



Vertiv™ Liebert® AFC

The inverter screw free cooling chiller range with low-GWP refrigerant from 900 to 1800 kW



Vertiv™ Liebert® AFC: *The coolest solution for a sustainable data center*

Today, the new challenges that critical infrastructures must face are increasing, in addition to reliability, service continuity and cost reduction, there is also environmental compatibility. Problems related to pollution, the greenhouse effect and global warming are the main challenges that modern industries face.

Liebert® AFC, as a result of its new low Global Warming Potential (GWP) HFO refrigerant and inverter technology, offers a solution, aiming at drastically reducing direct and indirect CO₂ emissions into the atmosphere, and limiting the carbon footprint of the data center.

Liebert AFC has been optimized to have very high levels of efficiency and at the same time ensuring the highest levels of reliability required by modern IT applications. The inverter technology widely used for compressors, pumps and fans allows to reduce energy consumption and in particular the electrical power

required during peaks, allowing to increase the power available for IT equipment.

The inverter driven compressor and the innovative Liebert AFC regulation algorithms ensure accurate control of the fluid delivery temperature to the indoor units under any working condition.

Cooling continuity and reliability are key factors for Liebert AFC and are granted by the Fast Restart functionality which allows for a quick and safe restart after a power failure.

Liebert AFC is a solution that is well suited to the different needs of critical infrastructures as it is an extremely versatile and highly configurable solution. The different options available allow for tailor-made solutions independently of the data center requirements.



Vertiv™ Liebert® AFC Chillers 900-1800kW

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® AFC Chillers:

- Compatible with, low Global Warming Potential (GWP) refrigerants.
- Reduce risk of environmental pollution via glycol-free versions.
- Up to 20% lower annual energy consumption compared to fixed screw solutions.



Features

How you benefit

Inverter driven compressor	Low in-rush current and higher part load efficiency, allowing for savings in the electrical infrastructure design and lower running costs.
Low-GWP HFO Refrigerant (R1234ze)	Compatible with refrigerant, R1234ze HFO, a low Global Warming Potential (GWP) refrigerant that drastically reduces direct CO ₂ emissions.
Optimized free cooling coils	Increased free cooling capacity and more free cooling hours lead to a better seasonal efficiency and lower operating costs.
Glycol-Free version	The possibility of using pure water inside the data center lowers the risk of environmental pollution and grants lower installation costs.
Fast restart option	Guaranteeing cooling continuity.
Compact Frame	Possibility to increase the cooling density.
Wide operative range from -25°C/-13°F to +56°C/+132°F external ambient temperature	Global solution suitable for any climatic condition.





Reduced carbon footprint

Vertiv™ Liebert® AFC uses new refrigerants with almost zero impact in the atmosphere. At the same time the improved efficiency leads to a reduction in the electricity consumption and in the CO₂ emissions related to it.



Energy efficiency

The Vertiv™ Liebert® AFC sets new efficiency standards on the chilled-water cooling systems for data centers. The chiller design combines market leading technologies such as inverter driven components and optimized control algorithm to leverage on efficiency while cutting the running costs.



Flexibility

Vertiv™ Liebert® AFC is designed to perfectly match the configuration and requirements of any data center. This unit is extremely configurable, and the vast number of versions and options combined with the wide operating range makes it an extremely versatile unit that can be used all over the world.



Vertiv™ Liebert® iCOM™ smart control

The Liebert® iCOM™ control manages and optimizes the overall system. It is fully-programmable via an advanced and user-friendly touch display and can be linked with common BMS protocols, allowing remote supervision.

Reduced carbon footprint for next generation data centers



- Vertiv™ Liebert® AFC offers a wide choice of refrigerants, from the traditional R134a to low-GWP solutions. R513A allows to have performances similar to traditional refrigerants, but with a more than halved environmental impact. The R1234ze HFO offers a GWP level close to zero.
- Glycol is very important in free cooling units to avoid problems related to freezing, but at the same time it is a pollutant. The Glycol-free versions allow glycol to be contained inside the unit, preventing it from circulating inside the data center. This allows to greatly reduce the risk of environmental pollution and at the same time to reduce installation costs.
- To further reduce the environmental impact, the unit has been designed to have a lower use of electricity, leading to a reduction in CO₂ emissions that are connected to it.

