TAHVIEHSAM
Cooling System Solutions

www.tahviehsam.com

EUROKLIMAT®

Give life to building & bring us back to nature™

www.euroklimat.com

Euroklimat Air-Conditioning & Refrigeration Co., Ltd.

EK Air-conditioner WeChat

ISO9001:2008 Certification of Quality Management System for Enterprises

ISO14001:2004 Environmental Management System Certification

Production Permit (XK06-015-00361)

Testing Laboratory Accredited by CNAS

- Products in printed materials may differ from actual products. See the actual products when you purchase them.
- The product design specifications, functions, performance parameters and external structure are subject to changes without notice. For specific parameters, see the parameters on the product nameplate.
- Data in this document has been carefully checked and reviewed. EUROKLIMAT shall not be held responsible for any consequence arising from print errors and omissions.
- EuroKlimat Air-Conditioning & Refrigeration Co., Ltd. reserves the final right to interpretation of this document.

TAHVIEHSAM
Cooling System Solutions

www.tahviehsam.com

"Apollo II" Series Air-cooled Screw Chiller (Heat Pump)

EUROKLIMAT®

Give life to building & bring us back to nature™

EUROKLIMAT Air Conditioner, Environmental & Energy-saving Technology from Europe

Founded in Italy in 1963, EUROKLIMAT Group is a famous and professional European refrigerating and air-conditioning equipment supplier. After half a century of development, EUROKLIMAT has become the synonym of energy-saving air-conditioner in Italy, Spain or even the whole Europe through continuous innovation and pioneering.

As a joint venture of China Aerospace Science & Industry Corp. and EUROKLIMAT Group, Guangdong Euroklimat Air-Conditioning & Refrigeration Co., Ltd. is the manufacturing base and sales service agency of EUROKLIMAT Group in Asia. It established a Euroklimat industrial park with an area of 100,000 m^2 in Dongguan and another one with an area of 50,000 m^2 in Tianjin. The whole product line introduces leading air conditioning technologies and manufacturing arts from Europe to provide high-quality products to Chinese customers.

A total of 30 sales service agencies of EK in China provide Chinese customers with 24-hour service guarantee, with the one-stop service hotline 400-188-1963. Adhering to the commitment of energy conservation and environmental protection, EK will keep developing comfortable and energy-saving air conditioners and join hands with partners to create a bright future.

ISO9001:2008 Certification of Quality Management System for Enterprises

ISO14001:2004 Certification of Environmental Management System

Production Permit (XK06-015-00361)

Test CNAS L5123

Testing Laboratory Accredited by CNAS

CRAA Certification

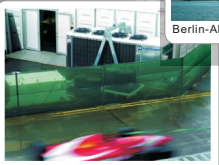
OHSAS 18001 Occupational Health and Safety Management System Certification

54

EK EUROKLIMAT®

Fifty-four years of Air-conditioning


Berlin-Allianz Assurance

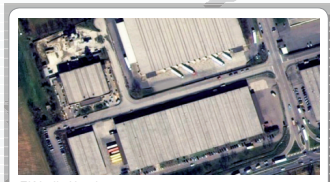

Silverstone, UK-F1 Circuit


Helsinki- Nokia R&D centers worldwide headquarters


Museum Island Berlin


Nestle France Headquarters


Italy DHL Data Processing Center


EK Italia Headquarters


German Aerospace Center (DLR)


Raiffeisen Bank Group Austria


BMW German Headquarters R&D Center


Russian Defence Ministry

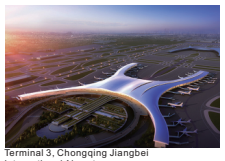

Technical University of Denmark


European Patent Office


Statoil ASA


Apple Store


Terminal 3, Shenzhen Bao'an International Airport


Terminal 3, Chongqing Jiangbei International Airport


Castle Peak Hospital


Chongqing International Expo Center

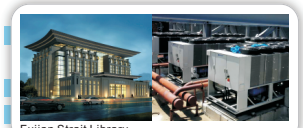
Project Presentation


Chinese Commercial Aircraft R&D Center


The Tenth Research Institute of the First Academy of China Aerospace Science and Technology Corporation


Shanghai Minhang Space City


Sanya·Atlantis Water Park


Fujian Strait Library


Kunshan Huaqiao International Expo Center


Southwestern Institute of Physics


Huaian TV FM Transmitting Tower


Liuzhou Diwang International Commercial Center


Tibet International Convention and Exhibition Center


Hubei Post Center


Xiamen National Sports Training Center


China Three Gorges Corporation


Guangxi Liuzhou Workers Hospital


Kunshan Kunhua International Plaza


Suzhou Sun Plaza


Huaian Sports Center


New campus of Hebei Normal University


Suzhou Software Park


Suzhou Shengbo Plaza


The Sixth Affiliated Hospital of Sun Yat-Sen University


Guangxi Guigang People's Hospital


Zhuzhou Shennong Sun City


New Pingjiang Hospital, The First Affiliated Hospital of Soochow University


Shuyang No.2 People's Hospital

Development History

Founded in Italy in 1963, EUROKLIMAT Group is a famous and professional European refrigerating and air-conditioning equipment supplier. After half a century of development, EUROKLIMAT has become the synonym of energy-saving air-conditioner in Italy, Spain or even the whole Europe through continuous innovation and pioneering.

