

# Magnetic Oil Free Centrifugal Water-Cooled (Air-Cooled) Chiller



H.Stars (Guangzhou) Refrigerating Equipment Group Ltd.



H.Stars 50STD Magnetic Oil Free Centrifugal Chiller has two series: "Magnetic Oil Free Centrifugal Water-Cooled Chiller" and "Magnetic Oil Free Centrifugal Air-Cooled Chiller". 8 standard specifications with Cooling Capacity range from 420 - 7800kw, Lowest outlet chilled water temperature is 5°C. Customized service available base on client requirement, such as Anti-corrosion sea water chiller with various power supply.

## High Efficiency & Reliable Operation Two Stage Centrifugal Compressor

System Economizer supply gas refrigerant for two stage centrifugal compressor, to increase cooling capacity up to 10%.

Intelligent identify surge area, adjust the rotate speed and IGV in time to avoid surge, more stable and reliable than normal centrifugal chiller.

## DC Variable Frequency Driver motor, high efficiency and energy saving

Permanent magnet synchronous motor is cooled by refrigerant, the efficiency is up to 97%.

Built-in soft starter, starting current is only 2A, no impact to the power grid.

## High Efficiency and Excellent Performance Heat Exchanger

Adopt self-developed high efficiency heat exchanger. Electronic expansion valve and liquid level sensor to control the liquid refrigerant level to ensure the evaporator always in the high efficiency heat exchange state.

IPLV reach 10.7, In partial load COP exceeds 13.

## Magnetic Oil Free Technology, Energy saving and low sound level

Without mechanical friction, Noise less than 74dB(A);  
Magnetic bearing, energy consumption reduced by 10%;  
Oil free system, reduces the heat loss of the heat exchanger, improves the performance of heat exchanger, and avoids the complicated oil system to simply the maintenance service.

## With Heat Recovery System, Free and practical (Optional)

Own heat recovery patent. The waste heat, which generated in the refrigeration process, is recovered by adopting our own patented heat recovery unit. When the chiller is adopted heat recovery system, the chiller not only provides chilled water but also a large amount of free hot water.

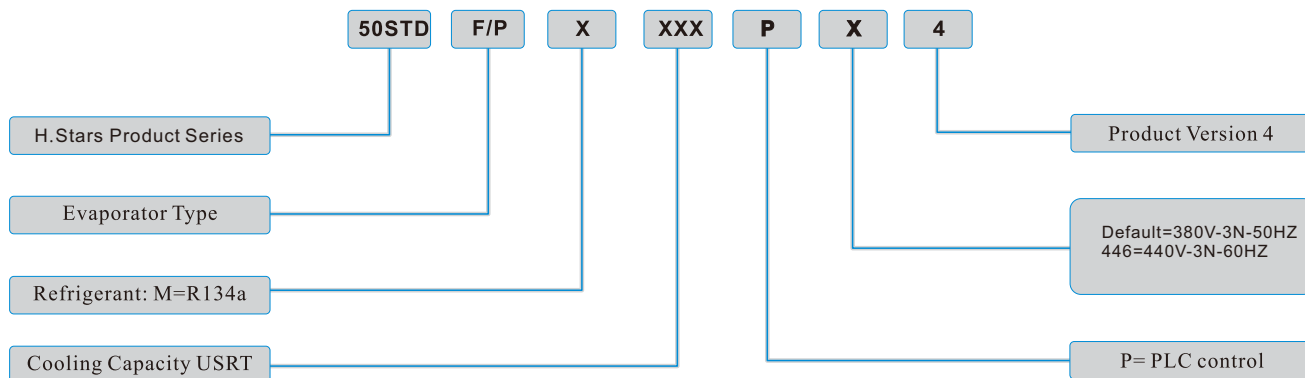
## R134a Refrigerant , Low-GWP Refrigerant

Fully Optimized for ultimate performance with a next generation low-GWP refrigerant. The world's mainstream environmental friendly refrigerant with a good comprehensive performance, the Ozone Depletion Potential (ODP) is 0.

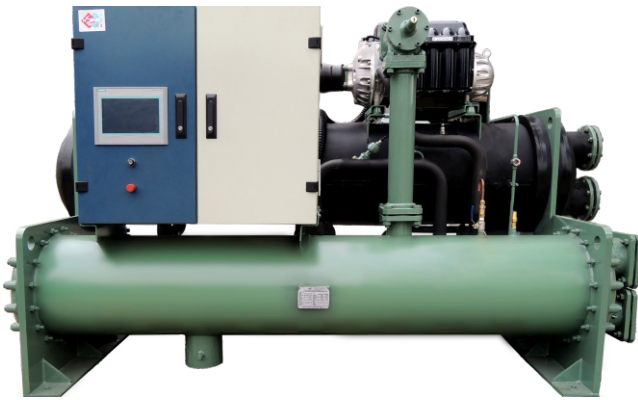


400RT Magnetic Oil Free Centrifugal Chiller

## Model Nomenclature



## Magnetic Oil Free Centrifugal Water-Cooled Chiller



Standard Configuration	
Compressor	Hanbell/Danfoss Magnetic Oil Free Centrifugal Compressor
Evaporator	Self-produced high efficiency evaporator
Condenser	Self-produced high efficiency condenser
Controller	Microcomputer controller
Economizer	Plate Type Heat Exchanger
Throttling Gear	Electronic expansion valve
Starting mode	Variable frequency starting
Power Supply	380V-3N-50HZ/460V-3N-60HZ
Insulation Material	Anti-corrosive waterproof mesh insulation
Packaging	Reinforced Shnk-wrap Covering , industrial-grade
Oil Paint	High strength matt paint
Water Pipe Connection	Flange

Magnetic Oil Free Centrifugal Water-Cooled Chiller, adopted Hanbell magnetic oil free variable-frequency centrifugal compressor or Danfoss Tubocor centrifugal compressor, equipped with self-developed and manufactured high-efficiency evaporator and condenser, and matched with international brand electronic expansion valve. IPLV can reach 10.7, In partial load COP exceeds 13. The unit control the outlet water

temperature precisely to  $\pm 0.1^{\circ}\text{C}$  with compressor variable frequency driver adjustment and automatic centralized control system. Cooling capacity range from 560kw-780kw, chilled water outlet temperature range: 5-20  $^{\circ}\text{C}$ . In spite of the standard unit, customized service also available to design any kinds of non-standard unit.

## Magnetic Oil Free Centrifugal Air-Cooled Chiller



Standard Configuration	
Compressor	Danfoss Tubocor Centrifugal Compressor
Evaporator	Self-produced high efficiency evaporator
Condenser	Self-produced high efficiency condenser
Fan	External rotor fan
Controller	PLC Controller
Economizer	Plate Type Heat Exchanger
Throttling Gear	Electronic expansion valve
Starting mode	Variable frequency starting
Power Supply	380V-3N-50Hz/460V-3N-60Hz
Insulation Material	Anti-corrosive waterproof mesh insulation
Packaging	Reinforced Shrink-wrap Covering, industrial-grade
Oil Paint	High strength matt paint
Water Pipe Connection	Flange

Magnetic Centrifugal Air-Cooled Chiller, adopting Danfoss Air-Cooled dedicated magnetic Tubocor centrifugal compressor, equipped with self-developed and manufactured high-efficiency evaporator and high-efficiency fin type condenser. Low energy consumption,

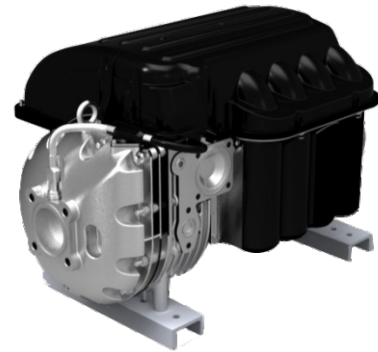
low sound external rotor fan is adopted. Chilled water outlet temperature range: 5-20 $^{\circ}\text{C}$ . Unit can operate at -5-43 $^{\circ}\text{C}$  ambient temperature. Applicable to all kinds of small and medium size industrial and commercial use.