Improved efficiency, increased savings



- The unit has been designed to ensure utmost efficiency in the peak conditions, that together with low in-rush current of the inverter compressor allows to reduce the electrical infrastructure. The reduced peak power increases the availability of the electrical power for IT load.
- The inverter driven technology widely used for the compressor, EC fans and pumps allows to maximize energy efficiency whilst minimizing energy consumption. The inverter screw compressor improves efficiency especially at part loads and in mixed mode, with a significant saving in annual energy up to 20% more compared to a fixed screw solution.
- The free cooling coils have been optimized to use the external ambient air as the primary source of cooling. The full free cooling temperature (or Zero Energy Temperature – ZET) in some models can be higher than 10°C/50°F, hence below this temperature the compressors can be switched off. The impact on efficiency is thus significant, as the use of the compressors can be limited only to cover the cooling peak. A redundant sensor can be installed and activated only if the first one breaks or is missing.

Adaptable to any critical infrastructure design



- Multiple available versions (Chiller - Free cooling - Free cooling Glycol-free) allow to easily adapt to different site conditions, having always the possibility to choose the best combination between efficiency and initial cost.
- In order to offer a solution that can be exploited globally, and therefore both in very cold climates and in warmer ones, Vertiv™ Liebert® AFC has been designed to have a wide operating range. Up to +56°C/+132°F and down to -25°C/-13°F external ambient temperature (-20°C/-4°F).
- The reduced footprint is ensured by the new compact design, 15% more compact than the industry standard.
- Highly configurable is a fundamental requirement for modern critical infrastructures and in this context the wide choice of Liebert® AFC options allows to build a tailor-made solution. Fast restart function for a quick and safe restart after power outage, Automatic Transfer Switch (ATS) on board, several pump configurations compatible with constant and variable flow, coil coating for harsh environments are just some examples.
- The acoustic pollution of the cooling units is a typical problem for critical infrastructures located in city centers or near residential areas, but Liebert AFC low noise and quiet versions guarantee a noise level from 5 to 10 dB lower than the standard models.

Vertiv™ Liebert® iCOM™ smart control



- Ready for Teamwork of up to 16 units with optimization based on working conditions, furthermore it allows for advanced control functionalities (sharing sensor's data, standby rotation, cascade operation and rotating master function).
- 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.
- Unit power consumptions and cooling gross capacity can be calculated thanks to specific algorithms and the direct communication between the control, sensors and the different devices. This allows the monitoring of the unit energy efficiency through the BMS system.

Rely on integrated project and lifecycle thermal services for superior data center protection

Guarantee continuity to your business activities with a service partner who stands by you throughout your critical equipment lifecycle. From the project phase with start-up and testing, to lifecycle maintenance contracts and operational support, Vertiv ensures your solution performs optimally.

Global presence & local resources



With the broadest, most comprehensive service presence in the industry and more than 1,600+ engineers dedicated to servicing United States, Vertiv ensures that your business is always protected, and that services are available whenever needed 24 hours a day.

Premium response



With Vertiv you can count on an extensive supply of critical parts plus crash-kits ready for deployment, and on service engineers that can respond to requests in record time. To do so, they can rely on a solid knowledge-base, and established escalation procedures valid across the entire region. In addition, they can also benefit from advanced incident management, and widespread presence of Service Centres all enabling them to deliver premium restoration capabilities.

Expertise & training



All service know how to operate with all refrigerants including the ones with low GWP (Global Warming Potential) and A2L category such as 1234ze, used in Vertiv™ Liebert® AFC inverter screw range.

Vertiv service engineers are trained, experienced professionals who undergo an average of one week of intensive training each quarter totaling one month of full-time training per year. Training includes both technology and safety, to ensure competent and safe field operations, reinforced by established procedures to follow and central technical support in case of need.

Project services



From project planning and design, through to equipment procurement, installation, and commissioning, our project team offers comprehensive capabilities, ensuring speed of deployment and execution according to pre-defined and repeatable procedures. Low-GWP gases require the use of specific tooling. Vertiv engineers are endowed with the right tools and trained on how to use them, thus ensuring proper installation, start up, and maintenance of low-GWP units.

Supporting your business around the globe



Regular service of critical equipment supports maximum uptime and often reduces total cost of ownership. A service program ensures timely and proactive maintenance for avoiding unexpected, costly equipment downtime and enables optimal equipment operation. Vertiv™ service programs cover all technologies and can be tailored to suit individual business needs.



Preventing or minimizing refrigerant losses is key to every direct expansion circuit. Even more so with low-GWP refrigerants, where the aim is to use as least refrigerant as possible both in case of maintenance or repair. Advanced incident management procedures leveraging site data allow Vertiv to be extremely effective in fault management and root cause analysis should it occur. Vertiv extensive service offering includes installation, startup, commissioning, maintenance, replacements, 24x7 remote monitoring and diagnostics, and much more.

