



# Vertiv™ Liebert® CRV

from 10 to 60 kW

Efficient Cooling for IT Equipment



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## Vertiv™

Vertiv designs, builds and services mission critical technologies that enable the vital applications for data centers, communication networks, and commercial and industrial environments. We support today's growing mobile and cloud computing markets with our portfolio of power, thermal, infrastructure management products, software and solutions, all complemented by our global service network. Bringing together global reach and local knowledge, and our decades-long heritage including brands like Chloride®, Liebert® and NetSure™, our team of experts is ready to take on your most complex challenges, creating solutions that keep your systems running—and your business moving. Together, we're building the future of a world where critical technologies always work.

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## Liebert® CRV Row-Based Cooling

**The Liebert CRV**, row-based cooling unit is optimized to ensure maximum cooling capacity in a minimal footprint. Targeted for small and medium data centers, as well as edge computing locations the unit provides cooling at the server rack level.

The Liebert CRV has been designed to deliver the highest efficiency and availability, by removing heated air from the data center hot aisles, using it to return cooled air to the servers (cold aisle). The Liebert CRV is available in Direct Expansion, as well as Chilled Water versions and in two frame widths - 600 mm and a compact 300 mm. Providing full capacity and airflow modulation to match the servers' load, the unit is able to deliver energy savings via its compressor with capacity modulation, Electronic Expansion Valve and variable speed EC Fans. All this leads to very low operating

costs with maximum availability. The Liebert CRV is a comprehensive row-based solution that includes all of the main functions fundamental to cooling units, such as cooling, humidification, dehumidification, re-heating, air filtration, condensation management, temperature and humidity control, alarm functions and data communications.

Furthermore, the unit enhances its performances and energy efficiency through the Vertiv™ ICOM™ Control, capable of optimizing unit operations by leveraging on its intelligent management of system components. All components are easily accessible from the front and the rear of the unit, granting simplified service intervention.

**The unit also allows ease of installation, through simplified cable and pipes routing from top and bottom of the unit.**



10kW CRV DX

## Designed to Optimize IT Performance

### The Liebert® CRV, row cooling unit Thermal Management unit is ideal for the cooling of data center rack rows

The Liebert CRV is a multi-option, precision air conditioner that delivers temperature and humidity control, as well as filtration and notification management, ensuring that data center temperatures are maintained at an optimum level.

The unit is designed to continuously monitor variations in heat loads and instantly deliver the most efficient and effective cooling necessary.

### Liebert CRV: Simple, Safe, Adaptable

The Liebert CRV is a plug-and-play unit with the capability of addressing the needs of both open and contained applications.

Cooling is provided at the server rack level rather than the room level. The Liebert CRV removes and filters hot air from the data center aisles, using it to return cooled air to the servers.

The integrated air diffusers accurately direct the airflow towards the necessary direction of the heat load.

Furthermore, Liebert CRV is designed to comply with mission-critical requirements and ensure that servers are maintained at the correct temperature and humidity levels.

For low operational costs, the Liebert CRV provides the exact level of cooling required by servers, modulating the airflow and cooling capacity.

The unit is available in two versions to meet various installation demands:

- A stand-alone, direct expansion system with variable capacity up to 36 kW, available in both 300 mm and 600 mm versions, complete with roof or wall-mounted condenser
- A chilled water system with up to 60 kW of capacity available in both 300 mm and 600 mm versions.

## Features and Performance

- Units ranging from 10 to 60 kW with chilled water and direct expansion versions
- Industry's highest energy saving levels achieved - increase of up to 50% when the Liebert CRV is combined with Vertiv™ SmartAisle™ cold aisle containment
- Best-in-class Thermal Management unit for row-based applications
- On-site adjustment capability of air diffuser distribution direction maximizes cooling results
- Integrated Vertiv ICOM™ Control for management of capacity and airflow through EC Fans and variable capacity Compressor
- Ideal for scalable IT infrastructure - increased cooling capacity, reduced noise levels and enhanced efficiency when compared with similar chilled water and direct expansion configurations.

## Ensuring Availability Under All Working Conditions

### Maintaining IT Infrastructure Availability

With integrated Vertiv™ ICOM™ Control, the Liebert® CRV is able to monitor variations in temperature and humidity, instantly adapting its performance to meet variations in load conditions.

This furthermore ensures increased availability and safety of protected IT equipment.

