

# **STM-WF Series**

## **"Large Flow" Water Heater**

Date: July. 2013

Version: Ver.B (English)





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# 1. General Description



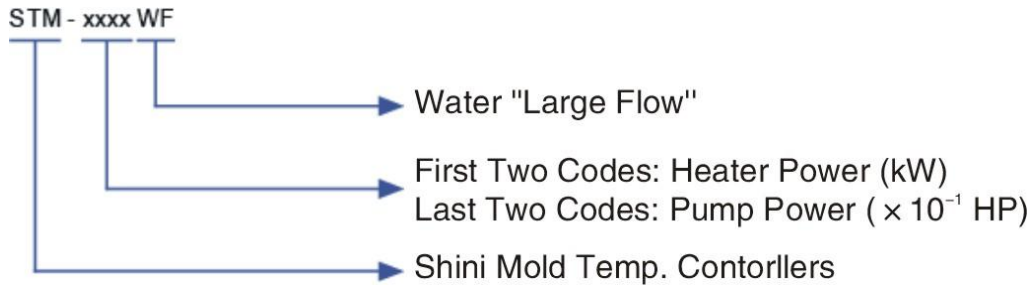
Read this manual carefully before operation to prevent damage of the machine or personal injuries.

STM-WF series "Large Flow" water heater are used to heat up the mould and maintain temperature, although they can be used in other similar applications. High temperature water from the mould is returned to the cooling tank and cooled by direct cooling. It is then pressurised by the high-pressure pump, sent to the heating tank and finally to the mould with a constant temperature. The HANYOUNG temperature controller can maintain an accuracy of  $\pm 0.5^{\circ}\text{C}$ .



Model: STM-607WF

## 1.1 Coding Principle



## 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 °C.
- P.I.D. multi-stage temperature control system can maintain a mould temperature with accuracy of  $\pm 0.5^{\circ}\text{C}$ .
- 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.
- Adopts large-flow pump with high stable performance, which especially suitable for extrusion molding and applications alike.
- Direct cooling can achieve optimal cooling effect; automatic water backup can rapidly cool down temperature to set point.
- Advanced design of cycle can avoid high pressure explosion when system is under faults.

## 2) Accessory option

- Teflon hose is 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.

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## 1.3 Technical Specifications

### 1.3.1 Specification

Table 1-1: Specification

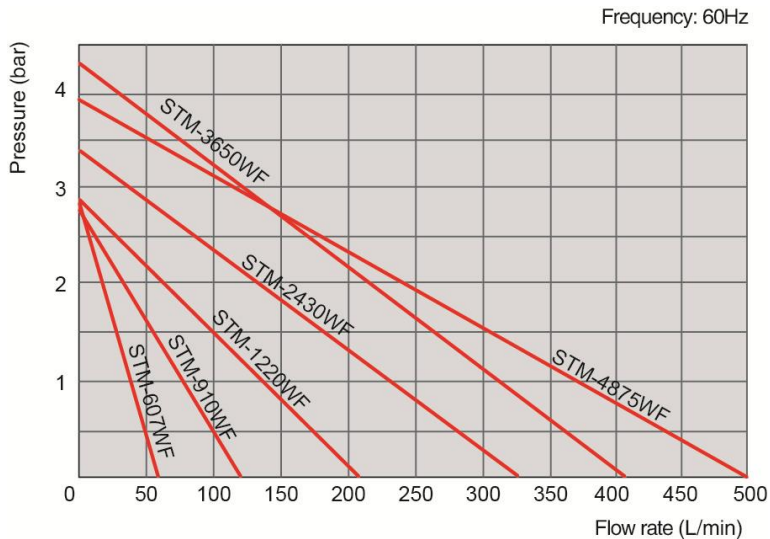
Model	Max. Temp.	Pipe heater (kW)	Pump power (kW) (50/60Hz)	Max. pump flow (L/min) (50/60Hz)	Max. pump pressure (bar) (50/60Hz)	Heating tank number	Heating tank capacity (L)	Cooling method	Mould coupling* (inch)	Inlet / Outlet (inch)	Dimensions (mm) (H×W×D)	Weight (kg)
STM-607WF	120°C	6	0.55 / 0.63	58 / 67	2.8 / 2.6	1	3.0	Direct	1(1×2)	1 / 1	635×280×640	60
STM-910WF		9	0.75 / 0.92	116 / 216	2.8 / 2.6	1	3.0				655×280×640	85
STM-1220WF		12	1.1 / 1.5	168 / 216	2.9 / 2.7	1	3.2		800×312×875	85		
STM-2430WF*		24	2.2 / 2.2	333 / 333	3.2 / 2.9	2	7.2		855×435×840	156		
STM-3650WF*		36	3.0 / 4.0	332 / 416	3.4 / 4.3	3	12.0		955×465×1130	180		
STM-4875WF*		48	5.5 / 5.5	533 / 500	4.5 / 3.8	4	16.0		980×480×1300	242		
										1½(1×2)	1½(1×2)	

Note: 1) "\*" stands for vertical pump, "\*" stands for options.

- 2) In order to maintain stable temp. of heat transfer media dia, cooling water pressure should be no less than 2kg/cm<sup>2</sup>, but also no more than 5 kg/cm<sup>2</sup>.
- 3) Pump testing standard : Power of 50 / 60Hz, purified water in 20°C. ( There is ±10% tolerance for either max. flowrate or max.pressure ).
- 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°C) × temperature difference between mould and environment (°C) × 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°C) × heating medium density (kg/L) × in/outlet temperature difference (°C) × time (60)]

Note: Water specific heat = 1kcal/kg°C

Heating medium oil specific heat = 0.49kcal/kg°C

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

<p><b>WARNING</b></p> <ol style="list-style-type: none"> <li>1. Before starting, please refer to operation section of the manual.</li> <li>2. Water is used as the heat transfer medium. The maximum temperature setting value is 120°C(248°F).</li> </ol> <p>YP31012100000</p>	<ol style="list-style-type: none"> <li>1. Before starting, please refer to operation section of the manual.</li> <li>2. Water is used as the heat transfer medium. The maximum temperature setting value is 120°C(248°F).</li> </ol>
<p>(Attached on motor cover)</p>	<p>This is to indicate motor rotating direction. When phase reversal happens, the alarm sounds and indicator on control panel will indicate.</p> <p>Please exchange the place of two of the electrical wires to solve this problem.</p>
	<p>High voltage! Electrical shock may happen. Carefulness is required from the operator.</p>
	<p>Attentions! This is general warnings which operators should pay attention to.</p>
<p>YP30422000000</p>	<p>From mould: connector for circulating water/oil coming from mould.</p>
<p>YP30425000000</p>	<p>Pump pressure meter: indicating actual pressure of system.</p>
<p>YP30423000000</p>	<p>To mold: connector for circulating water/ oil to go to mould.</p>

	<ol style="list-style-type: none"> <li>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.</li> <li>2. Clean Y-shape Cooling Water Strainer periodically to ensure perfect cooling capacity.</li> </ol>
	<p>Water inlet: inlet for replenishing water and cooling water.</p>
	<p>Water outlet: drainage outlet.</p>

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.

### 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°C.

- 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 below 50°C. Or the life of the unit would be affected.
- 7) If the setting temperature is below 100°C, then the pressure switch setting value should be 1.5-2 bar; If the setting temperature sets between 100°C and 200°C, then the recommendable pressure switch setting value should be 2.8 bar. If the cooling water pressure is too low, then the pressure switch setting value can be adjusted properly to ensure normal running. However, it may affect the limitation of setting temperature or cause unstable temperature control.
- 8) Please connect the cooling water outlet with high temperature resistant pipe when temperature is above 100°C.

## 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:

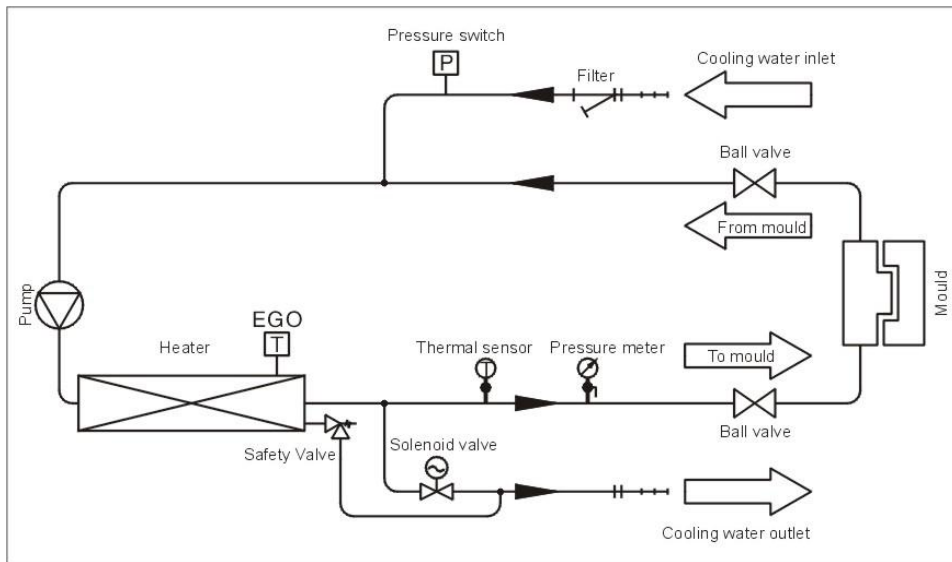
1. Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2. Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible 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 Main Functions

The STM-WF series of "Large Flow" water heater are used to heat up the mould and maintain its temperature, although they can be also apply in other similar applications. High temperature water from the mould return is cooled by direct design cooling and then sent to the pipe heater via high-pressure pump for heating to a constant temperature. With our optimized design, water can reach a maximum of 120°C and the HANYOUNG temperature controller can maintain an accuracy of  $\pm 0.5^{\circ}\text{C}$ .

### 2.2 Working Principle



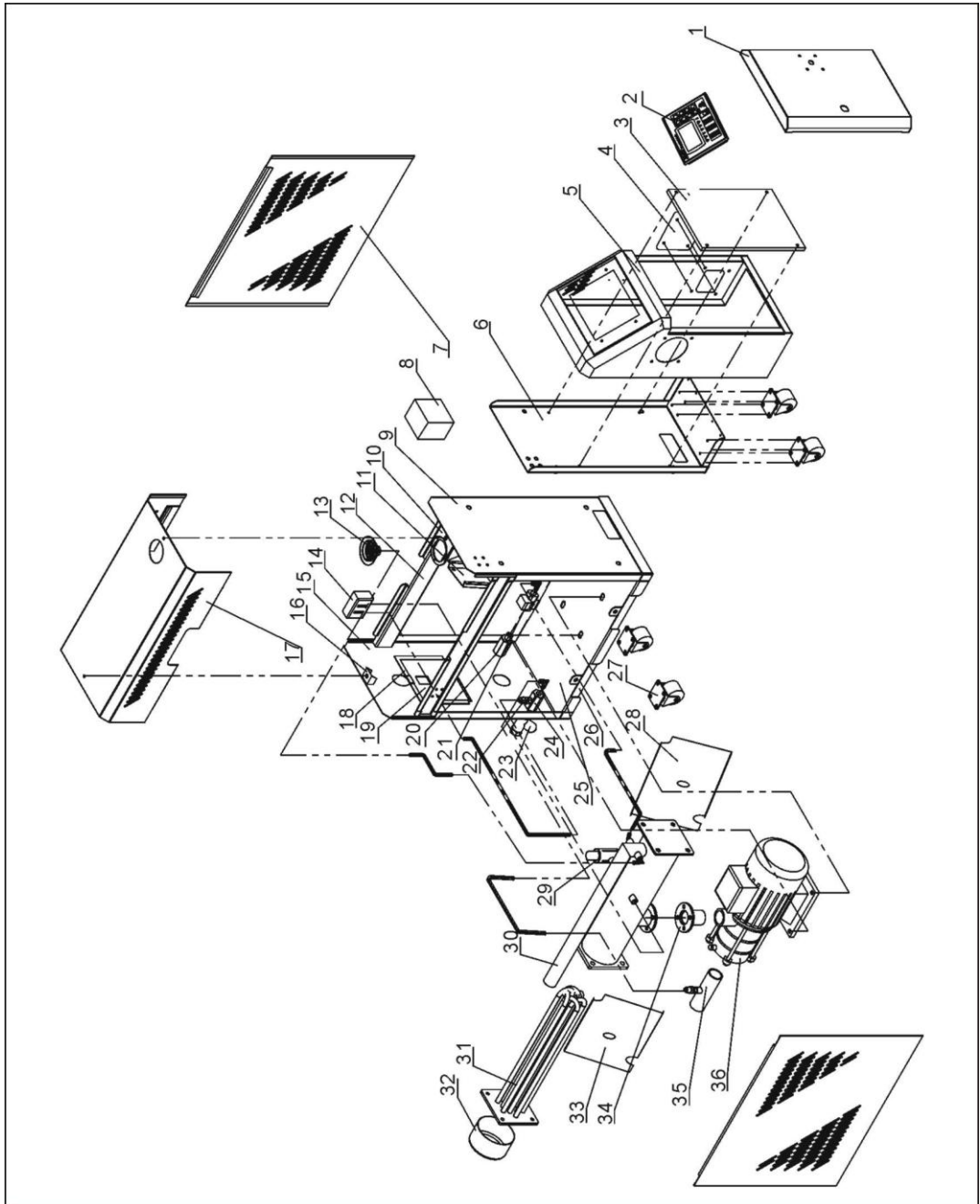
Picture 2-1: STM-W Working Principle

High temperature water returns to the machine and then be pressured by pump to the heater. After being heated, water will be forced to mould and continue the circle. In the process, if the temperature is too high, the system will activate the solenoid valve to let cooling water cool down the temp. Directly until the water is down to the system requirement. If the temp. keep increasing and reach to the set point of EGO, system will alarm and stop operation. The system will have low pressure alarm and stop working if cooling

water pressure doesn't reach set point.

## 2.3 Assembly Drawing

### 2.3.1 Assembly Drawing (STM-607~1220WF)



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-607~1220WF)

## 2.3.2 Parts List (STM-607~1220WF)

Table 2-1: Parts List (STM-607WF)

No.	Name	Part No.	No.	Name	Part No.
1	Door plate	-	19	Rear plate mini cover	-
2	HANYOUNG controller	YE81100010000	20	The sixth set of copper joint	-
3	Fixing plate of electric components	-	21	Solenoid valve 3/8"( AIRTAC)	YE32331000000
4	Linear gripper fixing plate	-	22	Copper teflon pipe connector 1/4H*1/4PT	BH12010400410
5	Electric control box	-	23	Y type water filter	YW57010200000
6	Electric control box rear plate	-	24	The fifth set of copper joint	-
7	Side plate	-	25	Base plate	-
8	EGO combination	BH90115000050	26	Stiffening rib	-
9	Clapboard	-	27	Rubber tire 2"	YW03000200000
10	Pressure gauge fixing plate	-	28	Wrapper sheet 1	
11	Heating tank fixing plate	-	29	Safety valve DR-1000(SHINI)	BW05100000050
12	Crossbeam	-	30	Heating tank	-
13	Pressure gauge	YW85001000100	31	Pipe heater	BH70060700250
14	High and low pressure switch HLP830HME	YE90832500000	32	Electric heating pipe shield	BL80091000120
15	Rear plate	-	33	Wrapper sheet	-
16	Plate cover fixing plate	-	34	Pump outlet connector	-
17	Plate cover	-	35	Pump inlet connector	-
18	Fixing plate of rear plate mini cover	-	36	Pump (CHLF2-20)	YM20022000000

\* 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-910WF)

No.	Name	Part No.	No.	Name	Part No.
1	Door plate	-	19	Rear plate mini cover	-
2	HANYOUNG controller	YE81100010000	20	The sixth set of copper joint	-
3	Fixing plate of electric components	-	21	Solenoid valve 3/8"( AIRTAC)	YE32331000000
4	Linear gripper fixing plate	-	22	Copper teflon pipe connector 1/4H*1/4PT	BH12010400410
5	Electric control box	-	23	Y type water filter	YW57010200000
6	Electric control box rear plate	-	24	The fifth set of copper joint	-
7	Side plate	-	25	Base plate	-
8	EGO combination	BH90115000050	26	Stiffening rib	-
9	Clapboard	-	27	Rubber tire 2"	YW03000200000
10	Pressure gauge fixing plate	-	28	Wrapper sheet 1	
11	Heating tank fixing plate	-	29	Safety valve DR-1000(SHINI)	BW05100000050
12	Crossbeam	-	30	Heating tank	-
13	Pressure gauge	YW85001000100	31	Pipe heater	BH70091000250
14	High and low pressure switch HLP830HME	YE90832500000	32	Electric heating pipe shield	BL80091000120
15	Rear plate	-	33	Wrapper sheet	-
16	Plate cover fixing plate	-	34	Pump outlet connector	-
17	Cover plate	-	35	Pump inlet connector	-
18	Fixing plate of rear plate mini cover	-	36	Pump (CHLF4-40)	YM20044000000

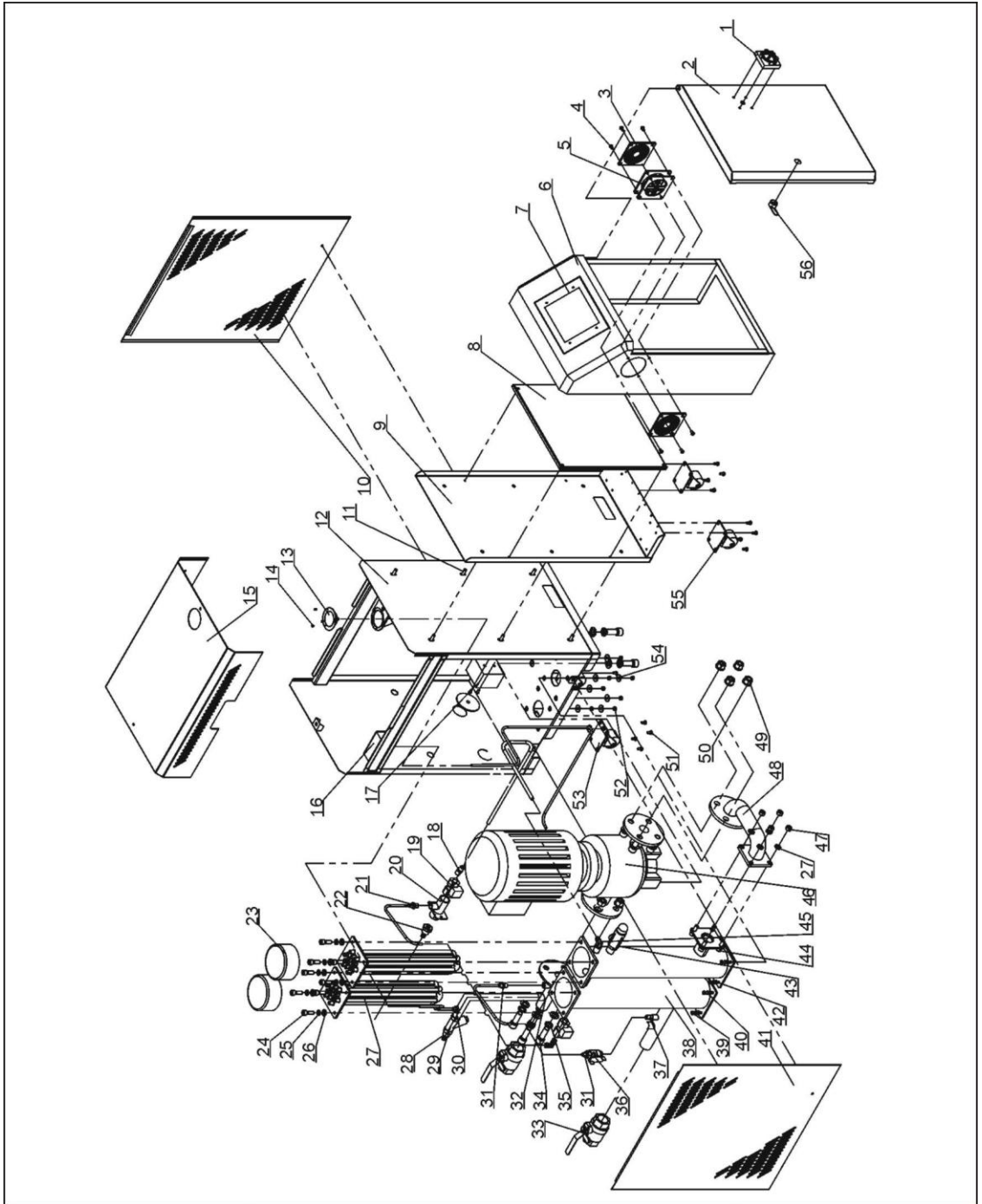
\* means possible broken parts. \*\* means easy broken part. and spare backup is suggested. Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

Table 2-3: Parts List (STM-1220WF)

No.	Name	Part No.	No.	Name	Part No.
1	Door plate	-	19	Rear plate mini cover	-
2	HANYOUNG controller	YE81100010000	20	The sixth set of copper joint	-
3	Fixing plate of electric components	-	21	Solenoid valve 3/8"( AIRTAC)	YE32331000000
4	Linear gripper fixing plate	-	22	Copper teflon pipe connector 1/4H*1/4PT	BH12010400410
5	Electric control box	-	23	Y type water filter	YW57010200000
6	Electric control box rear plate	-	24	The fifth set of copper joint	-
7	Side plate	-	25	Base plate	-
8	EGO combination	BH90115000050	26	Stiffening rib	-
9	Clapboard	-	27	Rubber tire 2"	YW03000200000
10	Pressure gauge fixing plate	-	28	Wrapper sheet 1	
11	Heating tank fixing plate	-	29	Safety valve DR-1000(SHINI)	BW05100000050
12	Crossbeam	-	30	Heating tank	-
13	Pressure gauge	YW85001000100	31	Pipe heater	BH70091000250
14	High and low pressure switch HLP830HME	YE90832500000	32	Electric heating pipe shield	BL80091000120
15	Rear plate	-	33	Wrapper sheet	-
16	Plate cover fixing plate	-	34	Pump outlet connector	-
17	Cover plate	-	35	Pump inlet connector	-
18	Fixing plate of rear plate mini cover	-	36	Pump (CHLF4-40)	YM20044000000

\* 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.

