air

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Quality and safety

ISO9001

ISO14001

OHSAS18001

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HITACHI

HITACHI Central Air-Conditioning Units

S Series

Cooling capacity range: 300-3000RT

R134a REFRIGERANT

Cooling & Heating



Keep innovating to catch up and constantly introduce new products with good quality

Since 1932, Hitachi has been producing and selling centrifugal chillers, thus, it has more than 80 years of experience and mature technology so far. Based on the advanced technology of "Hitachi Japan", Johnson Controls-Hitachi Wanbao Air-Conditioning (Guangzhou) Co., Ltd. keeps pace with the times, and continue to introduce new high-quality products according to market demands.

Hitachi centrifugal chiller adopts self-developed centrifugal two-stage compression technology and R134a environment-friendly refrigerant, which integrates the advantages of high efficiency and energy saving, safety and reliability, stable operation, long service life, simple operation and maintenance. The capacity for single-compressor unit can be 300RT ~ 2500RT, thus the cold capacity range is wider. Moreover, functions like heat recovery, heat pump, cold storage, inverter, soft starter and high voltage can be chosen at will. Hitachi centrifugal chillers have been widely used in airports, hospitals, hotels, large factories, schools and other public places for many years, and have won unanimous praise in air-conditioning industry.

Model specification

product		Fixed frequency centrifugal chiller		Variable frequency centrifugal chiller	
Model		HC-F***GXG-S(SC)	HC-F***GFG-S	HC-F***GXG-S(SC)IT	HC-F***GFG-SIT
Cooling capacity	RT	300.0 ~ 3000	300.0 ~ 2500	1150.0 ~ 3000	1150.0 ~ 2500
Refrigerant	t	R134a			
Evaporator outlet temp	℃	5 ~ 20			
Condenser outlet temp	℃	17 ~ 40			
COP	—	5.892 ~ 6.783	6.260 ~ 7.121	6.025 ~ 6.516	6.342 ~ 6.844
Power supply	380V×50Hz(3φ3W)	300.0-1400RT			
	10kV×50Hz(3φ3W)	500-3000RT			
Application	Dual-working(D)	●	●	●	●
	Heat pump(H)	●	●	●	●
	Heat recovery(HR)	●	●	●	●

Note:
Above COP is under the working condition of CHW in/outlet temp: 12/7℃
CW in/outlet temp: 32/37℃



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Product Overview

Model description

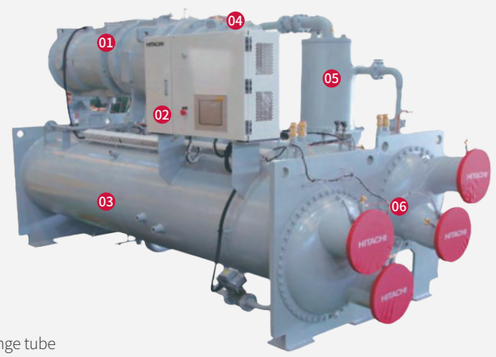
HC	—	ZE	600	G※	G	※	—	S	※※	※※	—	※※※	—	※※※
①		②	③	④	⑤	⑥		⑦	⑧	⑨		⑩		⑪

Number	Code description	options
①	High Pressure Refrigerant Centrifugal Chiller	—
②	Refrigerant Code	F:R134a
③	Rated Cooling Capacity(RT)	—
④	Heat Exchanger Code	GS: Economic Serles; GX: Standard Series; GF: Efficient Series
⑤	Place Of Production	G: Johnson Controls-Hitachi Wanbao Air Conditioning(Guangzhou)Co., Ltd.
⑥	High-voltage Power Supply	H: F05 ~ F35 Series High-voltage Power Supply; Default: Other
⑦	Product Series Number	S: Gear Transmission Series
⑧	Fixed Frequency / Frequency Conversion Code	Default: Fixed Frequency; IT: Variable speed
⑨	Application Product Code	Default: Standard Application; D: Dual-mode Application; H: Heat Pump Application; SC: With Subcooler Application
⑩	Evaporator / Condenser Code	Default: Standard Product; ※※※: Special Product
⑪	Motor Code	Default: Standard Product; ※※※: Special Product

Unit structure

01 Electric motor
- semi-hermatic
- cooled by refrigerant, efficient and reliable

02 Electric control box
- Color touch screen, 10.4-inch color touch screen
- English display, easy to operate



03 Evaporator
- High performance heat exchange tube
- optimal design, improved efficiency

04 Compressor
- two-stage impeller
- vane diffuser
  low loss bearing structure

05 Economizer
- External economizer, patented design
- Centrifugal separation, energy efficient

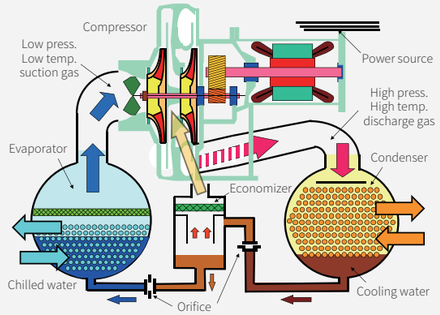
06 Condenser
- High performance heat exchange tube
- optimal design, improved efficiency

Product Characteristics

Two-stage compression high-efficiency cooling cycle

Hitachi began to develop and apply two-stage compression technology of centrifugal chillers in 1996 and has more than 20 years of design experience.Two-stage compression has the following advantages over single-stage compression:

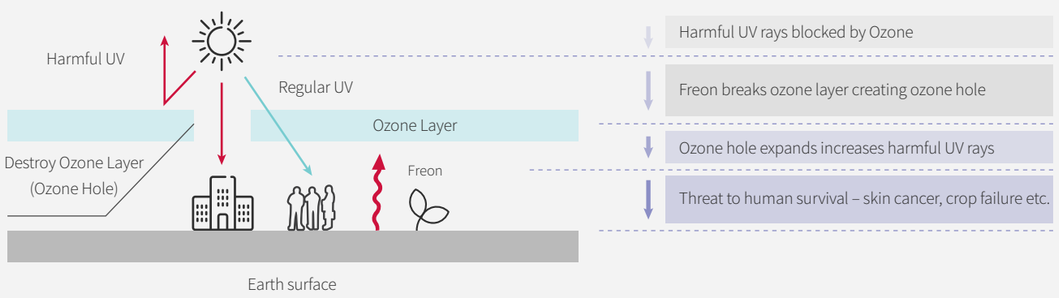
- Two-stage compression can provide a larger pressure ratio, obtain a higher refrigeration cycle efficiency, and expand the compressor application range, reduce the compressor under low load surge risk so that the unit can operate safely and stably.
- The use of multi-stage compression unique intermediate economizer, for one, to improve the refrigerant supercooling degree, increase the cooling capacity; for the other, reduce the gas transmission of the first stage impeller, so as to reduce the power consumption of the unit.
- Two-stage compression can reduce the speed of the compressor, improve the reliability of operation, increase the service life of the bearing, the unit vibration is small, low noise.



Ozone layer protection

Use R134a refrigerant with 0 ozone depletion factor

The destruction of the stratospheric ozone layer will pose a great threat to the survival of mankind. Chlorofluorocarbons in the stratosphere break down when exposed to ultraviolet light, releasing chlorine atoms, which combine with oxygen atoms in the odor layer and destroy the ozone layer. Due to R134a not containing this chlorine atom, it will not destroy the ozone layer in the atmosphere.



High-efficiency compressor

☒ 3D efficient two-stage impeller

The compressor adopts a new high efficiency closed impeller designed for HFO-1234ze refrigerant based on the theory of 3d-flow. The impeller adopts a wing-shaped three-dimensional structure with low flow loss to achieve high efficiency and reliability in a wider range of fields. The impeller is made of special aluminum alloy with high strength, and the ideal fluid shape is made by vacuum precision casting. At the same time, the strength analysis, coordinate detection, dynamic balance test and over-speed test of the impeller structure are carried out to ensure the reliable operation of the impeller at high speed.Ensure reliable operation of the impeller at high speeds.





☒ Low loss bearing structure

Using two-stage compression, the speed of the compressor is reduced, the bearing loss is reduced, and the operating life of the unit is extended.

☒ Vane diffuser

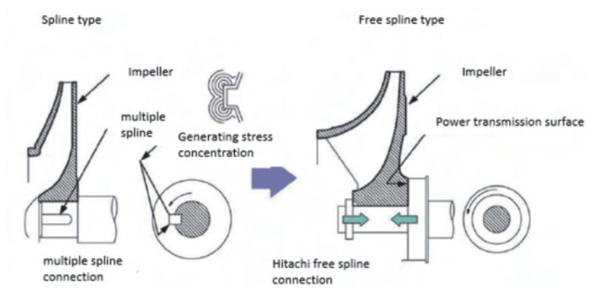
With vane diffuser design can effectively convert high-speed gas into high static pressure gas, and achieve excellent pressure recovery. At the same time, through software simulation calculation, the blade is machined into the most ideal shape by CNC machine tool, which makes the operation range of the unit wider, the surge margin wider and the unit efficiency higher.

☒ Reduced disturbing high-frequency sounds and achieved low noise

The fluid inside the compressor is reasonably designed to reduce the flow noise; By adopting two-stage compression, the rotation speed of the compressor is reduced, especially the low noise in the high frequency area is realized.

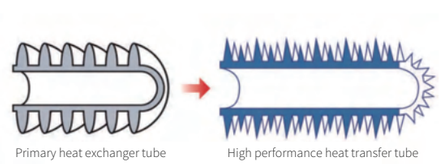
☒ Free spline connection

The impeller and the main shaft are connected with a free spline structure, which avoids the problem of local stress concentration caused by key connection, improves the low cycle fatigue strength of the compressor, and ensures the reliability and smoothness of the unit operation.



