STM Series

Oil Heater

Date: Nov. 2014

Version: Ver.B (English)

Contents

Table Index

Picture Index

1. General Description

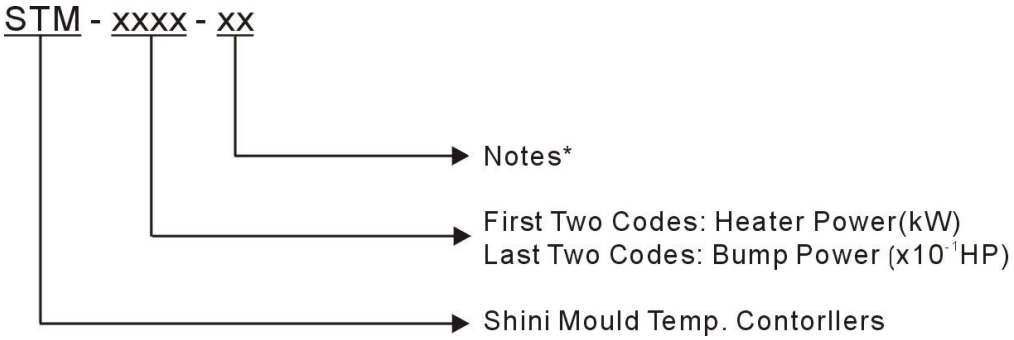
Read this manual carefully before operation to prevent damage of the machine or personal injuries.

The STM series standard oil heater are used to heat up the mould and maintain this 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, oil can reach a maximum of 200℃ and the HANYOUNG temperature controller can maintain an accuracy of ±1℃.

Model: STM-910

Model: STM-910-D

1.1 Coding Principle



Notes*

D=Dual-heating Zones HT=High Temperature Model

CE=CE Conformity M=Magnepic Pump B=Buzzer

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 ^{o}F and ℃.
- P.I.D multi-stage temperature control system can maintain 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.
- For standard STM, the heating temperature can reach 200℃,while for STM-HT, it can reach 300℃.

- STM-HT is equipped with magnetic pump and its internal structure is made of high pressure resistance stainless steel to prevent any explosion.
- Adopted Ethernet communication function to realize central monitoring online.

2) Accessory option

- Water manifolds, Teflon hose and Transfer oil are optional.
- Among the Standard Oil Mould Controllers STM, all models can opt for magnetic pump. (except STM-3650 series). 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.

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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-607	200℃	6	0.55 / 0.65	27 / 30	3.8 / 5	1	6 / 3.2	Indirect	3/8" (2×2)	3/4 / 3/4	635x280x740	65
STM-607-D		6×2	0.55×2 / 0.65×2	27×2 / 30×2	3.8 / 5	2	6×2 / 3.2×2		3/8" (4×2)	3/4 / 3/4	655x560x740	130
STM-910		9	0.75 / 0.92	42 / 50	5.0 / 6.4	1	6 / 3.2		3/8" (2×2)	3/4 / 3/4	635x280x740	70
STM-910-D		9×2	0.75×2 / 0.95×2	42×2 / 50×2	5.0 / 6.4	2	6×2 / 3.2×2		3/8" (4×2)	3/4 / 3/4	655x560x740	140
STM-1220		12	1.5 / 1.9	74 / 84	6.2 / 7.2	1	6.8 / 11.8		3/8" (4×2)	1 / 1	795x340x845	100
STM-2440		24	2.8 / 3.4	130 / 130	8.0 / 10.2	2	11 / 16		1"(1×2)	1 / 1	900x390x935	145
STM-3650		36	4.0 / 4.0	170 / 170	8.0 / 8.0	3	14 / 16		$1^1/_4$"(1×2)	$1^1/_4$ / $1^1/_4$	900x385x980	155

Note: 1) "D" stands for dual-heating zones.

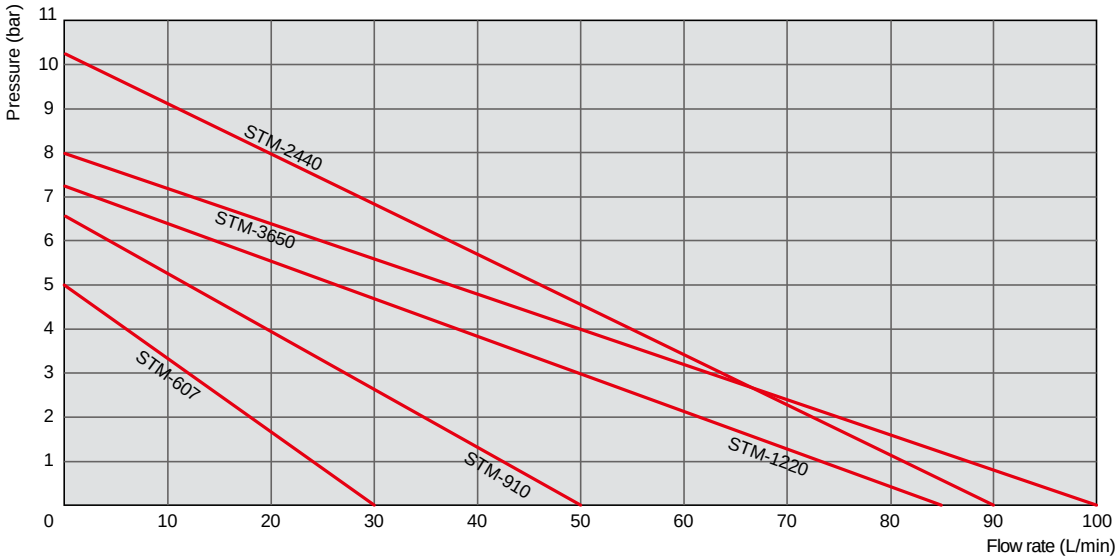
2) Pump testing standard: Power of 50 / 60Hz, purified water at 20℃. (There is ±10% tolerance for either max. flowrate or max. pressure).

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.

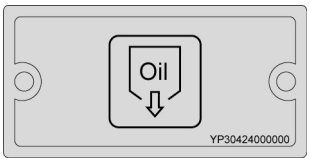
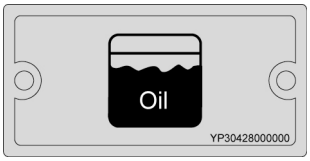
Do not remove safety signs or make it dirty.

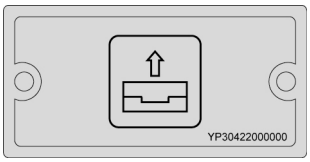
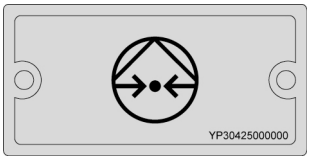
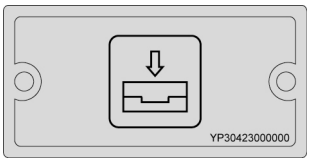
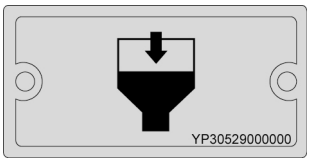
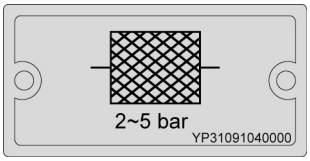
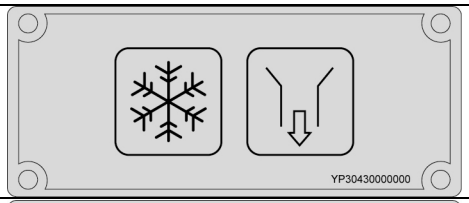
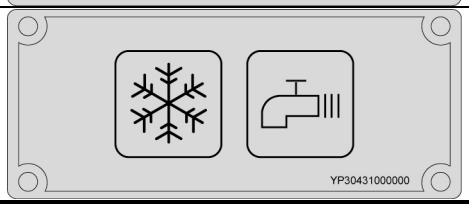
Drunken, medicine-taking, or men without proper judgement should not operate the machine.

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.
	Oil outlet valve: oil discharge outlet for renewing oil.
	High liquid level: the highest oil level to which machine can reach under room temperature.

	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.
	Oil inlet: oil filler for machine.
	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 outlet: drainage outlet.
	Water inlet: inlet for replenishing water and cooling water.

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.

1.4.4 Transportation and Storage of the Machine

Transportation

1) STM series standard 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 series standard 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

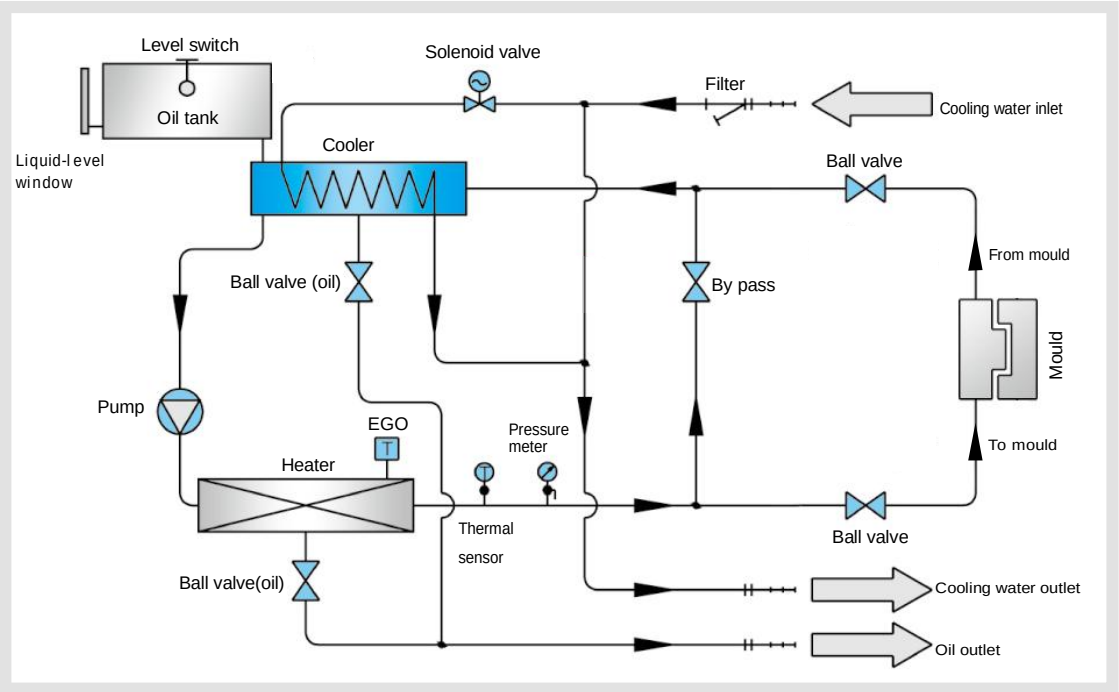
The following statements clarify the responsibilities and regulations born by any buyer or user who purchases products and accessories from Shini (including employees and agents).

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

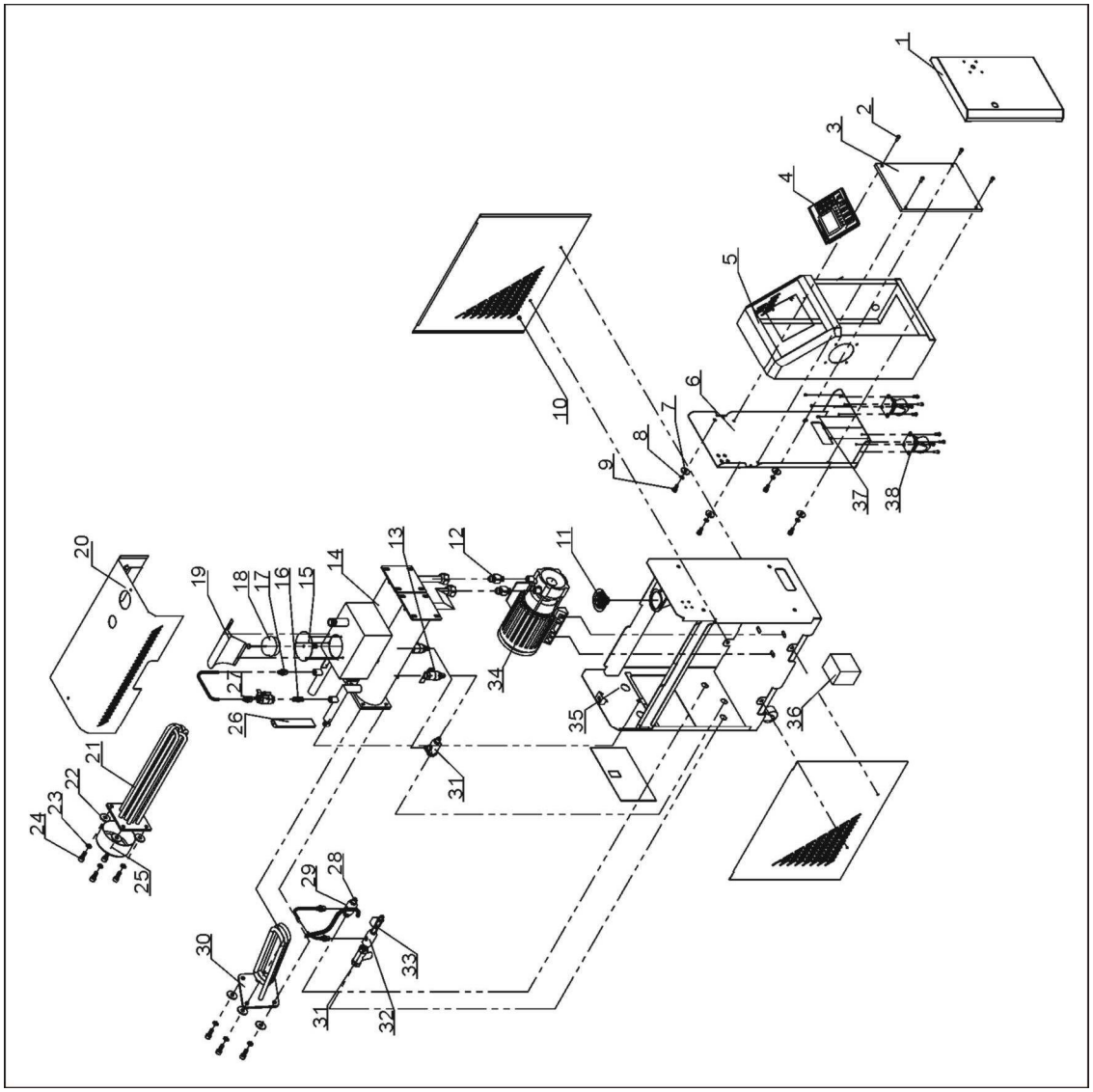


Picture 2-1: Working Principle

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-607/910)



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-607/910)

2.2.2 Parts List (STM-607~STM-1220)

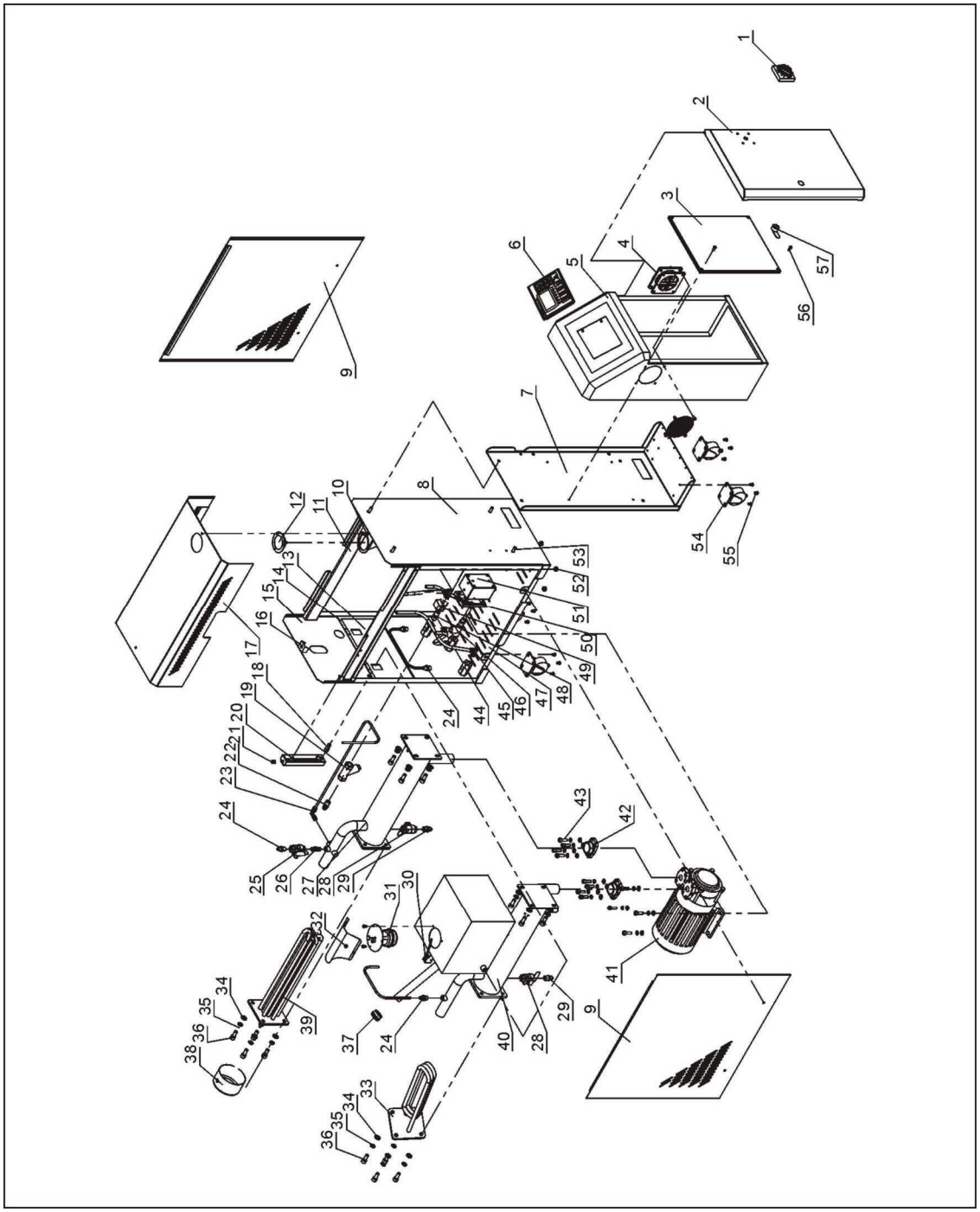
Table 2-1: Parts List (STM-607/STM-607-D)

No.	Name	Part No.	
		STM-607/607-D	STM-910/910-D
1	Door plank	-	-
2	Butterfly type screw M6×17	YW63061700000	YW63061700000
3	Base plate of electric components box	-	-
4	HANYOUNG controller	YE81100010000	YE81100010000
5	Fixing plate of electric components	-	-
6	Control box rear plate	-	-
7	Flat gasket 8	YW66082200100	YW66082200100
8	Elastic gasket 8	YW65008000200	YW65008000200
9	Inner hexagon cylindrical screw M8×20	YW61082000200	YW61082000200
10	Side plate	-	-
11	Pressure gauge 0~10kg	YW85001000100	YW85001000100
12	Copper trumpet joint 3/4”H×3/4”PT	BH12030400310	BH12030400310
13	Stainless steel ball valve 3/8”	YW50030800100	YW50030800100
14	Heating tank and auxiliary oil tank	-	-
15	Cover board of float ball*	-	-
16	Pipe coupler 1/4PT×1/4PT	BH12010400110	BH12010400110
17	Teflon pipe connector 1/4H×1/4PT	BH12010400410	BH12010400410
18	Float ball*	YW09703600000	YW09703600000
19	Alternative switch cover	-	-
20	Plate cover	-	-
21	Pipe heater*	BH70060700050	BH70091000050
22	Flat gasket 10	YW66102500000	YW66102500000
23	Elastic gasket 10	YW65010000000	YW65010000000
24	Inner hexagon cylindrical screw M10×25	YW61102500000	YW61102500000
25	Electric heat pipe cover	BL80091000120	BL80091000120
26	Level indicator*	-	-
27	Ball valve 1/4”	YY60001430000	YY60001430000
28	Teflon pipe connector 3/8H×3/8PT	BH12030800610	BH12030800610
29	Copper joint second	-	-
30	Cooling pipe	-	-
31	Y type strainer*	YW57010200000	YW57010200000
32	Copper connector	-	-
33	Solenoid valve**	YE32215400000	YE32215400000
34	Water pump*	BM20005500350	BM20007500050
35	Rack	-	-

No.	Name	Part No.	
		STM-607/607-D	STM-910/910-D
36	EGO Protective box	YR40000400300	YR40000400300
37	Thick head screw M4×5	YW62040600000	YW62040600000
38	2” castor	YW03000200000	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-1220)



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-1220)

2.2.4 Parts List (STM-1220)

Table 2-2: Parts List (STM-1220)

No.	Name	Part No.	No.	Name	Part No.
1	Main power switch	YE10010000000	24	Copper teflon pipe connector 1/4H×1/4PT	BH12010400410
2	Door plate	-	25	Copper ball core valve 1/4"	YY60001430000
3	Base plate of electric components box	-	26	Copper pipe coupler 1/4"	BH12010400110
4	Fan with fan guard	YM60922500100	27	Heating tank	-
5	Electric components box	-	28	Stainless steel ball valve 3/8"	YW50030800100
6	HANYOUNG controller	YE81100010000	29	Copper teflon pipe connector 3/8H×3/8PT	BH12030800610
7	Electric control box rear plate and caster mounting plate	-	30	Microswitch*	YE14152400000
8	Clapboard	-	31	Float ball*	-
9	Side plate	-	32	Switch cover plate	-
10	Pressure gauge fixing plate	-	33	Cooling pipe	-
11	Crossbeam	-	34	Flat gasket 10	YW66102500000
12	Pressure gauge	YW85001000100	35	Elastic gasket 10	YW65010000000
13	Rear plate mini cover	-	36	Inner hexagon cylindrical screw M10×25	YW61102500000
14	Fixing plate of rear plate mini cover	-	37	Oil cap	BH12030403040
15	Rear plate	-	38	Pipe heater cover	BL80091000120
16	Plate cover fixing plate	-	39	Pipe heater	BH70122000050
17	Plate cover	-	40	Coolling tank	-
18	External thread 1/4PT×1/4H	-	41	Pump TP-150	BM20015000050
19	Water filter 1/2	YW57010200000	42	Pump flange	-
20	Liquid level indicator		43	Inner hexagon cylindrical screw M10×30	YW61103000100
21	Set screws M12	YW68121000000	44	Copper tee joint 1/4"PT	BH12010400010
22	3/8"PT×⌀13 Copper connector	BH12030801110	45	Copper teflon pipe connector 3/8H×1/4PT	YW04030800400
23	Copper teflon pipe connector 1/4H×1/4PT(L type)	YW04010400400	46	1/4" Stainless steel tee joint	YW52010400000

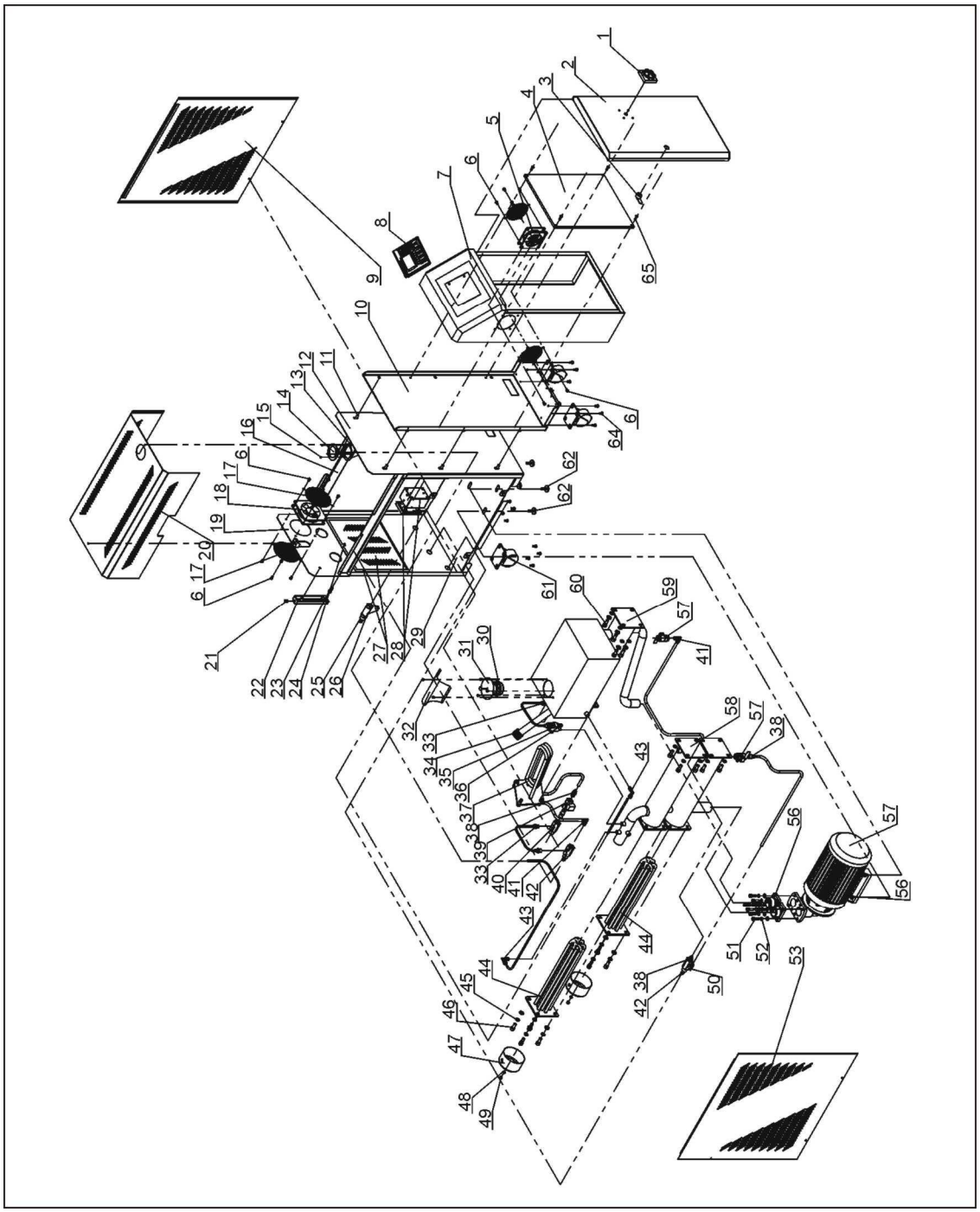
No.	Name	Part No.	No.	Name	Part No.
47	Base plate	-	53	Inner hexagon cylindrical screw M8×15	YW60081600100
48	Copper pipe coupler 3/8PT×1/4PT	BH12010400310	54	Caster 2.5"	YW03002500000
49	Solenoid valve 3/8"**	YE32215400000	55	Lentil-headed screw M6×10	YW63061000000
50	Copper teflon pipe connector 3/8H×3/8PT(L type)	YW04030800300	56	Lentil-headed screw M6×15	YW63061500000
51	EGO protective box	YR40000400300	57	Long gear lock	YW00000000100
52	M8 Screw	YW64080600000			

* 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 Assembly Drawing (STM-2440)



Remarks: Please refer to material list 2.2.6 for specific explanation of the Arabic numbers in parts drawing.

