Micro-module computer room standards



Overview

Suitable for the green energy saving data center with fast, flexible deployment, small number of cabinets, large single cabinet load and limited height of the computer room.

Key Takeaways

Micro-module computer rooms are independent, prefabricated rack clusters designed with standardized power, cooling, cabling, monitoring, and security subsystems for rapid deployment and modular scalability.

Overview

A micro-module computer room is a small, self-contained data center unit composed of IT racks, uninterruptible power supply (UPS), near-end cooling equipment, and other essential subsystems arranged in a closed aisle configuration. By isolating the cold or hot aisle, the micro-module forms a relatively independent environment, minimizing interference from other modules and improving airflow efficiency. These units are prefabricated, factory-tested, and can be rapidly assembled on-site, allowing flexible deployment and modular expansion.

Structural and Functional Standards

Subsystems: Each micro-module should include a power supply subsystem, cooling subsystem, structural subsystem, generic cabling subsystem, and management/control subsystem. Monitoring and Security: Independent monitoring systems must be installed, capable of uploading data to higher-tier monitoring platforms. Security systems should operate independently to ensure module isolation.

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Airflow Management: The IT racks typically use front-inlet and back-outlet airflow, compatible with high-end switches. Closed cold or hot aisles prevent mixing of airflows, enhancing cooling efficiency. Power and Cabling: Power distribution, copper, and optical fiber cabling should be pre-laid with reserved lengths for connection after module placement.

Emergency drainage should be provided for chilled water cooling systems. Flexibility: Micro-modules are frame structures that can accommodate IT racks delivered by manufacturers or added by users. Fully integrated rack deployment may require additional equipment like rack lifters.

Deployment and Operational Guidelines

Indoor Environment: Micro-modules are designed to operate indoors and form independent environmental systems through closed aisles. Rapid Assembly: Prefabricated components allow for quick on-site assembly, reducing construction time and personnel requirements by up to 50% compared to traditional data centers. Scalability: Multiple micro-modules can be deployed independently, enabling stepwise expansion of large-scale data centers without physical interdependence.

Applications: Suitable for small and medium-sized data centers, branch offices, centralized managed distributed computer rooms, and modular growth-oriented facilities in sectors like government, healthcare, finance, and communications.

Advantages

Energy Efficiency: Isolated airflow and near-end cooling improve energy utilization. Operational Independence: Each module operates independently, reducing the risk of cascading failures. Flexibility and Speed: Prefabrication and modular design allow rapid deployment and easy expansion.

Integrated Management: Centralized monitoring and control of power, cooling, and security systems ensure stable operation. Micro-module computer rooms represent a standardized, modular approach to modern data center design, combining prefabrication, independent operation, and scalable deployment to meet diverse enterprise and industry requirements.

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Article Content

What is a micro-module computer room

A Micro Module refers to an independent operating unit that takes several functional cabinets such as IT cabinets, power supply units, and air conditioning terminal units as the basic unit, and includes

Open_Compute_Project_Intel_Motherboard_v3

This standard specifies the technical requirements of all-in-one micro-modular data center, including applicable environment, typical model of micro-module, power supply subsystem, cooling subsystem,

PICMG | MicroTCA

PDF file

Smart Modular Data Center Solution - ZTT Group

Suitable for the green energy saving data center with fast, flexible deployment, small number of cabinets, large single cabinet load and limited height of the computer room.

Modular Data Center Guide: Types & When It Wins | ModulEdge

For workloads above roughly 1 MW, the right answer is almost always a prefabricated room or a hybrid campus, not a stack of containers. For workloads under 100 kW that need to live

Gcabling Micro Data Center Solutions

The design of Gcabling micro data center adopts a modular architecture, which allows each subsystem module to be flexibly added or removed according to the specific needs of

Modular Computing Data Center Checklist — Charmlink Network

For AI and High-Performance Computing (HPC) applications—specifically in deployments exceeding 50 square meters where individual cabinet power consumption exceeds 10 kW—a double

Micro Data Center

Delta''s modular datacenter solution offers a datacenter environment that provides safe equipment operations within the racks, and supports the development and standardizing of micro datacenters

Technical functional characteristics of micro-module computer rooms

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Integrating the cabinet system, refrigeration, power supply and distribution, centralized monitoring and other systems into one, with a fully redundant design, it ensures the safe and reliable

A Design Guide and Checklist For Server Room Facilities

Server Room Design Considerations As with the design of a datacentre, the design of a computer or server room starts with a floor plan based on a standard floor tile and the selection of

THE GLOBAL DATA CENTER STANDARD

THE GLOBAL DATA CENTER STANDARD The globally adopted ANSI/TIA-942 Telecommunications Infrastructure Standard for Data Centers specifies the minimum requirements and guidelines for the

ANSI/TIA-942

THE GLOBAL DATA CENTER STANDARD The globally adopted ANSI/TIA-942 Telecommunications Infrastructure Standard for Data Centers specifies minimum requirements and guidelines for the

Application Research of Integrated Prefabricated Module Computer Room ...

the design process, shorten the construction period of data center and save relevant resources.The modular machine room can synchronously start the micro-module pre-manufacturing

The RCA Micromodule

" The micro-module is a new dimension in military electronics. It offers answers to the urgent and growing need for equipment which is smaller, lighter, more

ISO 14644 standards: Cleanroom guidelines for data centers

Discover how ISO 14644 cleanroom standards set guidelines for proper cleanliness and maintenance practices in controlled environments, such as data centers.

Requirements for the Design of ICT rooms

1 Introduction This document provides specification of the Norwegian HE sector''s recommended standards for the design of ICT rooms, and is a revision of Version 2, originally released on 2 July

UNM Data Center and Server Room Standard

Definition of Data Center / Server Room For the purposes of this standard, “Data Center” or “Server Room” refers to any physical space, room or building, where computers and related equipment (such

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African project coordination: Umhlanga Ridge, Durban, KwaZulu-Natal, South Africa

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

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