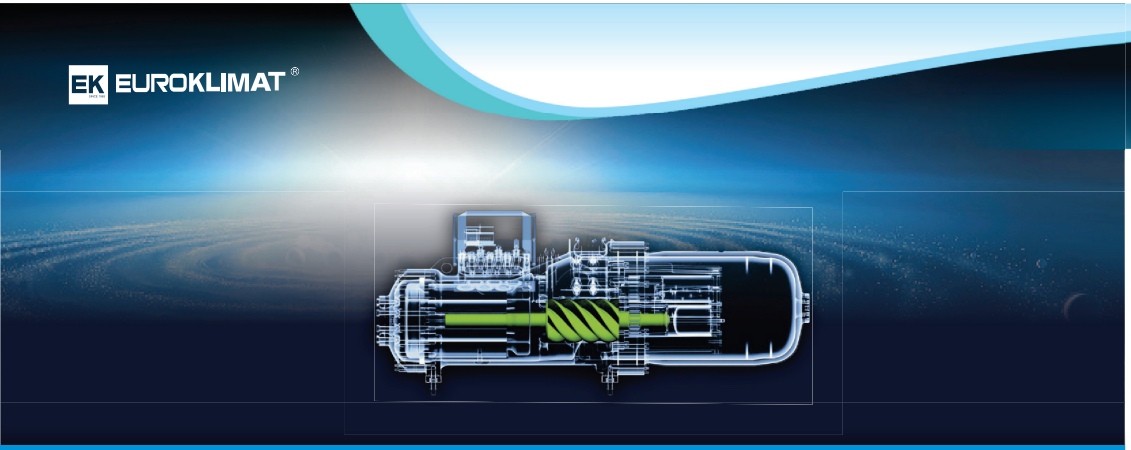
Back in 1964, EUROKLIMAT Group started design and R&D of air-cooled heat pump. It has grown into a global leader in air-cooled heat pump technologies after innovative development for half a century.

In 2009, Guangdong Euroklimat Air-Conditioning & Refrigeration Co., Ltd. introduced the technological achievements of leading large air-cooled heat pump units in Europe in an all-round way and launched the large air-cooled screw unit.

EKAS air-cooled screw chiller (heat pump) absorbs the design essence of Italy "air-cooled kingdom" and the climatic characteristics of China are combined to design the more environmentally-friendly air conditioning products, and actively promote the air conditioning system solutions of improving the environment and achieving energy saving buildings.

R134a

- 1963 — Italia Headquarters of EUROKLIMAT Group was registered and established
- 1964 — The first air-cooled heat pump unit was designed and developed
- 1965 — The condensation heat recovery idea of air-cooled unit was put forward
- 1975 — Air-cooled precision air conditioners were developed and manufactured
- 1985 — Became a world famous brand
- 2003 — Total heat recovery type air-cooled heat pump unit was launched in Europe
- 2007 — Special air-cooled air conditioner was developed for European Space Agency
- 2008 — Cooperated with China Aerospace Science & Industry Corp. to establish Guangdong Euroklimat Air-Conditioning & Refrigeration Co., Ltd.
- 2009 — Introduced the air-cooled heat pump technologies of Italy EUROKLIMAT Group to China
- 2010 — Introduced the ultra-low temperature technology of Europe and launched the ultra-low temperature air-cooled heat pump unit
- 2013 — "Apollo+" series ultra-high efficiency air-cooled screw unit was put into market
- 2017 — Launched the "Apollo II" series R134a air-cooled screw heat pump units



Patented double screw compressor, with high efficiency but low noise

The Apollo II series air-cooled screw unit adopts the new generation of HFC-134a special double screw compressor with high efficiency, 5:6 asymmetric rotor processed using patented technology, and the new screw profile and oil injection design. The newly optimized mechanical energy regulation structure works with the sliding ECO air inlet design to keep the compressor always at high energy efficiency level output at all the load segments and enable the unit to show extremely high energy efficiency of full load and partial load.

Patented rotor design

- The new generation of HFC-134a special double screw compressor with high efficiency uses the newly optimized 5:6 asymmetric rotor profile made using the patented production process, ensuring the rotor processing precision and optimal fit clearance of rotor.
- The one-shot moulded screw rotor effectively avoids the stress damage of late cutting processing and ensures the higher screw hardness and edge line velocity, shorter compression stroke and more efficient compression.

Double-layer pressure compensation shell

- The double-layer pressure compensation shell made through precision casting of nodular cast iron undergoes precision machining with the M/C machine tool, and a three-dimensional precision measurement instrument is used to check the machining precision so as to ensure that the compressor gap and precision can meet the requirement for efficient operation, and the double wall shell is rather stable and cannot be deformed even in a high pressure state. It not only complies with the pressurization requirement, but also reduces noises.
- The compressor housing adopts two stage casting and is divided into the compression side and oil separation side, with better pressurization performance. Meanwhile, the built-in pressure reducing safety valve can connect the high and low compression chambers for pressure relief, and the relative external safety valve avoids direct refrigerant leakage in the air.

Bearing

- The patented closed pressure-reducing bearing chamber works with the long life bearing, and the pressure relief design of pressure bearing with double bearings is adopted in the axial direction to make the bearing solid and durable.
- The bearing chamber is separated from the high pressure chamber to reduce the bearing chamber pressure effectively and ensure viscosity of the lubricating oil in the bearing cavity. The excellent lubricating oil path fully lubricates the bearing, further increases the bearing service life and ensures safe operation of the unit.

Air inlet filter

- The double-layer large-area air inlet screen is designed to ensure high strength and small pressure loss, not only protecting the compressor completely, but also ensuring long-term operation efficiency of the compressor.

