

动力机械与工程

动叶可调轴流式通风机叶片安装角异常工况下的气动特性

叶学民, 李俊, 王松岭, 李春曦, 骞宏伟

华北电力大学能源与动力工程学院

摘要: 动叶可调轴流式风机因具有较宽的高效区而得到广泛应用。以OB-84型带后导叶的动叶可调轴流风机为对象, 采用Fluent对单个动叶安装角处于3种异常状况下的叶轮内流特征进行了数值模拟, 并分析了安装角异常变化对风机全压和效率特性曲线的影响。研究表明: 随异常叶片安装角的增大, 异常叶片后缘处的尾迹损失增加, 压力面压力梯度从前缘到后缘逐渐减小, 而吸力面压力梯度增大并在后缘产生旋涡; 叶轮出口的低压区范围扩大而总压值减小, 异常叶片引起的流动损失主要集中在叶高中部位置; 风机全压呈现先增大后减小的趋势, 当异常叶片安装角增加为6°、12°和18°时, 风机内效率下降分别为2.9%、4.8%和9.1%。

关键词: 轴流风机 动叶可调 安装角异常 内流特征

Aerodynamics of Adjustable Blade Axial Fan Under Abnormal Installation Angles

YE Xue-min, LI Jun, WANG Song-ling, LI Chun-xi, QIAN Hong-wei

School of Energy and Power Engineering, North China Electric Power University

Abstract: The axial fan with adjustable blades is extensively applied in engineering with the wider high-efficiency-area. The internal characteristics of impeller under single blade in three abnormal installation angles were simulated with Fluent for the axial fan of OB-84 type, and the effect of abnormal installation angles on total pressure and efficiency characteristic curves was discussed. Simulated investigations show that the trailing edge loss of abnormal blade increases with increasing installation angle, and the pressure gradient in pressure side decreases from leading edge to trailing edge, and the pressure gradient in suction side increases and yields a notable vortex in its trailing edge. The lower region of total pressure in impeller outlet is enlarged and the value is reduced, and the flow loss induced by abnormal installation angle focuses on the middle section of blade height. The full pressure variation presents the firstly-increasing and then decreasing tendency, and the internal efficiency reduces 2.9%, 4.8% and 9.1% under increasing installation angle of 6°, 12° and 18° for single abnormal blade.

Keywords: axial fan adjustable blade abnormal installation angle internal flow characteristics

收稿日期 2008-09-19 修回日期 2008-11-14 网络版发布日期 2009-09-23

DOI:

基金项目:

通讯作者: 叶学民

作者简介:

作者Email:

参考文献:

本刊中的类似文章

1. 杨立军 杜小泽 杨勇平 王利宁.直接空冷系统轴流风机群运行特性分析[J]. 中国电机工程学报, 2009,29(20): 1-5
2. 杨立军 杜小泽 杨勇平.空冷凝汽器全工况运行特性分析[J]. 中国电机工程学报, 2008,28(8): 16-20

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(2486KB)
- ▶ [HTML全文]
- ▶ 参考文献[PDF]
- ▶ 参考文献

服务与反馈

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 轴流风机
- ▶ 动叶可调
- ▶ 安装角异常
- ▶ 内流特征

本文作者相关文章

- ▶ 叶学民
- ▶ 李俊
- ▶ 王松岭
- ▶ 李春曦
- ▶ 骞宏伟

PubMed

- ▶ Article by Ye,H.M
- ▶ Article by Li,j
- ▶ Article by Yu,S.L
- ▶ Article by Li,C.X
- ▶ Article by Qian,H.W

