

Tonga Low-Voltage Distribution Box Configuration



Overview

Tonga XL-21 Power Distribution Cabinet-Dongfeng-covering various The XL type low-voltage power distribution cabinet uses domestically designed new componen.

Key Takeaways

Tonga low-voltage distribution boxes are designed for AC systems below 660V, with modular configurations, protection devices, and compliance with IEC, GB, and local Tonga Power standards. General Standards and Compliance

Low-voltage distribution boxes in Tonga, such as the MNS and XL-21 types, are designed to meet international and local standards. They comply with IEC 60439-1, GB7251.1, VDE0660, and British and American standards for low-voltage switchgear and controlgear assemblies . These standards ensure safe operation, reliable protection, and modularity for industrial, commercial, and civil applications.

Voltage and Current Ratings

- Rated main circuit voltage: AC 380V (XL-21)
- Rated insulation voltage: AC 660V
- Rated current: Up to 6300A for MNS switchgear; XL-21 supports $\leq 800A$ for outgoing circuits
- Auxiliary circuit voltage: AC 220V or AC 380V

- Suitable for single-phase and three-phase systems (IT, TN-C, TT) with 50-60Hz frequency .

Enclosure and Protection

- Enclosures are made of cold-rolled steel, stainless steel, or aluminum-zinc coated steel
- Protection levels range from IP30 to IP54, depending on the model and installation environment
- Fully isolated compartments meet Form 4 requirements for safe operation
- Doors and panels are equipped with operation buttons, indicator lights, and grounding screws for safety and maintenance .

Components and Configuration

- Circuit protection: Air circuit breakers (ACB), molded case circuit breakers (MCCB), fuses
- Control devices: Contactors, thermal relays, and optional knife switches
- Modular design: Components and compartments are modularized (e.g., 25mm units for MNS) for flexibility and expansion
- Installation: Wall-mounted or floor-mounted with front access for maintenance
- Mechanical interlocks prevent misoperation and ensure safe switching .

Environmental and Installation Requirements

- Ambient temperature: -5°C to +40°C (24-hour average $\leq 36^\circ\text{C}$)
- Altitude: ≤ 2000 meters
- Relative humidity: $\leq 50\%$ at +40°C; up to 90% at lower temperatures
- Tilt angle: $\leq 5^\circ$ from vertical
- Locations should be free from severe vibration, impact, and corrosive environments .

Tonga-Specific Guidelines

- Tonga Power Limited requires that low-voltage distribution systems maintain voltage within $\pm 10\%$ of nominal and operate reliably under normal load conditions
- Underground LV networks and package substations follow SEC Distribution Planning Standards, including the use of 400A MCCBs for outgoing feeders and direct connection to 300mm² aluminum cables
- Renewable energy integration must comply with Tonga Power's grid connection code, ensuring voltage stability and reactive power support .

Summary

Tonga's low-voltage distribution boxes are modular, safe, and compliant with international standards, suitable for industrial, commercial, and civil applications. Key considerations include voltage/current ratings, protection devices, enclosure IP rating, environmental conditions, and adherence to Tonga Power Limited's operational and planning guidelines. These standards ensure reliable power distribution, ease of maintenance, and compatibility with both conventional and renewable energy sources.

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