VERTIV™

Liebert®

TAILORED SOLUTIONS FOR DATACENTER COOLING

Precision Cooling
for Business-Critical Continuity

Enabling Tomorrow's

CRITICAL EDGE INFRASTRUCTURE

We helped some of the largest names in the industry bring new capacity online faster and at a lower cost when search and social media increased demand for storage and computing.

We were the first to introduce an integrated enclosure system to distributed networks.

Our portfolio spans power, thermal and infrastructure management products, software and solutions.

Protecting your critical technologies takes more than just great software and equipment. It takes a level of experience that only comes from years of finding solutions when the industry needed them most. We were the first to protect mainframes with precision cooling systems.

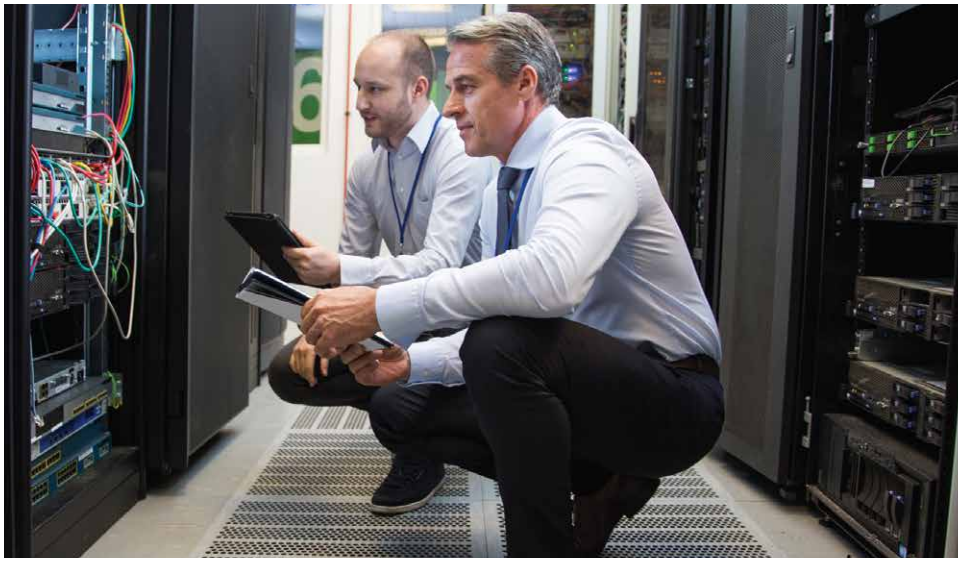
And now as challenges and demands grow, we continue to find better ways to help you strengthen your most vital applications. Formerly the Network Power business of Emerson, we've brought together the most trusted and experienced names in critical infrastructure.

Complemented by a network of nearly 250 service centers worldwide. It's a combination of experience and resources that allow us to better adapt to what's needed, anticipate what's next and continue to find solutions in ways other companies simply can't.

PRECISION SYSTEMS THAT OFFER REAL SOLUTIONS TO YOUR SPECIFIC COOLING NEEDS.

As the temperature rises, so does your risk

- Every operation of your company depends upon the instant around-the-clock availability of computers, servers and other electronic systems. If they aren't working, neither is your company.
- Unfortunantely, every piece of this equipment your company possesses produces heat. And if you don't get rid of the heat, you are going to have problems.
- The First step in taking control of this situation is to understand the threats to your system reliability — and exactly what you can do about them.



The ability to tailor a solution is what sets Vertiv apart

- No one knows more about precision cooling than Vertiv. Our precision cooling business started back in 1965 with the Liebert product line. Our technology has been proven in thousands of critical data centers around the world. In fact there are Liebert precision air conditioning systems in the World that have been in constant use for over 30 years -- a purchase that has spanned many generations of computers. These products are recognized as the world's standard for reliable operation.
- From high-capacity units to compact above-ceiling systems, there is a Liebert system designed to cool and protect your Critical Systems. We make the industry's widest range of precision environmental control, including air conditioners, Fluid chillers and heat rejection systems in capacities from 1 to more than 65 tonnes. These systems are available with a choice of cooling methods, including chilled water and air cooled.
- We also offer specialized systems, including exterior mounted air conditioning for telecommunications enclosures supplemental cooling for high density electronic applications and cost effective electrode steam humidifiers.

YOU FACE MANY CHALLENGES IN THE PURSUIT OF UPTIME

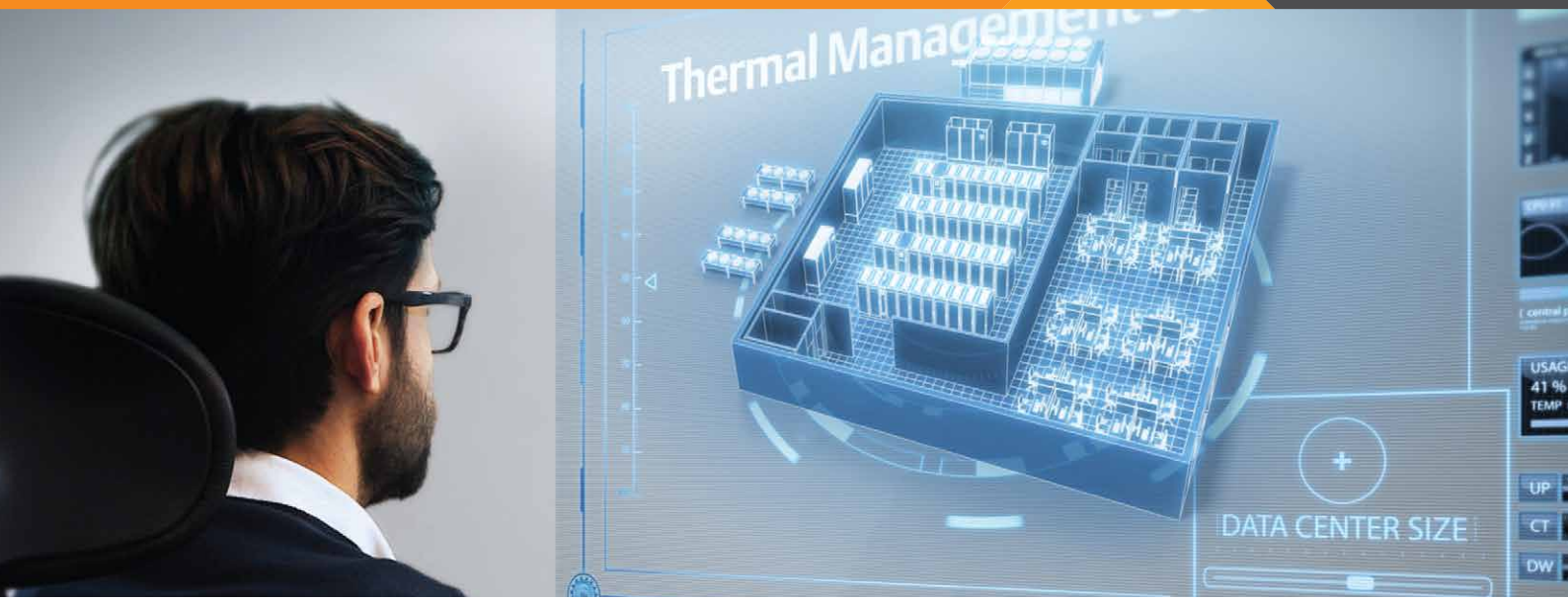
Heat is still the enemy
"Why is proper cooling so important – aren't today's computers designed to take the heat?"

It's aso the humidity - and the dust
"I need to protect my facility from air that is too hot – but also too cold, too dry, too moist...and too dirty." Different needs require different Cooling Configurations
"I know there are several ways to configure the cooling loop for a high-capacity air conditioning system – which is best for my facility?"

Every facility is unique
"No two of my facilities are alike – some have raised floors, some don't. Some are here right next to offices, others are located in a shelter out in the country.
I also need to take growth and changing space requirements into consideration.
How can I match a cooling system to all these different locations?"

Energy Is expensive
"With the cost of energy always f luctuating, can I get a precision cooling solution that I know will be the most energy efficient all the time?"

The protection has to be there, No matter what the calendar says
"These operations are online every day, every week, every year. There is simply no time when they can shut down without creating big problems"



BUT THERE ARE REAL SOLUTIONS

Precision Systems provide proper cooling under all conditions

Yes, computers have changed –but the threats to their operation are as real as ever.An air conditioning system that maintains the temperature at the proper levels in your critical facility is an absolute necessity for the viability of your usiness.

Precision Systems keep moisture and Air Cleanliness right where they need to be

Ordinary building air conditioning and heating systems are designed to keep people comfortable. Computers and other sensitive electronics require a system that provides precise humidity control to meet equipment specifications and air filtration designed to keep airborne particles from causing problems with critical equipment.

Precision Systems offer a real choice of cooling and heat rejection methods

A precision air conditioning system can be engineered to match just about any type or size of facility. Central chilled water systems use a single chiller for multiple units, while individual direct expansion systems utilize internal compressors and a remote condenser.

Precision Systems meet the cooling needs of Critical Spaces

Energy efficiency is no longer just an option for users of air conditioning.There are downflow systems for raised floor facilities and upflow units where the floors are not raised. Supplemental systems can be used where equipment is tightly packed in racks. Compact models are ideal for small or remote facilities.

Precision Systems are engineered to get the most from every Energy Dollar

Energy efficiency is no longer just an option for users of air conditioning. Today's systems offer a choice of compressor types, microprocessor controls and other optional features designed to reduce power consumption and maximize energy savings.

Precision Systems are designed to operate year-round

Because most critical computing and communications facilities function on a 24 x 7 basis – so must the environmental equipment that is protecting it. Precision air conditioning is designed to run around the clock, no matter what the outside weather conditions.

RANGE OF PRECISION COOLING SOLUTIONS

Liebert® PDX
The Cooling Solution for Small and Medium Data Centers

Liebert® PCW
Cool the Cloud

Liebert® CRV
The Efficient Cooling fot IT

SmartAisle™
Datacenter Efficiency Management Platform

Liebert® XD
Flexible, Energy Saving Cooling Solutions For High Heat Density Application

Liebert® AFC
Adiabatic Free Cooling Solutions

Liebert® HPC
A Complete Range of Chillers Respecting the Environment Through Efficiency

Liebert® EFC from 100 to 350 kW
The Highly Efficient Indirect Evaporative Freecooling Unit

Liebert® PeX
Next Generation Envionmental Control for Critical IT&T Systems

Liebert® SCU
Self-Contained Air Conditioner for Telecommunications

Liebert® Intellesplit
Energy Efficient Wall Mounted Cooling Solution For Critical Small Server/Equipment Room

Liebert® DM™
High Performance, Sensible Cooling for Small Computer Rooms and Network Closets

Purchasing from Vertiv is different from what you might experience with other companies that sell air conditioning products. It starts with your local Vertiv Representative or Distributor. We are the only company in this business that maintains such a strong local presence on a national and international basis. Specifying and maintaining a high availability precision cooling system requires someone who is knowledgeable in all phases of environmental control.

This resource, coupled with our broad product line, gives Vertiv the ability to create a "tailored solution" that will meet your protection needs precisely and efficiently. We don't have to take the one or two items we happen to have and stretch them to come up with the answer.

We give you the best answer every time.

Liebert® PDX

The Cooling Solution for Small and Medium Data Centers

The Thermal Management Solution for Small and Medium Data Centers

The Liebert PDX direct expansion cooling unit is equipped with the most advanced industry technology which allows the unit to reach significant levels of efficiency, guaranteeing precise cooling of data centers and server rooms.

Liebert PDX is designed to provide efficient small and large room cooling for data centers, where efficiency, flexibility and simplicity of installation are key factors.

FEATURES

- Extended Units
- Full load Efficiency +10%
- EC Fan 2.0
- pPUE 1.12
- Partial Load Efficiency +30%
- Up to 100m Length
- Economizer, Freecooler, SmartAisle™
- Digital & EEV
- Up to 38°C Room Temperature with SmartAisle™

APPLICATION

–Variable Frequency Drives Rooms
–Electrical Panel Rooms
–Control Rooms
–UPS, Battery & RACK Room
–Instrument Calibration Room

Liebert® PDX direct expansion cooling unit

Equipped with the most advanced industry technology which allows the unit to reach significant levels of efficiency, Liebert PDX guarantees an efficient thermal management of data centers and server rooms.

Liebert PDX is available both in air cooled and water cooled versions to suit various site installation requirements. It also allows multiple freecooling modes of operation (Direct Air, Indirect Water, Chilled Water on Freecooling Chiller and Liebert® EconoPhase™ pumped refrigerant economizer) increasing its ability to adapt to diverse application demands.

The Liebert® EconoPhase™ pumped refrigerant economizer is compatible with Liebert PDX and Liebert MC to improve thermal management and control, while drastically cutting energy costs and lowering pPUE.

The unit's Digital Scroll configuration, instead, is responsible for modulating cooling capacity while the fresh air economizer function, operated by the iCOMTM control, is adopted when outside air temperature is colder than the return temperature.

In addition, the combination of R410A refrigerant, Electronic Expansion Valve (EEV) and new generation Liebert® EC Fans 2.0 all allow the unit to reach significant levels of efficiency.