### 2.3.3 Assembly Drawing (STM-2430WF)



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-2430WF)

## 2.3.4 Parts List (STM-2430WF)

Table 2-4: Parts List (STM-2430WF)

No.	Name	Part No.	No.	Name	Part No.
1	Main power switch	YE10250400000	25	M10 Elastic gasket	YW65010000000
2	Door plate	-	26	D10×D25 Flat gasket	YW66102500000
3	Fan guard	YM60922500100	27	Pipe heater	BH70224000450
4	M6×10 Lentil-headed screw	YW62061000000	28	1" Copper core	BH12012500010
5	Fan	YM60922500100	29	1 Y type water filter	YW57010000000
6	Electric control box	-	30	Copper Teflon male connector 1/4H×1/4PT	BH12010400410
7	Operation panel	-	31	1/2"PT×1/2"H Teflon pipe connector	BH12010200210
8	Base plate of electric control box	-	32	Output pipe	-
9	Electric control box rear plate	-	33	M16×40 Outer hexagonal screw	YW60164000000
10	Side plate 1	-	34	1.5" Stainless steel ball valve	YW50015000100
11	M8×20 Inner hexagon screw	YW61082000200	35	M16 Elastic gasket	YW65016000000
12	Rack	-	36	1/4"PT×1/4"H Teflon pipe connector	BH12010400410
13	Pressure gauge	YW85001000100	37	Copper ball core valve 1/2"	YW50010200100
14	M3×6 Thick head screw	YW63030600000	38	1/2" Copper pipe coupler	BH12010200010
15	Cover plate	-	39	Heating tank	-
16	High and low pressure switch HLP830HME	YE90832500000	40	M6×25 Outer hexagonal screw	YW60062500000
17	EGO protective box	YR40000400300	41	M6 Elastic gasket	YW65006000100
18	3/4"PT×3/4"H Teflon pipe connector	BH12101000010	42	Side plate 2	-
19	3/4" Solenoid valve (Kai Ling US-20)	YE32342500000	43	M6 Flat gasket	YW66061300000
20	Outlet connector	-	44	Safety valve	YW05100000000
21	3/8"PT×3/8"H Teflon pipe connector	-	45	M10×40 Inner hexagon screw	YW61104000000
22	Copper core M23×3/4"	BH12223400010	46	1"PT×1"H Teflon pipe connector (L type)	YW04101000000
23	Electric heating pipe shield	BL80091000120	47	Nanfeng Pump TD32-32/2	YM20323200000
24	M10×25 Inner hexagon	YW61102500000	48	M10 Screw nut	YW64001000300

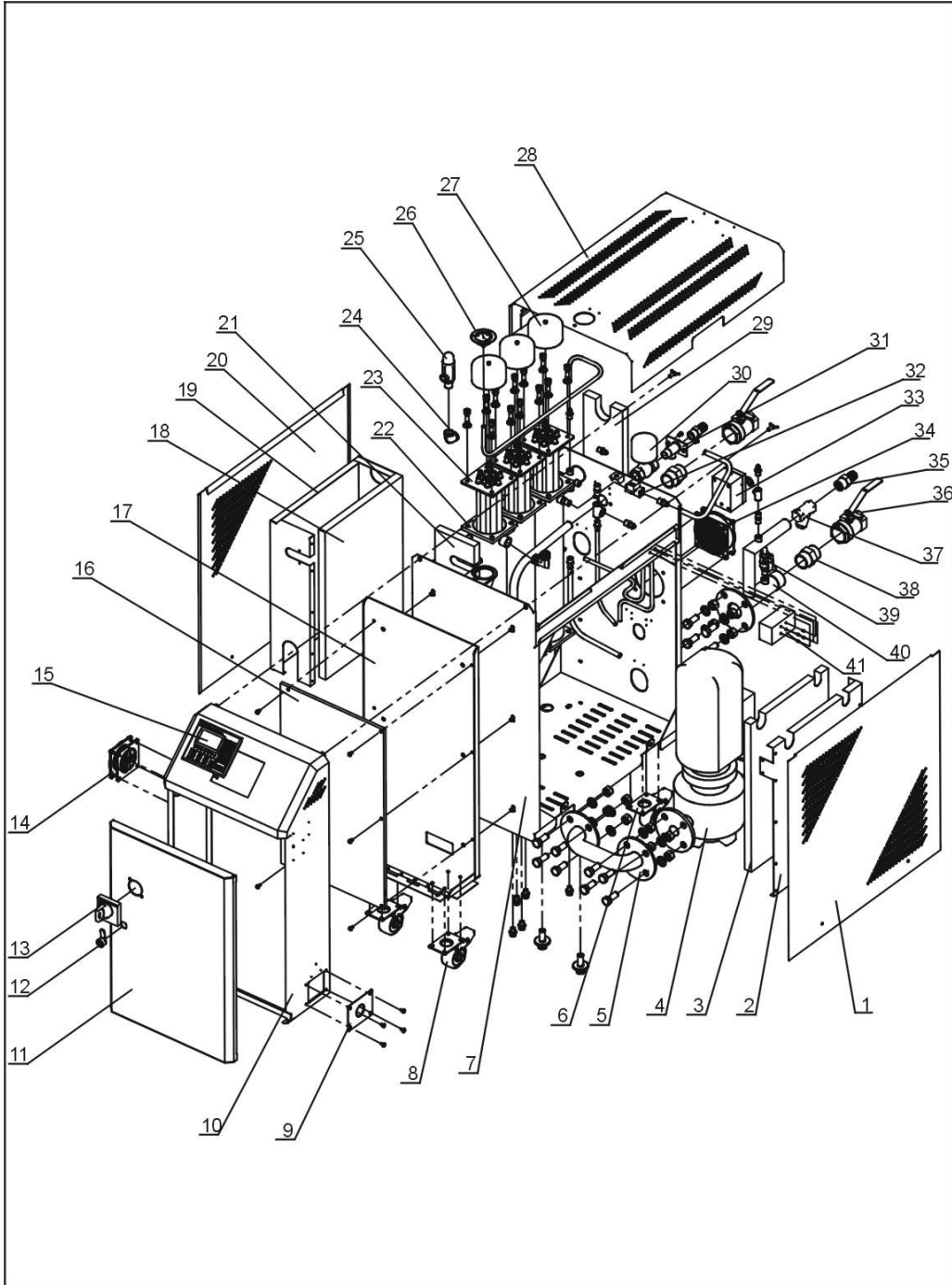
No.	Name	Part No.	No.	Name	Part No.
49	Connecting pipe	-	53	Brake castor	YW03000300000
50	M16 Screw nut	YW64001600000	54	D6 Big flat gasket	YW66061800000
51	M6×10 Outer hexagonal screw	YW60061000000	55	Movable castor	YW03000300200
52	M6 Screw nut	YW64000600300	56	Long gear lock	YW00000000100

\* 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 Assembly Drawing (STM-3650WF)



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-3650WF)

## 2.3.6 Parts List (STM-3650WF)

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

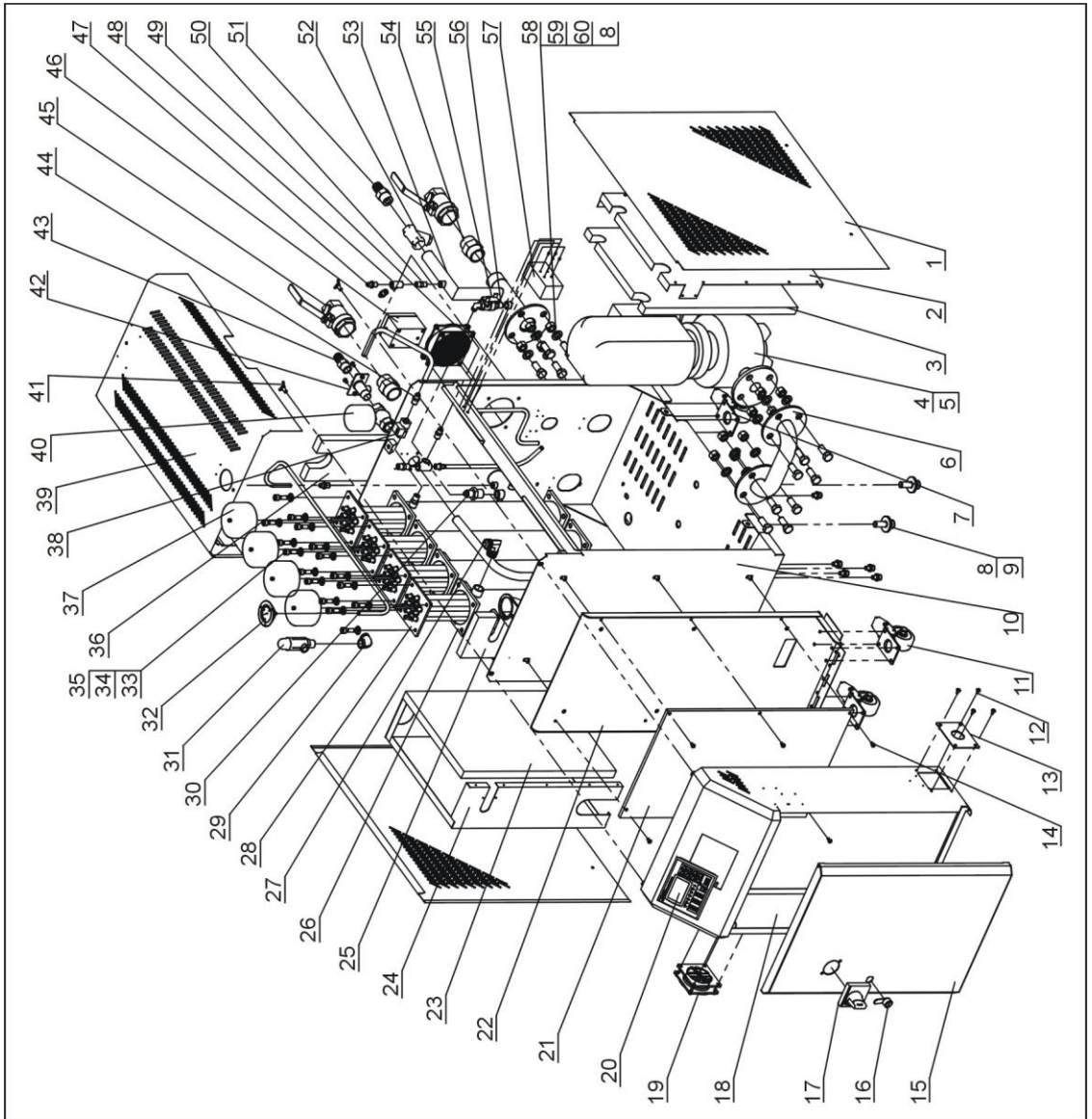
No.	Name	Part No.	No.	Name	Part No.
1	Right side plate		22	Heating plate	-
2	Heating tank cover plate 2	-	23	Pipe heater unit12kW	BH70122000150
3	Insulation cotton 2	-	24	Stainless steel elbow	YW53001200100
4	Southern pump	-	25	Safety valve1/2"	YW05100000000
5	Connection pipe	-	26	Pressure gauge	YW85001000100
6	Lentil heated screw 3"	YW03000300000	27	Electric heating pipe Shield*	BL80091000120
7	Frame		28	Cover plate	-
8	3" movable truckle*	YW03000300200	29	Insulation cotton 4	-
9	Line jig fixed board	-	30	Solenoid valve3/4"	YE32342500000
10	Electrical control box	-	31	Outfall connector	-
11	Door plank	-	32	Solenoid valve3/8"	BE32513000050
12	Long door lock	YW00000000100	33	EGO	BH90115000050
13	Breaker interlock	YE41110000000	34	Fan	YM60423000000
14	Fan	YM60922500100	35	Copper core in1"	-
15	Controller	YE81100010000	36	Stainless steel ball Valve1.5"	YW50015000100
16	base plate of electric control box	-	37	Ywater filtering Valve1"	YW57010000000
17	Control box rear plate1	-	38	Pipe coupler1.5"	-
18	Insulation cotton 1	-	39	Copper ball core Valve1/2"	YW50010200100
19	Heating tank cover plate 1	-	40	Filling water pipe	-
20	Left side plate	-	41	High and low Pressure switch	YE90083000100
21	Insulation cotton 3	-			

\* 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.

### 2.3.7 Assembly Drawing (STM-4875WF)



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-4875WF)

### 2.3.8 Parts List (STM-4875WF)

Table 2-4: Parts List (STM-4875WF)

No.	Name	Part No.	No.	Name	Part No.
1	Right side plate		25	Insulation cotton 3	-
2	Heating tank cover plate 2	-	26	Heating tank	-
3	Insulation cotton 2	-	27	Copper Christopher long pipe joint 3/4"PT×3/4"H(L)	YW04030400000
4	Southern pump TD40-36/2	YM20103600000	28	Pipe heater unit 12kw	BH70122000150
5	Southern pump TD40-35/2	YM20403500000	29	Stainless steel pipe elbow 1/2"	YW53001200100
6	Connection pipe	-	30	Copper Christopher long pipe joint 3/4"PT×3/4"H	BH12030400310
7	Castor with brake 3"	YW03000300000	31	Safety valve 1/2"	YW05100000000
8	Hexagon screw bolt M16×50	YW61165000000	32	Pressure gauge	YW85001000100
9	Flat gasket 16	YW66163800000	33	Inner hexagonal screwm10×25	YW61102500000
10	Rack	-	34	Elastic gasket 10	YW65010000000
11	3" Mobile castor *	YW03000300200	35	Flat gasket 10	YW66102000000
12	Lentil headed screw M5×10	YW62051000000	36	Insulation cotton 4	-
13	Line jig fixed board	-	37	Heating tube cover	BL80091000120
14	Lentil headed screw M6×15	YW62051000000	38	Solenoid valve	YE32331000000
15	Door plank	-	39	Plate cover	-
16	Long door lock	YW00000000100	40	Solenoid valve 3/4"	YE32342500000
17	Breaker interlock	YE41110000000	41	Butterfly screwm8×15	YW69081500000
18	Electrical control box	-	42	Water drainage port connector	-
19	Fan	YM60922500100	43	Copper inserted core 3/4"PT×Φ23	-
20	Controller	YE81100010000	44	Copper Christopher long pipe joint 3/8"PT×3/8"H	BH12030800610
21	Base plate of electric control box	-	45	Stainless steel ball valve 1.5"	YW50015000100
22	Control box rear plate	-	46	Egoassembly	BH90115000050
23	Insulation cotton 1	-	47	Copper Christopher long pipe joint 1/4"PT×1/4"H	BH12010400410

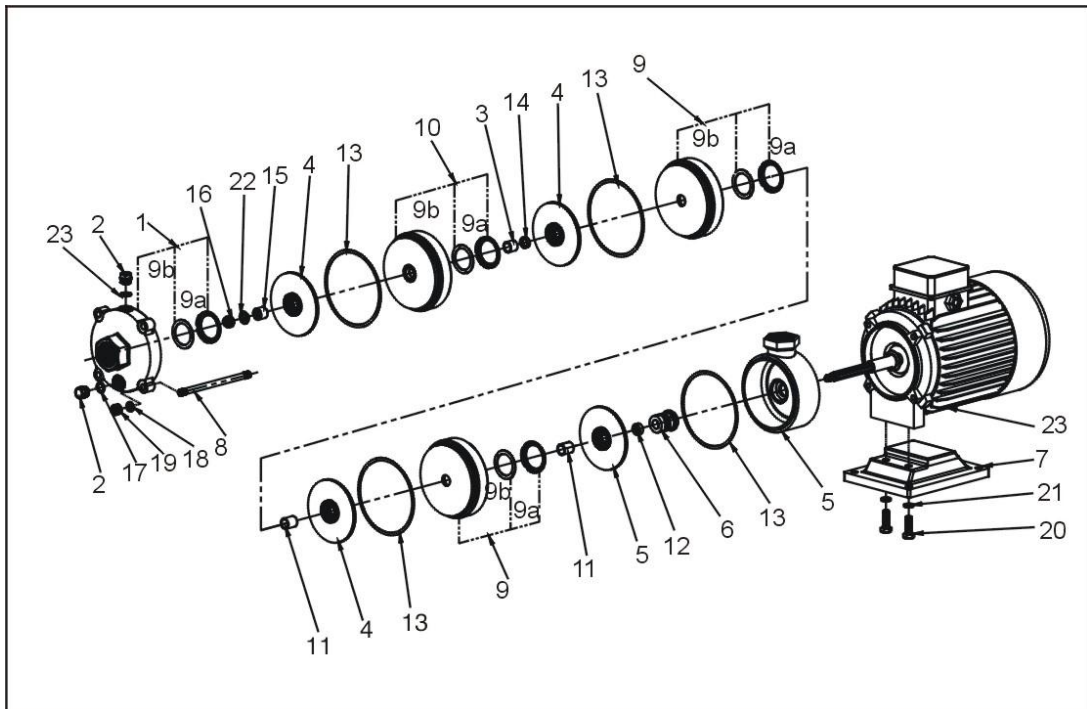
24	Heating barrel plating 1	-	48	Stainless steel ball valve 1/4"	YW52010400000
<b>No.</b>	<b>Name</b>	<b>Part No.</b>	<b>No.</b>	<b>Name</b>	<b>Part No.</b>
49	Fan	YM60423000000	55	Stainless steel ball valve 3/4"	YW50030400100
50	Pipe coupler 1/4"	BH12010400110	56	Pipe coupler 3/4"	BH12030400010
51	Copper inserted core 1"	-	57	High and low pressure switchhlp830hme	YE90832500000
52	Y type water strainer 1"	YW57010000000	58	Hexagonal nutm16	YW64001600000
53	Water drainage port connector	-	59	Flat gasket 16	YW66163000000
54	Pipe coupler 了 1.5"	YW04001500000	60	Elastic gasket 16	YW65016000000

