

Vertiv[™] Liebert®AFC

The Inverter Screw Chiller Range with Low GWP Refrigerant from 650 to 2000 kW



Liebert® AFC: The Coolest Solution for an Energy-Efficient 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 an innovative 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.



Liebert® AFC Chillers 650-2000 kW

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 for Liebert® AFC Chillers:

- Compatible with low global warming potential (GWP) refrigerants
- Reduced risk of environmental pollution via alycol-free versions.
- Up to 20% lower annual energy consumption compared to fixed screw solutions

Features

How You Benefit

- Inverter driven compressor
- Low GWP HFO Refrigerant (R1234ze)
- Optimized freecooling coils
- Glycol-Free version
- Fast restart option
- Compact Frame
- Wide operative range from -25°C to +56°C external ambient temperature

- Low in-rush current and higher part load efficiency, allowing for savings in the electrical infrastructure design and lower running costs.
- Compatible with R1234ze HFO, a low global warming potential (GWP) refrigerant that drastically reduces direct CO₂ emissions.
- Increased freecooling capacity and more freecooling hours lead to a better seasonal efficiency and lower operating costs.
- The possibility of using pure water inside the data center lowers the risk of environmental pollution and grants lower installation costs.
- Guaranteeing cooling continuity.
- Possibility to increase the cooling density.
- Global solution suitable for any climatic condition.





Reduced Carbon Footprint

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 CO_2 emission related to it.



Energy Efficiency

The 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 whilst cutting running costs.





Flexibility

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.



Smart Liebert® iCOM™ 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



- Liebert AFC offers a wide choice of refrigerants, from the traditional R134a to more eco-compatible 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 freecooling 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 during 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 freecooling coils have been optimized to use the external ambient air as the primary source of cooling. The full freecooling temperature (or Zero Energy Temperature ZET) in some models can be higher than 10 ° C, 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 Freecooling Freecooling 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, Liebert AFC has been designed to have a wide operating range. Up to +56°C and down to 25°C external ambient temperature (-20°C for R1234ze).
- 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 quite versions guarantee a noise level from 5 to 10 dB lower than the standard models.

Smart Liebert® iCOM™ 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.



Vertiv's Customer Experience Center Located in Tognana (Padova - Italy)

The site includes 7 different laboratories and is specifically designed for customers to interact with Thermal Management data center technologies. Labs n.5 and n. 6 are dedicated to test and validate Vertiv's chiller range including our latest Liebert AFC units.

R&D Validation Lab 1

R&D Validation Lab 2



The Research & Development Validation Lab 1 is specifically designed to test floor-mount units and can balance a thermal load of up to 150 kW with a chamber air temperature between 0°C and 60°C.

3 Floor-Mount Validation Lab



Designed for conditioners belonging to the Telecom sector, this lab includes two different testing chambers: one simulating internal ambient conditions from 0°C to 60°C and the other simulating external ambient conditions from -32°C to 60°C. This validation area can balance a thermal load of up to 100 kW (50 kW in each room).

The lab is equipped with a highly automated testing chamber, this validation area can balance a thermal load of up to 200 kW and can simulate a test environment within a temperature range of 0°C to 60°C.

Evaporative Cooling Innovation Lab



Testing parameters include IT loads of up to 450 kW and an airflow of up to 120,000 $\rm m^3$ per hour at any external ambient temperature required to simulate typical peak conditions across the EMEA region.

5 Freecooling Chiller Validation Area



The Freecooling Chiller Validation Area is able to balance a thermal load of up to 1600 kW with a chamber air temperature between 20°C and 50°C and chiller water set point between 5°C and 20°C.

6 Adiabatic Freecooling Chiller Innovation Lab



This lab can test units with cooling capacities up to 1.5 MW with state-of-the-art accuracy in a broad range of working conditions, from -10°C to +55°C, also for adiabatic units.

Large Indoor Innovation Lab



This latest designed lab can test up to 400 kW and 100,000 m3/h, with operating conditions between +10 $^{\circ}$ C and 50 $^{\circ}$ C.

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

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

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

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

Supporting Your Business Around the Globe

We bring our combination of strengths to life on a global scale, ensuring that we're able to serve you wherever you do business. Vertiv has the largest factory-trained service force with more than 3,300 field engineers together with the capability to support you remotely with a comprehensive range of remote Services and Software Solutions. Our service team members are located in virtually every major country across the globe and are backed by more than 250 technical support/response personnel. This means that no matter where you operate, you are covered by the most knowledgeable engineers and technicians available, giving you relief from any concern.

Vertiv™ Environet™ Alert

provides an easy-to-use monitoring software solution that helps ensure the continuous cooling and power of your critical infrastructure. Get monitoring, alerting and trending at a price that's right for your business. Vertiv Environet Alert is designed to achieve SMB and enterprise goals.

Vertiv™ Critical Insight

is a real-time software platform designed to ensure continuous performance improvement and efficiency for any critical infrastructure. It is a comprehensive web-based critical infrastructure monitoring tool designed to identify and manage key operational behaviours, analyse trending, and manage energy usage. Vertiv Critical Insight is designed to achieve medium and large enterprise goals.