Liebert® PDX

The Cooling Solution for Small and Medium Data Centers

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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	m^3/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 (WxD)	mm	844x890	844x 890	844x 890	844x 890	844x 890	1200x890	1200x890	1200x890	1750x890	1750x890	1750x890
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
Airflow Delivery												
Down Flow UP - Fans Over the Raised Floor		●	●	●	●	●	●	●	●	●	●	●
Up Flow		●	●	●	●	●	●	●	●	●	●	●
Frontal		●	●	●	●	●	●	●		●	●	●
Downflow Down - Fans in Raised Floor							●	●	●			
Cooling Version												
Air Cooled		●	●	●	●	●	●	●	●	●	●	●
Water Cooled		●	●	●	●	●	●	●	●	●	●	●
Dual fluid (Chilled water + DX Air Cooled)		●	●	●			●	●		●	●	
Dual fluid - Chilled water + DX Water Cooled		●	●	●	●	●	●	●		●	●	●
Freecooling		●	●	●			●			●	●	
EconoPhase												

Double Circuit

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	m^3/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 (WxD)	mm	1750x 890	1750x 890	1750x 890	2550x 890	1750 x890	1750x 890	2550x 890	2550x 890	2550x 890	2550x 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
Airflow Delivery											
Down Flow UP - Fans Over the Raised Floor		●	●	●	●	●	●	●	●	●	●
Up Flow		●	●	●	●	●	●	●	●	●	●
Frontal		●	●	●	●	●	●	●	●	●	●
Downflow Down - Fans in Raised Floor		●	●	●	●	●	●	●	●	●	●
Cooling Version											
Air Cooled		●	●	●	●	●	●	●	●	●	●
Water Cooled		●	●	●	●	●	●	●	●	●	●
Dual fluid (Chilled water + DX Air Cooled)		●	●	●	●		●	●	●	●	●
Dual fluid - Chilled water + DX Water Cooled		●	●	●	●	●	●	●	●	●	●
Freecooling		●	●	●	●	●	●	●	●	●	●
EconoPhase											

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

Liebert® PDX

The Cooling Solution for Small and Medium Data Centers

VERTIV.

Liebert® PDX - Digital Scroll - SmartAisle™

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	rn^3/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 (WxD)	mm	844x890	844x 890	845x 890	844x 890	1200x890	1200x890	1200x890	1750x890	1750x890	1750x890
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											
Down Flow UP - Fans Over the Raised Floor		●	●	●	●	●	●	●	●	●	●
Up Flow		●	●	●	●	●	●	●	●	●	●
Frontal		●	●	●	●	●	●	●	●	●	●
Downflow Down - Fans in Raised Floor							●		●		
Cooling Version											
Air Cooled		●	●	●	●	●	●	●	●	●	●
Water Cooled		●	●	●	●	●	●	●	●	●	●
Dual fluid (Chilled water + DX Air Cooled)		●	●	●	●	●	●	●	●	●	●
Dual fluid - Chilled water + DX Water Cooled		●	●	●	●	●	●	●	●	●	●
Freecooling		●	●	●	●	●	●	●	●	●	●
EconoPhase					●			●			●

Double Circuit

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	m^3/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 (WxD)	mm	1750x 890	1750x 890	1750x 890	2550x 890	1750 x890	1750x 890	2550x 890	2550x 890	2550x 890	2550x 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											
Down Flow UP - Fans Over the Raised Floor		●	●	●	●	●	●	●	●	●	●
Up Flow		●	●	●	●	●	●	●	●	●	●
Frontal		●	●	●	●	●	●	●	●	●	●
Downflow Down - Fans in Raised Floor		●			●	●			●		
Cooling Version											
Air Cooled		●	●	●	●	●	●	●	●	●	●
Water Cooled		●	●	●	●	●	●	●	●	●	●
Dual fluid (Chilled water + DX Air Cooled)		●	●	●	●	●	●	●	●	●	●
Dual fluid - Chilled water + DX Water Cooled		●	●	●	●	●	●	●	●	●	●
Freecooling		●	●	●	●	●	●	●	●	●	●
EconoPhase											

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

Liebert® PCW

Cool the Cloud

Energy efficiency, improved performance and reduced operating costs are the main goals for data centers today.

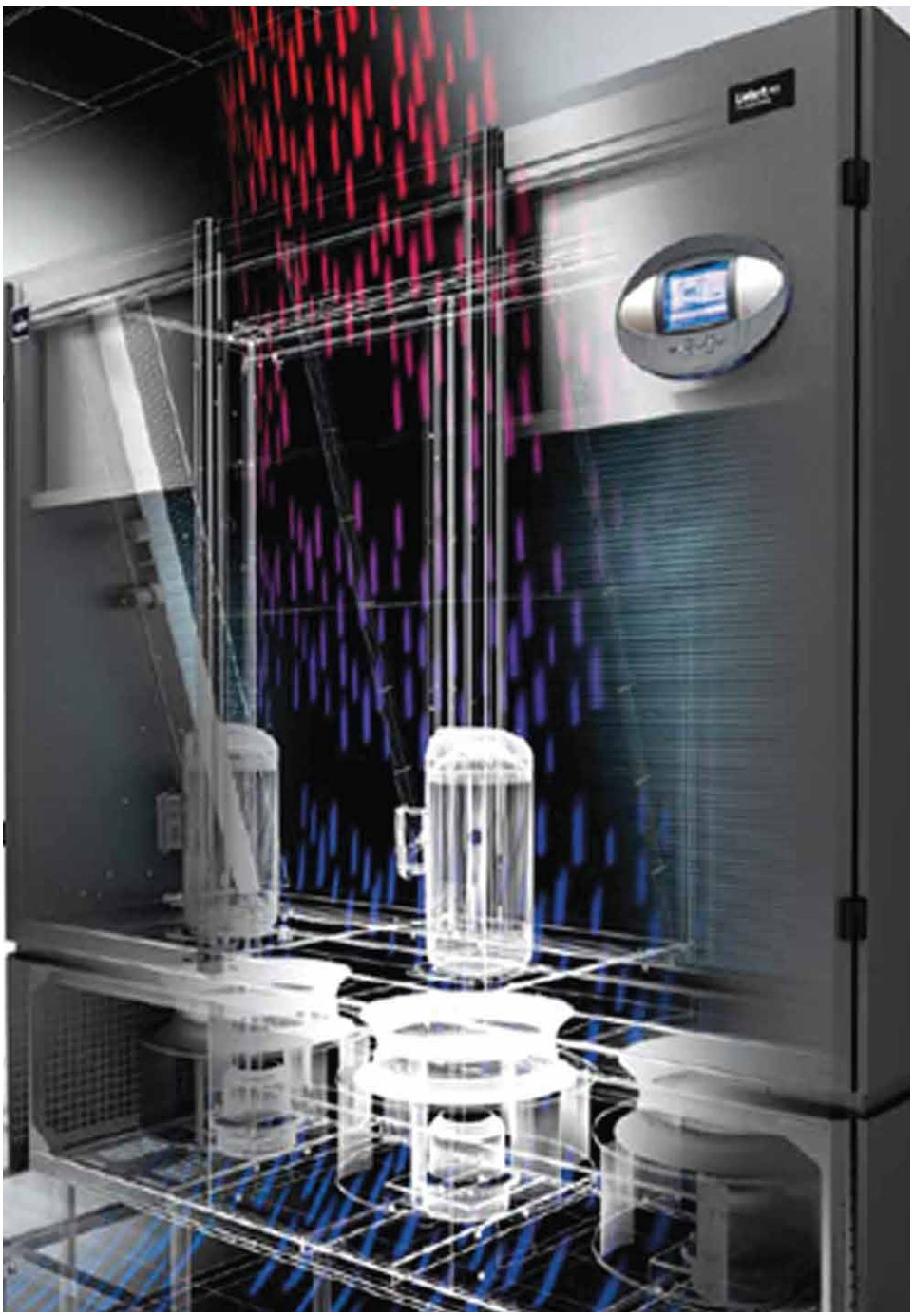
Liebert PCW set a new standard in energy efficiency amongst chilled water data center applications. All components have been optimized to provide an extremely efficient solution both for conventional computer rooms and for infrastructures facing the challenges of modern it applications.

FEATURES

- High Efficiency
- The new generation of Liebert EC Fan 2.0 is the core of the Liebert PCW
- Unit Aeraulic Design - A New Way to Look at Aerodynamics
- Cooling and Power Energy Meters - Only What Is Measured Can Be Controlled
- Available with iCOM® Control When Smart Means
- Freecooling Chillers & Supersaver Optimizing System

APPLICATIONS

- Server Rooms
- Electronic Switch Rooms
- Industrial Process Control Rooms
- Motor Control Rooms
- Broadcast Facilities
- Building Services Control Rooms
- Surveillance and Monitoring Centers
- Medical Equipment Installations
- Telecommunication Facilities



Liebert PCW : Top Performer

Standard Height - SMART (Single Circuit Units)

Unit	PH025	PH030	PH035	PH040	PH045	PH060	PH070	PH080	PH095	PH100	PH110	PH145	PH170
Total Gross Capacity [kW]	20.9	25.6	26.9	33.9	39.3	51.5	60.4	71.4	74.3	86.3	100.7	133.3	157.2
Net Sensible Capacity [kW]	20.3	24.6	26.1	32.9	38.3	50.0	58.6	68.9	71.6	83.3	97.2	127.0	149.1
Power Input [kW]	0.65	0.98	0.85	0.96	1.01	1.53	1.77	2.49	2.73	3.00	3.48	6.30	8.07
Net Sens EER	31.2	25.1	30.7	34.3	37.9	32.7	33.1	27.7	26.2	27.8	27.9	20.2	18.5
Airflow [m³/h]	6000	6900	8700	8700	10500	14700	17100	19000	24850	25000	25000	34000	40700
Water temperatures Air to the unit	20°C – 26°C 35°C 30% RH												

Unit Dimensions

Unit	PH025	PH030	PH035	PH040	PH045	PH060	PH070	PH080	PH095	PH100	PH110	PH145	PH170
Width [mm]	850	850	1200	1200	1750	1750	2050	2050	2550	2550	2550	2950	3350
Depth [mm]	890	890	890	890	890	890	890	890	890	890	890	890	890
Height [mm]	1970	1970	1970	1970	1970	1970	1970	1970	1970	1970	1970	1970	1970

Extended Height - SMART (Single Circuit Units)

Version	Extended DOWN						Extended UP					
Unit	PH046	PH066	PH091	PH136	PH161	PH201	PH046	PH066	PH091	PH136	PH161	PH201
Total Gross Capacity [kW]	33.2	49.0	59.4	88.5	100.6	117.3	33.2	49.0	59.4	88.5	100.6	117.3
Net Sensible Capacity [kW]	31.6	47.5	57.4	84.6	95.9	112.0	31.3	47.1	56.9	83.4	94.6	109.8
Power Input [kW]	1.62	1.51	2.01	3.93	4.67	5.27	1.86	1.91	2.51	5.13	5.97	7.47
Net Sens EER	19.5	31.5	28.6	21.5	20.5	21.3	16.8	24.7	22.7	16.3	15.8	14.7
Airflow [m³/h]	11500	16100	19500	30800	34500	40400	11500	16100	19500	30800	34500	40400
Water temperatures Air to the unit	20°C – 26°C 35°C 30% RH											

Unit Dimensions

Version	Extended DOWN						Extended UP					
Unit	PH046	PH066	PH091	PH136	PH161	PH201	PH046	PH066	PH091	PH136	PH161	PH201
Width [mm]	1200	1750	2050	2550	2950	3350	1200	1750	2050	2550	2950	3350
Depth [mm]	890	890	890	890	890	890	890	890	890	890	890	890
Height [mm]	1970 + 600	1970 + 600	1970 + 600	1970 + 600	1970 + 600	1970 + 600	2570	2570	2570	2570	2570	2570

Liebert® PCW

Cool the Cloud

The Liebert® PCW is the ideal precision cooling unit for data centers facing the challenges of of cloud computing. The system adapts perfectly to the dynamics of the data center environment, in response to heat load changes typically seen in a cloud computing application.

Liebert® PCW : simplifies installation for real operational efficiency

Liebert PCW : Top Performer

Standard Height - SMART (Double Circuits Units - One Circuit Running)

Unit	PH040	PH060	PH080	PH110	PH145	PH170
Total Gross Capacity [kW]	24.5	41.1	52.0	68.3	88.6	105.4
Net Sensible Capacity [kW]	23.3	39.1	49.1	64.5	81.9	96.8
Power Input [kW]	1.17	1.97	2.85	3.78	6.69	8.55
Net Sens EER	19.9	19.8	17.2	17.1	12.2	11.3
Airflow [m³/h]	8700	14700	19000	25000	34000	40700
Water temperatures Air to the unit	20°C – 26°C 35°C 30% RH					

Unit Dimensions

Unit	PH040	PH060	PH080	PH110	PH145	PH170
Width [mm]	1200	1750	2050	2550	2950	3350
Depth [mm]	890	890	890	890	890	890
Height [mm]	1970	1970	1970	1970	1970	1970

Extended Height - SMART (Double Circuits Units - One Circuit Running)

Version	Extended DOWN						Extended UP					
Unit	PH046	PH066	PH091	PH136	PH161	PH201	PH046	PH066	PH091	PH136	PH161	PH201
Total Gross Capacity [kW]	33.2	49.0	59.4	88.5	100.6	117.3	33.2	49.0	59.4	88.5	100.6	117.3
Net Sensible Capacity [kW]	31.6	47.5	57.4	84.6	95.9	112.0	31.3	47.1	56.9	83.4	94.6	109.8
Power Input [kW]	1.62	1.51	2.01	3.93	4.67	5.27	1.86	1.91	2.51	5.13	5.97	7.47
Net Sens EER	19.5	31.5	28.6	21.5	20.5	21.3	16.8	24.7	22.7	16.3	15.8	14.7
Airflow [m³/h]	11500	16100	19500	30800	34500	40400	11500	16100	19500	30800	34500	40400
Water temperatures Air to the unit	20°C – 26°C 35°C 30% RH											

Unit Dimensions

Version	Extended DOWN						Extended UP					
Unit	PH046	PH066	PH091	PH136	PH161	PH201	PH046	PH066	PH091	PH136	PH161	PH201
Width [mm]	1200	1750	2050	2550	2950	3350	1200	1750	2050	2550	2950	3350
Depth [mm]	890	890	890	890	890	890	890	890	890	890	890	890
Height [mm]	1970 + 600	1970 + 600	1970 + 600	1970 + 600	1970 + 600	1970 + 600	2570	2570	2570	2570	2570	2570

Liebert® CRV from 11 to 50 kW

The Efficient Cooling fot IT

The Liebert CRV is a self - contained precision cooling unit, ideally designed for cooling rows of racks in small and medium data centers. Liebert CRV: Simple, Safe, Adaptable. A new precision cooling unit to tackle new challenges The Liebert CRV is a multi - option, precision air conditioner that offers temperature and humidity control, filtration and notification management so you can keep your data center under control

IT environments are facing a growing number of challenges. To start with, consolidation, virtualization and blade technology are just a few criticalities of the IT infrastructure. Business-critical continuity is as vital for a computer room as it is for a large data center. Too often, the budget allocated is not enough. Nowadays, energy efficiency is a priority - both for saving money and for respecting the environment. If you don't want such challenges to become a threat to your business, you need to meet them head-on.

