Water-Cooled Screw Chiller

Service Manual

(T1/R22, R134a)

GREE ELECTRIC APPLIANCES INC. OF ZHUHAI

CONTENTS

PRODUCT

PRODUCT INTRODUCTION

1 MODELS LIST

Nominal Capacity	Model		Power Supply Ph, V, Hz	Appearance
RT	Refrigerant	Model Name		
54	R22	LSBLG190H-M	380～415V 3PH 50Hz	
85		LSBLG290H-M		
92		LSBLG325H-M		
122		LSBLG430H-M		
137		LSBLG480H-M		
156		LSBLG550H-M		
185		LSBLG650H-M		
222		LSBLG780H-M		
242		LSBLG850H-M		
274		LSBLG960H-M		
330		LSBLG1160H-M		
386		LSBLG1360H-M		
443		LSBLG1560H-M		
484		LSBLG1700H-M		
52	R134a	LSBLG180H/Nb-M	380 3PH 50Hz	
60		LSBLG210H/Nb-M		
68		LSBLG240H/Nb-M		
84		LSBLG300H/Nb-M		
97		LSBLG340H/Nb-M		
109		LSBLG380H/Nb-M		
126		LSBLG450H/Nb-M		
144		LSBLG500H/Nb-M		
165		LSBLG580H/Nb-M		
181		LSBLG640H/Nb-M		
193		LSBLG680H/Nb-M		
218		LSBLG760H/Nb-M		
250		LSBLG880H/Nb-M		
286		LSBLG1000H/Nb-M		
328		LSBLG1160H/Nb-M		
362		LSBLG1280H/Nb-M		

1RT=3.517kW=12000Btu/h

2 NOMENCLATURE

LS	BLG	1160	H	/Nb	- M
1	2	3	4	5	6

NO.	Description	Options
1	Water chiller	
2	Screw compressor	
3	Nominal Cooling Capacity	eg:1160:1160KW
4	Flooded	
5	Refrigeration	Default - R22 Nb - R134a
6	Power	380～415V 3PH 50Hz

3 FEATUREAS

3.1 Brief Introduction

With a wide cooling capacity range from 180 to 1700 KW, GREE water-cooled screw chillers are being selected by more and more users for high efficiency and absolute dependability. GREE chillers are now widely applied in hotel, apartment, restaurant, office building, shopping mall, theater, gymnasium, hospital and so on, as well as supplying cool water for machine cooling purpose based on customized design all over the world.

3.2 Standard Specifications

High Efficiency Full Load Operation

Utilizing new screw compressor technology, the chillers meet or exceed the performance requirements of ASHRAE 90.1. All system components are selected for optimum performance, including the condenser and evaporator sizes.

Excellent part load performance

Because the units are not operated in full load condition most of the time, integrated part load value (IPLV) is an important performance indicator as outlined in standard ARI550/590-1998. Thanks to the patented design of two system parallel connection technology, an excellent IPLV performance has been come true.

Capacity control

Step or stepless capacity control are optionally available, enabling the unit to be turned on with the least load to reduce startup current, and to match up capability output of the units to actual load, which make the units operate steadily and reduce operation cost.

Compressor

Compact suction gas cools semi-hermetic twin screw compressors with high efficiency performance curve. Compressors are provided with high efficiency suction strainer as well as oil trainer crank case heater and built in safety pressure relief valve. Compressors are also provided with intelligent electronics including motor temperature monitoring, phase reversal protection, manual reset lock-out and discharge temperature protection by PTC`s sensors. Optimized oil management ensures minimum refrigerant dilution in oil.

Cooler

Flooded type, shell-and-tube type with refrigerant evaporated inside the shell and water flowing in the tubes. With special high efficiency pool boiling heat-exchange tubes, which are expanded into a steel plate, the flooded type structure enable both the theories of pool boiling and nucleation boiling to be well applied.

Thus, the uniform refrigerant distribution, optimized temperature field of heat transferring, and heightened evaporating temperature are achieved, so that cooling capacity and EER of the unit are improved greatly.

All evaporator are designed, constructed, inspected, and stamped according to the requirements of the ASME Boiler and Pressure Vessel Code.

Condenser

The condenser is shell-and-tube type, carbon steel fin and seamless high efficiency copper tubes with water flowing inside the shell and refrigerant flowing through the tubes. Each condenser is designed, constructed, inspected, and stamped according to the requirements of the ASME Boiler and Pressure Vessel Code.

Reliable oil return

In order to ensure the oil in refrigeration system returning to compressor, the secondary oil separator with both centrifugal and absorption setups is used for improving the separating efficiency of oil from refrigerant, and a kind of injection equipment of refrigerant is specially designed which can be a great help for oil returning into compressor from refrigeration circuit.

At the same time, the low oil location protection is applied to avoid the damnification to compressor from low oil to ensure reliability of the chiller.

Strict Out-going test

Each unit will be tested strictly not only on nominal operation condition but also minimum/maximum operation condition before left factory by advanced on-line test system.

Control panel

The Control panel provides a friendly interface for the operator with the color touch LCD (liquid crystal display) which can display chiller's operating status, diagnostic message and date curve.

Superior Controls

GREE has provided the latest technology in controlling the chillers. The control logic is designed to provide maximum efficiency, to help provide continuous operation in unusual operating conditions through proactive controls, and to provide the history record of operating to aid in trouble shooting. Protocol for integrating with your building automation system (BAS) are optional available.

3.3 Standard Accessories

New throttling setup

The new throttle setup can calculate optimal value of EER through control logic, and adjust it automatically from actual value to optimal value, because refrigerant flux and the high of the liquid in Flooded evaporator can be controlled accurately by Electronic expansion valve, the efficiency of unit will be maximized in either Full Load Operation or Part Load Operation.

Water Flow Switch

A water flow switch is available for field installation in the chilled water piping to protect against evaporator freeze-up under low, or no flow conditions. Interface is provided in the unit control center for field connection of the water flow detection switch. The flow detection device needs to be prepared on field.

Pump control output

Provide a digital output to control the secondary chilled water pump. Standard unit has one pump control output.

Unit on-off switch

ON-OFF switch is provided for manually switching the unit control circuit.

Indicator lights

LED lights of indicating power on of unit, running state and fault indications.

Filter drier

Refrigerant circuits are kept free of moisture, sludge, acid and oil contamination by filter drier.

Under voltage and phase protection

Protect against low voltage as well as phase fault reversal.

Sight glass

A color indicator shows moisture contents and provides a mean for checking the system refrigerant charge volume.

Liquid line solenoid valve

It will be closed when the compressor is off to prevent any liquid refrigerant from accumulating in the evaporator.

3.4 Standard Control & Safety Devices

Safety valve

Protect the unit against high discharge pressure.

Compressor built-in protection device

Motor winding temperature, discharge gas temperature and phase reversal for direction of rotation.

Crankcase heaters

Protect the unit against from refrigerant migration, oil dilution and potential compressor failure.

4 PRODUCT DATA

4.1 Product Data at Rated Condition

Models			LSBLG H-M						
			190	290	325	430	480	550	650
Nominal Cooling Capacity		kW	190	298	325	430	482	550	650
		RT	54	85	92	122	137	156	185
Power Consumption		kW	38	59	64	83	94	104	120
Power Supply			380～415V 3PH 50Hz						
Running Control			the colorful touch LCD (liquid crystal display)						
Safety Apparatus			High/low pressure protection, discharge temp. protection, anti-freeze water flow protection , low water flow protection ,phase-sequence protection, compressor overload protection, low oil location protection, Safety valve , Crankcase heaters						
Compressor Type			Semi-Hermitic Screw Compressor						
Refrigerant Type			R22						
Cooler	Water Flow	l/s	9	14	16	21	23	25	33
		GPM	147	224	246	326	365	396	515
	Loss of Pressure	kPa	42	45	53	57	60	62	66
	Heat Exchanger		Flooded Shell and Tube Evaporator						
	Max. Pressure	MPa	1.4						
	Water In/Out Pipe Diameter	mm	DN100	DN100	DN100	DN125	DN125	DN125	DN150
Condenser	Water Flow	l/s	11	17	19	24	28	30	39
		GPM	175	268	295	387	440	475	585
	Loss of Pressure	kPa	51	56	57	61	63	66	67
	Heat Exchanger		Shell and Tube Condenser						
	Max. Pressure	MPa	2						
	Water In/Out Pipe Diameter	mm	DN100	DN100	DN100	DN125	DN125	DN125	DN200
Dimension	Height	mm	1487	1487	1487	1680	1680	1680	1920
	Width	mm	3160	3160	3160	3160	3160	3160	3160
	Depth	mm	1150	1150	1150	1400	1400	1400	1520
Shipping Weights		kg	1300	1800	1900	2450	2800	2900	3100
Operation Weights		kg	1350	1890	1995	2573	2940	3045	3255

Models			LSBLG H-M						
			780	850	960	1160	1360	1560	1700
Nominal Cooling Capacity		kW	780	850	964	1160	1360	1560	1704
		RT	222	242	274	330	386	443	484
Power Consumption		kW	142	156	182	218	248	288	312
Power Supply			380～415V 3PH 50Hz						
Running Control			the colorful touch LCD(liquid crystal display)						
Safety Apparatus			High/low pressure protection, discharge temp. protection, anti-freeze water flow protection , low water flow protection ,phase-sequence protection, compressor overload protection, low oil location protection, Safety valve , Crankcase heaters						
Compressor Type			Semi-Hermitic Screw Compressor						
Refrigerant Type			R22						
Cooler	Water Flow	l/s	37	41	46	55	65	75	82
		GPM	147	224	246	326	365	396	515
	Loss of Pressure	kPa	42	45	53	57	60	62	66
	Heat Exchanger		Flooded Shell and Tube Evaporator						
	Max. Pressure	MPa	1.4						
	Water In/Out Pipe Diameter	mm	DN150	DN150	DN200	DN200	DN200	DN200	DN200
Condenser	Water Flow	l/s	45	49	55	66	78	89	98
		GPM	708	774	876	1047	1244	1412	1544
	Loss of Pressure	kPa	68	70	75	77	80	82	84
	Heat Exchanger		Shell and Tube Condenser						
	Max. Pressure	MPa	2						
	Water In/Out Pipe Diameter	mm	DN200	DN200	DN200	DN200	DN250	DN250	DN250
Dimension	Height	mm	2130	2130	2030	2030	2180	2230	2230
	Width	mm	3160	3160	3400	3400	3900	3900	3900
	Depth	mm	1520	1520	1700	1700	1900	1900	1900
Shipping Weights		kg	3850	4600	5100	5450	6200	6500	7000
Operation Weights		kg	4043	4830	5355	5723	6510	6825	7350

Models			LSBLG H/Nb-M							
			180	210	240	300	340	380	450	500
Nominal Cooling Capacity		kW	182	212	238	296	340	383	445	508
		RT	52	60	68	84	97	109	126	144
Power Consumption		kW	36	**42**	47	57	65	74	84	95
Power Supply			380V 3N ~ 50Hz							
Running Control			the colorful touch LCD(liquid crystal display)							
Safety Apparatus			High/low pressure protection, discharge temp. protection, anti-freeze water flow protection , low water flow protection ,phase-sequence protection, compressor overload protection, low oil location protection, Safety valve , Crankcase heaters							
Compressor Type			Semi-Hermitic Screw Compressor							
Refrigerant Type			R134a							
Cooler	Water Flow	l/s	9	10	11	14	16	18	21	24
		GPM	136	158	180	224	260	290	334	383
	Loss of Pressure	kPa	40	45	50	60	60	62	64	66
	Heat Exchanger		Flooded Shell and Tube Evaporator							
	Max. Pressure	MPa	1.4							
	Water In/Out Pipe Diameter	mm	DN100	DN100	DN100	DN125	DN125	DN125	DN150	DN150
Condenser	Water Flow	l/s	10	12	14	17	19	22	25	29
		GPM	163	194	216	268	308	348	396	453
	Loss of Pressure	kPa	53	54	62	62	63	62	67	68
	Heat Exchanger		Shell and Tube Condenser							
	Max. Pressure	MPa	2							
	Water In/Out Pipe Diameter	mm	DN100	DN100	DN100	DN125	DN125	DN125	DN150	DN150
Dimension	Height	mm	1487	1487	1487	1680	1680	1720	2130	2130
	Width	mm	3160	3160	3160	3160	3160	3160	3160	3160
	Depth	mm	1150	1150	1150	1400	1400	1400	1520	1520
Shipping Weights		kg	1800	1900	1900	2800	2900	3100	3850	4600
Operation Weights		kg	1890	1995	1995	2940	3045	3255	4043	4830

Models			LSBLG H/Nb-M							
			580	640	680	760	880	1000	1160	1280
Nominal Cooling Capacity		kW	582	637	680	767	880	1006	1155	1275
		RT	165	181	193	218	250	286	328	362
Power Consumption		kW	112	122	130	148	168	190	224	244
Power Supply			380V 3N～ 50Hz							
Running Control			the colorful touch LCD(liquid crystal display)							
Safety Apparatus			High/low pressure protection, discharge temp. protection, anti-freeze water flow protection , low water flow protection ,phase-sequence protection, compressor overload protection, low oil location protection, Safety valve , Crankcase heaters							
Compressor Type			Semi-Hermitic Screw Compressor							
Refrigerant Type			R134a							
Cooler	Water Flow	l/s	28	31	33	37	42	48	56	61
		GPM	440	484	515	581	669	761	880	968
	Loss of Pressure	kPa	68	74	76	76	76	77	78	78
	Heat Exchanger		Semi-Hermitic Screw Compressor							
	Max. Pressure	MPa	1.4							
	Water In/Out Pipe Diameter	mm	DN150	DN150	DN200	DN200	DN200	DN200	DN200	DN200
Condenser	Water Flow	l/s	33	36	39	44	50	57	66	73
		GPM	524	576	616	695	792	906	1052	1153
	Loss of Pressure	kPa	68	68	68	68	78	78	80	80
	Heat Exchanger		Shell and Tube Condenser							
	Max. Pressure	MPa	2							
	Water In/Out Pipe Diameter	mm	DN150	DN150	DN200	DN200	DN200	DN200	DN200	DN200
Dimension	Height	mm	2130	2130	2030	2030	2230	2230	2230	2230
	Width	mm	3160	3160	3400	3400	3900	3900	3900	3900
	Depth	mm	1520	1520	1700	1700	1900	1900	1900	1900
Shipping Weights		kg	3850	4600	5100	5100	6200	6500	6500	7000
Operation Weights		kg	4043	4830	5355	5355	6510	6825	6825	7350

Notes：

□ Rated conditions: Cooling: Indoor air temperature **□ DB/**□ WB, outdoor air temperature **□ DBHeating: Indoor air temperature **□ DB, outdoor air temperature **□ DB/**□ WB.

□ 1 mm = 0.0394 inch.

□Unit application data:

4.2 Operating Condition of Nominal

4.2.1 Cooling Nominal Operate Condition：

Chilled Water		Cooling Water	
Inter Water Temp. (□/□)	Outlet Water Temp. (□/□)	Inter Water Temp. (□/□)	Outlet Water Temp. (□/□)
12	7	30	35

Operating Range

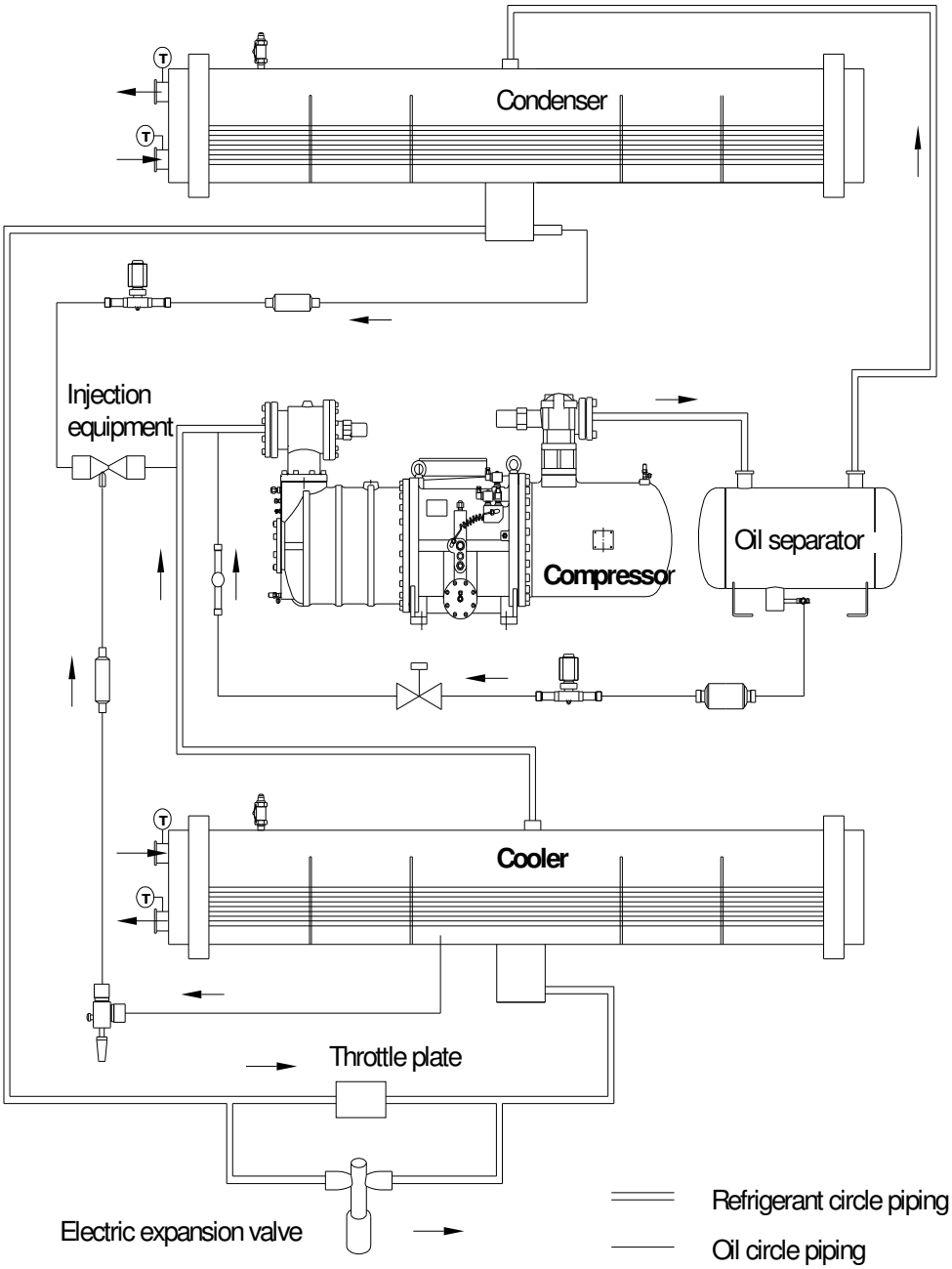
Chilled Water		Cooling Water	
Outlet Water Temp. (□/□)	Temp. Difference Between Inter & Outlet (□/□)	Inter Water Temp (□/□)	Temp. Difference Between Inter & Outlet (□/□)
5~15	2.5~8	22~37	3.5~8

4.3 Antifreeze

A glycol solution is required when ambient temperature is below 0°C and there is water in evaporator or condenser for avoiding the copper in evaporates or condenser is frosted cleft. The use of glycol will reduce the performance of the unit depending on concentration.