Oil separator

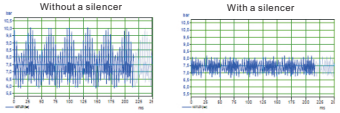
- The innovative built-in three-stage oil separator adopts the internal three-section oil filter and works together with the high density screen to achieve the optimum oil and gas separation rate of over 99.8%.

Stepless regulation

- The unit uses the slide valve-type load increase/decrease device and is configured with the highly reliable solenoid valve of international brand to implement precise control and stepless regulation in the range of 25% to 100%, thus realizing perfect matching with the actual load, ensuring highly efficient operation of the unit and saving energy as offering a comfortable environment.
- A sliding ECO air inlet is designed in the capacity adjusting slide valve mechanism, and ECO air supply is adjusted and changed along with load, making sure that the compressor energy efficiency can be fully exerted under the partial load.

Discharge damping silencer

- The discharge damping silencer designed based on the resonance principle can effectively reduce the vibration transmission, high frequency noise and the discharge noise of compressor.



Motor

- The unit uses the world-renowned high efficiency bipolar three-phase F-grade insulated inductive motor and built-in PTC thermistor and is configured with the intelligent imported motor protection module to protect the motor, accurately monitor the coil temperature of compressor motor and ensure normal operation of the compressor.
- The unique internal cooling channel is designed to ensure that the motor can operate for a long term in a wider compressor operating range. Both the step-down start and direct start modes can be realized.

Long acting oil filter

- The compressor oil way is designed with a built-in 10-micron grade oil filter set with a metal filter screen of high precision to implement 10-micron long acting filtration. It fully filters impurities from the oil way to ensure safe operation of the compressor and needs no replacement throughout the service life of the compressor.

Oil heater

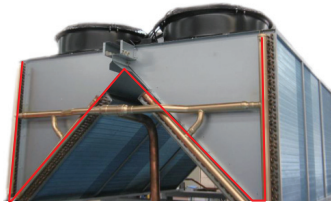
- The compressor is designed with an oil heater to ensure that the lubricating oil still keeps enough viscosity after the unit has stopped for a long term, ensuring reliable operation of the compressor.

Efficient heat exchanger with excellent performance

- The heat exchanger of EKAS screw air-cooled chiller (heat pump) adopts the patented refrigerant distribution design and passes the three major certifications of ASME, PED and GB. The internal heat exchange tube adopts the efficient internal thread heat exchange copper tube to strengthen heat transfer at the water side and refrigerant side, optimize the heat transfer efficiency, reduce the unit's energy consumption, and cut the operating cost for the customer.
- The standard pipe connection mode provided by the heat exchanger is groove clamping connection (with short pipes) which facilitates field installation, and each evaporator is configured with the discharge and drainage devices separately.
- It facilitates the compressor return oil design, simplifies air return without requiring any oil pump and eradicates the frost crack danger of heat exchange tube; the refrigerant charge is only 1/3 of that of a common heat exchanger, without leakage, more reliable and environmentally friendly.
- The anti-freeze electric heater and anti-freeze temperature sensor are installed to implement anti-freeze protection for the unit, and the large barrel type water filter and water flow switch are configured for the water system as additional accessories to implement multi-protection for the waterway system.

Inverted M type heat exchanger of air side, improving the heat transfer effect

- The unit newly introduces the inverted M type heat exchanger technology of air side with high performance from Europe and adopts the cooling and heating separation design to effectively reduce the pressure loss of refrigeration system and improve the unit operation efficiency.
- The wind speed distribution is even and consistent after CAE analysis, effectively avoiding the interference effect with the air side heat exchanger around the fan, and the wind speed is uniform, eliminating the blind zone of heat exchange and realizing heat exchange of high performance.



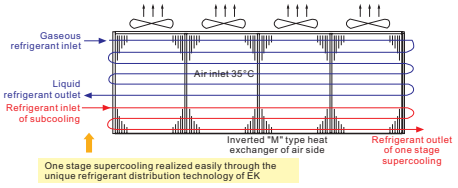
- The unit adopts the seamless inner grooved copper tube of imported brand and the world leading continuous casting and rolling technology to achieve the excellent extension and heat exchange performance. Moreover, heat shrink sleeving is allocated to every heat exchanger distributor to realize shock proof and abrasion proof design.
- Copper tubes for the heat exchanger undergo full mechanical expansion and are staggered and covered with corrugated aluminum condensing fins. In comparison with the fenestrated aluminum fin, the fin features small wind resistance, low dust accumulation probability and reduced heat exchange efficiency attenuation during long term operation, ensuring stable and long term heat exchange of the unit.

Item	EK corrugated aluminum fin	Fenestrated aluminum fin (other brands)	Disadvantages of fenestrated aluminum fin
Dust accumulation probability	Small	Big	High rate of dust accumulations, fast attenuation of heat exchange efficiency, and low efficiency
Cleaning probability	Small	Big	High rate of cleanings and considerable maintenance cost
Wind resistance	Small	Big	Big wind resistance, improved fan energy efficiency, and increased operating cost
Defrosting	Easy	Difficult	Hard defrosting, easy secondary frosting, and reduced water temperature of heating, not applicable to the heat pump condition

Two-stage supercooling technology

- One stage supercooling:

The special secondary distribution technology of refrigerant is adopted to recollect the liquid refrigerant, which passes the recooling coil bottom and undergoes one time supercooling to improve the cooling energy efficiency and capacity effectively.



One stage supercooling of condenser

- Two stage supercooling:

The efficient economizer implements two stage supercooling and adopts the independent electronic expansion valve to realize accurate throttling control. The differential pressure between the inlet liquid refrigerant and outlet liquid refrigerant is detected to achieve the best control on supercooling degree, further enhance the unit supercooling degree and improve the energy efficiency of main unit.

