Precision Cooling for
Business-Critical Continuity™

Liebert® CRV

Efficient Cooling For IT Equipment

NEW
Extended Range
Available
From 10
To 50 kW

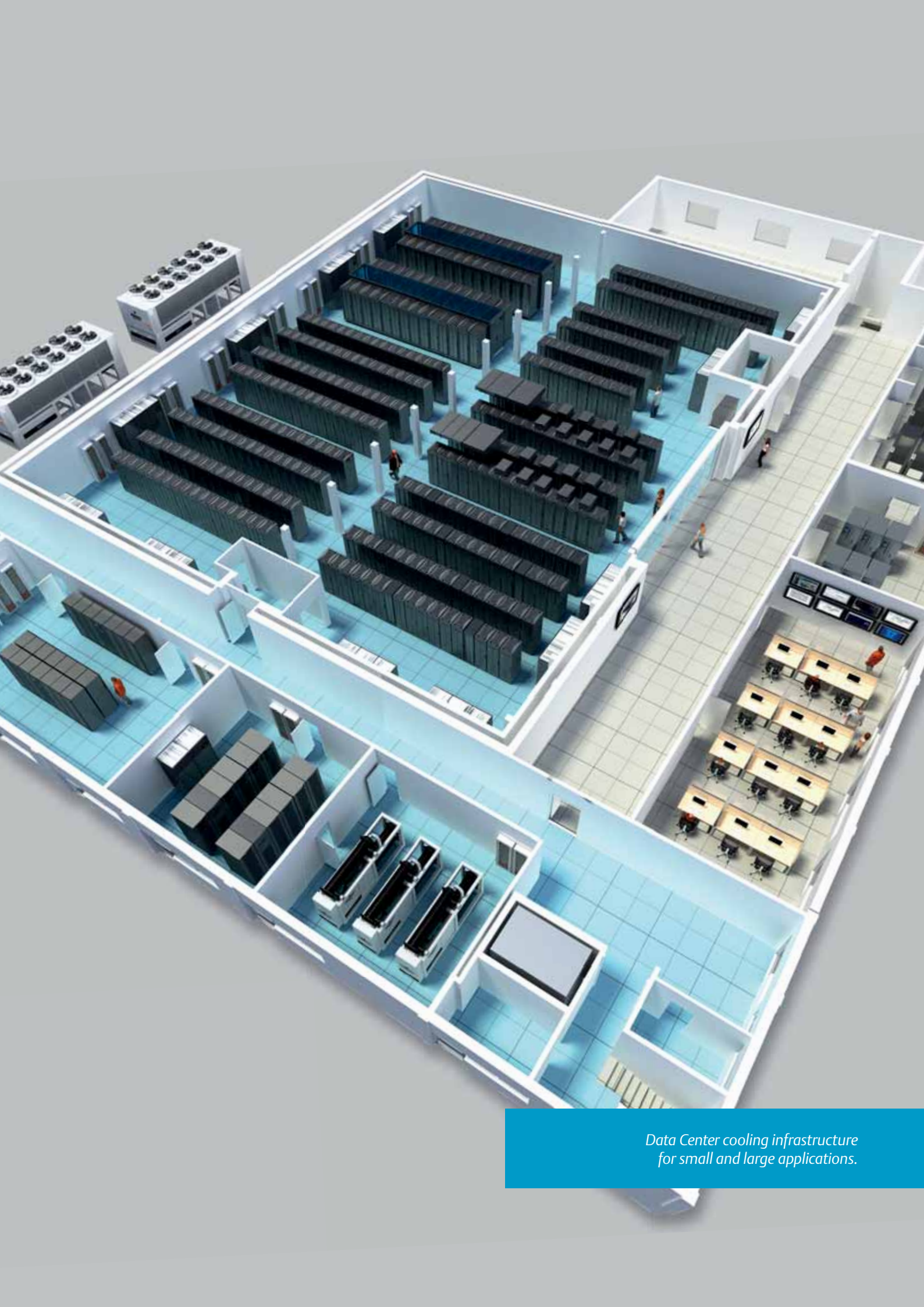
EMERSON
Network Power

Emerson Network Power, a division of Emerson, is a global company that combines technology with design to supply innovative solutions for the benefit of its customers.
Emerson Network Power is the leader in the "***business-critical continuity***" field, thanks to the company's products and services.
Emerson Network Power's broad technology base and global expertise support a full spectrum of enterprise-wide solutions for today's vital business needs.