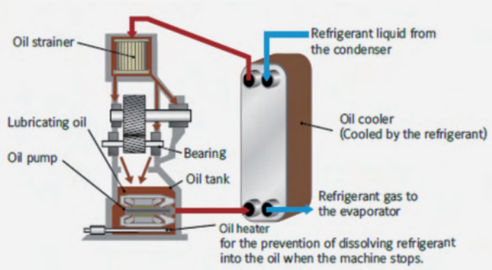
High performance heat exchanger

Adopt high-performance heat transfer tube designed for centrifugal chiller, the overall rational arrangement of the tube group, improve the performance of the heat exchanger.



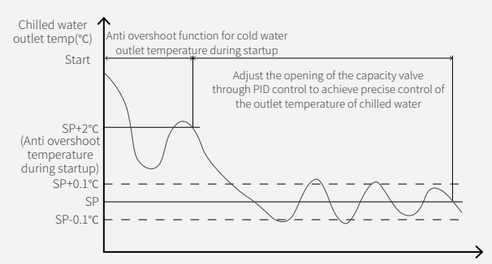
Reliable oil supply system

- The oil pump specially developed by Hitachi for centrifugal chiller has good sealing performance and adopts lubricating oil cooling to ensure reliable and stable operation.
- Lubricating oil is cooled by refrigerant through plate heat exchanger, no need to cooling water pipe, reliability is greatly enhanced.
- The oil filter before and after the pipe distribution system is equipped with a standard stop valve, easy to clean and replace the filter element.
- Before the unit starts, the oil pump starts in advance for bearing lubrication. The oil pump continues to operate during the unit's operation and the inertial operation phase of shutdown. In the case of abnormal power failure, the gravity type emergency oil supply device can ensure the lubrication of the shaft bearing, and will not occur abnormal wear and damage to ensure the safety of the unit.



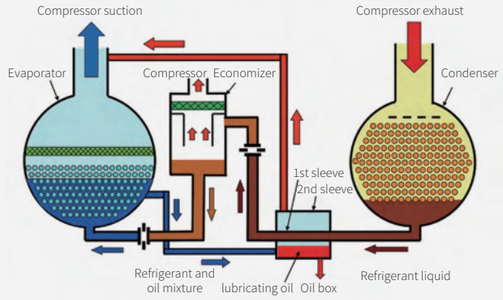
Precise outlet water temperature control

- The chilled water outlet temperature at start-up can be effectively avoided by the anti-overshoot function. When the unit starts, it enters the automatic start-stop and stop-temperature under low load.
- The opening of the capacity valve is adjusted by PID control, and the cooling capacity of is adjusted continuously to achieve accurate control of the chilled water outlet temperature.



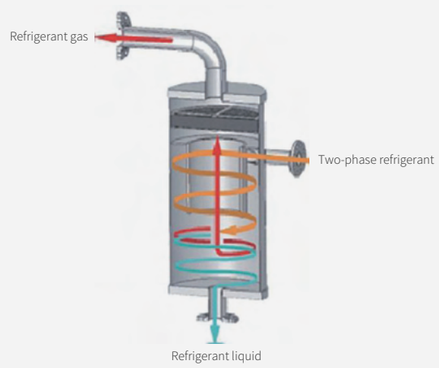
Fully automatic oil recovery system

Hitachi patented automatic injection oil return technology, which adopts oil pump exhaust as the injection power source, oil pressure is stable, oil recovery capacity will not be reduced with the change of unit working conditions, automatically and timely heat exchanger stored lubricating oil back to the tank, to avoid the lubricating oil into the refrigerant system which cause the reduction of by heat transfer efficiency; At the same time, no manual operation is required to reduce the daily maintenance and management costs of users.



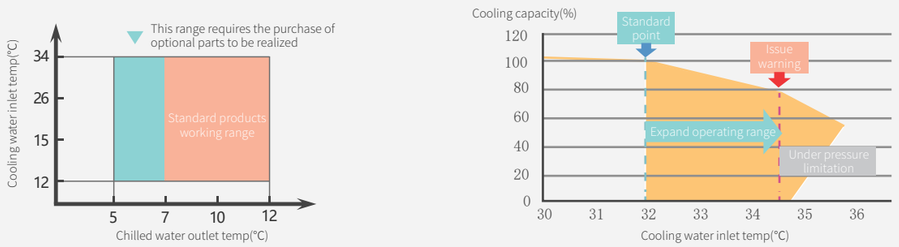
High Efficiency Economizer

Hitachi patented centrifugal economizer is used to improve the performance of gas-liquid separation, improve the capacity and efficiency of the refrigerant system as a whole, and extend the service life of the unit.



Expand operating range

As the rising of cooling water temperature during hot summer, and the rising of condensation pressure due to the contamination of heat transfer tube, limit the rising condensation pressure by forced limit of the condenser pressure to make the chiller to operate continuously and stably, reducing troubles such as fault shutdown.



Note:The above is the standard operating range of the unit. If the project requirements exceed the above range, please contact Hitachi factory for confirmation!

Semi hermetic motor, stable and reliable

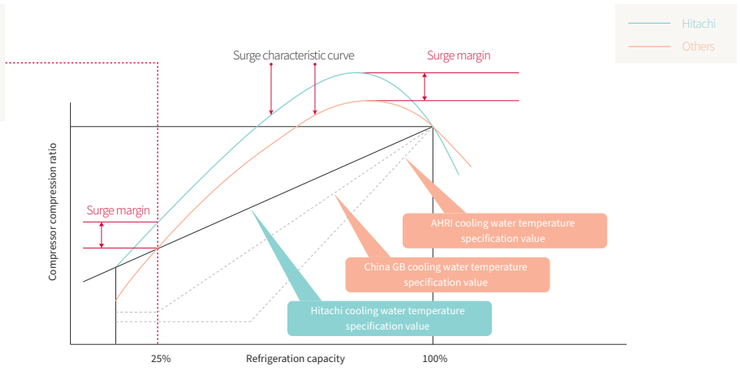
The semi-hermetic high-efficiency motor adopts liquid refrigerant spray cooling, low operating temperature and higher operating efficiency, which not only fully reduces the risk of massive leakage of refrigerant and lubricating oil, but also does not dissipate a large amount of heat to the machine room, which can save the initial investment cost of customers to increase the cooling device and operation control box in the machine room.

High anti-surge variable speed control technology

- Due to the high ambient temperature of summer in Japan, its industrial standard JIS puts forward high requirements for the stable operation of the unit in a high temperature environment. Hitachi centrifugal chiller strictly comply with Japanese JIS standards, the use of two-stage wing-like three-dimensional high efficiency impeller and blade diffuser can operate stably even when the cooling load is small and the cooling water temperature is high, to prevent the occurrence of surge and ensure high reliability of operation. It can realize stable operation in the cooling water inlet temperature range of 12 ~ 34℃ and realize stepless adjustment of 10 ~ 100% load.
- Adopt high-speed frequency conversion motor with wider frequency range, so that the unit priority through changing speed to achieve load change, thereby reducing the guide vane throttling loss to improve the unit performance.
- Speed changes through pressure ratio to avoid unit surge caused by pollution of the heat transfer tube and escort the unit through strict surge detection and avoidance functions.

Cooling water inlet temperature under different loads:

Load	Hitachi Standard	AHRI Standard	GB Standard
100%	32℃	29.4℃	30℃
75%	30.75℃	23.9℃	26℃
50%	29.5℃	18.3℃	23℃
25%	28.25℃	18.3℃	19℃
0%	27℃	18.3℃	19℃



Options

- **Evaporator/condenser water side pressure**

  standard unit design pressure 1.0MPa, can option with 1.6, 2.0MPa water side pressure as special requirements.

- **Refrigerant isolation valve**

  Allows the refrigerant to be isolated and stored in the condenser during maintenance, eliminating the need to transfer the refrigerant to another container.

- **Spring isolator**

  The standard unit is equipped with high elastic rubber shock absorber gaskets. If there are special application requirements, spring shock absorber can be selected to further slow down the vibration transmission of the unit to the bearing surface.

- **Disassemble and knockdown shipment**

  If the equipment handling space is limited and the whole chiller is not allowed to be hoisted, the chiller can be disassembled into several large parts (compressors, heat exchangers, electric control boxes, economizers) and then hoisted to a smaller space.

- **Marine water box**

  Marine water chamber tank makes it very convenient to clean the heat exchanger copper tubes without removing the water pipe.

- **Start panel**

  Optional circuit breaker



10.4 inch Color touch screen, Chinese display, easy to operate

- The control center is completely composed of 10.4-inch color LCD touch display (LCD), which is clean and clear in appearance.
- Colorful touch screen, improve the convenience of recognition, simple and fast operation.
- Centralized display of the unit's simple process and various operating information.
- Centralized control of various Settings and states of the unit.
- Set three levels of access according to manufacturer Settings, customer service maintenance and different needs of users.