Picture 2-4: Assembly Drawing (STM-2440)

2.2.6 Parts List (STM-2440)

Table 2-3: Parts List (STM-2440)

No.	Name	Part No.	No.	Name	Part No.
1	Main power switch*	YE10010000000	26	Water filter 1/2	YW57010200000
2	Door plate	-	27	Rear plate mini cover and mini cover fixing plate	-
3	Long gear lock	YW00000000100	28	EGO protective box	YR40000400300
4	Fixing plate of electric components	-	29	Base plate	-
5	Fan with fan guard	YM60922500100	30	Float ball	-
6	Thick head screw M6×10	YW63061000000	31	Float ball cover plate	-
7	Electric control box	-	32	Switch cover plate	-
8	HANYOUNG controller	YE81100010000	33	Copper teflon pipe connector 1/4H×1/4PT	BH12010400410
9	Side plate (right)	-	34	Oil cap	BH12030403040
10	Electric control box rear plate	-	35	Copper ball core valve 1/4"	YY60001430000
11	Inner hexagon cylindrical screw M8×16	YW60081600100	36	Copper pipe coupler 1/4"	BH12010400110
12	Clapboard	-	37	Cooling pipe	-
13	Pressure gauge fixing plate	-	38	Copper teflon pipe connector 3/8H×3/8PT	BH12030800610
14	Pressure gauge	YW85001000100	39	Solenoid valve 3/8"	YE32215400000
15	Thick head screw M3×5	YW63030600000	40	Copper tee joint 3/8"	BH12030800010
16	Crossbeam	-	41	Copper teflon pipe connector 3/8H×3/8PT(L typen)	YW04030800300
17	Fan guard	YM60423000000	42	Copper connector 2	-
18	Fan guard	YM60423000000	43	Copper teflon pipe connector 1/4H×1/4PT(L type)	YW04010400400
19	Rear plate	-	44	Pipe heater*	BH70244000050
20	Cover plate	-	45	Elastic gasket 10	YW65010000000
21	Set screw M12	YW68121000000	46	Inner hexagon cylindrical screw M10×25	YW61102500000
22	Liquid level indicator*	-	47	Electric heating pipe shield	BL80091000120
23	External thread1/4PT×1/4H	-	48	Flat gasket 6	YW66061300000
24	Butterfly screwM6×15	YW69061500000	49	Screw M6	YW64000600300
25	Core 3/8"×1/2PT	BH12131200010	50	Copper teflon pipe connector 3/8H×1/4PT(L type)	YW04030800200

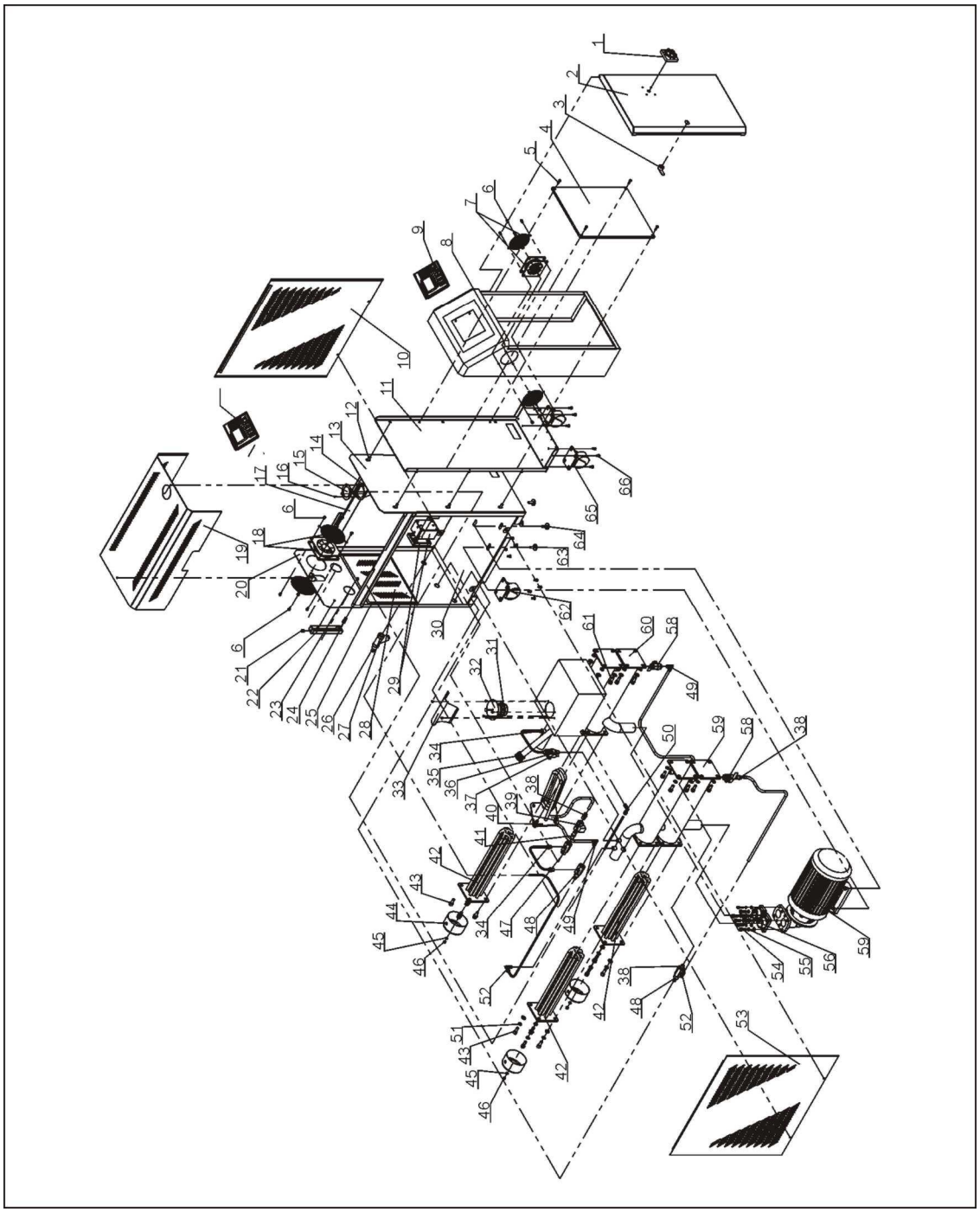
No.	Name	Part No.	No.	Name	Part No.
51	Inner hexagon cylindrical screw M8×25	YW61082500100	59	Cooling tank	-
52	Elastic gasket 8	YW65008000100	60	Inner hexagon cylindrical screw M10×20	YW61102000000
53	Side plate (left)	-	61	Brake rubber tire 3"	YW03000300000
54	Screw M8	YW64080600000	62	Hexagon head screw M8×30	YW60083000100
55	Pump (TP-280)*	YM20609100000	63	Flat gasket 8	YW66082200100
56	Pump flange	-	64	Hexagon head screw M6×10	YW60061000000
57	Ball valve 3/8"*	YW50030800100	65	Lentil-headed screw M6×15	YW63061500000
58	Heating tank	-			

* 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.

2.2.7 Assembly Drawing (STM-3650)



Remarks: Please refer to material list 2.2.8 for specific explanation of the Arabic numbers in parts drawing.

Picture 2-5: Assembly Drawing (STM-3650)

2.2.8 Parts List (STM-3650)

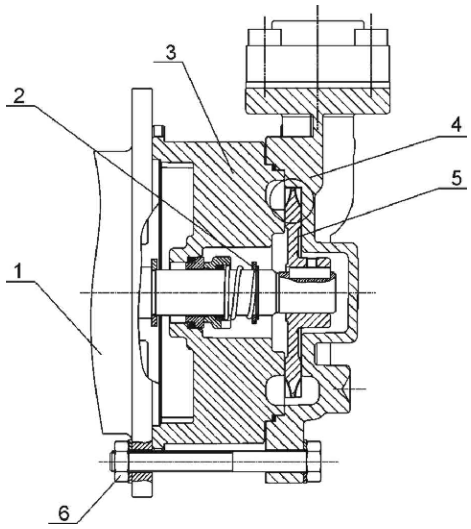
Table 2-4: Parts List (STM-3650)

No.	Name	Part No.	No.	Name	Part No.
1	Main power switch *	YE41109000000	27	Water filter 1/2	YW57010200000
2	Door plate	-	28	Rear plate mini cover and mini cover fixing plate	-
3	Long gear lock	YW00000000100	29	EGO protective box	YR40000400300
4	Base plate of electric components box	-	30	Base plate	-
5	M6×15 Lentil-headed screw	YW63061500000	31	Float ball	-
6	M6×10 Lentil-headed screw	YW63061000000	32	Float ball cover plate	-
7	Fan with fan guard	YM60922500100	33	Switch cover plate	-
8	Electric control box	-	34	Copper teflon pipe connector 1/4H×1/4PT	BH12010400410
9	HANYOUNG controller	YE81100010000	35	Oil cap	BH12030403040
10	Side plate (right)	-	36	Copper ball core valve 1/4"	YY60001430000
11	Electric control box rear plate	-	37	Copper pipe coupler 1/4"	BH12010400110
12	M8×16 Inner hexagon screw	YW61081600000	38	Copper teflon pipe connector 3/8H×3/8PT	BH12030800610
13	Clapboard	-	39	Solenoid valve 3/8"*	YE32215400000
14	Pressure gauge fixing plate	-	40	Cooling pipe	-
15	Pressure gauge	YW85001000100	41	3/8" Pipe coupler	BH12030800110
16	Thick head screw M3×5	YW63030600000	42	Pipe heater unit	BH70365000050
17	Crossbeam	-	43	Inner hexagon cylindrical screw M10×25	YW61102500000
18	Fan with fan guard	YM60423000000	44	Electric heating pipe shield	BL80091000120
19	Cover plate	-	45	Flat gasket 6	YW66061300000
20	Rear plate	-	46	Screw M6	YW64000600300
21	Set screw M12	YW68121000000	47	Copper tee joint 3/8"	BH12030800010
22	Liquid level indicator *	-	48	Copper connector 2	-
23	M6×15 Butterfly screw	YW69061500000	49	Copper teflon pipe connector 3/8H×3/8PT(L type)	YW04030800300
24	External thread 1/4PT×1/4H	-	50	Copper teflon pipe connector 1/4H×1/4PT(L type)	YW04010400400
25	Rear plate mini cover and mini cover fixing plate	-	51	Elastic gasket 10	YW65010000000
26	Core 3/8"×1/2PT	BH12131200010	52	Copper teflon pipe connector 3/8H×1/4PT(L type)	YW04030800200

No.	Name	Part No.	No.	Name	Part No.
53	Side plate (left)	-	60	Cooling tank	-
54	Inner hexagon cylindrical screw M8×25	YW61082500100	61	Inner hexagon cylindrical screw M10×20	YW61102000000
55	Elastic gasket 8	YW65008000100	62	Brake rubber tire 3"	YW03000300000
56	Pump flange	-	63	Hexagon head screw M8×30	YW60083000100
57	Pump (TP-400)	YM20609100100	64	Flat gasket 8	YW66082200100
58	Ball valve 3/8"*	YW50030800100	65	Movable rubber tire 3"	YW03000300200
59	Heating tank	-	66	Hexagon head screw M6×10	YW60061000000

* 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.

2.2.9 Pump



Picture 2-6: Pump

Table 2-4: Pump Parts List

No.	Name	Part No.				
		STM-607/607D	STM-910/910D	STM-1220	STM-2440	STM-3650
1	Motor	YM10055000500	YM10075000100	YM10015000000	YM10028000000	YM10040000000
2	Mechnical shaft seal *	YR80901000000	YR80901200000	YR80901600000	YR80902240000	YR80902240000
3	Bearing block	BW33005500110	BW33007500110	BW33015000110	BW33028000210	BW33028000210
4	Pump body	BW33005500210	BW33007500210	BW33015000210	BW33028000110	BW33028000110
5	Inpeller	BW33055000310	BW33075000310	BW33015000310	BW33028000310	BW33028000310
6	Hexagon nut	YW64001000100	YW64001000100	YW64001000100	YW64001000100	YW64001000100

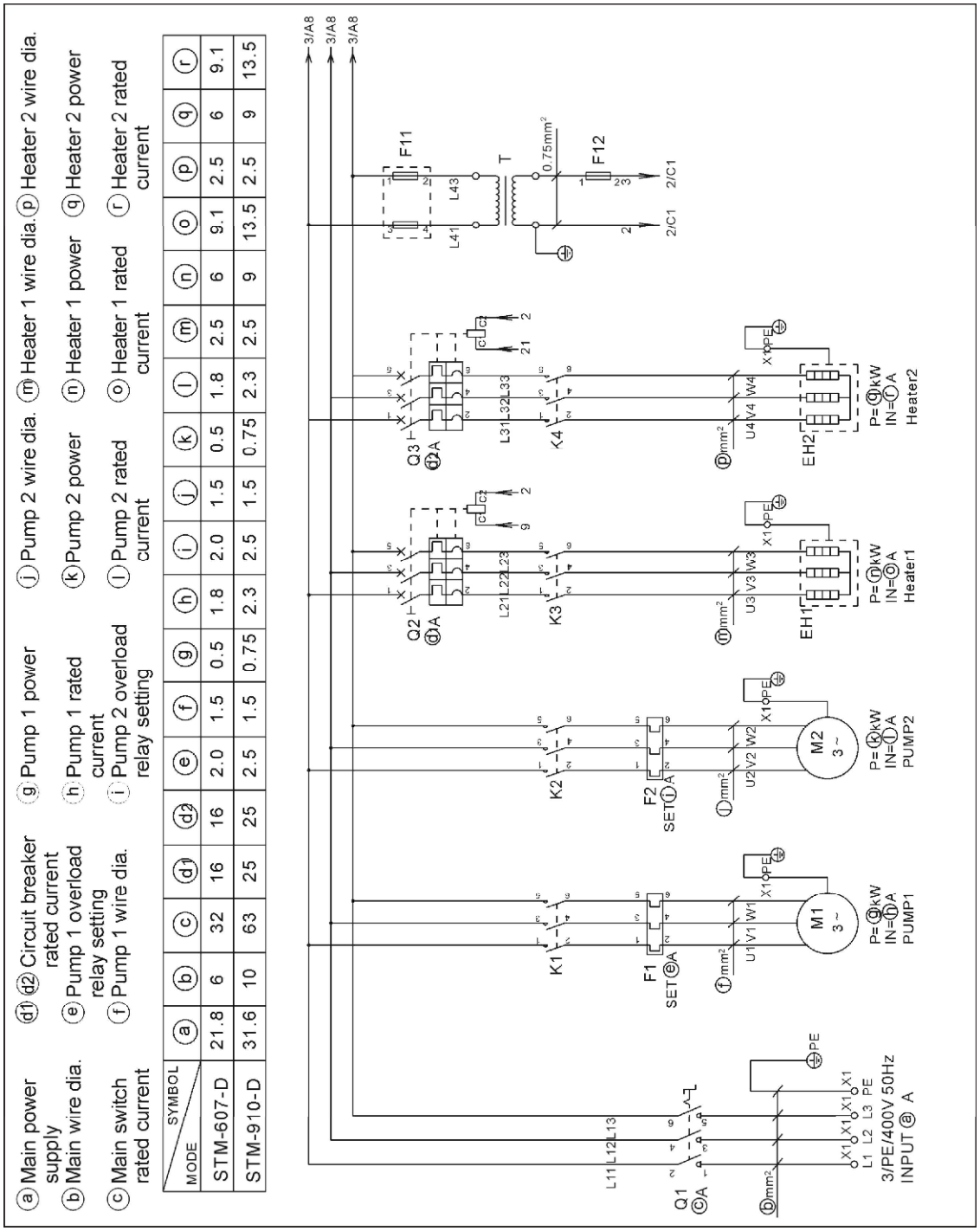
* means possible broken parts.

** 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 Electrical Diagram

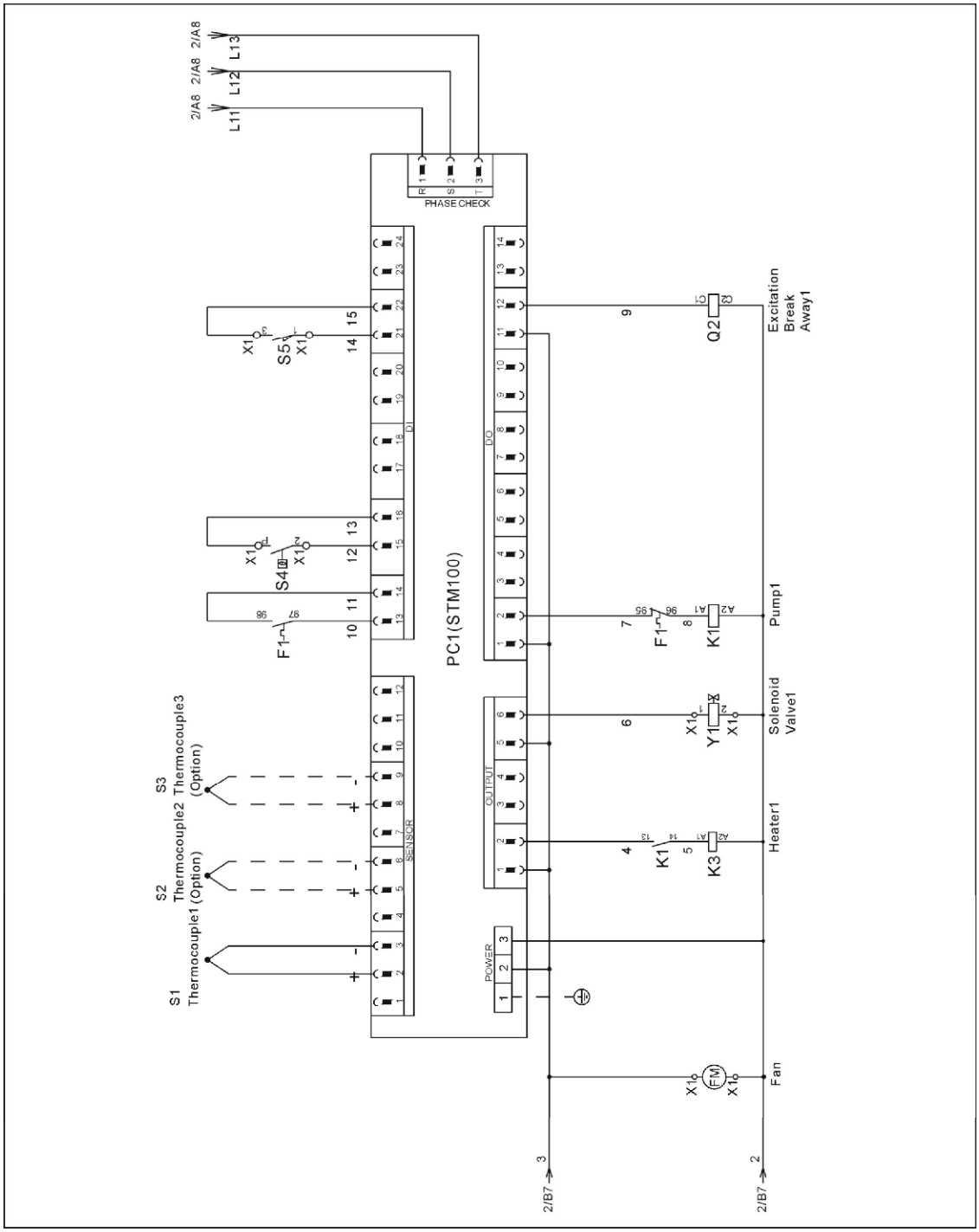
2.3.1 Main Circuit (STM-607/910-D)(400V)



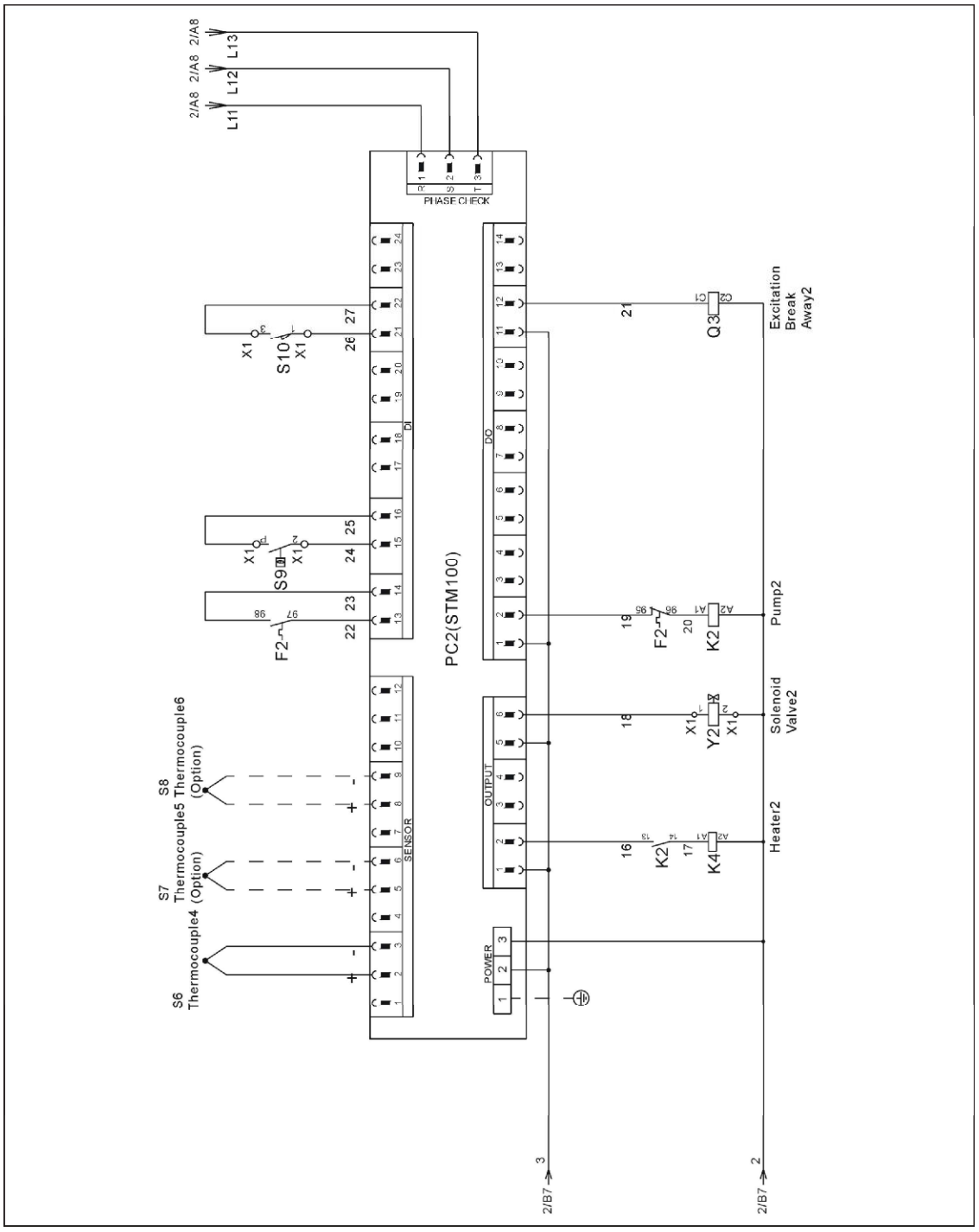
MODE \ SYMBOL	ⓐ	ⓑ	ⓒ	ⓓ①	ⓓ②	ⓔ	ⓕ	ⓖ	ⓗ	ⓘ	ⓙ	ⓚ	ⓛ	ⓜ	ⓝ	ⓞ	ⓟ	ⓠ	ⓡ
STM-607-D	21.8	6	32	16	16	2.0	1.5	0.5	1.8	2.0	1.5	0.5	1.8	2.5	6	9.1	2.5	6	9.1
STM-910-D	31.6	10	63	25	25	2.5	1.5	0.75	2.3	2.5	1.5	0.75	2.3	2.5	9	13.5	2.5	9	13.5

Picture 2-7: Main Circuit (STM-607/910-D) (400V)