Technical Specifications

CIZ - Low GWP Inverter Screw (Chiller Only - R1234ze)

Physical Data	CIZ125	CIZ135	CIZ145	CIZ150
Unit Dimensions (L x W x H), in (mm)	427 x 93 x 114 (10846 x 2362 x 2896)	478 x 93 x 114 (12141 x 2362 x 2896)	527 x 93 x 114 (13386 x 2362 x 2896)	527 x 93 x 114 (13386 x 2362 x 2896)
Est. Dry Weight, lb (kg)	21250 (9640)	23500 (10660)	25750 (11680)	25750 (11680)
Fan Qty.	16	18	20	20
Performance Data				
Nominal Cooling Capacity, Tons (kW)	386 (1357)	430 (1512)	457 (1608)	477 (1677)
EER (Btu/W-h)	14.5	14.3	14.7	14.2
Power Input, kW	320	360	380	403
Sound Level, dB(A)	82.2	83.1	82.6	82.7

FIZ - Low GWP Inverter Screw (Direct Free Cooling - R1234ze)

Physical Data	FIZ115	FIZ125	FIZ135	FIZ145	FIZ155
Unit Dimensions (L x W x H), in (mm)	427 x 93 x 114 (10846 x 2362 x 2896)	427 x 93 x 114 (10846 x 2362 x 2896)	478 x 93 x 114 (12141 x 2362 x 2896)	527 x 93 x 114 (13386 x 2362 x 2896)	527 x 93 x 114 (13386 x 2362 x 2896)
Est. Dry Weight, lb (kg)	25200 (11430)	25200 (11430)	28900 (13110)	30750 (13950)	30750 (13950)
Fan Qty.	16	16	18	20	20
Performance Data					
Nominal Cooling Capacity, Tons (kW)	354 (1247)	380 (1336)	423 (1489)	451 (1587)	470 (1652)
EER (Btu/W-h)	13.8	13.7	13.6	13.7	13.5
Power Input, kW	309	332	373	394	417
Sound Level, dB(A)	80.8	82.3	83.0	83.0	82.8

CH3 - Screw (Chiller Only - R513A)

Physical Data	CH3120	CH3135	CH3145	CH3160	CH3175
Unit Dimensions (L x W x H), in (mm)	427 x 93 x 114 (10846 x 2362 x 2896)	427 x 93 x 114 (10846 x 2362 x 2896)	478 x 93 x 114 (12141 x 2362 x 2896)	478 x 93 x 114 (12141 x 2362 x 2896)	527 x 93 x 114 (13386 x 2362 x 2896)
Est. Dry Weight, lb (kg)	21250 (9640)	21250 (9640)	23500 (10660)	23500 (10660)	25750 (11680)
Fan Qty.	16	16	18	18	20
Performance Data					
Nominal Cooling Capacity, Tons (kW)	388 (1364)	429 (1510)	464 (1633)	490 (1725)	557 (1958)
EER (Btu/W-h)	14.3	13.9	14.2	14.1	14.1
Power Input, kW	317	368	393	418	474
Sound Level, dB(A)	79.0	78.9	80.0	80.3	80.8

FH3 - Screw (Direct Free Cooling - R513A)

Physical Data	FH3120	FH3135	FH3145	FH3160	FH3175
Unit Dimensions (L x W x H), in (mm)	427 x 93 x 114 (10846 x 2362 x 2896)	427 x 93 x 114 (10846 x 2362 x 2896)	478 x 93 x 114 (12141 x 2362 x 2896)	478 x 93 x 114 (12141 x 2362 x 2896)	527 x 93 x 114 (13386 x 2362 x 2896)
Est. Dry Weight, lb (kg)	25200 (11430)	25200 (11430)	28900 (13110)	29000 (13155)	30750 (13950)
Fan Qty.	16	16	18	18	20
Performance Data					
Nominal Cooling Capacity, Tons (kW)	372 (1308)	421 (1481)	457 (1606)	482 (1695)	547 (1924)
EER (Btu/W-h)	13.6	13.2	13.5	13.4	13.4
Power Input, kW	327	382	405	431	490
Sound Level, dB(A)	79.2	80.0	80.1	80.4	81.0

*Preliminary data, Nominal capacity is based on 95°F ambient temperature; 82-66°F fluid inlet/outlet temperature; ethylene glycol 30%; power supply 460V/3ph/60Hz

**Sound Pressure Level (SPL) calculated at 3.3ft (1m) distance



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