SIC-A-R2

Air-cooled Water Chiller

Date: Oct, 2016

Version: Ver.A (English)

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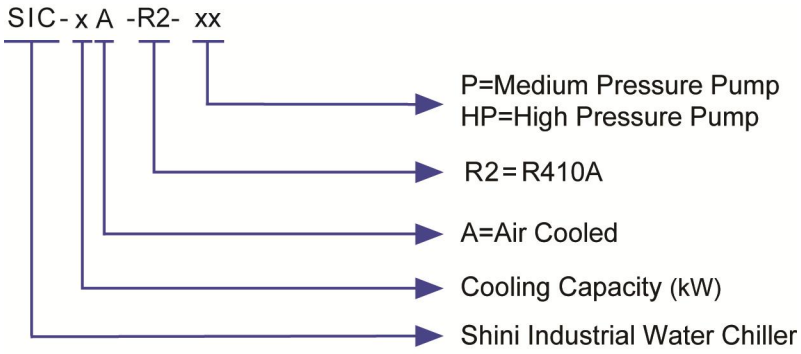
1. General Description

Please read through this operation manual before using and installation to avoid damage of the machine and personal injuries.

SIC-A-R2 series are applicable for cooling molds to reduce products molding cycle, also they are available in the cooling of equipments in order to maintain a normal temperature. Besides, they are suitable for other industries with the need of cooling.

Model: SIC-48A-R2

1.1 Coding Principle



1.2 Main Features

- Cooling range 7~25℃.
- Stainless steel made insulted water tank.
- Equipped with anti-freeze thermostat.
- Adopt R410A refrigerant, used to improve coefficient of performance (COP) and R410A is ozone-friendly.
- Refrigerant loop controlled by high and low pressure switches to ensure stable operation.
- Compressor and pump overload protection.
- Adopt precise Italian temperature controller with an display accuracy of±0.1℃.
- Water Chillers with single compressor are standard equipped with low-pressure pump; Water Chillers with double or above compressors are standard equipped with low-pressure pump.
- All adopt branded compressors with low noise, high efficiency and long service life.
- Adopt fin style condenser design. Without any need of cooling water for excellent heat transfer and rapid cooling.

All service work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both handling and servicing. Chapter 7, which contains service instructions intended for service engineers. Other chapters contain instructions for the daily operator.

Any modifications of the machine must be approved by SHINI in order to avoid personal injury and damage to machine. We shall not be liable for any damage caused by unauthorized change of the machine.

Our company provides excellent after-sales service. Should you have any problem during using the machine, please contact the company or the local vendor.

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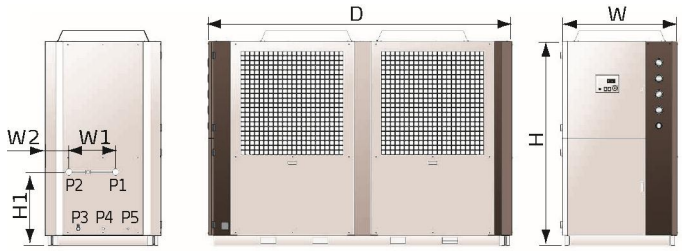
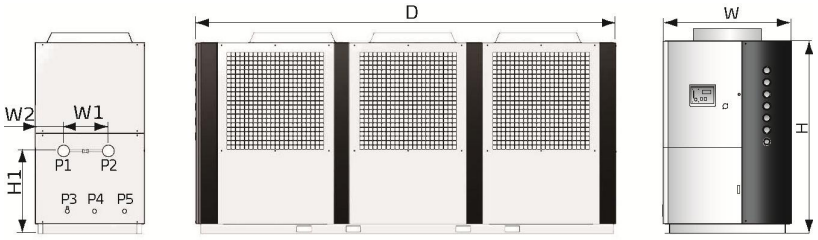
1.3 Technical Specifications

1.3.1 External Dimensions of SIC-A-R2



SIC-48A-R2~SIC-75A-R2



SIC-100A-R2~SIC-114A-R2

Picture 1-1: Outline Dimensional Drawing

Table 1-1: Specifications

Model	H (mm)	H1 (mm)	W (mm)	W1 (mm)	W2 (mm)	D (mm)	P1 Chilled Water Inlet (inch)	P2 Chilled Water Outlet (inch)	P3 Water Tank Outfall (inch)	P4 Water Tank Overfall (inch)	P5 Water Tank Refill Port (inch)	Weight (kg)
SIC-48A-R2	1942	755	1208	400	257	2922	2	2	1	1/2	1/2	775
SIC-58A-R2	1942	755	1208	400	257	2922	2	2	1	1/2	1/2	800
SIC-75A-R2	1942	755	1208	418	257	2922	$2^1/_2$	$2^1/_2$	1	1/2	1/2	840
SIC-100A-R2	1942	641	1300	800	243	3475	$2^1/_2$	$2^1/_2$	1	1	1	1400
SIC-114A-R2	1942	641	1300	900	255	3475	$2^1/_2$	$2^1/_2$	1	1	1	1600

1.3.2 Specification List

Table 1-2: Specification List (50Hz)

Item/Parameters \ Mode SIC-		48A-R2	58A-R2	75A-R2	100A-R2	114A-R2
Ver.		A	A	A	A	A
Refrigerant Capacity [1] (kW)		48	58	75	100	114
Refrigerant Capacity [2] (kW)		64	76	90	121	135
Compressor	Type	Scroll				
	Power(KW)	17.44	18.72	24.86	33.58	37.29
Refrigerant	Weight (kg)	7.5 × 2	8 × 2	8 × 2	7.8 × 2 + 6.8	8.7 × 3
	Control Mode	Thermostatic expansion valve				
	Type	R410A				
Evaporator	Type	Tube-in-shell style				
Condenser	Type	Fin style				
	Blower (kW)	2×1.03	2×0.85	2×1.92 / 2×2.2	2×2.2+1.5	3×2.2
Water Tank Capacity (L)		186		230	316	
Pump [3] (50Hz/60Hz)	Power (kW)	- / 1.8 / 2.4		- / 3.0 / 4.0 /		- / 4.0 / 5.5
	Pump Flow (L/min)	137.6	166.3	215.0	286.7	326.8
	Working Pressure (kg/cm^2)	-/ 3.4 / 4.5	-/ 3.2 / 4.3	- / 3.5 / 4.1	- / 3.1 / 3.9	- / 3.7 / 4.9
Total Power (kW) [4]		21	22.6	30	41.7	46
Pipe Coupling (inch)	Chilled Water Outlet	2			2.5	
	Chilled Water Inlet	2			2.5	
	Water Tank Inlet	1				
	Water Tank Overflow	1/2			1	
Protective Devices	Compressor	Overload relay				
	Pump	Overload relay				
	Cooling Water Circuit	High and low pressure switch/anti-freeze switch				
	Water Circuit	Flow flow /Water level switch (Optional)/By-pass valve				
Operation Noise dB (A)		84	82	86	90	90
Power(VAC)		3Φ, 400VAC, 50Hz				
Measures Exchange		1 kW = 860 kcal/hr 1 RT = 3,024 kcal/hr 10,000 Btu/hr = 2,520 kcal/hr				

Note: 1) Refrigeration capacity 1 is based on the flow 0.172 m3 / (h.k W) the chilled water outlet Temperature of 7℃/44.6°F and the environment temperature of 35℃/95°F.

2) Refrigeration capacity 2 is based on the flow 0.172 m3 / (h.k W) the chilled water outlet Temperature of 15℃/59°F and the environment temperature of 25℃/77°F.

3) Low pressure pump is for domestic and Southeast Asia export, customers can change for medium pressure pumps (use P for short; e.g.: SIC-and A-R2-P) or high pressure pumps (use HP for short; e.g.: SIC-and A-R2-HP), specific parameters in turn as shown above.

4) Pump power is included in total power.

5) The air-cooled water chiller is applicable to the conditions under the environment temperature of 43℃.

Table 1-3: Specification List (60Hz)

Item/Parameters \ Mode SIC-		48A-R2	58A-R2	75A-R2	100A-R2	114A-R2
Ver.		A	A	A	A	A
RefrigerantCapacity [1] (KW)		60	70	90	122	136
Refrigerant Capacity [2](KW)		75	82	96	133.5	144
Compressor	Type	Scroll				
	Power(KW)	20.4	23.76	29.6	39.8	44.4
Refrigerant	Weight (kg)	7.5 × 2	8 × 2	8 × 2	7.8 × 2 + 6.8	8.7 × 3
	Control Mode	Thermostatic expansion valve				
	Type	R410A				
Evaporator	Type	Plate evaporator				
Condenser	Type	Fin style				
	Blower (kW)	2×2.2	2×2.2	2×2.2	2×2.2+2.2	3×2.2
Water Tank Capacity (L)		180	200	270	400	
Pump [3] (50Hz/60Hz)	Power (kW)	3.0 / 3.0		5.5 / 5.5		
	Pump Flow (L/min)	171.3	200.5	257	348.3	388.3
	Working Pressure (kg/cm^2)	- /4.50 / -	-/ 3.10 / 4.60	- / 4.40 / 4.4	-	-
Total Power (kW)[4]		27.8	30.86	39.5	51.9	53.51
Pipe Coupling (inch)	Chilled Water Outlet	2		2.5 / 2.5		
	Chilled Water Inlet	2		2.5 / 2.5		
	Water Tank Inlet	1				
	Water Tank Overflow	1/2			1	
Protective Devices	Compressor	Overload relay				
	Pump	Overload relay				
	Cooling Water Circuit	High and low pressure switch/anti-freeze switch				
	Water Circuit	Flow flow /Water level switch (Optional)/By-pass valve				
Operation Noise dB (A)		84	82	86	90	90
Power(VAC)		3Φ, 400VAC, 50Hz				
Measures Exchange		1 kW = 860 kcal/hr	1 RT = 3,024 kcal/hr	10,000 Btu/hr = 2,520 kcal/hr		

Note: 1) Refrigeration capacity 1 is based on the flow 0.172 m3 / (h.k W) the chilled water outlet Temperature of 7℃/44.6°F and the environment temperature of 35℃/95°F.

2) Refrigeration capacity 2 is based on the flow 0.172 m3 / (h.k W) the chilled water outlet Temperature of 20℃/68°F and the environment temperature of 30℃/86°F.

3) Low pressure pump is for domestic and Southeast Asia export, customers can change for medium pressure pumps (use P for short; e.g.: SIC-and A-R2-P) or high pressure pumps (use HP for short; e.g.: SIC-and A-R2-HP), specific parameters in turn as shown above.

4) Pump power is included in total power.

5) The air-cooled water chiller is applicable to the conditions under the environment temperature of 43℃/109.5°F.

1.4 Safety Regulations

The user must conform to the following safety rules when operating the machine.

1.4.1 Security Labels

Attention!

Installation of the device is allowed only to the professional electrician. Before maintaining and repairing the device, be sure to turn off the main switch and control switch.

Warning! High Voltage!

This label is posted on enclosure of the electrical control cabinet!

Warning! Be careful!

Pay more attentions at the places where this sign is attached!

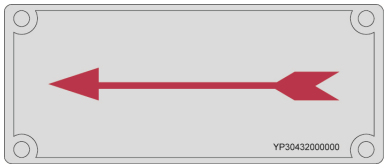
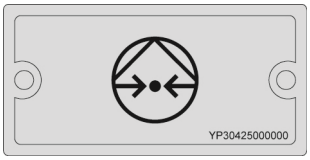
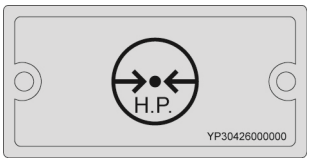
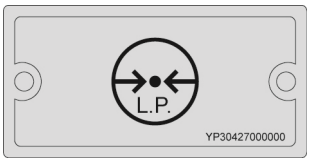
Attention!

Drain the water inside when power off at the cold day to avoid freezing!

Attention!

No need for regular inspection because all the electrical parts in the control unit are fixed tightly!

1.4.2 Signs and Labels

	This is for indicating motor rotating direction. When phase reversal happens, the alarm sounds and indicator on control panel will indicate. Please exchange the place of the two electrical wires to solve this problem.
	Pump pressure gauge: display actual pressure of cold water system.
	High pressure gauge: display pressure in the high-pressure side of refrigerant system.
	Low pressure gauge: display pressure in the low-pressure side of refrigerant system.
	Chilled Water Return(From Mould)
	Chilled Water Outlet (To Mould)
	Water Supply Inlet
	Drain
	Overflow

1.5 Exemption Clause

The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

Shini is exempted from liability for any costs, fees, claims and losses caused by reasons below:

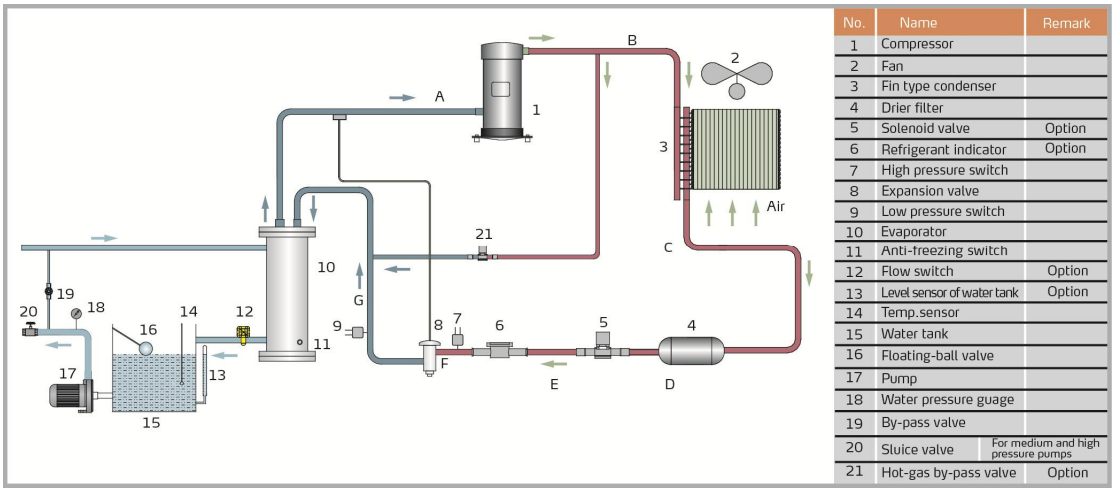
1. Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2. Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible natural disasters including fire, flood, storm and earthquake.
3. Any operational actions that are not authorized by Shini upon machine, including adding or replacing accessories, dismantling, delivering or repairing.
4. Employing consumables or oil media that are not appointed by Shini.

