Vertiv™ Liebert® PDX with Variable Speed Compressors

Direct Expansion Perimeter Unit
from 15 to 165 kW

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

Vertiv™ Liebert® PDX with Variable Speed Compressors

Liebert® PDX, equipped with variable speed compressors and Liebert® iCOM™ control, has been designed to be the most efficient, reliable, flexible and smart direct expansion cooling solution for data centers.

Liebert PDX maximizes part load efficiency, compared to most common direct expansion cooling systems, therefore significantly reducing running costs.

Liebert PDX ensures precise and constant control of airflow, temperature and humidity. Thanks to its innovative design and use of advanced technologies, it matches requirements for cooling continuity coming from the most trusted and adopted certification authorities for data center design and operation.

Liebert PDX enhances the inherent scalability of direct expansion systems, even on those data centers where the initial heat load is very low or subject to fluctuation. Its wider operating range allows Liebert PDX to be a step ahead of the new challenges posed by data center requirements and climate change.

Liebert PDX smart control manages and optimizes the overall system, is fully-programable via an advanced and user-friendly touch display and can be linked with common BMS protocols, allowing remote supervision.

Value of Liebert® PDX Range

Features

- Variable speed scroll compressors
- Direct control of condensers from indoor unit
- Fast start logic
- Equivalent piping length between unit and remote condenser up to 100m.
- Virtual Display
- Eurovent certified performance

How You Benefit

- Power consumption is reduced by up to 35% compared to a fixed speed compressor unit and the extra cost can be recovered in less than one year
- Integrated systems maximize overall system annual efficiency
- Ensuring fast unit restoration after a power outage and minimizing cooling interruption
- Extreme flexibility on the connections' layout with remote condenser
- All the functionalities of the standard display can be replicated through a web browser for easy remote monitoring
- Delivers performance rating accuracy, certified by an independent organization

annual pPUE

Liebert® PDX

At Vertiv we believe that being mindful of product design, development, use, and disposal are important to the longevity of our industry.

Checkout these environmentally conscious features of the Liebert® PDX:

- Inverter scroll compressor technology improves annual efficiency by up to 35% compared to a fixed speed compressor.
- New generation of heat rejection condensers equipped with EC fans reduce even further power consumption and noise emissions.
- With EconoPhase™ pumped refrigerant economizer version, compressors' working hours are significantly minimized resulting in increased energy savings.

Liebert® PDX Versions

Configurations

- From 15 to 165 kW
- From 1 to 4 fans
- Single or Double Circuit
- More than 4 air delivery configurations
- Compatible with Liebert EconoPhase™ Pumped Refrigerant Economizer

Main Options:

