

Dimensions and parameters of high-voltage complete sets of equipment for data center interconnection



Overview

This document discusses the power requirements and electrical system design for a data center project.

Key Takeaways

High-voltage complete sets for data center interconnection are compact, modular systems integrating switchgear, transformers, and control units, designed for safe, reliable, and high-performance power distribution. Key Components and Parameters



High-Voltage Switchgear: These systems typically use vacuum circuit breakers or SF6 gas-insulated technology, providing excellent breaking capacity and insulation performance. They are designed to handle high currents and voltages, respond quickly to faults, and ensure stable operation of the power system . Typical voltage ratings for HV switchgear in data centers range from up to 36 kV for medium-voltage interconnections, with modular designs allowing scalability. **Transformers:** Transformers in HV complete sets can be dry-type or oil-immersed, optimized for high efficiency, low noise, and long lifespan. They are sized according to the data center load, often ranging from 500 kVA to several MVA, depending on redundancy and peak demand requirements . **Automation and Control Systems:** Integrated PLC and SCADA systems enable remote monitoring, fault detection, and automatic switching. These systems improve operational efficiency and energy utilization, providing real-time data acquisition and analysis . **Interconnection Systems:** For high-current connections, systems like TE Connectivity's HC-STAK provide safe, compact, and scalable HV interconnections. For example, the HC-STAK 25 system supports up to 1,000 VDC and 257 A with 50 mm² conductors, while the HC-STAK 35 system supports 407 A with 95 mm² conductors, ensuring reliable power distribution across modular units .

Dimensions and Design Considerations

High-voltage complete sets are designed to be compact and structurally integrated, facilitating installation in ring network, dual power supply, or radial distribution systems. They are typically modular, allowing for easy maintenance and scalability . The physical footprint varies depending on voltage and current ratings, but modular cabinets are often 1–2 meters wide, 2–3 meters high, and 1–1.5 meters deep, with weight ranging from hundreds of kilograms to several tons depending on transformer and switchgear size . **Safety and Reliability:** These systems include touch-safe designs, insulation barriers, and fault protection devices. HV modules are often air-insulated or gas-insulated, with spatial separation between control and high-voltage units to allow safe operation .

Applications in Data Centers

High-voltage complete sets are used to interconnect power distribution units, transformers, and backup systems in data centers. They ensure continuous, reliable power delivery, support redundancy architectures, and allow remote monitoring and automated fault management, which is critical for high-availability environments . In summary, high-voltage complete sets for data center interconnection combine switchgear, transformers, and automation systems in a compact, modular, and safe design, with parameters tailored to the voltage, current, and reliability requirements of modern data centers. They are scalable, maintainable, and optimized for high-efficiency power distribution.

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Interconnecting Generation under Rule 21 Solar for Business

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PJM Manual 14C

Major Electrical Equipment Delivery – Activities that represent the duration of the procurement, fabrication and delivery to site for

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TECHNICAL REQUIREMENTS

The requirements established in this document cover a broad spectrum of interests. The addition of DERs to the distribution system

7.3 Interconnection and Net Metering Standards

86 Because most DG is used to serve electric load at the customer's site, states approve the interconnection standards used for the

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