## Danfoss compressor

The magnetic oil-free bearing and variable frequency shift regulation are combined with digital network control technology to achieve maximum energy efficiency.

The outer casing of the compressor is made of aerospace cast aluminum, the outer casing of the electronic component is made of high-strength thermoplastic material, and the impeller is machined by cast aluminum.

Compressor integrated frequency converter, anti-surge control, motor control, cooling control in one.



## Hanbell compressor

Active magnetic suspension bearings (AMB) and magnetic bearing control systems (MBC) are used.

It is equipped with permanent magnet synchronous motor and water-cooled variable frequency drive. The output is efficient and smooth, and the volume is only 50% of the air-cooled inverter.

Extra ceramic bearing is equipped to protect the compressor from power failure.

Fully enclosed two-stage aluminum alloy impeller, which is stable and efficiency.

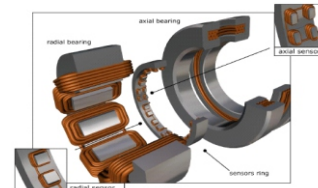


## Active magnetic suspension bearing

The magnetic suspension bearing works without friction, no energy loss, with long life-cycle.

Magnetic suspension bearings do not require lubricating oil, eliminating the hassle of traditional bearing clock lubricants.

The magnetic suspension bearing works without friction, small vibration, and very low sound levels.



## Permanent magnet synchronous

Permanent magnet synchronous technology, the power conversion rate is upto 97%.

Fully optimized for ultimate performance with a next generation low-GWP refrigerant, reliable operation and highly efficient, VFD starting, starting current only 2A, no impact on the power grid.

The PLC-VFD-MBC tripartite linkage, a complete negative feedback closed-loop control system, real-time regulation of the output frequency and voltage of the inverter circuit, to achieve precise control of the motor speed.



# Main Components(Shell and Tube Heat Exchanger)

Magnetic Oil Free Centrifugal Chiller

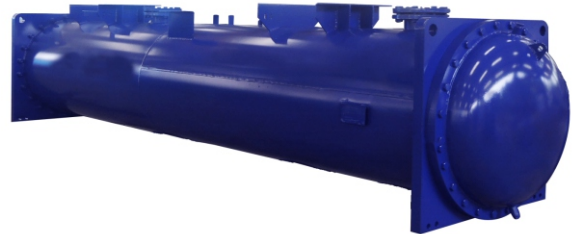
## High efficiency evaporator

The refrigerant entering the evaporator is spraying downward from the upper side of the heat exchange tube array, and the liquid refrigerant forms a film flowing downward on the tube wall. Since only a layer of liquid refrigerant film is coated on the surface of the heat exchange tube, the heat transfer effect is excellent.

The shell is made of Q345R steel, the heat exchange copper tube is double-sided enhanced high-efficiency tube, and besides the heat exchange tube is available in various materials and thicknesses. The distributor is made of stainless steel and is produced by self-owned CNC machine to ensure the quality of liquid distributor structure of falling film evaporator.

It only needs a small amount of liquid refrigerant at the bottom of evaporator, so the refrigerant charge volume of the unit is small and meets environmental protection requirements.

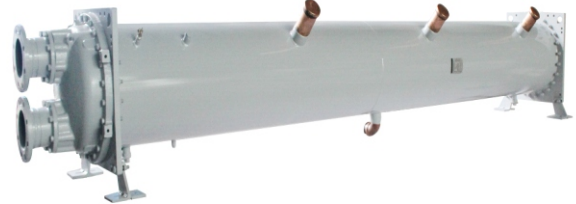
The refrigerant vapor does not need to be superheated, and the evaporation temperature can be greatly improved.



## High efficiency condenser

The shell is made of Q345R steel, and the heat exchange copper tube is double-sided enhanced high-efficiency tube, which is used to condense the high-temperature and high-pressure refrigerant in the refrigeration system into liquid, with certain degree of sub-cooling, as a result the chiller unit can operate efficiently and energy-efficiently.

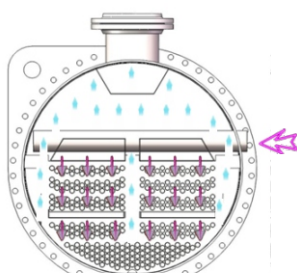
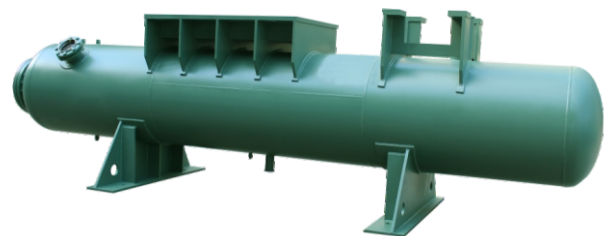
The built-in liquid refrigerant separation device ensures that the liquid refrigerant after condensation is automatically separated from the heat exchange tube, ensuring sufficient contact between the heat exchange tube and the gaseous refrigerant, and greatly improving the heat exchange efficiency of the copper tube. For large capacity chiller units, this technology is very effective, reducing the condensation temperature by about 1 °C.



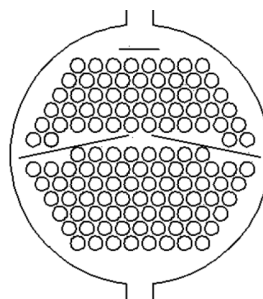
## Economizer

Flash evaporator: The shell is made of Q345R steel. It uses the evaporation of the refrigerant of the unit to cool the liquid refrigerant after the condenser is condensed, which increases the effect of sub-cooling and makes the unit run more efficient and energy-saving.

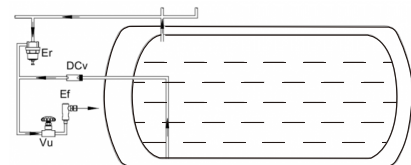
Plate Type Economizer: SUS 316L stainless steel. The Economizer adopts a small portion of the refrigerant evaporated by the expansion valve after throttling, and together with the main refrigerant to be exchanged heat through the plate to reduce the temperature of the main refrigerant, thereby to increase the effect of sub-cooling to improve its energy efficient.



Evaporator



Condenser



Economizer

# HMI (Human Machine Interface) Control Center

Magnetic Oil Free Centrifugal Chiller

## Product features and functions

Adopts high-integration single-chip microcomputer which greatly improves the anti-interference ability of the system.

The HMI directly displays the fault content, and cooperates with the simple operation interface to timely feedback various maintenance information.

The unit control system can be connected to the user's central control system (BMS), so the customer can monitor the chiller operation at any time.

Over-voltage, under-voltage, three-phase unbalance, and lack-phase protection are applied to the external power supply system.

And the chiller has built in more than 30 protection functions to provide comprehensive protection for the safe operation of the unit.

The chiller has advanced multi-anti-surge function, which combines prevention, control and alarm to ensure the unit meet the customer's cooling capacity within the safe operation range. Reserve user connection points to provide cloud services.



Controller

## Control center

It is equipped with a 10-inch display and is fitted with a standard rail.

Built-in electronic expansion valve drive module to ensure more accurate liquid supply.

Three-phase voltage and current are displayed timely and highly integrated with the controller.

The unit can be connected to each other to form module control, group control or single control freely switch to each control mode.

