

Vertiv™ Liebert® CRV

Intelligent, Integrated In-Row Infrastructure for the Data Center



Features & Benefits

Optimize your IT deployments with a highly efficient dedicated cooling solution

- Low total cost of ownership through the use of EC fans, unit-to-unit Teamworking, capacity modulation, and the variable speed compressor.
- Simultaneous top and bottom connections provide increased flexibility during installation.
- Reheat and humidification control.
- Connect up to 10 temperature sensors to one unit for enhanced temperature control.
- Easily monitor and control your IT system with integrated communication through BACnet, Modbus, and SNMP protocols.
- Large user-friendly display screen for setting temperature, humidity, and alarms.
- Multiple configurations and heat rejection options provide more flexibility when planning the site.
- New global design of the DX units provides seamless integration with other Vertiv™ products.
- Longer pipe runs allow for installation in a wider range of locations.

The Vertiv™ Liebert® CRV row-based cooling solution offers more than just highly efficient, dedicated cooling directly in front of your IT deployments. It offers peace of mind in knowing that your critical IT system is protected from suboptimal operating conditions.

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 is designed to deliver optimal efficiency and availability of your IT deployments by transforming hot air from the rear of the equipment to cool air returning to server inlets. 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, reheating, 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, simplifying service intervention.

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



35kW CRV DX

Technical Specifications - Direct Expansion

| | CRD10 | CRD25 | CRD35 |
|-------------------------------------|-------------------------------|-------------------|-------------------|
| Net Sensible Cooling Capacity* (kW) | 10 | 25 | 35 |
| Capacity Modulation Range | 20-100% | 20-100% | 20-100% |
| Rated Airflow (m3/h) | 3200 | 5200 | 8000 |
| Heating Capacity (kW) | 3 | 3 | 6 |
| Humidification Capacity (kg/h) | N/A | 2 | 2 |
| Air Filtration | G4 | G4 | G4 |
| Remote Monitoring | HTTP / SNMP / Modbus / BACnet | | |
| Piping and Cabling connections | Top & Bottom | Top & Bottom | Top & Bottom |
| Dimensions (W x D x H), mm | 300 x 1132 x 2000 | 300 x 1132 x 2000 | 600 x 1132 x 2000 |
| Weight, kg (lbs) | 230 (509) | 272 (599) | 358 (789) |
| Refrigerant/Coolant | R410A | R410A | R410A |

*Test conditions: 35°C, 24% Return Air, 35°C outdoor

Environmental Requirements

| | | | |
|----------------------------------|------------------------|------------------------|------------------------|
| Operating Temperatures, °C (°F) | | 24 to 45 (75 to 113) | 24 to 45 (75 to 113) |
| Storage Temperatures, °C (°F) | | -40 to 70 (-40 to 158) | -40 to 70 (-40 to 158) |
| Outdoor Air Temperature, °C (°F) | -15 to 45 (5 to 113) | -20 to 52 (-4 to 125) | -20 to 52 (-4 to 125) |
| With low ambient kit, °C (°F) | -34 to 45 (-29 to 113) | -35 to 48 (-31 to 118) | -35 to 48 (-31 to 118) |
| Max Piping Length, m (ft) | 91 (298) | 120 (393) | 120 (393) |

Electrical Requirements

| | | | |
|---------------|--------------------|-----------------|-----------------|
| Input Voltage | 230V, 1ph, 50-60Hz | 400V, 3Ph, 50Hz | 400V, 3Ph, 50Hz |
| Power Input* | 3.2 | 6.99 | 8.49 |
| FLA (A) | 38 | 30 | 40 |

* Cooling Only

** With humidifier and reheat

Condenser Specifications

| | CCD10 | CCD25 | CCD35 |
|-----------------|-------------|-------------|-------------|
| Width, mm (in) | 745 (29.3) | 1562 (61.5) | 2362 (93) |
| Depth, mm (in) | 1300 (51.2) | 830 (32.7) | 830 (32.7) |
| Height, mm (in) | 450 (17.7) | 1272 (50.1) | 1272 (50.1) |
| Weight, kg (lb) | 56 (123) | 120 (264.6) | 175 (385.8) |

Technical Specifications - Chilled Water

| | CRC30 | CRC60 | CR040 | CR050 |
|-------------------------------------|-------------------------------|-------------------|-------------------|-------------------|
| Net Sensible Cooling Capacity* (kW) | 27.3 | 39.5 | 40 | 50 |
| Capacity Modulation Range | 0-100% | 0-100% | 0-100% | 0-100% |
| Rated Airflow (m3/h) | 5100 | 7700 | 5650 | 7400 |
| Heating Capacity (kW) | 3 | - | 6 | N/A |
| Humidification Capacity (kg/h) | 2 | - | 2 | N/A |
| Air Filtration | G4 | G4 | G4/F5 | G4/F5 |
| Remote Monitoring | HTTP / SNMP / Modbus / BACnet | | | |
| Piping and Cabling connections | Top & Bottom | Top & Bottom | Top & Bottom | Top & Bottom |
| Chilled Water Connection size | Rp 1-1/4 | Rp 1-1/4 | Rp 1-1/4 | Rp 1-1/4 |
| Dimensions (W x D x H), mm | 300 x 1132 x 2000 | 300 x 1132 x 2000 | 600 x 1175 x 2000 | 600 x 1175 x 2000 |
| Weight, kg (lbs) | 242 (533.5) | 235 (518) | 365 (804) | 365 (804) |
| Refrigerant/Coolant | Chilled Water | Chilled Water | Chilled Water | Chilled Water |

