ZITHA TECH SPECIALTY CABLES (Pty) Ltd

Panel-operated distribution box



Overview

Electrical Control Panels & Distribution Boxes: Sizes, Types, and. Learn about control panels, breaker boxes, junction boxes, and custom enclosures. Expl.

Key Takeaways

A panel-operated distribution box is an electrical enclosure that safely distributes power from a main supply to multiple circuits, with individual control and protection for each circuit.Overview

A panel-operated distribution box (also called a distribution board, DB box, or panelboard) is a central hub in an electrical system that divides incoming electrical power into subsidiary circuits while providing protection through circuit breakers, fuses, or residual current devices (RCDs) for each circuit . It ensures safe, organized, and efficient power distribution in homes, commercial buildings, and industrial facilities .

Components

Key components of a panel-operated distribution box include:

• Main switch: Controls the overall power supply to the box.

• Circuit breakers or fuses: Protect individual circuits from overloads and short circuits.

• Residual-current devices (RCDs) or RCBOs: Provide protection against earth faults and overcurrent.

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• Busbars: Conduct electricity from the main input to the individual breakers.

• Indication lights: Show the status of mains power and circuit operation.

• Optional smart modules: Enable energy monitoring, remote control, and integration with home automation systems .

Materials and Construction

Distribution boxes are typically made from engineering thermoplastics like polycarbonate (PC) or ASA, or from epoxy-coated or powder-coated stainless steel for durability and safety . The enclosure is designed with a dead front, preventing contact with live parts while allowing access to breakers from the front .

Functions

• Power distribution: Divides the main supply into multiple circuits for lighting, appliances, or industrial equipment.

• Circuit protection: Prevents damage from overloads, short circuits, and earth faults.

• Isolation and maintenance: Allows individual circuits to be switched off for maintenance without disrupting the entire system.

• Energy management: Smart panel-operated boxes can monitor consumption and integrate with automation systems .

Applications

• Residential: Houses, apartments, and small offices use panel-operated DB boxes for lighting and appliance circuits.

• Commercial: Offices, retail spaces, and multi-unit buildings use larger panels with multiple breakers and RCDs.

• Industrial: Factories and plants use medium-voltage panelboards with custom enclosures, busbars, and control integration for machinery and automation systems .

A panel-operated distribution box is essential for safe, efficient, and manageable electrical power distribution, providing both protection and control over multiple circuits in any electrical installation.

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