INDUSTRIAL CHILLER
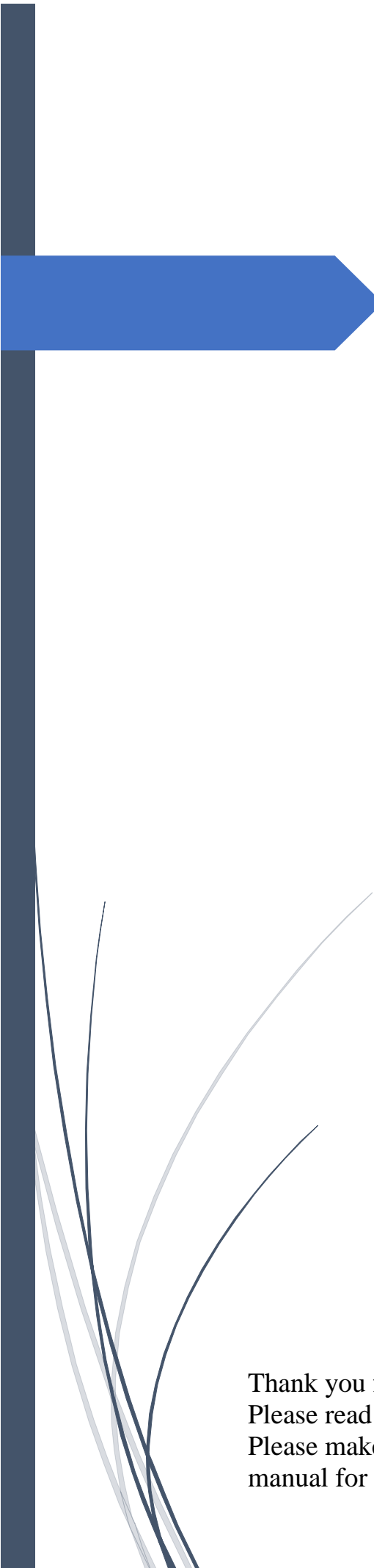# TECHNICAL MANUAL

Thank you for choosing and purchasing our products.
Please read carefully the technical manual before application.
Please make safekeeping of the technical
manual for further reference.

⚠ Danger!

To avoid any dangers caused to operators them selves or others, or any losses on assets, instructions are made on safety precautions to be observed as follows.

🚫 Operation stryctly prohibited

- Do not operate the device where water, corrosive or inflammable gas can be found or near inflammable substances.
- Do not place any inflammable substances on the device.
- Do not damage the power lines of the device; or attach overstress or pressure from both sides.
- Do not operate device with the power lines dipped in oil or water.
- Do not operate the device under vibrations or strong impacts.
- Do not disassemble the electric elements in the electric cabinet.
- Do not touch the high-temperatureor rotating parts of the device
- Do not operate the device or make wiring connection with hands wet.

⚠ Operation must be plemented
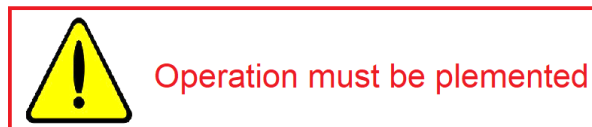
- Wiring connection must be operated by professional electrician.
- Safety validation must be made after the device is moved or natural disaster happens
- The equipment shall be operated in conditions with fewer dusts and away from water and oil.
- Emergency stop electric circuit shall be set external the device during installation to ensure that the device can be stopped and the power supply can be cutoff on emergent circumstances.
- Do not contact any part of the body with the metal parts of the connecting terminals when opening the electric cabinet.
- Appropriate arrangements shall be made when making operations such as installation etc. According to the net weight of the device.
- When making combination application of the device with other devices，the application must be made according to the relevant instructions on the combination.

CONTENTS

1. Foreword

1.1 User Precautions

1.Please read the technical manual carefully before the installation and application of the device.

2.The performances，operations and maintenance s of the device will be detailed in the following characters.

3.The documentations must be provided managerial personnel and the onsite operation and maintenance personnel.

4.The device has been made various testing before making the delivery to ensure that the device is complied with exfactory standards. Proper application，careful maintenance of the device is the greatest guarantees to ensure the reliability，stability and to the effective operation of the device.

5.The documentation is permanent file for the device，please make proper keeping of the documents.

1.2 Application environments

1.The device is required to be applied in the indoor environments of clean and neat，ensure that there's ample light and ventilation s.

2.The environmental temperatures for the operation of the device shall be controlled within the range of 5℃to 45℃，the surrounding temperature where operation is made for more than 24 hours shall be no more than 40℃.

3.The air humidity shall be controlled within the range of 20%to95%，certain space shall be left surrounding the device.

4.Irrelevant personnel are not allowed to enter the working area when the device is under operation.

5.Make proper use of the device.do not operate the device beyond the application ranges.

1.3 Product features

There are high effect to save energy and low noise and multifunctional for industrial chiller. The machine are widely used in many trades including plastic and rubber，electroplate，chemical industry，ultrasonic，etc. Especially，it shows high ascendant capability in plastic and rubber industry. It is important assistant equipment in plastic and rubber industry. It can exactly control the temperature of process mould，increase output，expedite finalizing the design，reduce shrink，buildup exterior luster and transparence. In the meantime，it appear important effect in pledging quality of output and reducing manufacture cost.

2. Structural drawings and names

2.1 Structural drawings
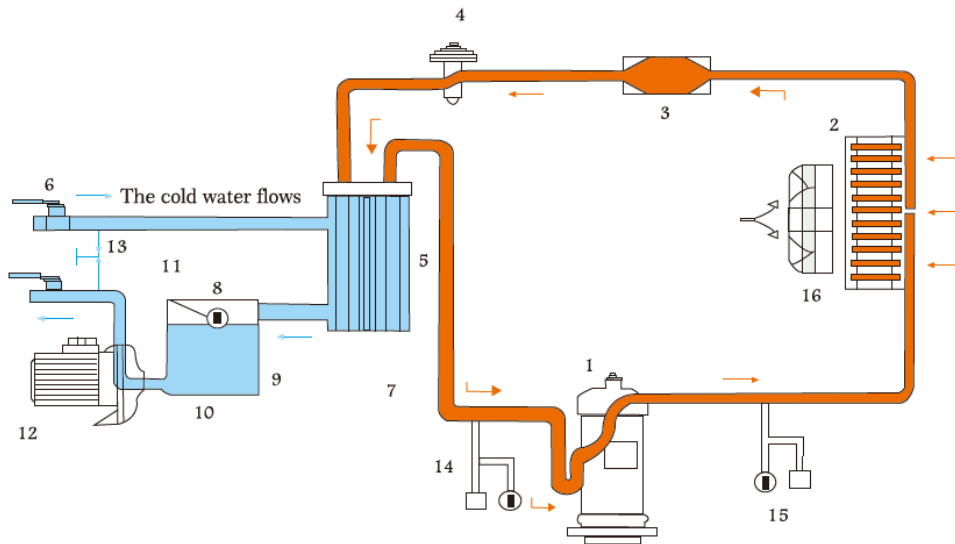
1. Compressor
2. Cooled condenser
3. Drier filter
4. Expansion valve
5. Evaporator
6. Globe valve
7. Antifreezing switch
8. Float switch
9. Temperature sensor
10. Water tank
11. Pressure gange
12. Pump
13. Pressure relieve valve
14. Low pressure controller
15. High pressure controller
16. Fan

