STC-W Cooling/Heating

Temperature Controllers (water-cooled)

Date: Nov. 2022

Version: Ver.A (English)

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1. General Description

Read this manual carefully before operation to prevent damage of the machine or personal injuries.

Shini Cooling/Heating Temperature Controllers STMC-W consist of the mould temperature controller and water chiller functions, which can heat up the moulds and cool down the products simultaneously.

a.Water Chiller section:

The refrigeration system adopts the single-stage vapor compression circuit, and has the compressor overload protection, pump overload protection, reverse phase warning, anti-freezing protection, and high/low pressure protector that ensure stable machine performance and long service life. It is applicable to the cooling occasions in the modern industry that is not subject to the impact of environment temperature, which is an indispensable configuration device. The Bangpu temperature controller can ensure stable temperature control within the control

accuracy of ±1℃, and display accuracy of ±0.1℃。

b.Water Heater section:

Used to heat up the mould and maintain temperature, although they can be used in other similar applications. High temperature water from the mould is returned to the cooling tank and cooled by either indirect cooling (For high temperature models) or direct cooling (for standard models). It is then pressurised by the high - pressure pump, sent to the heating tank and finally to the mould with a constant temperature. The HANYOUNG temperature controller can maintain an accuracy of ±1℃.

All service work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both handling and servicing. Chapter 6, which contains service instructions intended for service engineers. Other chapters contain instructions for the daily operator.
Any modifications of the machine must be approved by SHINI in order to avoid personal injury and damage to machine. We shall not be liable for any damage caused by unauthorized change of the machine.
Our company provides excellent after-sales service. Should you have any problem during using the machine, please contact the company or the local vendor.
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1.1 Feature

Water Chiller

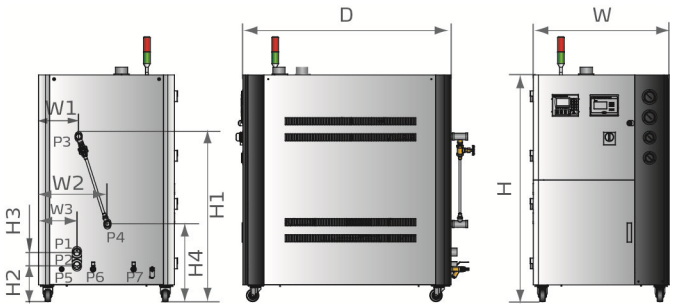
1) Cooling range 7～35℃.
2) Insulated water tank and evaporator made of stainless steel.
3) Equipped with anti-freeze therostate.
4) Adopt R22 refrigerant.
5) Refrigeration loop controlled by high and low pressure switches to ensure stable operation.
6) Compressor and pump overload protection.
7) Adopt Bangpu temperature controller with an accuracy of ±1℃
8) Adopt quality compressors from major supplier.
9) Adopt tube-in-shell condenser with excellent heat transfer and rapid cooling.
10) Equipped cooling water pipe pressure gauge.
11) Automatic water supply.

Water Heater

1) The water chiller is used for the cooling, within the temp.range of 10-120℃, and temp. control accuracy of ±1℃.
2) P.I.D multi-stage temperature control system can maintain mould temperature with accuracy of ±1℃.
3) Adopt high efficiency water cycle pump.
4) Multiple safety devices including power reverse phase protection, pump overload protection, overheat protection and low level protection that can automatically detect abnormal performance and indicate this via visible alarm.
5) Adopt stainless steel pipe, high pressure explosion-proof.
6) Possess water output high pressure, refilling low pressure and overheat protection.

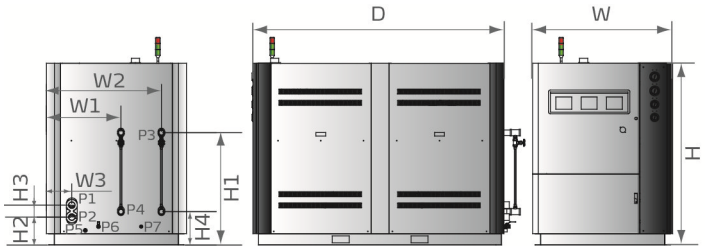
1.2 Specifications

1.2.1 Outline Drawings



STC-607-3W~2430-10W

STC-2430WF*2-15W



STC-3650WF*2-20W

Picture 1-1: Outline Drawings

Table 1-1: Specifications List

Item/parameter \ Mode STMC-			607-3W	910-5W	1220-8W	1430-10	2430×2 -15W	2430×2 -20W	2430×2 -30W
Refrig- erant[(1)]	kW		8.25	13.8	21.8	29.1	43	58.2	86
	Kcal/hr		7,095	11,868	18,748	25,026	36980	50052	73960
Heating capacity	kW		6	9	12	24	24×2	36×2	48×2
Compressor	Type		Scroll type						
	Output Power	kW	2.04	3.32	4.91	6.46	9.5	6.46×2	9.5×2
		HP	3	5	8	10	15	10×2	15×2
Refrig-	Filling amount(kg)		2	2.5	4.2	5.7	8.5	4.8×2	8.5×2

erant	Control mode	Thermostatic expansion valve						
	Type(2)	R22						
Evaporator	Type	Plate heat exchange				Shell-tube exchanger		
Chilled water in/out pipe(inch)		1	1	1-1/4	1-1/4	1-1/2	2	2
Condenser	Type	Shell-tube style						
	Flow(L/min)	56	65	90	100	160	220	330
	Pipe(inch)	1	1-1/2	1-1/2	2	2-1/2	2-1/2	3
Cooling water pump	Power	0.75	0.75	1.1	1.1	1.5	3	3
	Working pressure (kgf/cm^2)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Medium pump	Pump	0.55	0.75	1.1	2.2	2.2×2	3×2	5.5×2
	Pump flow(L/min)	33.3	66.7	133.3	166.7	166.7×2	250×2	333.3×2
	Working pressure (kgf/cm^2)	2~3	2~3	2~3	2~6	2~6	2~4.5	2~6
Protector	Compressor	Overload relay						
	Pump	Overload relay						
	Chilling water return circuit	High and low pressure switch/anti-freezing switch						
	Water return circuit	Water level switch(Option)/Bypass-valve						
W×D×H(mm)		805×1230×1340	805×1230×1340	845×1450×1425	845×1450×1425	1245×2235×1610	1245×2235×1610	1245×2235×1610
Unit conversion		1kW=860 kcal/hr 1RT=3,024 kcal/hr 10,000Btu/hr=2,520 kcal/hr						
Voltage specification		3Φ, 400VAC, 50Hz						
Dimension								
H(mm)		1340	1340	1425	1425	1610	1610	1610
H1(mm)		980	980	1040	1015	1045	995	995
H2(mm)		207	207	-	-	201	247	247
H3(mm)		80	80	130	130	106	106	106
H4(mm)		458	458	470	470	310	295	295
W(mm)		805	805	845	845	1245	1245	1245
W1(mm)		235	235	278	278	222	662	662
W2(mm)		407	407	450	450	502	1022	1022
W3(mm)		250	250	235	235	903	225	225
D(mm)		1230	1230	1450	1450	2235	2235	2235
P1(inch)		1	1½	1½	2	2½	2½	3
P2(inch)		1	1½	1½	2	2½	2½	3