Display Information

Display each operating status and operating data
Display the trend chart in operation
Display the past trend data (updated every minute)
Display and save the fault and alarm history
Display the corresponding guidance when the fault occurs



Operation interface

Main status information

- Chilled water inlet temperature
- Cooling water inlet temperature
- Capacity control valve opening
- Condensing pressure
- Oil supply pressure
- Main motor current and main motor current %
- Chilled water outlet temperature
- Cooling water outlet temperature
- Evaporation pressure
- Tank temperature
- Oil supply temperature

Remote control

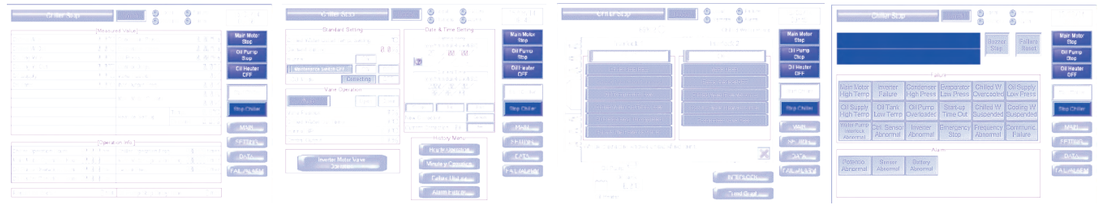
The user can control the start and stop of the unit through the remote signal and set the temperature or load limit value of the chiller outlet by inputting DC4~20mA current signal remotely according to their own needs, and the load limit range is 5%~100%.

Remote communication functions

Through the RS485 physical bus, using the same communication format as the superior communication MODBUS RTU, communicate with other equipment, collect and monitor the data of the unit in real time, and the user can form a group control system according to the actual needs.

Main safety protection

- Excessive main motor temperature
- Oil pump overload
- Main motor overload
- Cooling water cut off (optional)
- Condenser high pressure
- Chilled water cut off
- Low evaporator pressure
- Chilled water low temperature
- Low oil supply pressure
- Low tank temperature
- Restart limit
- Prevent surge when the capacity valve is closed



Parameter display | Parameter setting | Linkage setting | Fault Alarm

When the unit shuts down due to a malfunction, the possible causes and solutions of the corresponding malfunction can be queried on the touch screen. Based on the possible causes and corresponding countermeasures provided by our company, customers can quickly identify the cause of the malfunction and quickly troubleshoot, providing convenience for users and maintenance personnel.

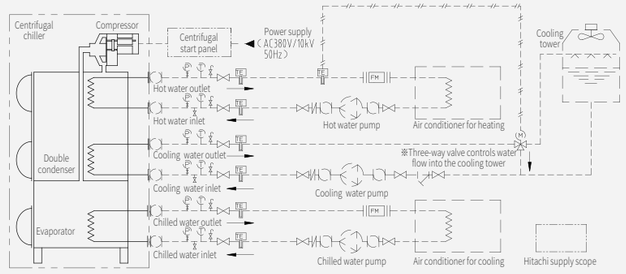
System Application

Remote signal output

- Chiller running signal output
- Main motor running signal output
- Restart limit signal output
- Remote/local signal output alarm
- Chilled water pump interlock signal output
- Main motor current analog signal output (DC4 ~ 20mA)
- Condensing pressure analog signal output (DC4 ~ 20mA)
- Capacity valve opening analog signal output (DC4 ~ 20mA)
- Fault signal output
- Low load stop signal output
- Cooling pump interlock signal output

Heat recovery system

The heat recovery unit improves the energy efficiency of the entire system by recovering and utilizing some or all of the heat generated during refrigeration. Unlike heat pump units that primarily focus on heating, heat recovery units utilize the by-product of refrigeration operation - heat discharge - to produce free hot water while meeting the cooling load. At the same time, they reduce the amount of heat discharged through cooling towers and do not exacerbate the urban "heat island effect". The Hitachi heat recovery centrifugal chiller unit adopts dual condensers to achieve partial or complete waste heat recovery. The system diagram is as follows:

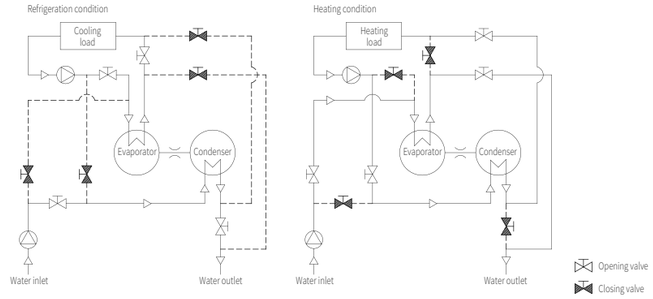


Heat recovery units are suitable for projects that require both cooling and heat, and are widely used in:

- ☒ Hot water preheating in hotels or hospitals, used for bathrooms, showers, swimming pools, kitchens, etc
- ☒ Comfort heating
- ☒ Air reheating
- ☒ Preheating of boiler feedwater or process hot water

Heat pump application

With the continuous development of the world economy, energy and environmental issues are becoming increasingly prominent. The application of heat pumps in Hitachi centrifugal chillers utilizes low-temperature heat sources or waste heat resources to further improve energy efficiency and respond to the strategic direction of sustainable development, which has positive significance for energy conservation and environmental protection.



Cool storage system

By utilizing the difference in peak and valley electricity prices and switching between air conditioning and cold storage conditions, night and day cooling can be achieved, reducing peak electricity loads and saving operating costs while meeting refrigeration needs.

- Suitable for regions with significant differences in peak and valley electricity prices
- "Nighttime cold storage and daytime cooling" can not only meet the refrigeration needs, but also achieve peak shaving and valley filling of building electricity demand, and users can reduce the installed capacity of air conditioning

Chiller Specifications

GXG-S Series

300～1400RT Recommend selection specification（power supply AC 380V/50Hz/3ϕ/3W， Open star-delta）

Model	Cooling		Input power	Full load efficiency	Rated Current	Start Current	Evaporator				Condenser				Overall Dimension				Net Weight	Operating Weight
							Flow rate	Pressure drop	Pipe Diameter	Pass	Flow rate	Pressure drop	Pipe Diameter	Pass	L	W	H	Extubation space		
—	USRT	kW	kW	kW/TR	A	A	m^3/h	kPa	DN	—	m^3/h	kPa	DN	—	MM	MM	MM	MM	t	t
HC-F300GXG-S	300.0	1055	187.0	0.6233	315	557	181.4	60.0	150		213.6	53.8	200		3600	1650	2200	3000	6.2	7.4
HC-F350GXG-S	350.0	1231	217.4	0.6211	366	557	211.7	77.0	200		249.1	64.2	200		3600	1650	2200	3000	6.2	7.4
HC-F400GXG-S	400.0	1407	247.1	0.6178	415	764	241.9	62.5	200		284.4	56.7	200		3650	1900	2400	3000	7.0	8.5
HC-F450GXG-S	450.0	1582	278.1	0.6180	467	764	272.2	76.8	200		320.0	63.8	200		3650	1900	2400	3000	7.0	8.6
HC-F500GXG-S	500.0	1758	300.5	0.6010	506	987	302.4	65.0	200		354.1	58.0	200		4150	1900	2450	3500	8.4	9.9
HC-F550GXG-S	550.0	1934	329.4	0.5989	555	988	332.6	77.2	200		389.3	63.5	250		4150	2000	2450	3500	8.7	10.4
HC-F600GXG-S	600.0	2110	358.8	0.5980	604	988	362.9	68.8	250		424.6	60.0	250		4150	2000	2450	3500	8.9	10.5
HC-F650GXG-S	650.0	2286	388.0	0.5969	654	1159	393.1	79.2	250		459.9	67.3	250		4150	2000	2450	3500	9.1	10.9
HC-F700GXG-S	700.0	2461	419.3	0.5990	708	1542	423.4	70.9	250	2	495.5	60.9	250	2	4200	2250	2650	3500	10.7	12.6
HC-F750GXG-S	750.0	2637	447.7	0.5969	756	1542	453.6	80.1	250		530.6	68.8	250		4200	2250	2650	3500	10.7	12.7
HC-F800GXG-S	800.0	2813	477.5	0.5969	807	1542	483.8	73.4	250		566.0	62.8	300		4200	2250	2650	3500	11.1	13.3
HC-F850GXG-S	850.0	2989	509.1	0.5989	860	1542	514.1	81.6	250		601.6	70.0	300		4200	2250	2650	3500	11.1	13.4
HC-F900GXG-S	900.0	3165	539.1	0.5990	917	1590	544.3	74.7	300		637.0	63.2	300		4200	2400	2800	3500	12.4	14.8
HC-F950GXG-S	950.0	3340	567.0	0.5968	964	1590	574.6	82.1	300		672.1	69.5	300		4200	2400	2800	3500	12.4	14.9
HC-F1000GXG-S	1000	3516	597.0	0.5970	1004	1846	604.8	81.7	300		707.5	69.6	350		4200	2400	2800	3500	12.8	15.3
HC-F1100GXG-S	1100	3868	658.9	0.5990	1108	1846	665.3	79.7	300		778.6	71.4	350		4200	2400	2800	3500	13.2	15.7
HC-F1200GXG-S	1200	4220	717.6	0.5980	1204	2384	725.8	78.3	300		849.2	66.3	350		4550	2700	2900	4000	15.8	19.1
HC-F1300GXG-S	1300	4571	776.0	0.5969	1302	2384	786.2	90.1	350		919.7	76.4	400		4550	2700	2900	4000	15.8	19.3
HC-F1400GXG-S	1400	4923	835.8	0.5970	1402	2384	846.8	102	350		990.5	87.0	400		4550	2700	2900	4000	16.0	19.7

900～3000RT Recommend selection specification（power supply AC 10kV/50Hz/3ϕ/3W,Reactance start）

