



Installation and Commissioning of Low Voltage Power Distribution System in Building Electrical Engineering

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Abstract

Electrical engineering has rapidly brought our country's economy into a new stage of development. Since electrical engineering is an important construction project in our country, and the quality of project construction is directly related to the overall quality, the relevant departments should strengthen the installation and commissioning of low-voltage distribution systems to ensure the normal operation of electrical equipment. The installation and commissioning of low-voltage distribution systems will have a significant impact on the overall safety of electrical engineering, so electrical engineering construction must be carried out in accordance with relevant technical standards and operating procedures to better ensure the safety, stability and reliability of electrical equipment and promote the technological development of electrical engineering. The installation and commissioning of low-voltage distribution systems directly affects the safety of electrical systems, so high-quality construction and maintenance of low-voltage distribution systems must be carried out on the premise of ensuring the normal operation of electrical systems.

Keywords

Building electrical engineering; low voltage power distribution system; installation and commissioning

Introduction

The installation and commissioning of the low-voltage power distribution system will have an important impact on the safety of electrical system operation and power supply. The company requires employees to strictly follow the technical specifications to carry out quality management of the low-voltage power distribution system and ancillary facilities to ensure the safety of building electrical engineering. In order to ensure the normal use of electrical equipment, the construction unit must debug and improve the stability of low-voltage power distribution equipment and operation. The construction unit should have a sufficient understanding of the installation issues of various electrical equipment, and strictly follow the operating procedures to ensure the safe operation of the entire distribution system. At the same time, it is also necessary to debug various electrical equipment so that various electrical equipment can work normally and the overall level of building electrical engineering can be comprehensively improved. With the continuous improvement of my country's construction level and the continuous expansion of the application scope of electrical equipment, people have put forward higher requirements for the installation and commissioning of low-voltage power distribution systems. Whether the low-voltage power distribution system can work normally in the project directly affects the safety of people's lives and property. Therefore, the installation and commissioning of the

low-voltage power distribution system must be carried out in strict accordance with relevant specifications during the design and commissioning process.

1. Low Voltage Distribution System in Building Electrical Engineering

Building electrical engineering is a huge project, and the engineering involved is relatively complex. Therefore, when implementing management work, the staff must clearly know the operating conditions of each link. The complexity of building electrical engineering work leads to dynamic work content, and special attention should be paid to the importance of low-voltage distribution system. The low-voltage distribution system is mainly composed of high-voltage distribution lines, distribution substations, voltage regulators, etc. In order to ensure the installation and operation of the low-voltage distribution system, there are a lot of overcurrent protection. Automatic switching is an important link in the low-voltage distribution system, so that the electricity can be distributed to the designated location, and the automatic switch can be well controlled to reduce the probability of error. The automatic undervoltage, overload, and automatic loss of pressure functions can also be realized when the automatic switch is started. Therefore, this method can reduce the damage to the electricity and even be negligible without considering the damage of components. The loss of the electrical system is minimized by automatically switching the low-voltage distribution system. In order to make the whole system work normally, the technicians should strengthen the installation and commissioning of the equipment before use. At the same time, there should be a clear and specific understanding of the use of mechanical equipment, so that when a failure occurs during the operation of the equipment, it can be handled in time so that the loss can be effectively controlled. The low-voltage power distribution system is composed of distribution transformers, low-voltage distribution lines, high-voltage distribution lines, control and protection equipment, etc. The low-voltage circuit breaker is a key component of the low-voltage power distribution system. It can ensure the reasonable distribution of power supply and has the function of automatic switching. It can also realize manual control and prevent the occurrence of overload, loss of voltage, undervoltage and other situations in the system. The low-voltage circuit breaker has a small number of motor starts and will not cause damage. It has a good protective effect on the power supply line of the system. The low-voltage power distribution system is a key link in electrical engineering. Only when the system is installed correctly can the safety of operation be guaranteed. Therefore, to improve the efficiency of the electrical system, the system must be reasonably installed and debugged to make the entire installation process more standardized. When a system failure occurs, appropriate adjustment measures should be taken to maintain the stability of the system.

