

Coolant Distribution Unit (CDU)

1MW Liquid-Liquid Heat Exchanger for Liquid Cooled & Hybrid Data Center Architectures



The Global Critical Cooling Specialist



Global Locations:

- **Leeds, UK**
Global Headquarters
Chillers, R&D, Test Labs,
Training Center
- **Bradford, UK**
CDUs, CRACs, CRAHs,
Fan Walls, Test Center
- **Consett, UK**
Air Handling Units
- **Guadalajara, ES**
CRAHs, Fan Walls,
Test Labs
- **Calgary, CN**
Air Handling Units
- **Allen, TX, US**
Immersion Cooling
- **Rockbridge, VA, US**
Chillers, Test Lab
- **Grenada, MS, US**
CDUs, CRAHs,
Fan Walls, Test Lab
- **Dubai, UAE**
Sales Office

In industries where cooling is critical, you need a critical cooling specialist. Airedale by Modine is a world leader in the delivery of innovative thermal management solutions in mission-critical environments like data centers, healthcare and telecoms. As part of the US-based Modine group, our global organisation is Engineering a Cleaner, Healthier World™.

At Airedale, we believe that air conditioning has a critical role to play in an ever-changing world. We also passionately believe that air conditioning manufacturers must play a responsible role in an era where sustainability is key to the preservation of our planet.

Airedale's success is a testament to its long-standing history of providing flexible, innovative, and efficient cooling solutions.

Our systems approach and ability to combine hardware and software ensures that cooling systems work smarter, not harder, to deliver more cooling for less power with 24/7 availability.

Significant software and service capabilities further enhance Airedale's product pedigree, providing complete visibility, harmony, support, and autonomy of our installations.

Coolant Distribution Unit (CDU)

Engineered to accelerate digital transformation and meet the needs of next-generation CPUs and GPUs, Airedale by Modine's CDUs enable liquid cooling in high-density IT applications.

Airedale by Modine's CDUs are designed for direct-to-chip and hybrid cooling environments, including rear door heat exchanger (RDHx) applications that facilitate simplistic, modular, efficient and performance-driven deployments.

Key Features, Proven Benefits:

- Engineered to perform, resilient and reliable with in-built redundant pumps, filtration and intuitive system controls to support load fluctuations with precise coolant delivery.
- Configuration flexibility with option to select standard model or work with us to develop custom configurations.
- Modular and global design, with ability to apply and deliver wherever your projects are.
- Seamless integration into in-rack server profiles or facility rooms, Airedale by Modine's CDU is compatible with your existing infrastructure to create a dynamic, end-to-end, future-proof thermal management system.



1 MW Capacity

Compact footprint & maximized power density for liquid/hybrid enablement



Redundancy

N+1 pumps, drives and filters allow for the isolation of redundant leg for service/maintenance during operation



Filtration

Extra large filter bodies to maximize filtration area, minimizing risk of contamination.

Standard filtration of 50 μ



Access

Front accessible components (control panel, VSDs, expansion tank, filter cartridges)

System Configuration

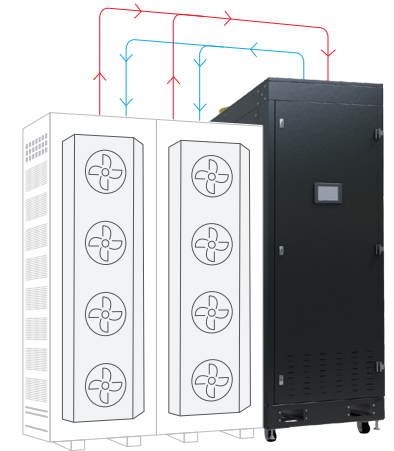
Airedale by Modine's CDU, designed in consultation with industry professionals, provides a secondary fluid cooling loop to achieve heat exchange between the facility water system (FWS) and the fluid circuits serving the IT equipment (ITE). The loop enables control and separation, allowing the CDU to monitor and regulate fluid flow, purity, and temperature to facilitate the adoption of liquid cooling systems, including direct-to-chip cooling and rear-door heat exchangers (RDHxs).

Integrated pumps drive the secondary loop flow to the ITE and can adjust the coolant flow and temperature.