Model	Cooling		Input power	Full load efficiency	Rated Current	Start Current	Evaporator				Condenser				Overall Dimension				Net Weight	Operating Weight
							Flow rate	Pressure drop	Pipe Diameter	Pass	Flow rate	Pressure drop	Pipe Diameter	Pass	L	W	H	Extubation space		
—	USRT	kW	kW	kW/TR	A	A	m^3/h	kPa	DN	—	m^3/h	kPa	DN	—	MM	MM	MM	MM	t	t
HC-F900GXGH-S	900.0	3165	541.9	0.6021	36	125	544.3	74.7	300		637.5	63.3	300		4250	2400	2800	3500	12.7	15.1
HC-F950GXGH-S	950.0	3340	570.0	0.6000	38	125	574.6	82.1	300		672.6	69.6	300		4250	2400	2800	3500	12.7	15.2
HC-F1000GXGH-S	1000	3516	600.0	0.6000	40	151	604.8	81.7	300		708.0	69.6	350		4250	2400	2800	3500	13.1	15.6
HC-F1100GXGH-S	1100	3868	662.3	0.6021	44	151	665.3	79.7	300		779.2	71.5	350		4250	2400	2800	3500	13.5	16.0
HC-F1200GXGH-S	1200	4220	721.3	0.6011	49	165	725.8	78.3	300		849.8	66.4	350		4750	2700	2900	4000	16.1	19.4
HC-F1300GXGH-S	1300	4571	780.1	0.6001	53	165	786.2	90.1	350		920.4	76.5	400		4750	2700	2900	4000	16.1	19.6
HC-F1400GXGH-S	1400	4923	840.1	0.6001	57	165	846.7	103	350		991.2	87.2	400		4750	2700	2900	4000	16.3	20.0
HC-F1500GXG-S	1500	5274	863.2	0.5755	57	185	907.2	91.9	400		1056	76.9	400		4850	3200	3400	4000	20.5	24.9
HC-F1600GXG-S	1600	5626	916.3	0.5727	61	185	967.7	92.3	400		1125	78.5	400		4850	3200	3400	4000	20.7	25.2
HC-F1700GXG-S	1700	5978	970.4	0.5708	62	220	1028	85.6	400		1195	80.6	400		4950	3350	3550	4000	21.2	26.0
HC-F1800GXG-S	1800	6329	1024	0.5689	65	220	1089	85.3	400		1265	78.8	450		4950	3350	3550	4000	21.5	26.5
HC-F1900GXG-S	1900	6681	1078	0.5674	69	220	1149	86.1	400	2	1334	78.4	450	2	4950	3350	3550	4000	21.8	26.9
HC-F2000GXG-S	2000	7033	1129	0.5645	72	220	1210	87.0	400		1404	81.5	450		4950	3350	3550	4000	22.0	27.2
HC-F2100GXG-S	2100	7384	1148	0.5467	74	252	1270	84.2	450		1468	88.2	500		5500	3750	3850	4500	29.3	36.1
HC-F2200GXG-S	2200	7736	1201	0.5459	77	252	1331	82.8	450		1537	83.0	500		5500	3750	3850	4500	29.6	36.6
HC-F2300GXG-S	2300	8087	1256	0.5461	80	252	1391	83.1	450		1607	82.8	500		5500	3750	3850	4500	30.0	37.2
HC-F2400GXG-S	2400	8439	1306	0.5442	86	301	1452	82.3	450		1676	82.5	500		5500	3750	3850	4500	30.5	37.9
HC-F2500GXG-S	2500	8791	1359	0.5436	89	301	1512	81.3	450		1746	81.5	500		5500	3750	3850	4500	31.0	38.5
HC-F2600GXG-SSC	2600	9142	1467	0.5642	97	248	1572	89.0	500		1825	93.2	500		5700	3850	4000	4500	34.0	42.7
HC-F2700GXG-SSC	2700	9494	1522	0.5637	100	248	1633	90.3	500		1895	93.4	500		5700	3850	4000	4500	34.3	43.1
HC-F2800GXG-SSC	2800	9846	1605	0.5732	106	248	1693	89.8	500		1970	94.0	500		5700	3850	4000	4500	34.6	43.5
HC-F2900GXG-SSC	2900	10197	1662	0.5731	106	367	1754	91.0	500		2040	93.3	600		5700	3850	4000	4500	35.2	44.2
HC-F3000GXG-SSC	3000	10549	1719	0.5730	110	367	1814	89.7	500		2110	95.1	600		5700	3850	4000	4500	35.5	44.6

REMARKS:

1.This table is applicable to standard condition:Chilled waterinlet/oulet temperature: 12/7 ℃ ,Cooling water inlet/outlet temperature:32/37 ℃

2.Other cooling capacity and running condition may be met upon request.Please refer to computer selection sheet for certain project.,

3.This table is applicable to chillers manufactured for normal water . If seawater or brine required to be used, please specify during inquiry.

4.Capacity control range:100～20%。

5.Auxiliary power： AC 380V/50Hz/3ϕ/4W ； Capacities： 3.0kVA 300～450RT / 5.0kVA 500～2500RT

6.Maximum working pressure is 1.0MPA for both chilled and cooling water.If higher maximum working pressure is required,please specify during inquiry.(Optional maximum working pressure can be up to 2.0MPA)

7.Chilled Water's Fouling Factor is 0.018m2 ℃ /kW，Cooling Water's Fouling Factor is 0.044m2 ℃ /kW.

8.It is our consistent policy to improve the products, and the configuration is subject to change without prior notice.

Chiller Specifications

GFG-S Series

300～1400RT Recommend selection specification（power supply AC 380V/50Hz/3ϕ/3W， Open star-delta）

Model	Cooling		Input power	Full load efficiency	Rated Current	Start Current	Evaporator				Condenser				Overall Dimension				Net Weight	Operating Weight
							Flow rate	Pressure drop	Pipe Diameter	Pass	Flow rate	Pressure drop	Pipe Diameter	Pass	L	W	H	Extubation space		
—	USRT	kW	kW	kW/TR	A	A	m^3/h	kPa	DN	—	m^3/h	kPa	DN	—	MM	MM	MM	MM	t	t
HC-F300GFG-S	300.0	1055	172.6	0.5753	291	557	181.4	68.5	150		211.1	60.0	200		4100	1650	2200	3500	6.5	7.8
HC-F350GFG-S	350.0	1231	201.4	0.5754	339	557	211.7	89.8	200		246.3	73.4	200		4100	1650	2200	3500	6.5	7.8
HC-F400GFG-S	400.0	1407	229.8	0.5745	386	764	241.9	83.3	200		281.4	67.7	200		4650	1900	2400	4000	7.6	9.4
HC-F450GFG-S	450.0	1582	258.6	0.5747	435	764	272.2	102	200		316.6	83.4	200		4650	1900	2400	4000	7.6	9.5
HC-F500GFG-S	500.0	1758	285.8	0.5716	481	988	302.4	74.6	200		351.6	60.6	200		4650	2000	2450	4000	9.1	10.9
HC-F550GFG-S	550.0	1934	313.4	0.5698	528	988	332.6	88.2	200		386.5	71.7	250		4650	2000	2450	4000	9.1	11.0
HC-F600GFG-S	600.0	2110	341.4	0.5690	575	988	362.9	78.6	250		421.6	67.4	250		4650	2000	2450	4000	9.3	11.2
HC-F650GFG-S	650.0	2286	369.2	0.5680	622	1159	393.1	90.5	250		456.6	77.6	250		4650	2000	2450	4000	9.3	11.4
HC-F700GFG-S	700.0	2461	398.9	0.5699	674	1542	423.4	81.1	250	2	492.0	68.7	250	2	4700	2250	2650	4000	11.2	13.3
HC-F750GFG-S	750.0	2637	426.0	0.5680	720	1542	453.6	91.6	250		526.9	77.6	250		4700	2250	2650	4000	11.2	13.4
HC-F800GFG-S	800.0	2813	454.4	0.5680	768	1542	483.8	83.9	250		562.0	70.9	300		4700	2250	2650	4000	11.6	14.1
HC-F850GFG-S	850.0	2989	484.4	0.5699	818	1542	514.1	93.3	250		597.4	79.0	300		4700	2250	2650	4000	11.6	14.2
HC-F900GFG-S	900.0	3165	512.9	0.5699	872	1590	544.3	85.3	300		632.5	71.3	300		4700	2400	2800	4000	12.0	14.7
HC-F950GFG-S	950.0	3340	539.7	0.5681	918	1590	574.6	93.8	300		667.4	78.5	300		4700	2400	2800	4000	12.0	14.8
HC-F1000GFG-S	1000	3516	568.1	0.5681	966	1590	604.8	93.4	300		702.5	78.5	350		4700	2400	2800	4000	12.7	15.7
HC-F1100GFG-S	1100	3868	626.9	0.5699	1054	1846	665.3	91.1	300		773.1	80.6	350		4700	2400	2800	4000	13.3	16.3
HC-F1200GFG-S	1200	4220	682.7	0.5689	1145	2384	725.8	88.0	300		843.2	73.6	350		5050	2700	2900	4500	16.5	20.2
HC-F1300GFG-S	1300	4571	738.8	0.5683	1240	2384	786.2	101	350		913.3	84.9	400		5050	2700	2900	4500	16.5	20.4
HC-F1400GFG-S	1400	4923	795.2	0.5680	1334	2384	846.8	115	350		983.5	96.0	400		5050	2700	2900	4500	16.7	20.8

900～2500RT Recommend selection specification（power supply AC 10kV/50Hz/3ϕ/3W,Reactance start）