% by Weight	10	20	30	40	50
Freezing Point □ (□)	-3.3(26)	-7.8(18)	-13.9(7)	-21.7(-7)	-33.3(-29)
Ambient Temperature □ (□)	8.3(47)	-1.7(29)	-6.7(20)	-16.7(2)	-26.7(-16)
Cooling Capacity Correction Factor	-.998	0.993	0.987	0.980	0.973
Water flow Correction Factor	1.036	1.060	1.092	1.132	1.182
Pressure Drop Correction Factor	1.07	1.10	1.18	1.24	1.30

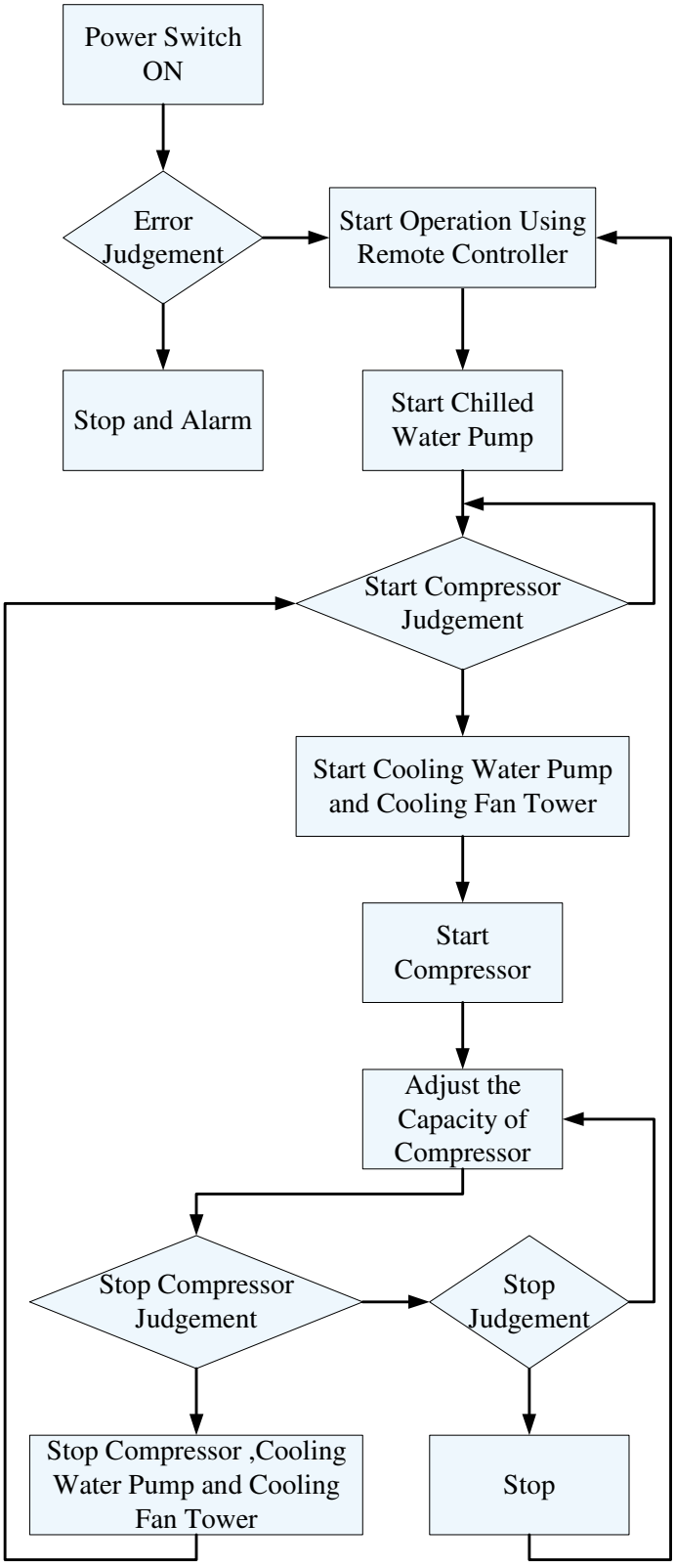
5 PIPING DIAGRAM



CONTROL

UNITS CONTROL

1 OPERATION FLOWCHART



2 MAIN LOGIC

2.1 Startup and Stop of the unit

The unit can only be started after the controller detects that all the input information is correct. During cooling, the unit controls the startup, unload and stop of the compressor by detecting the intake temperature of the chilled water. During heating, the unit controls the startup, unload and stop of the compressor and startup, stop of the cooling tower fan by detecting the intake temperature of the cooling water. Once the compressor starts up, it must be kept running for at least 6 min even if the intake temperature of chilled water or cooling water reaches the temperature for stopping the unit. The compressor must be stopped for at least 10 min before restart.

2.2 Startup and Stop Control of Cooling Water Pump

When the unit is started up from the stop state, the cooling water pump will run automatically, and the compressor will run later after the setting time T; when the unit is running (including standby), the cooling water pump keeps running.

After normal stop of the unit (as for the unit with dual system, both compressors stop normally), the cooling water pump will stop after the setting time T.

If the compressor stops due to malfunction (as for the unit with dual system, both compressors stop), the cooling water pump will stop after the setting time T.

2.3 Startup and Stop Control of Condensate pump

After the unit is started up, if the condition for the compressor to start is reached, the condensate pump will run after one third of the setting time T and the compressor will run after the setting time T; if the condition for the compressor to start is not reached, condensate pump will not run.

During running of the unit, the condensate pump will keep running.

During standby of the unit (as for the unit with dual system, both compressors stand by), the condensate pump will stop after the setting time.

When the compressor is started up from standby, the condensate pump will run after one third of the setting time T and the compressor will run after the setting time T;

After normal stop of the unit (as for the unit with dual system, both compressors stop normally), the condensate pump will stop after the setting time T.

If the compressor stops due to malfunction (as for the unit with dual system, both compressors stop), the condensate pump will stop after the setting time T.

2.4 Startup and Stop of the Cooling Tower Fan

2.4.1 Switch off Heat Reclaim Function

After the unit is started up, if the condition for the cooling tower fan to start is reached, the cooling tower fan will run after one third of the setting time T. After normal stop of the unit (as for the unit with dual system, both compressors stop normally), the cooling tower fan will stop at the same time.

When the unit starts or stands by, it checks the running state of the condensate pump.

If the condensate pump is started up:

When intake temperature of cooling water < T (minimum temperature of cooling water), the cooling tower fan will stop.

When intake temperature of cooling water ≥T (minimum temperature of cooling water) +5□, the cooling water fan will start.

When T (minimum temperature of cooling water) ≤ intake temperature of cooling water <T (minimum temperature of cooling water) +5□, the cooling tower fan will remain the same state.

If the condensate pump stops:

The cooling tower fan stops.

Note: There is no cooling tower fan in water heat pump unit.

2.4.2 Switch on Heat Reclaim Function

It can be set based on the manufacturer's parameter: high or low cooling priority.

After heat reclaim function is switched on:

2.4.2.1 If the low cooling priority is selected, cooling tower fan runs according to the following regulation:

After the unit is started up, if the condition for the cooling tower fan to start is reached, the cooling tower fan will run after one third of the setting time T. After normal stop of the unit (as for the unit with dual system, both compressors stop normally), the cooling tower fan will stop at the same time.

When the unit starts or stands by, it checks the running state of the condensate pump.

If the condensate pump is started up:

When intake temperature of cooling water < T (minimum temperature of cooling water), the cooling tower fan will stop.

When intake temperature of cooling water ≥T (minimum temperature of cooling water) +5℃, the cooling water fan will start.

When T (minimum temperature of cooling water) ≤ intake temperature of cooling water <T (minimum temperature of cooling water) +5℃, the cooling tower fan will remain the same state.

If the condensate pump stops:

The cooling tower fan stops.

Note: There is no cooling tower fan in water heat pump unit.

2.4.2.2 If the high heat reclaim priority is selected, cooling tower fan runs according to the following regulation:

After the unit is started up, if the condition for the cooling tower fan to start is reached, the cooling tower fan will run after one third of the setting time T. After normal stop of the unit (as for the unit with dual system, both compressors stop normally), the cooling tower fan will stop at the same time.

When the unit starts or stands by, it checks the running state of the condensate pump.

If the condensate pump is started up:

When intake temperature of cooling water < T (minimum temperature of cooling water) +5℃, the cooling tower fan will stop.

When intake temperature of cooling water ≥T (minimum temperature of cooling water) +10℃, the cooling water fan will start.

When T (minimum temperature of cooling water) +5℃ ≤ intake temperature of cooling water <T (minimum temperature of cooling water) +10℃, the cooling tower fan will remain the same state.

If the condensate pump stops:

The cooling tower fan stops.

Note: There is no cooling tower fan in water heat pump unit.

2.5 Capacity Regulation of Compressor

After startup of the compressor, the capacity is adjusted automatically according to the detected temperature of inflow water.. (Pulse signal: works for 1s and stops for 15s. Note: during capacity adjustment, pulse signal works for 1s and stops for 15s; in other situation such as protection unload, load and unload of start-up and stop, it works for 1s and stops for 10s).

The control logic of unloading magnetic valve is shown as below:

capacity	Pulse magnetic valve MV3(SV2)	Unloading magnetic valve MV2 (SV3-50%)	Unload magnetic valve MV1 (SV1-25%)
100%	ON	OFF	OFF
load	PULSE	OFF	OFF
unload	OFF	PULSE	OFF
50%	OFF	ON	OFF
25%（start-up）	OFF	OFF	ON
maintain	OFF	OFF	OFF

2.5.1 Stepless Capacity Regulation during Cooling

Module 1:

The capacity regulation of compressor for system 1 is performed according to the following water intake temperature.

The intake temperature of chilled water is T.

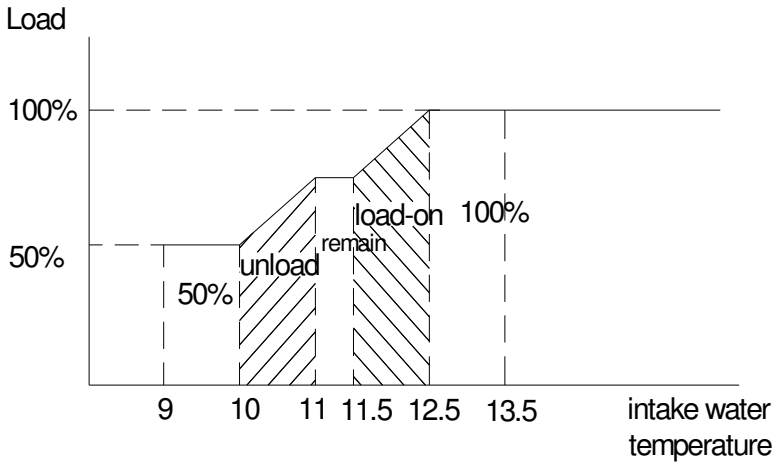
When T (minimum temperature of chilled water) +2/5ΔT (minimum temperature of chilled water) ≤ T < T (minimum temperature of chilled water) +3/5ΔT (minimum temperature of chilled water), the compressor runs at 50% of the capacity.

When T (minimum temperature of chilled water) +3/5ΔT (minimum temperature of chilled water) ≤ T < T (minimum temperature of chilled water) +4/5ΔT (minimum temperature of chilled water), the compressor runs according to unloading.

When T (minimum temperature of chilled water) +4/5ΔT (minimum temperature of chilled water) ≤ T < T(minimum temperature of chilled water) +9/10ΔT(minimum temperature of chilled water), the compressor runs according to the previous capacity.

When T(minimum temperature of chilled water)+9/10ΔT(minimum temperature of chilled water) ≤ T < T(minimum temperature of chilled water) + 11/10ΔT(minimum temperature of chilled water), the compressor runs according to loading.

When T ≥ T (minimum temperature of chilled water) +11/10ΔT (minimum temperature of chilled water), the compressor runs at 100% capacity.



The capacity regulation of compressor for system 2 should reach the following condition. (If the unit is flooded type, the capacity regulation for system 2 is the same as that for system 1)

The intake temperature of chilled water is T.

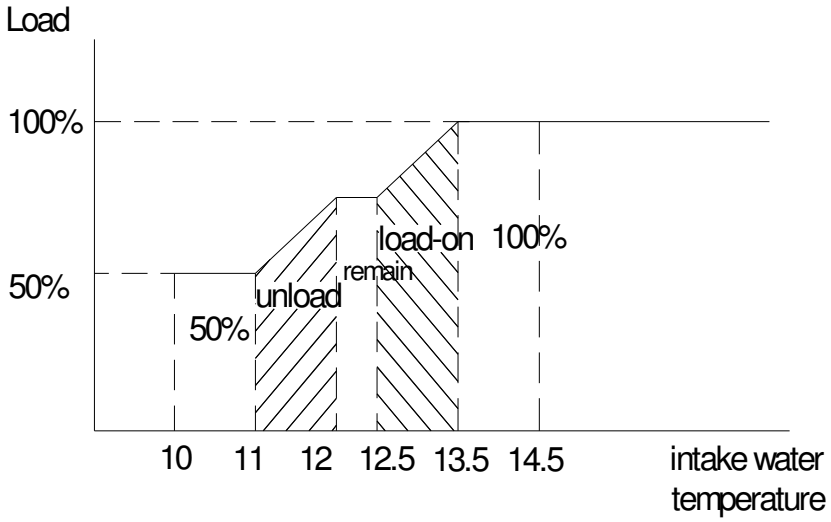
When T (minimum temperature of chilled water) +3/5ΔT (minimum temperature of chilled water) ≤ T < T (minimum temperature of chilled water) +4/5ΔT (minimum temperature of chilled water), the compressor runs at 50% of the capacity.

When T (minimum temperature of chilled water) +4/5ΔT (minimum temperature of chilled water) ≤ T < T (minimum temperature of chilled water) +ΔT (minimum temperature of chilled water), the compressor runs according to unloading.

When T (minimum temperature of chilled water) +ΔT (minimum temperature of chilled water) ≤ T < T(minimum temperature of chilled water) +11/10ΔT(minimum temperature of chilled water), the compressor runs according to the previous capacity.

When T(minimum temperature of chilled water)+11/10ΔT(minimum temperature of chilled water) ≤ T < T(minimum temperature of chilled water) + 13/10ΔT(minimum temperature of chilled water), the compressor runs according to loading.

When T ≥ T (minimum temperature of chilled water) +13/10ΔT (minimum temperature of chilled water), the compressor runs at 100% capacity.



Module 2

T (minimum temperature of chilled water) 2 = T (minimum temperature of chilled water) +ΔT

2.5.2 Stepless Capacity Regulation during Heating

Module 1

The capacity regulation of compressor for system 1 is performed according to the following water intake temperature.

The intake temperature of cooling water is T.

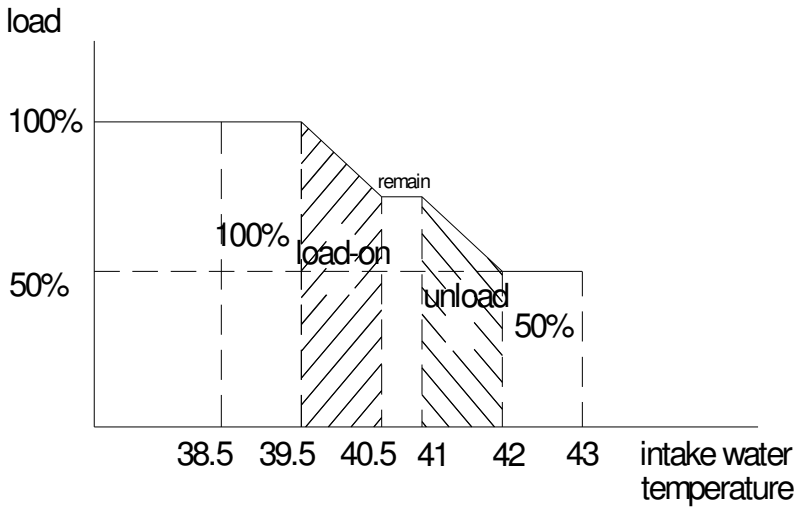
When T (minimum temperature of hot water) +2/5ΔT (minimum temperature of chilled water) < T ≤ T (minimum temperature of hot water) +3/5ΔT (minimum temperature of chilled water), the compressor runs at 50% of the capacity.

When T (minimum temperature of hot water) +1/5ΔT (minimum temperature of chilled water) < T ≤ T (minimum temperature of hot water) +2/5ΔT (minimum temperature of chilled water), the compressor runs according to unloading

When T (minimum temperature of hot water) +1/10ΔT (minimum temperature of chilled water) < T≤ T (minimum temperature of hot water) +1/5ΔT (minimum temperature of chilled water), the compressor runs according to the previous capacity.

When T(minimum temperature of hot water)-1/10ΔT(minimum temperature of chilled water) < T ≤ T(minimum temperature of chilled water) + 1/10ΔT(minimum temperature of chilled water), the compressor runs according to loading.

When T ≤ T (minimum temperature of hot water) -1/10ΔT (minimum temperature of chilled water), the compressor runs at 100% capacity



The capacity regulation of compressor for system 2 should reach the following condition. (If the unit is flooded type, the capacity regulation for system 2 is the same as that for system 1)

The intake temperature of cooling water is T.

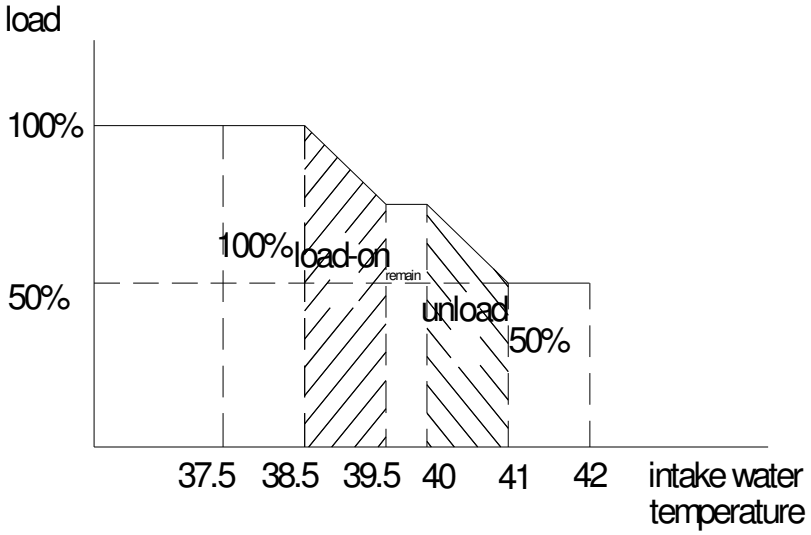
When T (minimum temperature of hot water) +1/5ΔT (minimum temperature of chilled water) < T ≤ T (minimum temperature of hot water) +2/5ΔT (minimum temperature of chilled water), the compressor runs at 50% of the capacity.

When T (minimum temperature of hot water) < T ≤ T (minimum temperature of hot water) +1/5ΔT (minimum temperature of chilled water), the compressor runs according to unloading.

When T (minimum temperature of hot water) - 1/10ΔT (minimum temperature of chilled water) < T≤ T (minimum temperature of hot water), the compressor runs according to the previous capacity.

When T(minimum temperature of hot water)-3/10ΔT(minimum temperature of chilled water) < T ≤ T(minimum temperature of chilled water)-1/10ΔT(minimum temperature of chilled water), the compressor runs according to loading

When T ≤ T (minimum temperature of hot water) -3/10ΔT (minimum temperature of chilled water), the compressor runs at 100% capacity.



Module 2

T (minimum temperature of hot water) 2 = T (minimum temperature of hot water) -ΔT

2.6 Protection of Compressor

2.6.1 High Pressure Protection

The high pressure protection includes high pressure switch and pressure sensor.

When the high pressure switch opens, the unit will stop and the error LED will light. Display: system X high pressure protection

When the high pressure sensor detects the excessive protection value for successive 3 s, the unit will stop and the error LED will light. Display: system X high pressure protection.

