

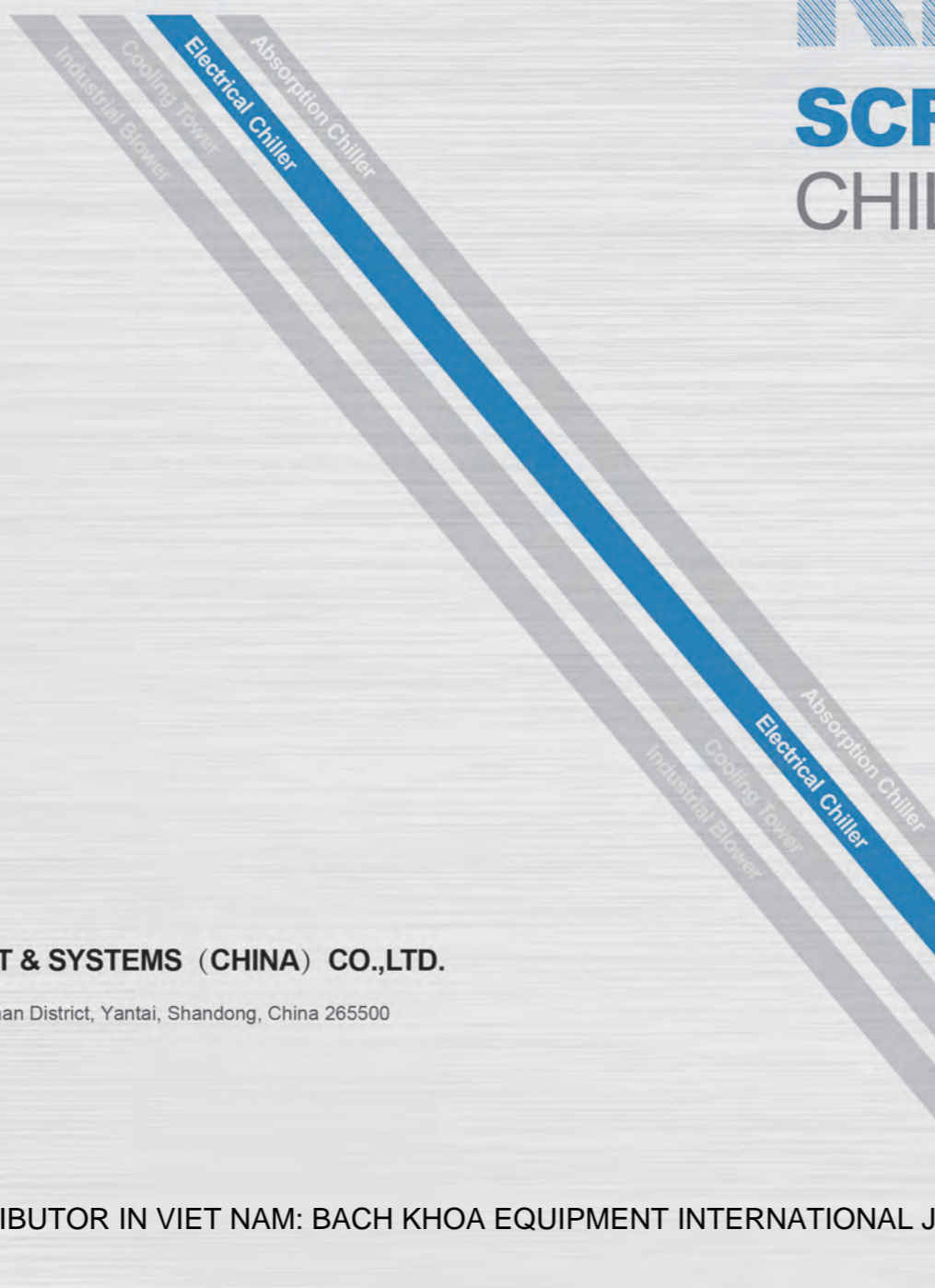
Electrical Chiller

RHSCW-JC

WWW.EBARA-ERSC.COM

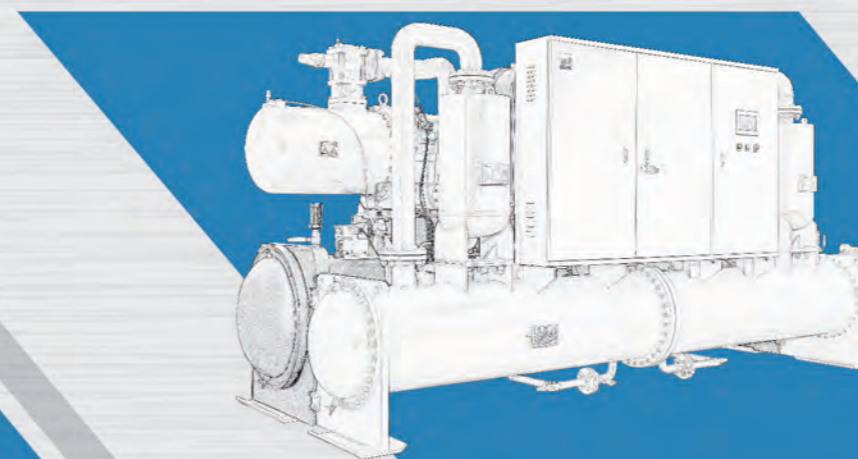


EBARA-ALWAYS BENEFITING THE EARTH



RHSCW_{JC}

SCREW CHILLER (HEAT PUMP)



EBARA REFRIGERATION EQUIPMENT & SYSTEMS (CHINA) CO.,LTD.

ADD: No.720, Yongda Road, New & High-Tech Zone, Fushan District, Yantai, Shandong, China 265500

Http: //www.ebara-ersc.com

International Sales/Service Hotline: +86-535-6319955

Email: international@ebara-ersc.com

EBARA REFRIGERATION EQUIPMENT & SYSTEMS (CHINA) CO.,LTD.

DISTRIBUTOR IN VIET NAM: BACH KHOA EQUIPMENT INTERNATIONAL JSC. - WWW.BKIC.VN - TEL: +84903999357

Ebara- An International famous brand
for Superior Environment
Friendly Products

RHSCW-C

- 03 / Ebara Brief Introduction
- 04 / Product Introduction
- 09 / Technical Data Sheet
- 10 / Technical Data Sheet
- 12 / Outline And Foundation
- 14 / Plumbing And Wiring
- 15 / Hoisting
- 16 / Scope Of Supply
- 17 / Reference Value Of Water Quality
- 18 / Job Reference

EBARA

ALL AROUND THE WORLD

AN ENVIRONMENTALLY FRIENDLY COMPREHENSIVE
ENGINEERING COMPANY

Ebara All Around The World

EBARA Corporation

Ebara Corporation is one of the world's largest manufacturers of pumps, compressors, fans, heat pumps and other HVAC and refrigeration equipment. Since its establishment in 1912, Ebara Corporation has been fully dedicated to protecting the environment with a comprehensive and contemporary commitment. "Ebara-Always Benefiting the Earth" is the philosophy that guides Ebara corporate strategy.



ERSC Company Profile

