

Application of Solar Energy in Floor Radiation Heating System

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Abstract: With the rapid, stable and normalized development of the economy, as an indispensable part of economic development, the solar energy industry has gradually ushered in a new stage of development. In the process of gradual transition to developed economies, the solar energy industry has also ushered in a state that the market is constantly approaching saturation. At the same time, people's material and cultural pursuit of the quality of life has also been continuously improved with the economic development from the pursuit of output to the pursuit of the quality of goods. The development of the solar energy industry has also been affected by this process. Therefore, the problem of improving the quality has become the focus of market competition. This article focuses on discussing the strategy from the perspective of design application and quality control.

Keywords: Solar Energy, Floor Radiation, Heating System, Application.

1. Introduction

At present, the solar energy industry is transiting from output competition to quality competition[1]. The important problems faced in various transitions focus on design application and design quality control, which are necessary and important for each of the two basic directions. The design application is indispensable in the application planning and implementation of solar energy. The application needs to pursue synergy. Any application process that delays time needs to be changed. While the quality-control design needs to pursue safety standards. The technical research in the process accounts for the main component. However, as an industry that has been put into use for a long time, solar energy not only needs to pay attention to these aspects, but also needs to pay attention to the overall grasp of solar energy in the continuous research due to its complexity. In the work, it focuses on the key points of the design and application of solar floor radiant heating system[2], so as to provide users with a good and comfortable living environment.

2. Basic Types of Solar Radiation Floor Heating System

In the design of the whole solar heating system, floor radiation and heating system are important components. Its installation mode, structure and materials will have a certain impact on the switchgear. Before installation, firstly, the solar energy design should check the floor radiation and heating system to ensure whether it meets the building requirements[3]. For overused radiation and strong light aging, which is easy to cause aging phenomenon, when using high-voltage floor radiation and floor radiation solar energy in wet weather, the lightning protection and grounding design shall be carried out by means of wind shelter and resistance discharge connection to ensure that the heating, heating lines and heating facilities can operate normally and meet the requirements of safe heating.

In solar energy design, the professional skill and working attitude of designers play a decisive role in the quality of the whole heating system. However, many solar energy designs

lack certain standards when installing solar energy. As the personnel installing solar energy equipment have not received professional training, they can't make a detailed inspection on important accessories such as heating and switches before design, resulting in leakage or aging of lines. Therefore, when problems can't be solved in time when they occur, which will result in equipment damage or other factors affecting the safe operation of the heating system. In addition, because the designers don't strictly apply and control the design progress in accordance with the relevant systems, it is also prone to error accidents, which will eventually bring huge losses to users, and even cause serious consequences.

Solar floor radiant heating system not only has the advantages of good comfort of traditional floor radiant heating system, but also has the characteristics of clean, energy-saving and environmental protection due to the use of solar energy. In the design of the substation, the floor radiation and heating system are a very important part. They cooperate with each other to effectively ensure the safe and reliable operation of the heating system. Therefore, it is very necessary for the whole heating system to do the work well. In general, the low-voltage side earthing mode should be selected as far as possible to meet the requirements for floor radiation. If the heating system protection device is not adopted or the secondary circuit protection scheme is adopted, the circuit breaker may not be necessary or the centralized control room can be accessed through the special line for operation [4].

3. Application of Solar Radiation Floor Heating System

When designing the heating system, attention must be paid to its installation and configuration. It is particularly important to select appropriate cabinets and lines according to the size, model and transformation ratio of the floor radiation capacity. After completing the inspection and acceptance work to ensure that the floor radiation solar energy and switches can operate safely and meet the needs of users. Then the wiring operation can be started to avoid the use of heating load and unnecessary losses in the process of changing wiring. Corresponding protective devices should be

set according to different heating system items to prevent equipment damage or fire accidents caused by heating leakage. In particular, anti-corrosion measures should be taken for floor radiation and solar cables, which must be considered, solved and improved in the actual work process[5].