Our Presence

GLOBAL PRESENCE

Manuf. and Assembly Locations 23

Service Centers 290+

Service Field Engineers 3,300+

Technical Support/Response 250+

Customer Experience Centers/Labs 14



AMERICAS

Manuf. and Assembly Locations 10 Service Centers 17+ Service Field Engineers 1,500+ Technical Support/Response 105+ Customer Experience Centers/Labs 5



EUROPE, MIDDLE EAST AND AFRICA

Manuf. and Assembly Locations 9
Service Centers 620+
Service Field Engineers 590+
Technical Support/Response 75+
Customer Experience Centers/Labs 5



ASIA PACIFIC

Manuf. and Assembly Locations 4
Service Centers 55+
Service Field Engineers 1,190+
Technical Support/Response 70+
Customer Experience Centers/Labs 4



Technical Features

R134a Screw Fi FH4 Models	reecooling Version		065	075	080	090	100	110	125	140	165	180	195
	Cooling capacity	kW	669	754	836	947	1035	1104	1277	1425			
Mechanical cooling performance	Total power input (Premium fans)	kW	156	179	200	229	243	261	302	342			
Standard ΔT	Unit EER (Premium fans)	-	4.29	4.2	4.18	4.14	4.26	4.24	4.23	4.17			
version.	Fluid flow	m3/h	107	121	134	152	166	177	205	228			
Total freecooling Standard ΔT version [100% load]: ²	ZET temperature	°C	9.6	8.2	9.2	7.5	8.4	7.6	7.4	5.3			
	Cooling capacity	kW	685	772	858	969	1072	1145	1314	1472	1688	1838	1986
Mechanical cooling	Total power input (Premium fans)	kW	157	181	202	231	246	264	305	346	393	467	504
performance High ΔT version: 1	Unit EER (Premium fans)	-	4,35	4,26	4,25	4,2	4,35	4,34	4,31	4,25	4.29	3.94	3.94
Vorsion	Fluid flow	m3/h	73	82	92	103	115	122	140	157	180	196	212
Total freecooling High ∆T version [100% load]: ²	ZET temperature	°C	11,0	9,5	10,5	8,9	9,6	8,8	8,7	6,6	6.3	6.6	5.3
	N. of fans		10	10	12	12	14	14	16	16	18	20	20
	Sound Pressure Level - SPL (Premium fans) ⁴	dB(A)	78.4	78.6	78.8	79,0	79.2	79.3	79.7	79.9	80.2	80.6	80.8
Sound levels	Sound Power Level - PWL (Premium fans) ⁵	dB(A)	99.9	100.1	100.8	101,00	101.6	101.7	102.4	102.6	103.3	104,0	104.2
	Sound Pressure Level - SPL (Low noise version) ⁶	dB(A)	72.3	73,0	73.2	73.9	74.1	74.4	75,0	75.8	76.4	77.1	77.7
	Sound Power Level - PWL (Low noise version) ⁶	dB(A)	93.8	94.5	95.2	95.9	96.4	96.8	97.7	98.5	99.5	100.5	101.1
	Unit length	mm	7026	7026	8296	8296	9566	9566	10836	10836	12106	13376	13376
Dimensions	Unit depth	mm	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350
	Unit height (Premium fans)	mm	2865	2865	2865	2865	2865	2865	2865	2865	2865	2865	2865

R134a Screw (CH4 Models	Chiller Version		065	075	080	090	100	110	125	140	165	180	195
Mechanical	Cooling capacity	kW	689	776	861	977	1067	1138	1315	1470			
cooling performance	Total power input (Premium fans)	kW	152	175	195	223	237	254	294	332			
Standard ΔT	Unit EER (Premium fans)	-	4.52	4.43	4.41	4.38	4.49	4.48	4.47	4.43			
version.	Fluid flow	m3/h	99.1	112	124	141	153	164	189	212			
March and all	Cooling capacity	kW	705	796	884	1000	1102	1178	1353	1516	1740	1894	2046
Mechanical cooling	Total power input (Premium fans)	kW	154	177	197	225	240	257	297	336	382	455	490
performance High ΔT version: ³	Unit EER (Premium fans)	-	4,58	4,5	4,48	4,44	4,59	4,58	4,55	4,51	4.56	4.16	4.18
version.	Fluid flow	m3/h	68	76	85	96	106	113	130	145	167	182	196
	N. of fans		10	10	12	12	14	14	16	16	18	20	20
	Sound Pressure Level - SPL (Premium fans) ⁴	dB(A)	77.2	77.4	77.6	77.9	78.1	78.2	78.6	78.9	79.2	79.6	79.9
Sound levels	Sound Power Level - PWL (Premium fans) 5	dB(A)	98.7	98.9	99.6	99.9	100.5	100.6	101.3	101.6	102.3	103,0	103.3
	Sound Pressure Level - SPL (Low noise version) ⁶	dB(A)	71.9	72.6	72.8	73.6	73.7	74,0	74.7	75.5	76	76.9	77.4
	Sound Power Level - PWL (Low noise version) ⁶	dB(A)	93.4	94.1	94.8	95.6	96,0	96.4	97.4	98.2	99.1	100.3	100.8
	Unit length	mm	7026	7026	8296	8296	9566	9566	10836	10836	12106	13376	13376
Dimensions	Unit depth	mm	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350
	Unit height (Premium fans)	mm	2865	2865	2865	2865	2865	2865	2865	2865	2865	2865	2865

