



## Vertiv™ Liebert® PCW

**66 kW to 250 kW**

**Cool the Cloud**

### Q1. What are the prime features available in Vertiv™ Liebert® PCW?

Liebert PCW sets a new standard in energy efficiency for both conventional computer rooms and the upcoming infrastructure facing the challenges from the modern IT equipment. It provides the following features:

- Optimized aerodynamic design results in less pressure drop
- Different configuration of airflow helps in various airflow selection at site
- Latest technology based EC fan enabling reduced power consumption
- New generation high-efficiency G4 filter
- Compact footprint by accommodating the height of the unit and the systematic placement of fan module
- Bottle type humidifier available to meet the desired RH levels
- The option of a Smart Aisle Containment technology feature in the iCOM controller enables the PAC unit to control the cold aisle environment in a containment based solution
- Optimized location of the electrical panel and heater helps in the ease of access during maintenance
- HMI display is a new add on feature and is available on request (for 250 kW model, it is standard)
- Energy meters can be provided as an optional feature for measuring the cooling and power utilization efficiency of the unit

### Q2. Which are the potential areas where Liebert PCW units can be positioned in the marketplace?

Data Center Technological rooms such as Switch room, VFD room, and PLC room which use chilled water as a cooling medium ranging from 50 kW to higher requirements of 2 MW -3 MW could be a potential prospect. These rooms primarily focus on reliability and energy efficiency wherein PCW would be the best choice to handle heat load.

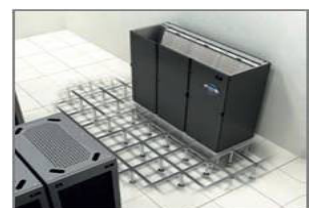
If heat density is very high, the indoor unit should be able to handle high return air temperature; also if there is a limitation of placing Liebert DX outdoor unit, Liebert PCW is a good solution subjected to availability of chilled water.

Liebert PCW has a unique cutting-edge technology which delivers the most appropriate cooling conditions as required by the servers to ensure business continuity. In today's scenario, IT infrastructures exhibit dynamic load variations due to which they require cooling solutions that are reliable, trustworthy, and deliver high performance under any circumstances.

### Q3. How to classify Liebert PCW according to configuration?

**Liebert PCW Extended Down:** Liebert PCW Extended Down has the fan modules installed in the raised floor, which delivers optimum energy efficiency (70% saving compared to standard market solution with EC Fan).

The system is shipped in two parts, the fan module and the indoor cabinet containing the coil, chilled water valve, electrical panels, controller, cabling and piping connection provisions, and the filter module. Adjustable stands/legs are provided for flexibility of raising/lowering the height of the indoor unit.



**Liebert PCW Extended Upflow:** Upflow units are the ideal solution for applications with air distribution from the top of the unit, even with no ducting system. With the latest EC fan technology incorporated in the Liebert PCW units, higher External static pressures can be handled whilst limiting the input power to the fan.



**Vertiv™ Liebert® PCW rear/front flow:** PCW series has introduced a new PH250 model that offers frontal & rear side air discharge. In absence of underfloor arrangement and special site condition, this is very useful air flow configuration. This particular model also delivers max air quantity i.e. 59000 m3/hr.

#### **Q4. What are the models available in Liebert PCW for downflow and upflow configuration?**

Liebert PH066, PH081, PH091, PH111, PH136, PH161, PH201 & PH250 are available in downflow configuration and PH066, PH081, & PH091 are available in upflow configuration.

New model Liebert PH250 is available in downflow, rear flow, and frontal flow configuration.

Standard capacity is calculated based on 24 °C & 50% RH return air condition: 7 °C & 12 °C chilled water in & out temperature respectively.

#### **Q5. How to deploy high-density critical servers and communication device with limited cooling resource?**

Virtualization and hyper-converged computing have resulted in dynamic heat loads in the data center. Sudden changes in computing load, consumption level, and server temperature are the consequences of adopting cloud computing.

An optimized selection of a chilled water unit for a perimeter cooling solution can be an optimal choice subjected to a combination of higher efficiency at a lower footprint.

Liebert PCW units can easily handle the sudden increase in the return air temperature due to high heat density. This is possible due to the aerodynamic design and no limitation of the suction temperature.