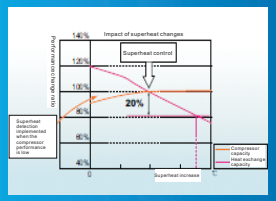
Two stage supercooling of the economizer

R134a environmentally-friendly refrigerant, protecting environment

The environmentally friendly refrigerant R134a with excellent performance saves power consumption and contains no chlorine element, so it does not damage the atmospheric ozone layer and has no forbidden period.
The refrigerant reduces CO_2 emission effectively, alleviates the increasingly serious urban heat island effect and constructs green life buildings.

Electronic expansion valve control, stable and accurate

The 0~3810 step electronic expansion valve control technology can realize fine adjustment in the range of 10% to 100%, achieve best control on the superheat degree and ensure high performance operation of the unit.



Note: Decrease or instability of the superheat degree will reduce the compressor performance or prevent refrigerant evaporation to generate liquid compression, thus leading to a compressor fault; increase of the superheat degree will reduce the heat exchanger performance at the water side.

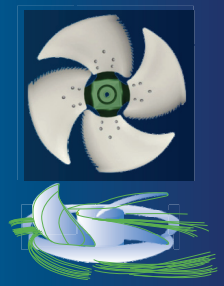
The unit uniquely adopts the dual power supply design of electronic expansion valve to implement power-off delay protection and prevent hidden danger of liquid hammer against the compressor when the power supply of the unit fails unexpectedly.

Invention patent (patent No.: ZL 2014 1 0503472.9)

If the electronic expansion valve cannot be controlled effectively when the power supply fails unexpectedly, liquid refrigerant will flow to the evaporator, and liquid hammer against the compressor will be generated and affect the compressor life seriously when the unit restarts.

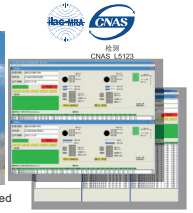
Patented aerofoil type spiral fan, achieving large air flow at lower noise

- The unit fan adopts the patented aerofoil type spiral fan design with low noise and looks like a bird's wings unfolded, effectively controlling air interference and reducing noise. Moreover, it adopts large diameter aluminum blade to achieve a higher air flow.
- The front end design of optimized bending impeller controls generation of air vortex at the fan impeller edge, improves the rotational speed efficiency and reduces the fan noise.
- The motor ensures zero idling and provides the thermal protection function, with a longer service life.
- The motor is directly driven to eliminate transmission loss effectively and reduce vibration.
- In addition, a high static pressure fan motor is optional, meeting all kinds of scenarios with static pressure requirements.



1800 kW national laboratory

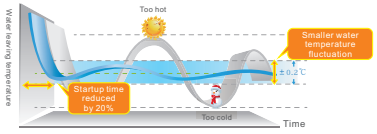
- EK boasts a large national safety performance laboratory of air-cooled screw unit (registration No.: CNAS L5123), which simulates the full condition testing status comprehensively and accurately, takes the lead in the testing technology and scope in the field, and provides quality detection guarantee for each set of produced equipment.
- With the low temperature testing ability of ethylene glycol
- Test scope: 150 to 1800 kW
- Test precision: ± 0.01°C
- Water flow test precision: 0.03 m^3/h
- Every air-cooled screw unit will undergo the strict test carried out by the national laboratory before delivery.



150 kW to 1800 kW national accredited laboratory

High precision control to realize safe and reliable operation

- The high performance double-screw compressor specially developed for the HCF-134a heat pump, high grade bearing, lubricating oil path design without oil pump, and suction spray and intermediate spray protection of the compressor guarantee extremely safe operation of the compressor.
- The chilled water outlet temperature is controlled as accurate as ± 0.2°C. Besides, all kinds of system sensors can transfer all the signal data to the controller accurately so that the controller can protect the unit components in time and make unit operation more reliable.
- The unit (with standard configuration)adopts outlet water temperature control to ensure constancy of the outlet water temperature, make the terminal temperature regulation more accurate and optimize the user experience; return water temperature control can also be selected to achieve the best unit efficiency under dynamic equilibrium of end user.
- The compressors start one by one to minimize the startup current and reduce the impact on the power grid.
- The three-level password protection prevents wrong operation of non-professionals and ensures safe operation of the unit. The multi-protection function ensures safe operation of the unit.



More accurate outlet water control and smaller water temperature fluctuation

Wide operation range and longer service life

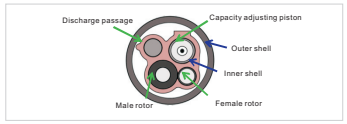
- The unit casing adopts the galvanized steel sheet (complying with the EU ROHS standard), undergoes electrostatic orange pattern spraying with anticorrosive paint, and uses stainless steel screws to prevent corrosion effectively and adapts to various outdoor adverse conditions.
- The unit can cope with the outdoor wide temperature range of -10°C to 50°C.
- The unit supports air-to-air heat exchange that does not pollute the environment and meets environmental regulations.