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NH4 Models	ycol-Free Version		065	075	080	090	100	110	125	140	165	180	195
	Cooling capacity	kW	678	763	848	960	1049	1117	1290	1441			
Mechanical cooling performance	Total power input (Premium fans)	kW	157	181	202	231	245	262	304	344			
Standard ΔT	Unit EER (Premium fans)	-	4.31	4.22	4.21	4.16	4.28	4.25	4.25	4.18			
version: 1	Fluid flow	m3/h	98	110	122	138	151	161	186	207			
Total freecooling Standard ΔT version 100% load]: 2	ZET temperature	°C	6.9	5,0	6.6	4.7	5.8	4.8	4.7	2.6			
Mechanical	Cooling capacity	kW	694	782	870	983	1083	1155	1328	1485	1703	1855	2003
cooling performance	Total power input (Premium fans)	kW	159	183	204	233	248	266	307	349	396	470	508
High ΔT version:	Unit EER (Premium fans)	-	4,37	4,27	4,27	4,22	4,37	4,35	4,32	4,26	4.30	3.94	3.95
	Fluid flow	m3/h	66,6	75	83,5	94,3	103,9	110,9	127,4	142,5	163	178	192
Fotal freecooling High ΔT version 100% load]: ²	ZET temperature	°C	7,4	5,6	7,0	5,2	6,2	5,2	5,2	3,1	3,1	3,5	1,9
	N. of fans		10	10	12	12	14	14	16	16	18	20	20
	Sound Pressure Level - SPL (Premium fans) ⁴	dB(A)	78.7	78.8	79.1	79.3	79.5	79.6	80,0	80.2	80.4	80.8	81,0
Sound levels	Sound Power Level - PWL (Premium fans) ⁵	dB(A)	100.2	100.3	101.1	101.3	101.9	102,0	102.7	102.9	103.5	104.2	104.
	Sound Pressure Level - SPL (Low noise version) ⁶	dB(A)	72.4	73.1	73.3	74.1	74.2	74.5	75.1	75.9	76.5	77.2	77.8
	Sound Power Level - PWL (Low noise version) ⁶	dB(A)	93.9	94.6	95.3	96.1	96.5	96.9	97.8	98.6	99.6	100.6	101.:
	(======================================												
	Unit length	mm	7026	7026	8296	8296	9566	9566	10836	10836	12106	13376	1337
Dimensions	Unit length Unit depth	mm	7026 2350	7026 2350	8296 2350	8296 2350	9566 2350	9566 2350	10836	10836 2350	12106 2350	13376 2350	
Dimensions													235
R513A Screw Fr	Unit depth Unit height	mm	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2356
R513A Screw Fr FH3 Models	Unit depth Unit height (Premium fans)	mm	2350 2865	2350 2865	2350 2865	2350 2865	2350 2865	2350 2865	2350 2865	2350 2865	2350 2865	2350 2865	2350
R513A Screw Fr FH3 Models Mechanical cooling	Unit depth Unit height (Premium fans) eecooling Version	mm	2350 2865 065	2350 2865 075	2350 2865 080	2350 2865 090	2350 2865	2350 2865	2350 2865 125	2350 2865 140	2350 2865	2350 2865	2350
R513A Screw Fr FH3 Models Mechanical cooling performance standard ΔΤ	Unit depth Unit height (Premium fans) eecooling Version Cooling capacity	mm mm	2350 2865 065	2350 2865 075 746	2350 2865 080 830	2350 2865 090 939	2350 2865 100 1027	2350 2865 110	2350 2865 125	2350 2865 140	2350 2865	2350 2865	2350
R513A Screw Fr FH3 Models Mechanical cooling performance standard ΔT	Unit depth Unit height (Premium fans) eecooling Version Cooling capacity Total power input (Premium fans)	mm mm	2350 2865 065 664 160	2350 2865 075 746 185	2350 2865 080 830 206	2350 2865 090 939 236	2350 2865 100 1027 250	2350 2865 110 1093 268	2350 2865 125 1266 311	2350 2865 140 1424 354	2350 2865	2350 2865	2350
R513A Screw Fr FH3 Models Mechanical cooling performance	Unit depth Unit height (Premium fans) eecooling Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans)	mm mm kW kW	2350 2865 065 664 160 4.15	2350 2865 075 746 185 4.04	2350 2865 080 830 206 4.03	2350 2865 090 939 236 3.98	2350 2865 100 1027 250 4.1	2350 2865 110 1093 268 4.07	2350 2865 125 1266 311 4.07	2350 2865 140 1424 354 4.02	2350 2865	2350 2865	2356
R513A Screw Fr FH3 Models Mechanical cooling performance Standard ΔT rersion: Total freecooling Standard ΔT version 100% load]: 2	Unit depth Unit height (Premium fans) eecooling Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow ZET temperature Cooling capacity	mm kW kW - m3/h	2350 2865 065 664 160 4.15 106	2350 2865 075 746 185 4.04 120	2350 2865 080 830 206 4.03 133	2350 2865 090 939 236 3.98 150	2350 2865 100 1027 250 4.1 165	2350 2865 110 1093 268 4.07 175	2350 2865 125 1266 311 4.07 203	2350 2865 140 1424 354 4.02 228	2350 2865	2350 2865	235 ⁶ 286
