

一种基于单传感器的热式气体流量测量方法

作者: 赵伟国^{1,2}, 宋执环¹, 黄震威²

单位: (1 工业控制技术国家重点实验室 浙江大学控制科学与工程学系 浙江 杭州 310027; 2 中国计量学院计量测试工程学院 浙江 杭州 310018)

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摘要:

基于热传递的原理, 提出了基于单一铂电阻的热式气体流量测量方法。首先研究了在不同温度和电流下铂电阻的温度特性。然后设计了流量测量系统的电路, 分析了流量测量原理及温度补偿。最后通过恒温控制算法使铂电阻工作在2个不同的设定温度, 由铂电阻的输出电压计算出气体的流量。实验结果表明该测量方法的量精度优于1%, 流量量程比近100:1。

关键词: 气体; 流量测量; 铂电阻; 恒温控制

Thermal Gas Flow Measurement Based on Single Sensor

Author's Name: ZHAO Weiguo ^{1,2}, SONG Zhihuan ¹, HUANG zhenwei ²

Institution: (1 State Key Laboratory of Industrial Control Technology Control Science and Engineering Department, Zhejiang University, Hangzhou 310027; 2 College of Metrological and Measurement Engineering, Jiliang University, Hangzhou 310018)

Abstract:

A thermal gas flow measurement is proposed based on heat transfer principle of single platinum resistance. Firstly, the temperature characteristics are studied at different surrounding temperatures and various currents passing through the resistance. Then, the measurement principle and temperature compensation are analyzed under the developed circuit. Finally, The constant temperature algorithm is designed to control the sensor at two different temperature, and the gas flowrate is obtained from the output voltage of the sensor. The research results show that the measurement accuracy is within 1% and the ratio of the dynamic measurement range is close to 100:1.

Keywords: gas; flow measurement; platinum resistance; constant temperature control

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