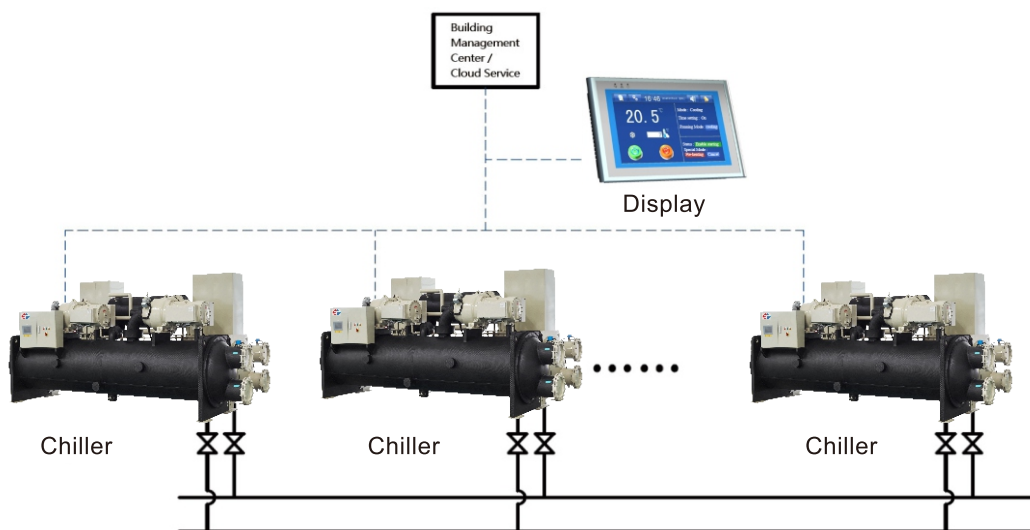
Accurately detect the operating current of the compressor and keep abreast of the operating status of the unit.

The control logic makes different operating strategies based on the detected information to ensure stable operation of the unit.

The high-precision temperature and pressure detecting device has a temperature detection accuracy at 0.01°C and a pressure accuracy at 0.001 Mpa.

Integrated communication interface for access to cloud servers.

## Network of multiple units (module systems)



Building Management System / Cloud Service.

Standard MODBUS interface, compatible with various engineering building management systems. Innovative LAN interface enables multiple unit to be connected into a network, by that it can optimize unit operation and increase life of the unit.

R LAN IP address knob is adopted, different module IP addresses are easier to change through the knob at the construction site.

In the construction site, the power distribution cabinet can be reduce, which greatly save the cost for the project.

The cable controller can achieve switching without stop the unit, it is more flexible.

English/Spanish/French or other language display available , and it displays the content of unit operation, fault conditions, built-in operating instructions ,etc. to facilitate the use of the unit.

Optional hydraulic module control for engineers , easy to operate and use friendly.

## Controller interface

Adopts 10 inch touch screen, the display with a larger screen and true color quality is more delicate and clear for operators to use.

The operation screen is simple and exquisite, showing a lot of useful information and easy to operate.

And it's designed with USB interface, easy to upgrade or download the chiller history running data chart.



## Function Display

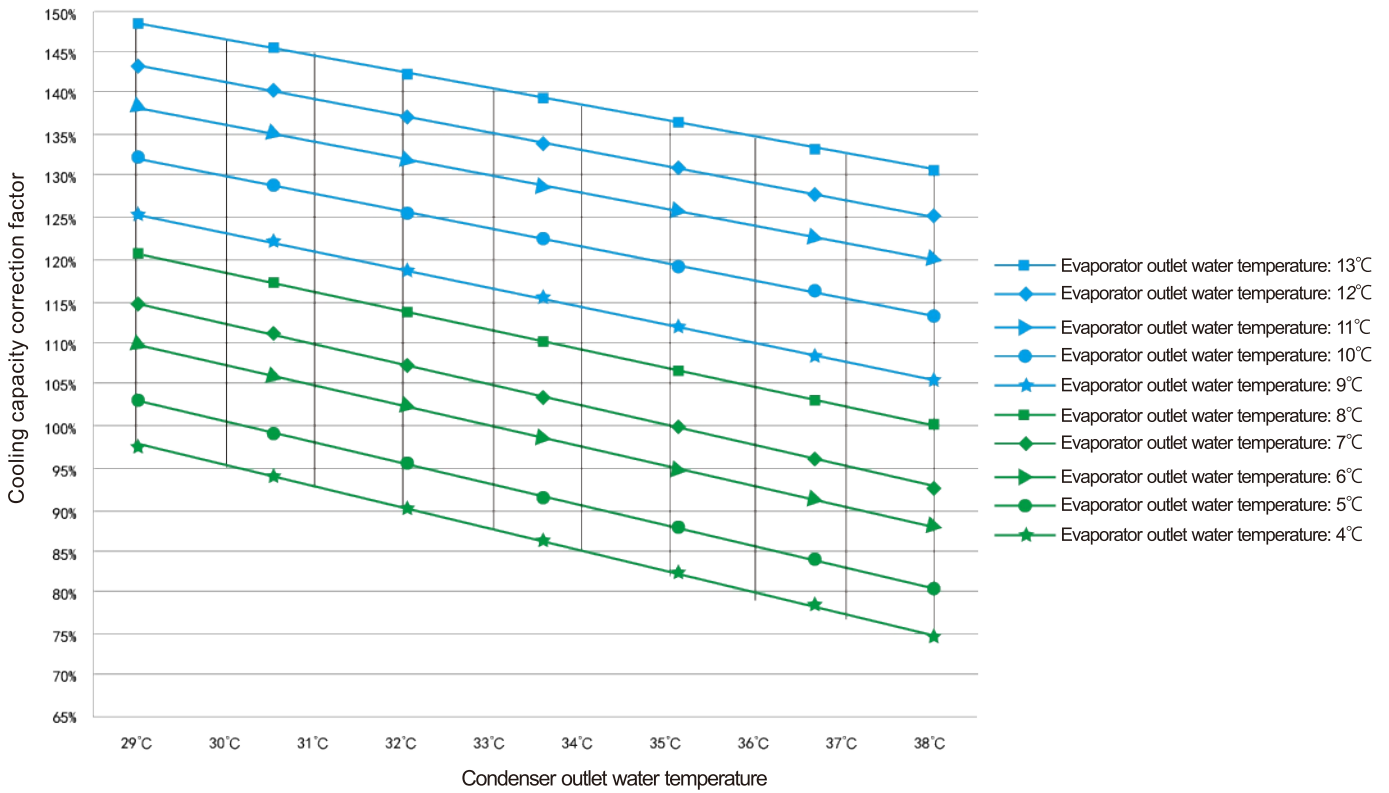
Parameter	Default	Setting Range
Setting model	Cooling	Cooling ,heating,water source automatic
Cooling temperature setting	12.0°C	Cooling down limit~30.0
Heating temperature setting	40.0°C	10.0~Heating up limit
Hot water temperature setting	/	10.0~60.0
Cooling temperature loading deviation	2.0°C	0.5~10.0
Cooling temperature unloading deviation	2.0°C	0.5~10.0
Heating temperature loading deviation	2.0°C	0.5~10.0
Heating temperature unloading deviation	2.0°C	0.5~10.0
Hot water temperature deviation	/	0.5~10.0
Power-on self-start setting	Disable	Disable/Power on automatically/Power on holding
1# compressor operating settings	Enable	Disable/Enable
2# compressor operating settings	Enable	Disable/Enable
3# compressor operating settings	Enable	Disable/Enable
4# compressor operating settings	Enable	Disable/Enable
Timer settings	Disable	Disable/Enable
Cooling external circulation temperature	/	- 30~100
Heating external circulation temperature	/	- 30~100
External circulation control temperature difference	/	0.5~10.0
Remote control cooling and heating switching	/	Disable/Enable
Prior choice	/	Hot water priority ,air conditioner priority
Chilled water setting temperature	/	0.0~40.0
Chilled water temperature deviation	/	0.5~10.0

