

## Article Overview

Proper grounding of explosion-proof distribution box casings is essential to prevent ignition of surrounding explosive atmospheres by providing a low-resistance path for fault currents and static charges.

## Importance of Grounding

Explosion-proof enclosures are designed to contain internal explosions and prevent ignition of surrounding gases or dust. However, if a metal casing is not properly grounded, any internal electrical fault can cause the external surface to heat up or generate sparks, potentially igniting flammable atmospheres. Grounding ensures that fault currents are safely directed back to the main panel, allowing protective devices to trip quickly and preventing hazardous arcing. Additionally, grounding prevents static electricity buildup on metal surfaces, which is critical in high-voltage or combustible environments.

## Grounding Requirements

- o **Connection Points:** Attach a ground wire from a threaded stud at the bottom of the housing to the mounting plate, and then from the mounting plate to the central factory grounding point.
- o **Wire Sizing:** In the US, a 10 AWG (5.26 mm<sup>2</sup>) ground wire is standard, while in other markets, a 6 mm<sup>2</sup> wire is recommended. For connections between mounting plates and spindle plates, larger wires (e.g., 16 mm<sup>2</sup> or 6 AWG) may be required depending on cable length and number of spindles to maintain total resistance below 0.1 Ohm.
- o **Door Grounding:** All metallic parts, including doors, must be bonded to the enclosure ground. This prevents static discharge and ensures that any accidental contact with live components does not create a shock hazard.
- o **Equipotential Bonding:** All conductive components in the hazardous area should be connected to a shared grounding point to eliminate potential differences and reduce spark risk.
- o **Compliance with Standards:** Grounding must comply with ATEX, IECEx, and national standards (e.g., GB7251 in China) to ensure the explosion-proof rating is maintained.

## Practical Considerations

- o Use galvanized fasteners and properly insulated or enameled wires to maintain reliable connections.
- o Ensure the ground resistance between all system parts is below 0.1 Ohm to guarantee effective fault current dissipation.
- o Avoid flammable materials for the enclosure; stainless steel with a minimum thickness of 4 mm is recommended.
- o Verify grounding connections during installation and periodically during maintenance to prevent degradation or loose connections.

# Grounding of the explosion-proof distribution box casing

## Summary

Grounding an explosion-proof distribution box casing is critical for safety in hazardous environments. It provides a low-resistance path for fault currents, prevents static buildup, and ensures compliance with international safety standards. Proper wire sizing, bonding of all metallic parts including doors, and regular inspection are essential to maintain the integrity of the grounding system and prevent ignition hazards .

Power Distribution panel box - Hazardous locations for explosive gas mixtures: Zone 1 and Zone 2. Explosive gas mixtures: Class

1. Introduction The IEE's Technical Helpline receives numerous calls from contractors requesting information on the earthing and

Explosion-proof electrical equipment, such as explosion-proof distribution boxes, is specifically designed

Available Ratings For Different Designs of Explosion Proof Enclosures Every Explosion Proof Enclosure, intrinsically safe barrier,

Internal grounding should be set up within the wiring compartment (junction box or main chamber), and external

The explosion-proof distribution box safely delivers power in hazardous zones (oil, gas, chemical plants) with rugged, spark-resistant

2.0 Scope The scope of this protocol is limited to bonding and grounding for the prevention of fire and explosion hazards. This is not

Grounding of metal enclosures in non-hazardous areas prevents electrical shock and enables protective devices to operate properly

A place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist,

Explosion-proof electrical equipment must have metal casings that are grounded. Additionally, equipotential bonding

Explosion-proof equipment are designed to withstand an internal explosion, prevent the ignition of any gas surrounding the enclosure

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Consequences: lighting explosion-proof distribution box (board) without inspection, after installation, often

Learn everything about explosion proof enclosures for hazardous areas--design, certification, and industrial applications with ATEX,

Explosion-Proof Enclosures: To make sure the explosion-proof enclosure can safely confine any ignition that happens inside, it is

Where the grounded system includes a power source, such as a transformer, the single-point ground connection should be made at

Each DISTRIBUTION BOX and controller must be grounded. On the US market, a 5.26 mm<sup>2</sup> (10 AWG) ground wire

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