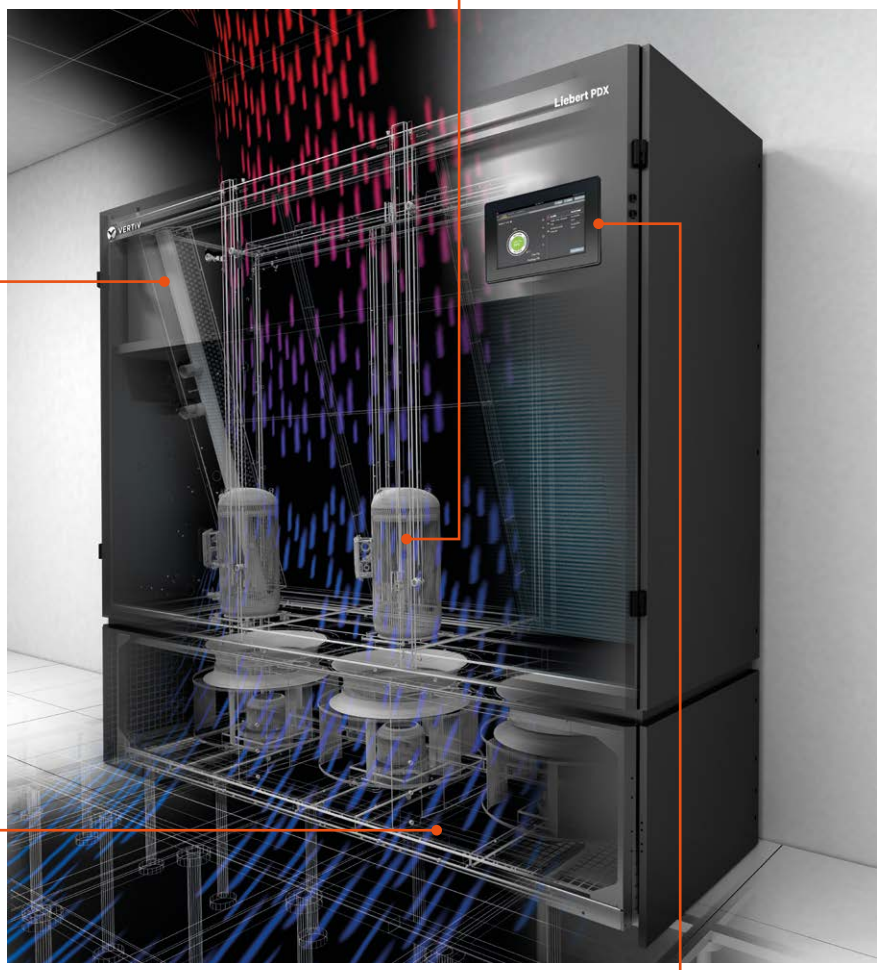
- High-Definition Touch Screen Display
- Dual power supply (Alternate or Parallel)
- Wide range of compatible heat rejection condensers equipped with EC fans and available also with micro-channel coil
- Low temperature version to operate down to -30°C outdoor air temperature
- Electrical heating
- Electrode, Infrared and Ultrasonic humidifiers available
- Air Economizer for direct freecooling

Cooling Continuity

Liebert® PDX guarantees enhanced availability and redundancy features; it can automatically manage power failures and restore quickly requested working conditions when power is back. Downtime is also minimized through the prevention of alarms and failures and real-time optimization and adaptation of working parameters.

Energy Efficiency

Liebert® PDX, thanks to variable speed drive compressors, increases full and part load efficiency, reduces starting current and improves power factor; as a result, power consumption and energy bills are considerably lowered. Liebert PDX cooling density has been maximized, allowing for reduced footprint and leaving more space for customers to install their IT equipment.



Flexibility

Liebert® PDX remains the product with the widest range of air configurations available in the market and a full set of options and accessories to adapt to any type of data center design.

Smart Liebert® iCOM™ Control

Liebert® iCOM™ control is the heart of the direct expansion cooling system, managing not only Liebert® PDX units but also outdoor heat rejection components (Liebert® MC or Liebert HCR condensers). Furthermore, it features a new 7" touch screen display for quicker and easier data readability.

Vertiv™ Liebert® PDX with Variable Speed Compressors

Energy Efficiency

- Variable speed scroll compressor technology is the best solution in terms of variable cooling capacity, with a minimum compressor speed down to 25% of maximum value. It improves annual efficiency even when requested cooling load is low, such as in the early stage of a data center life, or when the IT equipment usage is subject to big fluctuations; this reduces the cooling equipment's total cost of ownership and payback time.
- New EC fan generation with extended speed modulation range (minimum speed down to 30% of maximum value) in order to guarantee the requested supply air temperature at any moment.
- New generation of heat rejection condensers equipped with EC fans to reduce even further power consumptions and reduce noise at the same time.
- Eurovent certified performance guarantees independent testing, thus delivering rating accuracy and enhancing the unit's reliability. The new IT Cooling program updates performance tolerance, introducing stricter values than previous ones.*

Cooling Continuity

- Liebert® PDX can automatically manage a power failure for 60 seconds, keeping the Liebert iCOM™ control board and the BMS communication on and permitting system supervision during a power outage event. When power is restored, the intelligent Liebert iCOM™ control adopts a fast restart, recovering in less than 40 seconds at the requested operating condition.
- Electrically, units can be fed with two power sources combined with an ATS for full back-up or with two separate lines, one for control and fans and the other for compressors and other equipments.
- The airflow continuity is guaranteed until the last unit fan is able to run, both in the indoor and outdoor unit.
- In case of control sensor failure, the unit automatically adapts in order to grant the necessary cooling/airflow continuity. A redundant sensor can be installed and activated only if the first one breaks or is missing.

