

Liebert® PDX from 15 to 120 kW

The Thermal Management Solution for Small and Medium Data Centers





Whether a data center houses three or 200 IT racks, deployment of new technologies with high power densities are impacting the power and cooling systems that business-critical servers and communications devices depend on for their performance and reliability.

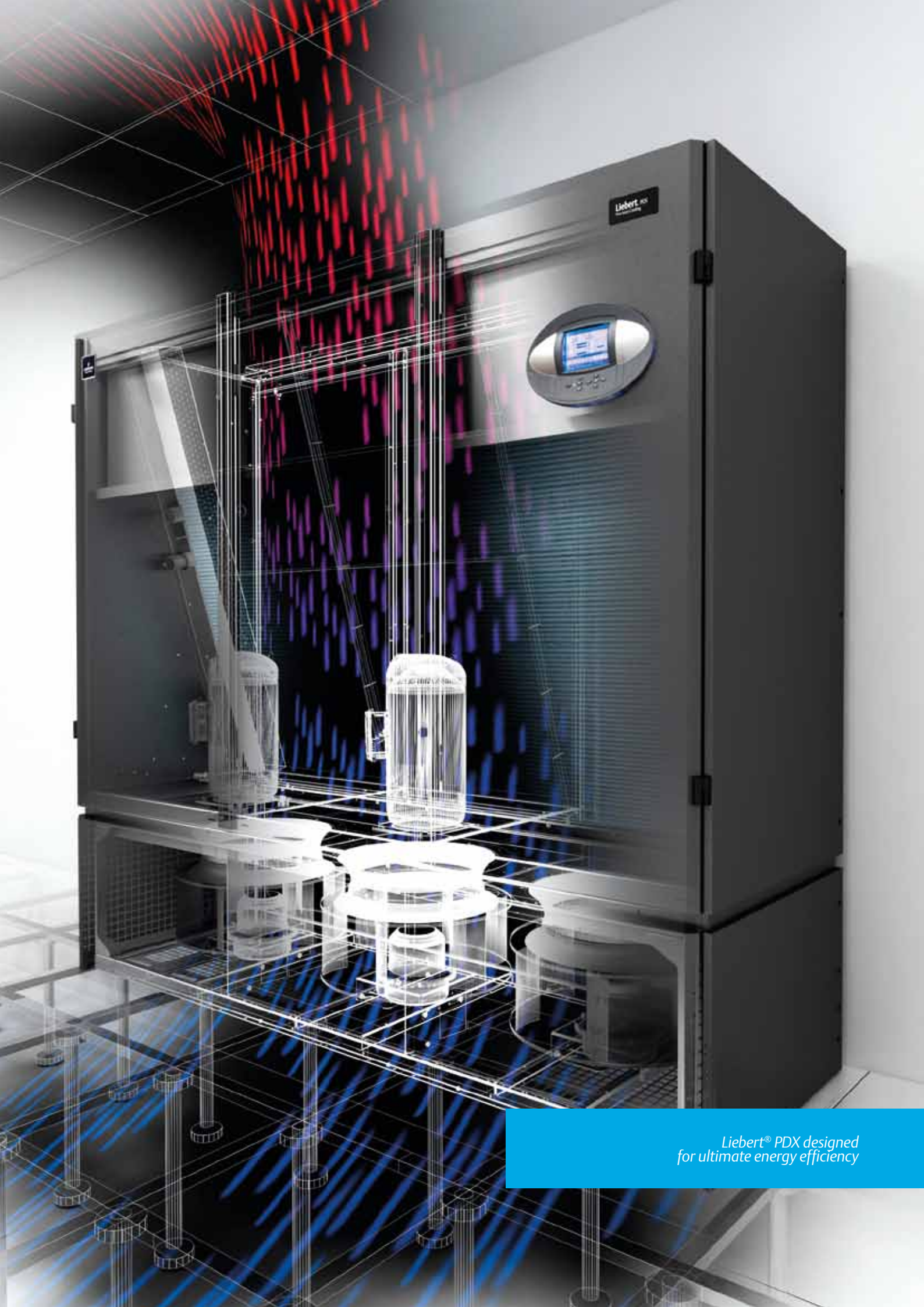
■ **The critical infrastructure systems from Emerson Network Power allow customers to respond to changes** in density, capacity and availability while achieving greater operating flexibility, higher system availability and lower total costs of ownership.

