

# How to install grounding for a photovoltaic combiner box

## Article Overview

Proper grounding of a PV combiner box involves connecting the equipment grounding conductor (EGC) from the combiner box to the array frame, surge protection devices, and the system grounding point using appropriately sized conductors and secure connections.

## Step-by-Step Grounding Procedure

1. Identify Grounding Points Inside the combiner box, locate the grounding busbar or grounding lug. This is the central point where all metallic parts, including the enclosure and surge protection devices (SPDs), will be bonded. Ensure the busbar is rated for DC grounding and corrosion-resistant . 2. Connect the Equipment Grounding Conductor (EGC)

- o Run an EGC from the combiner box grounding busbar to the array frame to bond all PV modules.
- o Connect the EGC to the SPD earth terminals to ensure surge protection devices can safely divert transient overvoltages to ground .
- o Extend the EGC to the system grounding point at the inverter or main service panel, creating a continuous fault current path . 3. Use Proper Connectors
- o Use listed compression connectors or exothermic welds for all grounding connections.
- o Avoid relying solely on mounting screws for grounding continuity, as this may compromise safety . 4.

## Grounding Electrode System

- o For large PV systems, connect the combiner box and array frame to a grounding electrode system (e.g., ground rods).
- o Ground rods should be at least 8 feet long and spaced at least twice their length apart if multiple rods are used.
- o Use acorn clamps or exothermic connections to secure the grounding electrode conductor (GEC) to the rods . 5. Conductor Sizing
- o Size the GEC according to NEC 250.166 based on the largest conductor supplying the system. For example, if the largest DC output conductor is 1/0 AWG, the minimum GEC is 6 AWG copper .
- o Ensure all conductors are rated for outdoor exposure and UV-resistant if routed externally. 6. Verify Continuity and Accessibility
- o After installation, measure resistance and continuity to confirm a low-impedance path to ground.
- o Ensure all grounding connections are accessible for inspection and maintenance . 7. Integrate with Surge Protection Devices
- o Connect SPDs with the shortest possible path to the grounding busbar to maximize surge suppression effectiveness.
- o Regularly check SPD status indicators and replace any faulty devices .



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## Key Considerations

- o Grounding provides a fault current path, while bonding ensures an equipotential plane across all metallic parts. Both are essential for safety .
- o Follow NEC Article 690 and IEC 60364-7-712 standards for compliance.
- o Maintain proper separation and labeling of positive, negative, and grounding conductors to avoid miswiring or ground faults . By following these steps, the PV combiner box will be safely grounded, protecting the system from electrical faults, lightning surges, and ensuring long-term reliability.

Wall-mounted or column-mounted installations are recommended, ensuring the wall or column can support the

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Summary: Installing an AC combiner box is critical for optimizing photovoltaic power generation systems. This guide covers best

This article covers grounding in PV systems, which differs slightly from standard grounding systems. The



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It is important to follow the wiring diagram carefully to ensure proper installation and avoid any potential

Learn how to wire a combiner box with this diagram. Understand the different components and their

A professional guide for install solar combiner boxes. Step-by-step instructions, safety protocols, wiring tips &

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