2.3.2 Control Circuit (STM-607/910-D) (400V)

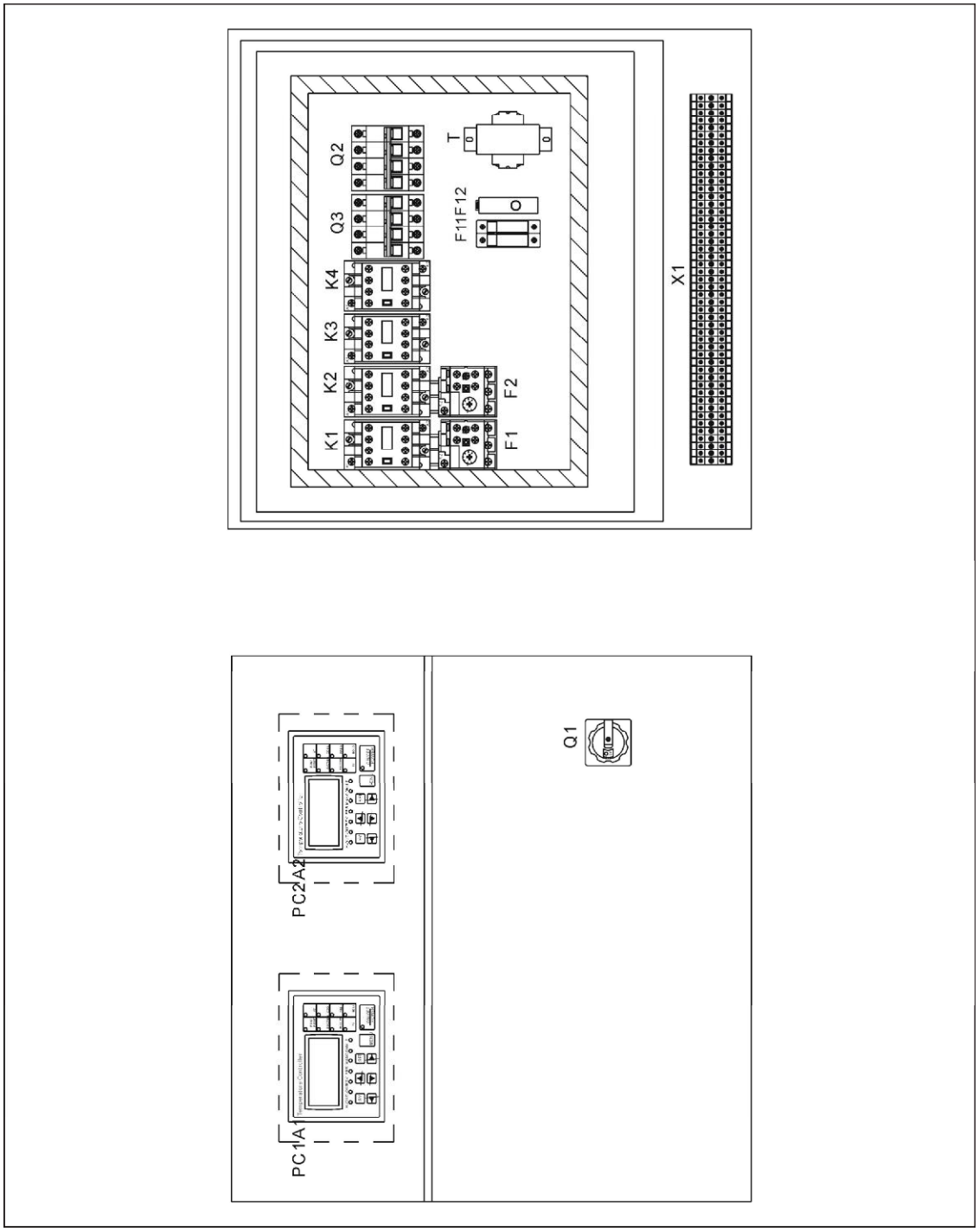


Picture 2-8: Control Circuit 1 (STM-607/910-D) (400V)



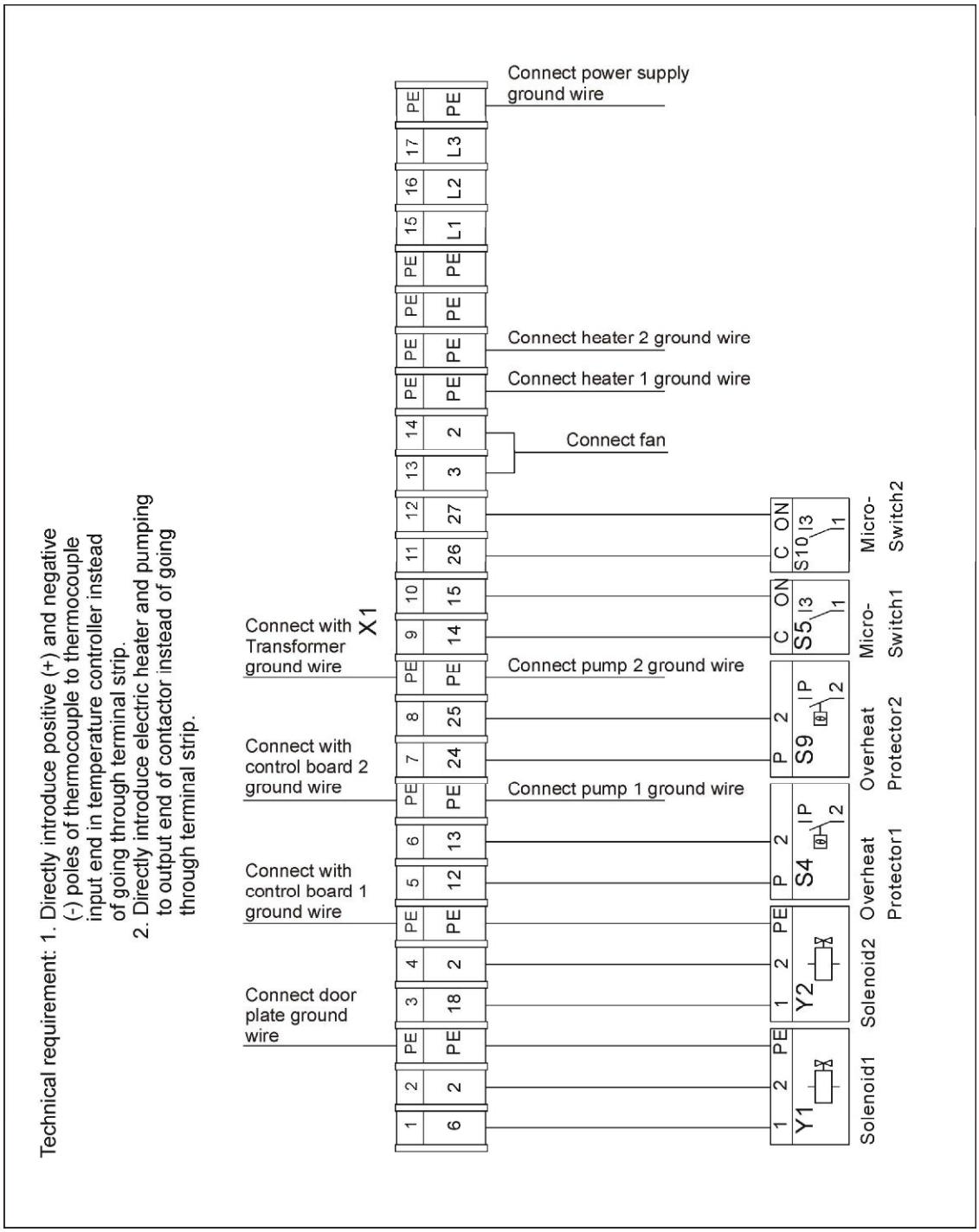
Picture 2-9: Control Circuit 2 (STM-607/910-D) (400V)

2.3.3 Electrical Components Layout (STM-607/910-D) (400V)



Picture 2-10: Electrical Components Layout (STM-607/910-D) (400V)

2.3.4 Thermocouple and Terminal Layout (STM-607/910-D) (400V)



Picture 2-11: Thermocouple and Terminal Layout (STM-607/910-D) (400V)

2.3.5 Electrical Components List (STM-607/910-D) (400V)

Table 2-5: Electrical Components List (STM-607-D) (400V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	32A	YE10323200000
2	Q2 Q3	Circuit_breakers*	16A	YE40601500000
3	-	Excitation break away*	230V 50/60Hz	YE40023560000
4	K1 K2	Contactors*	220V 50/60Hz	YE00601521000
5	K3 K4	Contactors**	220V 50/60Hz	YE00601800000
6	F1 F2	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 S6	Thermocouple	-	-
12	S2 S3 S7 S8	Thermocouple	-	-
13	S4 S9	Overheat protector *	-	-
14	S5 S10	Hydrailic switch	-	YE14152400000
15	PC1 PC2	Circuit board**	100~240VAC 50/60Hz	YE80000100000
16	A1 A2	Control panel	-	
17	Y1 Y2	Solenoid valve*	230VAC 50/60Hz	-
18	X1	Terminal board	-	YE61250040000
19	-	Terminal board	-	YE61253500000
20	-	Terminal board	-	YE61060000000
21	-	Terminal board	-	YE61063500000
22	M1 M2	Motor**	400V 50Hz 0.5kW	-
23	EH1 EH2	Heater**	400V 50Hz 6kW	-
24	FM	Fan*	230VAC 50/60Hz	-

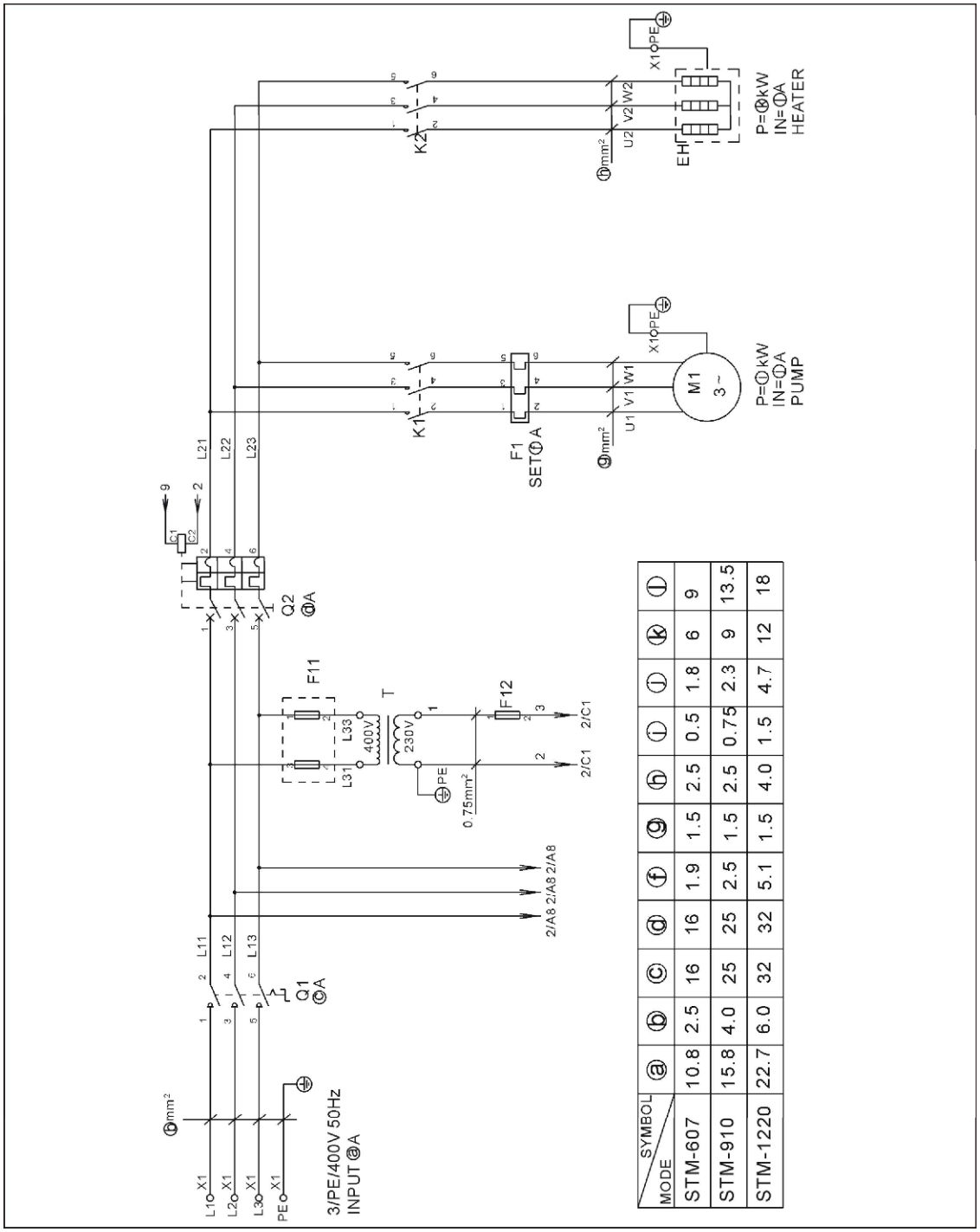
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

Table 2-6: Electrical Components List (STM-910-D) (400V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	63A	YE10636300000
2	Q2 Q3	Circuit_breakers*	25A	YE40602500000
3	-	Excitation break away*	230V 50/60Hz	YE40023560000
4	K1 K2	Contactors*	220V 50/60Hz	YE00601521000
5	K3 K4	Contactors**	220V 50/60Hz	YE00602522000
6	F1 F2	Overload relays	2.2~3.2A	YE01160220000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	F12	Fuse**	2A	YE41001000000
10	T	Transformer**	500mA	YE70402300800
11	S1 S6	Thermocouple	-	-
12	S2 S3 S7 S8	Thermocouple	-	-
13	S4 S9	Overheat protector *	-	-
14	S5 S10	Hydrailic switch	-	YE14152400000
15	PC1 PC2	Circuit board**	100~240VAC 50/60Hz	YE80000100000
16	A1 A2	Control panel	-	
17	Y1 Y2	Solenoid valve*	230VAC 50/60Hz	-
18	X1	Terminal board	-	YE61250040000
19	-	Terminal board	-	YE61253500000
20	-	Terminal board	-	YE61100000000
21	-	Terminal board	-	YE61103500000
22	M1 M2	Motor**	400V 50Hz 0.75kW	-
23	EH1 EH2	Heater**	400V 50Hz 9kW	-
24	FM	Fan*	230VAC 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.

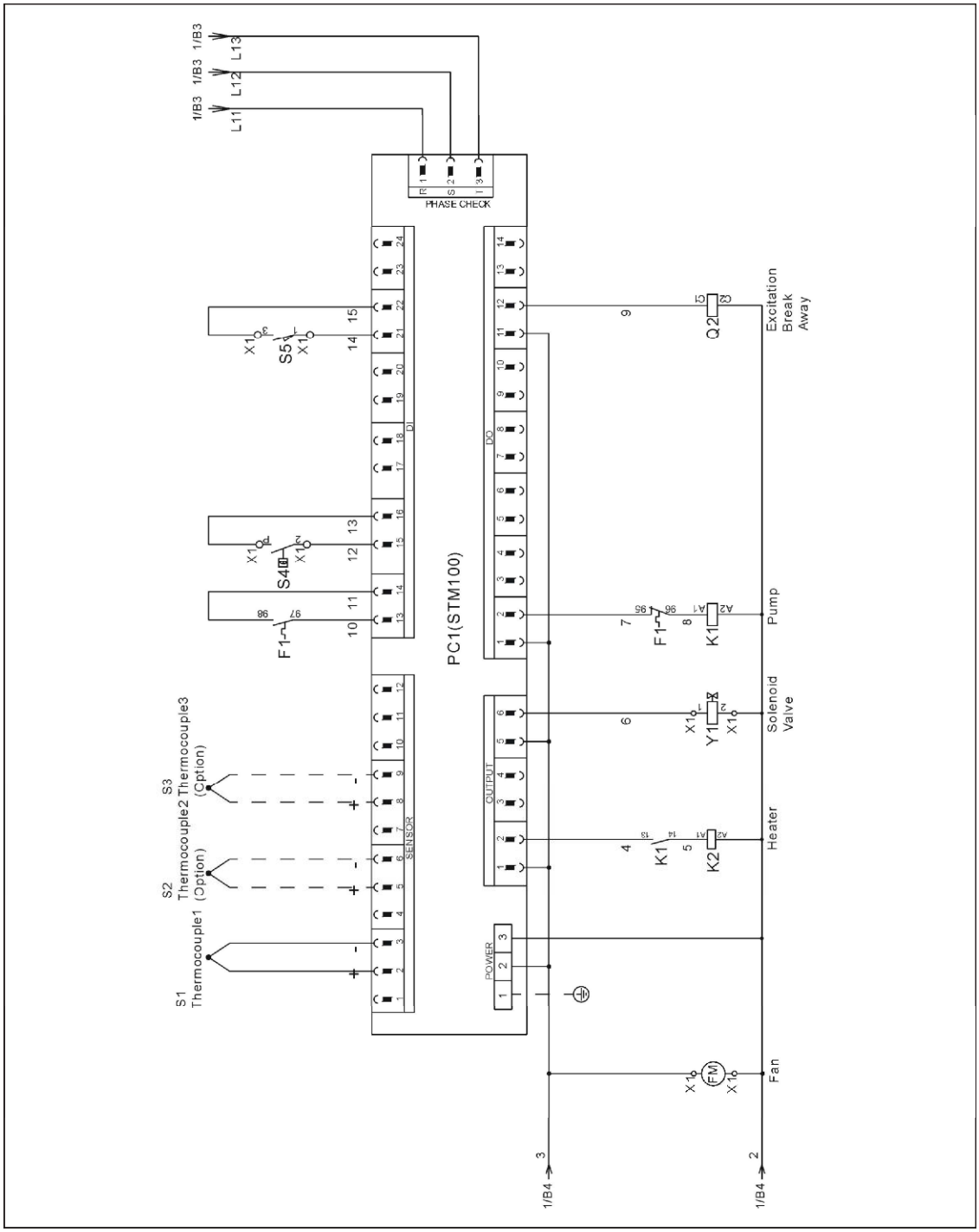
2.3.6 Main Circuit (STM-607~1220) (400V)



SYMBOL / MODE	ⓐ	ⓑ	ⓒ	ⓓ	ⓕ	ⓖ	ⓗ	ⓘ	ⓙ	ⓚ	ⓛ
STM-607	10.8	2.5	16	16	1.9	1.5	2.5	0.5	1.8	6	9
STM-910	15.8	4.0	25	25	2.5	1.5	2.5	0.75	2.3	9	13.5
STM-1220	22.7	6.0	32	32	5.1	1.5	4.0	1.5	4.7	12	18

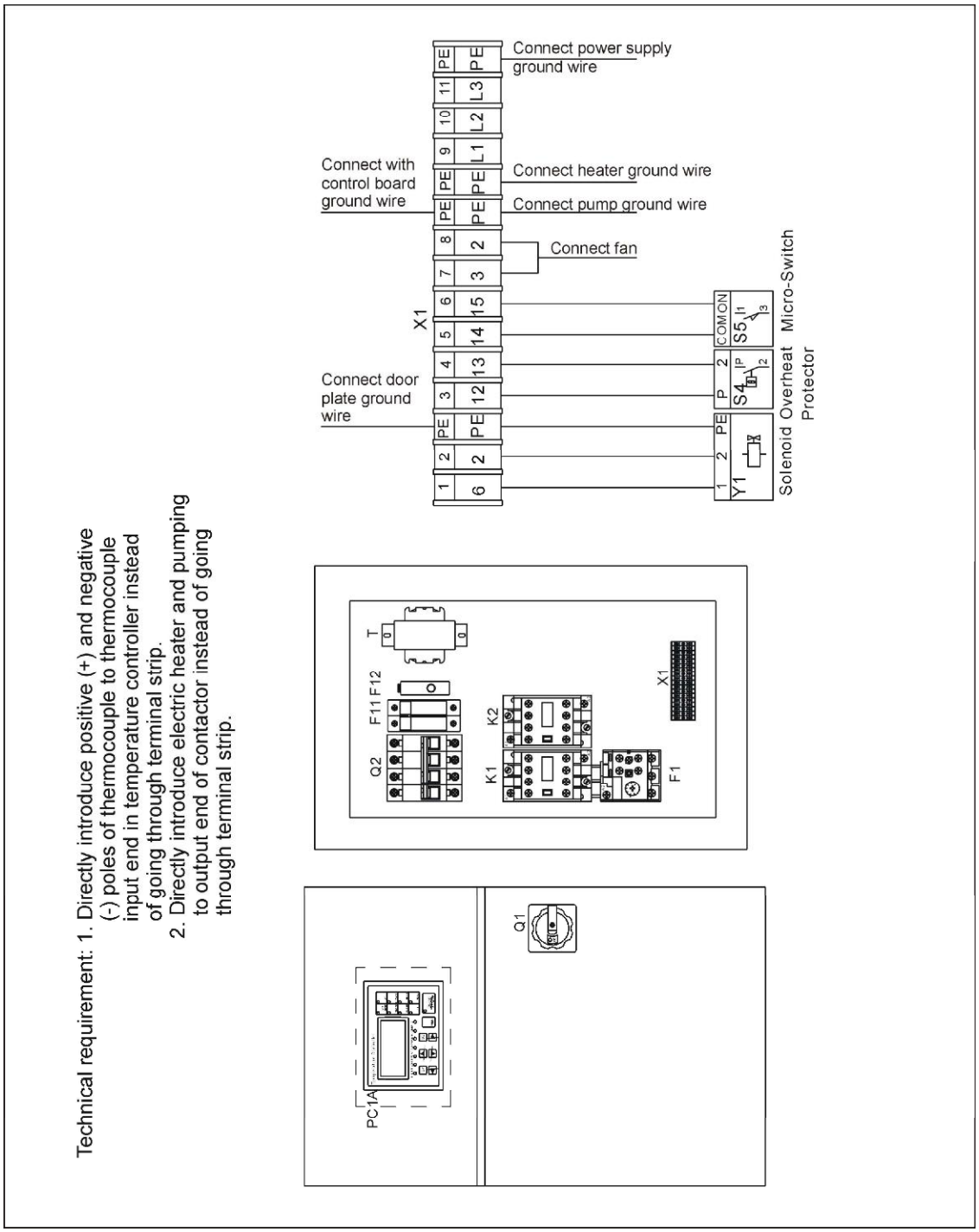
Picture 2-12: Main Circuit (STM-607~1220)(400V)

2.3.7 Control Circuit (STM-607~1220)(400V)



Picture 2-13: Control Circuit (STM-607~1220) (400V)

2.3.8 Electrical Components Layout (STM-607~1220) (400V)



Picture 2-14: Electrical Components Layout (STM-607~1220) (400V)

2.3.9 Electrical Components List (STM-607~1220) (400V)

Table 2-7: Electrical Components List (STM-607) (400V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	16A	YE10021160000
2	Q2	Circuit_breakers*	16A	YE40601500000
3	-	Excitation break away*	-	YE40023560000
4	K1	Contactors*	220V 50/60Hz	YE00601521000
5	K2	Contactors**	220V 50/60Hz	YE00601800000
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 protector*	-	-
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	M1	Motor**	400V 50Hz 0.5kW	-
20	EH	Heater**	400V 50Hz 6kW	-
21	FM	Fan*	230VAC 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-910) (400V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	25A	YE10125250000
2	Q2	Circuit_breakers*	25A	YE40602500000
3	-	Excitation break away*	-	YE40023560000
4	K1	Contactors*	220V 50/60Hz	YE00601521000
5	K2	Contactors**	220V 50/60Hz	YE00602522000
6	F1	Overload relays	2.2~3.2A	YE01160220000
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 protector*	-	-
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 0.75kW	-
21	EH	Heater**	400V 50Hz 9kW	-
23	FM	Fan*	230VAC 50/60Hz	-

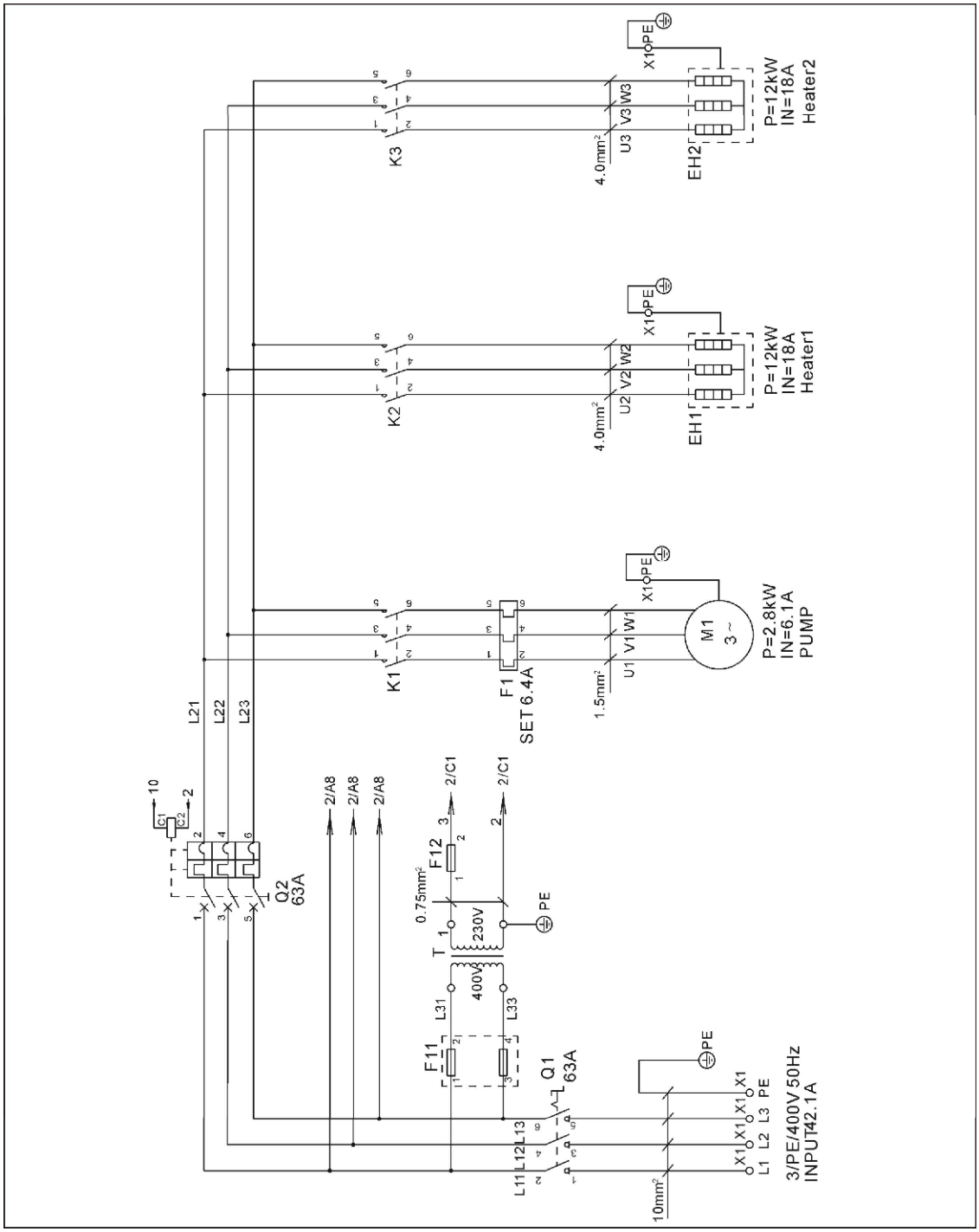
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

Table 2-9: Electrical Components List (STM-1220) (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	4.5~6.3A	YE01160450000
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 protector*	-	-
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
21	M1	Motor**	400V 50Hz 1.5kW	-
23	EH	Heater**	400V 50Hz 12kW	-
24	FM	Fan*	230VAC 50/60Hz	-