\* 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 Pump

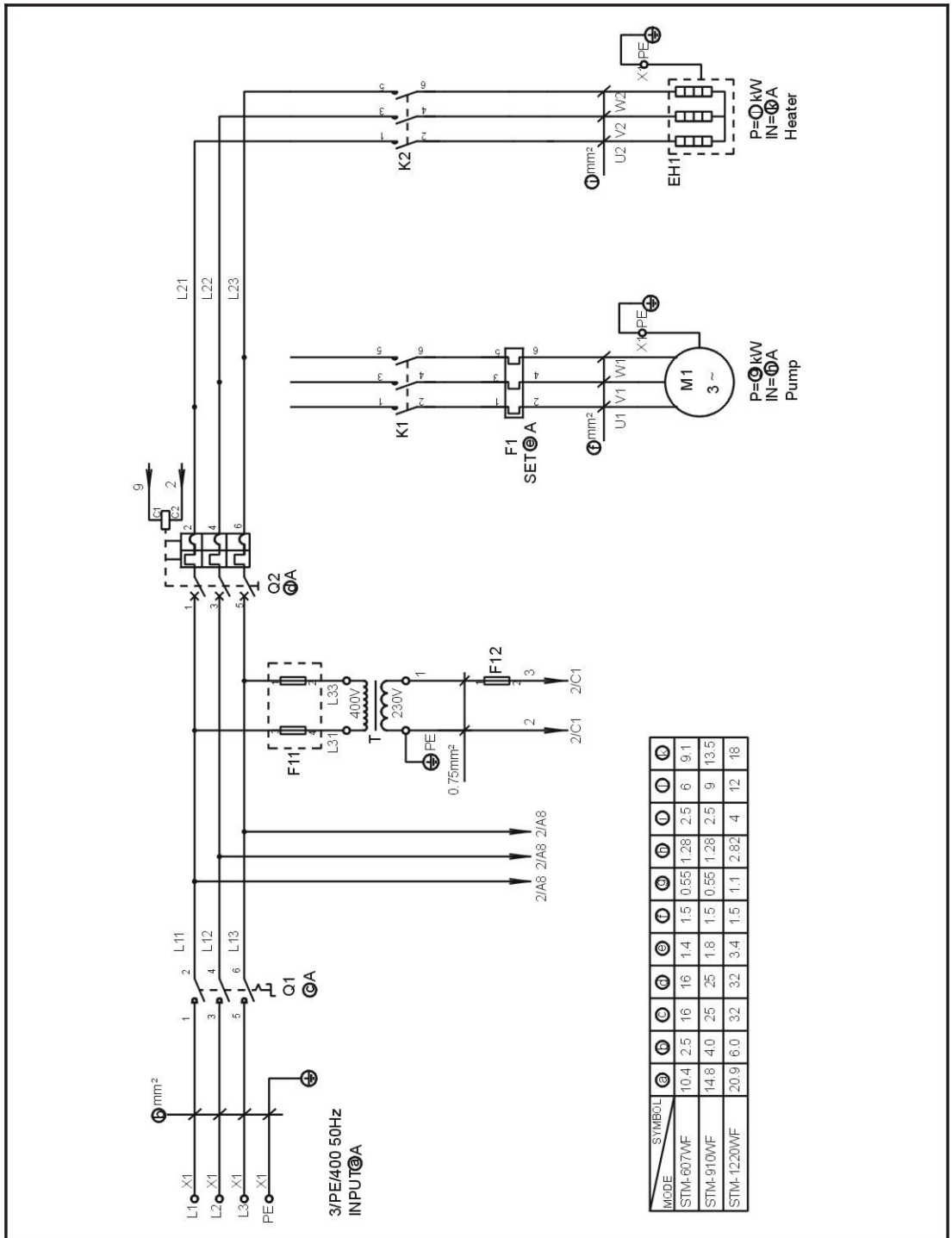


- |                           |                                |                          |                            |
|---------------------------|--------------------------------|--------------------------|----------------------------|
| 1. Inlet water body       | 2. End cap                     | 3. Wear-resistant sleeve | 4. Impeller                |
| 5. Outlet water body      | 6. Mechanical seal             | 7. Base                  | 8. Draw bar                |
| 9. Guide vane             | 9a. Choma cover                | 9b. Choma                | 10. Guide vane for support |
| 11. Impeller spacer       | 12. Spacer                     | 13. Sealing gasket       |                            |
| 14. Impeller short spacer | 15. First-level impeller gland | 16. Locknut              | 17. O-ring                 |
| 18. Elastic washer        | 19. Nut                        | 20. Bolt                 | 21. Elastic washer         |
| 22. Washer                | 23. Motor                      |                          |                            |

Picture 2-6: Pump

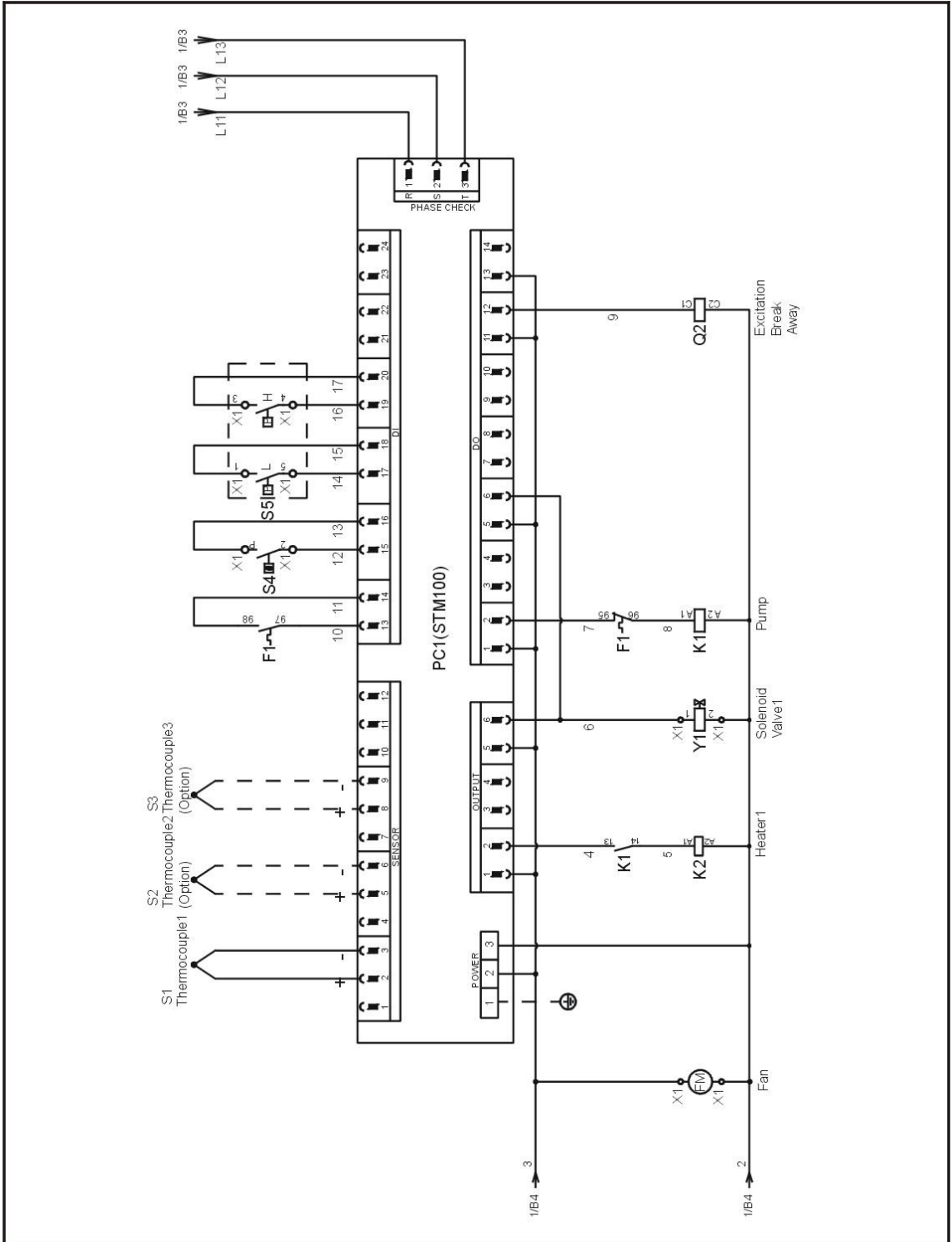
## 2.4 Electrical Diagram

### 2.4.1 Main Circuit (STM-607~1220WF) (400V)



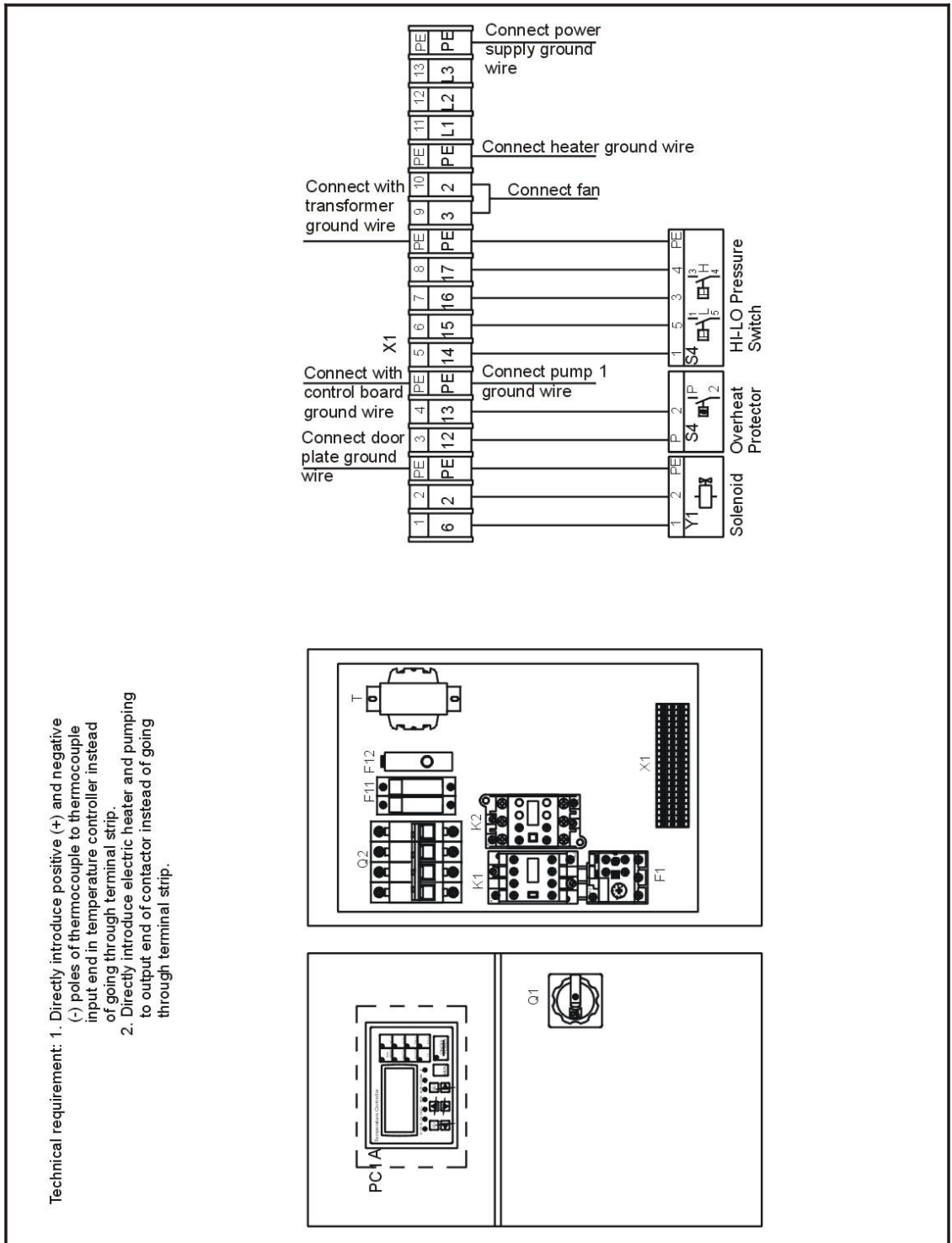
Picture 2-7: Main Circuit (STM-607~1220WF) (400V)

## 2.4.2 Control Circuit (STM-607~1220WF) (400V)



Picture 2-8: Control Circuit (STM-607~1220WF) (400V)

### 2.4.3 Electrical Components Layout (STM-607~1220WF) (400V)



Picture 2-9: Thermocouple and Terminal Layout (STM-607~1220WF) (400V)

## 2.4.4 Electrical Components List (STM-607~1220WF) (400V)

Table 2-4: Electrical Components List (STM-607WF) (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	1.1~1.6A	YE01160110000
7	T	Fuse box**	IN=400V OUT=230V 300mA	YE70402300700
8	F11	Fuse**	32A 2P	YE41032200000
9	-	Fuse**	2A	YE46002000100
10	F12	Transformer	2A	YE41001000000
11	S1	Thermocouple	-	-
12	S2 S3	Thermocouple	-	-
13	S4	Overheat protector	250V 5(4)A	YE21503000000
14	S5	Hi-lo pressure switch	H:5-30bar L:-0.7-6bar	YE90083000100
15	PC1 PC2	Circuit board	100~240VAC 50/60Hz	YE81100010000
16	A1 A2	Control panel	-	
17	Y1	Solenoid valve**	230VAC 50/60Hz	-
18	X1	Terminal board	-	YE61250040000
19	-	Terminal board	-	YE61253500000
20	M1	Motor**	400V 50Hz 0.55kW	-
21	EH1	Heater**	400V 50Hz 6kW	-
22	FM	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-910WF) (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	YE00401000100
5	K2	Contactors**	220V 50/60Hz	YE00602522000
6	F1	Overload relays	1.1~1.6A	YE01125200000
7	T	Fuse box**	IN=400V OUT=230V 300mA	YE70402300700
8	F11	Fuse**	32A 2P	YE41032200000
9	-	Fuse**	2A	YE46002000100
10	F12	Transformer	2A	YE41001000000
11	S1	Thermocouple	-	-
12	S2 S3	Thermocouple	-	-
13	S4	Overheat protector	250V 5(4)A	YE21503000000
14	S5	Hi-lo pressure switch	H:5-30bar L:-0.7-6bar	YE90083000100
15	PC1 PC2	Circuit board	100~240VAC 50/60Hz	YE81100010000
16	A1 A2	Control panel	-	
17	Y1	Solenoid valve**	230VAC 50/60Hz	-
18	X1	Terminal board	-	YE61040000000
19	-	Terminal board	-	YE61043500000
20	-	Terminal board	-	YE61250040000
21	-	Terminal board	-	YE61253500000
22	M1	Motor**	400V 50Hz 0.55kW	-
23	EH1	Heater**	400V 50Hz 9kW	-
24	FM	Fan*	230V 50/60Hz	-

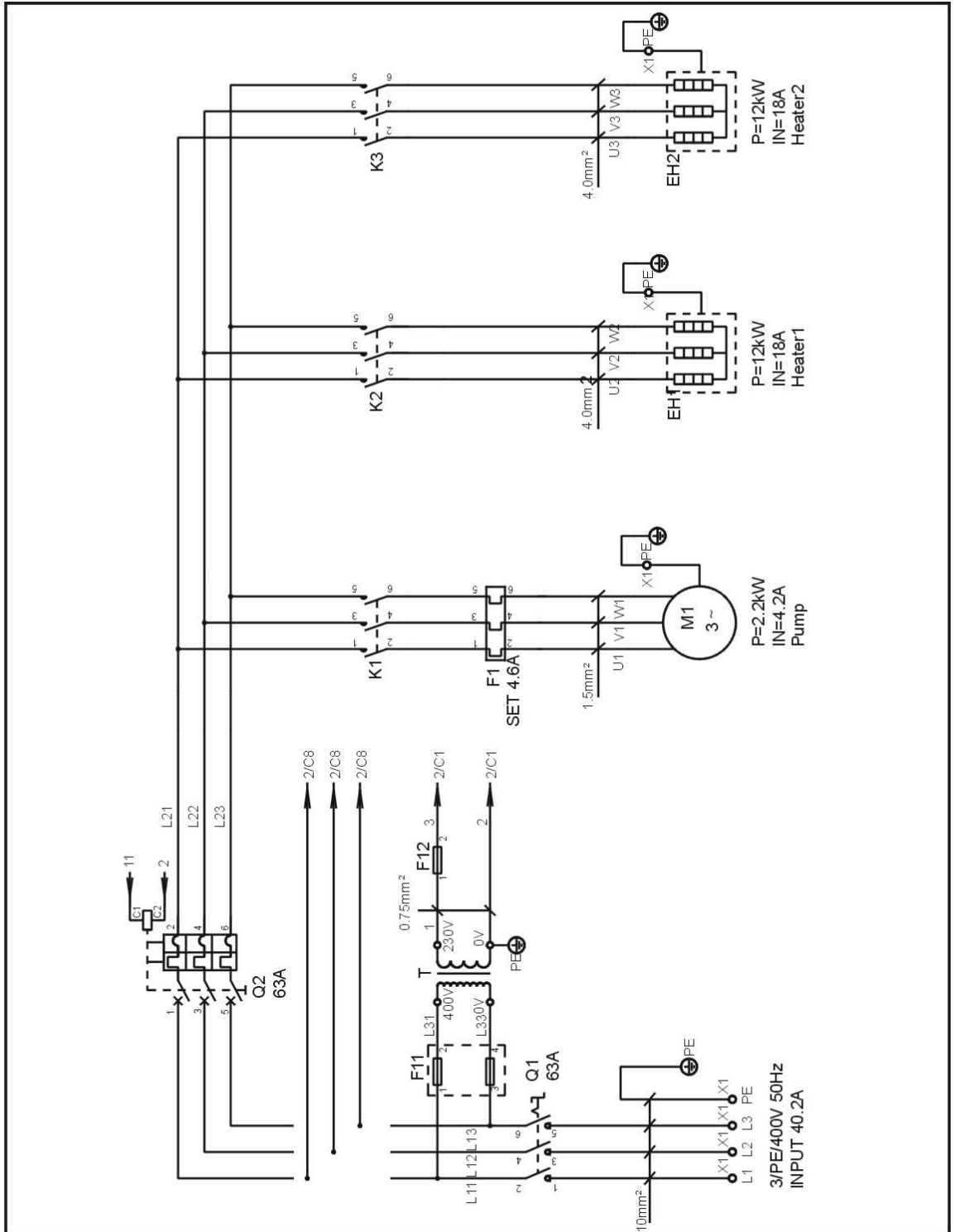
\* means possible broken parts. \*\* means easy broken part. and spare backup is suggested. Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

Table 2-6: Electrical Components List (STM-1220WF) (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	YE00401000100
5	K2	Contactors**	220V 50/60Hz	YE00602622000
6	F1	Overload relays	2.8~4A	YE01160280000
7	F11	Fuse box**	IN=400V OUT=230V 300mA	YE70402300700
8	-	Fuse**	32A 2P	YE41032200000
9	F12	Fuse**	2A	YE46002000100
10	T	Transformer	2A	YE41001000000
11	S1	Thermocouple	-	-
12	S2 S3	Thermocouple	-	-
13	S4	Overheat protector	250V 5(4)A	YE21503000000
14	S5	Hi-lo pressure switch	H:5-30bar L:-0.7-6bar	YE90083000100
15	PC1	Circuit board	100~240VAC 50/60Hz	YE81100010000
16	A	Control panel	-	
17	Y1	Solenoid valve**	230VAC 50/60Hz	-
18	X1	Terminal board	-	YE61250040000
19	-	Terminal board	-	YE61253500000
20	-	Terminal board	-	YE61043500000
21	-	Terminal board	-	YE61060000000
22	-	Terminal board	-	YE61063500000
23	M1	Motor**	400V 50Hz 1.1kW	-
24	EH1	Heater**	400V 50Hz 12kW	-
25	FM	Fan*	230V 50/60Hz	-

