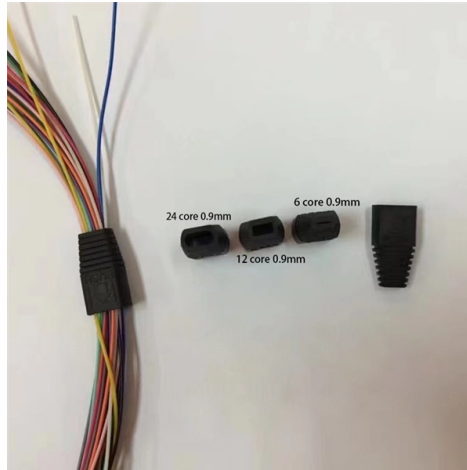


Grounding of the distribution box casing



Overview

The equipotential bonding of its metal casing is the underlying logic that ensures the reliable operation of the system.

Key Takeaways

The metal casing of a distribution box must be securely connected to the grounding system using designated grounding points, appropriate wire sizing, and corrosion-resistant connections to ensure safety and system reliability.

Grounding Points: Distribution boxes typically have pre-reserved threaded studs or welded points on the base plate or side walls for grounding connections. These points provide a stable mechanical anchor for the grounding wire and reduce the risk of loosening due to vibration or door movement . For hinged doors, flexible copper braided tape is often used to maintain reliable contact between moving parts .

Wire Sizing: The grounding wire size depends on regional standards. In the US, a 10 AWG (5.26 mm²) wire is standard, while in other markets, a 6 mm² wire is commonly used . For connections between mounting plates and equipment like spindle plates, larger wires (e.g., 16 mm² or 6 AWG) may be required to maintain low resistance, especially for long cable runs .

Connection Method: Ensure that contact surfaces are clean, free of oxide layers, and, if necessary, treated with conductive paste to prevent corrosion and reduce contact resistance . Anti-loosening washers should be used to maintain secure connections over time . The overall grounding resistance should meet low-voltage distribution standards, typically below 0.1 Ohm for industrial applications .

Material Considerations: The grounding connector material should match the enclosure material (e.g., stainless steel) to prevent galvanic corrosion . Copper is commonly used for grounding conductors due to its high conductivity and corrosion resistance .

System Integration: Grounding the distribution box casing is part of a broader equipotential bonding system. The box should be connected to the mounting plate and then to the central grounding point of the facility to ensure all conductive parts are at the same potential, reducing the risk of electric shock and equipment damage .

Environmental Considerations: In outdoor or high-humidity environments, condensation can accumulate at grounding points. Applying conductive paste and ensuring proper sealing can extend maintenance intervals and prevent localized overheating . Avoid installing distribution boxes in excessively humid or corrosive areas to maintain grounding integrity .

Summary

Proper grounding of a distribution box casing involves:

- Using factory-designated grounding points or welded studs
 - Selecting the correct wire size according to local standards
 - Ensuring clean, corrosion-resistant connections with anti-loosening hardware
 - Integrating the box into the facility's central grounding system
 - Considering environmental factors to maintain long-term reliability
- Following these practices ensures personnel safety, equipment protection, and system stability in both industrial and civil electrical installations .

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For all circuits of systems over 50 volts to ground, include an insulated equipment grounding wire sized according to NEC

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