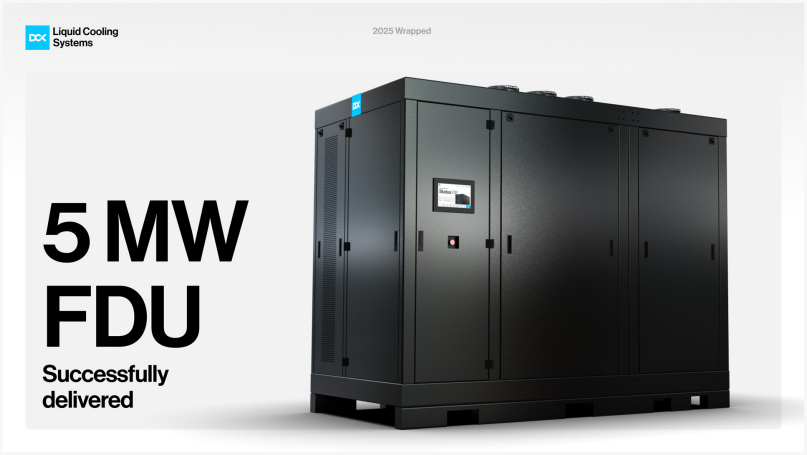
World's first 5MW Coolant Distribution Unit is now operational in data centers in Europe and The United States

The Facility Distribution Unit (FDU) is a 5-megawatt liquid cooling system, engineered to serve entire data halls. It is now operational in AI data centers

Facility Distribution Units in DCX Liquid Cooling Systems' warehouse



WARSAW, MASOVIAN, POLAND, January 16, 2026 /EINPresswire.com/ -- The rapid advancement of generative artificial intelligence has triggered a global technological arms race. Next-generation AI models not only learn faster and process increasingly large datasets, but most critically, demand unprecedented levels of compute power. This shift is placing immense pressure on data centers, accelerating the adoption of liquid cooling solutions and transforming the design of AI infrastructure to support high-density computing at scale.

This shift is accompanied by a sharp increase in power density – not incremental, but exponential. In modern AI clusters, 60-120 kW per server rack has become the new standard, with early deployments already exceeding 200 kW per rack. According to the latest hardware vendor roadmaps, by 2027, single rack deployments may require up to 600 kW of cooling capacity.

In this context, traditional liquid cooling systems based on distributed, in-row Coolant Distribution Units (CDUs) are reaching their limits. Each in-row CDU module typically serves a small group of racks, requires white space floor allocation, demands independent maintenance, and adds significant installation and operational overhead. When scaled to support tens of

megawatts of IT load, this architecture becomes inefficient, costly, and increasingly difficult to maintain.
To address these challenges, we propose a new cooling topology – centralized, resilient, and purpose-built for the needs of large-scale AI deployments. The Facility Distribution Unit (FDU) is a 5-megawatt liquid cooling system installed outside the white space, engineered to serve entire data halls. It replaces dozens of scattered CDUs, simplifies cooling infrastructure, and significantly reduces the risk of failure near mission-critical IT hardware. It is now operational in AI data centers located in France and the East Coast of the United States.

Benefits of Facility Distribution Unit

Liquid Cooling Systems
The official logo of DCX Liquid Cooling Systems

What is a Facility Distribution Unit?
Facility Distribution Unit (FDU) is a centralized coolant distribution unit used in direct liquid cooling systems for large-scale server clusters, including GPU-intensive environments. Unlike traditional Coolant Distribution Units (CDUs), which are typically installed locally in IT rows, the FDU is deployed outside the white space – either in a technical corridor or even outside. This relocation fundamentally changes both the cooling architecture and the physical design of data centers.

The new cooling topology based on FDU eliminates the legacy model of numerous distributed small cooling loops (each with its own CDU, pump, and heat exchanger) and replaces them with a single, high-capacity unit supporting the entire IT zone through centralized supply and return loops. This significantly reduces the number of critical components placed directly near the IT hardware.