■ **Emerson Network Power delivers innovative solutions through 12 Centers of Expertise**, distinct areas of breakthrough products and services that help determine what is needed in relation to the application. Supported by a global network in more than 150 countries, backed by local service and support from more than 2,000 certified professionals, Emerson Network Power is uniquely positioned to provide systems and integrated solutions wherever our customers are located.

Emerson Network Power understands the challenges of setting up the right infrastructure to support business-critical data center operations and helps respond to any demand by providing innovative solutions, allowing

customers to concentrate on their business requirements.

■ **The Liebert® PDX direct expansion cooling unit is equipped with the most advanced industry technology, guaranteeing precise cooling of data centers and server rooms. It comes complete with R410A refrigerant which allows the unit to reach significant levels of efficiency.** The Liebert® PDX range also includes new generation Liebert® EC Fans 2.0, thus ensuring top energy efficiency. The complete unit design has furthermore been optimized with enhanced heat exchangers, delivering high levels of overall efficiency and cooling capacity. In addition, Liebert® PDX also includes unique Digital Scroll technology, making it the ideal, scalable cooling system able to expand with evolving business needs. The Digital Scroll modulating capability greatly contributes to the efficiency levels reached by Liebert® PDX with a 50 kW unit (inclusive of Digital Scroll) consuming as little as a 10 kW unit, thus delivering advantageous energy savings.



Liebert PDX



Liebert® PDX designed
for ultimate energy efficiency

Liebert® PDX Key Features



R410A Refrigerant

Designed for R410A Refrigerant.



Copeland Digital Scroll Technology

The best solution in terms of variable cooling capacity.



Precise Temperature Control

Digital Scroll based technology allows for close monitoring and control of room temperature.



Liebert® EC Fan 2.0

The new generation of Liebert® EC Fan 2.0 is the core of the Liebert® PDX,

significantly minimizing noise levels and increasing the efficiency of the unit.



Electronic Expansion Valve

This valve is designed to constantly optimize the refrigeration circuit's performance in order to achieve the highest efficiency also at partial load. The relevant valve management software is also embedded in the unit's iCOM® control function.



Ultrasonic Humidifier - The Efficient Humidification Technology

Liebert® PDX's cutting-edge technology allows each of its components to save energy while delivering the required data center cooling performance. The infrared and electrode boiler humidifier are two efficient options made available.



iCOM® Control - When Smart Means Efficient

Smart mode is a control algorithm developed for SmartAisle™ containment applications, meeting the cooling and airflow needs of the servers while ensuring only necessary kilowatts are invested in targeted cooling.



European ErP 2015 Directive

Precision cooling floor mount products comply with the European ErP 2015 Directive requirements, respecting environmental commitments while reducing operating costs.



Energy Efficiency

First-class energy efficiency achieved through the combination of market leading technologies.



Integrated with SmartAisle™ containment, the Liebert® PDX is the ideal response to data center cooling demands and minimizing operating costs.



Freecooling Modes for Optimizing System Efficiency

- Fresh Air/Direct Freecooling
- Water/Indirect Freecooling



Heat Load Monitoring

Continuous monitoring of heat load ensures that only necessary kilowatts are invested in targeted cooling, thus conserving energy.



24x7 Service Offering

Emerson Network Power supports customers with an extensive service offering, guaranteeing availability and total peace of mind 24/7.





