

Structure of the primary distribution box



AI Overview

A primary distribution box serves as the main hub for distributing power from a transformer to secondary circuits, housing key components like isolating switches, circuit breakers, residual current devices, busbars, and protective enclosures.

Key Components

1. **Enclosure:** The outer shell, typically made of engineering thermoplastics (like PC or ASA) or epoxy-coated/powder-coated metal, protects internal components and ensures user safety.
2. **Isolating Switches:** Manually operated switches that allow sections of the circuit to be safely disconnected for maintenance or emergency purposes.
3. **Circuit Breakers:** These protect circuits from overloads and short circuits by automatically disconnecting power when faults occur.
4. **Residual Current Devices (RCDs/RCCBs):** Sensitive safety devices that detect imbalances between phase conductors, preventing electric shocks and enhancing protection.
5. **Busbars:** Solid copper or aluminum strips that distribute electricity from the main input to individual circuits within the box.
6. **Terminals and Connectors:** Points where incoming and outgoing wires are securely attached, ensuring proper electrical connections.
7. **Indicators and Control Modules:** Some primary distribution boxes include LED indicators, energy monitoring units, or communication modules for real-time status monitoring and remote control.

Functional Layout

Input Connection: The primary distribution box is directly connected to the transformer, typically receiving medium-voltage power (e.g., 0.4 kV) and converting it for distribution.

Power Routing: Power is divided into multiple sub-circuits, often supplying secondary distribution boxes or large loads like motors and machinery.

Protection and Safety: Each circuit is protected by breakers and RCDs, ensuring that faults do not propagate downstream and that personnel are safeguarded.

Three-Phase Handling: Primary boxes usually manage three-phase power and include larger three-phase breakers to handle high loads.

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Internal Structure of Distribution Box

This article discusses the construction of the distribution box, its functional divisions, and selection tips. This article can help you better

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