Convenient installation and simple maintenance

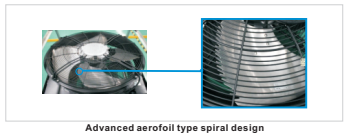
- The unit adopts the integral structure (models EKAS100 to EKAS400). One unit adopts the one inlet and one outlet system for the waterway to achieve simple installation. The user only needs to connect the power supply and water supply before operation, and does not need to rebuild an equipment room or purchase cooling tower and other auxiliary equipment, so the construction period can be shortened effectively and the installation cost is cut down.
- Due to the integrated design of the electrical part and the main unit, the user does not need to set a special power distribution cabinet, saving the complex power distribution work.
- Electrical layout adopts strong and weak current separation, switch design of power-on interlock and unique integrated design of electric shock prevention. The strong current cabinet is equipped with an anti-shock insulating glass baffle, and the standard main line configured for the electric control cabinet of unit is connected to the protection box to prevent electric shock.
- The intelligent control system automatically monitors and controls the operating status of the unit and displays the fault cause in case of an exception to facilitate unit maintenance.

Noise reduction optimization measures of the unit

- Source noise reduction: The double-wall pressure compensation shell reduces noise transmission from the source, the high precision rotor undergoes cutting-edge machining to ensure the meshing accuracy, and the rotor compression surface undergoes laser hardening treatment and cannot be deformed under compression force. The minimal vibration and smooth operation reduces the operating noise effectively.
- Discharge silencing and noise reduction: The compressor is provided with a built-in discharge damping silencer, which is designed according to the resonance principle to effectively reduce the noise generated by high pressure discharge vibration of the compressor.
- Fan noise reduction: The unit employs the most advanced aerofoil type spiral fan with a large diameter aluminum blade, which looks like a bird's wings unfolded, and the sickle-shaped fan controls generation of air vortex at the fan impeller edge. The noise is reduced by 6 dB(A) in comparison to the common axial fan.
- Noise reduction measures for unit body vibration: Flexible fastening parts are used at the key nodes of pipeline to reduce vibration effectively, and the directions of all the copper tubes are systematically optimized to greatly reduce the operating vibration of the unit body.
- Noise reduction during operation: The standard combined spring shock absorber is configured for the unit before delivery, the quantity, bearing points and bearing specifications of the configured shock absorbers are matched according to the weight and structural center of gravity of the corresponding unit, and the user can install a spring shock absorber between the unit bottom frame and the foundation to greatly reduce vibration transmission during operation of the unit, better reducing noise during operation.



Section sketch map of double layer casing


Advanced aerofoil type spiral design

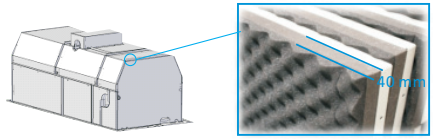

Patented base design, with high rigidity and light weight

The ultra low noise type can be selected

Sound insulation and noise reduction: The unit adopts the sound proof box (optional) of compressor, which is pasted with 40 mm efficient sound absorbing material. This method can be used to reduce noise by 6 dB(A).

Flexible soft connection (optional): The flexible connection of the suction side and discharge side of the compressor can be used to further reduce the suction/discharge noise of the compressor.

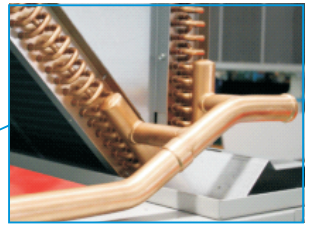
Fan speed control (optional): The fan motor adjusts the motor speed according to the system temperature detected by the sensor and reduces the operating noise of the unit during partial load.



Anti-frosting design of the system

Unique defrosting heat exchanger (special)

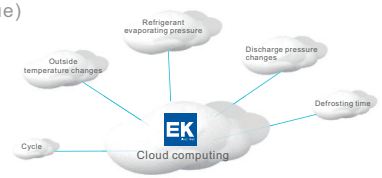
The difficulty of icing at the bottom of the finned heat exchanger in winter is eliminated to improve the heating efficiency and save more energy. The traditional heat exchanger is narrow at the bottom, and the melt water during defrosting easily gathers to lead to ice accretion.
The unique flow path design of EK can gather waste heat during defrosting to make it pass through the bottom of the flow path, avoiding ice accretion at the bottom during defrosting at low temperature and realizing more thorough defrosting.


Special heat exchanger design for supercooling defrosting

Smart defrosting control technology

Smart "cloud computing" defrosting technology (unique)

The defrosting function is the most important function to the heating effect of the heat pump unit. This becomes the important index used to evaluate performance of the heat pump unit. EK specially imports the defrosting formula, intelligent reverse circulation defrosting method and adaptive technology according to the thermodynamic principle. The unit can judge whether there is frost and the frosting degree by collecting multiple variables such as the outside temperature data, refrigerant evaporation pressure, discharge pressure change, defrosting time and defrosting cycle so as to enter the smart "cloud computing" dual-mode defrosting method.



Unique defrosting technology principle of EK

Precise monitoring for defrosting

Conventional defrosting is a simple defrosting mode of timed reversal, the frost amount on the surface cooler cannot be measured, and the system easily makes misjudgment and fails to remove frost (if any) or defrosts frequently, reducing the work efficiency of the unit and increasing the energy consumption. Meanwhile, this also affects normal operation of the unit and leads to heat attenuation, great water temperature fluctuation and poor heating effect.
On the precondition of not affecting the unit efficiency, the EK air-cooled heat pump unit judges the defrosting status through smart "cloud computing", minimizes the daily defrosting times, and improves the unit operation efficiency.

Adaptive technology, coping with different climate conditions at various regions

All regions of the country are different in the ambient temperature and humidity. The EK air-cooled heat pump unit can automatically correct the conditions of starting defrosting according to the temperature and humidity parameters in each region of the country and the actual defrosting status of the unit in the first few cycles, thus getting the most energy-efficient defrosting formula of the unit during actual local operation and achieving the energy saving objective of long term operation.

