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Further Application Of Automatic Control Based On Servo Motor In Smart Grid

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Abstract:

The paper summarize the advantages and applications of servo motor. As a kind of equipment that can replace manual long-distance inspection, the intelligent inspection device for overhead transmission lines can significantly improve inspection efficiency and reduce labor intensity. The servo motor with high power density and low torque ripple can guarantee the high precision and stable operation of the intelligent inspection device in line inspection, which provides a certain practical intelligent application significance for transmission line inspection.

Keywords: sevor motor, application, automatic control

The advantages of servo motor

Servo motor is a kind of motor that can accurately control angular displacement, speed and acceleration. Unlike traditional motors, servo motors usually need to be combined with a specific control system to achieve high-precision motion control. Servo motors are widely used in smart grid, industrial automation, robotics, medical equipment and other fields, becoming an important part of modern manufacturing.

Servo motors have those advantages over other motors

Ac servo motor in many aspects of the performance is better than the stepper motor, although in some special occasions or in some less demanding occasions often use the stepper motor to do the execution motor, but the AC servo motor is still the most popular motor, so what are the differences compared to the stepper motor? The difference in control accuracy; Different low frequency characteristics; There are also differences in moment frequency characteristics, overload capacity, and operational performance and speed response performance. In the design process of the control system, it is necessary to comprehensively consider the control requirements, costs and other factors, and then choose a more appropriate control motor in a timely manner.

The practical application of servo motor

Servo motor because of its high precision and high response speed, is widely used in many fields, the following are some main application scenarios:

Industrial automation

In industrial production, servo motors are widely used in CNC machine tools, automatic assembly lines, welding robots and other equipment. For example, the tool feed and spindle rotation of CNC machine tools require high precision control, and the servo motor can ensure that the tool is processed at the set speed and position.

Robot technology

Servo motors play a crucial role in robotics, especially in articulated robots and mobile robots. The servo motor can realize the precise positioning and flexible movement of the robot, so that it can complete complex tasks. For example, in medical surgical robots, servo motors are used to control the movement of surgical instruments to achieve high-precision operation.

intelligentize

With the development of artificial intelligence and big data technology, the control system of servo motor will become more and more intelligent. Through machine learning algorithms, the servo system can better adapt to the changing working environment, improve the control accuracy and response speed.

The application of servo motor in smart grid

Smart grid technology requires a high degree of automation and intelligent control to optimize energy distribution and improve system reliability. Servo motors can be applied to various grid devices in smart grids, such as switches, circuit breakers, and transmission lines. Its high accuracy and reliability are essential for the stable operation of smart grids.

Switches, circuit breakers

In the power supply system, the high-voltage circuit breaker undertakes the bidirectional key daily tasks of

control and maintenance, and its key functions are mainly manifested in the actual servo motor driver operation of the dynamic isolation switch, and the opening and closing operation is carried out by the operating mechanism. Therefore, the working characteristics of the operating mechanism and the quality of the product play a crucial role in the working characteristics and robustness of the high voltage circuit breaker. The traditional high-voltage circuit breaker has the following hidden dangers: poor sensitivity; The operation time is dispersed; The whole adjustment process is complicated and difficult to maintain; The mechanism will cause stress relaxation after frequent actual operation; There are personal safety and security risks. The servo motor driven operating mechanism has simple structure, firm high direction, small impact and small operation and maintenance cost. At this stage, the key machines and equipment in the power supply system website have been intelligently reformed. Through the detection of important main parameters such as mechanical equipment, servo motor driver, electrical equipment and operation, the operation firmness and operation firmness of the machine and equipment are fully guaranteed. With the rapid development of modern permanent magnet motor technology, power electronics, motor vector control technology and mechanical structure design, the new servo motor drive motor and automatic control system are getting closer and closer to the requirements of isolation switch operation, and the control characteristics of the output corner, speed ratio and heat are getting higher and higher. This establishes the foundation for the new motor operating mechanism used in high-voltage circuit breakers, makes up for the weak point of the control system, and realizes the intelligent system switch in the real sense.

Transmission line

As a kind of equipment that can replace manual long-distance inspection, the intelligent inspection device for overhead transmission lines can significantly improve inspection efficiency and reduce labor intensity. The servo motor with high power density and low torque ripple can guarantee the high precision and stable operation of the intelligent inspection device in line inspection, which provides a certain practical intelligent application significance for transmission line inspection.

In addition, in the transmission line cleaning, transmission line operation and maintenance equipment, servo motor has also been a good application.

References

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