P3(inch)	1	1	1¼	1¼	1½	2	2
P4(inch)	1	1	1¼	1¼	1½	2	2
P5(inch)	1/2	1/2	1/2	1/2	1/2	1/2	1/2
P6(inch)	1/2	1/2	1/2	1/2	1/2	1/2	1/2
P7(inch)	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Weight(kg)	280	300	350	380	800	1110	1280

Note: 1) Refrigeration capacity is measured based on the flow 0.172m^3/(h•kw) and the outlet temperature(7℃) of chilled water under the environment temperature of 30℃, and the flow of 0.215 m^3/(h•kw)

2) Environment-friendly R407C refrigerant is optional. (Add "R1" at model behind, such as STC-910-5W-R1)

We reserve the right to change specifications witchout prior notice

1.3 Pipeline connection

 Warning!

When the ambient temperature is below 5℃, the machine will stop. Please drainage the water in the water tank and evaporator, especially in the evaporator. If the ambient temperature is too low, the copper tube in evaporator will be frozen.

1.4 Safety Regulations

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

1.4.1 Safety Signs and Labels

 Danger!

The unit is designed to endure high temp, and high pressure. For safe operation, do not remove the covers or switches.

 Attention!

The unit should be operated by qualified personnel only.

During operation, avoid wearing gloves or clothes that may cause danger.

Turn off main switch when power supply is off.

Stop the unit when there may be power supply problems caused by static electricity.

Put on safety gloves and shoes during installation or relocation.

Components from our company can only be used for replacement.

 Warning!

Do not touch the switch with wet object or hands.

Do not use the machine before fully aware of its performance.

Be careful not to touch or hit the switch or sensor.

Please keep enough operation space, and keep away obstacles.

To avoid producing statics, clean the floor from oil or water to keep a dry environment.

Protect the machine against severe vibration or collision.

Do not remove safety signs or make it dirty.

Drunken, medicine-taking, or men without proper judgement should not operate the machine.

1.4.2 Signs and Labels

This is for indicating motor rotating direction.

1.4.3 Operation Notices

1) Before operation, check whether the cooling water and medium liquid is the clean water without impurities or drinking water meets the standard.
   ※ When the water quality is bad, it's easy to cause failures due to the scale and other reasons.
   ※If the water quality is not good, it will break the heating pipe, damage the pump impeller and reduce the flow rate, resulting in the temperature can not rise.
2) If the drainage is not smooth or the temperature control effect is poor, please clean the solenoid valve immediately or check whether there is blockage in the cooling water inlet and outlet.
3) The machine will generate high temperature when running, so don't touch the high temperature part when running.
4) During repair, the temperature must be cooled to below 30℃.
5) Cool down the temperature below 50℃ before machine shutdown, then it can shut down the pump; otherwise, it will affect the service life of the pump.
6) As to ensure the stability of heating temperature, and the pressure of cold water pump should be 2-5bar.
7) If the temperature is above 100℃, the cool water outlet must be connected with the high temperature resistant pipe.
8) If the temperature is below 100 ℃, it can set the value of pressure switch to 1.5～2bar; If the temperature is above 100 ℃, the recommended pressure value is 2.8bar.
9) If the first start or cold water pump stops running, the mould temperature

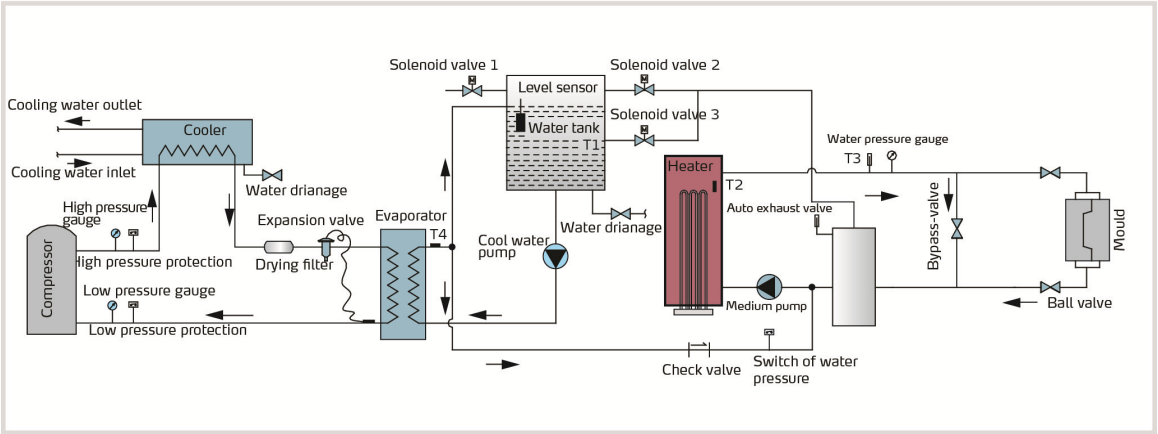
controller will sound low pressure alarm when start, which requires manual reset of the high and low pressure controller that can operate the machine unit.

2. Strutural Features and Working Principle

2.1 Functional Description

Shini Cooling/Heating Temperature Controllers STC-W is the temperature chamber that integrates the heating and cooling functions. The machine can offer a group of chilled water in temp. range of（7～35℃）and two groups of hot water temp. in range of（10～120℃）.

2.1.1 Working Principle

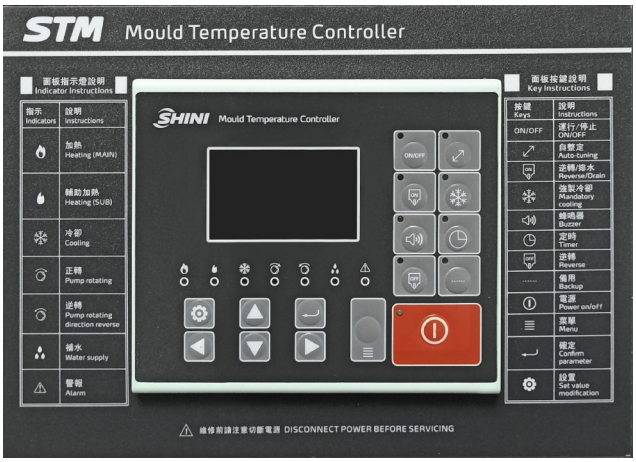


Picture 2-1: System Flow Chart

When the system needs to be heated up, solenoid valve 2 and 3 close and solenoid valve 3 opens, heaters quickly heat up the system to required temperature. Then P.I.D. controller maintains the water temperature by controlling solenoid valve 2. And when the system needs to be cooled, solenoid valve 2 and 3 opens, the temperature drops to the required temperature with the effects of chilled water in water tank. Quick heating and cooling can be achieved through solenoid valve controlling.