EBARA refrigeration equipment & systems (china) co.,ltd. established in 1996, is the only overseas production base of Ebara Japan for manufacturing air conditioning equipment including absorption heat pumps, absorption chiller, centrifugal chiller (heat pump), screw chiller(heat pump), cross-flow (closed) type cooling tower, etc. Its products are exported to JAPAN and all over the world. ERSC always keep up with the products and technology development of Ebara Japan.

Chiller Appearance



Nomenclature

RHSCW	100	H	JC
Serial Name	Cooling Capacity (USRt)	Function Empty: Cooling H: Heat Pump G: High T. Heat Pump	Version

RHSCW-JC

PRODUCT INTRODUCTION

Product Feature

Product Feature

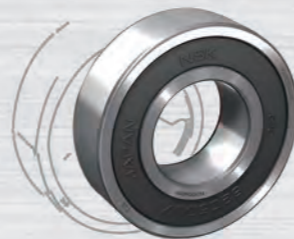
The chiller use high efficiency dual screw compressors, the performance reach industry high level and fulfill the multifunction use for air conditioning, heat pump.

- The compressor rotor use 5:6 type asymmetrical gear, patented line design, micron grade machining precision, precise positioning.
- Motor drive the male rotor directly, no transmission loss, very few movable components, high stability.
- High precision lubrication system, step-less capacity control, precisely match the chiller load change.



Japan Original Bearing

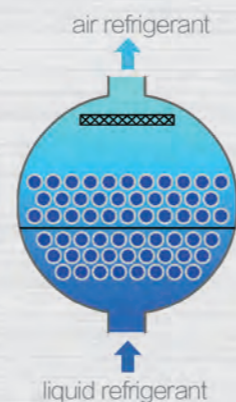
- Using high quality SKF bearing, the material is high carbon chromium steel, reaching class 5 aeronautical bearing standard. Higher efficiency and stability.
- Surface spraying lubrication system, reducing 30% of oil consumption and low maintenance cost.



High efficiency flooded type heat exchanger

Using high efficiency flooded type evaporator, Ebara patented liquid spacing design to ensure the refrigerant evenly distributed inside the evaporator.