With the extended version and new model i.e. PH250; more capacity can be delivered by same or lesser footprint and as a result of space-saving, more white space is available for racks.

Also, cold aisle containment is easier in case of Liebert PCW, as it is designed to handle high return air temperature; due to this, a higher supply air temperature can be achieved which in turn would increase the mechanical PUE thus optimizing the total PUE of the system.

#### **Q6. What value added features are offered by new EC fan?**

The latest generation of EC 2.0 fan used in the Liebert PCW series is made of fiberglass-reinforced plastic.

It is capable of modulating the full airflow range unlike the earlier fixed speed fan versions.

The optimized aerodynamic design permits achieving high energy efficiency and a reduced noise level.

The fan wheel is statically & dynamically balanced and have self-lubricated bearings.

#### **Q7. How Liebert PCW ensures the efficiency of EC fan control?**

All customer prefers to have units to be operating at a minimum power consumption.

Liebert PCW is equipped with an iCOM controller that offers different modes of operation to reduce power consumption and increase the energy efficiency. This would help the customers to save a lot of money on their electricity bills.

In a recent new series user-friendly HMI display is being offered and made available on request.

**ECO Mode:** This mode ensures that the chilled water valve is modulated first to meet the cooling requirements. If it is still unable to do so, the fan speeds are further modulated to meet the desired conditions.

**Cooling on demand:** This follows a simple rhythmic combination of fan and valve being modulated simultaneously to meet the cooling requirement. However, this is possible with a Constant pressure feature (with specific accessories) which ensures the pressure of the airflow inside the raised floor always remains constant irrespective of the cooling demands by the servers.

**Smart mode (cold aisle containment, with specific accessories):** Provides every server with the exact airflow needed without wasting even a single Watt of power.

#### **Q8. How Pressure Independent Control Valves (PICV) improve the system efficiency along with Liebert PCW? (Offering available on request)**

The major operational features of the PICV are:

- Enhance system delta T performance
- Accurate flow control
- Eliminates the need for balancing the chilled water system due to a pressure independent operation.

The primary purpose of PICV is to minimize the flow through the coil in the air handler (here in PCW) while maintaining system variable setpoint control.

Installing pressure independent two-way control valves, instead of pressure dependent two-way control valves typically used in variable flow systems.

This results in control valve modulation that is only in response to a controller signal to the actuator and not in response to a change in flow due to system differential pressure change across the valve body. The high rangeability of PICV provides enhanced control resulting in elevated delta T performance and reduced flow to serve system loads.

Modulating load profile which occurs in Data Center, Switch room, and other technological rooms, variable type Air handler unit (PCW) is used which connect to a variable capacity chillers and pumping device. To enhance the energy savings, Liebert PCW with PICV is one of the best tools that are offered by Vertiv.

### Q9. How Vertiv™ Liebert® PCW saves costly floor space?

To understand better about advantages of PCW in terms of floor space-saving against Vertiv's own CW product (Vertiv™ Liebert® PeX+ CW), we have highlighted a small calculation below.

For a provision of an additional 15% in the height of a room, an extended version has a lesser width space of about 10%-14%. This will increase the efficiency around 8%-12%.

E.g. PH161DC (PCW) - extended version: height 2570 mm

Net sensible capacity 52.7 kW/ Sqm



PCW Extended Version



Standard Version

P3170DC - standard ht version: height 1975 mm

Net sensible capacity 49.3 kW/Sqm.

Effective Space saving - 6.5% (without considering maintenance footprint)

Also in terms of NSEER - improvement by the PCW version is 5% (considering same models of both series)

So, due to less footprint, more white space is available for rack placement.

**Note:** Considered at 24 °C/50% RH return air and chilled water inlet & outlet 7 °C & 12 °C respectively.

### Q10. How will Liebert PCW save electricity bills?

Firstly, new generation EC fan takes minimum amps, and secondly a large surface area coil with an aerodynamic design exhibits a reduced air pressure drop thus enabling power saving on the fan.

With the same dimensional height of Liebert PCW v/s CW (Liebert PeX+series) units, Liebert PCW offers upto 30% energy saving. With this in mind, the extended version offers furthermore energy savings of upto 70%.