3. Parts Structure and Application

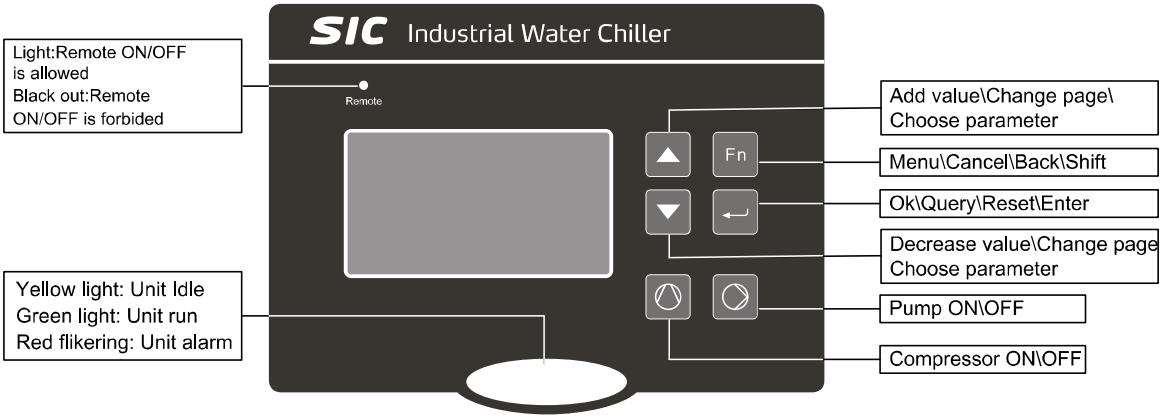
3.1 Operation Nameplate



Picture 3-1: STM Touch Panel

Picture 3-2: Water Chiller Touch Panel

3.2 Wather chiller panel diagram



Picture 3-3:Water Chiller Panel Diagram

3.2.1 Common Screens

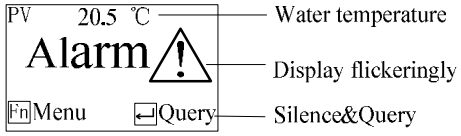
Commonly used screens include the main screen and the alarm screen.

1. Main Screen

The system will enter the main screen after countdown, which displays as follows:

2. Alarm Screen

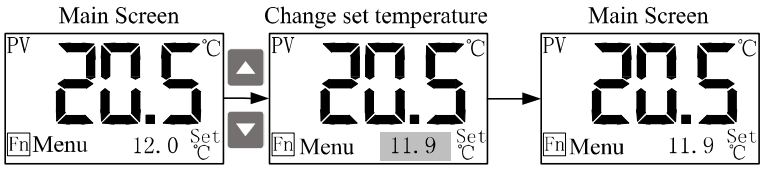
In case of unit failure, the alarm screen is as follows:



3.2.2 Quick Operation

1. Changing and Setting Temperature

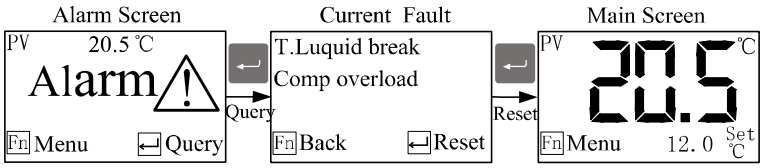
If the user parameter [Lock Temp.] is set to "No", the setting temperature can be modified directly in the main screen, with operation details as follows:



Note: the setting temperature can also be modified in the user parameters.

2. 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:



Attention: Pump rotating direction should be correct.

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

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

Attention: The compressor can't be started frequently because of its characteristics (Frequent start will shorten its service life.). If emergency shut-down happens, the compressor will run again 3 minutes later.

3.2.3 Startup

1) Open the main power switch.
2) Set the temperature of chilling water (if the temp. has already been set, omit this step). The minimum temperature of this series machine should be set as 7℃.
3) Press  button to start the water pump.
4) Press  button to start the compressor.

3.2.4 Shutdown

1) Turn off the switch of compressor.
2) Turn off the pump switch. If it adopts the quick molding cycle and low cooling water temperature, keep continuous running of water pump till the mould temperature rises to non-condensated temperature, then turn off the pump switch.
3) Switch the main power switch to OFF position.

Attention: When main power switch is at ON position, please be careful the electric shock!

Attention: As to reduce the machine damage and prolong its service life, please turn off the machine in correct orders.

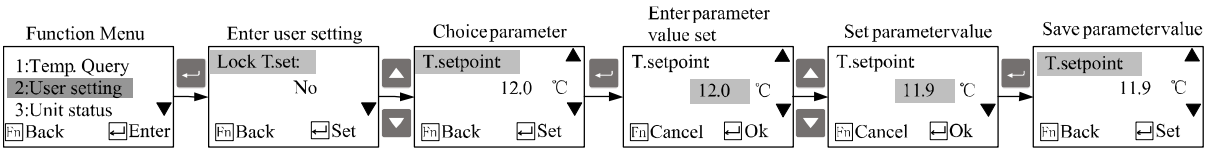
3.2.5 User Menu

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

No.	Menu Item	Funtion	Remark
1	User Setting	To set the user parameters	-
2	Unit Status	To display the current operating status of the unit	--
3	Fault Record	Allowing the query of the last 10 faults	Press ↵ for 2s to clear the fault history.
4	Machine Set	To set language, backlight, time and so on.	--
5	Temp Query	To query all the temperature value	It is not display these item If measure the water temperature only.

3.2.6 Parameter Operation

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



3.2.7 User Setting

All the parameters in user settings please refer to following table:

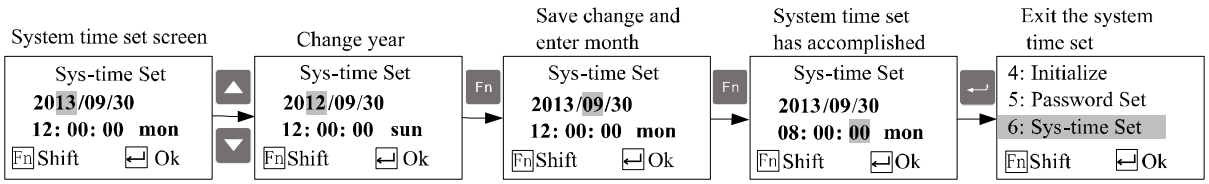
No.	Parameter Name	Factory Default	Setting Range	Remark
1	Lock Temp.	No	Yes ~ No	Yes: the [Set Temp.] can not be modified on the main screen when locked. No: the [Set Temp.] can be modified on the main screen.
2	Set Temp.	20.0℃	7.0~25℃	Setting range is limited by the manufacturer parameters [max. Temp.], [min. Temp.].
3	On/Off Mode	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.