- Using 3-D design to the maximize the heat transfer space and ensure the full contact of the tubes and refrigerant.
- Cleanable integral fin copper tubes for easy serviceability.
- Expanding tube jointing, two ring gouge design to ensure the tightness.
- Unique designed shell, double protection.



Product Feature

Optimize the refrigerant circling efficiency

- Optimize the refrigerant circling to increase the chiller cooling capacity and efficiency.
- Dual compressor intelligent on/off control, compressor run/stop according to the real cooling load. Min. cooling capacity is 12.5%.
- Two circles for refrigerant, oil evenly distributed.

Stable Oil Supply System

- Integral lubrication system using pressure differential.
- Special designed oil separator to balance the oil supply.
- Discharge check valve and service valve for easy maintenance of filter.

Green Refrigerant of R134a

The ODP of R134a is zero.



RHSCW-JC

PRODUCT INTRODUCTION

RHSCW-JC SCREW CHILLER (HEAT PUMP)
07/08

Control System

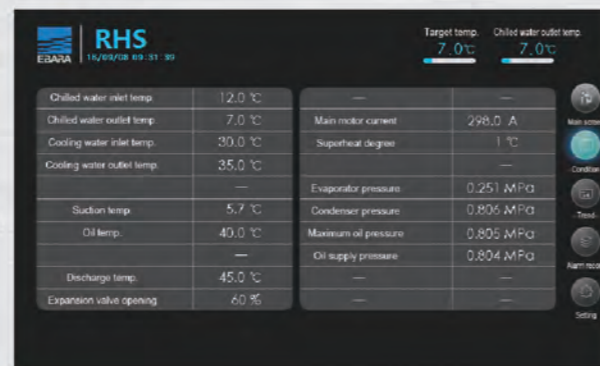
The Ebara RHSCW type screw chiller is designed with PLC controller, standard supply of chiller and its power control cabinet, power line and control line are factory mounted. No need extra wiring at customer job site.

Colorful touch screen with different language optional, RS485 interface, Modbus-RTU communication protocol, easy operation.



Detailed Data Display

- Chilled W. outlet temp.
- Chilled W. inlet temp.
- Cooling W. outlet temp.
- Cooling W. inlet temp.
- Compressor current
- Discharge temp.
- Air suction pressure
- DischargeAir drain pressure
- Total operation hours
- Compressor status
- Chiller status
- Fault record



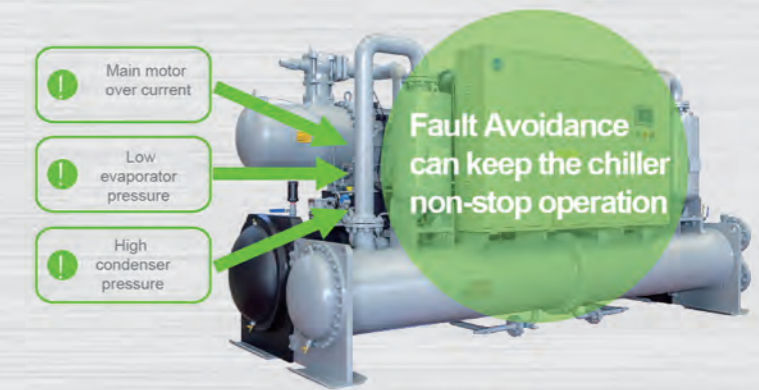
Unit Self Protection

- Low suction air pressure
- High discharge temp.
- High oil differential
- Freeze protection
- High discharge pressure
- Compressor run error and over current
- Compressor high temp.
- Phase failure-Phase sequence
- Low oil level
- Under voltage
- Low water flowrate
- Sensor error
- Urgent Stop
- Water pump and cooling tower fan control
- Condenser and chilled water flow switches

