

**Vertical sterilizer**  
**Operation Manual**  
LMQ.C-50E(EJ)/80E(EJ)/100E

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Welcome to use LMQ.C Vertical sterilizer. To bring the maximum performance into full play and ensure that the product operate safely, please read the manual carefully first and strictly comply with the requirements of installation, operation and maintenance mentioned in this manual.

This manual only suits for LMQ.C vertical type sterilizer installation, use, operation and maintenance, not specifically indicate the product's actual configuration. This manual does not apply to other models and configurations of products, and does not apply to other brands either.

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**Cautions and attentions**

In the operation manual, also using the following signs indicates the operation content needs to be paid high attention.



**NOTICE** It indicates to be paid high attention.



It indicates to be observed otherwise the equipment will be damaged.



It indicates to be observed strictly otherwise the personal safety will be endangered.

Please understand the symbols showed in the following table:

No.	Symbol	Instruction
1		It indicates high temperature and be careful of scald.
2		Note, please operate according to the manual.
3		On earth symbol
4		Here is voltage, please cut power before operation and maintenance
5		Emergency stop switch



Please read each chapter carefully and fully understand it before any operation, maintenance on the product especially the contents with the above symbols. If you use the equipment not by the way offered by my company, the equipment will be damaged.



Please properly keep this manual away from loss and damage.



The operator has responsibility to renovate the manual and complete the lost, damaged or unsuitable contents.



Anyone in any situation cannot tear off any page from the manual. During the usage of the product, please do not hesitate to contact us if there is any inconsistent explanation or unmentioned cases. We will timely solve the problems and update or renew the manual for free.



This manual booklet should be stored in dry and ventilated place without high temperature.



Please read each chapter carefully and fully understand it before any operation, maintenance on the product especially the contents with the above symbols.



Please properly keep this manual away from loss and damage.



The operator has responsibility to renovate the manual and complete the lost, damaged or unsuitable contents.



The product is not applicable for bottled liquid with tight seal. Please contact us to order special liquid sterilizer.



The bottle explosion that could endanger the personal and product safety may happen, if bottled liquid is sterilized by this product.




Since the chloridion is the important factor of corroding stainless steel, if the items that contain chloridion are sterilized by this product please wash the chamber everyday by clean water to increase the product service life. Otherwise, the chloridion may corrode the chamber.




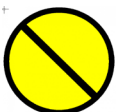
This product is only applicable for those instruments that are heat and humidity resisting, but not for the sterilization of oils or powder that contains Vaseline.



In order to adopt proper measures when you see the  sign in any place please consult the manual or other relevant document to clarify the potential danger.


















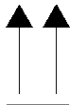
On any position on the instrument seeing the symbol , it indicates surrounding temperature is higher; please pay attention to avoid scald.




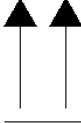

**DANGER**

- 1) User should make the constantly daily maintenance during this product using process, and inspect it itself regularly.
- 2) User should make once self-inspection each month on the product under using, and take a record. If user finds abnormal situation while doing self-inspection and daily maintenance, should treat it in time.
- 3) User should make periodical calibration, maintenance on the safety accessories (safety valve, pressure gauge etc.), safety protective device, measuring control device and relative auxiliary device of the products under using, and take a record.
- 4) The operator or relative administrator for this product should be tested qualified by the department of special vessel safety supervision and management accord to national relevant regulation, and obtain special operation certificate with national unified format, then can do the relative operation or management wok.
- 5) User unit should make special vessel safety, energy-saving education and training on the operators, ensure them master necessary safety and energy saving knowledge on the special equipment. This product operator should strictly execute the special vessel operation rules and relative safety regulations during operation.

**Safety sign**

			
On (power on) IEC 417, No. 5007	Off (power off) IEC 417, No. 5008	Ground IEC 417, No. 5017	Protective ground IEC 417, No. 5019
			
DC IEC417, No. 5031	AC IEC417, No.5032	Refer to the attached materials ISO3864 No.B.3.1	Prevent electric shock ISO3864, No.B.3.6
			
Prevent surface overheat IEC 417, No. 5041	Refer to user manual YY0466, No. 3.3	Keep dry YY0466, No. 3.8	Temperature limitation YY0466, No. 3.11
			



Avoid direct sunlight YY0466, No. 3.6	Avoid high voltage IEC417 , No.5036	Fuse IEC 417, No. 5016	Keep in upright position GB/T191, No. 3
Safety symbol			
			
Fragile	Keep in Upright Position	Lift here	
Packaging symbol			

## 1. General introduction

### 1.1. Unloading from the vehicle

When the sterilizer arrives, open the package and check if the equipment has damage and the extent of damage. Before the inspection, special attention to its package, and retain the packaging materials.

Please have your attention before unloading:

- Do not stand beneath the lifting equipment.
- Use a qualified lifting equipment.
- Adjust lifting equipment, to identify the center of gravity so that keep the level of hoisting equipment.
- Attention to work safety.

### 1.2. Installation and movement

Installation process, should be under the guidance of the professionals from the professional construction personnel.

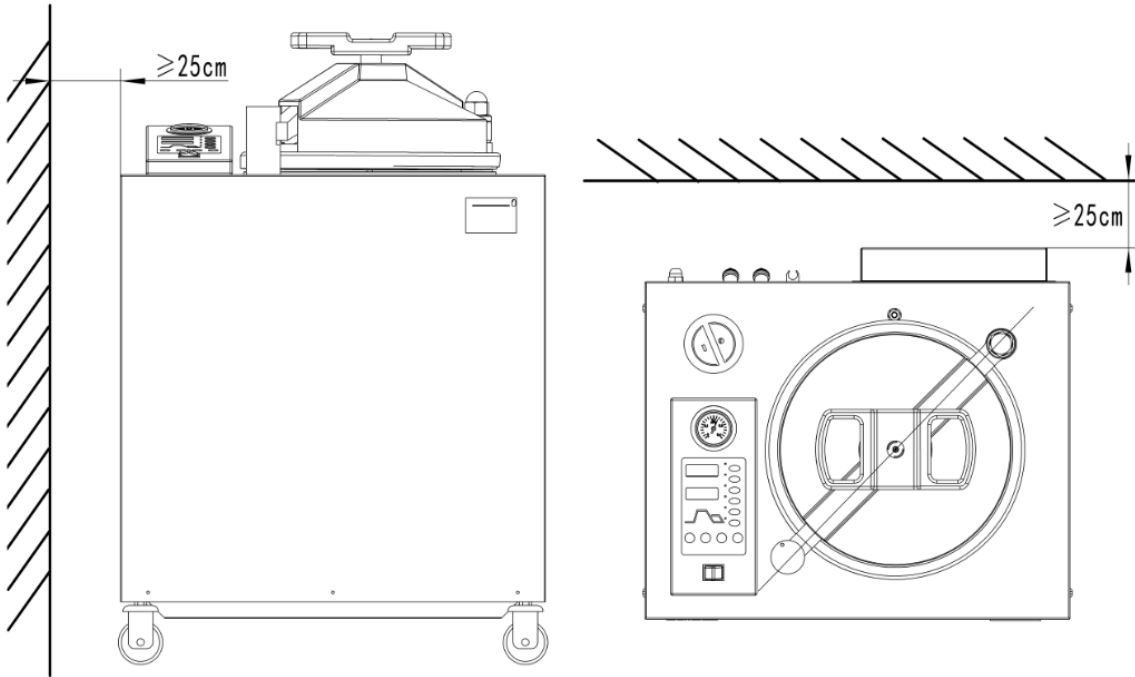
- Do not move the autoclave by pushing the handwheel.
- When moving the autoclave, cut off its power supply, loosen the casters and be careful.
- As the drainage device in the rear, thus avoiding the wall with electrical outlet.
- Installation and movement should be should be carries by multi-people.
- During the move, be careful not to damage or scratch the decorative cover.



Non-standard installation may hamper the operation of equipment!

### 1.3. Site and Location

- Make sure the autoclave placed at ground level and solid place with all its four wheels locked.
- The distance between the back and the wall should be not less than 25cm, in order to ensure proper ventilation.
- If close to the wall too tight, the autoclave may cause internal heat build-up failure.



#### 1.4. Power connection

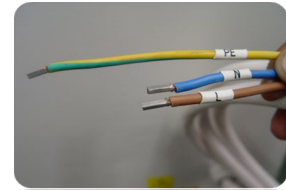
- Be sure to connect the power wiring to a suitable device whose power supply and power cord load capacity should be greater than the rated load.

Suggestions:

Single-phase AC 220V  $\pm$  10% (50HZ), 25A or more.

Three-phase AC 380V  $\pm$  10% (50HZ), 15A or more.

- The autoclave adopts two-phase three-wire or three-phase five-wire system.
- Firing line (L) - brown or black, neutral (N) - blue, earth (PE) – yellow and green.
- The electrical construction work should be carried out by professional personals.
- To ensure personal safety, be sure to lay a ground wire.



For safety, please be grounded the outside cover of the machine!