## Fault display function

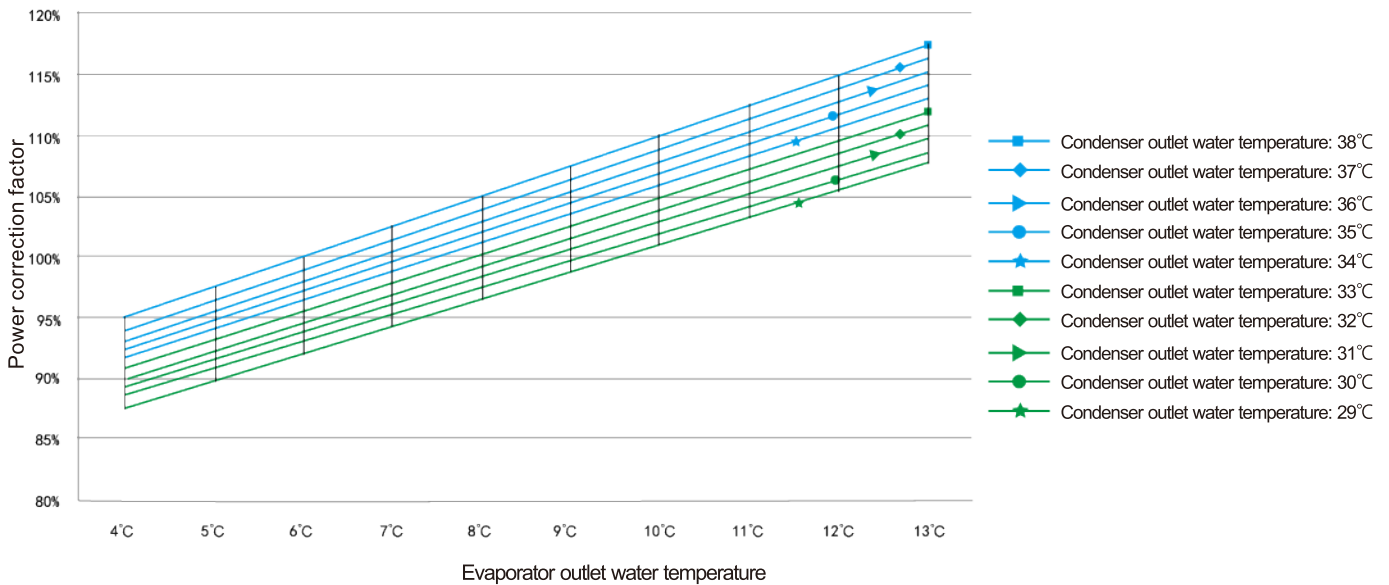
System failure				
Fault number	Fault name	Testing condition	Alarm action	Trouble clearing
1	External alarm	Power-on detection	Unit shut down	Check the [External Alarm] switch signal
2	A/C pump overload	Power-on detection	Unit shut down	Check [A/C pump overload] switch signal
3	A/C pump overload	The pump is power-on and the water flow is established. Please refer to "Pipe System Protection"	Unit shut down	Check the water flow switch signal Please refer to, "Pipe System Protection"
4	Water source pump overload	Power-on detection	Unit shut down	Check [water source pump overload] switch signal
5	Insufficient Water flow	The pump is power-on and the water flow is established. Please refer to "Pipe System Protection"	Unit shut down	Check the water flow switch signal Please refer to, "Pipe System Protection"
6	System power failure	Power-on detection	Unit shut down	Check the [system power failure] switch signal
7	External circulation pump overload	Power-on detection	Unit shut down	Check the [outer circulation pump overload] switch signal
8	External circulation Insufficient water flow	The pump is power-on and the water flow is established.	Unit shut down	Check [external circulation water flow is insufficient] switch signal
9	Cooling tower fan overload	Power-on detection	Unit shut down	Check [cooling tower fan overload] switch signal
10	Hot water pump overload	Power-on detection	Unit shut down	Check the [hot water pump overload] switch signal
11	Insufficient hot water flow	The pump is power on and the water flow is established	Unit shut down	Check [hot water flow is insufficient] switch signal
16	The system water and return water temperature difference is too large	Unit operation test	Unit shut down	Check waterway Sensor
17	System evaporation return temperature fault	Power-on detection	Alarm during one fault, Unit shut down when both faults happened	Check the corresponding temperature Sensor
18	System evaporation outlet temperature failure	Power-on detection		
19	System condensation return temperature fault	Power-on detection	Alarm during one fault, Unit shut down when both faults happened	
20	System condensation outlet temperature failure	Power-on detection		
21	Environmental temperature probe failure	Power-on detection	Only Alarm	
22	External circulation temperature failure	Power-on detection	Only Alarm	
23	Temperature of A/C side is too low	Unit operation detection	Unit shut down	Detect whether the corresponding temperature is in the normal range
24	Temperature of A/C side is too high	Unit operation detection	Unit shut down	Please refer to Waterway Protection
25	Water source side temperature is too low	Unit operation detection	Unit shut down	
26	Water source side temperature is too high	Unit operation detection	Unit shut down	
27	Heat recovery temperature sensor failure	Power-on detection	Alarm and shut down hot water pump	Check the corresponding temperature sensor
28	Pipe System switching failure	Antifreeze detection	Stop anti-freeze	Check the Pipe System state after the compressor is running antifreeze operation
33	EEPROM data error	Power-on detection	Unit shut down	Initializing the parameters, then reconnect the power
34	N# unit communication failure	Power-on detection	Stop corresponding compressor	Test corresponding communication connection
35	1#EX board communication failure	Power-on detection	Stop corresponding compressor	Test corresponding communication connection
36	2#EX board communication failure	Power-on detection	Stop corresponding compressor	Test corresponding communication connection
37	3#EX board communication failure	Power-on detection	Stop corresponding compressor	Test corresponding communication connection
38	4#EX board communication failure	Power-on detection	Stop corresponding compressor	Test corresponding communication connection
39	S-EE board communication failure (RLAN)	Power-on detection		
40	S-EE board communication failure (FBUS)	Power-on detection		



### Cooling Capacity Curve



### Power Variable Curve



Chiller regular working temperature:

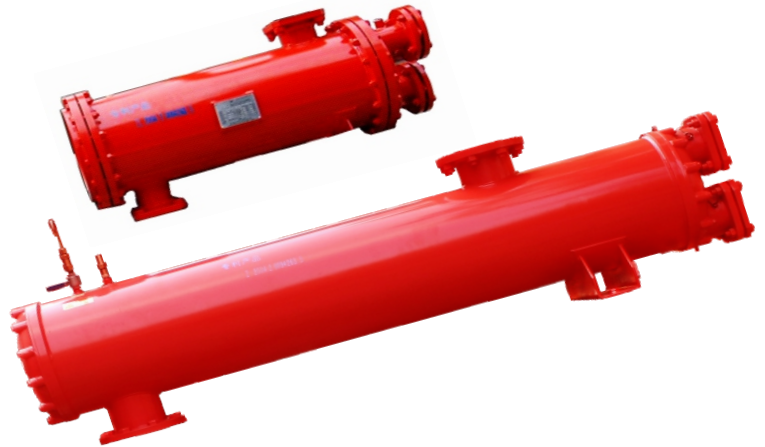
Evaporator outlet water temperature: 4°C - 13°C

Condenser outlet water temperature: 29°C - 38°C

## Heat Recovery Unit

Heat recovery technology, is to recycle part of or all of the heat capacity produced during the refrigeration process by heat recovery unit, to provide customers free hot water from 45°C to 55°C, suitable for hotels, hospitals, schools and other places of large public institutions.