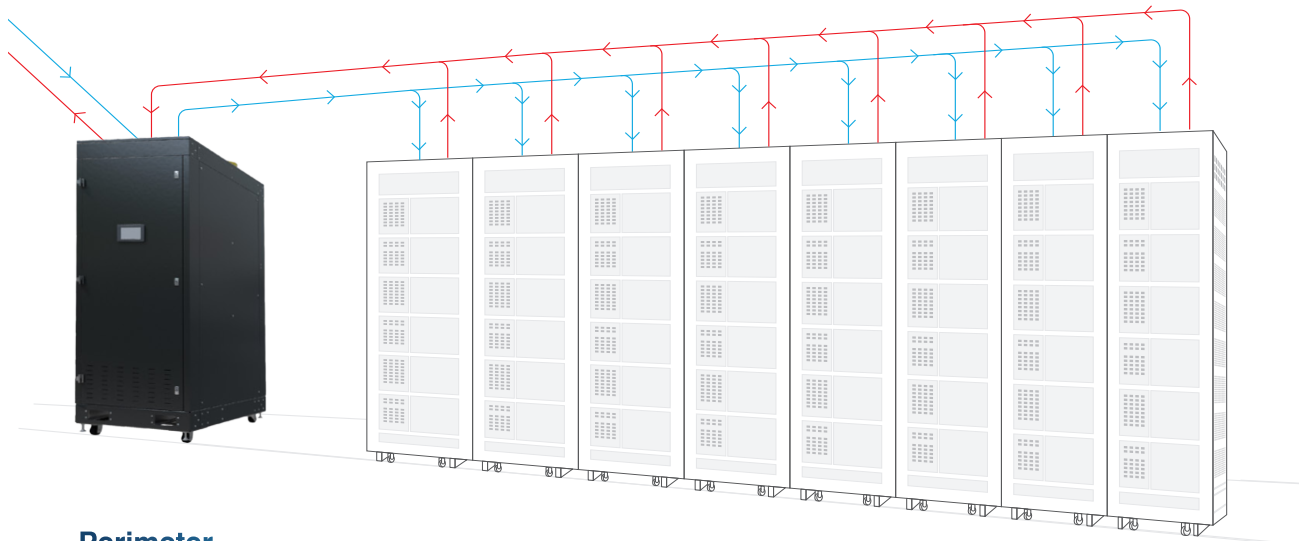
Optimized for space claim, serviceability, efficiency, and performance, the CDU can deliver up to 1MW of capacity and be positioned in the server rows, at the facility's perimeter, outside the white space, or in a facility room – via slab or raised floor.



Row Level Configuration



Row level CDU + RDHX for hybrid Direct-to-Chip Cooling



Perimeter Configuration

Key Features

1 PGDX Display

7" color touchscreen integrates with Airedale by Modine ACIS™ BMS, Cooling System Optimizer™ system control and sensors.

2 Pumps (N+1)

Redundant circulated pumps including premium efficiency (standard), super premium efficiency (option). Simultaneous or run/standby options.

3 Stainless Steel Pipework

Stainless 304 SCH10 pipework. Complete stainless secondary lines, including pumps, to eliminate particle generation.

4 Controller & Control Panel

Intuitive user and communication interface and protocols for BMS. Ability to network up to 8 CDUs. High voltage isolation cover to allow for safe access.

5 Heat Exchanger (HX)

Compact HX for low approach temperature differential. The HX is customizable to optimize CDU for application requirement.

6 Variable Speed Drives (N+1)

Integrated, redundant variable speed drives for precise fluid delivery performance.

7 Pipework Connections

Top connections (standard), bottom connections (option). Plain, grooved, flanged, tri-clamp sanitary options. Isolation valves, flow and return.

8 Filters

Keeps the coolant fluid free from contaminants, protecting the integrity of the cold plate and maintaining cooling performance. Standard filtration of 50µ (25µ option).

9 Motorized Isolation Valves

In the event of a leak the CDU would trigger an emergency shutdown, immediately closing supply/return legs of the sever side.



Liquid Courage

Introducing fluid close to critical IT equipment is a risk many data center operators are wary of. Airedale by Modine's CDU has integrated safety features that protect, detect, and mitigate fluid leaks, ensuring unrivaled peace of mind and an efficient, reliant, and resilient safe supply to critical IT equipment.



1. Prevent

The Airedale Quality Management System (AQMS) ensures adherence to highest possible build standards and robust testing protocols in our global manufacturing plants.

Fully welded internal pipework (option).

Motorized isolation valves on supply and return – In the event of a leak, the CDU triggers an emergency shutdown, immediately closing supply/return legs on the server side.