The Liebert CRV's constant temperature monitoring and control capabilities ensure the availability of servers in all working conditions.

Furthermore, its parallel load sharing functionality enables the management of N+1 configurations.

### Meeting Primary IT Requirements

The Liebert CRV's ability to modulate capacity allows for constant, accurate room temperature and humidity levels to be maintained.

The variable capacity capability of the Liebert CRV, contributes to increasing data center availability during both standard operations and in the event of load variations.

A reduction in its start/stop cycling function further contributes to increasing data center availability, as well as lengthening the life of critical components.

The integrated compressors with cooling capacity modulation are designed to avoid peaks in absorbed power, thus reducing the stress placed on components. The Liebert CRV uses a dedicated control that also enables the compressor to operate when the external air temperature increases above standard limits.

## Extreme Flexibility for Open and Closed Architectures

### Suitable For a Wide Range of Installations

The Liebert® CRV addresses the cooling needs of both new and existing data center space, regardless of raised floor availability. It is ideally suited to data centers with up to 50 racks, irrespective of heat load.

### Configuration Flexibility

The Liebert CRV can be configured to perform temperature as well as humidity control. The Liebert CRV 300 mm and 600 mm width versions have been designed to specifically meet the requirements of data centers in need of optimizing space occupancy, as well as capital and running costs.

### The Ideal Airflow

EC Fans and compressors with variable cooling capacity, managed through integrated Vertiv™ ICOM™ Control, achieve flexible capacity and airflow for the ideal operating conditions of IT equipment.

The Liebert CRV, designed using advanced, computer-aided dynamic fluid technology, delivers optimum air distribution across rack installations. The exceptional levels of air distribution have been proven as a result of wide-scale laboratory and field testing.



## Optimizing Total Cost of Ownership

### Delivering Optimized Results

Ideally suited for rack-level cooling and specifically designed for high return air temperatures, the Liebert CRV optimizes air distribution and maximizes efficiency, delivering both cost and energy-related savings.

Efficiency is further enhanced through the use of the environmentally friendly R410A refrigerant which ensures constant operation at the highest efficiency levels.

The Liebert CRV is also designed to optimize installation and minimize start up, connection and labor investments. The unit is available for integration with existing racks or as a bundled solution combined with racks, UPS and monitoring capabilities.

### Energy Efficient Cooling

The integrated Vertiv ICOM Control, equipped with up to 10 rack temperature sensors, continuously monitors the heat load of the racks and regulates the Liebert CRV, ensuring it provides the most effective level of cooling while at the same time delivering energy savings. Variable capacity compressors modulate the cooling capacity, thus reducing input power with partial loads. EC Fan technology regulates airflow and reduces fan input power.

## Customer Monitoring Interfaces

### Monitoring and Control Through Existing Network Via your Web Browser

The Liebert® CRV system can be fitted with a Vertiv monitoring card allowing full advantage to be taken of the Ethernet network and remote monitoring from your computer desktop, network operations center or any network access simply utilizing a standard web browser. A standard web browser, via HTTP protocol or Network Management System software via SNMP protocol, can be used to access the unit information.

### Monitoring Integration with Existing Building Management System

If required, by installing the optional monitoring card, the Liebert CRV can be monitored and controlled by an existing Building Management System. The monitoring card provides Modbus, Bacnet and SNMP protocol support.





## Data Center Rooms and Edge Locations With Up to 10 Racks

The Liebert® CRV is installed in close proximity to servers for installations relating to network access cabinets and small computer rooms, regardless of the presence of a raised floor. The cooling unit, equipped with ten temperature sensors, modulates the airflow to match the real-time cooling requirements of the server.

### Direct Expansion Solution

When a chilled water system and physical building limitations restrict the installation of chillers, a direct expansion solution is the ideal choice.

In the event that internal and external units are installed in close proximity, direct expansion units are able to deliver significant reductions in installation-related time and costs. One of the

advantages of the Liebert CRV with a direct expansion solution is the eco-friendly refrigerant R410A. The unit also offers variable capacity compressor, which has the capability of immediately modulating and adapting its operation according to server cooling requirements. It significantly minimizes start/stop cycling, extending the life cycle of your cooling equipment. The Liebert CRV,

operates with a significant return air temperature, which contributes to maximizing cooling capacity and increasing efficiency without placing additional stress on compressors.