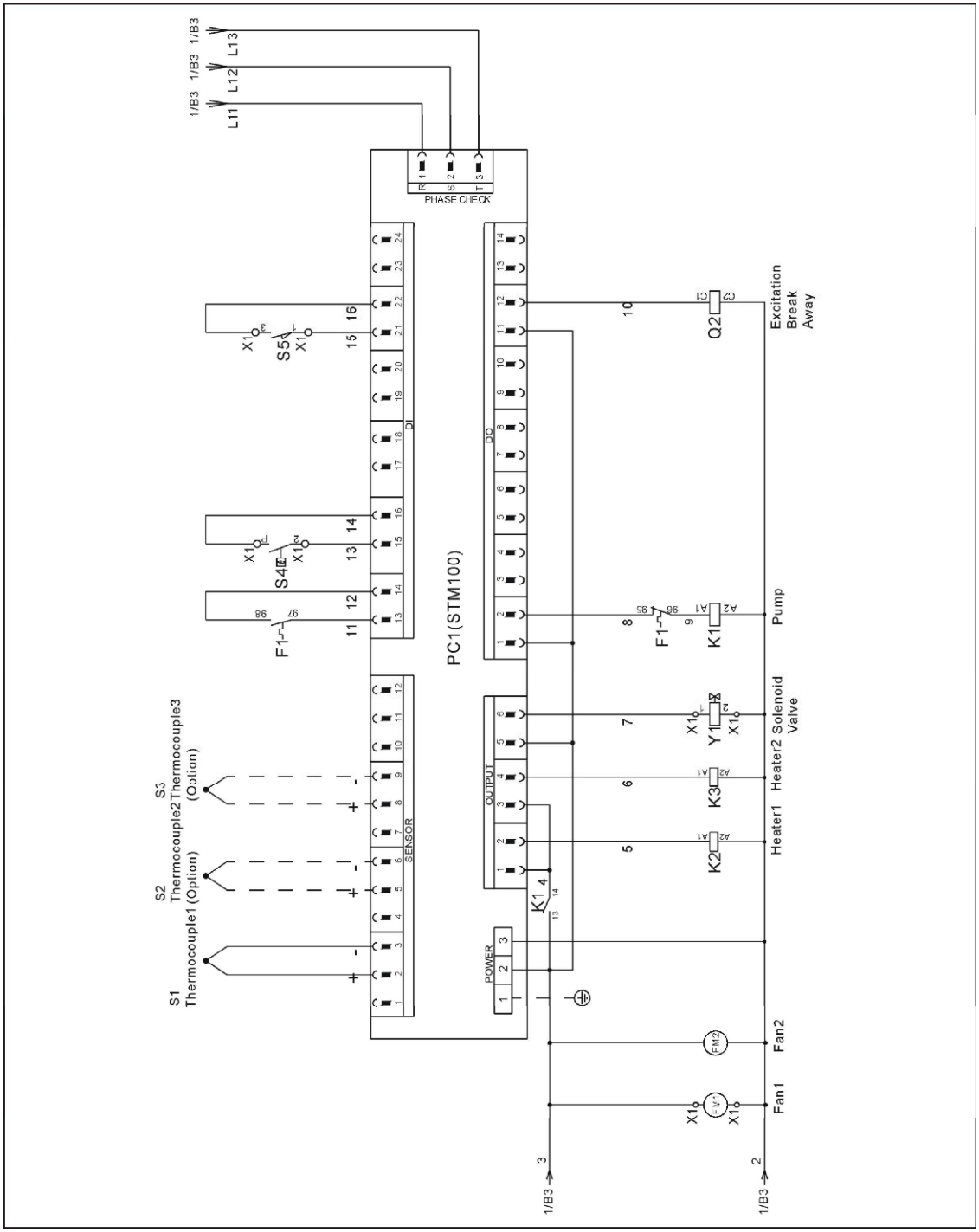
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

2.3.10 Main Circuit (STM-2440) (400V)



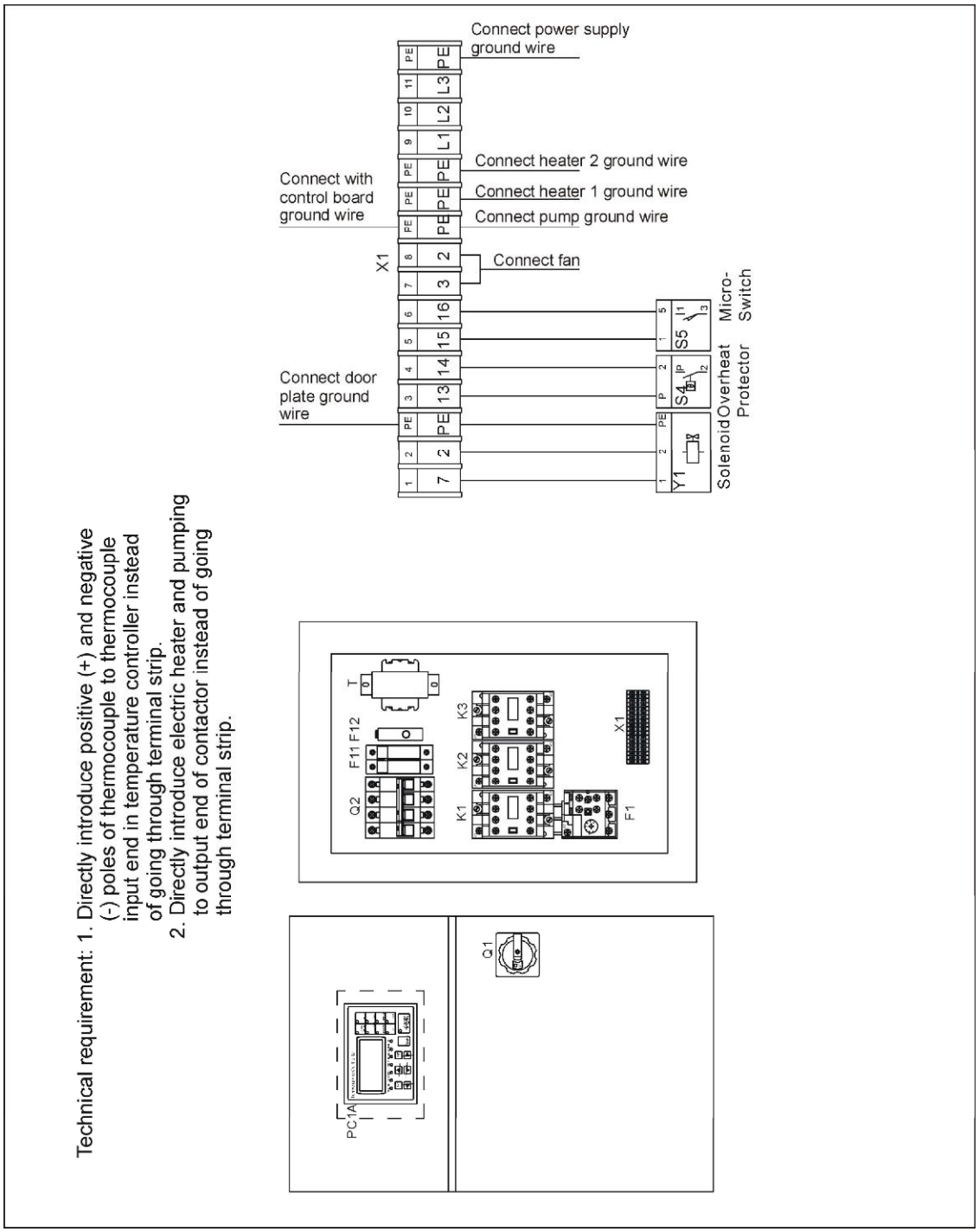
Picture 2-15: Main Circuit (STM-2440) (400V)

2.3.11 Control Circuit (STM-2440) (400V)



Picture 2-16: Control Circuit (STM-2440) (400V)

2.3.12 Electrical Components Layout (STM-2440) (400V)



Picture 2-17: Electrical Components Layout (STM-2440) (400V)

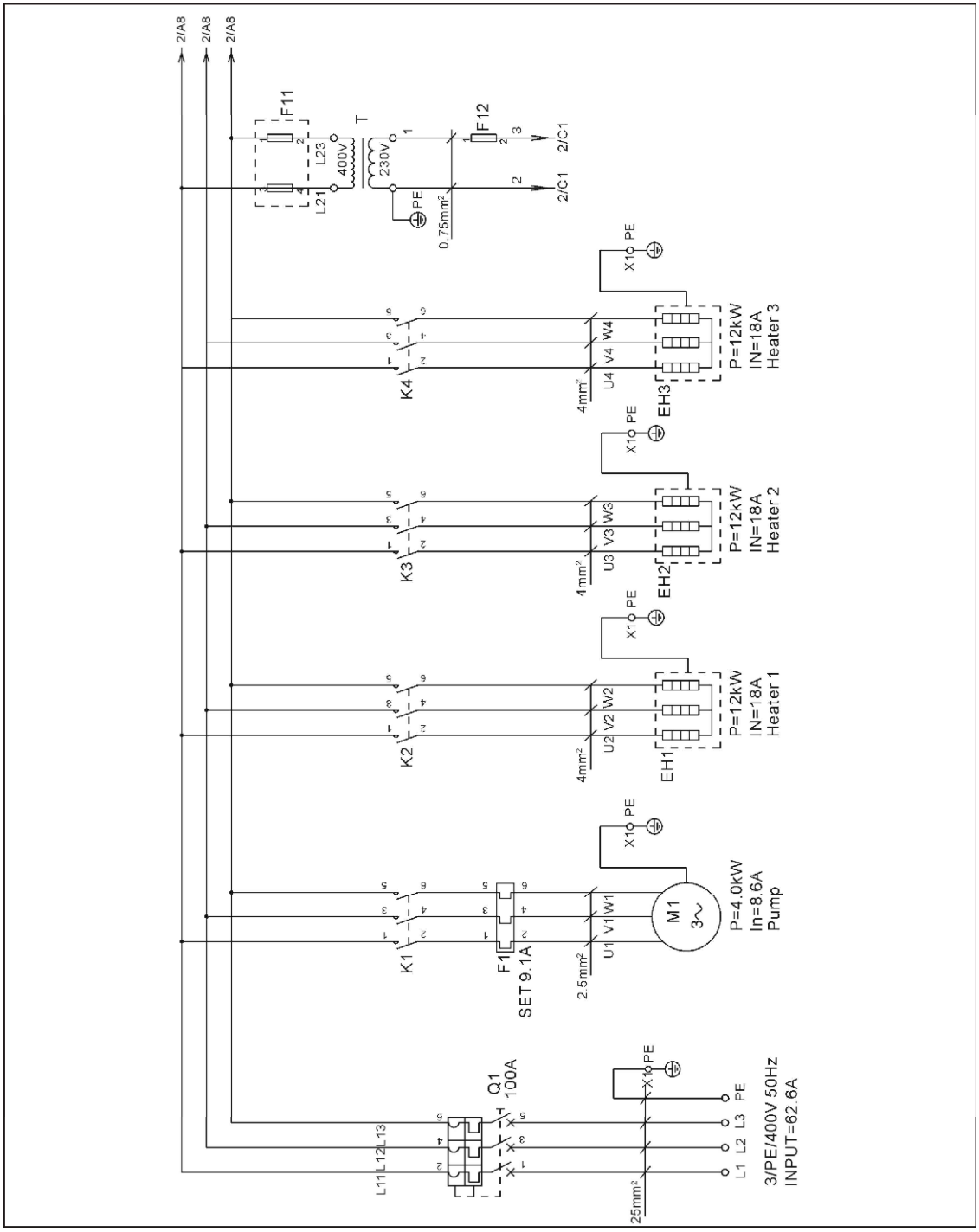
2.3.13 Electrical Components List (STM-2440) (400V)

Table 2-10: Electrical Components List (STM-2440) (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	500mA	YE70402300800
11	S1	Thermocouple	-	-
12	S2 S3	Thermocouple	-	-
13	S4	Overheat protector*	-	-
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	-	YE61160000000
21	-	Terminal board	-	YE61163500000
21	M1	Motor**	400V 50Hz 2.8kW	-
23	EH1 EH2	Heater**	400V 50Hz 12kW	-
24	FM1 FM2	Fan*	230VAC 50/60Hz	-

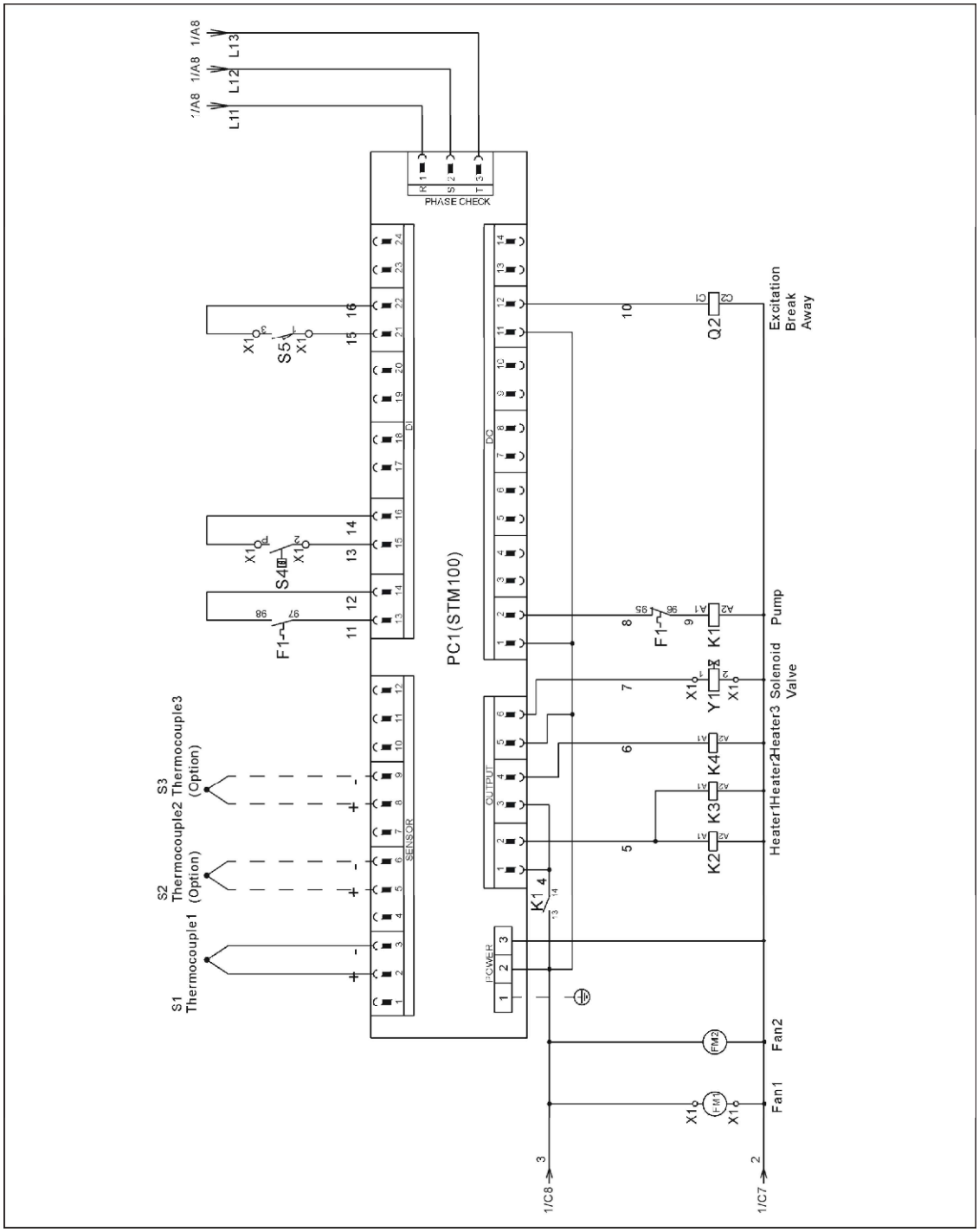
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

2.3.14 Main Circuit (STM-3650) (400V)



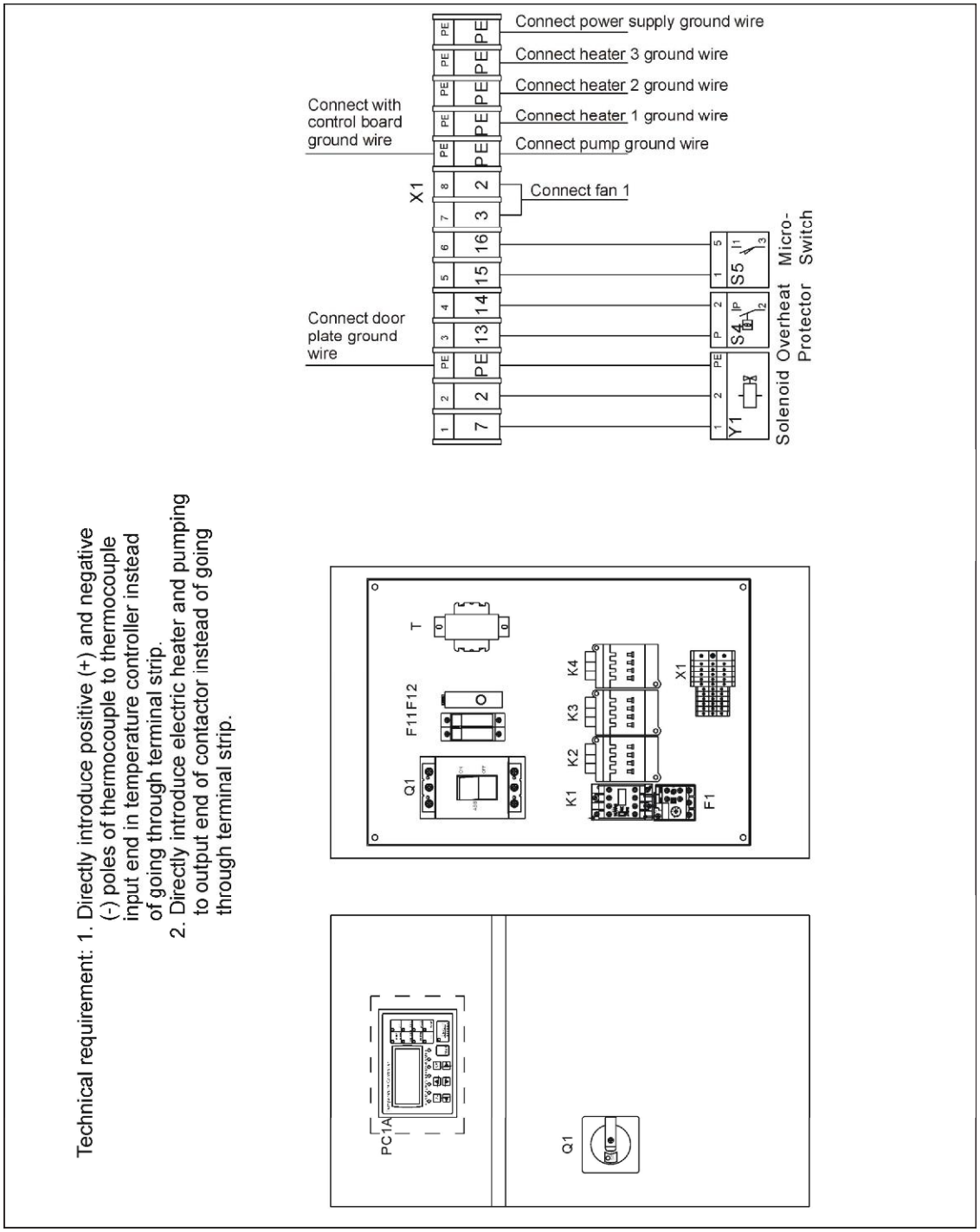
Picture 2-18: Main Circuit (STM-3650) (400V)

2.3.15 Control Circuit (STM-3650) (400V)



Picture 2-19: Control Circuit (STM-3650) (400V)

2.3.16 Electrical Components Layout (STM-3650) (400V)



Picture 2-20: Electrical Components Layout (STM-3650) (400V)

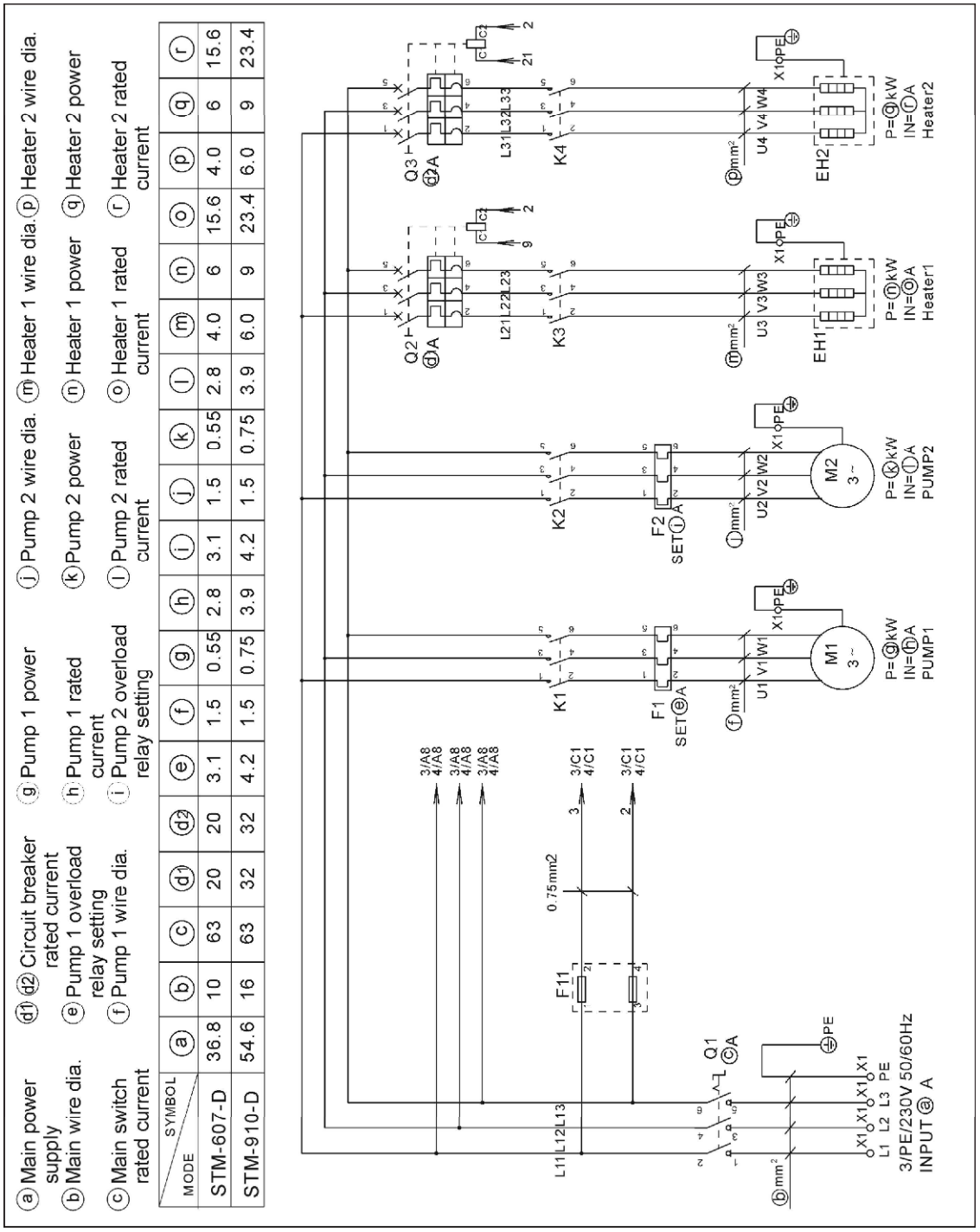
2.3.17 Electrical Components List (STM-3650) (400V)

Table 2-11: Electrical Components List (STM-3650) (400V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Circuit break	100A	YE41110000000
2	-	Excitation break away*	220VAC 50/60Hz	YE40101600000
3	K1	Contactors*	220V 50/60Hz	YE00601621000
4	K2	Contactors**	220V 50/60Hz	YE00602622000
5	F1	Overload relays	7~10A	YE01167100000
6	F11	Fuse box**	32A 2P	YE41032200000
7	-	Fuse**	2A	YE46002000100
8	F12	Fuse**	2A	YE41001000000
9	T	Transformer	500mA	YE70402300800
10	S1	Thermocouple	-	-
11	S2 S3	Thermocouple	-	-
12	S4	Overheat protector*	-	-
13	S5	Limit switch	250V 5(4)	YE14152400000
14	PC1	Circuit board**	100~240VAC 50/60Hz	YE81100010000
15	A	Control panel	-	
16	X1	Terminal board	-	YE61250040000
17	-	Terminal board	-	YE61253500000
18	-	Terminal board	-	YE61043500000
19	-	Terminal board	-	YE61163500000
20	M1	Motor**	400V 50Hz 4.0kW	-
21	EH1 EH2	Heater**	400V 50Hz 12kW	-
22	FM1 FM2	Fan*	230VAC 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.

