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How to select appreciate PV electrical box?

Introduction

In photovoltaic power generation system often use electrical box, electrical box is specified into DC junction box and AC distribution box. Electrical box is a wiring device to ensure the orderly connection and confluent function of photovoltaic modules in the photovoltaic power generation system. The bus box can be used to connect the photovoltaic power to the grid through the controller, the photovoltaic inverter and the ac distribution cabinet.

Figure 1 Projoy electrical box

PV Electrical Box

PV electrical boxes are divided into DC boxes and AC boxes. The DC power box is

equipped with photovoltaic special DC lightning protection module, DC fuse and DC isolating switch, which is convenient for users to timely and accurately grasp the working conditions of photovoltaic cells and ensure the maximum efficiency of solar photovoltaic power generation system. The DC box is mainly used as the disconnecting point between the photovoltaic module and the inverter, providing a guarantee for the maintenance personnel of the inverter.

Figure 2 DC box

The ac box is installed between the ac output side of the inverter and the parallel node/load. It is mainly composed of circuit breaker CB, surge protector SPD, leakage protector RCCB. Smart meters can also be used to detect system parameters such as voltage, current, power and electric energy. The ac box can be used as an inverter output disconnect point to provide system security, protect the installation and maintenance personnel, and can also be used as a confluence of multiple inverters.

Figure 3 AC box

Technical specifications

The main technical parameters of the electrical box are determined according to the system. Take the dc box as an example:

1. Determine the voltage of the dc system;
2. To determine the rated peak current of the photovoltaic group string, the normal current can be divided into two levels: lower than 15A and lower than 20A;
3. Determine the input loop number, which is usually the group string number;
4. Determine the output loop number, which is mainly determined by the system power and the inverter used;

The required type and quantity of electrical box components can be determined by the above parameters. The above are the parameters required by the conventional electrical box. If there are other requirements, special components such as dc meters and monitoring systems can be added to the electrical box.

Ac box design is mainly based on the mode of access to the grid or load conditions. For household photovoltaic ac boxes, the single-phase layout is generally adopted

to protect indoor load through ac micro-break MCB, leakage protector RCCB and ac surge protector. In some cases, smart meters and other components will be added.

Conclusions

The photovoltaic box is an important part of the photovoltaic system. This paper introduces the dc box and ac box from many aspects. When choosing the equipment, we need to select from the material, design, process, testing, certification and other aspects, so as to reduce the equipment failure, reduce the cost of operation and maintenance, and increase the safety of the photovoltaic system.