Regardless of your size, you can't afford for your critical business systems to go down and you can't waste time recovering your IT infrastructure after a disruption.

Leave that to us, the experts in *business-critical continuity*: from grid to chip, from the biggest to the smallest data centers, we are ready to serve your needs with the solutions we have developed.

More standardization, so you don't need further budget allocations to install it.
More simplification so you don't need to be a specialist to get the best for your business.
More support, so while you are enjoying doing business, we are protecting you.



Data Center cooling infrastructure for small and large applications.

Liebert® CRV: Precision Cooling for Optimized IT Performance

Features and Performances

- Units ranging from 10 - 50 kW with chilled water and direct expansion versions, featuring unique Digital Scroll compressor technology
- Industry's highest energy saving levels achieved - increase of up to 50% when the Liebert® CRV is combined with SmartAisle™ cold aisle containment
- Best-in-class precision cooling for in row-based applications
- On-site adjustment capability of air diffuser distribution direction maximizes cooling results
- Integrated iCOM® control for management of capacity and airflow through EC fan and Digital Scroll technology
- Ideal for scalable IT infrastructure - Increased cooling capacity, reduced noise levels and enhanced efficiency when compared with similar chilled water and direct expansion configurations.

The Liebert® CRV, self-contained precision cooling 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.
The Liebert® CRV is furthermore designed to comply with mission-critical requirements and ensure that servers are maintained at the correct temperature and humidity levels.

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, complete with roof or wall-mounted condenser.
- A chilled water system with up to 50 kW of capacity available in both 300-600 ml versions.

The Liebert® CRV, self-contained precision cooling unit is ideal for the cooling of row-based applications.

IT Infrastructure Availability is Essential to Every Business

Maintaining IT Infrastructure Availability

With integrated 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 Digital Scroll compressor technology is 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.

Liebert® CRV: Precision Cooling for Optimized IT Performance.

Flexibility to Adapt to Business Demands - Liebert® CRV is Suitable for both 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.

For large-scale applications, Liebert® CRV can also be used in combination with the Liebert® X-treme Density range to achieve optimum cooling control.

Configuration Flexibility

The Liebert® CRV can be configured to perform temperature as well as humidity control.
The Liebert® CRV 300 mm of 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 Fan and Digital Scroll Technology, managed through integrated 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.

The constant evolution of business infrastructure requires flexible cooling solutions.

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.

Total cost of ownership advantages are also achieved as a result of the Liebert® CRVs configuration flexibility. 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 iCOM® control, equipped with up to ten 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 delivering energy savings.
Digital Scroll compressors modulate the cooling capacity, thus reducing input power with partial loads.