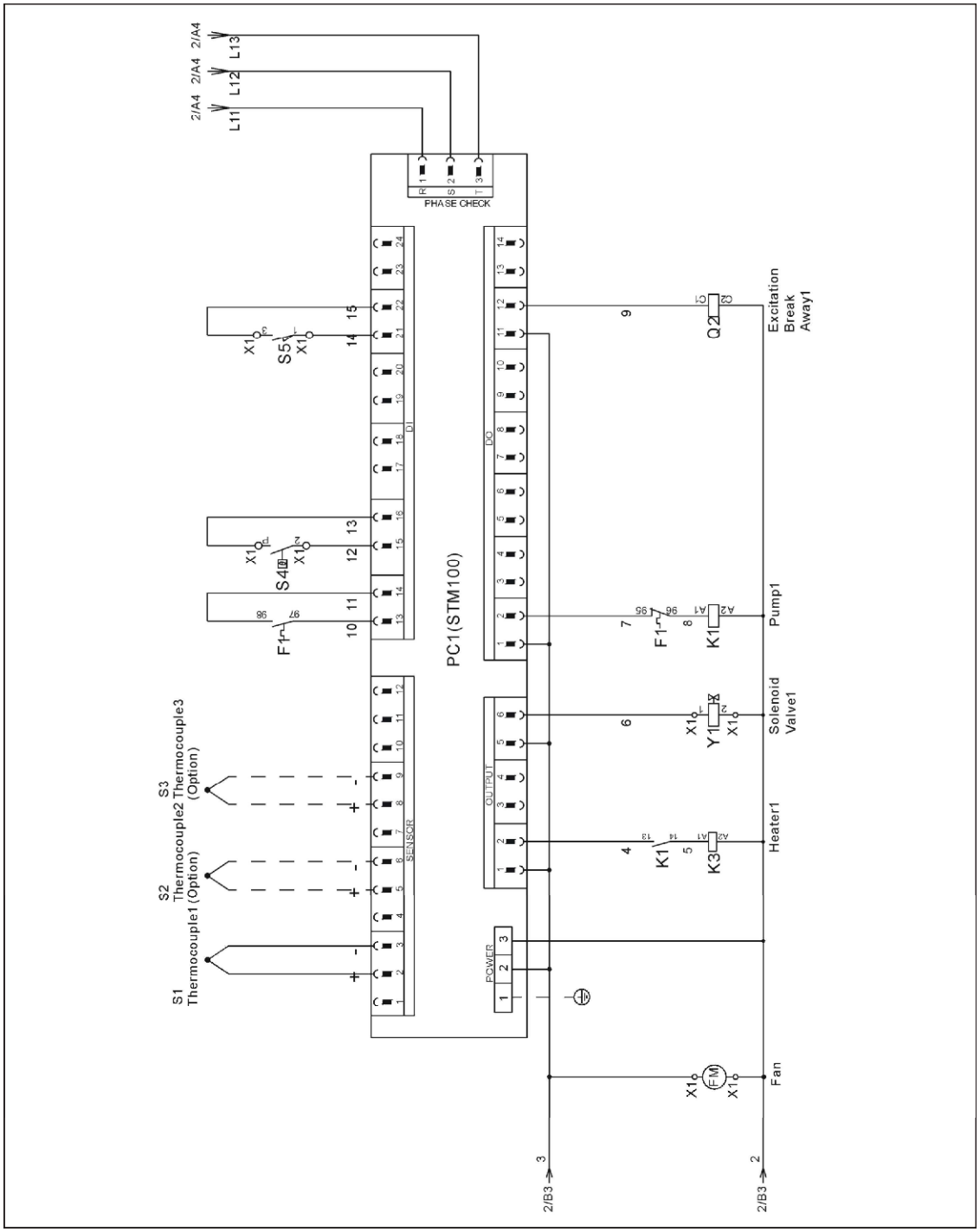
2.3.18 Main Circuit (STM-607/910-D)(230V)



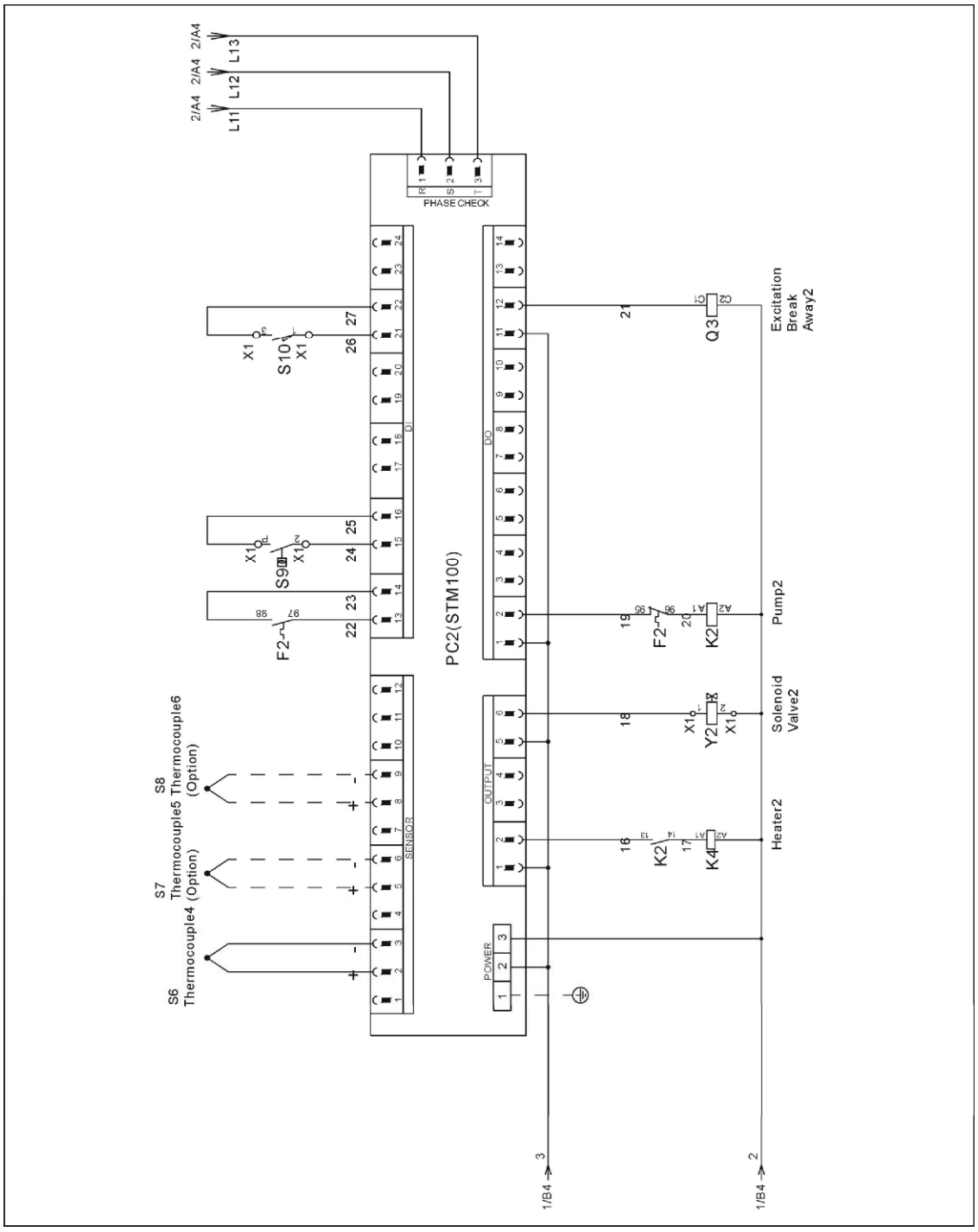
MODE \ SYMBOL	ⓐ	ⓑ	ⓒ	ⓓ①	ⓓ②	ⓔ	ⓕ	ⓖ	ⓗ	ⓘ	ⓙ	ⓚ	ⓛ	ⓜ	ⓝ	ⓞ	ⓟ	ⓠ	ⓡ
STM-607-D	36.8	10	63	20	20	3.1	1.5	0.55	2.8	3.1	1.5	0.55	2.8	4.0	6	15.6	4.0	6	15.6
STM-910-D	54.6	16	63	32	32	4.2	1.5	0.75	3.9	4.2	1.5	0.75	3.9	6.0	9	23.4	6.0	9	23.4

Picture 2-21: Main Circuit (STM-607/910-D) (230V)

2.3.19 Control Circuit (STM-607/910-D) (230V)

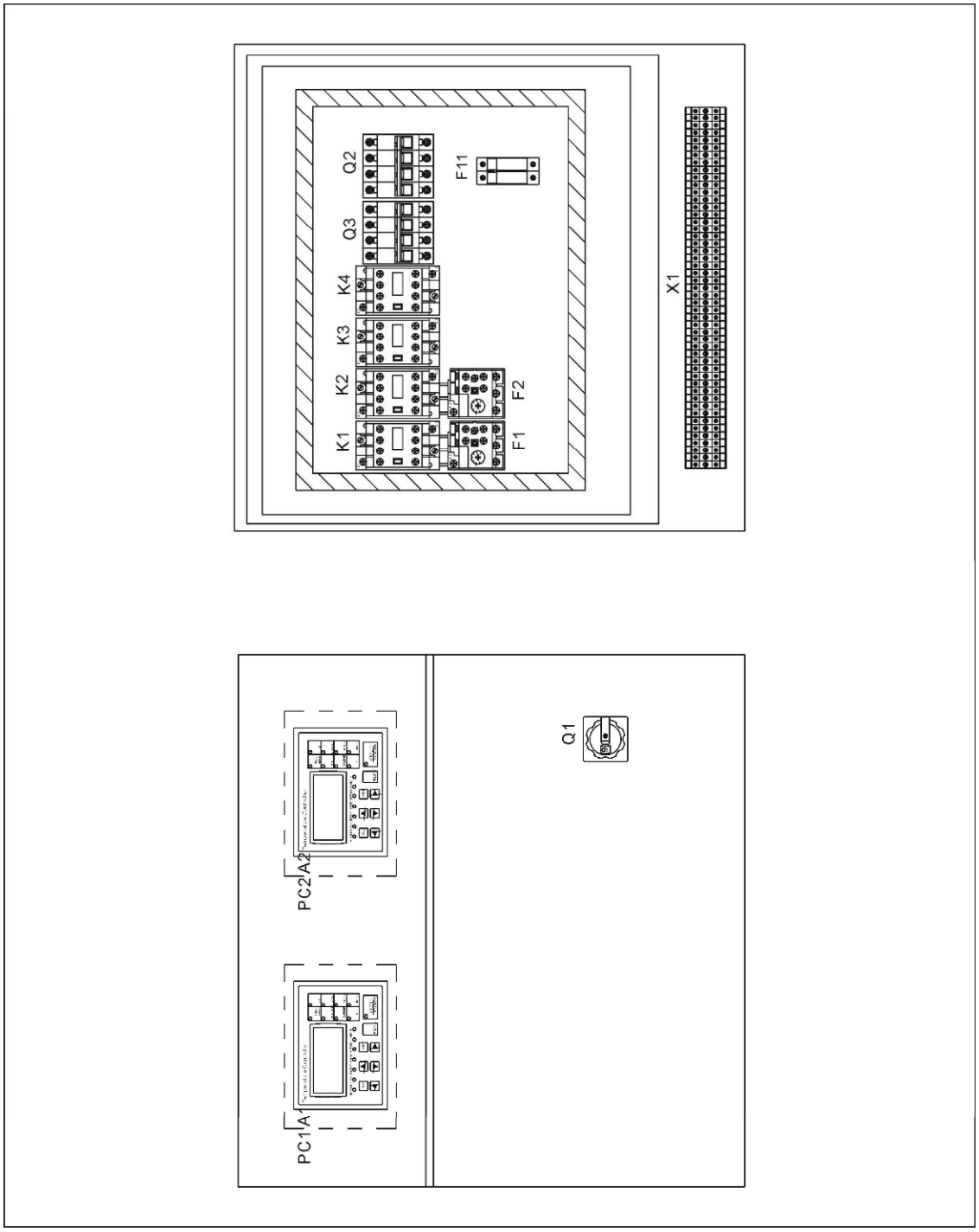


Picture 2-22: Control Circuit 1 (STM-607/910-D) (230V)



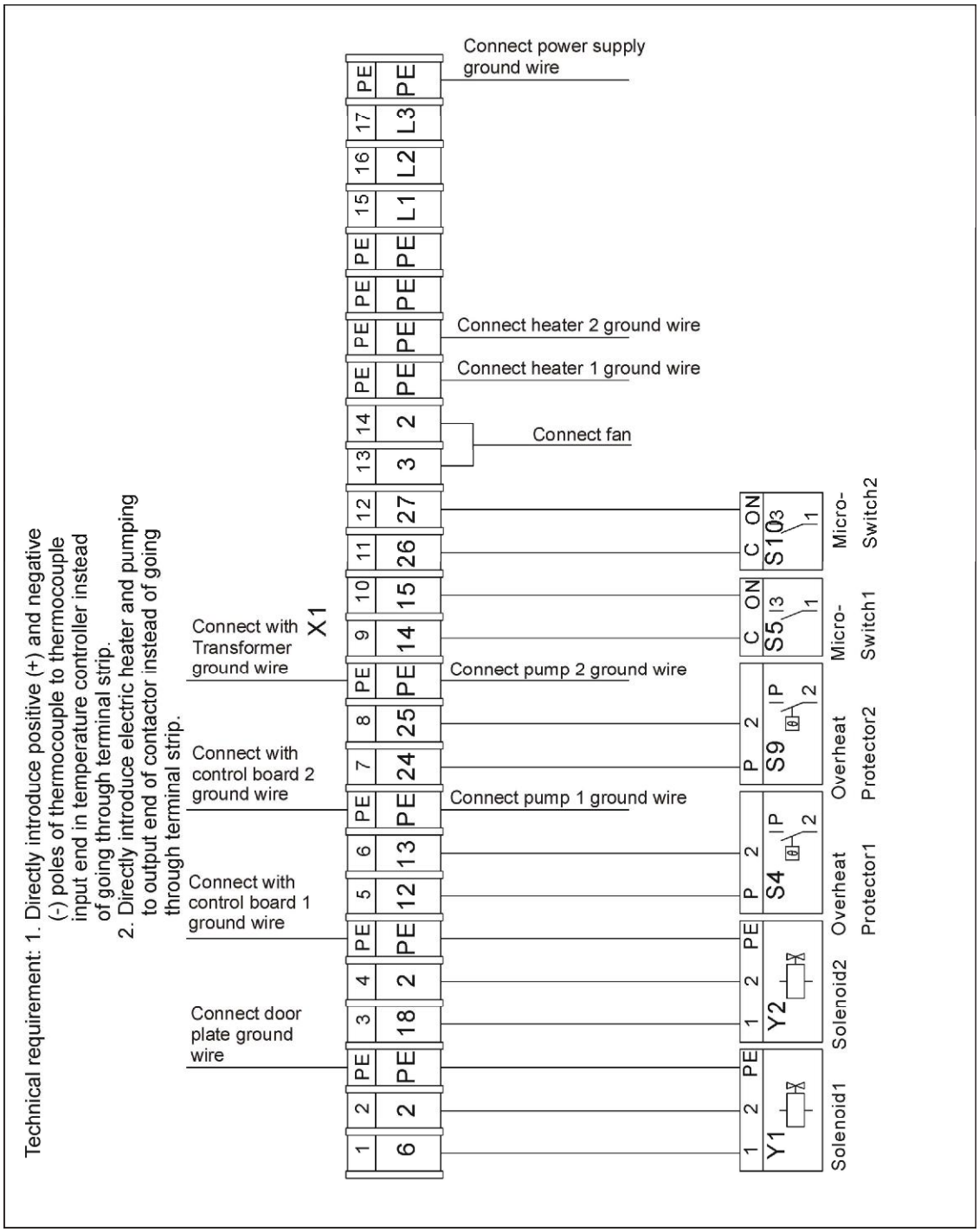
Picture 2-23: Control Circuit 2 (STM-607/910-D) (230V)

2.3.20 Electrical Components Layout (STM-607/910-D) (230V)



Picture 2-24: Electrical Components Layout (STM-607/910-D) (230V)

2.3.21 Thermocouple and Terminal Layout (STM-607/910-D) (230V)



Picture 2-25: Thermocouple and Terminal Layout (STM-607/910-D) (230V)

2.3.22 Electrical Components List (STM-607/910-D) (230V)

Table 2-12: Electrical Components List (STM-607-D) (230V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	63A	YE10636300000
2	Q2 Q3	Circuit_breakers*	25A	YE40602500000
3	-	Excitation break away*	230V 50/60Hz	YE40023560000
4	K1 K2	Contactors*	230V 50/60Hz	YE00601521000
5	K3 K4	Contactors**	230V 50/60Hz	YE00602522000
6	F1 F2	Overload relays	2.8~4A	YE01160280000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	S1 S6	Thermocouple	-	-
10	S2 S3 S7 S8	Thermocouple	-	-
11	S4 S9	Overheat protector *	-	-
12	S5 S10	Hydrailic switch	-	YE14152400000
13	PC1 PC2	Circuit board**	100~240VAC 50/60Hz	YE80000100000
14	A1 A2	Control panel	-	
15	Y1 Y2	Solenoid valve*	230VAC 50/60Hz	-
16	X1	Terminal board	-	YE61250040000
17	-	Terminal board	-	YE61253500000
18	-	Terminal board	-	YE61043500000
19	-	Terminal board	-	YE61100000000
20	-	Terminal board	-	YE61103500000
21	M1 M2	Motor**	400V 50Hz 0.55kW	-
22	EH1 EH2	Heater**	400V 50Hz 6kW	-
23	FM	Fan*	230VAC 50/60Hz	-

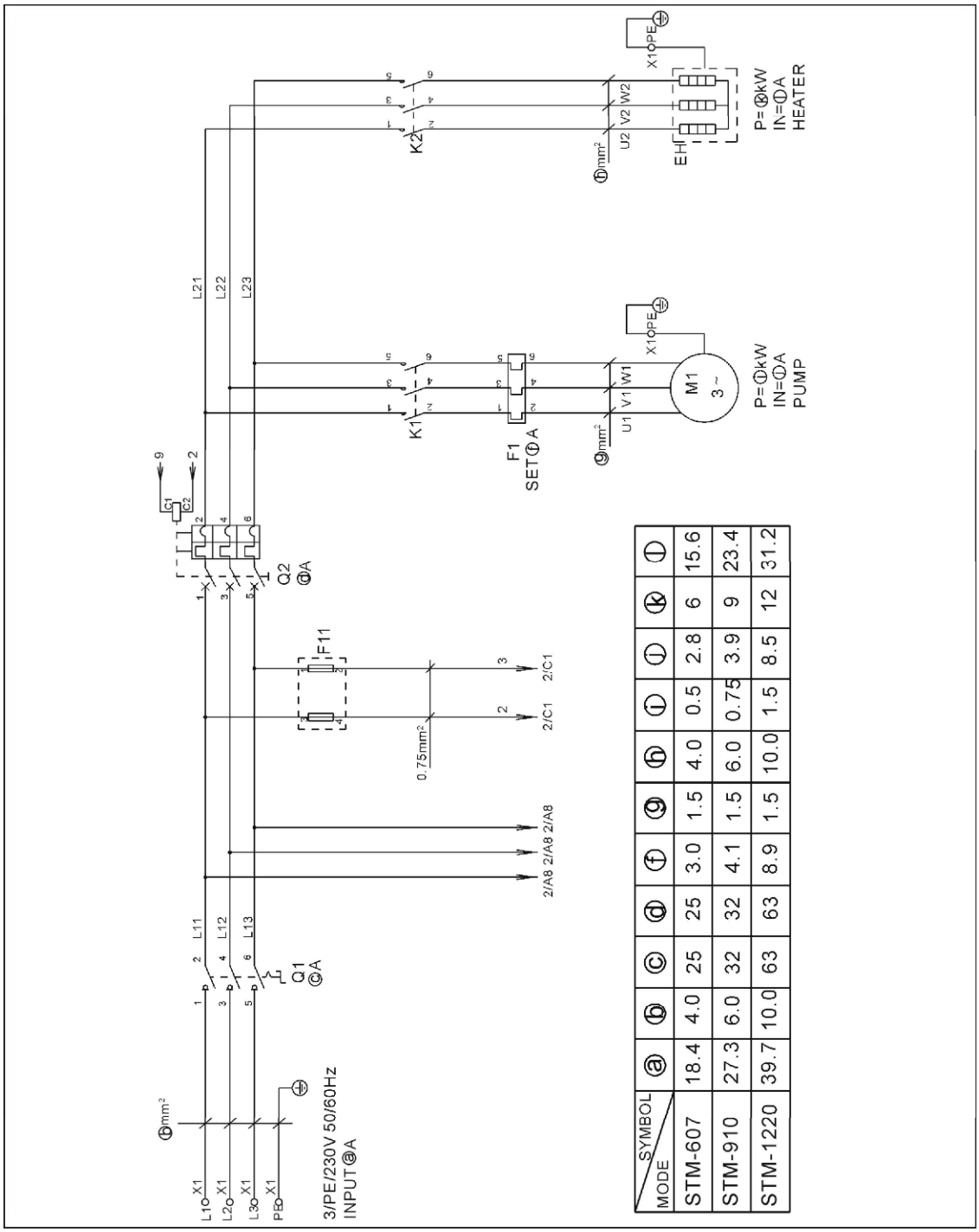
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

Table 2-13: Electrical Components List (STM-910-D) (230V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	63A	YE10636300000
2	Q2 Q3	Circuit_breakers*	40A	YE40604000000
3	-	Excitation break away*	230V 50/60Hz	YE40023560000
4	K1 K2	Contactors*	230V 50/60Hz	YE00601521000
5	K3 K4	Contactors**	230V 50/60Hz	YE00602722000
6	F1 F2	Overload relays	3.5~5A	YE01160350000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	S1 S6	Thermocouple	-	-
10	S2 S3 S7 S8	Thermocouple	-	-
11	S4 S9	Overheat protector *	-	-
12	S5 S10	Hydrailic switch	-	YE14152400000
13	PC1 PC2	Circuit board**	100~240VAC 50/60Hz	YE80000100000
14	A1 A2	Control panel	-	
15	Y1 Y2	Solenoid valve*	230VAC 50/60Hz	-
16	X1	Terminal board	-	YE61250040000
17	-	Terminal board	-	YE61253500000
18	-	Terminal board	-	YE61063500000
19	-	Terminal board	-	YE61160000000
20	-	Terminal board	-	YE61163500000
21	M1 M2	Motor**	400V 50Hz 0.75kW	-
22	EH1 EH2	Heater**	400V 50Hz 9kW	-
23	FM	Fan*	230VAC 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.

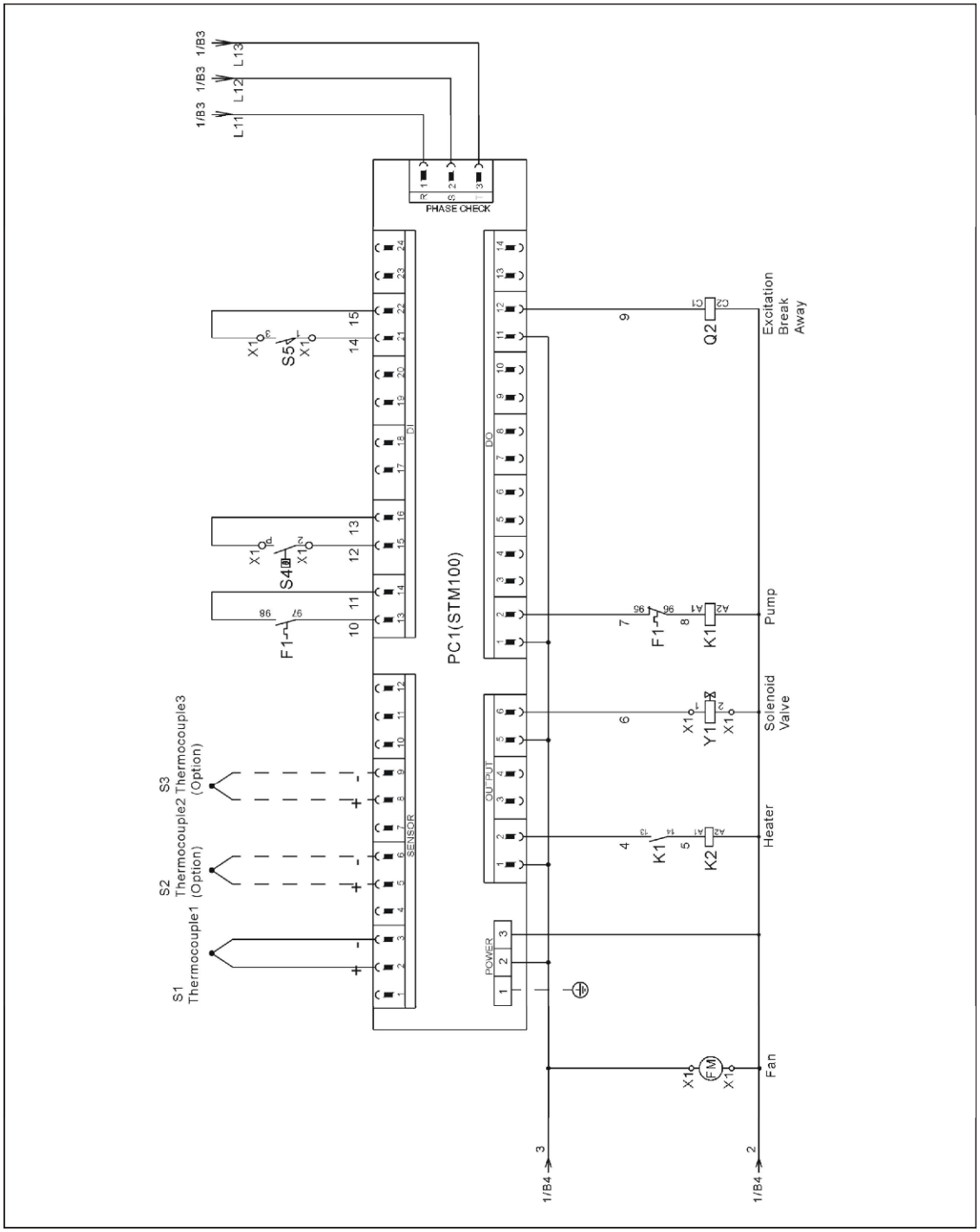
2.3.23 Main Circuit (STM-607~1220) (230V)



MODE \ SYMBOL	ⓐ	ⓑ	ⓒ	ⓓ	ⓕ	ⓖ	ⓗ	ⓘ	ⓙ	ⓚ	ⓛ
STM-607	18.4	4.0	25	25	3.0	1.5	4.0	0.5	2.8	6	15.6
STM-910	27.3	6.0	32	32	4.1	1.5	6.0	0.75	3.9	9	23.4
STM-1220	39.7	10.0	63	63	8.9	1.5	10.0	1.5	8.5	12	31.2