iCOM[®] Control Drives Liebert[®] PDX to the Highest Efficiency Levels

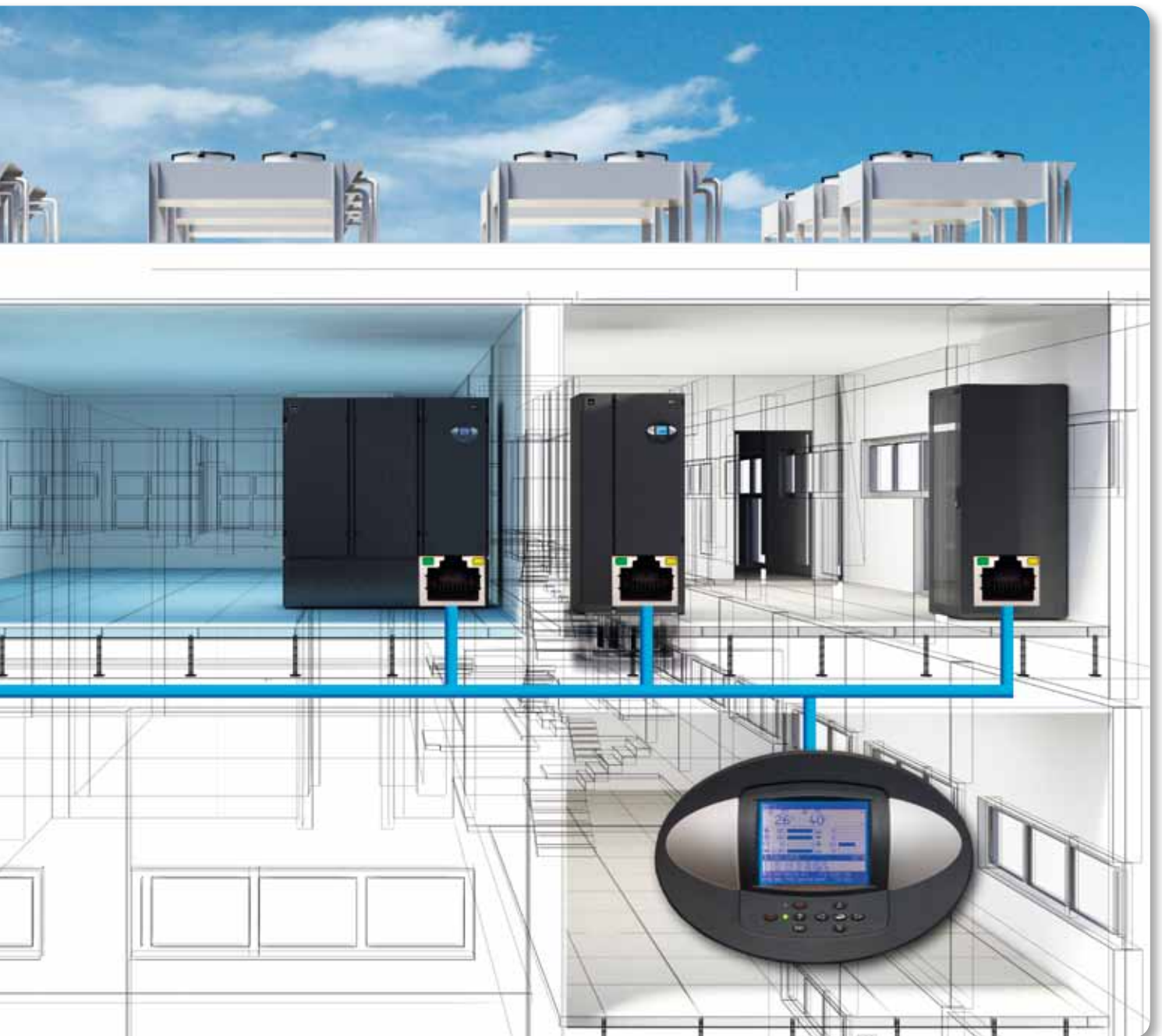
The iCOM[®] device features a unique control algorithm designed to manage the operation of the Liebert[®] PDX units, ensuring top reliability in all conditions. Liebert[®] PDX units with the iCom[®] control graphic display, may be centrally monitored and controlled with the optional wall mounted display. The display allows access to the unit via the Network, making coordination between Liebert[®] PDX units within the same room possible as a result of the integrated Ethernet connection. The self monitoring of redundant units alternates standby positions and gives priority to possible hot spots. The high-level supervision of multiple units allows them to work together as a single system optimizing room temperature and humidity. This is of particular importance for EC fans. EC fan power consumption is exponential. Having five units running at 80% instead of four at 100% will lower the total energy used by the entire group by 36%. iCOM[®] manages the reduction of fan speed whenever operation at full capacity is not required. Liebert[®] PDX digital modulates both fans and compressors thus increasing the entire system's efficiency. Efficiency is in turn further increased as a result of Liebert[®] PDX's ability to share the heat load among installed units, guaranteeing ideal cooling levels while minimizing consumption.