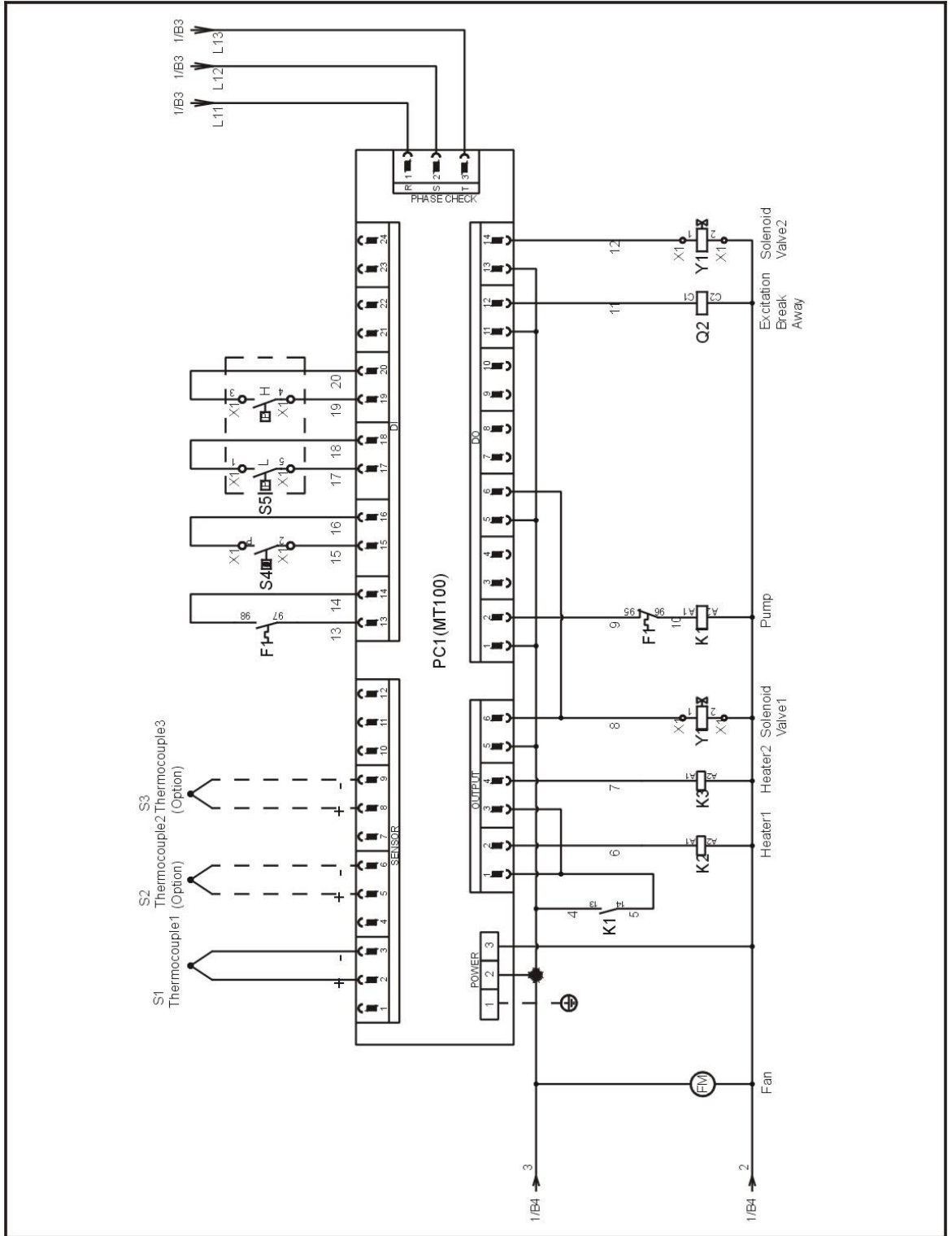
\* means possible broken parts. \*\* means easy broken part. and spare backup is suggested. Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

## 2.4.5 Main Circuit (STM-2430WF) (400V)



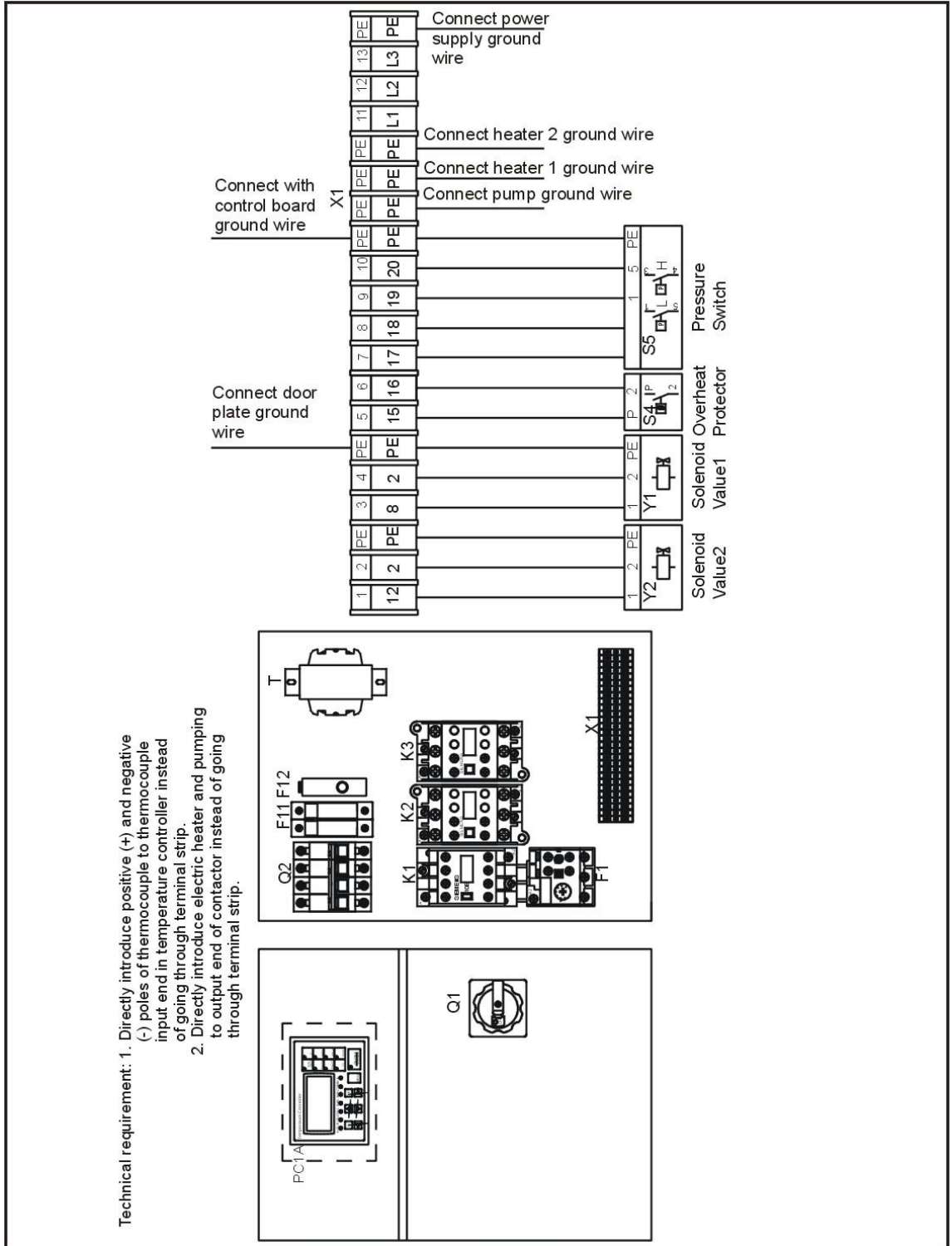
Picture 2-10: Main Circuit (STM-2430WF) (400V)

## 2.4.6 Control Circuit (STM-2430WF) (400V)



Picture 2-11: Control Circuit (STM-2430WF) (400V)

## 2.4.7 Thermocouple and Terminal Layout (STM-2430W) (400V)



Picture 2-12: Thermocouple and Terminal Layout (STM-2430WF) (400V)

## 2.4.8 Electrical Components List (STM-2430W) (400V)

Table 2-7: Electrical Components List (STM-2430WF) (400V)

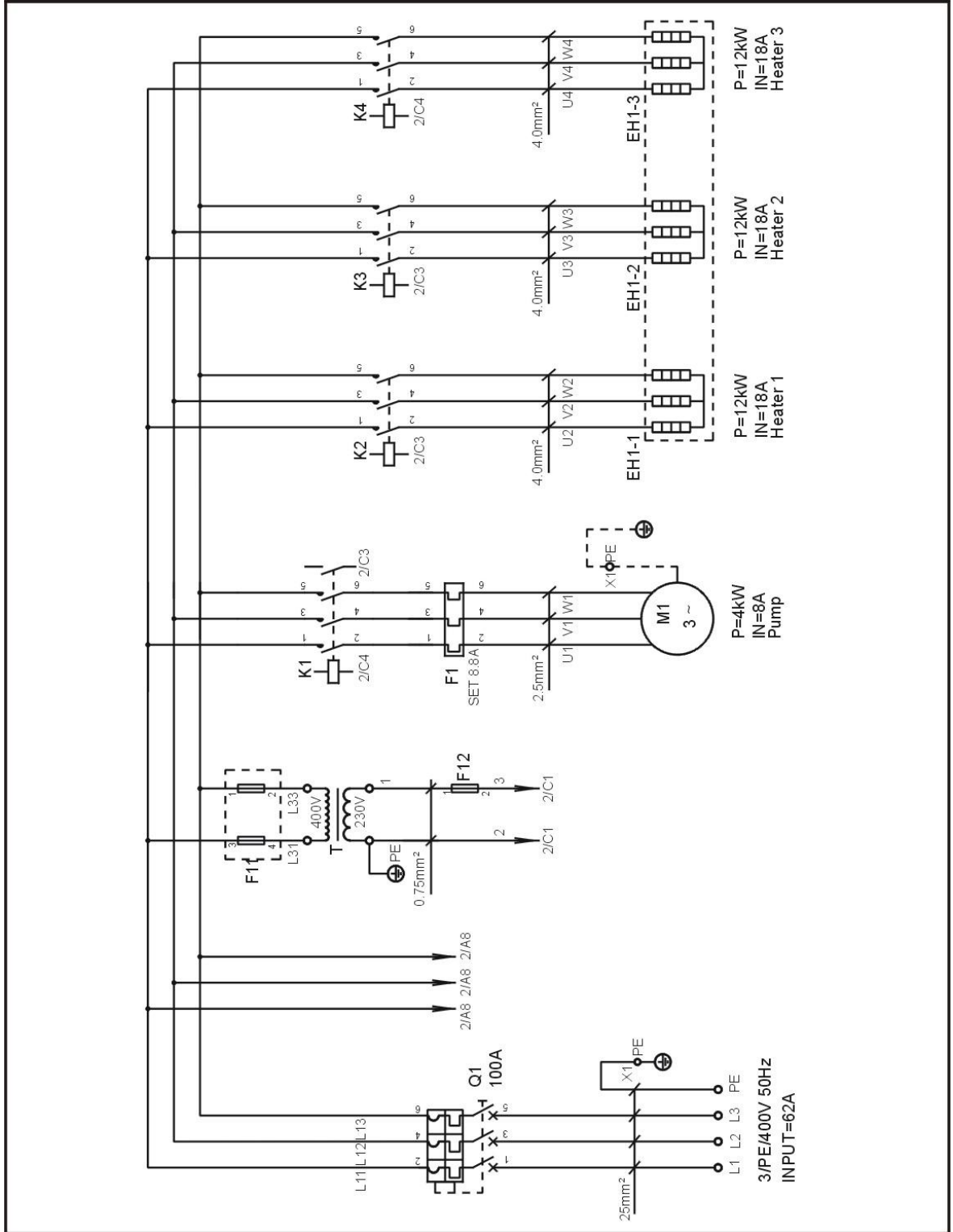
NO.	Symbol	Name	Specification	Part NO.
1	Q1	Main switch*	63A	YE10250400000
2	Q2	Circuit breakers**	63A	YE40606000000
3	-	Break away**	-	YE40023560000
4	K1	Contactors*	230V 50/60Hz	YE00601721000
5	K2 K3	Contactors**	230V 50/60Hz	YE00602622000
6	F1	Overload relays	4.5~6.3A	YE01160450000
7	T	Transformer	IN=400V      OUT=230V 500mA	YE70402300800
8	F11	Fuse box**	32A 2P	YE41032200000
9	-	Fuse**	2A	YE46002000100
10	S1	Thermocouple	-	-
11	S2 S3	Thermocouple	-	-
12	S4	Overheat protector	250V 5(4)A	YE21503000000
13	S5	Hi-lo pressure switch	AC 230V 12A	-
14	PC1 A	Circuit board	100~240VAC 50/60Hz	YE81100000600
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	Motor**	400V 50Hz 2.2kW	-
22	EH1	Heater**	400V 50Hz 12kW	-
23	FM	Fan*	230V 50/60Hz	-

\* means possible broken parts.

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

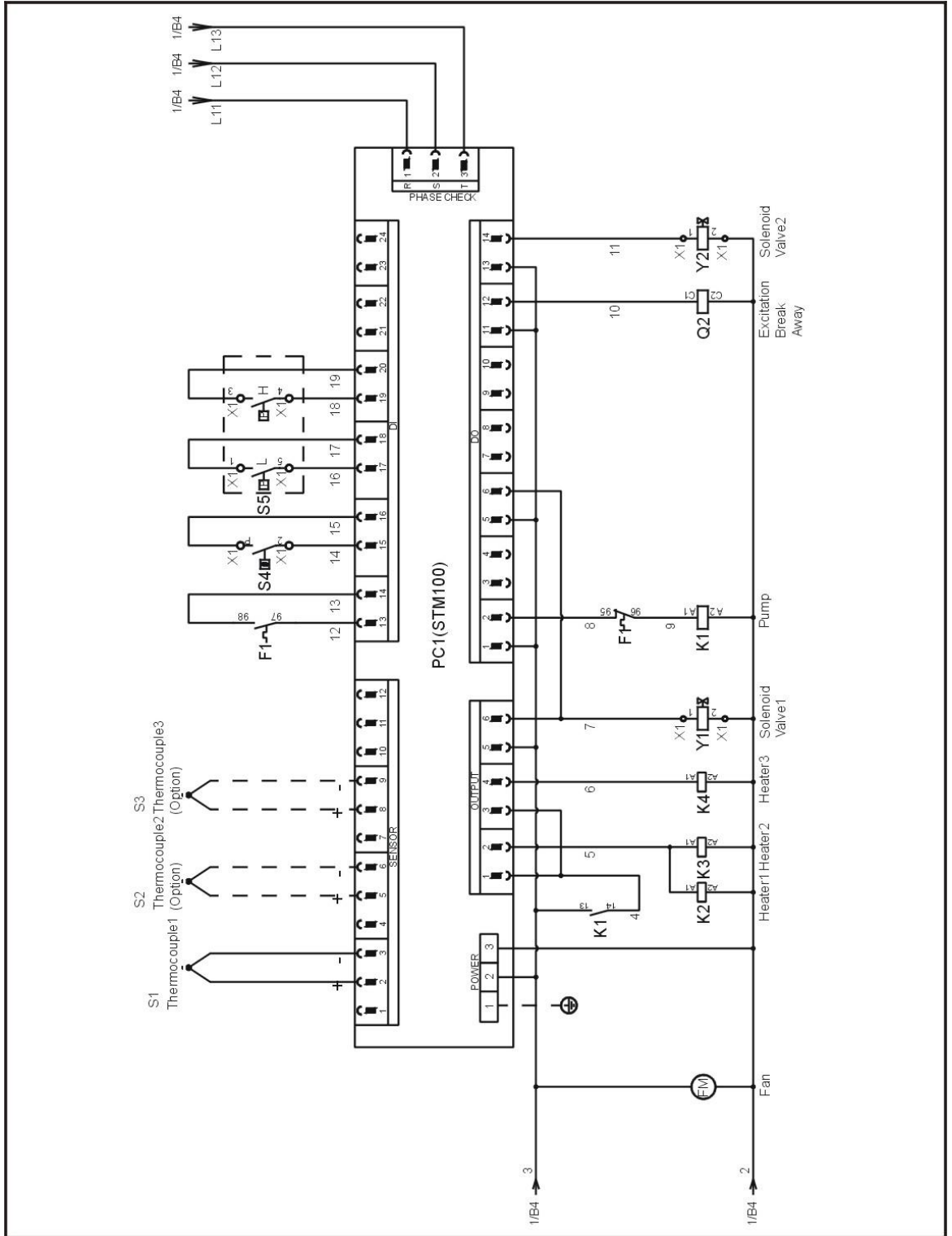
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

## 2.4.9 Main Circuit (STM-3650WF) (400V)



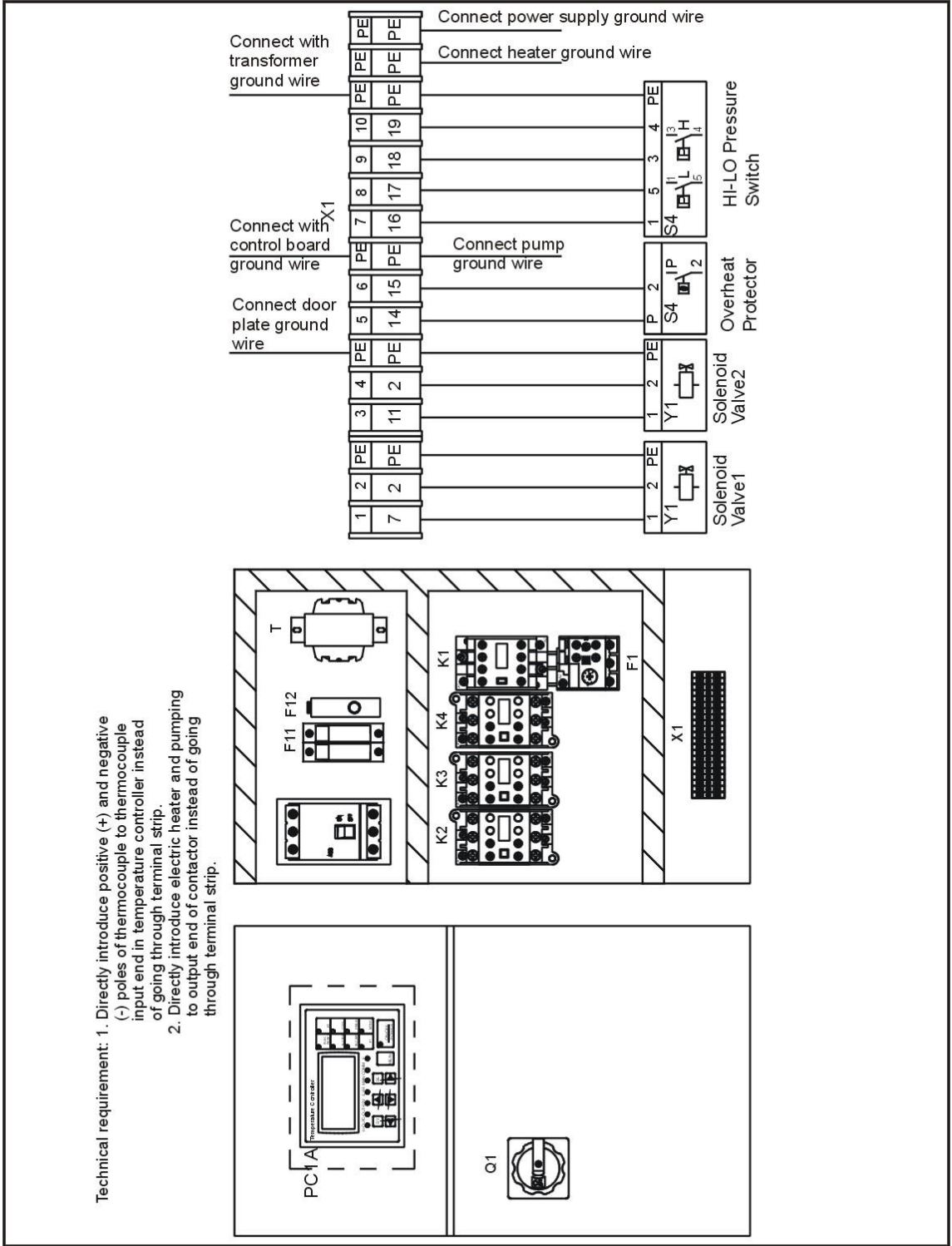
Picture 2-13: Main Circuit (STM-3650WF) (400V)

