Cooling the AI revolution

Artificial intelligence (AI) workloads are running hotter than ever – literally. Next-generation chips push performance to new heights, but the heat they generate is beyond what traditional air cooling can handle. Boyd, partnering with Alfa Laval's heat exchanger expertise, developed a breakthrough in-row coolant distribution unit (CDU) with unmatched capacity. Compact yet powerful, it delivers up to 2.3 MW of cooling, empowering data center owners and operators to scale AI with confidence.

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determined that the Alfa Laval heat exchanger met their demanding requirements.

Other heat exchangers fell short on efficiency and pressure drop. In contrast, the unique plate geometry of the Alfa Laval heat exchanger provided the perfect balance between heat transfer efficiency and hydraulic performance. Every heat exchanger is engineered around seven key parameters – from plate pattern to channel arrangement, allowing Alfa Laval to fine-tune every unit for maximum output in minimal space. This optimization delivers the best trade-off between capacity, footprint and pressure drops.

"Its efficiency and optimized pressure drop clearly set it apart," says Toth. "The CDU keeps the technical water loop and the facility water loop temperatures as close as possible, maximizing heat transfer efficiency while minimizing energy consumption as the heat is dissipated from the facility loop to the outside ambient."

A strong collaboration delivers
Boyd and Alfa Laval worked together, applying system-level cooling expertise to tailor engineering for the heat exchanger. Using advanced modeling tools, Alfa Laval accurately predicted real-world thermal and hydraulic performance, streamlining development and enabling Boyd to gain confidence in the heat exchanger design before testing.

Boyd highlighted the value: fast validation, reliable global supply, and solid collaboration.

Next-gen cooling for next-gen AI
As servers pack more power into smaller spaces, traditional cooling struggles to keep up. The Boyd ROL2300 CDU changes that. At its core is a custom Alfa Laval brazed plate heat exchanger ultra-compact, highly efficient, and powerful enough to maintain optimal operating temperatures for multiple AI racks. The result? Stable, reliable operation even under the heaviest workloads.

Non-stop cooling for the AI era
Liquid cooling is no longer optional – it is the way forward. That's why Boyd designed the ROL2300 CDU and selected Alfa Laval's heat exchanger for its compact footprint and exceptional efficiency.

"Every ROL2300 CDU design choice was made to maximize data center cooling and energy efficiency in the most compact and reliable format possible," says Jerry Toth, Boyd's chief technology officer. "We're enabling our hyperscale, colocation,

and enterprise data center customers to maximize compute density and energy efficiency in modern data centers."

Unmatched cooling efficiency
Liquid cooling is a proven approach to reducing energy consumption in modern data centers, enabling significant improvements in power usage effectiveness. Within this context, the Boyd CDU acts as a key enabler, ensuring efficient heat transfer between the facility loop and the IT equipment.

With the compact, highly efficient Alfa Laval heat exchanger, Boyd's CDU optimizes white space utilization, maintains precise temperature control, and maximizes energy savings by keeping servers within the ideal operating range.

Performance like no other
When developing the ROL2300 CDU, Boyd needed a brazed plate heat exchanger capable of delivering peak performance in a compact footprint. After evaluating several options, Boyd

"Our engineers worked closely and collaboratively with Alfa Laval to develop the optimized heat exchanger design for the ROL2300, maximizing its performance, efficiency and reliability."

Jerry Toth, chief technology officer at Boyd

At a glance

Challenge: AI workloads push air cooling beyond its limits

Solution: Enable liquid cooling with Boyd ROL2300 CDU with optimized Alfa Laval plate heat exchanger

Result: Reliable, high-efficiency in-row liquid cooling

– Provides up to 2.3 MW of cooling capacity
– Maximizes rack density and energy efficiency
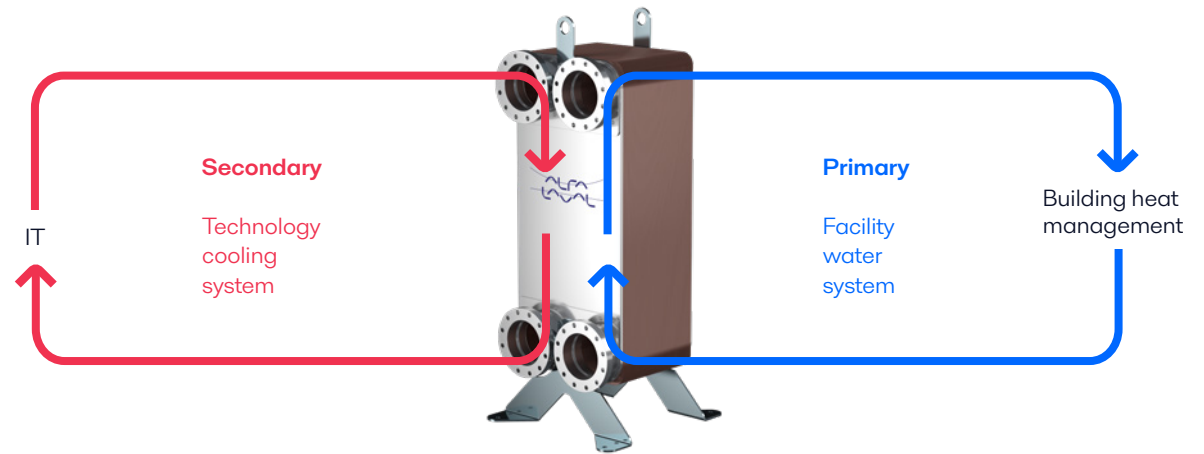– Fits seamlessly into AI-heavy data centers

Boyd ROL2300 CDU
A high-capacity data center cooling system designed to deliver efficient thermal management by leveraging facility water in an in-row cooling configuration.

Alfa Laval CB series
Compact, efficient and customizable, Alfa Laval CB brazed heat exchangers are ideal for thermal management in demanding, space-limited installations such as data center CDUs for AI applications.

The cooling distibution unit: CDU

Secondary — Technology cooling system — IT

Primary — Facility water system — Building heat management

Cooling without compromise

With the custom Alfa Laval heat exchanger integrated into its liquid-cooling ROL2300 CDU, Boyd is now redefining what's possible in AI data center cooling. Operators can:

– Scale AI workloads with confidence
– Maximize rack density without overheating
– Lower energy and operating costs
– Fit high-capacity cooling into existing facilities

The ROL2300 CDU is a platform for growth, enabling data centers to meet today's AI demands and prepare for the next wave of high-performance computing. Every design choice focused on delivering maximum cooling and efficiency in the most compact, reliable format possible.

The collaboration also enabled Alfa Laval to demonstrate its ability to deliver large-volume, high-quality components on time through a robust global supply chain. With demand for data centers growing rapidly worldwide, Alfa Laval has proven to be the right partner to meet this need.

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Contact Alfa Laval
Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com

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