STM-F

"Large Flow" Oil Heater

Date: Feb. 2019

Version: Ver.D (English)

SHINI

Contents

Table Index

Picture Index

1. General Description

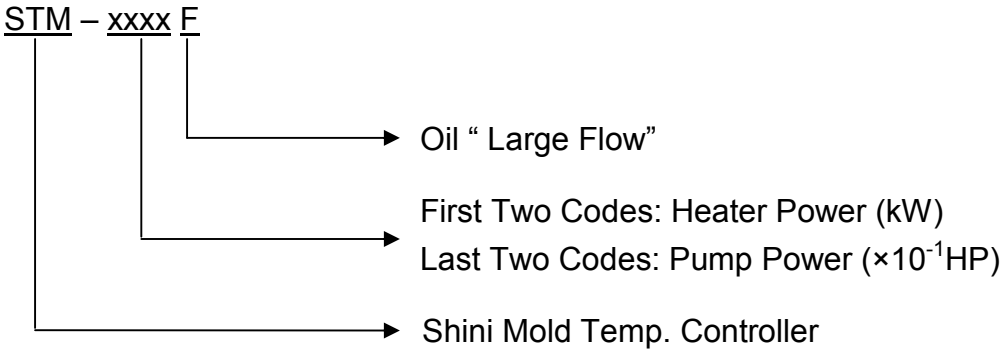
Read this manual carefully before operation to prevent damage of the machine or personal injuries.

STM-F series "Large Flow" oil heater mainly applied in extruder and rubber injection molding or other occasion requires large flow, strong cooling capability. Besides, it's also applicable to the fields with same requirements. This series of heaters adopt indirect cooling method after return oil from the mould passed through the cooler. The oil pressurized by pump, through heater pipe it will be heated, then it returns to the mould to reach the requirement of heating and maintaining constant temperature. Adopts P.I.D temperature controller can ensure stable temperature control.

Model: STM-4575F

Model: STM-3050F

1.1 Coding Principle



1.2 Feature

- P.I.D. multi-stage temperature control system can maintain a mould temperature.
- Maximum working temperature can reach 200℃ with control accuracy of ±1℃.
- Controller adopts 3.2" LCD for easy operation.
- Multiple safety devices including power reverse phase protection, pump overload protection, overheat protection and low level protection that can automatically detect abnormal operation and indicate this via visible alarm.
- Adopts large-flow pump with high stability, which is not only suitable for heating up moulds and maintaining temperature, but also for extrusion molding and applications alike.
- Double-cooler design ensures optimal cooling effect.
- RS485 communication function is standard

1.3 Options

- Water manifolds, Teflon hose and Transfer oil are optional.
- Display of mould temperature and mould return oil temperature is optional.

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.

Headquarter and Taipei factory：
Tel: (886) 2 2680 9119

China Service Line:
Tel: 800 999 3222

1.4 Technical Specifications

1.4.1 Specification

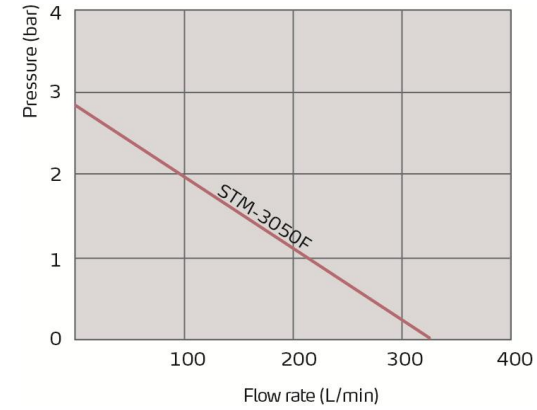
Table 1-1: Specification

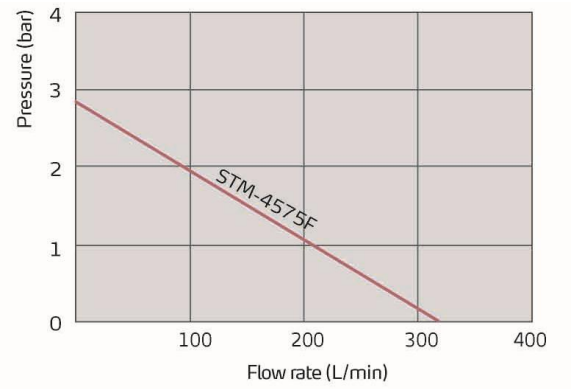
Model	STM-3050F	STM-4575F
Ver.	C	D
Max temp.(℃)	200	200
Heater Power (kW)	30	45
Pump power (HP)	5.0	7.5
Max. pump Flow (L/min)	263	373
Max. pump pressure (bar)	3.0	3.8
Heating TankNumber	2	33
Main / Sub.Oil Tank (L)	100/18	14/51
Cooling Method	Indirec	Indirec
Inlet/Outlet (inch)	1.5” / 1.5”	1.5” / 1.5”
Dimensions (mm) (H × W × D)	1240×550×1280	1200×500×1350
Weight (kg)	280	270

Note:： 1) "*" Stands for options.
2) Pump testing standard: Power of 50 Hz, purified water at 20℃. (There is ±10% tolerance for either max. flowrate or max. pressure).
3) Power supply: 3Φ, 400VAC, 50 Hz

We reserve the right to change specifications without prior notice

1.4.2 Pump Performance





Picture 1-1: Pump Performance

1.4.3 Reference Formula of Mould Controllers Model Selection

Heater Power (kW) = mould weight (kg) × mould specific heat (kcal/kg℃) × temperature difference between mould and environment (℃) × safety coefficient / heating duration / 860

Note: safety coefficient can select a value from 1.3 to 1.5.

Flow Rate (L/min) = heater power (kw) × 860 / [heating medium specific (kcal/kg℃) × heating medium density (kg/L)×in/outlet temperature difference (℃)× time (60)]

Note： Water specific heat =1kcal/kg℃
Heating medium oil specific heat =0.49kcal/kg℃
Water density =1kg/L
Heating medium oil density =0.842kg/L

1.5 Safety Regulations

Strictly abide by the following safety regulations to prevent damage of the machine or personal injuries.

1.5.1 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 put spare emergency switch in suitable place and remember the location.

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.

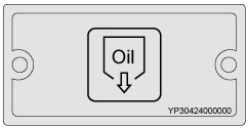
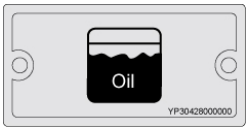
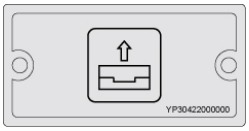
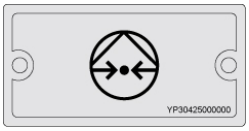
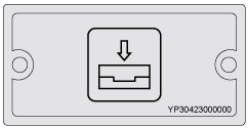
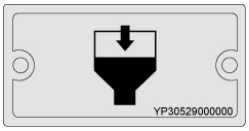
Protect the machine against severe vibration or collision.

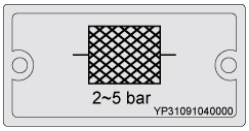
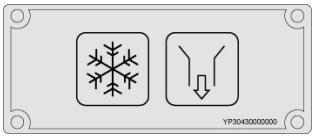
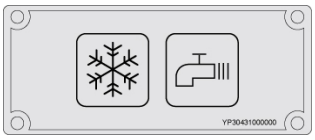
Don’t take off or dirty safety signs privately. Drunken, medicine-taking, or men without proper judgement should not operate the machine.

Warning!

All screws of electric components in cabinet have been tightened and no need for periodical checking.