Liebert® CRV Technical Data

		CR011RA	CR021RA	CR020RA/W	CR035RA/W	CR038RC	CR060RC	CR040	CR050
Net Sensible Cooling Capacity	[kW]	11.7	20.7	24.2	37.7	38.4	57.0	46.6	57.9
Nominal Airflow	m^3/h	2700	4050	4170	5540	5420	7758	5650	7410
Weight	[kg]	220	230	355/350	365/385	220	230	330	365
Humidity Control		Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Dimensions H x W x D	[mm]	2000x300x1100		2000x600x1175		2000x300x1100(*)		2000x600x1175	

Note: The performances shown above refer to an air inlet temperature of 38°C, condensing temperature for air and water-glycol cooled units of 45°C and a chilled water temperature of 7/12°C. (*) Unit available also with a 2200 mm height and 1200 mm depth.

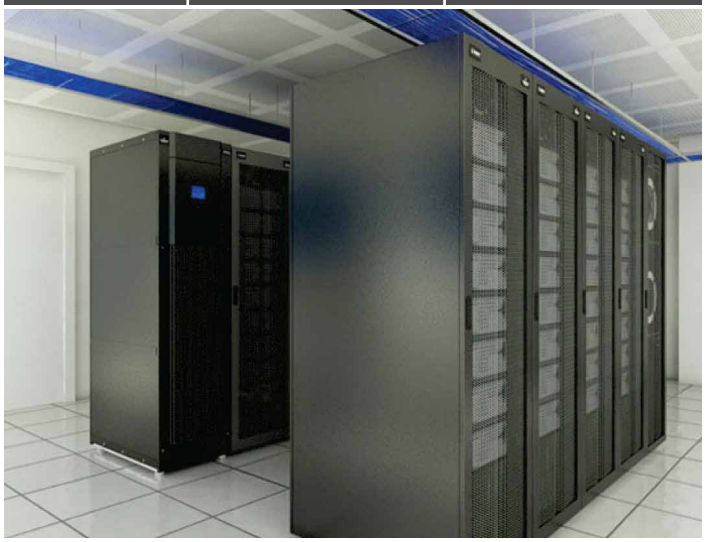
Liebert® CRV from 11 to 50 kW

The Efficient Cooling fot IT

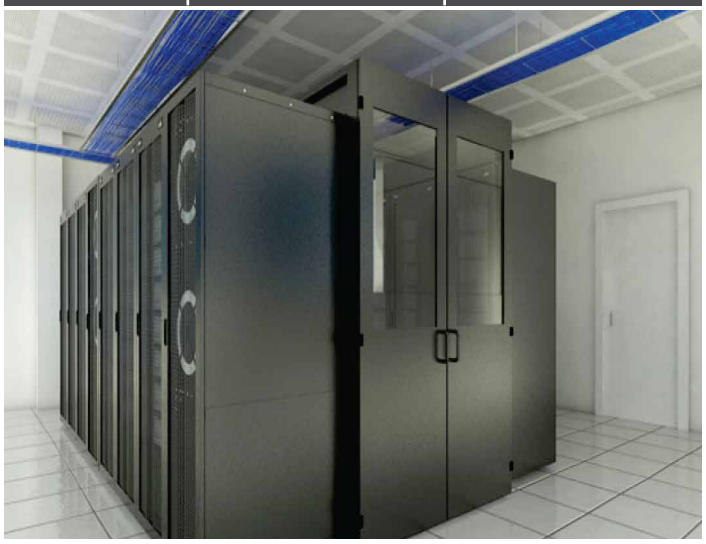
Various Application Scenarios

1° Scenario		
	No of racks	Between 1 and 4
	Heat Load	Up to 20 kW
	Space	Between 5m² and 15m²
	Raise Floor	Not Required
	Recommended Solution	Direct Expansion

2° Scenario		
	No of racks	Up to 10
	Heat Load	Up to 100 kW
	Space	Up to 30m²
	Raise Floor	Not Required
	Recommended Solution	Direct Expansion



3° Scenario		
	No of racks	Between 10 and 20
	Heat Load	Up to 200 kW
	Space	Up to 50m²
	Raise Floor	Not Required
	Recommended Solution	Chilled Water



4° Scenario		
	No of racks	Up to 30
	Heat Load	Up to 300 kW
	Space	Up to 100m²
	Raise Floor	Not Required
	Recommended Solution	Chilled Water

SmartAisle™

Datacenter Efficiency
Management Platform

Using SmartAisle™ solution most of the traditional approach limitations can be significantly improved. SmartAisle™ solution increases space efficiency with heat load limit up ot 12kW/rack with Liebert PDX/PCW units and up to 20 kW/rack with Liebert CRV cooling units.

SmartAisle™ provides always uniform and predictable temperature to all IT equipment controlling directly cold aisle temperature and humidity. Optimized cooling system efficiency is achieved by optimising the return air temperature without compromising reliability.

In combination with free cooling chilled water system it can provide up to 50% + efficiency increase and consequently fast return of investment (ROI).

SmartAisle™ allows easy retrofit and low initial investment as it fits existing Knurr reacks

FEATURES

- Physical separation of cold and warm air zones
- The Liebert® iCOM® control system featured on Thermal Management products brings high-level control and supervision to multiple units, allowing up to 32 cooling units to work together as a single system to optimize room performance
- **SmartAisle™** solution in combination with chilled water system with free cooling is the best practice how to maximize energy efficiency. This result has been reached by enhancing free cooling effect thanks to using higher fluid temperature.
- **SmartAisle™** solution in combination with direct expansion system can offer more than 34% saving thanks to intelligent control of Digital Scroll Compressor capacity and accurate fan speed management driven by cold aisle conditions. SmartAisle™ solution provides consistently hot return air for more effective precision cooling system performance.
- Flexibility and the best efficiency is achieved using EC fan technology and SmartAisle™ control logic

Savings - Chilled Water System **36.7%** **47.9%**

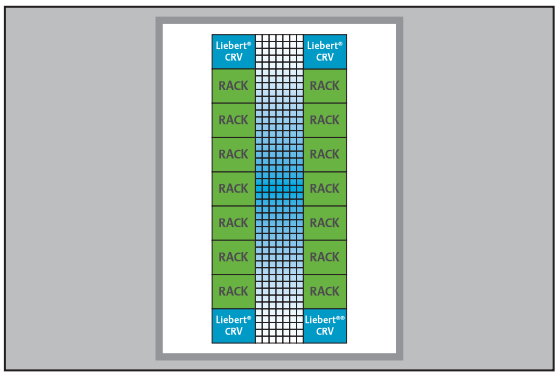
	Traditional Approach	With Cold Aisle Containment	With SmartAisle™
Chiller*	54.8 %	41.5 %	35.2 %
Pumps*	10.5 %	9.7 %	9.6 %
Cooling Unit	34.7 %	12.0 %	7.4 %
Total	**100 %**	**63.3 %**	**52.1 %**

Savings - Direct Expansion System **20,2%** **34,3%**

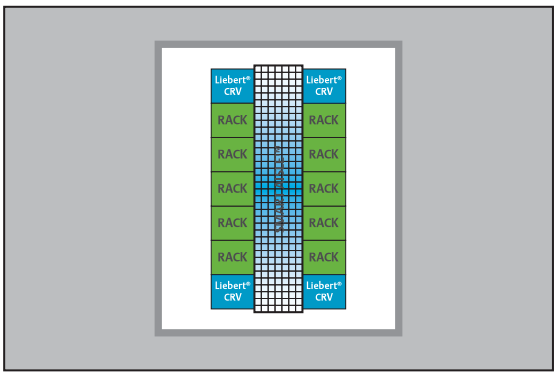
	Traditional Approach	With Cold Aisle Containment	With SmartAisle™
Compressor	72.2 %	59.2 %	55.2 %
Condenser	5.8 %	5.8 %	5.8 %
Evaporator Fan	22.0 %	14.9 %	4.7 %
Total	**100 %**	**79.8 %**	**65.7 %**

Case Study: Direct Expansion System With Row-Based CRAC Units

Traditional Approach



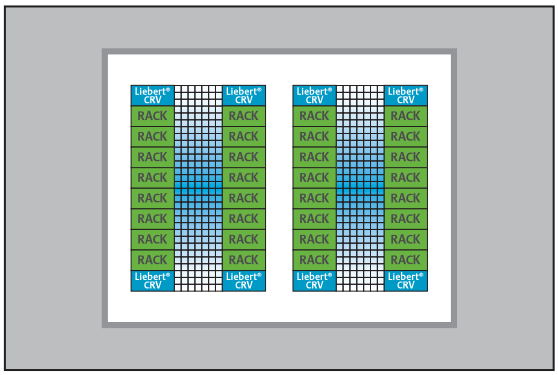
SmartAisle™



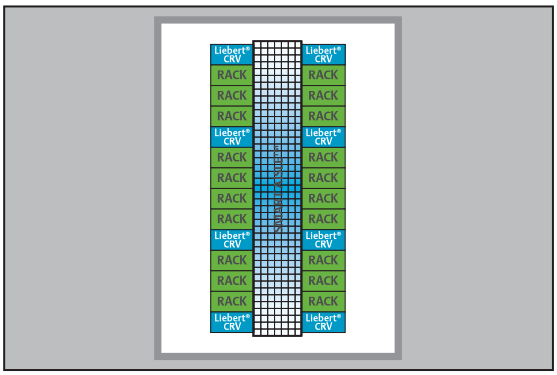
		Traditional Approach	SmartAisle™
Data Center Heatload	(kW)	100	100
Location		Munich, Germany	
Racks Qty	(·)	14	10
Min. Data Center footprint	(m^2)	54	42
Redundancy for CRAC units	(·)	N+1	N+1
CRAC unit type	(·)	CRO35 RA	CRO35 RA
Condenser	(·)	HCR051	HCR051
CRAC Qty	(·)	4	4
Heatload per Rack	(kW)	7.15	10
Annual energy consumption of the system	(kWh)	239380	217868

Case Study: Chilled Water System With Row-Based CRAC Units

Traditional Approach



SmartAisle™



		Traditional Approach	SmartAisle™
Data Center Heatload	(kW)	200	200
Location		Munich, Germany	
Racks Qty	(·)	32	20
Min. Data Center footprint	(m^2)	93.5	66
Redundancy for CRAC units	(·)	N+1	N+1
CRAC unit type	(·)	CR040 RC	CR040 RC
CRAC Qty	(·)	8	8
Freecooling Chiller	(·)	FG0023	FG0023
Fluid 35% Ethylene Glycol	(°C)	10/15	14/19
Heatload per Rack	(kW)	6.25	10
Annual energy consumption of the system	(kWh)	304438	242670

Power input of pumps is not considered

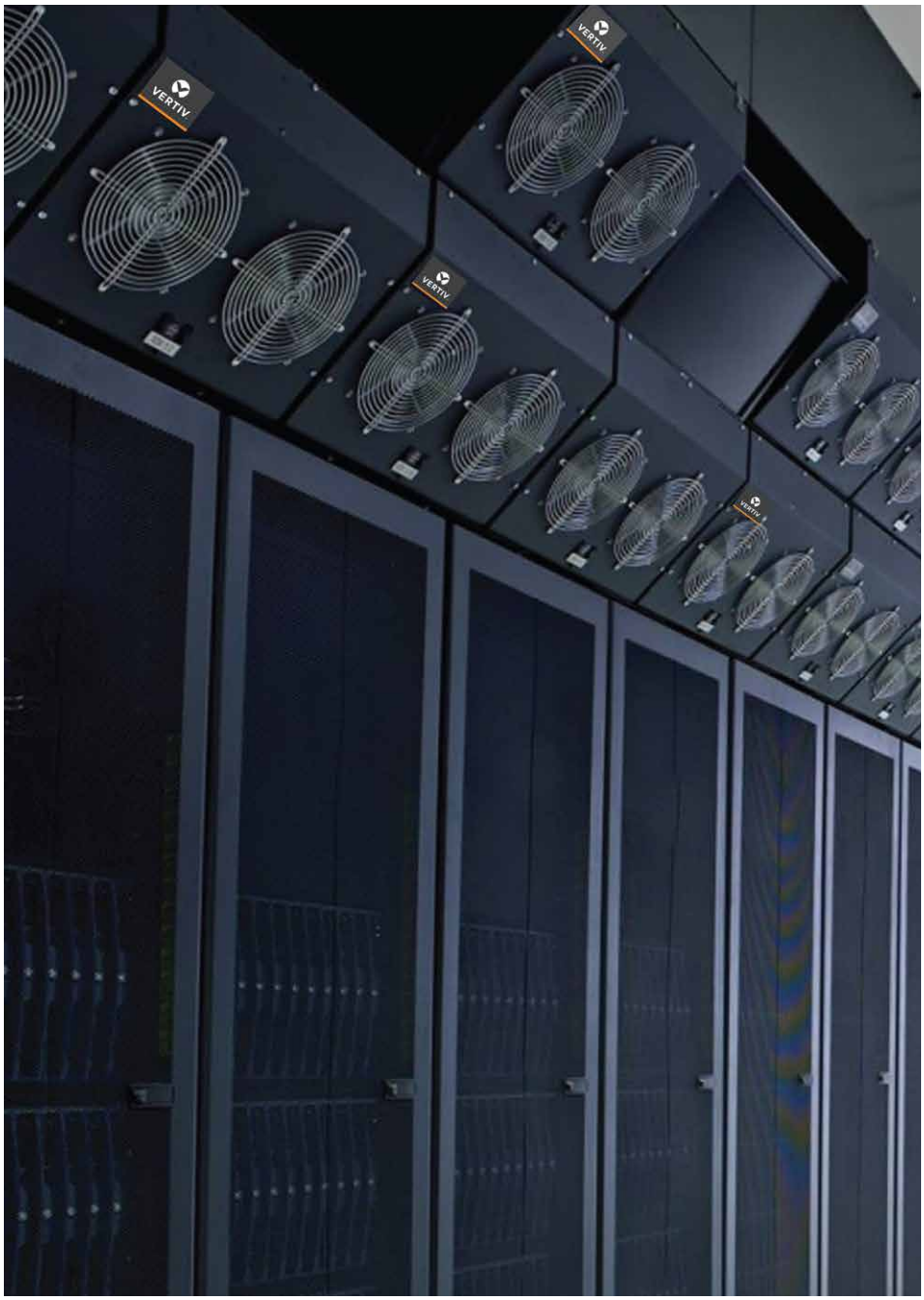
Flexible, Energy-Saving, Solutions For High Heat Densiity Applications

Using SmartAisle™ solution most of the traditional approach limitations can be significantly improved. SmartAisle™ solution increases space efficiency with heat load limit up ot 12kW/rack with Liebert PDX/PCW units and up to 20 kW/rack with Liebert CRV cooling units.