2. Technical Points for Installation of Low Voltage Power Distribution System

2.1 Install bus duct

When checking the wires, the staff should mark the position of the bus duct one by one to avoid line errors. When installing the bus duct, it must be strictly carried out according to the drawings to minimize the crossing of the bus duct. Due to the high failure rate at the bus duct connection point, the staff should reasonably choose the connection according to the actual situation when wiring. During the installation operation, the horizontal supports should be properly set at 500mm at both ends of the bus duct to avoid excessive force on the bus duct at the joint part, and maintain the continuity of the center line of the bus duct. When wiring, the contact surface area should be enlarged and electrical composite grease should be applied to the joints to increase the contact surface of the joints and better reduce the resistance of the contact surface. When using insulating bolts, a torque wrench must be used for installation according to the standard torque wrench.

2.2 Install low voltage distribution cabinet

The installation of low-voltage power distribution switch cabinet is a key link in low-voltage power distribution equipment. During the installation of the equipment, the performance of the switch cabinet equipment must be fully inspected and the color, specification, model, service life, performance standard, etc. of the equipment must be recorded. In the low-voltage power distribution system, double-layer partitions are usually used to install low-voltage switch cabinets to ensure the installation quality. In order to ensure the stability of voltage and current in the system, switch cabinets with partitions must be selected. In the installation of low-voltage switch cabinets, galvanized steel plates must be used for grounding in order to ensure overall stability and safety. First, the position must be determined.

During installation, the suspension method should be used at the center line of the device, and the longitudinal and lateral positions of the device should be marked with ink lines, and then the axis of the device should be measured with a level to determine the position of the device. During the installation of the low-voltage box, the design drawings and relevant technical specifications must be strictly followed. After installation in the base groove, it should be leveled step by step and then tightened with galvanized bolts to ensure a firm connection with the base groove.

2.3 Install low voltage distribution panel

When installing the low-voltage distribution board, pay attention to whether its installation and operation are stable, and ensure that there is no debris nearby to facilitate later maintenance. During installation, pay attention to the instructions of the low-voltage distribution system, ensure that the low-voltage distribution direction is perpendicular to the ground and there is no obvious shaking. In order to ensure the stability of the connection, there must be springs on the screws and an electric ruler must be used to ensure the safety of the joints.

2.4 Install lighting equipment

Lighting is also a critical link in the low-voltage power distribution system. The key point of installing lighting equipment is to strictly follow the relevant industrial standards and select appropriate lighting equipment according to the actual situation. Due to the different installation methods of different lighting equipment, the staff should find the correct installation position and scientific installation method during installation. For example, when installing lighting equipment at the ventilation and air conditioning vents, it is necessary to consider whether it should be facing the installation bracket; when installing embedded lighting equipment, the burial depth of the box should be strictly considered.

2.5 Bridge installation

The low-voltage power distribution system in electrical engineering must be overlapped with bridges during installation. When using the bridge, the staff must lay out the bridge and accurately determine the installation position of the bridge. In electrical engineering, the specific conditions and installation requirements of the low-voltage power distribution system should be combined. When installing on the roof or on the ground, it must comply with the installation requirements of the low-voltage power distribution system. When the bridge is installed vertically, it should be matched with the corresponding accessories to increase the reliability of the installation. The low-voltage power distribution system in electrical engineering must be debugged after installation. The debugging personnel must carefully check the installation of each equipment and analyze the main factors affecting the operation. Once a safety hazard is found, timely measures must be taken. The line must be tested before debugging. Since the low-voltage power distribution system includes automatic switches, fuses and other electronic devices, a variety of monitoring devices must be used to accurately measure the internal resistance of the insulation resistance.

2.6 Pay attention to installation organization and management

In order to strengthen the scientific control of the installation and operation of the low-voltage power distribution system, the staff must strengthen the organization and management of electricity, and at the same time strengthen the installation and safety education of employees on power distribution equipment. Technical training for employees can better improve the quality supervision and management mechanism, and the reasonable use of the low-voltage power distribution system can reduce the installation and operation costs and improve the economic benefits of the project [1].

