Liquid-cooled modular data center



Overview

Pre-Fabricated Modular Data Center Cooling | LiquidStackDataTank Modular represents the most advanced technology in pre-fabricated, 2-phase immersion-coole.

Key Takeaways

Liquid-cooled modular data center products provide scalable, high-efficiency cooling for AI, HPC, and high-density workloads, using CDUs, direct-to-chip systems, and immersion technologies.

Overview of Liquid Cooling Solutions

Liquid cooling is increasingly essential for modern data centers, especially those handling AI workloads, GPU servers, and high-density IT environments. Unlike traditional air cooling, liquid cooling removes heat directly at the source, improving energy efficiency and enabling higher compute density. Modular designs allow data centers to scale cooling capacity as demand grows, from small edge deployments to hyperscale facilities.

Key Product Types1. Coolant Distribution Units (CDUs) CDUs are central to liquid-cooled modular systems, distributing coolant to racks or servers. Examples include: Munters LCX: Liquid-to-liquid CDU for mission-critical data centers, supporting AI and high-density workloads with precise coolant control and high reliability.

Schneider Electric MCDU-70: 2. 5MW CDU with centralized controls, scalable beyond 10MW for AI and HPC environments.

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Liquid

Stack Direct-to-

Chip CDUs: Modular, scalable platforms delivering up to 14MW of high-density cooling, suitable for hyperscale AI infrastructure. 2.

Direct-to-

Chip Cooling This approach delivers coolant directly to the CPU, GPU, or other heat-generating components, maximizing thermal efficiency.

Rittal and Liquid

Stack offer solutions that integrate seamlessly into existing IT infrastructure, with outputs ranging from 70 kW to 1 MW per rack. 3. Immersion Cooling Two-phase immersion cooling submerges servers in dielectric fluids, providing ultra-efficient heat removal.

Liquid

Stack offers modular immersion tanks for edge, micro, and full-scale data centers, achieving significant energy savings compared to traditional cooling.

Modular and Scalable Deployment

Modular liquid-cooled products allow incremental expansion without major infrastructure changes. Systems can be deployed in small containers (up to 250 kW) or full modular containers (up to 1. 5 MW), supporting rapid scaling for AI and HPC workloads.

Redundancy, hot-swap components, and advanced monitoring ensure high operational reliability.

Energy Efficiency and Sustainability

Liquid cooling reduces power usage effectiveness (PUE) and water usage effectiveness (WUE) while enabling energy reuse opportunities, such as district heating or industrial applications. Two-phase immersion systems can reduce cooling energy consumption by over 90% compared to traditional air-cooled data centers. SummaryLiquid-cooled modular data center products, including CDUs, direct-to-chip systems, and immersion tanks, provide: High-density cooling for AI and HPC workloadsScalable, modular deployment from edge to hyperscaleEnhanced energy efficiency and sustainabilityReliable, redundant operation with minimal downtime These solutions are increasingly critical as data centers transition from air-based cooling to liquid-cooled architectures to meet the demands of next-generation computing.

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Article Content

Pre-Fabricated Modular Data Center Cooling | LiquidStack

DataTank Modular represents the most advanced technology in pre-fabricated, 2-phase immersion-cooled data centers. Offering massive compute

Direct Liquid Cooling in Hyperscale Data Centers | Rittal

Our liquid-to-air solutions cool heat-generating components like the AI chip using a water/glycol mixture which is air-cooled via the rear door of the rack. They are used in individual IT racks or in data

Data Center Liquid Cooling: The AI Heat Solution

Advanced AI chips are generating more heat in data centers, necessitating improved cooling solutions. Liquid cooling is becoming a viable alternative to traditional fan-based systems.

Liquid cooling solutions for AI and high-density data

Our advanced liquid cooling ensures peak thermal performance for AI and high-density workloads, keeping your data center efficient even under extreme

Liquid Cooling for Data Centers | Munters

Explore liquid cooling for data centers, including hybrid architectures, CDUs and system design for AI, HPC and high-density workloads.

DCX Liquid Cooling Systems

Each module is self-contained, scalable, and quick to deploy, enabling data centers to expand capacity on demand without sacrificing uptime. This modular design

Nvidia Vera Rubin: Data Center Impact Explained | ModulEdge

Nvidia Vera Rubin: 190-230 kW VR200 racks in H2 2026, 600 kW Kyber in 2027, 800 VDC power, all-liquid cooling, and stranded-facility risk.

Data Center Power, Infrastructure, and Cooling

Unlock your data center capacity and global scale with a comprehensive data center power and compute portfolio from Flex.

Data centre cost trends

On top of the core costs for traditional data centre construction shown in our index, which allows for the most accurate comparison between global regions, our latest analysis for projects within the US

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AI Server Market Update: Vendors Shift from Silicon to Services

With GPUs standardized around Nvidia, vendors compete on AIOps, liquid cooling, and deployment services as enterprises ramp up inference in 2026. Image: Nvidia The AI server market

AI Data Center Energy Consumption Statistics 2026: The Definitive Data ...

Global data center electricity hit 460–490 TWh in 2025, up 17% YoY. IEA, DOE, and Epoch AI primary-source data on AI energy demand, water use, capex, and our original AEII™

Compute Forecast | Insights on AI, Data Centers

Stay ahead of the compute economy with Compute Forecast- delivering research, news, and strategic analysis on AI, data centers, cloud, and

Building data centers bigger, faster | McKinsey

Advanced cooling technologies, such as immersion cooling and liquid cooling, are being implemented inside data centers to manage the heat that high

Schneider Electric Launches New Data Center Solutions to Meet ...

Evolving its EcoStruxure™ Data Center Solutions portfolio, Schneider Electric introduced a Prefabricated Modular EcoStruxure Pod Data Center solution that consolidates infrastructure for

Cooling Recent News

Explore the latest news and expert commentary on Cooling brought to you by the editors of Data Center Knowledge

Data center industry news, analysis, and opinion

Emma Strutton speaks with Andy Tolbert of Echelon Data Centres on AI-driven power density, liquid cooling adoption, evolving electrical systems, and hybrid energy strategies for next

Liquid Cooling Data Center: DLC, Immersion, RDHx

This post covers why air cooling fails above 30 kW per rack, how each liquid cooling method works, a side-by-side comparison of cost, density, and PUE impact, and why factory

Microsoft Word

This whitepaper explores the dynamic world of liquid cooling, with a particular focus on Direct-on-Chip Cooling, shedding light on its advantages and environmental implications.

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