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高压压气机进气压力畸变试验

Experiment on inlet pressure distortion of high-pressure compressor

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中文关键词： 高压压气机 压力畸变 畸变指数 畸变敏感系数 喘振裕度 航空发动机

英文关键词:high-pressure compressor pressure distortion distortion index distortion sensitive coefficient surge margin aero-engine

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中文摘要：

为准确评估高压压气机畸变特性而进行了一系列相关试验，重点阐述了高压压气机进气压力畸变试验方法，提出了对综合畸变指数、动态和稳态畸变成分、门槛值、畸变图谱等特征参数的指标要求，以及测试方案和试验数据处理方法，并据此完成某型高压压气机进气压力畸变试验，获得总压畸变对该高压压气机性能的影响，以及相关稳定性评定数据.试验结果表明：该高压压气机非设计转速压力畸变敏感系数明显高于风扇部件，抗畸变能力弱于风扇部件；设计转速压力畸变敏感系数与风扇部件相当，表现出较强的抗畸变能力和良好的气动稳定性.

英文摘要：

A series of relevant experiments were carried out for assessing high-pressure compressor distortion characteristics accurately. Inlet pressure distortion experiment methods of high-pressure compressor were emphasized, and targets of characteristic parameters such as complex distortion index, dynamic and steady state distortion components, threshold value, distortion contours as well as test concept and experimental data processing method were proposed. Furthermore, as the inlet pressure distortion experiment for a kind of high-pressure compressor was accomplished, and the effect on the performance of this high-pressure compressor by total pressure distortion along with the assessment data for relative stability was obtained. Experiment results show that high-pressure compressor has significantly higher pressure distortion sensitive coefficient, weaker anti-distortion ability than fans under off-design speed; high-pressure compressor is identical with fan in pressure distortion sensitive coefficient under design speed, showing strong anti-distortion ability and aerodynamic stability.

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