3.2.8 Machine Set

The machine set includes six items as the table below:

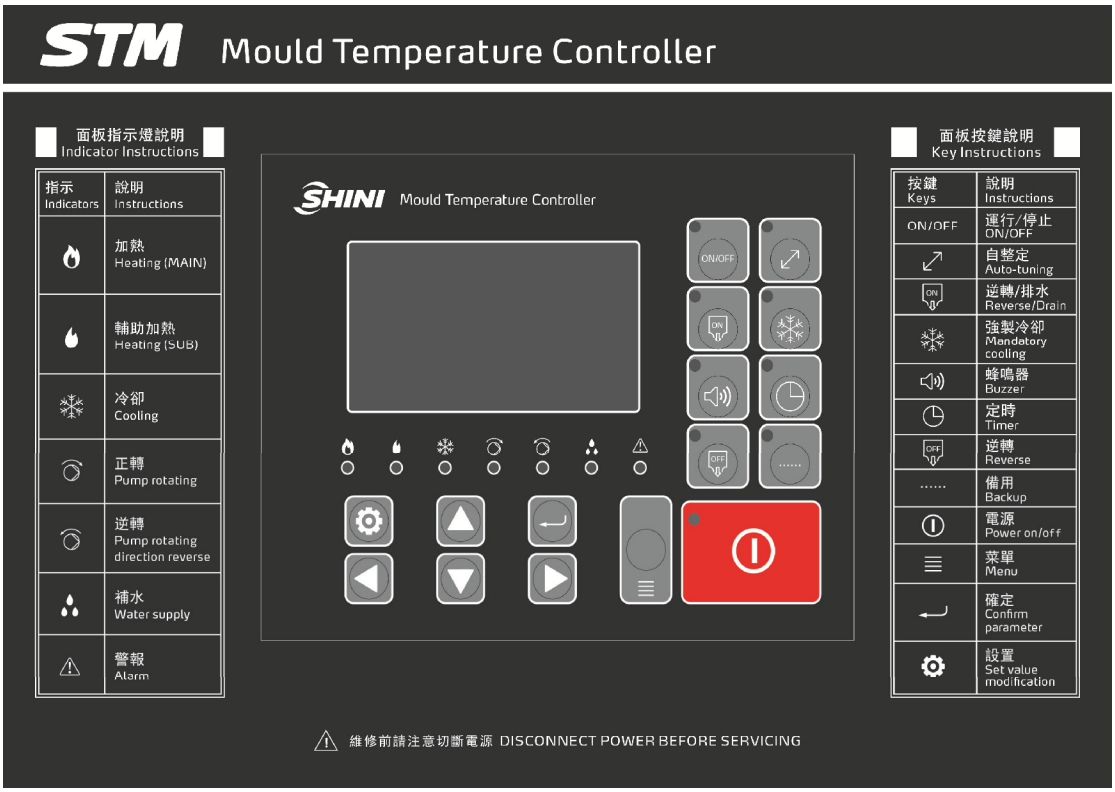
No.	Item	Function	Remark
1	Language	To set the display language.	Chinese and English
2	Backlight Time	Setting range：0~255min	0: backlight is not turned off.
3	Compr Use Time	To query the cumulative operation time of the compressor	-
4	Comm. Setting	To set baud rate, parity bit, stop bit and communication address.	Communication protocol：Modbus RTU
5	Machine Info.	To query the machine version information.	-
6	Clock setting	To query and set the system time.	-

3.2.9 System Time Set



Note：Press the button  can exit the system time set quickly, and the set value will be saved when exit.

3.3 Wather Heater Panel Diagram



Picture 3-4: STM Panel Diagram

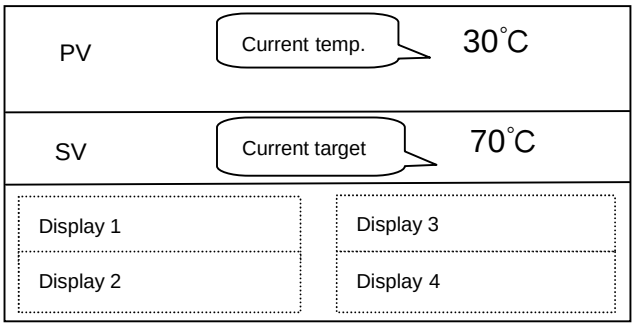
Table 3-1: STM Panel Description

No.	Name	Functions	Remarks
	Heating(Main)	Heating output indicator	-
	Heating(SUB)	Auxiliary heating output indicator	-
	Cooling	Cooling indicator	-
	Pump rotating	Display pump positive action indicator	-
	Pump rotating direction reverse	Pump reverse action indicator	-
	Water supply	Water refilling indicator	-
	Alarm	Send alarm indicator	Refer to table 4-2 for errors instruction.
ON/OFF	ON/OFF	Run/stop key	-

No.	Name	Functions	Remarks
	Auto-tuning	Auto tuning key	-
	Reverse/Drain	Reverse running/discharge	-
	Mandatory cooling	Forced cooling key	Hold the button for 2 secs to enable force cooling. It stop heating while enable 100% cooling. It stops after the temperutre drops below Cooling Temp.
	Buzzer	Buzzer off switch	After press" BUZZER" button, " BUZZER" LED on, Buzzer and alarm relay in idle mode even error occurs.
	Timer	Reserved timing key	-
	Reverse	Reverse key	-
.....	Backup	Backup key	-
	Power ON/OFF	Power on/off key	-
	Menu	Menu key	Parameter confirmation
	Confirm parameter	Confirm key	-
	Set valve modification	Setting key	-
	-	Up key	-
	-	Down key	-
	-	Left key	-
	-	Right key	-

3.3.1 Menu Introduction

3.3.1.1 Main screen



Picture 3-5: Main Menu Screen

Display 1：Display system time

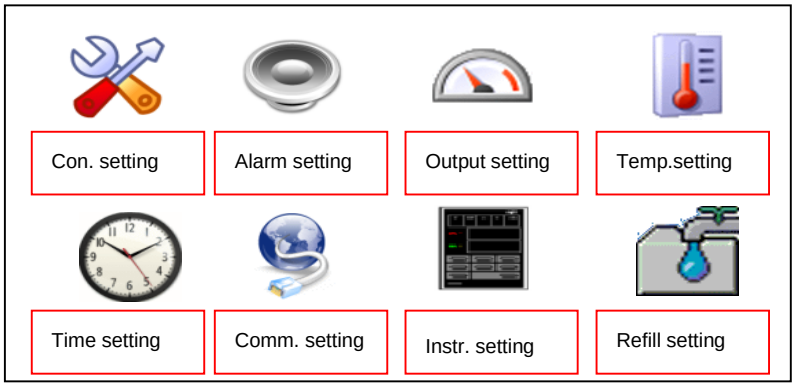
Display 2：Reserved time (reserve startup) / output percentage (start temp.control)

Display 3：System state / return water temp.(Return water and mould temp. display power consumption, and press SET key on the main screen, it displays the temp. of return water).

