On the Application of Electrical Control Technology in Intelligent Building

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Abstract: As the rapid development of economic and society of China, at present, intelligent building as a new architectural model, its application in the field of architecture is also expanding. Based on the present situation, this paper first analyzes the basic meaning and importance of intelligent electrical control in building, and then analyzes the application of electrical control technology in intelligent building. In the end, the paper sets forth the way of optimizing the application of this king of technology and its development prospect, so as to improve the application of this kind of technology effectively and create new circumstances for the steady and rapid development of intelligent building industry.

1. Introduction

As the improvement of people's material life, people's requirements for living environment are also increasing. The diversification of architectural functions has also become a microcosm of the urbanization process. Among them, as a multi-functional architecture system, intelligent building not only ensures the environmental adaptability and living comfort, but also combines with the new concepts such as green building, which reflects the new height of human civilization development. In order to improve the completeness of the facilities and the living comfort, it is necessary to combine the electrical control technology with the intelligent building so as to ensure the intelligent electrical control can meet the expected requirements.

2. Summary of intelligent electrical control in building

The so-called building intelligent electric, in fact, it means using the new electrical technology control method in the intelligent building to enhance the function characteristic and the stability. Compared with the traditional electrical technology, its pertinence is stronger, stability is better; at the same time, it has good adaptability. Building electrical control systems need to be supported by power, electricity and water etc when they are used, so it is difficult to ensure that all supplies meet the expected requirements. In addition, some high-end buildings also require a wealth of intelligent electrical control units and modules to achieve different functional requirements. As the foundation and core part of the whole intelligent building, the electric intelligent control system has certain help for realizing the energy saving and environmental protection.

As the development of modern intelligent building, it has gradually developed into a multi-disciplinary and multi-domain technology. Among them, anti-interference, anti-static and other technologies belong to the more basic functional types, and these types have a close relationship with electrical intelligent control. In addition, as the development of science and technology and the improvement of people's living standard, more scientific and effective application of electrical technology has become an urgent problem to be solved. By intelligent monitoring, protection and other technical means, it can greatly improve the security and convenience of buildings, and it can better meet the diverse needs of the residents. In the process of intelligent electrical control application, the condition can be selected by means of computer module, and the service task can be completed better, and all of these need more stable and effective electrical control technology to complete and realize.

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3. The current situation of the application of electrical control technology in intelligent building

In recent years, the electrical engineering intelligent technology of China has made some achievements in the field of building intelligence; it improves people's living level and comfort. However, compared with the western countries, there is still a big gap in control efficiency and adaptability. The overall intelligent level of building electrification in China is relative lower, which leads to insufficient theoretical research and poor practical results of many electrical intelligence projects. In addition, the combination of theory and practice is not closely tied together; there is no intelligent solution that can be applied as a model, which increases the cost of solving problems. At present, the intelligent electrical control technology in China is applied in some limited fields, and the application in most of these fields is not large-scale, only for the purpose of reducing the cost or achieving some functional need, but lacking the overall plan. As the upgrading and replacement of technology, the problem of insufficient modularization gradually appears; this problem increases the cost of upgrading and affects the further development of the project. In addition, the imperfect application of electrical control technology is also highlighted in the covering surface of the buildings. At present, the number of buildings in China that can really apply intelligent equipment and advanced electrical control technology is less than 10%. This is the result of the high cost of technology application and insufficient influence of the advanced technology.

4. Application and optimization of electrical control in intelligent building

To applied the electric control technology to intelligent building, it is necessary to strengthen the overall planning, and to make the best of its technical advantage and value in different systems. The optimistic strategy of applying distribution system, illumination system and security system is analyzed as follows.

Distribution system is an important part of intelligent building system, and it is also the basic part of improving service quality and stability. In the process of applying the electrical automatic technology, the management works of distribution system must be done well, the safety and stability of the system should be improved, the resources should be utilized to the maximum extent, and the waste of resources should be reduced. First of all, on the basis of ensuring safety, the operation efficiency of the transformer substation should be improved, the working efficiency should be improved and the cost should be reduced. The micro-equipment can be used instead of the original traditional equipment, and the signal transformation can be carried out by means of communication cable, it also can improve the signal transmission efficiency and signal intensity. The transformer substation can be monitored with the help of computer real-time monitoring system, so that the fault can be detected and solved in time. Secondly, to apply the equipment of production management in the automatic construction of power supply system, it can realize the scientific power supply in intelligent building. Finally, the application of electrical safety system is also the reflection of automatic technology in the distribution system, so we need to do a good job on intelligent management, including real-time monitoring system, digital simulation system and so on, so as to improve security and prevent unsafe accidents and so on. There may be the huge current passing through the conductor, in serious cases, the conductor heat, which can destroy insulation material and even causes fire accidents. So, in the process of the technology application and product upgrading, the management for electricity leakage should be done well so as to ensure the management of the safe electric load can achieve the desired results.