Today, more than ever, environmental and economic issues are pushing business continuity professionals to lobby for energy efficient, environmentally friendly solutions in their data centers. The Liebert XD solution is the answer on both fronts. With a hybrid approach that requires 15% - 50% less chiller plant capacity, as well as less diesel generator and switchgear capacity required, the potential energy consumption for your centers is reduced up to 40%. The significant energy savings achieved by the Liebert XD solution are attributed to these factors:

- Locating cooling units closer to the load reduces the energy required to move the air and results in less mixing of hot and cold air.
- Micro channel coils provide minimal air pressure drop losses and improved thermal heat transfer.
- No need to over-chill data centers to eliminate hot spots.

However, flexibility is also an important attribute of your cooling systems. The Liebert XD solution - a combination of floormount mission-critical cooling units and supplemental cooling - allows your facility to adapt as heat loads increase. And by adding/ reconfiguring solutions to react to changes in your environment, the flexible configuration of the Liebert XD system modules also allows scalability for future growth.



Liebert® XD

Flexible, Energy Saving Cooling Solutions
For High Heat Density Application

VERTIV.

The Liebert XDA Air Flow Enhancer

Lightweight fan unit is mounted to the exhaust side of a rack enclosure. The XDA, that is compatible with most rack enclosures, increases the airflow through densely populated enclosures, past congested cabling, thus removing hot spots within the enclosure that can threaten the uptime of critical systems.

Liebert XDA Air Flow Enhancer	
Nominal Capacity	1000 CFM
Input Voltage	120 V, 1, 60 Hz 230 V, 1 50/60 Hz
Full load amps	1.5 A @ 120 V
Height	56" / 1422.4 mm
Width	8" / 203.2 mm
Depth	2.25" / 57.1 mm
Weight	27 lbs / 12.2 kg

The Liebert XDP Pumping Unit

The XDP serves as an intermediary, to isolate the building chilled water circuit from the XD coolant circuit. It circulates the coolant to the XDV or XDO and it control the XD coolant fluid temperature to always be above the actual dew point.

Liebert XDP Pumping Unit	
Nominal Capacity, 60 Hz	160 kW / 46 Ton
Nominal Capacity, 50 Hz,	130 kW / 37 Ton connected to XDV modules
Nominal Capacity, 50 Hz, connected to XDO modules	140 kW / 40 Ton
Input Voltage	208 V, 3 ph, 60 Hz / 460 V, 3 ph, 60 Hz 380/420 V, 3 ph, 50 Hz
Full load amps	2.1 A @ 460 V, 3 ph, 60 Hz 3 A @ 380/420 V, 3 ph, 50 Hz
Height	76" (1930 mm)
Width	37" (940 mm)
Depth	30" (762 mm)
Weight, empty	855 lbs (388 kg)

The Liebert XDC Coolant

The XD Coolant makes the Liebert XD system very energy efficient. The Coolant converts from a liquid to a gas as it absorbs the heat energy in the space. It is later condensed back to a liquid in the XDP and pumped back to the XDO's and XDP's

Liebert XDC Coolant Chiller	
Nominal Capacity, 60 Hz	160 kW / 46 Ton
Input Voltage	460 V, 3 ph, 60 Hz
Full load amps	84 A @ 460 V, 3 ph, 60 Hz
Height	78" (1981 mm)
Width	74" (1879 mm)
Depth	34" (863 mm)
Weight, empty	2000 lbs (907 kg)

The Liebert XDV Top Cooling Module

The XDV is installed on top of a rack enclosure. It can either take the hot air directly from the enclosure and cool the air before it is discharged into the room; or the unit can draw discharged "hot spot" air from the room through the cooling coil and distribute it to the Cold Aisle. Uses XD waterless coolant.

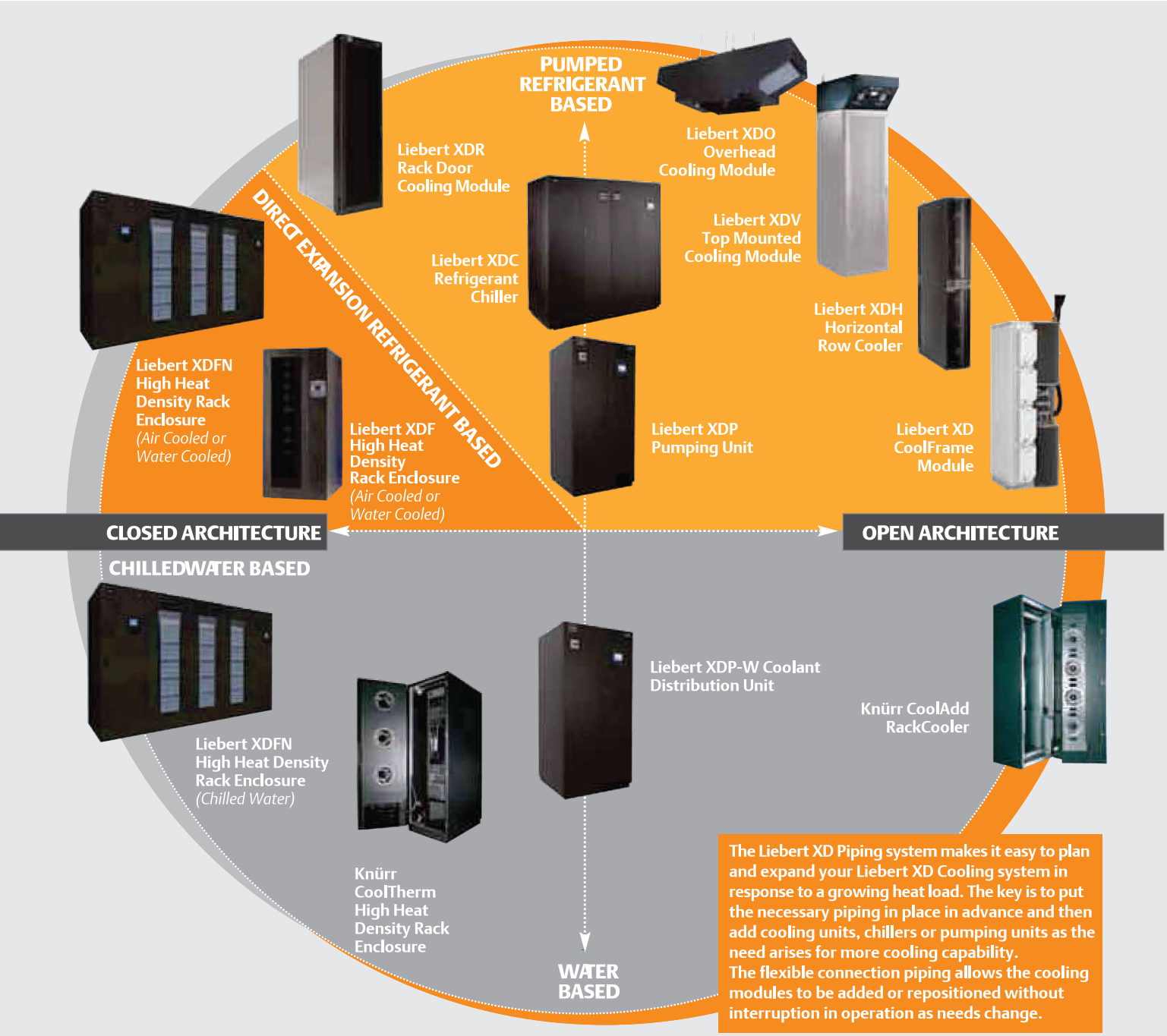
Liebert XDV Top Cooling Module	
Nominal Capacity, 60 Hz	8 kW / 2.2 Ton
Nominal Capacity, 50 Hz	6.5 kW / 1.85 Ton
Nominal Airflow, 60 Hz	1000 CFM (1700 m3/h)
Nominal Airflow, 50 Hz	830 CFM (1410 m3/h)
Input Voltage	120 V, 1 ph, 60 Hz or 230 V, 1 ph, 50/60 Hz
Full load amps (with optional Condensate Detection)	2A @ 120V, 1ph, 60 Hz 1A @ 230V, 1ph, 50 Hz
Height (unit only)	14" (355 mm)
Width	23.5" (597 mm)
Depth	29.5"-39.5" (749-1003 mm)
Weight, empty	77 lbs (35 kg)
Options	Pre-attached and pre-charged 6 ft flexible piping with threaded couplings, with automatic shut off when disconnected Condensate Detection (dry contacts)

The Liebert XDO Overhead Fan Coil

This ceiling-installed unit is placed above the heat-emitting equipment, drawing hot air into the coil and discharging air into the Cold Aisle. Uses XD waterless coolant

Liebert XDO Overhead Fan Coil	
Nominal Capacity, 60 Hz	16 kW / 4.5 Ton
Nominal Capacity, 50 Hz	14 kW / 4 Ton
Nominal Airflow, 60Hz	2700 CFM (4590 m3/h)
Nominal Airflow, 50Hz	2250 CFM (3820 m3/h)
Input Voltage	120 V, 1 ph, 60 Hz / 230 V, 1 ph, 60 Hz 200/230 V, 1 ph, 50 Hz
Full load amps (with optional Condensate Detection)	3.1A @ 120V, 1ph, 60 Hz / 1.5A @ 230V, 1ph, 50 Hz
Height	22.5" (572 mm)
Width	72.0" (1829 mm)
Depth	24" (610 mm)
Weight	150 lbs (68 kg)
Options Condensate Detection (dry contacts)	

A Cooling Solution For Every High Heat Density Application



The Liebert XD Piping system makes it easy to plan and expand your Liebert XD Cooling system in response to a growing heat load. The key is to put the necessary piping in place in advance and then add cooling units, chillers or pumping units as the need arises for more cooling capability.
The flexible connection piping allows the cooling modules to be added or repositioned without interruption in operation as needs change.

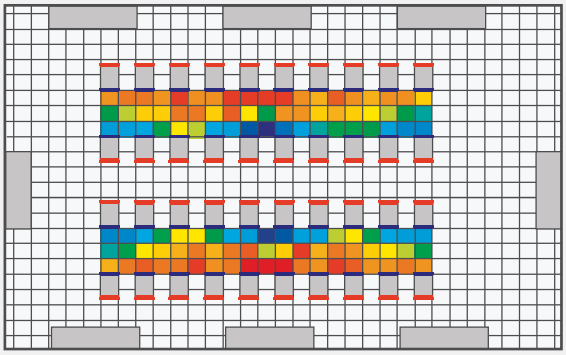
Liebert® XD

Flexible, Energy Saving Cooling Solutions
For High Heat Density Application

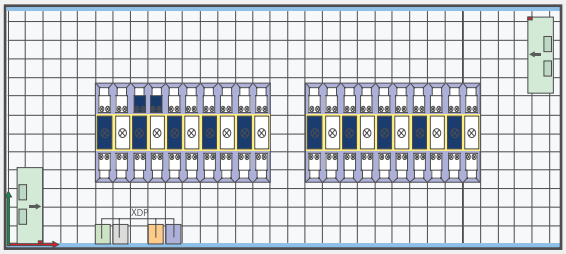
VERTIV.

The Liebert XD Cooling Solution Saves Floor Space

Here's a typical example of how implementation of the Liebert XD solution can impact life cycle costs. The example compares two data center layouts housing a total of 40 server racks with a capacity of 16 kW each.



Raised-Floor Cooling Only
Eight 30-Ton (105 kW) Precision Air Conditioners
N+2 redundancy
284 Tons (998 kW) chiller plant
3000 sq. ft. (300m²)



Raised-Floor And Liebert XD Cooling
Two 20-Ton (70 kW) Precision Air Conditioners
and 60 zero-footprint high heat density cooling modules 33% redundancy
182 Tons (640 kW) Chiller Plant
1500 sq. ft.(150m²)

Here are two solution possibilities to be considered:

The raised-floor only approach of System 1 requires eight 30 Ton (105 kW) floor-mount units (6 primary, two redundant), 3000 sq. ft. (300 m²) of raised floor space due to the need for 6 foot (1.8m) cold aisles to handle the air flow requirements and a 284 Ton (998 kW) chiller plant.

