Types of Temporary Power Distribution Boxes on Construction Sites

Overview

Temporary Power Distribution Box for Construction The design shown in the reference images brings together an IP-rated outdoor electrical enclosure, indust.

Key Takeaways

Temporary power distribution boxes, also known as spider boxes or portable PDUs, are classified by voltage, phase, capacity, mobility, and environmental protection to meet the dynamic needs of construction sites.

Voltage and Phase Classification

Temporary power distribution boxes are designed to handle different electrical loads depending on the site requirements: Single-phase boxes: Typically supply 120/240 V AC, suitable for small tools, lighting, and low-power equipment. Three-phase boxes: Provide 120/208 V or 277/480 V AC, ideal for heavy machinery, compressors, welders, and industrial equipment. Voltage-specific models: Some boxes are rated for specific applications, ensuring compatibility with the connected equipment and preventing overloads.

Capacity and Load Handling

Boxes are classified based on their power-handling capacity: Light-duty units: Handle small tools and temporary lighting, usually up to a few kilowatts. Heavy-duty distribution centers: Support multiple high-power connections simultaneously, often exceeding 3. 8 kW, and are used for large-scale construction operations.

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Portable power distribution carts: Mounted on wheels for easy relocation, combining moderate capacity with mobility.

Mobility and Installation Type

Portable units: Lightweight, easy to move, and designed for temporary setups where power needs shift frequently. Fixed temporary racks: Larger, more robust units that may remain in one location for the duration of a project phase.

Environmental and Safety Features

Construction sites expose electrical systems to harsh conditions, so boxes are classified by their protection and safety features: Weather-resistant or waterproof models: Often rated IP65 or higher, protecting against rain, dust, and debris. Impact-resistant enclosures: Made from aluminum, stainless steel, or reinforced plastics to withstand rough handling. Built-in safety devices: Include ground fault circuit interrupters (GFCI), overcurrent protection, and circuit breakers for each outlet.

Specialized hazardous-location units: Designed for Class I, Zone II (Div II) areas, suitable for welding or flammable environments.

Functional Classification

Spider boxes: Compact, portable units with multiple protected receptacles, ideal for distributing power from a single feeder to several tools. Distribution centers: Larger units that manage multiple circuits and higher loads, often used as central hubs for temporary site power. Industrial plug-equipped boxes: Use standardized connectors (e.g., CEE or IEC plugs) for safe, modular connections.

Regulatory ConsiderationsNEC 590 (US): Governs temporary installations, including voltage-drop planning, feeder sizing, and GFCI protection.

IE

C 60364-7-704 (International): Provides standards for construction and demolition site installations, including safety and voltage-drop limits. Temporary power distribution boxes are therefore classified based on voltage, phase, capacity, mobility, environmental protection, and regulatory compliance, ensuring safe, flexible, and reliable power delivery across dynamic construction sites.

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