Green to environment and energy saving.

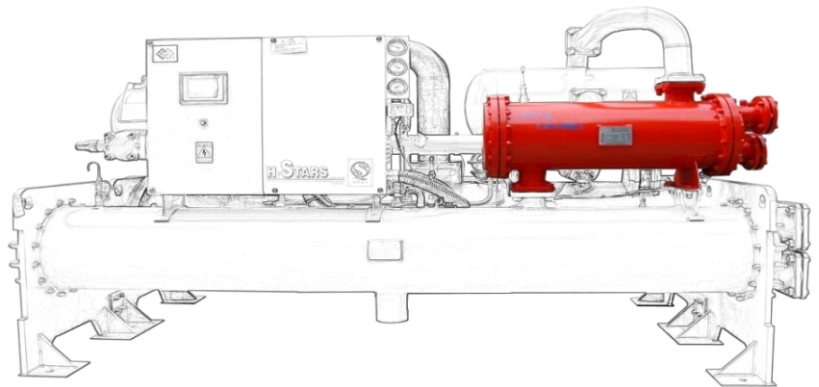


Heat recovery unit, patent number : ZL03223588.7

## Heat Recovery technology

H.Stars Group has been engaged in research and practice of heat recovery technology and application for a long period of time and has accumulated a lot of experience in heat recovery and utilization and own a national patent of heat recovery.

Free hot water supplied all year around, cost and energy saving, it not only reduces the heat pollution to the environment caused by condensation heat from the chiller, but also decreases the running cost and the sound from the cooling tower.



Schematic diagram of heat recovery unit



China machinery industry science and technology award

Model	30%Heat recovery		100%Heat recovery	
	Model of heat recovery unit	Heat recovery capacity (kW)	Model of heat recovery unit	Heat recovery capacity (kW)
50STD-120AP2	UHR035A	120	UHR120A	400
50STD-150F2	UHR045A	150	UHR150A	500
50STD-300F2	UHR090A	300	UHR300A	1000
50STD-450F2	UHR135A	450	UHR450A	1500
50STD-900F2	UHR270A	900	UHR900A	3000
50STD-1350F2	UHR405A	1350	UHR1350A	4700
50STD-1800F2	UHR540A	1800	UHR1800A	6000
50STD-2250F2	UHR675A	2250	UHR2250A	8000

Heat Recovery Specifications

## Cloud Service (Remote Monitoring)

Central A/C cloud service system



Cloud service advantage

- Remote control adjustment
- Remote monitoring
- Remote upgrade
- Fault warning
- Remote diagnosis
- Product distribution management
- Historical data analysis

## Heat Exchange Tube

### Condenser Heat Exchange Tube

Condenser heat exchange tube specification sheet



Heat exchange tube material	Copper Tube	Aluminum Brass Tube	Nickel Copper Tube	Stainless Tube
Tube thickness option 1 (mm)	1	1.2	1	1
Tube thickness option 2(mm)	1.1	1.3	1.1	1.15
Tube thickness option 3 (mm)	1.2	1.4	1.2	1.2
Tube thickness option 4 (mm)	1.3	1.5	1.3	1.35
Suitable for water quality	Standard non-corrosive neutral water	Seawater	Alkaline water	Acid water

### Evaporator Heat Exchange Tube

Evaporator heat exchange tube specification sheet



Heat exchange tube material	Copper Tube	Aluminum Brass Tube	Nickel Copper Tube	Stainless Tube
Tube thickness option 1 (mm)	1	1.2	1	1
Tube thickness option 2(mm)	1.1	1.3	1.1	1.15
Tube thickness option 3 (mm)	1.2	1.4	1.2	1.2
Tube thickness option 4 (mm)	1.3	1.5	1.3	1.35
Suitable for water quality	Standard non-corrosive neutral water	Seawater	Alkaline water	Acid water

### Important Notice:

Heat exchanger is the key components of the chiller unit, its manufacturing technology directly affects the quality of the product. Also, the heat exchange tube, which is the only component of the heat exchanger in contact with the ambient, closely affects the life of the unit.

The thickness and material of the heat exchange tube are very important. Customers can choose the suitable material and thickness of heat exchanger tube according to the air and water quality.

## 50STD series Magnetic Oil Free Water-cooled Centrifugal Chiller technical

Refrigerant: R134a Power supply: 380V-3N-50Hz/60Hz

Model	Nominal cooling capacity		Input power kW	Energy control %	Refrigerant charge kg	Condenser				Evaporator				Running noise dB(A)	Machine weight kg	Running weight kg
	kW	USRT				Inlet pipe diameter in	Water flow m <sup>3</sup> /h	Maximum pressure on the water side Mpa	Water pressure drop Kpa	Inlet pipe diameter in	Water flow m <sup>3</sup> /h	Maximum pressure on the water side Mpa	Water pressure drop Kpa			
50STD-150F2	559	159	95	10~100%, DC VFD adjustment	250	5"	112	1	68	5"	96	1	68	68	2430	2930
50STD-300F2	1117	318	190		450	6"	225	1	70	6"	192	1	70	69	4600	5100
50STD-450F2	1575	448	242		675	8"	312	1	74	8"	271	1	74	74	11000	11500
50STD-900F2	3150	896	484		1350	10"	625	1	76	10"	542	1	76	76	19000	19500
50STD-1350F2	4725	1343	726		2000	12"	937	1	76	12"	813	1	76	78	27000	27500
50STD-1800F2	6300	1791	968		2700	14"	1250	1	78	14"	1083	1	78	80	35000	35500
50STD-2250F2	7875	2239	1210		3350	16"	1562	1	78	16"	1354	1	78	82	43000	43500

**Note:**

1. Nominal cooling capacity reference: evaporator inlet and outlet water temperature 12°C/7°C ,condenser inlet and outlet water temperature 30°C~35°C fouling factor 0.088m<sup>2</sup>·°C/ KW;
- 2.Chilled water temperature range: 5 ~ 20°C ;
- 3.Cooling water temperature range:15~ 40°C ;
- 4.Specifications and dimensions improvement will be adjusted without notice.

## 50STD series Magnetic Oil Free Air-cooled Centrifugal Chiller

Refrigerant: R134a Power supply: 380V-3N-50Hz/60Hz

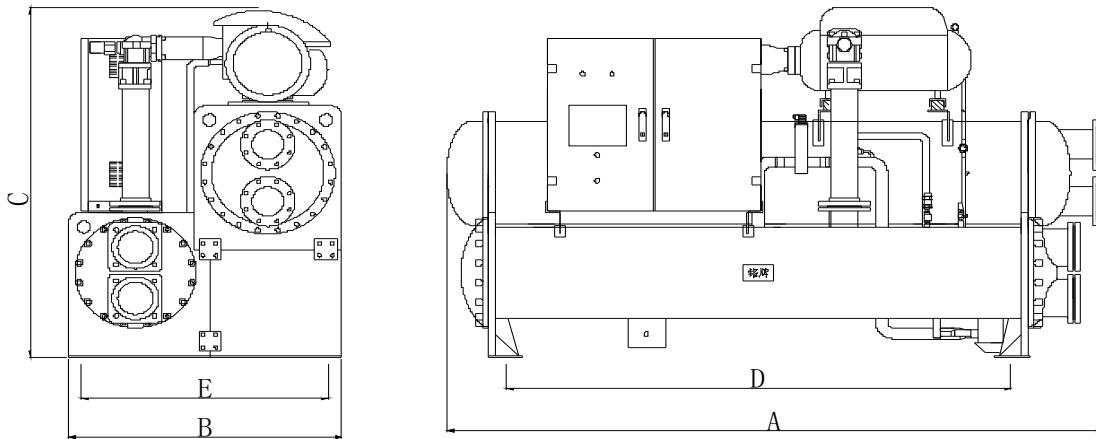
Model	Nominal cooling capacity		Input power kW	Energy control %	Refrigerant charge kg	Condenser			Evaporator				Running noise dB(A)	Machine weight kg	Running weight kg
	kW	USRT				Quantity	Air Flow m <sup>3</sup> /h	Power kW	Inlet pipe diameter in	Water flow m <sup>3</sup> /h	Maximum pressure on the water side Mpa	Water pressure drop Kpa			
50STE-120AP2	425	121	135	10~100%, DC VFD adjustment	190	8	170000	11	5"	73.1	1	35	84	3650	4000