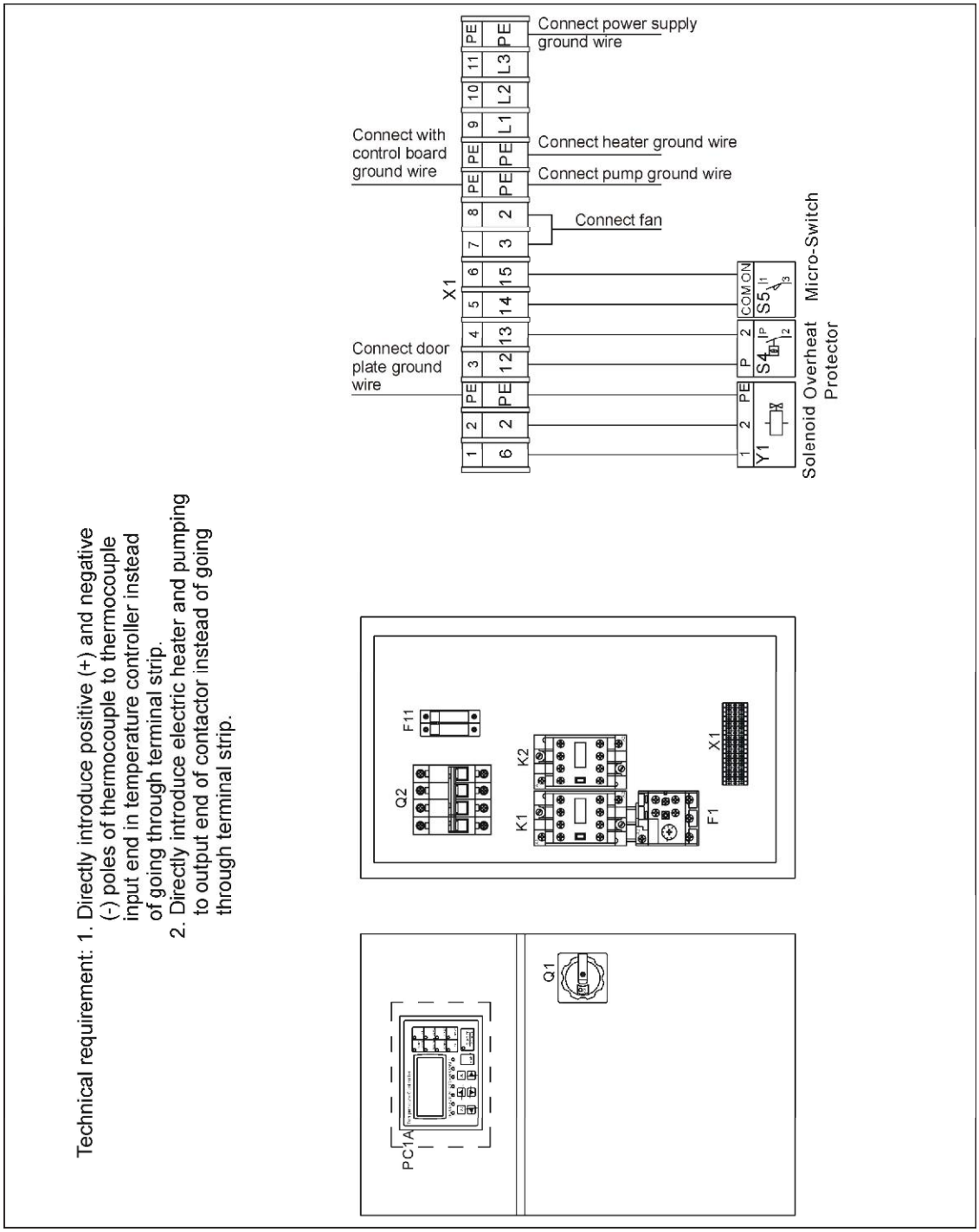
Picture 2-26: Main Circuit (STM-607~1220)(230V)

2.3.24 Control Circuit (STM-607~1220)(230V)



Picture 2-27: Control Circuit (STM-607~1220) (230V)

2.3.25 Electrical Components Layout (STM-607~1220) (230V)



Picture 2-28: Electrical Components Layout (STM-607~1220) (230V)

2.3.26 Electrical Components List (STM-607~1220) (230V)

Table 2-14: Electrical Components List (STM-607) (230V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	25A	YE10125250000
2	Q2	Circuit_breakers*	25A	YE40602500000
3	-	Excitation break away*	-	YE40023560000
4	K1	Contactors*	230V 50/60Hz	YE00601521000
5	K2	Contactors**	230V 50/60Hz	YE00602522000
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 protector*	-	-
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	-	YE61040000000
18	-	Terminal board	-	YE61043500000
19	Y1	Solenoid valve	230VAC 50/60Hz	-
20	M1	Motor**	230V 50Hz 0.55kW	-
21	EH	Heater**	230V 50Hz 6kW	-
22	FM	Fan*	230VAC 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 2-15: Electrical Components List (STM-910) (230V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	32A	YE10132320000
2	Q2	Circuit_breakers*	32A	YE40603200000
3	-	Excitation break away*	-	YE40023560000
4	K1	Contactors*	230V 50/60Hz	YE00601521000
5	K2	Contactors**	230V 50/60Hz	YE00602722000
6	F1	Overload relays	3.5~5A	YE01160350000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	S1	Thermocouple	-	-
10	S2 S3	Thermocouple	-	-
11	S4	Overheat protector*	-	-
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	Y1	Solenoid valve	230VAC 50/60Hz	-
20	M1	Motor**	230V 50Hz 0.75kW	-
21	EH	Heater**	230V 50Hz 9kW	-
22	FM	Fan*	230VAC 50/60Hz	-

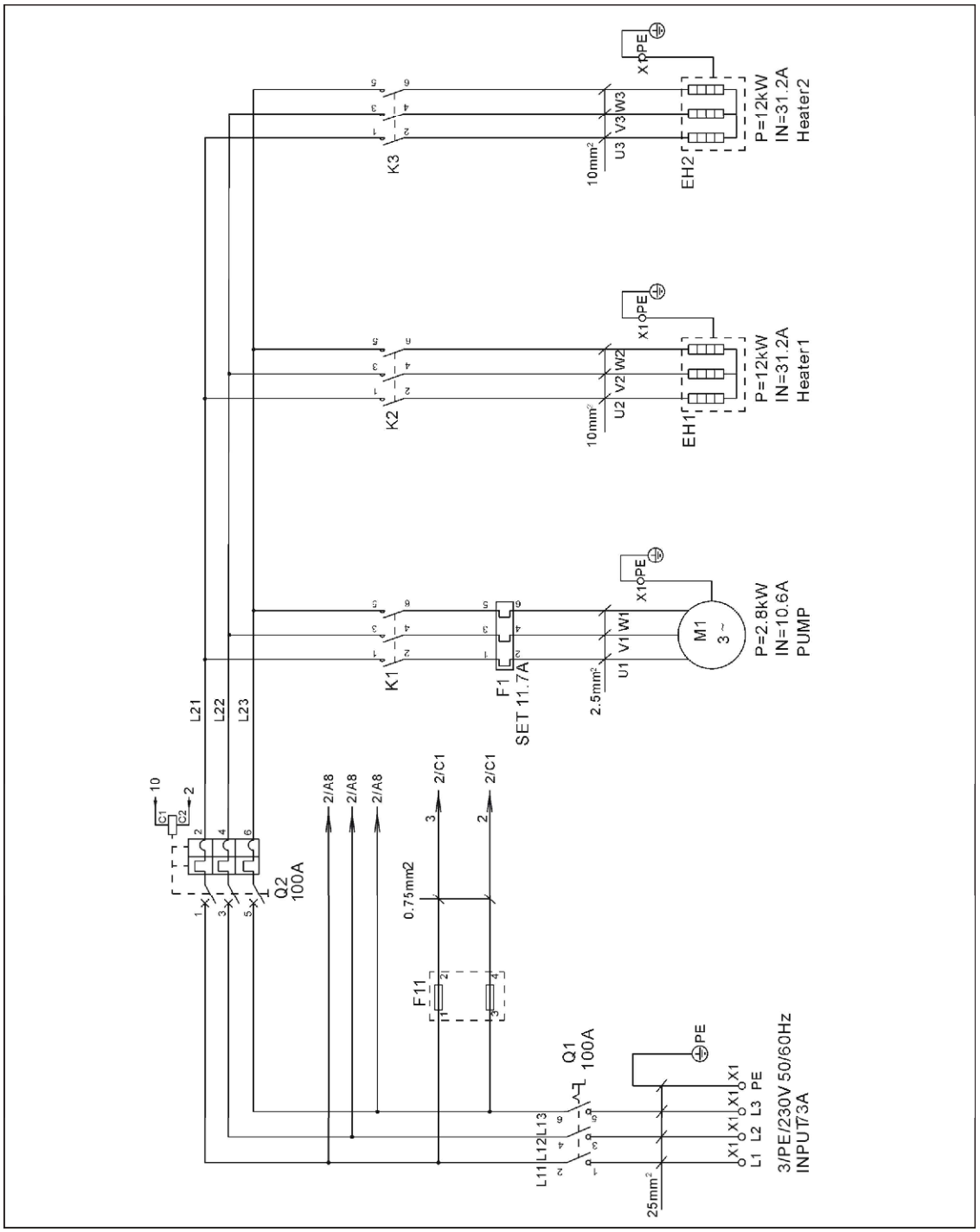
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

Table 2-16: Electrical Components List (STM-1220) (230V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	63A	YE10636300000
2	Q2	Circuit_breakers*	60A	YE40606000000
3	-	Excitation break away*	-	YE40023560000
4	K1	Contactors*	230V 50/60Hz	YE00601621000
5	K2	Contactors**	230V 50/60Hz	YE00500350000
6	F1	Overload relays	7~10A	YE01167100000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	S1	Thermocouple	-	-
10	S2 S3	Thermocouple	-	-
11	S4	Overheat protector*	-	-
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	-	YE61043500000
18	-	Terminal board	-	YE61100000000
19	-	Terminal board	-	YE61103500000
20	Y1	Solenoid valve	230VAC 50/60Hz	-
21	M1	Motor**	230V 50Hz 1.5kW	-
22	EH	Heater**	230V 50Hz 12kW	-
23	FM	Fan*	230VAC 50/60Hz	-

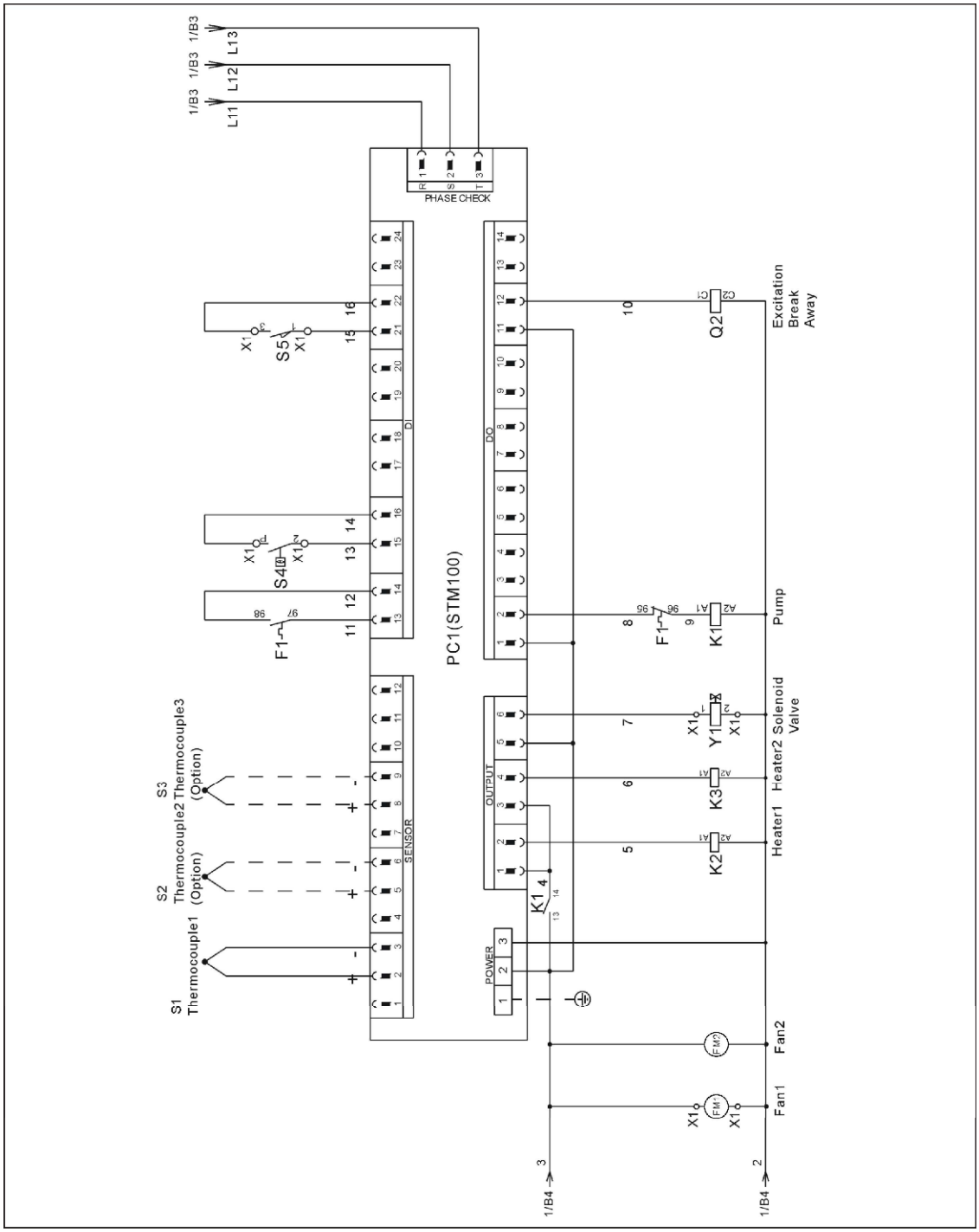
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

2.3.27 Main Circuit (STM-2440) (230V)



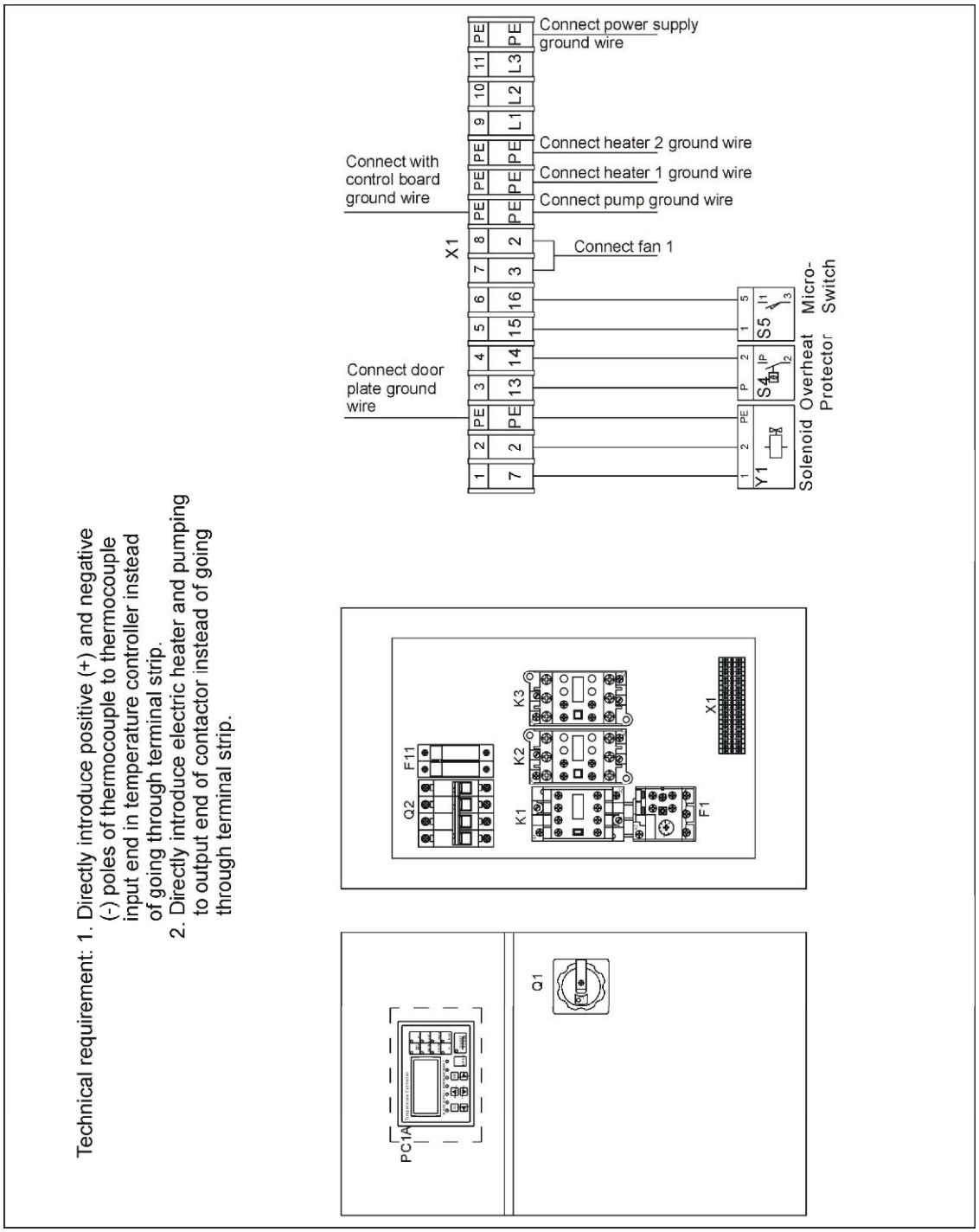
Picture 2-29: Main Circuit (STM-2440) (230V)

2.3.28 Control Circuit (STM-2440) (230V)



Picture 2-30: Control Circuit (STM-2440) (230V)

2.3.29 Electrical Components Layout (STM-2440) (230V)



Picture 2-31: Electrical Components Layout (STM-2440) (230V)

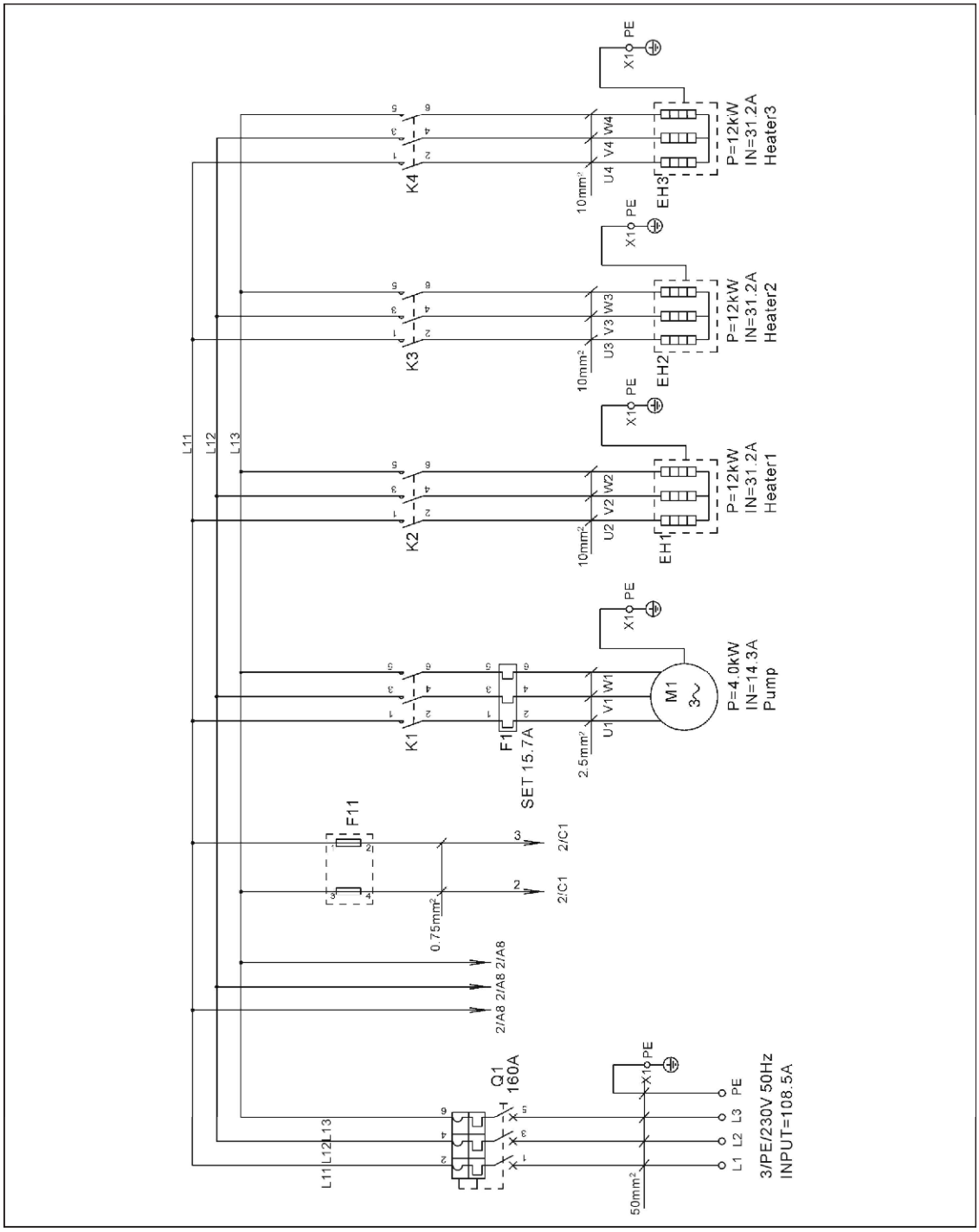
2.3.30 Electrical Components List (STM-2440) (230V)

Table 2-17: Electrical Components List (STM-2440) (230V)

No.	Symbol	Name	Specification	Part No.
1	Q1	Main switch*	100A	YE10010000000
2	Q2	Circuit_breakers*	100A	YE40100300000
3	-	Excitation break away*	230V 50/60Hz	YE40010000000
4	K1	Contactors*	230V 50/60Hz	YE00601721000
5	K2 K3	Contactors**	230V 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 protector*	-	-
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	Y1	Solenoid valve	230VAC 50/60Hz	-
20	M1	Motor**	230V 50Hz 2.8kW	-
21	EH1 EH2	Heater**	230V 50Hz 12kW	-
22	FM1 FM2	Fan*	230VAC 50/60Hz	-

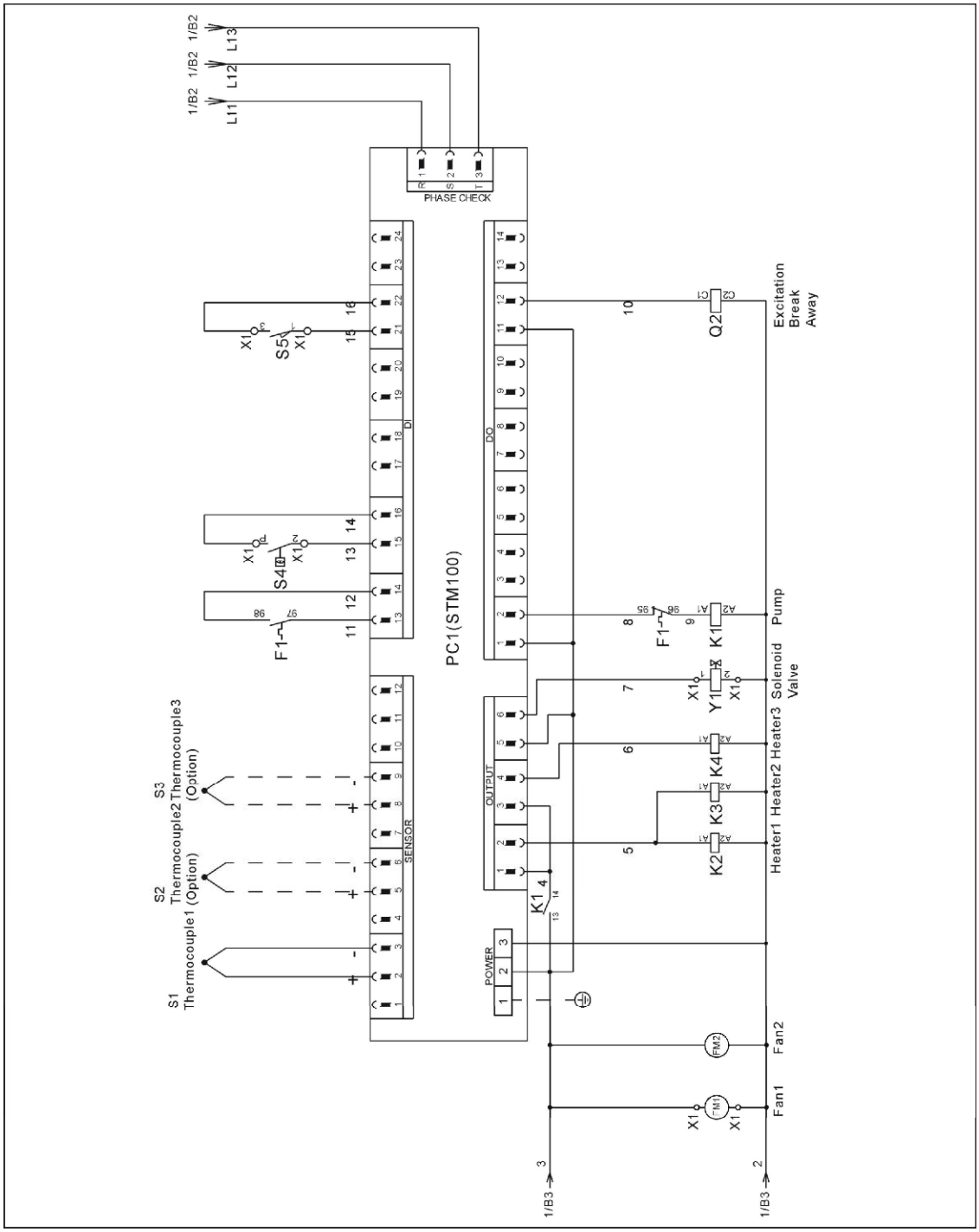
* means possible broken parts.
** means easy broken part. and spare backup is suggested.
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