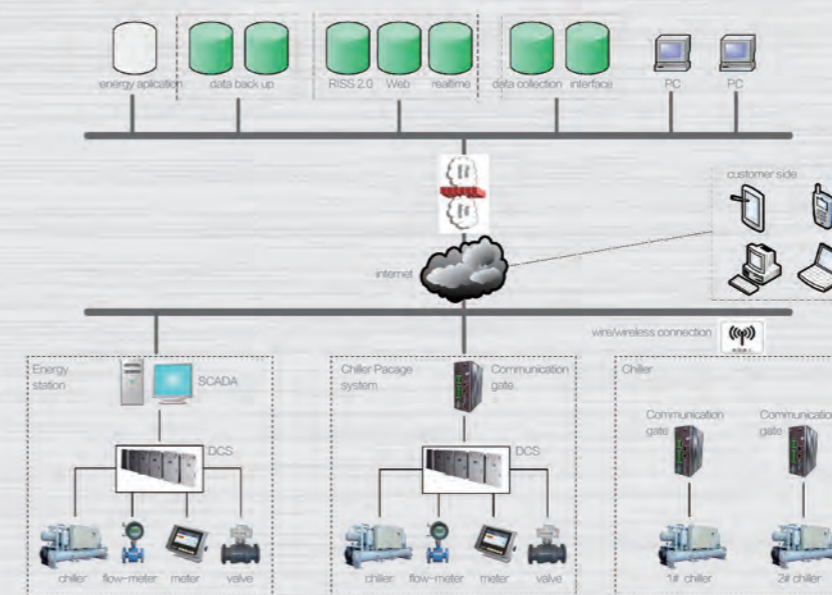
Control System

Fault Avoidance

When controller detects abnormality of evaporator/condenser pressure or compressor amps, it will force the chiller unload so as to avoid chiller trip and maintain the cooling system stable.



RISS control system



Ebara developed the RISS2.0 intelligent internet monitoring system, multi-function display and easy operation.

Ebara service engineer will do regular checking from the internet monitoring system for all the chiller operation parameters, analysis the reasons if any abnormal happen, and find the solution to solve the abnormal before chiller power off.

- Display the real-time chiller power consumption.
- Display the chiller real-time operation parameters on website or APP.
- Chiller spare parts replacement alarm.
- Fault alarm by email or phone message.

RHSCW-JC

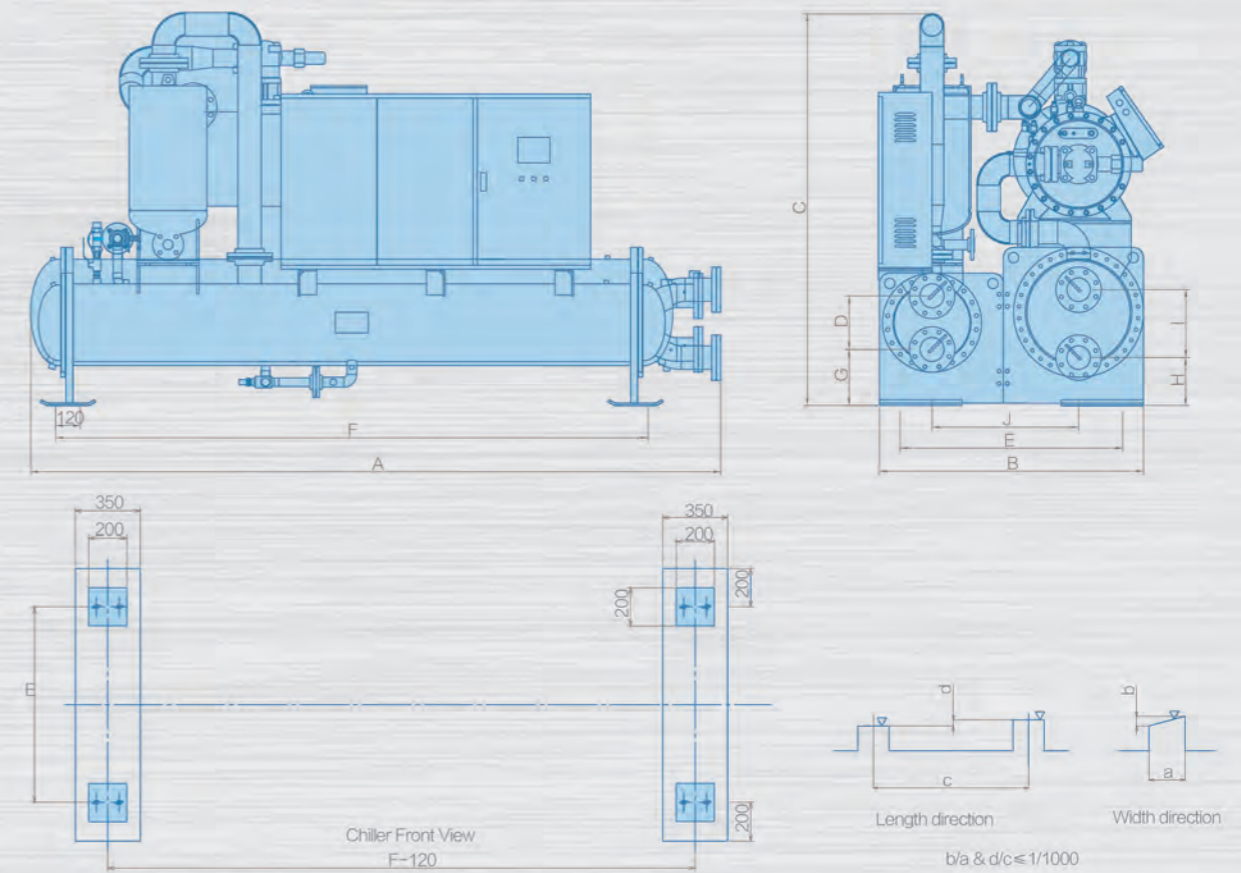
TECHNICAL DATA SHEET

OUTLINE AND FOUNDATION

Performance Data (Air-Conditioning)