2.2 product specifications

| Product model	ALW-LSQF05A1	ALW-LSQF05A2	ALW-LSQF10B1	ALW-LSQF10B2	ALW-LSQF15B1
Refrigerating capacity	60733 Btu/h	61416 Btu/h	121466 Btu/h	122832 Btu/h	159680 Btu/h
Rated power input	6.5 HP	6.5 HP	12 HP	12 HP	16 HP
Power supply	460V/3PH/60HZ	220V/3PH/60HZ	460V/3PH/60HZ	220V/3PH/60HZ	460V/3PH/60HZ
COP	10.2	10.5	10.2	10.5	10.6
Refrigerant	R407C	R407C	R407C	R407C	R407C
Flow rate	65 L/min	65 L/min	130 L/min	130 L/min	230 L/min
Process connections	NPT 1.5"	NPT 1.5"	NPT 2"	NPT 2"	NPT 2"
Overall dimensions	51.2×26.8×54.1 inch	51.2×26.8×54.1 inch	66.2×32.1×62.3 inch	66.2×32.1×62.3 inch	72.1×34.9×69.4 inch

3. Installation instruction

3.1 Preparation before installation

1.Other devices， stacking of materials and maintenance space must be taken into consideration before determining the installation position of the device. At least a distant of 1mis required to be kept surrounding the device.

2.The arrangements of power supply must be made before the installation， the load power of the power source wires shall be appearance has been over the total power of the device.

3.Please check whether the machine damaged during the transportation. If there is the obvious damage of the appearance， please don't hesitate to contact with the factory or seller.

3.2 Installation methods

1.Keep the device level and flat and ensure the ventilation of the surroundings.

2.During making the installation， do not change the tube diameter of the cooling water outlet in case that alarming is made on high pressure caused by poor heat dissipation.

3.Filter valves must be made on the return circuits of refrigerated water and cooling water when the water source is too directly or the surroundings near the water tower is too poor. Periodical cleaning shall be made.

4.If the refrigeration water system is designed as closing pipelines，exhaust valve shall be installed at the highest position of the system and drain valve at the lowest position of the system to facilitate the cleanings and drainages of the system.

5.Proper cooling tower with ample size shall be determined according to the refrigeration capacity of the device. The reference method is that each 1HP Compressor shall be allocated with a cooling tower of 1.5ton.

6.After the coolant hoses and pipelines have passed the leakage testing， coat them with heat preservation layer to avoid heat dissipation and pipeline dripping.

7.The water pump， water tower and water supply pump of the circulating water system can be connected into the control circuits of the chillers to facilitated operations and protect the chiller.

3.3 Diagram of installation
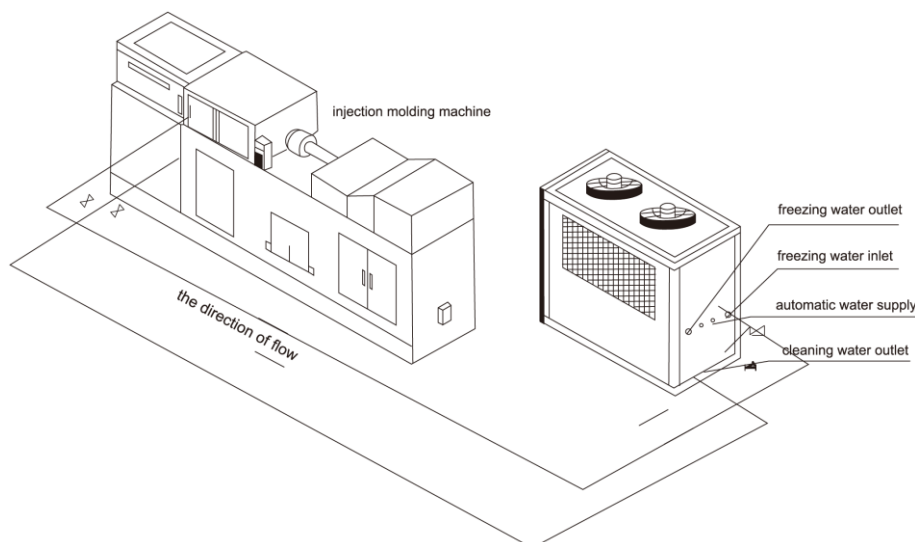
4. Operation instruction

4.1 Panel Diagram
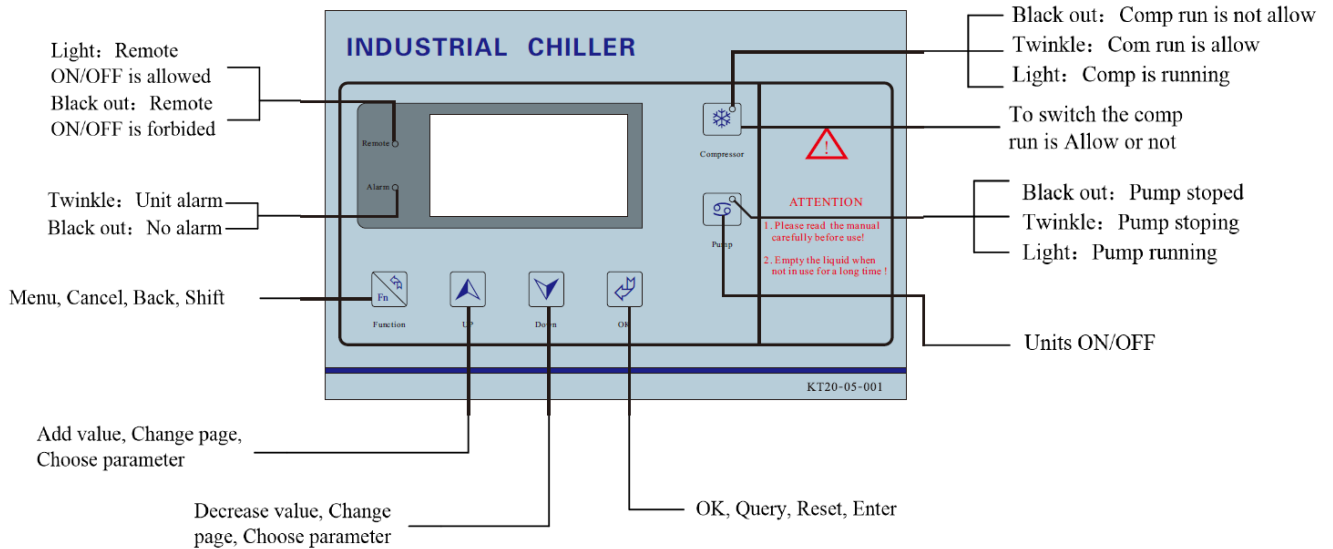
4.2 Common Screens

Commonly used screens include the main screen and the alarm screen.