For buildings, the application location is mostly in the bedroom, and the indoor temperature is usually low. If the system only relies on natural daylight during the day and can't achieve the expected heating effect, intermittent operation is required as shown below. The solar system operates in the daytime, storing hot water in the heat storage tank and directing hot water into the ground coiled pipe at night to realize night heating. The commercial solar heating system can provide flexible services, reducing the peak load of heating network and the huge difference between valleys, and make full use of a large number of renewable energy. In addition, the solar heating distribution system has various floor radiation and floor radiation solar energy. Different cables and cable materials play different roles, and the quality and effect of signal transmission are also different. Therefore, when selecting the floor radiation and the floor radiation solar energy of the heating distribution system, all the problems of the system should be considered according to the function and design objectives of the system, and select the appropriate floor radiation solar energy to improve the safety and stability of the heating distribution system.

The heating device is the foundation for the proper operation of floor radiation solar heating equipment, and it is also the prerequisite for realizing the practical function of floor radiation solar energy. The heating source supply system is not only related to the realization of solar energy and related functions, but also has a direct impact on the safety, ventilation, heating and other supply systems of floor radiation solar energy. Especially in the case of solar system failure of floor radiation solar energy, once the heating system appears, the whole solar energy is likely to be functionally paralyzed. Therefore, the heating system plays a vital role in people's life [6].

During the installation of floor radiation and heating system, the rated capacity should be checked first, and the insulation materials, connectors and grounding devices should be recorded to ensure that the heating floor radiation and radiation quality are qualified. To determine whether the switch action mode is correct or not, strict control must be carried out to ensure the stable, reliable and normal operation of the heating system, so as to provide favorable conditions and guarantee for the future solar heating system design. In addition, insulation isolation belt and lightning protection measures should be set at the connection of the box door. Meanwhile, rain proof facilities should be provided for the switchgear to prevent the floor radiation damage caused by water leakage. The following points should be paid attention to in the reservation of floor radiation and heating system. Firstly, the laying of radiant solar energy on the floor should be carried out in strict accordance with the design requirements and design specifications. Secondly, lightning protection and grounding measures should be taken. Besides, for the parts prone to high floor radiation problems such as transformer distribution heating room and switchgear, effective protective measures must also be taken. Finally, it is necessary to ensure that the transformer distribution heating equipment and the protection device can be connected with each other. In terms of tightness, it is necessary to take

corresponding measures to ensure that the floor radiation and the installation quality of the heating system meet the standards.

In the process of designing the solar heating system, it is necessary to combine the actual situation of the heating system and select the appropriate laying method, so as to effectively improve the operation efficiency of the solar internal floor radiation system. Relevant technical personnel need to strengthen the timely treatment of temperature difference between conductors, grounding pipelines and each different floor. Besides, they should take corresponding measures to reduce the temperature difference so as to ensure that the internal ambient temperature of solar energy is in a comfortable state and avoid greater losses caused by fire accidents. In addition, appropriate materials and equipment should be selected according to the requirements of relevant specifications, and measures such as ensuring the quality meets the standards should be taken to ensure that the length and height of the conductor meet the requirements of corresponding standards. In order to improve the efficiency and performance of the floor radiation solar system, it is necessary to choose a suitable, scientific and economic wiring scheme.

The installation of floor radiation and heating system should pay attention to the following points. Firstly, when setting the warming room in the heating room, the model should be reasonably selected according to the actual situation, and high-load equipment should not be used. Because the high-voltage solar power circuit has a certain load capacity, the matching of load radiation and required power should be considered in the design of switch and socket, so as to determine the appropriate location and ensure normal operation as well as meet the requirements of relevant standards. Secondly, the floor radiation in the switch box and the power line should be kept at a certain distance from the main circuit during the heating system, and the floor radiation value should be strictly controlled. Thirdly, the joint between the floor radiant solar core and the connection needs to be waterproof.

4. Conclusion

With the continuous improvement of people's living standards and the faster economic development, the solar heating system began to extend to the direction of high-end solar energy, and its design scope is gradually expanding and complicating. However, the design of the floor radiant solar heating system is more complex and difficult, involving many aspects of problems. It is necessary to fully master many equipment and lines involved in the whole solar energy. Attention should be paid to the reasonable and effective application as well as configuration of the whole heating system and heating distribution system, with the layout of various pipelines in the solar heating system. To sum up, the strong heating design is an important part of the floor radiation solar heating system, which plays a very key role in the solar heating system. Excellent solar energy design and application can provide users with a good and comfortable living environment and promote the common development of social, economic and ecological benefits.

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