**Note:**

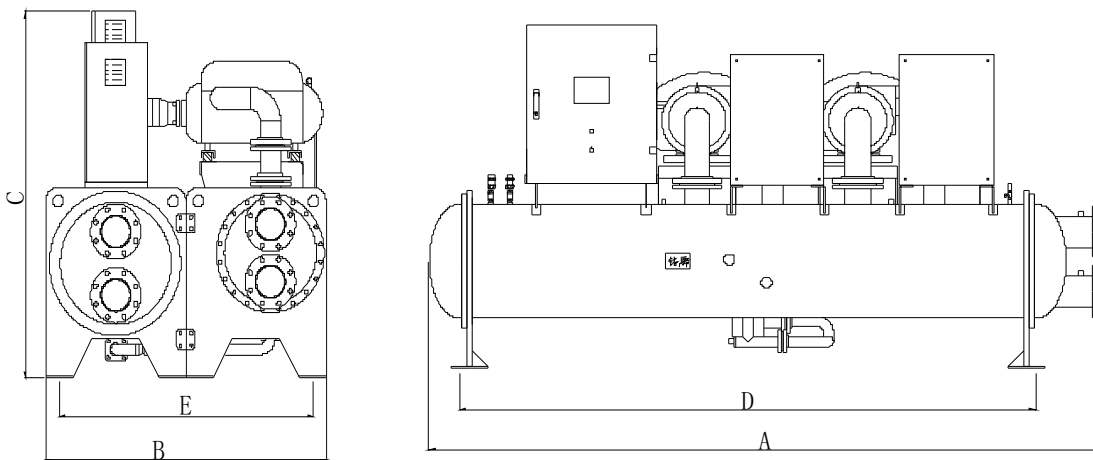
- 1.Nominal cooling capacity reference: ambient temperature 35°C, evaporator inlet and outlet water temperature 12°C/7°C , water flow 0.172m<sup>3</sup> (h,kw); fouling factor 0.088m<sup>2</sup> · °C/ KW;
- 2.Chilled water temperature range:5 ~ 20°C ;
- 3.Min. ambient temperature: -5°C ;
- 4.Specifications and dimensions improvement will be adjusted without notice.