3. Key Points of Debugging Technology for Low Voltage Power Distribution System

3.1 Electrical equipment commissioning

When debugging a low-voltage power distribution system, the electrical equipment must first be debugged to ensure that the insulation resistance meets the design specifications before subsequent debugging. When the measured value on the instrument is less than 1 ohm, the insulation resistance must be adjusted in a timely manner. The debugging of a low-voltage power distribution system is mainly a test of the sensitivity and adaptability of the equipment. Under the premise of ensuring its insulation performance, debugging must comply with relevant environmental protection

standards. Generally, a 1000 ohm shaking counter is used for testing. If its resistance is greater than 1 ohm, the device meets the standard; if the resistance is less than 1 ohm, debugging must be carried out [2].

3.2 Secondary circuit debugging

When debugging the secondary circuit of a low-voltage power distribution system, the switch cabinet should be disconnected to prevent leakage during the debugging process, which may threaten the safety of the debugging personnel. To ensure the normal operation of the system, the staff must simulate and debug the system to ensure the normal operation of the system. When debugging the secondary circuit of a low-voltage power distribution system, the technicians should first disconnect the switch cabinet to prevent leakage during this period, which may affect the operation of the distribution system and even endanger the life of the debugging personnel. When debugging the secondary circuit of a low-voltage power distribution system, each device should be tested to promptly find out whether the insulation resistance does not meet the design requirements. During the debugging of the secondary circuit, if there are electronic components such as transistors and integrated circuits, a multimeter should be used to check and debug to ensure the normal operation of the system [3].

3.3 Relay device debugging

Relay device debugging is an important part of the building electrical low-voltage distribution system, and its operating status is directly related to the overall stability and safety of electrical equipment. When operating the relay device, the operator must carefully check the appearance of the relay to make sure there is no problem before debugging the relay device. When debugging and inspecting the inside of the relay, it is necessary to determine whether the screws are firm and the connection of the internal contact points is reliable, and to have a certain understanding of the activity and stability of each internal component in order to ensure the overall quality of the relay. Relay device debugging is an important part of the low-voltage distribution network, and its operating status has a great impact on the electrical operation efficiency. Employees should pay attention to the debugging of the relay from the inside out, mainly to protect the integrity of the shell, the cleanliness of the shell, and to ensure that the external joints meet the design requirements [4].

3.4 Signal equipment debugging

Signal equipment debugging is a key link in the low-voltage power distribution system. It can provide timely warning of the operating status of the low-voltage power distribution system, and its working performance is directly related to the safety of the low-voltage power distribution system. Therefore, the staff must strictly debug the signal equipment. During debugging, all electrical appliances connected to the signal device must be disconnected to avoid leakage accidents during debugging that endanger the lives of the test runners. After starting the debugging, the insulation performance and appearance of each component of the signal device must be fully checked to see if they are good. The signal resistance should be measured. The signal device plays a vital role in the entire system. Its main function is to alarm. If an abnormality occurs in the line, the signal device will start immediately and send a fault signal to the staff. Then the staff will detect the line in time according to the information received. Therefore, as long as the staff installs the signal equipment properly, the normal operation of the entire low-voltage power distribution system can be guaranteed [5].

4. Conclusion

In short, the installation and commissioning of low-voltage power distribution systems are important factors affecting safe operation. Therefore, during the installation and commissioning of equipment, the operating procedures must be strictly followed, and the quality of the equipment must be monitored and debugged to ensure the safety of the low-voltage power distribution system. The installation work should strictly abide by the basic principles and follow the relevant construction procedures and technical standards to ensure the best operation of electrical equipment. The staff should strengthen the analysis of the causes of failures in the connection of each device, standardize the installation and commissioning of various electrical appliances, and take scientific installation and commissioning measures based on their respective characteristics to further enhance electrical safety protection and improve the safe operation of electrical engineering.

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