Model	Protection Value (□)	Resuming value (□)
cooling mode, low temperature mode (all models)	50	39
heating mode (all R22 models)	63	48
heating mode (all R134a models)	70	55

2.6.2 Low Pressure Protection

Low pressure protection includes low pressure switch and pressure sensor.

When the low pressure switch opens, the unit will stop and the error LED will light. Display: system X low pressure protection.

Low pressure protection value for pressure sensor:

Flooded cooling only unit (air-condition mode) and flooded water source heat pump unit: 6 min after start-up of the compressor, if the pressure is lower than the saturation pressure at -6□, the corresponding compressor will stop immediately. In other times, if the pressure is lower than saturation pressure at -2□, the corresponding compressor will stop immediately. It displays “system X low pressure Protection”. When the pressure resumes to above the saturation pressure at 2□, the malfunction can be removed manually. During standby of the unit, it is detected according to the saturation pressure at -2□.

Flooded cooling only unit (low temperature mode) and flooded ground source heat pump unit: when the low pressure exceeds the protection value, the unit will stop and the corresponding error LED will light. Display: system X low pressure protection.

Water source heat pump unit (include dry-type twin screw and dry-type single screw): 6min before startup of the unit, if the pressure is lower than the protection value for 60s or 6 min after start-up of the compressor, if the pressure is lower than the protection value for 5s (or the low pressure switch opens), the unit will stop and the display shows system X low pressure protection.

Model	Protection value (□)	Resuming value (□)
R22/R134a Flooded cooling only unit (cooling model) R22/R134a Flooded water source water source heat pump (cooling and heating mode)	-6 (within 6 min after startup of the compressor)	2
R22/R134a Flooded ground source heat pump (cooling mode)	-2 (other times)	2
R22/R134a Flooded cooling only unit (low temperature mode)	-20	-6

R22/R134a Flooded ground source heat pump (heating mode) Dry-type R22//R134 water source heat pump (cooling and heating mode)	-20	-6

2.6.3 Discharge High Temperature Protection

When the discharge sensor detects that the discharge temperature is higher than protection value, the unit will stop and the corresponding error LED will light. Display: discharge high temperature X.

Model	Protection value (□)	Resuming value (□)
R22 Flooded cooling only unit (cooling mode)	85	65
R134a Flooded cooling only unit (cooling mode)	75	55
Dry-type water source heat pump, R22/R134a flooded ground source and water source heat pump (cooling and heating mode), flooded cooling only unit (low temperature mode)	110	70

2.6.4 Overload protection

The overload protection is the protection after the thermal relay is disconnected.

When the overload occurs to the compressor for 3s, the unit will stop and the corresponding error LED lights. Display: overload protection X.

2.6.5 Lack Phase Protection (or winding protection and discharge high temperature protection)

When lack phase protection lasts for successive 2s, the unit will stop and the corresponding error LED will light. Display: lack phase protection.

2.6.6 Flow Switch Protection of Chilled water and Cooling Water

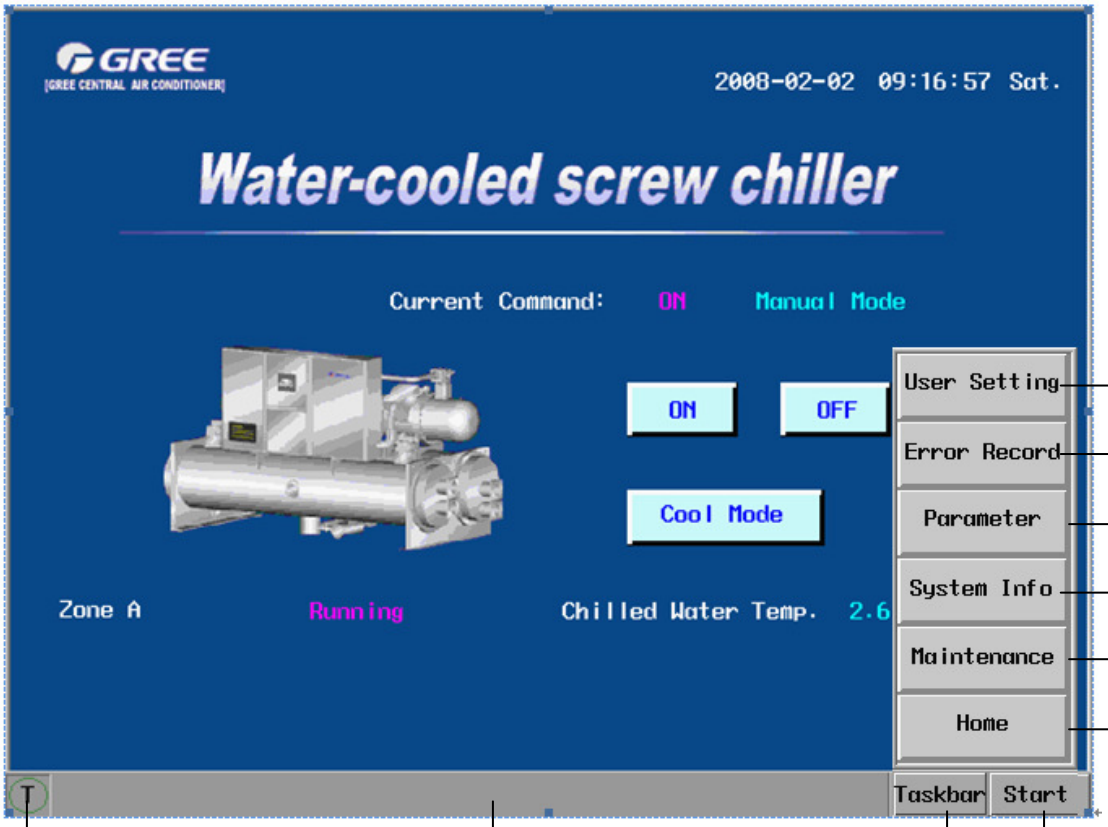
When the unit stops, the controller will not detect the signal of water flow switch. After the cooling water pump and condensate pump start, and either the chilled water flow switch or the cooling water flow switch disconnects, the controller will detect the flow switch for the time T successively. If the controller detects that there is still switch protection signal after the setting time T, the unit will stop and the corresponding error LED will light.

2.6.7 Anti-freezing Protection of Evaporator

Either anti-freezing temperature 1 or anti-freezing temperature 2 is lower than T (minimum anti-freezing temperature), the unit will stop. If anti-freezing protection of evaporator occurs, the malfunction can be removed by manual resetting only when both anti-freezing temperature 1 and anti-freezing temperature 2 are equal or higher than T (minimum anti-freezing temperature) +5□. If it is lower than T (minimum anti-freezing temperature) +5□, it can not be removed even by manual resetting.

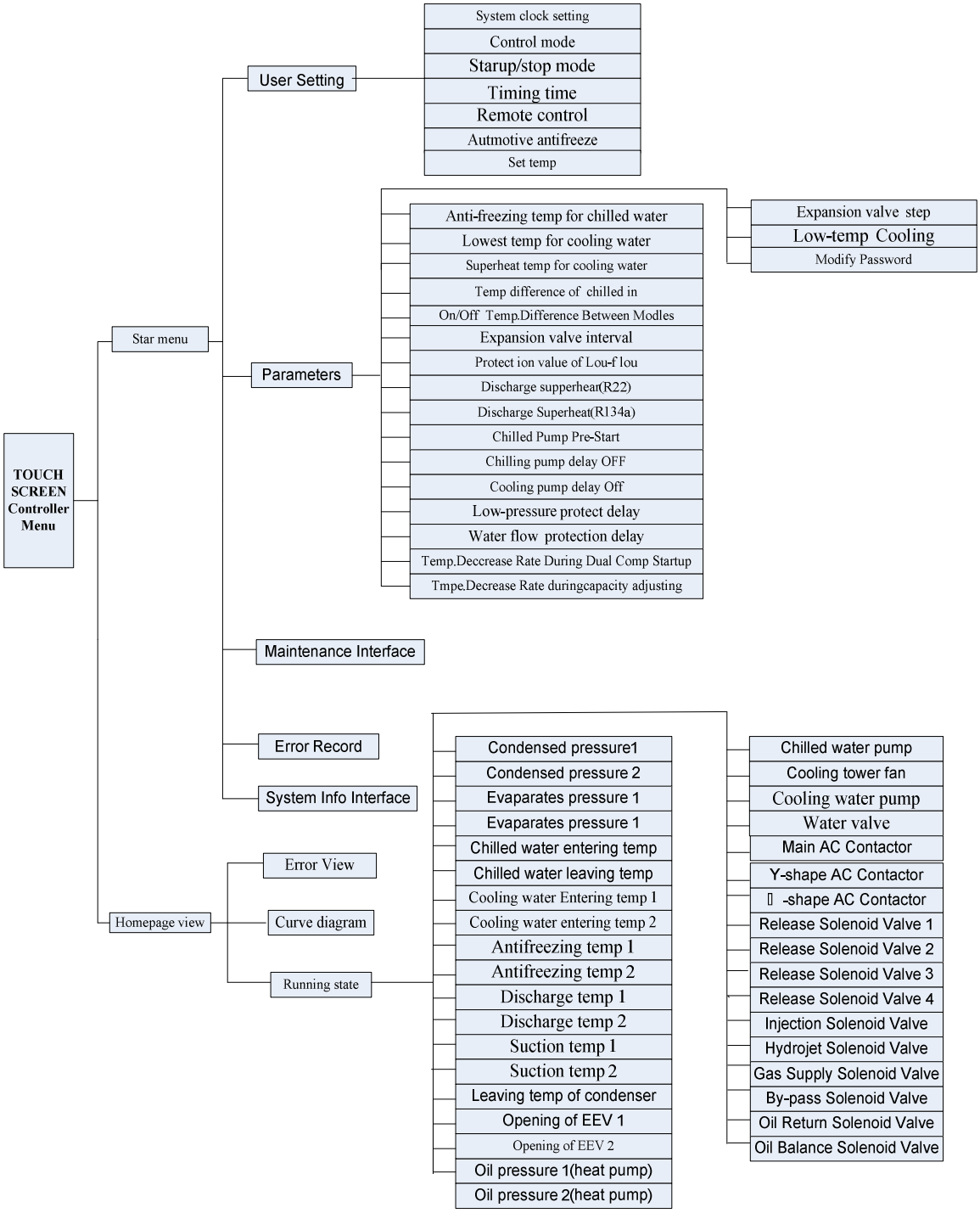
3 TOUCH SCREEN CONTROLLER

3.1 Main Interface



NO.	Name	Function description
1	User setting	User Setting can be touched into the interface for the setting of clock, timer, start-stop mode and chilled water inlet temp.(under heating mode, cooling water inlet temp.)
2	Error record	Error Records can be touched into the interface for review of malfunction info of recent 1200 times.
3	parameter	Factory Parameters can be touched into the interface of review of running parameters of the system.
4	System info	System Info can be touched into the interface of review of basic info of the system.
5	maintenance	Maintenance can be touched into the maintenance interface in which the events requested to be paid attention to during usage and maintenance of touch screen can be viewed.
6	home	Back to the Home can be touched into Home interface.
7	T	Indicator T, green, can be touched to light.
8	Taskbar	Taskbar consists of Indicator T and a blank column. A popped window with Minimize button can be minimized into the blank column of taskbar which can contain 6 minimized icons at most. The minimized window can be recovered in the screen after touching the minimized icon in taskbar.
9	Taskbar	Taskbar Button can be touched to hide or display taskbar.
10	Start	Start can be touched to hide or display Start menu.

3.2 Controller Menu



1. Touch User Setting into the interface for setting of System Clock, Start-stop Mode (Timer Mode or Manual Mode), Auto Antifreeze Enable, Timer of Each Day of a week, Chilled Water Inlet Temp (hot water Inlet Temp in heating mode) and so on.

2. Touch **View** in homepage interface for View of running state. This interface provides detailed running state of unit including each output, input of sampling point and malfunction info. There are 4 displaying pages. The first page is about input info of sampling point, the second and the third page is about the state of each output switch and the fourth one is about malfunction info.

Touch Curve in the first page to make temp and pressure curve diagram popped, as shown below. The horizontal

ordinate means times and vertical one means temp and pressure value. Current temp is displayed at the left side of Curve Diagram, while the pressure at the right side of Curve Diagram. The Curve Diagram consist of 31 pages which record temp and pressure alteration trend in up to 31 hr(1860 min.) shown at the upper side. The right side shows current page and representative time slice, for example, the first page represents the temperature and pressure within current 1hr, the second one represents the temperature and pressure before 1hr, the third one represents the temperature and pressure before 2hr, analogizing like this.

3. Touch **Error Records** into the interface for record of error info of recent 1200 times, which is divided into 60 pages. Each page contains 20 pieces of info which is arranged by No., Date, Time, Recovery Time and Error Type from left to right. The latest error info is always in the front.

4. This interface records the malfunction info of recent 1200 times. There are 60 pages in total and 20 pieces of information in each page which are ordered by Error No, Date, Time, Recovery Time and Error Type from left to right. The lasted error info is always on the top.

5. Parameters :Parameters are mainly used by after-sales persons with password and not open to the users. Pay attention to that casual modification of them will cause bad result.

6. Touch **System Info** into interface for control of basic parameters and use conditions of system, update time of software, accumulated running time of compressor and setting of control system in Region A and Region B and long-distance control.

INSTALLATION

UNITS INSTALLATION

1 UNITS INSTALL

1.1 Before Installation

It is a must to have related installers confirm the following situation so that the installing can be safe, correct and rapid.

Installing site: confirm if it accord with section 1.2.

Hole for carrying-in: confirm its size, height, capacity and remove the obstacle.

Sequence: for carrying-in: decide the way and sequence of carrying-in according to the installation site and equipment.

Access or carrying-in: remove the obstacles in the access.

1.2 Installation Site

The unit should not be close to fire and tinder. If it is installed together with heating unit such as boiler, it is necessary to consider the effect of thermal radiation.

Select those sites where indoor temperature is below 45℃ and is drafty. It is not permitted to install and store the unit outside or in the open air or in the environment with corrosive gas。

Select the site with less dust.

The site should be bright for easy maintenance and inspection.

In order to meet the needs of maintaining, inspecting and cleaning the evaporator and the heat exchange tube of the condenser, there should be enough space for tubing, which should be as long as the evaporator and the condenser.

For the sake of easy lift and overhaul, it is necessary to install traveling crane or derrick car and ensure that the machine room is high enough.

The surrounding of the unit and the whole machine room should be drained completely

1.3 Caution for Installation

1.3.1 Installation

1. First of all, check whether the base conforms to the footing size of the unit in the general diagram. The base should be smooth and level.
2. Put the steel plate of the chassis to the specific place.
3. Put the base steel in the prescriptive position.
4. There should be no space between the base steel and the foot plate of the refrigerant unit. Inser the adjusting shim between the base steel and the concrete base. Adjust the base steel to be horizontal (the altitude difference should be within 0.5mm every meter.)
5. Lift the refrigerant unit and put damper rubber blanket on the base steel, and then put the unit on the damper rubber blanket.
6. After installation, ensure that the horizontal slope should be within l / 1000. If it is beyond the range, adjust the unit.

   Put a pad (the pad is provided by the installer) between the footing and the shock pad, and then check the horizontal slope until it is passed.

1.3.2 Piping

1. After leveling the unit, connect the chilled water pipe and cooling water pipe. Piping should have flexible parts and independently supportive capability to avoid any distortion or vibration. The pipe should be supported and correctly joined. Shock pad can be added to the pipe supporter so as for reduce the vibration.
2. There are marks near the inlet and outlet for reference when connecting the pipe. It is necessary to connect the pipe according to the marks on the unit.
3. According to the general diagram, connect the pipe for cool water and cooling water (flange or clamping band connection), and set a filter in the inlet. Whether the pipe is horizontally or vertically led from the unit to the water pump is decided by the user based on the site condition. Manometer should be set on the inflow pipe and outflow pipe of the unit so as for measure the differential pressure of the inlet and outlet and thus estimate whether the water flow conforms to the rated water flow. The control valve of cool water and cooling water must be installed on the outflow pipe of the refrigerant unit to avoid disorder of the water flow as well as eroding the heat transfer tube near the inlet.

1.3.3 Water Quality Control

When the water quality is bad, there will be much deposit such as scale and sand in the shell and tube exchanger, which will decrease the water flow and affect the rate of heat exchange. Meanwhile, if the quality of chilled water and cooling water is bad, it will not only cause scaling, affecting the rate of heat exchange and the performance of the unit, but also cause erosion of the heat exchange pipe which may lead to serious leak. Thus, the water must be filtered and softened by the water-softening equipment before flowing into the system. If the water quality is too bad, treat the water according to ***GB 50050-2007 Treatment and Design Regulation of Industrial Circulating Cooling Water.*** The inclosed chilled water system should adopt soft water. During running of the unit, it is necessary to sample the water for analysis and the water quality should conform to the requirement of sheet 2-3. Otherwise, the water must be treated. Currently the commonly used water treating device is sand eliminator and water-softening equipment. If the water quality still can not reach the requirements, add a heat exchanger between the water on side of heat source and the water-cooled screw chiller. Actually, even if the above actions are taken, there will be deposit such as scale and sand in the shell and tube exchanger, which will decrease the water flow and affect the rate of heat exchange and even freeze the evaporator. Therefore, it is necessary to inspect and maintain the unit periodically.

Sheet 2-3 Quality of cooling water

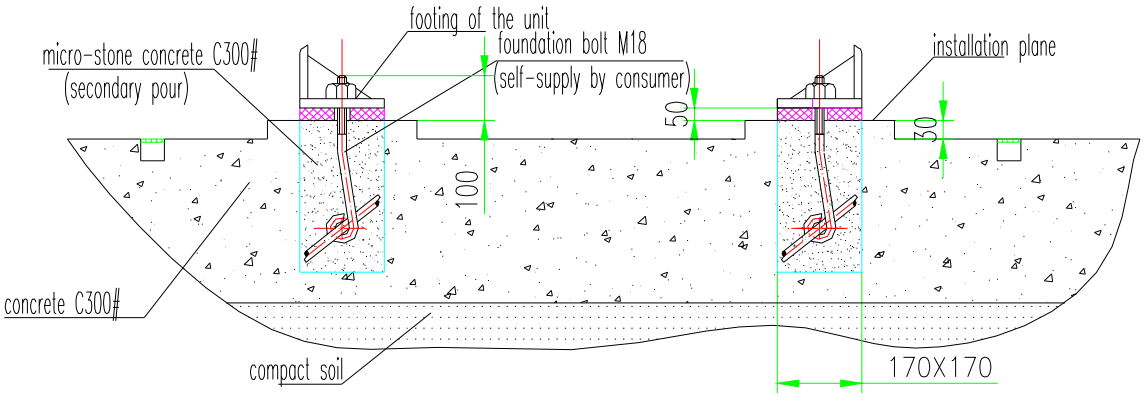
	item		standard value	trend	
				erosion	scaling
basic item	PH value（25□）		6.5-8.0	0	0
	specific conductance（25□）	μS/cm	<800	0	0
	chloride ion Cl-	Mg（Cl-）/L	<200	0	
	sulfate radical ion SO-2	Mg（SO-2）/L	<200	0	
	acid depletion（PH4.8）	Mg(CaCO3)/L	<100		0
	full hardnessl	Mg(CaCO3)/L	<200		0
reference item	Fe ferrum	mg(Fe)/L	<1.0	0	0
	sulphur ion S2-	mg(S2-)/L	none	0	

	ammon ion NH+	mg(NH+)/L	<1.0	0	
	monox SiO2	Mg(SiO2)/L	<50		0

1.4 Mounting Location

The screw compressor has relatively less movable parts and is stable, so the live load for base is small. The specific dimension of base is shown in general diagram of refrigerant unit. In case of corrosion of the unit footing, it is required that the surrounding of the unit is in good drain state. The corresponding basic plane to base steel of the unit should be smooth. The specific requirements are as below:

1. The maximum altitude difference (levelness) should be within 3mm.
2. For easy maintenance and inspection of the refrigerant unit, the base should be higher than 100mm
3. It is necessary to install drain ditch around the refrigerant unit.
4. There should be no space between the base steel and the foot plate of the refrigerant unit. Inser the adjusting shim between the base steel and the concrete base. Adjust the base steel to be horizontal (the altitude difference should be within 0.5mm every meter.)
5. The installation base of the unit must be concrete or steely structure, which can bear the running weight of the machine. Besides, the top should be horizontal. It is better to prepare a drain ditch in the installation base,
6. Refer to the diagram of installation base. Put the steel plate and anti-vibration cushion in the correct position. Finish the installation of the unit and the foundation bolt before secondary grouting. The foundation bolt is generally exposed for about 100mm.



