

Cable tray connection to inverter wiring method



Overview

Mounting hybrid inverter and connecting PV From the DC box, route PV wires inside cable trays and connect them to the MC4 connectors on the inverter's exte.

Key Takeaways

PV source and output circuits can be safely routed in cable trays to the inverter, following proper support, spacing, and mechanical protection requirements.

Planning and Tray Selection

Before installation, plan the cable tray route carefully, considering clearance, load capacity, and separation from other services or safety walkways. Choose the appropriate tray type: ladder trays allow airflow and easy cable entry, while perforated or solid-bottom trays are suitable for lighter loads or specific environmental conditions. Ensure the tray width and depth accommodate the total number of PV cables without overcrowding, which can cause overheating.

Wiring Method
PV Source Circuits: These run from the PV modules to the combiner box or inverter. Use single-conductor PV wire rated for outdoor use. Cables must be supported at intervals not exceeding 12 inches (300 mm) and secured at intervals not exceeding 4.

5 feet (1.4 m) when installed in outdoor cable trays.

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V Output Circuits: These are the conductors from the combiner box to the inverter. They follow the same tray support and securing requirements as source circuits.

Mechanical Protection: Ensure cables are protected from sharp edges, rodents, and physical damage.

Use conduit or protective covers where necessary, especially when cables pass through walls or near metal structures. Connection to the InverterRoute the cables from the tray to the inverter entry point using weatherproof cable glands to prevent moisture ingress. Maintain strain relief by securing cables with UV-resistant zip ties or clips to prevent stress on connectors.

Verify polarity with a multimeter before final connection to avoid short circuits or inverter damage. If using a combiner box, connect multiple strings in parallel inside the box before running the final output to the inverter, ensuring all connections are tight and secure.

Safety and Compliance

Avoid creating induction loops by keeping DC cables closely bundled and parallel to minimize electromagnetic interference. Ensure cables do not cross designated safety walkways unless code-compliant allowances are made. Follow local electrical codes (e.g., NEC 690.

31(C)(2)) for outdoor cable tray installations, support intervals, and conductor types. By following these steps, the cable tray connection to the inverter will be mechanically secure, electrically safe, and compliant with PV installation standards, ensuring long-term system reliability and performance.

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690.31 (C) (2) Cable Tray.

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Cable Tray and Conduit Installation Method Statement

Step-by-step cable tray and conduit installation method with safety, quality and inspection procedures as per IEEE standards.

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