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基于半导体制冷式热泵的幼蚕共育温湿度监控系统

Temperature and humidity monitoring system for young silkworm base on semiconductor refrigerating heat pump

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中文关键词: [环境](#),[监测](#),[控制系统](#),[LPC1111](#),[半导体制冷片](#),[DS18B20](#),[嵌入式控制器](#)

英文关键词: [environmental engineering](#) [monitoring](#) [control systems](#) [LPC1111](#) [semiconductor refrigeration piece](#) [DS18B20](#) [embedded conroller](#)

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中文摘要:

为解决人工操作的传统幼蚕共育方式的诸多缺陷,如使用不便、容易操控不当以及煤炉加湿时易产生有毒气体危害幼蚕等,设计了一种以LPC1111单片机为控制核心的幼蚕共育室温湿度监控系统。该系统采用半导体制冷片作为新型冷热源,结合丙烯酸类树脂高分子材料吸湿特性实现简易除湿,并与温湿度传感器构建闭环控制系统。论述了系统中温湿度控制环节设计方案,以及具体硬件电路与软件流程。应用试验表明,所控制温度最大偏差为1℃,相对湿度最大偏差为6%。只要合理设定温湿度数值,系统即可满足幼蚕的所需环境要求。

英文摘要:

The traditional way to foster silkworm had many defects, such as inconvenient to use, easily lead to misoperation and probable to hazard silkworm by poison gas produced by coal stove. In the light of this situation, it was introduced to design a new temperature and humidity control system for common foster room based on LPC1111. The system used semiconductor refrigeration piece as a new cool and heat source which combined with moisture absorption characteristic of acrylic resin to realize simple dehumidification, and closed-loop control system by using temperature and humidity sensors was built. The design of temperature and humidity control and its specific hardware circuit and software process were introduced in the article. Test results showed that the maximum deviation of temperature was one degree Celsius, and the maximum deviation of humidity was six percent. Consequently, the live environmental requirements for young silkworm could be met by setting the temperature and humidity reasonably.

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