2. Structural Features and Working Principle

2.1 Main Functions

SIC-A-R2 series are applicable for cooling molds to reduce products molding cycle, also they are available in the cooling of equipments in order to maintain a normal temperature. Besides, they are suitable for other industries with the need of cooling.

2.1.1 Working Principle



No.	Name	Remark
1	Compressor	
2	Fan	
3	Fin type condenser	
4	Drier filter	
5	Solenoid valve	Option
6	Refrigerant indicator	Option
7	High pressure switch	
8	Expansion valve	
9	Low pressure switch	
10	Evaporator	
11	Anti-freezing switch	
12	Flow switch	Option
13	Level sensor of water tank	Option
14	Temp.sensor	
15	Water tank	
16	Floating-ball valve	
17	Pump	
18	Water pressure guage	
19	By-pass valve	
20	Sluice valve	For medium and high pressure pumps
21	Hot-gas by-pass valve	Option

Picture 2-1: Working Principle Diagram

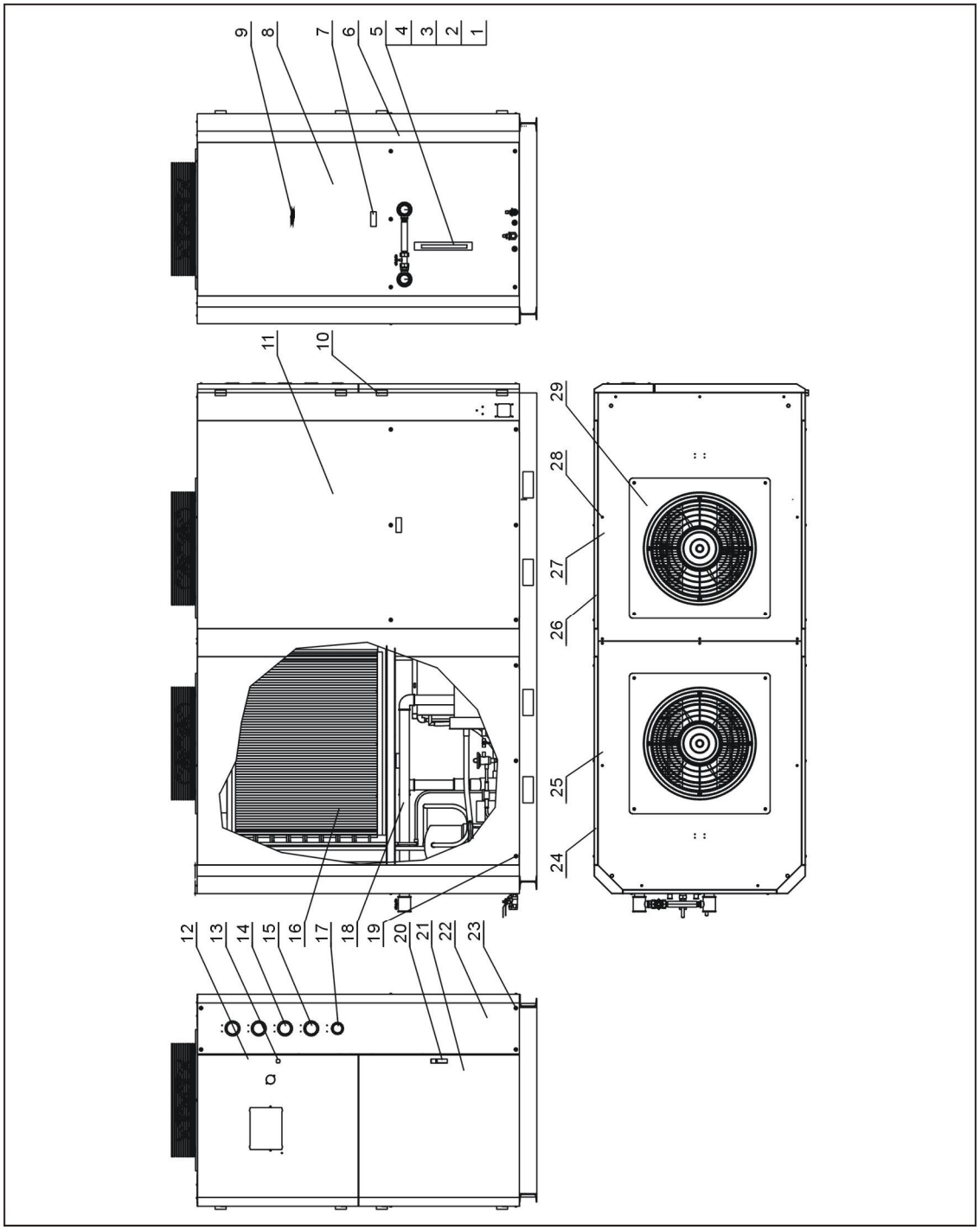
When the SIC-A-R2 air-cooled water chiller starting up, compressor starts working. Refrigerant is compressed into high temperature high pressure gas in the process from B to C, and then be cooled when passing through the condenser and changed into liquid. Heat is taken away by the cooling air. In the process from C to D to E and F, the liquid refrigerant is dried and filtered by the dry filter. After that, it passes through the solenoid valve, level sensor and then reaches the expansion valve. In the process from F to G, the high pressure liquid refrigerant is throttled and depressurized by the heat expansion valve and the temperature goes down. In the process of G to A, chilled water absorbs the heat of process water in the evaporator and returns back to the compressor. This heat exchange process repeats until process water is cooled down to required temperature.

Hot-air bypass function: the compressor continues working when the process water is cooled down to the required temperature, then the hot-air bypass valve

opens as the temperature drops to its set value. A part of refrigerant from the compressor passing through the bypass valve and then reach the evaporator, balancing out part of the machine refrigerating capacity and then goes back to the compressor without passing through the condenser. With the help of hot-air bypass valve, the system can stay in an balanced condition and meanwhile can keep the control accuracy at ±1℃ .

2.2 Parts Drawing

2.2.1 General Assembly Disgram (SIC-48A-R2~75A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.2.

Picture 2-2: General Assembly Disgram (SIC-48A-R2~75A-R2)

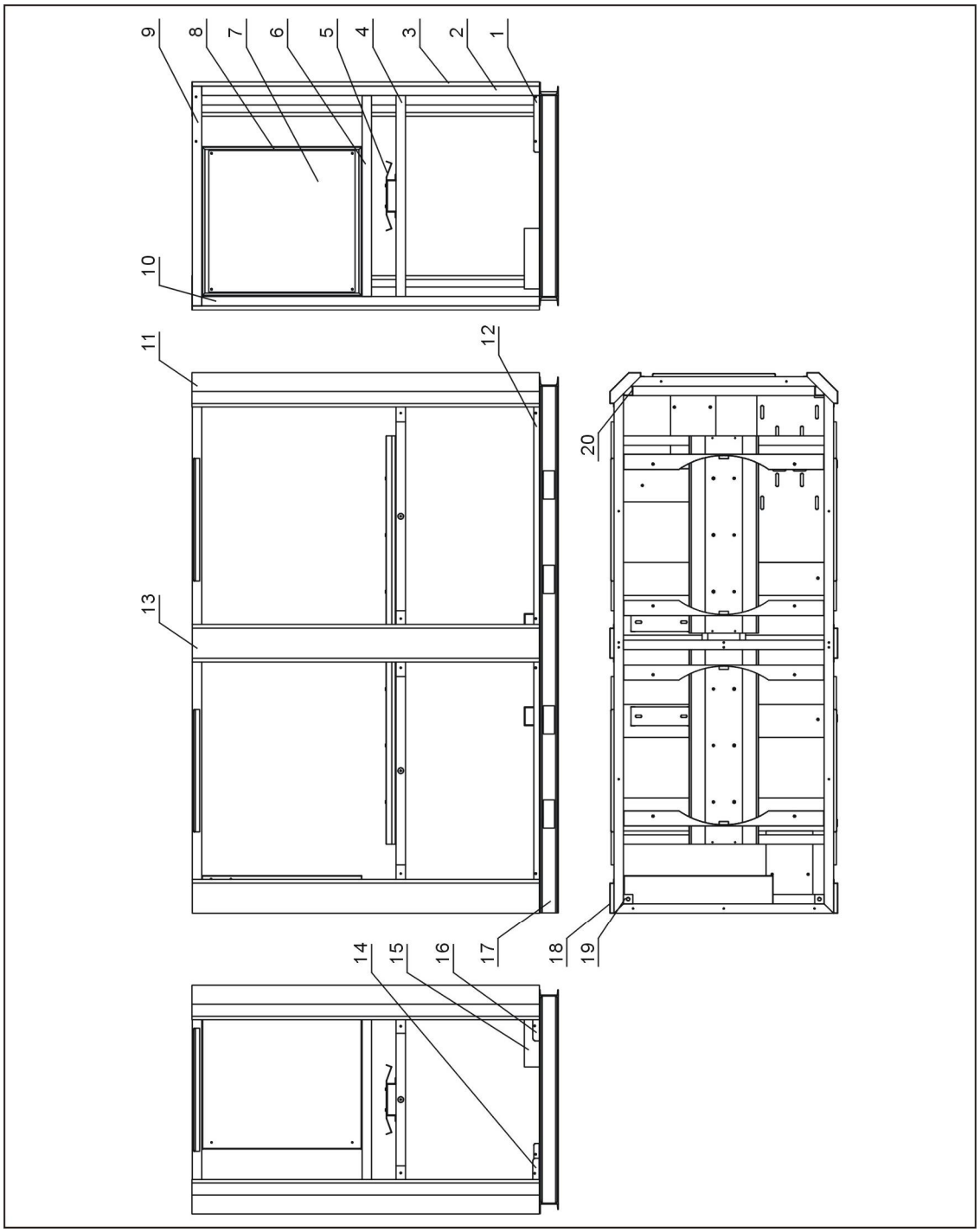
2.2.2 General Assemble Diagram Parts List (SIC-48A-R2~75A-R2)

Table 2-1: General Assemble Diagram Parts List (SIC-48A-R2~75A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Refrigerant indicator base	YW20000000400	16	Refrigerating system	-
2	Refrigerant indicator nut	BH12060700110	17	Pressure gauge 0~10kg	YW85001000100
3	Refrigerant indicator	BH12030000010	18	Chilled water system	-
4	Glass tube	YW70963000000	19	Cross recessed oval head screw M6×30	YW63063000000
5	Refrigerant indicator guard	BL90006800020	20	Door lock	YW00717100000
6	Rack	-	21	Lower plate	-
7	Plastic handle	YR40914040000	22	Gauge plate	-
8	Back plate	-	23	Cross recessed oval head screw M6×60	YW63066200000
9	Back plate 2	-	24	Side plate 2	-
10	Hinge	YW06203100400	25	Back cover plate	-
11	Side plate 3	-	26	Side plate 1	-
12	Upper plate	-	27	Front cover plate	-
13	Door lock	YW00816100000	28	Cross recessed oval head screw M6×10	YW63066200000
14	High pressure guage 0~55kg	YW85005500000	29	Fan	-
15	Low pressure guage 0~35kg	YW85003500000			

** means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.3 Rack Diagram (SIC-48A-R2~75A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.4.

Picture 2-3: Rack Diagram (SIC-48A-R2~75A-R2)

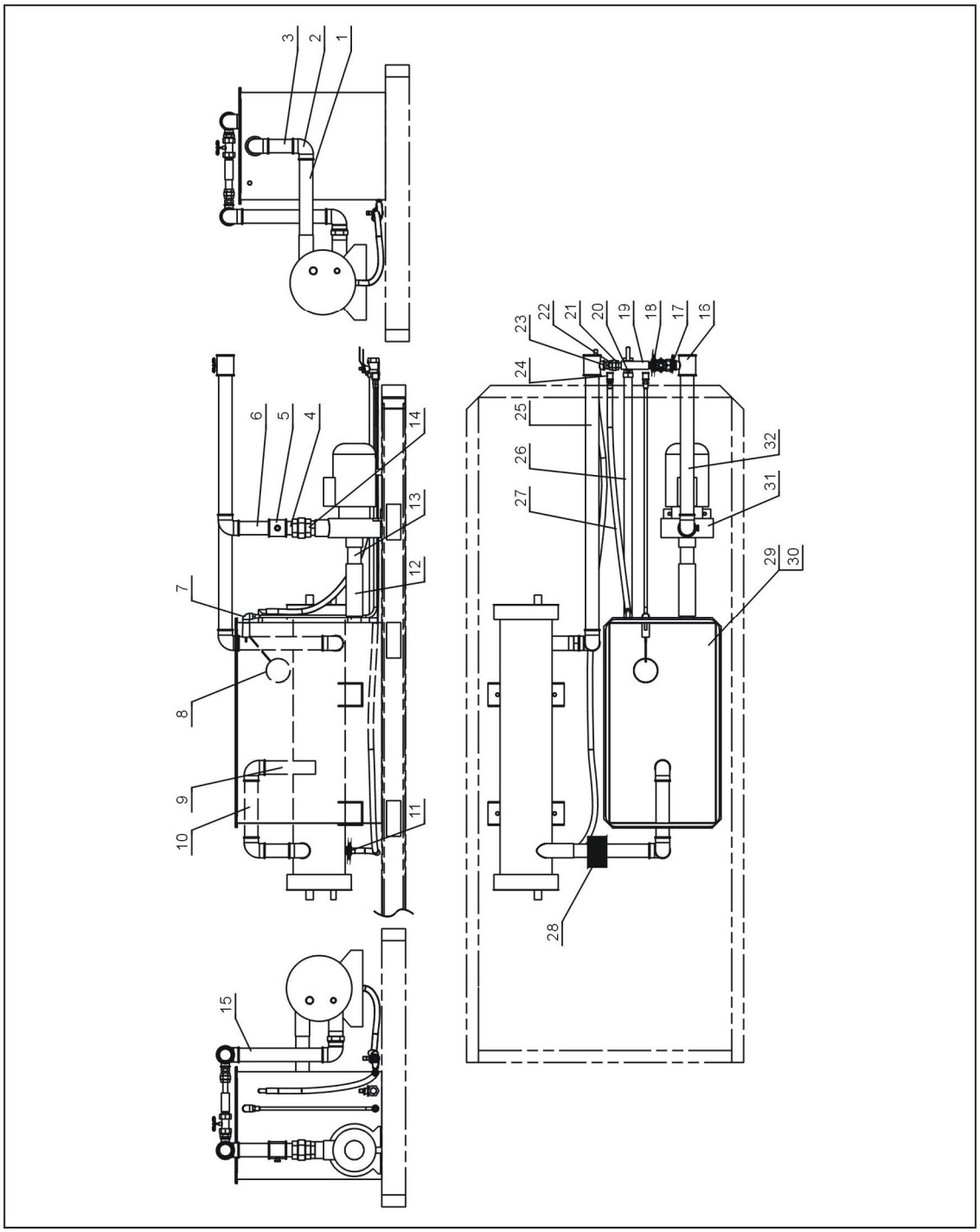
2.2.4 Rack Parts List (SIC-48A~75A -R2)