R513A Screw Fr FH3 Models Mechanical cooling performance candard ΔT version: 1 Total freecooling standard ΔT version 100% load]: 2 Mechanical cooling	Unit depth Unit height (Premium fans) eecooling Version Cooling capacity Total power input (Premium fans) Fluid flow ZET temperature Cooling capacity Total power input (Premium fans)	mm kW kW - m3/h °C	2350 2865 065 664 160 4.15 106	2350 2865 075 746 185 4.04 120 8.3	2350 2865 080 830 206 4.03 133 9.2	2350 2865 090 939 236 3.98 150 7.7	2350 2865 100 1027 250 4.1 165 8.5	2350 2865 110 1093 268 4.07 175 7.7	2350 2865 125 1266 311 4.07 203 7.5	2350 2865 140 1424 354 4.02 228 5.3	2350 2865 165	2350 2865 180	1337 2350 2863 195 1969 512
R513A Screw Fr FH3 Models Mechanical cooling performance Standard Δ T version: Total freecooling Standard Δ T version 100% load]: Mechanical cooling performance digh Δ T	Unit depth Unit height (Premium fans) eecooling Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow ZET temperature Cooling capacity Total power input	mm kW kW - m3/h °C kW	2350 2865 065 664 160 4.15 106 9.7 680	2350 2865 075 746 185 4.04 120 8.3 765	2350 2865 080 830 206 4.03 133 9.2 853	2350 2865 090 939 236 3.98 150 7.7 961	2350 2865 100 1027 250 4.1 165 8.5 1063	2350 2865 110 1093 268 4.07 175 7.7	2350 2865 125 1266 311 4.07 203 7.5	2350 2865 140 1424 354 4.02 228 5.3	2350 2865 165	2350 2865 180	2350 2860 195
R513A Screw Fr FH3 Models Mechanical cooling cerformance chanded ΔT cersion: 1 Total freecooling chandard ΔT version 100% load]: 2 Mechanical cooling cerformance chigh ΔT	Unit depth Unit height (Premium fans) eecooling Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow ZET temperature Cooling capacity Total power input (Premium fans) Unit EER (Premium fans)	mm kW kW - m3/h °C kW kW	2350 2865 065 664 160 4.15 106 9.7 680 162	2350 2865 075 746 185 4.04 120 8.3 765 187	2350 2865 080 830 206 4.03 133 9.2 853 208	2350 2865 090 939 236 3.98 150 7.7 961 238	2350 2865 100 1027 250 4.1 165 8.5 1063 254	2350 2865 110 1093 268 4.07 175 7.7 1133 272	2350 2865 125 1266 311 4.07 203 7.5 1304 314	2350 2865 140 1424 354 4.02 228 5.3 1471 359	2350 2865 165 1670 407	2350 2865 180	2350 2860 1985 1960 512
R513A Screw Fr FH3 Models Mechanical cooling performance Standard ΔT version: Total freecooling Standard ΔT version 100% load]: Mechanical	Unit depth Unit height (Premium fans) eecooling Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow ZET temperature Cooling capacity Total power input (Premium fans) Unit EER (Premium fans)	mm kW kW - m3/h °C kW kW	2350 2865 065 664 160 4.15 106 9.7 680 162 4,21	2350 2865 075 746 185 4.04 120 8.3 765 187 4,10	2350 2865 080 830 206 4.03 133 9.2 853 208 4,10	2350 2865 090 939 236 3.98 150 7.7 961 238 4,03	2350 2865 100 1027 250 4.1 165 8.5 1063 254 4,19	2350 2865 110 1093 268 4.07 175 7.7 1133 272 4,17	2350 2865 125 1266 311 4.07 203 7.5 1304 314 4,15	2350 2865 140 1424 354 4.02 228 5.3 1471 359 4,10	2350 2865 165 1670 407 4.11	2350 2865 180 1817 464 3.91	2350 2866 1989 1960 512 3.84
R513A Screw Fr FH3 Models Mechanical cooling berformance ctandard Δ T version: 1 Total freecooling cooling berformance digh Δ T version: 1 Total freecooling cooling cool	Unit depth Unit height (Premium fans) eecooling Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow ZET temperature Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Unit EER (Premium fans) Unit EER (Premium fans)	mm kW kW - m3/h °C kW kW - m3/h	2350 2865 065 664 160 4.15 106 9.7 680 162 4,21 73	2350 2865 075 746 185 4.04 120 8.3 765 187 4,10 82	2350 2865 080 830 206 4.03 133 9.2 853 208 4,10 91	2350 2865 090 939 236 3.98 150 7.7 961 238 4,03 103	2350 2865 100 1027 250 4.1 165 8.5 1063 254 4,19 114	2350 2865 110 1093 268 4.07 175 7.7 1133 272 4,17 121	2350 2865 125 1266 311 4.07 203 7.5 1304 314 4,15 139	2350 2865 140 1424 354 4.02 228 5.3 1471 359 4,10 157	2350 2865 165 1670 407 4.11 178	2350 2865 180 1817 464 3.91 194	235 286 198 196 512 3.84 210

