Analysis of effective application of electrical automation technology of intelligent labeling industrial robot

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Abstract: As a class of industrial robots, intelligent labeling robot has significant advantages in improving industrial production efficiency, reducing human labor and reducing comprehensive cost. The application of electrical automation technology to intelligent labeling industrial robots is an effective measure to upgrade and optimize the original functions of industrial robots, which helps to improve the intelligence and efficiency of intelligent labeling industrial robots. Based on this, this paper starts from the basic overview of industrial robot and electrical automation technology, analyzes the effective application of industrial robot electrical automation technology, and looks forward to the development trend of industrial robot electrical automation technology.

Key words: industrial robot; Electrical automation technology; Effective application

With the continuous progress of science and technology, industrial robot electrical automation technology is also constantly evolving and innovating. The development process of industrial robot electrical automation technology has experienced the evolution process from single to intelligent. Nowadays, intelligent labeling industrial robots have become an important part of modern manufacturing industry, providing efficient, accurate and reliable production solutions for industrial production. At the same time, in the Internet era, intelligent labeling industrial robots have become more intelligent and networked. Intelligent labeling robots can interact with other devices and systems to achieve collaborative work and real-time data transmission. In the future, in order to further improve the digitalization and automation of industrial robots, it is necessary to continue to study the application of electrical automation technology in industrial robots

I. Overview of intelligent labeling industrial robots and electrical automation technology

1. The characteristics of industrial robots

(1) High degree of automation

Industrial robots are equipped with a variety of sensors, such as vision sensors, force sensors, displacement sensors, etc., which can help robots perceive the surrounding environment and realize the identification, positioning and operation of objects. Through sensor technology, robots can autonomously complete various complex operational tasks. At the same time, the industrial robot adopts advanced algorithms and control systems, which can precisely control the trajectory, speed and strength of the robot, so as to achieve high-precision automatic operation.

(2) High degree of autonomy

At present, the combination of software and hardware of industrial robots has realized intelligent production. This intelligence enables industrial robots to complete a series of complex tasks independently, such as perception, decision-making, execution, etc., thus greatly improving production efficiency and quality. This also means that there are multiple mechanical devices inside the industrial robot to work together, and in order to enable the industrial robot to better complete the independent production operations, it is necessary to improve the control system of the complex mechanical structure, and then improve the control ability of the industrial robot, and promote the orderly development of industrial production.

2. Intelligent labeling industrial robots

Intelligent labeling industrial robot is a programmable device that can automatically perform a variety of intelligent labeling tasks, and its main role is to replace manpower in the manufacturing industry and improve production efficiency and quality. Intelligent labeling industrial robots can be programmed according to different needs to adapt to different production tasks. Intelligent labeling industrial robots also have a variety of actions and functions, such as grasping, assembly, etc., so that they can adapt to different production processes and environments. In addition, the built-in sensor and control system of the intelligent labeling robot can sense and adjust its own position and movement in real time to ensure accuracy and stability in the production process. This precision and control ability allows the robot to carry out high-precision production operations and improve product quality and consistency. At present, intelligent labeling robots also have a certain degree of autonomy and man-machine collaboration. In some relatively complex tasks, intelligent labeling robots have been able to complete tasks independently without continuous human intervention. At the same time, intelligent labeling robots are also able to interact and cooperate with workers to complete some tasks that require a combination of human and machine power. This autonomy and human-machine collaboration ability makes the robot more efficient and flexible on the production line. Finally, intelligent labeling industrial robots also have good safety performance. They usually employ a variety of safety sensors and measures to ensure safety in the production process. For example, upon detecting the approach of a human body or an obstacle, the robot will immediately stop its movement to avoid possible injuries or accidents. This safety feature allows the robot to work together with staff in the production environment, creating a safer production and work environment for enterprises.

3. Electrical automation technology

Electrical automation technology is one of the core technologies in the field of industrial robots. It uses electrical control system

and automation technology to realize the overall control and management of industrial robots. The technology of electrical automation in industrial robots mainly involves sensors, controllers, actuators and communication technology. Sensors perceive changes in the surrounding environment, convert these changes into electrical signals, and transmit them to the controller. The information obtained by the industrial robot through the sensor can be fed back to the controller in real time, so as to realize the perception and judgment of the working environment, and then make corresponding scientific decisions. As the core of the electrical automation system, the controller is responsible for directing and managing the tasks of the industrial robot. It receives the signal from the sensor, and controls the action, speed and strength of the industrial robot through the set program and instruction. The actuator is responsible for driving and controlling the various joints and actuators of the industrial robot according to the instructions of the controller. Through the precise drive of the actuator, the industrial robot can realize a variety of complex actions and operations, so as to complete a variety of production tasks and improve production efficiency. Communication technology can enable industrial robots to exchange information and work cooperatively with other robots and other equipment on the production line.

II. The effective application of electrical automation technology for intelligent labeling industrial robots

1. The application of modern electrical automation technology

Through the application of electrical automation technology, the intelligent labeling industrial robot can increase its learning ability and autonomous ability on the basis of completing the accurate labeling work, so as to replace the staff to complete the tedious mechanical labeling work, and avoid the occurrence of mistakes and deviations. The use of electrical automation technology can also build intelligent, embedded high-precision control system, further improve the performance of intelligent labeling industrial robots, and add network communication, data analysis and other functions to the existing system functions, in order to promote the intelligent labeling industrial robots in the complex work environment, work efficiency and accuracy improvement. In addition, on this basis, through the development and improvement of the existing electrical automation technology, to promote the research and development of new industrial robot algorithms and system software with independent intellectual property rights, so as to realize the innovation and development of China's industrial robot technology.

