STM-HT Series

Hi-temp. Oil Heater

Date: Apr, 2013

Version: Ver.B (English)

SHINI

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1. General Description

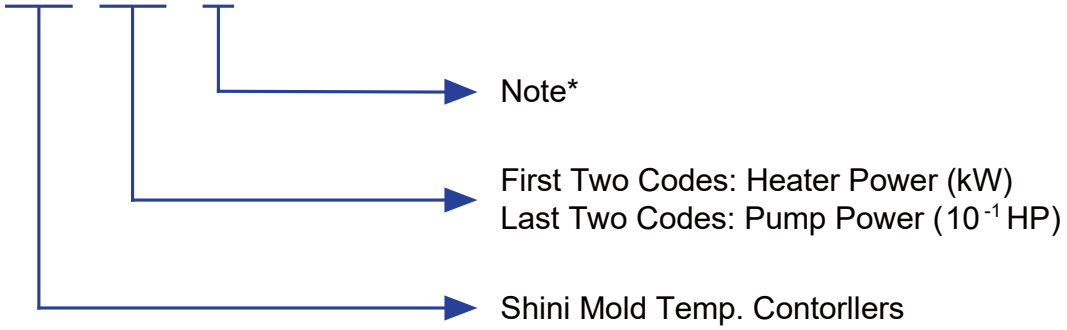
Read this manual carefully before operation to prevent damage of the machine or personal injuries.

STM-HT series high temperature oil heater are used to heat up the mould and maintain temperature, although they can be used in other similar applications. High temperature oil from the mould is returned to the cooling tank and cooled by indirect cooling. It is then pressurised by the high - pressure pump, sent to the heating tank and finally to the mould with a constant temperature. With our optimised design, It can reach a maximum of 300℃ and the HANYOUNG temperature controller can maintain an accuracy of ±1℃.

Model: STM-2440HT

1.1 Coding Principle

STM - xxxx - xx



Note*:

D=Dual-heating Zones HT=High Temperature Model

CE=CE Conformity

1.2 Feature

1) Standard configuration

- Controller adopts 3.2" LCD for easy operation.
- Equipped with the design of 7-day automatic start/stop timer. LCD screen can be converted between Chinese and English. The unit of temperature can be converted between °F and ℃.
- P.I.D. multi-stage temperature control system can maintain a mould temperature with accuracy of ±0.5℃.
- Adopts high efficiency high temperature pump, which can meet the demands of temperature control for precise moulds and mould loop with minor diameter to achieve precise temperature control and high efficient heat exchange.
- 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.

- Pipe heater are made of stainless steel.
- While for STM-HT, it can reach 300℃.
- Inside tank of STM-HT is made of high pressure resistance stainless steel to prevent any explosion.

2) Accessory option

- Water manifolds, Teflon hose and Transfer oil are optional.
- RS485 communication function is optional. Display of mould temperature and mould return water 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：

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1.3 Technical Specifications

1.3.1 Specification

Table 1-1： Specification

Model	Max. Temp.	Pipe Heater (kW)	Pump Power (kW) (50 / 60Hz)	Max. pump Flow (L / min) (50 / 60Hz)	Max. pump Pressure (bar) (50 / 60Hz)	Heating Tank Number	Main / Sub. Oil Tank (L)	Cooling Method	Mould Coupling* (inch)	Inlet/Outlet (inch)	Dimensions (mm) (H×W×D)	Weight (kg)
STM-907-HT	300℃	9	0.5	28	4.8	1	6 / 6	Indirect	3/8" (2×2)	3/4 / 3/4	695×280×740	75
STM-1215-HT		12	1.0	58	5.8	1	6.8 / 16		1" (1×2)	1 / 1	795×340×820	100
STM-2440-HT		24	2.8	100	8	2	16 / 25		1" (1×2)	1 / 1	1050×515×910	190

Note: 1) "HT" stands for high temperature model.

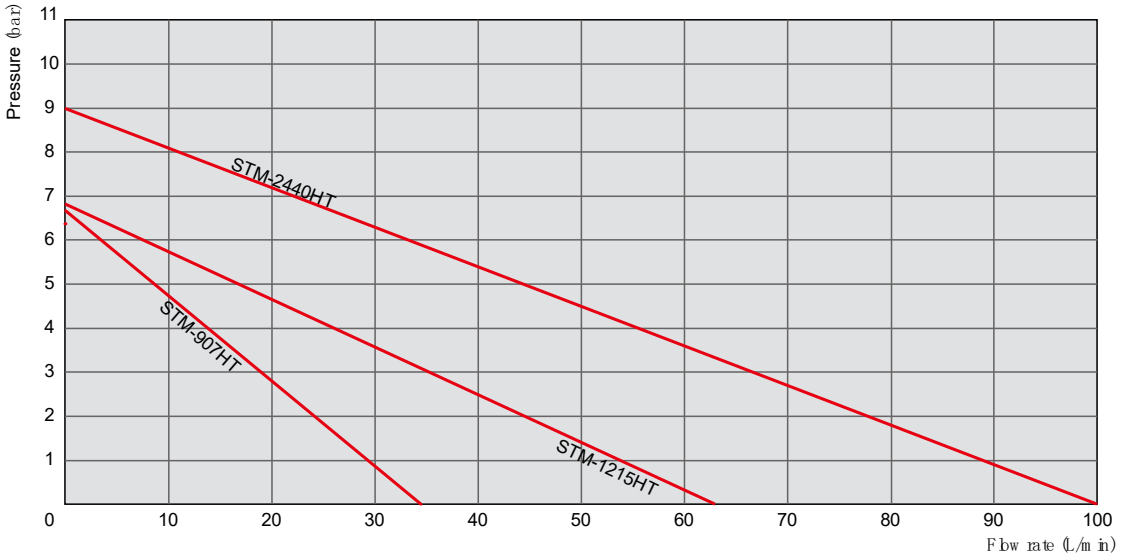
2) Pump testing standard: Power of 50 / 60Hz, purified water at 20℃.(There is ±10% tolerance for either max. flowrate or max. pressure).

3) "*" Stands for options.

4) Power supply: 3Φ, 230 / 400 / 460 / 575VAC, 50 / 60Hz.

We reserve the right to change specifications without prior notice.

1.3.2 Pump Performance



Picture 1-1: Pump Performance

1.3.3 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

1.4 Safety Regulations

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

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.

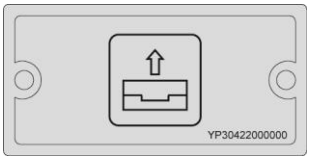
Warning!

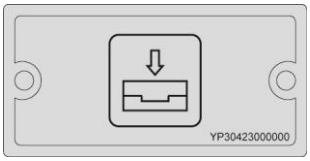
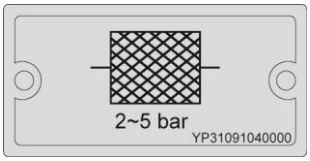
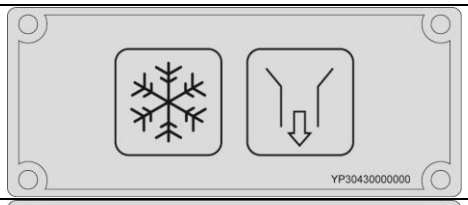
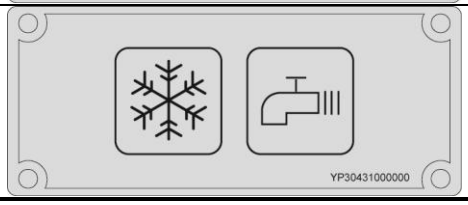
Do not touch the switch with wet object or hands.
Do not use the machine before fully aware of its performance.
Be careful not to touch or hit the switch or sensor.
Please keep enough operation space, and keep away obstacles.
To avoid producing statics, clean the floor from oil or water to keep a dry 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.

Warning!

High temperature, take care of hands! This label is attached on the surface of heating parts.

1.4.2 Signs and Labels

	Clean the filter screen of Y type strainer timely to avoid obstruction which may affect machine performance.
	It is used for oil heater. Max. temperature setting of this unit is 200℃.
 (Attached on motor cover)	This is to indicate motor rotating direction. When phase reversal happens, the alarm sounds and indicator on control panel will indicate. Please exchange the place of two of the electrical wires to solve this problem.
	High voltage! Electrical shock may happen. Carefulness is required from the operator.
	Attentions! This is general warnings which operators should pay attention to.
	From mould: connector for circulating water/oil coming from mould.
	Pump pressure meter: indicating actual pressure of system.

	To mold: connector for circulating water/ oil to go to mould.
	1. To maintain temperature consistency, 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 inlet: inlet for replenishing water and cooling water.
	Water outlet: drainage outlet.

1.4.3 Operation Regulations

1) Before operation, make sure that cooling water is clean soft water without pollutants.

※ Low quality water brings limescales, which may cause problems.

2) If problems of drainage or bad temperature control are noted, please clean solenoid valve and cooling water inlet and outlet.

3) Do not move the unit when it is in operation.

4) When in need of repairing, wait until oil temperature falls below 30℃.

5) Motor overload may be caused by phase shortage, pipe obstruction, broken bearing, etc. Motor overload relay will trip off to stop the machine when this happens. Fixing the problems, press RESET on overload relay to clear the alarm.

6) Before turn off the pump, wait until oil temperature falls blow 50℃. Or the life of the unit would be affected.
7) Please firstly open cooling water before start the machine, and close cooling water after stop the machine.

1.4.4 Transportation and Storage of the Machine

Transportation

1) STM-HT series hi-temp. oil heater are packed in crates or plywood cases with wooden pallet at the bottom, suitable for quick positioning by fork lift.
2) After unpacked, castors equipped on the machine can be used for ease of movement.
3) Do not rotate the machine and avoid collision with other objects during transportation to prevent improper functioning.
4)The structure of the machine is well-balanced, although it should also be handled with care when lifting the machine for fear of falling down.
5) The machine and its attached parts can be kept at a temperature from -25℃ to +55℃ for long distance transportation and for a short distance, it can be transported with temperature under +70℃.

Storage

1) STM-HT series hi-temp. oil heater should be stored indoors with temperature kept from 5OC to 40OC and humidity below 80%.
2) Disconnect all power supply and turn off main switch and control switch.
3) Keep the whole machine, especially the electrical components away from water to avoid potential troubles caused by the water.
4) Plastic film should be used to protect the machine from dust and rains.

Working environment

The machine should be operated:

1) Indoors in a dry environment with max. temperature +45℃ and humidity no more than 80%.

Do not use the machine:

1) If it is with a damaged cord.
2) On a wet floor or when it is exposed to rain to avoid electrical shock.
3) If it has been dropped or damaged until it is checked or fixed by a qualified serviceman.
4) This equipment works normally in the environment with altitude within 3000m.
5) At least a clearance of 1m surrounding the equipment is required during operation. Keep this equipment away from flammable sources at least two meters.
6) Avoid vibration, magnetic disturbance at the operation area.

Rejected parts disposal

When the equipment has run out its life time and can not be used any more, unplug the power supply and dispose of it properly according to local code.

Fire Hazard

 In case of fire, Co_2 dry powder fire extinguisher should be applied. Please abide by the safety guide when you operate the machine so as to prevent damage of the machine and personal injuries.

 All electrical components should be installed by qualified electricians. Turn off main switch and control switch during repair and maintenance.

 Warning! High voltage!
This mark is attached on the cover of the control box.

 Warning! Be careful!
Be more careful when this mark appears.

Warning!

High temperature, take care of hands! This label is attached on the surface of heating parts.

1.5 Exemption Clause

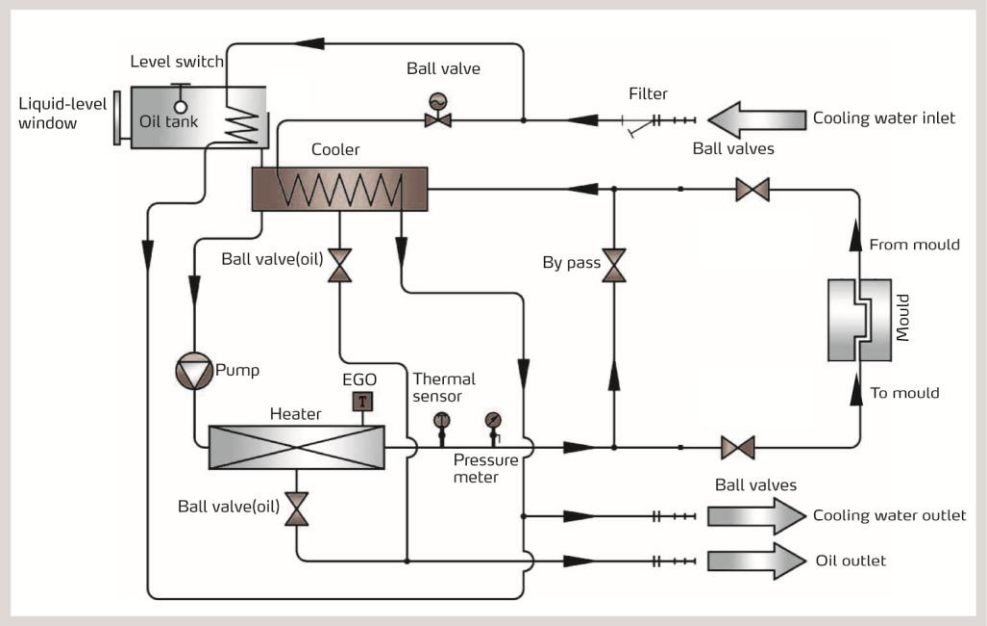
The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

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

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

2. Structure Characteristics and Working Principle

2.1 Working Principle

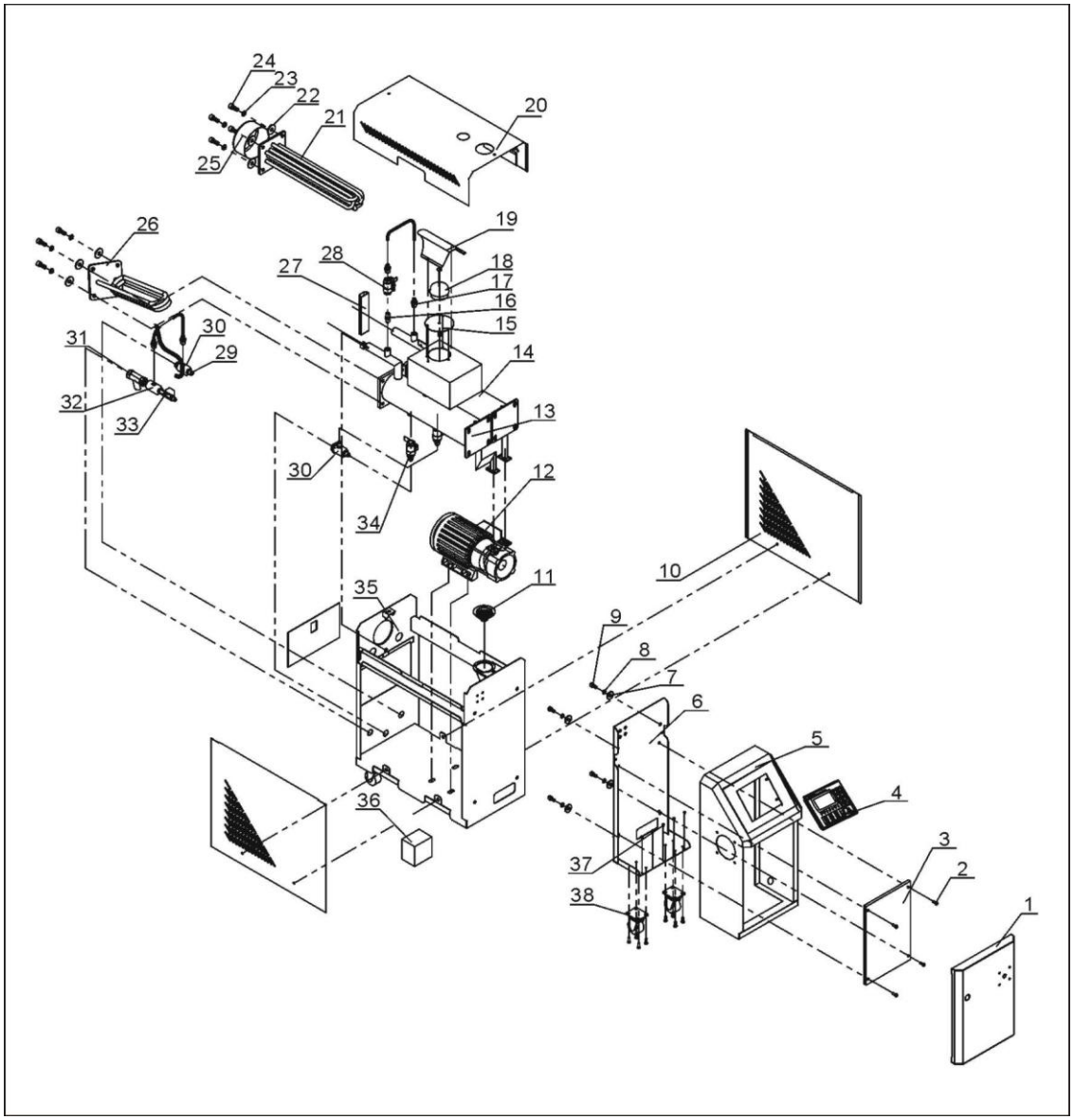


Picture 2-1： Working Principle

The high temperature oil returns to the machine and then be pressured by pump to the heater. 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.

2.2 Assembly Drawing

2.2.1 Assembly Drawing (STM-907/1215-HT)



Remarks: Please refer to material list 2.2.2 for specific explanation of the Arabic numbers in parts drawing.

