

Article Overview

A Cold Electricity Linkage Micro-module is a modular data center solution that integrates power, cooling, and intelligent management, using cold aisle containment and micro-channel cooling to optimize energy efficiency and operational reliability.

Overview

Cold Electricity Linkage Micro-modules are designed to provide highly integrated, modular, and scalable data center infrastructure. They combine power distribution, UPS systems, precision cooling, server racks, and intelligent monitoring into a compact, prefabricated unit, enabling rapid deployment and plug-and-play operation. These systems are particularly suited for edge computing nodes, small to medium enterprise data centers, and large-scale IDC facilities.

Cooling and Energy Efficiency

A key feature is the cold aisle or closed cold channel containment, which directs cold air precisely to high-density cabinets while removing heat efficiently. Compared to traditional open-air cooling, closed cold channels reduce air supply volume by up to 40%, achieving significant energy savings. Additionally, micro-channel cold plates with patented Micro Deformation Technology (MDT) can be integrated to cool high-power electronics, inverters, CPUs, GPUs, and other heat-intensive components, offering lower thermal resistance and reduced pressure drop.

Modular and Intelligent Design

These micro-modules adopt a hierarchical architecture with perception, control, execution, and management layers, enabling full-process intelligent operation and maintenance. Prefabricated and modular designs allow for rapid on-site assembly, often reducing deployment time from months to just 1-2 weeks. Intelligent monitoring systems (DCIM) provide real-time environmental and power management, enhancing reliability, availability, and maintainability.

Advantages

- o Energy Efficiency: Optimized cooling and precise airflow reduce power consumption and improve PUE (Power Usage Effectiveness).
- o Rapid Deployment: Modular, pre-tested units simplify installation and commissioning.
- o Scalability: Systems can be expanded or reconfigured according to business needs.
- o Reliability: Integrated UPS, power distribution, and monitoring ensure stable operation of IT equipment.
- o Cost Reduction: Lower construction and operational costs due to standardized modules and energy savings.



Cold Electricity Linkage Micro-module

Applications

Cold Electricity Linkage Micro-modules are widely used in:

- o Data centers with high heat density
 - o Edge computing facilities
 - o Telecommunications and enterprise IT infrastructure
 - o Renewable energy and industrial electronics requiring precise thermal management
- These systems represent a green, intelligent, and flexible approach to modern data center design, combining energy-efficient cooling with integrated power and monitoring solutions.

Explore how direct die liquid cooling offers a scalable, high-performance thermal integration

Cold Electric provides innovative cold plate technology for sustainable energy storage and power solutions.

To increase the energy flexibility and economy of the system, this research establishes a cooling-heating-electricity

Assemble such that the Peltier module will not damage anything while it heats up! Do not

Renewable energy power generation forecasting and cold storage energy supply adaptation are discussed, and the

Scientists have created a miniature 2D device that can convert heat into electricity with record-breaking efficiency at

The closed cold channel system module in data centers achieves green energy conservation through closed cold channels, which is

Power electronics distributor PPM Power has developed cold plates that offer integrated cooling of power modules, DC

The KITOZER Intelligent Micro-Module Data Center Infrastructure System is a highly

We offer advanced plate-to-air thermal management solutions designed for efficient heat transfer from thermally conductive plates to

This method draws heat directly away from high-power components such as CPUs, GPUs,

This tiny power module could change how the world uses energy Date: January 19, 2026

Deployable in restricted spaces and any type of environment, including harsh conditions, this modular solution uses significantly less

Seven different new designs of minichannel cold plates (MCPs) are proposed in this work for the cooling of Li-ion

In this paper, the working principles of thermoelectric modules are discussed together with a review of different relevant aspects,

This review aims to provide a quick reference for researchers and industry experts in designing cold thermal energy

Web: <https://supremeacademicresearch.co.za>