With high-pump head capabilities (loop reach exceeding 50□m), FDUs allow flexible placement of high-density racks based on power availability, structural constraints, or cabling, rather than proximity to cooling units. The use of standardized loop topology ensures repeatability across deployments: whether the system supports 20 or 200 racks, the piping layout, controls, and integration logic remain consistent. This reduces engineering effort, commissioning time, and the likelihood of configuration errors.

From a logical architecture standpoint, the FDU becomes the central node of the thermal cooling system, bridging the chilled water source with the downstream distribution network that feeds

manifolds and server-side cold plates. As a result, local CDUs become obsolete – their function is taken over by a centralized FDU offering greater capacity, longer reach, and full diagnostic control via the facility management layer.

Key technical features of the 5 MW FDU unit:
1) Designed for full data halls and large-scale AI deployments:The 5 MW FDU provides the highest heat transfer capacity per unit available on the market, eliminating the need for dozens of in-row CDUs in high-density deployments.

2) Supports up to 60 AI racks at 80 kW each: Capable of supporting to 60 AI racks, each consuming around 80 kW and equipped with NVIDIA H100 GPUs or equivalent, enabling seamless operation of over 1,000 servers.

3) Compact footprint with high output capacity: At just 3.0 m (L) × 1.5 m (W) × 2.3 m (H), the unit delivers unmatched capacity per square meter, ideal for space-constrained facilities.

4) Smart 37 kW inverter system with predictive diagnostics: Embedded accelerometers, pressure and incline sensors feed a remote analytics platform. It enables early detection of operational anomalies, such as: dirty filters, sand fouling and debris buildup, pump wear or impeller damage, rising system friction or degraded hydraulic performance.

4) High pump head and multi-pump redundancy (N+1):Equipped with four industrial-grade pumps, each capable of 8,000 L/min, with peak burst performance up to 10,666 L/min. The unit includes multiple built in pumps that delivers twice the power of standard high-capacity CDUs, along with N+1 redundancy pumps. This makes it perfectly suited for large-scale secondary loop configurations that require high reliability.

5) Redundant electronic control panel with LCD HMI: Dual-path logic with redundant PLC controllers ensures full local control and immediate system response in case of alerts or anomalies. The intuitive, crystal-clear HMI interface gives operators real-time visibility and 24/7 operational control.
Integrated coolant conditioning system: Maintains coolant purity without the performance penalties associated with glycol-based fluids such as PG25, which can cause up to a 20% efficiency loss.

6) Customizable heat exchanger: The FDU contains a single, high-capacity heat exchanger that can be resized by removing or adding plates to match project-specific requirements.

7) Full compliance with Tier 3 Uptime Institute requirements: FDUs provide higher fault tolerance compared to legacy systems. With an N+1 redundant configuration: additional pumps and components – they continue operation during maintenance or a single-point failure. Centralized monitoring and onboard sensors also enable proactive diagnostics before issues impact IT hardware.

8) Future-proof scalability: Computing power demand from next-gen AI workloads is inherently unpredictable – models evolve faster than infrastructure investment cycles. FDU based cooling offers an adaptive, scalable architecture capable of supporting rapid increases in rack power density without requiring complete redesigns.

About DCX Liquid Cooling Systems
DCX Liquid Cooling Systems is a premier global manufacturer offering an extensive range of sustainable liquid cooling solutions, including both Direct Liquid Cooling and Immersion Cooling technologies. The company designs & manufactures Server Immersion Enclosures, Coolant Distribution Units (CDUs) including Hyperscale FDU (Facility sized CDU) system, CPU and GPU coldplates, manifolds and other components of liquid cooling system. DCX delivers Hydro & Immersion Containers and facility-based systems. DCX supplies Immersion Optimised Dry Coolers and a Thermasafe Dielectric Engineered Fluids. Hardware solutions are complemented with liquid cooled data hall design and implementation services, making DCX the first choice for liquid cooling systems' supplier.

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