



Case Study:

Avtron LC35 Liquid Cooled Load Banks
for Apx Data Centre Solutions

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Client: Apx Data Centre Solutions - A leading Coolant Distribution Unit manufacturer for Data Centres

Location: Lyon, France

Background & Challenge

Apx Data Centre Solutions, a leading manufacturer of coolant distribution units (CDUs) for the rapidly evolving data-centre market—where liquid cooling is rapidly becoming essential to support next-generation high-density compute—must continually advance its expertise in thermal management technology. To guarantee absolute reliability, Apx requires test environments that precisely mirror the conditions encountered in live data-centre operations.

For Apx, proving system resilience means pushing their cooling systems to their operational limits long before deployment in any customer facility. Achieving this level of accuracy demands that their load-testing equipment be fully integrated within their in-house, Eurovent-certified laboratory. Only then can Apx produce a truly representative demonstration of real-world performance.

Key Challenges:

- **Precise and Repeatable Test Conditions:** Apx required load-testing equipment capable of delivering identical test profiles with absolute precision every time. To validate advanced thermal-management systems, they needed consistent, controlled load behaviour that accurately replicated real data-centre rack conditions.
- **Simulate Variety of Load Changes:** To fully stress their cooling systems, Apx needed the ability to ramp power up and down instantly, introduce aggressive spikes, and run irregular or chaotic load patterns. This demanded a load bank that could react quickly, simulate extreme operational scenarios, and apply stress conditions far beyond normal steady-state testing. It also required the ability to transfer electrical energy into liquid heat-energy circuits at a very high rate of efficiency (>97.5%).
- **Data Capture, Fast Setup and Strong Support:** Apx required a solution that offered clear data logging, seamless integration, and straightforward commissioning so results could be monitored, captured, and analysed effortlessly. Equally important was having a responsive support team to assist with setup, programming, and ongoing testing control to ensure their lab environment operated flawlessly.

COOLANT DISTRIBUTION UNITS (CDU) EXPLAINED

A coolant distribution unit (CDU) is the central system that manages and circulates liquid coolant between high-density IT racks and a data centre's facility cooling plant. It keeps the two loops separate for safety, using a heat exchanger to transfer heat from the server coolant to the building's chilled water system, while precisely controlling temperature, pressure, and flow.

In modern liquid-cooled data centres—especially those supporting GPU-heavy or AI workloads—a CDU ensures stable, efficient heat removal and rapid response to thermal spikes. In short, it's the key piece of infrastructure that makes reliable, high-density liquid cooling possible.