#### 1.5. Water requirement

The autoclave no need to connect with water, you need to fill water into the water tank or sterilization chamber manually. Recommend that you use soft water or pure water, because the unsuitable water may shorten the service life of the autoclave, resulting in unnecessary trouble. Water quality must meet the following requirements:

- ◆ Conductivity $\leq 15\mu\text{s}/\text{cm}$
- ◆ The content of bleach $\leq 2\text{mg} / \text{l}$
- ◆ PH value 5-7
- ◆ Hardness $\leq 0.02\text{mmol} / \text{l}$

## 1.6. Storage Environment

The autoclave should be stored at a temperature of  $-20\text{ }^{\circ}\text{C}\sim 55\text{ }^{\circ}\text{C}$ , relative humidity less than 80%, non-corrosive gases and well-ventilated room or sheltered places.

## 1.7. Working conditions

- ◆ Ambient temperature  $5\text{ }^{\circ}\text{C}\sim 40\text{ }^{\circ}\text{C}$ .
- ◆ Relative humidity less than 85%.
- ◆ Avoid heavy dust, oil mist, containing conductive particles, corrosive gas, flammable gas environment.
- ◆ Avoid areas subject to shock or vibration.
- ◆ Avoid high temperature and high humidity, or easily get wet places.
- ◆ Avoid strong magnetic fields.

## 2. Basic introduction

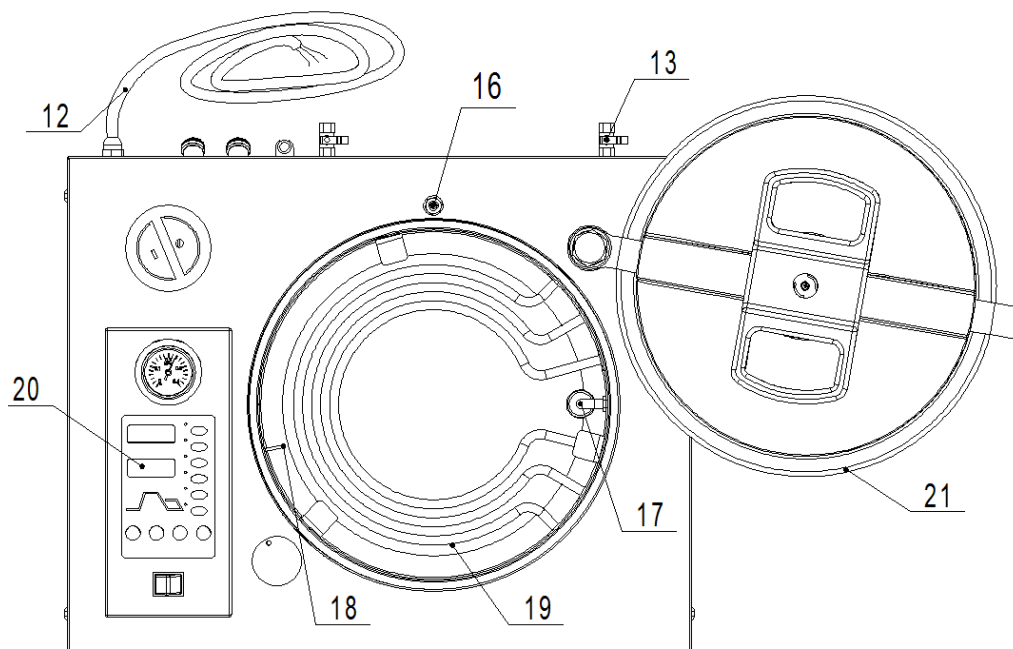
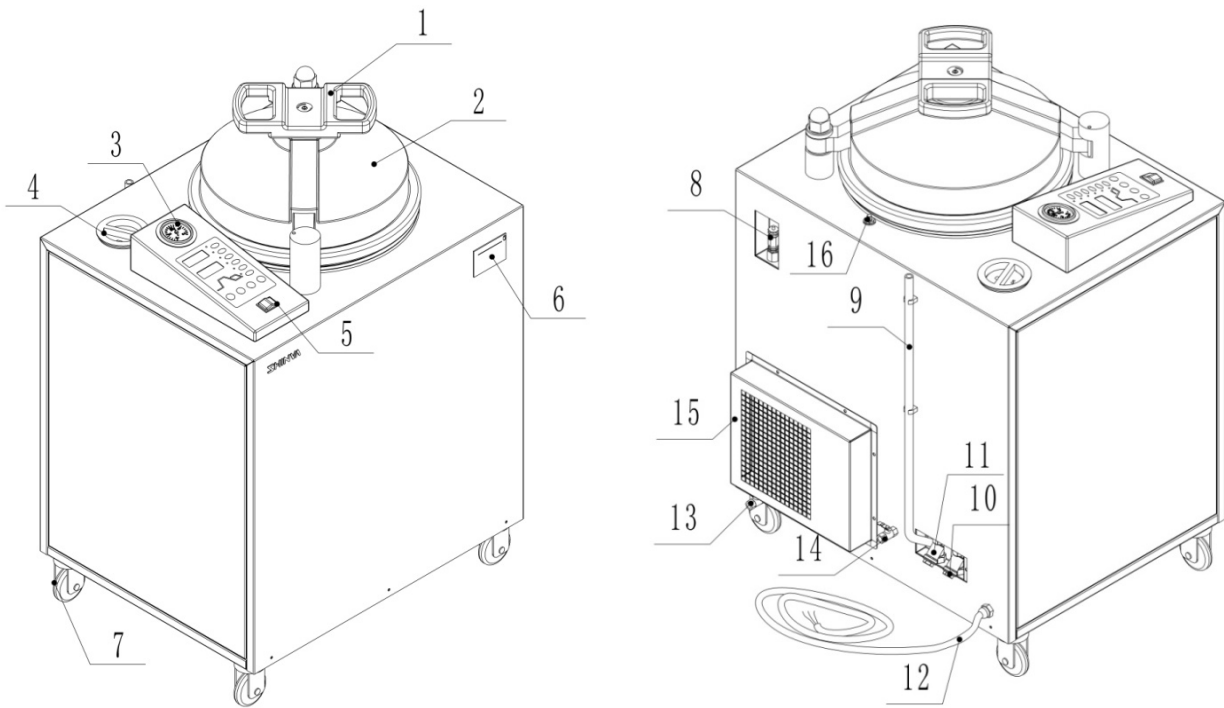
### 2.1. Basic introduction

The autoclave use high temperature and pressure saturated steam generated by electrical heating and through controlling the steam temperature and time to make the protein denaturation and the microbial death, so as to achieve the purpose of sterilization. It has a simple, easy to use, thorough sterilization, beautiful appearance, suitable for medical units, laboratories, laboratory surgical instruments, glassware sterilization, hospital outpatient departments, operating rooms, laboratories and bio-medical research institutes and other departments of the ideal sterilization equipment. The autoclave uses the internal heating with excellent performance.

## 2.2. Technical parameters

Model	LMQ.C-50E	50EJ	LMQ.C-80E	80EJ	LMQ.C-100E
Power supply	Single phase 220V±10% 50HZ				
Total power	5KVA		5.3KVA		
Overall dimension(mm)	W476×L616×H990		W546×L688×H1030		W546×L688×H1195
Weight	70Kg		87Kg		92 Kg
Volume	50L		80L		100L
Chamber size	φ316×D667		φ386×D695		φ316×D860
Chamber material	06Cr19Ni10 Stainless steel				
Sterilization temperature	105°C~138°C				
Melt	60°C~100°C(Special designed)				
Holding temperature	40°C~60°C				
Temperature display	Digital display 0~150°C				
Pressure gauge	Analog display 0~0.4MPa				
Design pressure	0.28MPa				
Time	Sterilization	0~99 Hours			
	holding	0~99 Hours			
Accessories	Stainless steel sterilization basket				

### 2.3. Parts introduction



**Appearance of equipment**

No.	Name	No.	Name
1	Handle wheel	2	Door cover
3	Pressure gauge	4	Water tank
5	Power switch	6	Printer(optional)
7	Universal-joint wheel	8	Safety valve
9	Water indicator tube	10	Water inlet filter
11	Water discharge filter	12	Power line
13	Water drain valve	14	Exhaust ball valve <sup>①</sup>
15	condenser <sup>②</sup>	16	Door switch
17	Water level float	18	Temp. sensor
19	Heat element	20	Control panel
21	Door gasket		

Note:

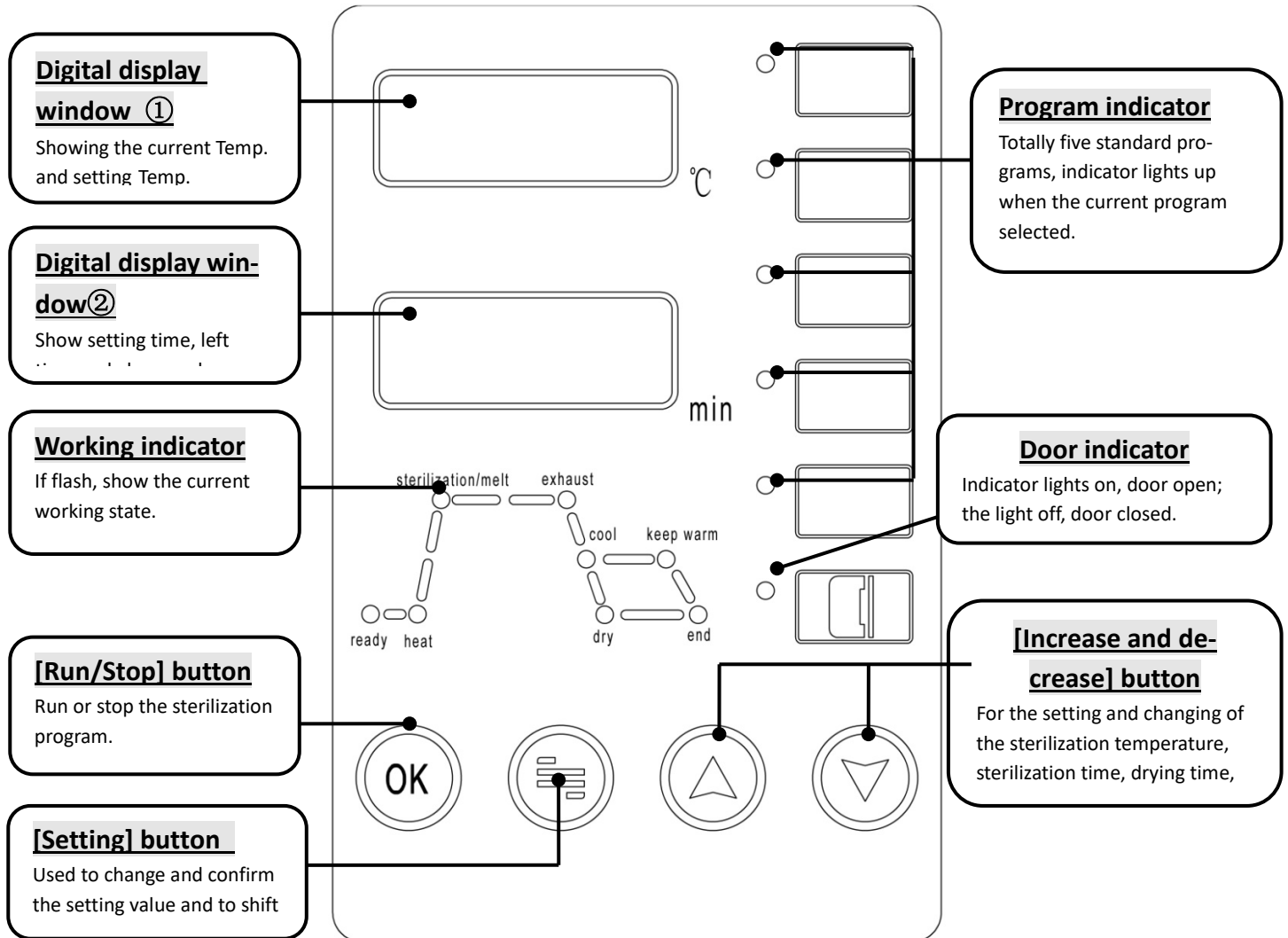
① LMQ.C-50E/80E/100E does not have exhaust ball valve.

② LMQ.C-50EP/80EP has condenser.

Components	FUNCTION
Universal-joint wheel	Support equipment, and make equipment move on the ground smoothly.
Door cover	Cover the door parts to isolate the heat and protect the operator.
Handle wheel	Used for opening or closing the door
Control panel	Operation panel of the autoclave
Power switch	Convenient operation of power on or off
Pressure gauge	When the autoclave running, displays the inside pressure in real time.
Air breaker	If exceed the rated electricity, auto cut off the electric circuit.
Water drain valve	When no pressure in the chamber, discharge the water in the cham-
Safety valve	If exceed the rated pressure, the valve will open to release the chamber pressure for protection.
Water tank	For water storage, collecting steam and condensate water

### 3. Operation panel

#### 3.1. Operation panel



#### 3.2. Meaning of the numbers

Table 1 comparison table

Code	A	b	C	d	E	F	G	H	I	J	K	L	ñ
Meaning	A	B	C	D	E	F	G	H	I	J	K	L	M
Code	n	o	P	q	r	S	t	U	v	y	ü	Y	z
Meaning	N	O	P	Q	R	S	T	U	V	W	X	Y	Z



### 3.3. Standby interface

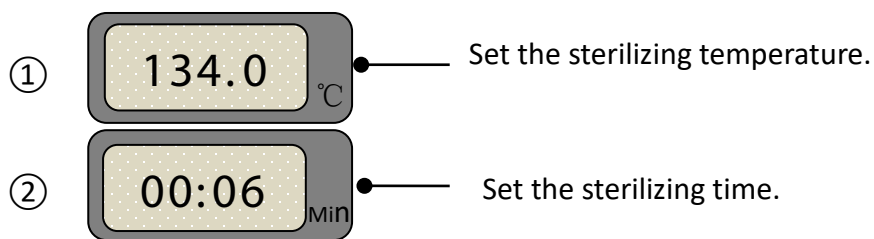
Turn on the power switch, the operation panel initialization, enter [standby] interface, this state is called "standby state"

This screen:

- Digital display window ① Showing the current temperature and setting temperature.  
Digital display window ② Show setting time, left time and alarm code.
- Working indicator lights to show the current sterilization state.

This screen you can perform the following operations:

- Press [Increase and decrease] button to implement five standard sterilization program selection switch;
- Press [Setting] button to enter the setting interface;
- Press and hold the [Setting] button for 3 seconds to enter the [Password Management] screen;
- Press [Run / Stop] button to run the selected sterilization program

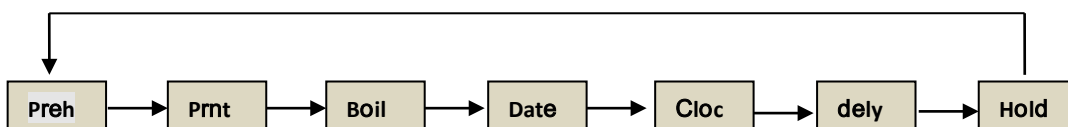


134°C/6min Sterilization parameters

### 3.4. Setting interface

In standby interface, press the [Setting] button to enter the setting interface. This screen can be operated like below:

- Successively press [Setting] button can set the preheated mode, print mode, the boiling temperature, date, clock, holding time and other settings.



- Press [Run / Stop] button to save settings and exit to the standby interface.

### 3.4.1. Preheat mode.

- Digital display window ① display *PREH*, Digital display window ② flashing *OFF/ON*
- This is the switch of the preheat system, off/on.
- Press the [Increase and decrease] button, to release the shift of *ON-OFF-ON*

### 3.4.2. Print mode (If having built-in printer).

- Digital display window ① display *PRNT*, Digital display window ② flashing *OFF/ON*
- This is the switch of the printing system, off/on.
- Press the [Increase and decrease] button, to release the shift of *ON-OFF-ON*

### 3.4.3. Boiling point setting

- Digital display window ① display *boil*, Digital display window ② flashing **0100**
- Make sure that the boiling point set suitable to your altitude, range 80.0 °C -105.0 °C;
- Press the [Increase and decrease] button, to release changing the value.

### 3.4.4. Date and clock

- Digital display window ① display *DATE/CLOC* Digital display window ② flashing **2012/01 01/12:30** Year/Month/Day/Hour: Minute
- Press the [Increase and decrease] button, to release changing the value.

### 3.4.5. Delay mode

- Digital display window ① display *DELY* Digital display window ② flashing **00:00** Hour: Minute
- Preset the start time of sterilization and press [Run/stop] button, the system starts timing. When reaches the setting time, the autoclave will start sterilization automatically. For example **72:00** means the time between timing and sterilization starting is 72 hours.
- **00:00~99:99** adjustable default **00:00**;
- Press the [Increase and decrease] button, to release changing the value.

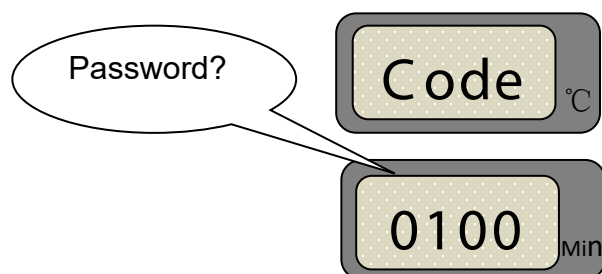
### 3.4.6. Temperature holding time

- Digital display window ① display *hold*, Digital display window ② flashing **72:00** Hour: Minutes
- This the liquid holding time, if time reaches, autoclave will automatically end the program (this function should turned on the temperature holding function, see **[how to achieve temperature holding function]**);  
For example **72:00** means the temperature holding time is 72 hours, **00:01** means the temperature holding time is 1 minutes.
- **00:00~99:99** adjustable default **72:00**
- Press the [Increase and decrease] button, to release changing the value.