Picture 2-2：Assembly Drawing (STM-907/1215-HT)

2.2.2 Parts List (STM-907/1215-HT)

Table 2-1： Parts List (STM-907-HT)

No.	Name	Part No.	No.	Name	Part No.
1	Door plank	-	20	Cover plate	-
2	Flat head screw M6×17	YW63061700000	21	Electric heating pipe (120×120, 9kw)*	BH70091000050
3	Electrical mounting plate	-	22	Flat gasket 10	YW66102500000
4	HANYOUNG controller MT100-01	YE81100010000	23	Elastic gasket 10	YW65010000000
5	electrical control box	-	24	Inner hexagon socket cap screw M10×25	YW61102500000
6	Backboard of electric components cabinet	-	25	Electric heating pipe cover	BL80091000120
7	Flat gasket 8	YW66082200100	26	Cooling pipe	BL43907190020
8	Elastic gasket 8	YW65008000200	27	Liquid level indicator	BH12060700210
9	Inner hexagon socket cap screw M8×20	YW61082000200	28	Copper ball core valve 1/4"	YY60001430000
10	Side plate	-	29	Copper teflon pipe connection 3/8H×3/8PT	BH12030800610
11	Pressure gauge 0~10kg	YW85001000100	30	The second set of copper connection	BH12060702010
12	Magnetic pump MP-55	BM20005500050	31	Y type water strainer	YW57010200000
13	Cooling tank	-	32	Copper connection	-
14	Heating tank	-	33	Solenoid valve *	YE32215400000
15	Cover plate of float ball	-	34	Stainless steel ball valve3/8"(Resist to high temperature of 300 degrees)	YW50030800200
16	Copper pipe coupler 1/4PT×1/4PT	BH12010400110	35	Rear plate	-
17	Copper teflon pipe connection 1/4H×1/4PT	BH12010400410	36	EGO protection box	YR40000400300
18	Float ball	YW09703600000	37	Thick-headed screw M4×5	YW62040600000
19	Switch control cover	-	38	2" castor	YW03000200000

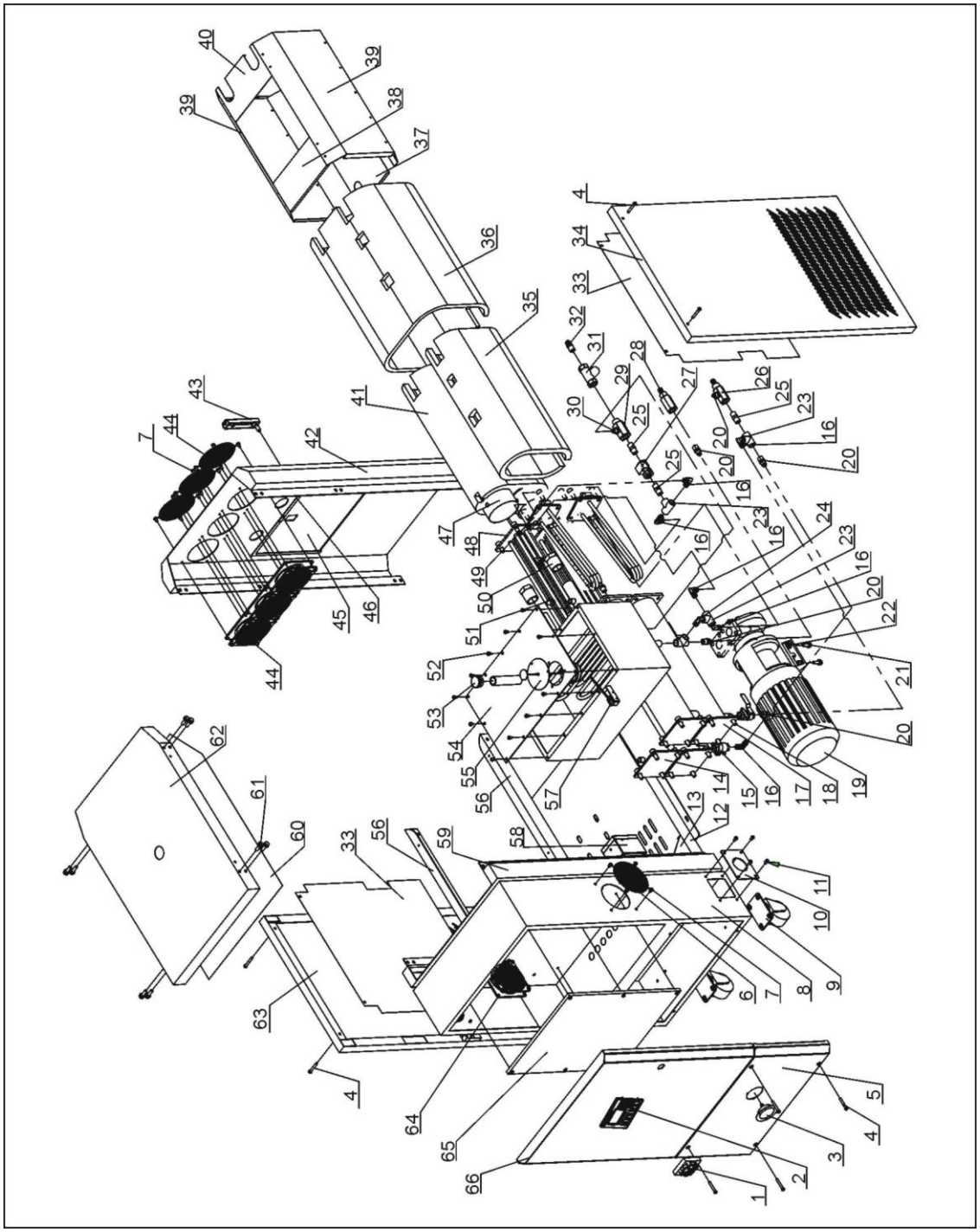
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

Table 2-2：Parts List (STM-1215-HT)

No.	Name	Part No.	No.	Name	Part No.
1	Door plank	-	20	Cover plate	-
2	Flat head screw M6×17	YW63061700000	21	Electric heating pipe (120×120, 12kw)*	BH70122000050
3	Electrical mounting plate	-	22	Flat gasket 10	YW66102500000
4	HANYOUNG controller MT100-01	YE81100010000	23	Elastic gasket 10	YW65010000000
5	electrical control box	-	24	Inner hexagon socket cap screw M10×25	YW61102500000
6	Backboard of electric components cabinet		25	Electric heating pipe cover	BL80091000120
7	Flat gasket 8	YW66082200100	26	Cooling pipe	BL43121500221
8	Elastic gasket 8	YW65008000200	27	Liquid level indicator	BH12060700210
9	Inner hexagon socket cap screw M8×20	YW61082000200	28	Copper ball core valve 1/4"	YY60001430000
10	Side plate	-	29	Copper teflon pipe connection 3/8H×3/8PT	BH12030800610
11	Pressure gauge 0~10kg	YW85001000100	30	The second set of copper connection	BH12060702010
12	Magnetic pump MP-100	BM20123400000	31	Y type water strainer	YW57010200000
13	Cooling tank	-	32	Copper connection	-
14	Heating tank	-	33	Solenoid valve *	YE32215400000
15	Cover plate of float ball		34	Stainless steel ball valve3/8"(Resist to high temperature of 300 degrees)	YW50030800200
16	Copper pipe coupler 1/4PT×1/4PT	BH12010400110	35	Rear plate	-
17	Copper teflon pipe connection 1/4H×1/4PT	BH12010400410	36	EGO protection box	YR40000400300
18	Float ball	BL43121500621	37	Thick-headed screw M4×5	YW62040600000
19	Switch control cover	-	38	2" castor	YW03000200000

* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

2.2.3 Assembly Drawing (STM-2440-HT)



Remarks: Please refer to material list 2.2.4 for specific explanation of the Arabic numbers in parts drawing.

Picture 2-3：Assembly Drawing (STM-2440-HT)

2.2.4 Parts List (STM-2440-HT)

Table 2-3：Parts List (STM-2440)

No.	Name	Part No.	No.	Name	Part No.
1	Main power switch	YE10250400000	27	3/8" solenoid valve	YE32215400000
2	HANYOUNG controller	YE81100010000	28	Copper connection 2	-
3	Pressure gauge	YW85001000100	29	Copper connection 4	BH12060702110
4	M4×6 thick-headed screw	YW63064500000	30	Teflon pipe connection 1/4pt×3/8h	BH12010400510
5	Panel	-	31	Y type filter	YW57010200000
6	Fan	-	32	Copper insert m13×1/2pt	BH12131200010
7	M5×10 screw	YW62051000100	33	Side plate clapboard	-
8	Control box	BL43244001521	34	Right side plate	BL43244002420
9	Movable castor	YW03000300000	35	Cooling tank heat-resistant asbestos	-
10	Fixed board	-	36	Cooling tank heat-resistant asbestos 2	-
11	M6×10 screw	YW62061000000	37	Heating tank encircle board 5	-
12	Bottom plate	BL43244002320	38	Heating tank encircle board 2	-
13	Bracket	-	39	Heating tank encircle board 3	-
14	Heating tank	BL43244000921	40	Heating tank encircle board 1	-
15	3/8" float ball (heating insulation 300℃)	YW50030800200	41	Cooling tank heat-resistant asbestos	-
16	Teflon pipe connection 3/8pt×3/8h I type	YW04030800300	42	Rear plate	BL43244001220
17	Cooling tank auxiliary oil tank	BL43244000321	43	Liquid level indicator	BH12030000010
18	M10×25 inner hexagon screw	YW61102500000	44	Fan	YM60423000000
19	Magnetic drive pump	BM20283300050	45	Mini cover board of backboard	BL43244001120
20	Teflon pipe connection 8/3pt×3/8h ltype	BH12030800610	46	Mini cover board of backboard bracket	BL43244001120
21	External hexagonal screw m10×35	YW60103500000	47	Pipe heater cover	BL80091000120
22	M10 external hexagonal screw	YW64001000100	48	Heating pipe	BH70244000250

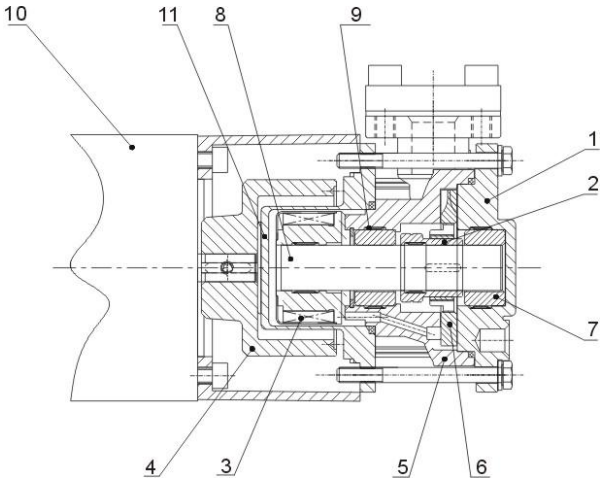
23	3/8" stainless steelthree way	YW52030800000	49	Cooling pipe	-
24	Pipe coupler 3/8pt×3/8 pt I type	YW04030800100	50	Water flow regulator connector	-
25	Pipe coupler 3/8pt×3/8pt	BH12030800110	51	Screw 1/4pt	BH12010400710
26	Connector	-	52	Flat head screw M6×15	YW62061500000
No.	**Name**	**Part No.**	**No.**	**Name**	**Part No.**
53	Oil cap 3/4pt	BH12030403040	60	Top plate heat-resistant board	-
54	Oil tank cover board	BL43244002520	61	External hexagonal screw M8×20	YW60082000300
55	Float ball	BL43244001221	62	Top plate	-
56	Support beam	-	63	Left side plate	BL43244002420
57	Microswitch	YE14152400000	64	Ventilation fan + fan guard	YM60922500100
58	Ego protection box	YR40000400300	65	Electrical control box base	BL43244002120
59	Front panel	-	66	Panel	-

* means possible broken parts.

** means easy broken part. and spare backup is suggested.

Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

2.2.5 Pump



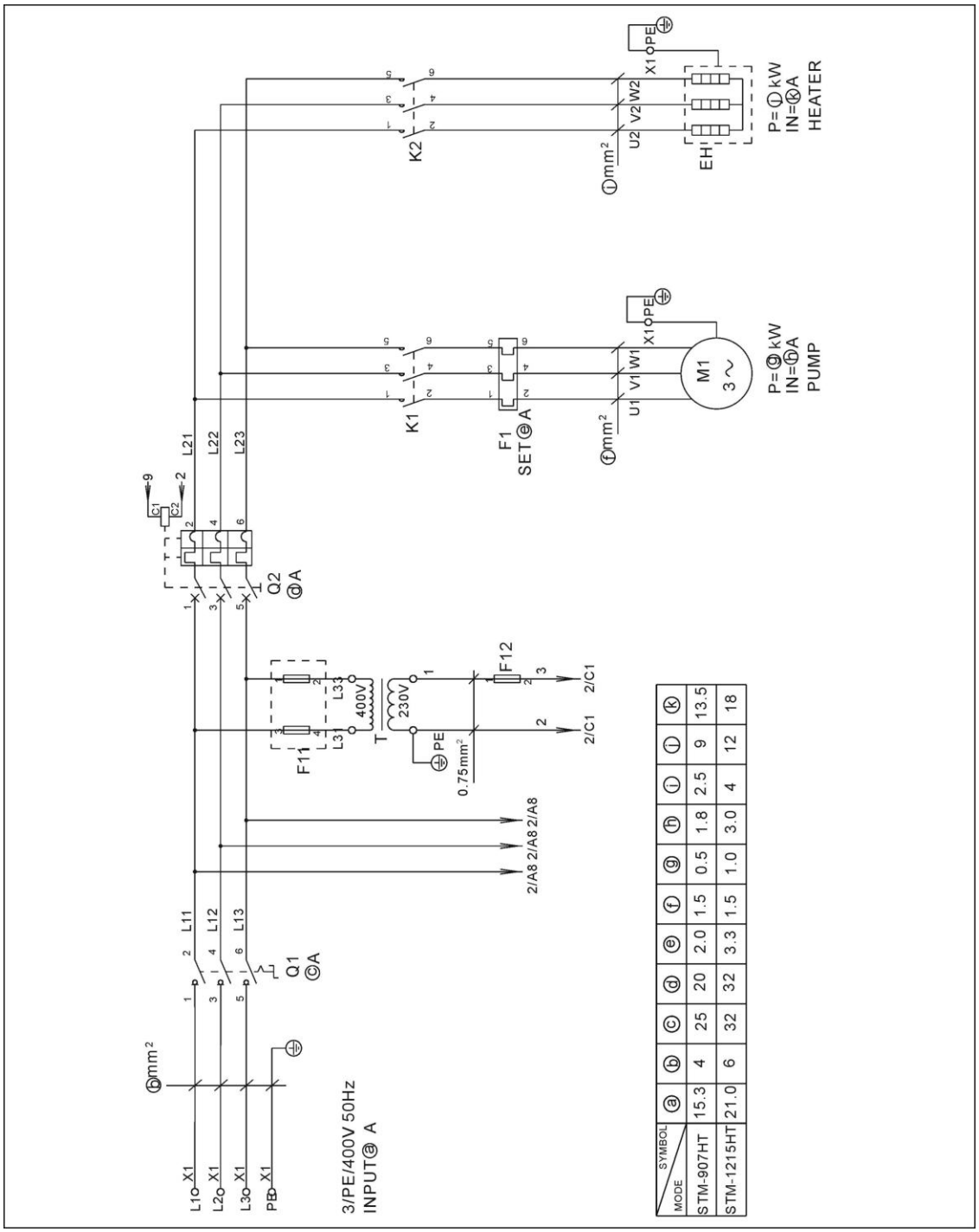
Names of Parts:

1. Pump cover	2. Shaft sleeve	3. Inner magnetic coupler
4. Out magnetic coupler	5. Pump body	6. Paddle wheel
7. Carbonated silcon bearing		8. Ceramic stick
9. Lockup parts	10. Motor	11. Magnetic cover

Picture 2-4：Pump

2.3 Electrical Diagram

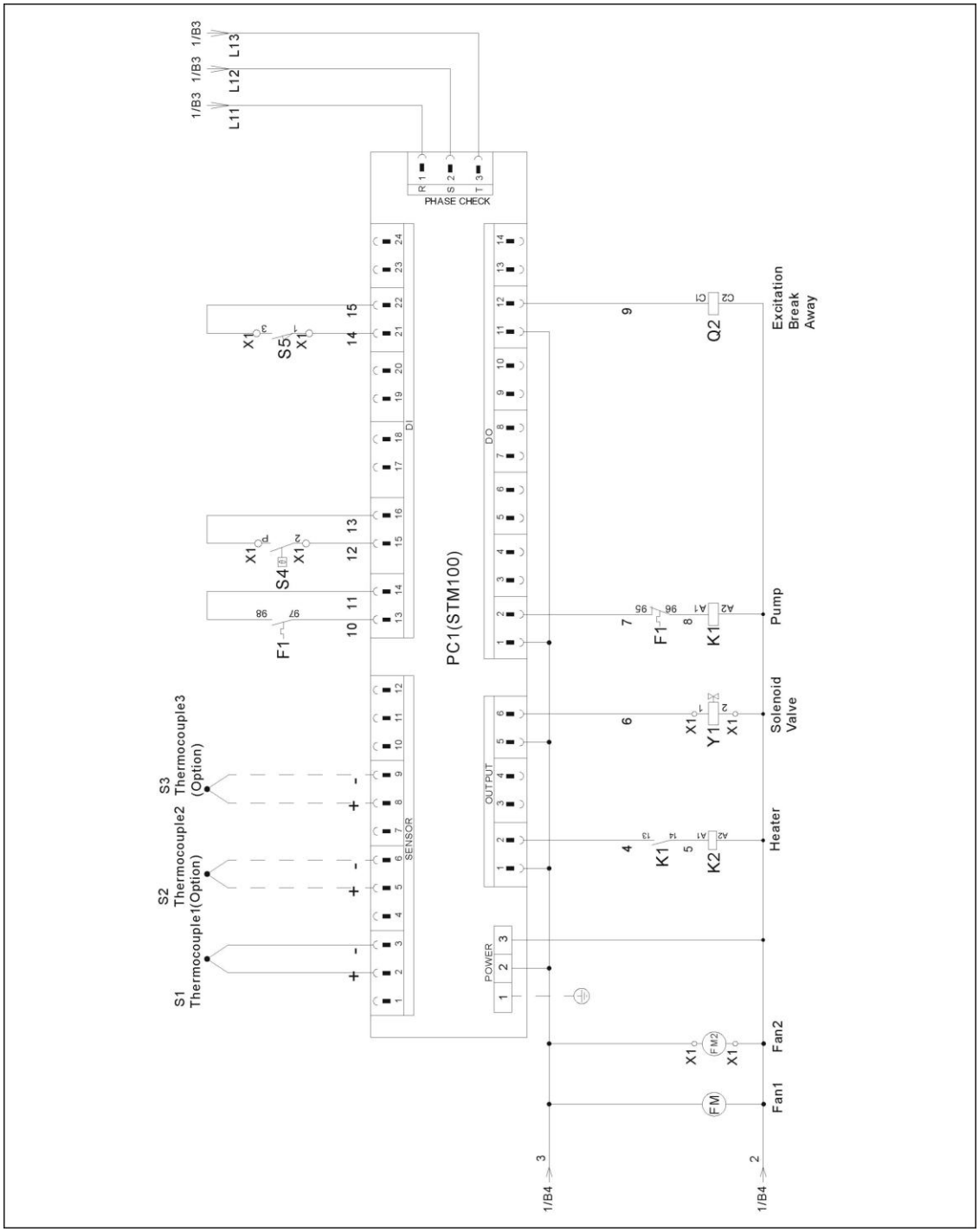
2.3.1 Main Circuit (STM-907/1215-HT 400V)