Sound Power Level - PWL (Premium fans) ⁵

Sound Pressure Level - SPL (Low noise version) ⁶

Sound Power Level - PWL (Low noise version) ⁶

Unit length

Unit depth

Unit height (Premium fans) dB(A)

dB(A)

dB(A)

 $\mathsf{m}\mathsf{m}$

mm

99.9

72.4

93.9

2350

100.1

73.1

94.6

2350

100.9

73.4

95.4

2350

2865

101.1

74.1

96.1

8296

2350

2865

101.7

74.2

96.6

9566

2350

2865

101.8

74.5

96.9

2350

2865

102.5

75.2

97.9

2350

102.7

76,0

98.7

2350

103.4

76.6

99.7

2350

2865

104,0

77.1

100.5

2350

2865

104.3

77.7

101.1

2350

2865

Sound levels

Dimensions



R513A Screw C CH3 Models	Chiller Version		065	075	080	090	100	110	125	140	165	180	195
Mechanical	Cooling capacity	kW	684	770	856	969	1059	1127	1305	1471			
cooling	Total power input (Premium fans)	kW	156	180	201	230	244	262	303	344			
performance Standard ΔT version: 3	Unit EER (Premium fans)	-	4.38	4.27	4.26	4.21	4.33	4.31	4.3	4.27			
version.	Fluid flow	m3/h	98	111	123	139	152	162	188	212			
	Cooling capacity	kW	700	789	879	993	1094	1167	1344	1517	1723	1874	2036
Mechanical cooling	Total power input (Premium fans)	kW	158	182	203	233	248	265	307	349	395	452	500
performance High ΔT version: 3	Unit EER (Premium fans)	-	4,44	4,33	4,33	4,27	4,42	4,4	4,38	4,35	4.36	4.15	4.07
VCI SIOII.	Fluid flow	m3/h	67	76	84	95	105	112	129	146	165	180	195
	N. of fans		10	10	12	12	14	14	16	16	18	20	20
	Sound Pressure Level - SPL (Premium fans) ⁴	dB(A)	77.2	77.4	77.7	77.9	78.2	78.3	78.7	79,0	79.3	79.6	79.9
Sound levels	Sound Power Level - PWL (Premium fans) 5	dB(A)	98.7	98.9	99.7	99.9	100.6	100.7	101.4	101.7	102.4	103,0	103.3
	Sound Pressure Level - SPL (Low noise version) ⁶	dB(A)	72.1	72.8	73,0	73.8	73.9	74.2	74.8	75.7	76.3	76.8	77.5
	Sound Power Level - PWL (Low noise version) 6	dB(A)	93.6	94.3	95,0	95.8	96.2	96.6	97.5	98.4	99.4	100.2	100.9
	Unit length	mm	7026	7026	8296	8296	9566	9566	10836	10836	12106	13376	13376
Dimensions	Unit depth	mm	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350
	Unit height (Premium fans)	mm	2865	2865	2865	2865	2865	2865	2865	2865	2865	2865	2865

R513A Screw GI NH3 Models	ycol-Free Version		065	075	080	090	100	110	125	140	165	180	195
Mechanical	Cooling capacity	kW	673	755	841	951	1040	1105	1279	1439			
cooling	Total power input (Premium fans)	kW	161	186	208	238	252	270	313	357			
performance Standard ΔT version: 1	Unit EER (Premium fans)	-	4.17	4.05	4.05	4,00	4.12	4.09	4.09	4.03			
version.	Fluid flow	m3/h	96.8	109	121	137	150	159	184	207			
Total freecooling Standard ΔT version [100% load]: ²		°C	7,0	5.2	6.7	4.8	5.7	4.8	4.7	2.5			
	Cooling capacity	kW	689	774	864	974	1074	1144	1317	1483	1684	1833	1984
Mechanical cooling	Total power input (Premium fans)	kW	163	188	210	240	256	274	317	362	410	468	516
performance High ΔT version: 1	Unit EER (Premium fans)	-	4,23	4,11	4,12	4,05	4,20	4,17	4,16	4,10	4.11	3.92	3.84
VOI SIOTI.	Fluid flow	m3/h	66	74	83	93	103	110	126	142	162	176	190
Total freecooling High ∆T version [100% load]: ²	ZET temperature	°C	7,6	5,8	7,1	5,3	6,3	5,3	5,3	3,1	3,3	3,8	2,1
	N. of fans		10	10	12	12	14	14	16	16	18	20	20
	Sound Pressure Level - SPL (Premium fans) ⁴	dB(A)	78.7	78.9	79.1	79.3	79.5	79.6	80,0	80.3	80.5	80.8	81.1
Sound levels	Sound Power Level - PWL (Premium fans) ⁵	dB(A)	100.2	100.4	101.1	101.3	101.9	102,0	102.7	103,0	103.6	104.2	104.5
	Sound Pressure Level - SPL (Low noise version) ⁶	dB(A)	72.6	73.3	73.5	74.3	74.3	74.6	75.3	76.1	76.7	77.2	77.8
	Sound Power Level - PWL (Low noise version) ⁶	dB(A)	94.1	94.8	95.5	96.3	96.7	97,0	98,0	98.8	99.8	100.6	101.2
	Unit length	mm	7026	7026	8296	8296	9566	9566	10836	10836	12106	13376	13376
Dimensions	Unit depth	mm	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350
	Unit height (Premium fans)	mm	2865	2865	2865	2865	2865	2865	2865	2865	2865	2865	2865