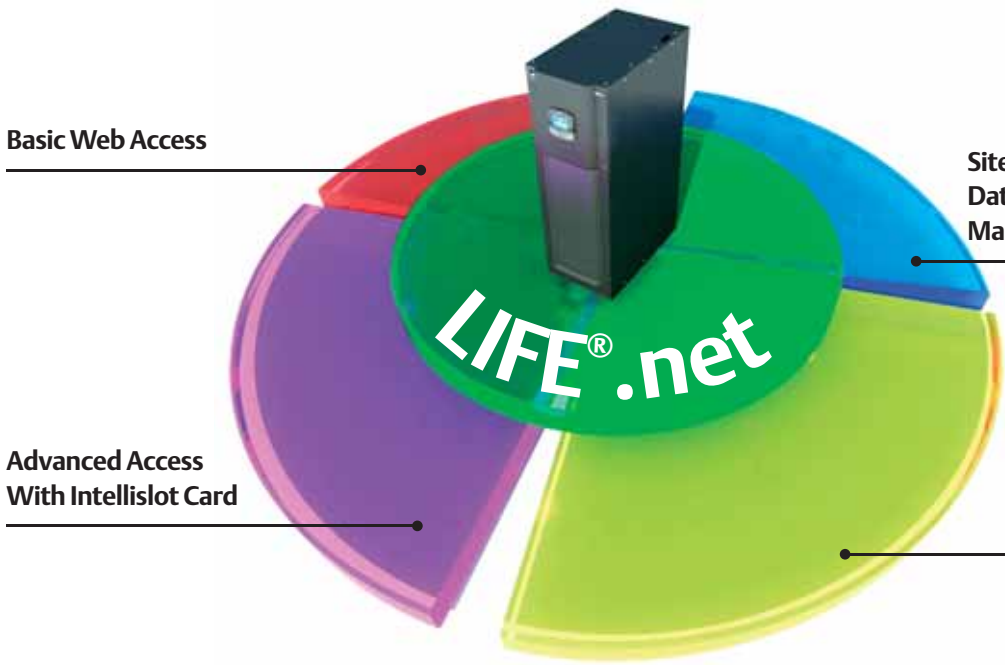
EC fan technology regulates air flow and reduces fan input power.

Liebert® CRV:
simple, safe, adaptable cooling.

Liebert® CRV: Remote Monitoring Service and Connectivity

- **LIFE®.net Remote Monitoring and Diagnostic Service**
  It is essential that your critical cooling system is maintained in an optimum state of readiness at all times. With LIFE®.net remote monitoring and diagnostics, Emerson Network Power Services monitor and prevent possible alarm conditions. This allows effective proactive maintenance and fast incident response, giving customers complete security and peace of mind. Service center engineers are permanently on hand to provide immediate fault analysis and appropriate corrective action.

- The customer will be informed about the status of the installation through detailed reporting providing valuable information on unit functioning and trends over any selected period of time.



- **Basic Web Access**
  Basic operational information can be made available through the monitoring feature offered by the iCOM® Control over Ethernet. A web browser is the only requirement needed for the unit to communicate directly with the local or remote web interface.

- **Monitoring and Control Through Existing Network Via your Web Browser**
  The Liebert® CRV system can be fitted with a Liebert® IntelliSlot Web 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, Liebert® CRV may be integrated with an existing Building Management System, while the IntelliSlot 485 Cards provide Modbus RTU and Modbus TCP compatibility. SCADA support is completed through the Bacnet over IP card.

- **Liebert® Nform™ Software Centralized Management**
  As business grows, critical equipment infrastructure expands, thus the need for centralized management of any equipment is key to business success. Connecting to equipment in the distributed critical space is only part of the monitoring challenge. Liebert® Nform™ leverages the network connectivity capabilities of Liebert® CRV to provide centralized monitoring of the distributed equipment. Utilizing the SNMP and Web technologies integrated in each Liebert® IntelliSlot communication card, Liebert® Nform™ centrally manages alarm notifications and provides an intuitive interface to access critical status information. Liebert® Nform™ allows critical system information to be readily available to support personnel wherever they are, increasing responsiveness to alarm-event conditions, thus allowing IT organizations to maximize their system availability.

Liebert SiteScan® Web Control, Data Capture, Energy Management and Planning

For customers who require extensive management of critical system equipment spanning multiple locations in an ever-moving global enterprise, Liebert SiteScan® Web will centrally manage critical equipment and give the power to move beyond the event responsive service paradigm.