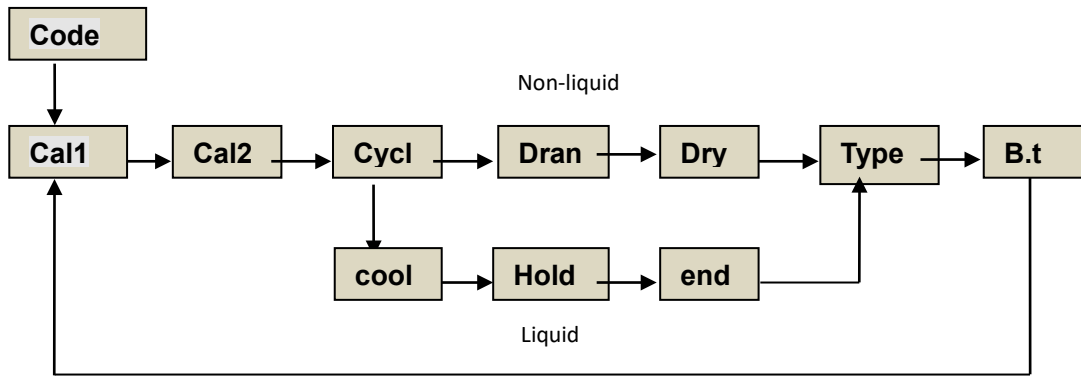
### 3.5. Senior management

In [standby] interface, press and hold [Setting] button for 5 seconds, you can enter the password setting, only enter the correct password **0149** can enter the [senior management] interface:

- Press [Increase and decrease] button to enter the password;
- Enter the password **0200**, the autoclave can recover to the factory settings (see P.19);
- Press [Run / Stop] button to return to the [Standby] interface;
- Press the [Setting] button to confirm your password, input the correct password to enter the [senior management];
- If the password is entered incorrectly consecutive three time, the autoclave will automatically exit and return to the [Standby] interface;



- Each time you press [Setting] button, the set options will flash in turn, as shown below:



### 3.5.1. Calibration 1

- Digital display window ① display **CAL1**, Digital display window ② flashing **00.0**
- Calibrate to compensate for system temperature (sterilization chamber) offset, and correct correspondence between temperature and pressure to ensure the safe operation of sterilization;
- Press [Increase and decrease] button to modify the value, -5.0 ~ 5.0 adjustable;
- It has been corrected when left factory, please don't change it at will.

### 3.5.2. Calibration 2

- Digital display window ① display **CAL2** Digital display window ② flashing **00.0**
- For other temperature offset calibration, this feature is not yet open to the user.

### 3.5.3. Running cycle times

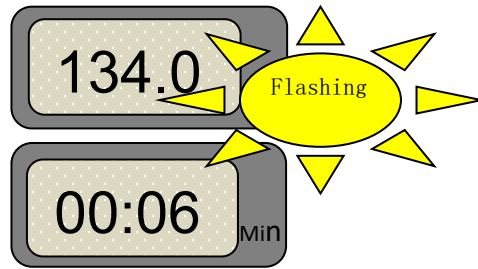
- Digital display window ① display **CYCL**, Digital display window ② flashing **0000**
- Shows the running cycle times of the autoclave;
- Press the [Increase and decrease] button, to release changing the value.

### 3.5.4. Sterilization parameter

#### 1) Temperature

- Digital display window ① flashing **134.0** ( Sterilization Temperature) ;
- Show the sterilization temperature of the current program;

- Parameter 105.0°C~138.0°C adjustable;
- Press the [Increase and decrease] button, to release changing the value.



## 2) Time

- Digital display window ② flashing **00:06**(Sterilization time);
- Show the sterilization time of the current program. (Hour: Minute)
- Press the [Increase and decrease] button, to release changing the value.

### 3.5.5. Water drainage time

- Digital display window ① display **dr AN**, Digital display window ② flashing **00:04**;
- Show the water drainage time of the autoclave; (Hour: Minute)
- Press the [Increase and decrease] button, to release changing the value;
- This is only suitable for non-liquid program.

### 3.5.6. Drying time

- Digital display window ① display **dry**, Digital display window ② flashing **00:02**;
- Show the drying time of the current program; (Hour: Minute)
- Press the [Increase and decrease] button, to release changing the value;
- This is only suitable for non-liquid program.

### 3.5.7. Exhaust temperature

- Digital display window ① display **COOL**, Digital display window ② flashing **05.0**;
- This is the water drainage temperature during liquid natural cooling. When the temperature reaches the boiling point temperature + this value, begins to drain water and exhaust pressure;
- Such as: Pressure exhaust temperature is 05.0, the boiling point temperature is 100.0, it means that the liquid begins to drain when cooling to 105.0 °C

- Parameters 0.0 °C ~ 25.0 °C adjustable, default 5.0 °C;
- Press the [Increase and decrease] button, to release changing the value;
- This is only suitable for liquid program.



Use this function with caution, inappropriate exhaust temperature may cause danger!

### 3.5.8. Holding temperature

- This is the value of the liquid holding temperature. When holding time arrives, autoclave will automatically end the program (this function should turn on temperature holding function, see [how to achieve temperature holding function]);
- Parameters 40.0 °C ~ 60.0 °C adjustable, default 40.0 °C;
- Press the [Increase and decrease] button, to release changing the value;
- This is only suitable for liquid program.

### 3.5.9. Ending temperature

- Digital display window ① display *End*, Digital display window ② flash **080.0**
- This is safe temperature that the liquid natural cooling and prompting ending.
- Parameters 60.0 °C ~ 100.0 °C adjustable, default 80.0 °C;
- Press the [Increase and decrease] button, to release changing the value;
- This is only suitable for liquid program.



Careful to avoid burns

### 3.5.10. Function on/off

- Digital display window ① display **134.0** Sterilization temperature  
Digital display window ② show **00:02** Sterilization time
- The working indicator showing the current stage of the current program keeps flashing;
- Liquid Program - Press ▼[Decrease] button to turn on or off the liquid temperature holding function, [holding] is lit, liquid temperature holding function enabled;
- Non-liquid process - press ▼[Decrease] button to turn on or off the drying function.

### 3.5.11. Type choosing

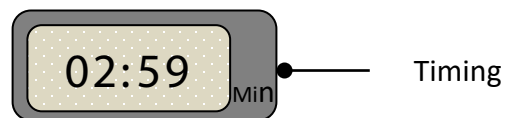
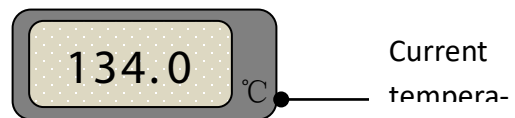
- Digital display window ① shows **TYPE** ;
- This function is not open to the user now.

### 3.5.12. Displacement time

- Digital display window ① shows **bt** Digital display window ② shows **5** minutes
- This the replacement time that temperature reaches the boiling point temperature.
- 0 ~ 9999 seconds adjustable, default 5 minutes;
- Press the [Increase and decrease] button, to release changing the value;
- This is only suitable for liquid program.

### 3.6. Running interface

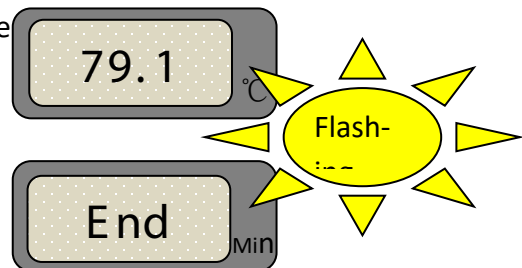
- This means the autoclave is running
- Digital display window ① shows current temperature;
- Digital display window ② shows sterilization/drying elapsed time;
- The working indicator of the current stage flashing.
- The working indicators of the pasted stage lights.



### 3.7. End interface

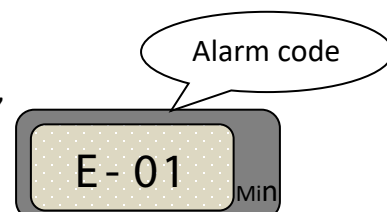
This means the sterilization cycle ends and sterilization completed.

- Digital display window ① shows current temperature
- Digital display window ② flashing **End**
- The end indicator flashes, the alarm buzzer sounds.
- Open the door or press the [Run/stop] button.



### 3.8. Alarm

- It means autoclave malfunction or sterilization failure
- Digital display window ① shows the current temperature, Digital display window ② shows the alarm code;



- Working indicator flashes, the alarm buzzer sounds;
- The sterilization program automatically stopped;
- The relative alarm code information, please refer to [Inspection and maintenance]

#### **4. Operation and Running**

Sterilizer operating procedures include preparation, sterilization items loading, sterilization, sterilization items unloading steps.

##### **4.1. Preparation**

(1) Washing: items before sterilization should be thoroughly cleaned to avoid the presence of blood and other impurities as these residues may harm the sterilized items and sterilizer. Items washed should be dry and timely packaging.