Model	Cooling		Input power	Full load efficiency	Rated Current	Start Current	Evaporator				Condenser				Overall Dimension				Net Weight	Operating Weight
							Flow rate	Pressure drop	Pipe Diameter	Pass	Flow rate	Pressure drop	Pipe Diameter	Pass	L	W	H	Extubation space		
—	USRT	kW	kW	kW/TR	A	A	m^3/h	kPa	DN	—	m^3/h	kPa	DN	—	MM	MM	MM	MM	t	t
HC-F900GFGH-S	900.0	3165	515.4	0.5727	34	125	544.3	85.3	300		633.0	71.4	300		4750	2400	2800	4000	12.7	15.0
HC-F950GFGH-S	950.0	3340	542.3	0.5708	36	125	574.6	93.8	300		667.8	78.6	300		4750	2400	2800	4000	12.7	15.1
HC-F1000GFGH-S	1000	3516	570.8	0.5708	38	125	604.8	93.4	300		703.0	78.6	350		4750	2400	2800	4000	13.0	16.0
HC-F1100GFGH-S	1100	3868	630.0	0.5727	42	151	665.3	91.1	300		773.6	80.7	350		4750	2400	2800	4000	13.6	16.6
HC-F1200GFGH-S	1200	4220	686.1	0.5718	47	165	725.8	88.0	300		843.8	73.7	350		5150	2700	2900	4500	16.8	20.5
HC-F1300GFGH-S	1300	4571	742.1	0.5708	50	165	786.2	101	350		913.9	84.9	400		5150	2700	2900	4500	16.8	20.7
HC-F1400GFGH-S	1400	4923	799.2	0.5709	54	165	846.7	115	350		984.2	96.9	400		5150	2700	2900	4500	17.0	21.1
HC-F1500GFG-S	1500	5274	821.6	0.5477	54	185	907.2	115	400		1049	95.0	400		5850	3200	3400	5000	24.5	29.9
HC-F1600GFG-S	1600	5626	872.3	0.5452	58	185	967.7	115	400	2	1118	97.0	400	2	5850	3200	3400	5000	24.8	30.3
HC-F1700GFG-S	1700	5978	923.9	0.5435	61	185	1028	113	400		1187	103	400		5850	3350	3400	5000	25.1	30.7
HC-F1800GFG-S	1800	6329	975.1	0.5417	62	220	1089	107	400		1256	88.1	450		5950	3350	3550	5000	26.0	32.1
HC-F1900GFG-S	1900	6681	1026	0.5400	66	220	1149	108	400		1326	92.0	450		5950	3350	3550	5000	26.3	32.5
HC-F2000GFG-S	2000	7033	1075	0.5375	69	220	1210	109	400		1395	95.9	450		5950	3350	3550	5000	26.6	33.0
HC-F2100GFG-S	2100	7384	1094	0.5210	70	252	1270	93.5	450		1458	96.9	500		6000	3750	3850	5000	32.2	39.9
HC-F2200GFG-S	2200	7736	1144	0.5200	73	252	1331	92.0	450		1527	91.2	500		6000	3750	3850	5000	32.7	40.6
HC-F2300GFG-S	2300	8087	1196	0.5200	77	252	1391	92.3	450		1597	90.9	500		6000	3750	3850	5000	33.1	41.3
HC-F2400GFG-S	2400	8439	1245	0.5188	82	301	1452	91.5	450		1666	90.6	500		6000	3750	3850	5000	33.5	41.8
HC-F2500GFG-S	2500	8791	1295	0.5180	85	301	1512	90.3	450		1735	89.5	500		6000	3750	3850	5000	34.0	42.5

REMARKS:

1.This table is applicable to standard condition:Chilled waterinlet/oulet temperature: 12/7 ℃ ,Cooling water inlet/outlet temperature:32/37 ℃

2.Other cooling capacity and running condition may be met upon request.Please refer to computer selection sheet for certain project.,

3.This table is applicable to chillers manufactured for normal water . If seawater or brine required to be used, please specify during inquiry.

4.Capacity control range:100～20%。

5.Auxiliary power： AC 380V/50Hz/3ϕ/4W ； Capacities： 3.0kVA 300～450RT / 5.0kVA 500～2500RT

6.Maximum working pressure is 1.0MPA for both chilled and cooling water.If higher maximum working pressure is required,please specify during inquiry.(Optional maximum working pressure can be up to 2.0MPA)

7.Chilled Water's Fouling Factor is 0.018m2 ℃ /kW，Cooling Water's Fouling Factor is 0.044m2 ℃ /kW.

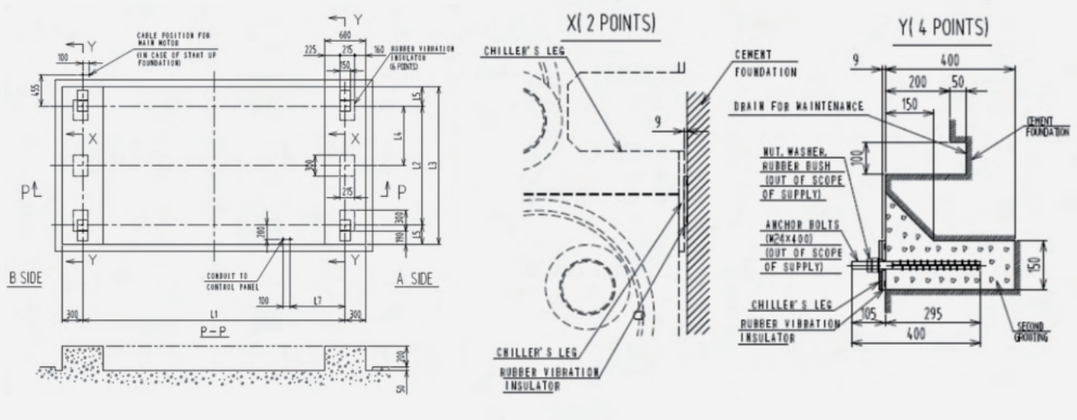
8.It is our consistent policy to improve the products, and the configuration is subject to change without prior notice.

Product Installation

Unit installation environmental

- The unit cannot be installed in a corrosive, flammable and explosive environment or a place with special requirements such as oil mist, otherwise it will cause the unit to fail to operate normally or shorten the service life of the unit, and even cause fire or serious injury. If it is set up with a heating body such as a boiler, full attention should be paid to the impact of thermal radiation.
- Please select a room temperature below 40 ° C, well-ventilated place, (because the over high temperature is the cause of electrical failure and accelerate the corrosion of the equipment) at 40 ° C, the relative humidity of the environment should be below 90%, do not allow outdoor or open installation, storage.
- The altitude is below 1000 meters (because of the high altitude, it will affect the electrical insulation and conductivity, and the unit needs special correspondence).
- Please choose a place with less dust (too much dust is also one of the causes of electrical failure).
- Please choose good lighting, conducive to maintenance and inspection. In order to meet the needs of maintenance, overhaul and cleaning of the evaporator-condenser heat exchange tube, sufficient space must be left around the unit.
- In order to facilitate the lifting and maintenance of the machine, the line machine or the boom crane should be installed and pay attention to
- the machine room to have sufficient height.
- Around the unit and the entire machine room should be able to achieve complete drainage.

Unit basic installation dimensions



User Notice:
1.Floor installation is the standard installation method of the unit, and the foundation on both sides of A and B should be able to withstand the load of the unit.
2.When installing the floor, the attached rubber vibration damping pad should be placed.
3.As shown in the construction of the basic drawing, it can effectively drain water and prevent corrosion of the unit feet.
4.When cleaning the heat exchange tube of the unit, it is necessary to carry out drainage treatment. So please set up drains around the unit.
5.The cement foundation surface needs to be smooth and horizontal, and the horizontal error between the centers above the installation seat must be within 0.5mm every 1m. (Please prepare the level ball for adjustment)
6.Cement construction for foundation and maintenance is not in the scope of our construction.
7.Foundation bolts, nuts, washers will not be supplied, please prepare in advance.
8.Can choose the installation method of the unit according to the local geological conditions and the requirements of the equipment installation specifications for the equipment foundation, such as the fixing method of expansion screws proposed by the design institute and the owner.
9.Please contact us if spring isolator is needed for floor installation.

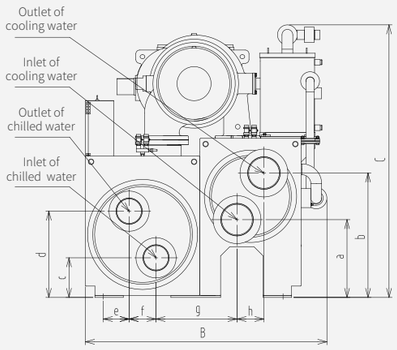
GXG-S(SC) Series

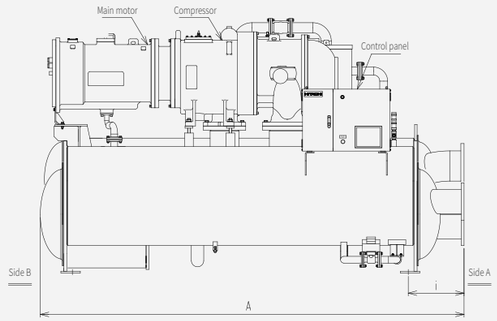
Model	Unit Dimensions				
	L1	L2	L3	L4	L5
—	mm	mm	mm	mm	mm
HC-F300~350GXG-S	2800	1216	1976	620	380
HC-F400~450GXG-S	2800	1303	2063	620	380
HC-F500GXG-S	3300	1373	2133	680	380
HC-F500~650GXG	3300	1402	2162	680	380
HC-F700~850GXG-S	3300	1622	2382	835	380
HC-F900~950GXG（H）-S	3300	1758	2518	870	380
HC-F1000~1100GXG（H）-S	3300	1758	2518	870	380
HC-F1150~1400GXG（H）-S	3800	1898	2658	970	380
HC-F1500~1600GXG-S	3776	2568	3468	1306	450
HC-F1700~2000GXG-S	3760	2754	3654	1370	450
HC-F2100~2300GXG-S	4260	3121	4021	1370	450
HC-F2400~2500GXG-S	4260	3121	4021	1370	450
HC-F2600~3000GXG-SSC	4220	3351	4251	1417	450