PCW is an alternate name for energy saving due to its unique location of coil, filter, and EC fan inside the cabinet thus resulting in the least resistance to airflow inside the cabinet.

Advanced optional features of Smart Aisle technology in the iCom controller can further reduce the energy consumption.

### Q11. What are the factors that governs the aerodynamic design?

Extensive research by expertise on the internal design of Liebert PCW has been done to optimize the aerodynamic impact of all the internal parts. The design factors that are responsible for a good aerodynamic design are mentioned below:

- Coil shape
- Coil size
- Coil angle
- Electrical panel design
- Heater position
- Fans nozzle and optimized distance from the coil
- Filter type and shape

### Q12. How will the design and arrangement of filters make a difference?

Intelligent positioning of the air filter and optimizing the filtration area results in lower resistance to airflow without compromising on the efficiency aspect.

### Q13. How does the cooling coil design make a difference?

Higher coil surface area with louvered design increases the heat transfer capability and reduces the air pressure drop. This fact has already been proved by a CFD analysis of the airflow across the unit. More space for positioning the fan nozzle has a proportionally increasing effect on the efficiency.

### Q14. What are the optional components that can be offered in Liebert PCW?

Apart from the standard offering, the optional components which can be offered on request are mentioned below:

Two-stage electric heater, Smoke & fire sensor, Supply air temperature sensor & pressure sensor, Water temperature sensor, Dual power supply with ATS, PICV, Water flow sensor, Water flow switch, etc.

### Q15. What are the distinctive features of the controller used?

Vertiv™ Liebert® iCOM controller is used in Vertiv™ Liebert® PCW. The iCOM Controller with an easy-to-use interface with “auto-restore on power-failure” feature can store up to 400 records at a given point of time. It comes with triple options, namely- a small display, a large display, and a HMI display. It directly connects to the facility network (Ethernet) and enables communication with several Liebert PCW chillers in a synchronous manner, establishing a high degree of reliability. It offers the highest capabilities in unit control, communication, and monitoring of mission-critical cooling units.

### Q16. How does Liebert PCW react to a power failure?

In the event of a power failure, the control valve position is retained and stored. Once the power is restored back again, the unit is already in a ready-to-cool operational mode without the necessity to re-open or close the CW valve.

### Q17. How can Liebert PCW be positioned against our competitors in technical specifications?

The following features need to be specified which are apart of Liebert PCW's standard offering but they are not been provided by the competitors.

Mention about the following points below:

- Net Sensible capacity with allowable footprint, NSEER, etc
- Cooling Capacity Meter within the unit controller
- Dual Power Supply feature incorporating redundancy on the power sources
- Maintenance of heaters and fans independently
- Top or lateral water connections
- Unique design based 630 mm dia. Plastic EC Fan
- Infrared Humidifier
- F5 grade of filtration as option
- Liebert PCW series offers the largest chilled water capacity by PH250 model with a maximum air quantity of 59000 CMH
- Also Liebert PCW series offers rear/front flow configuration.

For more details please refer the followings:

**BATTLE CARD**  
Vertiv™ Liebert® PCW - 66 kW to 250 kW (Competition Landscape)

Higher air flow allows additional flow off flow 50000 CMH for cooling

Advanced iCOM Controller with HMI display enables communication with multiple Liebert chillers in a synchronous manner

Optimized fan operation and lower electrical noise

Close control of the rack temperature during peak loading (up to 10% higher than standard) to 10% further extend power rating

Highly advanced cooling units for low air pressure long life and high efficiency

Feature	Liebert iCOM	Liebert iCOM Plus
Compressor	EC Fan	EC Fan
Control Valve	EC Fan	EC Fan
Power Supply	EC Fan	EC Fan
Control Valve	EC Fan	EC Fan
Control Valve	EC Fan	EC Fan
Control Valve	EC Fan	EC Fan

Battle Card

Vertiv™ Liebert® PCW Chilled Water Chiller Cooling Technology for Maximum Energy Saving

Product Brochure

GUIDE SPECIFICATION  
Vertiv™ Liebert® PCW

Guide Specification

Liebert® PCW Cool the Cloud

Product Presentation