With the raised-floor and Liebert XD cooling solution of System 2, the facility requires only two 20-Ton (70 kW) floor-mount units (one primary, one redundant) in half the floor space. Even with more redundancy, the chiller plant size is cut by 30% and energy consumption reduced by 40% per year. Here are the specifics on these numbers:

Capital Cost Comparison

	System 1	System 2	Savings
Net Sensible Load	2,184,320	2,184,320	
Total Gross Load	3,405,600	2,208,500	
Chiller Tons Required	284	184	**100 (351 kW)**

Capital Savings

Chiller at $400 / Ton	=$40,000
Diesel Generator / Switchgear capacity reduction 360 kW / 450 KVA	=$20,000
Total Savings	=$60,000

The sensible load is based on 40 racks times 16 kW each. But the chiller plant is sized to handle the gross total capacity of the raised-floor units. Only six raised-floor units are used for this calculation, but the cooling units at the rating conditions of 72˚ (22˚C)/50% humidity have a relatively high latent capacity requirement and the fan load needs to be added back to the chiller load. The Liebert XD System hybrid approach requires 1/3 less chiller plant capacity, also less diesel generator and switchgear capacity required. A conservative estimate is a savings of over $60,000 in capital costs.

Energy		System 1	System 2	
	kW ea	Qty / kW	Qty / kW	Savings
Chiller per Ton	0.9	284 / 256	184 / 166	
30 Ton CRAC	7.5	8 / 60		2 / 4
15 Ton CRAC	2.2	8 / 60		2 / 4
Liebert XDO	0.37		20 / 7	
Liebert XDV	0.2		40 / 8	
Liebert XDP	1.7		4 / 7	
Total kW		**316**	**192**	**124**
Cost / year @ $0.10 /kWhr		**$276,816**	**$168,192**	**$108,624**
Operational Costs				
Maintenance		$6,400	$1,600	$4,800
Humidifier		$5,400	$1,350	$4,050
Total Annual Savings				**$117,474**

Total First Year Savings $184,624 10 month payback

The significant energy savings achieved by the Liebert XD solution are, in great part, due to several factors.

- The cooling units are located closer to the load, which results in less mixing of hot and cold air.
- The fans can be optimized for a very low total system static pressure thanks to the micro channel coils and no pressure drop losses in ducts

Customers are also finding they do not need to over chill their data centers to eliminate the hot spots as they have had to do with the raised-floor cooling only approach. They no longer need the cold aisle to be 62°F (17°C) in some places to maintain the desired 70°F (21°C) in other areas experiencing the hot bypass air.

The Adiabatic Freecooling Solution with Top-Tier Availability

Liebert® AFC Operating Modes

FREECOOLING
Only fans are needed to operate: direct exchange between water and air.

Freecooling

ADIABATIC FREECOOLING
The adiabatic system allows freecooling to operate at higher ambient temperatures.

Freecooling
Adiabatic

HYBRID COOLING
Adiabatic freecooling is the primary cooling source, multiple scroll compressors are used as back up.

Freecooling
Adiabatic
Compressors

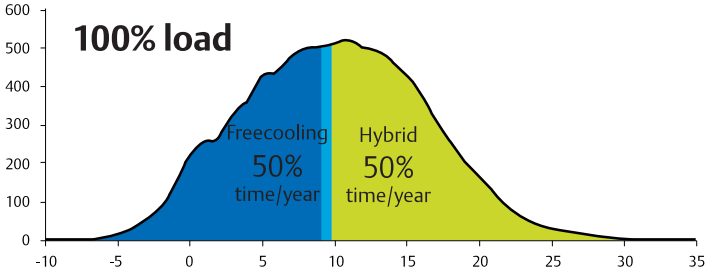
ADIABATIC MECHANICAL COOLING
Compressor's efficiency is increased by the adiabatic system.

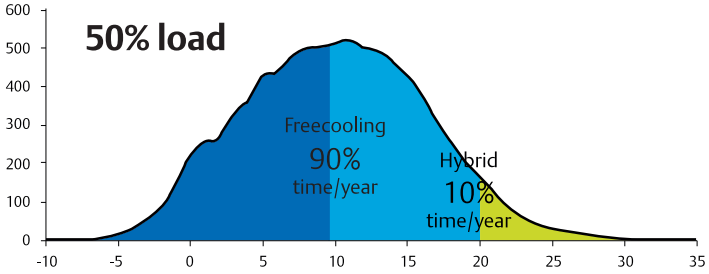
Adiabatic
Compressors

SAFE MODE
100% availability also during water shortages; the sole mechanical cooling system will guarantee full load.

Compressors

- Adiabatic Cooling
- Fast Start Ramp
- Electronic Expansion Valve
- Microchannel Condensing Coil
- 100% Compressor back up





Liebert® AFC

Adiabatic Free Cooling Solutions

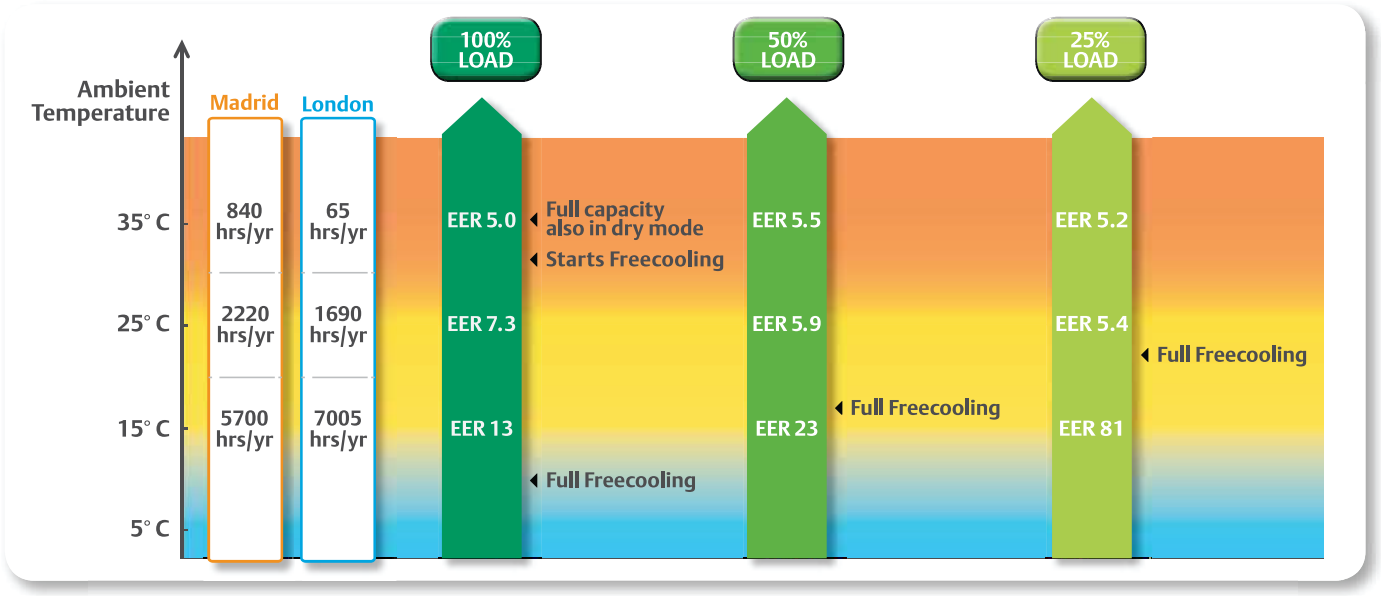
Adiabatic Freecooling Chiller
available from 500 kW to 1450 kW

Liebert® AFC - Adiabatic Freecooling Chiller

		Standard								Ultra Silent							
Model FA0		**046**	**053**	**059**	**073**	**087**	**102**	**117**	**130**	**046 LN**	**053 LN**	**059 LN**	**073 LN**	**087 LN**	**102 LN**	**117 LN**	**130 LN**
Dry Performance - ambient 35°C, adiabatic OFF																	
Cooling capacity [1]	kW	518	573	655	803	948	1133	1288	1451	494	543	630	764	903	1073	1218	1385
Wet Performance - ambient 35°C, relative humidity 45%, adiabatic ON																	
Cooling capacity [1]	kW	562	622	708	869	1023	1228	1396	1572	540	594	686	835	981	1175	1335	1516
Sound level																	
SPL [2]	dB(A)	73.5	73.5	74	74.5	74.5	74.5	75.0	75	67.5	67.5	68	68.5	68.5	68.5	69.0	69
PWL [3]	dB(A)	94.7	94.7	95.5	96.3	97	97.6	98.1	98.5	88.9	88.9	89.5	90.3	91	91.5	92.0	92.5
Dimensions																	
Length	mm	5597	5597	6867	8137	9407	10677	11947	13217	5597	5597	6867	8137	9407	10677	11947	13217
Depth	mm	3043	3043	3043	3043	3043	3043	3043	3043	3043	3043	3043	3043	3043	3043	3043	3043
Height	mm	2669	2669	2669	2669	2669	2669	2669	2669	2669	2669	2669	2669	2669	2669	2669	2669

1 Performance data calculated at the following conditions: power supply 400V/3ph/50Hz; coolant inlet/outlet temperature 26/20°C; ethylene glycol 30%.
2 Measured at outdoor temperature of 35 °C; 1 m from the unit; free field conditions; according to ISO 3744.
3 Measured at outdoor temperature of 35°C; calculated according to ISO 3744.

Efficency at Full and Part Load Condition



EER values for the *FA0 Range* at the following conditions: adiabatic function active (wet pads mode) and calculated according to the average humidity data obtained from Central Europe locations.

A complete range of chillers respecting the environment through efficiency

Nowadays chilled water demand is required to satisfy many different needs, in many different applications: from residential uses to industry, from commercial and leisure to technological sites. In order to cover all types of requirements, a flexible kind of chiller is necessary which case by case, could be used to meet any kind of request and supply what is really needed: this is the Liebert HPC series, the chiller family from Vertiv Liebert brand, covering a range from40 to 1600kW.

IT environments are facing a growing number of challenges. To start with, consolidation, virtualization and blade technology are just a few criticalities of the IT infrastructure. Business-critical continuity is as vital for a computer room as it is for a large data center. Too often, the budget allocated is not enough.

Nowadays, energy efficiency is a priority - both for saving money and for respecting the environment. If you don't want such challenges to become a threat to your business, you need to meet them head-on.

Liebert® HPC

A Complete Range of Chillers
Respecting the Environment Through Efficiency

HPC series is available in different versions:

- Water-cooled: Liebert HPC-W (280-12001M) with semi-hermetic screw compressors
- Air-cooled ductable: Liebert HPC-R (40-3501M) for indoor installations, with scroll compressors and radial fans, providing available ESP up to 450Pa
- Air-cooled: Liebert HPC-S/MiL (40-16001M) for out-door installations with axial fans and scroll (40-3501M) or screw (340-16001M) compressors.

All the air-cooled series are available in Free-cooling con-figuration which, exploiting cold outdoor air temperatures, lets HPC save up to 40% of energy consumption.

Liebert® HPC

A Complete Range of Chillers
Respecting the Environment Through Efficiency

HPC W Range — Watercooled Screw Chiller

Model		WS1027	WS1031	WS1035	WS1040	WS1047	WS1052	WS1060	WS2033	WS2039	WS2043	WS2048
Performances[1]												
Cooling capacity	kW	283	319	362	419	480	541	602	341	402	445	485
Compressor power input	kW	58	66	72	85	97	113	124	73	83	96	101
Unit EER	---	4,88	4,84	5,04	4,91	4,94	4,78	4,87	4,67	4,83	4,62	4,80
Performances[2] with ECO												
Cooling capacity	kW	301	345	382	456	511	581	638	361	434	471	528
Compressor power input	kW	59	69	73	89	99	118	127	74	87	98	106
Unit EER	---	5,11	5,03	5,24	5,13	5,18	4,94	5,04	4,86	4,98	4,81	4,96
Number of refrig circuits	#	1	1	1	1	1	1	1	2	2	2	2
Base version SPL[3]	dB(A)	76,5	77,0	77,5	76,5	76,0	77,0	77,0	73,0	74,0	74,0	77,0
Base version PWL[4]	dB(A)	94,0	94,5	95,0	94,5	94,0	95,0	95,0	91,0	92,0	92,0	95,5
Low-Noise version SPL[3]	dB(A)	68,0	69,0	69,0	69,0	68,0	69,0	69,0	65,0	65,0	66,0	68,0
Low-Noise version PWL[4]	dB(A)	86,0	87,0	87,0	87,0	86,0	87,0	87,0	83,0	83,0	84,0	86,5
Diameter (evaporator side)	DN-inch	DN125-5"-141,3 VICT.			DN150-6"-168,3 VICT.				DN125-5"-141,3 VICT.	DN150-6"-168,3 VICT.		
Diameter (condenser side)	DN-inch	DN80-3"GAS F	DN100-4"GAS F		DN125-5"GAS F				DN80-3"GAS F			
Operating weight	kg	2.403	2.509	2.570	3.530	3.557	3.741	3.761	3.238	3.463	3.601	4.311

1 At the following standard conditions: power supply 400V/3ph/50Hz; refrigerant R134a; evaporator water inlet/outlet 12/7 °C; condenser water inlet/outlet 30/35 °C;
2 At the following standard conditions: power supply 400V/3ph/50Hz; refrigerant R134a; with Economiser evaporator water inlet/outlet 12/7 °C; condenser water inlet/outlet 30/35 °C;
3 Measured at 1mt from the unit; free field conditions; according to ISO 3744; nominali working conditions
4 Calculated according to ISO 3744; nominal working conditions

Dimensions

Model	Length [mm]	Depth [mm]	Height [mm]
WS1027	4.350	890	2.000
WS1031	4.350	890	2.000
WS1035	4.350	890	2.000
WS1040	4.650	890	2.040
WS1047	4.650	890	2.040
WS1052	4.650	890	2.040
WS1060	4.650	890	2.040
WS2033	4.100	1.750	2.000
WS2039	4.100	1.750	2.000
WS2043	4.100	1.750	2.000
WS2048	4.350	1.750	2.000