Model	RHSCW-JC	100	125	150	175	200	225	250	275	300	325	350	400	450	500
Cooling capacity	kW	383	440	513	580	710	791	879	988	1069	1153	1294	1420	1582	1758
Power input	kW	67.9	78.4	89.6	97.9	120.5	133.1	149.3	167.6	183.1	196.0	222.9	244.3	269.8	290.2
COP	kW/kW	5.64	5.61	5.72	5.92	5.89	5.94	5.89	5.89	5.84	5.88	5.80	5.81	5.86	6.06
Qty of Compressor	-	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Load Range	-	25~100%							12.5~100%						
Evaporator	inlet/outlet temp. °C	12 - 7													
	Flow rate m ³ /h	65.7	75.5	88.1	99.5	121.9	135.8	150.9	169.6	183.5	197.9	222.1	243.7	271.5	301.7
	Pressure drop kPa	37.8	35.4	65.9	73.9	83.4	73.9	74.4	85.6	82.9	86.6	86.0	82.5	81.3	80.6
	Pipe dia mm	DN100	DN125	DN125	DN150	DN150	DN150	DN150	DN150	DN200	DN200	DN200	DN200	DN200	DN200
Condenser	inlet/outlet temp. °C	30 - 35													
	Flow rate m ³ /h	78.1	89.8	104.4	117.4	143.8	160.0	178.1	200.1	216.8	233.6	262.7	288.2	320.7	354.7
	Pressure drop kPa	31.5	33.2	49.8	54.9	57.9	55.3	57.0	67.6	62.5	71.3	77.3	71.0	73.5	75.2
	Pipe dia mm	DN100	DN100	DN125	DN125	DN150	DN150	DN150	DN150	DN200	DN200	DN200	DN200	DN200	DN200
Start amps	A	273	345	403	460	547	604	662	345	403	460	460	547	604	662
Run amps	A	115	132	151	165	203	225	252	283	309	331	376	413	456	490

Overall Dimension



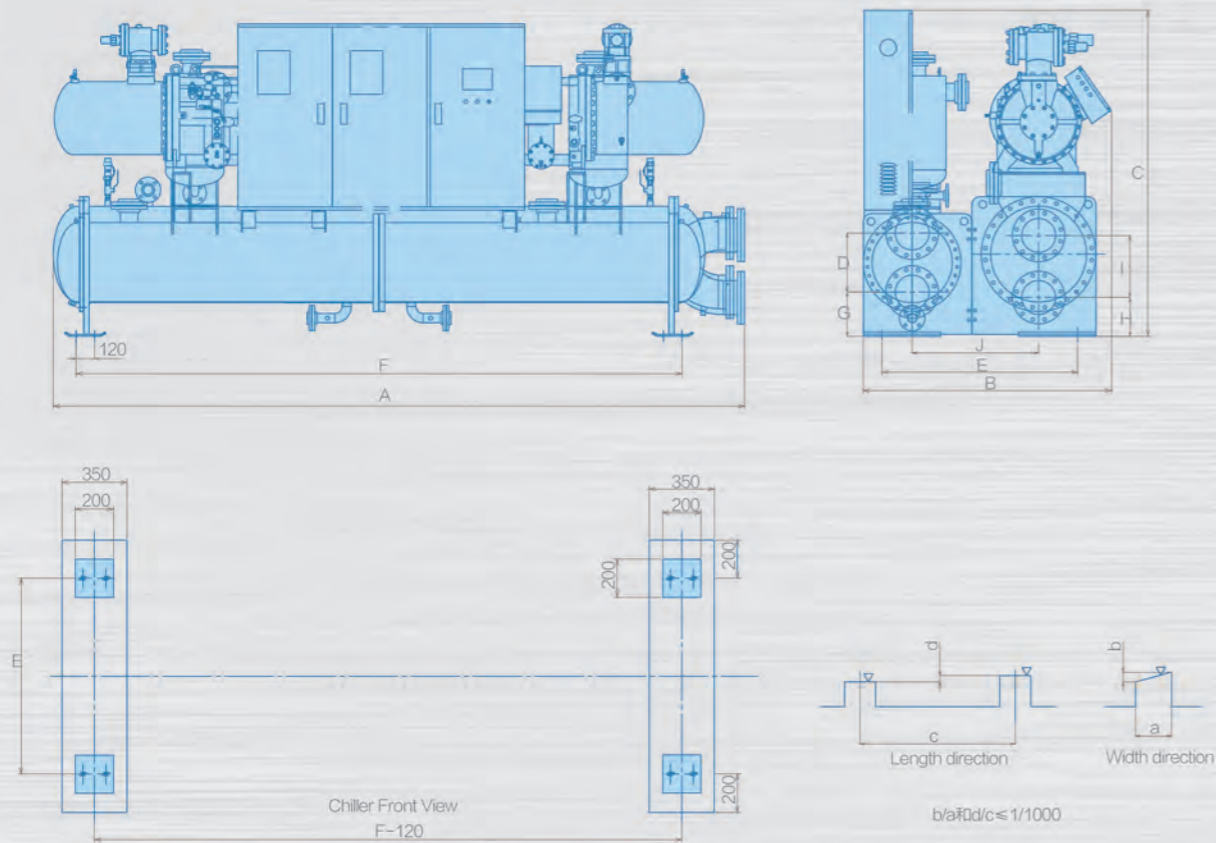
Model	dimension (mm)										Pipe size		Shipping W. kg	Operation W. kg	Refrigerant kg	Oil L
	A	B	C	D	E	F	G	H	I	J	Evaporator	Condenser				
RHSCW100	3340	1250	1900	260	1050	2860	272	242	330	670	DN100	DN100	3170	3370	160	22
RHSCW125	3340	1250	1920	310	1050	2860	247	242	330	670	DN125	DN100	3620	3820	160	24
RHSCW150	3990	1300	1990	310	1050	3490	246	225	330	670	DN125	DN125	3890	4110	180	32
RHSCW175	3990	1300	1990	310	1050	3490	246	225	330	670	DN150	DN125	4570	4920	190	32
RHSCW200	3990	1300	2020	310	1050	3490	246	322	340	670	DN150	DN150	5070	5400	210	32
RHSCW225	3990	1400	2020	360	1180	3490	322	322	340	760	DN150	DN150	5280	5620	250	44
RHSCW250	3990	1400	2020	360	1180	3490	322	322	340	760	DN150	DN150	5630	5980	260	44