Flexibility

- Liebert® PDX is fit for extreme working conditions and environments; the extended working range allows a maximum external temperature of 55°C and a minimum of -30°C, with an internal return air temperature up to 40°C.
- Liebert® PDX extended compressor's and evaporator fan's speed modulation range improves system scalability, particularly in case of variable data center load.
- Liebert® PDX units adapt perfectly to all kinds of installations; maximum equivalent piping length between unit and condenser can reach 100 m. Two different coil treatments (epoxy coating and electrofin) are available for the entire range of Liebert® condensers, making their installation possible also in critical conditions.
- More than 4 airflow configurations allow the units to adapt to any data center layout and configuration.

Smart Liebert® iCOM™ Control

- Ready for Teamwork of up to 32 units connected in a common network, with optimization based on installation type; furthermore it allows for advanced control functionality (sharing sensor's data, standby rotation, lead-lag, cascade operation and rotating master function). A single display can be used as a 'team display' to manage up to 32 units, optimizing and harmonizing the parameters of all systems through one single display.
- The Liebert® iCOM™ software embeds a comprehensive algorithm library with more than 10 different strategies to control temperature/humidity & airflow adapting perfectly to the different data center solutions.
- A virtual display can replicate, through a web browser, all the functionalities of the standard display, either remotely or connecting a laptop on the ethernet port directly to the frontal door.
- The unit can communicate with the user's BMS system with extended parameter availability, and it can also be connected to Vertiv™ LIFE™ remote diagnostic and preventive monitoring Services. Extended parameter availability to customer BMS through different protocols (Modbus IP, BACnet IP, SNMP and HTTP).

* Check ongoing Eurovent certification validity: www.eurovent-certification.com

Rely on a Higher Level of Service Expertise for Thermal Management in Your Data Center

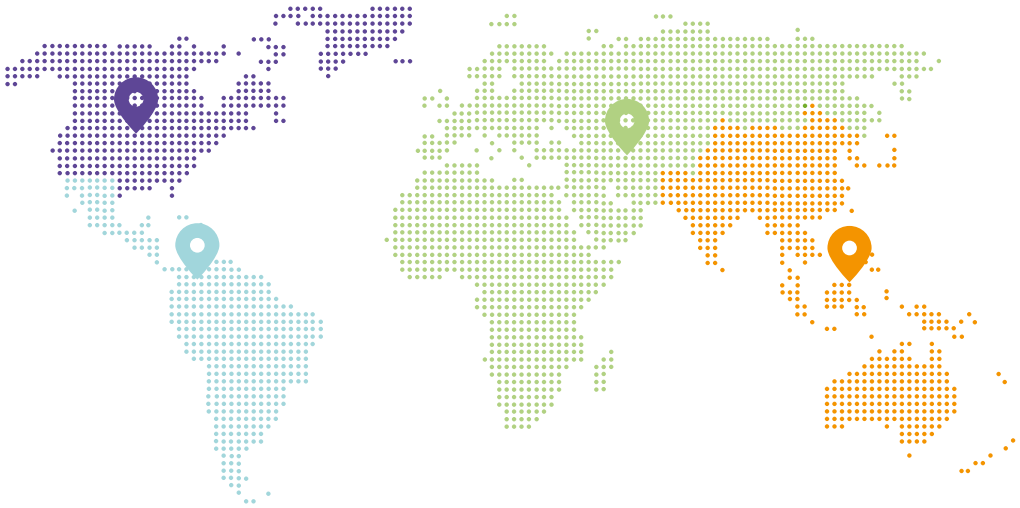
Who is better prepared to meet the service needs for your thermal management system than the company that pioneered the precision air conditioning market? We're a world leader in research and development of innovative products that protect mission-critical thermal applications and have supported data centers around the world for decades.