Main Screen
The system will enter the main screen after countdown, which displays as follows:
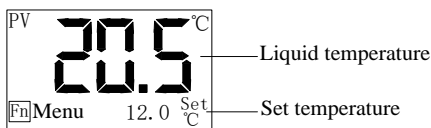
Alarm Screen
In case of unit failure, the alarm screen is as follows:
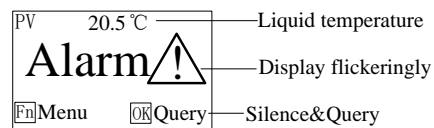
4.3 Common Operation

Quick Modification of Setting Temperature

If the user parameter [Locked T.set] is set to "No", the setting temperature can be modified directly in the main screen, with operation details as follows:
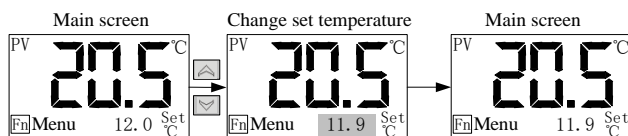
Note: the setting temperature can also be modified in the user parameters.

Query/Reset Fault

In case of fault, the alarm screen will automatically pop up. The operation details of query and reset faults are as follows:
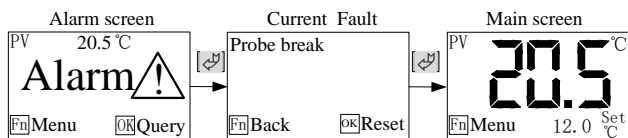
Cut over the Chinese-English quickly

Press at the same time ⟨⟩ + ⟨⟩ 3 seconds in the main screen cut over the Chinese-English quickly behind .

Note: The language establishes can also be modified in the user parameters.

4.4 Function Menu

Press the button ⟨Fn⟩ on the main screen to enter the Function Menu, which includes five items as the table below:

| No.	Menu Item	Funtion	Remark
1	User Settings	To display user parameters	For number of user parameters and their implications, please refer to: 9 User Parameters Table.
2	Unit Status	To display the current operating status of the unit	Current value is not displayed when current module is not used.
3	History List	Allowing the query of the last 10 faults	Press ⟨⟩ for 2s to clear the fault history.
4	Comp Run Time	To display the cumulative operation time of the compressor	
5	Version	To check the current software version	

4.5 Parameter Operation

For the modification operation of parameter value, the user's modification of setting temperature will be described as an example.
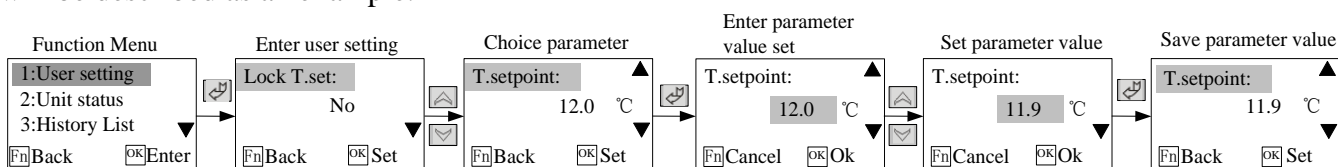
4.6 User Parameters Table

The implication of each parameter in the user parameters is listed in the following table:

No.	Parameter Name	Factory Default	Setting Range	Remark
1	Locked T.set	No	Yes ~ No	Yes: the set temperature can not be modified on the main screen when locked. No: the set temperature can be modified on the main screen.
2	T.setpoint	12.0°C	[setting lower temperature limit] ~[setting upper temperature limit]	Setting range is limited by the manufacturer parameters [setting upper temperature limit], [setting lower temperature limit]. (When the [Temp unit] is set "Fahrenheit", the parameter is not displayed.)
3	T.setpoint	53.6 °F	[setting lower temperature limit] ~[setting upper temperature limit]	Setting range is limited by the manufacturer parameters [setting upper temperature limit], [setting lower temperature limit]. (When the [Temp unit] is set "Celsius", the parameter is not displayed.)
4	Temp unit	Celsius	Celsius；Fahrenheit	
5	Contrast	32	20~44	Adjust the LCD contrast
6	On/Off type	Local	Local / Local + Remote / Remote	Local: the unit can only start and stop locally. Local + Remote: the start and stop of the unit can be controlled both locally and remotely. Remote: the unit can only start and stop remotely.
7	Backlight On	0	0~255 minute(s)	0: backlight is not turned off.
8	Language	Chinese	Chinese~English	Select the display language.
9	Comp Select	Two Comp	1#Comp/2#Comp/Two Comp	Select the Comp to run.if select one comp the other does not work.The parameter is not listed for the single comp machine.

4.7 Manufacturer Menu

Press ⬜ + ⬜ in the main screen to enter the Enter Password screen and enter the correct manufacturer password (default 4561, which is recommended to change). Then enter the Manufacturer Function Menu, which includes five items.

Procedures of Entering Manufacturer Menu
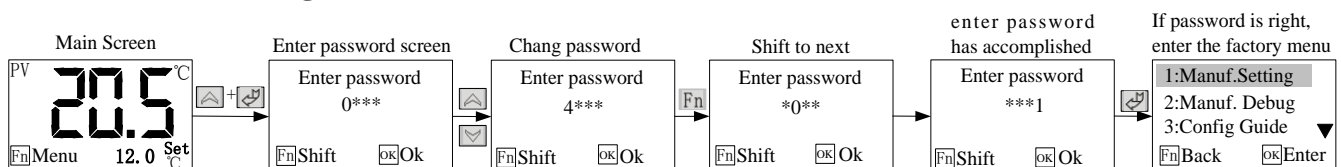
Details of Manufacturer Menu

The details and function of manufacturer menu are shown in the following table:

No.	Parameter Item	Function	Remark s
1	Manuf.setting	To set the parameters commonly used by the manufacturer	Refer to 13 Manufacture Parameters for specific parameters.
2	Manuf.Debug	To debug the abnormal operation of each electrical part of the unit	Not available during the unit operation.
3	Config Wizard	Commonly used parameters of config the unit	Not available during the unit operation. The screen will pop up when powered on for the first time.
4	Initialize	For initialize all parameters of the machine.	Refer to 10.5 Manufacture Parameters for the initial values of the parameters.
5	Password Set	To set the password to enter manufacturer menu.	The default value is 4561, which is recommended to change.