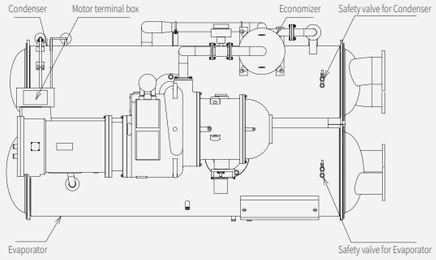
GFG-S Series

Model	Unit Dimensions				
	L1	L2	L3	L4	L5
—	mm	mm	mm	mm	mm
HC-F300-350GFG-S	3300	1216	1976	620	380
HC-F400-450GFG-S	3800	1303	2063	620	380
HC-F500GFG-S	3800	1402	2162	650	380
HC-F500 650GFG-S	3800	1402	2162	650	380
HC-F700 ~ 850GFG-S	3800	1622	2382	800	380
HC-F900 ~ 950GFG(H)-S	3800	1758	2518	850	380
HC-F1000 ~ 1100GFG(H)-S	3800	1758	2518	850	380
HC-F1150 ~ 1400GFG(H)-S	4300	1898	2658	900	380
HC-F1500~1600GFG-S	4776	2668	3468	1306	450
HC-F1700-2000GFG-5	4760	2754	3554	1370	450
HC-F2100-2300GFG-S	4760	3121	4021	1370	450
HC-F2400-2500GFG-5	4760	3121	4021	1370	450

Unit outline and piping size





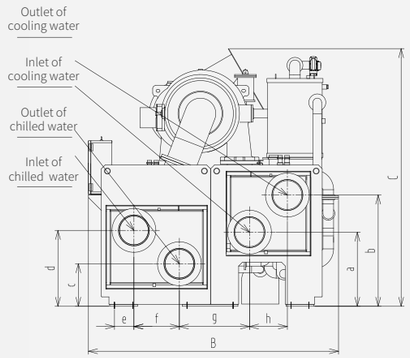


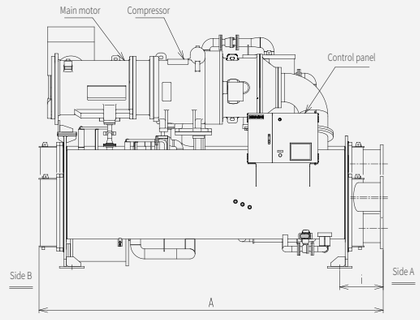
User Notice:
1.Facing the operation panel of the electric control box, inlet and outlet of cold water and cooling water are in the right side. If the direction of the piping is otherwise specified, it should be clearly marked in the contract.
2.Cold water and cooling water are both in from the bottom and out from the top. The piping flange should be prepared by the customer. Please refer to the PN16 plate flat welded steel pipe flange in HG/T20592-2009.
3.The piping of cold water and cooling water should be supported by a pipe frame to prevent the heavy load of the evaporator cooler.
4.In the inlet piping side of cold water and cooling water, please install 10-mesh filter.
5.Please arrange the flow adjustment of cold water and cooling water at the outlet side of the unit.
6.Install the pressure gauge and the valve for disassembling the pressure gauge within 200mm from the inlet and outlet pipe flange of the cold water and cooling water of the chiller.

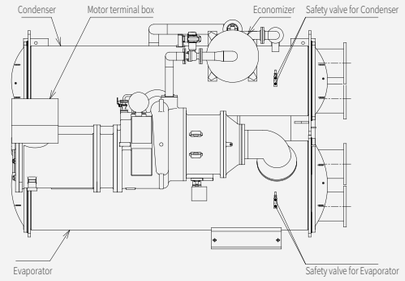
GFG-S Series (300 ~ 1400RT)

Model	Unit Dimensions			Pipe Position Dimensions								
	A	B	C	a	b	c	d	e	f	g	h	i
—	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
HC-F300 ~ 350GFG-S	4100	1650	2200	619	987	351	663	117	180	562	214	525
HC-F400 ~ 450GFG-S	4650	1900	2400	671	1017	372	712	170	196	652	200	525
HC-F500 ~ 550GFG-S	4650	2000	2450	663	1057	368	762	176	228	667	228	525
HC-F600 ~ 650GFG-S	4650	2000	2450	663	1057	387	781	176	228	667	228	525
HC-F700 ~ 750GFG-S	4700	2250	2650	768	1162	363	757	231	228	775	228	525
HC-F800 ~ 850GFG-S	4700	2250	2650	740	1190	383	777	231	228	758	260	525
HC-F900 ~ 950GFG(H)-S	4700(4750)	2400	2800	745	1195	393	878	239	280	800	260	525
HC-F1000 ~ 1100GFG(H)-S	4700(4750)	2400	2800	745	1195	393	878	239	280	795	270	525
HC-F1150GFG(H)-S	5050(5150)	2700	2900	858	1278	456	836	164	500	668	444	420
HC-F1200 ~ 1400GFG(H)-S	5050(5150)	2700	2900	858	1278	475	855	164	500	668	444	420

Unit outline and piping size







User Notice:
1.Facing the operation panel of the electric control box, inlet and outlet of cold water and cooling water are in the right side. If the direction of the piping is otherwise specified, it should be clearly marked in the contract.
2.Cold water and cooling water are both in from the bottom and out from the top. The piping flange should be prepared by the customer. Please refer to the PN16 plate flat welded steel pipe flange in HG/T20592-2009.
3.The piping of cold water and cooling water should be supported by a pipe frame to prevent the heavy load of the evaporator cooler.
4.In the inlet piping side of cold water and cooling water, please install 10-mesh filter.
5.Please arrange the flow adjustment of cold water and cooling water at the outlet side of the unit.
6.Install the pressure gauge and the valve for disassembling the pressure gauge within 200mm from the inlet and outlet pipe flange of the cold water and cooling water of the chiller.

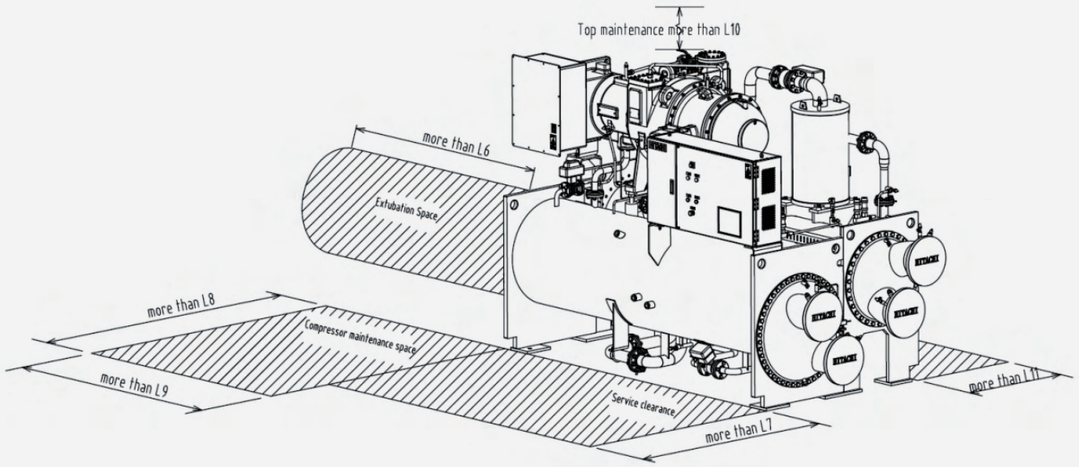
GXG-S Series (1500 ~ 2500RT)

Model	Unit Dimensions			Pipe Position Dimensions								
	A	B	C	a	b	c	d	e	f	g	h	i
—	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
HC-F1500GXG-S	4850	3300	3400	979	1469	562	1002	257	600	925	500	612
HC-F1600GXG-S	4850	3300	3400	979	1469	582	1022	257	600	925	500	612
HC-F1700GXG-S	4950	3500	3550	1005	1565	603	1043	269	700	897	580	620
HC-F1800GXG-S	4950	3500	3550	1005	1565	603	1043	269	700	897	580	620
HC-F1900GXG-S	4950	3500	3550	1005	1565	623	1063	269	700	897	580	620
HC-F2000GXG-S	4950	3500	3550	1005	1565	623	1063	269	700	897	580	620
HC-F2100GXG-S	5500	3850	3850	1073	1713	641	1141	388.5	800	1035	600	620
HC-F2200GXG-S	5500	3850	3850	1073	1713	660.5	1160.5	388.5	800	1035	600	620
HC-F2300GXG-S	5500	3850	3850	1073	1713	680	1180	388.5	800	1035	600	620
HC-F2400GXG-S	5500	3850	3850	1073	1713	680	1180	388.5	800	1035	600	620
HC-F2500GXG-S	5500	3850	3850	1073	1713	699.5	1199.5	388.5	800	1035	600	620

GFG-S Series (1500 ~ 2500RT)

Model	Unit Dimensions			Pipe Position Dimensions								
	A	B	C	a	b	c	d	e	f	g	h	i
—	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
HC-F1500GFG-S	5580	3200	3400	979	1469	562	1002	257	600	925	500	612
HC-F1600GFG-S	5580	3200	3400	979	1469	582	1022	257	600	925	500	612
HC-F1700GFG-S	5580	3350	3400	1005	1565	603	1043	269	700	897	580	620
HC-F1800GFG-S	5950	3350	3550	1005	1565	603	1043	269	700	897	580	620
HC-F1900GFG-S	5950	3350	3550	1005	1565	623	1063	269	700	897	580	620
HC-F2000GFG-S	5950	3350	3550	1005	1565	623	1063	269	700	897	580	620
HC-F2100GFG-S	6000	3750	3850	1073	1713	641	1141	388.5	800	1035	600	620
HC-F2200GFG-S	6000	3750	3850	1073	1713	660.5	1160.5	388.5	800	1035	600	620
HC-F2300GFG-S	6000	3750	3850	1073	1713	680	1180	388.5	800	1035	600	620
HC-F2400GFG-S	6000	3750	3850	1073	1713	680	1180	388.5	800	1035	600	620
HC-F2500GFG-S	6000	3750	3850	1073	1713	699.5	1199.5	388.5	800	1035	600	620