(2) Packing: when packing, please choose a beneficial items inside the air exhaust and steam penetration of packaging materials, strict compliance with the "disinfection technical specifications" and the relevant national standards. Observe the following points may be beneficial to your sterilizing effect:

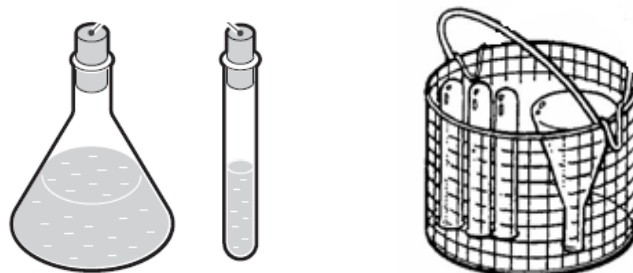
- Plate, pots, bowls and other utensils, try to pack in a single package. When packaging, should open the lid or cap.
- Surgical instruments should be placed in the basket or tray with holes for set packaging.
- Scissors and forceps isometric section of Class I devices should not completely lock; lumen items should be placed coiled maintain luminal patency, precision instruments, sharps should take protective measures.
- The piled up items must be exposed, absorbent cloth, gauze or medical absorbent paper should be used to separate between the containers.
- The containers with mesh should make the opening down or on its side.
- Items should not be tied too tight.
- The sterilization package weight should be not more than 7 kg. Fabric bag weight should not exceed 5 kg. The volume of sterilization bag should not exceed 30cm × 30cm × 25cm.

##### **4.2. Sterilization items loading**

Please load the sterilization items as the following requirements:



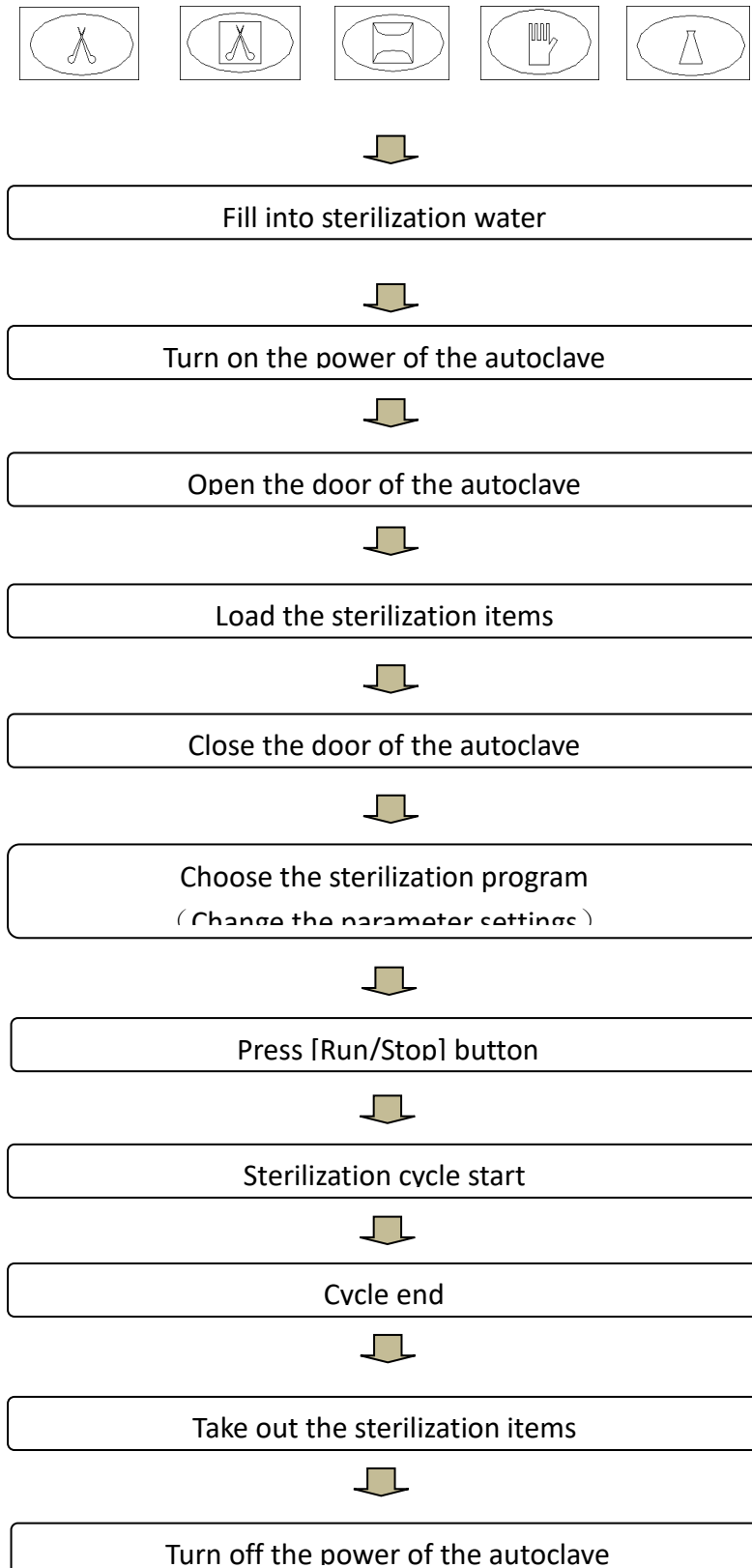
- When loading, the sterilization items should have a certain distance around the up and down and between each other. The items should not abutting doors and walls to prevent inhalation more condensate water.
- Similar materials devices, appliances and items should be placed together sterilization; if the material is not the same, textile items placed in the upper in heel, metal instrument placed in the lower layer.
- Surgical instrument package, rigid containers should be flat placed; pots, bowls items should be diagonal placed, openings in package towards the consistent direction; glass bottles and other containers without holes on the bottom should be placed with openings down.
- Recommend to use appropriate loading racks and baskets to load the sterilization items.
- Sterilization gap should be left between packages, conducive to the penetration of sterilization factor.
- The difficult sterilized large bag should be placed in the upper layer; smaller package should be placed on the lower layer.
- Sterilizer load shall not exceed 80% of volume.
- Liquid should only be loaded by heat-resistant glass bottles and test tubes; loading capacity should not exceed 1/2 of the container, to avoid spills; vessel sealing should be used with a gas-permeable silicone rubber lid stopper or fully release the lids.



- Do not put sterilized items into non steam passing containers, bags for sterilization.
- Do not completely seal sterile goods containers, use a ventilation stopper or fully release the lids.

### 4.3. Sterilization operation

#### 4.3.1. Operation steps



#### 4.3.2. How to open and close the door

- The autoclave is manual door, before open the door, make sure the following situations:  
The autoclave inside is installed safe pressure interlock devices, if the door forced open, the machine will cause malfunction.  
✓ The pressure gauge is 0MPa.
- Please open the door follow the direction identifies on doorknob door; when the door open the door light on the operation panel is off; when close, the door indicator lights.
- Door operation should be light and slow; when open the door, ensure that the door is completely screwed up; when close door, make sure the door is completely and reliable closed.

#### 4.3.3. How to fill the water

- The autoclave is equipped with built-in water tank; please fill the sterilization water into the tank manually. When the autoclave runs, it will automatically fill the water into the sterilization chamber.
- You can also fill the water directly into the sterilization chamber until the water level 15-20mm higher than the heating tube.
- When filling the water, check and close the water drain ball valve.
- Details about sterilization water please refer to **[water requirements]**



Due to the water reducing during sterilization, before operation, check the water level in the tank is necessary.

#### 4.3.4. Turn on the power of the autoclave

- Refer to **[Power Connection]** to connect power supply, dial sterilizer power switch to "I" side to turn on the machine power.
- When powered on, the system automatically balances the pressure in sterilization chamber, into the "standby state" (Within the first three seconds, the digital display window ① Display **CyCL**, indicates sterilizer running times)

#### 4.3.5. Load the sterilization items

- Place the sterilization items into the stainless steel basket, then gently put into the sterilizer chamber.

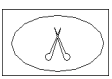
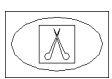
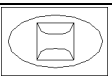
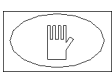
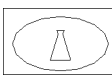


Please do not allow the sterilization items clogging the holes  
and temperature sensor and do not let the temperature

#### 4.3.6. How to choose the sterilization program

Sterilizer offers five kinds of standard programs, which could be chosen according to the load type.

- Under standby state, press the [Increase and decrease] button to shift the program, the selected program indicator will light;
- The program parameter settings can be changed according to the actual situation. Please refer to **[How to change the program parameter settings]**;
- The initial settings of the sterilization programs show in the following table.

Program	Sterilization temperature	Sterilization time	Drying time	Holding temperature	Appropriate loading
	134°C	6 mins	2 mins	—	For the fast sterilization of the surgical instrument, solid naked instrument,
	134°C	8 mins	10 mins	—	For the sterilization of packed instrument, apparatus bags
	134°C	12 mins	18 mins	—	For the sterilization of fabric packages.
	121°C	25 mins	5 mins	—	For the sterilization of rubber
	121°C	30 mins	—	40°C~60°C	For the sterilization of water, culture medium. When reaches exhaust temperature, the exhaust

					valve will open and release the pressure.
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#### 4.3.7. How to change the program parameter settings

- Setting value (sterilization temperature, sterilization time, holding temperature, etc.) can be changed if necessary.
- After the setting values are changed, the original settings will be lost, and the new settings could be saved;
- ① In standby state, press the [Setting] button and hold for 5 seconds to enter [senior management];
- ② Press the [Increase and decrease] button to enter the admin password (0149);

▲▼ increase or decrease 1 in each press; If pressing in long time, you can realize rapid increase and decrease

- ③ Press the [Settings] button to switch to target options;
- ④ Press [Increase and decrease] button to change the settings;
- ⑤ Finally, press [Start / Stop] button to save and exit to the standby state.
- For setting options, please refer **[Senior management]** part.