Unit to Unit Communication

iCOM[®] directly connects with the facility network (Ethernet) and enables communication between multiple Liebert[®] PDX units for synchronized operation, guaranteeing increased reliability and precision cooling room control.



Smart mode is a control algorithm developed for SmartAisle™ containment applications, meeting the exact cooling and airflow needs of the servers, investing only necessary kilowatts in targeted cooling.



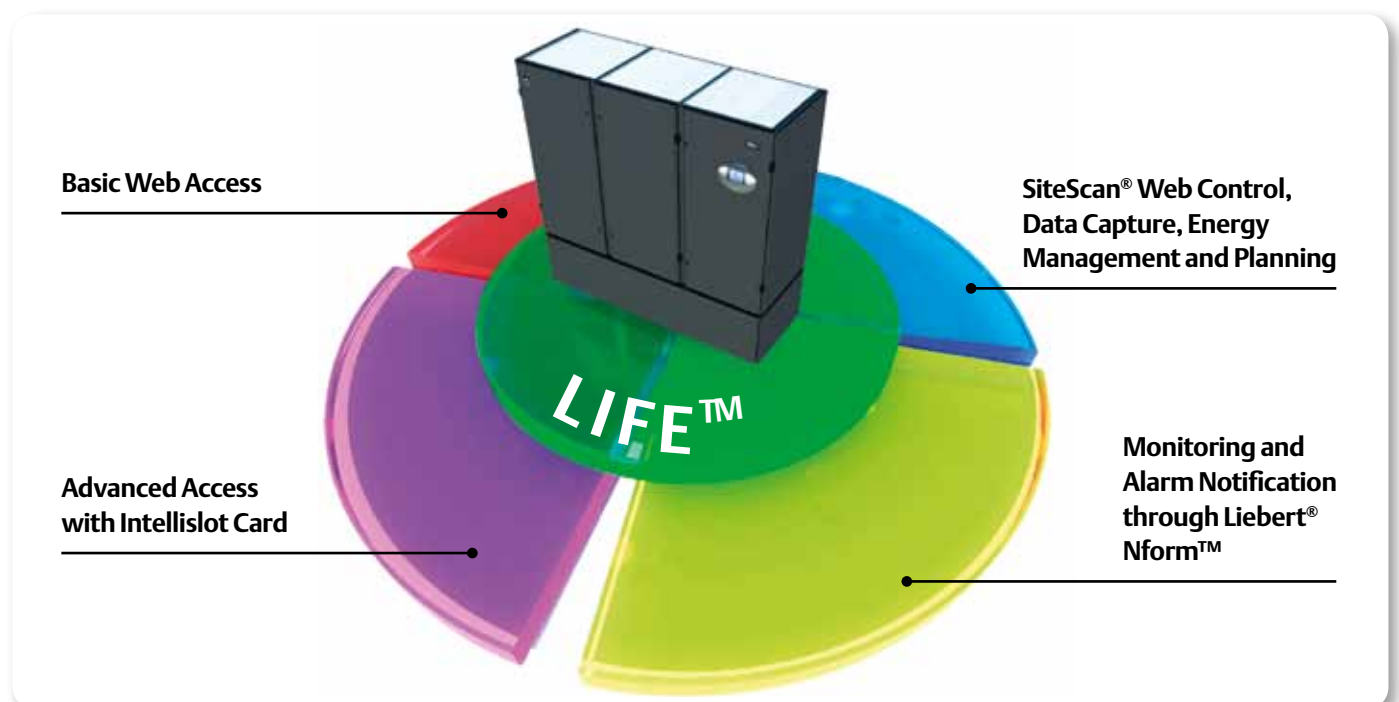


Liebert® PDX: Remote Diagnostic and Preventive Monitoring Services

■ LIFE™ Remote Diagnostic and Preventive Monitoring Services

Proactive equipment maintenance reduces downtime and extends equipment life which in turn maximizes return on investment and increases system availability. Emerson Network Power supports entire critical infrastructures with an extensive service offering, guaranteeing network availability and total peace of mind 24/7. Our approach to servicing critical infrastructure covers all aspects of availability and performance,

from single units to entire mission critical systems, providing customers with tailored services to meet their individual business needs. Emerson Network Power's service program is designed to ensure that your critical Thermal Management system is maintained in an optimum state of readiness at all times. The LIFE™ services enable 24/7 remote diagnostic and preventive monitoring providing early warning of Thermal Management units conditions and out of tolerances. This allows proactive maintenance and remote trouble





shooting minimizing the risk of downtime and optimizing Mean Time Between Failures and First Time Fix Rate, granting total peace of mind.