Table 2-2: Rack Parts List (SIC-48A~75A -R2)

No.	Name	Part No.	No.	Name	Part No.
1	Baffle 1	-	11	Back stand column	-
2	Right main stand column	-	12	Fixed welding piece of side plate	-
3	Right front stand column	-	13	Middle stand column	-
4	Rack middle layer	-	14	Baffle 3	-
5	Base plate of condenser	-	15	Fixed plate of evaporator	-
6	Brace of electrical cabinet	-	16	Baffle 3	-
7	Base plate of electrical cabinet	-	17	Rack base layer	-
8	Electrical cabinet	-	18	Left front stand column	-
9	Rack layer	-	19	Davit	-
10	Left main stand column	-	20	Back main stand column	-

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.5 Water System Diagram (SIC-48A-R2~75A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.6.

Picture 2-4: Water System Diagram (SIC-48A-R2~75A-R2)

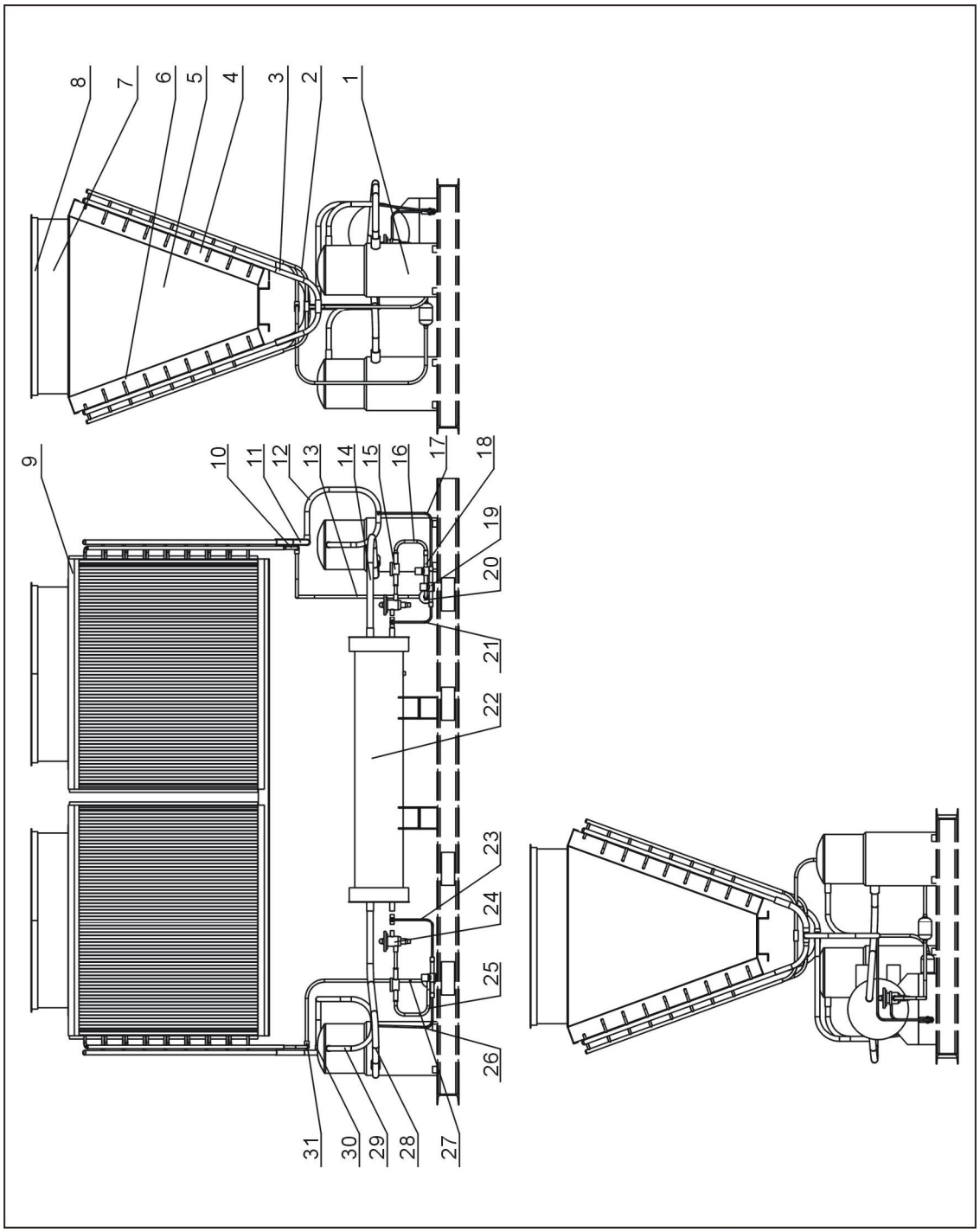
2.2.6 Water System Parts List (SIC-48A-R2~75A-R2)

Table 2-3: Water System Parts List (SIC-48A-R2~75A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Evaporator outlet 1	-	17	Galvanized pipe inner joint 1”	YW50000100000
2	Galvanized pipe elbow 2’’	YW53000200100	18	Sluice valve 1”	YW50000101000
3	Evaporator outlet 2	-	19	Balck rubber pipe inner diameter 32	YR60320500000
4	Galvanized pipe inner joint 2’’	YW50000200000	20	Copper globe valve 1”	YW50010000000
5	Galvanized pipeT-joint 2”×1/2”	YW52201200100	21	By-pass pipe	-
6	Pump outlet 1	-	22	Galvanized pipe loose joint 1”	YW54000100000
7	Galvanized pipeelbow 1/2”	YW53100200100	23	Galvanized pipe inner joint 1”	YW50000200000
8	Floating ball switch 1/2”	YW59010200000	24	Galvanized pipe direct connection 1/2”	YW51001200000
9	Evaporator outlet 4	-	25	Return water pipe 1	-
10	Evaporator outlet 3	-	26	Water outlet pipe	-
11	Copper inserted core M16×1/2PT	BH12161200010	27	Wire rubber hose 0.5”	YW85010400100
12	Balck rubber pipe inner diameter 60× thickess 3	YR60600300000	28	Flow switch	YW85005000000
13	Pump inlet	-	29	Water tank	-
14	Galvanized pipe loose joint 2”	YW54000200000	30	Water tank cover	-
15	Return water 2	-	31	Pump	-
16	Galvanized pipe T-joint 2” ×1”	YW52020100000			

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.7 Refrigerant System Diagram (SIC-48A-R2~75A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.8.

Picture 2-5: Refrigerant System Diagram (SIC-48A-R2~75A-R2)

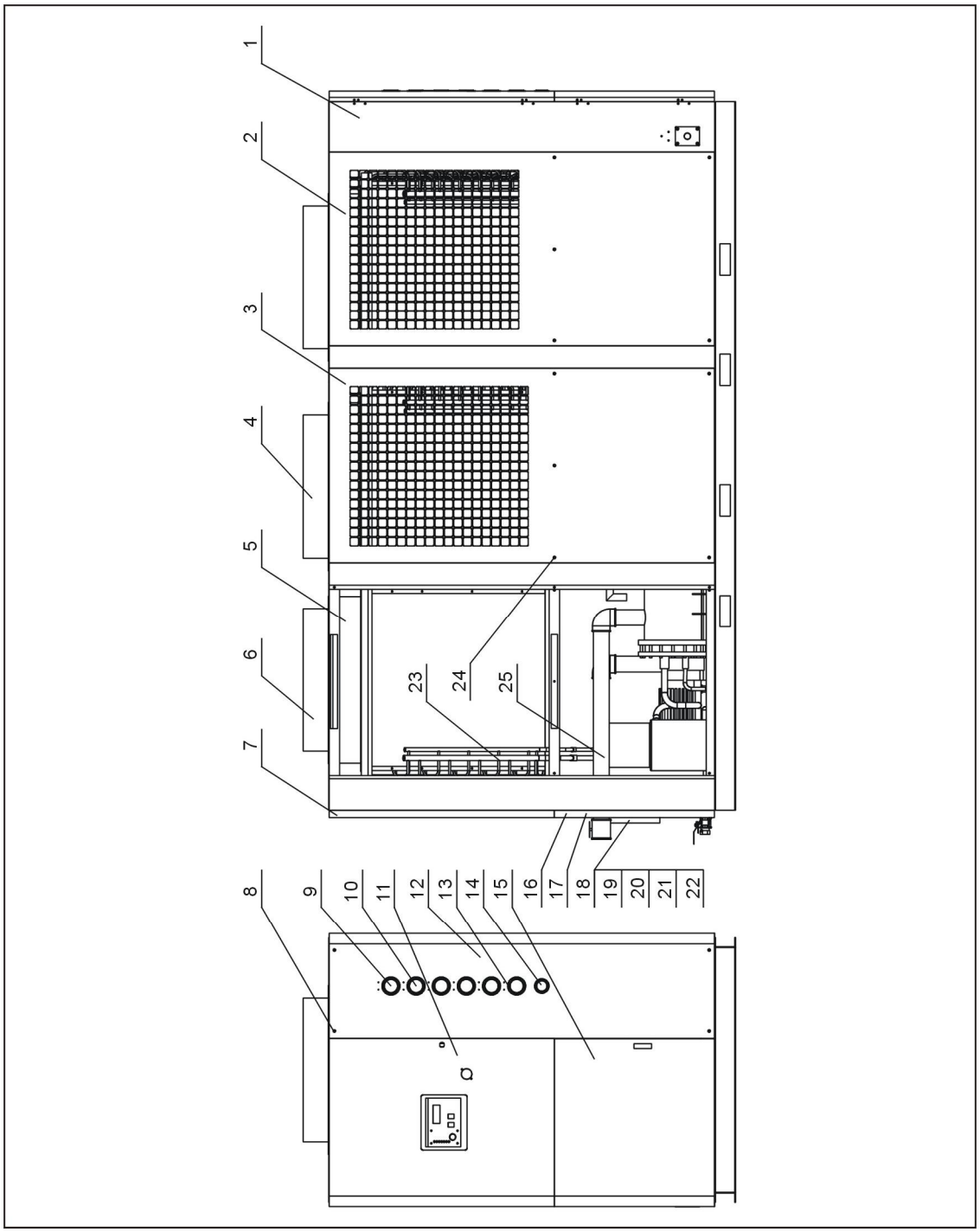
2.2.8 Refrigerant Sytem Parts List (SIC-48A-R2~75A-R2)

Table 2-4: Refrigerant Sytem Parts List (SIC-48A-R2~75A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Compressor	-	17	Front chiller by-pass 1	-
2	Back chiller liquid pipe 1	-	18	Solenoid valve	-
3	Back chiller air exhaust pipe 2	-	19	Heat by-pass valve	-
4	Right condenser	-	20	Dryer filter	YW85016400100
5	Base plate of condenser	-	21	Front chilller by-pass 1	-
6	Left condenser	-	22	Evaporator	-
7	Air guide	-	23	Back chiller by-pass 1	-
8	Fan cover	-	24	Expansion valve	-
9	Cover plate of condenser	-	25	Back chiller liquid pipe 2	-
10	Front chiller liquid pipe 1	-	26	Back chiller by-pass 1	-
11	Front chiller air exhaust pipe 2	-	27	Back chiller liquid pipe 3	-
12	Front chiller air exhaust pipe 1	-	28	Back chiller return air pipe	-
13	Front chiller liquid pipe 2	-	29	Back chiller air exhaust pipe 1	-
14	Front return air pipe	-	30	Copper T-joint 7/8''	YW05000700100
15	Refrigerant indicator HMI-1TT4	YW85001400000	31	Copper T-joint 1/2''	YW05000400300
16	Front chiller liquid pipe 3	-			

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.9 General Assembly Diagram (SIC-100A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.10.