2. The application of intelligent electrical equipment

In the design and manufacture of intelligent electrical equipment, it is necessary to meet the requirements of automated and intelligent production. The intelligent labeling robot electrical automation technology can be applied to the design and manufacture of intelligent electrical equipment. Intelligent electrical equipment manufacturing is a comprehensive equipment industry involving a number of technical fields. When designing, we should consider which processes can use electrical automation technology and industrial robots in production and manufacturing. Then the two are applied to the production and manufacturing process of intelligent electrical equipment, improve production efficiency and accuracy, and lay a solid foundation for the production and application of intelligent electrical equipment through intelligent algorithms and high-tech systems to ensure the operating performance of the equipment in actual use.

3. The application of mechanical parts driving and programming technology

The application of electrical automation technology can meet the needs of intelligent labeling industrial robot mechanical parts assembly and drive. In industrial production, different industrial needs lead to the parts drive of intelligent labeling industrial robots are not the same. This puts forward higher requirements for the production, manufacturing and application maintenance of intelligent labeling industrial robots. And the application of electrical automation technology, the staff can detect the mechanical parts of the intelligent labeling industrial robot, so as to effectively collect the feedback of the intelligent labeling industrial robot parts drive. And by processing and adjusting the abnormal mechanical parts, in order to ensure the normal operation of the intelligent labeling industrial robot. At the same time, in the field of mechanical parts programming, electrical automation technology can build a good transmission bridge between the intelligent labeling robot and the server, so as to better meet the needs of intelligent industrial production.

4. The application in the production of clothing

With the rapid development of electrical automation technology, its application is more and more extensive. For example, the field of clothing production has been widely used intelligent labeling industrial robot electrical automation technology. In the past, the clothing industry generally used a manipulator to grasp the material to achieve loading and unloading, and the result was uneven label placement and unsatisfactory sewing effect, which not only was not conducive to improving production efficiency, but also increased the workload of manual review, and thus increased the comprehensive cost. And the application of electrical automation technology intelligent labeling robot, through the intelligent algorithm system parts drive, controller and sensor cooperation, can efficiently complete a series of delivery and control work such as marking, labeling, pressure labeling, recycling. Thus complete the industrial technology upgrade of artificial + manipulator into intelligent labeling industrial robot.

III. The development trend of electrical automation technology for intelligent labeling industrial robots

1. Intelligent labeling industrial robots are more intelligent

With the continuous progress of science and technology and the continuous advancement of industrial modernization, intelligent labeling industrial robots are more and more widely used in the production process. At present, there are still many intelligent labeling

industrial robots in the application of predetermined mechanical motion according to the program, the execution of repetitive work tasks. However, with the application of artificial intelligence technology, intelligent labeling industrial robots gradually have the ability of independent learning, independent decision-making and independent adaptation. This enables the intelligent labeling industrial robot to have a higher level of intelligence and better adapt to the complex and changeable production environment. On the one hand, through the perception system and data processing algorithm, the intelligent labeling industrial robot can obtain and analyze the information in the production environment in real time, and make intelligent adjustments and decisions according to the situation. This intelligent feature makes the intelligent labeling industrial robot able to adapt to changes in the production line and improve production efficiency and quality. On the other hand, traditional intelligent labeling industrial robots usually need to operate independently on the production line, and there is a lack of effective interaction and cooperation with the staff. In the future, intelligent labeling industrial robots can communicate and collaborate with humans in real time through human-computer interaction technology. While improving production efficiency, it will also help improve the working experience of staff.

2. Promote the innovation and development of electrical automation technology

Electrical automation technology has important application value in the field of intelligent labeling industrial robots. With the continuous progress of science and technology and the needs of industrial development, electrical automation technology is facing new challenges and opportunities. With the continuous expansion of the application of intelligent labeling industrial robots, the demand for automatic control systems is also increasing. Innovative electrical automation technology requires the ability to implement highly programmable control systems to meet the demands of different production environments and tasks. At the same time, the electrical automation technology of intelligent labeling industrial robots can further realize networking and cloud platform. Through network connectivity, different industrial robots can achieve information sharing and task collaboration to improve production efficiency and flexibility. Meanwhile, the cloud platform can provide big data analysis and intelligent decision support, providing more possibilities for the operation and optimization of industrial robots.

Epilogue

In summary, with the innovative development of intelligent labeling industrial robot electrical automation technology in the new era, it can promote the increasingly automated and intelligent intelligent industrial robots, thereby improving the efficiency of industrial production, and promote the organic integration of electrical automation technology with artificial intelligence, Internet technology and other high-tech. Lay a good foundation for the technical upgrade and development of electrical automation and intelligent labeling industrial robots in the future.

References:

[1] Ke Zhao. Application of Electrical Automation Technology in Industrial Robot [J]. Modern Industrial Economy and Information Technology,202,12(03):148-149.

[2] Sixue Huang. Application of Electrical Automation Technology for Industrial Robot [J]. Electronic Testing,2021(12):119-120+10.

[3] Jun Wei. Application of Electrical Automation Technology of Industrial Robot [J]. Agricultural Equipment Technology,2021,47(02):42-44. (in Chinese)

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