1.5.2 Signs and Labels

	Please according to schedule to make regular maintenance.
	Oil discharge valve: oil discharge port when machine is changing oil.
	High oil level: max. oil level of machine in constant temperature.
	From mould: connector for circulating water/oil of coming from mould
	Pump pressure meter: indicating actual pressure of system.
	To mold: connector for circulating water/ oil to go to mould.
	Oil inlet: Machine oil inlet

	1. To maintain temperature stability, cooling water pressure must be higher than 2 bar at all time, but should never exceed 5 bar in any case. 2. Clean Y-shape Cooling Water Strainer periodically to ensure perfect cooling capacity.
	Water outlet: cooling water outlet
	Water inlet: cooling water intlet

1.5.3 Operation Regulations

1) When cooling water: qualified standard cooler for industrial use is recommented. Reference as Table 1-2.
2) When in use, if there's poor water drainage or poor control effect, clean up the solenoid valve at once or check cooling water outlet has blockage or not.
3) Do not move the unit when it is in operation.
4) During repairing, wait until oil temperature falls below 30℃.
5) STM-F possesses pump overload device. When overload occurs, pump and heater will stop working. At this moment, it needs to check overload reasons (phase shortage, pipe obstruction, broken bearing, etc.) After the system runs normally, press RESET on overload relay to rest the operation.
6) Before turn off the pump, wait until oil temperature falls blow 50℃. Or the service life of the unit would be affected.

Table 1-2: Standard Water Quality

No.	Control Items	Cooling Water	
		Direct Cooling Water	Circulating Cooling Water System Replenishment Water
1	pH	6.0-9.0	6.5-8.5
2	SS(mg/L)≤	30	-
3	Turbidity（NTU）≤	-	3
4	BOD5（mg/L）≤	30	10
5	CODcr≤（mg/L）	-	50
6	Fe（mg/L）≤	-	0.3
7	Mn（mg/L）≤	-	0.1
8	Cl（mg/L）≤	250	250
9	GH（CaCO3 /mg/L）≤	450	450
10	Total ALK （CaCO3 /mg/L）≤	500	350
11	Sulfate（mg/L）≤	600	250
12	NH3-N（mg/L）≤	-	10
13	Total P（P mg/L）≤	-	1
14	TDS（mg/L）≤	1000	1000
15	Fecal coliform（/L）≤	2000	2000
16	Petroleum（mg/L）≤	-	1
17	Anionic surfactant（mg/L）≤	-	0.5

1.6 Exemption Clause

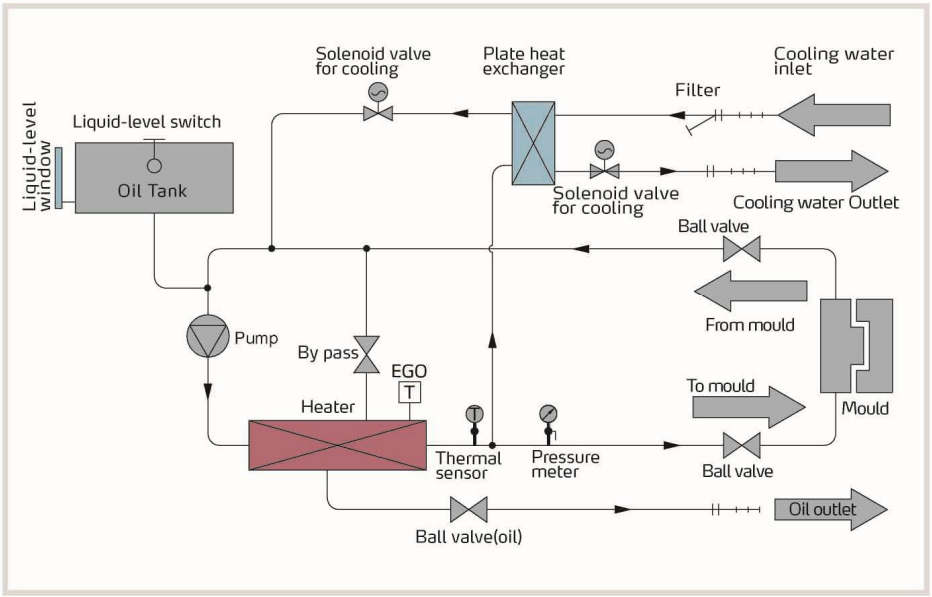
The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

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

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

2. Structure Charateristics and Working Principle

2.1 Working Principle



Picture 2-1: Working Principle

The high temperature oil returns to the machine and then be pressured by pump to the heaters. After being heated, oil will be forced to the mould and continue the circle. In the process, if the oil temperature is too high, system will activate the solenoid valve to let cooling water cool down high temperature oil indirectly until the temperature is down to the system requirement. If the temperature keeps increasing and reaches to the set point of EGO, the system will sound alarm and stop operation. The system will have low level alarm and stop working if oil level falls down below the set point.

3. Installation and Debugging

3.1 Installation Space

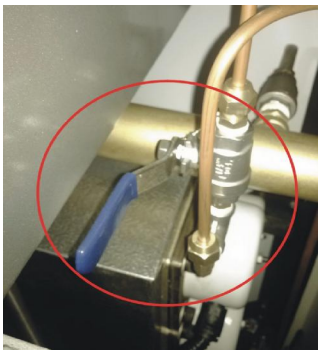
During installation of the machine, keep at least 500mm installation space around the machine as following picture. Don’t install the machine in a narrow or crowded place with other objects. This would cause inconvenience to operation, maintenance and repair.

Keep away inflammables and explosive goods.

Picture 3-1: Installation Space

3.2 Pipeline Connection

1) Open the ball valve when machine is filling the oil. After the mould is filled with oil, close the valve and start up the machine.



Picture 3-2: Ball Valve

2) After connect the cooling water outlet to drainage port, turn on the water source switch.

Attention: Cooling water discharge port is shown as below. Reverse connection is forbidden.

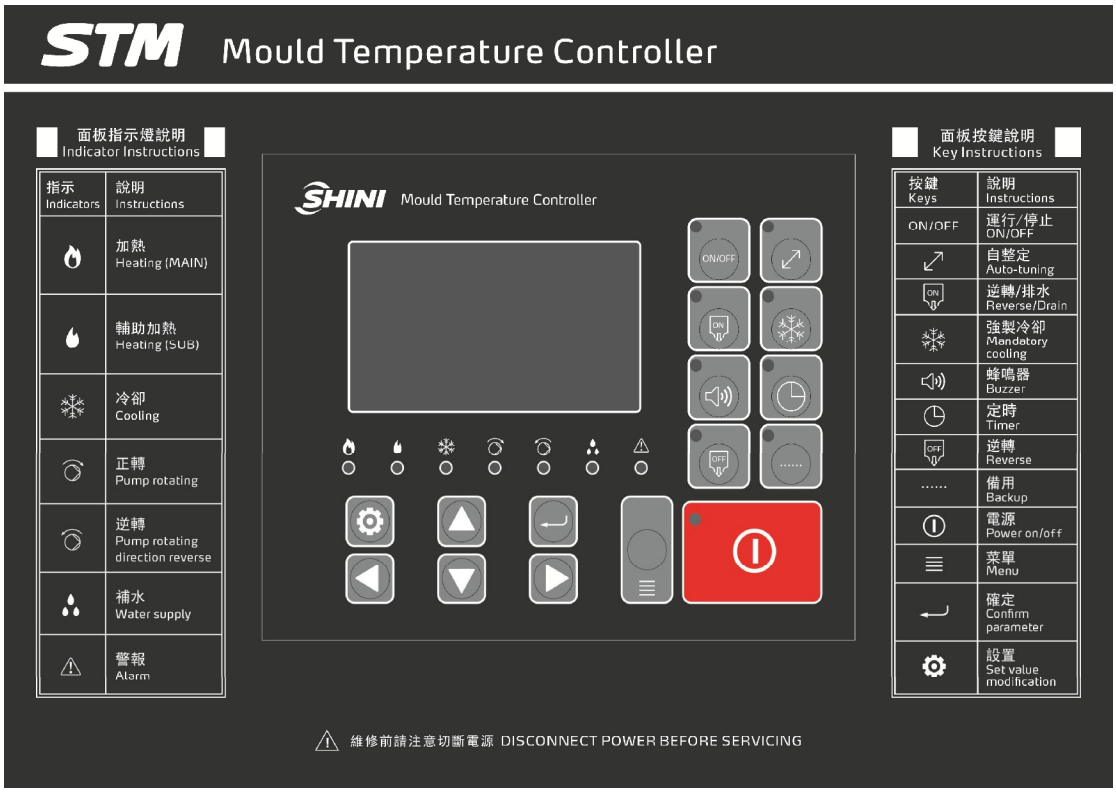
Picture 3-3: Pipeline Connection

3.3 Power Connection

Make sure the power match the specification, then connect the power supply. Please check the voltage specification signs on machine's nameplate carefully. The power supply must match the specification indicated on nameplate. The cable must match the section specification indicated in circuit diagram.