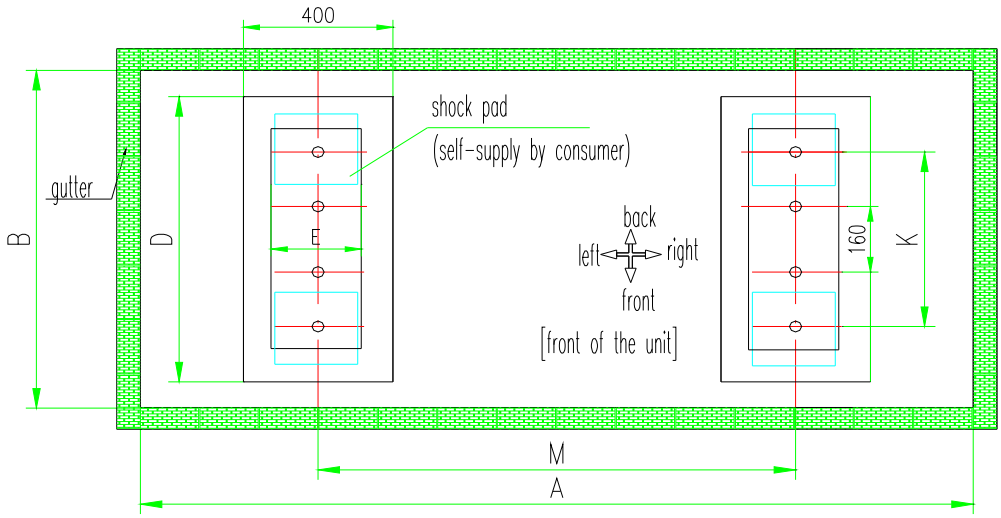


Fig2-2 Diagram of istallation base

Sheet 2-2 Demsion of installation base Unit :mm

Name	A	B	D	M	K
LSBLG190H -M	3160	1350	1150	2630	740
LSBLG290H -M	3160	1350	1150	2630	740
LSBLG325H -M	3160	1350	1150	2630	740
LSBLG430H -M	3160	1600	1400	2630	920
LSBLG480H -M	3160	1600	1400	2630	920
LSBLG550H -M	3160	1600	1400	2630	920
LSBLG650H -M	3160	1720	1520	2630	1100
LSBLG780H -M	3160	1720	1520	2630	1100
LSBLG850H -M	3160	1720	1520	2630	1100
LSBLG960H -M	3400	1900	1700	2830	1210
LSBLG1160H -M	3400	1900	1700	2830	1210
LSBLG1360H -M	3900	2100	1900	3330	1420
LSBLG1560H -M	3900	2100	1900	3330	1420
LSBLG1700H -M	3900	2100	1900	3330	1420
LSBLG180H/Nb-M	3160	1350	1150	2630	740
LSBLG210H/Nb-M	3160	1350	1150	2630	740
LSBLG240H/Nb-M	3160	1350	1150	2630	740
LSBLG300H/Nb-M	3160	1600	1400	2630	920
LSBLG340H/Nb-M	3160	1600	1400	2630	920
LSBLG380H/Nb-M	3160	1600	1400	2630	920
LSBLG450H/Nb-M	3160	1720	1520	2630	1100
LSBLG500H/Nb-M	3160	1720	1520	2630	1100
LSBLG580H/Nb-M	3160	1720	1520	2630	1100
LSBLG640H/Nb-M	3160	1720	1520	2630	1100
LSBLG680H/Nb-M	3400	1900	1700	2830	1210
LSBLG760H/Nb-M	3400	1900	1700	2830	1210
LSBLG880H/Nb-M	3900	2000	1900	3330	1420
LSBLG1000H/Nb-M	3900	2000	1900	3330	1420
LSBLG1160H/Nb-M	3900	2000	1900	3330	1420
LSBLG1280H/Nb-M	3900	2000	1900	3330	1420

1.5 Rigging Instruction

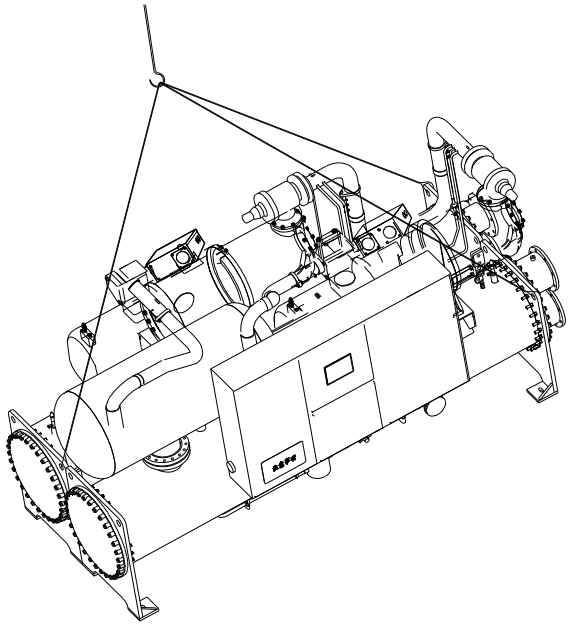
ATTENTION TO RIGGERS

Center of gravity is not unit center line. Ensure center of gravity aligns with the main lifting point before lifting. Use spreader bar when rigging, to prevent the slings during the unit.

CAUTION

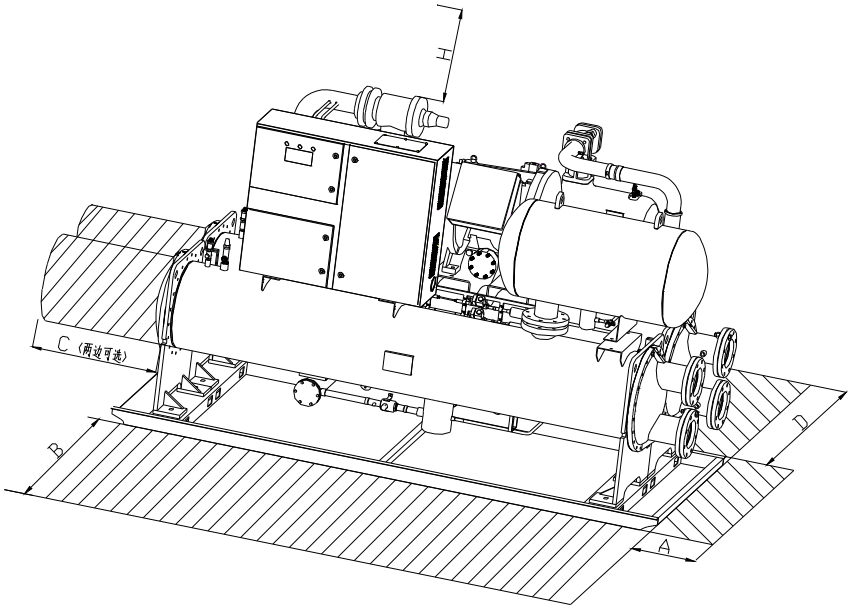
All panels should be in place when rigging.

Care must be taken to avoid damage to the pipeline during handing.



Rigging schematic plan（according to the indication on unit)

1.6 Installation Clearance Data

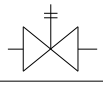
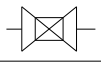


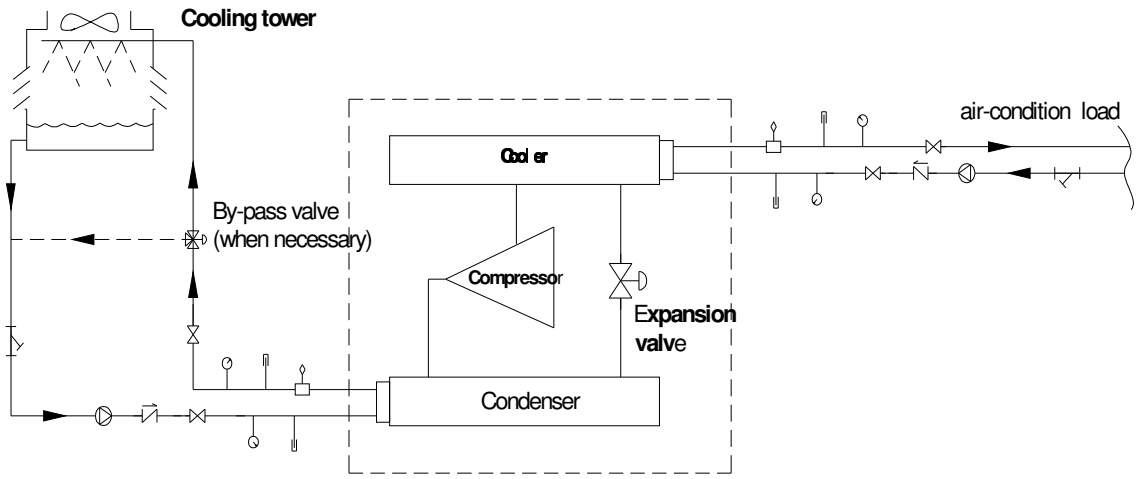
Installation Clearance schematic plan

Name	A	B	C	D	H
LSBLG190H -M	600	600	2600	1000	500
LSBLG290H -M	600	600	2600	1000	500
LSBLG325H -M	600	600	2600	1000	500
LSBLG430H -M	600	600	2600	1000	500
LSBLG480H -M	600	600	2600	1000	500
LSBLG550H -M	600	600	2600	1000	500

LSBLG650H -M	600	600	2600	1000	500
LSBLG780H -M	600	600	2600	1000	500
LSBLG850H -M	600	600	2600	1000	500
LSBLG960H -M	600	600	2600	1000	500
LSBLG1160H -M	600	600	2600	1000	500
LSBLG1360H -M	600	600	3000	1000	500
LSBLG1560H -M	600	600	3000	1000	500
LSBLG1700H -M	600	600	3000	1000	500
LSBLG180H/Nb-M	600	600	2600	1000	500
LSBLG210H/Nb-M	600	600	2600	1000	500
LSBLG240H/Nb-M	600	600	2600	1000	500
LSBLG300H/Nb-M	600	600	2600	1000	500
LSBLG340H/Nb-M	600	600	2600	1000	500
LSBLG380H/Nb-M	600	600	2600	1000	500
LSBLG450H/Nb-M	600	600	2600	1000	500
LSBLG500H/Nb-M	600	600	2600	1000	500
LSBLG580H/Nb-M	600	600	2600	1000	500
LSBLG640H/Nb-M	600	600	2600	1000	500
LSBLG680H/Nb-M	600	600	3000	1000	500
LSBLG760H/Nb-M	600	600	3000	1000	500
LSBLG880H/Nb-M	600	600	3000	1000	500
LSBLG1000H/Nb-M	600	600	3500	1000	500
LSBLG1160H/Nb-M	600	600	3500	1000	500
LSBLG1280H/Nb-M	600	600	3500	1000	500

2 Typical Piping

water pump	soft contact	check valve	stop valve	Y-type filter	temperature meter	pressure gauge
						
discharging valve	water switch	safety valve	balanced valve			
						


Cooling tower
air-condition load
Cooler
By-pass valve
(when necessary)
Compressor
Expansion
valve
Condenser

3 ELECTRIC WIRING WORK

3.1 Wiring Principle

1）General Provision

- All the cables, equipments, wire, connector must meet the related regulation and engineering requirement.
- All the wiring must be executed by electrician with certificate.
- The power must be cut off before wire connection.
- Installers should be responsible for any damage caused by incorrect outer wiring.
- Caution: the wire must be copper conducting wire.

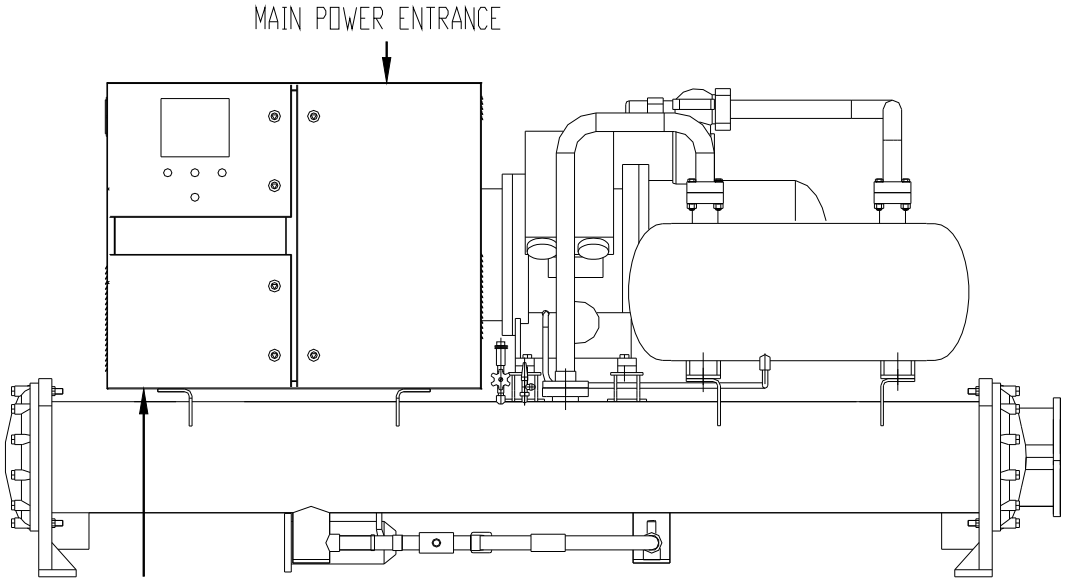
2）Lead power cord into electric cabinet

- The switch cabinet must be fitted with circuit breaker for cutting of the power of electric cabinet
- The power cord must be led trough the trunking, wire duct or electric trench.
- When led into the electric cabinet, the power cord must be protected with rubber or plastic from scratching by edge of sheet metal.
- The power cord near the electric cabinet must be fixed reliably so that the power terminal is not affected by the outside force.
- It must be earthed reliably.

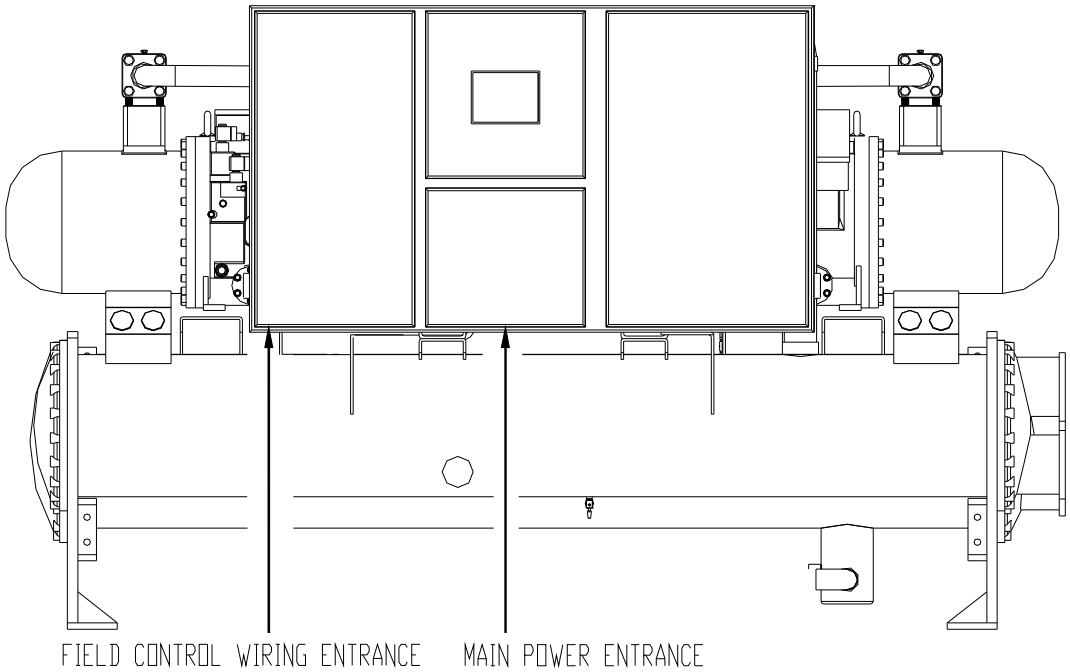
3）Connection of control wire

- The control wire should be 1mm^2 or bigger.
- The connected signal of flow switch should be 12V weak-current signal. Do not lead the control wire parallel to the wire of 50V or higher voltage. If it is unavoidable, they must be kept a space of at least 150mm.
- The electric cabinet has control signal of chilled water pump and cooling water pump (220V AC ;5A capacity). It can drive the AC contactor such as chilled water pump and cooling water pump. Do not drive the motor of chilled water pump and cooling water pump directly with the control signal.
- The reserved control wire should be suitable. Do not bind the superfluous wire and fill it into the electric cabinet.