SYMBOL / MODE	ⓐ	ⓑ	ⓒ	ⓓ	ⓔ	ⓕ	ⓖ	ⓗ	ⓘ	ⓙ	ⓚ
STM-907HT	15.3	4	25	20	2.0	1.5	0.5	1.8	2.5	9	13.5
STM-1215HT	21.0	6	32	32	3.3	1.5	1.0	3.0	4	12	18

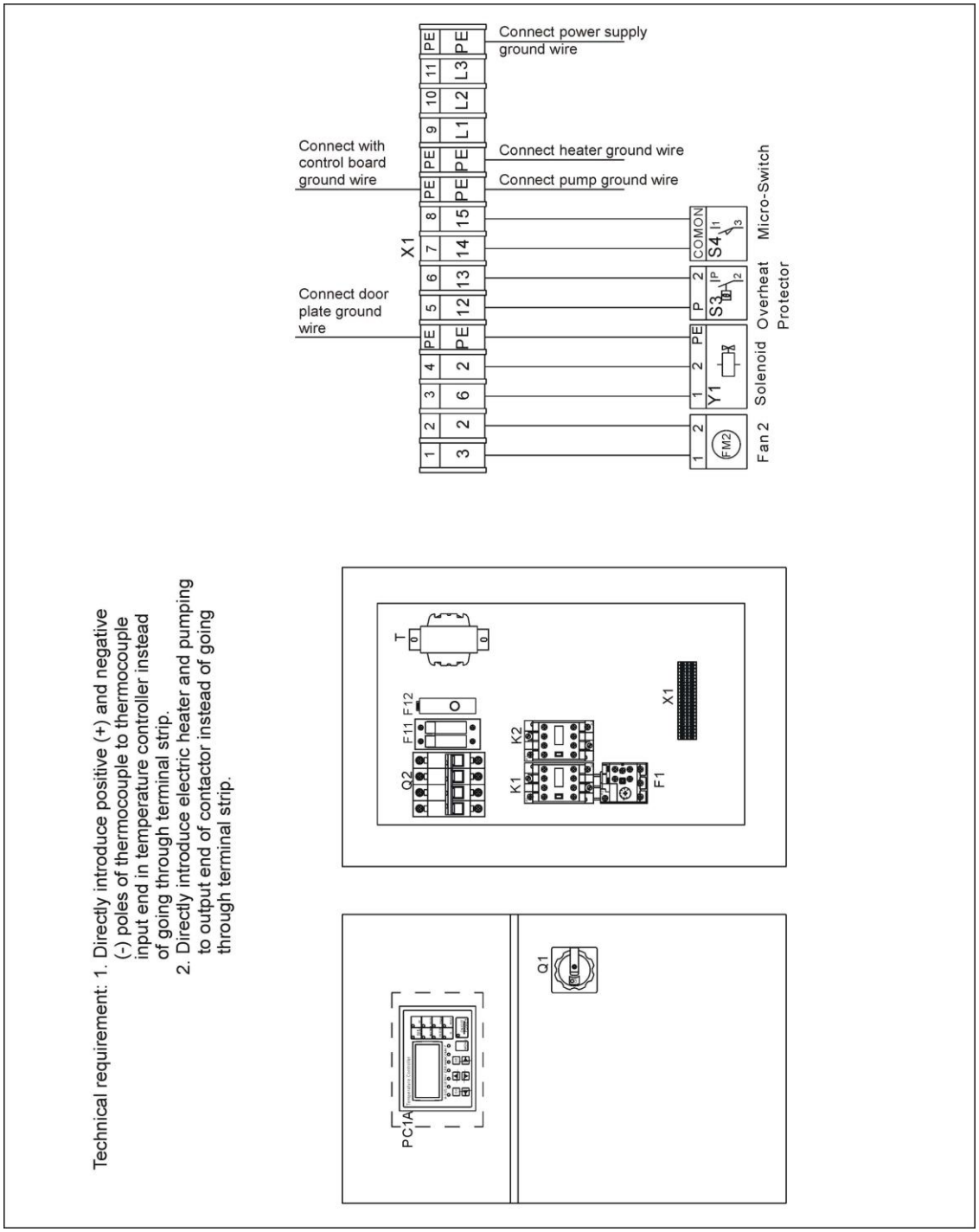
Picture 2-5：Main Circuit (STM-907/1215-HT 400V)

2.3.2 Control Circuit (STM-907/1215-HT 400V)



Picture 2-6: Control Circuit (STM-907/1215-HT 400V)

2.3.3 Electrical Components Layout (STM-907/1215-HT 400V)



Picture 2-7： Electrical Components Layout (STM-907/1215-HT 400V)

2.3.4 Electrical Components List (STM-907/1215-HT 400V)

Table 2-4：Electrical Components List (STM-907-HT 400V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	25A	YE10125250000
2	Q2	Circuit breakers*	20A	YE40602000000
3	-	Excitation break away	-	YE40023560000
4	K1	Contactors*	220V 50/60Hz	YE00601521000
5	K2	Contactors**	220V 50/60Hz	YE00602522000
6	F1	Overload relays	1.8~2.5A	YE01160180000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	F12	Fuse**	2A	YE41001000000
10	T	Transformer**	500mA	YE70402300800
11	S1	Thermocouple	-	-
12	S2 S3	Thermocouple	-	-
13	S4	Overheat protrctor*	-	-
14	S5	Limit switch	250V 5(4)	YE14152400000
15	PC1	Circuit board**	100~240VAC 50/60Hz	YE81100010000
16	A	Control panel	-	
17	X1	Terminal board	-	YE61250040000
18	-	Terminal board	-	YE61253500000
19	-	Terminal board	-	YE61040000000
20	-	Terminal board	-	YE61043500000
21	M1	Motor**	400V 50Hz 0.5kW	-
22	EH1	Heater**	400V 50Hz 9kW	-
23	FM1 FM2	Fan*	230V 50/60Hz	-

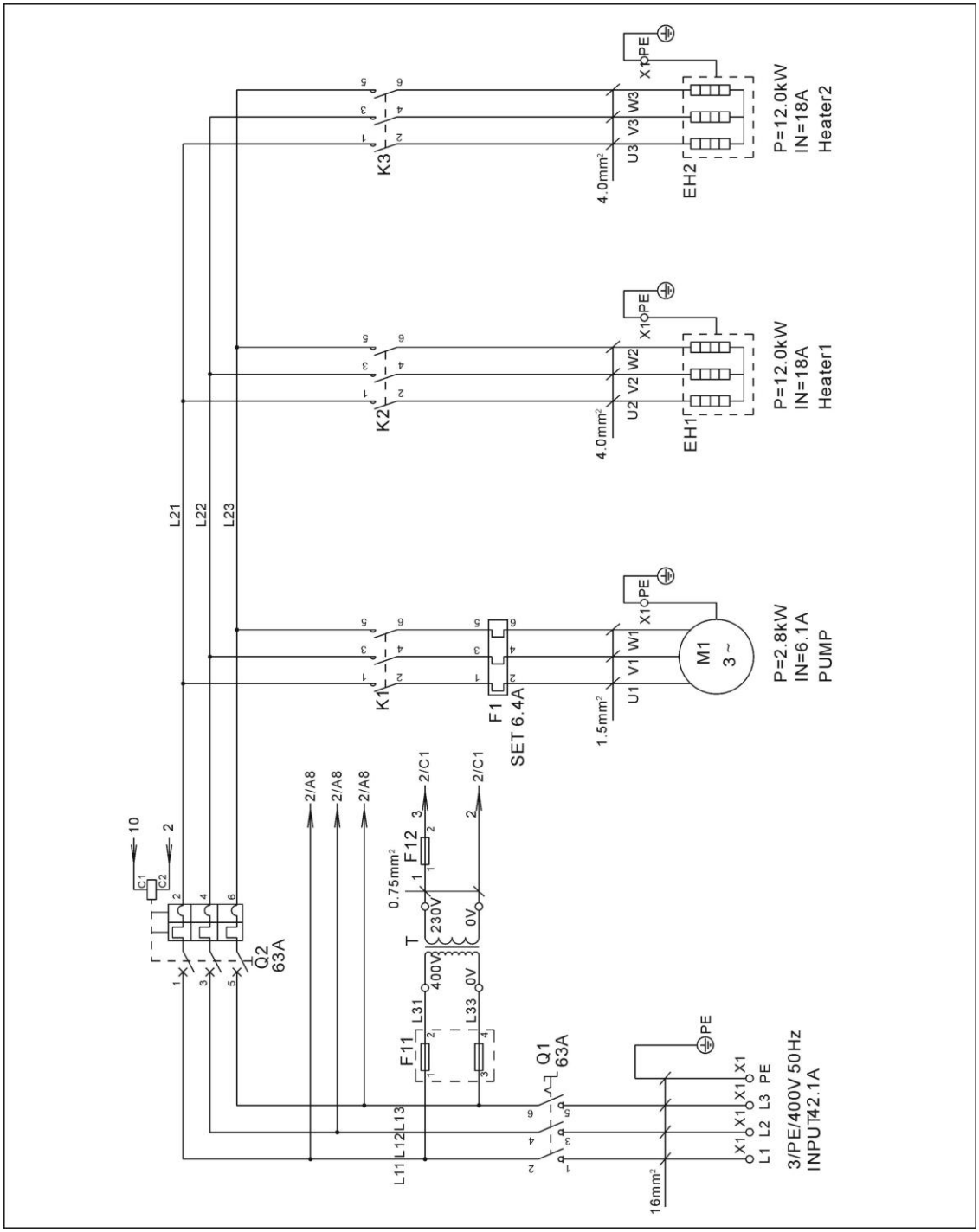
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

Table 2-5：Electrical Components List (STM-1215-HT 400V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	32A	YE10323200000
2	Q2	Circuit breakers*	32A	YE40603200000
3	-	Excitation break away	-	YE40023560000
4	K1	Contactors*	220V 50/60Hz	YE00601521000
5	K2	Contactors**	220V 50/60Hz	YE00602622000
6	F1	Overload relays	2.8~4A	YE01160280000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	F12	Fuse**	2A	YE41001000000
10	T	Transformer**	500mA	YE70402300800
11	S1	Thermocouple	-	-
12	S2 S3	Thermocouple	-	-
13	S4	Overheat protrctor*	-	-
14	S5	Limit switch	250V 5(4)	YE14152400000
15	PC1	Circuit board**	100~240VAC 50/60Hz	YE81100010000
16	A	Control panel	-	
17	X1	Terminal board	-	YE61250040000
18	-	Terminal board	-	YE61253500000
19	-	Terminal board	-	YE61040000000
20	-	Terminal board	-	YE61060000000
21	-	Terminal board	-	YE61063500000
22	M1	Motor**	400V 50Hz 1.0kW	-
23	EH1	Heater**	400V 50Hz 12kW	-
24	FM1 FM2	Fan*	230V 50/60Hz	-

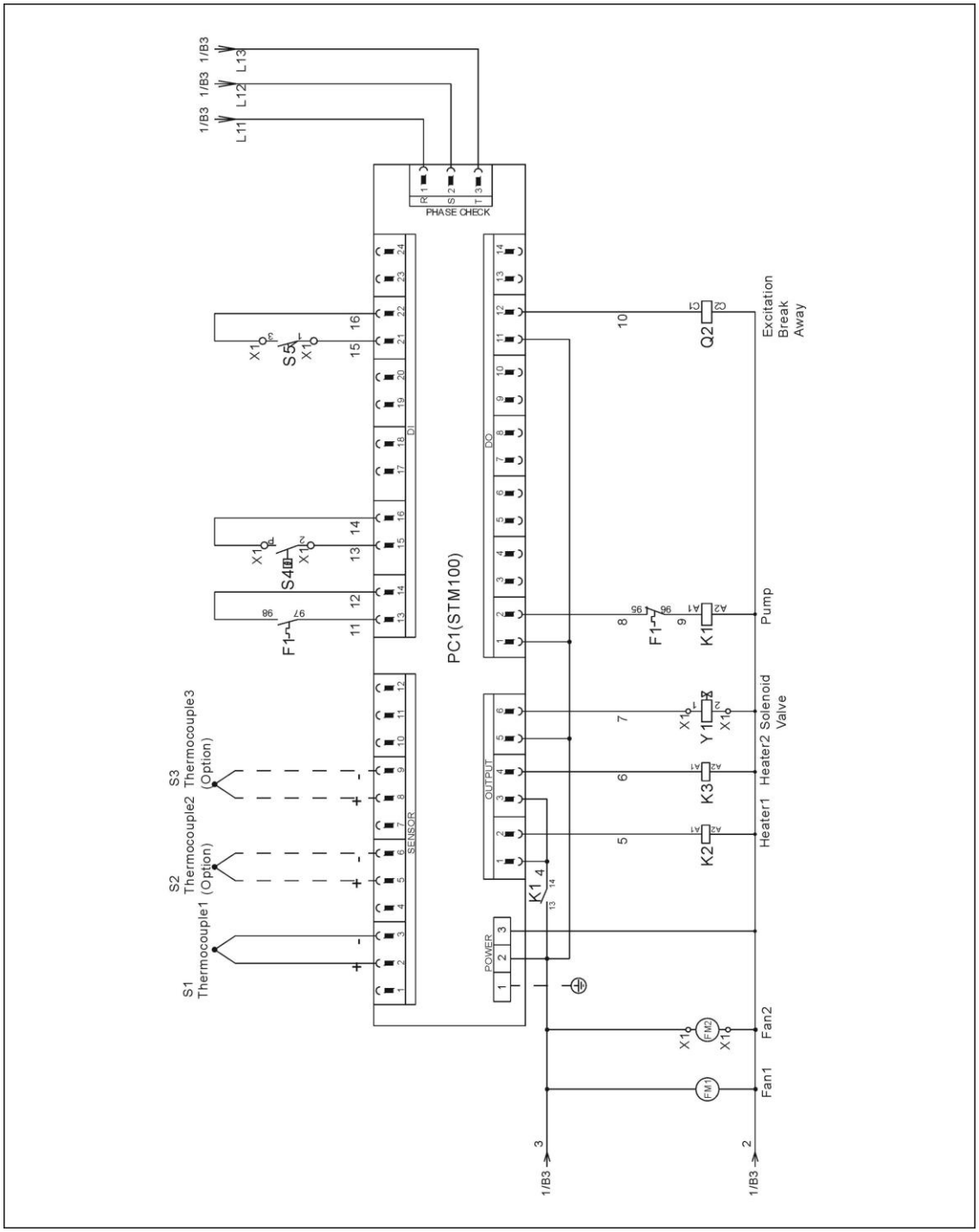
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

2.3.5 Main Circuit (STM-2440-HT 400V)



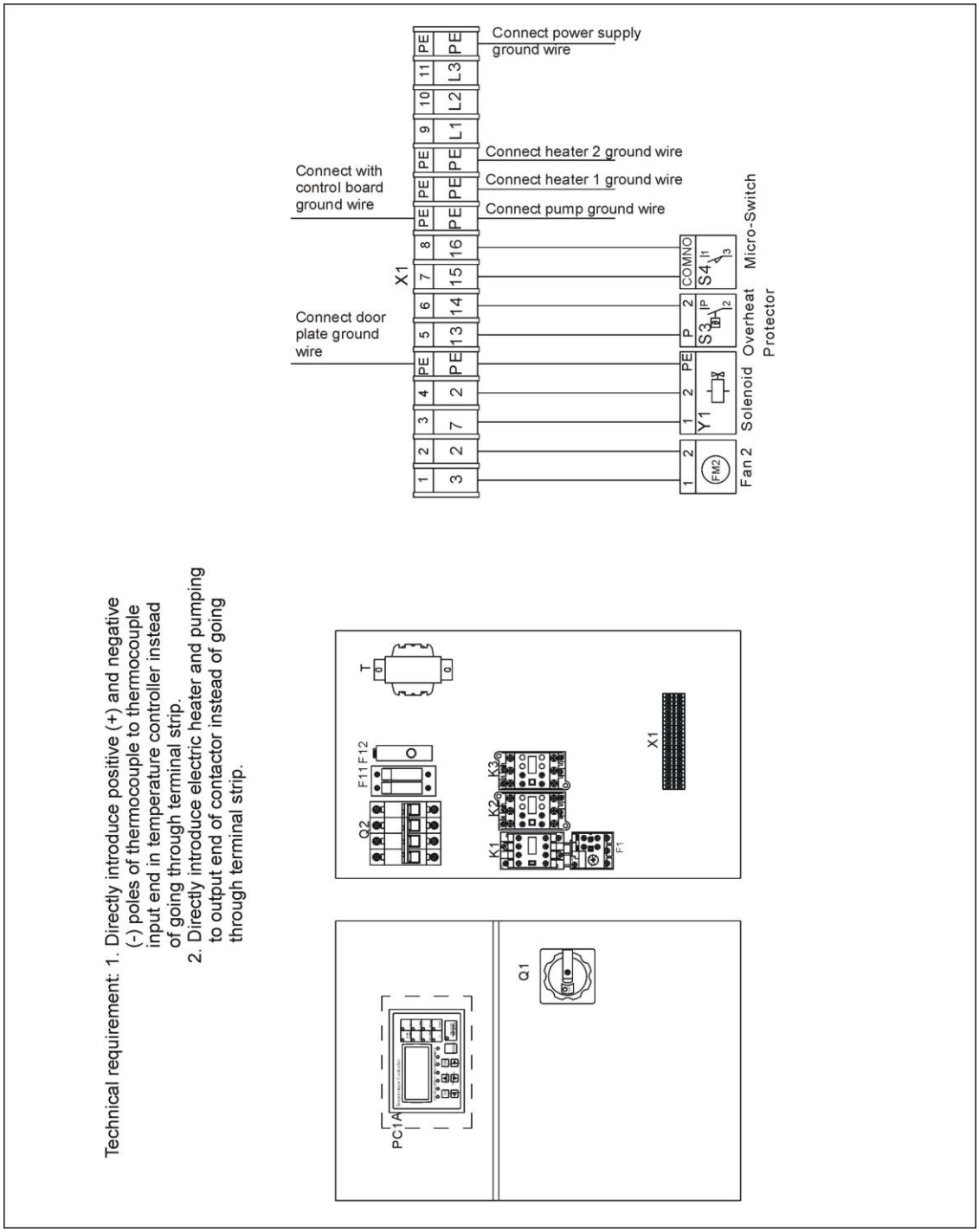
Picture 2-8: Main Circuit (STM-2440-HT 400V)