4. Operation Guide

4.1 Control Panel



Picture 4-1: Control Panel

Table 4-1: Control Panel

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	-

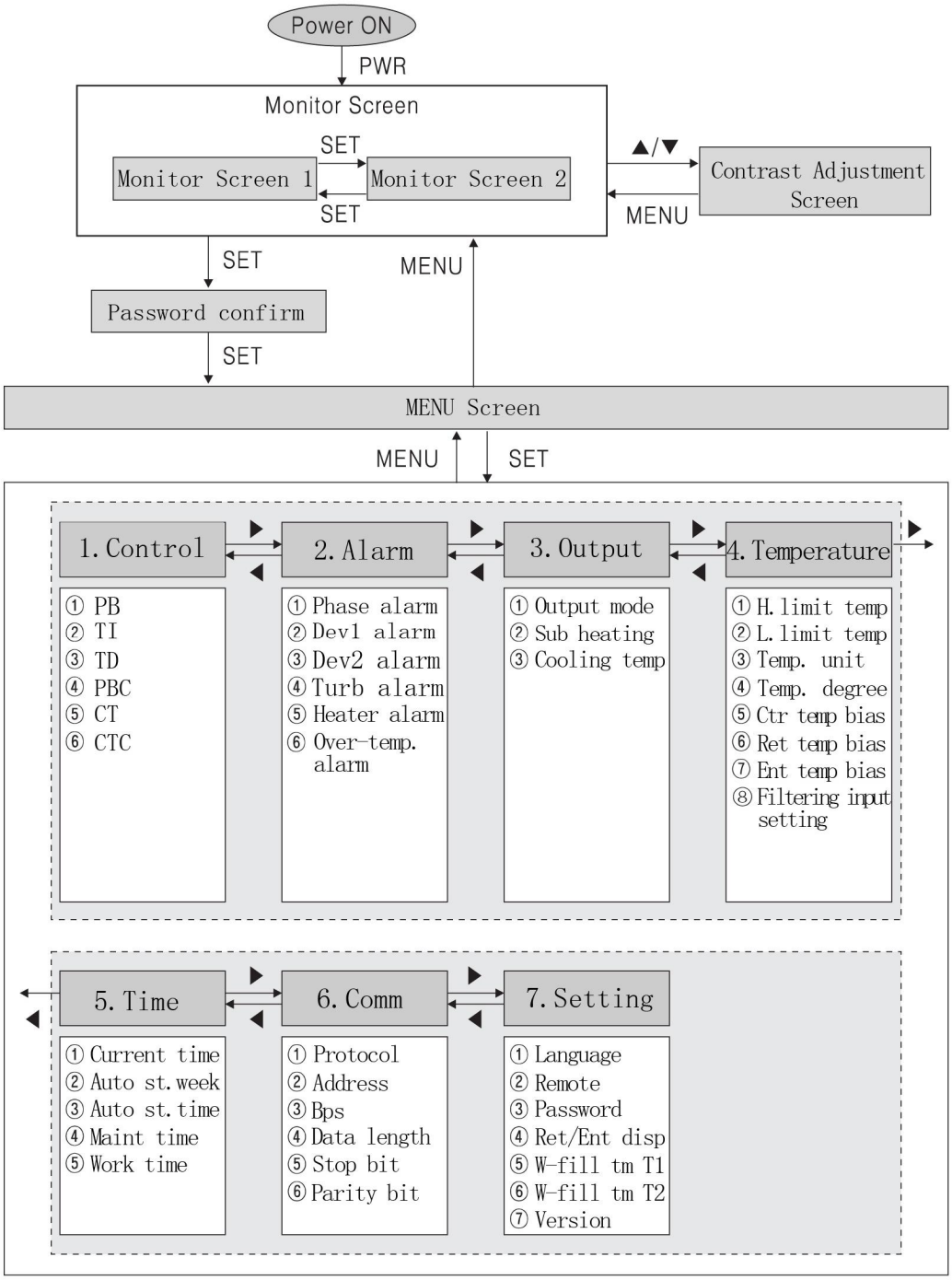
No.	Name	Functions	Remarks
	Auto-tuning	Auto tuning key	-
	Reverse/Drain	Reverse running/discharge	-
	Mandatory cooling	Forced cooling key	Hold the button for 2 secs to enable force cooling. It stop heating while enable 100% cooling. It stops after the temperutre drops below Cooling Temp.
	Buzzer	Buzzer 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	-

Table 4-2：Error Type

Error display	Cause of Error	Alarm	Temp. control
Board error	Regulator error	Activated	Stop
Calib error		Activated	Stop
Adc error		Activated	Stop
Rjc error		Activated	Stop
Eeprom error		Activated	Maintain its status
Phase error	Default phase or phase reverse	Activated	Stop
EGO Over temp.	Check input EGO temp.	Activated	Stop
Pump overload	Check input pump overload	Activated	Stop
Low pressure	Check low pressure input	Activated	Stop
High pressure	Check high pressure input	Activated	Stop
Low water level	Check low water level input	Activated	Stop
Appear “-----“ on temperature display	Sensor abnormality	Activated	Stop
Dve1 alarm	Deviation between set (SV) and process (PV) water/oil temperature.	Activated	Maintain its status
Dev2 alarm	Deviation between process (PV) and return water/oil temperature.	Activated	Maintain its status
Turb. alarm	Process temperature (PV) drops rapidly.	Activated	Maintain its status
Heater alarm	Set temperature (SV) on but process temperature (PV) remains idle.	Activated	Maintain its status
Overheat	Over temp. alarm	Activated	Stop

Notes: When alarm sounds, controller will automaticlly stops the equipment. Press "RUN" to restart the machine.

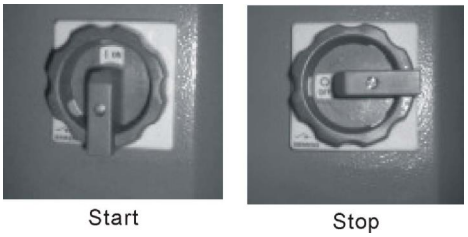
4.2 Menu Introduction



Pictute 4-2: Menu Outline

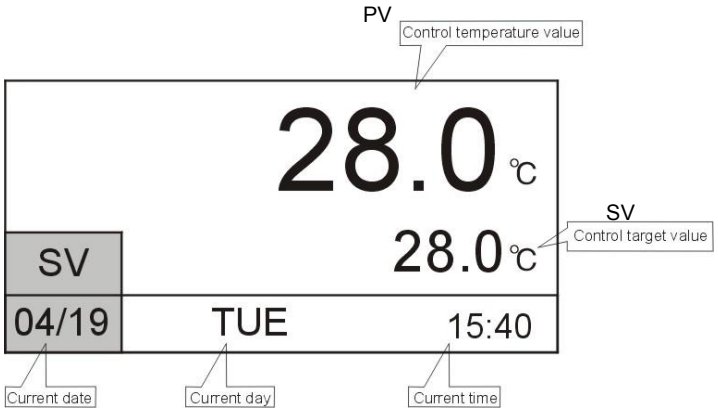
4.3 Machine Startup

1) Switch on main power.



