

适用于风力发电的三相脉宽调制整流器接口电路

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摘要

用于风力发电的AC-DC整流器接口电路, 需要对感应发电机或永磁同步发电机提供无功功率。采用空间矢量分析方法, 对一种传统的用于单位功率因数校正的串联双Boost型三相脉宽调制(pulse width modulation, PWM)整流器进行了研究, 并分析了该电路的有功和无功处理能力, 表明该电路可以在超前或滞后30° 功率因数角的范围内工作, 适用于风力发电系统中的三相PWM整流器接口电路。同时该电路的共模电压幅值比常规的6开关PWM整流器减少33%, 且仅用2个高频开关, 因而具有一定的工程实用价值。

关键词 [风力发电; 脉宽调制整流器; 接口电路; 共模电压](#)

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Research on a Three-Phase PWM Rectifier Interface Circuit Suitable for Wind Power Generation

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Abstract

The interface circuit of AC-DC rectifier for wind power generation has to provide reactive power for induction generator or permanent magnet synchronous generator. Using space vector analysis, the research on traditional series dual-boost three-phase PWM rectifier, which is used for unit power factor correction, is conducted. The result of analysis on the active and reactive power processing ability of this kind of PWM rectifier show that it can work within the range of power factor angle from lagging 30° to leading 30°, so it is suitable to the interface circuit of three-phase PWM rectifier for wind power generation system. Meanwhile, the amplitude of common-mode voltage generated by this kind of PWM rectifier in which only two high frequency active switches are employed is 67% of that generated by conventional six-switch PWM rectifier, so this kind of PWM rectifier possesses certain practical engineering value.

Key words [wind power generation; PWM rectifier; interface circuit; common-mode voltage](#)

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