



Detailed design of a 30kW switched reluctance starter/generator system used in more/all electric aircraft

By Shoujun Song

Shaker Verlag Sep 2009, 2009. Taschenbuch. Condition: Neu. Neuware - Many studies have indicated that More/All Electric Aircraft (M/A EA) technology is the future development trend of the aviation industry, and Combined engine Starter/Generator (CS/G) is a key subsystem of M/A EA. Among kinds of machines that can be used as an CS/G in M/AEA, the Switched Reluctance Machine (SRM) is considered as a prime candidate to meet the requirements and constraints well. In this thesis, the design of a 30kW Switched Reluctance Starter/Generator (SR S/G) system for M/A EA is presented. The fundamental concepts and advantages of M/A EA and CS/G system are briefly addressed. Some important performance requirements for CS/G system are obtained based on the typical 30s starting procedure of the aircraft engine. According to these requirements, the design processes of the SRM and the power converter are presented in detail. The design of the SRM comprises two main parts: electromagnetic design and thermal design. In electromagnetic design stage, the electromagnetic structure and dimensions of the machine and the number of phase winding turns per pole are obtained. In thermal design stage, the thermal analysis of the machine is presented. The simplified thermal model of the SRM...



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