■ **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® PDX 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® PDX may be integrated with an existing Building Management System, while the IntelliSlot 485 and the Bacnet over

IP 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® PDX to provide centralized monitoring of the distributed equipment. Utilizing the SNMP and Web technologies integrated in the 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.

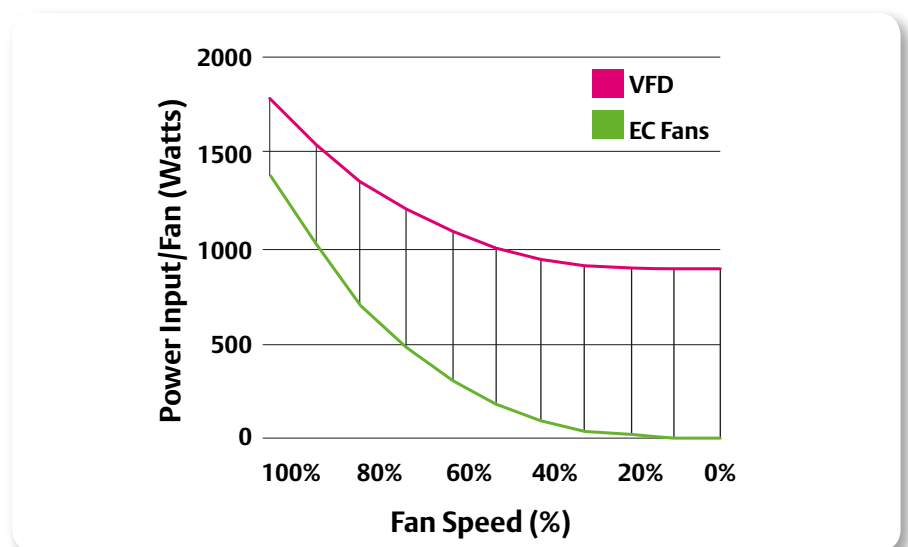


Liebert® MC: The New Condensing Technology

Liebert® MC new microchannel condensers are ideally designed to match the outstanding performances of Liebert® PDX. The highly efficient Liebert® MC unit directly communicates with Liebert® PDX units via the integrated iCOM® Control, providing significant advantages in terms of condenser management. The Liebert® MC can thus be managed through the Liebert® PDX iCOM® control allowing the complete coordination of unit and condenser settings status and alarm conditions. The possibility of selecting silent functioning modes at defined times (i.e. during the night or the weekend), through the unit control, further ensures full operating flexibility.

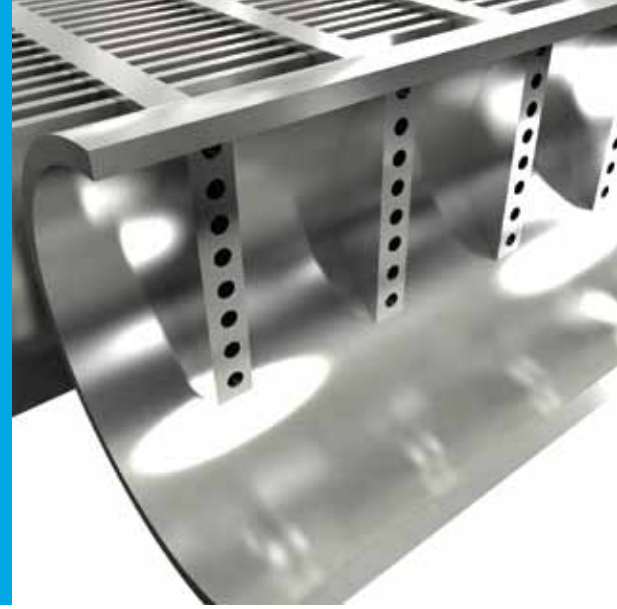
High Efficiency at Full and Partial Load Conditions

Liebert® MC microchannel condensers, equipped with EC fans, deliver a 20% increase in unit efficiency at full load, when compared to a standard condenser adopting the Variable Frequency Drive (VFD). Efficiency levels are further optimized at partial load where the EC Fans require a lower power input, thus reducing energy consumption and guaranteeing top-tier performances.



