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基于红外阵列传感器的数据融合技术

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摘　要：

电站锅炉空气预热器存在二次烧现象，现有检测技术还存在一些问题。针对这些问题，本设计采用基于红外阵列的多个红外传感器同时检测空气预热器温度，根据空气预热器的温度分布规律以及运用数据融合技术来判定火灾。首先根据多传感器的检测值，自动建立空气预热器内部的温度分布规律模型，并在运行过程中对温度分布模型进行自我调节与修正。最后运用D-S证据理论进行判警，检测出火灾发生部位及火灾程度。其克服了阈值判断容易出现漏报警和误报警的缺点，克服了移动式检测装置不断往返运动容易卡死的问题。不仅如此，本系统还具有自诊断和自适应能力，当某个传感器出现故障时，会发出相应的报警信号，并根据故障调整具体融合方法。

关键词：空气预热器, D-S证据理论, 数据融合

he Data Fusion Technology Based on the Infrared Array Sensor

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Abstract:

Power plant boiler air preheater's secondary burning phenomenon exists, the existing detection technology still exists some problems. To solve these problems, the design use a number of infrared sensors，which based on the infrared sensor array，detect an air pre-heater's temperature at the same time. It uses data fusion theory to determine the fire, in accordance with its temperature distribution. Firstly, the system was able to automatically find the rules of the temperature distributions of the air pre-heater, according to the values of the multi-sensor. And it can automatically adjust the temperature distribution model in the testing process. Finally, we use the D-S evidence theory to detect the fire location and extent. With fast response and high reliability, it overcomes the threshold alarm's shortcomings and mobile device's problem. The system also has self-diagnosis and self-adaptive capabilities. When a sensor fails, it will give the corresponding alarm signal, and adjust the specific fusion method according to the failure.

Keywords: Air preheater，D-S evidential theory，Data fusion

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