Picture 4-3: Main Power Switch

2) Press <ON/OFF POWER> button of the controller to enter initial screen.



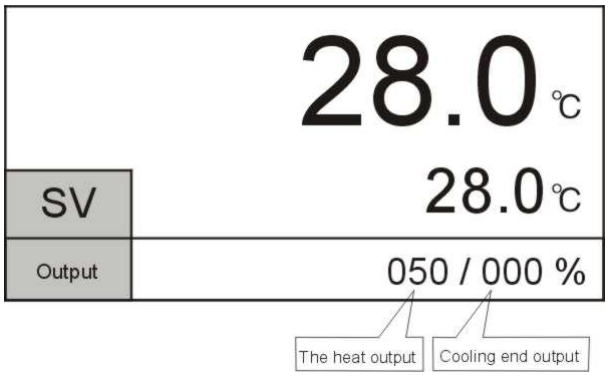
Picture 4-4: Initial Menu

3) After confirming the temperature, press <run/stop> key to start the mould temperature controller.

4.4 How to change the temperature

1) Press the <setting> key of the controller, the column of controlled target value will be flashing, press ◄/► key to move cursor then press ▲/▼ key to change values. Finally press Confirm Key to confirm them.
2) After setting the SV, press <ON/OFF> key to begin temperature control, Auto-tuning is needed if deviation of temperature is large. Press AT key and LED light begins flashing to start Auto-tuning. When flashing ends, Auto-tuning finishes and parameters will be automatically saved. During Auto-tuning, pressing AT key will exit Auto-tuning process; controller will

conduct temperature control based on exisiting parameters before the Auto-tuning.

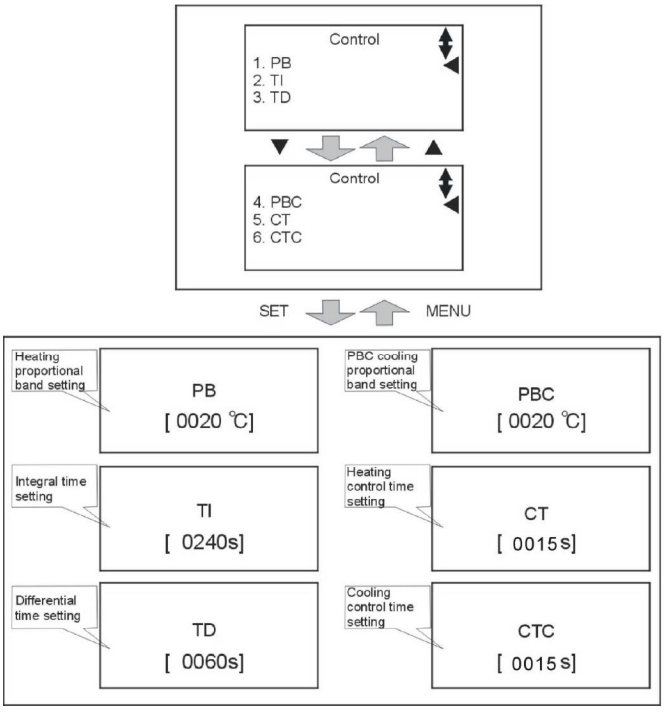


Picture 4-5: Operation Screen

4.5 Parameter setting

1) Control Menu

Press <MENU> key to enter menu selection screen, press ◄/► keys to control setting menu, press < Confirm Key > key to enter setting screen, see picture below. Note: The parameters derived based on AT auto-tuning. Please do not change it with no special circumstance.

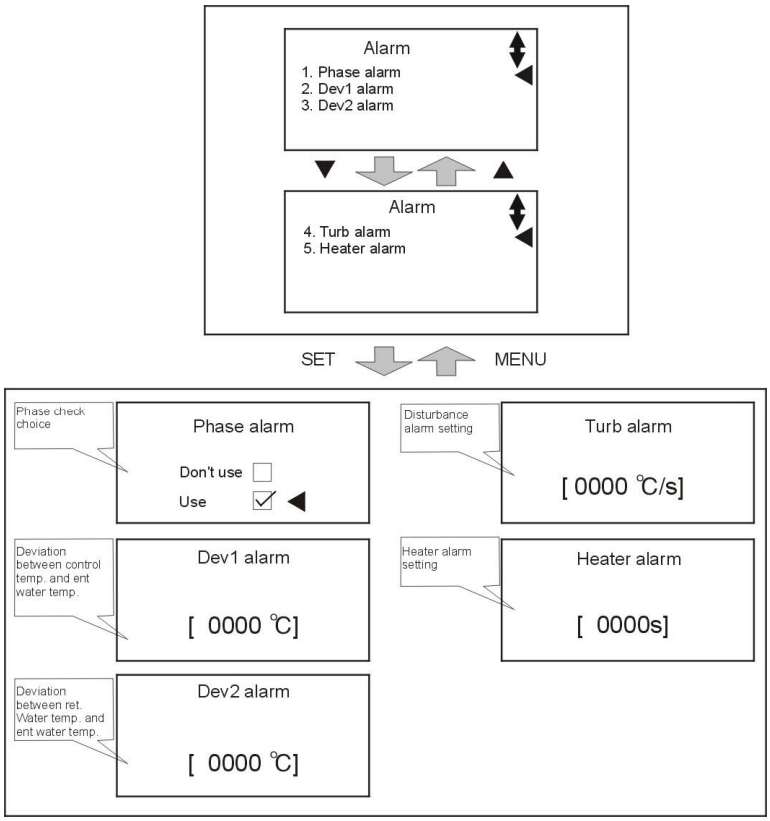


Picture 4-6: Control Setting Screen

2) Alarm Setting

Press <MENU> key to return menu selection screen, press ◄/►keys to alarm setting menu, press < Confirm Key > key to enter setting screen, as the table. All parameters are as below:

Items	Description	Default
PHASE Detection	Prevent water pump reverse due to phase error	Activate
DEV1 ALARM	Without temp. sensor	0°C
DEV2 ALARM	Without temp. sensor	0°C
TURB ALARM	Monitor temp. variation, it alarms when control temp. drops rapidly	0°C/ sec
HEATER ALARM	Activate when control temp. doesn't rise up. If default value is 0/ sec., the function is disabled.	-
Overheat	Exceed permissible upper limit temp. n℃, machine alarms and excitation release enables power off	n is set value, the default is 20℃

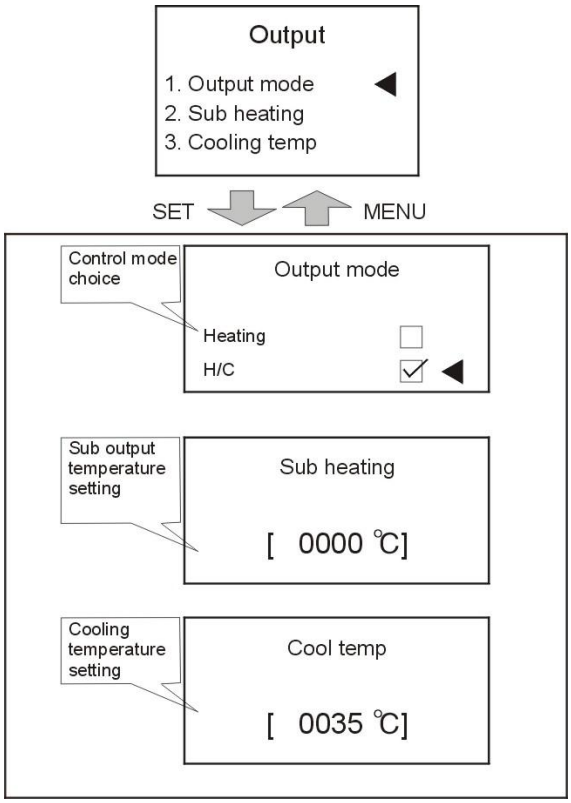


Picture 4-7: Alarm Setting Screen

3) Output Setting

Press the <Menu> key of the controller to return the selection screen of the menu, and press ◄/► keys to shift to output setting menu. Press <Confirm Key> to enter setting screen, and all the parameters are as below:

Items	Description	Default
OUTPUT MODE	heating control or heating and cooling control	Default is heating and cooling control
SUB HEATING	temp. difference of activating sub. heating ouput (SUB) function. When actual temp. is less than (set temp. – temp. difference), main heating output and sub. heating output share a same output; when actual temp. is higher than (set temp. –temp. difference), main heating output and sub. heating output only has one group of output (Note: output relay alternatively output to prolong lifespan).	0 ℃ ((SUB) function is forbidden, only 1 group of heater) 5 ℃ (two or more groups of heaters)
COOLING TEMP.	Force cooling setting temperature. Default is 35℃ (machine halts if temp. drops to set value).	35℃

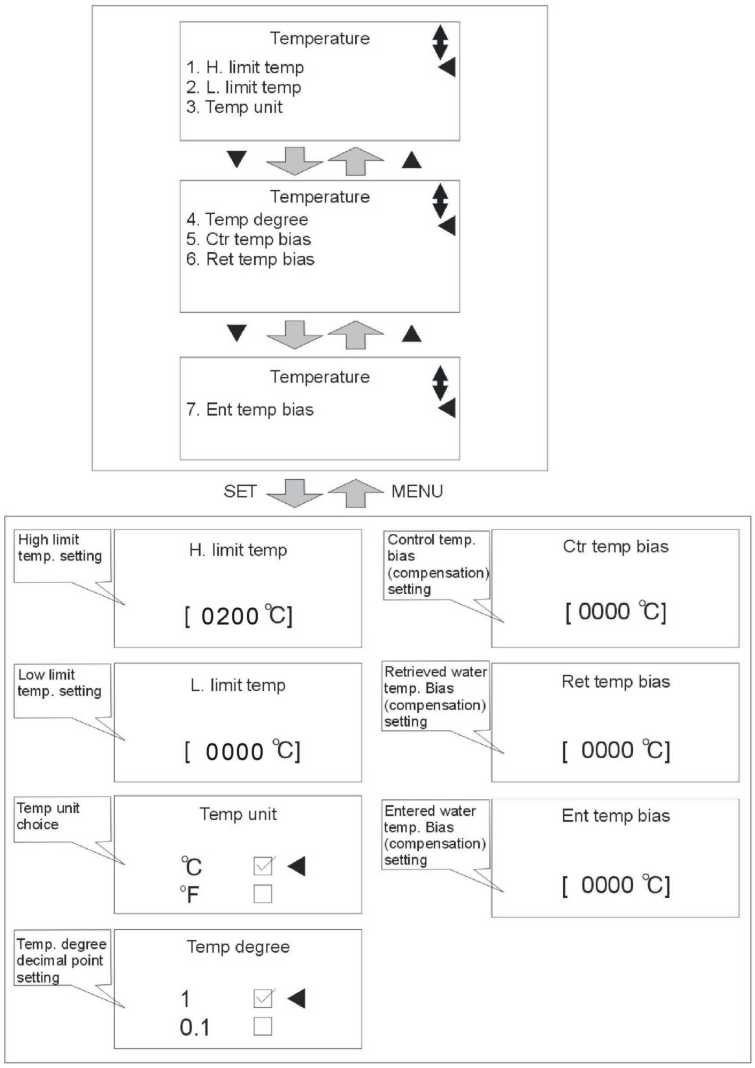


Picture 4-8: Output Setting Screen

4) Temperature Setting

Press <MENU> key to return menu selection screen, press ◄/► keys to temp. setting menu, press <Confirm> key to enter setting screen, as picture. All parameters are as below:

Items	Description	Default
UPPER LIMIT TEMP.	Software limit on maximum temperature	STM-O: 200, STM-O-HT: 260, STM-607E:150(max.value is 200), STM-W/STM-WF/STM-WE: 120, STM-PW: 160, STM-HPW: 180, STM-W/O: Water 95 Oil 160
LOWER LIMIT TEMP.	Software limit on minimum temperature. (Note: The equipment use external cooling water to cool. Cooling temperature can't below cooling water temperature.)	0°C
TEMP. UNIT	Unit in ℃/℉ (Celsius and Fahrenheit)	-
TEMP. DEGREE	Temperature display in 1℃/℉ or 0.1℃/℉	1
CTR TEMP BIAS	Bias correction of control water/oil temperature	Default is 0℃, modification is not recommended.
RET TEMP BIAS	Bias correction of return water/oil temperature.	Default is 0℃, modification is not recommended.
ENT TEMP BIAS	Bias correction of process water/oil temperature	Default is 0℃, modification is not recommended.
Input filtersetting	average temperature during sampling process	Default is 0℃, modification is not recommended.

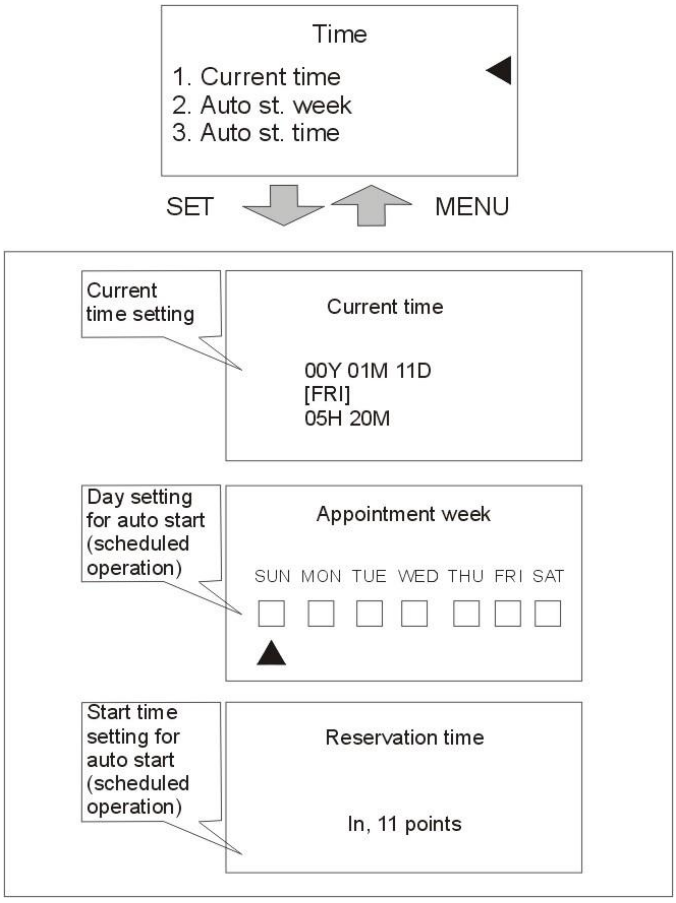


Picture 4-9: Temperature Setting Screen

5) Time Setting

Press <MENU> key to return menu selection screen, press ◄/► keys to time setting menu, press <Confirm> key to enter setting screen, as picture. The time has been adjusted before delivery. All the reserve time can be set according to actual production demands.

