

# Automatic Steam Sterilizer

## Operation Manual



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# Automatic Steam Sterilizer

## 1.General Introduction

Automatic Steam Sterilizer(here in after referred to as sterilizer) is a precision instrument specializing in the operation occasion in need of simple, fast and efficient sterilization by the doctor or his/her assistants. The doctor shall take the responsibility for such work.

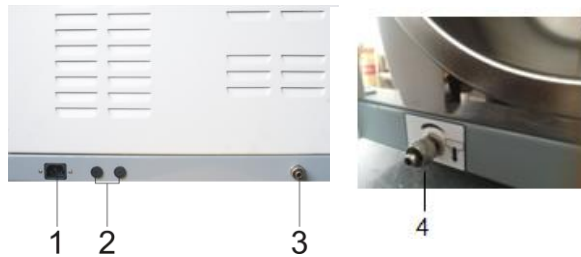
The sterilizer adopts a microprocessor to enable intelligent control, which makes it easy to operate. Fully automated control, dynamic parameters and status display. Automatic fault diagnosis, over-temperature, over-pressure auto-protection to ensure the reliability of sterilization and disinfection.

1、Socket

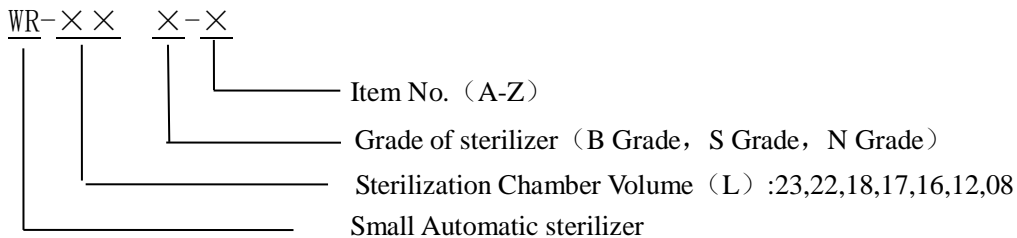
2、Fuse

3、Tank drain

4、Condensate collection tank drain



## ITEM NO. AND SPECIFICATION



## 2.Constructure Feature and Application Scope

- The accessories of Sterilization include: Sterilization Chamber, Door unit, Insulation unit, Pipe system, Safety valve, Control system, Storage tanks, waste water tank, Steam generator and so on
- The vacuum pump pulsates three times creating less residual air in the chamber to ensure better sterilization effect.
- The LCD screen show all sterilization data, which ensure better control of the sterilization process



## 4. Diagram Specification



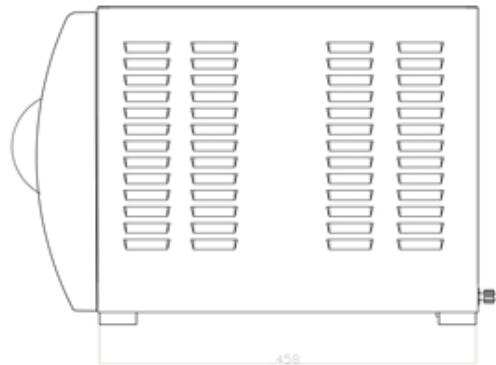
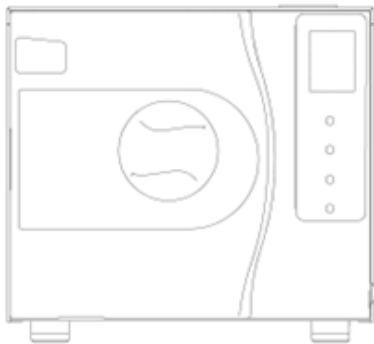
Attention and warning



I Sort B model device



Protective Grounding



## 5. Installation

The clearance between the exterior side surface of the Sterilizer and the ambient neighboring articles shall be 10cm as retained, and the top surface shall be 20cm retained.

The air-cooling window attached to the exterior surface of the autoclave shall be non-clog by dust or articles, and the autoclave shall be located in the proper air flowing environment by recommendation of the supplier.

Sterilizer shall be installed on the horizontal working base.

