

基于 PLC 机械手结构与控制系统

摘要

随着我国的工业的飞快进步，在成功解放人类劳动力中，机械手的应用已经成为必不可少的部分，自动化程度也随着社会的发展的需求日益增加。机械手的使用可以消除人工进行操作时产生的失误而避免造成的不必要损失，同时还可提高工作效率加快生产速度，改善产品的质量。根据驱动介质可区别为不同的四种。其中气力驱动技术以高安全性能、高稳定性、良好的性价比方面较为突出，并且它可以在各种环境糟糕的情况下使用如强磁场、高频率震动、温度差异较大、高放射性等。本文研究内容是采用 PLC 控制系统来控制气动机械手以实现物体搬运技术。

本文开头首先阐述了气动式机械手的国内外发展的现状与机械手种类，以合理制定机械手总体设计方案展开机械手结构分析，在制定总体计划后以计划为框架对机械手的手部、手臂、立柱、电机等做计算处理，最后合理设计的机械手运行步骤利用西门子 s7-200 型号的 PLC 对机械手运行过程进行编程。

关键词：PLC；机械手； 程序设计；结构设计

Abstract

With the rapid development of China's industry, in the successful liberation of human labor, the application of manipulator has become an essential part, and the degree of automation is also increasing with the development of society. The use of the manipulator can eliminate the mistakes caused by manual operation and avoid unnecessary losses. At the same time, it can improve work efficiency, speed up production and improve product quality. According to the driving medium, it can be divided into four kinds. Among them, pneumatic drive technology is more prominent in terms of high safety performance, high stability, good cost performance, and it can be used in a variety of bad circumstances, such as strong magnetic field, high frequency vibration, large temperature difference, high radioactivity and so on. In this paper, the PLC control system is used to control the pneumatic manipulator to achieve the object handling technology.

At the beginning of this paper, the development of pneumatic manipulator at home and abroad and the types of manipulator are described. The structural analysis of the manipulator is carried out by making a reasonable overall design scheme of the manipulator. After making the overall plan, the calculation and processing of the manipulator's hand, arm, column and motor are carried out within the framework of the plan. Finally, the operation steps of the reasonably designed manipulator are based on the P of Siemens S7-200 model LC program the manipulator operation process.

Key words: PLC; manipulator; program design; structure design

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