HPC S Range — Aircooled Scroll Chiller

Base

Model		CBH004	CBH204	CBH006	CBH206	CBH007	CBH207	CBH008	CBH011	CBH014	CBH016
Performances[1]											
Cooling Capacity	kW	39,7	39,7	54,8	53,9	66,0	67,0	77,6	106,9	129,0	164,8
Compressors power input	kW	13,8	13,8	18,6	18,3	23,5	23,8	27,3	36,7	46,5	56,8
Number of Compr. / Refrig. Circuits	#	1/1	2/2	1/1	2/2	1/1	2/2	2/2	2/2	2/2	2/2
Compressors COP		2,88	2,88	2,95	2,95	2,81	2,81	2,84	2,91	2,78	2,90
Unit EER		2,55	2,55	2,69	2,69	2,61	2,61	2,51	2,65	2,58	2,65
Air flow rate	m³/h	21.400	21.400	19.400	19.400	18.000	18.000	42.800	38.800	36.000	58.200
SPL (Sound Pressure Level)[2]	dB(A)	70	70	70	70	70	70	72	72	72	73
SPL (Sound Pressure Level)[3]	dB(A)	55	55	55	55	55	55	58	58	58	60
PWL (Sound Power Level)[4]	dB(A)	86	86	86	86	86	86	89	89	89	91
Length	mm	2046	2046	2046	2046	2046	2046	3046	3046	3046	4046
Depth	mm	1201	1201	1201	1201	1201	1201	1201	1201	1201	1201
Height	mm	1904	1904	1904	1904	1904	1904	1904	1904	1904	1904
Operating Weigth	kg	584	658	663	692	688	734	946	1119	1167	1421

HPC S Range — Aircooled Scroll Chiller

Base

Model		CBH017	CBH020	CBH023	CBH025	CBH028	CBH030	CBH032
Performances[1]								
Cooling Capacity	kW	156,3	169,9	213,7	230,0	260,8	309,1	331,3
Compressors power input	kW	54,5	63,6	74,2	85,7	92,5	101,0	116,0
Number of Compr. / Refrig. Circuits	#	4/2	4/2	4/2	4/2	4/2	4/2	4/2
Compressors COP		2,87	2,67	2,88	2,69	2,82	3,06	2,86
Unit EER		2,61	2,46	2,63	2,48	2,62	2,81	2,65
Air flow rate	m³/h	59.100	59.100	78.800	78.800	74.000	92.500	92.500
SPL (Sound Pressure Level)[2]	dB(A)	73	73	74	74	74	75	75
SPL (Sound Pressure Level)[3]	dB(A)	60	60	61	61	61	62	62
PWL (Sound Power Level)[4]	dB(A)	91	91	92	92	92	94	94
Length	mm	3750	3750	4750	4750	4750	5750	5750
Depth	mm	1300	1300	1300	1300	1300	1300	1300
Height	mm	2502	2502	2502	2502	2502	2502	2502
Operating Weigth	kg	1788	1915	2331	2331	2431	2808	2868

1 At the following standard conditions: power supply 400V/3ph/50Hz; outdoor temperature 35°C; refrigerant R407C; water inlet/outlet temperature 12/7 °C; ethylene glycol 0%; 0m a.s.l.; 0,43 x 10^{-4} m^2°C/W evaporator fouling factor; rated in accordance with EN12055
2 Measured with outdoor temperature 35 °C; 1m from the unit; free field conditions; according to ISO 3744
3 Measured with outdoor temperature 35 °C; 10m from the unit; free field conditions; according to ISO 3744
4 With outdoor temperature 35°C; calculated according to ISO 3744

Liebert® HPC

A Complete Range of Chillers
Respecting the Environment Through Efficiency

HPC M Range — *Freecooling Aircooled Screw Chiller*

Base Model		SBS040	SBS045	SBS045_B	SBS054	SBS063	SBS073
R134a refrigerant							Performances[2]
Cooling capacity	kW	350	406	439	479	547	639
Freecooling capacity[3]	kW	250	287	296	298	372	451
Compressors power input	kW	106	122	139	164	174	193
Compressors COP	---	3,29	3,33	3,16	2,92	3,15	3,32
Unit EER	---	2,97	2,96	2,85	2,67	2,84	2,97
Unit EER at Z.E.T.	---	21,9	18,9	19,5	19,6	19,6	19,8
R407C refrigerant							Performances[2]
Cooling capacity	kW	389	452	---	528	613	725
Freecooling capacity[3]	kW	261	299	---	308	385	466
Compressors power input	kW	131	149	---	185	211	239
Compressors COP	---	2,97	3,03	---	2,85	2,91	3,03
Unit EER[2]	---	2,72	2,75	---	2,64	2,66	2,77
Unit EER at Z.E.T.	---	34,1	29,7	---	34,7	32,3	31,8
Air flow rate	m3/h	118.800	146.400	146.400	146.400	183.000	219.600
SPL (Sound Pressure Level)[4]	dB(A)	77	77	77	77	78	79
PWL (Sound Power Level)[5]	dB(A)	97	97	97	97	98	99
Capacity control		25 --> 100 % stepless					
Operating weight	kg	4.953	5.240	5.840	5.970	6.694	7.522

Dimensions

Model	Length	Depth	Height
	[mm]	[mm]	[mm]
SBS040	5220	2260	2517
SBS045	5220	2260	2517
SBS045_B	5220	2260	2517
SBS054	5220	2260	2517
SBS063	6320	2260	2517
SBS073	7420	2260	2517

HPC L Range — *Aircooled Screw Chiller*

High Availability Model		CA4069	CA4075	CA4081	CA4087	CA4093	CA4100	CA4107
R134a refrigerant								Performances[1]
Cooling capacity	kW	745	790	846	881	926	972	1063
compressors power input	kW	195	215	238	256	269	288	295
compressors COP	---	3,82	3,67	3,55	3,44	3,44	3,38	3,60
unit EER	---	3,31	3,22	3,16	3,08	3,04	3,00	3,15
cooling capacity with ECO[2]	kW	836	882	937	981	1033	1079	1158
compressors power input[2]	kW	222	243	265	290	308	327	325
compressors COP[2]	---	3,77	3,63	3,54	3,38	3,35	3,30	3,56
unit EER[2]	---	3,32	3,23	3,18	3,07	3,00	2,97	3,16
SPL (Sound Pressure Level)[3]	dB(A)	83,5	83,5	83,5	83,5	84	84	84,5
PWL (Sound Power Level)[4]	dB(A)	104,5	104,5	104,5	104,5	105	105	105,5
air flow rate	m3/h	250.000	250.000	250.000	250.000	270.000	270.000	315.000
operating weight	kg	9100	9108	9.187	9.264	9.446	9.477	10.282

Dimensions

Model	Length	Depth	Height
	[mm]	[mm]	[mm]
CA4069	8.590	2308	2563
CA4075	8.590	2308	2563
CA4081	8.590	2308	2563
CA4087	8.590	2308	2563
CA4093	8.590	2308	2563
CA4100	8.590	2308	2563
CA4107	9.586	2308	2563

HPC L Range — *Aircooled Screw Chiller*

High Availability Model		CA7081	CA7087	CA7093	CA7100	CA7107	CA7115	CA7122	CA7131	CA7140
R407C refrigerant										Performances[1]
Cooling capacity	kW	885	928	996	1045	1157	1211	1322	1462	1529
Compressors power input	kW	301	328	351	384	399	434	447	453	490
Compressors COP	---	2,94	2,83	2,84	2,72	2,90	2,79	2,96	3,23	3,12
Unit EER	---	2,67	2,59	2,57	2,49	2,62	2,54	2,67	2,85	2,78
Cooling capacity with ECO[2]	kW	980	1016	1080	1126	1238	1297	1415	1550	1613
Compressors power input[2]	kW	372	402	422	455	458	507	524	511	545
Compressors COP[2]	---	2,63	2,53	2,56	2,47	2,70	2,56	2,70	3,03	2,96
Unit EER[2]	---	2,44	2,35	2,36	2,29	2,48	2,36	2,47	2,71	2,67
SPL (Sound Pressure Level)[3]	dB(A)	83,5	83,5	84	84	84,5	84,5	85	86	86
PWL (Sound Power Level)[4]	dB(A)	104,5	104,5	105	105	105,5	105,5	106,5	108	108
Air flow rate	m3/h	250.000	250.000	270.000	270.000	315.000	315.000	360.000	450.000	450.000
Operating weight	kg	9.134	9.156	9.316	9.336	10.143	10.204	11.176	12.230	12.255

Dimensions

Model	Length	Depth	Height
	[mm]	[mm]	[mm]
CA7081	8.590	2308	2563
CA7087	8.590	2308	2563
CA7093	8.590	2308	2563
CA7100	8.590	2308	2563
CA7107	9.586	2308	2563
CA7115	9.586	2308	2563
CA7122	11.578	2308	2563
CA7131	13.570	2308	2563
CA7140	13.570	2308	2563

1 At the following standard conditions: power supply 400V/3ph/50Hz; outdoor temperature 35°C; water inlet/outlet 12/7°C; ethylene glycol 0%; 0m a.s.l.; 0,43x10⁻⁴ 2°C/W evaporator fouling factor; rated in accordance with EN12055
2 At the following standard conditions: power supply 400V/3ph/50Hz; outdoor temperature 35°C; water inlet/outlet 15/10°C; ethylene glycol 30%; 0m a.s.l.; 0,43x10⁻⁴ 2°C/W evaporator fouling factor; rated in accordance with EN12055
3 At the following standard conditions: power supply 400V/3ph/50Hz; outdoor temperature 5°C; coolant inlet temperature 15°C; ethylene glycol 30%
4 Measured with outdoor temperature 35 °C; 1meter from the unit; free field conditions; according to ISO3744
5 Measured with outdoor temperature 35 °C; according to ISO3744

Liebert® EFC

from 100kW to 350 kW

The Highly Efficient Indirect Evaporative Freecooling Unit

Enhancing Data Center Efficiency

Evaporative Cooling

The highly efficient evaporative system sprays water onto the heat exchanger to enable cooling even at high ambient air temperatures, without the need for mechanical cooling.

Highly Efficient EC Fans

The new generation of fans installed in the Liebert EFC dramatically reduce the noise level and increase the overall efficiency of the unit.

Reduced CO_2 Emissions

At pPUE levels of 1.03, Liebert EFC requires minimum power input consequently reducing CO_2 emissions.

Data Center Free from Contaminations

The air-to-air heat exchanger separates external and internal air, protecting the data center air from bacterial contamination, as well as other external events such as fire and pollution.

New iCOM™ 7" Touch Display

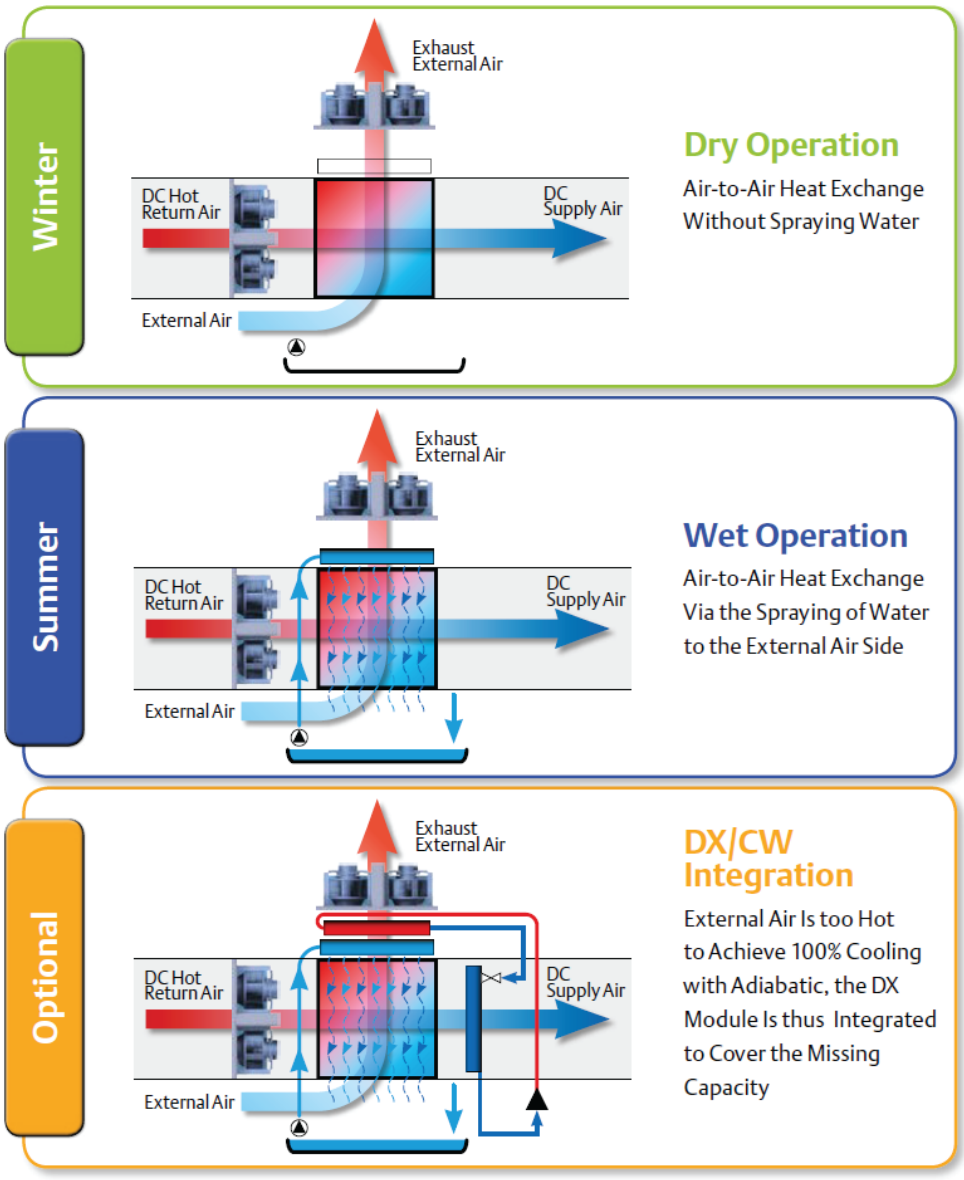
iCOM Control ensures high level management of the units to work together as a single system, thus optimizing room temperature and airflow. Furthermore, it features a new 7" touch screen display for quicker and easier data readability.