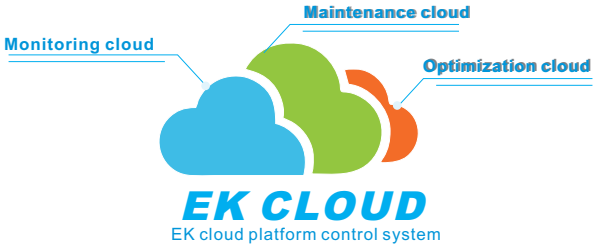
EK "cloud computing" double-mode defrosting technology to implement accurate defrosting by segment

Fan defrosting mode:

The system calculates the amount of formulated frost by measuring the ambient temperature, refrigerant evaporating pressure, discharge pressure and other variables to determine the defrosting mode to enter. When there is a small amount of frost and the parameters are introduced to the defrosting formula to reach the fan defrosting mode, fan defrosting starts, and the four-way valve is not reversed, reducing increase of the compressor energy consumption caused by frequent reversing and reducing heating attenuation.

Reverse defrosting mode without stopping the compressor:

The system calculates the amount of formulated frost by measuring the ambient temperature, refrigerant evaporating pressure, discharge pressure and other variables to determine the defrosting mode to enter. When there is a small amount of frost and the parameters are introduced to the defrosting formula to reach the fan defrosting mode, fan defrosting starts, and the four-way valve is not reversed, reducing increase of the compressor energy consumption caused by frequent reversing and reducing heating attenuation.



EK-CLOUD System Service Provider

Industrial Big Data Era

——Wise man, always walking at the forefront of the times

The "cloud platform" monitoring system service launched for the first time in the industry, making unit maintenance easier (value added service can be selected)

The "cloud platform" monitoring system can monitor various devices such as the air-cooled chiller (heat pump), water-cooled chiller, water-source heat pump unit, hot water unit, VRF unit and AHU, realize three-party after-sales service connection of the customer, service organization and EK, bring customers more timely and efficient equipment maintenance service, and provide 24-hour service guarantee.

Data acquisition: EK can acquire unit operating parameters through the online remote function, upload them to the cloud, self-improve the established cloud platform database after systematic analysis through the cloud server system, and use the parameters as the big data analysis sample of numerous projects.

Early warning: The cloud system compares the acquired data with the cloud platform database parameters, analyzes the automatic notification service of unit operating status, and overhauls the unit in time in case of any exception to prevent faults and make unit maintenance more convenient.

Real-time notification: The operating fault alarm can be checked directly through the Web page or sent through a text message or mail to remind the customer, and the diversified alarm notification methods give customers an excellent experience.

EK-CLOUD "cloud platform" monitoring system

——Remote maintenance, taking preventive measures

Configuring the F-Box remote networking communication box

Simple installation and configuration: Remote equipment management and data interaction operations can be performed without local configuration so long as the network is connected through Ethernet or in 2G/3G/4G mode, etc.

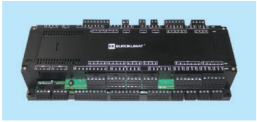
Long connection distance: The RS485 communication cable can be used for connection and the maximum supported transmission distance is 1000 m. This ensures a flexible installation.

Many monitoring points: Related operating parameters of all the units involved in a project (regardless of whether there is one or more units in the project) can be collected and uploaded to the cloud server system for effective analysis.

Wealth of transmitted information: The data collection system collects and uploads data every 2 minutes, and the transmitted information includes all the operating parameters of main unit.

Patented control technology, the unique "black box" function in the industry

The screw unit controller of patented design makes the unit control safer and more reliable. Besides, the advanced microcomputer controller provided for the unit has the "black box" function, which can monitor in real time and store the unit operating parameters, continuously record all the unit operating status data in the past year, and rapidly and accurately locate the cause of possible abnormal operation of the unit so that the problem can be analyzed and fixed easily.



Microcomputer controller

EK intelligent group control system

- EK provides the intelligent group control system software, which can implement centralized control on multiple main units, automatically balance the operating time of multiple units, and perform automatic switching when a unit fails, making the system operate more intelligently and stably and achieving the objective of energy conservation.
- The system adopts the internationally adopted standard RS485 serial communication interface and can connect to other building automation systems (BASs) through the communication protocol conversion module (optional) provided by EK to achieve group control of multiple units. The standard protocols include BacNet, Modbus and LonWorks.
- The digital control center with the professional 10-inch ultra-large LCD touch screen developed by EK provides the unit with monitoring, data recording, safe protection and convenient operations. A range of technical information can be clearly displayed by simply pressing a single button, and both Chinese and English menus are available.

10-inch ultra-large touch screen

- The LCD displays the information about the water chiller, subsystem and system parameters, and can display multiple operating parameters simultaneously on the same screen. Besides, the administrator can also set an access password to prevent change to the set value without permission.

Displaying information

The control center implements continuous monitoring of the operating system and displays the unit running status and fault information.

The displayed status information includes, but not limited to:

- Unit status
- Unit capacity
- Compressor, water pump and expansion valve status
- Inlet and outlet water temperatures
- Suction/discharge pressure/oil pressure of compressor
- Suction/discharge temperature/oil temperature of compressor, etc.

Alarm information includes, but not limited to:

- Power supply over/under-voltage and reverse phase/phase loss protection
- Compressor high/low voltage protection
- Compressor and fan overload protection
- Oil filter clogging protection
- Discharge temperature high protection
- Anti-freezing protection, cutoff protection and frequent start/stop protection
- Feedback on various pressure/temperature sensor faults, etc.