RHSCW-JC

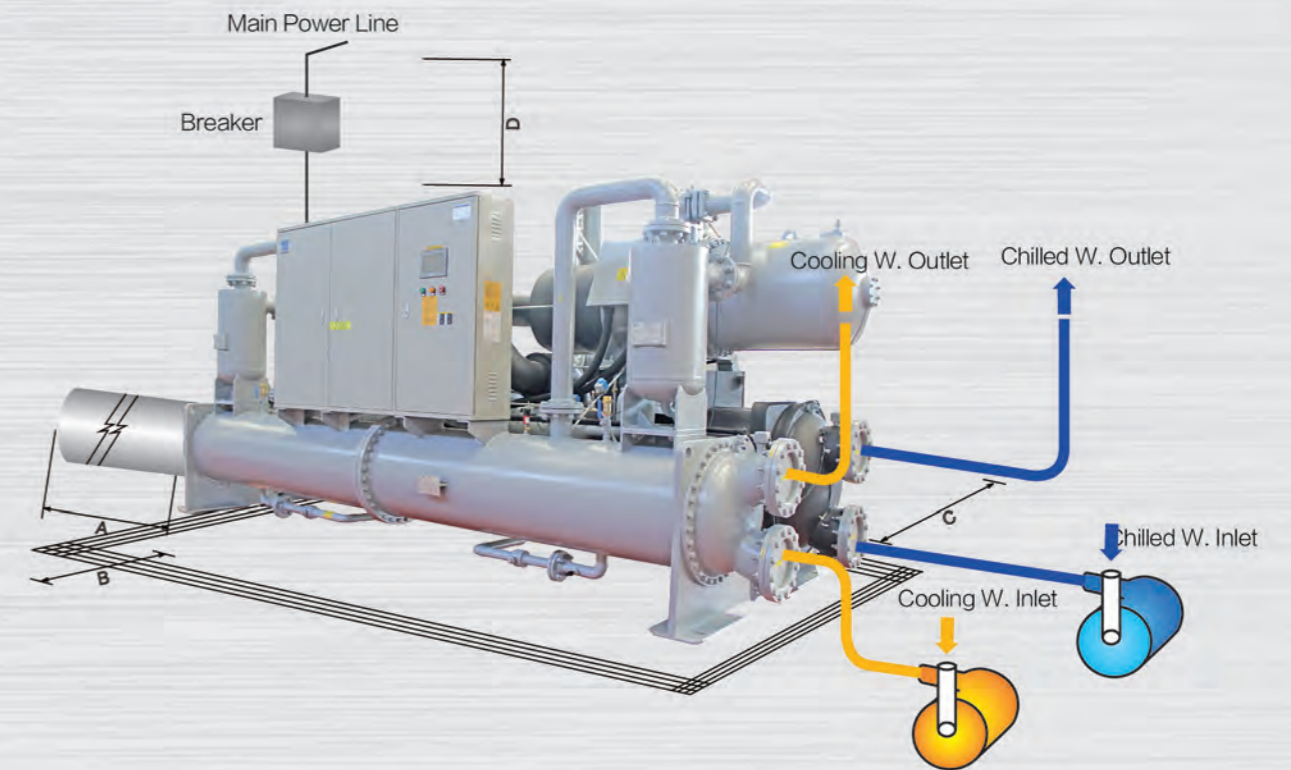
OUTLINE AND FOUNDATION

PLUMBING AND WIRING

Overall Dimension



Plumbing and wiring



Model	dimension (mm)										Pipe size		Shipping W. kg	Operation W. kg	Refrigerant kg	Oil L
	A	B	C	D	E	F	G	H	I	J	Evaporator	Condenser				
RHSCW275	4440	1570	2100	330	1180	3886	317	317	390	740	DN150	DN150	6210	6570	280	54
RHSCW300	4440	1570	2100	380	1270	3886	285	250	400	785	DN200	DN200	6710	7060	340	64
RHSCW325	4440	1570	2100	380	1270	3886	285	250	400	785	DN200	DN200	6730	7080	340	64
RHSCW350	4440	1570	2100	380	1270	3886	285	250	400	785	DN200	DN200	7100	7560	350	64
RHSCW400	4480	1670	2100	380	1350	3886	285	262	400	845	DN200	DN200	8190	8690	380	64