# Standard Unit Dimensions

Magnetic Oil Free Centrifugal Chiller



Model	A	B	C	D	E
50STD-150F2	2950	1220	1720	2250	1100

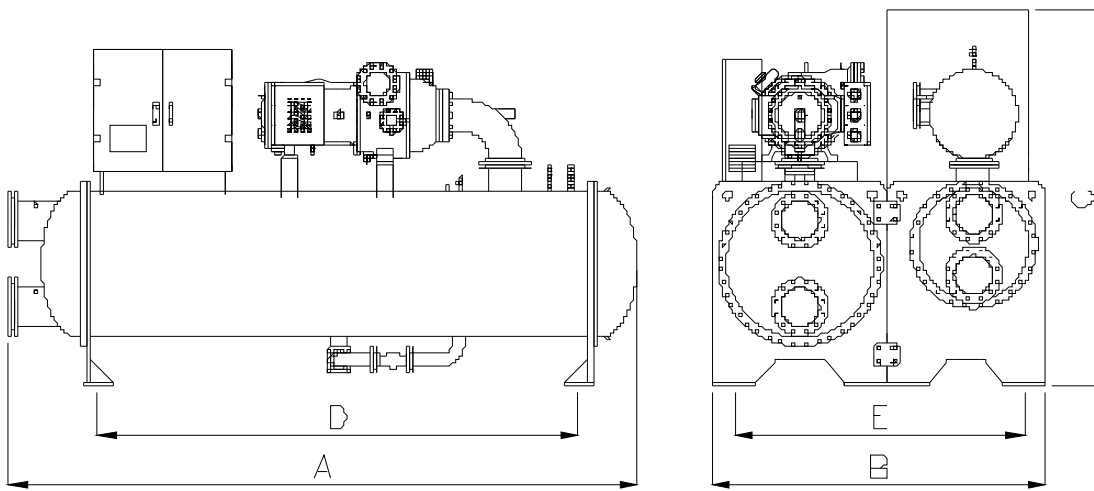


Model	A	B	C	D	E
50STD-300F2	3600	1560	1850	3075	1410

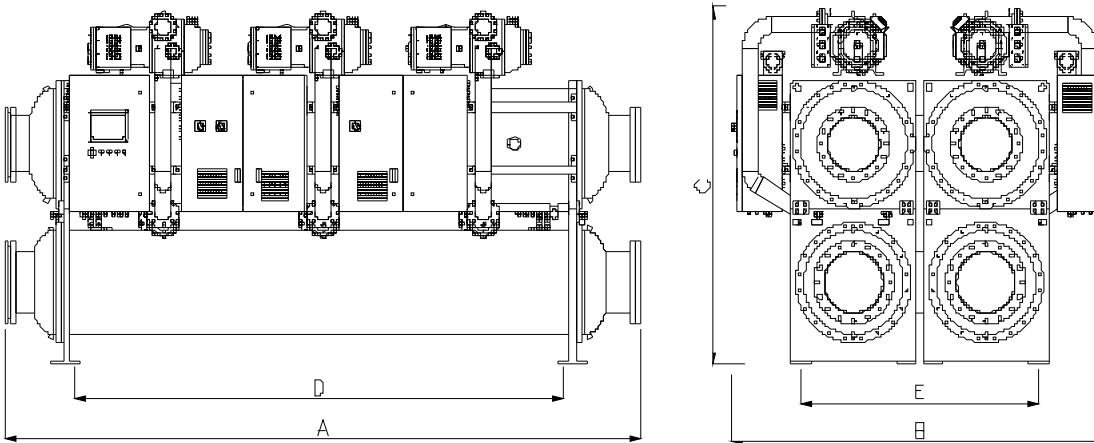
Unit:mm

# Standard Unit Dimensions (continued)

Magnetic Oil Free Centrifugal Chiller

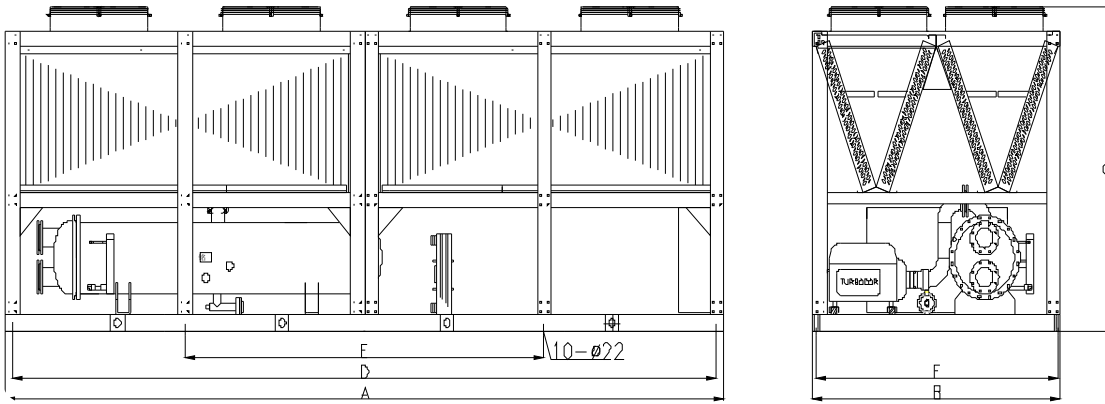


Model	A	B	C	D	E
50STD-450F2	4400	2300	2600	3300	2000



Model	A	B	C	D	E
50STD-900F2	6000	2300	2600	4000	2000
50STD-1350F2	7000	2500	2700	5000	2000
50STD-1800F2	8000	2700	2800	5000	2000
50STD-2250F2	9000	2900	2800	6000	2000

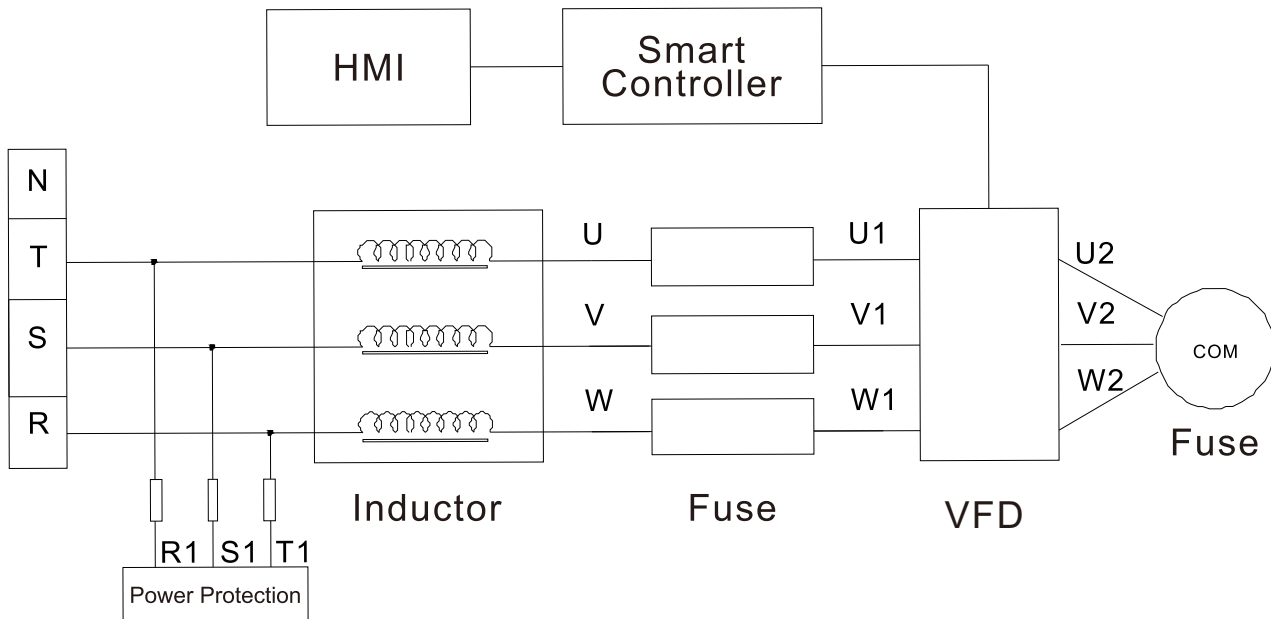
Unit : mm



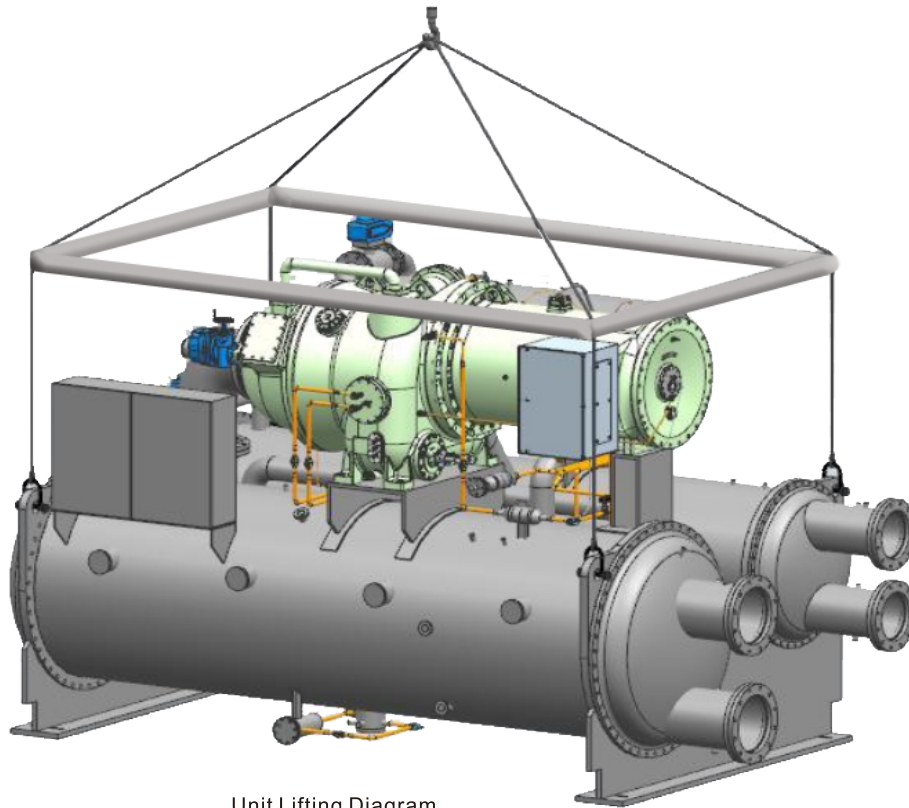
Model	A	B	C	D	E	F
50STE-120AP2	6100	2100	2305	5980	3050	2050

Unit : mm

## Wiring Diagram



## Product Lifting



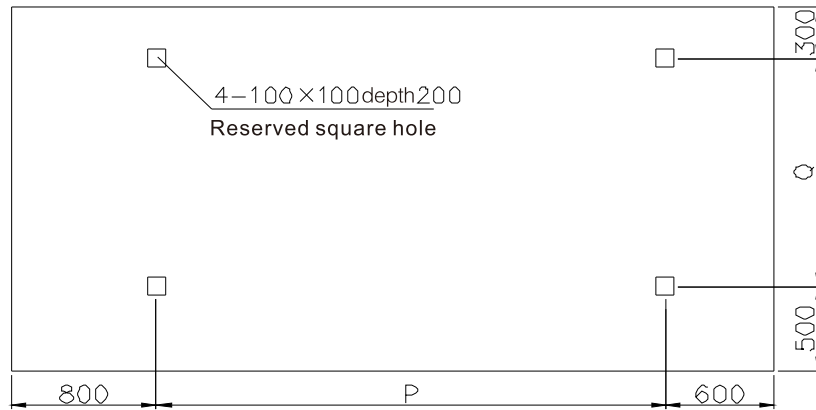
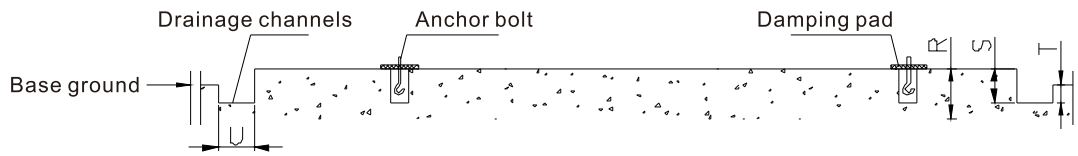
Unit Lifting Diagram