### PREPARATION BEFORE OPERATION

**Please read this manual carefully before operating.**

- A. Before operation, please connect well to the power source. Connect the power source hole under the back left side of the autoclave and the power socket by the attached power cable inside the product's package so as to switch on the autoclave. Push down the main power button at the right bottom corner of the front side, when the indicator light is on, it means that the autoclave is successfully connected to power, and the process then is in initialization status with "LD" being shown on the screen. The autoclave is not heated while under such initialization status.

## B. Water filling

After turning on the sterilizer, the display panel will display water empty and with buzzer sounds. The user must fill in distilled water from the top water inlet use the complimentary cups and then machine can start (The first usage requires 2000ml distilled water. Fill 1500ml distilled water per time when you notice the water shortage alter in future operations). Meanwhile please drain the waste water in the waste water tank to ensure the normal use of the sterilizer. Otherwise there would be an abnormal sound and effect sterilization effect.



**Notice: Please clean the sterilizer chamber copper filter regularly to avoid the filter blockage and effect the exhaust and drainage. Waste water tank should be cleaned after each drainage.**



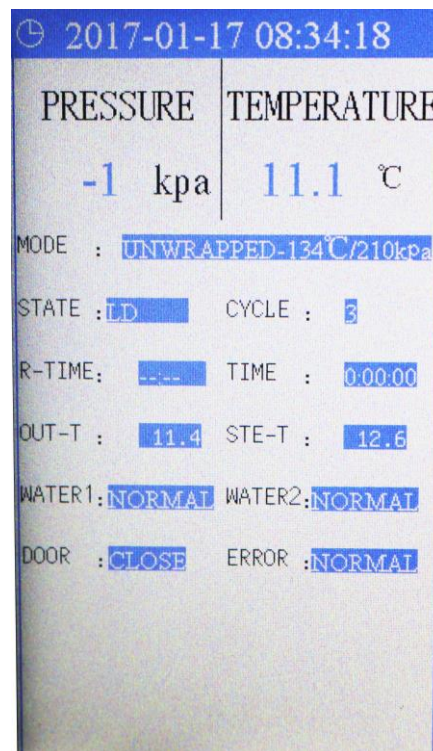
**Notice: The distilled water msut be used to extend the machine life**

- The Sterilizer must get through with the power and hold the indicator light to be in pending status before water filling.
- Maximum volume for one time water filling shall be noted by hearing the “du” sound for reminding water full.
- Please fill the water tank after seeing the water filling indicator on and hearing the alarm, because there is enough water capable for one more working recycle in order to insure the normal and safe operation of the sterilizer. When water indication light turn off, please Close the door the sterilization chamber and begin sterilization

## 6.Control Panel

### A、Menu

- ◆ 1. System time
- ◆ 2. Chamber pressure real-time: KPa
- ◆ 3. Chamber temperature real-time: °C
- ◆ 4. Current operating mode
- ◆ 5. The current work status
- ◆ 6. Machine running total cycle
- ◆ 7. Sterilizer outdoor wall temperature
- ◆ 8. Steam temperature
- ◆ 9. Waste water tank level
- ◆ 10 Distilled water tank level
- ◆ 11 Safety gate status
- ◆ 12 Error Code



## B、Parameter setting menu

### ◆ Operating Model

- 1、Unwrapped metal: 121℃, default Sterilize time 15min, Vacuum: 1 cycle
- 2、Unwrapped metal: 134℃, default Sterilize time 4min, Vacuum: 1 cycle
- 3、Wrapped: 121℃, default Sterilize time:15min,Vacuum:3 cycles
- 4、Wrapped 134℃, default Sterilize time 4min, Vacuum:3 cycles
- 5、Cotton 121℃, default Sterilize time 15min,Vacuum:3cycles
- 6、Plastic 121℃, default Sterilize time 15min,Vacuum:1cycle