## 2.4.10 Control Circuit (STM-3650WF) (400V)



Picture 2-14: Control Circuit (STM-3650WF) (400V)

## 2.4.11 Electrical Components Layout (STM-3650WF) (400V)



Picture 2-15: Electrical Components Layout (STM-3650WF) (400V)

## 2.4.12 Electrical Components List (STM-3650WF) (400V)

Table 2-8: Electrical Components List (STM-3650WF) (400V)

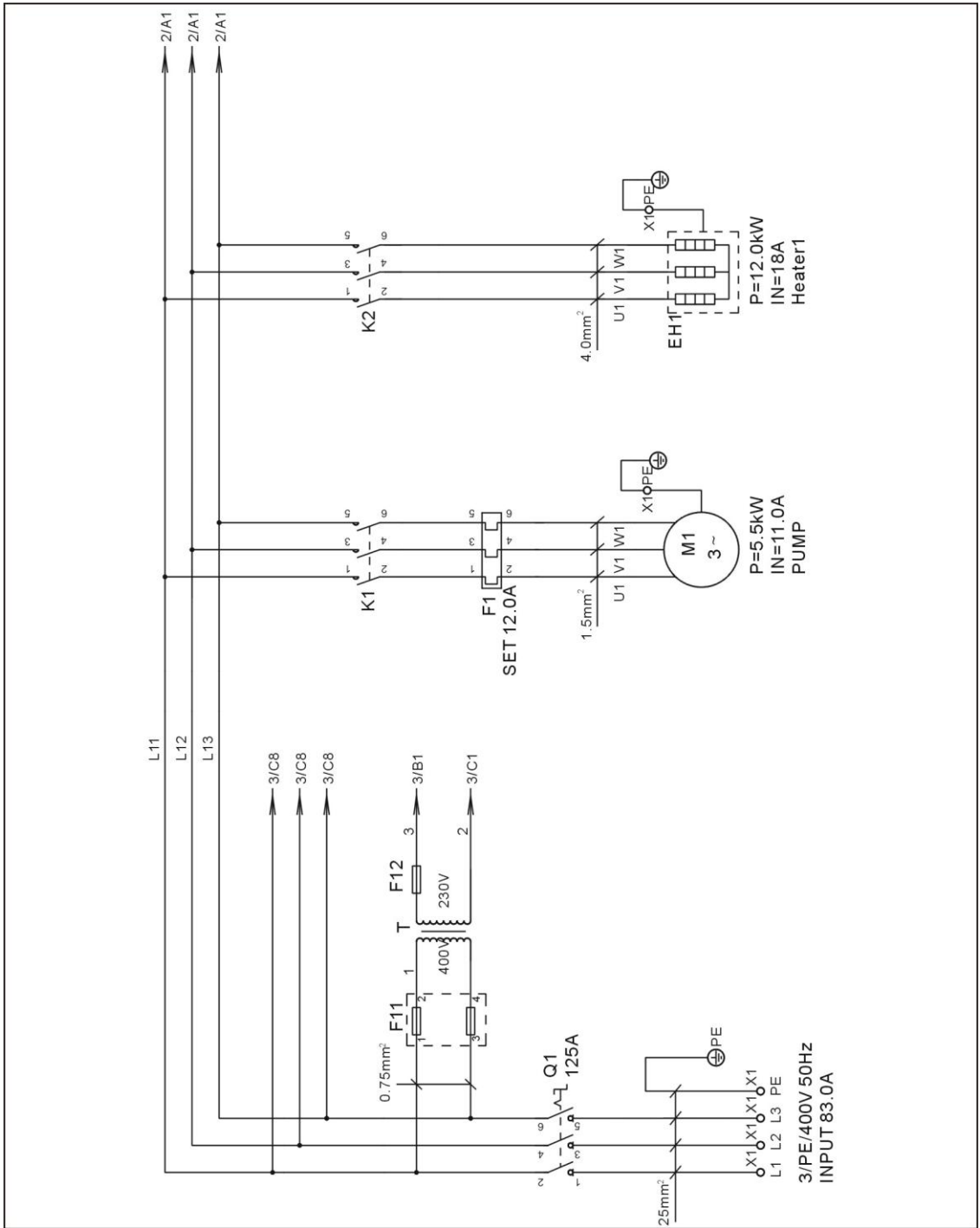
NO.	Symbol	Name	Specification	Part NO.
1	Q1	Circuit break*	100A	YE41110000000
2	-	Circuit break**	230VAC 50/60Hz	YE40101600000
3	K1	Break away**	230V 50/60Hz	YE00601621000
4	K2~K4	Break away**	230V 50/60Hz	YE00602622000
5	F1	Overload relays	7~10A	YE01167100000
6	T	Transformer*	IN=400V      OUT=230V 500mA	YE70402300800
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	F12	Fuse**	2A	YE41001000000
10	S1	Thermocouple	-	-
11	S2 S3	Thermocouple	-	-
12	S4	Overheat protector	250V 5(4)A	YE21503000000
13	S5	Hi-lo pressure switch	H:5-30bar L:-0.7-6bar	YE90083000100
14	PC1 PC2	Circuit board	100~240VAC 50/60Hz	YE81100000600
15	Y1 Y2	Control panel	230V 50/60Hz	-
16	X1	Solenoid valve**	-	YE61250040000
17	-	Terminal board	-	YE61253500000
18	-	Terminal board	-	YE61043500000
19	-	Terminal board	-	YE61163500000
20	M1	Motor**	400V 50Hz 4.0kW	-
21	EH1~EH3	Heater**	400V 50Hz 12.0kW	-
22	FM1	Fan*	230V 50/60Hz	-

\* means possible broken parts.

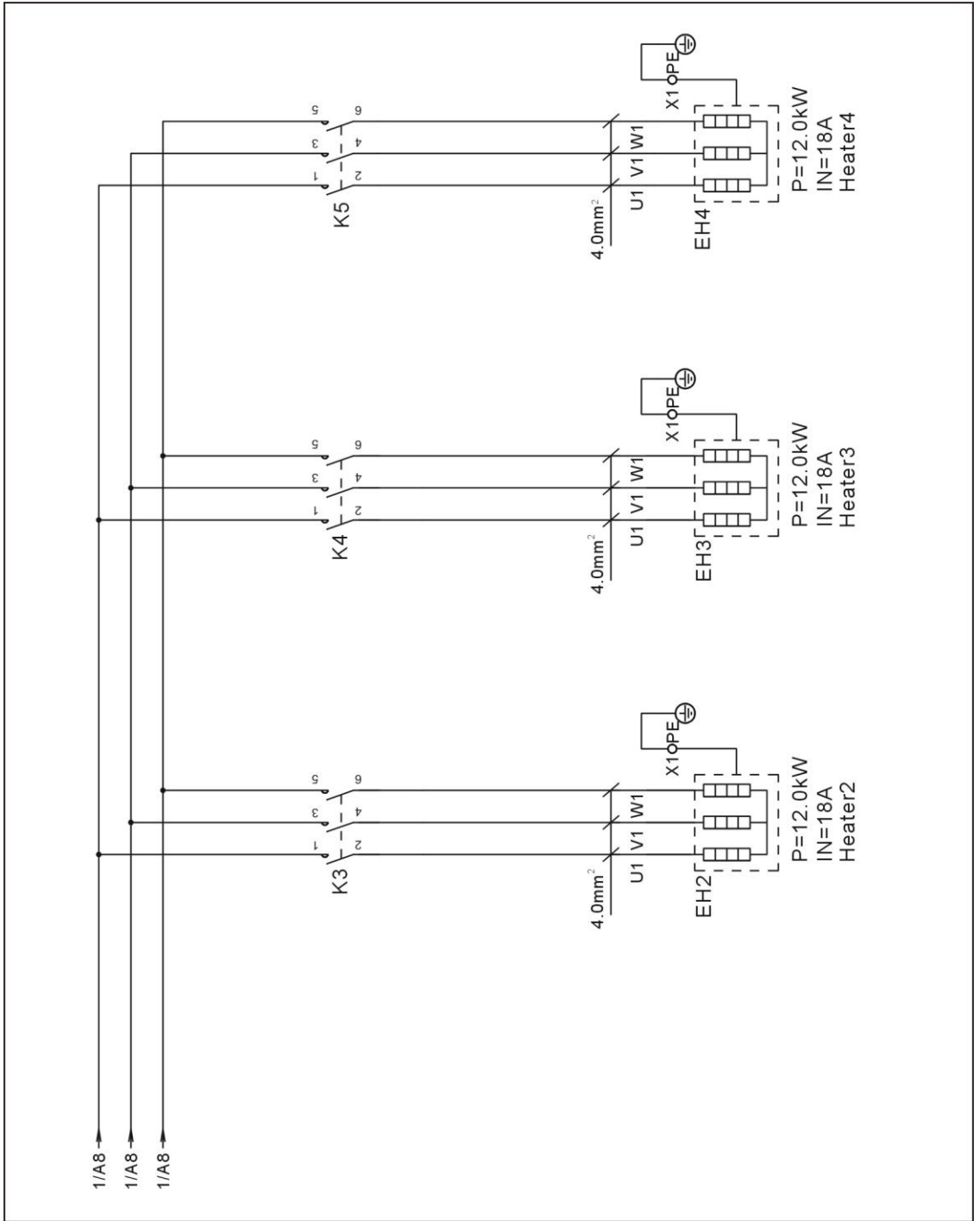
\*\* means easy broken part. and spare backup is suggested.

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.

### 2.4.13 Main Circuit (STM-4875WF) (400V)



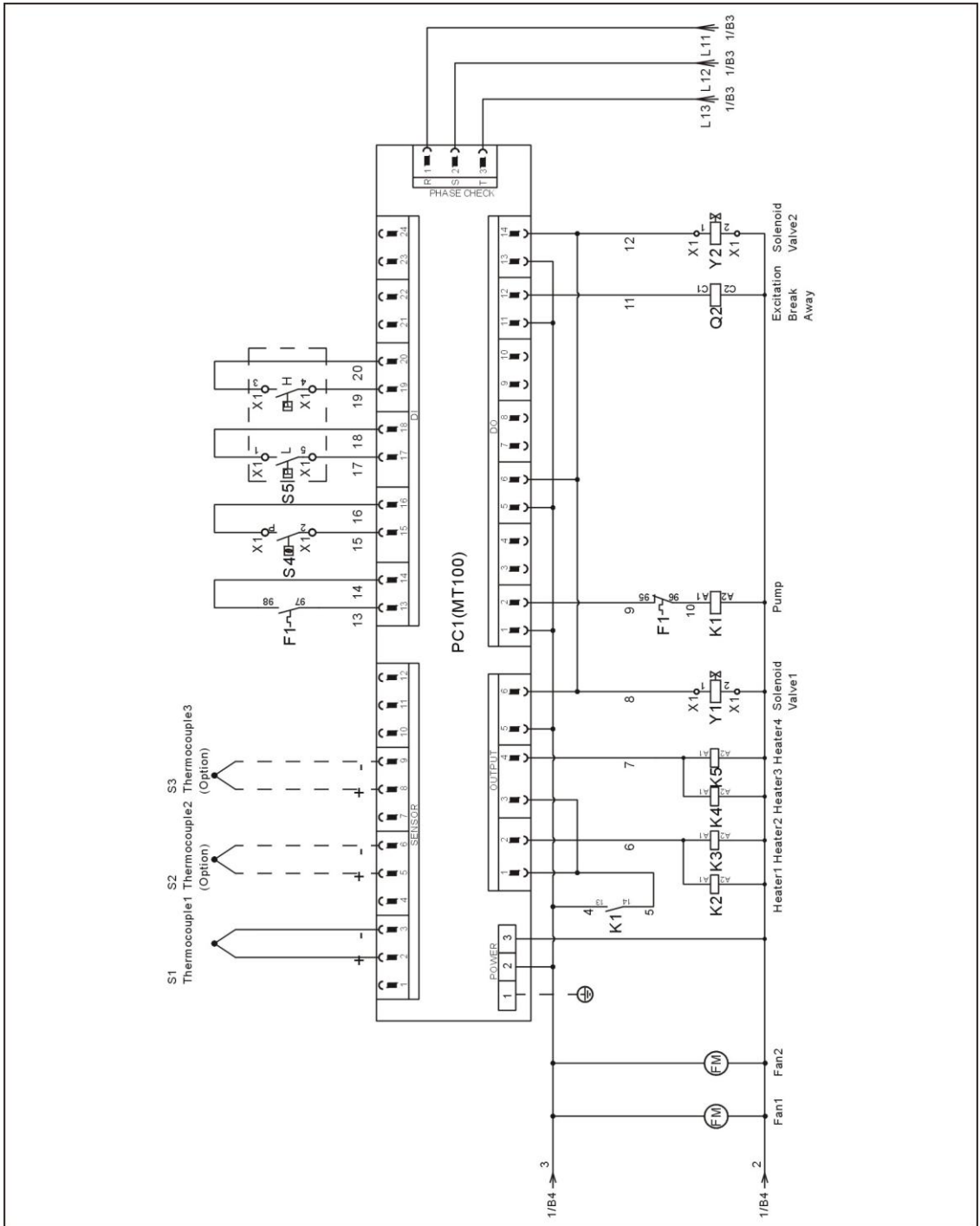
Picture 2-16: Main Circuit 1(STM-4875WF) (400V)



Picture 2-17: Main Circuit 2(STM-4875WF) (400V)

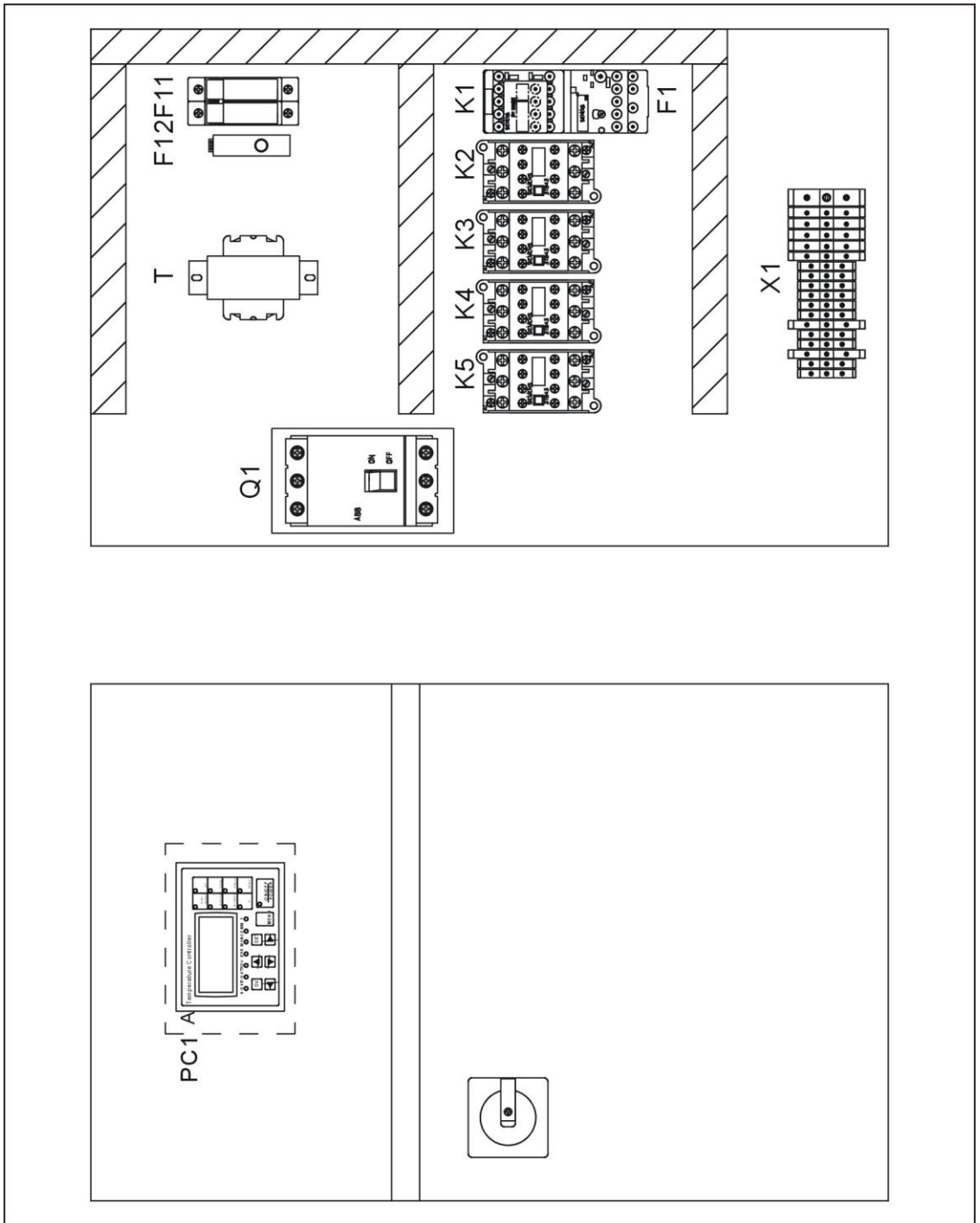


### 2.4.14 Control Circuit (STM-4875WF) (400V)



Picture 2-18: Control Circuit (STM-4875WF) (400V)





Picture 2-20: Electrical Components Layout 2(STM-4875WF) (400V)



## 2.4.16 Electrical Components List (STM-4875WF) (400V)

Table 2-9: Electrical Components List (STM-34875WF) (400V)