Items	Description
Current time	Format in YYMMDD
Reserv week	Weekly auto start/stop days
Reserv time	Auto start/ stop hour and minutes of the day. Format: xxHour xxMinutes
Maint. time	Machine maintenance time
Work time	Machine working hours

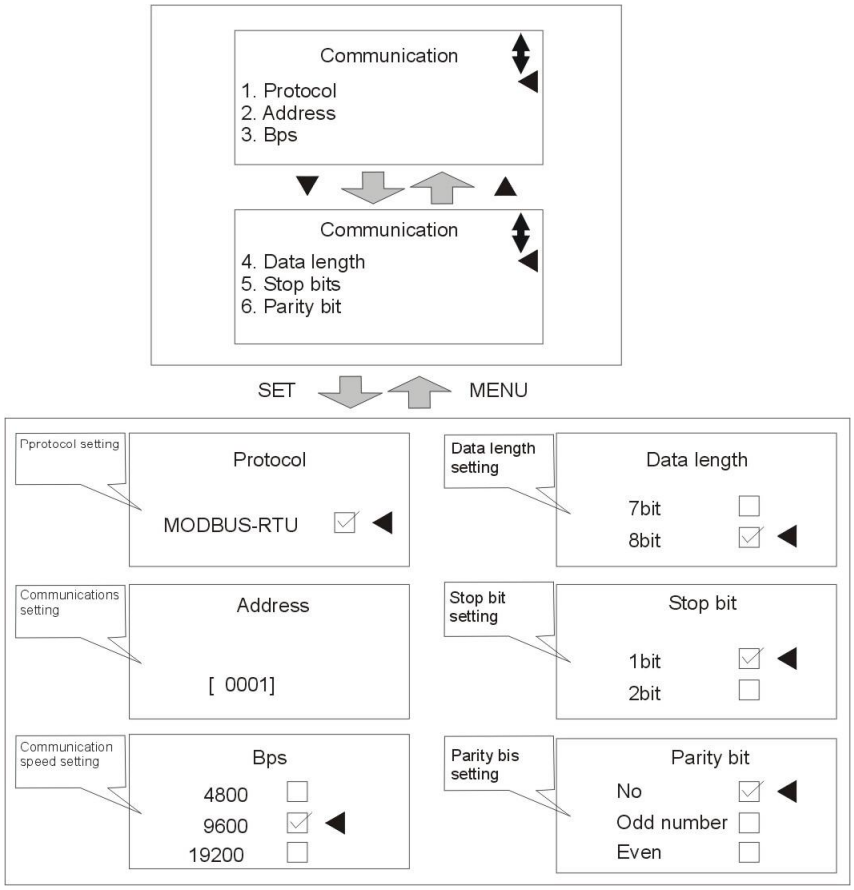


Picture 4-9: Time Setting Screen

6) Communication Setting

Press <MENU> key to return menu selection screen, press ◄/► keys to communication setting menu, press < Confirm > key to enter setting screen, as picture.

When optional with communication function, set the parameters according to the requirements.



Picture 4-10: Communication Setting Screen

7) Instrument setting

Press <MENU> key to return menu selection screen, press ◄/►keys to machine setting menu, press <Confirm> key to enter setting screen, as picture. The parameters are set before delivery, and all the parameters can be adjusted according to actual demands.

Items	Description
Language	English and Chinese.
Remote control	Default Unused (Special notes: this remote control uses 1-5 VDC to set control temp. value, which is unrelated with communication function. When remote control is activated, temp. set value can't be adjusted on the control panel.) Password: Default 0000.
Ret/Ent Disp	Return and process water/oil temperature display. Default: Disable.

W-fill tm t1	Start delay for water unit to refill water in seconds. Automatically enable after disable the breaker. Default 1 for oil unit, water unit as below table.
W-fill tm t2	Interval delay for water unit to refill water in seconds. Automatically enable after disable the breaker. Default 0 for oil unit, water unit as below table.

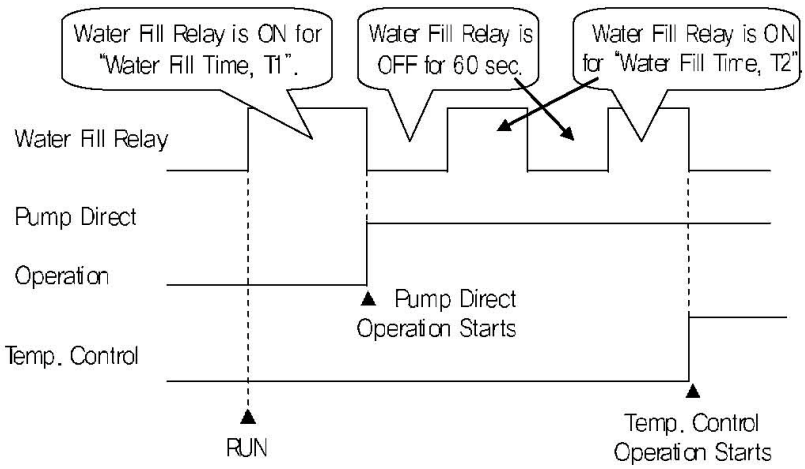
Table 4-3：Water-filling Time of Each Water Unit

Model	**STM-607W/W-D/PW /PW-D/HPW/WF STM-910W/W-D//WF**	**STM-1220W/PW/WF /STM-1213HPW/STM-2440W /STM-2430WF**	**STM-3650W /STM-3650WF /STM-4875WF**
t1	60S	120S	180S
t2	10S	15S	20S

Specific instructions are as follows:

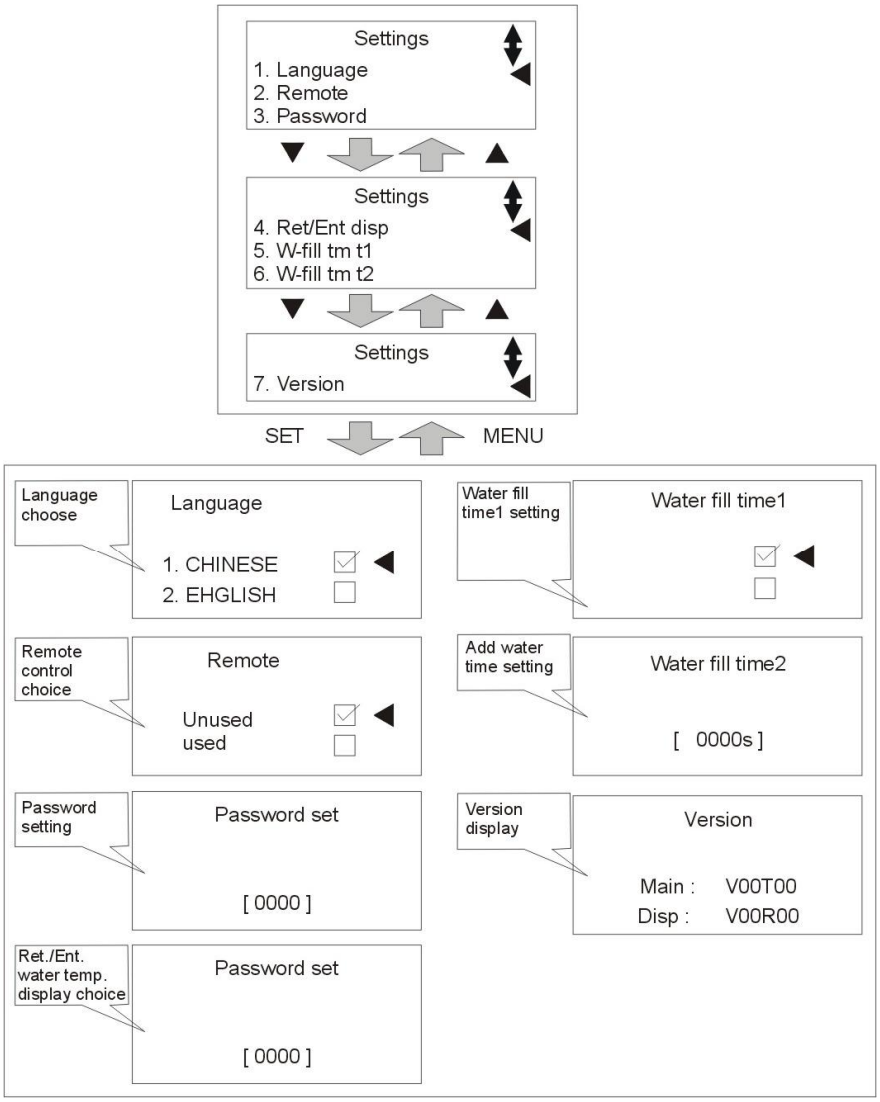
W-fill tm T1=0: press<water filling> key to start water refilling, when reaches the high water level it starts the pump and heating.

