

全射流喷头转折角喷管运动力学分析与试验 Mechanical Analysis and Experiment on Effuser with Turning Angle for Complete Fluidic Sprinkler

朱兴业 袁寿其 李红 刘俊萍

江苏大学

关键词: 全射流喷头 喷管 转折角 力学分析 试验

摘要: 为了扩大全射流喷头压力适用范围, 提出在喷管处加转折角增加喷头固有驱动力矩。转折角喷管的重要结构因素包括转折角角度和转折角力臂长度, 理论分析推导出全射流喷头步进旋转时所受总驱动力矩和旋转角方程。对不同转折角角度或转折角力臂组成的7种不同喷管进行了试验, 测量性能指标包括步进角度、步进频率、射程和均匀系数。结果表明: 试验值与理论分析具有较好的一致性; 工作压力影响射程、均匀系数和步进频率, 对步进角度影响不大; 随转折角角度的增大, 步进角度、均匀系数增大, 步进频率减小, 射程变化不大; 随转折角力臂的加长, 步进角度增大, 射程减小, 步进频率和均匀系数变化不大。 To enlarge the scope of working pressure for complete fluidic sprinkler, turning angle was applied in the effuser, which can increase intrinsic driving moment. The important geometrical parameters for the turning angle effuser included angle and arm of force. The equations of total driving moment and stepping angle were deduced. Experiments were carried out on seven types of effusers with different turning angles or arms of force. The results showed that testing value agrees well with the theoretical analyzing. Working pressure, with a small infection on stepping angle, positively influences wetted diameter, uniformity coefficient and stepping frequency. Turning angle positively influences stepping angle and uniformity coefficient, and negatively influenced stepping frequency. Turning arm of force positively influenced stepping angle, negatively influenced wetted diameter.

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