#### 4.3.8. How to start the program

- Press [Run / Stop] button to automatically start the cycle;
- Non-Liquid programs followed through: preparation, heating, sterilization, exhaust, dry, end stage;
- Liquid program followed through: preparation, heating, sterilization, cooling, end stage;
- Non-Liquid temperature program process may be repeated intervals exhaust which is normal phenomenon.

**Instruction: During sterilization process, the settings value cannot be changed.**

#### 4.3.9. Cycle end

- Cycle end, the buzzer sounds for 30 seconds, the display window shows *End*, on behalf of the run is finished;

- For more information about the end of the state, please refer **[End]** interface.

#### 4.3.10. How to stop the program

- During the program running, press **[Run / Stop]** button for 3 seconds, autoclave will automatically exit the program;
- The ongoing sterilization cycle will be interrupt.
- Alarm appears , the digital display window ② display alarm code E-00, the buzzer alarm;
- Wait steam in the chamber completed exhausted;
- Press **[Run / Stop]** button to confirm the alarm.

#### 4.3.11. Take out the sterilization items

- Confirm the steam in chamber has discharged and pressure gauge indicates zero; open the door and take out the sterilization items.
- Unloading requirements please refer to **[Sterilization items unloading]**.

When taking out the sterilization items, they may be very hot, please wear heat resistant leather gloves to prevent burn!

#### 4.3.12. How to print (Just suit for the machine with built-in printer)

- In standby state, press the **[Setting]** button to enter the **[Setting]** interface;
- Press the **[Setting]** button to switch to **PRNT** option;
- Press **[Increase and decrease]** button to switch **OFF** state to **ON** state;
- Finally, press **[Start / Stop]** button to save and exit the setting;
- Specific information about printing, see **[Setting]** interface.

#### 4.3.13. How to open temperature holding function

- In standby state, press the **[Setting]** button and hold for 5 seconds to enter **[senior management]**;
- Press the **[Setting]** button to switch to **[Function on/off]**option;
- Press the ▼ button, temperature holding indicator flashes, turn on temperature holding function;
- Finally, press **[Start / Stop]** button to save and exit the setting;

- Specific information for temperature holding, refer to **[senior management]**.

#### 4.3.14. How to cancel the alarm

Cancel method of false alarms: Please wait the steam is completed exhausted, press the **[Run / Stop]** button, or turn off the power switch.

#### 4.3.15. How to recover the factory settings

- In standby state, press the **[Setting]** button and hold for 5 seconds, print the system initialization code (0200);
- Press the **[Setting]** button to confirm the password;
- Restart the autoclave.

### 4.4. Sterilization items unloading

- The items after sterilization should wait for the temperature dropped to room temperature, then move saved.
- Check the integrity of the packaging, if damaged, cannot be used as a sterile package.
- Keep sterile and non-sterile items placed in separate articles.
- The items after sterilization, please put in order and in separate classification, and stamped with the dust cover.
- For the bare instrument of rapid sterilization, please use them in 4 hours and cannot be stored.
- After daily work, clear the dirt in the chamber, keeping the autoclave clean.

## 5. Maintenance

To ensure the autoclave is in good working condition, and to minimize the failures, please follow the instruction in this chapter.



Before starting maintenance, make sure the autoclave is powered off and no pressure in chamber.

### 5.1. Each day

- Wipe the door gasket with a soft wet cloth or gauze carefully.
- Take out the basket.
- Wipe the inner wall of the chamber with soft gauze with detergent and water; do not use steel slag wool or steel brushes to avoid damaging the sterilization chamber wall.
- Discharge sterile water.

### 5.2. Each week

- Once a week, wipe the cover of the autoclave with a soft cloth.
- Weekly inspect the record sheets, regular inspections and make records, check the autoclave's operating status (including leakage, water leakage, etc.)

### 5.3. Each month

- Once a month, clean the filters core.
- Clean and remove the scale in sterilization chambers.

### 5.4. Regulation inspection

- Once every six months, test and calibrate pressure gauge.
- Once a year, testing and calibrate the safety valve.
- Once a year, tighten fittings, test the heating device on or off state, it should be completed by a professional electrician.
- Once a year, due to wear and tear, door safety devices must be checked and greased.

## 6. Inspection and repairing

### 6.1. Trouble-shooting sheet

Phenomenon	Reason	Solutions
Power indicator is not bright	Boat-shape switch may broken	Check or replace the boat-shape switch
Temperature increase slowly	Heat element may broken The autoclave may have leakage.	Replace the heat element; Check and stop the leakage.



Can't reach sterilizing temperature	The boiling point setting wrong according the local altitude.	Reset the boiling point setting.
No printing or printing error (Only for the machine with printer)	The printing mode is not turned on.	Open the printing mode Reset DIP switch.
Safety valve open or relief	Pressure in chamber is too high Safety valve error.	Calibrate the temperature departure Correct and replace the safety valve
Door gasket leakage	Door gasket may harden or aging, craze or mottled.	Replace and reinstall the door gasket with a new one.
Digital display window shows 0000	Battery no power.	Recover factory settings

## 6.2. Alarm code

During operation, when an error occurs, the alarm code and alarm buzzer prompt, autoclave will automatically stop running. Please look for the following instructions and take measures as below.

About the alarm canceling method, please refer to **[How to cancel the alarm]**

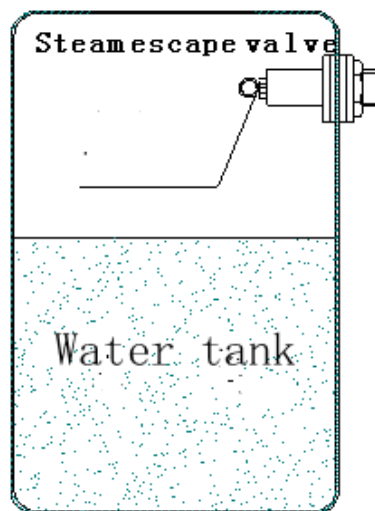
Alarm code	Instruction	Solutions	Page
E-00	Exit by manual	Cancel the alarm	
E-01	Door switch loosening or malposition.	Contact with SHINVA	—
E-02	Dry burning-resistant temperature controller in chamber action		
E-03	Over temperature in chamber	Contact with SHINVA	—
E-04	Temperature sensor in chamber failure		

E-08	Low temperature during sterilizing.	Check if exist leakage	—
E-09	No enough water in water tank Water filling time too long.	Refill the water into water tank Clean the water filling filter	22 32
E-10	Communication failure	Contact with SHINVA	—

### 6.3. Parts inspection

#### 6.3.1. How to clean air escape valve

Position of the air escape valve in the water tank



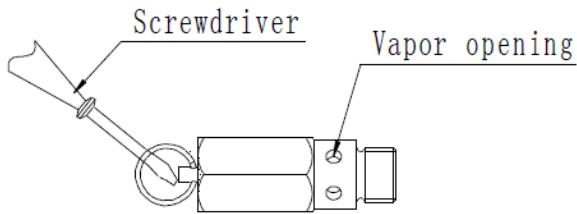
- Open the cap of the water tank
- Pull and push the core of air escape valve forward and backward to flush the air escape valve.

#### 6.3.2. How to check the safety valve

In order to test the safety valve, normally, every month, release the steam through the valve once.

Safety valve located on the top rear of the autoclave.

Pulling ring



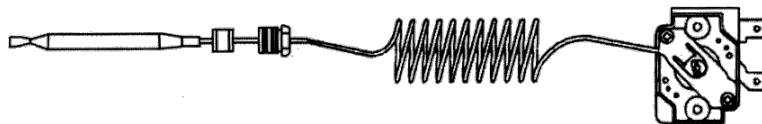
- Run the machine in accordance with manual operation;
- Make the chamber produce 0.21Mpa pressure;
- Use a screwdriver to push safety valve handle, make it is open, about 2 seconds;
- Turn off the main switch, terminate the operation, meanwhile release the steam in chamber;
- Until the pressure drops to 0MPa, open the door.

### 6.3.3. How to replace the safety valve

When the autoclave exists safety valve leakage, indicating that you need to replace the safety valve.

- Removed the safety valve from the valve fixed joint.
- With a new safety valve to replace the old one.
- Test sterilization process.

### 6.3.4. How to replace temperature controller



The autoclave equipped with two types of temperature controller.

Dry heat alarm temperature controller in chamber is fixed on the heater to prevent chamber dry heat. It is used to detect the alarm signals.

Drying control temperature controller fixed on the wall of chamber walls which is used for preheating and drying control.