Vertiv $^{\!\scriptscriptstyle\mathsf{M}}$ Liebert $^{\!\scriptscriptstyle\mathsf{o}}$ AFC | The Inverter Screw Chiller Range with Low GWP Refrigerant

R1234ze - Inverter - Freecooling Version

FIZ Models				075	080	085	095	110	125	140	150
	Cooling capacity	kW	671	735	782	853	960	1106	1258		
Mechanical cooling	Total power input (Premium fans)	kW	152	178	182	204	226	267	301		
performance Standard ΔT	Unit EER (Premium fans)	-	4.4	4.14	4.29	4.17	4.25	4.14	4.18		
version: 1	Fluid flow	m3/h	107	118	125	137	154	177	202		
Total freecooling Standard ΔT version [100% load]: 2	ZET temperature	°C	9.6	8.5	9.9	8.9	9.3	7.5	7.6		
	Cooling capacity	kW	688	754	803	876	987	1149	1295	1432	158
Mechanical cooling performance High ΔT	Total power input (Premium fans)	kW	153	179	184	206	228	270	304	334	374
High ΔT	Unit EER (Premium fans)	-	4,49	4,21	4,37	4,26	4,33	4,25	4,26	4.29	4.2
version: 1	Fluid flow	m3/h	73	81	86	94	105	123	138	153	169
Total freecooling High ΔT version [100% load]: ²	ZET temperature	°C	11,0	9,8	11,3	10,3	10,7	8,7	8,9	9,1	9,2
	N. of fans		10	10	12	12	14	14	16	18	20
	Sound Pressure Level - SPL (Premium fans) ⁴	dB(A)	78.6	78.9	79,0	79.3	79.5	79.3	79.7	79.8	80.
Sound levels	Sound Power Level - PWL (Premium fans) ⁵	dB(A)	100.1	100.4	101,0	101.3	101.9	101.7	102.4	102.9	103
	Sound Pressure Level - SPL (Low noise version) ⁶	dB(A)	73.2	74.5	74.1	75.1	75.2	74.5	75,0	75.4	76,
	Sound Power Level - PWL (Low noise version) ⁶	dB(A)	94.7	96,0	96.1	97,0	97.5	96.9	97.8	98.5	99.
	Unit length	mm	7026	7026	8296	8296	9566	9566	10836	12106	133
					2250	2350	2350	2350	2350	2350	235
_	Unit depth	mm	2350	2350	2350	2000					
Dimensions	Unit height (Premium fans)	mm	2350	2865	2865	2865	2865	2865	2865	2865	286
R1234ze - Invert	Unit height						2865	2865		2865	
R1234ze - Invert CIZ Models	Unit height (Premium fans)		2865	2865	2865	2865			2865		
R1234ze - Invert CIZ Models Mechanical cooling	Unit height (Premium fans)	mm	2865	2865 075	2865	2865	095	110	2865		
R1234ze - Invert CIZ Models Mechanical cooling performance Standard ΔΤ	Unit height (Premium fans) ter - Chiller Version Cooling capacity	mm kW	2865 065 686	2865 075 757	2865 080 804	2865 085 878	095 986	110	2865 125 1294		
R1234ze - Invert CIZ Models Mechanical cooling performance Standard ΔΤ	Unit height (Premium fans) ter - Chiller Version Cooling capacity Total power input (Premium fans)	mm kW	2865 065 686 147	2865 075 757 172	2865 080 804 177	2865 085 878 198	095 986 220	110 1139 259	2865 125 1294 296		
R1234ze - Invert CIZ Models Mechanical cooling performance Standard ΔT version: 3	Unit height (Premium fans) ter - Chiller Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans)	mm kW kW	2865 065 686 147 4.68	2865 075 757 172 4.4	2865 080 804 177 4.54	2865 085 878 198 4.44	095 986 220 4.49	110 1139 259 4.4	2865 125 1294 296 4.44		150
R1234ze - Invert	Unit height (Premium fans) ter - Chiller Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow	kW kW - m3/h	2865 065 686 147 4.68 99.1	2865 075 757 172 4.4 109	2865 080 804 177 4.54 116	2865 085 878 198 4.44 126	095 986 220 4.49	110 1139 259 4.4 164	2865 125 1294 296 4.44 186	140	150
	Unit height (Premium fans) ter - Chiller Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Cooling capacity Total power input	mm kW kW - m3/h kW	2865 065 686 147 4.68 99.1 707	2865 075 757 172 4.4 109 776	2865 080 804 177 4.54 116 825	2865 085 878 198 4.44 126 901	095 986 220 4.49 142	110 1139 259 4.4 164	2865 125 1294 296 4.44 186 1332	140	15 0 162 363
R1234ze - Invert CIZ Models Mechanical cooling performance Standard ΔT version: ³ Mechanical cooling performance High ΔT	Unit height (Premium fans) ter - Chiller Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Cooling capacity Total power input (Premium fans) Unit EER (Premium fans)	mm kW kW - m3/h kW kW	2865 065 686 147 4.68 99.1 707 148	2865 075 757 172 4.4 109 776 173	2865 080 804 177 4.54 116 825 178	2865 085 878 198 4.44 126 901 199	095 986 220 4,49 142 1013 221	110 1139 259 4.4 164 1181 261	2865 125 1294 296 4.44 186 1332 294	140 1468 323	162 36: 4.4
R1234ze - Invert CIZ Models Mechanical cooling performance Standard ΔT version: ³ Mechanical cooling performance High ΔT	Unit height (Premium fans) ter - Chiller Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Cooling capacity Total power input (Premium fans) Unit EER (Premium fans)	mm kW kW - m3/h kW kW	2865 065 686 147 4.68 99.1 707 148 4,77	2865 075 757 172 4.4 109 776 173 4,48	2865 080 804 177 4.54 116 825 178 4.63	2865 085 878 198 4.44 126 901 199 4.53	095 986 220 4.49 142 1013 221 4,58	110 1139 259 4.4 164 1181 261 4.52	2865 125 1294 296 4.44 186 1332 294 4.53	1468 323 4.54	162 36: 4.4