Picture 2-6: General Assembly Diagram (SIC-100A-R2)

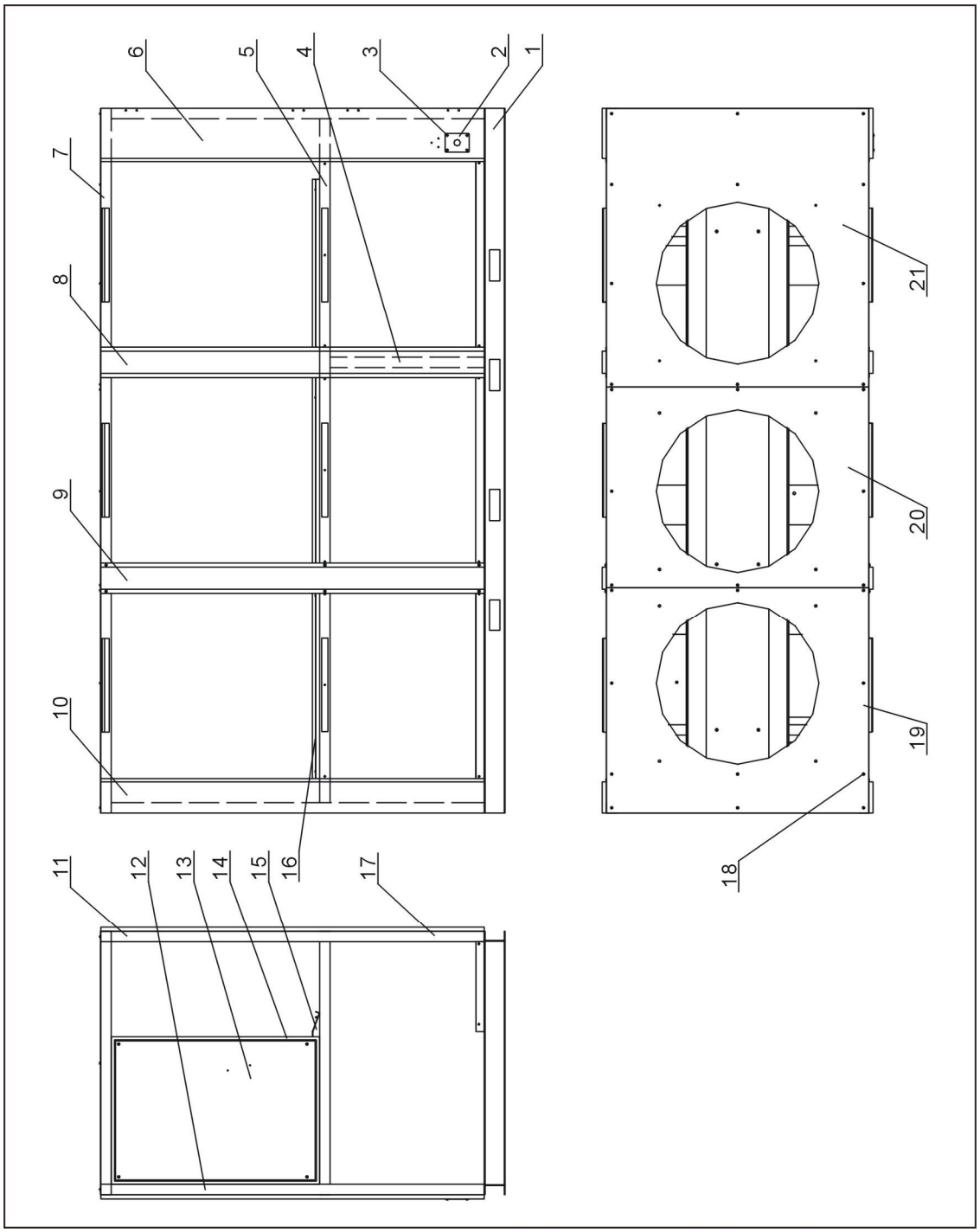
2.2.10 General Assembly Diagram Parts List (SIC-100A-R2)

Table 2-5: General Assemble Diagram Parts List (SIC-100A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Rack	-	14	Water pressure gauge	YW85001000100
2	Side plate 2	-	15	Lower plate	-
3	Side plate 1	-	16	Back plate 2	-
4	Fan	-	17	Back plate 3	-
5	Air guide	-	18	Refrigerant indicator base	YW20000000400
6	Fan	-	19	Refrigerant indicator screw	BH12060700110
7	Back plate 1	-	20	Refrigerant indicator STM-310	BH12030000010
8	Socket head cap screw M6×65	YW61066500100	21	Glass tube	YW70963000000
9	High pressure gauge	YW85005500000	22	Refrigerant indicator guard	BL90006800020
10	Low pressure gauge	YW85003500000	23	Refrigerating system assembly	-
11	Upper door plate	-	24	Cross recessed oval had screw M6×30	YW62063000000
12	Gauge plate	-	25	Chilled water system	-
13	Cross recessed oval head screw M4×10	YW62041000000			

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.11 Rack Diagram (SIC-100A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.12.

Picture 2-7: Rack Diagram (SIC-100A-R2)

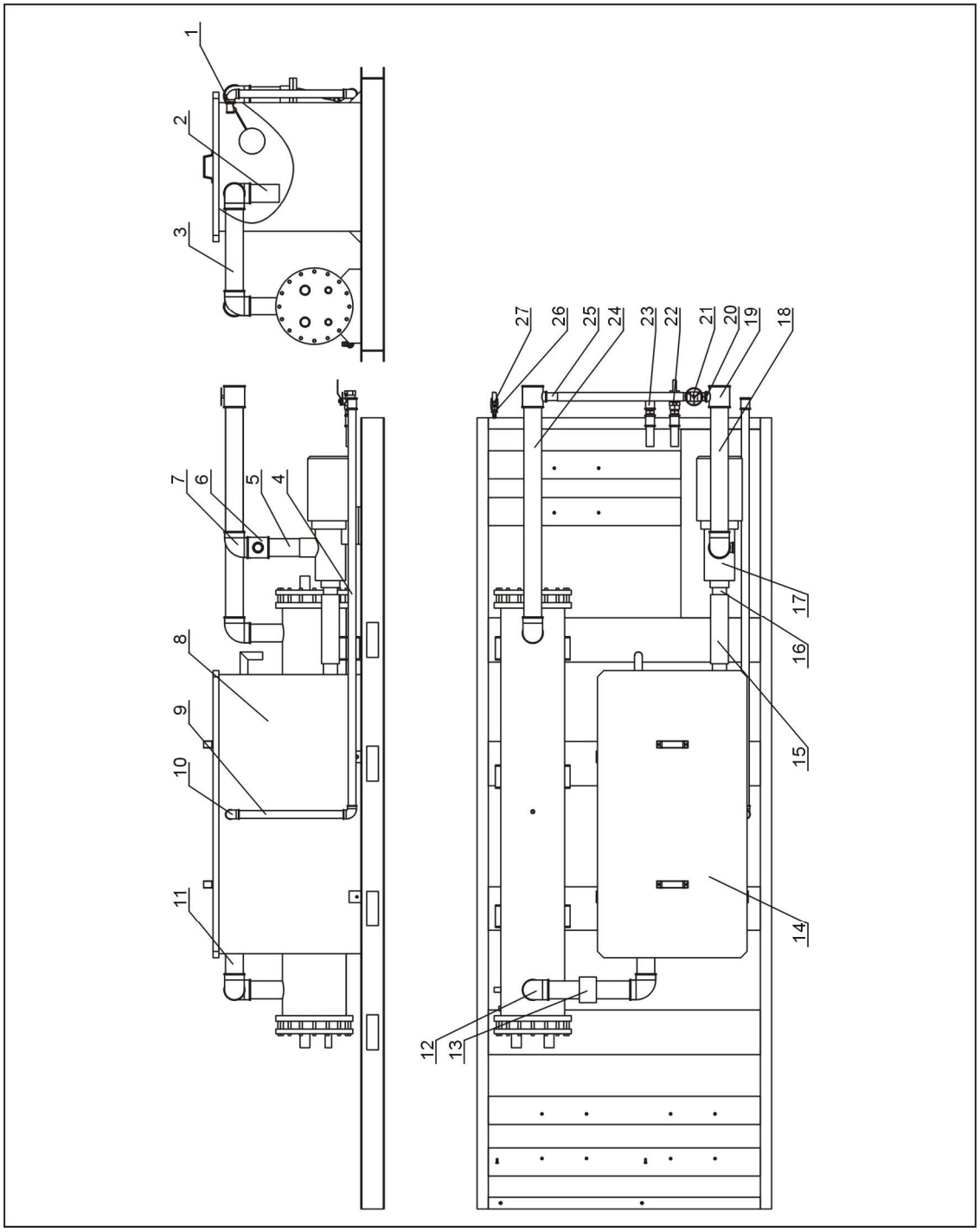
2.2.12 Rack Parts List (SIC-100A-R2)

Table 2-6: Rack Parts List (SIC-100A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Rack base layer	-	12	Left front brace	-
2	Line jig fixed board	-	13	Base plate of electrical cabinet	-
3	Cross recessed oval head screw M5×15	YW62051500000	14	Electrical cabinet	-
4	Brace 1	-	15	Middle water pond assembly 2	-
5	Rack middle layer	-	16	Middle water pond assembly	-
6	Left front stand column	-	17	Right front stand column	-
7	Rack top layer	-	18	Cross recessed oval had screw M6×15	YW62061500000
8	Middle stand column	-	19	Top plate 1	-
9	Movable stand column	-	20	Top plate 2	-
10	Back stand column	-	21	Top plate 3	-
11	Brace 2	-			

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.13 Water System Diagram (SIC-100A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.14.

Picture 2-8: Water System Diagram (SIC-100A-R2)

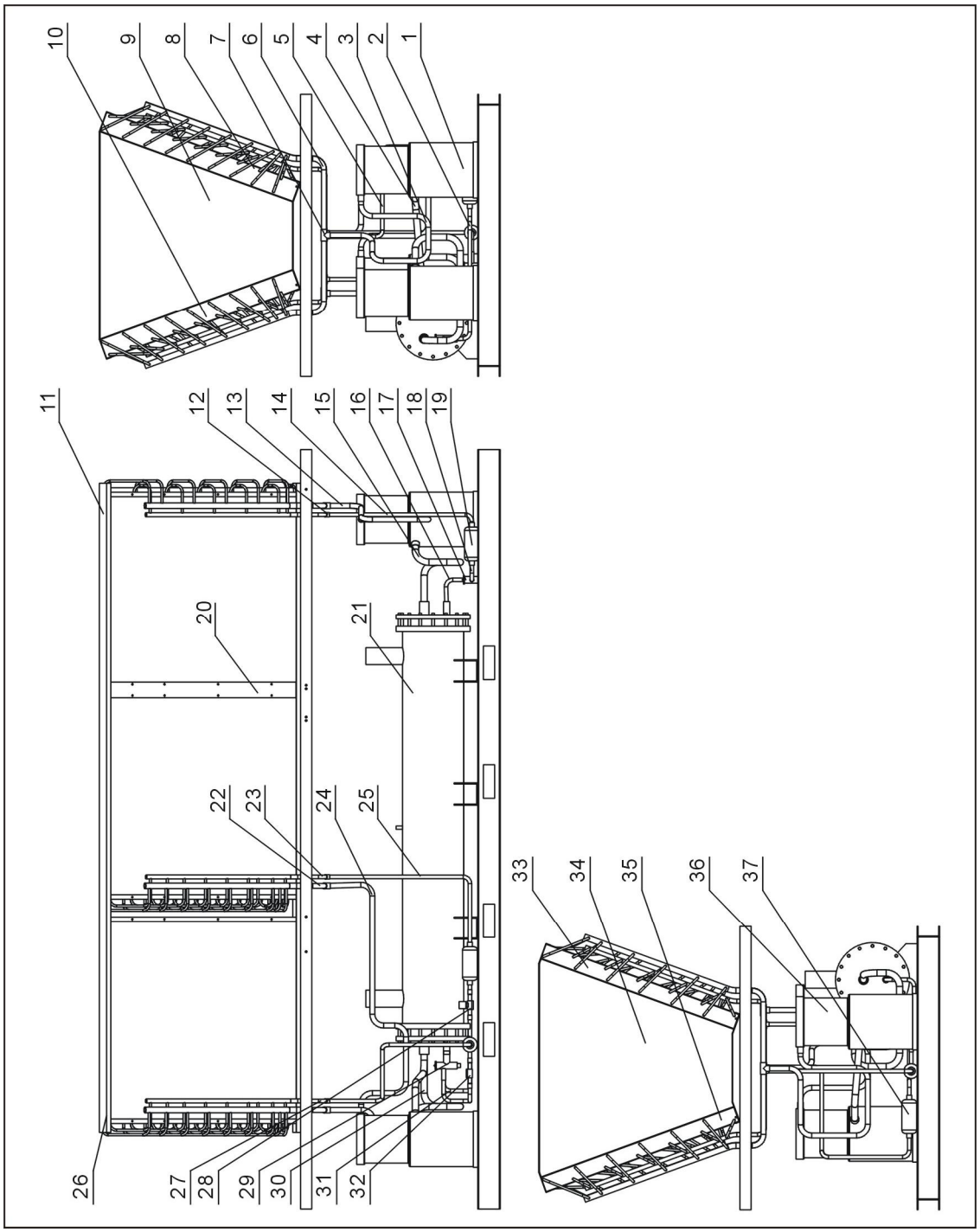
2.2.14 Water System Parts List (SIC-100A-R2)

Table 2-7: Water System Parts List (SIC-100A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Floating ball switch 1”	YW59010000000	15	Balck rubber pipe 3”	YR60390300000
2	Water pipe 6	-	16	Water pipe 10	-
3	Water pipe 4	-	17	Pump	-
4	Water pipe 9	-	18	Water pipe 2	-
5	Water pipe 1	-	19	Galvanizewd pipe T-joint 2.5” ×1”	YR52250100000
6	Galvanized pipe T-joint 2”×1/2”	YW52201200100	20	Galvanized pipe inner joint 1”	YW50000100000
7	Galvanized pipe street elbow 2” ×1/2”	YW53252500000	21	Sluice valve 1”	YW50000101000
8	Water tank body	-	22	Copper globe valve 1”	YW50010000000
9	Water pipe 8	-	23	Galvanized pipe direct connection 1”	YW51000100000
10	Galvanized pipe elbow 1”	YW53100000000	24	Water pipe 3	-
11	Pipe water 5	-	25	Water pipe 7	-
12	Galvanized pipe elbow 2.5”	YW53002500000	26	Copper inserted core M16×1/2PT	BH12161200010
13	Flow switch	YW85005000000	27	Copper globe valve 1/2”	YW50010200100
14	Water tank cover	-			

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.15 Refrigerant System Diagram (SIC-100A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.16.