RHSCW450	5000	1760	2200	390	1400	4426	412	323	419	870	DN200	DN200	8590	9170	400	88
RHSCW500	5000	1760	2200	390	1400	4426	412	323	419	870	DN200	DN200	8740	9320	400	88

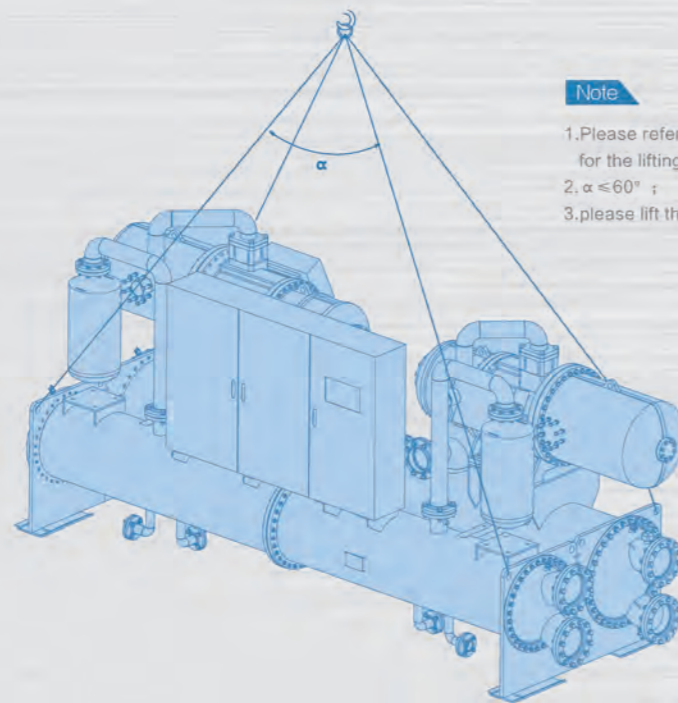
Note

Customer need to install separate air switch.

Item	Install Space	Notes
A	Chiller length × 0.9	Tube maintenance space
B	≥ 1200mm	Space in front of control cabinet
C	≥ 1000mm	Service space at rear of the chiller
D	≥ 1500mm	Clearance of chiller

RHSCW-JC HOISTING

Hoisting Installation Instruction



Note

1. Please refer to the chiller technical specification for the lifting weight;
2. $\alpha \leq 60^\circ$;
3. please lift the chiller by the lifting lugs;