2.3.31 Main Circuit (STM-3650) (230V)



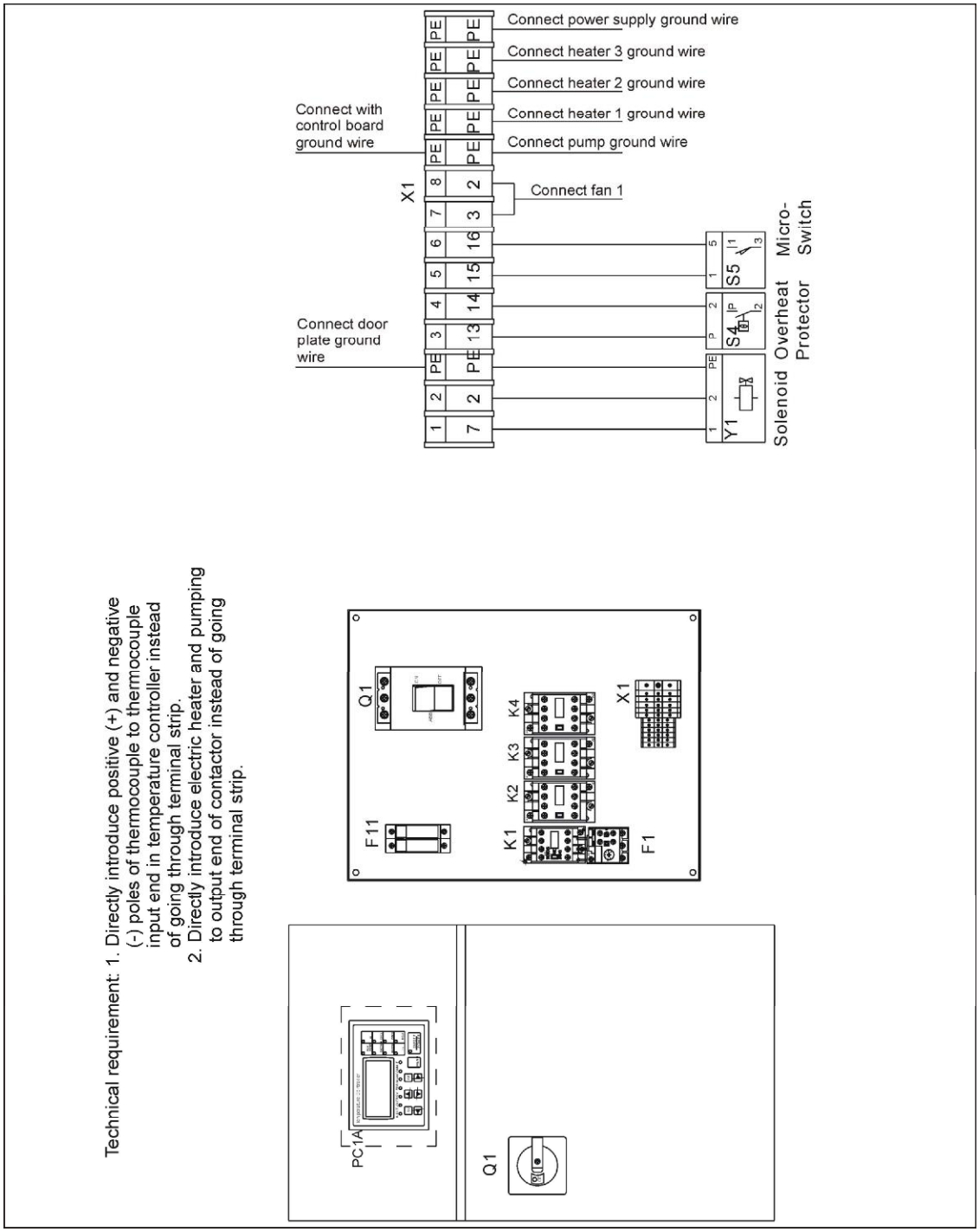
Picture 2-32: Main Circuit (STM-3650) (230V)

2.3.32 Control Circuit (STM-3650) (230V)



Picture 2-33: Control Circuit (STM-3650) (230V)

2.3.33 Electrical Components Layout (STM-3650) (230V)



Picture 2-34: Electrical Components Layout (STM-3650) (230V)

2.3.34 Electrical Components List (STM-3650) (230V)

Table 2-18: Electrical Components List (STM-3650) (230V)

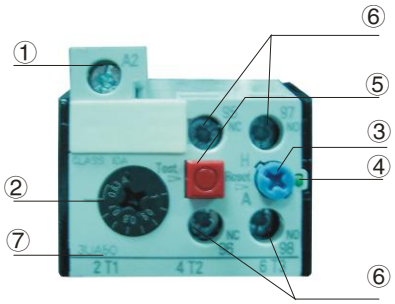
No.	Symbol	Name	Specification	Part No.
1	Q1	Circuit break	160A	YE41161200000
2	-	Excitation break away*	220VAC 50/60Hz	YE40101600000
3	K1	Contactors*	230V 50/60Hz	YE00602522000
4	K2~K4	Contactors**	230V 50/60Hz	YE00503500000
5	F1	Overload relays	14~20A	YE01260140000
6	F11	Fuse box**	32A 2P	YE41032200000
7	-	Fuse**	2A	YE46002000100
8	S1	Thermocouple	-	-
9	S2 S3	Thermocouple	-	-
10	S4	Overheat protector*	-	-
11	S5	Limit switch	250V 5(4)	YE14152400000
12	PC1	Circuit board**	100~240VAC 50/60Hz	YE81100010000
13	A	Control panel	-	
14	X1	Terminal board	-	YE61250040000
15	-	Terminal board	-	YE61253500000
16	-	Terminal board	-	YE61043500000
17	-	Terminal board	-	YE61353500000
18	Y1	Solenoiud valve	230VAC 50/60Hz	-
19	M1	Motor**	230V 50Hz 4.0kW	-
20	EH1 EH2	Heater**	400V 50Hz 12kW	-
21	FM1 FM2	Fan*	230VAC 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 2-35: Overload Relay

1) Terminal for contact coil A2.
2) Setting current adjusting scale.
3) Reset (blue).

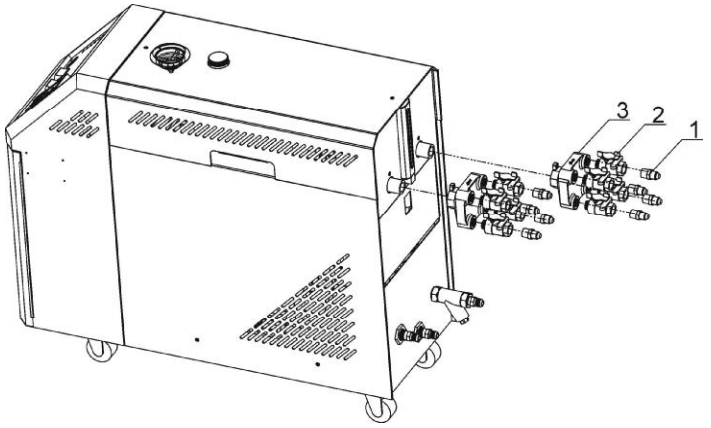
H: manual reset

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 connector No. must be correspond with terminal Number of contactor.

2.5 Operation Procedures

2.5.1 Installation steps for options water manifold (dewaxing)

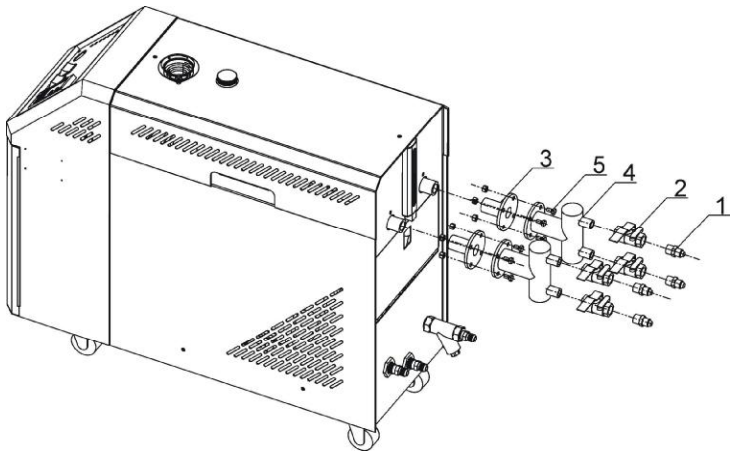


1) Install copper joint to the level valve.
2) Install level valve with copper joint to the dewaxing water manifold.
3) Install water manifold to the machine.
4) Install Teflon to copper joint.

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.

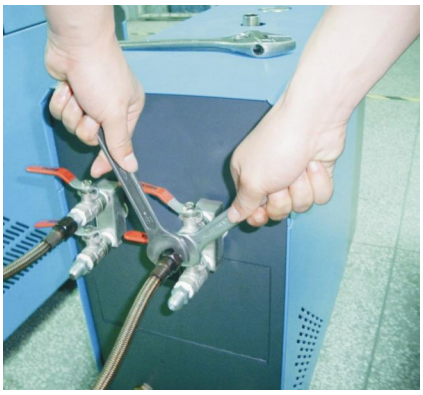
Do not sit on the machine.

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.



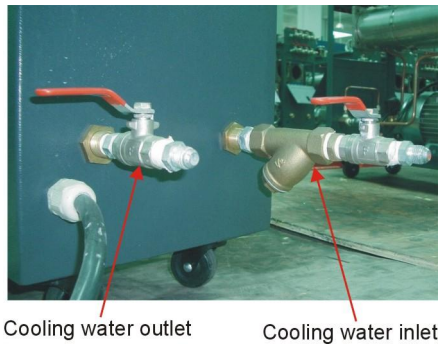
Picture 3-2: Mould and Water Coupling 1

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.

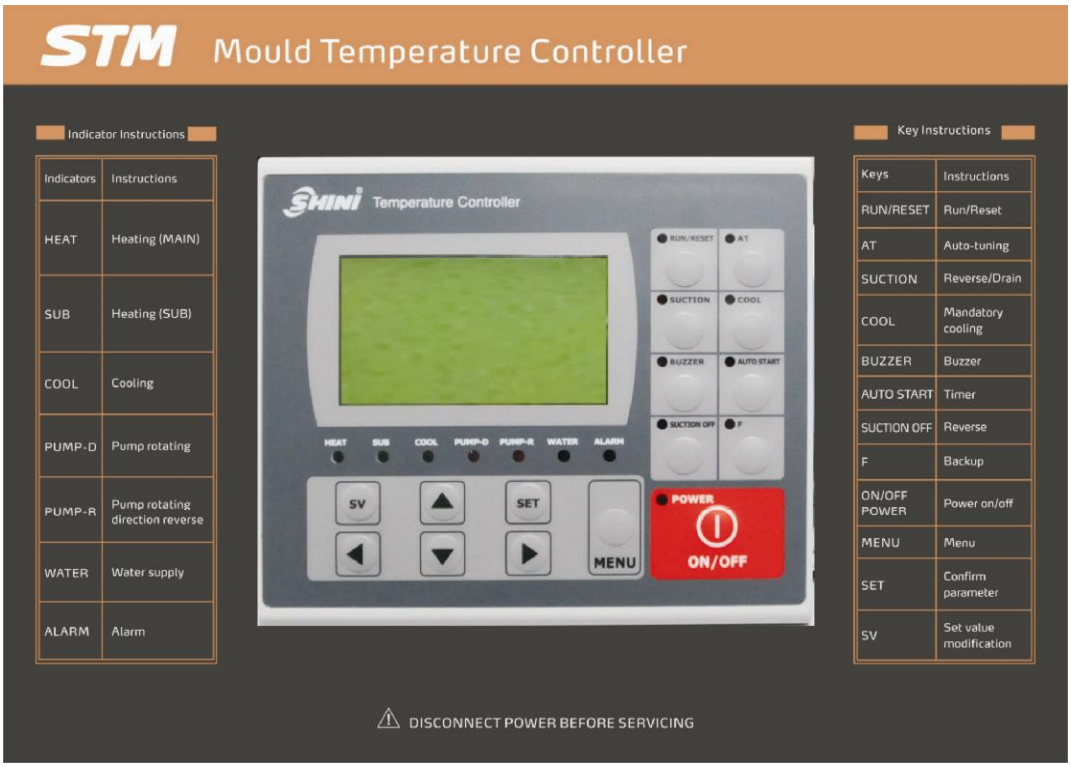
3.3 Power Supply

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	

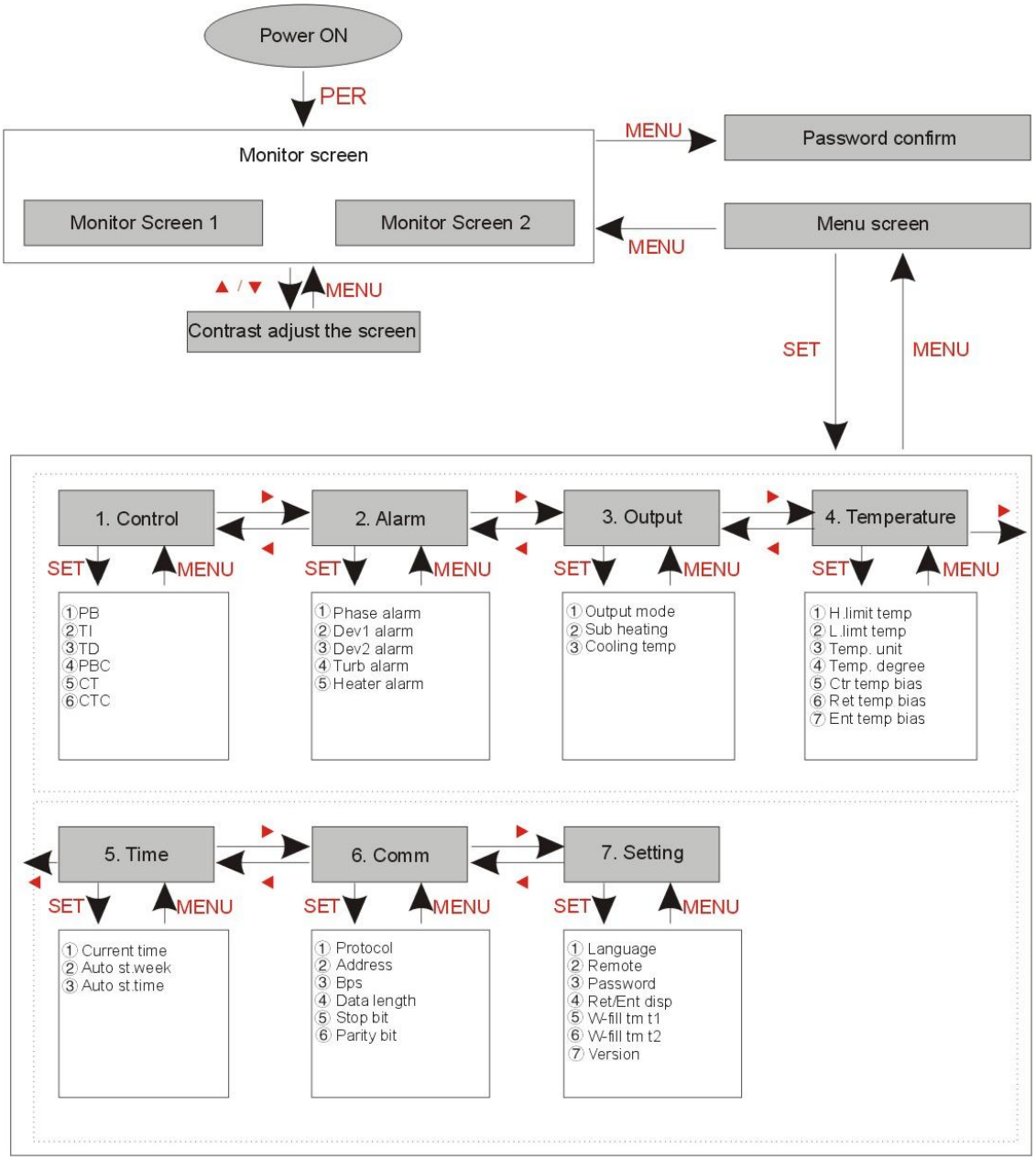
No.	Name	Functions	Remarks
9	AT	AUTO-TUNING switch start and stop	Auto-tuning can run during operation. Auto-tuning cannot work under SUCTION and COOL operation.
10	SUCTION	SUCTION switch start and stop	SUCTION is to remove medium (watre/oil) from molds. Can not start during operation or cooling. After 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, and then pump continues to do reverse action.
15	F	Backup	Reserve button of developing function
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

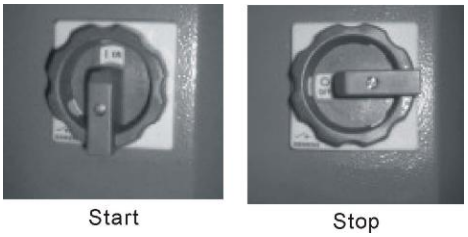
4.3 Machine Startup

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)

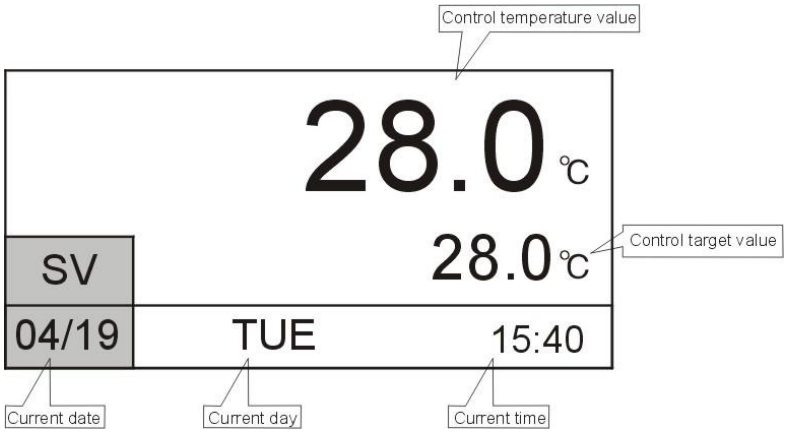
3) Open all the globa valves.

4) Switch on main power.



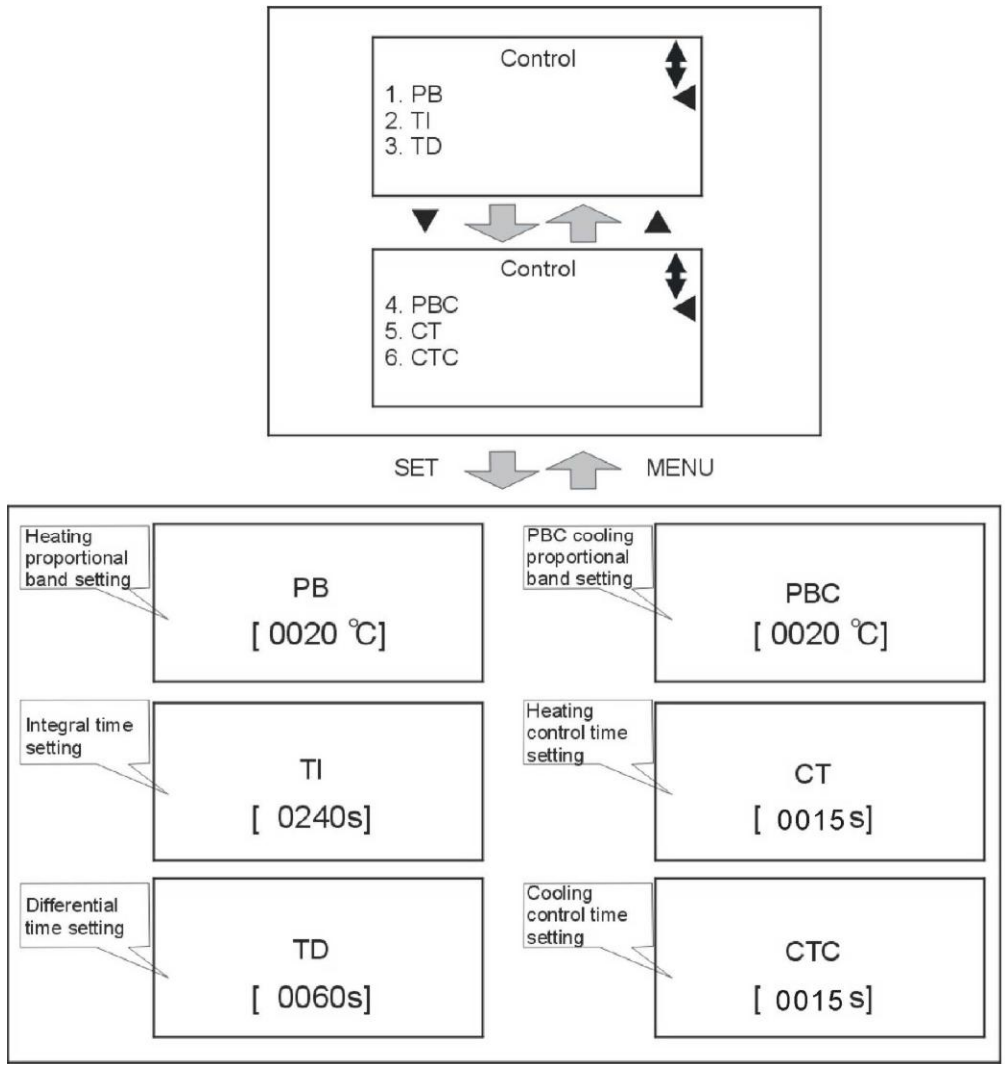
Picture 4-3: Main Power Switch

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.



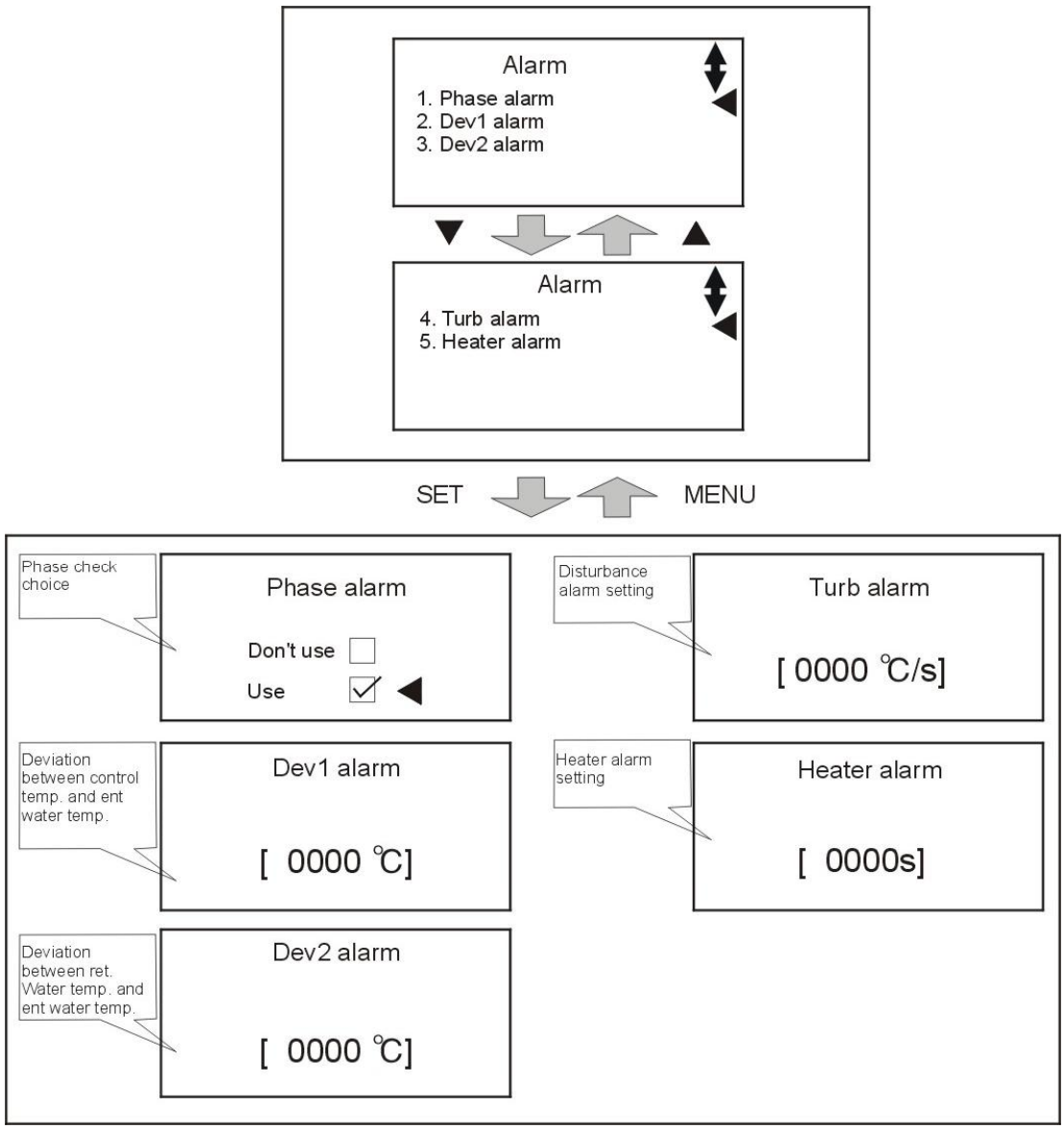
Picture 4-5: Control Setting

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
- DEV1 ALARM——0 (without temp. sensor)
  5 (with temp. sensor, the value can be increased properly when alarm sounds frequently)
- DEV2 ALARM——0 (without temp. sensor)

10 (with temp. sensor, the value can be increased properly when alarm sounds frequently)

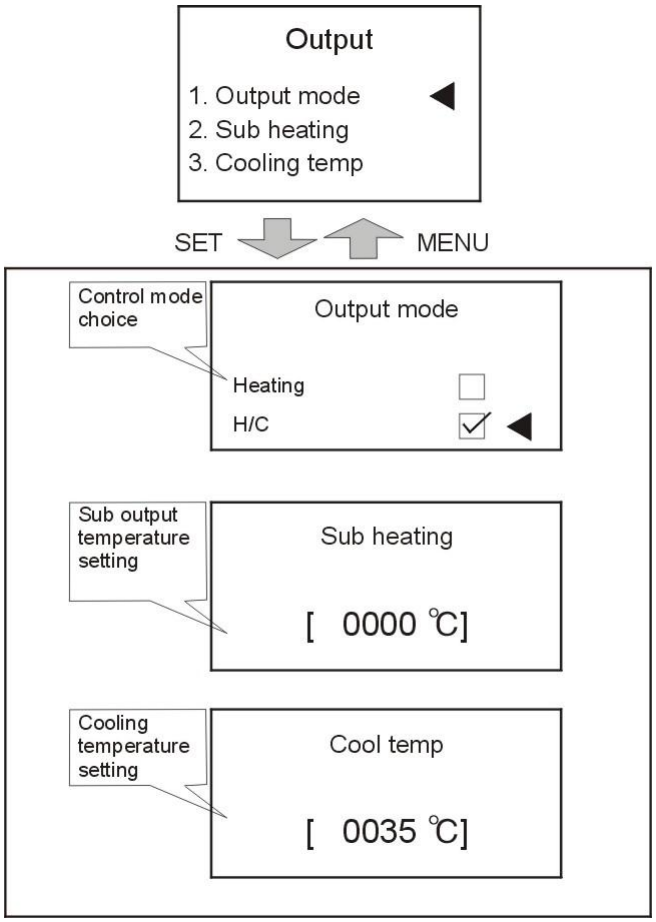
- TURB ALARM——control temp.-10
- HEATER ALARM——based on auctual set value. If factory default value is 0, the heater alarm is not available.