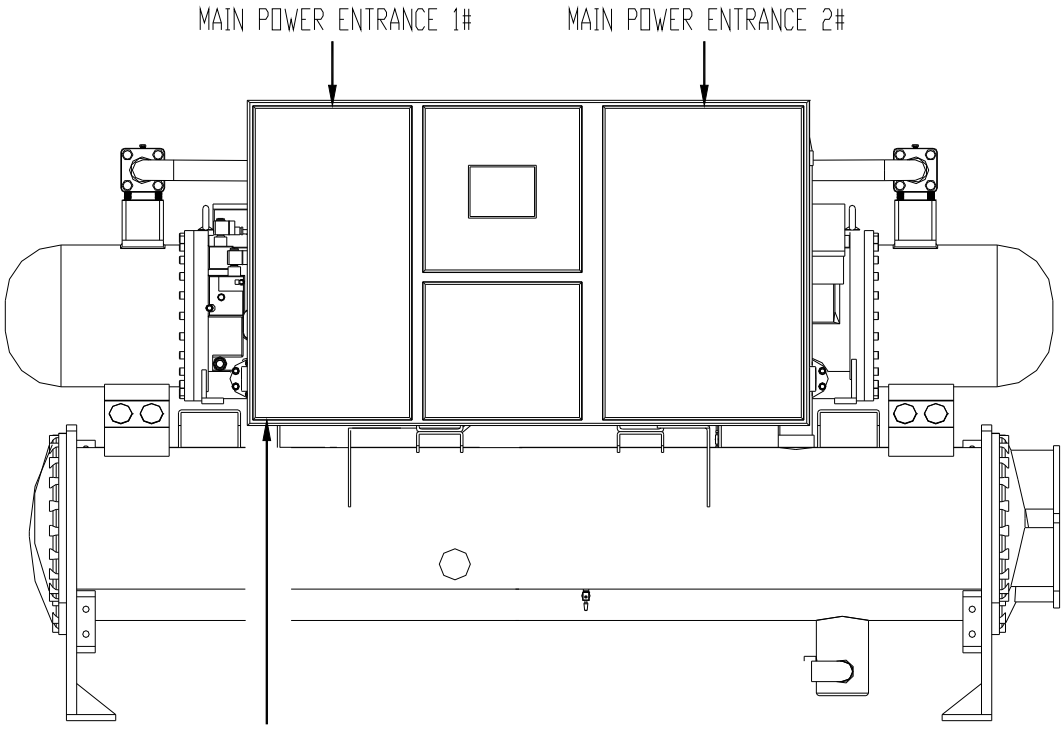
3.2 Electric Wiring Design



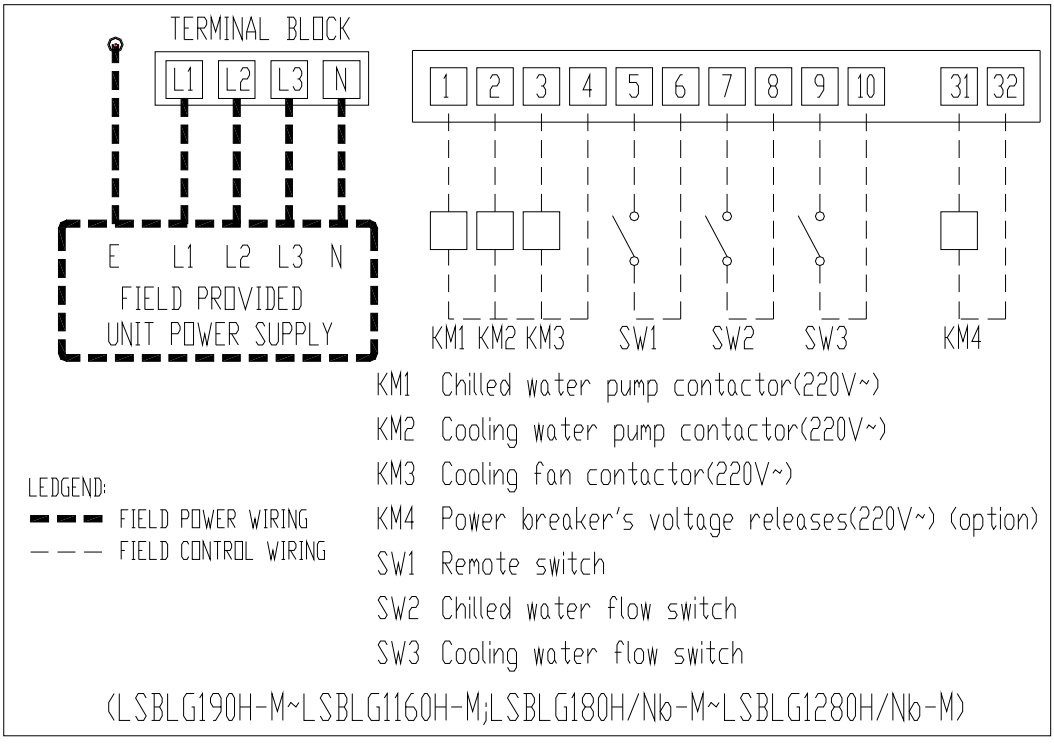
TYPICAL CONTROL BOX LOCATIONS AND FIELD WIRING
(LSBLG190H-M~LSBLG850H-M;LSBLG180H/Nb-M~LSBLG640H/Nb-M)



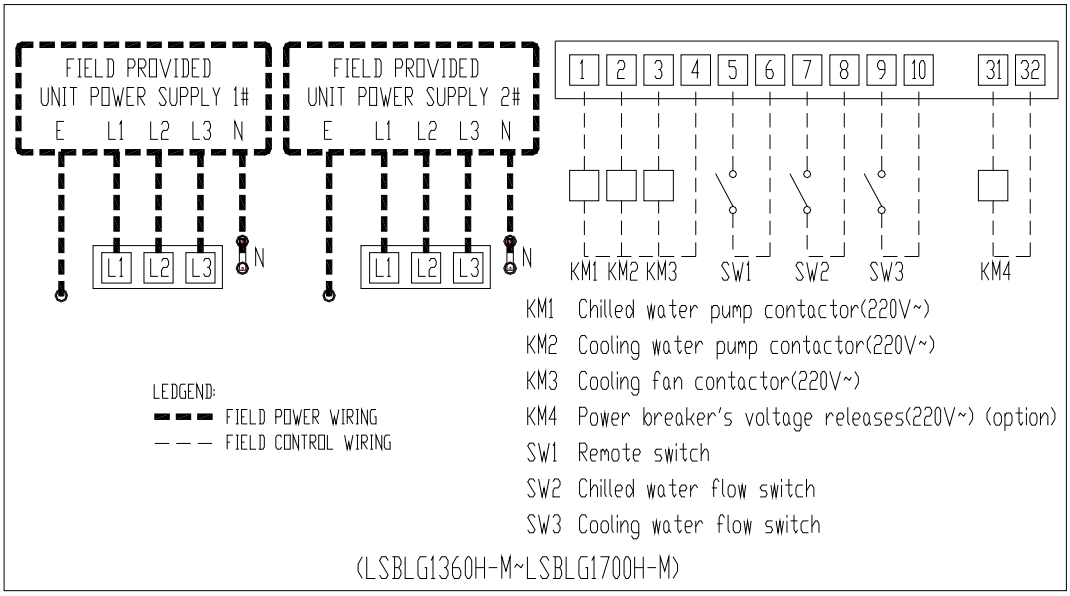
TYPICAL CONTROL BOX LOCATIONS AND FIELD WIRING
(LSBLG960H-M~LSBLG1160H-M;LSBLG680H/Nb-M~LSBLG1280H/Nb-M)



TYPICAL CONTROL BOX LOCATIONS AND FIELD WIRING
(LSBLG1360H-M~LSBLG1700H-M)

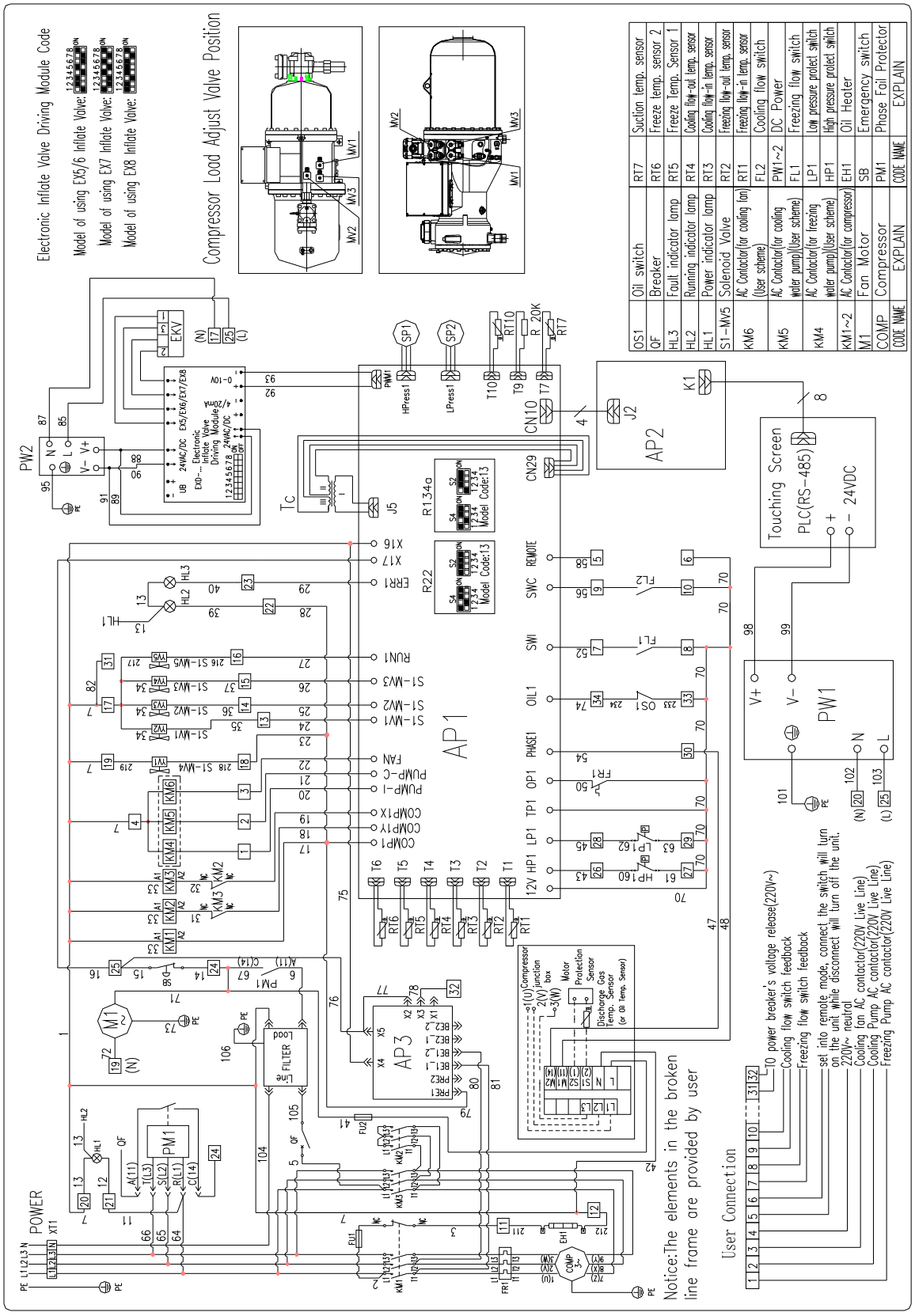


(LSBLG190H-M~LSBLG1160H-MjLSBLG180H/Nb-M~LSBLG1280H/Nb-M)



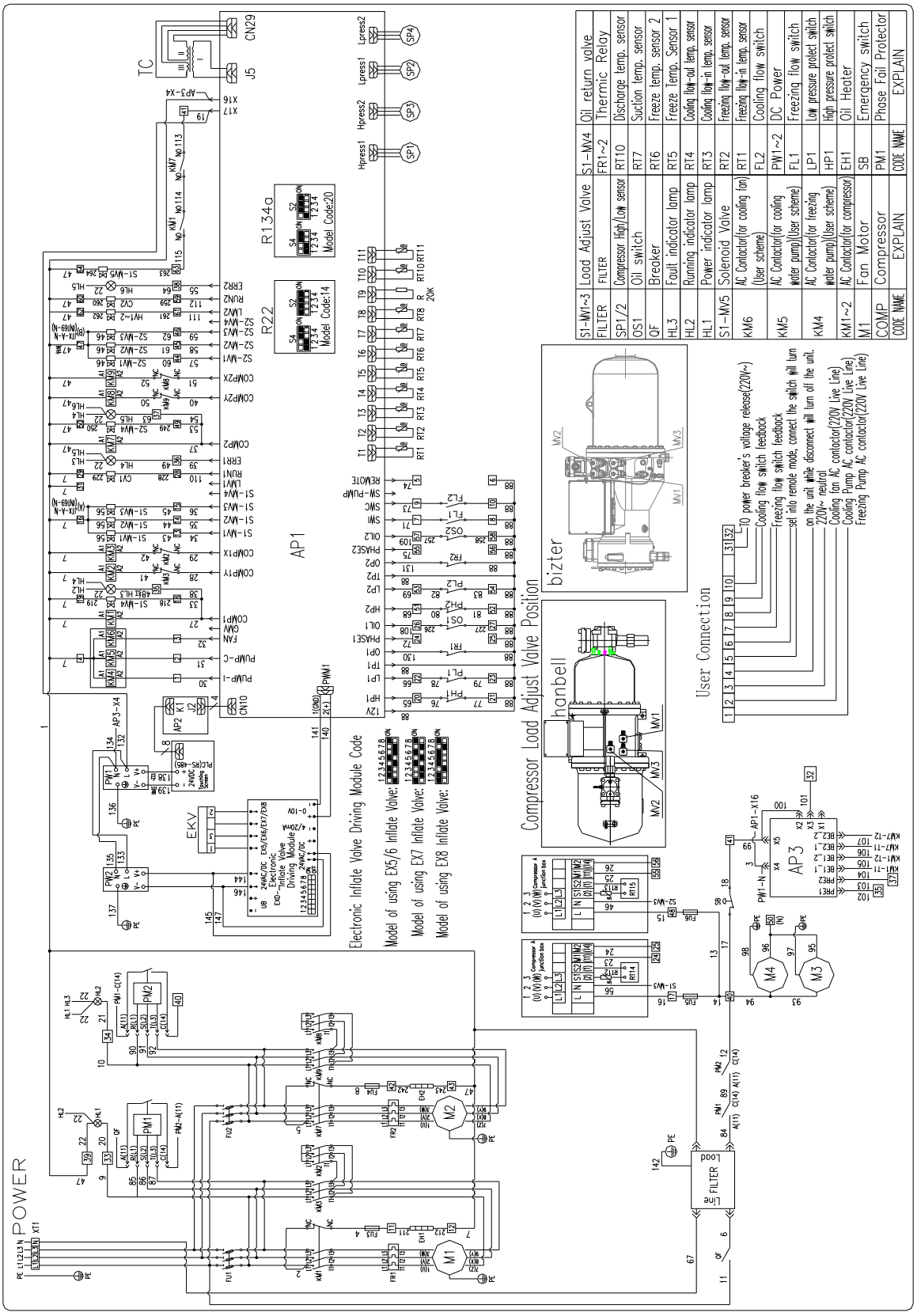
3.3 WIRING DIAGRAM

(LSBLG190H-M~LSBLG850H-M; LSBLG180H/Nb-M~LSBLG640H/Nb-M)

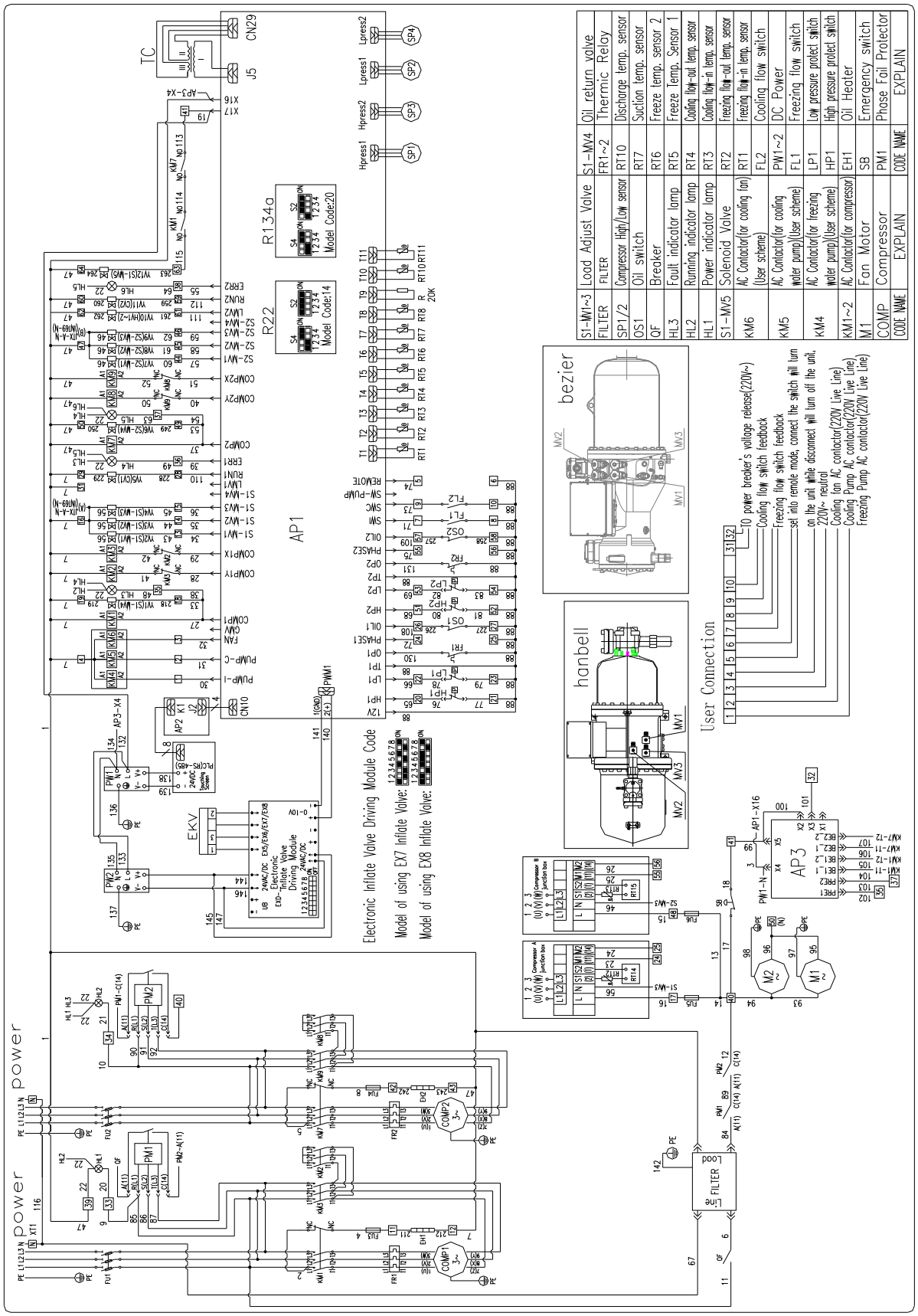


OS1	Oil switch	RT7	Suction temp. sensor
QF	Breaker	RT6	Freeze temp. sensor 2
HL3	Fault indicator lamp	RT5	Freeze Temp. Sensor 1
HL2	Running indicator lamp	RT4	Cooling flow-out temp. sensor
HL1	Power indicator lamp	RT3	Cooling flow-in temp. sensor
S1-MV5	Solenoid Volve	RT2	Freezing flow-out temp. sensor
KM6	AC Contactor(for cooling fan) (User scheme)	RT1	Freezing flow-in temp. sensor
		FL2	Cooling flow switch
KM5	AC Contactor(for cooling water pump)(User scheme)	PW1~2	DC Power
		FL1	Freezing flow switch
KM4	AC Contactor(for freezing water pump)(User scheme)	LP1	Low pressure protect switch
		HP1	High pressure protect switch
KM1~2	AC Contactor(for compressor)	EH1	Oil Heater
M1	Fan Motor	SB	Emergency switch
COMP	Compressor	PM1	Phase Foil Protector
CODE NAME	EXPLAIN	CODE NAME	EXPLAIN

(LSBLG960H-M~LSBLG1160H-M; LSBLG680H/Nb-M~LSBLG1280H/Nb-M)



(LSBLG1360H-M~LSBLG1700H-M)



MAINTENANCE

UNITS MAINTENANCE

1 ERROR CODE LIST

error display	name	Source of error signal	description
high pressure of compressor	high pressure protection	high pressure switch	When the high temperature of system exceeds the setting value, the high pressure protection occurs and the corresponding malfunction LED lights while the compressor stops immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
low pressure of compressor	low pressure protection	low pressure switch	When the low temperature of system is lower than the setting value, the low pressure protection occurs and the corresponding malfunction LED lights while the compressor stops immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
overload of compressor	overload protection	thermal relay	Upon overcurrent of compressor, the overload protection will occur and the corresponding malfunction LED lights while the compressor stops immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
chilled water switch	flow switch protection	chilled water switch	When the chilled water flowing through the unit is not sufficient, the flow switch protection will occur. The error LED of system 1 and system 2 (dual system) will light and all the compressors, chilled water pumps and cooling water pumps will stop immediately. The malfunction information is shown on the wired controller. It can be reset automatically.
cooling water switch	chilled water switch	chilled water flow switch	When the cooling water flowing through the unit is not sufficient, the flow switch protection will occur. The error LED of system 1 and system 2 (dual system) will light and all the compressors, chilled water pumps and cooling water pumps will stop immediately. The malfunction information is shown on the wired controller. It can be reset automatically.
anti-freezing heat detector	anti-freezing protection	anti-freezing heat detector	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.