1. Set at least 1200mm space at the front of the chiller, either side of the heat exchanger should be enough space or window for heat exchange tube drawing, the rest two sides should be enough space for operators pass through.
2. The chiller should be installed at place where the levelness can be guaranteed, and can fully bear the chiller operating weight.
3. During hoisting, the strength of the rope must be strong enough and ensure that nobody or any other items under the unit.
4. After chiller located on the foundation, it must be adjusted on level; the level deviation should be within 1/1000.
5. For the outlet of the safety valve, the connecting pipe to it should be set to safe place, and the water drain pipe should not put any weight on the safety valve, in the meanwhile, please set the rubber soft connecting pipe to avoid any vibration pass to buildings.
6. For the inlet and outlet piping of the chiller chilled water (refrigerant medium) and cooling water, please install manual valve and thermal meter, which will be better for chiller commissioning and maintenance.
7. For the pipes connected to chilled water and cooling water, the pipe inlet and outlet direction should be according to the specification, and water pipe diameter should not be too small.
8. Please set 20 meshes or above filter at the chilled water and cooling water inlet, to protect heat transfer tube and avoid any block happen.
9. As to the water (refrigerant medium) quality, beside the concentration, the PH value (7.5~8.5) will also need to be managed, especially when the refrigerant medium is open, and refrigerant medium change with the contacting to air, the management should be strictly followed, the sediment need to be filter out.
10. The power supply to chiller should be enough in volume, the voltage vibration should be less than $\pm 10\%$. Chiller should be wired to ground properly.

SCOPE OF SUPPLY

Scope of supply

standard scope of supply list

item	Ebara	Customer Note	Item	Ebara	Customer Note
Chiller	Chiller	■	Electrical installation	Main power line crimping	■
	Starting cabinet	■		Wiring between start cabinet and control cabinet	■
	Refrigerant	■		Line crimping between start cabinet and control cabinet	■
	Lubricating oil	■		Wiring between start cabinet and compressor	■
	Connecting flange	■		Line crimping between start cabinet and compressor	■
	Anchor bolt	■		The auxiliary interlock wiring	■
	Anchor damping pad	■		Line crimping for the auxiliary interlock	■
	Cold/heat insulation	■			
Shipment & Installation	Foundation Installation	■	Start-up & Maintenance	Commissioning & Maintenance	■
	From factory to China seaport	■		Inspection during operating	■
	Shipment cost	■		Maintenance during stopping	■
	Customs clearance	■		Water quality management	■
	Shipment to jobsite	■	others		
	Level adjustment	■			
	Anchor bolt installation	■			
	Starting cabinet installation	■			

optional supply list

Item	Standard supply	Options	Item	Standard supply	Options
Starter type (380V)	Star-delta start-up	VFD start, soft start	Water side working pressure	1.0MPa	1.6MPa、 2.0MPa
Cooling water flow switch	None	Included	Inlet/outlet water pipe direction	Same side	Different side
Vibration isolator	Rubber damping pad	Spring isolator	Split shipment	Whole unit shipment	Split shipment according to customer's request
Refrigerant insulation valve	None	Optional	Material for heat exchanger	Copper	Stainless steel Copper nickel tube

RHSCW-JC

REFERENCE

OF WATER QUALITY

Reference Of Water Quality

Bad chilled water and cooling water quality is not only scaling inside the heat transfer tube, reducing heat exchange and chiller efficiency, but also corrosive to the heat transfer tube, and break down the chiller. The water quality reference data in the below sheet is by GB 50050-95 standard (industrial circulating water design standard). Please use soft water if the chilled water system is in closed cycle. Please do periodical random analysis for cooling water (open cycle) during chiller operating, and water quality should meet the demand below. If not, please do water treatment.

Item	Cooling water system		Chilled water system		Effect to chiller	
	Circulating water	Make-up water (below 20 C)	Circulating water	Make-up water	Corrosion	Scaling
PH[25 C]	6.8~8.2	6.0~8.0	6.8~8.2	6.8~8.0	—	—
[25 C](μS/cm)	800	300	400	300	—	—
Cl (mgCl/L)	200	50	200	50	—	—
SO ₄ ²⁻ (mg/L)	200	50	200	50	—	—
[PH4.8](mgCaCO ₃ /L)	100	50	100	50	—	—
(mgCaCO ₃ /L)	200	50	200	200	—	—
(mgCaCO ₃ /L)	150	30	150	150	—	—
(mgSiO ₂ /L)	50	30	30	30	—	—

Routine Management

01. Clean the cooling water pipe before water goes through it.
02. During the chiller operating season, analyze the water quality 1~2 times each month, make sure the data for all the checking items are within the standard value. Meanwhile, judge the tendency of the PH and electric conductivity.
03. Beside the content mentioned above, considering the concentration during circulation, please change the cooling water each month for the open cycle system.
04. If the PH and electric conductivity is above set value, please operate as the sequence below:
 - (a) Test all the items for water quality checking.
 - (b) If the water is tend to be corrosive, please check if the cooling tower location is appropriate. Adjust the ball float valve to reduce the concentration index to less than 3 times (normally check the chloridion index). If it's still doesn't work, please discuss with the professional water treatment company and take relevant steps.
 - (c) If the water is tend to be scaling, please take step of cleaning the chiller(use hairbrush or chemical wash) as the way to handle.

JOB REFERENCE

Job Reference



RHSCW-JC SCREW CHILLER (HEAT PUMP)