After all, there's a vast difference in the expertise necessary to address the comfort cooling needs of a normal building and the thermal management needs of your sensitive and sophisticated data center. An incorrect repair procedure by improperly trained technicians, or the use of non-genuine parts, can have a profound effect on your equipment performance, your data center availability, and your energy costs.

The factory trained and certified technicians of Vertiv know the difference. We are equipped to maximize the performance and efficiency of your thermal management system as no one else can.

Supporting Your Business Around the Globe

We bring our combination of strengths to life on a global scale, ensuring that we're able to serve you wherever you do business. Vertiv has the largest factory-trained service force with more than 2,700 field engineers together with the capability to support you remotely with a comprehensive range of remote Services and Software Solutions. Our service team members are located in virtually every major country across the globe and are backed by more than 330 technical support/response personnel. This means that no matter where you operate, you are covered by the most knowledgeable engineers and technicians available, giving you relief from any concern.



Our Presence

Global Presence

Manuf. and Assembly Locations **28**

Service Centers **250+**

Service Field Engineers **2,650+**

Technical Support/Response **300+**

Customer Experience Centers/Labs **16**

US and Canada
Manuf. and Assembly Locations **13**
Service Centers **100+**
Service Field Engineers **850+**
Technical Support/Response **120+**
Customer Experience Centers/Labs **4**

Latin America
Manuf. and Assembly Locations **1**
Service Centers **20+**
Service Field Engineers **240+**
Technical Support/Response **20+**
Customer Experience Centers/Labs **2**

Europe, Middle East And Africa
Manuf. and Assembly Locations **9**
Service Centers **70+**
Service Field Engineers **590+**
Technical Support/Response **90+**
Customer Experience Centers/Labs **5**

Asia Pacific
Manuf. and Assembly Locations **5**
Service Centers **60+**
Service Field Engineers **970+**
Technical Support/Response **80+**
Customer Experience Centers/Labs **5**

Vertiv™ Liebert® PDX with Variable Speed Compressors

	Single circuit models		PI015	PI021	PI025	PI031	PI033	PI041	PI045	PI047	PI051	PI057	PI075	PI059
	Maximum net sensible cooling capacity (*)	kW	19,2	23,9	29,1	32,7	37,0	50,9	56,4	52,5	60,9	62,4	77,5	70,4
	Minimum net sensible cooling capacity (*)	kW	5,9	7,0	8,5	9,6	11,8	15,4	18,1	15,8	18,2	17,5	23,3	13,0
Compressor modulation 80% (*)	Nom. ESP	Pa	20	20	20	20	20	20	20	20	20	20	20	20
	Net Total Cooling Capacity	kW	15,8	19,8	24,5	27,8	31,9	43,2	49,3	43,7	51,1	52,0	65,4	60,6
	Net Sensible Cooling Capacity	kW	15,8	19,8	24,5	27,8	31,9	43,2	49,3	43,7	51,1	52,0	65,4	60,6
	nSHR		1	1	1	1	1	1	1	1	1	1	1	1
	Unit Net Sensible EER		4,63	4,49	4,11	3,54	3,36	3,91	3,66	4,02	3,86	4,17	3,71	3,53
	Airflow	m^3/h	4049	5040	6217	7126	8163	11080	12608	11199	13104	13273	16745	13191
Compressor modulation 40% (*)	Net Total Cooling Capacity	kW	8,3	10,5	13,4	15,3	18,2	23,8	27,8	23,7	28,1	27,8	36,2	35,4
	Net Sensible Cooling Capacity	kW	8,3	10,5	13,4	15,3	18,2	23,8	27,8	23,7	28,1	27,8	36,2	35,4
	nSHR		1	1	1	1	1	1	1	1	1	1	1	1
	Unit Net Sensible EER		5,46	5,20	5,17	4,77	4,76	5,25	5,05	4,95	4,92	5,25	4,99	4,64
	Airflow	m^3/h	2112	2669	3372	3911	4665	6086	7099	6047	7166	7118	9222	9045
	Dimensions (W x D)	mm			840x890			1200x890			1750x890			1200x890
	Height (H)	mm						1970						2570
	Weight	kg	315	316	336	358	358	471	472	640	641	688	754	584
	Aiflow Delivery													
	Down Flow UP - Fans Over the Raised Floor				•					•				•
	Down Flow UP - Frontal air delivery				•					•				•
	Down Flow UP - Back air Delivery													•
	Down Flow Down - Fans in the Raised Floor									•				•
	Up Flow				•					•				•
	Cooling Version:													
	Air Cooled				•					•				•
	Water Cooled													
	Dual fluid (Chilled water + DX Air Cooled)													
	Dual fluid - Chilled water + DX Water Cooled													
	Freecooling													
	EconoPhase													