2.3.6 Control Circuit (STM-2440-HT 400V)



Picture 2-9：Control Circuit (STM-2440-HT 400V)

2.3.7 Electrical Components Layout (STM-2440-HT 400V)



Picture 2-10: Electrical Components Layout (STM-2440-HT 400V)

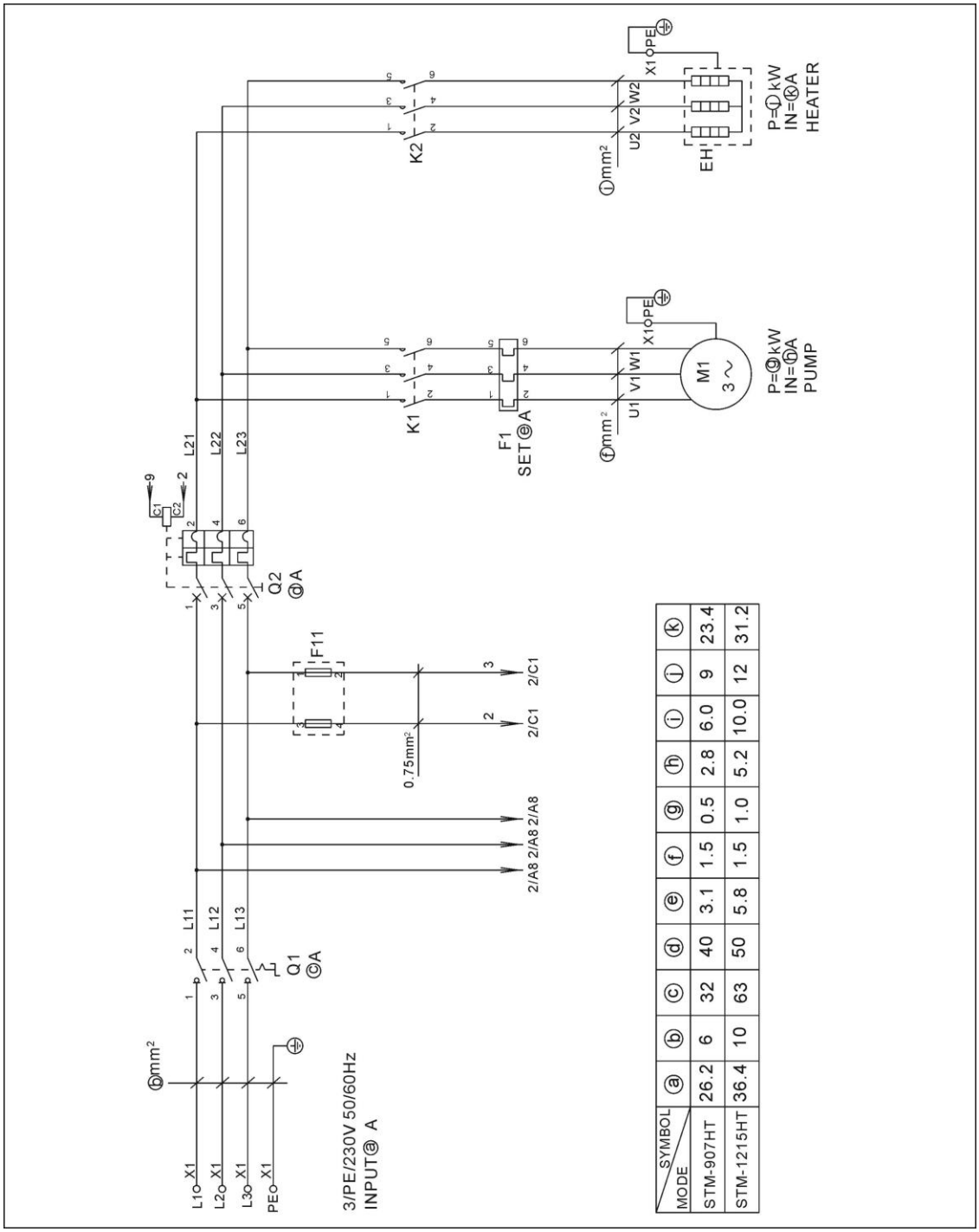
2.3.8 Electrical Components List (STM-2440-HT 400V)

Table 2-6: Electrical Components List (STM-2440-HT 400V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	63A	YE10636300000
2	Q2	Circuit breakers*	63A	YE40606000000
3	-	Excitation break away	-	YE40023560000
4	K1	Contactors*	220V 50/60Hz	YE00601521000
5	K2	Contactors**	220V 50/60Hz	YE00602622000
6	F1	Overload relays	5.5~8A	YE01160550000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	F12	Fuse**	2A	YE41001000000
10	T	Transformer**	800mA	YE70402300900
11	S1	Thermocouple	-	-
12	S2 S3	Thermocouple	-	-
13	S4	Overheat protrctor*	-	-
14	S5	Limit switch	250V 5(4)	YE14152400000
15	PC1	Circuit board**	100~240VAC 50/60Hz	YE81100010000
16	A	Control panel	-	
17	X1	Terminal board	-	YE61250040000
18	-	Terminal board	-	YE61253500000
19	-	Terminal board	-	YE61043500000
20	-	Terminal board	-	YE61060000000
21	-	Terminal board	-	YE61063500000
22	M1	Motor**	400V 50Hz 2.8kW	-
23	EH1 EH2	Heater**	400V 50Hz 12kW	-
24	FM1 FM2	Fan*	230V 50/60Hz	-

* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

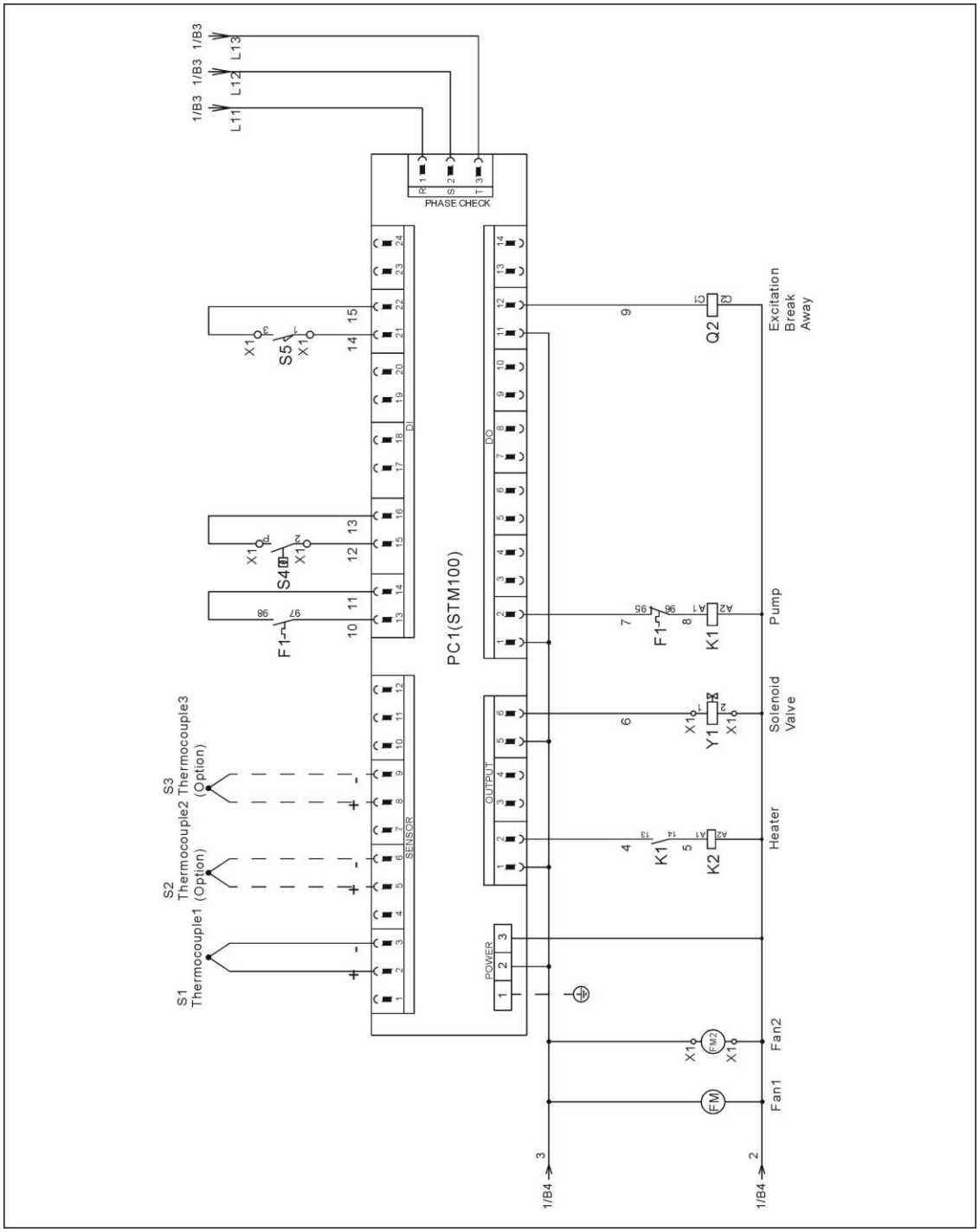
2.3.9 Main Circuit (STM-907/1215-HT 230V)



SYMBOL / MODE	ⓐ	ⓑ	ⓒ	ⓓ	ⓔ	ⓕ	ⓖ	ⓗ	ⓘ	ⓙ	ⓚ
STM-907HT	26.2	6	32	40	3.1	1.5	0.5	2.8	6.0	9	23.4
STM-1215HT	36.4	10	63	50	5.8	1.5	1.0	5.2	10.0	12	31.2

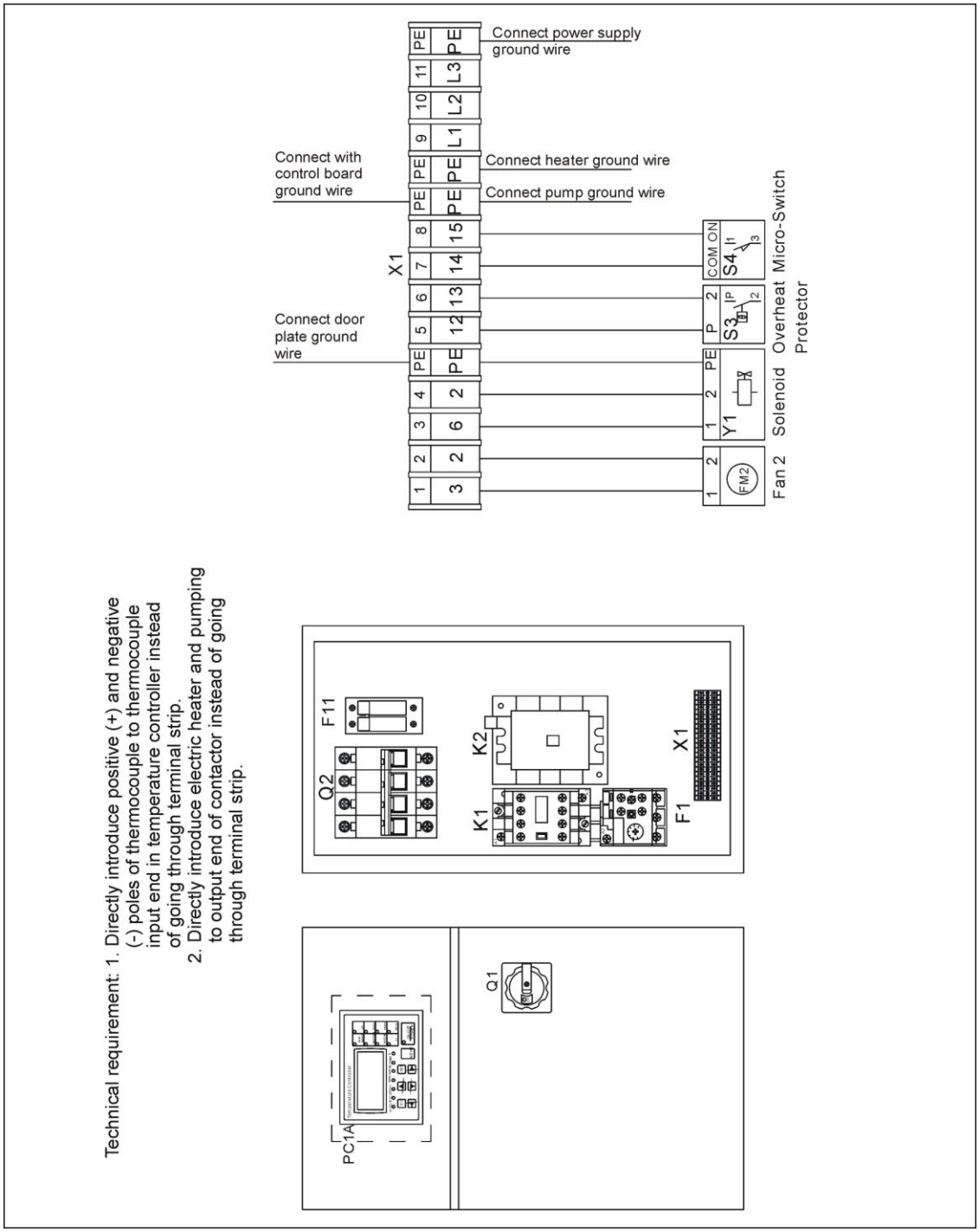
Picture 2-11: Main Circuit (STM-907/1215-HT 230V)

2.3.10 Control Circuit (STM-907/1215-HT 230V)



Picture 2-12: Control Circuit (STM-907/1215-HT 230V)

2.3.11 Electrical Components Layout (STM-907/1215-HT 230V)



Picture 2-13: Electrical Components Layout (STM-907/1215-HT 230V)

2.3.12 Electrical Components List (STM-907/1215-HT 230V)

Table 2-7: Electrical Components List (STM-907-HT 230V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	32A	YE10323200000
2	Q2	Circuit breakers*	40A	YE40602000000
3	-	Excitation break away	-	YE40023560000
4	K1	Contactors*	220V 50/60Hz	YE00601521000
5	K2	Contactors**	220V 50/60Hz	YE00602722000
6	F1	Overload relays	2.8~4A	YE01160280000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	S1	Thermocouple	-	-
10	S2 S3	Thermocouple	-	-
11	S4	Overheat protrctor*	-	-
12	S5	Limit switch	250V 5(4)	YE14152400000
13	PC1	Circuit board**	100~240VAC 50/60Hz	YE81100010000
14	A	Control panel	-	
15	X1	Terminal board	-	YE61250040000
16	-	Terminal board	-	YE61253500000
17	-	Terminal board	-	YE61060000000
18	-	Terminal board	-	YE61063500000
19	M1	Motor**	230V 50Hz 0.5kW	-
20	EH1	Heater**	230V 50Hz 9kW	-
21	FM1 FM2	Fan*	230V 50/60Hz	-