Note: Press △ + ▽ in the manufacturer menu for 2 seconds can reset the accumulative operation time of the compressor.

Manufacturer Debugging

Manufacturer debugging is mainly used to test whether the operation of each electrical part of the unit is normal, which is not available when the unit is under operation.

Method: to determine whether the unit is normal by testing three-phase power input, seven alarm inputs (10 alarm inputs for two compressors) and 5 relay outputs. For alarm input, it only displays the test result. If the result is normal the wiring is good and parameter settings are correct; if it alarms, with flashing display of alarm characters, then make sure whether the external wiring is good and the parameter settings are consistent.
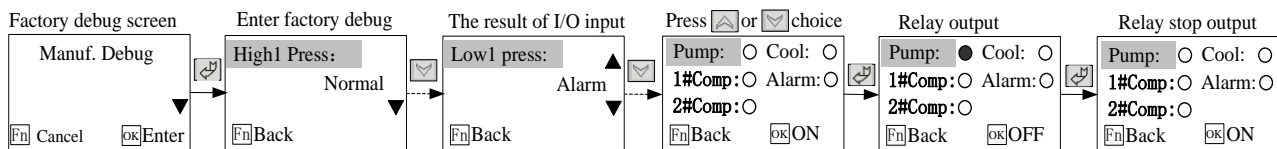
Configuration Wizard

Configure the common parameters of the machine. For the number of parameters of configuration wizard and the significance, please refer to 13 Manufacturer Parameters Table. Access is not available during the unit operation.

Refer to the Parameter Operation for specific configuration method. The Configuration Wizard screen will pop up when powered on for the first time. And if you click "Cancel" operation without configuring at this point, the Configuration Wizard screen will still pop up when powered on next time. Once you have entered the Configuration Wizard, the Configuration Wizard screen will not pop up when powered on and you can only enter the Configuration Wizard through the Manufacturer Menu.

↵

One-Key start:
　　　　Forbid
Fn Back　　OK Set ▼

the number of parameters of configuration wizard and the significance, please refer to 13 Manufacturer Parameters Table

Config Guide

Config Guide

Fn Cancel　　OK Enter

Enter：the screen will not pop up when powered on next time

Fn

Cancel：the screen will still pop up when powered on next time

PV　　　　　　　　℃
20.5
Fn Menu　　12.0 Set ℃
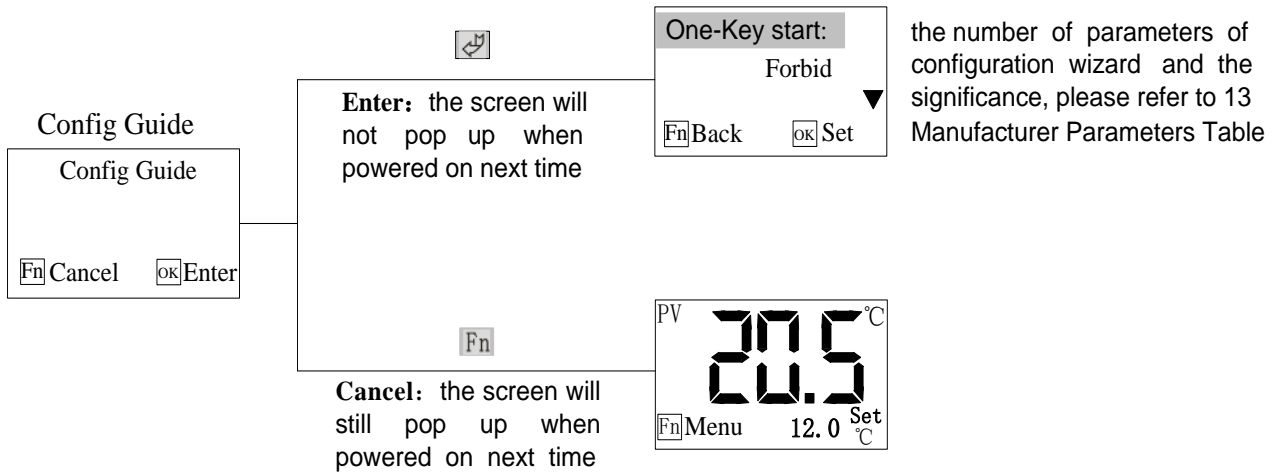
4.8 Fault List

Fault	Description	Test Conditions	Troubleshooting	Solution
1#Comp.P high	High pressure of compressor1	Test when the compressor button has pressed	Stop compressor1 only without affect other equipments to work. [Note1]	Check if the input is consistent with the switch setting.
1#Comp.P low	Low pressure of compressor1	If the [LP check delay] is 0, test when the compressor button has pressed; If the [LP check delay] is not 0, then compressor1 runs the test.		
1#Comp overload	The compressor1 overload	Compressor1 runs the test.		Check if the input is consistent with the switch setting.
1#Comp.I high	The current of compressor1 is too high			Check if the rated current of compressor1 is input is reasonable.
1#Comp.I low	The current of compressor1 is too low			Check if the measure tool of the compressor1 current is connect.
1#T.Vent high	The vent temperature of compressor1 is too high			Check if the input is consistent with the switch setting.
2#Comp.P high	High pressure of compressor2	Test when the compressor button has pressed	Stop compressor2 only without affect other equipments to work. [Note2]	Check if the input is consistent with the switch setting.
2#Comp.P low	Low pressure of compressor2	If the [LP check delay] is 0, test when the		

		compressor button has pressed; If the [LP check delay] is not 0, then compressor2 runs the test.		
2#Comp overload	The compressor2 overload	Compressor2 runs the test.		Check if the input is consistent with the switch setting.
2#Comp.I high	The current of compressor2 is too high			Check if the rated current of compressor2 is input is reasonable.
2#Comp.I low	The current of compressor2 is too low			Check if the measure tool of the compressor2 current is connect.
2#T.Vent high	The vent temperature of compressor2 is too high			Check if the input is consistent with the switch setting.
Temp.low AL	The liquid temperature is too low	Test after cold pump starts	Stop the compressor and delay to stop the cool pump, and do not stop the cold pump.	Check if the Liquid temperature is lower than the set temperature of Liquid protection.
T.high warn	The liquid temperature is higher than the warn value.		Alarm only without affect other equipments to work.	Check if the Liquid temperature is higher than the set temperature of Liquid warn.
Temp.high AL	The liquid temperature is too high		If the [Temp.high AL] is set "Pump keep",Stop the compressor and delay to stop the cool pump, and do not stop the cold pump; If the [Temp.high AL] is set "Pump stop", Stop the unit in case of fault.	Check if the Liquid temperature is higher than the set temperature of Liquid protection.
Anti-freez.AL	Antifreeze alarm	Power on to test	Stop all the compressor and cool pump, and do not stop the cold pump.	Check if the antifreeze input is consistent with the switch setting.
Probe break	The liquid temperature sensor is break			Check if the temperature probe is in proper contact.
Probe short	The liquid			

