Vertiv™ CoolCenter

Immersion Cooling System

Vertiv™ CoolCenter - Immersion Cooling System

The Vertiv™ CoolCenter Immersion cooling system addresses thermal management challenges in high heat density environments caused by the adoption of artificial intelligence (AI) and machine learning (ML) applications. Vertiv CoolCenter Immersion is specially designed for high-performance servers in data centers, using a dielectric fluid to directly cool the server.

With the innovative development of AI, Internet of Things, big data, and distributed computing, the application of high-performance equipment in the field of data centers is growing rapidly. With the exponential growth of data traffic and the increasing power density of equipment, traditional cooling solutions no longer meet the heat dissipation requirements of high thermal density racks.

How does immersion cooling work?

Immersion cooling systems consists of three main components: a liquid-filled cabinet (tank), a coolant distribution unit (CDU), and fluid pipes connecting the two together. The high density servers are immersed vertically in the tank which contains a thermally conductive dielectric coolant that is in direct contact with the heat-generating components of the server. The coolant absorbs the heat and is pumped out to the heat exchanger in the CDU. This plate heat exchanger transfers the IT load to the facility water circuit, cooling the dielectric coolant. The coolant is then recirculated back to the tank while the facility water is pumped by the CDU out to a heat rejection unit (e.g. cooling tower, chiller, etc.) outside of the data center for heat reuse or rejection. This approach to thermal management maximizes the thermal transfer properties of liquid, and is a highly efficient form of liquid cooling.

Key Benefits

- 100% Heat Dissipation with energy-efficient thermal transfer

- Meet various deployment needs with multiple configurations

- Ensure high cooling availability with redundant pumps and power supply options

- Maintain precise coolant temperature and flow with integrated temperature sensors and variable speed pumps

- Easily view unit operation through transparent window

- Protects IT from harsh environments

- Significantly reduces noise since server fans are not required

- User-friendly control of system through an integrated 9" color touchscreen display

- Recover heat from IT for reuse opportunities

CoolCenter Immersion, self-contained unit

CoolCenter Immersion, four-tank unit

CoolCenter Immersion, Self-Contained Features

Swing-Type Cover with Transparent Window

Allows for ease of observation and maintenance

9" Color Touch Screen Display

With power-down self recovery, muti-level password protection, and real time display data

Dual power supply with automatic transfer switch

Increase up-time and cooling availability

PDU Cable Inlet

Redundant (2N) power distribution units provide additional reliability for IT systems

Switch Compartment

Network switch compartment to accommodate 1U switch

Self-Contained Unit

24U immersion cooled tank with integrated CDU

Dual variable speed pumps

seamlessly adjust coolant flow to match cooling demand

Built-in circuit breaker

Prevent electrical overload

Chilled Water Inlet/Outlet with auto-regulating flow control valve

Manage primary water usage, and utilize waste heat for heat reuse opportunities

VERTIV

CoolCenter Immersion

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Technical Specifications

Physical Data	24U Standalone System	42U	52U	CDU
Unit Dimensions, mm	1360 x 896 x 1392	2130 x 730 x 1284	2600 x 730 x 1284	1190 x 1073 x 1398
Dry Weight, kg	401	342	424	575
Wet Weight (with coolant), kg	881	1102	1364	631
Shipping Weight, kg	492	451	533	658

Performance Data	24U Standalone System	Four Tanks	Three Tanks	Dual Tanks	Single Tank
Total Nominal Cooling Capacity with Chilled Water (12 C), kW	50	240	240	240	120
Nominal Cooling Capacity per Tank with Chilled Water (12 C), kW	50	60	80	120	120
Total Nominal Cooling Capacity with Warm Water (35 C), kW	25	120	120	120	60
Nominal Cooling Capacity per Tank with Warm Water (35 C), kW	25	30	40	60	60
System pPUE	1.08	1.08	1.08	1.08	1.08

Fluid Circuit Data

Fluid Circuit Data		
Fluid Type		Thermal Conductive Dielectric Fluid
Filtration		80 mesh
Maximum Fluid Flowrate, Tank		7m³/h
Maximum Fluid Flowrate, CDU		29m³/h
Single Tank Fluid Capacity, L	550	950 per 42Utank / 1180 per 52Utank
Primary Side Piping Connection	DN40	DN50

Electrical Data

Electrical Data		
Power Supply, CDU		380-415V/3ph/50-60Hz+N
Power Supply, Tank	N/A	24V (from CDU)
Max Power Consumption, kW	3	4.5
FLA, A	6	10
PDU Power Supply	230-400V, 3Ph, 50/60Hz, 40A	230-400V, 3Ph, 50/60Hz, 63A

Operating Conditions

Operating Conditions	
Ambient Temperature, °C Dry Bulb	5 to 40 (Max. 24°C WB)
Ambient Humidity, RH	20 to 80%
Inlet Water, °C	12 to 35
Altitude, m	2000

