

Three-level distribution box wiring system



Overview

According to the hierarchical and branch circuit principle, in a three-level distribution system, no electrical equipment shall be connected by bypassing levels.

Key Takeaways

A three-level distribution system distributes power hierarchically from the main distribution board to secondary and tertiary boxes, ensuring safe, controlled, and efficient power delivery to electrical equipment.

Overview of Three-

Level Distribution
First-Level Distribution Box (Main Distribution Box): Installed near the power source, it receives electrical energy and distributes it to second-level boxes. It typically contains the main circuit breaker, main leakage protector, voltmeter, and ammeter for centralized monitoring and control of the entire site.

Second-

Level Distribution Box: Located near power consumption areas or large equipment, it receives power from the first-level box and distributes it to third-level boxes. It usually contains branch circuit breakers and branch leakage protectors to protect individual circuits.



Third-

Level Distribution Box (Switch Box): Positioned close to the electrical equipment, it directly powers devices. Each switch box generally controls one piece of equipment or a group of similar devices, following the “one machine, one switch” principle. It contains isolation switches, circuit breakers, and leakage protectors for direct control and protection.

Wiring Principles

Hierarchical Wiring: No equipment should bypass levels; the main board should not connect directly to equipment, and each level should feed the next level only.

Separate Circuits: Power and lighting circuits should be separated, with distinct branch circuits and switch boxes. Distance Guidelines: Keep distribution distances short—main to secondary boxes ≤ 30 meters, switch box to equipment ≤ 3 meters.

Dry and Ventilated Installation: Ensure boxes are installed in dry, ventilated areas for safety.

Three-

Phase Distribution Box Wiring

Main Switch (MCCB): Connect all three phases from the input power supply to the MCCB input.

The MCC

B protects against overcurrent and short circuits.

Branch MC

Bs: Connect the output of the MCCB to the input of all 3-pole MCBs.

Each MC

B protects individual circuits or loads. Neutral and Earth Links: Connect the neutral wire from the supply to the neutral link and the earth wire to the earth link. If multiple links exist, interconnect them.

Load Connections: Connect each load's three-phase wires to the output of the corresponding MCB. Connect the load neutral to the neutral link and the load earth to the earth link.

Optional RCC

B: If required, install an RCCB after the main MCCB to provide additional leakage protection, then connect its output to the branch MCBs. Busbars: Use busbars to connect MCBs with the main MCCB for high-current circuits, ensuring safe and efficient distribution.

Safety and Reliability

Each level of distribution improves reliability by isolating faults and preventing a single failure from shutting down the entire system. Follow proper labeling, secure connections, and periodic inspection to maintain safety and efficiency. By adhering to these principles and wiring steps, a three-level distribution system ensures safe, organized, and reliable power distribution across a construction site or industrial facility.

Article Content

Essential Rules for 3-Level Electrical Distribution

According to the hierarchical and branch circuit principle, in a three-level distribution system, no electrical equipment shall be connected by bypassing levels.

three-level distribution system_switchgear_Switchboard_circuit

The three-level distribution system refers to a system that distributes electric power through three levels of distribution devices from the incoming power line at the construction site to

Step-by-Step Guide to Wiring a 3 Phase DB Box

Learn about the wiring process for a 3 phase distribution board (DB) box, including the necessary steps and safety precautions. Understand how to connect the

SELECT YOUR DISTRIBUTIONSYSTEM

With its new Increased Safety distribution system, Legrand offers three levels of service for so-called high criticality sites where it is impossible to shut down the network for maintenance (hospitals,

Three (3) Phase Distribution Board Wiring Diagram and

The three-phase distribution board is carefully designed to receive electrical power from a three-phase supply and distribute it to multiple circuits

Three Phase Distribution Box Functions and

It hides wires and lets you control many circuits from one spot. Electricians can change these boxes to fit what factories, big buildings, or even temporary places

Three-Tier Power Distribution System in a Newly Constructed

Learn about the three-tier power distribution system (main secondary tertiary distribution boards) in a new residential area including their roles connections and safety measures for 0.4kV power supply.

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, earth bars, RCDs, RCBOs, SPDs, enclosure ratings, and wiring layout.

Three Phase Electrical Wiring Installation in Home

In our today electrical wiring installation tutorial, we will show how to wire and install a Three Phase distribution board and Consumer Unit from utility pole to a 3

The difference between the first,second,and third levels of ...

As for the equipment inside, there are certain differences: the first level distribution cabinet generally has isolation switches, circuit breakers, leakage protectors, etc., the second level

Electrical Wiring Installation Diagrams & Tutorials

Explore basic electrical wiring diagrams and tutorials, including UPS, solar panels, batteries, single-phase, three-phase systems, and motor power control wiring.

3 Phase Distribution Board Layout and Wiring Diagram / Three phase

In this video, I try to explain three phase distribution board layout and wiring diagram. Three phase power supply is required, when the Power distribution requirement cannot be handled by a ...

Size determination, installation method and wiring mode of distribution ...

The distribution box is the central hub of the home circuit and the general control of our daily power consumption. It is an indispensable electrical equipment. If there are some potential safety hazards,

Industrial 3 Phase Electrical Distribution Box Guide

Explore the essentials of industrial 3 Phase Electrical Distribution Box for efficient power management in commercial settings. Get expert insights

How to Wire 3-Phase, 400V Distribution Board? IEC

How to Wire 120V & 240V Main Panel? Breaker Box Installation How to Wire 208V & 120V, 1-Phase & 3-Phase Main Panel? The following wiring diagram shows all the three phase loads and 3-Poles

Three Phase Distribution Box Functions and Applications Explained

A three phase distribution box safely distributes and protects power for large equipment in factories, buildings, and high-demand commercial settings.

Essential Rules for 3-Level Electrical Distribution

Follow key principles: no cross-level wiring, one machine-one switch, $\leq 30\text{m}$ box spacing, dry/ventilated installation for safe distribution.

The Meaning and Function of Primary, Secondary, and Tertiary ...

Forms part of the three-level protection system. Features inner and outer doors, powder-coated exteriors, and rainproof tops for outdoor use. Tertiary Distribution Box: The system includes a

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