	temperature sensor is short			
cool fan overload [Note3]	The cool pump or fan overload	Test after Cool pump starts	Stop compressor1 and cool pump or fan only	Check if the fan1 overload input is consistent with the switch setting.
Cool.I high	The current of cool pump or Fan is too high			Check if the rated current of cool is input is reasonable.
Cool.I low	The current of cool pump or Fan is too low			Check if the measure tool of the cool current is connect.
Cool W.flow AL	Lack of cool water flow	Test after the cool pump starts for [Cool on delay] time	Stop compressor1 and cool pump or fan only	Check if the cool water flow input is consistent with the switch setting.
Cold W.flow AL	Lack of cold water flow	Test after the cold pump starts for [Pump on delay] time	If the [Lack of liquid] is set "Pump keep", Stop compressor and cool pump in case of fault. If the [Lack of liquid] is set "Pump stop", Stop the unit in case of fault.	Check if the cold water flow input is consistent with the switch setting.
cold pump overload [Note3]	The cold pump overload	Test after cold pump starts	Stop the unit	Check if the cold pump overload input is consistent with the switch setting.
Pump.I high	The current of cold pump is too high			Check if the rated current of cold is input is reasonable.
Pump.I low	The current of cold pump is too low			Check if the measure tool of the cold current is connect.
Phase AL	The three-phase power input is alarm	Power on to test	Stop the unit	Check if there is default phase or anti-phase in the three-phase power input and if the switch is correct.
Water level AL	The water level is low	Power on to test	If the [Low liquid lv] is set "Pump keep", Stop compressor and cool pump in case of fault. If the [Low liquid lv] is set "Pump stop", Stop the unit in case of fault.	Check if the water level input is consistent with the switch setting.
Need Maintain	The total time of	Test after cold	The unit cannot start once stops (the	

	compressor run over the allow value	pump starts	accumulative operation time of compressor exceeds the set value).

[Note 1]: In case of "1#Comp.P low " fault, if [LP stop pump] is not zero, the troubleshooting program is: to immediately stop all compressors and cool pump, delay the [LP stop pump] and stop the cold pump. If [LP stop pump] is zero, then the troubleshooting program is: to only stop compressor1 without affect other equipments to work.

[Note 2]: In case of "2#Comp.P low " fault, if [LP stop pump] is not zero, the troubleshooting program is: to immediately stop all compressors and cool pump, delay the [LP stop pump] and stop the cold pump. If [LP stop pump] is zero, then the troubleshooting program is: to only stop compressor2 without affect other equipments to work.

[Note3]:

Machine type	Cold Pump Overld	Cold Pump Overld
fan-cooled water chiller	Cold Pump Overld	Cool Fan Overld
water-cooled water chiller	Cold Pump Overld	Cool Pump Overld
fan-cooled fan cooler	Cold Fan Overld	Cool Fan Overld
water-cooled fan cooler	Cold Fan Overld	Cool Pump Overld

4.9 Manufacturer Parameters Table

Parameters set by the manufacturer and parameter meanings are listed as follows: ("*" is for parameters of the configuration wizard)

Setting Item	Name of Parameter	Factory Default	Setting Range	Remark
Control Settings	*One-Key start	Forbid	Forbid ~ Use	Forbid: the compressor is allowed to ON only when press the compressor button; Used: the compressor allows ON when press the pump button.
	Auto start up	Forbid	Forbid ~ Use	Use: the unit starts automatically when powered on; Forbid: the unit doesn't start automatically when powered on; When the user parameter [On/Off type] is set to be"Remote", the electrical autostart is invalid.
	Alarm output	Keep when mute	Keep when mute; Stop when mute	Keep when mute: press the "alarm output" parameter to take action once a fault occurs; Stop when mute: press the "alarm output" parameter to take action in case of no fault after silencing.
	Alarm type	N.O	N.O~N.C	N.O: the alarm relay is ON in case of faults; N.C: the alarm relay is OFF in case of faults.
	DI5	Water switch	Water switch;	Water switch: DI5 input for water level

	fuction		Vent1 temp	detection Vent1 temp: DI5 input for Vent1 temperature detection
	DI9 fuction	Phase swtich	Phase swtich; Vent2 temp; Cool W.flow	Phase swtich: DI9 input for phase sequence detection Vent2 temp: DI9 input for Vent2 temperature detection Cool W.flow: DI9 input for cool water flow detection
	*Low water lv.	Pump stop	Pump stop ~ Pump keep	Pump stop: stop the cold pump in case of low water level fault; Pump keep: do not stop the cold pump in case of low water level fault.
	*Lack of water	Pump stop	Pump stop ~ Pump keep	Pump stop: stop the cold pump in case of cold water flow fault; Pump keep: do not stop the cold pump in case of cold water flow fault.
	*Current detect	Use	Forbid ~ Use	Use: there is a current detection module; Forbid: no current detection module
	*1#Comp.I rating	0.3A	0~35.0A	0A: do not detect the current fault. When [Current detect] is set "Forbid", those parameter is not displayed. (if the rating current of Comp or Pump is lower 1A, when using please winding two or three laps on the sensor)
	*2#Comp.I rating	0.3A	0~35.0A	
	*Pump. I rating	0.3A	0~25.0A	
	*Cool. I rating	0.3A	0~25.0A	
	*Phase monitor	On_board	On_board; Forbid; IO_input	Onboard: use the controller's own three-phase power protection; Switch input: use an external three-phase power protection. (The external three-phase power protection can only be ued when [DI9 fuction] is set " Phase swtich" .) Forbid: do not use three-phase power detection function.
	DI1 input opt	Cool overload	Cool overload; Anti-freezing	Selection of switch DI1 input function
	*Comp number	2	1~2	Selection of the number of compressor
	*Machine type	AIR-WATER	4 machine models in total	Four models: fan-cooled water chiller, water-cooled water chiller, fan-cooled fan cooler and water-cooled fan cooler
	*Lang switch	Use	Forbid ~ Use	Use: Allows users to switch between English and Chinese. Forbid: Forbid users to switch between English and Chinese.
	Temp.high AL	Pump keep	Pump stop ~ Pump keep	Pump stop: stop the cold pump in case of Temp.high fault;