<b>Scenario</b> <b>1</b>	<b>N° of Racks</b>	1 to 4
	<b>Heat Load</b>	Up to 20 kW
	<b>Space</b>	From 5 m <sup>2</sup> and 15 m <sup>2</sup>
	<b>Raise Floor</b>	-
	<b>Recommended Solution</b>	Direct Expansion

<b>Scenario</b> <b>2</b>	<b>N° of Racks</b>	Up to 10
	<b>Heat Load</b>	Up to 100 kW
	<b>Space</b>	Up to 30 m <sup>2</sup>
	<b>Raise Floor</b>	-
	<b>Recommended Solution</b>	Direct Expansion



## Data Center Rooms and Density Areas with up to 50 Racks

The Liebert® CRV's integration with Vertiv™ SmartAisle™ proves to be the ideal cold aisle containment approach for small data centers requiring heat density increases. This solution has the added advantage of avoiding the installation of raised floors or heightening roof levels. CRV is also very well suited for the installation of high-density areas in data centers.

### Chilled Water Solution with Vertiv™ SmartAisle™

The Vertiv SmartAisle separates hot returning air and cold supply air, optimizing the entire cooling solution. By increasing the room temperature, the floor-mounted cooling units can be significantly downsized, reducing the overall level of investment. The higher Energy Efficiency Ratio also improves energy savings and dramatically reduces running costs. The solution delivers the best results when combined with the Liebert HPC - maximizing the freecooling effect and reducing running costs.

### Combining the Liebert® CRV with the Liebert HPC Freecooling Chiller for Increased Advantages

Chilled water solutions are optimized to reduce energy consumption:

- With the use of EC Fans and the unit's close proximity to the racks, the Liebert CRV minimizes fan power input and can be regulated based on server load levels.
- As it is specifically designed for high return air temperatures, the Liebert CRV can operate at high chilled water temperatures while maintaining capacity, thus maximizing the chiller freecooling effect.

<b>Scenario</b> <b>3</b>	<b>N° of Racks</b>	10 to 20
	<b>Heat Load</b>	Up to 200 kW
	<b>Space</b>	Up to 50 m <sup>2</sup>
	<b>Raise Floor</b>	-
	<b>Recommended Solution</b>	Chilled Water

<b>Scenario</b> <b>4</b>	<b>N° of Racks</b>	Up to 50
	<b>Heat Load</b>	Up to 300 kW
	<b>Space</b>	Up to 100 m <sup>2</sup>
	<b>Raise Floor</b>	-
	<b>Recommended Solution</b>	Chilled Water



## Liebert® CRV Technical Data

### DIRECT EXPANSION (DX) MODELS

### CHILLED WATER (CW) MODELS

		CRD10	CR025RA	CR020RA/W	CR035RA/W	CR030RC	CR052	CR060RC	CR040	CR050
Net Sensible Cooling Capacity	[kW]	11.9	22.5	24.2	37.7	39.2	54.0	57.0	46.6	57.9
Nominal Airflow	m <sup>3</sup> /h	3200	4000	4170	5540	5900	7200	7758	5650	7410
Weight	[kg]	220	260	335 / 350	365 / 385	180	230	230	330	365
Humidity Control		No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Dimensions H x W x D	[mm]	2000x300x1100 (*)			2000x600x1175		2000x300x1100 (*)		2000x600x1175	

Note: The performances shown above refer to an air inlet temperature of 38°C, condensing temperature for air and water-glycol cooled units of 45°C and a chilled water temperature of 7/12°C. (\*) Unit available also with a 2200 mm height and 1200 mm depth.



