

电机与电器

双凸极电机全桥变换器单管开路故障在线诊断

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摘要: 变换器是电机驱动系统中最薄弱、故障出现率最高的环节,对变换器的故障检测、诊断是提高系统可靠性,实现容错运行的关键。基于全桥变换器的电磁式双凸极电机中性点电压能够反映电机运行状态,可以用于电机故障诊断,分别在正常工作状态和单管开路故障状态,对基于全桥变换器的电磁式双凸极电机中性点电压作了分析和比较,提出利用中性点电压在故障前后的变化特征进行故障诊断的方法。实验验证了该方法能够正确快速实现单相开路故障诊断。

关键词: 全桥变换器 故障检测与诊断 中性点电压 电磁式双凸极电机

On-line Diagnosis of Single Transistor Open-circuit Fault in Full-bridge Converter of Doubly Salient Electro-magnet Motor

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Abstract: The converter is the weakest link in motor drive systems with the highest rate of failure, so failure detection and diagnosis of converter is essential to improving system reliability and to realizing fault-tolerant operation. The neutral point voltage of doubly salient motor reflects its operational state, and can be used for fault diagnosis. The neutral point voltage of doubly salient electro-magnet motor (DSEM) under normal conditions and single transistor open-circuit fault is analyzed first. Based on the differences between neutral point voltage under normal conditions and single transistor open-circuit fault, a new fault detection and diagnosis method is given. Experimental results show that the fault diagnosis method can realize single-phase fault diagnosis effectively and rapidly.

Keywords: full-bridge converter fault detection and diagnosis neutral point voltage doubly salient electro-magnet motor

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