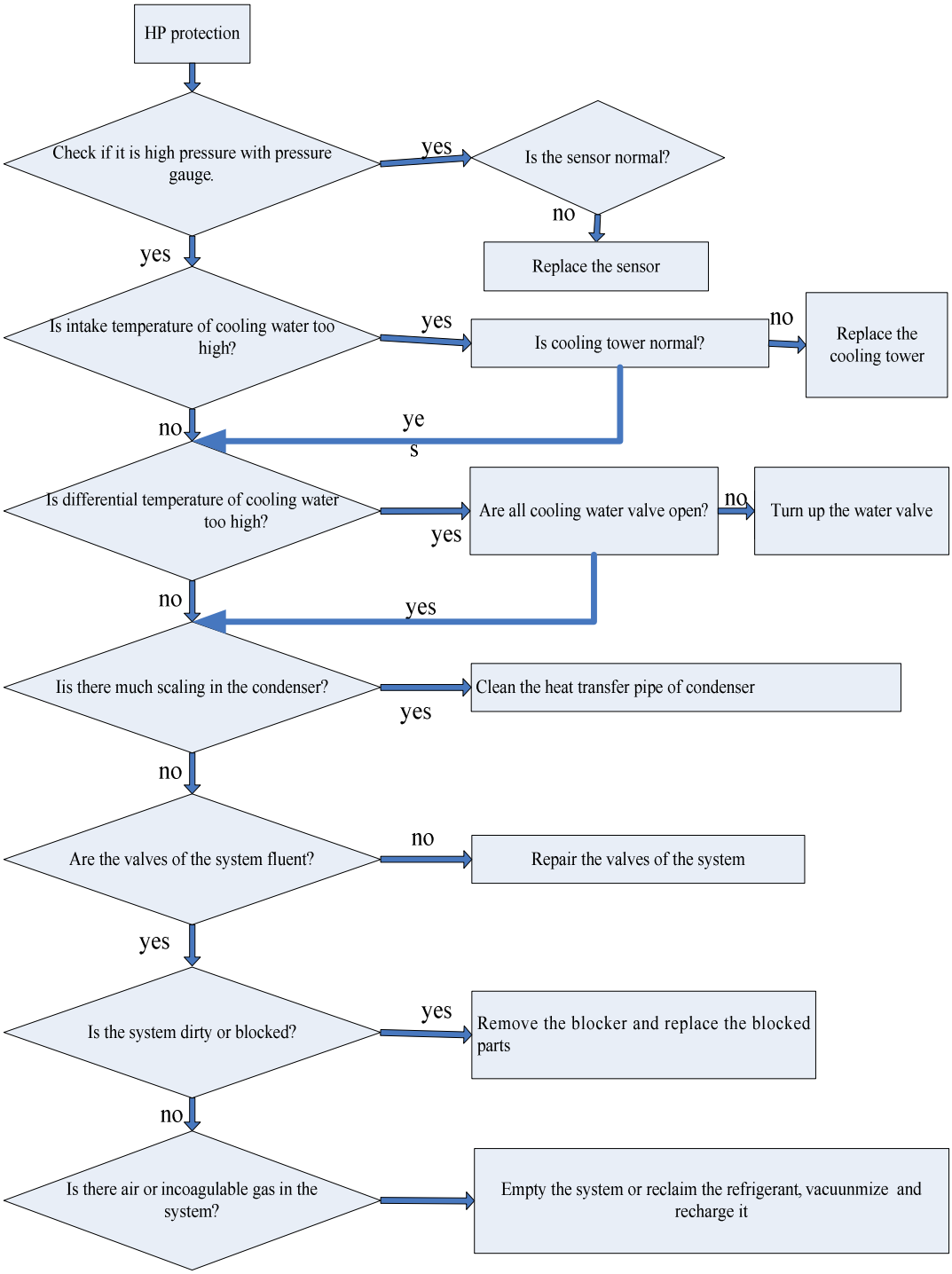
heat detector of intake chilled water	sensor malfunction protection	heat detector of intake chilled water	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
heat detector of outflow chilled water	sensor malfunction protection	heat detector of outflow chilled water	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
heat detector of intake cooling water	sensor malfunction protection	heat detector of intake cooling water	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
heat detector of outflow cooling water	sensor malfunction protection	heat detector of outflow cooling water	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
superheat	superheat protection	heat detector of outflow cooling water	When the outflow cooling water temperature is higher than the setting value, the superheat protection will occur. The error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. In that case, only when the outflow cooling water temperature is lower than the setting value, the malfunction can be removed by manual resetting.
anti-freeze	anti-freezing protection	anti-freezing heat detector	When the anti-freezing heat detector detects that temperature is lower than the setting value, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. In that case, only when the temperature is higher than the setting value, the malfunction can be removed by manual resetting.
discharge high temperature	discharge high temperature protection	heat detector of discharge high temperature	When the discharge temperature is higher than the setting value, the error LED of corresponding system will light and the corresponding compressors will stop immediately. The malfunction information is shown on the wired controller. In that case, only when the discharge temperature is lower than the setting value, the malfunction can be removed by manual

			resetting.
phase sequence of power supply	Phase sequence protection	Lack phase protector	When the phase sequence of the power supply is wrong or the power supply is lack of phase, the lack phase protection will occur and the error LED of system 1 and system 2 will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
low flow of cooling water	low flow protection of cooling water	heat detector of inflow and outflow temperature for cooling water	When the controller detects for successive 10min that the differential temperature between inflow and outflow cooling water is higher than the setting value, the error LED will light. The wired controller will display the information of insufficient cooling water flow, but the unit will not stop. The error can be removed automatically.
low flow of chilled water	low flow protection of chilled water	heat detector of inflow and outflow temperature for chilled water	When the controller detects for successive 10min that the differential temperature between inflow and outflow chilled water is higher than the setting value, c, but the unit will not stop. The error can be removed automatically.
high pressure sensor	sensor malfunction protection	high pressure sensor	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
low pressure sensor	sensor malfunction protection	low pressure sensor	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
discharge temperature sensor	sensor malfunction protection	discharge temperature sensor	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
inspiratory temperature sensor	sensor malfunction protection	inspiratory temperature sensor	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
oil switch	oil switch protection	oil switch	When the oil level of the compressor is too low, the oil level switch protection will occur. The corresponding error LED will

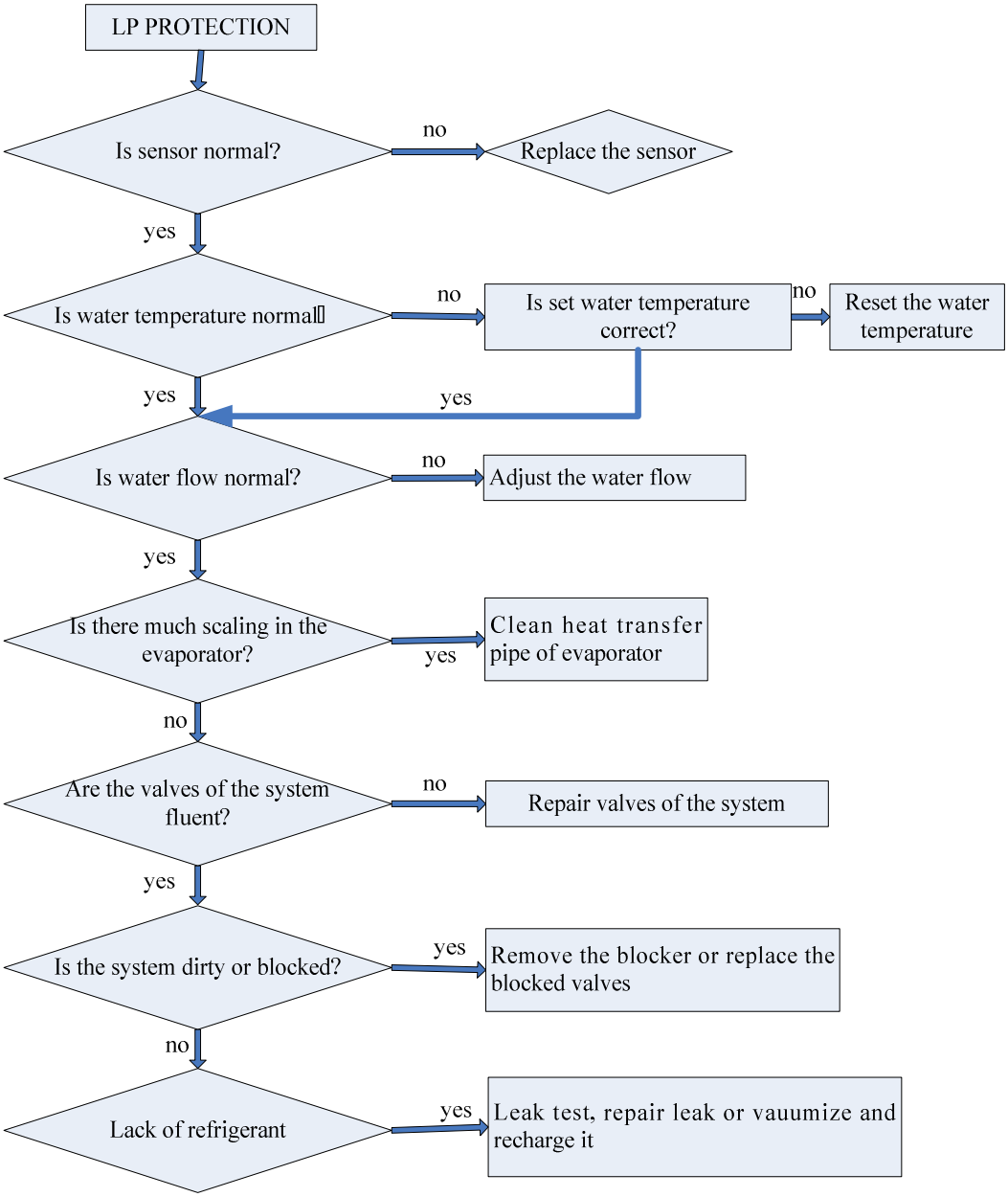
			light and the corresponding compressor will stop. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.
differential pressure protection	differential pressure protection	high pressure and low pressure sensor	When it is detected that the differential pressure of the compressor is too low, the differential pressure protection will occur and the compressor will stop. The unit can be started up only after the malfunction is removed manually.
heat detector of condenser outlet	sensor malfunction protection	heat detector of condenser outlet	If the sensor is wrong, the error LED of system 1 and system 2 (dual system) will light and all the compressors will stop immediately. The malfunction information is shown on the wired controller. The unit can be started up only after the malfunction is removed manually.