Unit maintenance space



GXG-S(SC) Series

Model	Unit Dimensions					
	L6	L7	L8	L9	L10	L11
—	mm	mm	mm	mm	mm	mm
HC-F300~350GXG-S	3300	1500	2000	2500	850	500
HC-F400~450GXG-S	3300	1500	2000	2500	850	500
HC-F500GXG-S	3800	1500	2000	2500	850	500
HC-F550~650GXG	3800	1500	2000	2500	850	500
HC-F700~850GXG-S	3800	1500	2000	2500	900	500
HC-F900~950GXG（H）-S	3800	1500	2000	2500	900	500
HC-F1000~1100GXG（H）-S	4300	1500	2000	2500	1000	500
HC-F1150~1400GXG（H）-S	4300	1500	2000	2500	1000	500
HC-F1500~1600GXG-S	4300	1600	2400	3300	1000	700
HC-F1700~2000GXG-S	4300	1600	2400	3300	1000	700
HC-F2100~2300GXG-S	4800	1600	2400	3300	1000	700
HC-F2400~2500GXG-S	4800	1600	2400	3300	1000	700
HC-F2600~3000GXG-SSC	4800	1600	2400	3300	1000	700

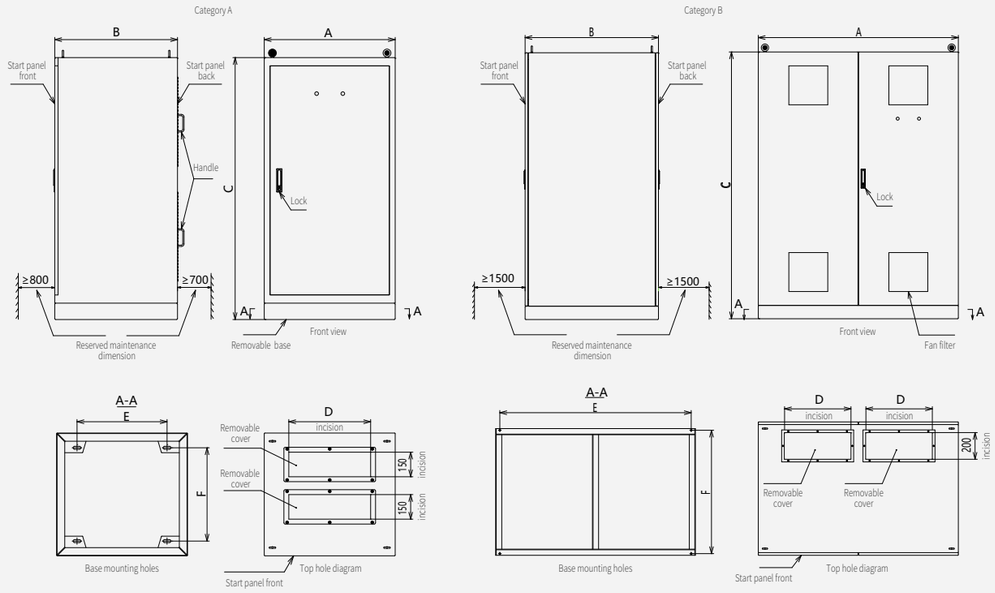
GFG-S Series

Model	Unit Dimensions					
	L6	L7	L8	L9	L10	L11
—	mm	mm	mm	mm	mm	mm
HC-F300~350GFG-S	3800	1500	2000	2500	850	500
HC-F400~450GFG-S	4300	1500	2000	2500	850	500
HC-F500GFG-S	4300	1500	2000	2500	850	500
HC-F550~650GFG	4300	1500	2000	2500	850	500
HC-F700~850GFG-S	4300	1500	2000	2500	900	500
HC-F900~950GFG（H）-S	4300	1500	2000	2500	900	500
HC-F1000~1100GFG（H）-S	4800	1500	2000	2500	1000	500
HC-F1150~1400GFG（H）-S	4800	1500	2000	2500	1000	500
HC-F1500~1600GFG-S	5300	1600	2400	3300	1000	700
HC-F1700~2000GFG-S	5300	1600	2400	3300	1000	700
HC-F2100~2300GFG-S	5300	1600	2400	3300	1000	700
HC-F2400~2500GFG-S	5300	1600	2400	3300	1000	700

Delivery and Installation Chart

Category		GA Scope (Domestic)	Customer Scope	Notes
Delivery Scope	Centrifugal Chiller Unit	●		①Evaporater ②Condenser ③Compressor ④Electric Control Box ⑤Bearing Control Box ⑥Inverter Box
	Parts with Chiller	●		①Anti-vibration rubber for Chiller ② Chiller technical documents*1
Moving-in	From Factory to Site	●		—
	Installation base for unit on site		●	—
Assembly	On-site assembly	●		If chiller unit shipped on a disassembled form
	Unit Installation		●	—
Installation	Startup & Commissioning	●		Once
	Operation Instruction	●		—
Electical Works	External electrical wiring installation		●	Please install wiring all the way to terminal strip within the inverter box
	Basic Contracting Works		●	—
Other Works	External wiring works		●	—
	Prevent freezing of chilled water piping		●	During operation stop in the winter, please have anti-freeze treatment or release all water for the chilled water and cooling water piping.
	Water mgmt. for chiller water		●	Please setup chiller water piping with appropriate water quality management
	Evaporator insulation	●		—
	Chilled water piping works		●	—
Painting	Chiller Unit	●		Use anti-rust base paint and gray anti-corrosion paint
	Electical Control Box	●		Anti-rusting processing (Use anti-rust base paint: Munsell 5Y 8/1 bright)
	Starter Box	●		Anti-rusting processing (Use anti-rust base paint: Munsell 5Y 7/1 semi-gloss)
OthersOthers	Electricity, water, sand etc. for on-site installation		●	—
	Electricity, water etc. for on-site calibration		●	—

Star-Delta start panel dimension



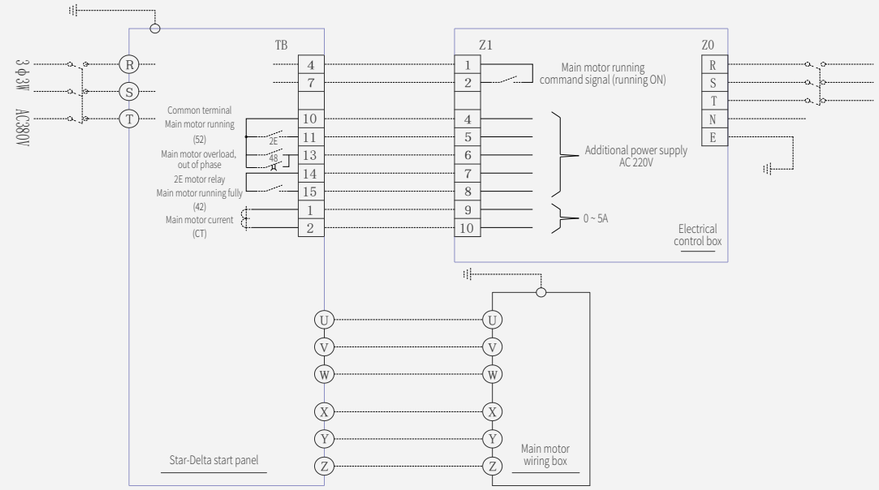
GFG-S Series

Model	Start panel type	L	W	H	D	E	F
—	—	mm	mm	mm	mm	mm	mm
HC-F300 ~ 450GFG-S	A	800	600	2100	500	50	570
HC-F500 ~ 600GFG-S	A	800	50	1700	500	50	570
HC-F650 ~ 800GFG-S	A	1000	800	1900	620	750	620
HC-F850 ~ 1000GFG-S	A	1000	800	2200	620	750	620
HC-F1050 ～ 1400GFG-S	B	1500	1000	2100	500	1435	925

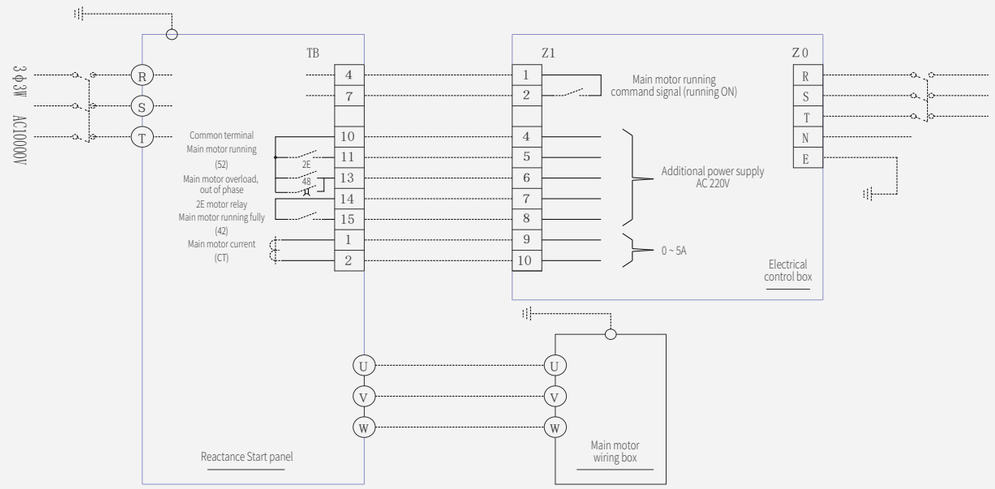
Caution:
1.There are power inlet and outlet posts in the starting cabinet, and the connection between the outlet post and the power terminal post is taken care of by the user;
2.The back of the starter cabinet can be removed during maintenance;
3.The standard wiring mode of the starter cabinet is up and out. If customer have special requirements, please contact the local office.