Liebert SiteScan® Web does it all

- Real-Time Monitoring and Control
- Event Management and Reporting
- Data Analysis and Trending
- Building Management Integration

Liebert SiteScan® Web is a comprehensive critical system management solution dedicated to ensuring reliability through graphics, event management and data export. The standard Web interface allows users easy access from anywhere, anytime.

Data Center Application Scenarios

Data Center Rooms 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 precision 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 building 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 Digital Scroll, which has the capability of immediately modulating and adapting its operation according to server cooling requirements. Digital Scroll significantly minimizes start/stop cycling, increasing 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.

Scenario 1	**N° of racks**	1 to 4
	Heat Load	Up to 20 kW
	Space	From 5 m^2 and 15 m^2
	Raise Floor	-
	Recommended Solution	Direct Expansion

Scenario 2	**N° of racks**	Up to 10
	Heat Load	Up to 100 kW
	Space	Up to 30 m^2
	Raise Floor	-
	Recommended Solution	Direct Expansion

Data Center Rooms with up to 50 Racks

The Liebert® CRV's integration with SmartAisle™ proves to be the ideal cold aisle containment approach for small data centers in which heat density requires increasing, without the necessity of installing raised floors or heightening roof levels.

Chilled Water Solution with SmartAisle™

The 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 E E R 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 fan 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 free cooling effect.

Scenario 3	**N° of racks**	10 to 20
	Heat Load	Up to 200 kW
	Space	Up to 50 m²
	Raise Floor	-
	Recommended Solution	Chilled Water

Scenario 4	**N° of racks**	Up to 50
	Heat Load	Up to 300 kW
	Space	Up to 100 m²
	Raise Floor	-
	Recommended Solution	Chilled Water

Liebert® CRV technical data

		CR010RA / W	CR020RA / W	CR035RA / W	CR030RC	CR034RC	CR040RC	CR050RC
Sensible Net Cooling Capacity	[kW]	**10.4**	**23.2**	**37.1**	**29.6**	**30.7**	**40.4**	**50.2**
Power input	[kW]	2.5	6.2	9.7	0.83	1.02	1.3	1.9
Nominal Air Flow	m^3/h	2500	4170	5540	5000	5900	5650	7410
Weight	[kg]	280 / 290	335 / 350	365 / 385	166	184	330	365
Humidity Control		yes	yes	yes	*	*	yes	*
Dimensions H x W x D	[mm]	2000x600x1175	2000x600x1175	2000x600x1175	2000x300x1000 2000x300x1100 2000x300x1200	2222x300x1000 2222x300x1100 2222x300x1200	2000x600x1175	2000x600x1175

Note: The performances shown refer to nominal conditions, i.e. air inlet temperature 37°C, condensing temperature for air and water/glycol cooled units 45°C, chilled water temperature 10/ 15°C. (*) Only sensible cooling no hum/dehum allowed.

Standard Features and Options

- Crankcase heater
- Locking disconnect
- EC Plug Fans
- R410A
- Adjustable modular baffle system
- Simultaneous top and bottom connections
- Units provided with castors and levelling feet
- G4 (EU4) gravimetric & clog filter switch for 600 mm only
- MERV1 filter for 300 mm version
- Steam Humidifier
- Electric reheat 1-stage
- CW 3-way valve
- Dual-float condensate pump
- (3) Remote Rack Sensors
- iCOM® Large Graphic Display
- (1) Web Monitoring Card

Additional Options

- Extra iCOM® display
- Additional Remote Rack Sensors
- Smoke Sensor
- CW 2-way valve
- Additional alarm contact
- Reheat and Humidity Lockout
- High Temperature Stat
- Compressor Jacket
- F4 (EU5) gravimetric & clog filter switch
- 485 Monitoring Card

Coupling Air Cooled Liebert® CRV units with air cooled condensers

Model	Ambient temperature up to 35° C		Ambient temperature up to 40° C		Ambient temperature up to 46° C	
	standard noise	low noise	standard noise	low noise	standard noise	low noise
CR20RA	1 x HCR33	1 x HCR43	1 x HCR43	1 x HCR51	1 x HCR51	1 x HCR59
CR35RA	1 x HCR51	1 x HCR59	1 x HCR51	1 x HCR59	1 x HCR76	1 x HCR88