2 FLOW CHART OF TROUBLESHOOTING

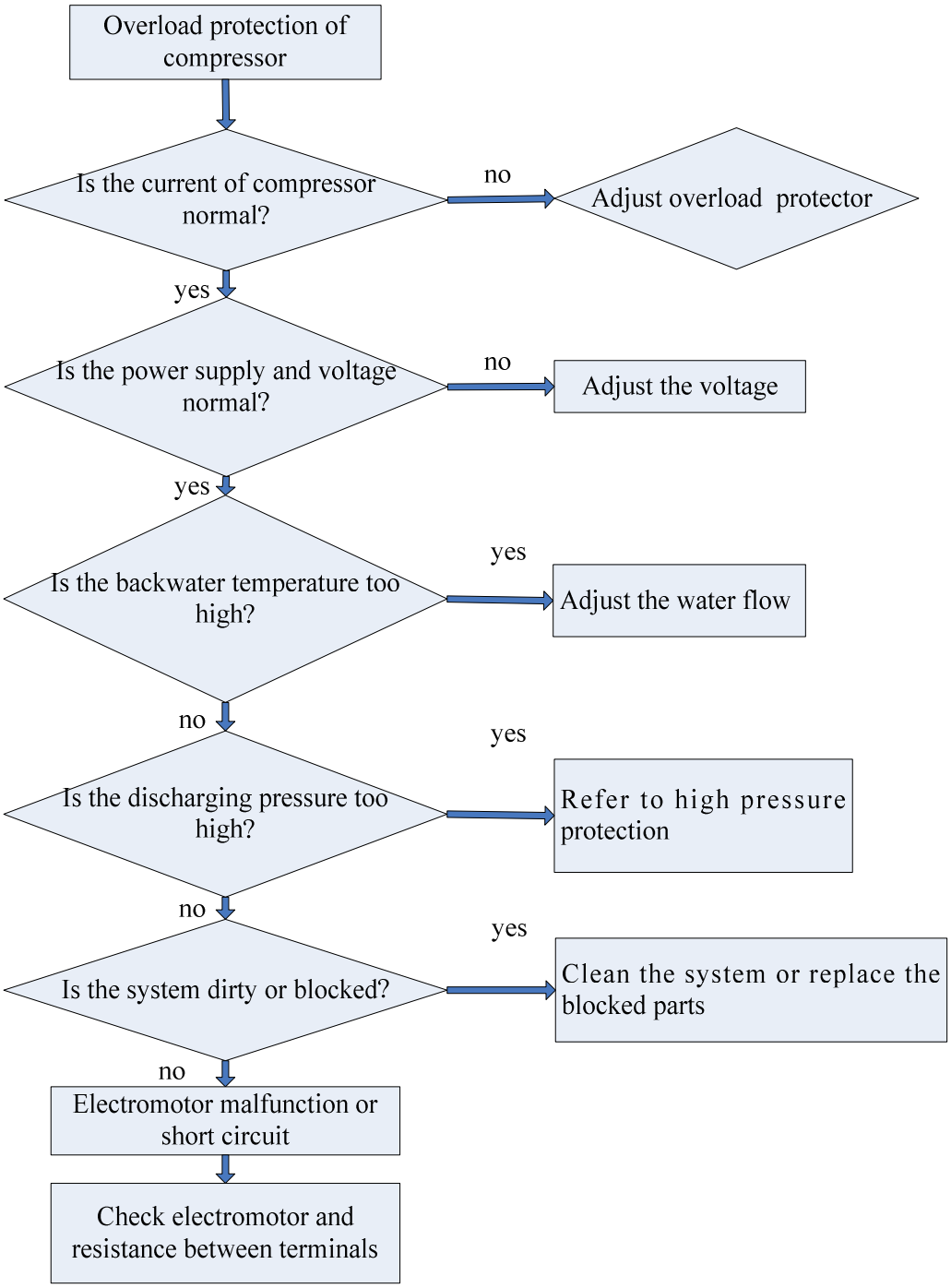
2.1 High Pressure Protection



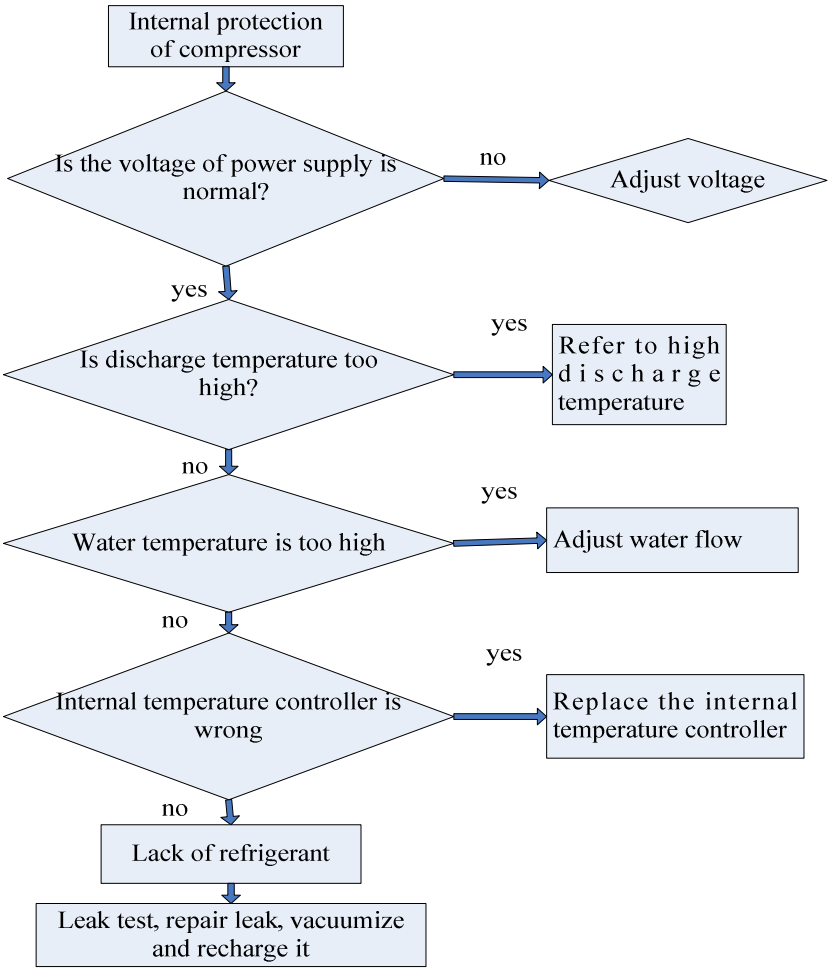
2.2. Low Pressure Protection



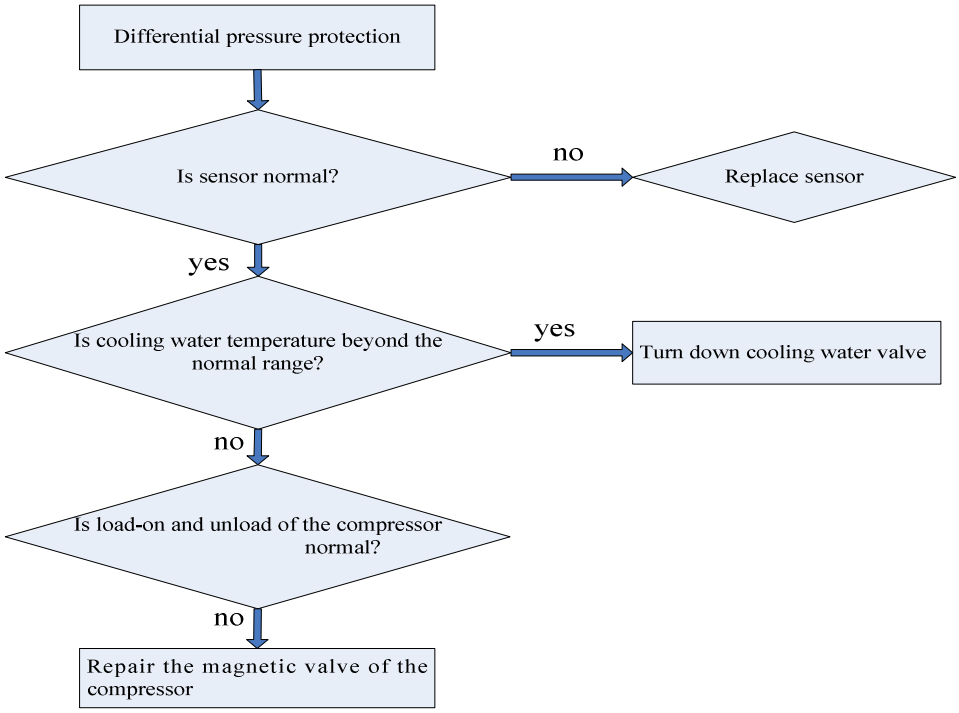
2.3. Overload Protection of Compressor



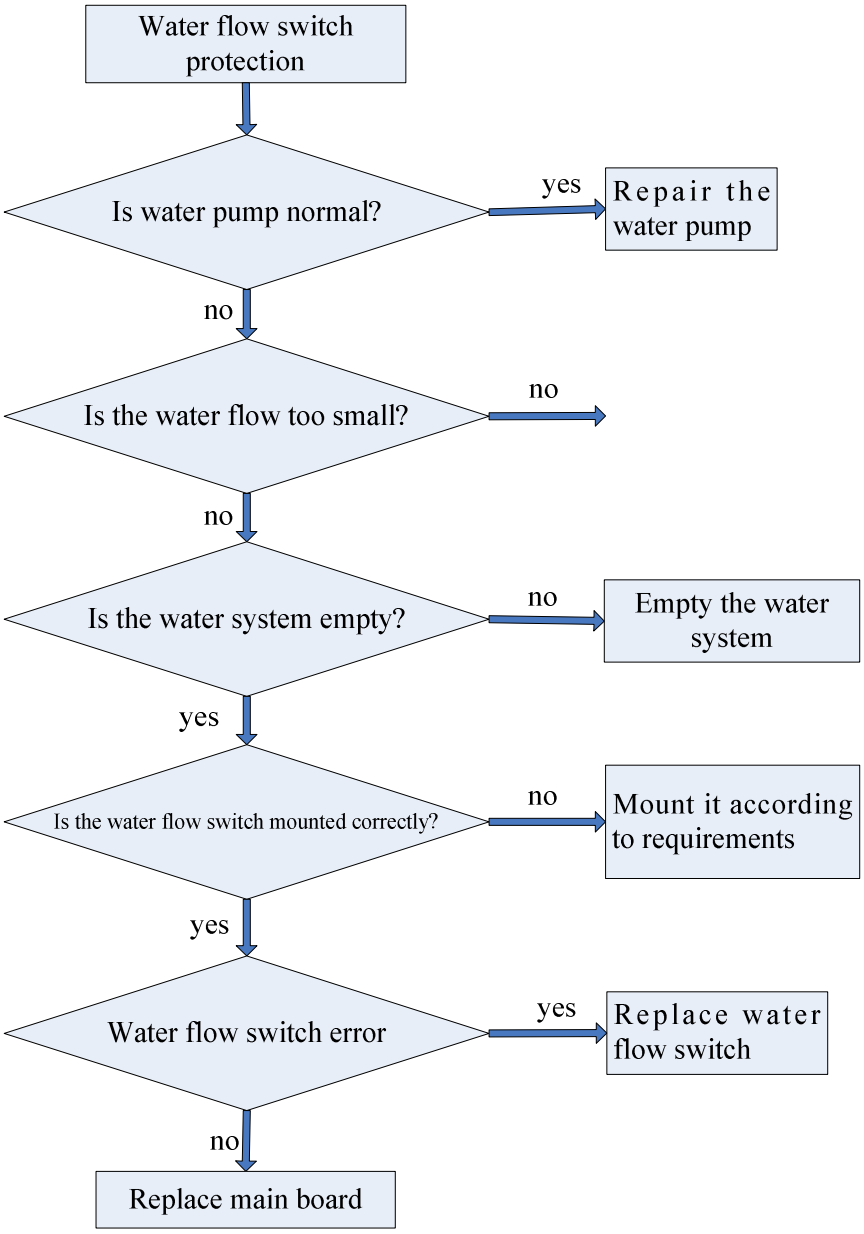
2.4. Internal Protection



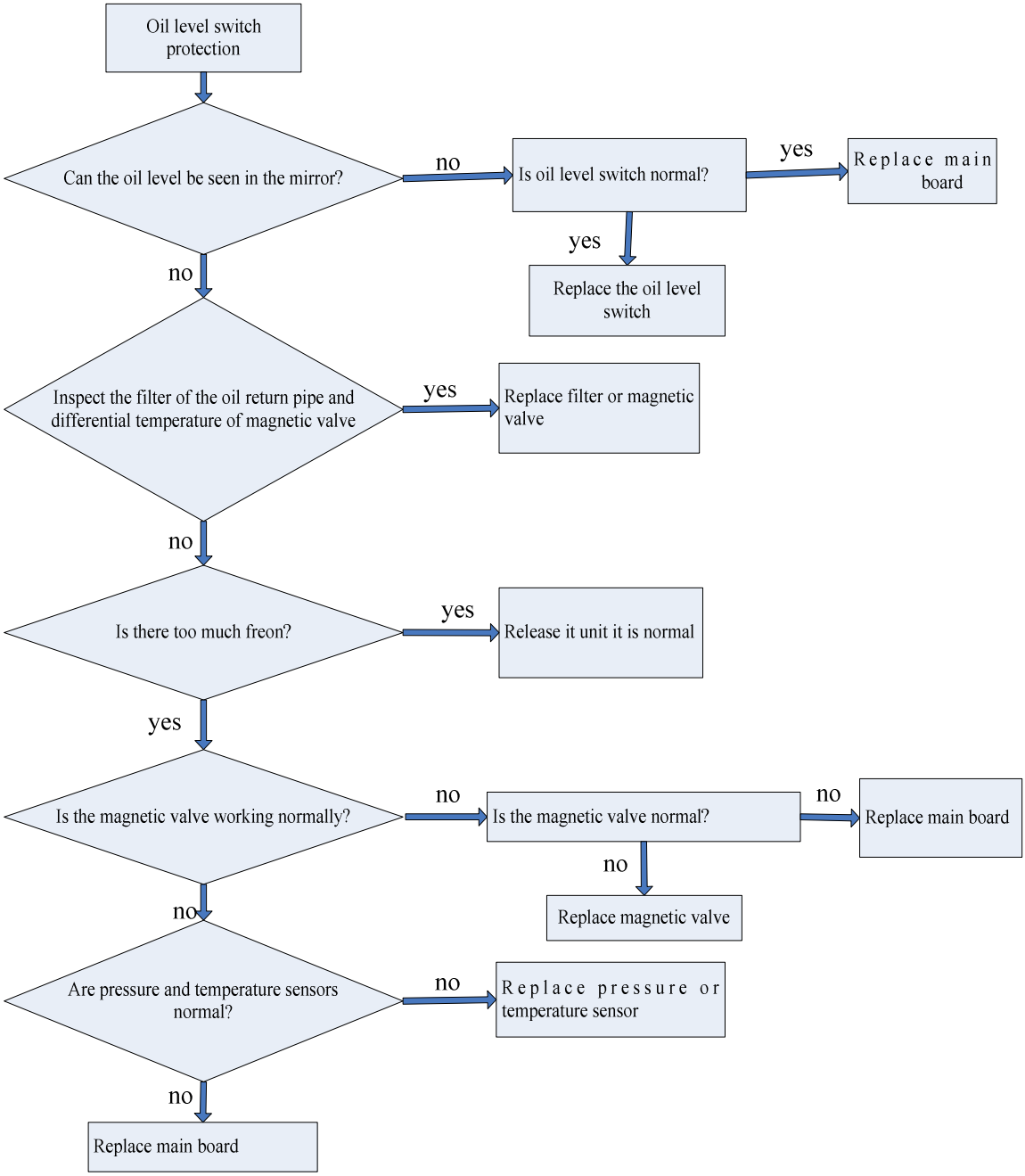
2.5. Differential Pressure Protection



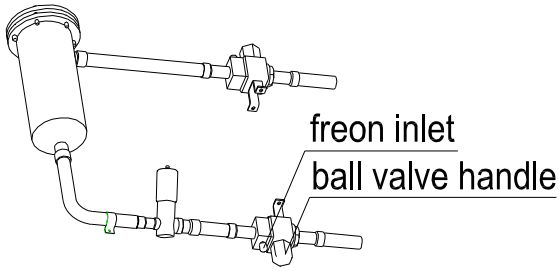
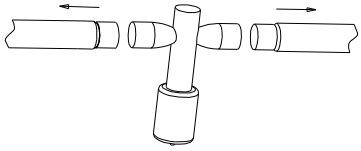
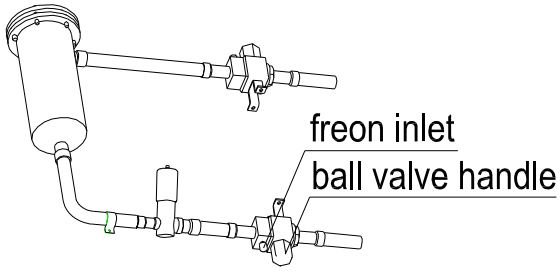
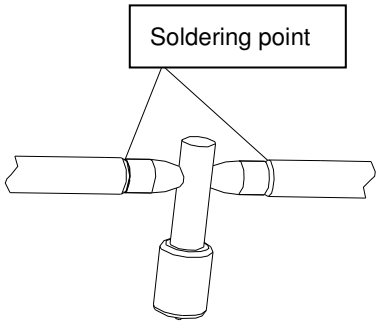
2.6. Water Flow Switch Protection

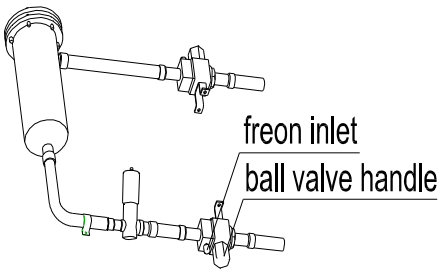
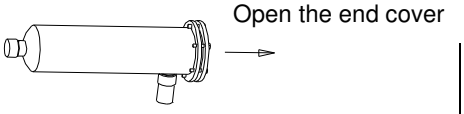
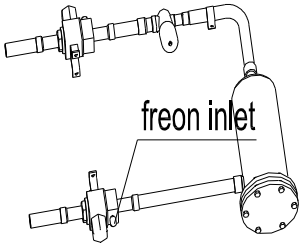
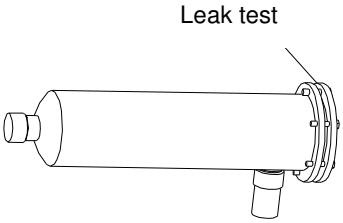


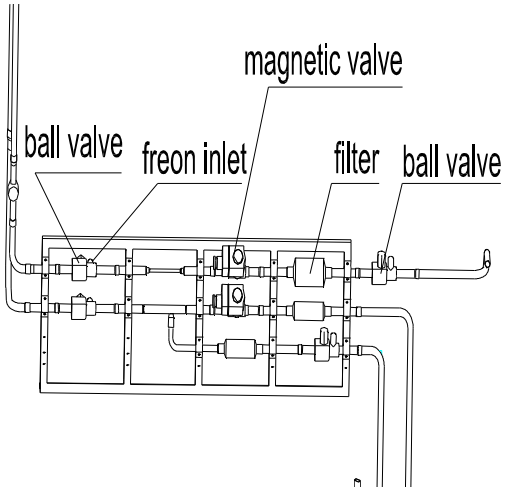
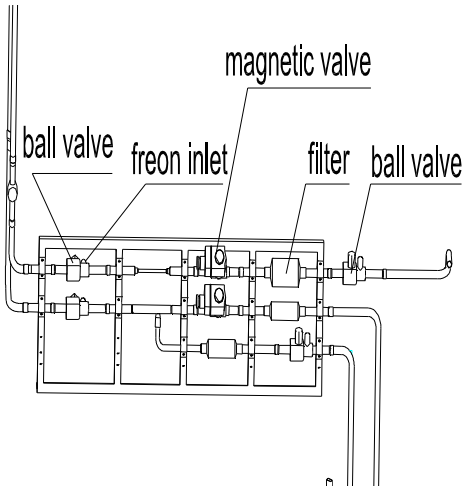
2.7. Oil Level Switch Protection



3 DISASSEMBLY AND ASSEMBLY PROCEDURE OF MAIN PARTS

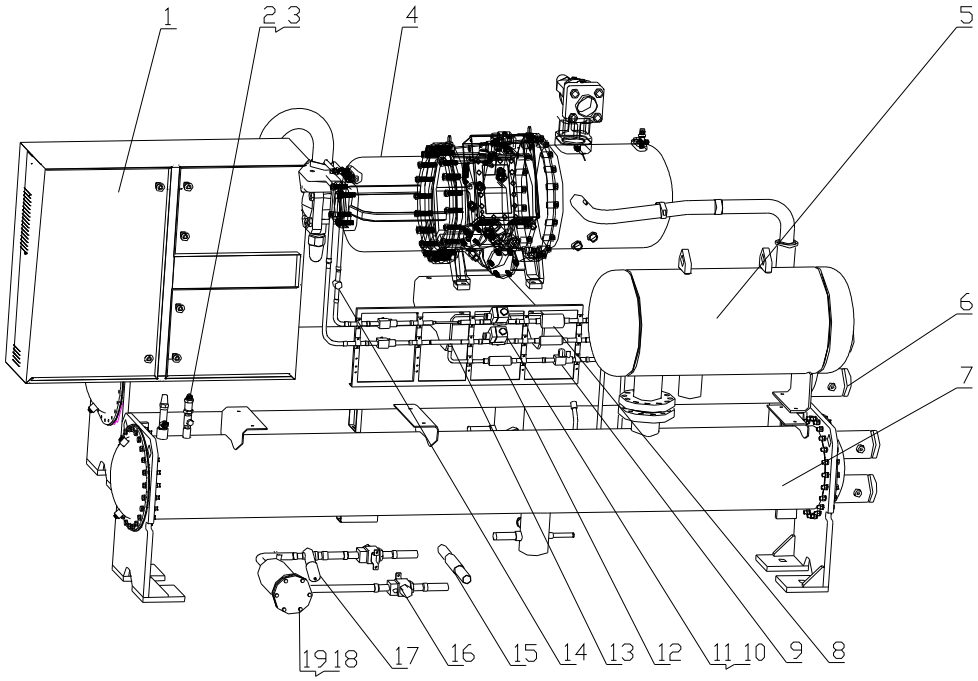
<table>
<tr><td colspan="3">disassembly of electric expansion valve</td></tr>
<tr><td colspan="3">Remarks: before disassemble the electric expansion valve, ensure that the inside pressure is released. Otherwise, it may cause accident and injury.</td></tr>
<tr><td>step</td><td>diagram</td><td>instruction</td></tr>
<tr><td>discharge Freon</td><td> 
</td><td>After stopping the unit, close the ball valve and open the Freon inlet on the ball valve to release the Freon in the pipe.</td></tr>
<tr><td>replace electric expansion valve</td><td>  </td><td>Solder off the expansion valve and replace a new one.</td></tr>
<tr><td>vacuumizing</td><td> 
</td><td>Vacuumize the expansion valve via the Freon inlet and then open the ball valve.</td></tr>
<tr><td>leak test</td><td> 
</td><td>Test the soldering point for leakage. If it is leaked, repair it.</td></tr>
</table>

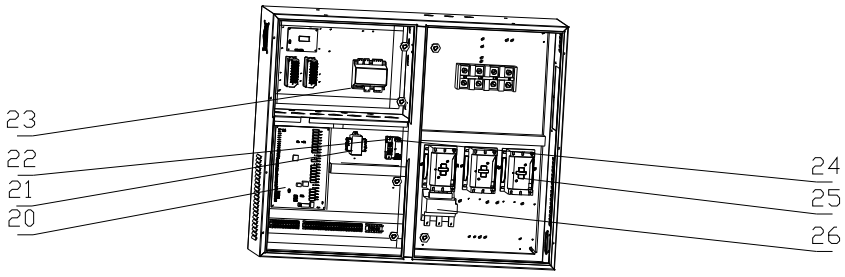
disassembly of dry filter		
Remarks: before disassemble the dry filter, ensure that the inside pressure is released. Otherwise, it may cause accident and injury.		
step	diagram	instruction
discharge Freon		After stopping the unit, close the ball valve and open the Freon inlet on the ball valve to release the Freon in the pipe.
replace the filter core		Open the end cover of the filter and remove the old filter core. Replace a new one and mount the cover.
vacuumizing		Vacuumize the filter via the Freon inlet and then open the ball valve.
leak test		Test the end cover and orificial screw for leakage. If it is leaked, tighten it.

<table>
<tr><td colspan="3">disassembly of the filter of the oil return pipe</td></tr>
<tr><td colspan="3">Remarks: before disassemble the filter of the oil return pipe, ensure that the inside pressure is released. Otherwise, it may cause accident and injury.</td></tr>
<tr><td>step</td><td>diagram</td><td>instruction</td></tr>
<tr><td>discharge Freon</td><td> 
</td><td>After stopping the unit, close the ball valve and open the Freon inlet on the ball valve to release the Freon in the pipe. When discharging the Freon, the magnetic valve on the pipe must be energized to keep the pipe smooth.</td></tr>
<tr><td>replace the filter</td><td>  </td><td>Solder off the filter from the pipe and mount a new one.</td></tr>
<tr><td>vacuumizing</td><td> 
</td><td>vacuumize the pipe via the Freon inlet on the ball valve. Open the ball valve after finish vacuumizing the pipe.</td></tr>
<tr><td>leak test</td><td> 
</td><td>Test the welding spot for leakage. If it is leaked, repair it.</td></tr>
</table>

4 EXPLODED VIEWS & PARTS LIST

LSBLG190H-M, LSBLG290H-M, LSBLG325H-M, LSBLG430H-M, LSBLG480H-M, LSBLG550H-M, LSBLG650H-M, LSBLG780H-M, LSBLG850H-M, LSBLG180H/Nb-M, LSBLG210H/Nb-M, LSBLG240H/Nb-M, LSBLG300H/Nb-M, LSBLG340H/Nb-M, LSBLG380H/Nb-M, LSBLG450H/Nb-M, LSBLG500H/Nb-M, LSBLG580H/Nb-M, LSBLG640H/Nb-M





LSBLG190H-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398056	1
2	Relief Valve 3/8(30bar)	0718000801	1
3	Relief Valve 3/8	07388802	1
4	Compressor and fittings RC-2-200B-F	00201322	1
5	Oil Separator SSD1600H	07428007	1
6	Flooded evaporator MZ190D	01058815	1
7	Shell and Tube Condenser WN230DHorizontal	01158812	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	07228122	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222802508	1
16	Valve 2-φ28.58X1.5	071800042	2
17	Expansion Valve EX6-121	07139065	1
18	Dry Filter A-TDS-969/STAS-969/STAS-969T	07210041	1
19	Filtering Core D48	07218205	2
20	Main Board 1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch (3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1D80M7C	44010239	1
26	Thermal Overload Relay LRD3357C	44020376	1

LSBLG290H-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	02408004	1
2	Relief Valve 3/8(30bar)	0718000801	1
3	Relief Valve 3/8	07388802	1
4	Compressor and fittings RC-2-300B-F	00201302	1
5	Oil Separator SSD1600H	07428007	1
6	Flooded evaporator MZ290D	0105881501	1
7	Shell and Tube Condenser WN350D	0115881201	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	07228122	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	02228025	1
16	Valve 2-φ28.58X1.5	071800042	2
17	Expansion Valve EX6-121	07139065	1
18	Dry Filter A-TDS-969/STAS-969/STAS-969T	07210041	1
19	Filtering Core D48	07218205	2
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch (3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1D80M7C	44010239	1
26	Thermal Overload Relay LRD3363C	44020374	1

LSBLG325H-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	02408003	1
2	Relief Valve 3/8(30bar)	0718000801	1
3	Relief Valve 3/8	07388802	1
4	Compressor and fittings RC-2-310B-F	00208005	1
5	Oil Separator SSD1600H	07428007	1
6	Flooded evaporator MZ325D	0105881502	1
7	Shell and Tube Condenser WN360D	0115881202	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	07228122	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222802501	1
16	Valve 2-φ28.58X1.5	071800042	2
17	Expansion Valve EX6-121	07139065	1
18	Dry Filter A-TDS-969/STAS-969/STAS-969T	07210041	1
19	Filtering Core D48	07218205	2
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1D80M7C	44010239	1
26	Thermal Overload Relay LRD3365C	44020377	1