Picture 2-9: Refrigerant System Diagram (SIC-100A-R2)

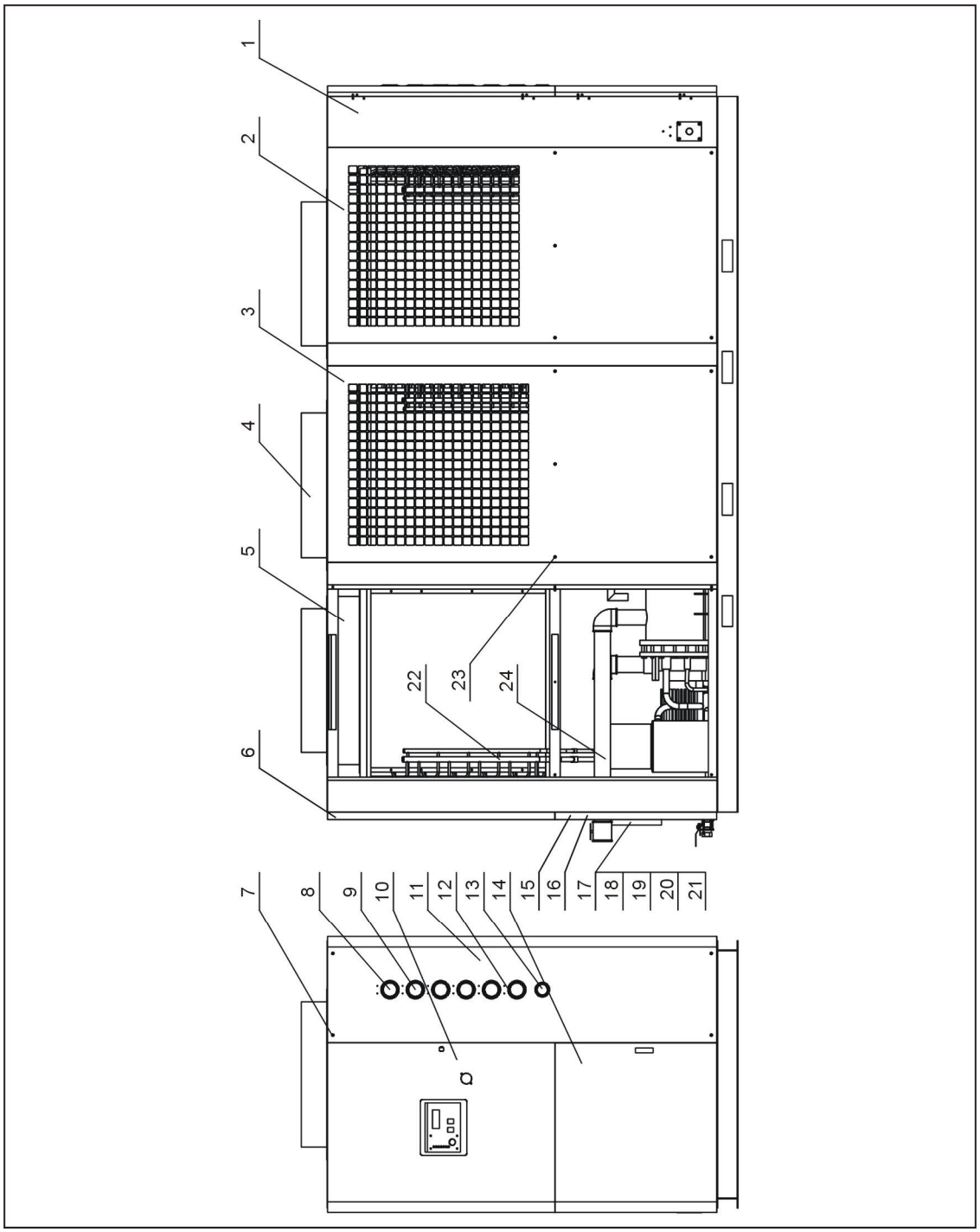
2.2.16 Refrigerant Sytem Parts List (SIC-100A-R2)

Table 2-8: Refrigerant Sytem Parts List (SIC-100A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Compressor	-	20	Condenser baffle 3	-
2	Liquid pipe 3	-	21	Evaporator	-
3	Air exhaust pipe 1	-	22	Air exhaust piep 5	-
4	Return air pipe 1	-	23	Liquid pipe 4	-
5	Liquid pipe 2	-	24	Air exhaust pipe 2	-
6	Air exhaust pipe 4	-	25	Liquid pipe 5	-
7	Copper T-joint 7/8''	YW05000700100	26	Condenser cover 2	-
8	Right condenser 1	-	27	Liquid valve 1	-
9	Condenser baffle 1	-	28	Solenoid valve	-
10	Left condenser 1	-	29	Expansion valve	-
11	Condenser cover plate	-	30	Return air pipe 2	-
12	Copper T-joint 5/8''	YW05000500200	31	Liquid pipe 6	-
13	Air exhaust pipe 3	-	32	Refrigerant indicator	-
14	Liquid pipe 7	-	33	Right condenser 2	-
15	Return air pipe 3	-	34	Condenser baffle 2	-
16	Liquid pipe 9	-	35	Left condenser 2	-
17	Expansion valve	-	36	Compressor	-
18	Liquid pipe 8	-	37	Dryer filter	YW85016500100
19	Dryer filter	YW85016400100			

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.17 General Assembly Disgram (SIC-114A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.18.

Picture 2-10: General Assembly Disgram (SIC-114A-R2)

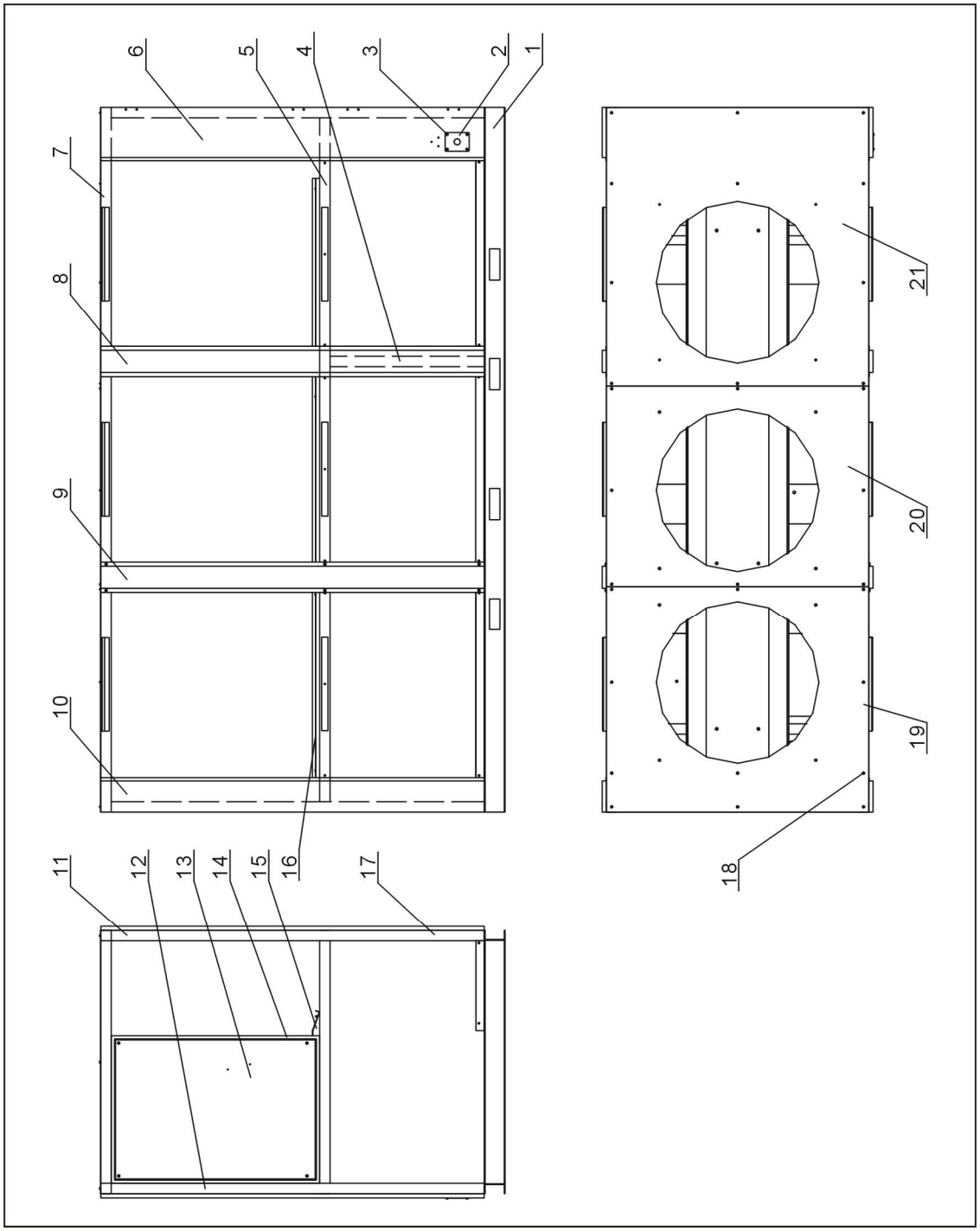
2.2.18 General Assembly Diagram Parts List (SIC-114A-R2)

Table 2-9: General Assembly Diagram Parts List (SIC-114A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Rack	-	13	Water pressure gauge	YW85001000100
2	Side plate 2	-	14	Lower door plate	-
3	Side plate 1	-	15	Back plate 2	-
4	Fan	YM60650650000	16	Back plate 3	-
5	Air guide	-	17	Refrigerant indicator base	YW20000000400
6	Back plate 1	-	18	Regrigerant indicator screw	BH12060700110
7	Socket head cap screw M6×65	YW61066500100	19	Refrigerant indicator STM-310	BH12030000010
8	High pressure gauge	YW85005500000	20	Glass tube	YW70963000000
9	Low pressure gauge	YW85003500000	21	Refrigeration indicator	BL90006800020
10	Upper door plate	-	22	Refrigerating system assembly	-
11	Gauge plate	-	23	Cross recessed oval head screw M6×30	YW62063000000
12	Cross recessed oval head screw M4×10	YW62041000000	24	Cooling water system	-

** means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.19 Rack Diagram (SIC-114A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.20.

Picture 2-11: Rack Diagram (SIC-114A-R2)

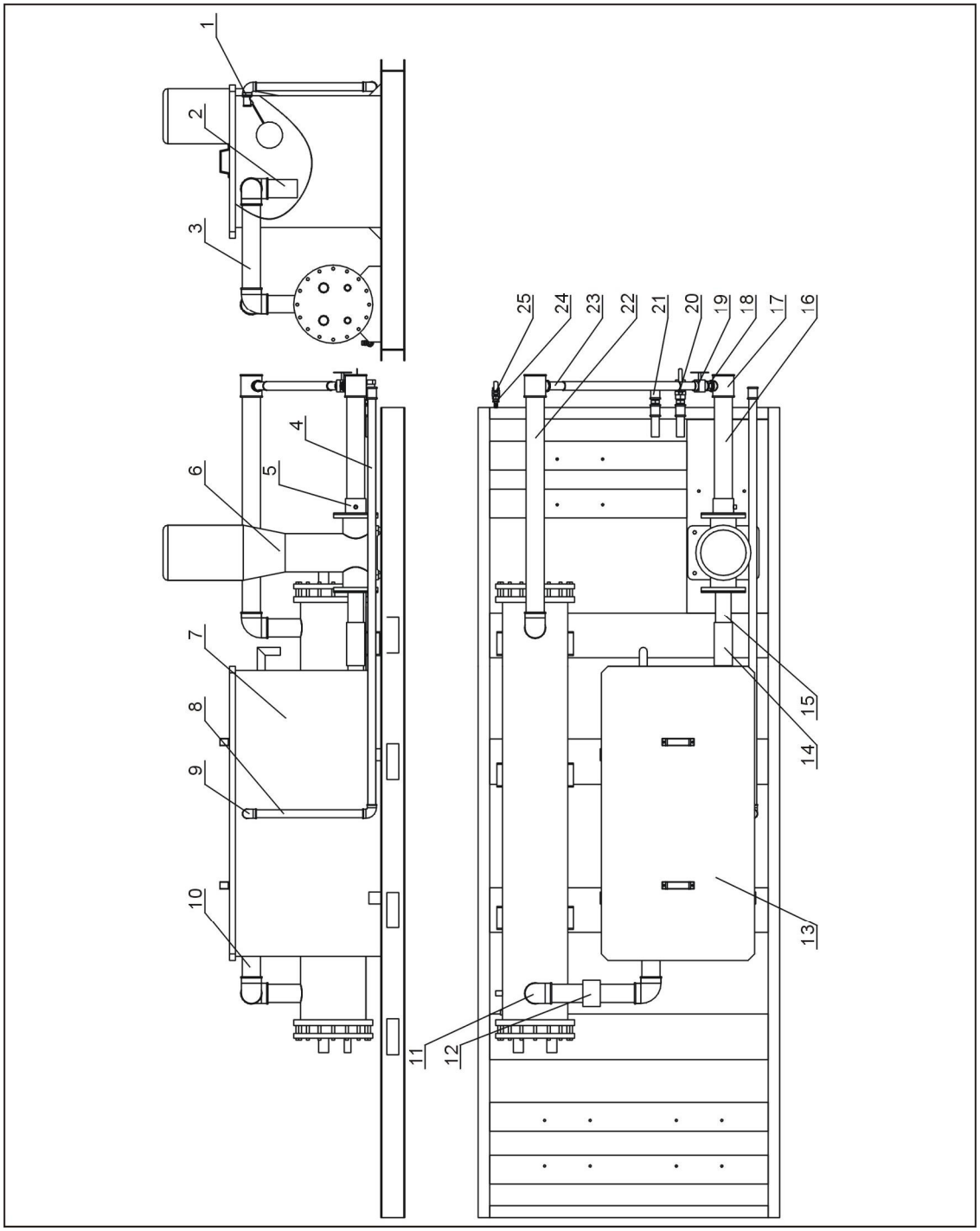
2.2.20 Rack Parts List (SIC-114A-R2)

Table 2-10: Rack Parts List (SIC-114A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Rack base layer	-	12	Brace 2	-
2	Line jigf ixed board	-	13	Left front stand column	-
3	Cros-recessed oval head screw M5×15	YW62051500000	14	Base plate of electrical cabient	-
4	Brace 1	-	15	Electrical cabinet	-
5	Rack middle layer	-	16	Middle water pond assembly 2	-
6	Middle water pond assembly	-	17	Right front stand column	-
7	Left front stand column	-	18	Cros-recessed oval head screw M6×15	YW62061500000
8	Rack top layer	-	19	Top plate 1	-
9	Middle stand column	-	20	Top plate 2	-
10	Movable stand column	-	21	Top plate 3	-
11	Back stand column	-			

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.21 Water System Diagram (SIC-114A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.22.