### ◆ Sterilization time:

Mode:1、 3、 5、 6 can choose 15minuts to 30minutes

Mode:2、 4 can choose 4 minutes to 20 minutes

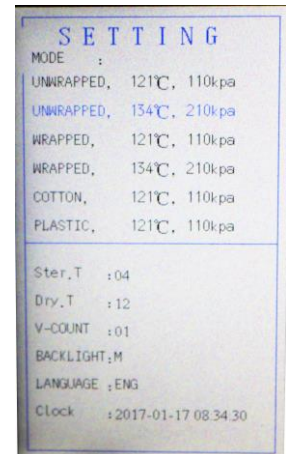
### ◆ Dry Time:Can choose 12 minutes to 30 minutes

### ◆ Vacuum cycle: Can choose 1 cycle to 3 cycles

### ◆ Backlight: Can choose 3 level

### ◆ Language: Can Choose English or Turkish

### ◆ System time: Can be adjusted



## C、 Setup Button

Press this switch to the parameter setting page

## D、 Select button

Choose program selection and adjust sterilization time

## E、 Select Button

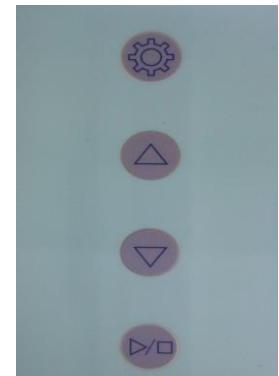
Choose program selection and adjust sterilization time

## F、 Start/Stop/Confirm Button

press this button, the machine starts to work


press this button 5 seconds to exit the operating state

+In the parameter setting, This button used as confirm feature



## 7.Operation

### A. Connect with electric power, Sterilizer now in initial state, the status display

“LD”. Press  to start operation in case no need to set parameter. In

case the parameter should be set ,please follow the steps as below.

### B. Parameter Setting

Press the Setup button to enter the parameter setting. Press select button to choose the operating modes, sterilization time, drying time, vacuum cycle, backlight brightness, language version and time. the corresponding parameters are flashing when selected .

Adjust parameter: press confirmation button when corresponding parameter flashes to adjust the parameter. Press the select button to chose the needed parameter. Press the confirm button to escape the setting when finished, then the program will automatically jump to the next parameter setting, operator can change settings one after another. Press setup button to return to main menu when

all settings are complete.

C. Choose Operating mode, put the sterilization products into sterilizer.


Notice: Individual sterilization product should be placed on instrument tray and can not exceed the maximum weight 2Kgs. Each instrument tray layer maximum load 3Kgs. Total instrument G.W can not exceed 6Kgs. The gap should be left between the instrument to facilitate the flow of vapor. It is recommended that use the supplied hand-held instrument tray rack into sterilization chamber to prevent burns

D. Close the window and turn the handle to the maximum position.



Note: Due to the heat air and vapor inside the autoclave room, it's normal to feel a strong resistance force from the door when you close it. Please heavily close the door

and revolve the handle to the other side or close the door after drying the interior water steam so as to close the door comfortably, or push the door little bit toward the room while revolving the handle as well.

E. Press  to start operating, the initial state is "LD". When "HE" display, it means the sterilizer will start its automatic sterilizing process. During this process, you can enjoy a leisure moment brought by sterilizer automatic function, or you can pay your attention to other work because sterilizer runs automatically during the process of heating, sterilizing and drying, which will spend about 40-70 minutes for the whole process according to different settings.

The time length of the whole process is determined by the total quantity of apparatus inside the sterilizing room, the initial temperature of autoclave and the sterilizing process the user chooses.



Note: If the door is not completely closed, a "LD" is flashing when pressed down "START/STOP" button. Please reclose the door otherwise the autoclave can not start working. If the door is open during the working process, the working status display will flash "E5" as alarm and the autoclave will stop working until restarted again by switching off the power and dismissing the alarm.

F. When status displays "ED" it means the process has finished, accompanied by a buzzer sound. You can open the sterilizer door and remove the sterilized products



Please use the supplied instrument tray holding the instrument tray rack removed from the sterilization chamber to prevent burns.

The status will return to initial status after sterilizer door opened and waits for the next heat sterilization procedures. Before starting a new sterilization procedures, sterilization will have the insulating state.

- G. Please shut off the main power supply when you don't use the autoclave. (The light for power is turned off)



**Warning:** Please don't open the door of autoclave when the pressure high than "6KPa".

During each time's sterilizing process, the supplier recommends to put the special sterilizing paper or bags marked by the sterilizing effect instruction into the room together with the object apparatus for insuring the liability of the sterilization effect.