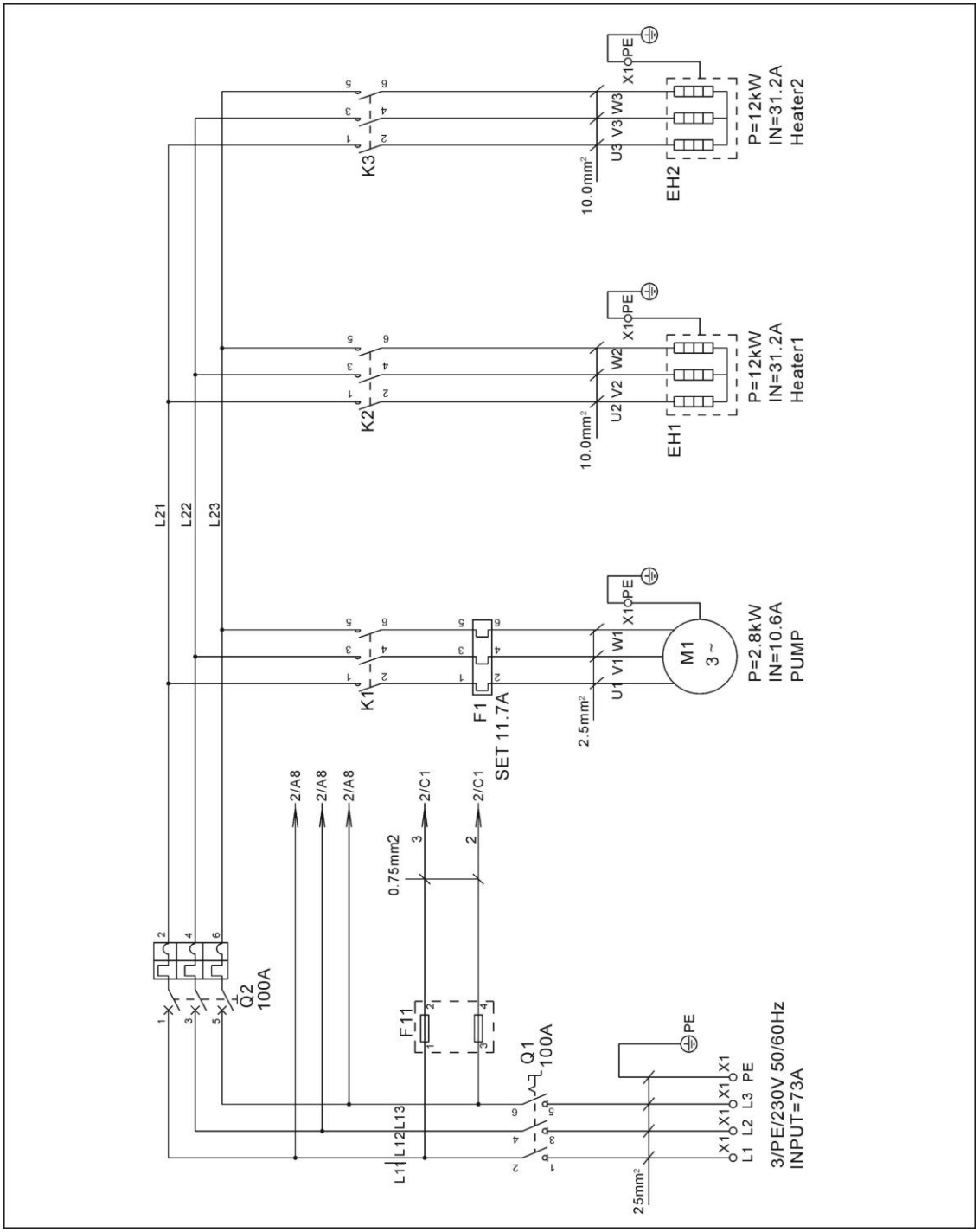
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

Table 2-8：Electrical Components List (STM-1215-HT 230V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	63A	YE10323200000
2	Q2	Circuit breakers*	50A	YE40602000000
3	-	Excitation break away	-	YE40023560000
4	K1	Contactors*	220V 50/60Hz	YE00601521000
5	K2	Contactors**	220V 50/60Hz	YE00602722000
6	F1	Overload relays	5.5~8A	YE01160280000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	S1	Thermocouple	-	-
10	S2 S3	Thermocouple	-	-
11	S4	Overheat protrctor*	-	-
12	S5	Limit switch	250V 5(4)	YE14152400000
13	PC1	Circuit board**	100~240VAC 50/60Hz	YE81100010000
14	A	Control panel	-	
15	X1	Terminal board	-	YE61250040000
16	-	Terminal board	-	YE61253500000
17	-	Terminal board	-	YE61060000000
18	-	Terminal board	-	YE61063500000
19	M1	Motor**	230V 50Hz 1.0kW	-
20	EH1	Heater**	230V 50Hz 12kW	-
21	FM1 FM2	Fan*	230V 50/60Hz	-

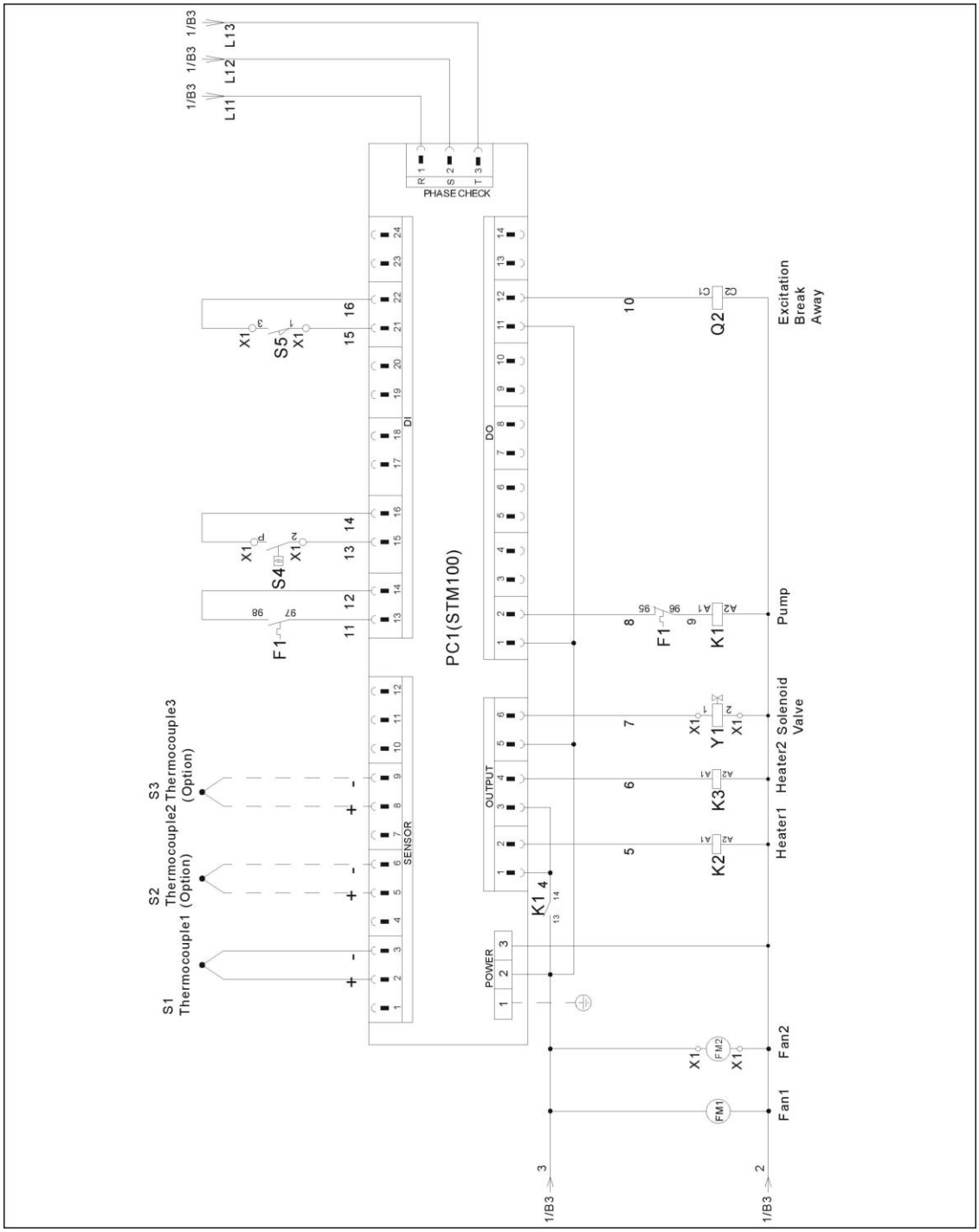
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

2.3.13 Main Circuit (STM-2440-HT 230V)



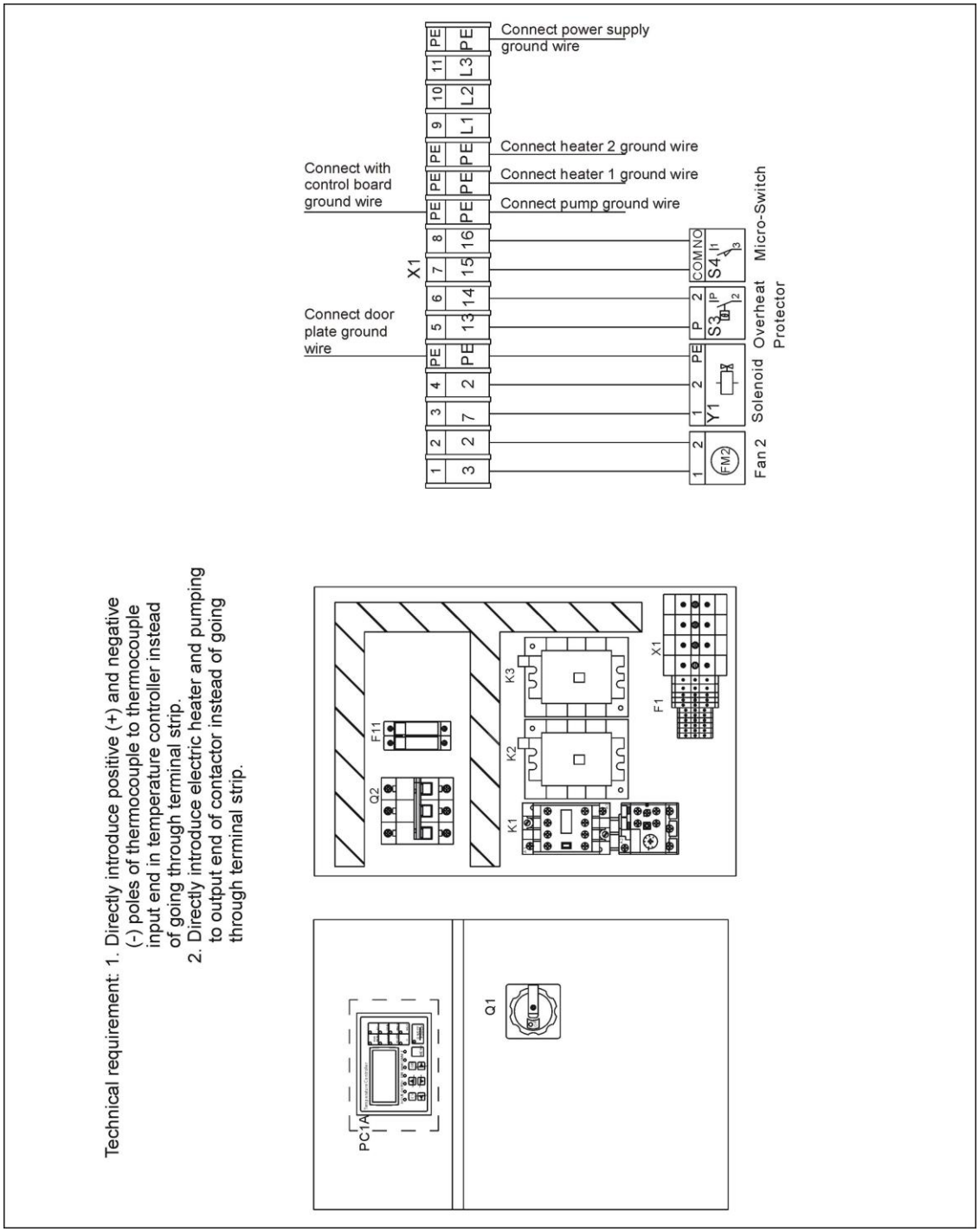
Picture 2-14: Main Circuit (STM-2440-HT 230V)

2.3.14 Control Circuit (STM-2440-HT 230V)



Picture 2-15: Control Circuit (STM-2440-HT 230V)

2.3.15 Electrical Components Layout (STM-2440-HT 230V)



Picture 2-16: Electrical Components Layout (STM-2440-HT 230V)

2.3.16 Electrical Components List (STM-2440-HT 230V)

Table 2-9：Electrical Components List (STM-2440-HT 230V)

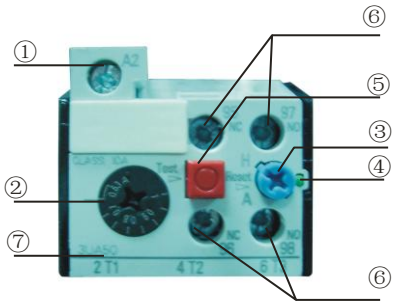
No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	100A	YE10010000000
2	Q2	Circuit breakers*	100A	YE40100300000
3	-	Excitation break away	-	YE40023560000
4	K1	Contactors*	220V 50/60Hz	YE00601721000
5	K2	Contactors**	220V 50/60Hz	YE00503500000
6	F1	Overload relays	11~16A	YE01611640000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	S1	Thermocouple	-	-
10	S2 S3	Thermocouple	-	-
11	S4	Overheat protrctor*	-	-
12	S5	Limit switch	250V 5(4)	YE14152400000
13	PC1	Circuit board**	100~240VAC 50/60Hz	YE81100010000
14	A	Control panel	-	
15	X1	Terminal board	-	YE61250040000
16	-	Terminal board	-	YE61253500000
17	-	Terminal board	-	YE61103500000
18	-	Terminal board	-	YE61163500000
19	M1	Motor**	400V 50Hz 2.8kW	-
20	EH1 EH2	Heater**	400V 50Hz 12kW	-
21	FM1 FM2	Fan*	230V 50/60Hz	-

* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

2.4 Main Electrical Components Description

2.4.1 Overload Relay

At delivery, the overload relay is set for mannual reset. (the reset button pointing to H). Manually reset the relay at the tripping of the switch. When motor overload occurs, stop the machine, then check and solve the problem. After that open the door of control box, press down the reset button of overload relay (if you can not press down the reset button, wait for one minute).

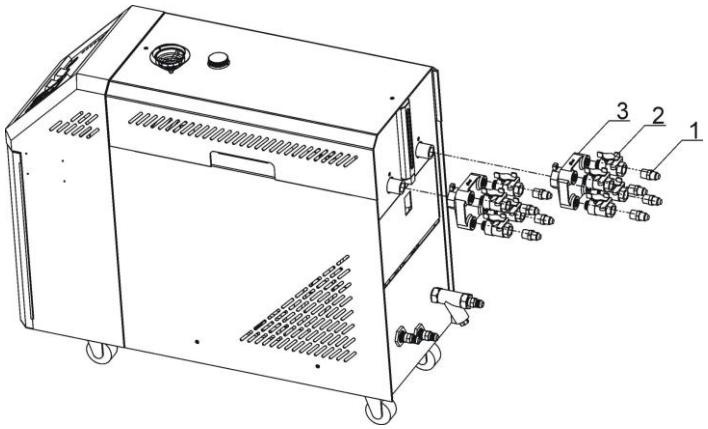


Picture 2-17：Overload Relay

1) Terminal for contact coil A2.
2) Setting current adjusting scale.
3) Reset (blue).
H: manual reset
A: automatic reset
4) Switch position indication (green).
   Tripping of a manual-resetting is indicated by a pin projecting from the front plate.
5) Test button (red).
6) Auxiliary contact terminals shown in 95.96.97.98. NC and NO contacts are shown in position 95.96. and 97.98. repectively.
7) Main circuit connection No. must be correspond with terminal Number of contactor.

2.5 Operation Procedures

2.5.1 Installation steps for options water manifold (dewaxing)

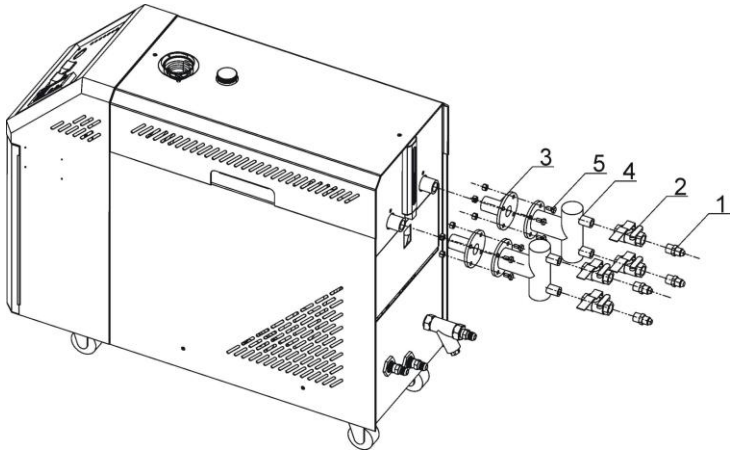


1) Install copper joint to the level valve.
2) Install level valve with copper joint to the dewaxing water manifold.
3) Install water manifold to the machine.
4) Install Teflon to copper joint.

Note!

For the operating temperature not higher than 200℃, Teflon with temperature resistance 200℃ is usable; for the operating temperature from 200 to 300℃, must use Teflon with temperature resistance 300℃.

2.5.2 Installation steps for options water manifold (welding)



1) Install copper joint to the level valve.
2) Install level valve with copper joint to the welding water manifold.
3) Install water manifold to the machine.
4) Connect water manifold with manifold joint via screws.
5) Install Teflon to copper joint.

Note!

For the operating temperature not higher than 200℃, Teflon with temperature resistance 200℃ is usable; for the operating temperature from 200 to 300℃, must use Teflon with temperature resistance 300℃.

3. Installation and Debugging

3.1 Installation Space

During installation of the machine, keep at least 500mm installation space around the machine as shown by the picture. Do not install the machine in a position crowded with other objects. This would cause inconvenience to operation, maintenance and repair.

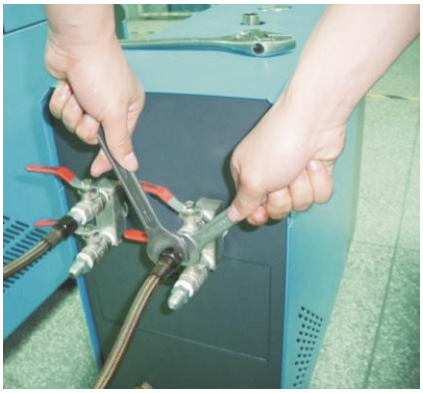
Do not sit on the machine.

Keep away flammable and explosive goods.

Picture 3-1：Installation Space

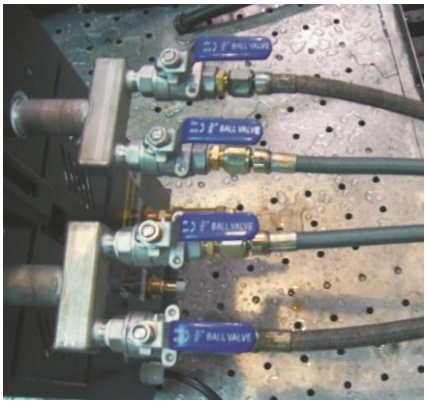
3.2 Mould and Water Coupling

1) When connect mould coupling with pipes from the mould. Use a spanner to secure one end of the coupling, insert mould connecting pipe and fasten it by another spanner.