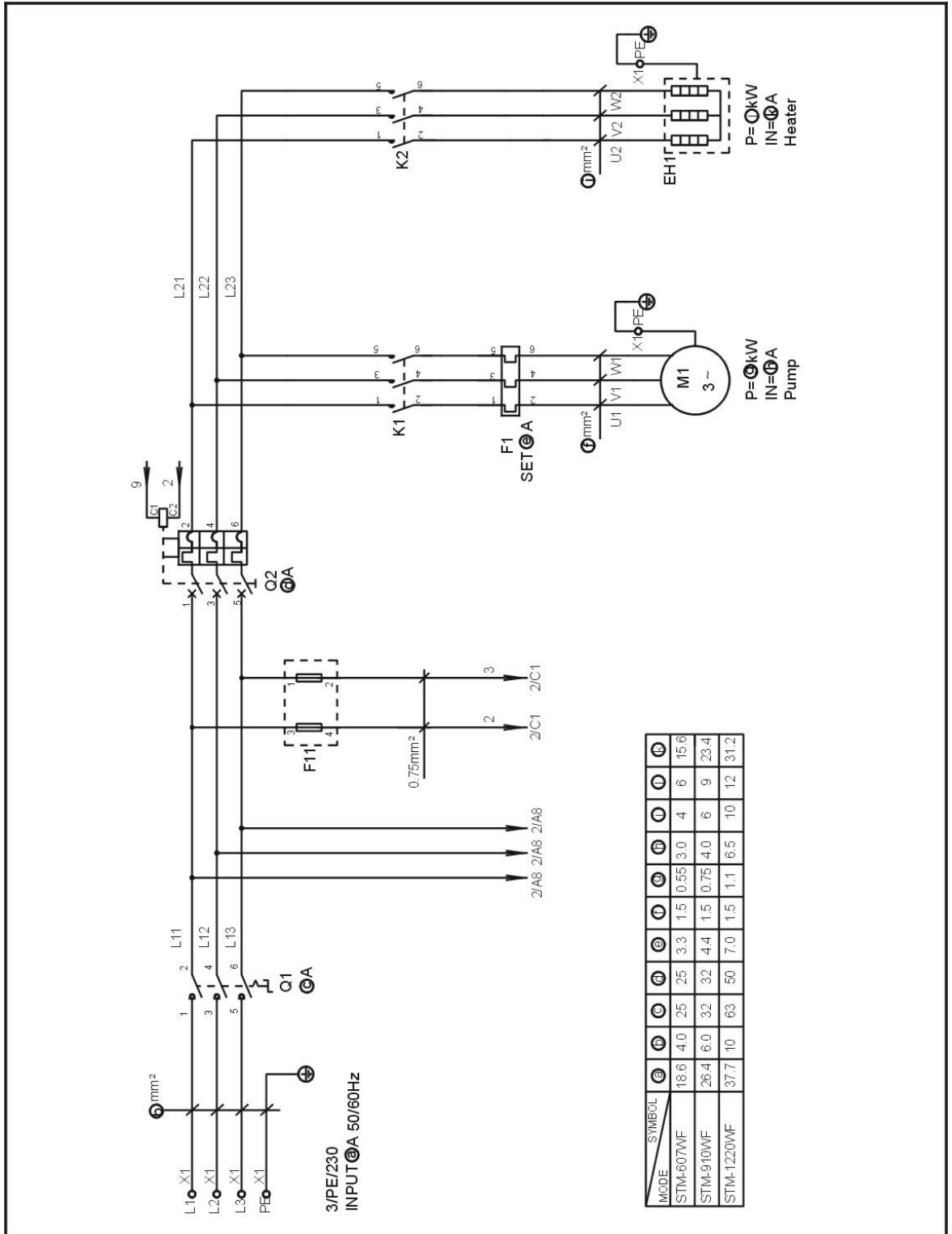
NO.	Symbol	Name	Specification	Part NO.
1	Q1	Circuit break*	125A	YE41161200000
2	-	Circuit break**	220VAC 50/60Hz	YE40101600000
3	K1	Break away**	220V 50/60Hz	-
4	K2~K5	Break away**	220V 50/60Hz	YE00602622000
5	F1	Overload relays	11~16A	YE01611640000
6	T	Transformer*	IN=400V OUT=230V 800mA	YE70402300900
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	F12	Fuse**	2A	YE41001000000
10	S1	Thermocouple	-	-
11	S2 S3	Thermocouple	-	-
12	S4	Overheat protector	250V 5(4)A	YE21503000000
13	S5	Hi-lo pressure switch	H:5-30bar L:-0.7-6bar	YE90083000100
14	PC1 A	Circuit board	100~240VAC 50/60Hz	YE81100000600
15	Y1 Y2	Control panel	230V 50/60Hz	-
16	X1	Solenoid valve**	-	YE61250040000
17	-	Terminal board	-	YE61253500000
18	-	Terminal board	-	YE61043500000
19	-	Terminal board	-	YE61163500000
20	M1	Motor**	400V 50Hz 5.5kW	-
21	EH1 EH2	Heater**	400V 50Hz 12.0kW	-
22	FM1	Fan*	230V 50/60Hz	-

\* means possible broken parts.

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

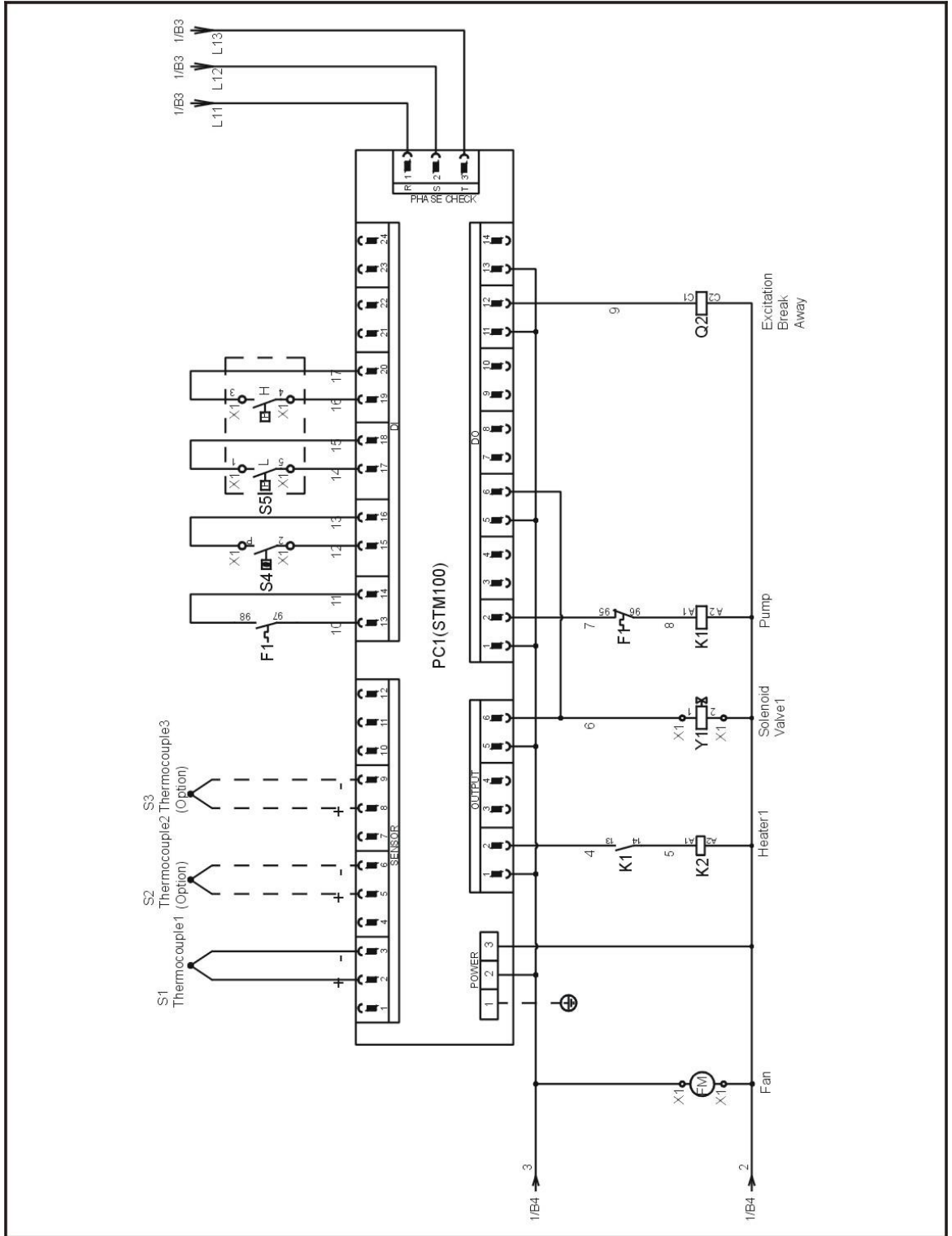
Please confirm the version of manual before placing the purchase order to guarantee that the item number of the spare part is in accordance with the real object.

## 2.4.17 Main Circuit (STM-607~1220WF) (230V)



Picture 2-21: Main Circuit (STM-607~1220WF) (230V)

## 2.4.18 Control Circuit (STM-607~1220WF) (230V)



Picture 2-22: Control Circuit (STM-607~1220WF) (230V)

## 2.4.19 Electrical Components Layout (STM-607~1220WF) (230V)



## 2.4.20 Electrical Components List (STM-607~1220WF) (230V)

Table 2-10: Electrical Components List (STM-607WF) (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**	220V 50/60Hz	YE00601521000
5	K2	Contactors**	220V 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*	250V 5(4)A	YE21503000000
12	S5	Hi-lo pressure switch	H:5-30bar L:-0.7-6bar	YE90083000100
13	PC1 PC2	Circuit board	100~240VAC 50/60Hz	YE81100010000
14	A1 A2	Control panel	-	
15	Y1	Solenoid valve**	230VAC 50/60Hz	-
16	X1	Terminal board	-	YE61250040000
17	-	Terminal board	-	YE61253500000
18	-	Terminal board	-	YE61040000000
19	-	Terminal board	-	YE61043500000
20	M1	Motor**	400V 50Hz 0.55kW	-
21	EH	Heater**	400V 50Hz 6kW	-
22	FM	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 2-11: Electrical Components List (STM-910WF) (230V)

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	YE00401000100
5	K2	Contactors**	220V 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*	250V 5(4)A	YE21503000000
12	S5	Hi-lo pressure switch	H:5-30bar L:-0.7-6bar	YE90083000100
13	PC1 PC2	Circuit board	100~240VAC 50/60Hz	YE81100010000
14	A1 A2	Control panel	-	
15	Y1	Solenoid valve**	230VAC 50/60Hz	-
16	X1	Terminal board	-	YE61060000000
17	-	Terminal board	-	YE61063500000
18	-	Terminal board	-	YE61250040000
19	-	Terminal board	-	YE61253500000
20	M1	Motor**	400V 50Hz 0.75kW	-
21	EH	Heater**	400V 50Hz 9kW	-
22	FM	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 2-12: Electrical Components List (STM-1220WF) (230V)

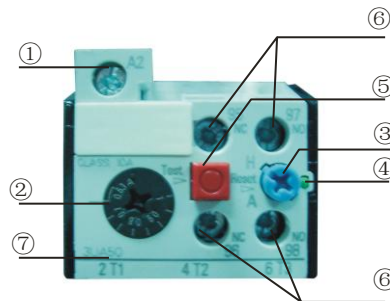
NO.	Symbol	Name	Specification	Part NO.
1	Q1	Main switch*	63A	YE10636300000
2	Q2	Circuit breakers**	63A	YE40605000000
3	-	Excitation break away**	-	YE40023560000
4	K1	Contactors**	220V 50/60Hz	YE00601621000
5	K2	Contactors**	220V 50/60Hz	YE00503500000
6	F1	Overload relays	5.5~8A	YE01160550000
7	F11	Fuse box**	32A 2P	YE41032200000
8	-	Fuse**	2A	YE46002000100
9	S1	Thermocouple	-	-
10	S2 S3	Thermocouple	-	-
11	S4	Overheat protector*	250V 5(4)A	YE21503000000
12	S5	Hi-lo pressure switch	H:5-30bar L:-0.7-6bar	YE90083000100
13	PC1 PC2	Circuit board	100~240VAC 50/60Hz	YE81100010000
14	A1 A2	Control panel	-	
15	Y1	Solenoid valve**	230VAC 50/60Hz	-
16	X1	Terminal board	-	YE61250040000
17	-	Terminal board	-	YE61253500000
18	-	Terminal board	-	YE61100000000
19	-	Terminal board	-	YE61103500000
20	M1	Motor**	400V 50Hz 1.1kW	-
21	EH	Heater**	400V 50Hz 12kW	-
22	FM	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.

## 2.5 Main Electrical Components Description

### 2.5.1 Overload Relay

At delivery, the overload relay is set for manual 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 2-24: 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.

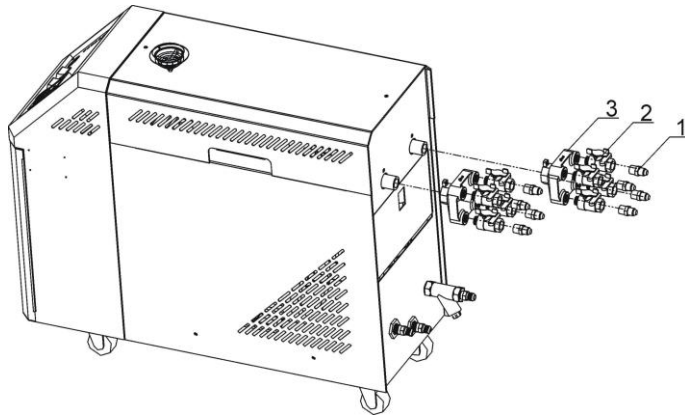
- 5) Test button (red).

- 6) Auxiliary contact terminals shown in 95.96.97.98. NC and NO contacts are shown in position 95.96. and 97.98. respectively.

- 7) Main circuit connection No. must be correspond with terminal Number of contactor.

## 2.6 Operation Procedures

### 2.6.1 Installation steps for options water manifold (dewaxing)



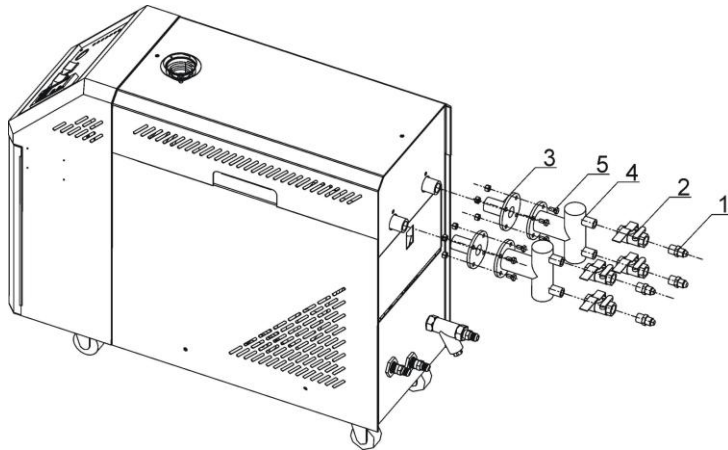
- 1) Install copper joint to the level valve.
- 2) Install level valve with copper joint to the dewaxing water manifold.
- 3) Install water manifold to the machine.
- 4) Install Teflon to copper joint.



Note!

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

### 2.6.2 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°C, Teflon with temperature resistance 200°C is usable; for the operating temperature from 200 to 300°C, must use Teflon with temperature resistance 300°C.

### 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.

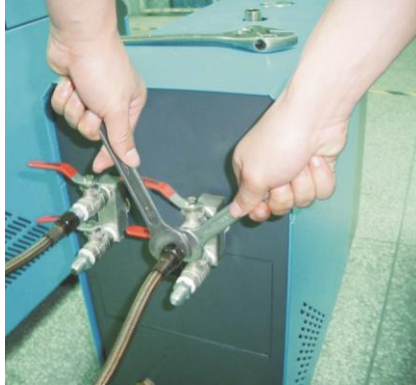
Keep away flammable and explosive goods.



Picture 3-1: Installation Space

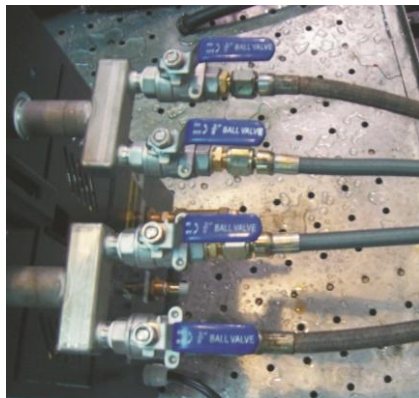
#### 3.2 Mould and Water Coupling

- 1) It is necessary, while connecting from the access to mould, to use two spanners to fix the switching connector and ball valve before screw tightly the horn nut of the connection pipe, otherwise water might leaks from the machine.



Picture 3-2: Mould and Water Couplings 1

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

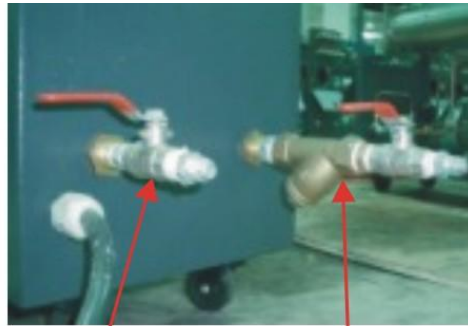


Picture 3-3: Mould and Water Couplings 2



Note!

Cooling water inlet and outlet as shown by the Figure. Please do not connect reversely. Please connect the cooling water outlet with high temperature resistant pipe when temperature is above 100°C.



Cooling water outlet

Cooling water inlet

Picture 3-4: Mould and Water Couplings 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 3 $\Phi$ 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, electric shock may happen if power is on.
3	MENU	LCD menu shift key	Initial password: 3588
4	SET	Parameters setting	Confirm parameters
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

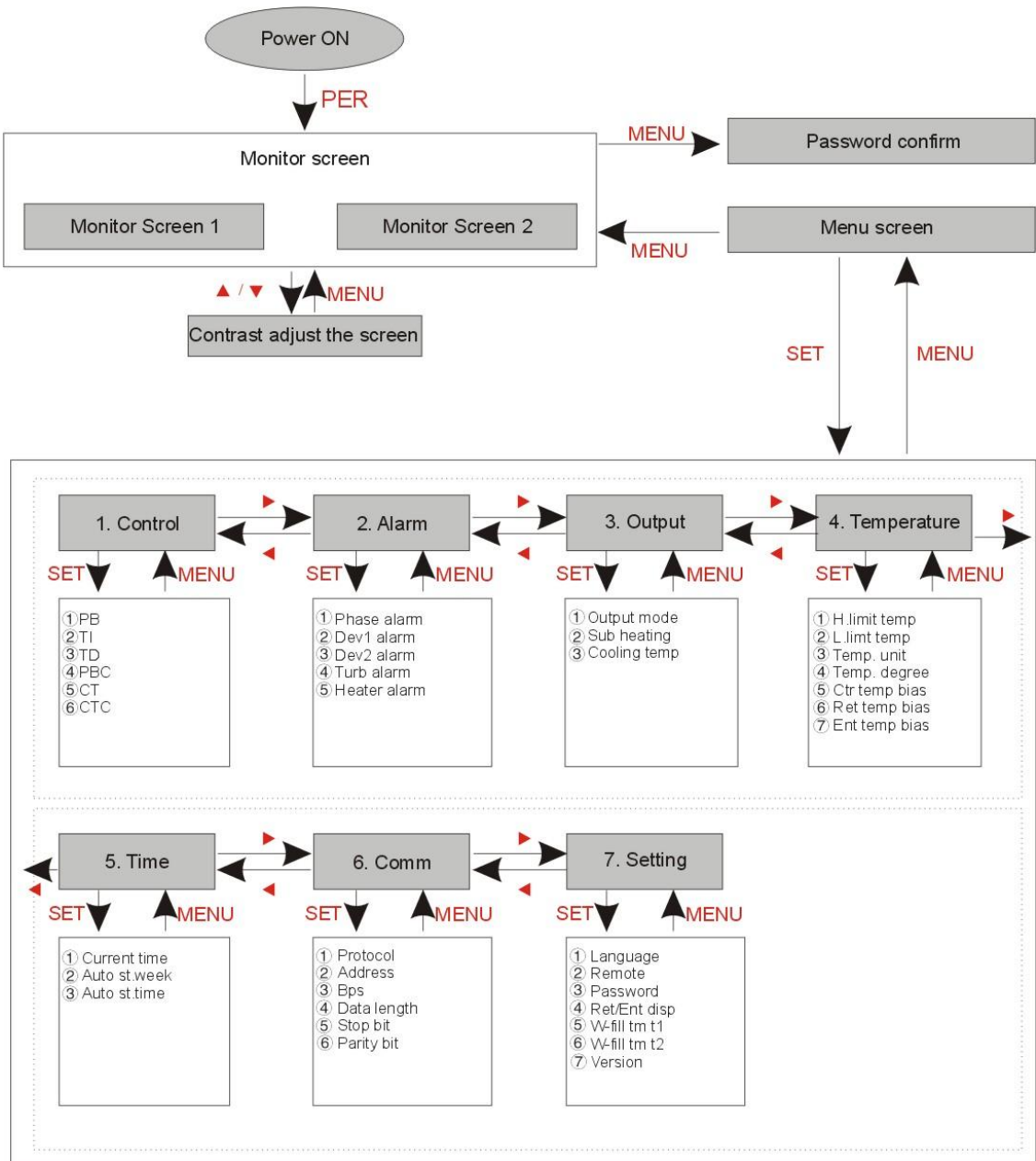
No.	Name	Functions	Remarks
			under SUCTION and COOL operation.
10	SUCTION	SUCTION switch start and stop	SUCTION is to remove medium (water/oil) from molds. Can not start during operation or cooling. After SUCTION turns on, "SUCTION relay" and "pump inverse run relay" will turn on.
11	COOL	Forced cooling switch start and stop	Press it for 2 secs for forced cooling, 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

<b>Error display</b>	<b>Reasons</b>	<b>Alarm</b>	<b>Temp. control</b>
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 automatically start the protective function and stop the machine. Press "ON" to restart the machine.