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:

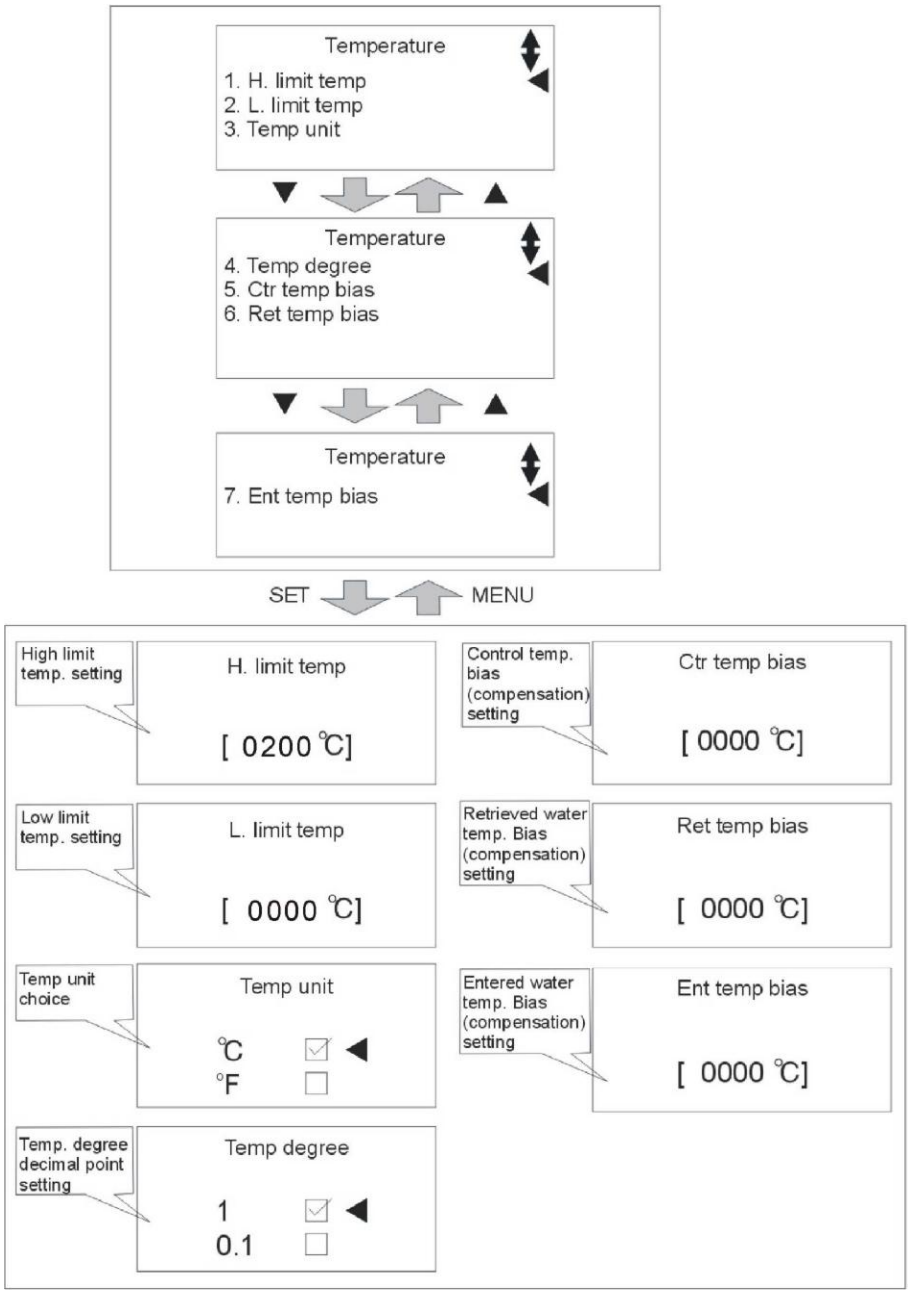
- OUTPUT MODE——heating or cooling control
- SUB HEATING——0 (only 1 group of heater)
- 5 (two or more groups of heater)
- COOLING TEMP.——35



Picture 4-7: Output Setting

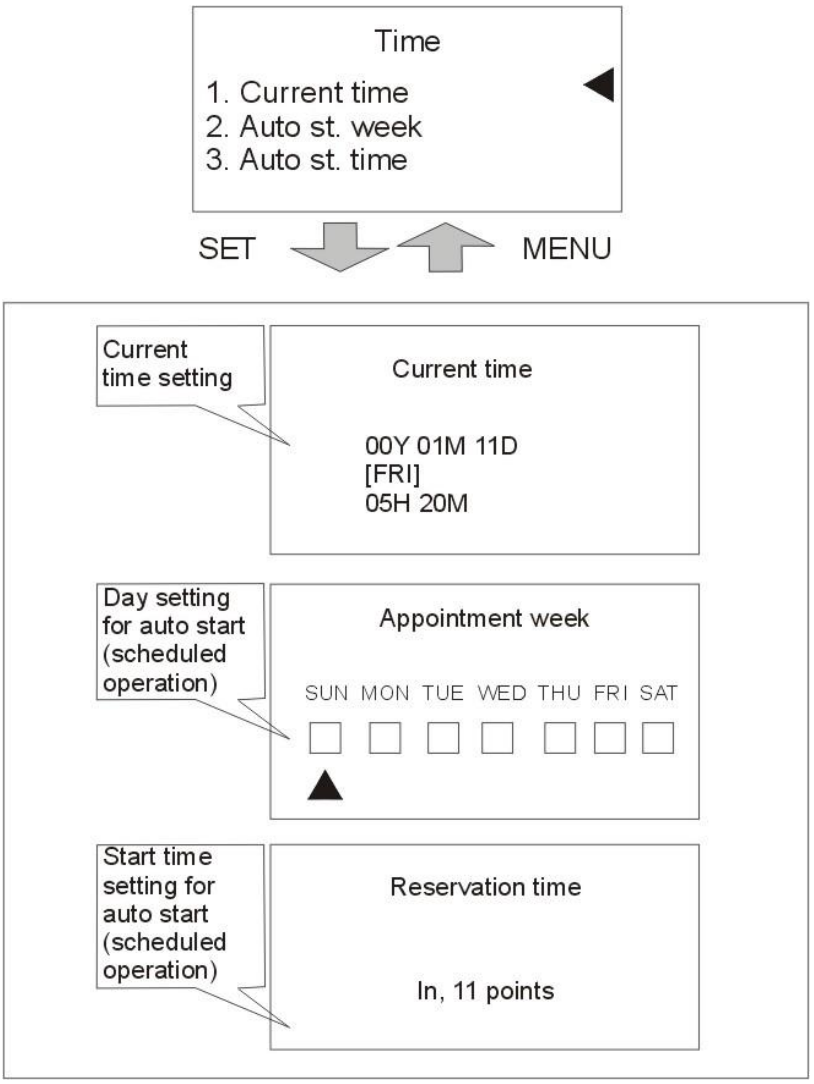
9) Press MENU key to return to menu screen, then press◄/► keys to select temp.setting, press SET key to enter setting screen, see picture below.

- 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



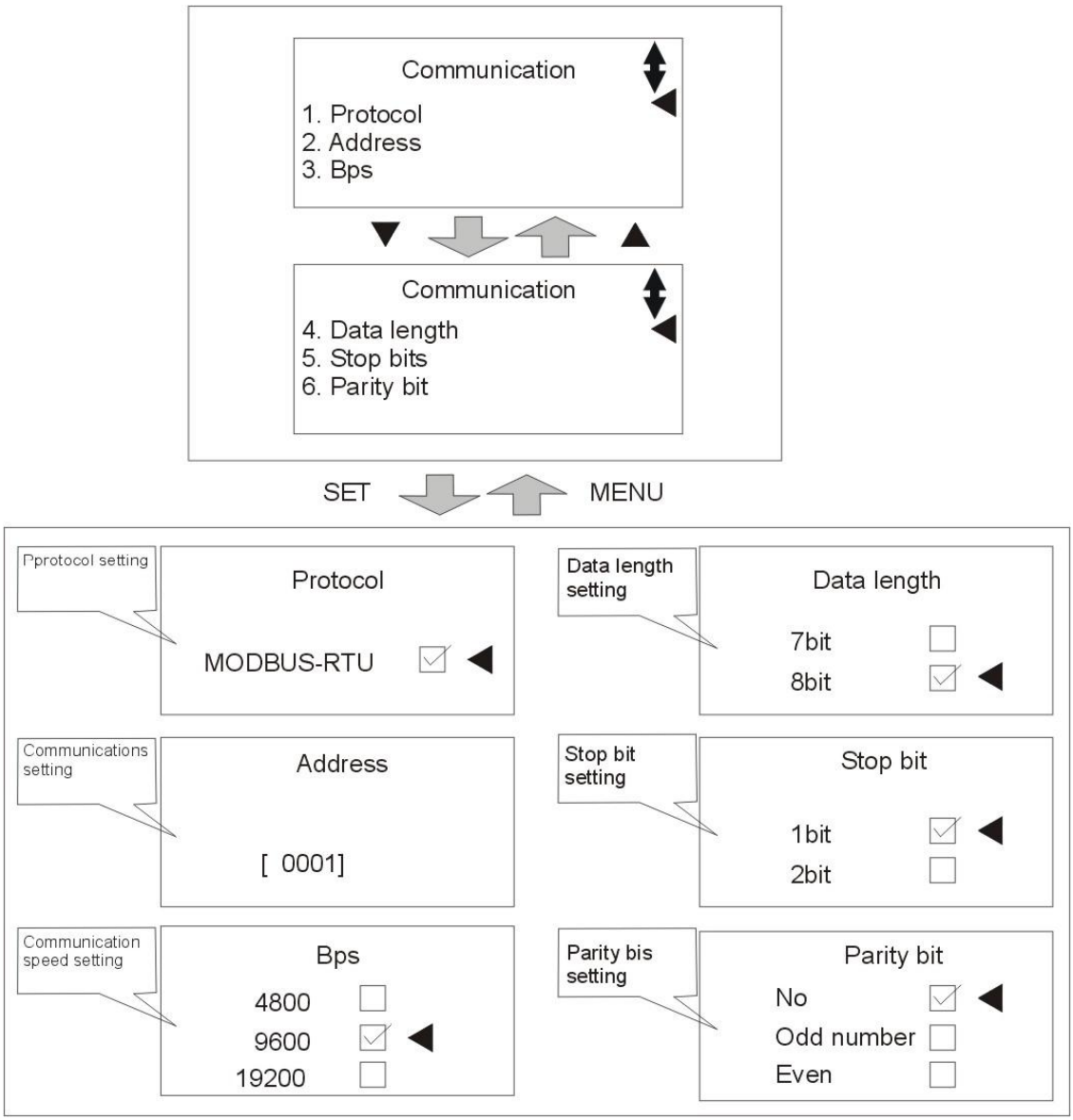
Picture 4-8: Temperature Setting

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.



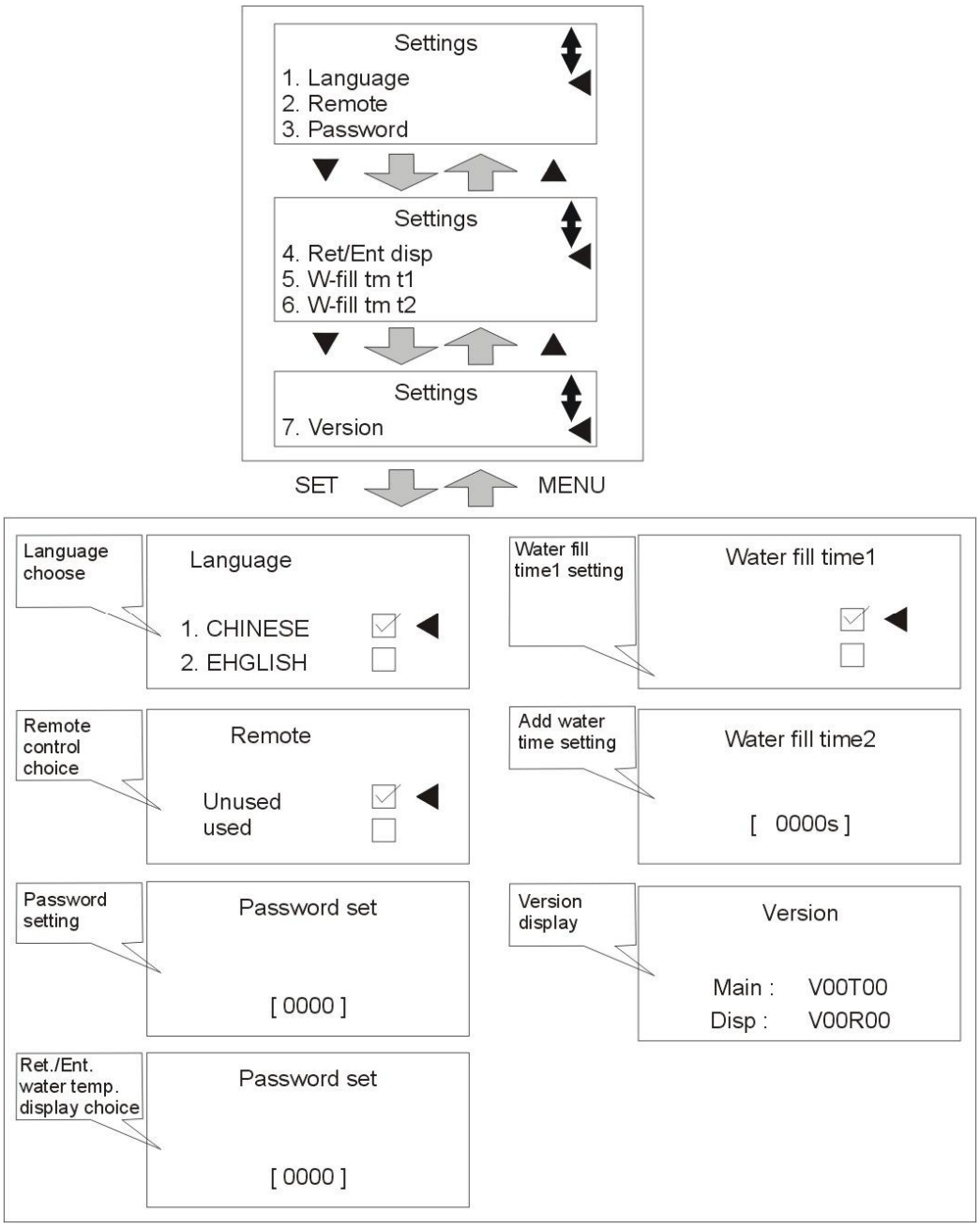
Picture 4-9: Time Setting

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.

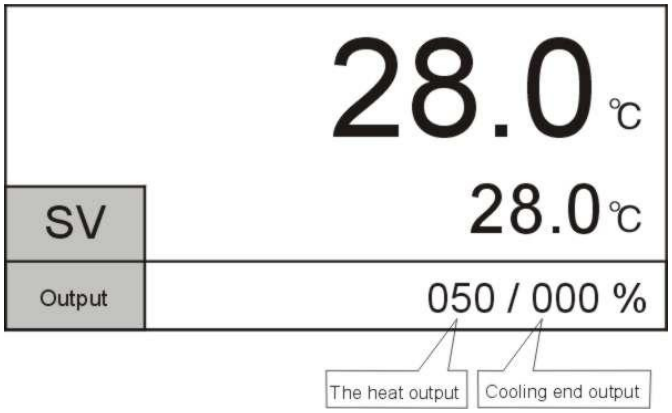


Picture 4-11: Equipment Setting

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 200℃.

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 ℃/ ^{o}F	℃/ ^{o}F	℃
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 cooling process will be on.
2) Wait until temp. drops to below 50℃, press COOL key to shut down forced cooling, then press RUN/RESET key to stop operation.

3) Switch off the main power.

 Warning!

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

 Note!

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

 Note!

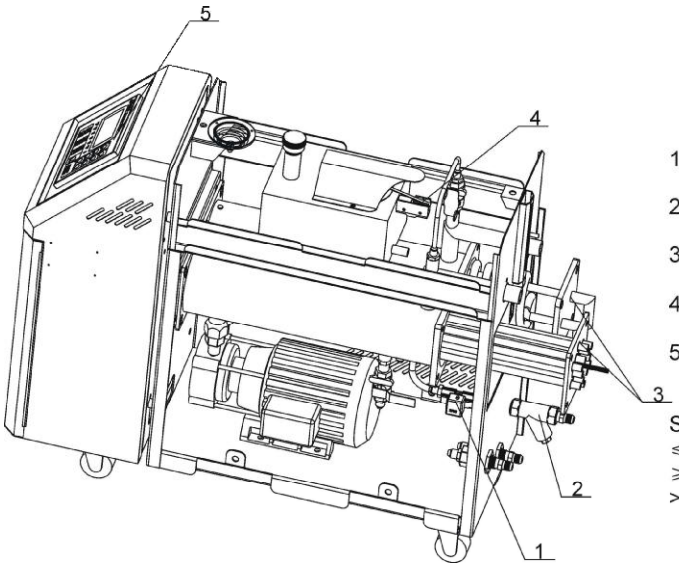
In order to prolong machine lifespan, please do follow the above steps to turn on and off the machine.

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



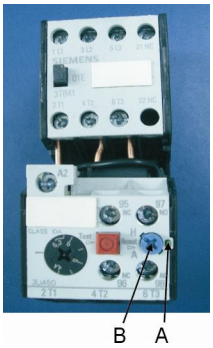
1. Clean solenoid valve
   Period: trimonthly
2. Clean Y-type filter
   Period: monthly
3. Clean process heater/Cooler
   Period: half yearly
4. Check level switch
   Period: trimonthly
5. Check contactor
   Period: trimonthly

Service time of high temperature oil:

≤120℃	Period: replace annually
≥120℃~≤160℃	Period: replace half yearly
>160℃	Period: replace trimonthly

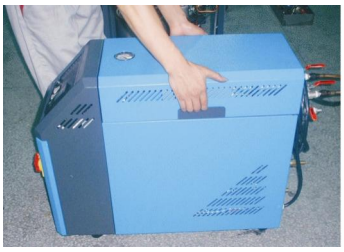
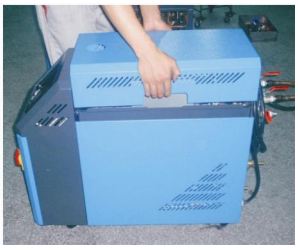
Pay attention to the following rules during maintenance:

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.)



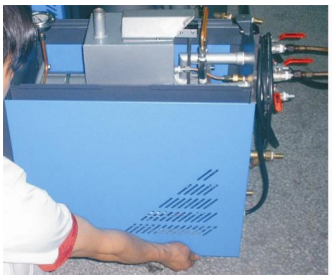
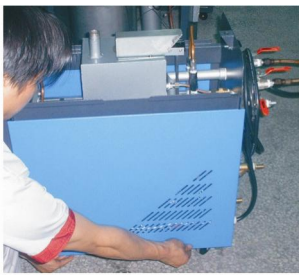
6.1 Open the Covers

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

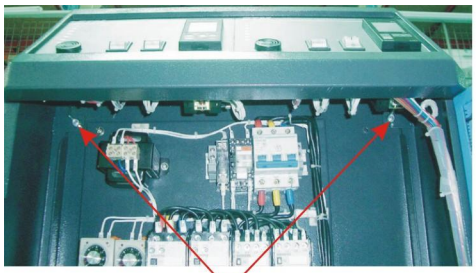
Picture 6-1: Open the Covers 1

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.

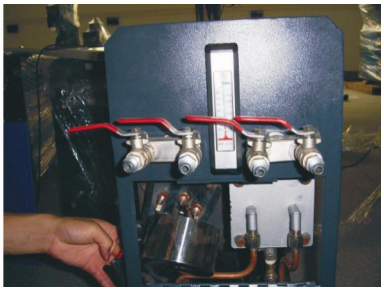
Picture 6-5: Solenoid Valve

6.4 Pipe Heater

1) Pull the black door locker downward, then draw it outward to open machine rear cover. (Refer to pictures below)

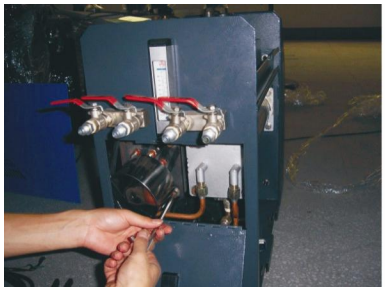
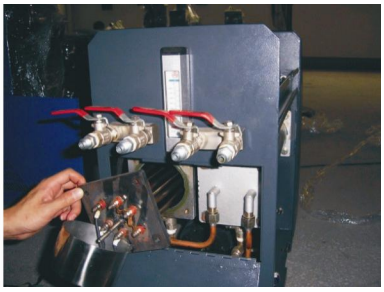

Picture 6-6: Pipe Heater 1

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

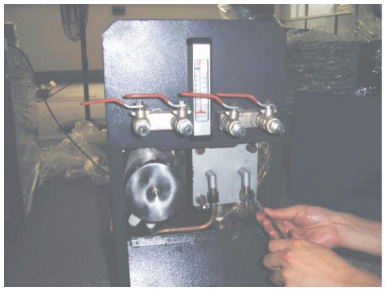
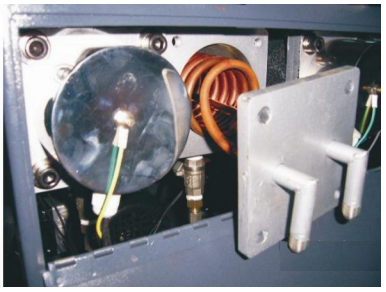
4) Re-fix the pipe heater in a reverse order.

6.5 Cooling Pipes

1) Pull the black door locker downward, then draw it outward to open machine rear cover. (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

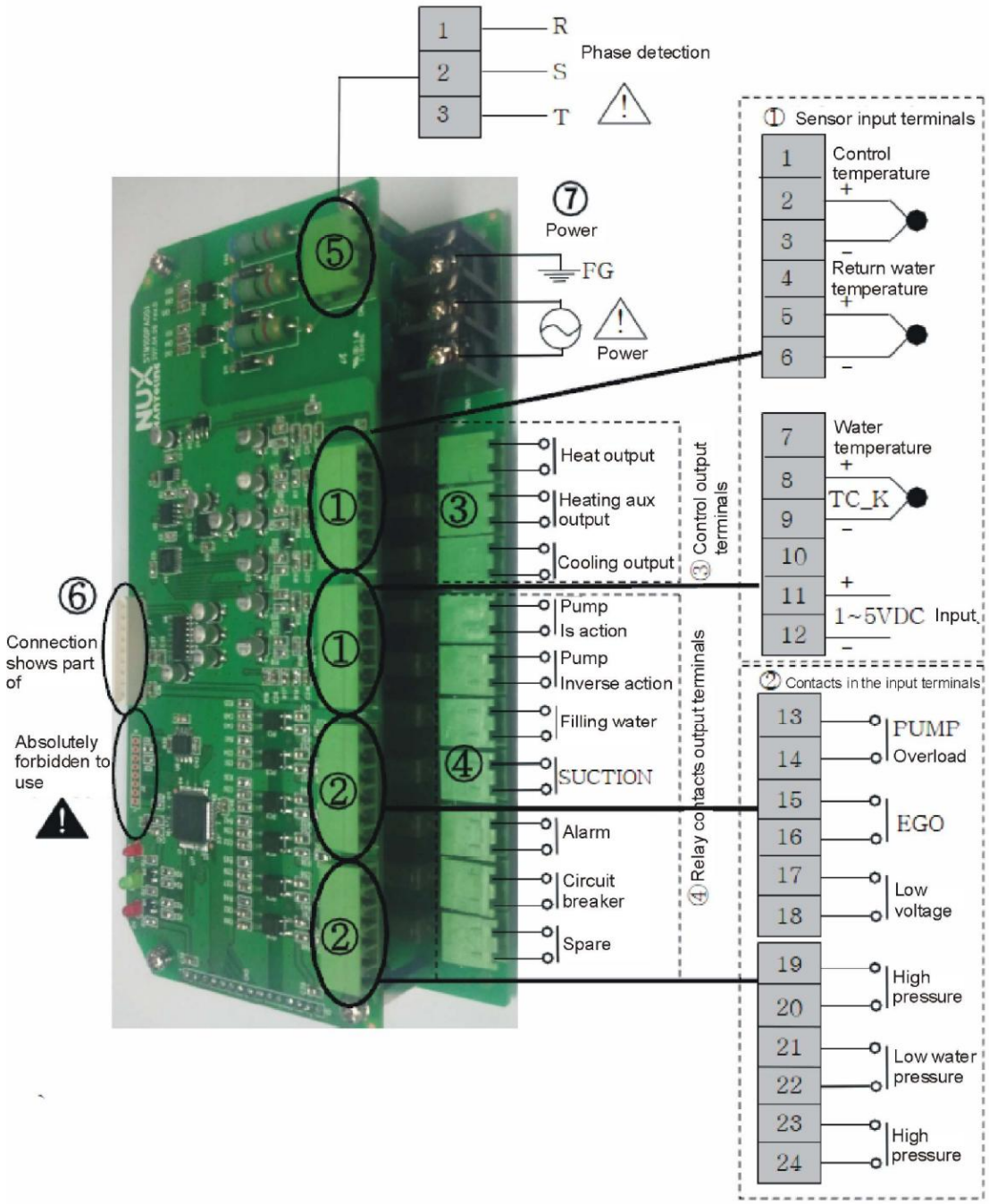
③ OUTPUT TERMINAL (output terminal for controlling)
1, 2 : heating control output MAIN (RELAY output)
3, 4 : heating control output SUB (RELAY output)
5, 6 : coling control output (RELAY output)

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
PUMP
Overload
15
16
EGO
17
18
Low voltage
19
20
High pressure
21
22
Low water pressure
23
24
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

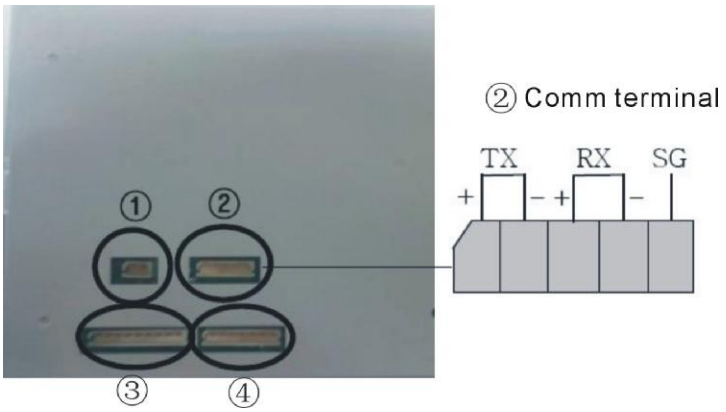
5: Earth terminal

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.