Display 4：System state/mould temp. (Return water and mould temp. display power consumption, and press SET key on the main screen, it displays mould temp.)

Notes: The SV value range varies from different models.

3.3.1.2 MENU Screen



Picture 3-6: MENU Screen

In the main screen, press the <MENU>key, it pops up the password prompt, and input the password to enter the MENU screen, the initial password is 0000.

3.3.2 Parameter Table

3.3.2.1 Parameter Setting Table

Table 3-1: Control Setting

Parameter	Description	Range	Default
P	proportional band	1-100℃(2℉-212℉)	13℃(55℉)
I	heating integral time	1-999S	100S
D	heating to differential time	1-999S	15S
heating cycle	heating output cycle	3-60S	15S
cooling cycle	cooling output cycle	1-30S	15S

Table 3-2: Alarm Setup

Parameter	Description	Range	Default
Phase detection	for three-phase detection	use/not use	not use
Return water temp.	Control temp. and return temp. deviation alarm (only effective in normal humidity control)	0-100℃(0= not use)	0
Mould temp. deviation	Control temp. and mould temp. deviation alarm（only effective in normal humidity control）	0-100℃(0= not use)	0
Disruption alarm	Temp. sudden drop alarm	0-300℃(0= not use)	0
Heater alarm	It doesn't reach set temp. in required time	0-3600S	0
Over temp. alarm	PV>SV+overheat alarm set temp., it alarms and stops	0-50℃	15℃

Table 3-3: Output Setting

Parameter	Description	Range	Default
Auxiliary output	auxiliary output OFF temp.	0-300℃(0= not use)	0
Cooling temp.	forced cooling temp.	0-100℃(0= not use)	35℃
Overhaul temp.	set machine running time before maintenance	0-10000H(0= not use)	0
Total running time	total machine running time		

Table 3-4: Temp. Setting

Parameter	Description	Range	Default
Temp. upper limit	SV upper limit temp. can be set	0-300℃	300℃
Temp. lower limit	SV upper lower temp. can be set	0-300℃	0℃
Temp. unit	℃/℉ setting	℃、℉	℃
Decimal point	temp.value of decimal point can be set	0.1、1	1
Control temp. offset	control temp. offset	-100-100℃	0℃
Return water temp. offset	return water temp. offset	-100-100℃	0℃
Mould temp. offset	mould temp. offset	-100-100℃	0℃

Notes: The SV value range varies from different models.

Table 3-5: Time Setting

Parameter	Description	Range	Default
Current time	Current time setting	hr./min./week	No
Reserve the week	Reserve power ON/OFF	ON/OFF	OFF

Table 3-6: One Week ON/OFF Setup

Parameter	Description	Range	Default (start,stop)
Mon.	Reserved ON/OFF time on Mon.	hr/min.，hr/min.	01:02，08:09
Tues.	Reserved ON/OFF time on Tue.	hr/min.，hr/min.	02:03，09:10
Wed.	Reserved ON/OFF time on Wed.	hr/min.，hr/min.	03:04，10:11
Thu.	Reserved ON/OFF time on Thu.	hr/min.，hr/min.	04:05，11:12
Fri.	Reserved ON/OFF time on Fri.	hr/min.，hr/min.	05:06，12:13
Sat.	Reserved ON/OFF time on Sat.	hr/min.，hr/min.	06:07，13:14
Sun.	Reserved ON/OFF time on Sun.	hr/min.，hr/min.	07:09，14:15

Table 3-7: Communication Setup

Parameter	Description	Range	Default
Comm. protocol	comm. protocol	Modbus-RTU	Modbus-RTU
Comm. unit No.	comm. address	1-99	1
Comm. speed	comm. speed	4800、9600、19200	9600
Comm. length	data length	7,8Bit	8Bit
Stop bit	stop bit	1,2Bit	1Bit
Check bit	stop bit	None,odd, even	Even

Table 3-8: Instrument Setup

Parameter	Description	Range	Default
Language	language selection	Chinese/English	Chinese
Far-end setting	far-end setting	use/not use	not use
Password setting	password setting	0-9999	0
Return water and mould temp. display	Return water and mould temp. display	use/not use	not use
DISP	TFT version		
MAIN	control board version		

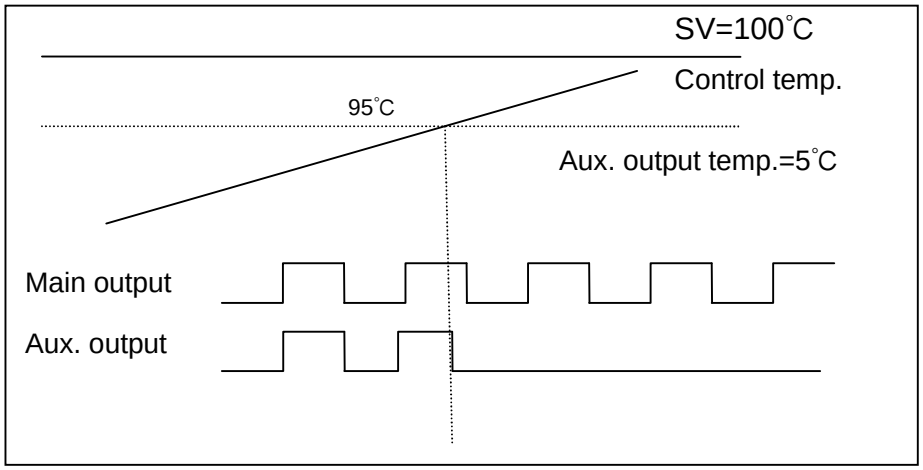
Table 3-9: Refilling Setup

Parameter	Description	Range	Default
Startup refill time	startup refill time	0-601S	0
Intermittent refill time	intermittent refill time	0-600S	0

3.3.2.2 Output Setting

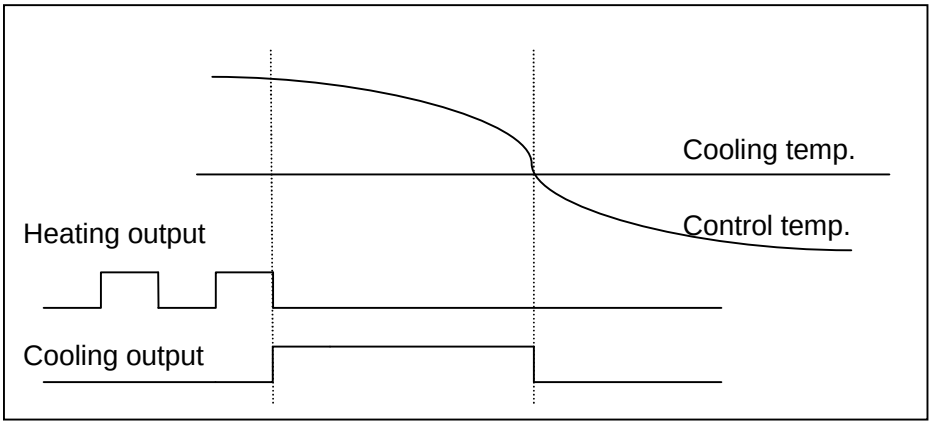
3.3.2.2.1 Main output and auxiliary output of heating control

1) When control temp. is smaller than set value, initiate main output and auxiliary output to promptly improve the temp.
2) Alternatively select the main output and auxiliary output.