Picture 2-12: Water System Diagram (SIC-114A-R2)

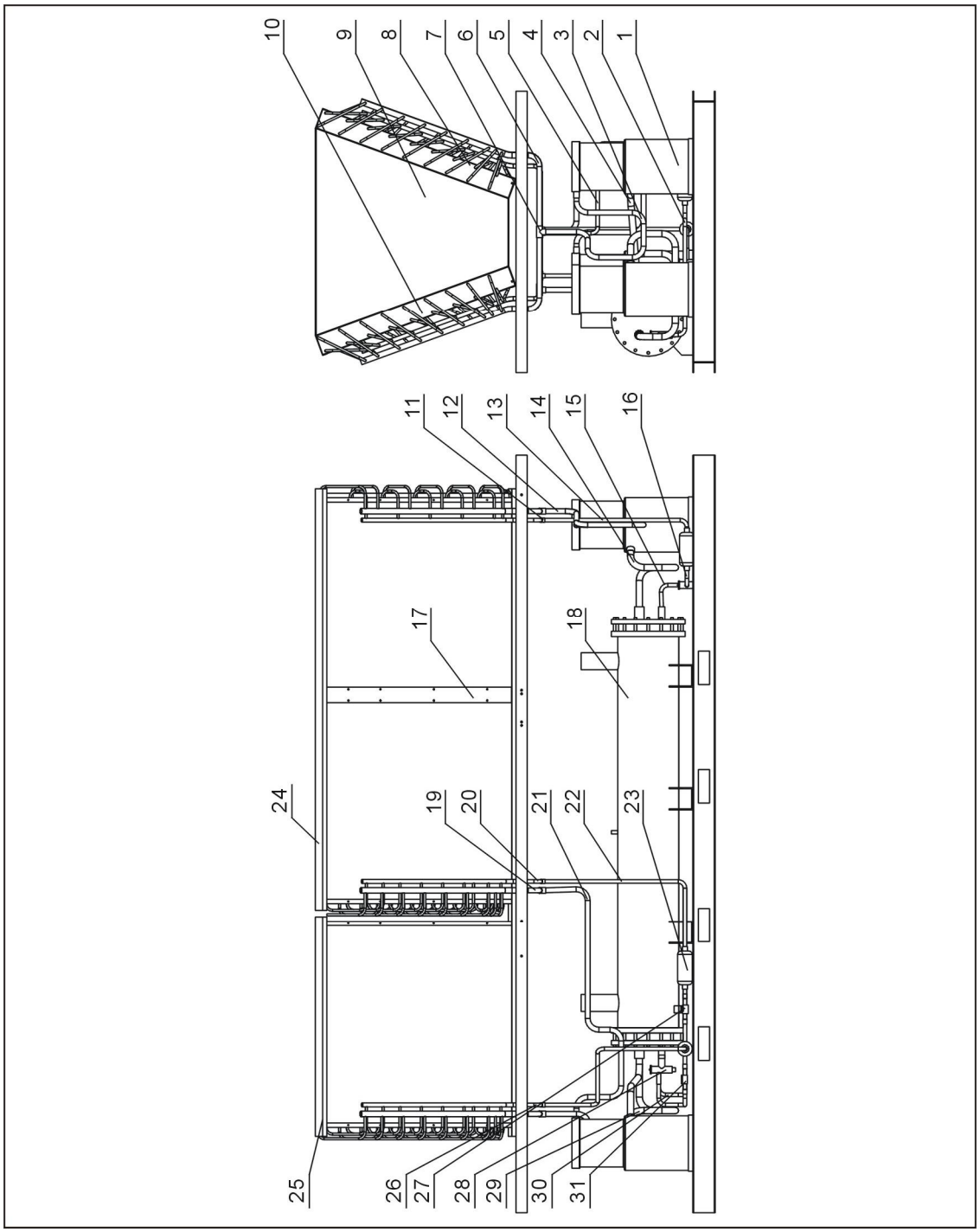
2.2.22 Water System Parts List (SIC-114A-R2)

Table 2-11: Water System Parts List (SIC-114A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Floating ball valve 1”	YW59010000000	14	Black rubber pipe 3”	YR60390300000
2	Water pipe 6	-	15	Water inlet flange	-
3	Water pipe 4	-	16	Water pipe 1	-
4	Water pipe 9	-	17	Galvanized pipe T-joint 2.5” ×1”	YR52250100000
5	Water outlet flange	-	18	Galvanized pipe inner joint 1”	YW50000100000
6	Pump	-	19	Sluice valve 1”	YW50000101000
7	Water tank body	-	20	Copper globe valve 1”	YW50010000000
8	Wate pipe 8	-	21	Galvanized pipe direct connection 1”	YW51000100000
9	Galvanized pipe elbow 1”	YW53100000000	22	Water pipe 3	-
10	Wate pipe 5	-	23	Water pipe 7	-
11	Galvanized pipe elbow 2.5”	YW53002500000	24	Copper inserted core M16×1/2PT	BH12161200010
12	Flow switch	YW85005000000	25	Copper globe valve 1/2”	YW50010200100
13	Water tank cover	-			

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.2.23 Refrigerant System Diagram (SIC-114A-R2)



Note: For details of the numbers in the parts drawing, please refer to the part list in 2.2.24.

Picture 2-13: Refrigerant System Diagram (SIC-114A-R2)

2.2.24 Refrigerant Sytem Parts List (SIC-114A-R2)

Table 2-12: Refrigerant System Parts List (SIC-114A-R2)

No.	Name	Part No.	No.	Name	Part No.
1	Compresser	-	17	Condenser baffle 3	-
2	Liquid pipe 3	-	18	Evaporator	-
3	Air exhaust pipe 1	-	19	Air exhaust pipe 5	-
4	Return air pipe 1	-	20	Liquid pipe 4	-
5	Liquid pipe 2	-	21	Air exhaust pipe 2	-
6	Air exhaust pipe 4	-	22	Liquid pipe 5	-
7	Copper T-joint 7/8''	YW05000700100	23	Dryer filter	YW85016500100
8	Right condenser 1	-	24	Condenser cover plate	-
9	Condenser baffle 1	-	25	Condenser cover 2	-
10	Left condenser 1	-	26	Liquid valve 1	-
11	Copper T-joint 5/8''	YW05000500200	27	Solenod valve	-
12	Air exhaust pipe 3	-	28	Expansion valve	-
13	Liquid pipe 7	-	29	Return air pipe 2	-
14	Return air pipe 3	-	30	Liquid pipe 6	-
15	Liquid pipe 9	-	31	Refrigerant indicator	-
16	Liqid pipe 8	-			

* means possible broken parts. ** means easy broken parts. Spare backup is suggested.
Please confirm the version number of the manual before you order to ensure the stock number and the parts are consistent.

2.3 Main Parts and Functions

2.3.1 Compressor

1) Compressing and conveying the refrigeration steam and forming low pressure in evaporator and high pressure in condenser, the compressor is the core of the whole system.
2) SIC-A-R2 adopts scroll compressor.

Picture 2-14: Compressor

2.3.2 Condensor

1) Condenser is a heat output device which is used to discharge the heat absorbed by the evaporator and converted by the compressor to the cooling medium.
2) SIC-A-R2 adopts fin-style condenser.

Picture 2-15: Condensor

2.3.3 Drying Filter

1) The functions of the dry filter are: clean the impurity in the refrigerant, absorb the free moisture in the refrigerant, and prevent the narrow section (especially the valve port of the heat expansion valve) of the pipe from forming ice jam.
2) The size of the filter is usually chosen according to the caliber of the cooling agent pipe.

3) The dry filter is installed in front of the heat expansion valve and solenoid valve (optional) to maintain the strictness of the valve.。

Picture 2-16: Drying Filter

2.3.4 Evaporator

1) The evaporator is the equipment which output the refrigerating capacity, in which the cooling agent absorb the heat of the cooled objects and achieve the aim of refrigeration.
2) SIC-A-R2 adopts adopts tube-in-shell horizontal evaporator.

Picture 2-17: Evaporator

2.3.5 High and Low Pressure Controllers

1) The high and low pressure controllers are used to control the working pressure of the compressor suction port and outlet port.
2) The high pressure of switch is 40 bar, and the low pressure of switch is 5 bar.
3) Give an alarm when the pressure of the compressor outlet port is higher than 40 bar or the pressure of the compressor suction port is lower than 5 bar.

2.3.6 Anti-freeze Switch

Anti-freeze protector should be mounted on the evaporator to monitor the water temperature inside it, ensuring the water temperature is controlled within suitable range. As to prevent the freezing, and protect the evaporator.

Pic. 2-20: Anti-freeze Switch

2.4 Optional Accessories

2.4.1 Refrigerant Indicator

Picture 2-18: Refrigerant Indicator

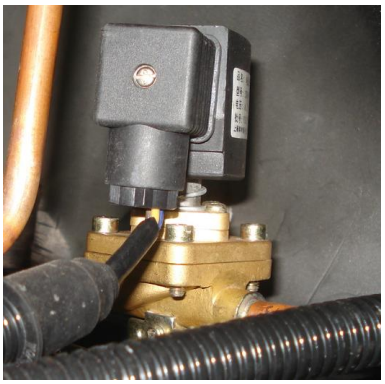
1) The refrigerant indicator is used to detect whether the refrigerant is filled appropriately.
2) The refrigerant indicator is used to detect the water ratio of the system.
3) The refrigerant indicator is installed infront of expansion valve.

2.4.2 Solenoid Valve

Picture 2-19: Solenoid Valve

1) Solenoid valve is used to cut the refrigerant supply immediately after the machine stops to prevent the compressor freezing.
2) Solenoid vlave is installed in front of the refrigerant indicator.

2.4.3 Heat By-pass Valve



Picture 2-20: Heat By-pass Valve

1) Heat by-pass valve is used to bypass the cooling refrigerant when the temperature is low to prevent frequent starts and stops of the compressor and achieve accurate temperature control.
2) Heat by-pass valve is installed on the connecting pipe of the compressor outlet and expansion valve outlet.

2.4.4 Flow Switch

Picture 2-21: Flow Switch

1) Flow switch is adopted to detect whether the chilled water flow is sufficient.
2) Flow switch is installed on the water pipe between the evaporator and the water tank.

2.4.5 Liquid Level Indicator

Through the liquid level indicator, the water level in the tank can be viewd.

3. Installation and Debugging

 Attention!

Read this chapter before installation. Install the machine according to following steps!

3.1 Machine Location

1) Air-cooled water chiller should be installed in an environment that has good ventilation, such as draughty area near the window. Ambient temperature should not be more than 43℃ if it is installed indoors. Use ventilator or exhaust pipe to conduct the hot air produced by the chiller to the outside. If the chiller is installed outdoors, protective cover should be used.
2) Please ensure at least 1m installation and maintenance space around the machine.

3.2 Power Connectors

1) Make sure that the voltage and frequency corresponds with the requirements on manufacturer's name plate.
2) Connection of the machine electrical wires and negative wire according to local rules and regulations.
3) Use independent electrical wires and switch. Diameter of electrical wire should not be smaller than that of the electric wire which is used for the electrical control box.
4) Wiring connections should be firmly fixed.
5) The chiller use three phase & five core wire. Connect wire N to null wire, G to earth wire, and others to live wire.
6) Power supply:
   Voltage deviation: Rated voltage on the nameplate: ±5%
   Frequency deviation: ±2%
7) Specific power supply specifications please refer to the schematic model.

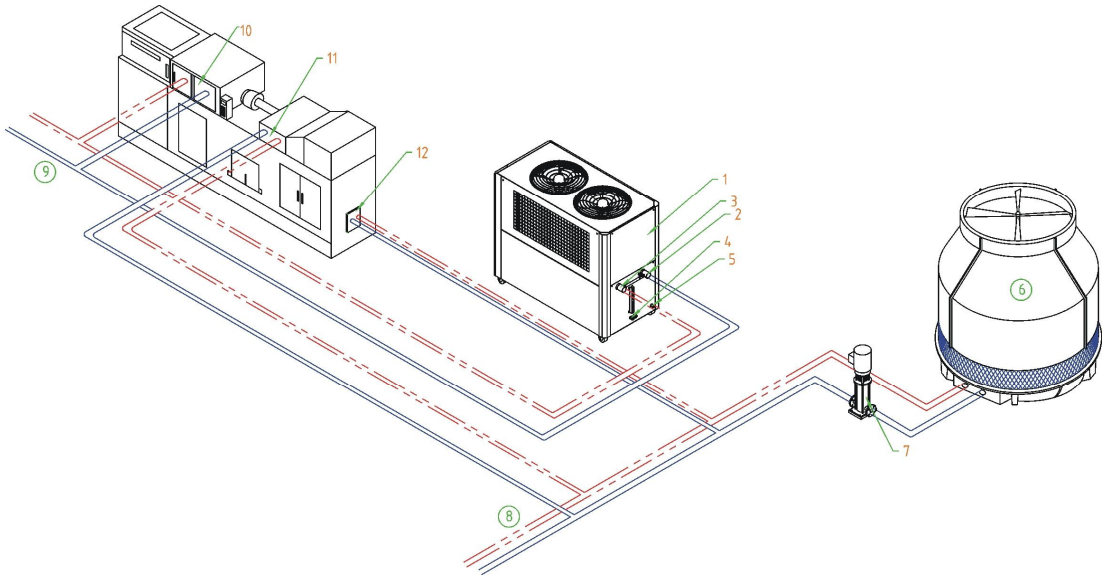
 Electrical wire connection of water chiller should be done by qualified electrician! Electrical wiring circuit should not be modified unless

authorized by our company. We shall not be reliable for machine damages caused by unauthorized modification.