## 4.2 Menu Introduction



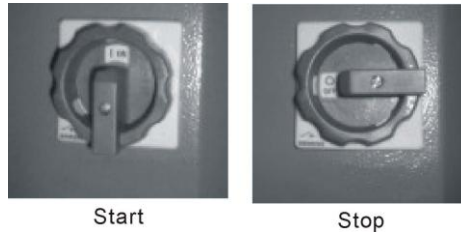
Pictute 4-2: Menu Outline

## 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

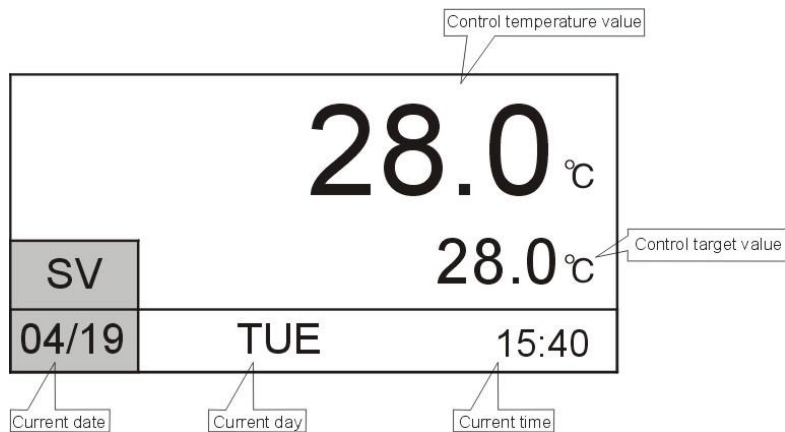
pipeline connection)

- 3) Open all the global valves.
- 4) Switch on main power.



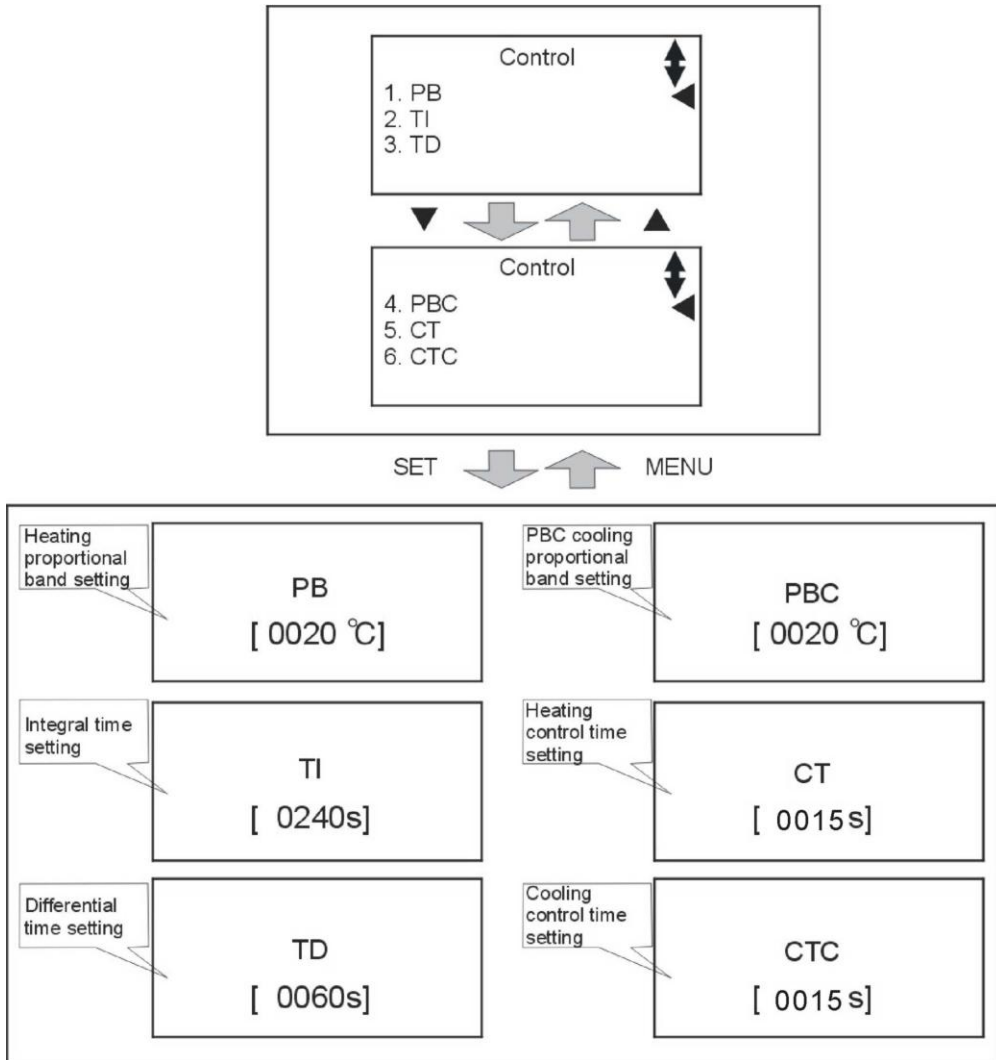
Picture 4-3: Main Power Switch

- 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 menu, 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 return to menu screen, press ◀/▶ key to select alarm setting then press SET to enter setting menu, see picture below. Here is parameter setting:

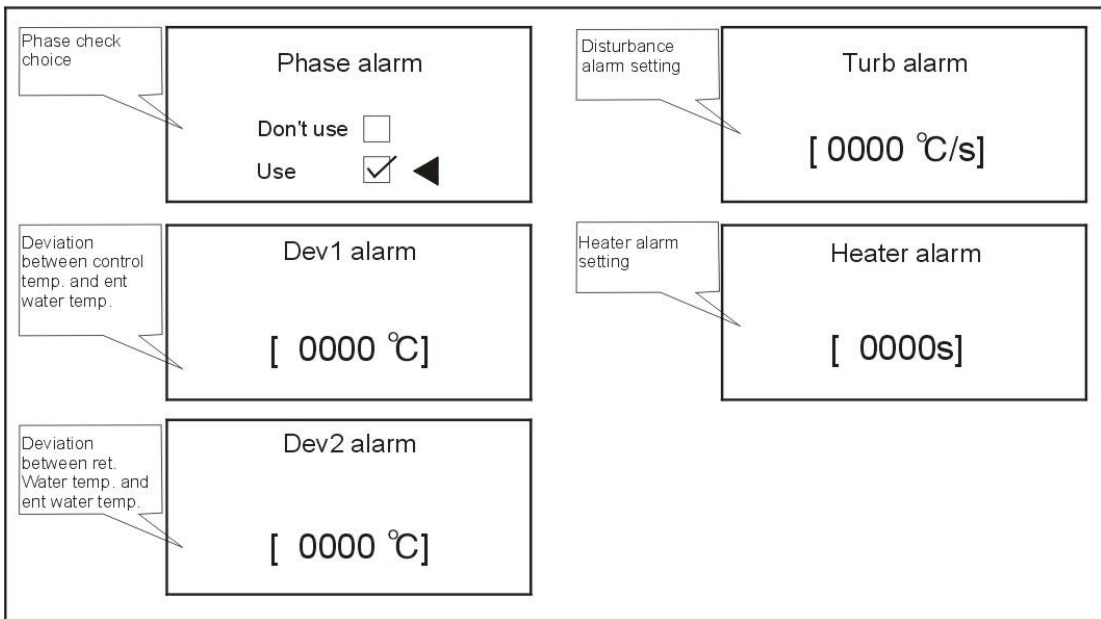
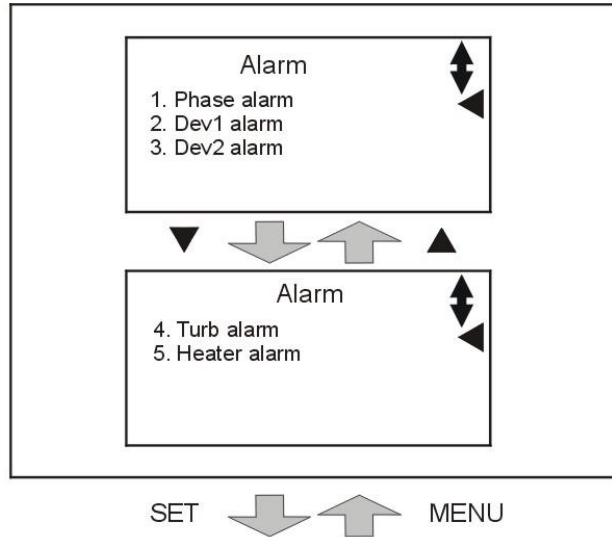
- PHASE——used
- Water out temp. deviation——0 (not opt for temp. sensor)

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.

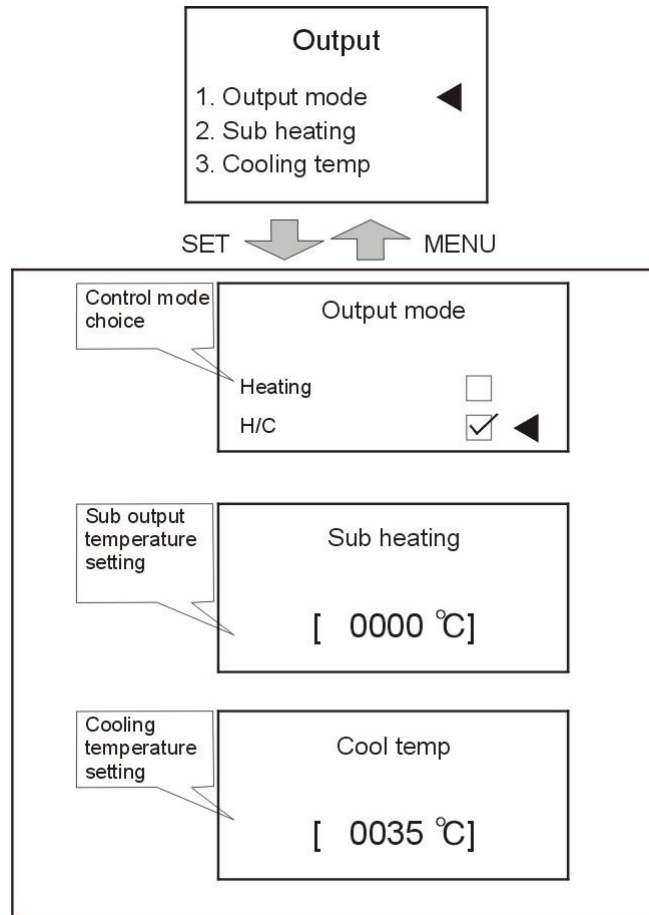


Picture 4-6: Alarm Setting

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

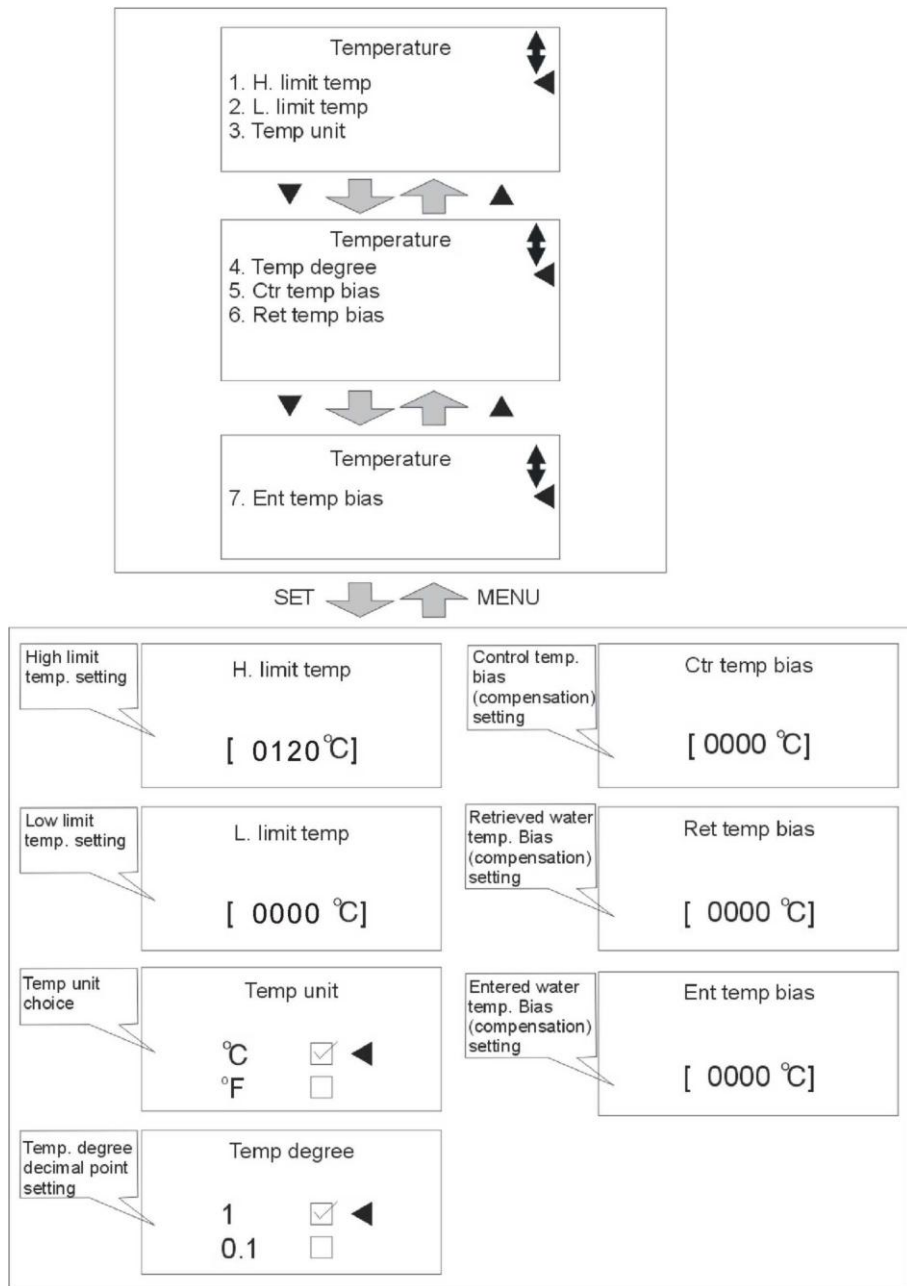


Picture 4-7: Output Setting

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.

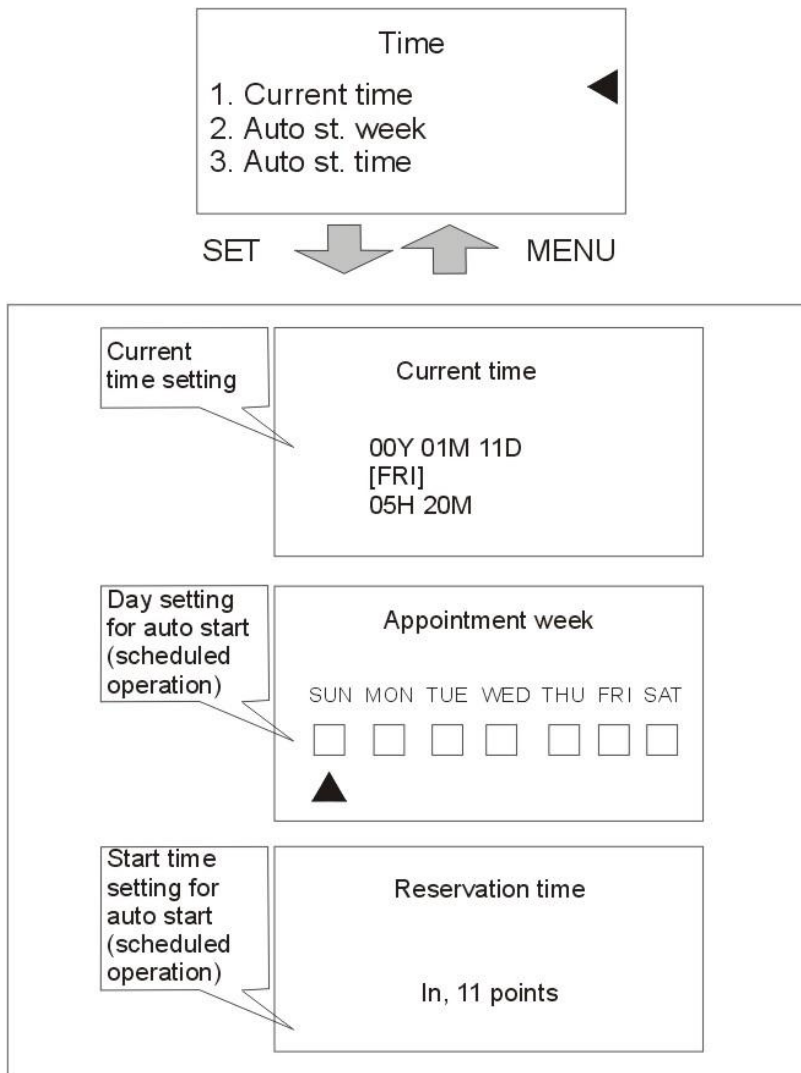
- H. LIMIT TEMP.—based on actual operation.
- L. LIMIT TEMP.—based on actual operation.
- TEMP. UNIT—°C (Celsius and Fahrenheit)
- TEMP. DEGREE—0.1

- CTR TEMP BIAS——based on actual operation.
- RET TEMP BIAS——based on actual operation
- ENT TEMP BIAS——based on actual operation



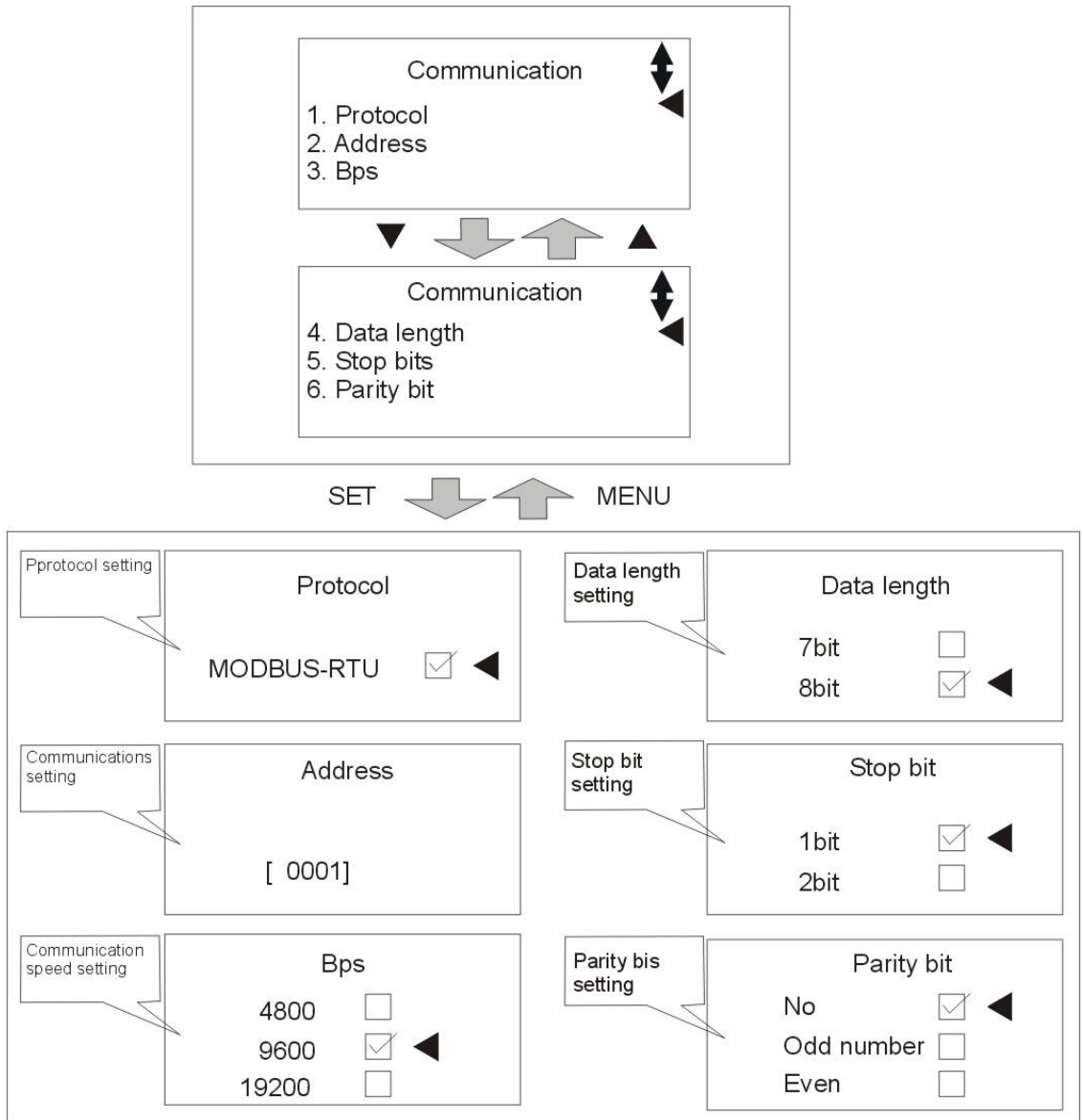
Picture 4-8: Temperature Setting

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.



