

Photovoltaic combiner box selection requirements



Article Overview

Selecting a PV combiner box requires matching system voltage, string current, number of inputs, protection devices, and environmental ratings to ensure safe, reliable, and maintainable solar array operation.

Key Selection Criteria

1. System Voltage Rating The combiner box must support the maximum DC voltage of the PV array, including adjustments for cold temperature open-circuit voltage (Voc) per NEC 690.7. Typical ratings are 600VDC, 1000VDC, or 1500VDC, depending on residential, commercial, or utility-scale systems . 2. String Current and Overcurrent Protection Each input string requires overcurrent protection using either fuses (IEC 60269-6) or DC-rated circuit breakers (MCBs/MCCBs). Breakers provide resettable protection, while fuses require replacement after a fault. String current sizing follows NEC 690.8, often using $I_{sc} \times 1.25 \times 1.25$ for crystalline modules . The main output conductor must handle the aggregated current of all strings. 3. Number of Inputs Select a combiner box with enough input channels for all PV strings, plus spare positions for future expansion. Common configurations include 2-in/1-out, 4-in/1-out, 6-in/1-out, 12-in/1-out, and 24-in/1-out . Unused inputs must remain sealed and maintain the enclosure's IP/NEMA rating. 4. Protection Devices

- DC Surge Protective Devices (SPDs): Type 2 SPDs protect against lightning and transient surges.
- DC Isolator Switch: Provides safe disconnection for maintenance....

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