Functions

- Three level password protection of factory, service and user
- Power-on self-test function
- Weekly timed-on/off function
- Memory function in power failure
- Unit preheating
- Outlet/return water temperature setting/control
- Automatic/manual control of unit operation
- Balancing compressor operating time
- Delayed start control of compressor
- Compressor start time setting
- Compressor energy regulation control/setting

Unit configuration

Standard unit accessories

- Spring shock absorber
- Water filter
- Water flow switch
- Clamp

Unit options

- Low temperature cooling type/ annual heat pump type
- Plateau type
- Ultra low noise type
- "EK Cloud" remote monitoring
- Centralized controller
- Remote touch screen controller
- Soft starter/inverter start
- Building automation interfaces - Modbus, LonWorks, BACnet
- Flange interface
- Anticorrosive fin
- Water side pressure bearing 1.6 Mpa
- Built-in hydraulic module (some models are available)

For the above options, contact the local office.

Unit model		—BR3	EKAS100	EKAS120	EKAS130	EKAS140	EKAS155	EKAS175	EKAS190	EKAS200	EKAS220	EKAS235
Nominal cooling capacity		kW	342.8	408.0	460.5	491.8	537.2	610.3	660.3	703.2	759.8	816.0
		USRT	97.5	116.0	130.9	139.8	152.7	173.5	187.7	199.9	216.0	232.0
		×10⁴ kcal/h	29.5	35.1	39.6	42.3	46.2	52.5	56.8	60.5	65.3	70.2
Nominal heating capacity		kW	343.6	408.0	463.2	493.5	538.0	612.1	661.4	708.5	762.3	816.0
		USRT	97.7	116.0	131.7	140.3	153.0	174.0	188.1	201.5	216.7	232.0
		×10⁴ kcal/h	29.5	35.1	39.8	42.4	46.3	52.6	56.9	60.9	65.6	70.2
Cooling compressor power		kW	97.2	113.2	128.0	135.3	149.5	167.9	184.9	190.9	212.4	227.5
Heating compressor power		kW	90.2	105.1	118.7	121.8	135.7	150.7	175.0	178.9	195.5	211.0
Control type			25% to 100% stepless regulation								12.5% to 100% stepless regulation	
Startup Type			Y-Δ									
Power supply			380~415V/3~/50HZ									
Refrigerant	Type		R134a									
	Circuits NO	No.	1	1	1	1	1	1	1	1	2	2
	Control type		Electronic expansion valve									
Compressor	Type		Semi-hermetic double-screw type									
	Qty	No.	1	1	1	1	1	1	1	1	2	2
Lubricant	Brand		EK05									
	Charging		19	30	30	30	30	30	30	30	19+30	30+30
Fan	Type		Spiral axial fan									
	Qty	No.	6	8	8	10	10	12	12	14	14	16
	Total power	kW	9.6	12.8	12.8	16	16	19.2	19.2	22.4	22.4	25.6
	Air flow	×10⁴m³/h	12	16	16	20	20	24	24	28	28	32
Air-Side Heat Exchanger	Type		Fin type									
	Pitch of fins	Fin/Inch	16FPI									
Water-side heat exchanger	Type		Dry shell and tube type									
	Cooling water flow	m³/h	59.0	70.2	79.2	84.6	92.4	105.0	113.6	120.9	130.7	140.4
	Heating water flow	m³/h	59.1	70.2	79.7	84.9	92.5	105.3	113.8	121.9	131.1	140.4
	WPD	kPa	38	44	48	36	34	47	54	56	48	61
	Diameter of connected pipe	inch	8	5	5	6	6	6	6	6	6	6
Rated current		A	209	240	258	279	303	339	353	371	449	480
Maximum operating current		A	275	303	338	345	385	434	505	512	578	606
Maximum startup current		A	414	649	710	710	882	882	1007	1007	689	952
Unit dimensions	Length	mm	3750	4650	4650	5550	5550	6450	6450	7350	7350	8900
	Width	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
	Height	mm	2525	2525	2525	2525	2525	2525	2525	2525	2525	2525
Unit weight	Transportation of cooling-only unit	kg	3380	4305	4315	5463	5723	5703	5803	6673	7374	8200
	Operation of cooling-only unit	kg	3580	4505	4565	5766	6026	6053	6153	7093	7794	8620
	Transportation of heat pump unit	kg	3528	4453	4463	5621	5881	5861	5961	6887	7588	8414
	Operation of heat pump unit	kg	3728	4653	4713	5924	6184	6211	6311	7307	8008	7834

Notes:
■ Cooling design condition: Outdoor dry bulb temperature 35°C, outlet water temperature 7°C and water flow 0.172 m³/(h · kW);
■ Heating design condition: Outdoor dry/wet bulb temperature 7°C/6°C, outlet water temperature 45°C and water flow 0.172 m³/(h · kW);
■ Power distribution and wiring on the unit installation site are subject to the unit nameplates or installation instructions.