Model 50STD-	150F2	300F2	450F2	900F2	1350F2	1800F2	2250F2	120AP2
Total Weight(kg)	2430	4600	11000	19000	27000	35000	43000	3650

## Installation Environment

- 1.The unit should avoid access to sources of ignition and flammable materials. If it is installed together with a heating element such as a boiler paying a great attention to the influence of heat radiation.
- 2.It is the best to install in a well-ventilated room which temperature below 45°C and the relative humidity of hetenvironment should be below 90%. Installed or stored outdoors in the open air are strictly prohibited.
- 3.Install in a place with less dust (dust is the cause of Electrical fault).
- 4.The installation site should be well lit for easy maintenance and inspection.
- 5.In order to meet the need to maintain, overhaul and clean the evaporator-condenser heat exchange tubes, a sufficient space around the unit are very necessary .
- 6.In order to facilitate the lifting and overhaul of the machine, a crane or a jib crane should be installed and make sure that the machine room is of sufficient height.
- 7.There should be a good drainage system around the unit and throughout the machine room.
- 8.Avoid direct sunlight.

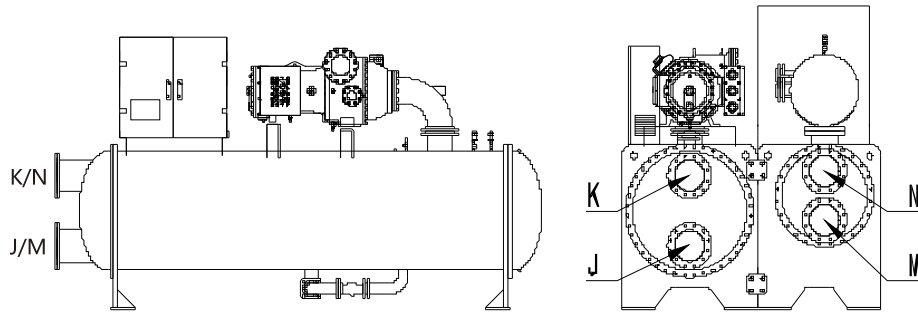




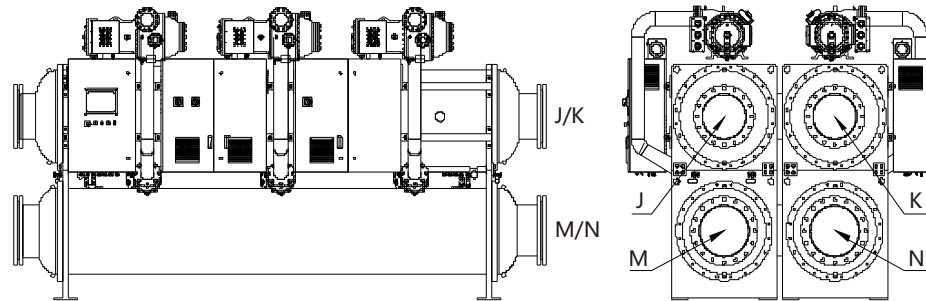
Model	P	Q	R	S	T	U
50STD-150F2	2250	1100	300	200	100	200
50STD-300F2	3075	1410	300	200	100	200
50STD-450F2	3300	2000	300	200	100	200
50STD-900F2	4000	2000	300	200	100	200
50STD-1350F2	5000	2000	300	200	100	200
50STD-1800F2	5000	2000	300	200	100	200
50STD-2250F2	6000	2000	300	200	100	200
50STD-120AP2	2050	2050	300	200	100	200

Unit : mm

## Water-cooled Connection Pipe diagram

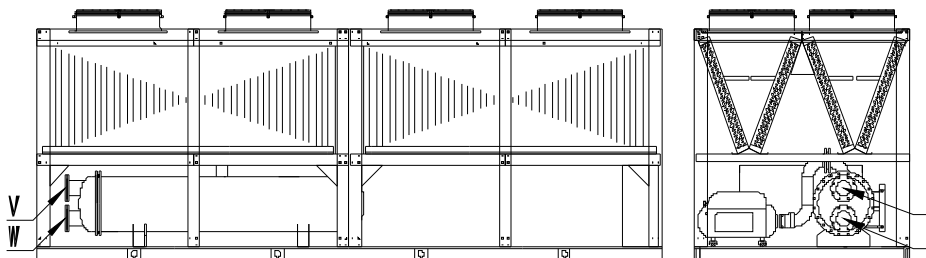


Code	K	J	N	M
Interface definition	Evaporator water inlet	Evaporator water outlet	Condenser water inlet	Condenser water outlet



Code	K	J	N	M
Interface definition	Evaporator water inlet	Evaporator water outlet	Condenser water inlet	Condenser water outlet

## Air-cooled Connection Pipe diagram



Code	V	W
Interface definition	Evaporator water inlet	Evaporator water outlet



## H.Stars Group

H.Stars (Guangzhou) Refrigerating Equipment Group Ltd., established in Economic & Technological Development Zone of Guangzhou, China in 1992, composed of 8 subsidiaries to provide one-stop solution to HVAC customers, specializing in R&D, production, design and installation. As the company grows, H.Stars group expands its business globally and has sold to 53 different countries. H.Stars Group is awarded with "New and High Technology Enterprise in Guangzhou" and has become the training base of many universities both in China and abroad via technology cooperation.

H.Stars group supplies an extensive line of Commercial and Industrial Energy Saving HVAC products including: Air Cooled Chiller, Water Cooled Chiller, Industrial Chiller, Centrifugal Chiller, Magnetic oil free centrifugal chiller, Multi-function Chiller, Hot Water Unit, Heat Recovery Unit, Heat Pump Unit, Condensing Unit, Glycol Chiller, Shell and Tube Heat Exchanger, Air Handling Unit, Fan Coil Unit, Cooling Tower, etc. all type of HVAC products.

H.Stars Group has been dedicated in quality and innovation and is technically strong in commercial and industrial application as a HVAC manufacturer. Apart from obtaining plenty of energy-saving product patents, H.Stars Group has achieved CE certifications for Pressure Vessel and standard chillers, BR1, ASME, ISO9001:2000, ISO14001:2004 and other certifications.

A good reputation of H.Stars Group has been built and delivers a full HVAC service to customers worldwide. Our products are widely applied in industries for cooling of Laser generators, Welding electrodes, Cutting machines, Electric spark machines, Extrusion process, Hydraulic System, Electroplating, Ultrasonic Cleaning, Ion Plating film, Electronic facility, Electrical appliance components, Compressed Gas Dehumidification, Dairy and Beverage Cooling processing, Pharmaceutical and Biological products, Medical equipment, Glass Coating, Tempered Glass and Cultivation Sea Food.

H.Stars Group will continue to develop energy saving and environmental friendly equipment to create "The Efficiency Planet" as our obligation. By focusing on customers' needs and wants in order to contribute more our potentials, from now on, H.Stars Group will hand in hand with you to be a shining star in the foreseeable future.

### **H.Stars (Guangzhou) Refrigerating Equipment Group Ltd.**

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LinkedIn: [www.linkedin.com/company/hstarsgroup](http://www.linkedin.com/company/hstarsgroup)

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