W-fill tm T1≠0: press < water filling > key to start water refilling t1, then pump starts, delay for W-fill tm t2, it starts heating (the water-filling process is as below picture).



(Water filling function in water filling time)

Version: version of control program.



Picture 4-11: Machine Setting Screen

4.6 Stop the Machine

1) Press <forced cooling> key to shut down heating output, and cooling works 100%.
2) Wait until temperature drops to below 50℃, press < forced cooling > key to shut down forced cooling, then press <run/stop>key to stop operation.
3) Switch off the main power.

Warning: While the main switch is on, caution of electrical shock.

Note: Pump motor rotating direction should be the same with the indicator.

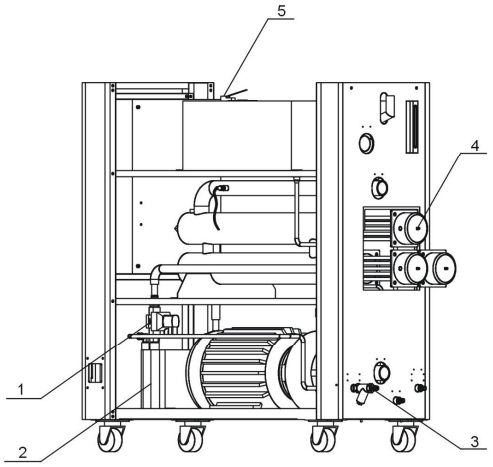
Note: Please do follow the above steps to turn on and off the machine. Fail to do so will reduce the lifespan of equipment.

5. 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 current of overload relay 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 overheat.	EGO temperature setting mistakes. EGO poor temperature detecting. Heater contactor 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.
Temp. window displays “----“	Abnormal sensor.	Check and repair sensor.
Once running, pump output indicator works, but pump cannot start. After a while pump still fails to run.	PCB output relay problems. Electrical circuit problems. Pump contactor problem.	Check or replace the PCB. Check electrical circuit. Replace the contactor.
Difference between setting temp. and actual temp. is too big.	Too short time after machine startup. Temperature parameter setting error. Cooling solenoid valve problems.	Wait for a while. Check temperature parameters. Please refer to the standard manual of setting parameters. Replace solenoid valve.
Temperature can't rise up.	Heater contactor problems. Heater pipe problems. Thermocouple problems. PCB output point problems.	Replace the contactor. Replace pipe heater. Replace thermocouple. Check/ repair PCB.

Failures	Possible reasons	Solutions
Circuit breaker trips off when turning on main power 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 trips off when pump running for a while.	Pump motor coil short circuit. Problems of circuit breaker.	Check pump motor. Replace circuit breaker.
Circuit breaker trips off after heater output for a while.	Heater pipe short circuit or shell contact. Problems of circuit breaker.	Replace heater pipe. Replace circuit breaker.

6. Maintenance and Repair



1. Clean solenoid valve
   Period: trimonthly
2. Clean cooler
   Period: half yearly
3. Clean Y-type filter
   Period: half yearly
4. Clean heater pipe
   Period: half yearly
5. Clean liquid level switch
   Period: trimonthly

Use time of high temperature kerosene

≤120℃	Replacement period: yearly
≥120℃~≤160℃	Replacement period: half yearly
>160℃	Replacement period: trimonthly

Pay attention to the following rules during maintenance:

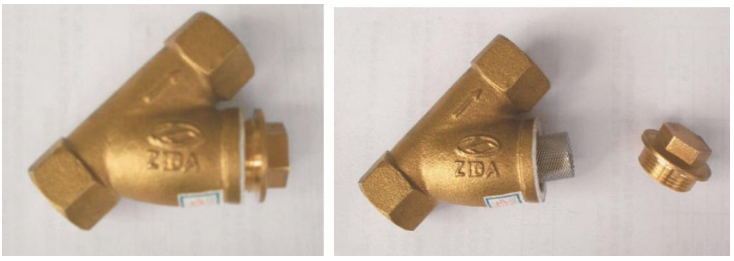
1) Need at least two persons present when checking the machine. Let the machine cool down, turn off power supply, drain out the oil and water. Make sure checking and maintenance space then start operation.
2) It's dangerous that machine works in high temperature. Stop the machine, wait it to cool down. Put on protective gloves before servicing or maintenance.
3) In order to prolong the life of the machine and to prevent accidents, check the machine at a fixed frequency.
4) ing operation, the oil is heated up to a high temperature, wait it to fall below 5℃ then to perform repairing or maintenance.

(Please note that it is dangerous to check or tear down the machine during operation.)

6.1 Y Type Strainer Cleaning

Clean soft water should be used as cooling water. Filter screen is used in the strainer to stop impurities and pollutants entering into water pipe. Impurities or pollutants may cause errors and bad temperature control. It needs to clean the Y type strainer periodly.

Cleaning steps: turn off power and cooling water supply. Open the top cover of filter screen to clean the filter.



Picture 6-1: Y Type Strainer

6.2 Solenoid Valve

Replacement steps:

1) Open machine top cover.
2) Open right side cover.
3) Take out the solenoid valve for replacement.
4) Install the covers in a reverse order.

Picture 6-2: Solenoid Valve

6.3 Heater Pipe Cleaning

After long use of the machine and with high temperature, there will be clingage and limscale accumulated on heater pipe which lower the heating efficiency. At this time, it needs to clean the clingage and limscale accumulated on heater pipe.

1) Open the heater cover (Press the black switch downward, then open the heater cover. As picture)


Picture 6-3: Heater Pipe 1

2) Take out the heater pipe (as picture, loose the screws, take out the heater pipe).


Picture 6-4: Heater Pipe 2

3) Heater pipe cleaning method: immerse the heater pipe into the thinner till all of the clingage fall off. Wet a cloth with some nature water, wipe the heater pipe cleanly and wait for the air drying.
4) After heater pipe cleaning up according to reverse orders to put them back to the machine.

6.4 Printed Circuit Board

MAIN terminal board drawing (refer to next page for terminal position and number).