Picture 3-2：Mould and Water Coupling 1

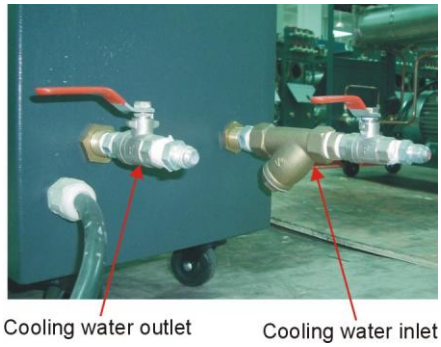
2) Unused mould couplings can be connected with each other by a teflon pipe, as shown in.



Picture 3-3：Mould and Water Coupling 2

Note!

Cooling water inlet and outlet as shown by the picture 3-4.



Picture 3-4：Mould and Water Coupling 3

3) Connect cooling water inlet with water supply and cooling water outlet with a drainage pipe. After that, turn on water supply.

3.3 Power Supply

Make sure that power supply is the same as required before installation.

Mould heater are generally set to be used with 3Φ 400V power supply or other specifications according to customers' requirement.

4. Operation Guide

4.1 Control Panel

Picture 4-1: Control Panel

Table 4-1: Control Panel

No.	Name	Functions	Remarks
1	LCD	Display showing LCD	
2	ON/OFF POWER	Power ON, OFF shift key	After connect power, press “POWER ON/OFF”, initial screen is displayed and starts. Pls note that even if regulator is idle, electrci shock may happen if power is on.
3	MENU	LCD menu shift key	Initial password: 3588
4	SET	Parameters setting	Confirm paramerters
5	SV	Change set value	Modify setting temp.
6	▲/▼	Change parameters	
7	◄/►	Cursor movement	
8	RUN/RESET	Control start and stop	
9	AT	AUTO-TUNING switch start and stop	Auto-tuning can run during operation. Auto-tuning cannot work

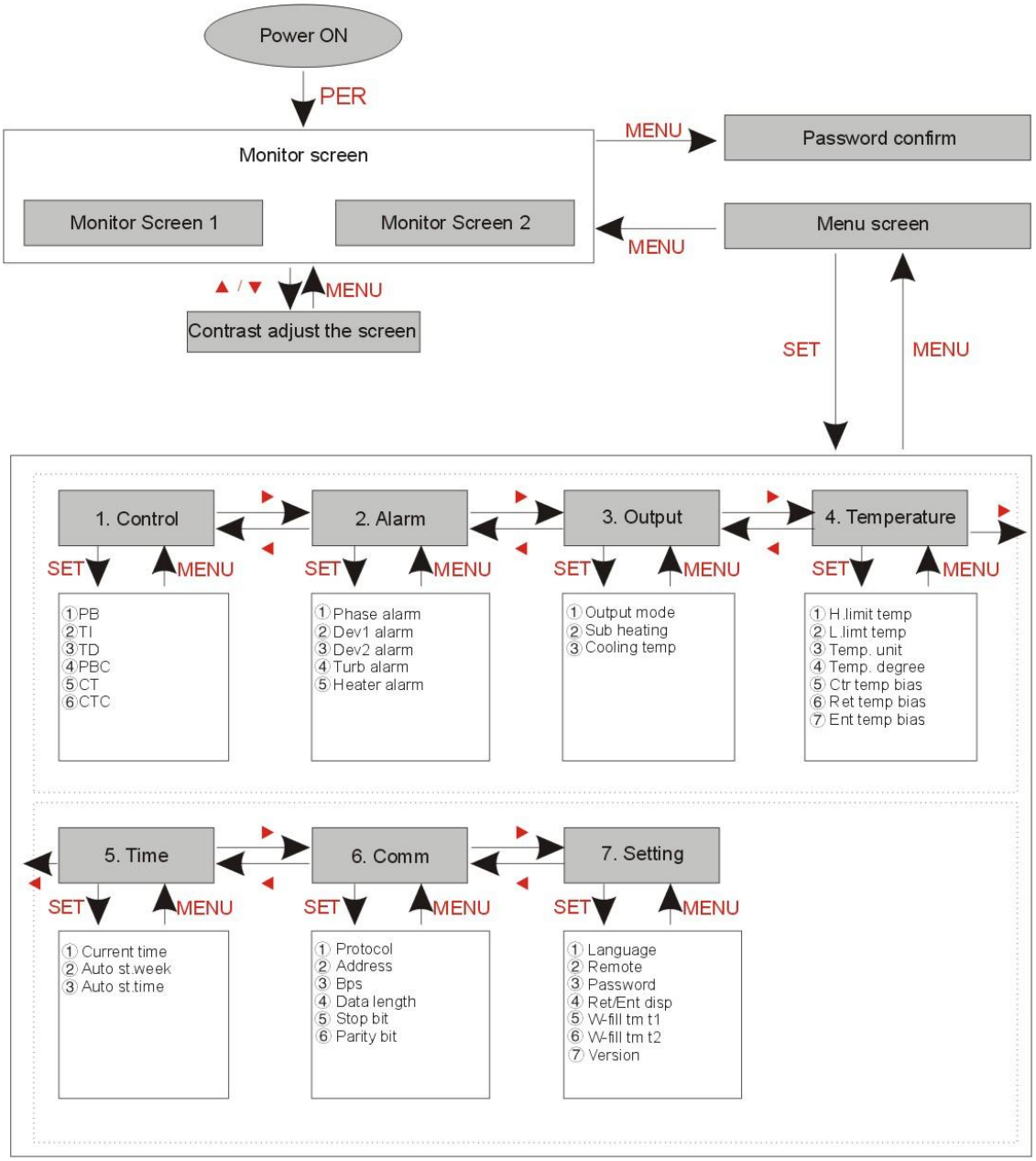
			under SUCTION and COOL operation.
No.	**Name**	**Functions**	**Remarks**
10	SUCTION	SUCTION switch start and stop	SUCTION is to remove medium (watre/oil) from molds. Can not start during operation or cooling. After SUCTION turns on, “SUCTION relay” and “pump inverse run relay” will turn on.
11	COOL	Forced cooling switch start and stop	Press it for 2 secs for forcedcooling, then stop heating output while output 100% cooling control. If control temp. is below Cooling Temp, forced cooling will be auto stopped then control turns off.
12	BUZZER	Turn off buzzer	Press “BUZZER” key and “BUZZER” LED lightens; buzzer and alarm relay are idle even error occurs.
13	AUTO START	Start and stop key	
14	SUCTION OFF	SUCTION relay switch start and stop	Under SUCTION is on, this key is to turn on or off SUCTION relay.
15	F	Not used (for extension)	
16	HEAT	Heating output (MAIN) display LED	
17	SUB	Heating output (SUB) display LED	
18	COOL	Cooling output display LED	
19	PUMP_D	Display pump running LED	
20	PUMP_R	Display pump inverse running LED	
21	WATER	Display water filling LED	
22	ALARM	Give the alarm LED	Refer to table 4-2 for errors type

Table 4-2：Error Type

Error display	Reasons	Alarm	Temp. control
Board error	Controller error	Activated	Stop
Calib error		Activated	Stop
Adc error		Activated	Stop
Rjc error		Activated	Stop
Eeprom error		Activated	Maintain its status
Phase error	Phase disconnect or phase reverse	Activated	Stop
Over temp. ego	Contact input for ego temp. check	Activated	Stop
Over pump	Contact input for pumper overload check	Activated	Stop
Low press	Contact input for low pressure check	Activated	Stop
High press	Contact input for high pressure check	Activated	Stop
L. level water	Contact input for low water level check	Activated	Stop
Appear “-----“ on temperature display	Sensor abnormality	Activated	Stop
Dve1 alarm	Deviation between control temp. and entered temp.	Activated	Maintain its status
Dev2 alarm	Deviation between control temp. and retrieved temp.	Activated	Maintain its status
Turb. Alarm	Control temp. is suddenly dropped	Activated	Maintain its status
Heater alarm	Control temp. does not rise	Activated	Maintain its status

Notes: When alarm sounds, controller will automaticlly start the protective function and stop the machine. Press "ON" to restart the machine.

4.2 Menu Introduction



Pictute 4-2：Menu Outline

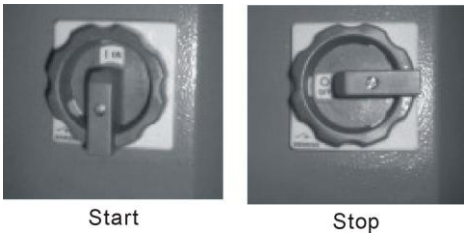
4.3 Machine Startup

1) Conenct pipeline from STM water in/outlet to the mold. (refer to chapter 3.2 for pipeline connection)
2) Connect chilled water port and water backup port. (refer to chapter 3.2 for

pipeline connection)

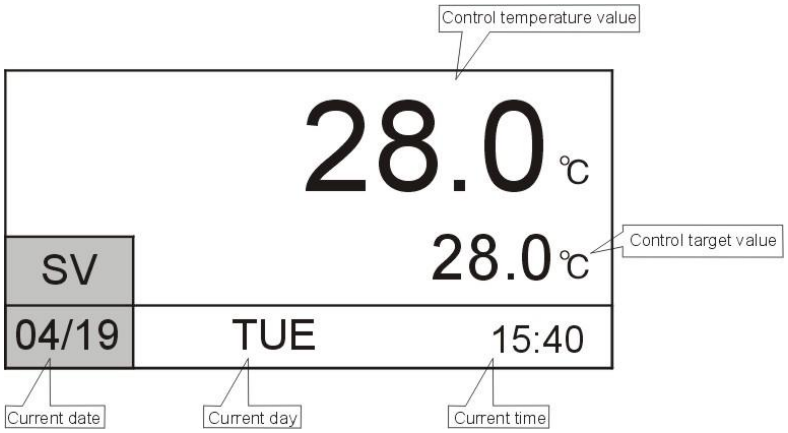
3) Open all the globa valves.

4) Switch on main power.



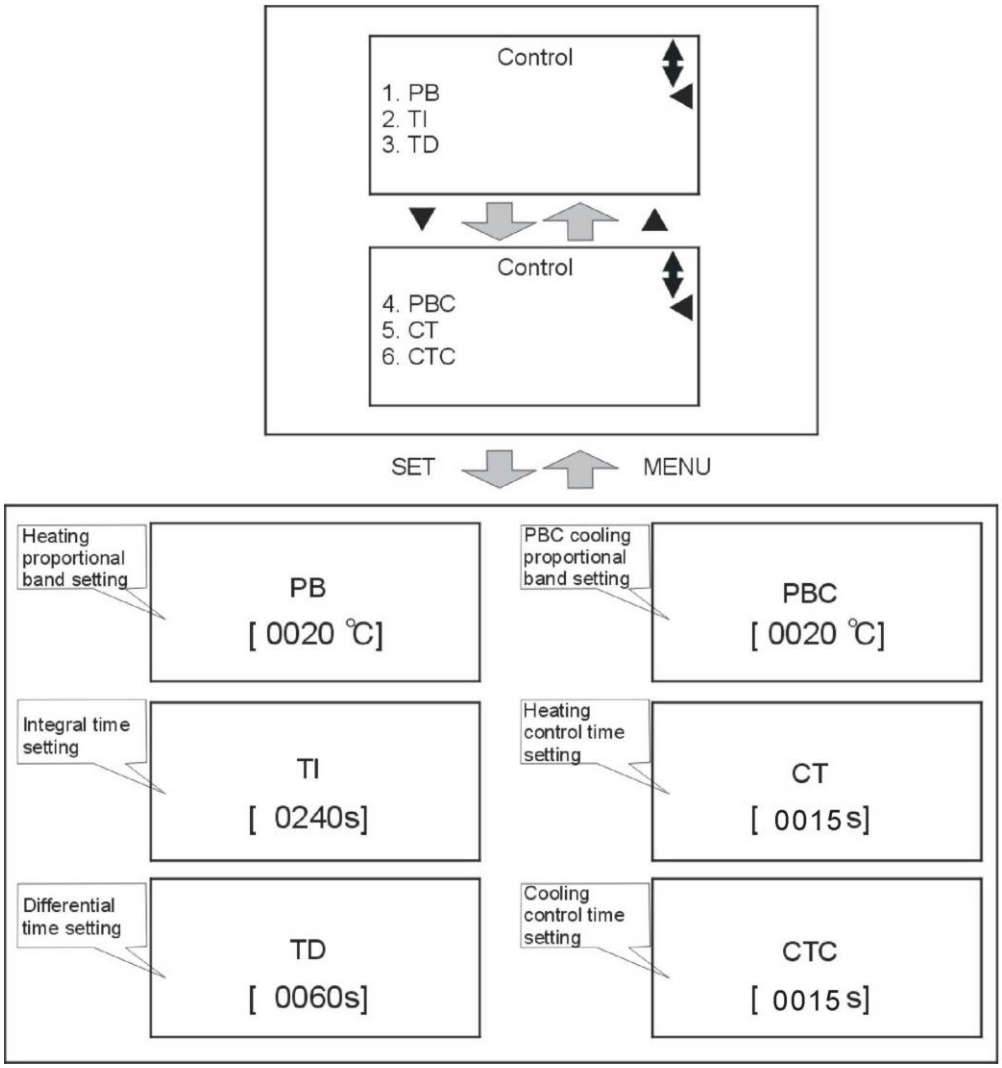
Picture 4-3: Main Power Switch

5) Press ON/OFF POWER key to enter menu screen.



Picture 4-4: Initial Menu

6) Press MENU key to enter menu selection, press ◄/► keys to select control setting, press SET key to enter setting nemu, see picture below. Parameter setting is based on AT auto-tuning. Never change it privately.



Picture 4-5: Control Setting

7) Press MENU key to retuen to menu screen, press ◄/► key to select alarm setting then press SET to enter setting menu, see picture below. Here is parameter setting:

PHASE——used

Water out temp. deviation——0 (not opt for temp. sensor)

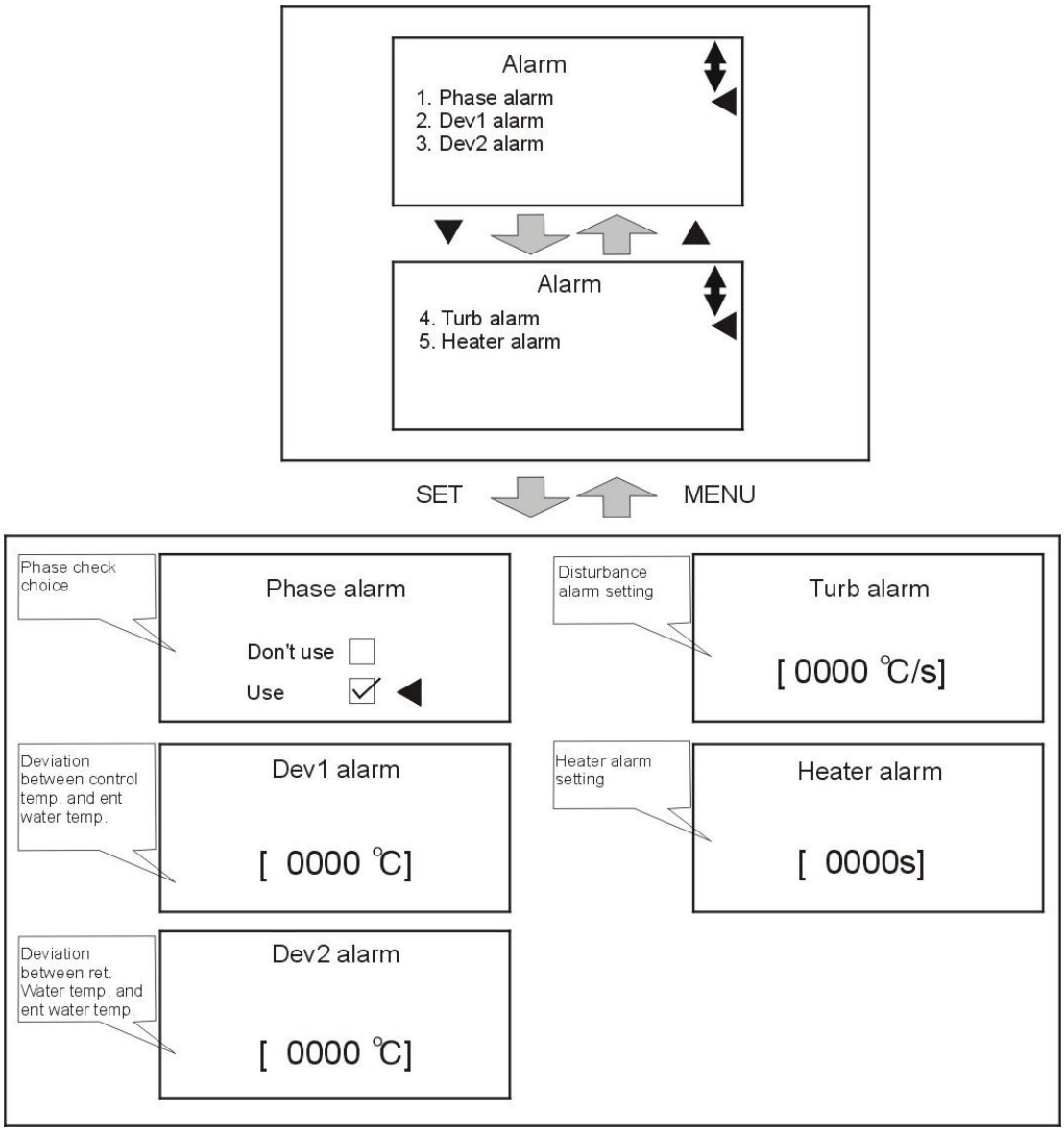
5 (opt for temp. sensor, increase it suitably if frequent alarms)

Return water deviation——0 (ont opt for temp. sensor)

10 (opt for temp. sensor, increase it suitably if frequent alarms)

Interfere alarm——control temp.-10

Heater alarm——depending on auctual setpoint, default setting is 0 upon delivery to make it out of service.



