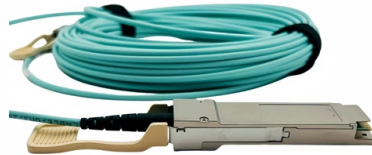


Dimensional parameters of low-voltage complete sets of equipment for hospitals



Overview

IEC 61439 Low Voltage Switchgear Design: Complete 2026 GuideMaster IEC 61439 low voltage switchgear design. Learn temperature limits, short-circuit verific.

Key Takeaways

Low-voltage complete sets of equipment for hospitals must comply with IEC 60364-7-710 and IEC 61439, ensuring safety, redundancy, and rated current capacity for medical locations. Key Standards and Compliance

IEC 60364-7-710 specifies requirements for electrical installations in medical locations, including hospitals, clinics, and mobile medical units, focusing on patient and staff safety. It mandates the use of IT systems with isolation transformers in critical areas (Group 2) to maintain continuity in case of insulation failure, along with insulation monitoring devices (IMD) and fault location detectors. IEC 61439 governs the design of low-voltage switchgear assemblies up to 1000V AC or 1500V DC, requiring verification of temperature rise, short-circuit withstand, dielectric properties, and protection against electric shock. All assemblies must meet uniform safety and performance benchmarks, whether type-tested or partially type-tested.

Dimensional and Electrical Parameters

- Rated Current and Busbar Capacity
- The main busbar must carry the total current without exceeding temperature rise limits.
- The rated current of the assembly (I_n) is determined by the lower of the sum of incoming circuit ratings or the main busbar rating.

- Outgoing circuits are designed with a rated diversity factor to account for simultaneous loading .
- Physical Dimensions
 - LV switchgear assemblies are modular, with compartmentalized design for separation of busbars, incoming, and outgoing circuits.
 - Dimensions vary depending on the number of circuits, rated current, and redundancy requirements, typically ranging from floor-standing cabinets (600–1200 mm width, 2000 mm height, 600–800 mm depth) to smaller wall-mounted units for local distribution .
 - Clearance and accessibility must comply with maintenance and operational safety requirements.
 - Insulation and Voltage Withstand
 - Assemblies must meet r.m.s. and impulse withstand voltage values declared by the manufacturer.
 - Insulation must prevent electric shock and withstand transient overvoltages .
 - Redundancy and Safety Circuits
 - Hospitals require dual power paths from the medium-voltage supply to critical medical locations.
 - Redundant transformers and UPS systems ensure continuity during maintenance or failure .
 - Safety circuits include arc fault detection, insulation fault location, and monitoring devices as per IEC 60364-7-710 clauses 710.411–710.421 .
 - Documentation and Verification
 - Each assembly must include diagrams, operating instructions, and verification reports.
 - Verification includes temperature rise tests, short-circuit withstand, and dielectric tests to ensure compliance with IEC 61439 .

Practical Considerations

- Customization: Each hospital installation is unique; dimensions and layout must be adapted to building architecture and medical equipment load.
- Maintenance Access: Adequate space around LV panels is required for safe operation and maintenance.

- National Deviations: Local regulations may modify IEC requirements, including earthing and climatic considerations . In summary, low-voltage complete sets for hospitals are modular, compartmentalized, and designed to carry rated currents safely while ensuring redundancy and compliance with IEC 60364-7-710 and IEC 61439 standards. Physical dimensions depend on the number of circuits, rated current, and redundancy, with typical floor-standing cabinets ranging from 600–1200 mm width, 2000 mm height, and 600–800 mm depth, while safety circuits and monitoring devices are mandatory for critical medical locations.

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