ZITHA TECH SPECIALTY CABLES (Pty) Ltd

Building-specific electrical distribution boxes



Overview

Distribution Box and Selection Guide: Internal Structure, Components. Learn how to choose a distribution box and understand its internal structure, inclu.

Key Takeaways

Electrical distribution boxes, also known as distribution boards or panelboards, are central hubs that safely distribute incoming power to multiple circuits in residential, commercial, and industrial buildings.Common Types of Distribution Boxes
• Main Distribution Board (MDB)
• Central hub for incoming power from the utility.

• Houses main breakers, busbars, and protective devices.

• Typically used in large buildings or industrial facilities .

• Sub Distribution Board (SDB)
• Receives power from the MDB and distributes it to specific areas or floors.

• Contains MCBs, RCDs, or RCBOs for localized protection .

• Residential Distribution Box
• Compact units for homes or small apartments.

• Usually includes 4–12 ways for circuits, with MCBs and optional RCCBs .

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• Commercial Distribution Box
• Designed for offices, shops, or commercial complexes.

• Can handle higher loads and multiple phases (single-phase or three-phase) with surge protection .

• Industrial Distribution Box
• Heavy-duty enclosures for factories or machinery.

• Supports three-phase power, high short-circuit capacity, and specialized protective devices .

• Outdoor/Weatherproof Distribution Box
• IP-rated enclosures for outdoor installations.

• Resistant to UV, corrosion, and impact; suitable for gardens, construction sites, or solar installations .

• Temporary Power Distribution Box
• Portable units for construction sites or events.

• Provides multiple outlets with built-in protection for temporary setups .

• Solar Distribution Box
• Integrates with photovoltaic systems.

• Includes DC breakers, surge protection, and monitoring devices .

• Panelboard with Metering
• Combines distribution with energy metering.

• Useful for monitoring consumption in commercial or multi-tenant buildings .

• Power Distribution Unit (PDU)
• Common in data centers or server rooms.

• Distributes power to multiple devices efficiently, often with surge and overload protection .

• Fuse Box
• Traditional type using fuses instead of circuit breakers.

• Still used in older buildings or specific industrial applications .

• Modular Distribution Box
• Flexible design with DIN rails for easy installation of MCBs, RCDs, and other modules.

• Allows future expansion and customization .

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Key Selection Considerations
• Number of Circuits (Ways): Choose based on current load and future expansion.

• Phase & Voltage: Single-phase (230V) or three-phase (400V) depending on building requirements.

• Protective Devices: MCBs, RCCBs, RCBOs, surge protection, and isolators.

• Enclosure Rating: IP rating, material, UV and corrosion resistance.

• Compliance: Must meet local electrical codes and standards such as IEC 61439, UL/NEC, or BS 7671 . By selecting the appropriate type of distribution box and ensuring proper installation, buildings can achieve safe, reliable, and organized electrical distribution while minimizing risks of overloads, short circuits, and electrical hazards.

Article Content

Distribution Box and Selection Guide: Internal Structure, Components ...

Learn how to choose a distribution box and understand its internal structure, including MCBs, busbars, neutral bars,

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Learn what an electrical distribution box is in simple terms. Complete guide to panel types, NEC 408 requirements,

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A distribution box is an exposed or concealed metal box that houses the circuit breakers

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Common examples include junction boxes, outlet boxes, switch boxes, distribution boxes,

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In any electrical system, the distribution box is the heart and brain, a critical component that safely manages and distributes power

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