## 8.Package request

- A. Packaging materials should allow internal air and steam discharged . Daily use aluminum boxes and enamel boxes shall not be permitted to put items to be sterilized, The package should with automatically opening and closing feature or with vented appliances.
- B. Commonly used packaging materials including cotton cloth, disposable non-woven, disposable composite materials (such as paper and plastic packaging), Vented metal or glass containers. Before packing materials should be carefully examined whether the incomplete damaged.
- C. The new cotton should be washed before use; packaging materials and containers for repeated use, should be used again after cleaning each time to avoid affecting the sterilizing effect for permeability.
- D. Plates, pots, bowls and other utensils items should be single package and with the lid open. If under a plurality of packages together, the open mouth of utensils should be in same direction. When utensils storage, there should be absorbent towel or gauze to separate the utensils to facilitate penetration of steam;
- E. Sterilized items must be disassembled in case it can be disassembled, such as when the syringe packaging, the die should be withdrawn. The individual must be exposed surface of the article (such as scissors and forceps must be fully stretched) to facilitate access to all surfaces sterilizing surface. There are mesh container lid should be open, put it as opening down or on its side;
- F. Tying should be loose and not too tight.

## **9. Load Method**

- A. Loading capacity of Pre-vacuum sterilizer should not be 5% (or 10%) to 90% of the chamber volume. Otherwise there will be "small loading effect" and residual air affect the sterilization effect;
- B. Please sterilization for same kind product. In case there are different types products should be sterilization together, The temperature and time should be set as the product which need longest time and highest temperature.
- C. There should be enough gap between products when loaded products to ensure vapor and air flow.
- D. Load difficult sterilization product on top an easily sterilization product on the lower layer. Load metal product on lower layer and fabric products in top layer. items can not be loaded abutment doors and walls to prevent inhaling more condensed water;
- E. Metal packages should be loaded as flat. Plates dishes bowls and so on should be loaded in an upright position. fabrics should be loaded as folded into a vertical position to the horizontal direction. Glass and other openings should be put down or side. These will help d steam into the air discharge;

## **10. Use notice**

- A. After sterilized, The products should be carefully examined and put in suitable location to avoid recontamination
- B. The sterilized products can not be mixed up with non-sterile products
- C. Check the sterilized product package in perfectly status. In case package damaged, product can not be used as s sterile products.
- D. The sterilized product should be used immediately or stored in clean and dry location.
- E. Sterilized product delivery tools should be clean and sterilized every day and keep dry. Tool storage should be clean and avoid contamination

## 11.Mode parameter

code	mode	Temp. (°C)	Pressure (KPa)	Ster. time (min)	Dry time (min)	Highest temp (°C)	Start temp. (°C)	End Temp. (°C)
1	Unwrapped metal	134	210	4-20	12-30	135	Room	90±5
2	Unwrapped metal	121	110	15-30	12-30	122	Room	90±5
3	Wrapped	134	210	4-20	12-30	135	Room	90±5
4	Wrapped	121	110	15-30	12-30	122	Room	90±5
5	Cotton	121	110	15-30	12-30	122	Room	90±5
6	Plastic	121	110	15-30	12-30	122	Room	90±5

## 12.Emergency Condition

During the running time, the autoclave will automatically raise the alarm, release pressure, stop heating and display the warning code(The definition of the warning code is as the below table: malfunction code and resolving method )for ensuring the safety of the operator if the emergencies occur.

Any emergencies happen, please check the warning code table for resolving the according malfunctions. If not possible to resolve, please contact the dealers. We will try our best to provide help to you in short time.