For specific environments in which microchannel condenser use is limited, Liebert® HCR base condensers are available.

Microchannel
Aluminum Coils



Liebert® MC: Enhancing Efficiency Levels



Microchannel Condensing Coil:

The full aluminum coil ensures enhanced efficiency levels also during the mechanical cooling mode.







































New generation EC Fans:









































The new generation EC Fans guarantee the highest efficiency at full and at partial load, ensuring also extremely silent operations.

Single Circuit												
Model		PX015	PX021	PX025	PX031	PX033	PX041	PX045	PX059	PX047	PX051	PX057
Total Gross Cooling Capacity	kW	13.9	19.1	25.0	30.1	34.2	40.41	44.6	57.3	46.28	53.1	59.0
Net Sensible Cooling Capacity	kW	13.4	18.2	23.2	26.5	28.7	35.8	39.1	45.1	43.8	50.0	54.6
SHR		1.00	1.00	0.98	0.94	0.90	0.93	0.93	0.82	1.00	1.00	0.98
Net Sensible EER		4.37	3.93	3.53	3.21	3.09	3.51	3.33	2.99	3.70	3.47	3.40
Airflow	m³/h	4462	5672	6792	7752	7944	10000	10900	11200	14500	15800	16300
Max. ESP	Pa	250	250	250	220	180	250	100	80	300	300	300
Dimensions (W x D)	mm	844 x 890	844 x 890	844 x 890	844 x 890	844 x 8890	1200 x 890	1200 x 890	1200 x 890	1750 x 890	1750 x 890	1750 x 890
Height (H)	mm	1970	1970	1970	1970	1970	1970	1970	2570	1970	1970	1970
Weight	kg	290	300	320	340	340	452	456	593	620	621	675
Number of Capacity Steps		1	1	1	1	1	1	1	2	1	1	2
Aiflow Delivery												
Cooling Version:												

Double Circuits											
Model		PX044	PX054	PX062	PX068	PX074	PX092	PX082	PX094	PX104	PX120
Total Gross Cooling Capacity	kW	44.8	55.1	62.5	66.1	74.8	92.5	85.7	94.5	106.5	123.9
Net Sensible Cooling Capacity	kW	42.3	51.2	55.6	62.2	62.9	72.2	78.4	84.9	91.7	100.7
SHR		0.99	0.99	0.95	0.98	0.90	0.82	0.97	0.96	0.92	0.86
Net Sensible EER		3.79	3.53	3.35	4.08	3.09	2.93	3.60	3.38	3.10	2.95
Airflow	m³/h	12500	15500	16300	18500	17600	17950	24000	26000	27000	27000
Max. ESP	Pa	300	200	200	300	80	180	250	150	100	100
Dimensions (W x D)	mm	1750 x 890	1750 x 890	1750 x 890	2550 x 890	1750 x 890	1750 x 890	2550 x 890	2550 x 890	2550 x 890	2550 x 890
Height (H)	mm	1970	1970	1970	1970	1970	2570	1970	1970	1970	1970
Weight	kg	638	642	680	887	680	776	901	901	901	954
Number of Capacity Steps		2	2	2	2	2	2	2	2	2	4
Aiflow Delivery											
Cooling Version:											