Field Wiring Diagram

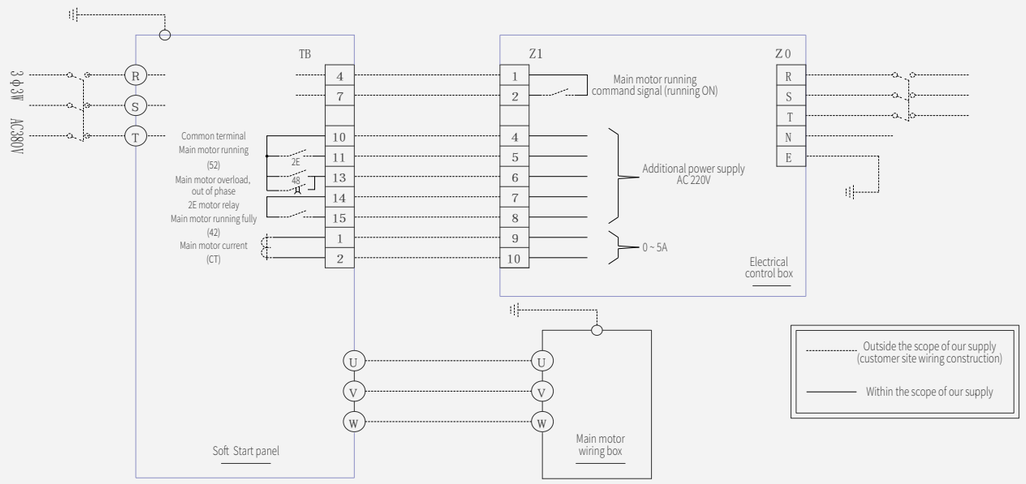
Star-Delta start



Reactance Start



Soft Start(optional)



Note: This image is for reference only

Advisory Notes

Chilled water & cooling water variable flow control

The inverter water pump can change the water flow rate of the system according to the load change, thereby reducing the pump consumption of the system, so when the customer needs to control the variable flow of the chilled water & cooling water pump of the centrifuge, in order to ensure the normal operation of the chiller and let the system run stably and efficiently, the following precautions need to be taken into account:

Chilled water & cooling water variable flow control conditions:

Items	Contents	Notes
Variable flow range	50% ~ 100%	In order to prevent the chiller from entering the over-cooling protection during startup, follow the 100% flow rate during startup
Rate of flow change	Not more than 30% per minute	If the flow change (increase or decrease) is too large, the opening and closing speed of the chiller capacity control device blade can not immediately catch up, which can lead to the chilled water outlet temperature overcooling alarm, so that the host fault shutdown. Therefore, please pay full attention to the appropriateness of the rate of change of water flow
Start-up flow rate	Rated flow, maintenance time about 30 minutes	In order to prevent the chiller from entering the over-cooling protection during startup, follow the 100% flow rate during startup
The signal interrupts	Force the operation to follow the rated flow rate	When the variable flow signal is interrupted or short-circuited, the variable frequency pump is generally used to restore the rated frequency control mode. Therefore, the chilled water and cooling water will be forced to adjust to the rated flow rate when the signal is interrupted

Precautions for variable flow control of chilled water & cooling water

- The chilled water circuit adopts variable flow rate, which can reduce the pump consumption of the system, and will not lead to the reduction of unit efficiency.
  The cooling water circuit adopts variable flow rate, although it can reduce the system pump consumption, but it will bring about the increase of the condensation pressure of the unit, and the pressure head of the compressor rises, which is easy to make the unit enter the surge area, and the power consumption of the compressor increases. In the end, the energy saved by the pump only compensates for the increased power consumption of the compressor. Therefore, when the cooling water is transformed, the temperature of the cooling water outlet should be controlled below 37°C as much as possible, and in order to ensure that the overall energy consumption of the system is reduced, it is recommended to carry out the cooling water flow according to the following table：

cooling capacity	20% ~ 70% ~ 100%
cooling water flow rate	50% ~ 100% ~ 100%

- When the chilled water & cooling water need to be controlled by variable flow, pay attention to the flow ratio can not be reversed, and the water pump of chilled water & cooling water should be controlled by frequency conversion, please ensure that the flow ratio of chilled water/cooling water is ≤1.

The flow rate of water in the container must be kept within a certain range, and the maximum should not exceed 3.0m/s. If the flow rate is too low, it is easy to attach scale or rust to the inner wall of the pipe, which is easy to cause problems such as the reduction of the efficiency of the main engine; if the flow rate is too high, it will lead to excessive pressure drop and increase the wear of the pipeline. Please confirm with our company for specific flow rate and flow limit, and at the same time, in terms of daily maintenance, please strictly manage water quality and clean copper pipes regularly.

Operation Instruction

Storage environment

Category	Contents
Ambient Temperature	Below 40℃ (When the ambient temperature is lower than 0℃, water side of evaporator and condensor must release pressure and add appropriate amount of anti-freeze, or release all water)
Relative Humidity	Relative humidity in environment should be under 80%， without condensing water
Atmosphere Corrosive Gas Content	SO2: ≤10mg/m3 HCN: ≤5mg/m3 H2S: ≤5mg/m3 Nitrogen Oxides: ≤5mg/m3 HCL: ≤5mg/m3 CL: <1mg/m3
Storage	① Please store the unit in the room with ventilation facilities, do not store outdoors in direct contact with rain, water and sunlight. ② The unit must not be placed in a corrosive, flammable and explosive, and oil mist environment

Water quality management

When the unit is running, the quality of chilled water & cooling water directly affects the performance and life of the unit. Therefore, it is necessary to investigate the water quality well in advance and manage the water quality while the unit is running. It is recommended that the water used in the system meet the following parameters:

Category		Unit	Benchmark	Corrosion	Fouling
Standard Items	PH(25℃)	—	6.5 ~ 8.0	●	●
	Conduciveness(25℃)	μs/cm	<800	●	●
	CL- ions	mg(CL-)/L	<200	●	
	SO_4^{2-} ions	mgSO_4^{2-}/L	<200	●	
	Acid Consumption(PH=4.80)	mg($CaCO_3$)/L	<100	●	
	Water Hardness	mg($CaCO_3$)/L	<200		●
Reference Items	Fe	mg(Fe)/L	<1.0		●
	S^{2-}	mg(S^{2-})/L	—	●	
	NH+ions	mg(NH+)/L	<1.0	●	
	SiO_2	mg(SiO_2)/L	<50		●

Note:
1. The water quality index refers to the "Vapor Compression Circulating Chilled Water (Heat Pump) Unit" GB/T18430.1-2007, and the appendix cools the water quality.
2. The "●" in the table indicates the relevant factors of corrosion or scaling tendency.
3. If the water quality does not meet the requirements of GB/T18430.1-2007, please refer to the GB50050-2007 "Design Code for Industrial Circulating Cooling Water Treatment" for treatment.

Operating environment

Category	Contents
Voltage Fluctuating Range	Rated running voltage ±10%
Voltage Imbalance	≤2%
Operating Environment Temperature	3℃ ~ 40℃(Chiller plant room ambient temperature)
Relative Humidity	Relative humidity in environment should be under 80%， without condensing water
Altitude	＜1000 meters(High altitiude will influence the electric insulation and conductive performance of the unit, need special adjustmenets)
Atmosphere Corrosive Gas Content	SO_2: ≤10mg/m³ HCN: ≤5mg/m³ H_2S: ≤5mg/m³ Nitrogen Oxides: ≤5mg/m³ HCL: ≤5mg/m³ CL: <1mg/m³
installation	① The unit cannot be installed in a corrosive, flammable and explosive environment or a place with special requirements such as oil mist, otherwise it will cause the unit to fail to operate normally or shorten the service life of the unit, and even cause fire or serious injury. If installed together with heating elements such as boilers, full attention should be paid to the impact of thermal radiation ② Please install the unit in a well-ventilated place, because over-high temperature is the cause of electrical failure and can accelerate the corrosion of the equipment ③ Please choose a place with less dust, because excessive dust is also one of the causes of electrical failure ④ Please choose a place with good lighting, which is conducive to maintenance and inspection ⑤ In order to meet the needs of maintenance, overhaul and cleaning of the evaporator-condenser heat exchange tube, there must be enough space around the unit ⑥ To facilitate machine lifting and maintenance. The crane or boom crane should be installed, and pay attention to the machine room to have sufficient height ⑦ Around the unit and the whole machine room should be able to achieve complete drainage

Unit insulation

The factory has laid a 20mm thick insulation layer on the evaporator shell (including end covers, feet, etc.), compressor suction pipes and motor housings and other parts that mainly need to be insulated.
For different use environments, 25mm, 40mm and other thickness non-standard options can be provided according to customer requirements. Please specify when ordering. You can refer to the following table to select the thickness of the insulation layer:

Chilled water outlet Temperature	Ambient temperature	Relative humidity	Recommended insulation thickness
℃	℃	%	mm
teo≥5	10 ～ 32	RH≤70	20
		70＜RH≤73	25
		73＜RH≤38	40
4≤teo<5	10 ～ 32	RH≤73	40

Note:
If the unit exceeds the above range, please contact the factory technical support to confirm the thickness of the corresponding unit insulation material.