Attention!

Before connecting the machine with power supply, please make sure that main switch is turned off!

3.3 Water connections



Parts Name ：

1. Water chiller	2. Chilled water inlet	3. Chilled water outlet
4. Water outfall	5. Water refill port	6. Cooling water pump
7. Cooling water circulation	8. Chilled water circulation	
9. Mould Cooling	10. Cooling tank	12. Oil Cooling

Picture 3-1： Installation Location

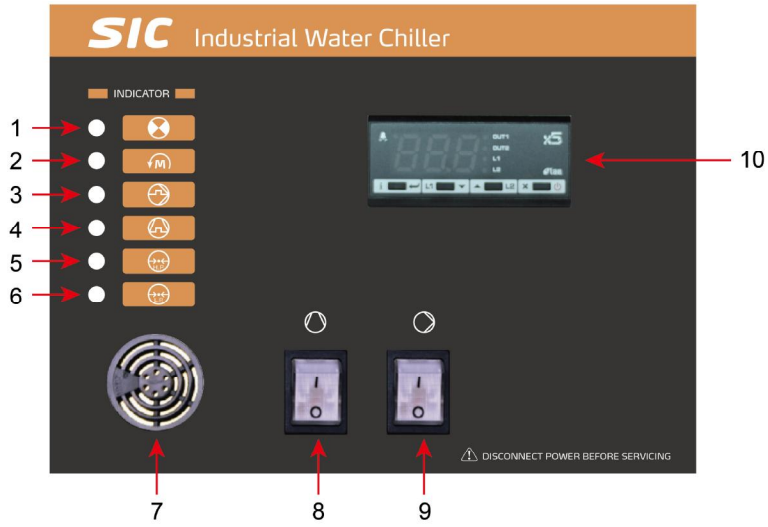
3.3.1 Notice of Pipeline Installation

1) According to the installation configuration diagram to install the pipe system, and use thermal insulation materials to protect the refrigerated water pipe.
2) At the lowest part of cooling water circulation, drainage valve should be installed.
3) Water filter should used in the cooling water and chilled water circulation pipe if water quality and surroundings of cooling tower is bad.
4) After the installation is completed, check if there are leakages in the

circulation system. Cooling water circulation pipe should be covered with a layer of insulated material to avoid temperature increasing and water drops forming on the surface of circulation pipe.

4. Application and Operation

4.1 Control Panel



Picture 4-1: Control Panel

Table 4-1: Specification of Control Panel

No.	Name	Functions	Remarks
1	Power indicator	Connect through power supply and turn on the main switch, the indicator will become bright.	Note: Do not disassemble any electrical components or terminals in case of electrical shock.
2	Anti-phase indicator	It is used to indicate phase reversal or phase shortage. The buzzer sounds and system stops working.	Check the power supply and exchange two of the live wires to reset the alarm.
3	Pump overload indicator	When pump current exceeds the limits, this indicator becomes bright. The buzzer sounds and system stops working.	Check if the motor is blocked or the bearing is broken. If motor works normally, please check if the setting current of the overload relay in the control box is set too low. After the above measures are taken, wait for about 1 minute, then press the blue "reset" button to reset the alarm.
4	Compressor overload alarm light	If working current of the compressor is above the setting current of overheat relay, the alarm will be raised. The buzzer sounds and system stops working.	Check if the setting current of overheat relay is correct. Setting current of overheat relay should be bigger than the rated current of the compressor.

No.	Name	Functions	Remarks
5	Over-pressure alarm light	When the outlet pressure of the compressor is higher than setting value of high-pressure switch, the alarm will be raised. The buzzer sounds and system stops working.	High-pressure switch setting value should be correctly set as 37 bar.
6	Under-pressure alarm light	When the inlet pressure of compressor is lower than setting value of low-pressure switch, the alarm will be raised. The buzzer sounds and system stops working.	Low-pressure switch should be correctly set as 4 bar.。
7	Buzzer	The buzzer makes audible alarm when problems are detected.	
8	Compressor switch	The start & stop of the compressor.	Note: Before turning on the compressor, turn on the pump first.
9	Pump switch	The start & stop of the pump.	Note: Pump rotating direction should be correct.
10	Temperature controller	Temperature setting and controlling.	Detail information pleaserefer to Chapter 4-4.

4.2 Machine startup

1) Turn on the main switch.

ON OFF

Picture 4-2: Stepup Step 1

2) Switch on the pump switch, and start up the pump.

Type / Pressuure / Model	50Hz		60Hz	
	Medium pressure	High pressure	Medium pressure	High pressure
SIC-48A-R2	2.3~3.8	3.7~4.4	3.3~4.3	4.0~5.4
SIC-58A-R2	2.3~3.7	3.7~4.3	3.3~3.5	4.0~4.2
SIC-75A-R2	2.3~3.6	3.7~4.2	2.6~4.4	2.6~4.4
SIC-100A-R2	2.3~3.1	3.7~3.9	2.6~3.8	2.6~3.8
SIC-114A-R2	1.9~3.7	4.2~5.0	3.1~4.1	3.1~4.1
Units: bar 1bar=0.1Mpa				

Noets: 1) When the operation pressure is lower than the values in the table above, the motor of the pump may be damaged because of large water flow.
2) When the operation pressure is higher than the vaues in the table above, the water flow may be insufficient and the machine may need a pump replacement to ensure high pressure.

3) Set chilling water temperature (If it is set, it's unnecessary to set the temperature). Setting method please according to Chapter 4.4 Temperature Control Table. The lowest temperature of this series water chiller is 7℃.

4) Switch on the compressor.


Attention!

Pump rotating direction should be correct.


Attention!

Before starting the system, make sure that cooling water pump is turned on. Check the water tank of the chiller. Do not start the machine when there is no water left in water tank. We shall not be liable for any damages caused by this reason.


Attention!

In order to reduce the possibilities of machine damage and prolong the life, start the machine with correct methods.


Attention!

Temperature of anti-freezing switch and high and low pressure switch is already set before delivery. We shall not be liable for any damage caused by unauthorized change of the setting.


Attention!

The compressor can't start too often due to its property (Frequent start would affect its life span). So there's 3 minutes delay of the compressor after pump start up. The parameter of temperature controller has already set. Random adjustment is forbidden.

4.3 Machine Shutdown

1) Turn off the compressor.

2) Turn off the pump.If you adopt quick molding cycle, and the cooling water temperature is low, maintain the operation of pump till the temperature rises up to the un-condensating value, then turn off the pump.

3) Turn off the main switch.

Attention!

Avoid electrical shock when main switch is turned on.

Attention!

In order to reduce the possibilities of machine damage and prolong the service life, shut off the machine with correct methods.

Attention!

The compressor can't be started frequently because of its characteristics (Frequent start will shorten its service life.). Therefore, the compressor will work about 3 minutes later after turning on the water pump. The parameter of temperature controller shall not be adjusted freely since it is already set.

4.4 Thermostat

Picture 4-3: Thermostat

4.4.1 Temperature Setting

1. Press key L1, the screen shows 1SP. The indicator L1 on the right of screen turns on. For about 1 sec., the screen would show a number that means the set of temperature.
2. Press key L1 or L2 to change the temperature, this value has been set between 7~25℃ in the factory.
3. Press key i to save the value or wait 10 secs, it would save automatically. Press key X, it won't save any one of the value and would return to the display mode.

Attention!

When temperature unit change, all parameters need to set once again. On the stand by mode, press key L2, it can change the 2DF parameters of the machine. Strongly recommend that you do not modify the value, otherwise it will cause the abnormality.

4.4.2 Default Setting Table

Table 4-2: Default Setting

No.	Code	Meaning of parameters	Default value	Remark
1	1SP	Setting value of output 1	7	Unit: ℃

Note: These parameters are only exclusive to AC1-5TSR2W-A.

Attention!

Don't try to enter any setting of other parameters. Otherwise you would change the parameter by accident which leads to the abnormality.

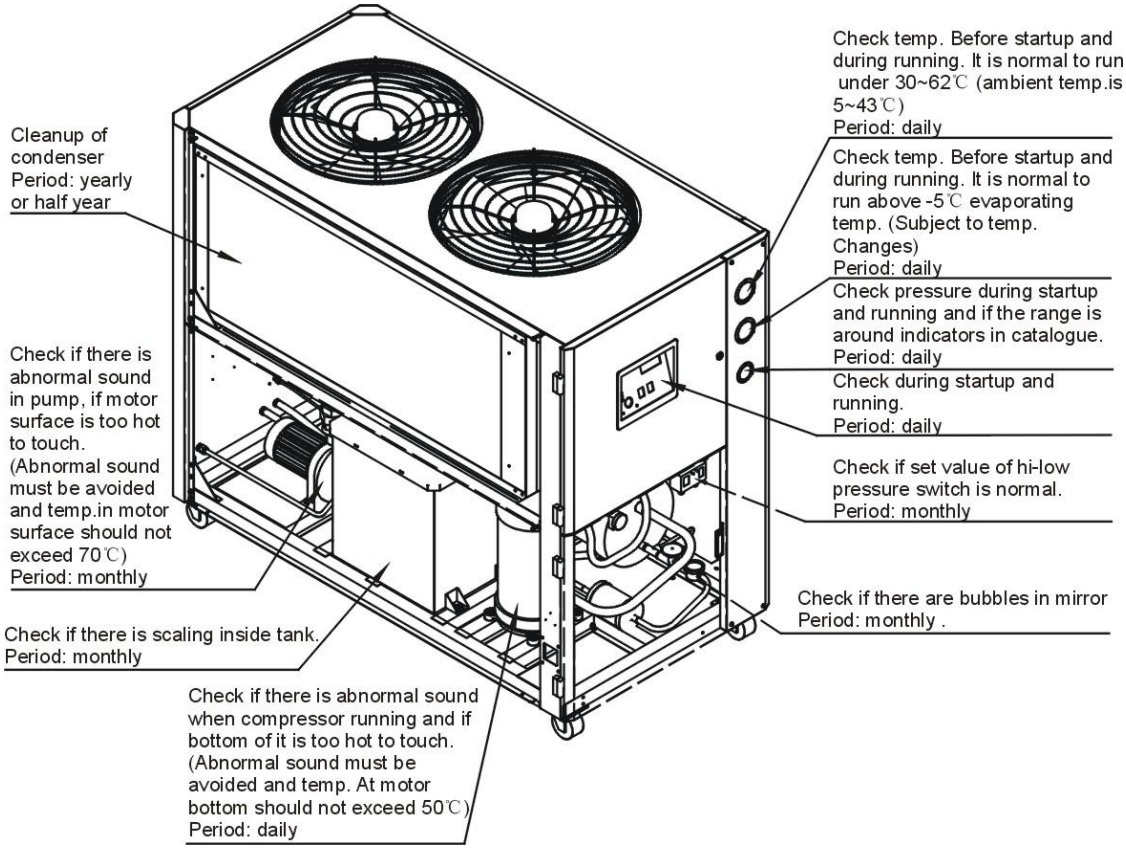
5. Trouble-shooting

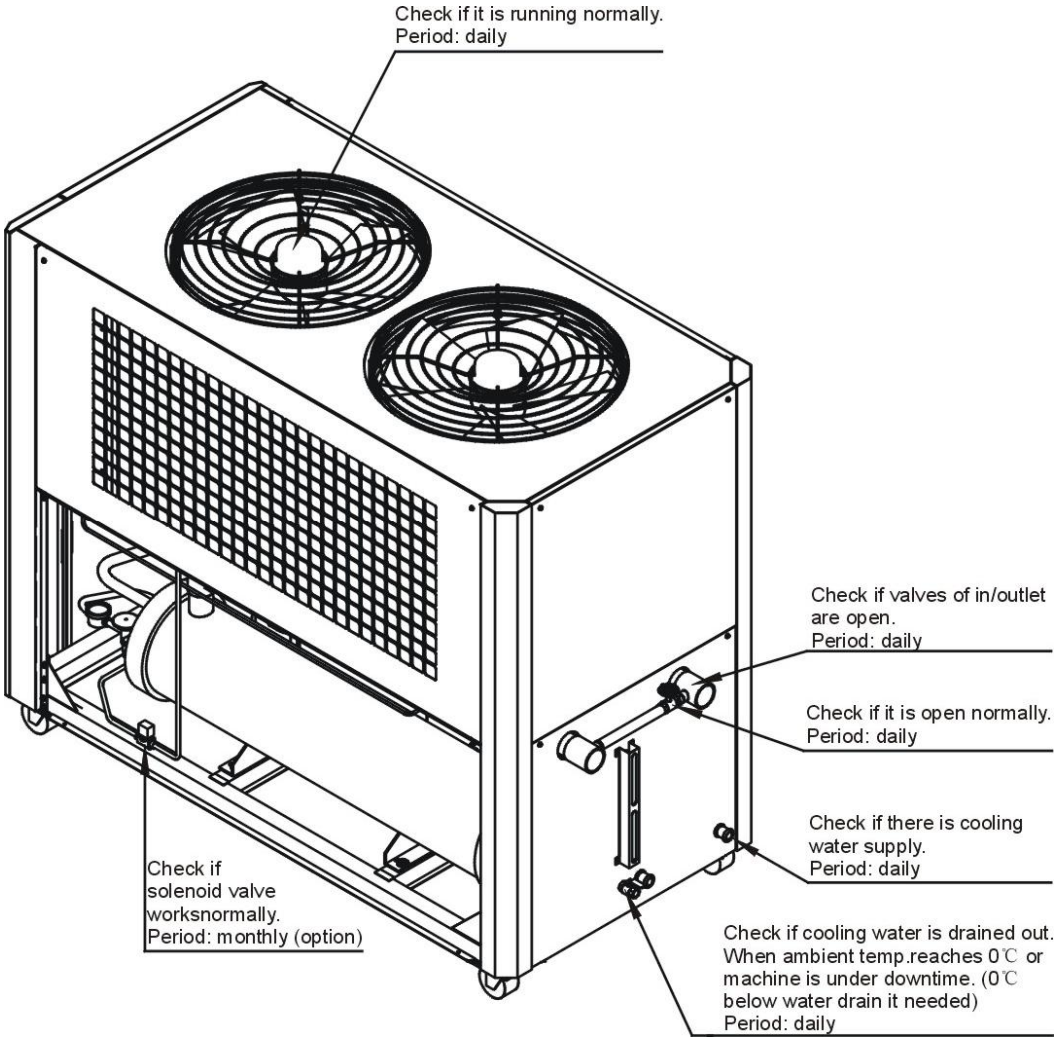
Faults	The action of the protection units	The possible fault analysis	Solutions
1. No power supply display or phase reversal	The protection units have no action	A. The power supply is not switched on B. The fuse wire of the control loop is burned out C. The linear ordering of the power supply is in the reverse order D. The fault of the main switch or circuit	A. Power on after checking B. Check the protection loop C. Change the wires in order of two random power supply wires D. Check or replace
2. Pump overload	The loader trips	A. Over current B. The fault of the pump C. The fault of the pump over loading controller	A. Reset the over loader B. Replace after checked and repaired C. Replace after checked and repaired
3. Compressor overload	The loader trips	A. Over current B. The fault of the compressor C. The fault of the compressor over loading controller	A. Reset the over loader B. Replace after checked and repaired C. Replace after checked and repaired
4. The high pressure is too high	The high pressure switch trips	A. The refrigerant is too much B. The amount of blast to the condenser is not enough C. The sediment incrustation of the condenser is too much D. The dry filter is blocked up E. The open scale of the expansion valve is too narrow F. The fault of F. The fault of the fan G. The fault of the high ressure switch I. The condenser is beaten by the sunshine	A. Discharge some of the refrigerant B. Increase the amount of blast to the condenser C. Clean the condenser D. Clean the dry filter E. Adjust the open scale properly F. Replace after checked and repaired G.. Replace after checked and repaired H. Replace after checked and repaired I. Prevent the condenser from being beaten by the sunshine

