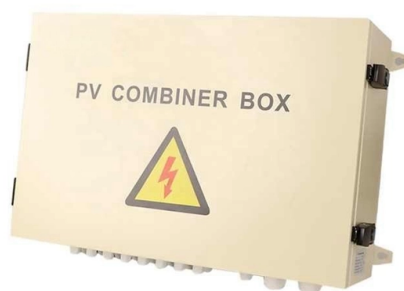


Detailed Configuration of Level 3 Distribution Box



Overview

Configuration of Level 2 and Level 3 Distribution Boxes The low-voltage power supply system at the construction site shall be equipped with a general distri.

Key Takeaways

A Level 3 distribution box requires a three-level protection hierarchy with ACB, MCCB, and MCB, proper material selection, leakage protection, and compliance with national and IEC standards. Three-Level Protection Hierarchy

A Level 3 distribution box follows a three-level protection configuration to ensure selective protection and reliable power supply:

- Primary Distribution – Air Circuit Breaker (ACB)
- Equipped with a short-time delay (0.1–0.5s) for selective coordination with downstream devices.
- Rated current: 1.2–1.5 times the transformer capacity.
- Short-circuit breaking capacity must exceed the maximum short-circuit current at the installation point.
- Typically installed at the conversion point in TN-C-S systems .

- Secondary Distribution – Molded-Case Circuit Breakers (MCCB)
 - Thermomagnetic type for general loads; electronic type for precise protection and communication.
 - Selectivity with the upstream ACB must be verified.
 - Motor circuits use D-type tripping curves .
- Tertiary Distribution – Miniature Circuit Breakers (MCB)
 - Modular, DIN rail-mounted.
 - Type B (3–5In) for resistive loads and lighting.
 - Type C (5–10In) for mixed loads and socket circuits.
 - Type D (10–20In) for inductive loads like motors and transformers.
 - Terminal circuits require RCBO or separate RCD for leakage protection .

Material and Construction Requirements

- Enclosure: Cold-rolled steel plate, rainproof, dustproof, suitable for outdoor use.
- Steel thickness: Distribution box $\geq 1.5\text{mm}$; switch box $\geq 1.2\text{mm}$.
- Surface treatment: Anti-corrosion coating.
- Certification: Must comply with national standards and CCC certification .

Installation and Layout

- Placement: Near power supply for main distribution; close to concentrated electrical loads for sub-distribution.
- Distance limits: Distribution box to switch box $\leq 30\text{m}$; switch box to controlled equipment $\leq 3\text{m}$.
- Internal components: N-line and PE-line terminal boards, busbars, circuit breakers, meters (voltmeter, ammeter, total current meter), and current transformer connections.
- Wiring: Secure grounding, proper insulation, correct wire gauge, and neat cable management .

Additional Considerations

- Power rating: Example main distribution box rated at 580 kW.
- Incoming cables: Double 3240mm² + 2120mm² armored aluminum core cables in parallel.
- Protection philosophy: "Three-level power distribution, two-level leakage protection, one machine one switch, one leakage one box" ensures safety and operational reliability .

- Standards compliance: Follow GB 50054, IEC 60364, and IEC 61439-3 for low-voltage distribution boards . By adhering to these configuration requirements, a Level 3 distribution box ensures safe, reliable, and code-compliant power distribution suitable for industrial, commercial, or construction site applications.

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