To apply intelligent electrical control system in illumination system, it is necessary to pay attention to the visual effect and the overall stability. In most cases, the premise should be to improve the illumination of natural light, so as to effectively improve the using efficiency of light energy and reduce the consumption of energy, so as to obtain higher economic benefits and lighting effects. In addition, in the arrangement and replenishment of the light, the brightness should be adjusted in conjunction with the natural rays of the sun, so as to keep the entire room, which keeps

the same luminance, as bright as possible at different times. This not only can effectively improve the lighting efficiency of the building, but also can avoid the influence of the different natural light intensity on the final lighting comfort. In addition, the light energy efficiency of building illumination system also need to be introduced into the electrical energy saving technology, to reduce the energy loss in illumination by energy saving technology, and make the best use of the functional advantages. The goal of illumination can be achieved by the electrical accessories that are low energy consumption and high performance.

At present, the security system of intelligent building mainly includes burglar alarm, video surveillance and other systems. Among them, video surveillance can realize the effective application of different types of cameras by means of a large number of surveillance cameras, and improve the integrity and clarity of monitoring. After the camera is installed in the specified position, it can directly carry out the monitoring and transmission of the intelligent building by means of cable, optical fiber and other equipments, these can form some more comprehensive and effective monitoring means. In the use of modern computer technology for camera image control and unidentified object analysis, it is necessary to combine the sensing equipment with intelligent control equipment so as to detect and alarm unsafe factors in the area. In this way, the anomaly can be controlled at the very beginning and in the first place. What's more, the entrance and exit control system can also use electronic locks to evacuate, isolate and control people in the area, in case of fire or other disasters. The intelligent entrance and exit control system can be used to insulate the fire so as to improve the safety of people and ensure the reduction of accident casualties. In addition, the electronic lock can also separate the work area and abnormal personnel, which can improve the security level of the building, but also reduce the safeguard difficulty of the building and reduce the security cost.

5. Application trend and prospect of electrical control in intelligent building

As the rapid development of science and technology, and the accelerating process of urbanization, the scale and number of intelligent buildings are increasing, and the advanced nature of electrical control technology has been put forward more strict requirements. From the objective point of view, the relationship between technology and market is synchronous development. Only by enhancing the advanced nature of technology can the market scale and development level be maintained well. Combined with the author's practical experience and the above analysis, the application trend and prospect of electrical control technology in intelligent building are introduced as follows**.**

Intellectualization is one of the main developing trends of electrical control technology in the future. Among them, intelligent content mainly includes neural network, fuzzy logic and genetic algorithm and so on. As a nonlinear mapping mode, neural network can adapt to a lot of different logical computing conditions and modular processing tasks, so it has a wide application prospect in the application of intelligent technology. Fuzzy logic can effectively improve the identification scope of electrical control technology and better meet the needs of different types of users; while genetic algorithm has the good extensibility, which is an important prerequisite for system upgrading.

As the rapid development of information technology, electrical control technology has gradually realized the network and information technology. In order to meet this characteristic, it is necessary to provide a more stable network and improve the standard of network security service. As the trend of electrical control technology in the future, network will develop to the model of intensive management. By network management, fault online diagnosis can be realized, the need of manpower can be reduced, at the some time, it can solve the problems that are caused by the wrong operation, such as the status information is not protected well, the security decline, and so on. In addition, networking also depends on the construction of network security system, which is an important prerequisite to ensure that the information carrier can be used normally in the security environment.

The application and development of electrical control technology is a remarkable symbol of the

progress of human civilization. As the improvement of the technology application level, the electrical control technology has gradually entered the stage of openness and clarity, so the application of the technology will be expanded, not only in high-end intelligent buildings, ordinary residents' homes will also be equipped with more perfect and effective electrical control equipment and technology, so as to achieve technology openness, clarity, technology exchange and mutual reference, furthermore, it can promote the overall and rapid development of the industry, and realize the improvement and perfection of technology.

6. Summary

To sum up, as the constant improvement of the building intelligence level in China's building engineering field, as one of the basic elements to reflect the intelligence, electrical control is also the part that must be highlighted in the design and development of modern architecture. Combined with the application of electrical control technology in intelligent building, this paper tries to analyze the application ways of intelligent building from many systems, such as distribution, illumination and security, and to promote the development of intelligent building, so as to improve the scale and level of construction industry and provide people with better living environment.

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