Storage Conditions

Storage Conditions	
Ambient Temperature, °C dry bulb	32
Ambient Humidity, RH (@ 30°C)	Less than 95%
Ingress Protection Rating (IP Rating)	IP20

Storage Conditions

Storage Conditions	
Safety Compliance	CE, RoHS

1. Cooling water, 32°C inlet water, 37°C outflow water parameters
2. Chilled water, 12 °C inlet water, 22 °C outwater parameters
3. Weight values included do not include weights associated with servers and other related ITE equipment.
4. Air-cooled parameters and solutions, please contact the product department colleagues for support

Monitor and control your IT

Monitoring environmental conditions around liquid cooled systems is pivotal to ensuring protection of the IT equipment. Liquid cooling is inherently different than air cooling when it comes to rapid system response time when a failure scenarios occur due to the higher heat densities associated with liquid cooling.

Because dielectric fluid is in direct contact with heat generating components, fluid level monitoring, leak detection, and temperature sensors are integrated into the CoolCenter Immersion systems, increasing the ability to monitor and control system status. These sensors in conjunction with an expert-level fault diagnosis automatically display active alarms/warnings in addition to supporting any necessary troubleshooting and maintenance.

Available teamwork modes provide flexible deployments and functionality for Tanks and CDUs. Teamworking modes allow for the sharing of parameters, control calculation modes, and temperature setpoints while also enabling standby units, and rotational unit functions.

Built-in Features

- User-friendly touch screen control interface

- Temperature, fluid level, and leak detection sensors integrated in the CDU and tank for adaptive control

- BMS (Modbus, SNMP) communication

- Unit-to-unit teamwork functionality up to 4 Tanks

- Multi-level password protection

- Ambient LED Status Light for high operational visibility
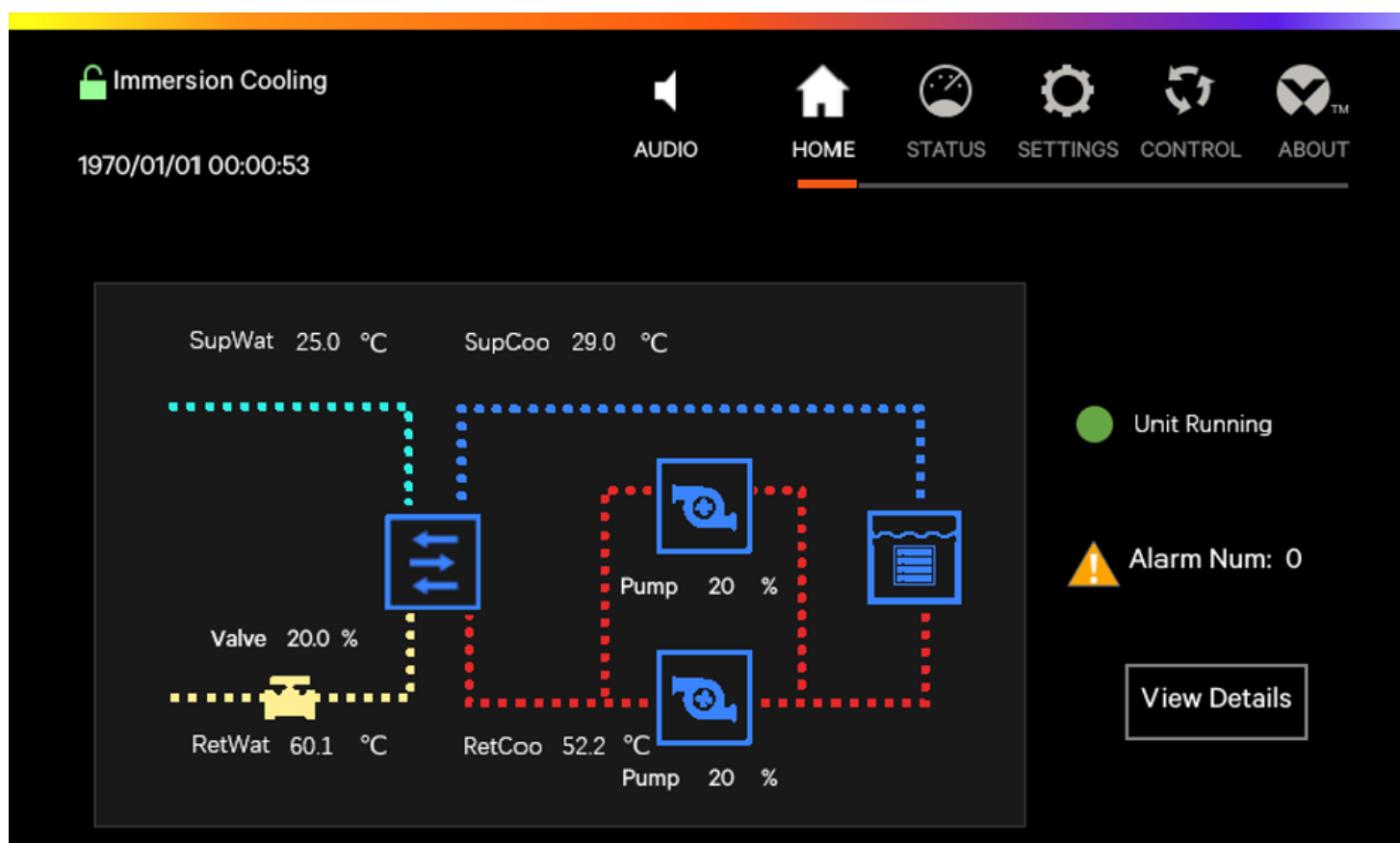
Vertiv™ Liquid Cooling Services