Picture 4-6: Alarm Setting

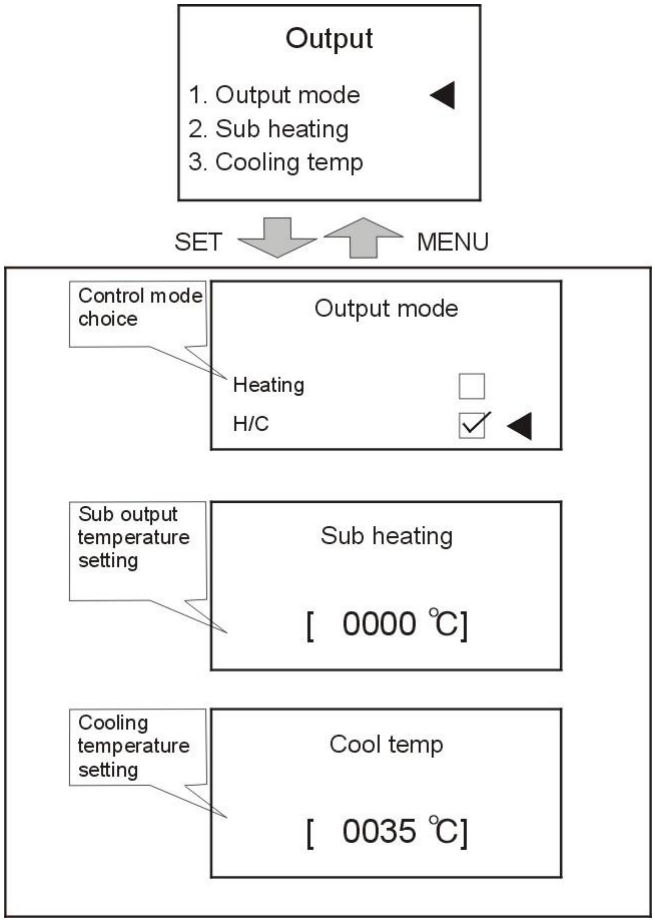
8) Press MENU key to return to menu screen, then press ◄/► key to select output setting and press SET key to enter setting screen, see picture below. Here is parameter setting:

OUTPUT MODE——heating or cooling control

SUB HEATING——0 (only 1 group of heater)

5 (two or more groups of heater)

COOLING TEMP.——35



Picture 4-7: Output Setting

9) Press MENU key to return to menu screen, then press◄/► keys to select temp.setting, press SET key to enter setting screen, see picture below.

H. LIMIT TEMP.——based on actual operation.

L. LIMIT TEMP.——based on actual operation.

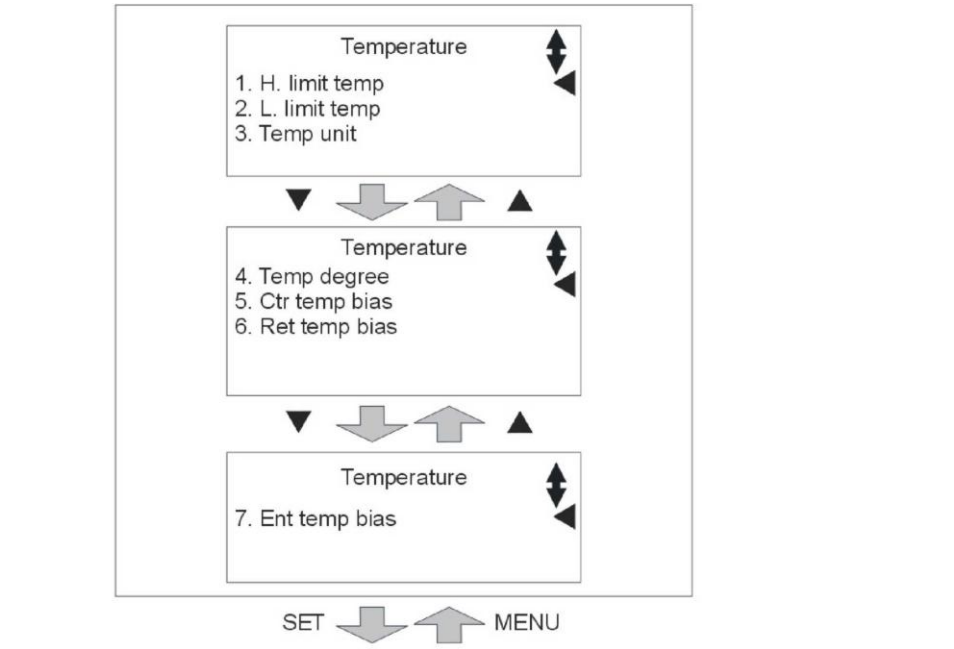
TEMP. UNIT——℃ (Celsius and Fahrenheit)

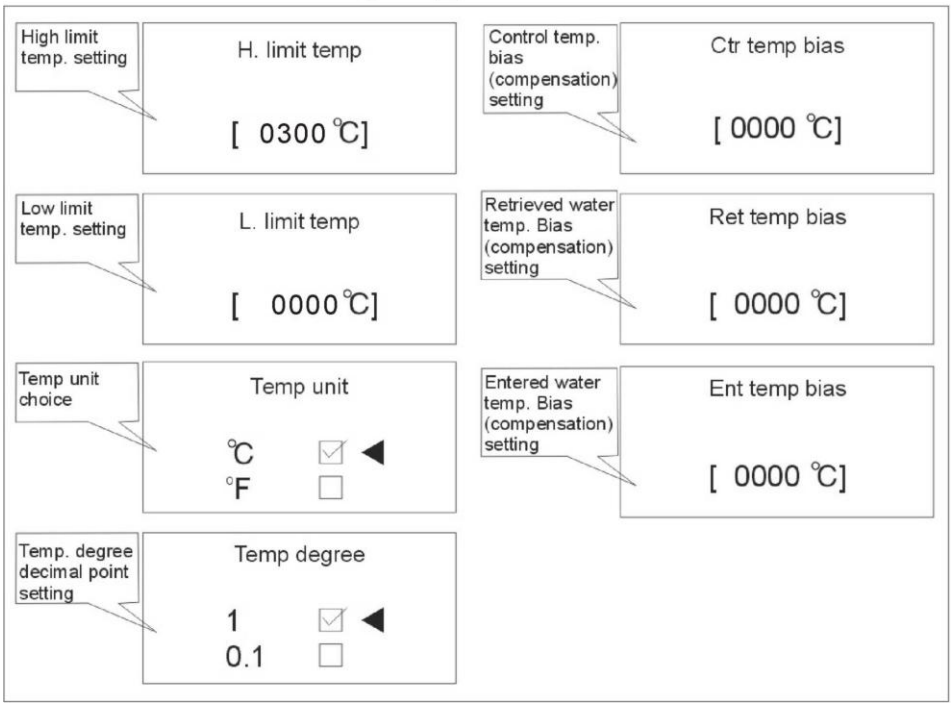
TEMP. DEGREE——0.1

CTR TEMP BIAS——based on actual operation.

RET TEMP BIAS——based on actual operation

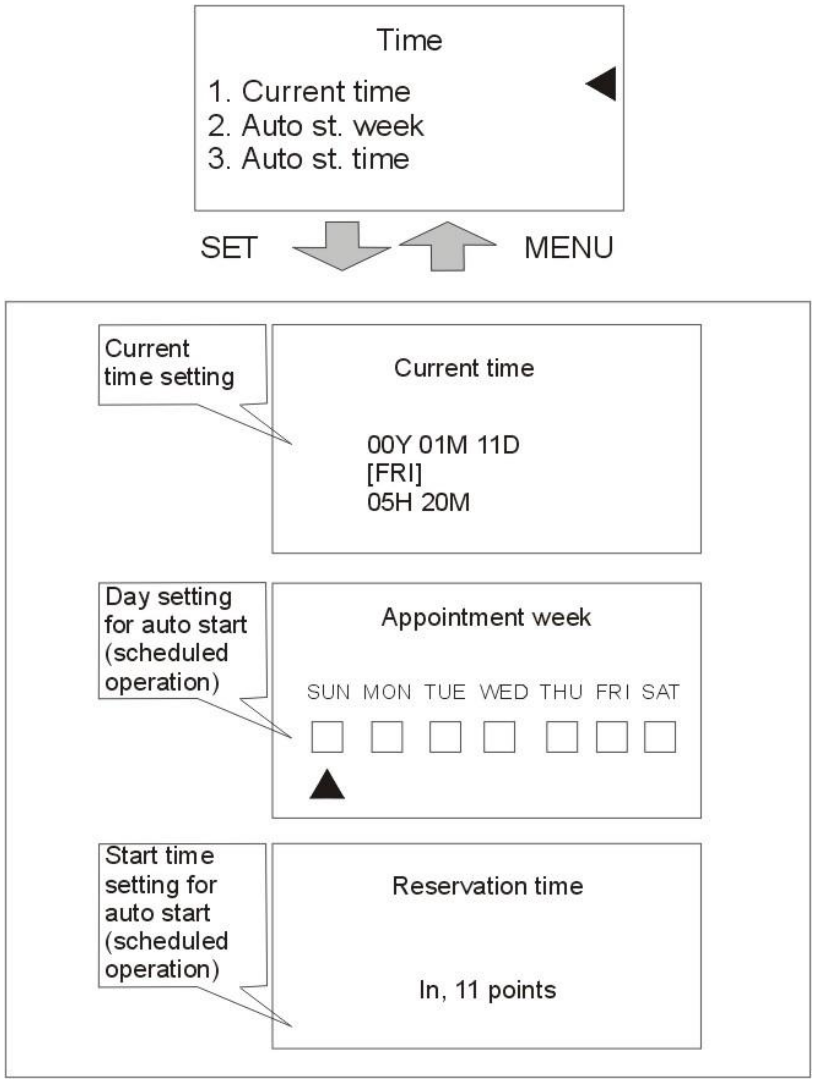
ENT TEMP BIAS——based on actual operation





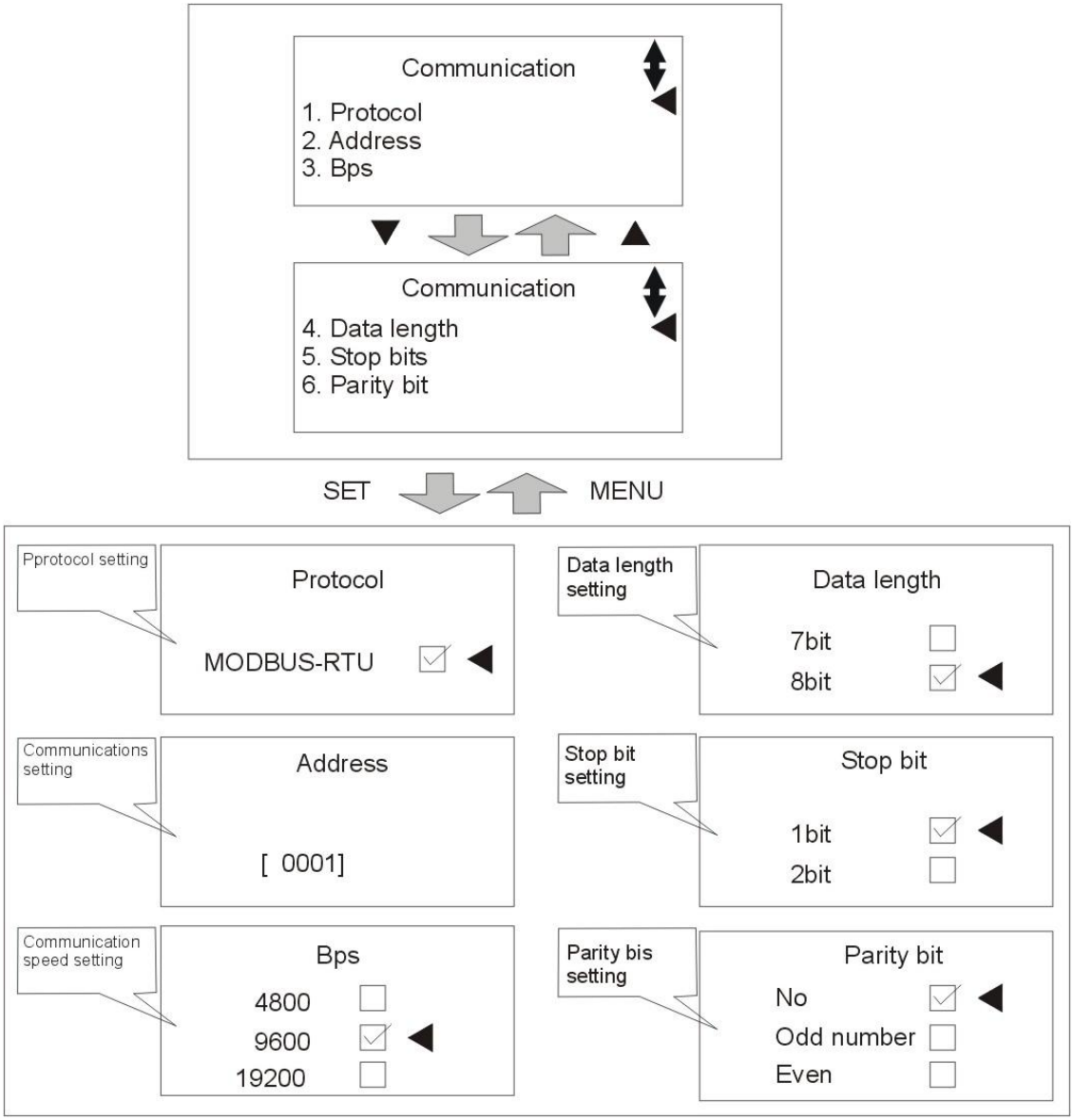
Picture 4-8: Temperature Setting

10) Press MENU key to return to menu screen, press ◄/► key to select time setting, press SET key to enter setting screen, see picture below. Time has been set before delivery; customers can set appointment time based on actual needs.



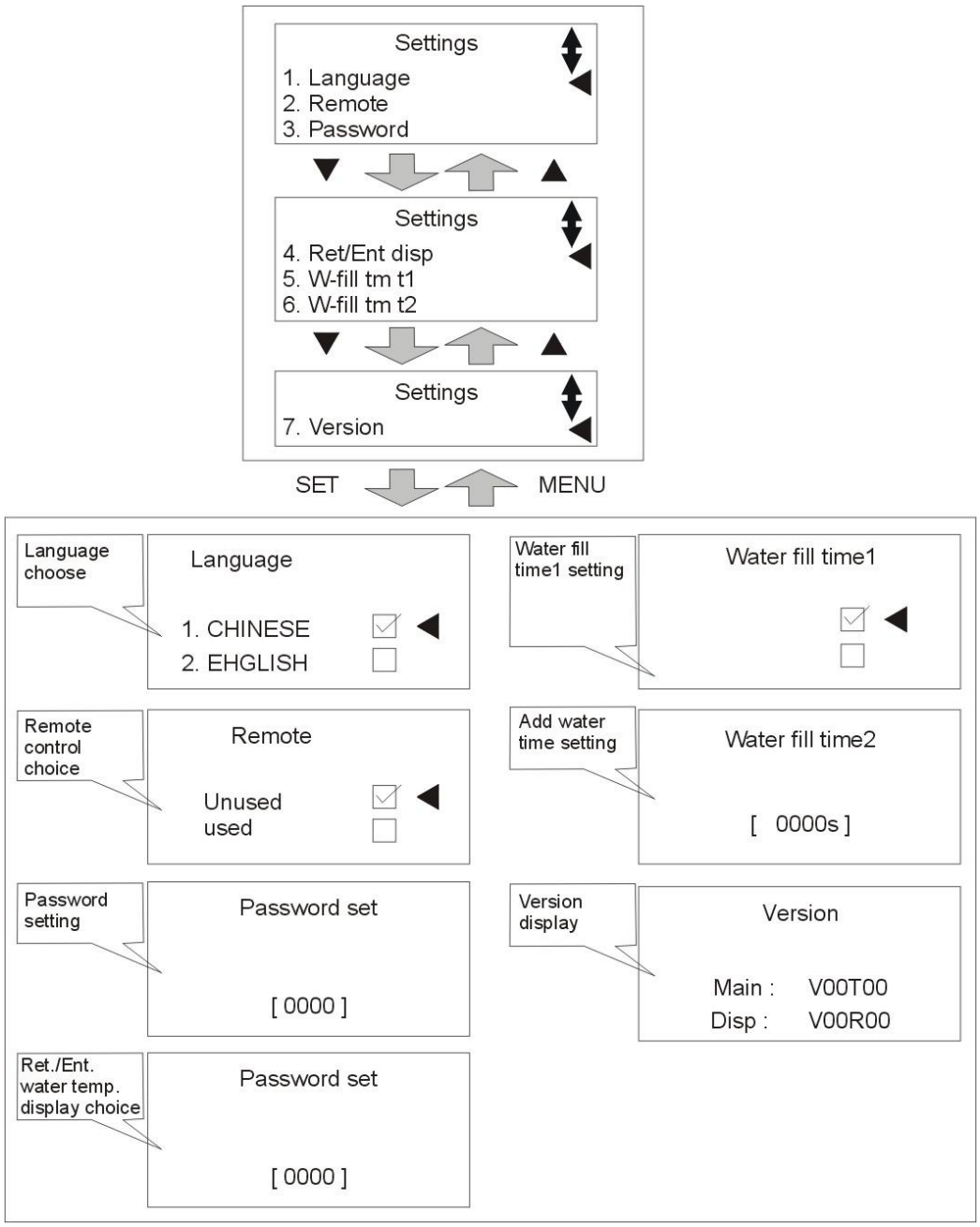
Picture 4-9: Time Setting

11) Press MENU key to return to menu screen, press ◄/► key to select communication setting, press SET key to enter setting screen, see picture below. If communication function is selected as an option, customers should set communication parameters based on actual needs.



Picture 4-10: Communication Setting

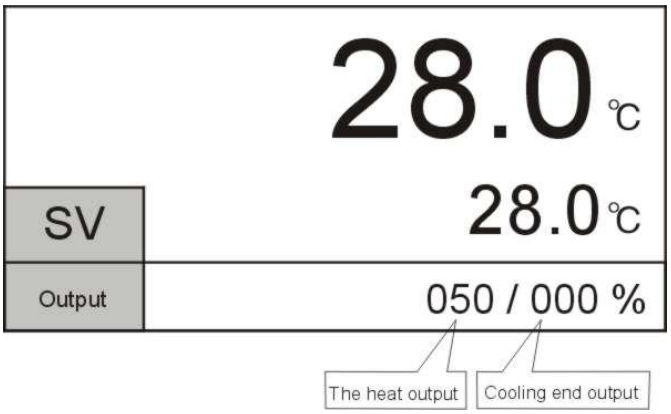
12) Press MENU key to return to menu screen, press ◄/► key to select device setting, press SET key to enter setting screen, see picture below. Before delivery, parameters have been set and customers can modify them based on actual needs.