*Test Conditions: 37C, 24% Return Air, 10/15C Chilled Water Temp

Environmental Requirements

| | | | | |
|---------------------------------|------------------------|------------------------|-----------------------|-----------------------|
| Operating Temperatures, °C (°F) | 18 to 45 (64 to 113) | 27 to 45 (80 to 113) | 18 to 40 (64 to 104) | 18 to 40 (64 to 104) |
| Storage Temperatures, °C (°F) | -40 to 70 (-40 to 158) | -40 to 70 (-40 to 158) | -20 to 50 (-4 to 122) | -20 to 50 (-4 to 122) |

Electrical Requirements

| | | | | |
|---------------|-----------------|--------------------|-----------------|-----------------|
| Input Voltage | 400V, 3Ph, 50Hz | 230V, 1ph, 50-60Hz | 400V, 3Ph, 50Hz | 400V, 3Ph, 50Hz |
| Power Input* | 1.06 | 1.9 | 1.24 | 1.89 |
| FLA (A) | 14 | 13 | 3* / 11.7** | 4.5 |

* Cooling Only

** With humidifier and reheat

Designed to Optimize IT Performance

The Vertiv™ Liebert® CRV, in-row Thermal Management unit is ideal for the cooling of data center 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 optimum level.

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

The Liebert® CRV is a row-based cooling 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 35 kW, available in both 300mm and 600mm versions, complete with roof or wall-mounted condenser.
- A chilled water system with up to 60 kW of capacity available in both 300mm and 600mm versions.

Integrated unit-to-unit communication through Teamworking further increases system performance

Designed to maximize system performance, reliability, and availability, the Liebert® CRV has integrated Teamworking built into the unit, allowing for up to 15 units to be connected together to function as a team. Included with this functionality are four modes: Standby, Rotation, Anti-Competition, and Cascading.

When the units are placed in Standby mode, one (or several) units can be placed on standby operation. These units are run at 20% fan speed. If any unit running at full capacity fails to operate properly, a standby unit will switch to full capacity to replace the failed unit, providing a back-up to maintain proper thermal conditions in the data center.

When the units are placed in Rotation mode, a unit (or units) will be placed on standby mode. When the heat load in the space exceeds the maximum available from the units in normal operation, the standby unit will run at full capacity to help manage the extra heat load.

If the units are placed in Anti-Competition mode, the system will ensure that no unit will be running in a competing function as another unit. For example, if one unit is in reheat while the another unit is cooling the same area, this Teamwork function will stop those units from competing against each other.

Last, when the units are placed in Rotation mode, each unit connected to the Teamwork network will be given an equal amount of run time. This ensures a longer life for your cooling equipment while providing optimal thermal conditions.

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 or 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 Vertiv™ 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, regardless of heat load.

Configuration Flexibility

The Liebert® CRV can be configured to perform temperatures as well as humidity control. The Liebert® CRV 300mm and 600mm 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 startup, 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.

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 by 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.

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.

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.



Vertiv™ Liebert® CRV - Services

Installation and Start-Up Services

| Installation | | Start-Up | |
|---------------------------------------|--------------------|--------------------------|----------------------|
| Description | Part Number | Part Number | Description |
| Direct Expansion Unit Start-Up (8x5) | PS-THM-ST8X5-CRDX | Unit Installation (8x5) | PS-THM-INST8X5-CRDX |
| Direct Expansion Unit Start-Up (24x7) | PS-THM-ST24X7-CRDX | Unit Installation (24x7) | PS-THM-INST24X7-CRDX |
| Chilled Water Unit Start-Up (8x5) | PS-THM-ST8X5-CRCW | | |
| Chilled Water Unit Start-Up (24x7) | PS-THM-ST24X7-CRCW | | |

Extended Warranties

| Integrated Warranty Extensions | | Extended Warranty Renewal | |
|--------------------------------|----------------------|--------------------------------------|----------------------|
| Part Number | Description | Part Number | Description |
| Preferred Warranty | THM-WP1-8WH-8R8WH-CW | Integrated Extended Warranty Renewal | THM-IEW1R-8W-8R8W-CW |
| Preferred Warranty | THM-WP1-8WH-8R8WH-DX | Integrated Extended Warranty Renewal | THM-IEW1R-8W-8R8W-DX |
| Integrated Extended Warranty | THM-IEW-8WH-8R8WH-CW | | |
| Integrated Extended Warranty | THM-IEW-8WH-8R8WH-DX | | |

Installation and Start-Up - Summary

Installation

This Service Program includes the visit of a Vertiv technician for the on-site installation of your three-phase equipment:

- Installation Service Program can be purchased within six months from the Equipment purchase date.
- This Service program is available with the two scheduling options, 8x5* or 24x7 (excluding public holidays) in the country where the equipment is installed.