Expert turnkey services & maintenance

As the demand for high-performance computing continues to rise, effective thermal management becomes essential.
Liquid cooling technologies are critical for managing high-density computing loads, preventing downtime, and extending equipment lifespan. Validated startup processes are essential for maintaining fluid integrity and cold plate performance. Given the high cost of failure, managing cooling system fluids demands expert attention. Vertiv™ Liquid Cooling Services provide a comprehensive solution that includes design, installation, commissioning, and maintenance, enabling seamless and sustainable operations helping to protect the resiliency of your IT infrastructure and help you achieve your operational goals.

Getting started with Liquid Cooling Services

Hassle-free design, deployment, and management for forward-looking data centers in every location.

Consultation & assessment

Perform design consultation and assessment customized to specific site requirements:

- Site visit
- Product selection
- System planning/design
- System layout
- Integration drawings
- Computational fluid dynamic (CFD) Digital Twin modeling

Installation & integration

Manage project and perform assembly services:

- Rack assembly
- Busway installation
- Rack PDU installation
- Aisle containment
- Integration from CDU to chip via overhead and rack manifolds
- Removal of old equipment
- New Vertiv unit installation

Commissioning

OEM commissioning and startup service:

- Site Acceptance Inspection
- Startup
- Site Acceptance Testing
- Integration System Testing
- Training

Recurring services

- Preventive Maintenance Visits
- Parts/Labor Coverage
- Emergency Response
- Technical Support
- Fluid management:
  - Fluid sampling and testing
  - System discharge and recharge
  - Fluid quality remediation

Reliability through our extensive global network. Vertiv's strong global footprint and network of certified technicians enables us to support large-scale deployments world-wide with consistent quality and quick responsiveness.

Optimize operations with end-to-end lifecycle support. Providing a holistic suite of services including installation, startup, system commissioning, maintenance, fluid management, and digital management for smooth and optimized operation of your liquid cooling systems.

Save time when leveraging world-class expertise. Digitally-enabled and swift diagnosis, prompt technician assignment, and guaranteed on-site response, all delivered by highly skilled technicians who are experts in liquid cooling equipment.

Global Service Portfolio

	PM Contract	Basic	Essential/Preferred	Premier	
Performed by Vertiv Certified Technicians	✓	✓	✓	—	**Unit Management**
Guaranteed Emergency Response Time	✓	✓	✓	—	
Access to Customer Resolution Center	✓	✓	✓	—	
Preventive Maintenance Service Visits	✓	✓	✓	—	
Labor and Travel Coverage	—	✓	✓	—	
Parts Coverage	—	—	✓	—	
Secondary Circuit Fluid Sampling	✓	✓	✓	✓	**Fluid Management**
Secondary Circuit Fluid Analysis*	+	+	+	✓	
Secondary Circuit Fluid Remediation	+	+	+	✓	
Secondary Circuit Initial Fill	+	+	+	+	
Secondary Circuit Flush and Fill	+	+	+	+	

*Inclusion of fluid analysis and remediation is predicated upon the use of DOWFROST LC25. If another manufacturer fluid is being used, pricing and offering will need be evaluated.

✓ These items are included at this level of service coverage.

— These items are not included at this level of service coverage, and they will be quoted on time and material basis.

+ These items are available to be quoted on Time and Material basis.

Our global service presence

With a global network of certified technicians and industry experts, we provide consistent support and service quality across all locations. This global reach allows you to receive the same high level of service, no matter where your data centers are located.

Worldwide
Manufacturing locations: 24
Service centers: 310+
Service field engineers: ~4,000
Technical support/response: ~300
Customer experience centers/labs: 27

Americas
Manufacturing locations: 9
Service centers: 170+
Service field engineers: ~1,750
Technical support/response: ~120
Customer experience centers/labs: 4

Europe, Middle East, and Africa
Manufacturing locations: 9
Service centers: 60+
Service field engineers: ~650
Technical support/response: ~130
Customer experience centers/labs: 12

Asia Pacific
Manufacturing locations: 6
Service centers: 80+
Service field engineers: ~1,600
Technical support/response: ~50
Customer experience centers/labs: 11

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