				Pump keep: do not stop the cold pump in case of Temp.high fault.
Temperature Settings	Load offset	1.0°C	0~10.0°C	Temperature deviation of load the compressor
	Load offset	1.8°F	0~18.0°F	Fahrenheit °F
	Unload offset	1.0°C	0~10.0°C	Temperature deviation of unload the compressor
	Unload offset	1.8°F	0~18.0°F	Fahrenheit °F
	T.setpoint max	30.0°C	-38.0~99.9°C	To limit the temperature of user set.
	T.setpoint max	86.0°F	-36.4~211.8°F	
	T.setpoint min	5.0°C	-38.0~99.9°C	
	T.setpoint min	41.0°F	-36.4~211.8°F	Fahrenheit °F
	T.bias	0.0°C	-9.9~9.9°C	Compensation for the liquid temperature
	T.bias	0.0°F	-17.8~17.8	Fahrenheit °F
	T.low protect	4.0°C	-40.0~99.9°C	Fault of "Temp.low AL" warning is reported when the liquid temperature is lower than the set value.
	T.low protect	39.2°F	-40.0~211.8°F	Fahrenheit °F
	T.high warn	50.0°C	0~99.9°C	Fault of "Temp.high warn" warning is reported when the liquid temperature is higher than the set value.
	T.high warn	122.0°F	32.0~211.8°F	Fahrenheit °F
	T.high alarm	60.0°C	0~99.9°C	Fault of "Temp.high AL" warning is reported when the liquid temperature is higher than the set value. And Stop the compressor and delay to stop the cool pump.
	T.high alarm	140.0°F	32.0~211.8°F	Fahrenheit °F
	T.high reset	5.0°C	0~99.9°C	If liquid temperature<[T.high alarm]–[T.high reset], manual reset of "Temp.high AL" fault is allowed; If liquid temperature<[T.high warn]–[T.high rese], the "Temp.high warn" fault is automatically reset;
	T.high reset	9.0°F	0~179.8°F	Fahrenheit °F
Time Settings	Pump on delay	10 S	1~255 S	Delay after cold pump startup.
	Cool on delay	10 S	1~255 S	Delay after cool pump startup.

Capacity ctrl.	5 S	0~255 S	Control the compressor ON/OFF every [Capacity ctrl.] interval time; For double-compressor control, if the conditions of two compressors ON are satisfied, then one of the compressors ON and the other after the time of [Capacity ctrl.].
Comp protect	60 S	0~255 S	To avoid frequent ON/OFF the compressor, the interval between the start of two compressors must be greater than the set value.
Input stable	2 S	0~255 S	The time General fault stable.
W.flow stab.	5 S	0~255 S	It is considered to be valid only when the water flow alarm continue for the time.
LP detect dly	60 S	0~255 S	Compressor low-pressure fault input is allowed only when the compressor has run for the set time.
LP stable	5 S	0~255 S	Low-pressure fault stable time
LP stop pump	0 S	0~300 S	0: the parameter has no effect . Non-0: in case of low pressure fault of the compressor, immediately stop all compressors and cool pump, delay the [LP stop pump] and stop the cold pump.
Comp operation	0 H	0~9999 H	0: this parameter has no effect. Non-0: the compressor cannot start when the accumulative operation time is greater than the set value.
Comp shift	0 Min	0~255 H	0: the parameter has no effect ; Non-0: a compressor will automatically switch to another after it has run continuously for that time.
1#Comp.I avoid	2 S	1~255 S	The current fault of 1#compressor can only be detected after 1# compressor has started for the set time. (When the [Current detect] is set "forbid", the parameter is not displayed.)
2#Comp.I avoid	2 S	1~255 S	The current fault of 2#compressor can only be detected after 2# compressor has started for the set time. (When the [Current detect] is set "forbid", the parameter is not displayed.)
Pump. I avoid	2 S	1~255 S	The current fault of cold pump can only be detected after it has started for the set time. (When the [Current detect] is set "forbid", the parameter is not displayed.)
Cool. I avoid	2 S	1~255 S	The current fault of cool pump can only be detected after it has started for the set time. (When the [Current detect] is set "forbid", the parameter is not displayed.)

	*Freez overload	N.O	N.O ~ N.C	Selection of switch input mode N.O: switch off with no fault; N.C: the switch is closed with no fault.
	*Cold W.flow	N.C	N.O ~ N.C	
	*W.level switch	N.C	N.O ~ N.C	When [DI5 fuction] is " Vent1 temp", it is the place for N.O and N.C settings of vent1 temperature detection.
	*Comp overload	N.O	N.O ~ N.C	Selection of switch input mode N.O: switch off with no fault; N.C: the switch is closed with no fault.
Switch Settings	*Low pressure	N.C	N.O ~ N.C	
	*High pressure	N.O	N.O ~ N.C	
	*Phase error	N.O	N.O ~ N.C	When [DI9 fuction] is " Cool W.flow", it is the place for N.O and N.C settings of cool water flow switch. When [DI9 fuction] is "Vent1 temperature", it is the place for N.O and N.C settings of vent1 temperature detection.
	*Cool overload	N.C	N.O ~ N.C	When [DI1 input opt] is " Anti-freezing", it is the place for N.O and N.C settings of antifreezing switch.

[Note]: remote switch, if the remote control is used, the unit will start up when remote switch input is closed and stop when remote switch input is disconnected.

Control

Double compressor but select only one / Single compressor:

The heating process, the compressor ON when PV ≥SV + ADD.

The cooling process, the compressor OFF when PV < SV – SUB

Double compressors:

a) If [Unload offset] is not 0

The heating process, one compressor ON when PV> SV and two compressors ON when PV≥ SV + ADD.

The cooling process, if two compressors ON currently, one compressor OFF when PV < SV and two compressors OFF when PV < SV - SUB.If compressor ON currently, the compressor OFF when PV <SV-SUB.

b) If [Unload offset] is 0

The heating process, one compressor ON when PV> = SV + ADD; after the time of [Capacity ctrl], if PV≥ SV + ADD remains, two compressors ON.

The cooling process, the compressor OFF when PV <SV.

Note: PV: The liquid temperature   SV: set temperature

ADD: load temperature diefference   SUB: unload temperature difference

4.10 Intelligent digital display motor protector operation manual

★**Function introduction:**
·**Current display:** Under normal working status (or standby), the three-phase current value is displayed cyclically, and the switching interval is 3 seconds. When a current fault occurs, the three-phase current value at the moment of triggering the protection is locked, which is convenient for finding the cause of the fault.
·**Overload protection:** When it detects that any phase current exceeds the set overload current, the protection is triggered and theprotector cuts off the load (with a delay, which can be set).
·**Phase loss protection:** When one or two phases of the ABC three-phase current are detected to be lost, the protection is triggeredand the protector disconnects the load.
·**Unbalance protection:** [formula: (maximum value-minimum value) ÷ maximum value × 100%]
Example: A phase 20A, B phase 25A, C phase 22A, unbalance value = $(25-20) \div 25 \times 100\% = 20\%$.
When the detection value exceeds the set value, the protection is triggered and the load is disconnected. (Note: If you select 00 to turn off the unbalance protection, if the unbalance value exceeds 80%, the phase loss protection will be triggered.)
·**Wrong phase (phase sequence) protection:** When the protector detects a phase error, or the 380V voltage phase sequence signal (refers to the 3 signal wires connected to the protector) is cut off, the protector will disconnect the load.
·**Delay description:** every time the protector is re-powered, the load side will delay output (parameter F).
·**Alarm description:** When the protector is protected, the alarm terminal is closed.

