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Research on the energy-controlling system for the terminal electric equipment in office building

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Abstract

According to the statistics, large public building's total area is less than 4% of the total construction area of town; But the total energy consumption of large public buildings accounts for 22% of the town's total power consumption; So large public buildings is the focus of energy efficiency with great energy saving space. However, in the energy-saving renovation project of office buildings which is an important part in large public buildings, people often focus on unit product upgrades and technical improvement of energy-using equipment in building, and ignore the user equipment for energy saving space. This research aims at indoor terminal controlling end system of energy-controlling electrical equipment; With the real-time monitoring of environmental parameters and working-status control of electric equipment, it is proposed to complete the premise function of building use, reduce the power consumption cost of office buildings' operation, improve the buildings' electrical energy to efficiency ratio and promoting the development of green building's construction process. It has high social and economic benefits, and has good prospects for development.

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Keywords: Office building; Building energy efficiency; Terminal controlling; Energy efficiency ratio

1. Introduction

In the office building energy-saving renovation project, people tend to focus on upgrades and technical improvement of the energy-using equipment unit product in the building, while ignoring the user equipment's

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energy-saving space[1]. The usage of the facilities used in office buildings can have regular stop time. Due to user's error and less energy saving consciousness, a lot of phenomena of long time with high energy or standby appear, causing a lot of energy waste. According to related statistics, public buildings' energy consumption caused by unreasonable use accounts for 30% of its total energy consumption[2]. This paper proposed the control of office buildings' indoor comprehensive energy-saving electrical equipment, combining with the characteristics of office, the actual demand and the indoor dynamic environment parameter, to control the energy saving buildings electrical wiring electrical equipment[3].

2. The overall design of the system

In this article, the system takes floor area controller as the main body, makes use of room detection unit to accomplish real-time monitoring of indoor temperature and presence of person, when the environment parameters reach the conditions of system's setting threshold value, the system adjusts the working status of the corresponding electric equipment to achieve the goal of energy saving control. At the same time, the system designed can realize function of real-time monitoring working state detecting energy consumption of electric equipment, and transfer the related data information to building energy consumption monitoring platform[4]. Floor area controller detects independent regional environmental information parameters through the detection unit installed in the room, issues commands to make execution unit control indoor electric equipment's working condition in combination with the practical characteristics and requirements of office.

System overall scheme design mainly includes the function of environment parameter detection, monitoring of electrical equipment, monitoring power and working status, information data gained and energy-saving electrical equipment control. Floor area controller in the main control room can control multiple detection units for centralized management.

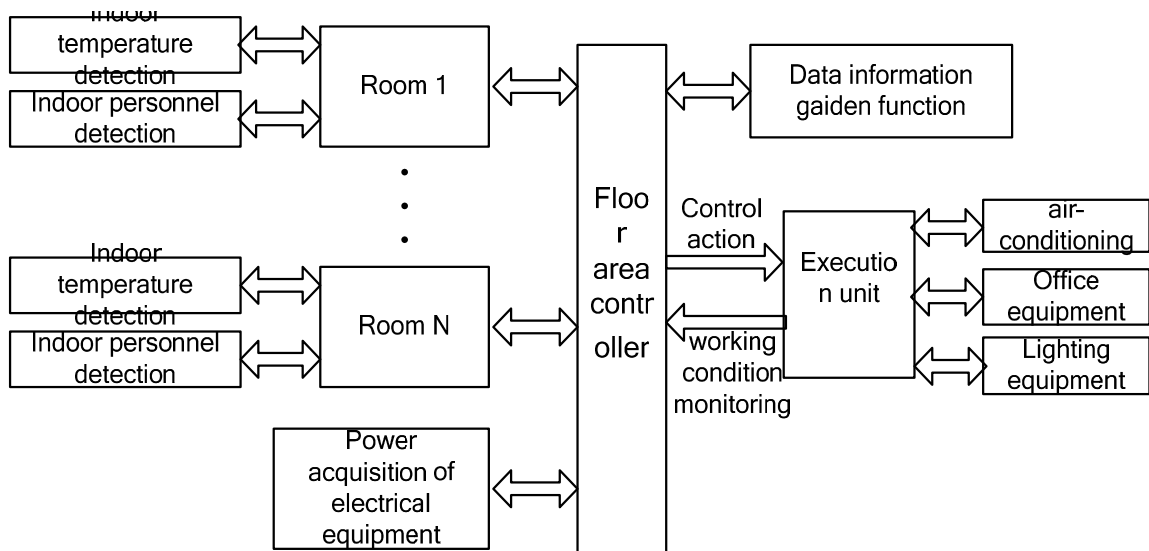


Fig. 1. The system overall scheme design structure

In the practical engineering, installation quantity and the location of the temperature detection device in the room based on "public building energy efficiency test standard", provisions of article 4.0.2, specific requirements are shown in table 1[5]. Human body's induction signal should choose sensor products with good stability and reliability; the specific installation depends on the specific product parameters[6]. When the system works in a predetermined pattern, indoor electric equipment controls the saving of energy according to a set schedule of working mode[7].

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