Which meter should be used for installing a photovoltaic combiner box



Overview

Solar Combiner Box: Complete DC & PV Guide (2026)MCB-equipped combiner boxes use DC MCBs rated to IEC/EN 60947-2, providing both overload and short-circuit.

Key Takeaways

Installing a meter in a PV combiner box involves connecting DC strings through fuses or breakers, integrating surge protection, grounding properly, and wiring the meter for accurate monitoring of each string or combined output.

Understanding the Combiner Box

A P

V combiner box aggregates multiple DC strings from solar modules into one or more outputs for the inverter or charge controller. It typically contains DC fuses or breakers, busbars, surge protection devices (SPDs), disconnect switches, and monitoring modules. The meter can be integrated to monitor current, voltage, or energy output for each string or the combined output, providing real-time data for performance assessment and maintenance planning.

Step-by-



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Step Installation

Select the Location: Install the combiner box in a well-ventilated area, away from direct sunlight, moisture, and extreme weather. Ensure the enclosure meets IP65/66 standards for dust and water protection.

Prepare D

C Cables: Strip insulation carefully and use ferrules on multi-strand conductors to prevent fraying. Connect positive (+) and negative (-) conductors from each string to the designated fuse holders or breakers. Install Surge Protection: Place SPD modules according to IEC standards (IEC 60364-7-712 and IEC 61643-11) to protect against transient overvoltages.

Type 1 SPDs are used at service entrances, and Type 2 SPDs can be installed in sub-distribution boards or combiner boxes. Integrate the Meter: Connect the meter to the busbar or monitoring module terminals. Ensure the meter is compatible with the DC voltage and current range of the PV strings.

For string-level monitoring, connect each string's output to the meter input channels. For combined output monitoring, connect the meter to the main output busbar. Grounding: Connect the lightning protection ground, metal enclosure ground, and monitoring module ground to a common system ground busbar.

This ensures a low-resistance path and proper SPD operation. Final Checks: Verify all screws and terminals are secure, disconnect switches operate freely, SPD indicators function correctly, and the enclosure seals are intact. Ensure the inverter is in standby mode before energizing.

Power-

Up Sequence: Sequentially engage string circuit breakers, then the main circuit breaker, and finally start the inverter for self-testing. This prevents reverse current damage and ensures safe operation.

Best Practices

Use fuses rated for each string's current to prevent overcurrent damage. Leave sufficient space around the box for cable routing and maintenance. Regularly inspect the meter and SPDs to detect shading, mismatch, or faults in individual strings.

Document wiring and meter connections for future troubleshooting and maintenance. By following these steps, the PV combiner box with an integrated meter will provide safe, reliable, and accurate monitoring of your solar array, while protecting the system from overcurrent and transient surges.

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Article Content

Solar Combiner Box: Complete DC & PV Guide (2026)

MCB-equipped combiner boxes use DC MCBs rated to IEC/EN 60947-2, providing both overload and short-circuit protection with a polarityless terminal design that simplifies installation.

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