



## 摘 要

本文设计中采用 AT89C51 单片机进行温控系统的开发。改水温控制系统主要用于水温控制，系统主要有四部分组成，分别为水温检测部分、水温控制部分、显示部分、水温设定。其中水温检测部分主要采用了水温传感器对水温进行采集，并将信号传输至单片机，水温传感器型号为 DS18B20；系统显示部分使用了 LED 数码管，能够将水温显示的精度控制在  $0.1^{\circ}\text{C}$ 。水温设定部分主要通过设定按钮进行水温的设定，水温控制部分主要通过检测部分采集的水温与设定的水温之间的对比，通过两者之间的差值进行 PWM 的调节来对可控硅的导通进行控制，实现室内的水温调节。在本文中水温控制的程序采用汇编语言设计，系统整体结构较为简洁，功能满足设计需求，成本较低能够在实际生活中进行使用。

**关键词：**AT89C51 单片机；传感器 DS18B20；水温

## Abstract

In this paper, AT89C51 is used to develop the temperature control system. The temperature control system is mainly used for indoor temperature control. The system consists of four parts: temperature detection part, temperature control part, display part and temperature setting part. In the temperature detection part, the temperature sensor is mainly used to collect the indoor temperature and transmit the signal to the single chip microcomputer. The model of the temperature sensor is DS18B20. In the system display part, the LED digital tube is used to control the accuracy of the temperature display at 0.1 °C . The temperature setting part mainly sets the indoor temperature through the setting button, and the temperature control part mainly controls the conduction of the thyristor through the comparison between the temperature collected by the detection part and the set temperature, and the PWM adjustment of the difference between the two to realize the indoor temperature adjustment. In this paper, the temperature control program is designed by assembly language, the overall structure of the system is relatively simple, the function meets the design requirements, the cost is low and can be used in real life.

**Key Words:** AT89C51Singlechip; sensorDS18B20 ; temperature control

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