★**Operation process description:**
①**Unlock:** Press and hold the "Set/Unlock" button for 3 seconds, the " 🔒 " light will be on, and it will enter the parameter setting state at this time.
②**Parameter setting:** continue to press the "set/unlock" button to switch between the various parameters, and press the "≋" and "≋" keys to adjust the value of the parameter. Example: The screen displays "F00", where "F" is the parameter code, and "00" is the value corresponding to the parameter. The following is the parameter code comparison table:

Parameter code	parameter name	range	Factory setting
"Set current" lights up	Overload protection current value setting	2A〜90A (Overload current setting value is generally set to be 1.3〜1.5 times greater than the maximum phase display current, subject to actual demand)	30.0A
F	Power-on delay time setting	0〜9.9 minute(0.1 minutes=6 second)	0.0 minute
H	Unbalance protection	00 〜 40% (When 00 is selected, the unbalance protection function is turned off)	30%

C	Skip starting current setting	1~29 seconds	5 seconds
d	Overload protection delay setting	1~29 seconds	3 seconds
p	Automatic reset times	1~99 times (0 means turn off the automatic reset function)	3 times
L	Automatic reset interval time	1~99 seconds	3 minutes

③**Save parameters:** After setting the parameters, keep for 12 seconds without any operation, and the display screen returns to the standby interface, then the parameters are successfully saved and locked. Or continue to press the "Unlock/Set" key to switch to the standby interface, at this time, exit setting parameters and save the parameters.

④**Query parameters:** Click the "Unlock/Set" button to view each parameter in turn.

★**How to recover from the protection state:**
①**Manual reset:** After the protector is protected, click the "reset" button, and the protection state will be released. If the current still meets the protection trigger conditions, the protector will be protected again.

②**Automatic reset:** After the protector is protected, the protector will automatically reset every L minutes. If the current still meets the protection trigger condition after P times of automatic resets, it will not automatically reset. (P and L parameters are adjustable, see the parameter table for details)

★**Notes:**
1. The three phase wires of the protected motor must pass through the three holes of the current transformer respectively.
2. Please arrange the load configuration of any phase of the three-phase current reasonably and scientifically to avoid excessive single-phase load.
3. After the protector has a fault display, the fault must be eliminated before it can be put into operation again, otherwise you will be responsible for the consequences.
4. Before the protector is used,

5. Repair and maintenance

5.1 Common faults and solutions

Phenomenon	Cause	Elimination
No indication for the whole device	The breaker of the device is turned off	Open the breaker
Phase reverse	The phase sequence of the power supply is incorrect	Shift the positions of any two of the connection wires of the power supply
Water pump overloaded	The water pump is blocked， the power supply is incorrectly connected that regarding the null line as the Phase line，the pressure is abnormal，and the motor of the water pump is burnt.	Inspect the water pump and the power supply.
Compressor overloaded	The high pressure is over high， the motor is heated abnormity caused by the bad contact ion of the compress，or the electric coil of the compressor is broken.	Clean the cooling fin， inspect the cold media pipeline，inspect the power wire of the compressor and the electric coil of the compressor.
High pressure excess	The cooling fin is blocked by dusts and it leads to heat dissipation badness，or the environmental temperature is over high.	Clean the cooling fan， put the device in a ventilated place or keep away from the heat source.
Low pressure shortage	The pipeline is leaking，the cold media is not sufficient， or the drying filter is blocked.	Figure out the leakage points，make welding again and recharge the cold media moderately， or replace the drying filter.
Low water temperature	Water temperature is below 5°C.	To ensure the device can work normally，please ensure the water temperature is above 5°C
without water flow	The device doesn't connect with the water pump， or the water pump is lack of water.	Inspect the source of the water pump and the water pump.
Fan overloaded	The heat release fan is blocked， the motor is damaged， or the power supply is breakdown.	Inspect the heat release fan and the power supply
Water leakage of the pump	The water seal is broken	Replace the water seal

5.2 Cautions for maintence

1.When the device's work and the temperature is very high，please don't process servicing to avoid the danger of scald. If necessary，please shutdown the electric heater until the machine is cooling， then can do it.

2.All the repairs and maintenance s must be made with the main power supply off. Lock the disconnected switches if necessary.

3.All the repair and maintenance must be made by assigned qualified person. The repair and maintenance personnel must know clearly the performances and parameters of the machine.

4.Careful inspections shall be made after the repair or maintenance. The device can only be handed to the operators after all are confirmed to be in order. Records shall be kept.

5.3 Maintences

1.Condenser shall be cleaned under the following circumstances：The chiller has been operated for over half years； he circulating water is in order while warnings are often made on high pressure，the refrigeration capacity is lowered Or the high pressure indication is over 20Kg/cm 2 under operations.

2.Keep the cleanliness of the water tower and the air ventilation surrounding the water tower to avoid the irrelevant materials to enter the water tower to reduce the heat dissipation efficiency.

3.To reduce the dew accumulation of the molds，before stopping the injection er，first turn off the refrigeration water and the chiller； stop the injection er after the temperature of the mold is heated up so that the mold will not be damaged by corrosion.

4.The blades of the water pump of the chiller can be blocked by water fouling after the suspension for along period. Please rotate the water pump before starting to ensure that the water pump is in order.

5.If the chiller will be suspended for along time，especially in winter，the residual water in the water tank and condenser shall be discharged to prevent the condenser from being frost broken or blocked.

6.Cleaning shall be made on the cooling fin and evaporator of the chiller when the Air cooled chiller has been operated for 3 to 6 months with methods as follows：Cleanup the dusts and irrelevant materials in the cooling fin with compressed air；the cleaning methods of the evaporator can be referred to water cooled chiller.

