

基于ATMEGA16的便携式瓦斯检测仪

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摘要:

针对目前常用瓦斯检测仪检测范围高时精度低, 检测精度高时检测范围低等不足, 本文设计了一种基于双检测回路的便携式瓦斯检测仪。该系统以ATMEGA16控制器为核心, 利用催化燃烧式传感器和红外探测器组成双回路瓦斯检测电路, 并将朗伯-比尔红外吸收定律运用到瓦斯检测原理中, 提高了低瓦斯浓度时的测量精度, 同时扩大了瓦斯浓度的测量范围。系统的无线收发模块可以和上位机通信实现信息共享, 其开关机电路可以实现关机后仪器与电源完全断开, 有效节约电池能量。实验表明该瓦斯浓度检测仪具有检测精度高, 检测范围广, 高效节能等特点, 具有较高的应用价值。

关键词: 瓦斯检测; 双回路检测; 朗伯-比尔红外吸收定律; ATMEGA16

Portable gas detector based on ATMEGA16

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Abstract:

In this paper, a new portable gas detector which can automatically realize selection between the catalytic combustion sensor and the infrared detector to achieve the higher detection accuracy at different concentration range has been thoroughly discussed. The dual-detection circuit and corresponding control system based on the micro-chip ATMEGA16 have been designed. And the detection data can be transmitted to the host computer by the transceiver module of the controller in time. The shutdown circuit can cut the power supply with the device, when the computer is halted, so that the system can save the energy. The experiments show that the gas concentration detector has features of high detection accuracy, wide measurement range and high detection speed.

Keywords: gas detection; double-loop detection; Lambert-Beer law of infrared absorption; ATMEGA16

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