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Technical Overview

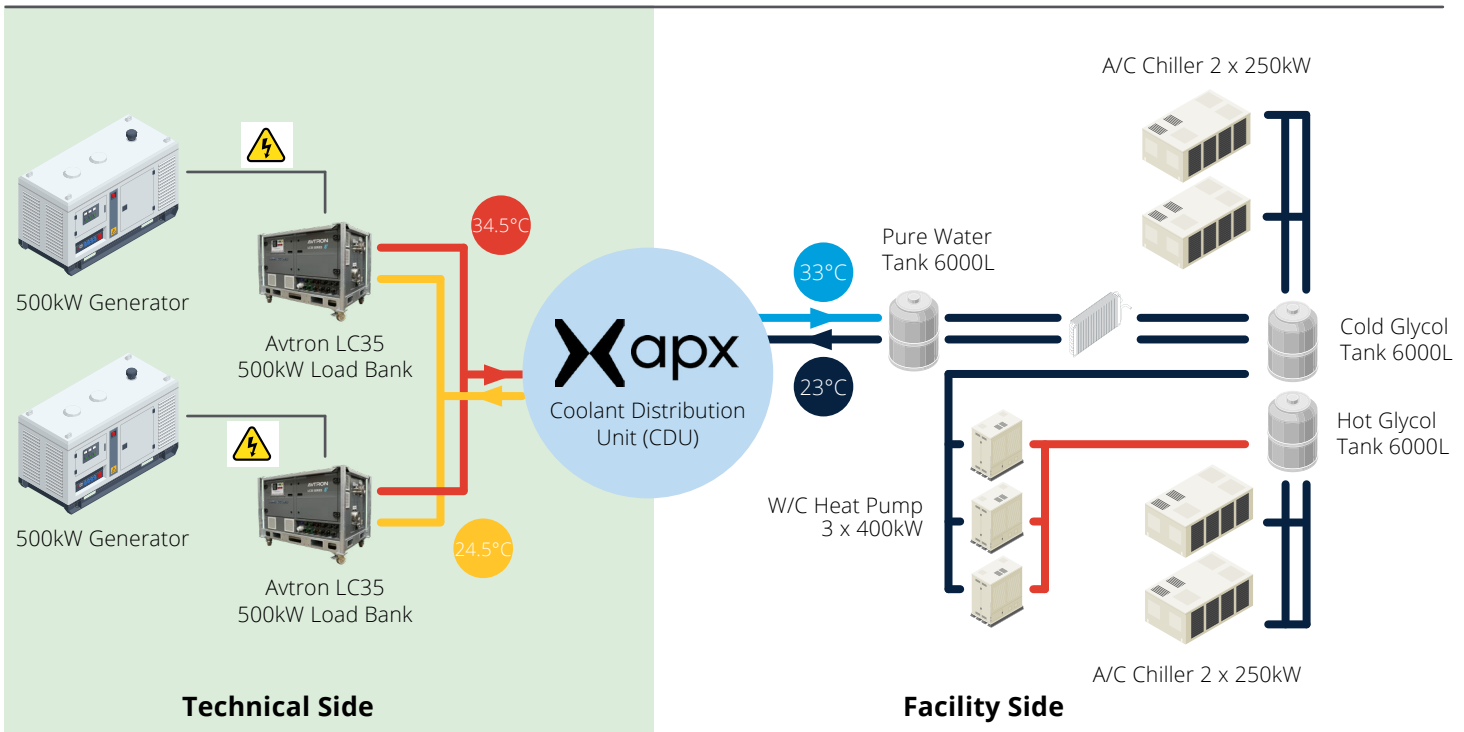
The Apx laboratories offer validation of equipment performance in a particular environment to replicate full scale, high density data centre thermal conditions with precision and repeatability. At the heart of the setup are two Avtron LC35 500 kW liquid-cooled load banks, each powered by an independent 500 kW generator. This configuration enables Apx to generate controlled thermal loads up to 1 MW without relying on facility power, while the LC35 units interface directly with the Apx CDU to emulate real rack-level heat rejection.

The test environment is structured around a dual-loop architecture. A pure-water facility loop, buffered by a 6,000 L tank, supplies tightly controlled flow and temperature conditions to the CDU, typically operating around 23 °C supply and 33 °C return. The Apx CDU acts as the central thermal hub, isolating this loop from the technical glycol loop while managing flow, pressure, and ΔT to simulate realistic cooling behaviour.

On the facility side, a 6,000 L cold-glycol tank and a 6,000 L hot-glycol tank feed a high-capacity cooling plant that includes two pairs of 250 kW A/C chillers and three 400 kW water-cooled heat pumps.

The setup allows Apx to deliver precise steady-state conditions or introduce aggressive thermal transients by switching between hot and cold sources, enabling testing across a wide dynamic operating envelope.

Across the system, integrated instrumentation captures temperature, flow, pressure, and electrical load data, while Avtron's programmable control interface allows Apx to run reproducible test sequences or highly erratic load patterns to stress CDU performance. The result is a fully controllable, high-capacity liquid-cooling validation platform that allows Apx to test, characterise, and refine their CDU technology under any conceivable real-world operating scenario.





Solution

To meet these stringent requirements, Apx selected the Avtron LC35 liquid-cooled load banks as a core component of their test and validation process. The LC35 units have since become a critical and highly valued asset within Apx's laboratory environment.

These load banks allow Apx to accurately replicate the thermal and electrical behaviours of high-density server racks, providing the exact testing conditions encountered in modern data-centre environments. For Apx, this capability is vital in validating both the efficiency and the stability of their CDU systems when subjected to realistic operational stress.



"The LC35 gives Apx the precision and dynamic control needed to push our cooling systems to real-world limits. The ability to simulate high-density rack behaviour with complete accuracy is exactly what makes these load banks so valuable in advanced thermal testing environments."

— Ted Pulfer, Director of Sales and Marketing, Apx Data Centre Solutions

The LC35 is available now as a proven, production-ready load bank for operators and manufacturers looking to push their liquid-cooling technology to real-world limits. Visit avtronpower.com or apx-dcs.com for more information.



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