7.Method of cleaning for water cooled chiller Cleaning shall be made on the condenser and evaporator of the chiller when the chiller has been operated for 3 to 6 months with methods as follows：The first cleaning shall be implemented d with 25 minutes from feeding the soaking liquid to finishing the rinsing. As instructed in the figure，hose and hopper at the"cooling water outlet"of the chiller；feed the soaking liquid (with the main ingredient of hydrochloric acid) from the hopper；collect the soaking liquid coming from the "cooling water inlet" with rubber basin. Wait or 1-2 minutes after feeding in about two liters of soaking liquid， then pour the soaking liquid running into the rubber basin again into the hopper. Collect with another rubber basin. Repeat for 4 to 5 times and then feed clean water in the hopper to rinse the soaking liquid in the condenser and connect discharge the sewage.
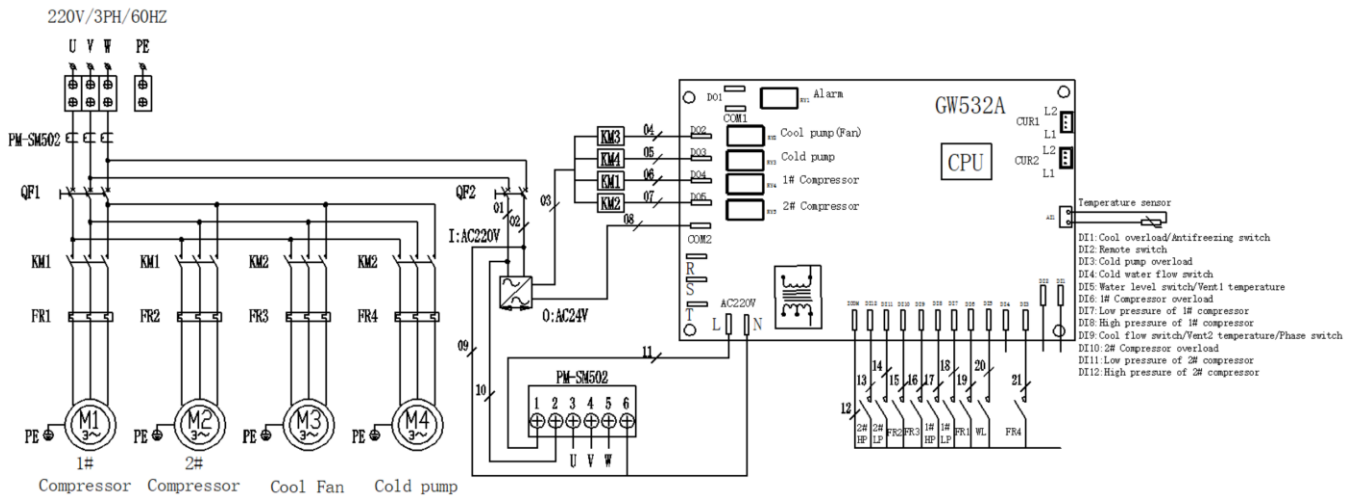
5.4 Electrical schematics

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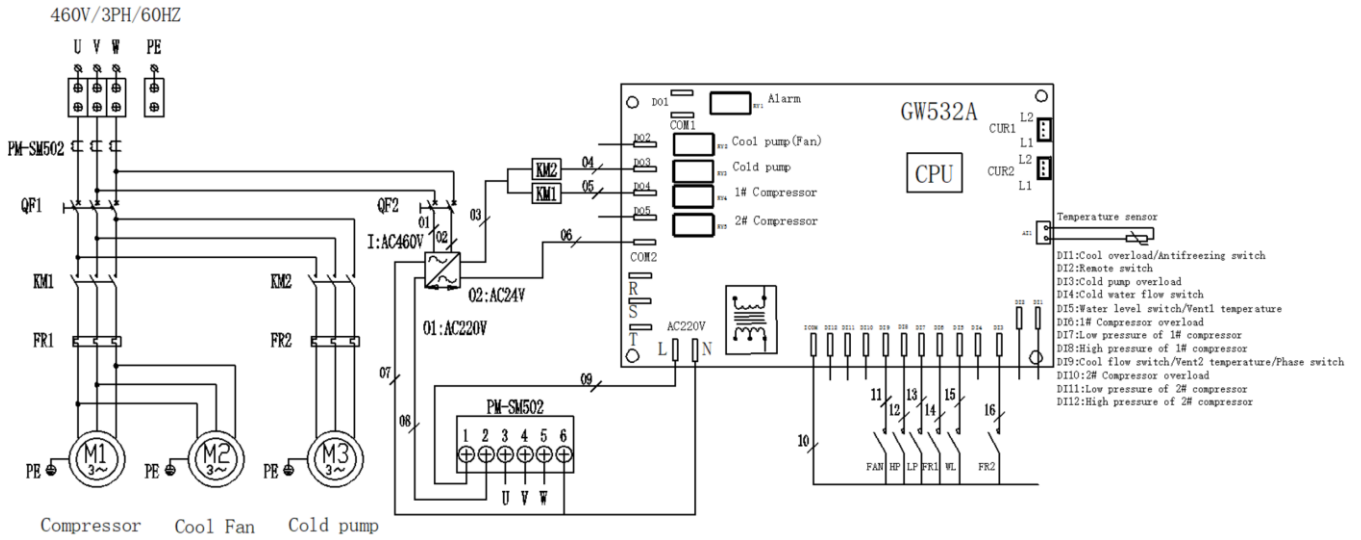
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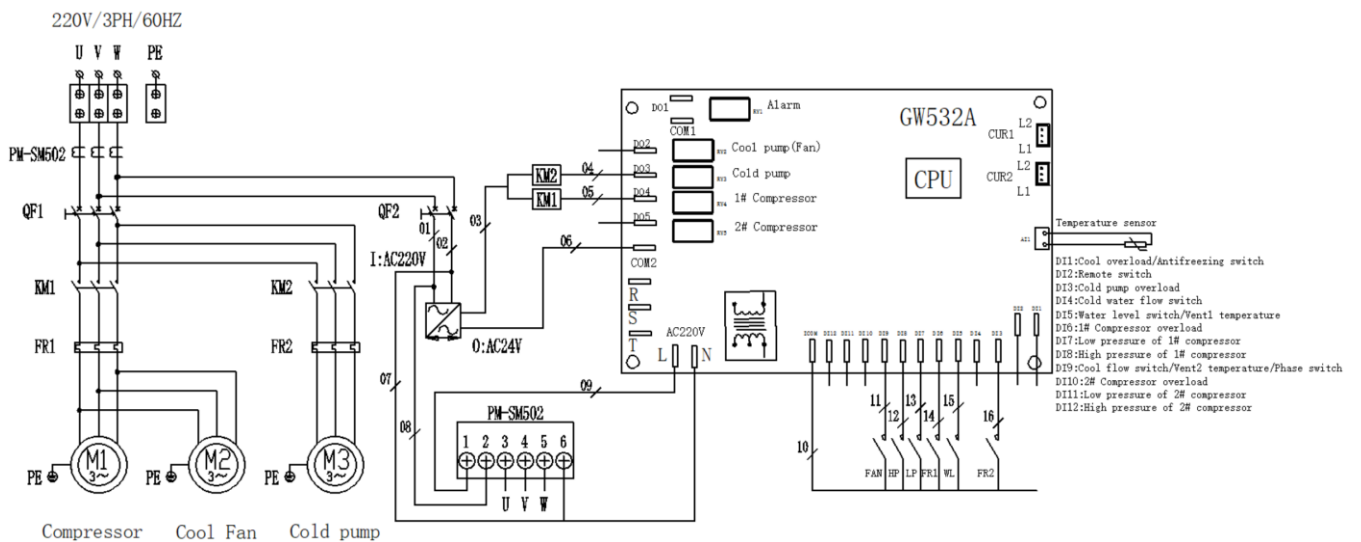
ALW-LSQF10B2

ALW-LSQF10B1、ALW-LSQF15B1