3.3.2.2.2 Forced cooling

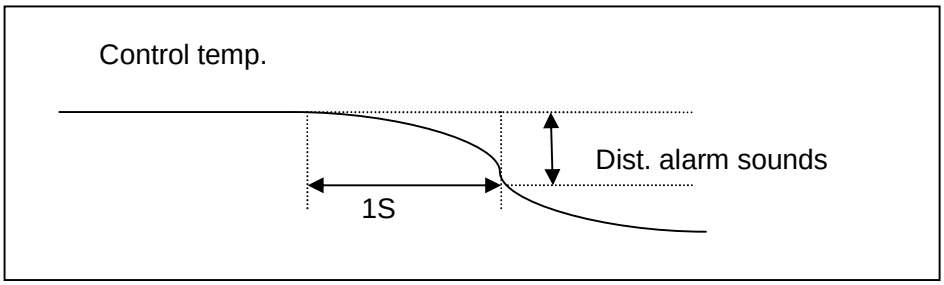
1) Press the forced cooling key to stop heating and 100% output the cooling control.
2) Control temp. is lower than the cooling temp., automatically dismiss the forced cooling to terminate the control.
3) Forced cooling key is available to stop forced cooling for normal control.



3.3.2.3 Alarm Settings

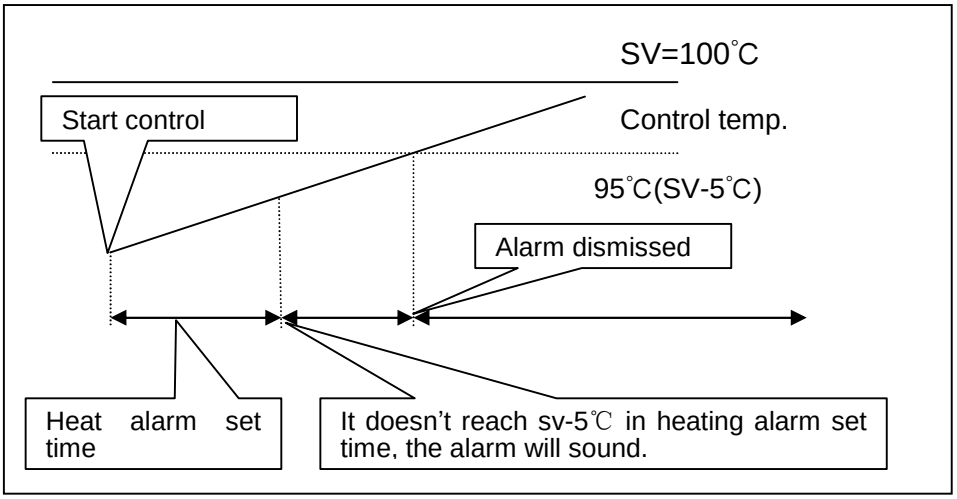
3.3.2.3.1 Disruption alarms

1) If the control temp. is kept over the value of disruption alarm for 1 sec., it is considered being interrupted, which will alarm.
2) The disruption alarm only works in controls without cooling output.
3) Once it sounds alarm, it will keep alarming till BUZZER key is pressed to concel the alarm.



3.3.2.3.2 Heater Alarm

1) In heater alarm setting time, it will alarm when the control temp. can't reach 5℃ below the set temp.
2) The heater alarm only works in controls, and once it reaches the temp. range, the alarm will be dismissed.
3) Even it sounds the alarm, the temp. control is still effective.



3.3.2.4 Startup for refilling

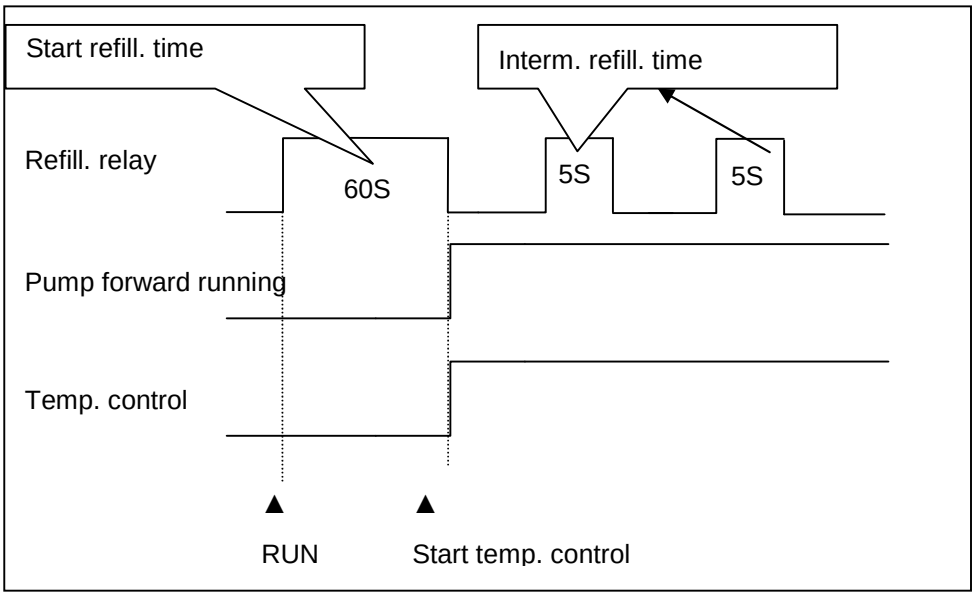
1) Only after the startup time is set as 60s, and water refilling reaches the

high level that the PID starts operation.

2) When startup refilling <60S, it will refill according to set time, and the PID will operate.

3.3.2.5 Auto refilling process

Presss RUN key to refill the water.



