-sharing. The paper sets up the mathematical model of circulating impedance, and researches on the design of current-sharing controller based on circulating impedance. Experimental 220Vac/3kVA inverters are built and paralleled. The results of experiment verify that the current-sharing strategy based on circulating impedance is available and efficient.

Keywords: circulating impedance multi-inverter system current-sharing parallel operation

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