Condensers Dimensions

		Width	Depth	Height	Weight
HCR33	[mm]	1340	831	1112	75
HCR43	[mm]	2340	831	1112	92
HCR51	[mm]	2340	831	1112	93
HCR59	[mm]	2340	831	1112	102
HCR76	[mm]	3340	831	1112	136
HCR88	[mm]	3340	831	1112	165

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
CR20RW	1 x ESM018	1 x ELM018	1 x EST028	1 x ELM027	1 x EST050	1 x ELT047
CR35RW	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 Cooled

Chilled water cooled unit CRxxxRC may be coupled with Emerson Networ Power chillers (Liebert® HPC series). The Liebert® HPC chiller series offers a wide range of chillers (air cooled or water cooled for indoor and outdoor installation). All chillers are available with variable noise versions and with free cooling which can greatly enhance the system energy saving capabilities. Liebert® HPC freecooling chillers are available from 60 kW to 1500 kW.




Emerson Network Power

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 SmartAisle™
- Premium energy efficiency version
- iCOM® control featured

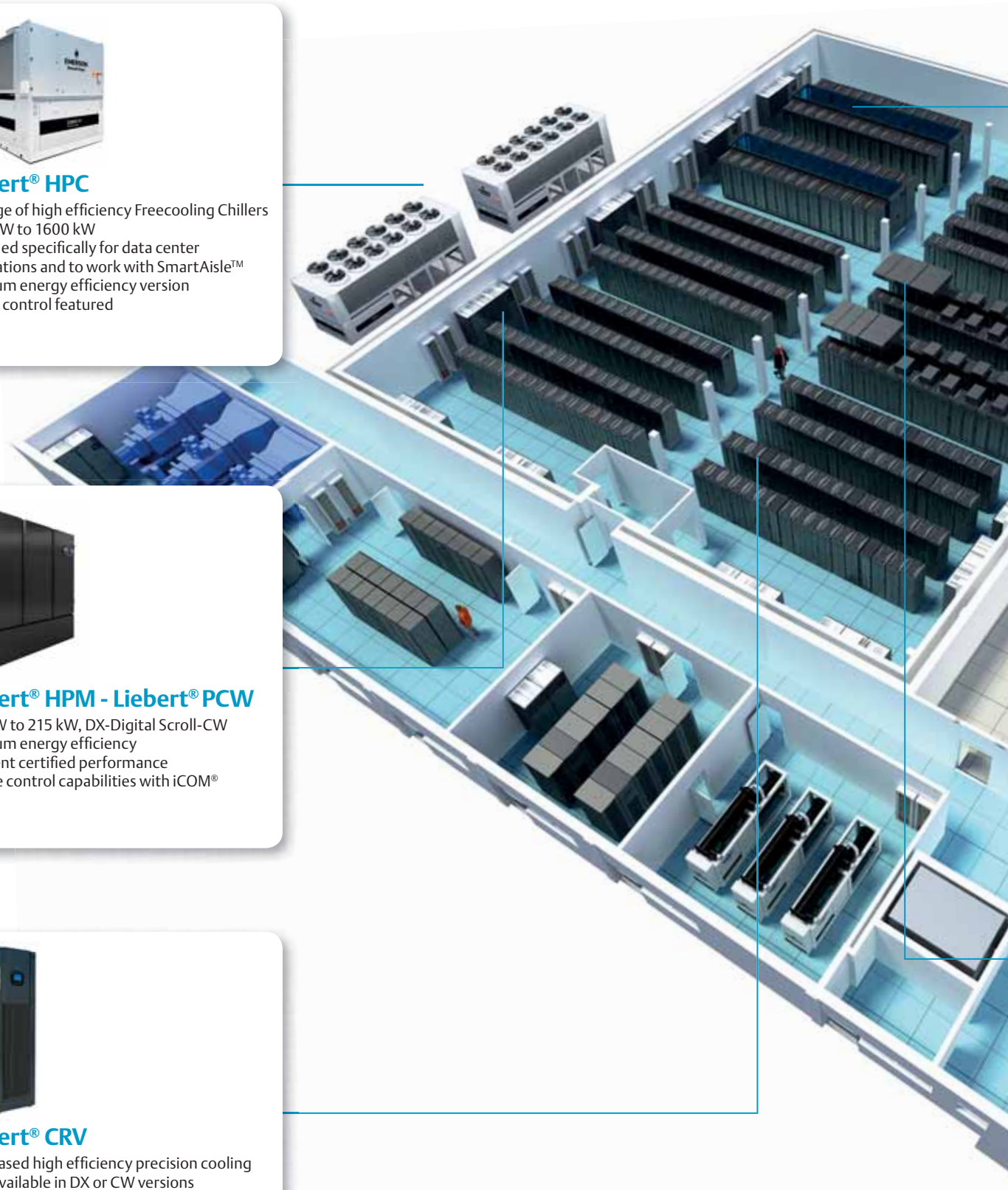
Liebert® HPM - Liebert® PCW

From 4 kW to 215 kW, DX-Digital Scroll-CW

- Premium energy efficiency
- Eurovent certified performance
- Unique control capabilities with iCOM®

Liebert® CRV

- Row-based high efficiency precision cooling units available in DX or CW versions
- Decoupled control for airflow and cooling capacity
- Modulating cooling capacity with digital scroll
- iCOM® control with remote rack sensors



SmartAisle™

- Aisle containment
- Provides highest energy efficiency
- Works with any Liebert® cooling unit

Liebert® XD

- Refrigerant based high density cooling installed close to the server
- Hot spot management for up to 30 kW per rack
- On-demand upgrade with plug and play
- High efficiency and 100% sensible cooling

Service

Emerson Network Power supports Business-Critical Continuity™ with the largest global services organization in the industry and a service offering dedicated to entire critical infrastructure, delivering:

- Design, installation and startup