R1234ze - Invert	Unit height (Premium fans) ter - Chiller Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Unit EER (Premium fans)	mm kW kW - m3/h kW kW	2865 065 686 147 4.68 99.1 707 148 4,77 68	2865 075 757 172 4.4 109 776 173 4,48 75	2865 080 804 177 4.54 116 825 178 4,63 79	2865 085 878 198 4.44 126 901 199 4,53 87	095 986 220 4.49 142 1013 221 4,58 97	110 1139 259 4.4 164 1181 261 4,52 113	2865 125 1294 296 4.44 186 1332 294 4,53 128	1468 323 4.54 141	162 363 4.4 156 20
R1234ze - Invert	Unit height (Premium fans) ter - Chiller Version Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Not fans Sound Pressure Level - SPL	mm kW kW - m3/h kW kW - m3/h	2865 065 686 147 4.68 99.1 707 148 4,77 68 10	2865 075 757 172 4.4 109 776 173 4,48 75	2865 080 804 177 4.54 116 825 178 4.63 79 12	2865 085 878 198 4.44 126 901 199 4.53 87	095 986 220 4.49 142 1013 221 4.58 97	110 1139 259 4.4 164 1181 261 4.52 113	2865 125 1294 296 4.44 186 1332 294 4.53 128 16	1468 323 4.54 141	162 36: 4.4 156 20 79,
R1234ze - Inverticized Mechanical cooling performance standard ΔT version: 3 Mechanical cooling performance cooling perfor	Unit height (Premium fans) ter - Chiller Version Cooling capacity Total power input (Premium fans) Fluid flow Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Luit EER (Premium fans) Unit EER (Premium fans) Unit EER (Premium fans) Sound Pressure Level - SPL (Premium fans)	mm kW kW - m3/h kW - m3/h dB(A)	2865 065 686 147 4.68 99.1 707 148 4,77 68 10 77.3	2865 075 757 172 4.4 109 776 173 4,48 75 10 77.7	2865 080 804 177 4.54 116 825 178 4,63 79 12 77.8	2865 085 878 198 4.44 126 901 199 4,53 87 12 78.2	095 986 220 4.49 142 1013 221 4,58 97 14 78.4	110 1139 259 4.4 164 1181 261 4,52 113 14 78.2	2865 125 1294 296 4.44 186 1332 294 4,53 128 16 78.5	1468 323 4.54 141 18 78.7	162 36 4.4 150 79,
R1234ze - Inverticized Mechanical cooling performance standard ΔT version: 3 Mechanical cooling performance cooling perfor	Unit height (Premium fans) Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Nof fans Sound Pressure Level - SPL (Premium fans) Sound Power Level - PWL (Premium fans)	mm kW kW - m3/h kW - m3/h dB(A) dB(A)	2865 065 686 147 4.68 99.1 707 148 4,77 68 10 77.3 98.8	2865 075 757 172 4.4 109 776 173 4.48 75 10 77.7 99.2	2865 080 804 177 4.54 116 825 178 4,63 79 12 77.8 99.8	2865 085 878 198 4.44 126 901 199 4,53 87 12 78.2 100.1	095 986 220 4.49 142 1013 221 4.58 97 14 78.4 100.8	110 1139 259 4.4 164 1181 261 4.52 113 14 78.2 100.6	2865 125 1294 296 4.44 186 1332 294 4,53 128 16 78.5 101.2	1468 323 4.54 141 18 78.7 101.8	162 36: 4.4 156 20 79; 102 75;
R1234ze - Invert CIZ Models Mechanical cooling performance Standard ΔT version: ³ Mechanical cooling performance High ΔT	Unit height (Premium fans) Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow No for fans Sound Pressure Level - SPL (Premium fans) Sound Power Level - PWL (Premium fans) Sound Pressure Level - SPL (Low noise version)	mm kW kW - m3/h kW - m3/h dB(A) dB(A)	2865 065 686 147 4.68 99.1 707 148 4,77 68 10 77.3 98.8 72.8	2865 075 757 172 4.4 109 776 173 4,48 75 10 77.7 99.2 74.1	2865 080 804 177 4.54 116 825 178 4,63 79 12 77.8 99.8 73.7	2865 085 878 198 4.44 126 901 199 4,53 87 12 78.2 100.1 74.7	095 986 220 4.49 142 1013 221 4.58 97 14 78.4 100.8 74.8	110 1139 259 4.4 164 1181 261 4.52 113 14 78.2 100.6 74.1	2865 125 1294 296 4.44 186 1332 294 4,53 128 16 78.5 101.2 74.6	140 1468 323 4.54 141 18 78.7 101.8 75,0	162 363 4.4 156 20 79,1 102 75.1 99,1
R1234ze - Invert	Unit height (Premium fans) Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Cooling capacity Total power input (Premium fans) Unit EER (Premium fans) Fluid flow Nof fans Sound Pressure Level - SPL (Premium fans) Sound Power Level - PWL (Premium fans) Sound Pressure Level - SPL (Low noise version) Sound Power Level - PWL (Low noise version) Sound Power Level - PWL (Low noise version)	mm kW kW - m3/h kW - m3/h dB(A) dB(A) dB(A)	2865 065 686 147 4.68 99.1 707 148 4,77 68 10 77.3 98.8 72.8 94.3	2865 075 757 172 4.4 109 776 173 4.48 75 10 77.7 99.2 74.1 95.6	2865 080 804 177 4.54 116 825 178 4.63 79 12 77.8 99.8 73.7 95.7	2865 085 878 198 4.44 126 901 199 4.53 87 12 78.2 100.1 74.7 96.6	095 986 220 4.49 142 1013 221 4,58 97 14 78.4 100.8 74.8 97.2	110 1139 259 4.4 164 1181 261 4,52 113 14 78.2 100.6 74.1 96.5	2865 125 1294 296 4.44 186 1332 294 4.53 128 16 78.5 101.2 74.6 97.4	1468 323 4.54 141 18 78.7 101.8 75.0 98.1	162 362 4.44 156 20 79,0 102. 75.6 99,0