LSBLG430H-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398070	1
2	Relief Valve 3/8(30bar)	0718000801	1
3	Relief Valve 3/8	07388802	1
4	Compressor and fittings RC-2-410B-F	00120053	1
5	Oil Separator SSD4600H	07428008	1
6	Flooded evaporator MZ430D	01058816	1
7	Shell and Tube Condenser WN520D	01158813	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	07228122	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222802502	1
16	Valve 2-φ35X1.5	07180005	2
17	Expansion Valve EX7	07130333	1
18	Dry Filter A-TDS-9611/STAS-9611/STAS-9611T	07218210	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D170006M7C	44010237	1
26	Thermal Overload Relay LR9-D5369	44020375	1

LSBLG480H-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398046	1
2	Relief Valve 3/8(30bar)	0718000801	1
3	Relief Valve 3/8	07388802	1
4	Compressor and fittings RC-2-470B-F	00201314	1
5	Oil Separator SSD4600H	07428008	1
6	Flooded evaporator MZ480D	0105881601	1
7	Shell and Tube Condenser WN550D	0115881301	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	07228122	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222802502	1
16	Valve 2-φ35X1.5	07180005	2
17	Expansion Valve EX7	07130333	1
18	Dry Filter A-TDS-9611/STAS-9611/STAS-9611T	07218210	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D170006M7C	44010237	1
26	Thermal Overload Relay LR9-D5369	44020375	1
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LSBLG550H-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398012	1
2	Relief Valve 3/8(30bar)	0718000801	1
3	Relief Valve 3/8	07388802	1
4	Compressor and fittings RC-2-550B-F	00201303	1
5	Oil Separator SSD4600H	07428008	1
6	Flooded evaporator MZ525D	0105881602	1
7	Shell and Tube Condenser WN600D	0115881302	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	07228122	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222802504	1
16	Valve 2-φ35X1.5	07180005	2
17	Expansion Valve EX7	07130333	1
18	Dry Filter A-TDS-9611/STAS-9611/STAS-9611T	07218210	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D170006M7C	44010237	1
26	Thermal Overload Relay LR9-D5369	44020375	1

LSBLG650H-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398013	1
2	Relief Valve 3/8(30bar)	0718000801	1
3	Relief Valve 3/8	07388802	1
4	Compressor and fittings RC-2-620B-F	00201318	1
5	Oil Separator SSD7000H	07428009	1
6	Flooded evaporator MZ630D	01058817	1
7	Shell and Tube Condenser WN760D	01158814	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	07228122	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222802505	1
16	Valve 2-φ35X1.5	07180005	2
17	Expansion Valve EX7	07130333	1
18	Dry Filter A-TDS-9611/STAS-9611/STAS-9611T	07218210	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D245M7C	44010249	1
26	Thermal Overload Relay LR9-F5371	44020381	1

LSBLG780H-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398013	1
2	Relief Valve 3/8(30bar)	0718000801	1
3	Relief Valve 3/8	07388802	1
4	Compressor and fittings RC-2-710B-F	00201313	1
5	Oil Separator SSD7000H	07428009	1
6	Flooded evaporator MZ780D	0105881701	1
7	Shell and Tube Condenser WN920D	0115881401	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	07228122	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222802506	1
16	Valve 2-φ35X1.5	07180005	2
17	Expansion Valve EX7	07130333	1
18	Dry Filter A-TDS-9611/STAS-9611/STAS-9611T	07218210	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D245M7C	44010249	1
26	Thermal Overload Relay LR9-F5371	44020381	1

LSBLG850H-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398013	1
2	Relief Valve 3/8(30bar)	0718000801	1
3	Relief Valve 3/8	07388802	1
4	Compressor and fittings RC-2-790B-F	00201315	1
5	Oil Separator SSD7000H	07428009	1
6	Flooded evaporator MZ850D	0105881702	1
7	Shell and Tube Condenser WN1000D	0115881402	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	07228122	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222802507	1
16	Valve 2-φ35X1.5	07180005	2
17	Expansion Valve EX7	07130333	1
18	Dry Filter A-TDS-9611/STAS-9611/STAS-9611T	07218210	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D245M7C	44010249	1
26	Thermal Overload Relay LR9-F5371	44020381	1

LSBLG180H/Nb-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398058	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW7572-70Y-40P	00208029	1
5	Oil Separator	07428001	1
6	Flooded evaporator MZ180DNb	01058808	1
7	Shell and Tube Condenser WN220DNb	01158807	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222810305	1
16	Valve 2-φ35X1.5	071800042	2
17	Expansion Valve EX6-121	07139065	1
18	Dry Filter A-TDS-9611/STAS-9611/STAS-9611T	07218210	1
19	Filtering Core D48	07218205	2
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1 D6511M7C	44010280	1
26	Thermal Overload Relay LRD3359C	44020383	1

LSBLG210H/Nb-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398058	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW7582-80Y-40P	00208030	1
5	Oil Separator	07428001	1
6	Flooded evaporator MZ210DNb	0105880801	1
7	Shell and Tube Condenser WN250DNb	0115880701	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222810307	1
16	Valve 2-φ35X1.5	071800042	2
17	Expansion Valve EX6-121	07139065	1
18	Dry Filter A-TDS-9611/STAS-9611/STAS-9611T	07218210	1
19	Filtering Core D48	07218205	2
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1 D6511M7C	44010280	1
26	Thermal Overload Relay LRD3359C	44020383	1

LSBLG240H/Nb-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398058	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW7592-90Y-40P	00208031	1
5	Oil Separator	07428001	1
6	Flooded evaporator MZ240DNb	0105880802	1
7	Shell and Tube Condenser WN290DNb	0115880702	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222810309	1
16	Valve 2-φ35X1.5	071800042	2
17	Expansion Valve EX6-121	07139065	1
18	Dry Filter A-TDS-9611/STAS-9611/STAS-9611T	07218210	1
19	Filtering Core D48	07218205	2
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1 D6511M7C	44010280	1
26	Thermal Overload Relay LRD3359C	44020383	1
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LSBLG300H/Nb-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01392338	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW8572-110Y-40P	00208032	1
5	Oil Separator	07428004	1
6	Flooded evaporator MZ300DNb	01058807	1
7	Shell and Tube Condenser WN360DNb	01158806	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222810304	1
16	Valve 1-5/8	07189057	2
17	Expansion Valve EX7	07130333	1
18	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
19	Filtering Core D48	07218205	4
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1D95M7C	44010227	1
26	Thermal Overload Relay LRD3363C	44020374	1

LSBLG340H/Nb-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01392340	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW8582-125Y-40P	00208033	1
5	Oil Separator	07428004	1
6	Flooded evaporator MZ340DNb	0105880701	1
7	Shell and Tube Condenser WN400DNb	0115880601	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222810304	1
16	Valve 1-5/8	07189057	2
17	Expansion Valve EX7	07130333	1
18	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
19	Filtering Core D48	07218205	4
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D115006M7C	44010238	1
26	Thermal Overload Relay LR9-D5369	44020375	1

LSBLG380H/Nb-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01392340	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW8592-140Y-40P	00208034	1
5	Oil Separator	07428004	1
6	Flooded evaporator MZ380DNb	0105880702	1
7	Shell and Tube Condenser WN460DNb	0115880602	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222810309	1
16	Valve 1-5/8	07189057	2
17	Expansion Valve EX7	07130333	1
18	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
19	Filtering Core D48	07218205	4
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D115006M7C	44010238	1
26	Thermal Overload Relay LR9-D5369	44020375	1

LSBLG450H/Nb-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398053	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW9562-160Y-40D	00208035	1
5	Oil Separator	07428005	1
6	Flooded evaporator MZ450DNb	01058806	1
7	Shell and Tube Condenser WN540DNb	01158805	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	02228103	1
16	Valve HYV-G09	07180007	2
17	Expansion Valve EX8	07138119	1
18	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D170006M7C	44010237	1
26	Thermal Overload Relay LR9-D5369	44020375	1

LSBLG500H/Nb-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398053	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW9572-180Y-40D	00208036	1
5	Oil Separator	07428005	1
6	Flooded evaporator MZ500DNb	0105880601	1
7	Shell and Tube Condenser WN600DNb	0115880501	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222810302	1
16	Valve HYV-G09	07180007	2
17	Expansion Valve EX8	07138119	1
18	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D170006M7C	44010237	1
26	Thermal Overload Relay LR9-D5369	44020375	1

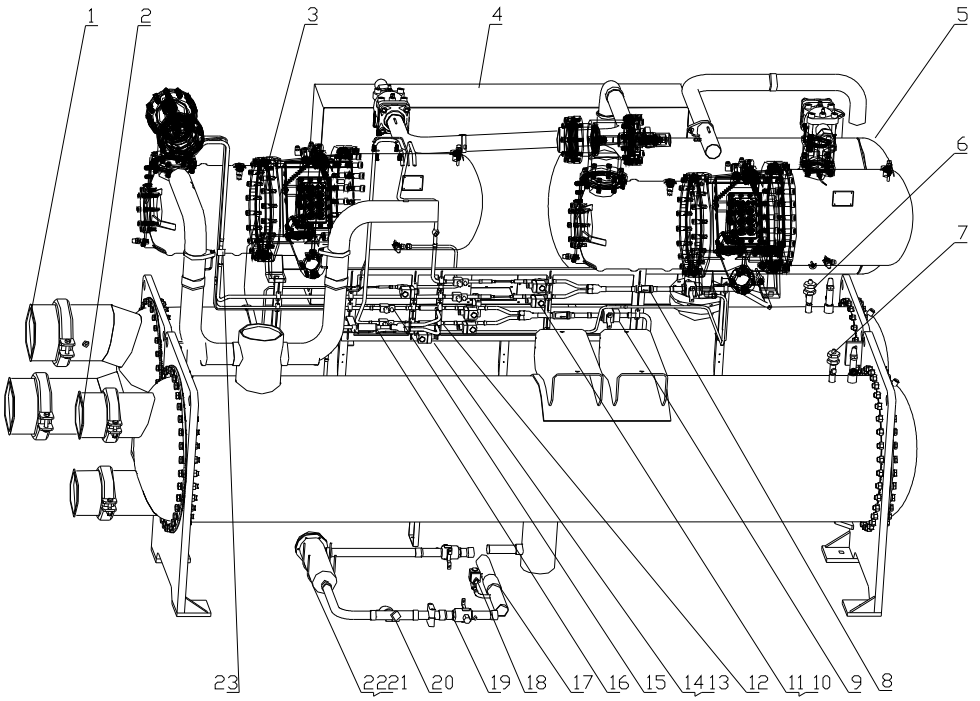
LSBLG580H/Nb-M

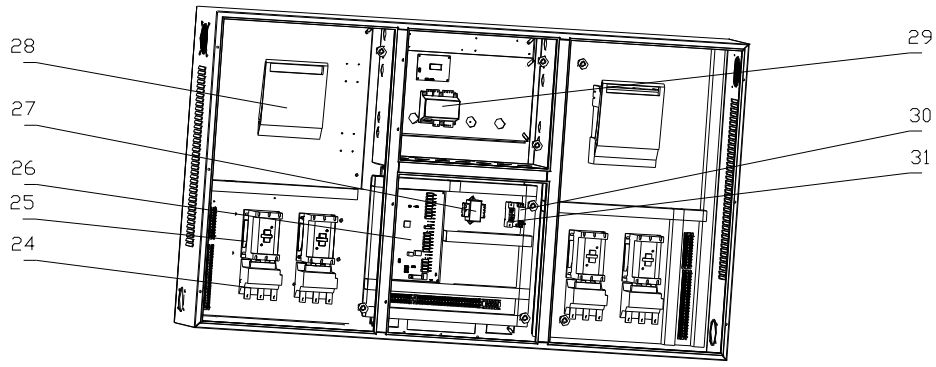
No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398053	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW9582-210Y-40D	00208037	1
5	Oil Separator	07428005	1
6	Flooded evaporator MZ580DNb	0105880602	1
7	Shell and Tube Condenser WN700DNb	0115880502	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222810306	1
16	Valve HYV-G09	07180007	2
17	Expansion Valve EX8	07138119	1
18	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D170006M7C	44010237	1
26	Thermal Overload Relay LR9-D5369	44020375	1

LSBLG640H/Nb-M

No.	Name of part	Part code	Quantity
1	Electric Cabinet Assy	01398081	1
2	Relief Valve 3/8	07388801	1
3	Relief Valve 3/8	0718000804	1
4	Compressor and fittings CSW9592-240Y-40D	00208038	1
5	Oil Separator	07428005	1
6	Flooded evaporator MZ640DNb	0105880603	1
7	Shell and Tube Condenser WN780DNb	0115880503	1
8	Filter	07418001	1
9	Liquid Valve Sub-Assy	07108627	4
10	Electromagnetic Valve EVR10	43008155	2
11	Magnet Coil	43008152	2
12	Bidirection Strainer φ16	07210044	2
13	injector Assy	0722812201	1
14	Sight glasses SGN16s(ODFXODF)	22458401	1
15	orifice plate	0222810308	1
16	Valve HYV-G09	07180007	2
17	Expansion Valve EX8	07138119	1
18	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
19	Filtering Core D48	07218205	3
20	Main Board1 WZ2G1A	30222061	1
21	Transformer 66X28B	43110028	1
22	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1
23	Driver EXD-U00	32210012	1
24	Phase Reverse Protector EWS	46020054	1
25	AC Contactor LC1-D170006M7C	44010237	1
26	Thermal Overload Relay LR9-D5369	44020375	1

LSBLG960H-M , LSBLG1160H-M, LSBLG1360H-M, LSBLG1560H-M, LSBLG1700H-M, LSBLG680H/Nb-M, LSBLG760H/Nb-M, LSBLG880H/Nb-M, LSBLG1000H/Nb-M, LSBLG1160H/Nb-M, LSBLG1280H/Nb-M





LSBLG960H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN1210S	01158815	1
2	Flooded evaporator MZ960S	01058818	1
3	Compressor and fittings RC-2-470B-F	00201314	2
4	Electric Cabinet Assy	01398051	1
5	Oil Separator	07428010	1
6	Relief Valve 3/8(30bar)	0718000801	1
7	Relief Valve 3/8	07388802	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	02228026	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-D5369	44020375	2
25	AC Contactor LC1-D170006M7C	44010237	4
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG1160H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN1450S	0115881501	1
2	Flooded evaporator MZ1160S	0105881801	1
3	Compressor and fittings RC-2-550B-F	00201303	2
4	Electric Cabinet Assy	01398045	1
5	Oil Separator	07428010	1
6	Relief Valve 3/8(30bar)	0718000801	1
7	Relief Valve 3/8	07388802	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	0222802601	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-D5369	44020375	2
25	AC Contactor LC1-D170006M7C	44010237	4
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG1360H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN1500S	01158816	1
2	Flooded evaporator MZ1260S	01058819	1
3	Compressor and fittings RC-2-620B-F	00201318	2
4	Electric Cabinet Assy	01398026	1
5	Oil Separator	07428011	1
6	Relief Valve 3/8(30bar)	0718000801	1
7	Relief Valve 3/8	07388802	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	0222802602	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-F5371	44020381	2
25	AC Contactor LC1-D245M7C	44010249	6
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG1560H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN2000S	0115086902	1
2	Flooded evaporator MZ1700S	0105193302	1
3	Compressor and fittings RC-2-790B-F	00201315	2
4	Electric Cabinet Assy	01398026	1
5	Oil Separator	07428011	1
6	Relief Valve 3/8(30bar)	0718000801	1
7	Relief Valve 3/8	07388802	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	0222802603	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-F5371	44020381	2
25	AC Contactor LC1-D245M7C	44010249	6
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG1700H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN2000S	0115881602	1
2	Flooded evaporator MZ1700S	0105881902	1
3	Compressor and fittings RC-2-790B-F	00201315	2
4	Electric Cabinet Assy	01398026	1
5	Oil Separator	07428011	1
6	Relief Valve 3/8(30bar)	0718000801	1
7	Relief Valve 3/8	07388802	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	0222802604	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-F5371	44020381	2
25	AC Contactor LC1-D245M7C	44010249	6
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG680H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN810SNb	01158804	1
2	Flooded evaporator MZ680SNb	01058805	1
3	Compressor and fittings CSW8582-125Y-40P	00208033	2
4	Electric Cabinet Assy	01398062	1
5	Oil Separator	07428006	1
6	Relief Valve 3/8	07388801	1
7	Relief Valve 3/8	0718000804	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	0222802605	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-D5369	44020375	2
25	AC Contactor LC1-D170006M7C	44010237	4
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG760H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN910SNb	0115880401	1
2	Flooded evaporator MZ760SNb	0105880501	1
3	Compressor and fittings CSW8592-140Y-40P	00208034	2
4	Electric Cabinet Assy	01398062	1
5	Oil Separator	07428006	1
6	Relief Valve 3/8	07388801	1
7	Relief Valve 3/8	0718000804	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	02228026	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-D5369	44020375	2
25	AC Contactor LC1-D170006M7C	44010237	4
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG880H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN1060SNb	01158803	1
2	Flooded evaporator MZ880SNb	01058804	1
3	Compressor and fittings CSW9562-160Y-40D	00208035	2
4	Electric Cabinet Assy	01398050	1
5	Oil Separator	0742800301	1
6	Relief Valve 3/8	07388801	1
7	Relief Valve 3/8	0718000804	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	0222802601	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-D5369	44020375	2
25	AC Contactor LC1-D170006M7C	44010237	4
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG1000H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN1200SNb	0115880301	1
2	Flooded evaporator MZ1000SNb	0105880401	1
3	Compressor and fittings CSW9572-180Y-40D	00208036	2
4	Electric Cabinet Assy	01398050	1
5	Oil Separator	0742800301	1
6	Relief Valve 3/8	07388801	1
7	Relief Valve 3/8	0718000804	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	0222802602	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-D5369	44020375	2
25	AC Contactor LC1-D170006M7C	44010237	4
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG1160H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN1390SNb	0115880302	1
2	Flooded evaporator MZ1160SNb	0105880402	1
3	Compressor and fittings CSW9582-210Y-40D	00208037	2
4	Electric Cabinet Assy	01398052	1
5	Oil Separator	0742800301	1
6	Relief Valve 3/8	07388801	1
7	Relief Valve 3/8	0718000804	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	0222802604	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-D5369	44020375	2
25	AC Contactor LC1-D170006M7C	44010237	4
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1

LSBLG1280H/Nb-M

No.	Name of part	Part code	Quantity
1	Shell and Tube Condenser WN1530SNb	0115880303	1
2	Flooded evaporator MZ1280SNb	0105880403	1
3	Compressor and fittings CSW9592-240Y-40D	00208038	2
4	Electric Cabinet Assy	01398052	1
5	Oil Separator	0742800301	1
6	Relief Valve 3/8	07388801	1
7	Relief Valve 3/8	0718000804	1
8	Pipe Filter	07219051	2
9	Valve 2-φ22.2X1.5	07180004	2
10	Electromagnetic Valve EVR10	43008155	4
11	Magnet Coil	43008152	4
12	injector Assy	07228122	2
13	Electromagnetic Valve EVR6(032F1236)	43000078	2
14	Magnet Coil	43008152	2
15	Liquid Valve Sub-Assy	07108627	2
16	Bidirection Strainer φ16	07210044	1
17	orifice plate	0222802606	1
18	Electromagnetic Valve EVR10	43008155	1
19	Valve 1-5/8	07189057	2
20	Expansion Valve EX8	07138119	1
21	Dry Filter A-TDS-14413/STAS-14413/STAS-14413T	07218158	1
22	Filtering Core D48	07218205	3
23	Sight glasses SGN16s(ODFXODF)	22458401	2
24	Thermal Overload Relay LR9-D5369	44020375	2
25	AC Contactor LC1-D170006M7C	44010237	4
26	Main Board1 WZ2G1A	30222061	1
27	Transformer 66X28B	43110028	1
28	Fuse Switch XLP2	45010017	2
29	Driver EXD-U00	32210012	1
30	Phase Reverse Protector EWS	46020054	2
31	Single-phase Air Switch(3/40A) C45N.6A QF1/C65N	45020203	1