Operation Modes In Detail

- During the cold season (winter operation mode) return air from the data center is cooled down, leveraging the heat exchange process with external cold air. There is no need to run the evaporative system and the fan speed is controlled by the external air temperature.

- During the warm season (summer operation mode) the evaporative system must run in order to saturate the air. This enables the unit to cool the data center air even with high external air temperatures. By saturating the air, the dry bulb temperature can be reduced.

- In the case of extreme external conditions, a Direct Expansion (DX) system is available to provide additional cooling. As an alternative, the Chilled Water (CW) coil can be installed. DX and CW systems are sized to provide partial back up for the overall cooling load and are designed to provide maximum efficiency with minimum energy consumption.



Liebert® PeX

Next Generation Envionmental
Control for Critical IT&T Systems

FEATURES

- Energy efficient EC fan
- Intelligent Communication and Monitoring
- System Supervision and management
- Modular Construction
- Smallest Footprint
- High Sensible Heat Ratio
- Available in Up flow and Down flow version
- Wide range available from 20kW to 100kW
- Available With Energy Efficient Scroll / Digital Scroll Compressors

ADVANTAGES EC FAN

- Continuous speed control across full operating range.
- Power consumption 30% lower than regular AC motors.
- Soft start without inrush current.
- No transmission losses through belt & pulleys.
- Adjustable fan speed, easy adaptable to changing load condition.
- Integrated electronics
- Low noise, vibration free operation.
- High efficiency across full operating Range
- Integral overload protection
- Lower running cost
- Reduced energy usage & lower operating cost.

APPLICATIONS

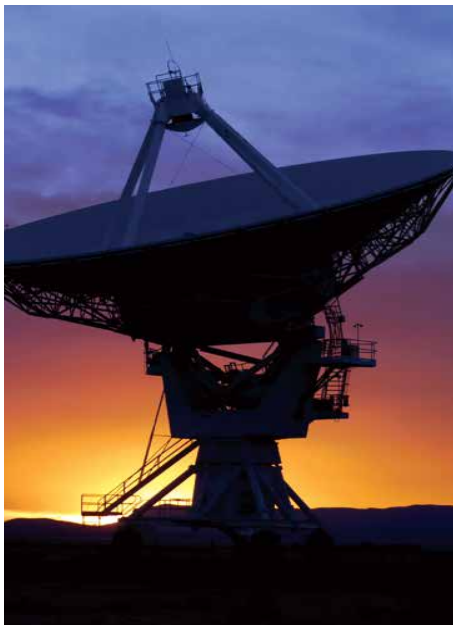
- Datacenter Rooms
- Computer Rooms
- Production Facilities
- Network Operation Centers
- Telecommunication Facilities
- Electronic Switch Rooms
- Broadcast Facilities
- Surveillance and Monitoring Centers
- Available with copeland scroll / digital scroll compressers

Technical Data

Model Size	120	125	130	135	240	245	250	260	270	380	390	3100
Unit Dimension - mm												
Width	850	850	850	850	1700	1700	1700	1700	1700	2550	2550	2550
Depth	850	850	850	850	850	850	850	850	850	850	850	850
Heiht	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Fan Section - Floor and Room Units												
Fan Section - Backward Curve EC Fan												
Airflow - l/s	1800	2250	2250	2250	3550	4400	4400	4400	4400	6650	6650	6650
Fan Section - Ducted Units												
Fan Section - Backward Curve EC Fan												
Airflow - l/s	1800	2150	2150	2150	3550	4200	4200	4200	4200	6350	6350	6350
Rate Unit Performance and Weight- Floor and Room units -R22												
Rated Unit Performance -kW												
24°C DB, 17.1°C WB, 50% RH												
Total	19.2	22.8	30.7	34.8	39.4	46.4	53.2	61.9	70.9	79.5	92.6	105.8
Sensible	19.0	22.6	27.9	29.6	38.4	45.6	48.2	55.8	59.6	72.2	83.7	89.2
22°C DB, 15.5°C WB, 50% RH												
Total	18.5	22.0	29.3	33.2	37.5	44.3	50.3	59.2	67.7	74.7	88.4	100.9
Sensible	18.3	21.8	27.4	29.1	37.2	44.0	47.1	54.8	58.6	70.3	82.2	87.7
Unit Weight -kg												
Air Cooled	296	299	325	328	512	516	551	570	577	815	843	853
Rate Unit Performance and Weight- Ducted units - R22												
Rated Unit Performance -kW												
24°C DB, 17.1°C WB, 50% RH												
Total	19.2	22.9	30.8	34.7	39.4	46.0	52.4	62.1	70.0	78.4	92.8	104.8
Sensible	19.0	22.2	27.3	29.0	38.4	44.4	46.4	54.6	58.0	70.3	81.9	86.9
22°C DB, 15.5°C WB,50% RH												
Total	18.5	21.6	29.4	33.2	37.5	43.4	49.7	59.2	66.8	74.3	88.6	100
Sensible	18.3	21.4	26.9	28.6	37.2	43.1	45.9	53.6	57	68.8	80.5	85.6
Unit Weight -kg												
Air Cooled	283	286	312	315	490	494	529	548	555	781	809	819
Rate Unit Performance and Weight- Floor and Room units -R407C												
Rated Unit Performance -kW												
24°C DB, 17.1°C WB, 50% RH												
Total	21.9	24.9	32.3	37.2	43.9	50.1	56.8	65	74.6	84.8	97.3	106.3
Sensible	19.7	23.1	27.6	29.7	37.4	46.2	48.9	55.1	59.2	73.2	82.8	87.4
22°C DB, 15.5°C WB,50% RH												
Total	20.3	23.1	30.4	35.5	41.3	46.9	53.4	61.7	70.8	80.3	92.1	106.3
Sensible	19.0	22.4	27.0	29.3	38.4	44.9	47.7	54.0	58.2	71.7	81.1	87.4
Unit Weight -kg												
Air Cooled	296	299	325	328	512	516	551	570	577	815	843	853
Rate Unit Performance and Weight- Ducted units - R407C												
Rated Unit Performance - kW												
24°C DB, 17.1°C WB, 50% RH												
Total	21.9	24.9	32.3	37.2	43.9	50.0	56.1	64.6	74.4	84.1	96.9	111.6
Sensible	19.7	22.6	27.1	29.2	39.4	45.1	47.6	53.8	57.9	71.5	80.8	87.1
Total	20.3	23.1	30.4	35.0	41.3	46.4	53.3	60.7	69.9	79.7	91.2	104.8
Sensible	19.0	21.9	26.5	28.5	38.4	43.7	46.7	52.5	56.6	70.0	79.0	85.1
Unit Weight -kg												
Air Cooled	283	286	312	315	490	494	529	548	555	781	809	819

Liebert® SCU

Self-Contained Air Conditioner for Telecommunications



FEATURES

- 3-in-1 Best Cooling Solution for Telecom Equipment
- Highly reliable design for outdoor Application
- Available with highest reliability parts
  - Scroll Compressor
  - Backward Curve Direct Driven EC Cooling Fan
  - Embedded Condenser Fan Motor
  - Best-in-class Damper Motor
  - Intelligent Controller
- Designed for 24 X 7 Application at 45°C Ambient Temperature

Liebert SCU Emergency Freecooling Unit provides the most advanced thermal management solution, through its inovative emergency cooling technology and air-to-air heat exchange.

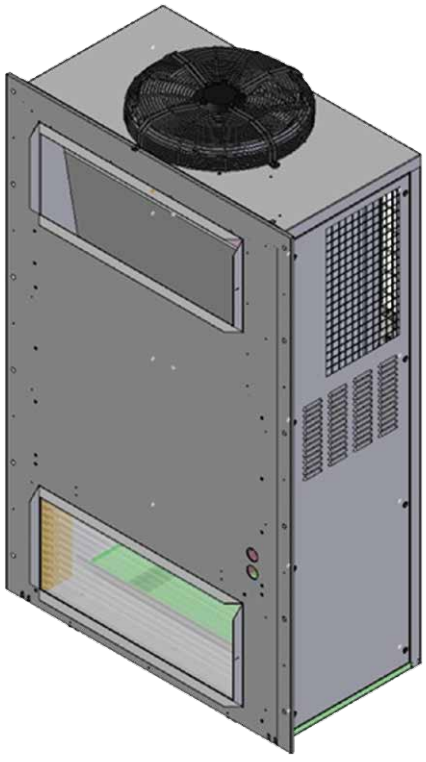
The Highly Efficient Emergency Freecooling Unit

The Liebert® SCU emergency cooling system is equipped with the most advanced industry technology, including emergency air-to-air heat exchange and emergency cooling technology all in one footprint, ensuring top energy efficiency and minimized operating costs.

The Liebert SCU is capable of reducing air temperatures by leveraging on the emergency cooling principle. The process involves the evaporation of pressurized water which cools the surrounding air. Through this technology, the unit can thus achieve pPUE levels of 1.03, ensuring minimum power input and reduced CO2 emissions.

Liebert SCU operates in different functioning modes according to the external air conditions. Its integrated chilled water coil or direct expansion compressors ensure the unit's operation even in climates characterized by extreme humidity levels or severe temperature peaks.

Liebert SCU delivers substantial reductions and savings in terms of electrical infrastructure and equipment. With the unit being installed externally, the internal white space is reduced to a minimum ensuring ease of system installation and maintenance. All of these features significantly reduce shelter TCO.



Liebert® Intellesplit

Energy Efficient Wall Mounted Cooling Solution
For Critical Small Server/Equipment Room

Liebert Intellesplit precision cooling machine is developed for critical applications in data center and small server rooms. It is a wall mounted unit equipped with energy efficient scroll compressor. The Liebert Intellesplit is available in the range of 2TR and 3TR.

The Liebert Intellesplit is result of extensive research and development, conducted with leading environmental control experts, consultants and major corporation.

FEATURES

- Suitable For Removing Sensible Load generated by equipment
- Designed For 24 x 7 Operation.
- Easy in operation and low in maintenance.

APPLICATION

- Datacenter Rooms
- Critical Server Rooms
- Telecommunication Facilities
- Medical equipment Installations
- Motor Control Rooms
- Broadcast Facilities
- Surveillance & Monitoring Centers
- UPS Rooms

Liebert Intellesplit vs. Comfort Cooling

PARAMETERS	LIEBERT INTELLESPLIT	OTHER ACs	BENEFITS
Air Quantity (CFM / Tr)	600	300 - 400	- Faster removal of heat - Requires 33% tonnage
Sensible Heat Ratio	0.95	0.65	- Requires 33% tonnage
Duty Cycle	Designed for 24x7x365 days operation	Designed for 8 hours per day	- Standby unit not reqd. - Reduces capital expenses upto 60%
Running Cost	1.05 kW/Tr	1.4 - 2 kW/Tr	- Minimum running cost of Rs. 15,330/- per year
Floor Area	Available	Not Available	- No need of false ceiling and ducting
Average Life	Min 8 Yrs for 24x7	Max 5 Yrs for 24x7	- Durability

Liebert® Intellesplit

Energy Efficient Wall Mounted Cooling Solution
For Critical Small Server/Equipment Room

Technical Data

Liebert Intellisplit			
Unit Capacity	TR	2	3
Sensible Capacity	TR	1.9	2.8
Design Conditions			
Room Conditions	Deg C	24°C	24°C
Standard Operating Ambient	Deg C	35°C	35°C
Refrigerant		R407C	R407C
Compressor Section			
Type	-	Complaint Scroll	Complaint Scroll
No. of Compressors	nos.	1	1
Operating Voltage	V/Ph/Hz	415/3/50	415/3/50
Evaporator Fan Section			
No. of Fans	nos.	2 Nos./1No.	2 Nos./1No.
Nominal Air Flow	CFM	1000	1600
Condenser Section			
Type	-	Air Cooled	Air Cooled
Material of Tube	-	Copper	Copper
Operating Voltage	V/Ph/Hz	415+/-10/3/50	415+/-10/3/50
Dimensional Details			
Indoor Unit			
Width	mm	964	964
Height	mm	810	810
Depth	mm	457	457
Outdoor Unit			
Width	mm	964	964
Height	mm	700	700
Depth	mm	457	457

High Sensible Cooling Machine

Scroll Compressor

Liebert® DM™

High Performance, Sensible Cooling for Small Computer Rooms and Network Closets

Liebert® DM- delivers enterprise level thermal management to small computer rooms and network closets. It is designed for year-round temperature and humidity control for IT applications across the critical infrastructure. Equipped with an air-filtration feature, the Liebert® DM- is ideal for areas where people and IT equipment occupy the same space. It provides enough flexibility in the critical infrastructure as it occupies minimum floor space which suits small and medium-sized computer rooms.

The Liebert® DM- offers a selection of variants to fit your infrastructure's requirements and conditions. It also features communication capabilities to the critical infrastructure manager for easy monitoring of the temperature across the IT infrastructure.