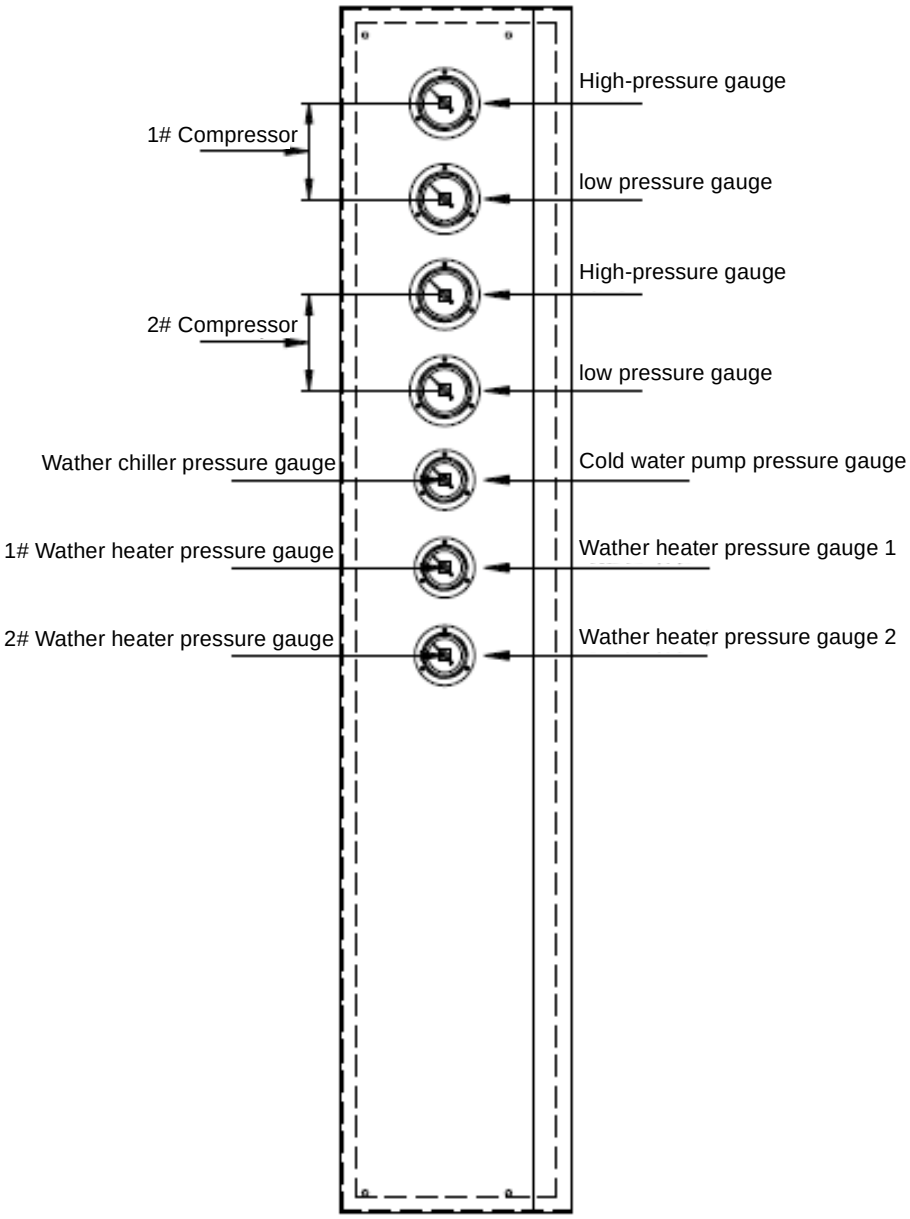
3.3.3 Errors and Causes

Errors	Causes	Alarm	Temp. control
PCB erros	Regulator error	Occur	Stop
Calibration error	-	Occur	Stop
ADC error	-	Occur	Stop
RJC error	-	Occur	Stop
EEPROM error	-	Occur	State maintain
Phase alarm	Phase shortage or phase reverse detected	Occur	Stop
EGO over temp.	EGO temp. contact input detected	Occur	Stop
Pump overload	Pump overload contact input detected	Occur	Stop
Insufficient pressure	Low pressure contact input detected	Occur	Stop
Overpressure	High pressure contact input detected	Occur	Stop
Low water (liquid) level	Low water (liquid) level contact input detected	Occur	Stop
Temp. window "----"display	Sensor abnormal	Occur	Stop
Water outlet temp. deviation	Control temp. and water outlet temp. deviation	Occur	state maintaining
Return water temp. deviation	Control temp. and return water temp. deviation	Occur	State maintain
Disruption alarm	Control temp. sudden drop	Occur	State maintain
Heater alarm	Control temp. doesn't rise	Occur	State maintain
Over heat	Overheat alarm sounds	Occur	Stop

Notice：

As various alarms above, the controller will activate the protective function as auto shutdown or stop running; please re-press the "operation" to restart.

3.4 Table board description



3.5 Safety switch

Picture 3-7: Heater

Picture 3-8: Compressor

Picture 3-9: Compressor anti-freeze switch

Note:

1.The features of mould temperature controller's pressure controller: connect the 2 cm copper pipe to the pressure connection point.

2.The high pressure of the mould temperature controller's pressure controller is set as 8kg, and the low pressure is set as 2kg.

3.The features of compressor's pressure controller: copper capillary is connected at the pressuer connection point.
The high pressure of the compressor pressure controller is set as 20kg, and the low pressure is set as 2kg.
4. The anti-freeze switch has been debugged, which only can be adjusted by qualified maintenance personnel.

4. Trouble-shooting

Failures	Possible reasons	Solutions
LCD displays nothing after switch on power and press ON/OFF key.	Did not connect through power supply. Main switch broken. Power supply wires problems. Control circuit fuse melt. Transformer broken.	Connect through power supply. Replace main switch. Check electrical wires. Fix the fuse. Replace the transformer.
Phase alarm.	Power supply low voltage. Phase shortage. Phase reversal. PCB problems.	Check power supply. Check power supply. Exchange two of the wires of power supply. Replace the PCB.
Pump overload.	Abnormal fluctuations of power supply. Pump blocked. Pump motor problems. Overload relay (F1) setting value error.	Check power supply. Check the pump. Check pump motor. Set the setting current of overload relay to equal to 1.1 times of motor rated current. Please refer to Mian Components for detailed description of overload relaly. Reset overload relay: Wait for one minute, then press the blue button to reset.
EGO overheats.	EGO temperature setting mistakes. EGO poor temperature detecting. Heater contactor K1 and K2 problems.	Correctly set EGO temperature. (EGO temperature setting value= temperature setting value+10℃) Replace EGO. Replace the contactor.
Low liquid level.	Oil shortage.	Fill high temp. oil.
Insufficient pressure.	Insufficient water pressure of external water supply. Pressure switch failure.	Increase the water pressure of external water supply. Repaly the pressure switch.
Excess process pressure.	Globe valve of mould circulating water is not open or pipe blockage. Pressure switch failure.	Check the globe valve and pipeline. Repaly the pressure switch.
Temp. window displays "----"	Abnormal sensor.	Check and repair sensor.
Once running, pump output indicator lightens but pump cannot start. After a while pump still fails to run.	PCB output relay problems. Electrical circuit problems.	Check or replace the PCB. Check electrical circuit.
Differences between setting temperature and actual temperature is too big.	Too short time after machine startup. Temperature parameter setting error. Cooling water valve problems.	Wait for a while. Check temperature parameters. Please refer to the standard manual of setting parameters. Replace solenoid valve.