Faults	The action od the protection units	The possible fault analysis	Solutions
5. The high pressure is too low	The protection units have no action	A. The regrigerant is not enough. B. The vanes of the compressor are spoiled C. Ambient temperatute is too low	A. Check the system pipeline and weld pipeline, add refrigerant. B. Replace after checked and repaired. C. Ward off part of the condenser to ensure high pressure above 27bar.
6. The low pressure is too low	The low pressure switch trips	A. The refrigerant is not enough B. The dry filter is blocked up C. The open scale of the expansion valve is too small D. The fault of the expansion valve E. The fault of the low pressure switch	A. Check the system pipe lines, weld pipelines, and supply refrigerant. B. Clean the dry filter C. Adjust the open scale properly D. Replace after checked and repaired E. Replace after checked and repaired
7. The low pressure is too high	The protection units have no action	A. The cooling load is too big B. The power of the compressor decreases C. The open scale of the expansion valve is too big D. The packed weight of the refrigerant is excessive	A. Adjust the cooling load B. Replace after checked and repaired C. Adjust the open scale of the expansion valve D. Discharge some of the refrigerant
8. Compressor overheat	The protection units have no action	A. The heat degree of the refrigerant in the air return pipe is too high B. The high pressure is too high C. The low pressure is too low	A. Adjust the open scale of the expansion valve properly B. Check, repair and improve C. Check, repair and improve
9. The chassis of the air return pipe and the compress or frost over	The protection units have no action	A. The open scale of the expansion valve is too small B. The refrigerant is too much C. The heat load is too small D. Bad efficiency of evaporator.	A. Adjust the open scale of the expansion valve properly B. Check the system pipeline and weld pipeline, add refrigerant. C. Increase the heat load. D. Clean the evaporator.

Faults	The action of the protection units	The possible fault analysis	Solutions
10. The compressor can not start up or trips after starting up	The protection units have no action	A. The power supply wire is broken or the voltage is off normal B. The temperature control instrument is not set up properly C. The over loading protector is not reset	A. Check and connect the wires according to Specifications B. Reset the temperature control instrument C. Reset the over loading protector
	The freeze protection switch trips	A. The amount of the ice water is too little and bring about that the water temperature is too low B. The temperature control is set too low or has some faults C. The freeze protection switch is not properly set or has some faults	A. Check the pump and discharge the air in the water pipe B. Correct the set point or change C. Check, weld and repair
11. The cooling capacity can not get up to the standard		A. There is some air in the cooling system B. The water quantity and water supply in the cooling system is abnormal C. The fans run abnormally D. The filter is blocked up E. The configure of the cooling pump is not prope F. The cooling water pipe is not configured according to the standard. G. Bad efficiency of the evaporator and condenser. H. Expansion valve is blocked. I. Inaccurate refrigerant fillig.	A. Discharge the air B. Control the water level of the water supply tank C. Check and repair D. Clean the filter E. Choose the pump up to the standard (flow quantity and delivery lift) F. Configure water pipe according to the standard G. Clean the evaporator and condenser. H. E. Replace after checked and repaired. I. Accurately supply the refrigerant.

6. Maintenance and Repair





Attention!

All repair work should be done by qualified personnel only to avoid damage to the machine or personnel injury.

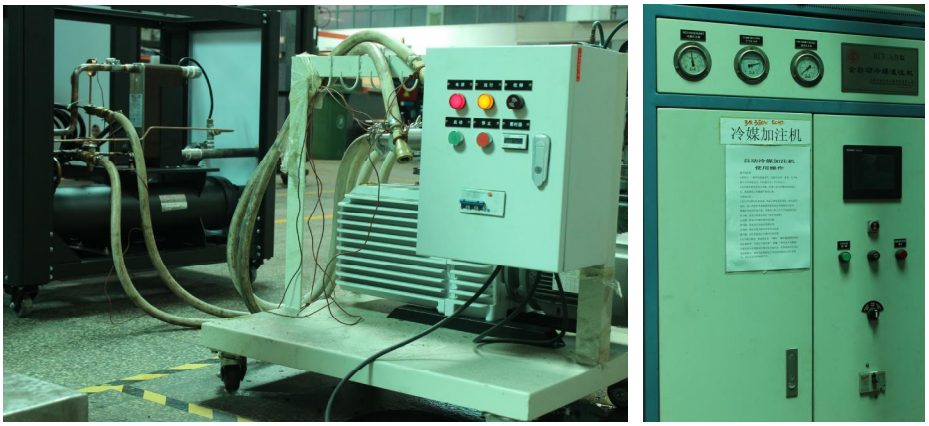
In order to operate the machine rightly and safely, please caution the matter follows:

1) Do not turn off the main power switch to stop the machine, except emergency situation.
2) When failures set in and the machine stop work with buzzer sound, first turn off the main power switch of the machine (alarm indicator will die), then go to check the reason of the failures, do not force the machine on before remove the failures.

3) Please check periodicaly to prolong the life of the machine and prevent the safety accident to appear.
4) Water supply should be processed, because the high PH can corrode the copper pipe acute. This must reduce the life of the heating and cooling implement, PH of the water supply must be between 7.0~8.5.
5) Keep the machine room dry, clean and draughty.
6) The operation and service of the machine should be done by qualified technician only.
(Please take notice that the disassembly and the inspection of the machines are hazardous when the machines are running!)

6.1 Fill in the Refrigerant

1) Infuse the nitrogen with pressure maintaining for some time. Use the soapy water to smear all the welding parts to make sure if there's the leakage.
2) Under no leakage circumstance, it should use R410A special hose for filling that connects to vacuum pump. The vacuumizing time should not less than 4h;
3) After vacuumizing, connect the refrigerant filling machine at once to detect the vacuum, and the vacuum degree should be less than 13Pa;
4) After the detection of vacuum degree is passed, select corresponding model and refrigerant capacity, then finish the auto filling.



Picture 6-1: Refrigerant Filling

Table 6-1: SIC-A-R2 Filling Quantity

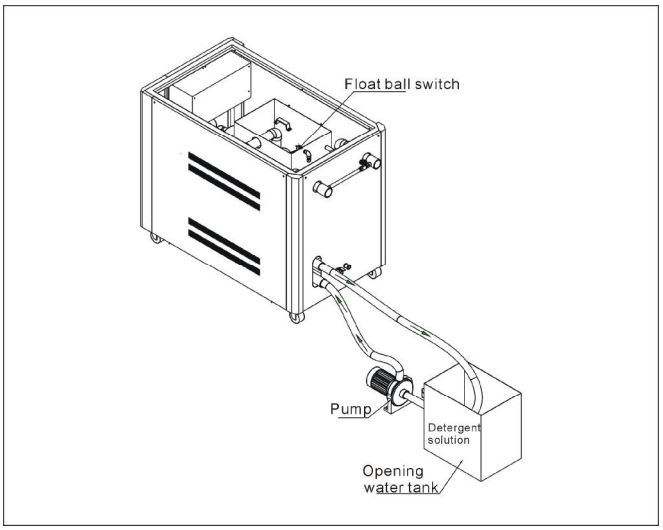
Model	Filling Quantity of Refrigerant (kg)
SIC-48A-R2	7.5 x 2
SIC-58A-R2	8 x 2
SIC-75A-R2	8 x 2
SIC-100A-R2	7.8 x 2+6.8
SIC-114A-R2	8.7 x 3

6.2 Components Maintenance

6.2.1 Condenser

SIC-A-R2 series water chiller use the air cooled fin style condenser which installed openly, in the using time, it is hard to avoid any dust and sundries, which will influence the heat emission effect, so it is necessary to clean the condenser at fixed periods in order to keep its working performance. Use brush, dust catcher or compressed air to clean the wings and copper pipe. Then use the low pressure water to cascade the tray pipe. Note: do not let the water to cascade on the surface of the fan motor.

Tube-in-shell Condenser Cleaning:



1. Ensure the float ball in water tank of the machine is closed, to prevent the detergent solution from getting into the water tank of the machine.

2. Connect pipeline with hoses according to above picture.
3. Detergent and water (according to purchased detergent mixing requirement for specific proportion) proportional to solution and pour into the opening water tank, then start-up pump cleaning.

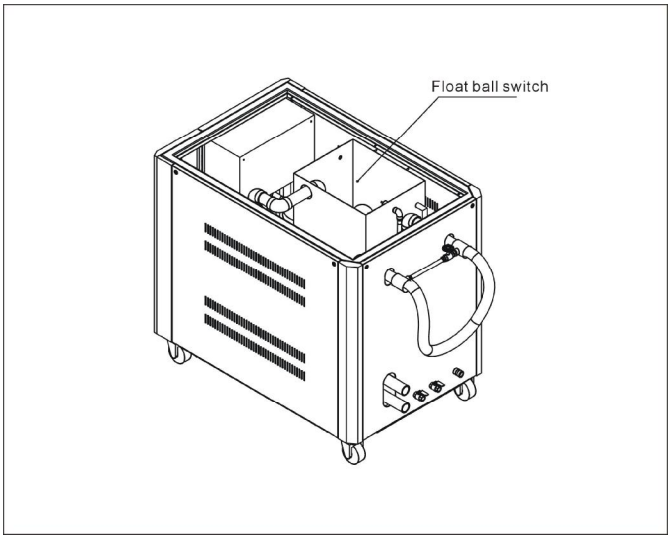
 Attention!

Do the cleaning work every half-year in the environment with little dust, but you must do the work every month in the environment with a great deal of dusts, and under the severe environment you had better see the situation to do the work.

6.2.2 Evaporator

The inner flank of the heat emission pipe will pile up a great deal of water incrustation after a long time use of the evaporator, which will influence the heat emission effect, so it is necessary to clean the evaporator at fixed periods in order to keep its working performance. If the circulation has been under water treatment, it is advised that firstly use hydrogen peroxide to kill bacteria and then use a high pressure water rifle to flush it, at last check whether there is still incrustation scale. If the circulation is not processed under water treatment, clean it with citric acid and sulfamic acid along with inhibiter, and then flush it with a high pressure water rifle. Passivation is need after acid washing, and the dirt will be diacharged from the water outfall.

Tube-in-shell Evaporator Cleaning



1. Connect chilling water inlet/outlet of machine with hoses according to above picture.
2. Bactericide and water (according to purchased bactericide mixing requirement for specific proportion) proportional to solution and pour into the water tank of machine, then start-up pump cleaning of the machine.
3. After discharging the bactericide solution when cleaning finished, it should repeat more turns of water washing to water tank for ensuring there's no bactericide solution left in the system.

Attention!

Drain the water inside the evaporator and the condenser away when the machine stop running under 0℃.

6.3 Maintenance Schedule

6.3.1 About the Machine

Model _____ SN _____ Production date _____

Voltage_____ Φ _____ V Frequency _____ Hz

Total power _____ kW

6.3.2 Check after Installation

☐Check the pipes are all correctly connected.

☐Check if there are leakages in the piping system.

☐Check if there are breaks in welding joint.

Electrical Installation

☐Voltage: _____ V _____ Hz

☐Fuse specification: 1 Phase _____A 3 Phase _____ A

☐Check phase sequence of power supply.

6.3.3 Daily Checking

☐Check switch functions.

☐Check all the electrical wires.

☐Check whether pressure gauges are accurate.

☐Check whether compressor temperature is normal.

☐Check whether cooling water circulation is normal.

6.3.4 Weekly Checking

☐Check electrical connections.

☐Check protection & alarm function.

☐Check whether set point of hi-low pressure switch is normal.

6.3.5 Montly Checking

☐Check refrigerant circulation pipe.

☐Check whether there are bubbles in liquid indicator.

☐Check whether there is abnormal sound in pump.

☐Check whether there is scale formation in tank.

6.3.6 Trimonthly Checking

- ☐ Check whether condenser is under blockage.

6.3.7 Half-yearly Checking

- ☐ Check and clean the condenser and evaporator.
- ☐ Check and clean the filter and expansion valve.
- ☐ Check system performance.
- ☐ Clean condenser.

6.3.8 Yearly Checking

- ☐ Check whether the contactor is normal.

6.3.9 3 year Checking

- ☐ PC board renewal.
- ☐ No fuse breaker renewal.