Liebert® DM— variants:
- Air Cooled up to 161M capacity
- Chilled Water up to 251M capacity

The Liebert® DM— is ideally suited for:
- Small and medium sized computer rooms
- UPS and battery rooms
- Outdoor electronic and communication equipment rooms
- Transformer stations, substations
- Laboratories, test rooms and storage rooms

Description	Air Cooled / Water Cooled (12kW & 7.5kW Models)	Air Cooled (16kW Model only)	Chilled Water System
Models	DME07 & DME12	DME16U, DME16D & DME16F	DMHO9U/D/F, DMH12U/D/F, DMH17U/D/F & DMH25U/D/F
Available Capacities	7.5kW & 1 2.5kW	16kW	"8.2kW, 11.61<W, 16.31<W & 23.2kW"
Upflow Plenum	Yes	Yes	Yes
Ducted	No	Yes	Yes
Downflow	No	Yes	Yes
Power Supply	380V/3PH/50Hz 230V/1PH/60Hz	380V/3PH/50Hz 230V/3PH/60Hz	380V/3PH/50Hz 230V/3PH/60Hz
Condenser Type	Air Cooled: Outdoor Condenser Water Cooled Heat Exchanger	Outdoor Condenser	Not Applicable
Refrigerant	R-22	R-22	Not Applicable

Liebert® DM™

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Small Computer Rooms and Network Closets

FEATURES AND BENEFITS

Energy saving
- High sensible heat ratio and high energy efficiency
- Equipped with cope land scroll compressor
- Provide stable temperature and humidity condition
- Full range fan speed regulation for outdoor unit
- Manageable & unique ECO-MODE option
- Intelligent control function for optimum performance

User friendly & Maintenance free
- 100% front access for servicing
- Large screen display with multi level password
- Expert fault diagnosis functions
- Automatic startup & scheduled startup also available
- Standard RS485 Monitoring Interface
  Equipped with alarm for irregularities on blast reduction,
- Fan failure and filter clogging Email and SMS notification (thru the Liebert®RDU™) for remote monitoring functions

Highly Adaptive
- 24/7 Operation capability
- Ultra wide input voltage range
- Multiple power protection functions
- Environment adaptability: adoption to outdoor temperature while meeting cooling requirements
- Adaptive to heat dissipation of main equipment

Unique ECO mode
- Economic operation mode
- With simple Setup, unit can reduce the temperature control precision, which will cut down compressor start -stop time to save energy
- Very effective control technique for adjusting to varying load conditions
- Produces energy savings during night operation or period of low electric load.

High Efficient Scroll Compressor
High COPCopelnad scroll compressor
Excellent reliability due to few moving parts
High Mean Time Before Failure (MTBF)
Low noise &Vibration

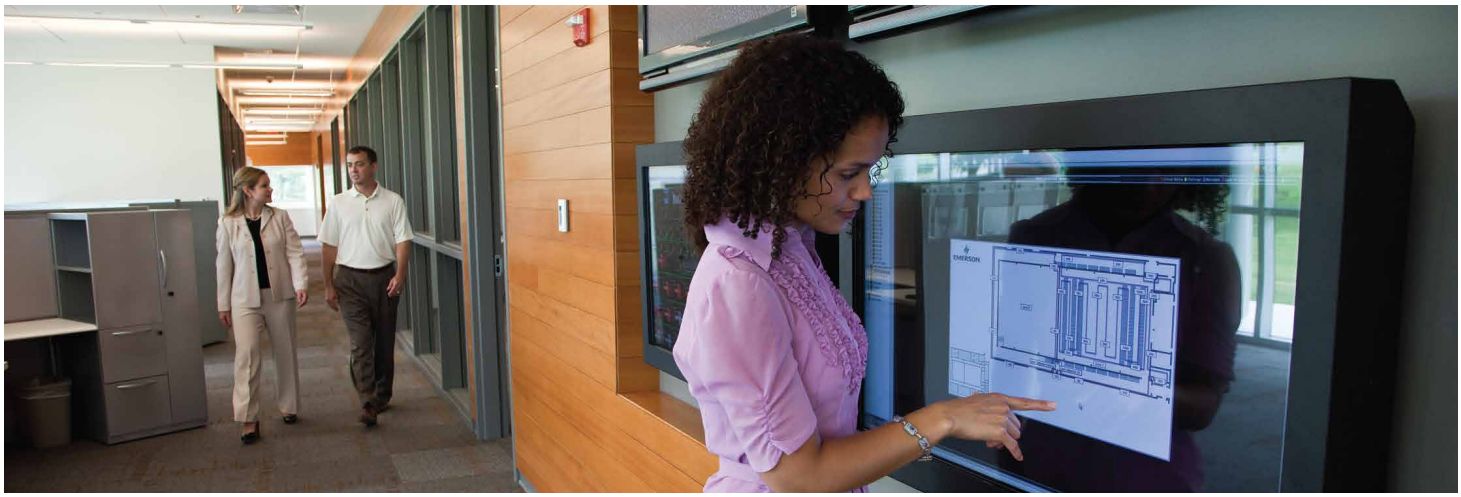
Humidifier
Easy to maintain & repair
Automaticflush out

Intelligent Controller
Intelligent stable control funct
Easy to use, large screen displa
Multi password protection
Fault Diagnostic Function
Automaticstart up during pow fluctuations
Scheduled shutdown-startup i available
Flexible duty standby function

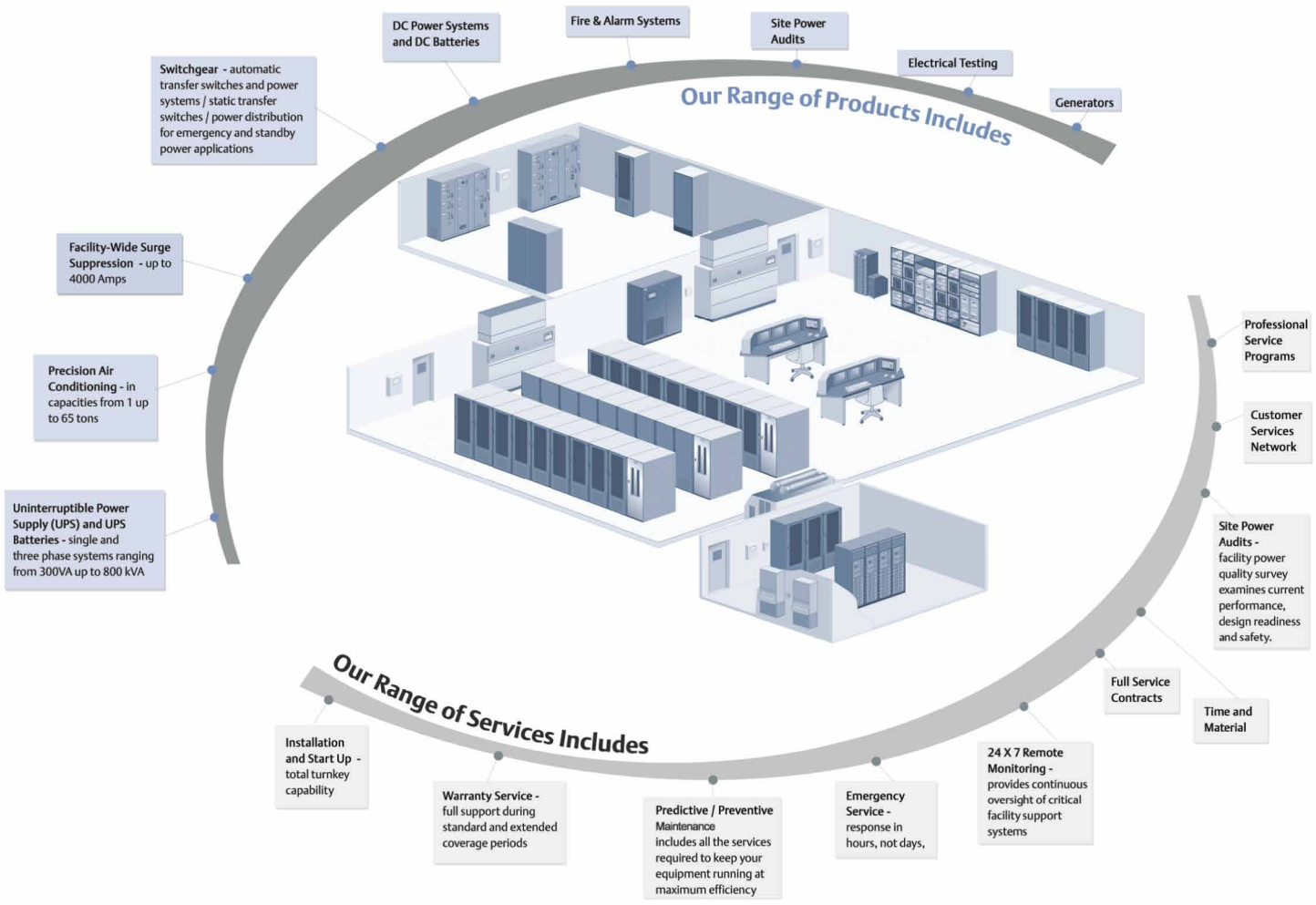
Evaporator Coil
High efficiency& large area design
25%larger than com fort cooling a
Inner threaded copper pipe
Hydrophilicfilm coating prevents
water carryover
High effici encyal um inum fins

PTC Heater
High efficient , low surface
temperature heater

Evaporator Fan
Direct driven centrifugal fan
Reliable & heavy duty
High efficiency& low power consumption;
Low noise
Automatic fan speed reduction when required



Our End to End Solutions



HEAT REMOVAL IS JUST PART OF THE RELIABILITY STORY

We also offer a full range of Power Protection Solutions

A steady flow of power, and the means to get it to each piece of equipment in a critical facility, is another key to reliability. The proper functioning of these systems depends on the quality of power and the ability to ride through outages of any duration. Only Vertiv offers the breadth of power supply products to meet any of these needs.

How good does your Power Protection need to be?

Your protection must be good enough to give you peace-ofmind...and that can be different for every application. Tell us what you have, what you need to accomplish and we will develop a plan to protect it. Different requirements for system availability demand varying levels of protection. These include back-up power, power quality, system redundancy, extended battery time, long-term alternate power sources and the ability to monitor all of these systems.

Power is involved with three of the five key areas of protection that must be addressed to maintain the highest level of system uptime:

Power Availability

Reliability depends on the continuity of power and the ability of an uninterruptible electrical supply to ride through outages of any duration.

Vertiv offers UPS solutions ranging from 500 VA up to 1000kVA.

Power Protection

Utility power is often far too “dirty” for sensitive systems. In these situations, surge suppression and power conditioning can deliver the power quality you need.

We offer surge protection and power conditioning systems up to 300 kVA.

Power Conversion/Distribution

Converting and delivering both AC and DC power throughout a large facility is an important step in protecting availablity.

Vertiv manufactures Power Conversion and Distribution Systems ranging from 1 5 kVA to 225 kVA.

WHERE DO YOU NEED MISSION CRITICAL COOLING TECHNOLOGY?

We have cooling solutions for any of the applications that are part of your mission-critical business operations.
Liebert has identified nine distinct zones or areas of application, found within many business operations, which have a requirement for mission-critical cooling technology. While these zones have similarities in the importance of their essential functions, they also have different needs for infrastructure protection all of which can be met by Liebert solution.

Data Centers
High availability data and network applications are the heart of your enterprise with blade servers and high-density racks that demand increased cooling protection.

Computer Rooms
Smaller sized network and computer facilities, but equally essential to your operations.

Network Operations Centers -
As networks expand and grow more complex, you need reliable and timely access to mission-critical infrastructure monitoring information long before problems arise.

Telecom Wireline / Wireline Sites
Indoor or outdoor spaces hosting cable, DSL and fiber optics to remote cell sites and enclosures.

Emergency Shelters
Emergency operations centers, police and fire facilities, medical facilities, public works operations and more.

Network Closets
Housing routers, switches, modems, cabling devices and numerous other communications components.

Labs & Testing
Sensitive computers and equipment t used for diagnosing patients, analyzing data, performing critical tests, and operating electronic tools and lab instruments.

Production
Smart factories backed by a complex electronic network, from computer-controlled machinery and processes to electronic sensors, business systems and utility equipment.

Mechanical Rooms
Home of your critical infrastructure, from the main electrical distribution system to your mission-critical networks.

VERTIV GLOBAL SERVICES

FACTORY TRAINED
You can be sure that the only people who deal with your Critical Air Equipment will be 100% Factory Trained Vertiv Experts

ORIGINAL PARTS
You can be sure that the parts you will receive from our 100% Vertiv Service Experts are 100% Original Parts. with our multi-tiered parts availability program, you are ensured that parts will be made available to you when and where you need them.

VERSION CONTROL
You are assured of 100% Version Control so that your critical business systems won't have to experience downtime due toincompatibility.

SUPPORT NETWORK
We not only help you develop you Environmental Control System, but our 100% Vertiv Service Experts also offer a Full Support Network so that your critical systems have a 100% Safety Net every step of the way.

QUALITY RESPONSE
We know it is important to get to your critical systems on time. With our 100% Vertiv Service Experts you don't just get prompt service; you also get 100% Quality Response. This means no useless tinkering, no wasted time- just Quality Service, straight away.

100% Vertiv Service Experts.
Would you settle for anything less?

OUR OFFERINGS

- **CRITICAL POWER**
  - Uninterruptible Power Supplies (UPS)
  - DC Power Systems
  - Power Distribution
  - Industrial AC and DC Systems
  - Power Transfer Switches
  - Paralleling Switch Gear
  - Load Banks
  - Surge Protective Devices
  - Fire Pump Controllers
  - Power Control and Monitoring

- **THERMAL MANAGEMENT**
  - Room Cooling
  - In-Row Cooling
  - Rack Cooling
  - Enclosure Cooling
  - Evaporative Free Cooling
  - Free Cooling Chillers
  - Thermal Control and Monitoring

- **FACILITIES & ENCLOSURES**
  - Integrated Solutions
  - Outdoor Enclosures

- **MONITORING, CONTROL AND MANAGEMENT**
  - IT Management
  - Software
  - Monitoring

- **SERVICES**
  - Design, deployment and optimization services with 24/7 local services and support in over 50 countries

VertivCo.com | E-mail : marketing.india@vertivco.com | Toll free : 1-800-2096070

Vertiv Energy Private Limited | Plot C-20, Rd No.19, Wagle Ind Estate, Thane (W), 400604. India