Performances at
24°C 50% - 45°C condensing temperature
Nominal ESP 20 Pa

Single Circuit											
Model		PX021	PX025	PX031	PX033	PX041	PX045	PX059	PX047	PX051	PX057
Total Gross Cooling Capacity	kW	24.9	32.4	37.8	41.9	50.3	55.4	68.8	63.0	67.4	74.6
Net Sensible Cooling Capacity	kW	24.1	31.1	36.0	39.9	48.4	53.0	66.4	60.5	64.3	71.3
SHR		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Net Sensible EER		4.79	4.65	4.24	4.18	4.62	4.36	4.35	4.58	4.53	4.37
Airflow	m³/h	5672	6792	7752	7944	10000	10900	11200	14500	15800	16300
Max. ESP	Pa	250	250	230	200	250	100	80	300	300	300
Dimensions (W x D)	mm	844 x 890	844 x 890	845 x 890	844 x 890	1200 x 890	1200 x 890	1200 x 890	1750 x 890	1750 x 890	1750 x 890
Height (H)	mm	1970	1970	1970	1970	1970	1970	2570	1970	1970	1970
Weight	kg	300	320	340	340	452	456	593	635	637	675
Minimum Nominal Capacity Modulation		20%	20%	20%	20%	20%	20%	25%	25%	25%	25%
Airflow Delivery			   			   		  		   	
Cooling Version:			    		 	    		    		   	

Double Circuits											
Model		PX044	PX054	PX062	PX068	PX074	PX092	PX082	PX094	PX104	PX120
Total Gross Cooling Capacity	kW	61.0	72.8	80.4	90.1	94.5	113.3	111.8	126.3	133.4	153.4
Net Sensible Cooling Capacity	kW	59.0	69.3	76.6	87.5	89.8	109.3	106.6	120.1	126.5	146.5
SHR		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Net Sensible EER		5.19	4.80	3.28	5.60	4.34	4.38	4.46	4.33	4.35	4.22
Airflow	m³/h	12500	15500	16300	18500	17600	17950	24000	26000	27000	27000
Max. ESP	Pa	300	200	200	300	80	180	250	150	100	100
Dimensions (W x D)	mm	1750 x 890	1750 x 890	1750 x 890	2550 x 890	1750 x 890	1750 x 890	2550 x 890	2550 x 890	2550 x 890	2550 x 890
Height (H)	mm	1970	1970	1970	1970	1970	2570	1970	1970	1970	1970
Weight	kg	638	642	680	887	680	776	931	931	931	954
Minimum Nominal Capacity Modulation		10%	10%	10%	10%	10%	10%	12,5%	12,5%	12,5%	12,5%
Airflow Delivery			   		   	   		  		   	
Cooling Version:			    		 	    		    		   	

Performances at
37°C 24% - 45°C condensing temperature
Nominal ESP 20 Pa
Fan over the floor