Picture 4-11: Equipment Setting

13) Set mold temperature (if temp. has been set, this step can be ignored). Press SV key and control target value column will be flashing, press ◄/► key to move cursor then press ▲/▼ key to change values. Finally press SET key to confirm them. Maximum setting temperature of STM is 300℃.

14) After setting the target value, press RUN/RESET key to begin temperature control, Auto-tuning is needed if deviation of control is a little bit 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 parameters set before Auto-tuning.



Picture 4-12: Operation Screen

4.4 Parameter Reference Table

English Name	Description	Range	Default
Control pv	Control temp.	-50~500℃	-
Ret pv	Retrieved water temp.	-50~500℃	-
Ent pv	Entered water temp.	-50~500℃	-
Sv	Control taget temp.	-50~500℃	-50℃
Hout	Amount of heating output	0~100%	0%
Cout	Amount of cooling output	0~100%	0%
Pb	Heating proportional band	0~550℃	20℃
Ti	Integral time	1~3600s	240s
Td	Derivative time	1~3600s	60s
Pbc	Derivative time	0~550℃	20℃
Ct	Time for heating output	1~100s	15s
Ctc	Time for cooling output	1~100s	15s
Phase alarm	Use for phase check	ON/OFF	OFF
Dev1 alarm	Alarm for deviation between control temp. and entered water temp.	0~550℃(0=off)	0=off
Dev2 alarm	Alarm for deviation between entered water temp. and retrieved water temp.	0~550℃(0=off)	0=off

Turb. Alarm	Alarm for sudden temp. drop	0~550℃/s (0=off)	0=off
English Name	**Description**	**Range**	**Default**
Heater alarm	Alarm for not reaching to the setting temp.	0~3600s(0=off)	0=off
Output mode	Select between heating and heating/cooling control	Heating Heating/cooling	Heating/cooling
Sub heating	Set “off temperature” in sub heating output	0~550℃ (0=off)	0=off
Cooling temp	Set compulsory cooling	-50~500℃	35℃
H.limit temp	High(upper) limit temp.	-50~500.0℃	500℃
L.limit temp	Low(lower) limit temp.	50~500.0℃	-50℃
Temp unit	Swlect ℃/ ºF	℃/ ºF	℃
Temp. degreen	Select the decimal point position 0.1/1	0.1, 1	1
Ctl temp bias	Control temp. bias (compensation)	-550~550.0℃	0℃
Ret temp bias	Retrieved water temp. bias (compensation)	-550~550.0℃	0℃
Ent temp bias	Entered water temp. bias (compensation)	-550~550.0℃	0℃
Current time	Year/month/date/day/hour/minute	99/12/31/mo~su/24/59	-
Auto st. week	Mon/tue/wed/thur/fri/sat/sun	Mo~Su	-
Auto st. time	Hour/minute	24/59	0
Protocol	Proto col	Modbus-rtu	Modbus-rtu
Address	Communication address	0~99	1
Bps	Communication speed	4800, 9600, 19200	9600
Data length	Data length	7, 8	8
Stop bit	Stop bit	1, 2	1
Parity bit	Parity bit	None, even, odd	None
Language	Selsct language	Chinese, English	Chinese
Remote	Remote control	Use, unused	Unused
Password	Password setting	0~9999	0
Ret/ent disp	Display ret/ent water temp.	Off, on	Off
w-fill tm t1	Water fill time t1	0~6000sec	0
w-fill tm t2	Water fill time t2	0~60sec	0
version	Display its version	-	-

4.5 Stop the Machine

1) Press COOL key to shut down heating output, and open cooling process.
2) Await until temp. drops to 50℃ below, press COOL key to shut down

forcedcooling, then press RUN/RESET key to stop operation.

3) Switch mian power to OFF position.

 Warning!

When main switch is turned on, be careful of electrical shock.

 Note!

Pump motor rotating direction should be the same as indicated.

 Note!

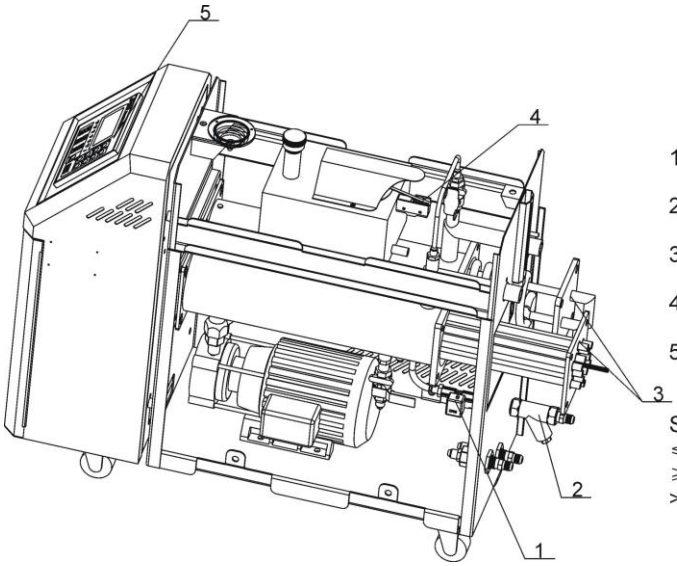
In order to prolong machine lifespan, please do as above steps to turn on and off the machine.

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 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 overheat.	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.0	Fill high temp. oil.
Temp. window displays "----"	Abnormal sensor.	Check and repair sensor.
Once running, pump output indicator lightens but pump cannot start. Afetr 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.
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.

Failures	Possible reasons	Solutions
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.

6. Maintenance and Repair



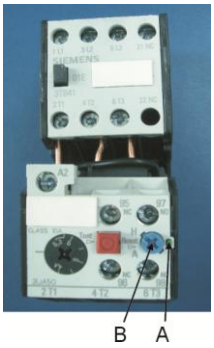
1. Clean solenoid valve
   Period: trimonthly
2. Clean Y-type filter
   Period: monthly
3. Clean process heater/Cooler
   Period: half yearly
4. Check level switch
   Period: trimonthly
5. Check contactor
   Period: trimonthly

Service time of high temperature oil:

≤120℃	Period: replace annually
≥120℃~≤160℃	Period: replace half yearly
>160℃	Period: replace 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 enough place before checking and maintenance.
2) The 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) During operation, the oil is heated up to a high temperature, wait it to fall below 50℃ to perform repairing or maintenance. (Please note that it is dangerous to check or tear down the machine during operation.)

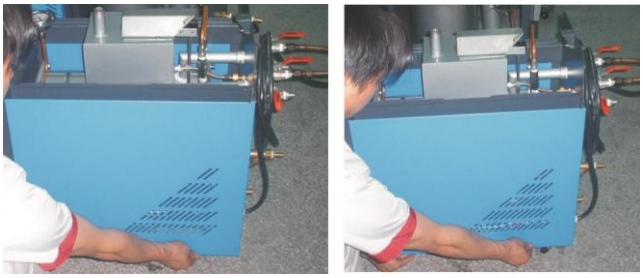


6.1 Open the Covers

1) Lift the top cover gently to open it. (Refer to the pictures below)

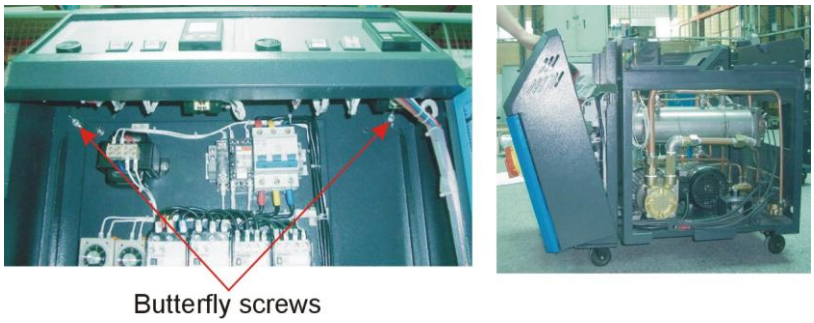
Picture 6-1：Open the Covers 1

2) Pull the bottom of side cover outward, and lift it to open. (Refer to the pictures below)



Picture 6-2：Open the Covers 2

3) Open the cover of control box. Screw off two butterfly screws to unlock the cover. (Refer to the pictures below)



Picture 6-3：Open the Covers 3

6.2 Y Type Strainer

1) 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.
2) Impurities or pollutants may cause errors and bad temperature control. Clean filter screen of the strainer periodically.
3) Cleaning steps: turn off power and cooling water supply. Open the top cover of filter screen to clean the filter.

Picture 6-4：Y Type Strainer

6.3 Solenoid Valve

Replace solenoid valve:

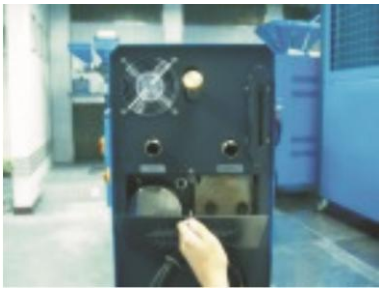
1) Open machine top cover.
2) Take down right side cover.
3) Unfix the solenoid valve for replacement.
4) Install the covers in a reverse order.

Picture 6-5：Solenoid Valve

6.4 Pipe Heater

1) Unscrew the butterfly screw of machine rear plate to open it. (Refer to pictures

below)

Picture 6-6：Pipe Heater 1

2) Unscrew the screws of heater cap and take it down. (Refer to pictures below)


Picture 6-7：Pipe Heater 2

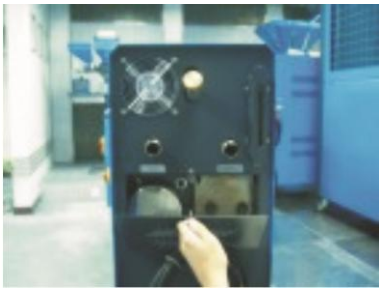
3) Unscrew the screws of pipe heater to take it out. (Refer to pictures below)


Picture 6-8：Pipe Heater 3

4) Re-fix the pipe heater in a reverse order.

6.5 Cooling Pipes

1) Unscrew the butterfly screw of machine rear plate to open it. (Refer to pictures below)

Picture 6-9：Cooling Pipes 1

2) Screw off the screws of cooling pipe to take it out. (Refer to pictures below)


Picture 6-10：Cooling Pipes 2

3) Re-fix the cooling pipe in a reverse order.

Because the heat transfer oil may become carbonized agglutination after a long time heating, which will shorten the lifespan of the pump, so it is suggested to replace every three monthes.

Oil used parameters recommended:

Use kerosene up to 200 degrees model:

Model: Nanhai MCH32. For using other brands, fire point should be higher than 240 degrees.

Use kerosene up to 300 degrees model:

Model: Goddess HT-3 heat trsnfer oil. For useing other brands, fire point should be higher than 340 degrees.

6.6 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 : retuen water temp. sensor terminal
8, 9 : water out 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 : coling 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 contactor output terminal
9, 10 : alarm contactor output terminal
11, 12 : relay contactor output terminal
13, 14 : reserve

⑤ PHASE CHECK TERMINAL (phase detect terminal)

1 : R phase connect terminal
2 : S phase connect terminal

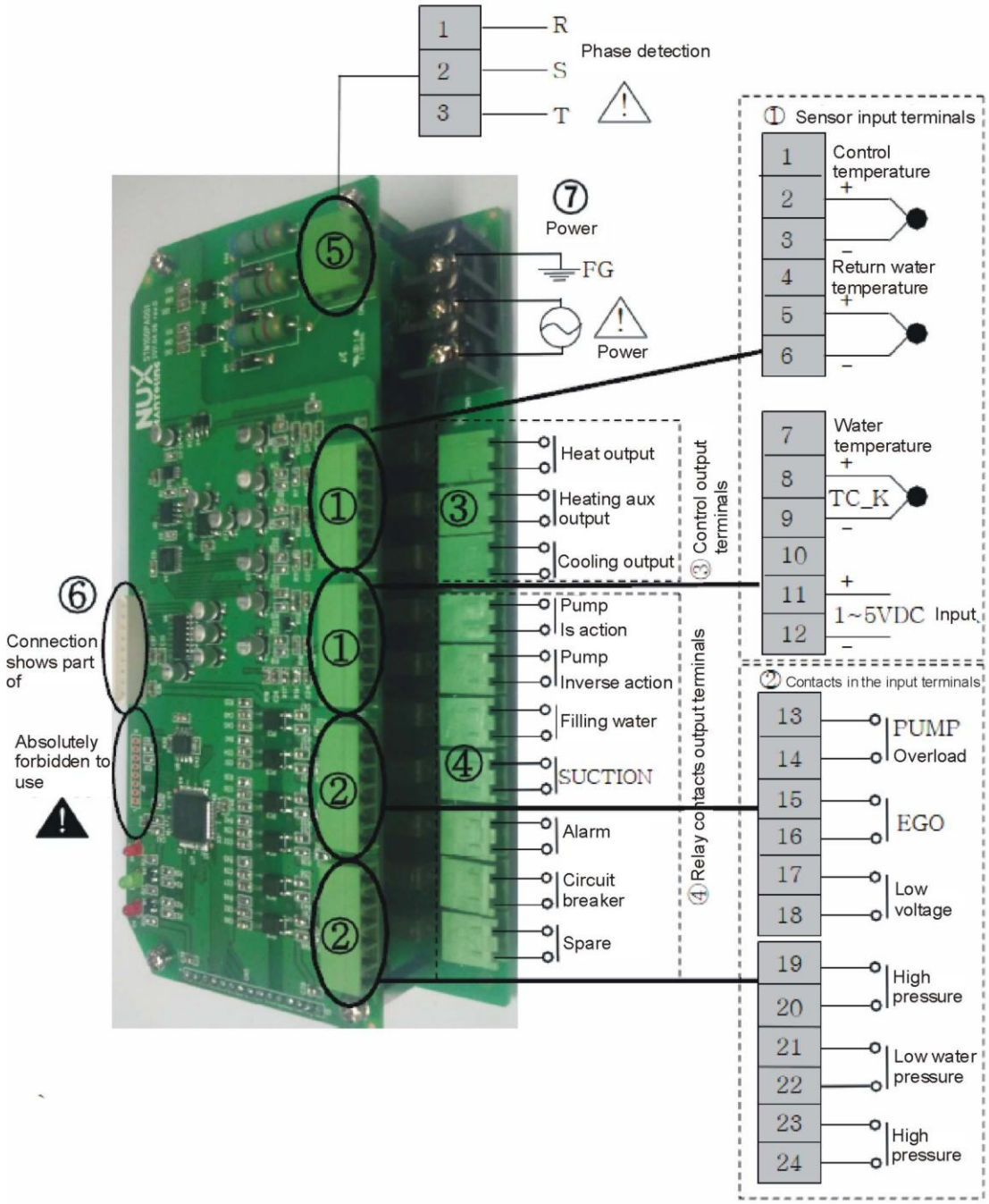
3 : T phase connect terminal

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)


1
2
3
R
S
T
Phase detection
⑦
Power
FG
Power
⑤
①
③
Heat output
Heating aux output
Cooling output
③ Control output terminals
⑥
Connection shows part of
Absolutely forbidden to use
①
Pump Is action
Pump Inverse action
Filling water
④
SUCTION
Alarm
Circuit breaker
Spare
④ Relay contacts output terminals
②
②
① Sensor input terminals
1
2
3
4
5
6
Control temperature
+
–
Return water temperature
+
–
7
8
9
10
11
12
Water temperature
+
TC_K
–
+
1~5VDC Input
–
② Contacts in the input terminals
13
14
15
16
17
18
19
20
21
22
23
24
PUMP Overload
EGO
Low voltage
High pressure
Low water pressure
High pressure

6.7 Displayer Terminal Connecting Diagram

① DI TERMINAL

1, 2: Run/stop di terminal

② COMM TERMINAL

1, 2, 3, 4: rs485 Comm terminal

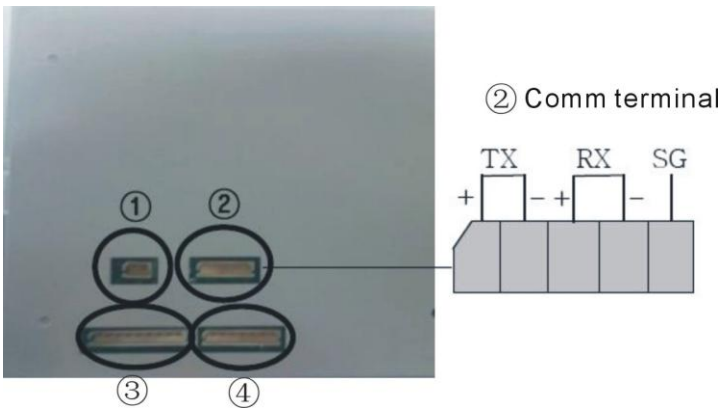
5：Earth terminal

③ MAIN CN

Connet to the electric cables which also connected with stm100

④ TEST PIN

Test pin　No connection



6.8 Maintenance Schedule

6.8.1 About the Machine

Model _____ SN _____ Manufacture date _____

Voltage_____Φ_____V Frequency _____ Hz Power _____ kW

6.8.2 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.

6.8.3 Daily Checking

☐Check machine startup function.

☐Check all the electrical wires.

6.8.4 Weekly Checking

☐Check loose eletrical 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.

6.8.5 Trimonthly Checking

☐Check level switch.

☐Check the contactor [2].

☐Replace the hot kerosene with a using temperature above 160 degree [3].

6.8.6 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].

6.8.7 Yearly Checking

☐Replace the hot kerosene with a using temperature above 120 degree [5].

6.8.8 3 year Checking

☐PC board renewal.
☐No fuse breaker renewal.

Note: 1. Y-type filter 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 work eight hours per day, recommended replacing frequency is 1.5 years, if work 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.