

How to connect the copper rod to the small busbar



Overview

Connection: Connect the busbar to the power source and other components, following proper wiring practices.

Key Takeaways

The most reliable way to connect a small copper rod to a busbar is by using a properly torqued bolted or clamped joint, ensuring good contact pressure and minimal resistance.

1. Joint Type:

- Bolted Joints: Overlap the copper rod with the busbar and secure it using bolts through the overlap area. Bolted joints are versatile and widely used, but holes can slightly distort current flow. Proper torque is critical to ensure low contact resistance and long-term reliability .



- **Clamped Joints:** Use an external clamp around the overlap without drilling holes. Clamped joints maintain uniform contact pressure and reduce joint resistance, though they require more space and are costlier .
- 2. **Contact Pressure and Torque:** The effectiveness of the connection depends more on torque and contact pressure than on the overlap area. Electrical current concentrates under the clamping force, so ensure bolts or clamps are tightened according to manufacturer specifications. For copper busbars wider than 40 mm, M12 bolts with 30–50 mm spacing and torque above 70 N·m are recommended .
- 3. **Surface Preparation:** Ensure the contact surfaces are clean, free of oxidation, and properly aligned. Oxidation or dirt increases contact resistance, which can lead to heating and energy loss .
- 4. **Material Compatibility:** Use copper rods and busbars of compatible grades to avoid galvanic corrosion. If connecting copper to aluminum, special connectors or joint compounds are required .
- 5. **Inspection and Maintenance:** After installation, inspect the joint for proper torque and alignment. Periodic checks help prevent loosening due to thermal expansion, vibration, or creep .

Practical Steps

- Position the copper rod against the busbar with sufficient overlap.
- Choose the appropriate joint type (bolted or clamped).
- Clean the contact surfaces to remove oxidation or debris.
- Install bolts or clamps and tighten to the recommended torque.
- Verify alignment and ensure no gaps exist between the rod and busbar.
- Optionally, apply protective coatings or anti-oxidation compounds if the environment is prone to corrosion . By following these guidelines, the connection will maintain low resistance, high current-carrying capacity, and long-term reliability. Proper torque and contact pressure are more important than maximizing overlap, ensuring a safe and efficient electrical connection .

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