A comprehensive list of electrical distribution box specifications and prices with illustrations

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 vary widely in material, capacity, and features, with prices ranging from $20 for basic residential units to over $1,000 for advanced industrial models.Overview

A distribution box (also called a panel board, breaker panel, or load center) is a central hub for distributing electrical power safely across circuits. It houses circuit breakers, fuses, bus bars, and switches, protecting circuits from overloads and short circuits while enabling organized power distribution .

Key Specifications

1. Material and Construction

• Plastic (ABS, PC): Lightweight, corrosion-resistant, suitable for indoor and some outdoor applications .

• Metal (Steel, Aluminum): Durable, often used in industrial or outdoor environments; provides better protection against mechanical damage .

• Enclosure Thickness: Typically 4–6 mm for robust protection .

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• Ingress Protection (IP Rating): Common ratings include IP40 for indoor use and IP65 for weather-resistant outdoor units . 2. Electrical Ratings

• Voltage: Single-phase (120/240V) for residential, three-phase (208/400V) for commercial/industrial .

• Amperage Capacity: Ranges from 10A–200A for residential, up to 800A+ for industrial applications .

• Number of Circuits: Residential units often have 4–24 circuits; commercial/industrial units can exceed 100 circuits . 3. Mounting and Design

• DIN Rail Mounting: Standard 35mm rails for modular breakers .

• Wall-Mount or Rack-Mount: Options for indoor or server/data center installations .

• Modular Design: Allows expansion with detachable panels and clip-together assembly .

• Cable Entries: M20 or larger for easy wiring . 4. Safety and Features

• Circuit Breakers: Single- or double-pole breakers for overload protection .

• Bus Bars: Copper or aluminum strips for power distribution .

• Advanced Features: Smart monitoring, remote control, digital displays, and sensors for heat, moisture, or vibration detection in modern units .

• Environmental Considerations: Weather-resistant enclosures for outdoor use, fire-resistant materials, and compliance with IEC or local electrical codes .

Price Ranges

• Basic Residential Units: $20–$150, single-phase, 4–12 circuits .

• Advanced Residential/Small Commercial: $150–$500, three-phase, 12–36 circuits, enhanced safety features .

• Industrial/High-Capacity Units: $500–$1,500+, three-phase, 50+ circuits, smart monitoring, weatherproof enclosures .

• Customization: Prices increase with specialized mounting, labeling, integration with building management systems, or energy monitoring capabilities .

Illustrations and Examples

• Plastic DIN Rail Box: Compact, clip-together design, clear lid, suitable for PCB or sensor housing (e.g., 168x51mm, 155g), .

• IP40 GOLD Series Box: Yellow cover, spring mechanism, 2-port keystone module, suitable for residential/tertiary sector .

• Industrial Rack-Mount Box: 19" 3U chassis with blade modules for fiber or high-voltage distribution .

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• BAHRA Load Centers: Optimized size, hidden screws, cable management system, designed for residential and commercial buildings .
Selection Tips
• Assess Load Requirements: Match voltage, amperage, and number of circuits to your building's needs.

• Consider Environment: Choose IP-rated enclosures for outdoor or harsh conditions.

• Plan for Expansion: Modular designs allow future upgrades without replacing the entire box.

• Check Compliance: Ensure IEC or local electrical code certification.

• Factor in Smart Features: Advanced monitoring can reduce maintenance and improve energy efficiency. Investing in a quality distribution box ensures safety, durability, and operational efficiency, while modern features can provide long-term energy savings and system reliability .

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