Failures	Possible reasons	Solutions
Temperature can't rise up.	Heater contactor problems. Heater problems. Thermocouple problems. PCB output point problems.	Replace the contactor. Replace pipe heater. Replace thermocouple. Check and repair PCB.
Circuit breaker tripping off at turning on main switch.	Short circuit of main circuit. Transformer short circuit or connected with earth wire. Problems of circuit breaker.	Check electrical wire. Replace circuit breaker.
Circuit breaker tripping off at turning on pump switch.	Pump motor coil short circuit. Problems of circuit breaker.	Check pump motor. Replace circuit breaker.
Circuit breaker trippingoff after short heater output.	Heater tube short circuit or shell contact. Problems of circuit breaker.	Replace heater tube. Replace circuit breaker.

Table 4-1: Double Compressor

Fault	Test Conditions	Troubleshooting	Solution
Compressor 1 pressure high	Test when the compressor button has pressed	Stop compressor 1 only without affect other equipments to work.	Check if the input is consistent with the switch setting.
Compressor 1 pressure low	If the [LP Check Delay] is 0, test when the compressor button has pressed;If the [LP Check Delay] is not 0, then compressor 1 runs the test.		
Compressor 1 overload	Compressor 1 runs the test		
Compressor 2 pressure high	Test when the compressor button has pressed	Stop compressor 2 only without affect other equipments to work.	Check if the input is consistent with the switch setting.
Compressor 2 pressure low	If the [LP Check Delay] is 0, test when the compressor button has pressed;If the [LP Check Delay] is not 0, then compressor 2 runs the test.		
Compressor 2 overload	Compressor 2 runs the test		
Water Temp. Low	Runs test	Stop the compressor, and do not stop the pump.	Check if the water temperature is lower than the set temperature of Liquid protection.
Water Temp. High		Stop the compressor, and do not stop the pump.	Check if the water temperature is higher than the set temperature of Liquid protection.
Anti-freeze Err	Power on to test	Stop the compressor, and do not stop the pump.	Check if the antifreeze input is consistent with the switch setting.
Water-temp. Sensor breaks			Check if the temperature probe is in proper contact.
Water-temp. Sensor short circuit			
Anti-freeze Sensor breaks			
Anti-freeze Sensor short circuit			
Anti-freeze temperature is too low		Stop the compressor, and do not stop the pump.	Check if the antifreeze temperature is lower than the set temperature of antifreeze protection
Blower 1 fault (Only applicable for air-cooled series)	Compressor 1 runs the test	Stop the compressor, and do not stop the pump.	Check if the blower 1 fault input input is consistent with the switch setting.

Blower 2 fault (Only applicable for air-cooled series)	Compressor 2 runs the test		Check if the blower 2 fault input input is consistent with the switch setting.
Water flow short	Test after the pump starts for (Pump on delay)time	Stop the unit	Check if the water flow input is consistent with the switch setting
Pump Overload	Test after pump starts	Stop the unit	Check if the pump overload input is consistent with the switch setting.
Phase Err	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 Low	Power on to test	Stop the unit	Check if the water level input is consistent with the switch setting.
Need Maintenance	Test after pump starts	The unit connot start once stops(the accumulative operation time of compressor exceeds the set value)	

Table 4-2: Triple,Quadruple Compressor

Fault	Test Conditions	Troubleshooting	Solution
Compressor 1 pressure high	Test when the compressor button has pressed	Stop compressor 1 only without affect other equipments to work.	Check if the input is consistent with the switch setting.
Compressor 1 pressure low	If the [LP Check Delay] is 0, test when the compressor button has pressed;If the [LP Check Delay] is not 0, then compressor 1 runs the test.		
Compressor 1 overload	Compressor 1 runs the test		
Compressor 2 pressure high	Test when the compressor button has pressed	Stop compressor 2 only without affect other equipments to work.	Check if the input is consistent with the switch setting.
Compressor 2 pressure low	If the [LP Check Delay] is 0, test when the compressor button has pressed;If the [LP Check Delay] is not 0, then compressor 2 runs the test.		
Compressor 2 overload	Compressor 2 runs the test		
Compressor 3 pressure high	Test when the compressor button has pressed	Stop compressor 3 only without affect other equipments to work.	Check if the input is consistent with the switch setting.
Compressor 3 pressure low	If the [LP Check Delay] is 0, test when the compressor button has pressed;If the [LP Check Delay] is not 0, then compressor 3 runs the test.		
Compressor 3 overload	Compressor 3 runs the test		
Compressor 4 pressure high	Test when the compressor button has pressed	Stop compressor 4 only without affect other equipments to work.	Check if the input is consistent with the switch setting.
Compressor 4 pressure low	If the [LP Check Delay] is 0, test when the compressor button has pressed;If the [LP Check Delay] is not 0, then compressor 4 runs the test.		
Compressor 4 overload	Compressor 4 runs the test		
Water Temp. Low	Test after pump starts	Stop the compressor, and do not stop the pump.	Check if the water temperature is lower than the set temperature of Liquid protection.
Water Temp. High		Stop the compressor, and do not stop the pump.	Check if the water temperature is higher than the set temperature of Liquid

			protection.
Anti-freeze Err	Power on to test	Stop the compressor, and do not stop the pump.	Check if the antifreeze input is consistent with the switch setting.
Water-temp. Sensor breaks			Check if the temperature probe is in proper contact.
Water-temp. Sensor short circuit			
Anti-freeze Sensor breaks			
Anti-freeze Sensor short circuit			
Anti-freeze temperature is too low		Stop the compressor, and do not stop the pump.	Check if the antifreeze temperature is lower than the set temperature of antifreeze protection
Blower 1 fault (Only applicable for air-cooled series)	Compressor 1 runs the test	Stop the compressor, and do not stop the pump.	Check if the blower 1 fault input input is consistent with the switch setting.
Blower 2 fault (Only applicable for air-cooled series)	Compressor 2 runs the test		Check if the blower 2 fault input input is consistent with the switch setting.
Blower 3 fault (Only applicable for air-cooled series)	Compressor 3 runs the test		Check if the blower 3 fault input input is consistent with the switch setting.
Blower 4 fault (Only applicable for air-cooled series)	Compressor 4 runs the test		Check if the blower 4 fault input input is consistent with the switch setting.
Water flow short	Test after the pump starts for (Pump on delay)time	Stop the unit	Check if the water flow input is consistent with the switch setting
Pump Overload	Test after pump starts	Stop the unit	Check if the pump overload input is consistent with the switch setting.
Phase Err	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 Low	Power on to test	Stop the unit	Check if the water level input is consistent with the switch setting.
Need Maintenance	Test after pump starts	The unit connot start once stops(the accumulative operation time of compressor exceeds the set value)	