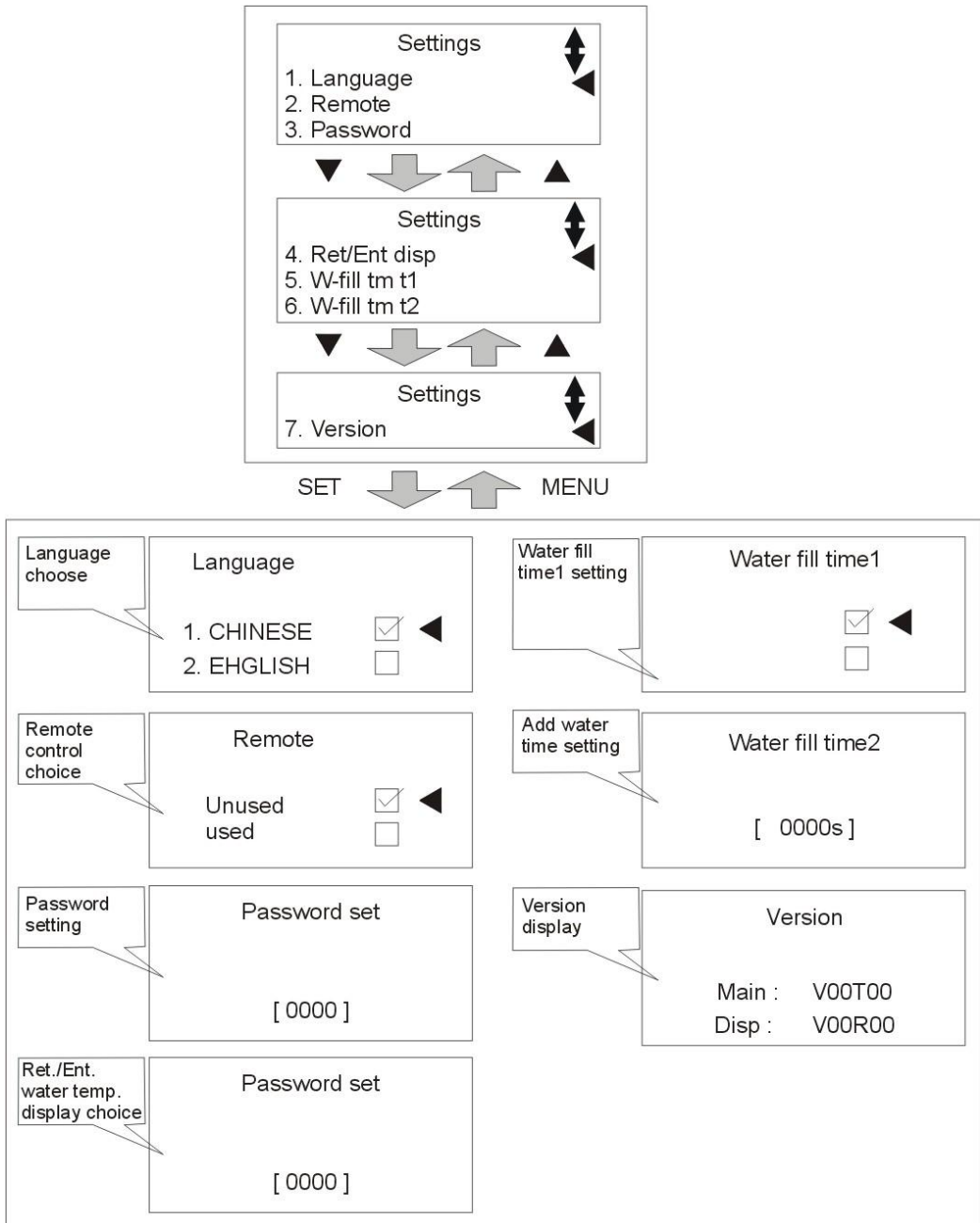
Picture 4-9: Time Setting

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

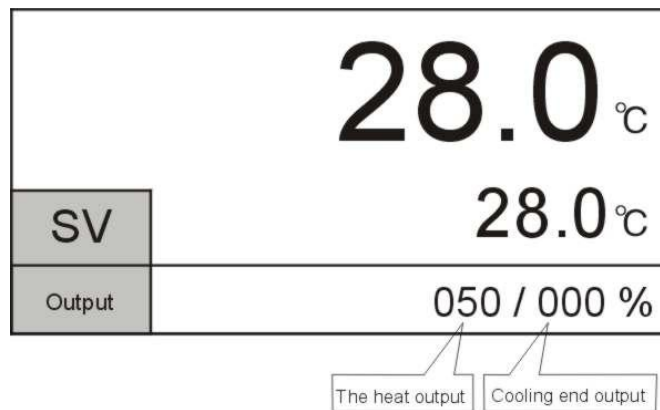
12) Press MENU key to return to menu screen, press ◀/▶ key to select device setting, press SET key to enter setting screen, see picture below. Before delivery, parameters have been set and customers can modify them based on actual needs.



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-WF is 200°C.

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°C	-
Ret pv	Retrieved water temp.	-50~500°C	-
Ent pv	Entered water temp.	-50~500°C	-
Sv	Control target temp.	-50~500°C	-50°C
Hout	Amount of heating output	0~100%	0%
Cout	Amount of cooling output	0~100%	0%
Pb	Heating proportional band	0~550°C	20°C
Ti	Integral time	1~3600s	240s
Td	Derivative time	1~3600s	60s
Pbc	Derivative time	0~550°C	20°C
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°C(0=off)	0=off
Dev2 alarm	Alarm for deviation between entered water temp. and retrieved water temp.	0~550°C(0=off)	0=off

Turb. Alarm	Alarm for sudden temp. drop	0~550°C/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°C (0=off)	0=off
Cooling temp	Set compulsory cooling	-50~500°C	35°C
H.limit temp	High(upper) limit temp.	-50~500.0°C	500°C
L.limit temp	Low(lower) limit temp.	50~500.0°C	-50°C
Temp unit	Swlect °C/ °F	°C/ °F	°C
Temp. degreeen	Select the decimal point position 0.1/1	0.1, 1	1
Ctl temp bias	Control temp. bias (compensation)	-550~550.0°C	0°C
Ret temp bias	Retrieved water temp. bias (compensation)	-550~550.0°C	0°C
Ent temp bias	Entered water temp. bias (compensation)	-550~550.0°C	0°C
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°C below, press COOL key to shut down

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

3) Switch main 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!

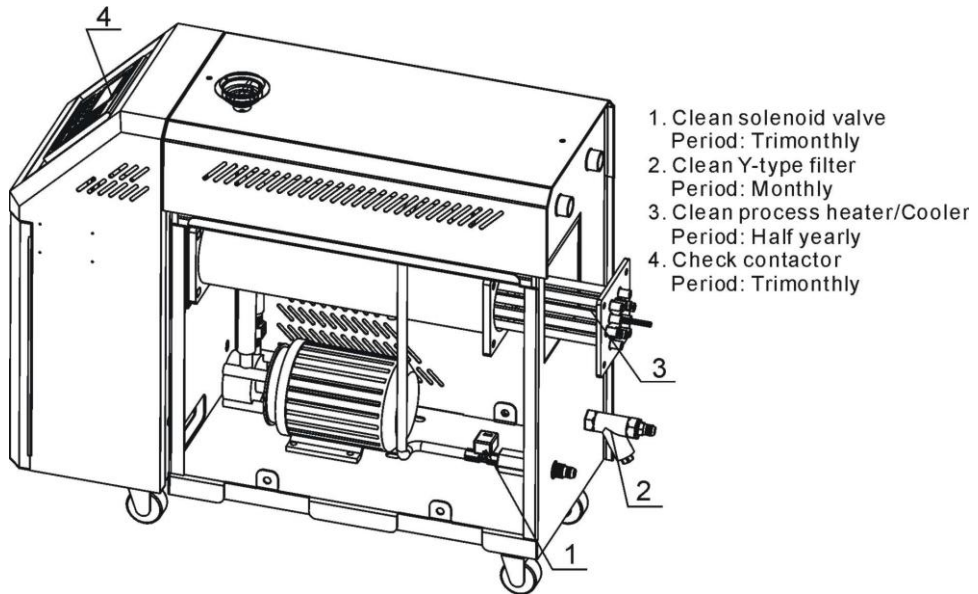
In order to prolong machine lifespan, please do as above steps to turn on and off the machine.

## 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 relay. Reset overload relay: Wait for one minute, then press the blue button to reset.
EGO overheats.	EGO temperature setting mistakes. EGO poor temperature detecting. Heater contactor K1 and K2 problems.	Correctly set EGO temperature. (EGO temperature setting value= temperature setting value+10°C) Replace EGO. Replace the contactor.
Low liquid level.	Oil shortage.	Fill high temp. oil.
Temp. window displays ----	Abnormal sensor.	Fill high temp. Oil.
Once running, pump output indicator lightens but pump cannot start. After a while pump still fails to run.	PCB output relay problems. Electrical circuit problems.	Check or replace the PCB. Check electrical circuit.
Differences between setting temperature and actual temperature is too big.	Too short time after machine startup. Temperature parameter setting error. Cooling water valve problems.	Wait for a while. Check temperature parameters. Please refer to the standard manual of setting parameters. Replace solenoid valve.

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



Pay attention to the following rules during maintenance:

- 1) Please reduce the temperature to room temperature (below 50°C), cut off power supply and drain oil and water first while inspecting the machine; carry out operations with safety gloves on after complete confirmation of spaces for inspection and maintenance.
- 2) It is necessary to carry out periodic inspections in order to prolong service life of the system and prevent from safety accidents.  
(Please note that it is dangerous to check or tear down the machine during operation.)

### 6.1 Open the Covers

- 1) Open the top covers of the unit. (Refer to the pictures below)



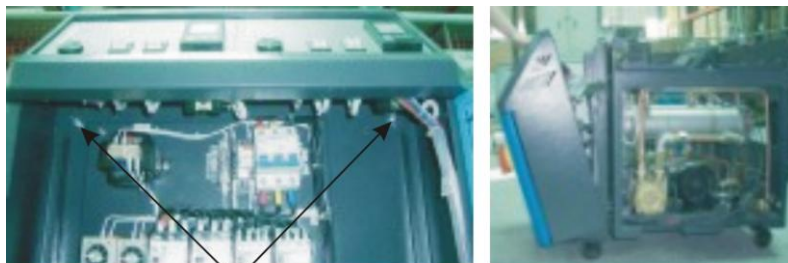
Picture 6-1: Open the Covers 1

2) Take down the side covers. (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)



Butterfly screws

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 to enter 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.



Solenoid valve

Picture 6-5: Solenoid Valve

## 6.4 Pipe Heater

- 1) Open machine rear cover door. (Refer to pictures below)



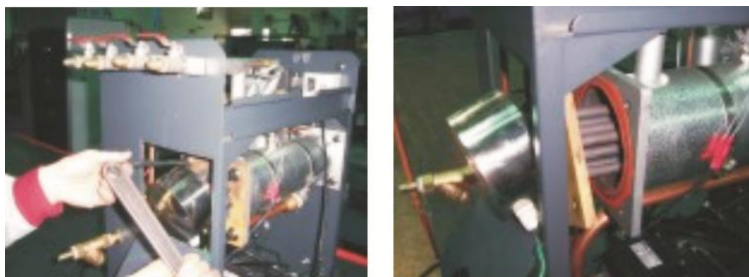
Picture 6-6: Pipe Heater 1

2) Unlock heater cap. (Refer to pictures below)



Picture 6-7: Pipe Heater 2

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



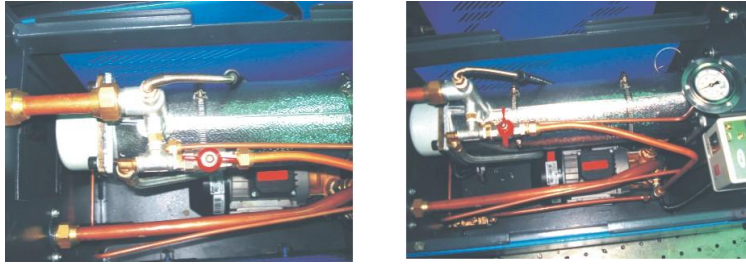
Picture 6-8: Pipe Heater 3

4) Install the pipe heater in a reverse order.

## 6.5 By-pass Globe Valve

Shut off the by-pass globe valve when water pressure gauge display value is too

low.



Picture 6-9: By-pass Globe Valve

## 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 terminal

5, 6 : return 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 : cooling control output (RELAY output)

④ DO TERMINAL (relay contactor output terminal)

- 1, 2 : pump running contactor output terminal
- 3, 4 : pump inverse running contactor output terminal
- 5, 6 : backup water contactor output terminal
- 7, 8 : SUCTION 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)

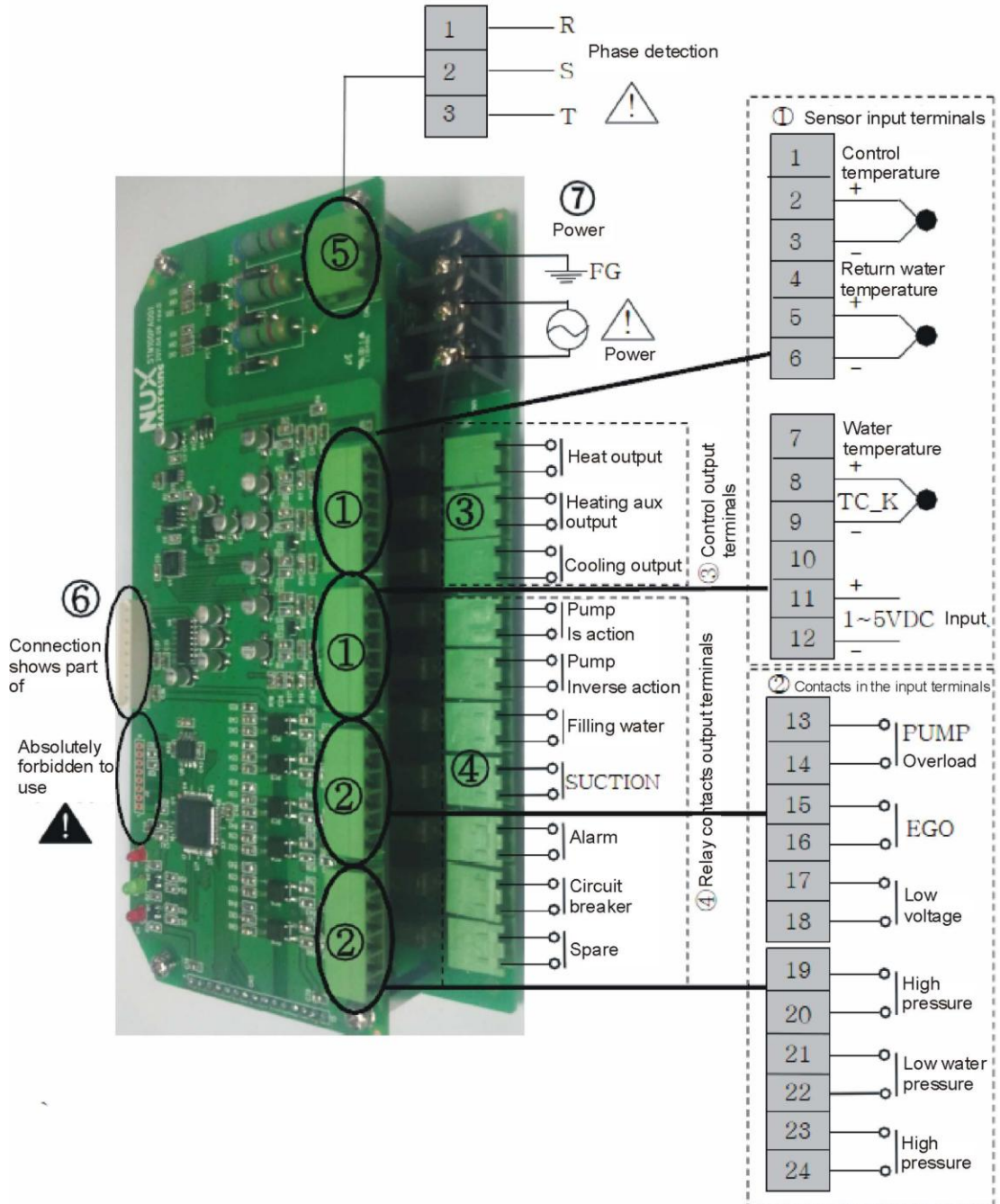
- 1 : R phase connect terminal
- 2 : S phase connect terminal
- 3 : T phase connect terminal

⑥ DISPLAY CN (connect terminal for display)

Connect stub cable with STM100.

⑦ POWER TERMINAL (power supply terminal)

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



## 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

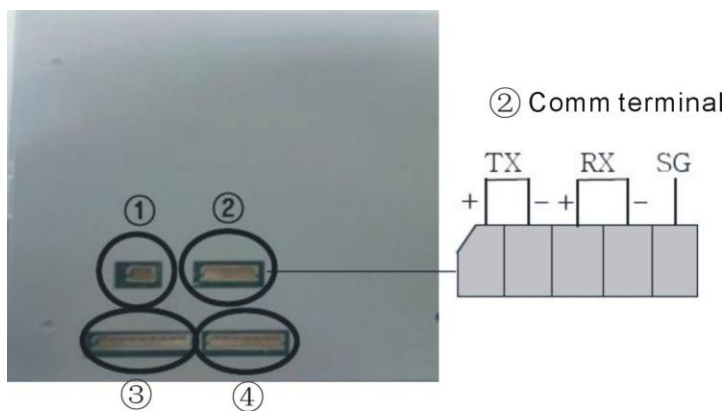
5: Earth terminal

### 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 \_\_\_\_\_  $\Phi$  \_\_\_\_\_ 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 electrical connections.

Check and clean Y type filter <sup>1</sup>.

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 <sup>2</sup>.

Replace the hot kerosene with a using temperature above 160 degree <sup>3</sup>.

### 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 <sup>4</sup>.

### 6.8.7 Yearly Checking

- Replace the hot kerosene with a using temperature above 120 degree <sup>5</sup>.

### 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.