Emerson Network Power

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



■ Liebert® PDX - Liebert® PCW

Liebert® PDX available from 15-120 kW
Liebert® PCW available from 30-220 kW

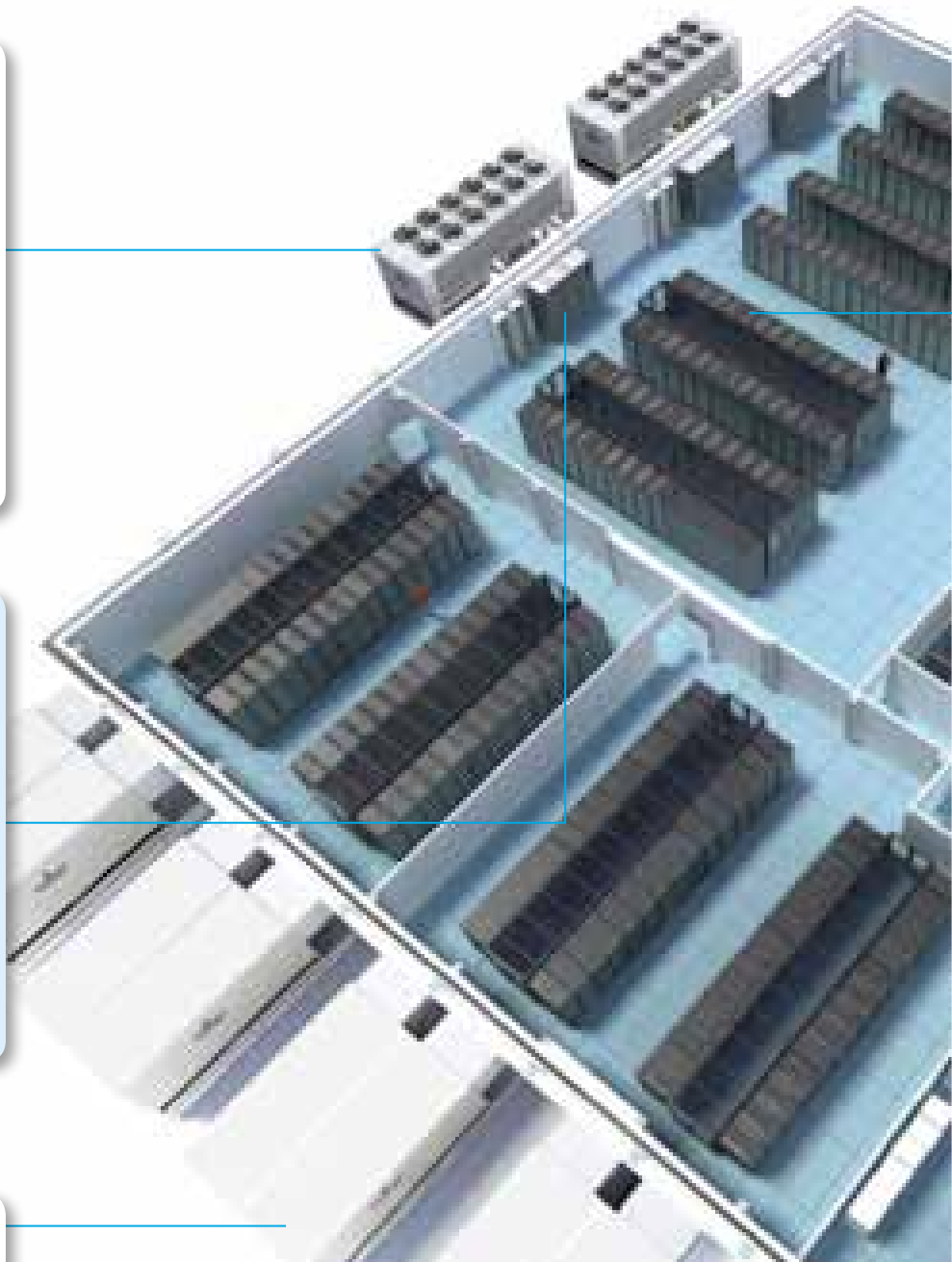
- Premium energy efficiency
- Eurovent certified performance
- Unique control capabilities with the iCOM® Control



■ Liebert® EFC

Indirect evaporative freecooling unit

- iCOM® control featured
- New generation Liebert® EC Fans
- Eurovent certified heat exchanger



Trellis™ Platform



Emerson Network Power's Trellis™ platform is a real-time infrastructure optimization platform that enables the unified management of data centre IT and facilities infrastructure. The Trellis™ platform software can manage capacity, track inventory, plan changes, visualize configurations, analyze and calculate energy usage, and optimize cooling and power equipment as well as enable for virtualization. The Trellis™ platform monitors the data center, providing a thorough understanding of system dependencies to help IT and facilities organizations keep the data center running at peak performance. This unified and complete solution, delivers the power to see the real situation in your data center, make the right decision and take action with confidence.



■ Liebert® AFC

The Adiabatic Freecooling Chiller available from 650-1450 kW

- Integrated adiabatic pad system
- High freecooling capacity
- 100% compressor backup

■ SmartAisle™

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



■ Liebert® CRV

Row-based high efficiency cooling units available from 10-50 kW in DX and CW versions

- Decoupled control for airflow and cooling capacity
- Modulating cooling capacity with digital scroll
- iCOM® control with remote rack sensors



■ 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 its customers with the largest global services organization in the industry and a service offering dedicated to the entire critical infrastructure, delivering:

- Design, installation and startup
- Warranty service
- Preventive maintenance
- Priority on-site response time
- 24/7 remote diagnostics and monitoring
- Emergency service
- Site assessments and upgrades

Service Contracts

Regular service of business critical infrastructure provides uptime assurance and reduces the total cost of ownership over the life of the 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™

Maximized system availability via real-time remote diagnostics and proactive action

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

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.eu

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