### 6.3.5. How to replace heat elements

- Turn off the power;
- Remove the outside cover of the autoclave;
- Remove the heat element wirings;
- Loosen the screws of the heat element;
- Replace damaged heat element, make sure it is horizontal installed;
- Rewiring according to the electrical schematics;
- Reinstall the outside cover;
- Test all of the work process.

### 6.3.6. How to replace the door safety interlock system

Door safety interlock system is to prevent the door opening when having pressure in the chamber.

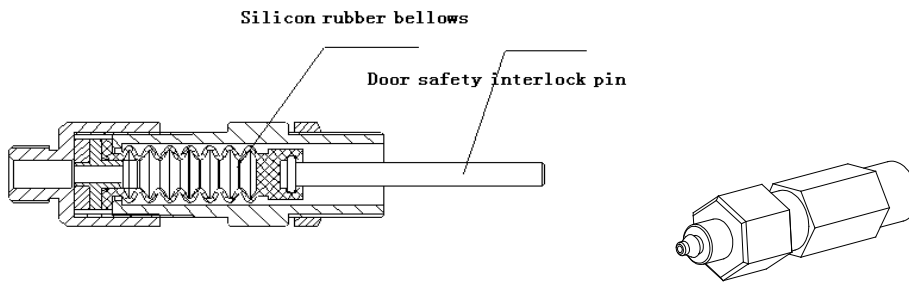
Its working principle is:

The pressure generated in the chamber make the silicon rubber bellows stretching, pushes the pin to lock the door, preventing the door open by maloperating.

When the pressure is released, the safety interlock recovery, door pin loose, you can open the door.



Door safety interlock system

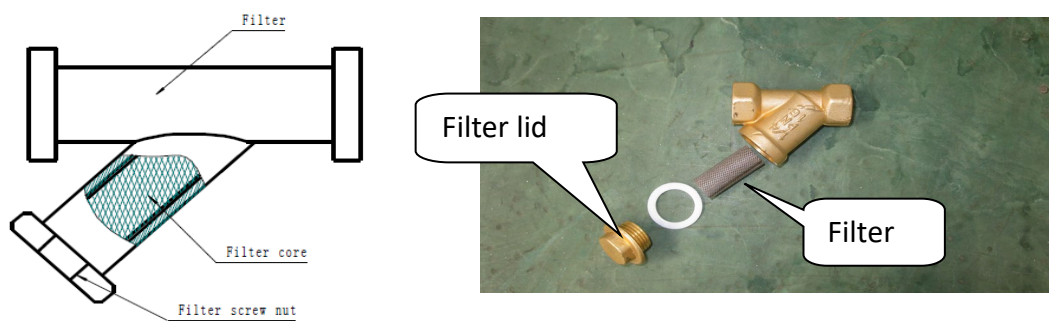


- Remove the screws on the handwheel, take off the hand wheel and the door cover;
- Remove and open the fuse holder;
- Slowly remove the safety pin;
- Replace the damaged parts;
- Reinstall the door safety interlock system;
- Test all sterilization processes.

**6.3.7. How to clean the pipe filter**

The autoclave installed two pipe filters which are separately connect with water filling valve and exhaust valve. They are used to filter out impurities, to ensure the pipe patency and the leakproofness of the solenoid valve.

Once a month, unscrew the filter lid, remove the filter net and clean it.



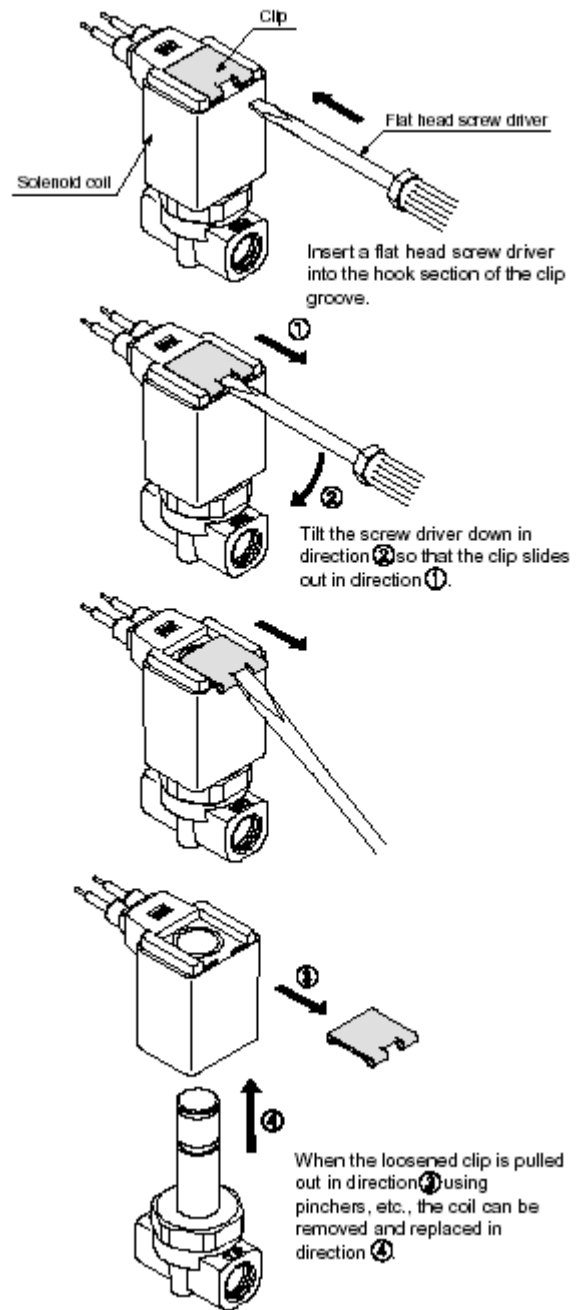
**6.3.8. How to clean the solenoid valve**

- Take off the cover of the autoclave
- Use a screwdriver to poke the stainless steel tableting on the top of the solenoid valve or use a

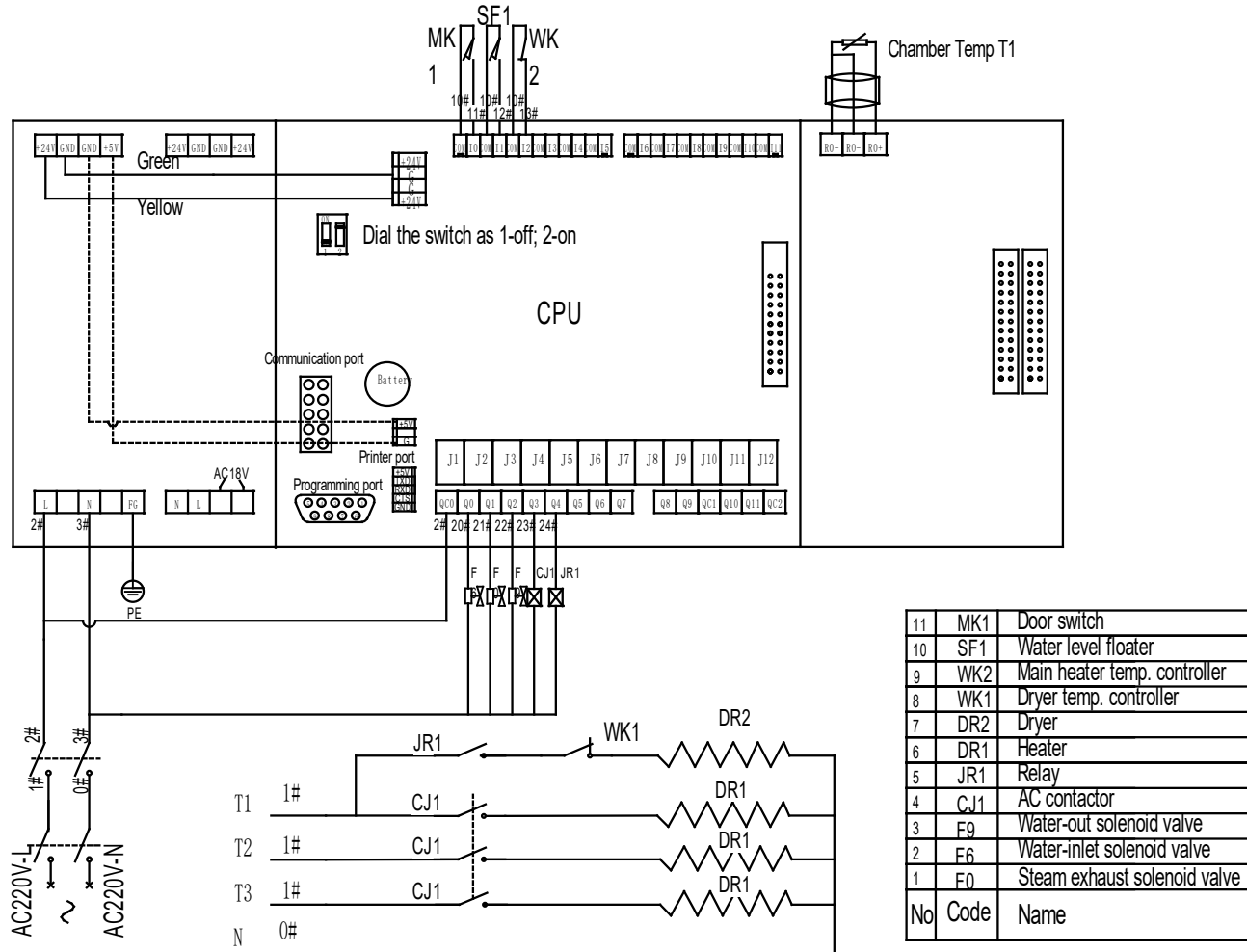
wrench to remove the nut on the coil.