Unit model		—BR3	EKAS260	EKAS280	EKAS295	EKAS305	EKAS330	EKAS350	EKAS375	EKAS400	EKAS415	EKAS450
Nominal cooling capacity		kW	915.5	980.0	1032.3	1067.8	1146.6	1221.3	1313.0	1406.3	1455.4	1583.7
		USRT	260.3	278.6	293.5	303.6	326.0	347.3	373.3	399.9	413.8	450.3
		$\times 10^4$ kcal/h	78.7	84.3	88.8	91.8	98.6	105.0	112.9	120.9	125.2	136.2
Nominal heating capacity		kW	919.1	985.3	1033.0	1069.0	1148.1	1227.1	1303.0	1423.5	1458.0	1565.6
		USRT	261.3	280.2	293.7	304.0	326.4	348.9	370.5	404.7	414.6	445.2
		$\times 10^4$ kcal/h	79.0	84.7	88.8	91.9	98.7	105.5	112.1	122.4	125.4	134.6
Cooling compressor power		kW	256.7	269.9	285.1	299.1	318.1	336.7	370.7	384.4	404.9	441.3
Heating compressor power		kW	235.8	241.8	255.0	267.3	284.0	301.1	349.9	357.5	373.4	404.5
Control type			25% to 100% stepless regulation								8% to 100% stepless regulation	6% to 100% stepless regulation
Startup Type			Y-Δ									
Power supply			380~415V/3~/50HZ									
Refrigerant	Type		R134a									
	Circuits NO	No.	2	2	2	2	2	2	2	2	3	4
	Control type		Electronic expansion valve									
Compressor	Type		Semi-hermetic double-screw type									
	Qty	No.	2	2	2	2	2	2	2	2	3	4
Lubricant	Brand		EK05									
	Charging		30+30	30+30	30+30	30+30	30+30	30+30	30+30	30+30	30+30+30	30+30+30+30
Fan	Type		Spiral axial fan									
	Qty	No.	16	20	20	20	22	24	24	28	28	30
	Total power	kW	25.6	32	32	32	35.2	38.4	38.4	44.8	44.8	48
	Air flow	$\times 10^4 m^3/h$	32	40	40	40	44	48	48	56	56	60
Air-Side Heat Exchanger	Type		Fin type									
	Pitch of fins	Fin/Inch	16FPI									
Water-side heat exchanger	Type		Dry shell and tube type									
	Cooling water flow	m^3/h	157.5	168.6	177.6	183.7	197.2	210.1	225.8	241.9	120.3+130.0	131.3+141.1
	Heating water flow	m^3/h	158.1	169.5	177.7	183.9	197.5	211.1	224.1	244.8	120.8+130.0	130.1+139.2
	WPD	kPa	56	61	56	70	55	80	90	71	56/48	48/61
	Diameter of connected pipe	inch	6	6	8	8	8	8	8	8	6+6	6+6
Rated current		A	514	556	582	606	642	677	706	743	371+449	449+480
Maximum operating current		A	676	690	730	770	819	868	1010	1024	512+578	578+606
Maximum startup current		A	1048	1055	1227	1267	1316	1316	1512	1519	1007+689	689+952
Unit dimensions	Length	mm	8900	10700	10700	10700	11600	12500	12500	14300	14700	16250
	Width	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
	Height	mm	2525	2525	2525	2525	2525	2525	2525	2525	2525	2525
Unit weight	Transportation of cooling-only unit	kg	8233	8429	9437	9537	9521	10555	10875	11275	13426	14622
	Operation of cooling-only unit	kg	8653	8849	9917	10017	10021	11055	11375	11875	14226	15442
	Transportation of heat pump unit	kg	8447	8643	9685	9785	9769	10813	11123	11523	13742	14938
	Operation of heat pump unit	kg	8867	9063	10165	10265	10269	10703	11623	12123	14542	15758

Notes:
■ Cooling design condition: Outdoor dry bulb temperature 35°C, outlet water temperature 7°C and water flow 0.172 $m^3/(h \cdot kW)$;
■ Heating design condition: Outdoor dry/wet bulb temperature 7°C/6°C, outlet water temperature 45°C and water flow 0.172 $m^3/(h \cdot kW)$;
■ The EKAS415 to 450 units consist of the main unit and auxiliary unit, which are transported to the site by segment for combination.
■ Power distribution and wiring on the unit installation site are subject to the unit nameplates or installation instructions.

Working Temperature Range of Units

	Cooling	Heating
Outdoor maximum temperature (°C)	50	50
Outdoor minimum temperature (°C)	5	-10
Water side maximum outlet water temperature (°C)	15	55
Water side minimum outlet water temperature (not containing ethylene glycol) (°C)	4	35
Water side minimum outlet water temperature (containing ethylene glycol) (°C)	-8	--
Water side maximum temperature difference (°C)	8	8
Water side minimum temperature difference (°C)	4	4

Notes:
■ If the cooling at the ambient temperature -15°C to 5°C is required, contact the technical personnel at your local office of EK.

Altitude correction factor

Altitude (m)	0	300	600	900	1200	1500	1800
Atmospheric pressure (bar)	1.013	0.977	0.942	0.908	0.875	0.843	0.812
Cooling correction factor	1.000	0.993	0.986	0.979	0.973	0.967	0.960
Input power correction factor	1.000	1.005	1.009	1.015	1.021	1.026	1.031

Correction factor for adding ethylene glycol

Ethylene glycol solution concentration (%)	10	20	30	40	50
Cooling capacity correction factor	0.991	0.982	0.972	0.961	0.946
Input power correction factor	0.996	0.992	0.986	0.976	0.966
Water flow correction factor	1.013	1.04	1.074	1.121	1.178
Water pressure drop correction factor	1.070	1.129	1.181	1.263	1.308

Correction factor of operating performance at low temperature

Ethylene glycol chilled water outlet temperature (°C)	2	0	-2	-4	-6	-8
Maximum outdoor ambient temperature (°C)	40	39	38	37	36	35
Cooling capacity correction factor	0.842	0.785	0.725	0.67	0.613	0.562
Compressor input power correction factor	0.95	0.94	0.92	0.89	0.87	0.84
Minimum ethylene glycol solution concentration (%)	10	20	20	30	30	30