Start-Up Visit

This Service Program includes the visit of a Vertiv technician for equipment Startup:

- Start-up Service Program can be purchased within six months from the Equipment purchase date.
- This Service program is available with the two scheduling options, 8x5* or 24x7 (excluding public holidays) in the country where the equipment is installed.
- This offer is not intended to be used as a repair service in case of three-phase equipment failure.

Integrated Extended Warranty - Summary

Upgrade Warranty Terms

Preferred Warranty 1 year & 2 years

This Service Program expands the coverage of the standard warranty to include Preventive Maintenance and Response Time. It can be purchased within two months from the Equipment purchase date.

- During this period, one annual visit to ensure continuous and optimal equipment performance is included.
- This Service Program grants response within 8 working hours from the incident ticket acknowledgment with the on-site intervention of a certified Vertiv technician*.
- This Service Program includes 24x7 Professional helpline.
- For UPS this Service Program does not cover internal or external batteries or other accessories.

Extend and Upgrade Warranty Duration

Integrated Warranty Extension +1

This Service Program extends the Standard Warranty coverage by one year also adding Preventive Maintenance and Response Time. It can be purchased within six months from the Equipment purchase date.

- During this period, parts, labour and travel are covered if the repair of a faulty unit is necessary.
- For UPS, this Service Program does not cover internal or external batteries, or other accessories.
- This Service Program grants response within 8 working hours from the incident ticket acknowledgment with the on-site intervention of a certified Vertiv technician*.
- This Service Program includes 24x7 Professional helpline.
- This Service Program includes one annual preventive maintenance performed by a certified Vertiv technician*.

Extended Warranty Renewal - Summary

This Service Program renews Integrated Warranty Extension +1 and extends it by one year. It can be purchased before Integrated Warranty Extension +1 or its first renewal expire.

- During this period, parts, labour and travel are covered if the repair of a faulty unit is necessary.
- For UPS, this Service Program does not cover internal or external batteries, or other accessories.
- This Service Program grants response within 8 working hours from the incident ticket acknowledgment with on-site intervention of a certified Vertiv technician*.
- This Service Program includes 24x7 Professional helpline.
- This Service Program includes one annual preventive maintenance performed by a certified Vertiv technician*.

Standard Features and Options



CRD35 DX

DX Version

High Efficiency Scroll/Rotary Compressor with Capacity Modulation

- Electronic expansion valve
- EC plug fans
- R410A Refrigerant
- Adjustable modular baffle system
- Top/Bottom connections
- Leveling feet
- Filters with up to F5 filtration class and clog filter switch
- Electrode humidifier
- Electric reheat 1-stage
- Internal condensate pump
- User Friendly Display
- Remote rack temperature sensors
- Monitoring card for WEB, Modbus and BACnet
- Teamworking functionality

CW Version

- EC plug fans
- 3-way or 2-way valve with 0 -10V actuator
- Adjustable modular baffle system
- Top/Bottom connections
- Levelling feet
- Filters with up to F5 filtration class and clog filter switch
- Electrode humidifier
- Electric reheat 1-stage
- Internal condensate pump
- User Friendly Display
- Remote rack temperature sensors
- Monitoring card for WEB, Modbus and BACnet
- Teamworking functionality

Additional Options

DX Version

- Additional remote rack temperature sensors
- Compressor jacket (600mm models)
- Dual power supply with ATS on selected models
- Optional extension frame for height 2200mm and depth 1200mm

CW Version

- Additional remote rack temperature sensors
- Dual power supply with ATS
- Cooling Capacity Meter

Fully integrate your IT deployments with Vertiv™ solutions



Vertiv™ Geist™ SwitchAir

Prevents overheating of network switches by directing cool air to switch intakes, keeping hot exhaust air out.

Vertiv™ Aisle Containment

Maximize your efficiency and capacity from the core to the edge with adaptable hot or cold aisle containment.



Vertiv™ VR Racks

Supports a wide variety of equipment and gives you the flexibility you need with easy installation.



Vertiv™ Liebert® CRV



Delivers highly efficient and scalable in-row cooling to maintain optimal thermal operating conditions for maximum system reliability.



Vertiv™ Geist™ rPDU

Reliably distributes power to the rack, supporting dynamic data center operations and DCIM.

Vertiv™ Liebert® GXT5



Helps protect mission critical equipment from all power disturbances due to blackouts, brownouts, sags, surges or noise interference.

Round out your IT solution with Vertiv Services

Protect your critical IT system with a host of Vertiv services for all products listed above. When your business relies on high system performance and availability, having Vertiv certified technicians on hand to provide their expertise should be your top priority.