2. Detect

Onboard-integrated leak detection as standard. The 50mm stainless steel unit drip tray has a point leak detection sensor.

Braided cables detect the presence of water anywhere along the length of the cable. They are connected to an alarm unit, which can locate the spatial position of the leak based on the cable signal. The BMS communicates this to implement a mitigation strategy.

Point leak detectors applied where cables are unsuitable (drip trays) – as an option.

Guided wave sensors (option).



3. Mitigate

Facility mapping is possible for accurate spatial location of leak points. All sensors communicate to the BMS, which will shut off the source and can be implemented at a localized scale (rack/zone isolation).

If the leak detection is activated, the CDU unit isolates the system cooling water from it by closing the isolation valves, ceasing flow to the technology fluid circuit and raising the alarm.

50mm deep, fully welded, stainless steel drip tray supplied. Floor level curbing to confine a leak and direct it towards a drain point.

Other Features

● Standard ● Optional

Electrical/Controls

- Capacity setpoint w/constant pressure
- Temperature setpoint w/constant flow
- Pump operation
 - 1: Simultaneous operation
 - 2: Run/standby only
- Dew point offset
- Manual override

Sensors

- Filter change
- Primary inlet/outlet pressure
- Secondary inlet/outlet pressure (optional n+1 redundancy)
- Secondary supply temperature (optional n+1 redundancy)
- Secondary return temperature
- Secondary flow meter
- Primary supply temperature
- Primary return temperature
- Primary flow meter

- Space temperature/humidity
- Leak detection – up to 3 rope style sensors supported

Pipework connections

- Top
- Bottom

Filtration

- 50 micron
- 25 micron

Valves

- Energy valve – facility side
- Manual isolation – server side
- Electronic isolation valves – both sides

Power

- Single power supply (460V/3Ph/60Hz)
- Disconnect switches (60Hz)
- Up-rated SCCR (65kA) (60Hz)



Nominal Design Conditions



	ASHRAE W2 Facility Water Temperature				ASHRAE W3 Facility Water Temperature			
	US	Global	US	Global	US	Global	US	Global
Secondary	Water		25% Prop. Glycol		Water		25% Prop. Glycol	
Supply Temperature	88°F	31°C	88°F	31°C	97°F	36°C	97°F	36°C
Return Temperature	115°F	46°C	113°F	45°C	124°F	51°C	122°F	50°C
Primary	Water		20% Prop. Glycol		Water		20% Prop. Glycol	
Supply Temperature	81°F	27°C	81°F	27°C	90°F	32°C	90°F	32°C
Return Temperature	104°F	40°C	102°F	39°C	113°F	45°C	111°F	44°C
Req Flow	293 GPM	1110 LPM	274 GPM	1038 LPM	293 GPM	1110 LPM	274 GPM	1038 LPM
Total								
Cooling Capacity	1MW		850 kW		1MW		850 kW	
Flow	255 GPM	852 LPM	239 GPM	852 LPM	257 GPM	852 LPM	239 GPM	852 LPM
External Head	45 PSI	310 kPa	45 PSI	310 kPa	45 PSI	310 kPa	45 PSI	310 kPa
Approach	7.2°F	4°C	7.2°F	4°C	7.2°F	4°C	7.2°F	4°C

Dimensions

Height	89in	2134mm
Width	38in	914mm
Depth	48in	1219mm



IQity™ is Airedale's IoT-enabled technology framework, revolutionizing how cooling is connected, controlled and automated in critical facilities at a product, system and site level.

SYSTEM

- CW System Optimizer
- CRAH Energy Optimizer
- Chiller Sequencer
- HVAC Controls Suite

Optimizer

SITE

- ACIS Facility Management
 - BMS
 - PMS
 - BEMS
- ACIS Edge
- ACIS Telecoms

ACIS™

PRODUCT

- Precision Controls
- Chiller Controls
- Optimized Head
- Pressure Control
- Chiller Fast Start
- Energy Manager
- Refrigerant Manager
- Compressor Manager

helix™



Sales Offices

Headquarters

Airedale by Modine
Leeds Road
Rawdon
Leeds LS19 6JY
T: +44 113 239 1000
E: connect@airedale.com

US Headquarters

Airedale by Modine
360 Collierstown Road
Lexington
Virginia 24450
T: +1 540 464 3640
E: connect@airedale.com