- Warranty service
- Preventive maintenance
- 24/7 remote monitoring
- Emergency service
- Site audits

Service contracts

Regular service of business critical infrastructure provides uptime assurance and reduces the total cost of ownership over the life of equipment.
A service contract ensures that infrastructure is regularly maintained in order to avoid unexpected, costly downtime. Emerson Network Power service contracts cover all technologies and can be tailored to suit individual business needs.

LIFE®.net

Maximized system availability via real-time diagnosis and resolution of operating anomalies

- 24-hour real-time monitoring by expert engineers
- Monitoring and trending of system data
- Diagnosis through expert data analysis allowing effective proactive maintenance and prevention of future anomalies
- Alarm notification
- On-site corrective maintenance dispatching

Ensuring The High Availability Of Mission-Critical Data And Applications.

About Emerson Network Power

Emerson Network Power, a business of Emerson (NYSE:EMR), delivers software, hardware and services that maximize availability, capacity and efficiency for data centers, healthcare and industrial facilities. A trusted industry leader in smart infrastructure technologies, Emerson Network Power provides innovative data center infrastructure management solutions that bridge the gap between IT and facility management and deliver efficiency and uncompromised availability regardless of capacity demands. Our solutions are supported globally by local Emerson Network Power service technicians.

Learn more about Emerson Network Power products and services at www.EmersonNetworkPower.com

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Emerson Network Power
The global leader in enabling *Business-Critical Continuity™*

- AC Power
- Connectivity
- DC Power
- Embedded Computing
- Embedded Power
- Infrastructure Management & Monitoring
- Outside Plant
- Power Switching & Controls
- Precision Cooling
- Racks & Integrated Cabinets
- Services
- Surge Protection