W

Liebert® CRV 300 mm CW

### STANDARD FEATURES AND OPTIONS

#### DX Version

#### CW Version

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• High Efficiency Scroll/Rotary Compressor with Capacity Modulation</li> <li>• Electronic expansion valve</li> <li>• EC plug fans</li> <li>• R410A Refrigerant</li> <li>• Adjustable modular baffle system</li> <li>• Top/Bottom connections</li> <li>• Levelling feet</li> <li>• Filters with up to F5 filtration class and clog filter switch</li> <li>• Electrode humidifier</li> <li>• Electric reheat 1-stage</li> <li>• Internal condensate pump</li> <li>• User Friendly Display</li> <li>• Remote rack temperature sensors</li> <li>• Monitoring card for WEB, Modbus and BACnet</li> <li>• Teamworking functionality</li> </ul> | <ul style="list-style-type: none"> <li>• EC plug fans</li> <li>• 3-way or 2-way valve with 0-10V actuator</li> <li>• Adjustable modular baffle system</li> <li>• Top / Bottom connections</li> <li>• Levelling feet</li> <li>• Filters with up to F5 filtration class and clog filter switch</li> <li>• Electrode humidifier</li> <li>• Electric reheat 1-stage</li> <li>• Internal condensate pump</li> <li>• User Friendly Display</li> <li>• Remote rack temperature sensors</li> <li>• Monitoring card for WEB, Modbus and BACnet</li> <li>• Teamworking functionality</li> </ul> |
|---|---|

### ADDITIONAL OPTIONS

#### DX Version

#### CW Version

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Additional remote rack temperature sensors</li> <li>• Compressor jacket (600mm models)</li> <li>• Dual power supply with ATS on selected models</li> <li>• Optional extension frame for height 2200 mm and depth 1200 mm</li> </ul> | <ul style="list-style-type: none"> <li>• Additional remote rack temperature sensors</li> <li>• Dual power supply with ATS</li> <li>• Cooling Capacity Meter</li> </ul> |
|--|--|



## Coupling Air Cooled Liebert CRV Units with Air Cooled Condensers

Model	Outdoor Temperature		
	up to 35°C	up to 40°C	up to 45°C
<b>CRD102</b>	CCD10	CCD10	CCD10
<b>CR025RA</b>	HCR33	HCR43	HCR51
<b>CR020RA</b>	HCR33	HCR43	HCR51
<b>CR035RA</b>	HCR51	HCR51	HCR76

## Condensers Dimensions

		Width	Depth	Height	Weight
CCD10	[mm] / [kg]	745	1300	1005	66
HCR33	[mm] / [kg]	1112	1340	910	75
HCR43	[mm] / [kg]	1112	2340	910	92
HCR51	[mm] / [kg]	1112	2340	910	93
HCR59	[mm] / [kg]	1112	2340	910	102
HCR76	[mm] / [kg]	1112	3340	910	136

## Coupling Water/Glycol Cooled Liebert CRV Units with Drycoolers

Model	Ambient Temperature up to 30° C		Ambient Temperature up to 35° C		Ambient Temperature up to 40° C	
	Standard Noise	Low Noise	Standard Noise	Low Noise	Standard Noise	Low Noise
<b>CR20RW</b>	1 x ESM018	1 x ELM018	1 x EST028	1 x ELM027	1 x EST050	1 x ELT047
<b>CR35RW</b>	1 x EST028	1 x ELM027	1 x EST050	1 x ELT055	1 x EST070	1 x ELT065

## Dry Cooler Dimensions

		Width	Depth	Height	Weight
ESM018	[mm]	2236	820	1030	82
EST028	[mm]	2866	1250	1070	133
EST050	[mm]	2866	1250	1070	193
EST070	[mm]	4066	1250	1070	283
ELM018	[mm]	2236	820	1030	94
ELM027	[mm]	3136	820	1030	139
ELT047	[mm]	4066	1250	1070	225
ELT055	[mm]	4066	1250	1070	254
ELT065	[mm]	5266	1250	1070	302

## Chilled Water Cooling

Chilled water cooling units may be coupled with Vertiv™ chillers (Liebert HPC or Liebert AFC series). The Liebert HPC chiller series offers a wide range of air cooled or water cooled solutions. Available with various noise thresholds and with freecooling modes, these units significantly enhance the system's energy saving capabilities. Liebert HPC freecooling chillers are available from 40 kW to 1600 kW. The Liebert AFC, Adiabatic Freecooling Chillers, are available from 500 kW to 1700 kW and are designed to maximize data center efficiency and availability.



## Thermal Management Data Center Infrastructure for Small and Large Applications



### Liebert® HPC

Wide range of high efficiency Freecooling Chillers from 40 kW to 1600 kW

- Designed specifically for data center applications and to work with Vertiv™ SmartAisle™
- Premium energy efficiency version
- Unique control capabilities with the Vertiv ICOM™ Control.

### Liebert PDX Liebert PCW

Available from 5-220 kW

- Premium energy efficiency
- Eurovent certified performance
- Unique control capabilities with the Vertiv ICOM Control
- Liebert® EconoPhase™ available for the direct expansion system.



