

基于红外传感器阵列的智能温度传感器研究

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摘要：

为了提高空气预热器热点检测系统的可靠性，本文设计了一种新型的智能温度传感器。该传感器采用一种红外传感器阵列结构，并且运用基于均值的分批估计理论对数据进行融合处理，最后运用非线性补偿的方法对数据进行校准。该传感器的硬件采用了双单片机和双总线系统结构，每一个单片机系统都通过各自的通讯总线将处理结果输出。系统的通讯协议采用改进的Modbus通讯协议，使得系统可以自组网、自愈合。与以往空气预热器热点检测系统的传感器相比，本传感器具有测温范围广、自校准、精度高、兼容性强、性能可靠等优点。

关键词：智能传感器；红外传感器阵列；分批估计理论；双单片机与双总线系统；非线性补偿

The Research on an intelligent temperature sensor based on the infrared sensor array

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Abstract:

In order to improve the reliability of the air preheater hot spots detecting system, this paper introduces a new kind of intelligent temperature sensors. The sensors adopt the structure of the infrared sensors array, and apply the patch estimation theory based on mean value to data processing, then use the nonlinear compensating method to calibrate the data. The hardware parts of the sensor adopt the system with dual MCU and dual bus, and each dual MCU system exports the results by its respective communication bus. The communication protocol of the system adopts the modified Modbus protocol, which can make systems have the function of ad hoc networks and self-healing. Compared with the common sensors of the air preheater hot spots detecting system, the temperature sensors mentioned in this paper have some advantages, such as wide measuring range, self-calibration, high accuracy, good compatibility and reliability, etc.

Keywords: The an intelligent temperature; Infrared sensors array; The patch estimation theory; The system with dual MCU and dual bus; The nonlinear compensation.

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