* Performance at RAT 30°C / RH 35% - Condensing temperature 45°C - Downflow up air configuration. CE units - Power supply 400V/3ph/50Hz - High Power EC Fans - Refrigerant R410A

The Liebert EconoPhase pumped refrigerant economizer is compatible with the Liebert PDX indoor unit and the Liebert MC condenser to improve overall system efficiency.

* Performance at RAT 30°C / RH 35% - Condensing temperature 45°C - Downflow up air configuration. CE units - Power supply 400V/3ph/50Hz - High Power EC Fans - Refrigerant R410A

	Double circuit models		PI044	PI054	PI062	PI074	PI068	PI082	PI094	PI104	PI120	PI092	PI150	PI165
	Maximum net sensible cooling capacity (*)	kW	56,0	62,0	73,1	82,9	78,5	97,4	105,1	112,8	136,2	94,3	169,3	176,2
	Minimum net sensible cooling capacity (*)	kW	8,6	9,4	11,3	13,1	12,5	13,5	15,1	16,8	22,2	13,5	22,2	24,9
Compressor modulation 80% (*)	Nom. ESP	Pa	20	20	20	20	20	20	20	20	20	20	20	20
	Net Total Cooling Capacity	kW	45,2	51,1	60,4	70,5	64,8	79,2	87,1	95,4	119,8	80,7	146,4	153,7
	Net Sensible Cooling Capacity	kW	45,2	51,1	60,4	70,5	64,8	79,2	87,1	95,4	119,8	80,7	146,4	153,7
	nSHR		1	1	1	1	1	1	1	1	1	1	1	1
	Unit Net Sensible EER		4,42	4,32	3,99	3,66	4,71	4,15	4,04	3,91	3,35	3,69	3,65	3,51
	Airflow	m^3/h	11546	13093	15414	18134	16921	20667	22769	24854	31292	20603	38428	40076
Compressor modulation 40% (*)	Net Total Cooling Capacity	kW	21,8	23,8	28,6	32,8	31,2	45,2	49,5	55,1	69,8	36,3	83,3	90,1
	Net Sensible Cooling Capacity	kW	21,8	23,8	28,6	32,8	31,2	45,2	49,5	55,1	69,8	36,3	83,3	90,1
	nSHR		1	1	1	1	1	1	1	1	1	1	1	1
	Unit Net Sensible EER		4,14	4,20	4,03	3,94	4,53	5,10	5,10	5,04	4,66	4,21	4,99	4,83
	Airflow	m^3/h	5590	6113	7311	8490	8129	11686	12881	13984	18157	9239	21719	23299
	Dimensions (W x D)	mm	1750x890				2550x890					1750x890	3350x890	
	Height (H)	mm	1970										2570	
	Weight	kg	671	682	723	708	935	957	967	987	1006	811	1496	1544
	Aiflow Delivery													
	Down Flow UP - Fans Over the Raised Floor			•					•			•	•	
	Down Flow UP - Frontal air delivery			•								•	•	
	Down Flow UP - Back air Delivery											•	•	
	Down Flow Down - Fans in the Raised Floor			•					•			•	•	
	Up Flow			•					•			•		
	Cooling Version:													
	Air Cooled			•			•		•			•	•	
	Water Cooled													
	Dual fluid (Chilled water + DX Air Cooled)													
	Dual fluid - Chilled water + DX Water Cooled													
	Freecooling													
	EconoPhase								•				•	

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