How to install distribution boxes in the photovoltaic industry

Overview

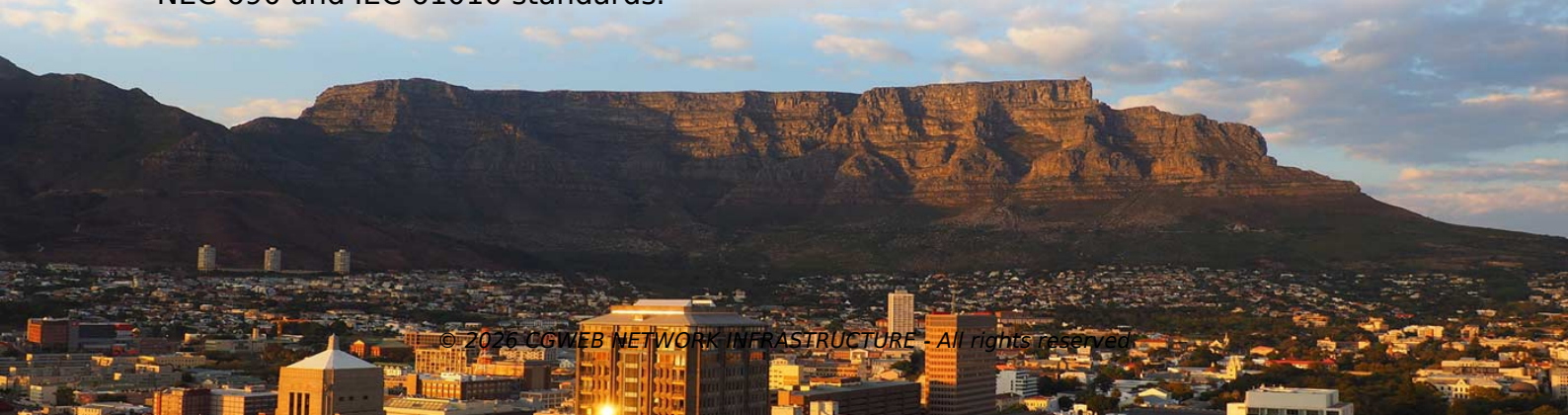
During the installation process, please be sure to follow the installation manual provided by the distribution box manufacturer to ensure correct installation.

Key Takeaways

Installing a photovoltaic distribution box involves careful site selection, secure mounting, proper wiring of DC strings, and adherence to safety standards to ensure reliable solar system operation. Step 1: Site Assessment and PlacementChoose a location that is close to the solar panels but easily accessible for maintenance. Ensure the area is well-ventilated, away from direct sunlight, rain, or extreme weather, and free from obstructions like trees or buildings that could shade the panels.

The distribution box should be mounted stable and level using robust brackets, leaving enough space for cable routing and inspection. Step 2: Gather Tools and MaterialsEssential tools include a drill, screwdrivers, wire cutters, multimeter, and wrenches. Materials should include a weather-resistant distribution box, DC fuses, busbars, DC breakers, SPD (surge protection) modules, and UV-rated PV cables.

Using high-quality components ensures long-term reliability and safety. Step 3: Electrical Safety PrecautionsBefore wiring, cover the solar panels with an opaque tarp to stop power generation and measure voltage to confirm it reads zero. Always follow NEC 690 and IEC 61010 standards.



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Wear insulated gloves and use tools rated for DC voltage. Safety is critical because PV systems generate high-voltage DC even in partial sunlight. Step 4: Wiring the Distribution BoxUnderstand the internal layout: The box typically contains DC fuses, busbars, DC breakers, and SPD modules.

Connect each DC string from the solar array to the designated fuse holder and busbar, ensuring correct polarity (+ and -) and proper fuse ratings.

Install SP

D modules to protect against transient overvoltages, connecting them to the grounding system according to IEC standards. Check all connections with a multimeter to ensure proper voltage and continuity before energizing the system. Step 5: Final Checks and CommissioningVerify that all DC strings are properly fused and breakers are correctly rated.

Ensure grounding and surge protection are correctly installed. Confirm that the box is securely mounted and that cables are neatly routed to prevent mechanical stress. Once verified, remove the tarp and energize the system, monitoring for correct operation.

Following these steps ensures that your photovoltaic distribution box is safely installed, properly wired, and compliant with electrical standards, maximizing the efficiency and longevity of your solar energy system.

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