

RIVO MULTITRADE OPTICAL SYSTEMS

How to connect a secondary electrical box to a distribution box



Overview

How to Wire a Breaker Box to Another Breaker Box Advanced guide to wiring a secondary breaker box. Master load calculations, safety steps, and code-compliance.

Key Takeaways

A secondary distribution box, or subpanel, is connected to the main panel using a dedicated feeder breaker, four-wire feeder cable, and proper grounding to safely distribute power to localized circuits.

A subpanel is an auxiliary electrical panel that redistributes power from the main panel to a specific area, such as a garage, basement, or workshop. It does not generate power but allows for additional circuits closer to the load, reducing long wire runs and improving organization.

Safety First

- Turn off the main service disconnect to de-energize the system. Use a lockout/tagout procedure to prevent accidental re-energization.
 - Verify with a voltage tester that all conductors in the main panel are dead before touching any wires.
 - Obtain necessary permits from your local authority, as subpanel installation typically requires inspection and compliance with the National Electrical Code (NEC).
- Materials Needed
- Subpanel with appropriate amperage rating

- Feeder breaker in the main panel
- Four-wire feeder cable: two hot wires, one neutral, and one ground
- Circuit breakers for the subpanel
- Grounding rods or connection to existing grounding system
- Conduit and connectors as required

Step-by-Step Connection

- **Determine Subpanel Location:** Ensure at least 3 feet of clear working space in front, 30 inches wide, and a height of 6.5 feet, avoiding damp or obstructed areas .
 - **Calculate Load and Breaker Size:** Add all continuous loads (multiply by 125%) and non-continuous loads (100%) to determine the subpanel's feeder breaker size. Ensure it does not exceed the main panel's remaining capacity .
 - **Install Feeder Breaker:** In the main panel, install a two-pole breaker sized according to the calculated load .
 - **Run Feeder Cable:** Connect the two hot wires to the breaker, the neutral wire to the neutral bus, and the ground wire to the ground bus in the main panel. Use conduit if required .
 - **Connect Subpanel:**
 - Attach hot wires to the subpanel's main lugs or main breaker.
 - Connect the neutral wire to the neutral bus in the subpanel.
 - Connect the ground wire to the ground bus in the subpanel.
 - **Important:** In a subpanel, the neutral and ground must be separated; do not bond them together as in the main panel .
 - **Install Circuit Breakers in Subpanel:** Add breakers for the circuits you intend to power locally.
 - **Inspection and Energizing:** Secure the subpanel cover and call the local authority for inspection. Only energize the subpanel after approval .
- #### Additional Considerations
- **Wire Gauge:** Choose wire size based on amperage and distance to prevent voltage drop. For example, a 60-amp subpanel typically uses 6 AWG copper wire, but longer runs may require 4 AWG .
 - **Grounding:** Subpanels require a dedicated ground wire to grounding rods or the main panel's ground bus. Existing subpanels without a ground may need upgrading .

- Code Compliance: Follow NEC Article 110 for working space and Article 250 for grounding. Local amendments may apply . By following these steps, you can safely and efficiently connect a secondary distribution box to your main electrical panel, ensuring proper load distribution, grounding, and compliance with electrical codes.

Article Content

electrical

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