① SENSOR TERMINAL1 (sensor terminal)

2, 3 : control temp. sensor termnal

5, 6 : return water temp. sensor terminal

8, 9 : water outlet temp. sensor terminal

11, 12 : 1~5V input terminal

② DI TERMINAL (contactor input terminal)

13, 14 : pump overload contactor input terminal

15, 16 : EGO overheat contactor input terminal

17, 18 : underpressure contactor input terminal

19, 20 : overpressure contactor input terminal

21, 22 : lower water limit contactor input terminal

23, 24 : upper water limit contactor input terminal

③ OUTPUT TERMINAL (output terminal for controlling)

1, 2 : heating control output MAIN (RELAY output)

3, 4 : heating control output SUB (RELAY output)

5, 6 : Cooling control output (RELAY output)

④ DO TERMINAL (relay contactor output terminal)

1, 2 : pump running contactor output terminal

3, 4 : pump inverse running contactor output terminal

5, 6 : backup water contactor output terminal

7, 8 : SUCTION

7, 8 : SUCTION contactor output terminal

9, 10 : alarm contactor output terminal

11, 12 : breaker contactor output terminal

13, 14 : reserve

⑤ PHASE CHECK TERMINAL (phase detect terminal)

1 : R phase connect terminal

2 : S phase connect terminal

3 : T phase connect terminal

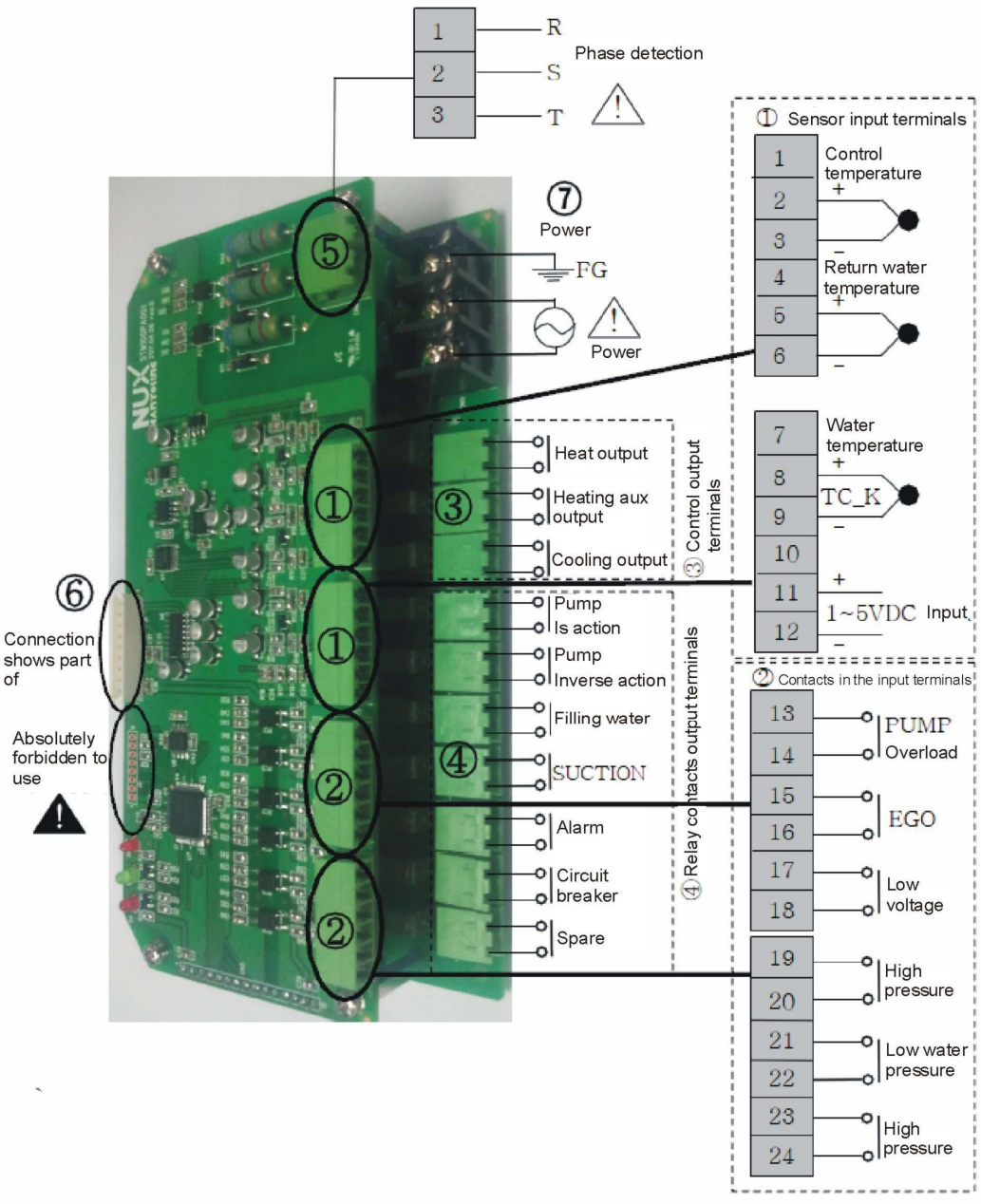
⑥ DISPLAY CN (connect terminal for dispaly)

Connect stub cable with STM100.

⑦ POWER TERMINAL (power supply terminal)

1 : FG terminal

2, 3 : power supply terminal (100~240VAC)



6.5 Display Terminal Connecting Diagram

① DI TERMINAL (contactor input terminal)

1，2：RUN/STOP contactor input terminal

② COMM TERMINAL (comm terminal)

1, 2, 3, 4: rs485 comm terminal

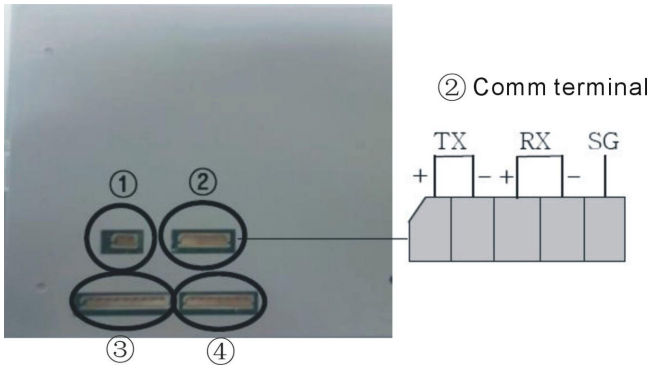
5：Earth terminal

③MAIN CN (MAIN earth terminal)

Connet to the electric cables which also connected with stm100

④ TEST PIN

Test pin No connection



6.6 Maintenance Schedule

6.6.1 About the Machine

Model _____ SN_____ Manufacture date _____

Voltage_____Φ_____ V Frequency_____Hz Power_____ kW

6.6.2 Installation & Inspection

☐Check the installation space is enough as required.

☐Check the pipes are correctly connected.

Electrical installation

☐ Voltage: _____V _____Hz _____

☐ Fuse melting current: 1 Phase_____A 3 Phase _____ A

☐ Check phase sequence of power supply.

6.6.3 Daily Checking

☐Check machine startup function.

☐Check all the electrical wires.

6.6.4 Weekly Checking

☐Check loose electrical connections.

☐Check and clean Y type filter (1)

☐Check solenoid valve.

☐Check motor overload and phase reversal alarm function.

☐Check whether pipeline joints are under looseness.

☐Check the sensitivity of EGO.

6.6.5 Trimonthly Checking

☐Check level switch.

☐Check the contactor (2)

☐Replace the hot kerosene with a using temperature above 160 degree (3)

6.6.6 Half-yearly Checking

☐Check damaged pipes.

☐Clean process heater/cooler.

- ☐ Check indicator and buzzer.
- ☐ Replace the hot kerosene with a using temperature above 120~160 degree (4)

6.6.7 Yearly Checking

- ☐ Replace the hot kerosene with a using temperature above 120 degree (5)

6.6.8 3 year Checking

- ☐ PCB board replacement
- ☐ No fuse switch replacement

Note: (1) Y-type strainer has the function of filling water cooling protection effect, be sure the waterway are clear to avoid cooling failure.

(2) Manufacturer laboratory data for AC contactor is two million times in life. we suggest service life for one million four hundred thousand times, if it works eight hours per day, recommended replacing frequency is one and half a year, if it works day and night, replacement is suggested to be done every six months.

(3) Hot kerosene coke will influence the detection accuracy of internal temperature probe and the efficiency of heat elements, three months replacing frequency is suggested.

(4) Hot kerosene coke will influence the detection accuracy of internal temperature probe and the efficiency of heat elements, six months replacing frequency is suggested.

(5) Hot kerosene coke will influence the detection accuracy of internal temperature probe and the efficiency of heat elements, suggested replacing frequency is one year.