

Grounding and bridging of distribution boxes



Overview

Stainless Steel Distribution Box Installation Manual: When inspecting the interior of a stainless steel outdoor electrical box distribution box, pay attention.

Key Takeaways

Proper grounding and bridging of distribution boxes ensure safety, equipment protection, and reliable electrical operation by maintaining low-resistance conductive paths. Grounding Principles

Grounding a distribution box involves connecting all metallic parts of the enclosure to a reliable earth reference to protect personnel and equipment from electrical faults, overvoltages, and lightning strikes. The metal casing of the box must form a continuous conductive circuit, and all internal components should be bonded to the enclosure to maintain electrical continuity. Grounding also stabilizes voltage during transient conditions and ensures correct operation of protective devices.

Connection Methods

- **Dedicated Grounding Points:** Most stainless steel or metal distribution boxes have pre-fabricated grounding terminals on the base plate or side walls, often marked with grounding symbols. These points are used to attach ground wires securely.
- **Flexible Connections:** Use braided copper tape or flexible copper conductors to connect the door panel to the box body. This ensures continuity even when the door is opened or closed frequently.

- Anti-Loosening Measures: Serrated washers or conductive grease can be applied to connections to pierce oxide layers and reduce contact resistance, preventing corrosion and maintaining long-term conductivity .
- Wire Sizing: Ground wires should be sized according to local standards. For example, in the US, a 10 AWG (5.26 mm²) wire is typical, while other markets may require 6 mm². For connections between mounting plates and equipment, larger wires (e.g., 16 mm² or 6 AWG) may be used to ensure low resistance .

Bridging Techniques

Bridging involves creating parallel grounding paths to reduce total resistance and improve reliability. For example, connecting the mounting plate to both the spindle plate and the central grounding point ensures that the total ground resistance remains below 0.1 Ohm, even if one path has higher resistance . Parallel connections are preferred over sequential links to avoid a single point of failure .

Verification

After installation, measure the resistance from any point on the enclosure to the main grounding electrode using a multimeter. High resistance may indicate poor contact, insufficient cleaning of surfaces, or loose bolts . Regular testing is recommended because resistance can vary with soil conditions, moisture, and corrosion .

Summary

- Use pre-marked grounding terminals and flexible connections for continuity.
- Apply conductive grease and serrated washers to maintain low resistance.
- Size ground wires according to standards and application requirements.
- Implement parallel grounding paths to reduce total resistance.
- Verify grounding resistance post-installation and periodically thereafter. Following these methods ensures safe, reliable, and long-lasting grounding and bridging for distribution boxes in industrial and outdoor environments .

Article Content

250.148 Continuity of Equipment Grounding Conductors and

An equipment grounding conductor passing through the box without a splice is not required to be joined inside the box to others that

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