R1234ze - Invert NIZ Models	ter - Glycol-Free Version		065	075	080	085	095	110	125	140	150
Mechanical	Cooling capacity	kW	679	745	792	864	971	1118	1271		
cooling	Total power input (Premium fans)	kW	153	179	184	206	228	269	303		
performance Standard ΔT	Unit EER (Premium fans)	-	4.43	4.16	4.31	4.2	4.27	4.15	4.19		
version: 1	Fluid flow	m3/h	97.7	107	114	124	140	161	183		
Total freecooling Standard ΔT version [100% load]: ²	ZET temperature	°C	6.9	5.5	7.6	6.3	6.9	4.5	4.9		
Mechanical	Cooling capacity	kW	697	764	813	886	997	1159	1308	1443	1597
cooling	Total power input (Premium fans)	kW	155	181	185	207	229	272	306	336	376
performance High ΔT	Unit EER (Premium fans)	-	4,51	4,23	4,39	4,28	4,35	4,26	4,27	4.29	4.25
version: 1	Fluid flow	m3/h	67	73	78	85	96	111	126	138	153
Total freecooling High ΔT version [100% load]: ²	ZET temperature	°C	7,4	6	8	6,8	7,4	5,1	5,4	5.9	5.8
	N. of fans		10	10	12	12	14	14	16	18	20
	Sound Pressure Level - SPL (Premium fans) ⁴	dB(A)	78.8	79.1	79.3	79.5	79.8	79.6	79.9	80.1	80.4
Sound levels	Sound Power Level - PWL (Premium fans) ⁵	dB(A)	100.3	100.6	101.3	101.5	102.2	102,0	102.6	103.2	103.8
	Sound Pressure Level - SPL (Low noise version) ⁶	dB(A)	73.4	74.6	74.2	75.2	75.4	74.6	75.2	75.5	76,0
	Sound Power Level - PWL (Low noise version) ⁶	dB(A)	94.9	96.1	96.2	97.2	97.7	97,0	97.9	98.6	99.5
	Unit length	mm	7026	7026	8296	8296	9566	9566	10836	12106	13376
Dimensions	Unit depth	mm	2350	2350	2350	2350	2350	2350	2350	2350	2350
	Unit height (Premium fans)	mm	2865	2865	2865	2865	2865	2865	2865	2865	2865

Notes:

- $^1~35^{\circ}\text{C ambient temperature; 20°C fluid outlet temperature; ethylene glycol 30\%; power supply 400V/3ph/50Hz;}$
- $^2\,$ 20°C fluid outlet temperature; ethylene glycol 30%; power supply 400V/3ph/50Hz;
- $^{\rm 3}$ 35°C ambient temperature; 20°C fluid outlet temperature; water; power supply 400V/3ph/50Hz;
- ⁴ The value of SPL is measured in free field conditions and 1 meter from the unit according to ISO 3744 average method. At nominal working conditions (1);
- $^{5}\,$ The value of PWL is calculated in according to ISO 3744 procedure method. At nominal working conditions (1).
- $^{\rm 6}\,$ Cooling capacity and efficiency for low noise version are indicated in the product document





Vertiv.com | Vertiv Infrastructure Limited, Fraser Road, Priory Business Park, Bedford, MK44 3BF, United Kingdom, VAT Number: GB60598213

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