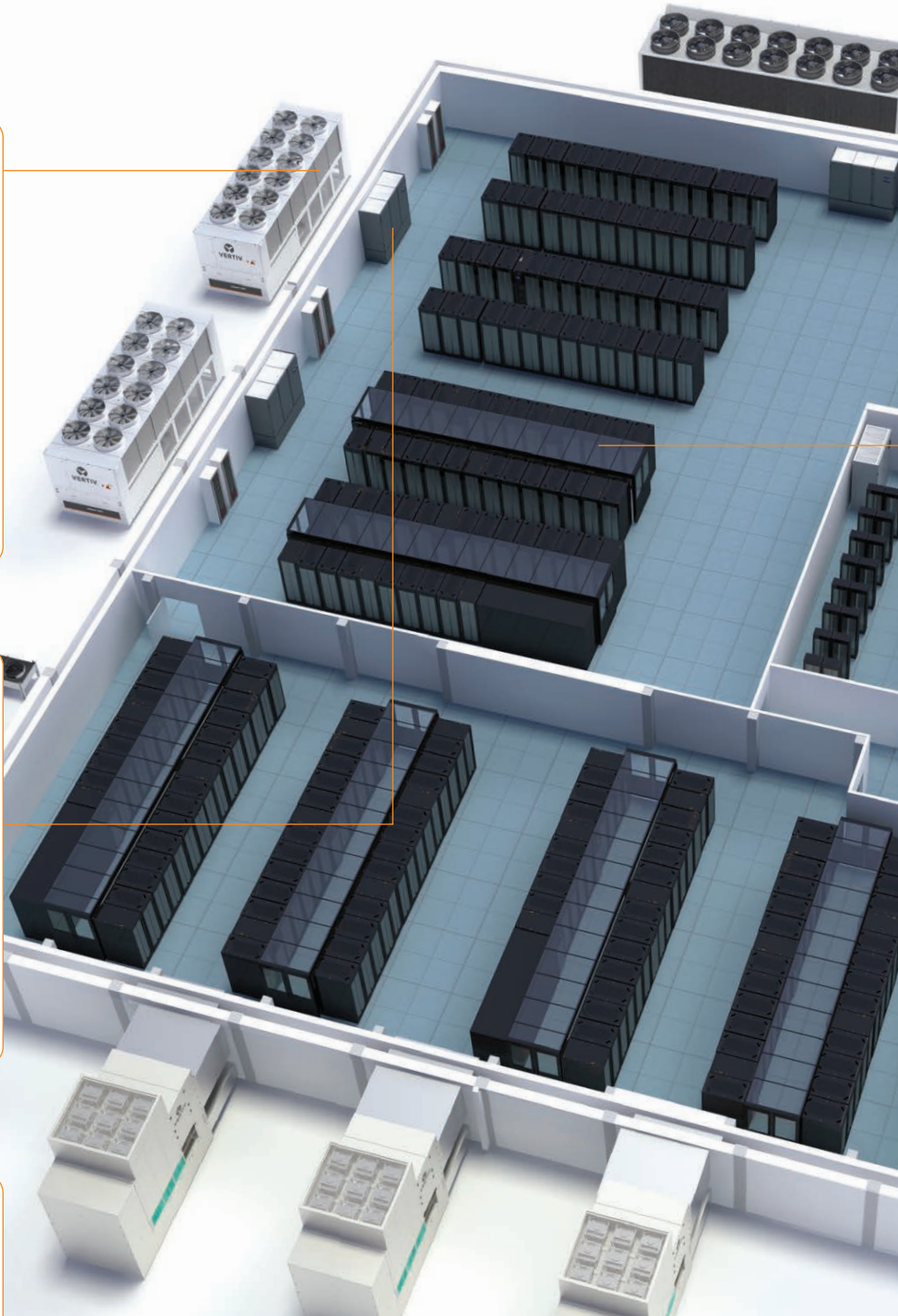
### Liebert EFC

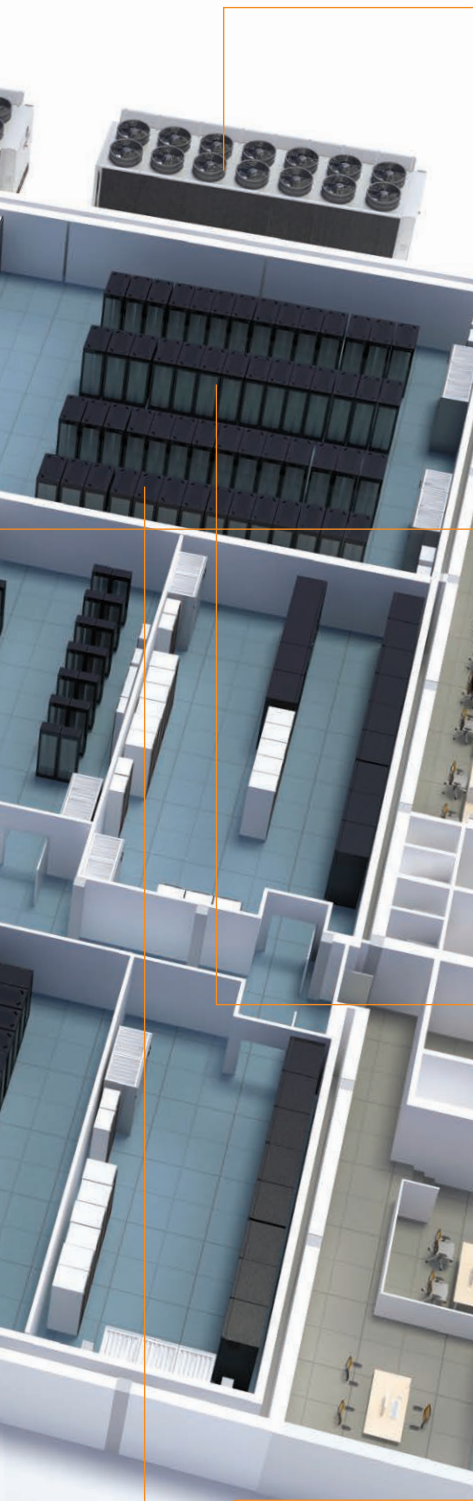
Indirect evaporative freecooling unit leveraging on data center know-how. Available from 100 to 450 kW

- Unique control capabilities optimizing water and energy costs
- Substantial reductions and savings in terms of electrical infrastructure.

### Vertiv™ Environet Alert

Vertiv™ Environet™ Alert provides industry companies with critical facility monitoring software that is affordable and easy to use. This solution delivers superior monitoring, alerting, trending and data organization capabilities for all types of companies, helping them protect and grow their business. Customers get monitoring, alerting and trending at a price that's right for their business.





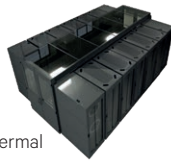
### Liebert AFC

The Adiabatic Freecooling Chiller available from 500-1700 kW

- Integrated adiabatic pad system
- High freecooling capacity
- 100% compressor back up.

### Vertiv SmartAisle™

- Aisle containment
- Provides highest energy efficiency
- Works with any Liebert Thermal Management unit.



### Liebert CRV

Row-based high efficiency cooling units available from 10-60 kW in DX and CW versions

- Full airflow and cooling capacity modulation to match server load and to save energy
- Best footprint capacity with the highest efficiency
- Six different control modes to ensure greater flexibility.



### Liebert DCL

Closed loop rack cooling

- Two different architectures:  
Closed Loop  
Hybrid Loop
- Multiple combinations for up to 4 server racks
- Available as direct expansion or chilled water version

## Services

Vertiv supports entire critical infrastructures with the largest global service organization and an extensive service offering, enhancing network availability and ensuring total peace of mind 24/7.

Our approach to servicing critical infrastructure covers all aspects of availability and performance: from single power and thermal management equipment to entire mission-critical systems.

The most comprehensive insurance for business protection can be obtained with a service program from Vertiv which includes access to Vertiv LIFE™ Services.

## Vertiv™ Life™ Services

Vertiv LIFE Services provides Remote Diagnostics and Preventive Monitoring for UPS and thermal management equipment.

Vertiv LIFE Services delivers increased uptime and operational efficiency by enabling continuous monitoring of your equipment, expert data analysis and field engineering expertise.

Through the data transferred from your equipment via Vertiv LIFE Services, our Remote experts gain the real-time insight and information needed to quickly identify, diagnose, and resolve any irregularities that may arise in operation, ultimately taking responsibility for your critical assets 24/7.



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