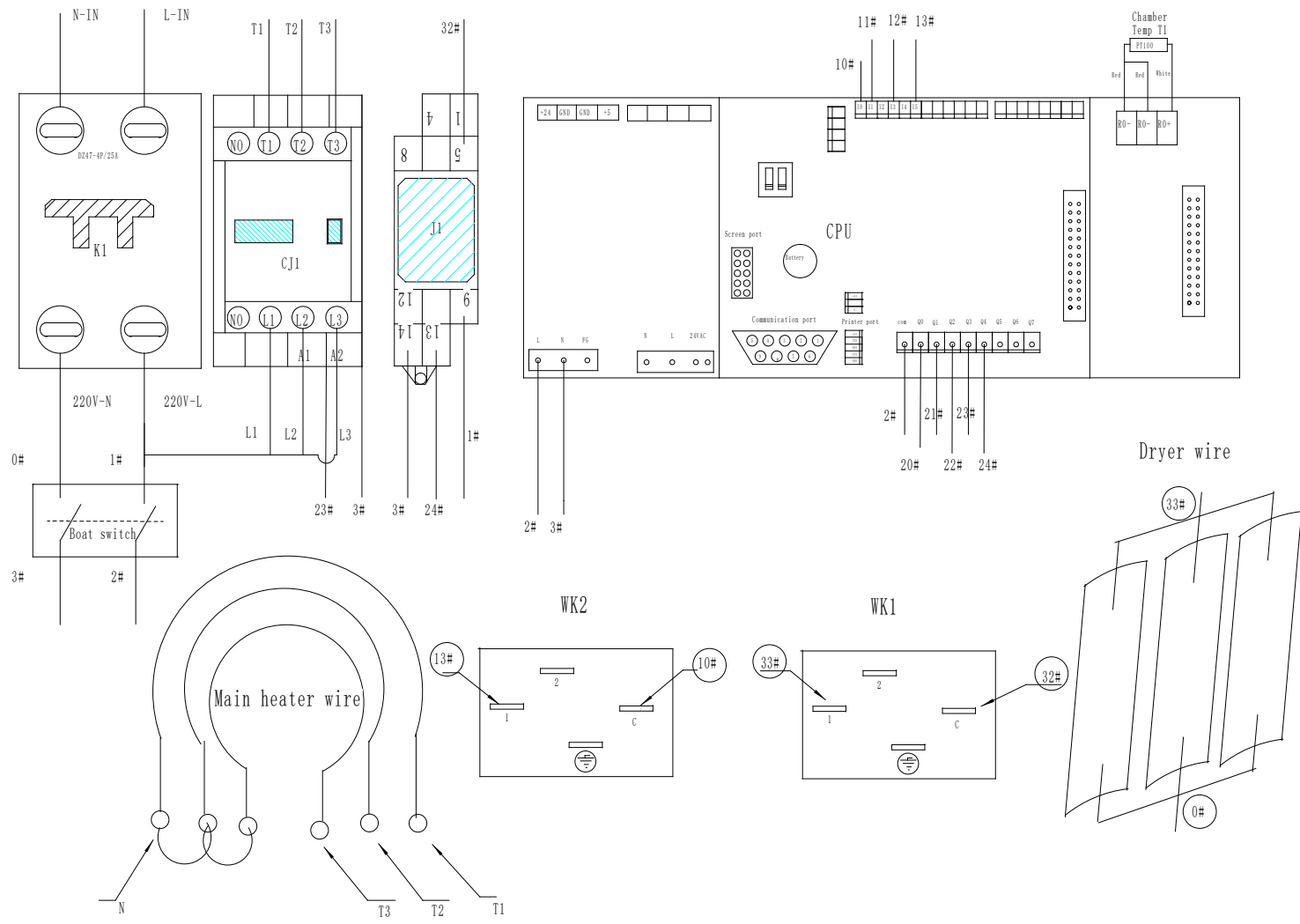
- Lift the coil of the solenoid valve.
- Open the valve with the spanner.
- Flush the dirt on the core of the solenoid valve.
- Reinstall the solenoid valve

Follow the steps in the right side, remove the hex nut with a wrench on the top of the valve and then



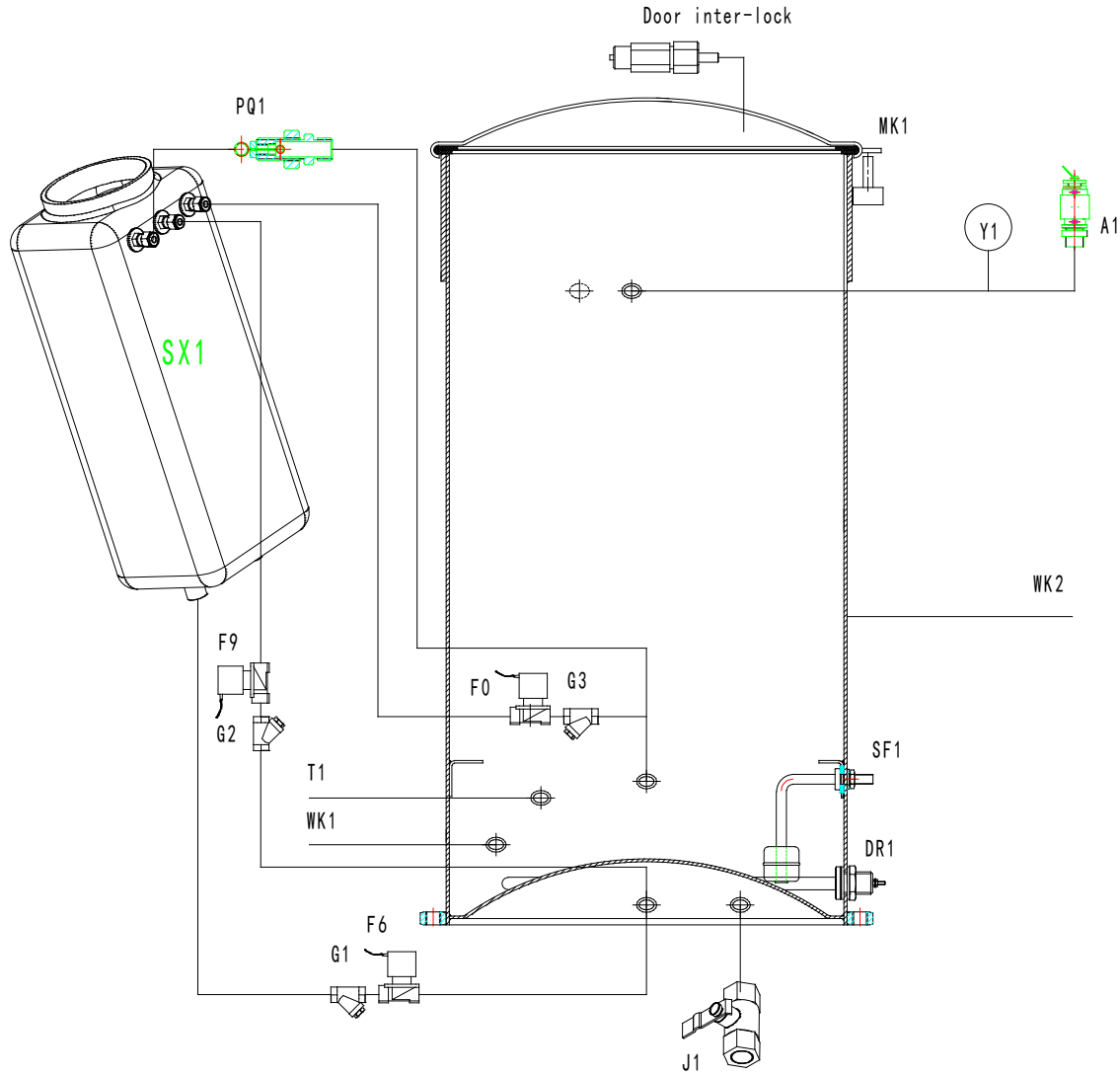
## Appendix 1 Wiring connection drawing







## Appendix 2 PID drawing



Code	Name
F6	Water-in solenoid valve
F9	Water-out solenoid valve
F0	Steam-out solenoid valve
J1	Water-out ball valve
T1	PT100
WK1	Temperature controller
WK2	Chamber wall temperature controller
Y1	Pressure gage
A1	Safety valve
G1	Water-in filter
G2	Water-out filter
G3	Steam-out filter
MK1	Door switch
SF1	Water level floater
PQ1	Steam overflow valve
DR1	Heating tube
SX1	Water tank

