基于单片机的 12V 逆变电源设计

中文摘要

本次逆变电源设计是基于单片机 TL494 以及 SG3525A 等设计的。这次设计依据市场上的逆变转换器。其额定电压值大小是 12V，其电源的输出功率大小是 300w,输出频率大小是 50Hz 电压值为 220V 的交流电压，以用于满足大部分常规小电器的供电需求。在本次课题设计中笔者设计了一些相关的保护电路。以温度为主要参数指标，对冷却风扇的开度参数的应用予以了全面的控制。通过这样，以便达到低压输入、过压关断的功效。如果输入电压确实比较低，则逆变器在这种环境下停止作业，以便预防对电池的损坏。另外如果是电压值太高，也必须令逆变器停止作业，以便预防损坏芯片。其在具体的操作过程中，可以进行反向连接，也就是说在输入正极和负极连接有所异常，会直接令输入端和后端电路的连接被切断，而不是导致芯片或电池被损毁。在其显示屏幕上，主要能够展现出输出电压、输出频率等相关的指标数据。两个发光二极管在这种可以被用来对工作条件予以展现。蜂鸣器是则是在出现毛病的情况下直接发出警报。输出的交流相当于一个标准正弦波，而不是其他的波形，允许更大范围的负载能力

关键词：单片机，逆变器，反相保护，电源设计；

Abstract

The design of the inverter power supply is based on the single chip TL494 and SG3525A. This design is based on inverter converters on the market. Its rated voltage value is 12V, its output power is 300w, and the output frequency is 50Hz. The voltage is 220V AC voltage, which is used to meet the power supply requirements of most conventional small appliances. In this project design, the author designed some related protection circuits. Temperature is taken as the main parameter index, and the application of the opening parameter of the cooling fan is comprehensively controlled. In this way, in order to achieve the effect of low voltage input, over voltage shutdown. If the input voltage is indeed low, the inverter stops operating in this environment to prevent damage to the battery. In addition, if the voltage value is too high, the inverter must be stopped to prevent damage to the chip. In the specific operation process, the reverse connection can be made, that is to say, if the input positive and negative connection are abnormal, the connection between the input terminal and the back end circuit is directly cut off, instead of causing the chip or the battery to be damaged. On its display screen, it can mainly display relevant index data such as output voltage and output frequency. Two LEDs can be used to demonstrate the operating conditions. The buzzer is an alarm directly in the event of a fault. The output of the AC is equivalent to a standard sine wave, not other waveforms, allowing for a wider range of load capacities..

Keywords： MCU, inverter, sine wave, inverter protection;

目录

中文摘要.....I
Abstract.....II
目录.....III
第一章 引言.....1
1.1 系统研究背景.....1
1.2 系统研究的意义.....2
第二章 逆变电源的工作原理与结构.....3
2.1 逆变电源的工作原理.....3
2.2 逆变电源结构.....3
第三章 设计总体目标.....6
3.1 设计要求.....6
3.2 总体方案的选取.....6
第四章 整体电路设计.....7
4.1 逆变电源整体框图.....7
4.2 脉宽调制技术及其原理.....8
4.3 正弦波脉宽调制技术的实现方法.....10
第五章 逆变电源元器件特性及各部分电路设计.....12
5.1 逆变电源主要分立元件及其应用.....12
5.2 逆变电源主要集成芯片及其功能简介.....14
5.3 各芯片外围电路.....16
5.4 各变换电路设计.....18
5.5 逆变电源保护电路.....21
第六章 结论.....25
参考文献.....26
致谢.....27

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。如要下载或阅读全文，请访问：
https://d.book118.com/158067067033006075