### Malfunction code and resolving measures

Code	display	alarm	Malfunction content	Resolving Measures
0	E0	"du" buzzer	Chamber wall Temperature sensor wrong	Check chamber wall Temperature sensor
1	E1	"du" buzzer	Chamber inside Temperature sensor wrong	Check chamber inside Temperature sensor
2	E2	"du" buzzer	Evaporator temperature sensor error	Check evaporator temperature sensor
3	E3	"du" buzzer	Pressure sensor long or leak	Check pressure sensor long or where is leak
4	E4	"du" buzzer	Maintaining constant pressure value error	Check where is leak
5	E5	"du" buzzer	Door open when operating	Check the door handle is tight enough
6	E6	"du" buzzer	Increased pressure failure	Check where is leak
7	E7	"du" buzzer	Pressure release error	Check the discharge valve and pipeline

### 13.Maintenance and Service

- A. Sterilize the pure water tank by medical disinfectant on time weekly.
- B. Disinfect and clean the interior surface of autoclave room on time monthly.
- C. Replace the core of the melter.
  - a. Shut off the power
  - b. Revolve the fuse base by counter-clockwise by screwdriver to bring out the melting fuse to be replaced;
  - c. Replace the new fuse and reset the fuse base on the original position, then use the screwdriver to fasten the base by clockwise.
  - d. Check the correctness of the parameter of the new fuse replaced.



- D. Clean the sealing ring periodically  
The user shall clean the sealing ring periodically for avoiding the influence to the seal caused by the dust/dirt left due to the long period use. Use the smooth cloth with distilled water to wipe the surface of the sealing ring or sealing cap gently. The user shall discharge the sealing ring for further cleaning or replacement if the air-leaking problem can not be resolved after the above process (The user shall discharge the sealing ring periodically for cleaning and inspection as recommendation by the supplier).
- E. The replacement work for sealing ring  
Tool: One flat screwdriver (No sharp edge at the head)
  - a. One hand catches the lip of the sealing ring, the other hand insert the screwdriver into the clearance between the sealing ring and the door for raise up the sealing ring.
  - b. After raising up part of the ring, you can use hand to draw the whole ring out. Wash its groove after drawing out the ring and pay attention to see whether it's spoiled or not in consideration of the necessity of replacement.
  - c. Put back the ring to the original door groove after cleaning. Most Important: the inset work must be done equably to the groove During the installation, the laid four equal points of the ring must be inserted to the groove firstly, later for the same work for the remaining segments of the ring. After finishing, press the sealing ring equally by the force of hand.
  - d. Note: The inner circle of the ring may be raised up when insert the ring into the groove. Please press it to the groove by using the screwdriver carefully. Shut off the power and cooling the autoclave sufficiently before inserting the ring for avoiding scald.
- F. Shut off the power before service or components' replacement, and the service or replacement work shall be done by the supplier or his designated technician.

## 14. Transportation and Storage

A. The preparatory work before transportation and storage

Shut off the power, draw out the plug and cool the autoclave down.

B. Drainage

Empty the water storing tank and the cooling water collecting tank; The terminal side of the attached pipe with no connecting joint shall be inserted into the water exiting joint pipe. Revolving the water exit button by anticlockwise direction so as to release the water.

C. The autoclave shall be transferred and stored with the below conditions:

Ambiance temperature:  $-40^{\circ}\text{C}$   $-+55^{\circ}\text{C}$

Relative humidity:  $\leq 85\%$

Atmospheric pressure: 500HPA-1060HPA



Note: Don't drag or drop during transportation.

## 15. Attention

1. The autoclave must be placed on the horizontal working base.
2. Must use the distilled water for the purpose of lasting the working life.
3. There shall be no clog to the air cooling window on the outer surface.
4. The object apparatus to be sterilized shall be placed on the device plate with enough clearance retained in favor of the air circulation inside the sterilizing room.
5. Empty the water inside the cooling water collecting tank frequently. Usually, the cooling water collecting tank shall be emptied once the water storing tank emptied.
6. Must revolve the door handle to the terminal side while working.
7. Don't open the door of autoclave when the pressure high than "6KPa".
8. Not be too closed to the door of the autoclave in case of scald when open the door.
9. Shut off the power before discharging/installing the sealing ring, and the work shall be carried out after further sufficient cooling in case of scald.
10. Don't drag or drop the autoclave during relocation period of the autoclave.
11. The protecting ground shall be reliable.
12. Equipment must be used away from the magnetic field.
13. Equipment life end, dealing with to local environmental protection laws and regulations

## APPENDIX

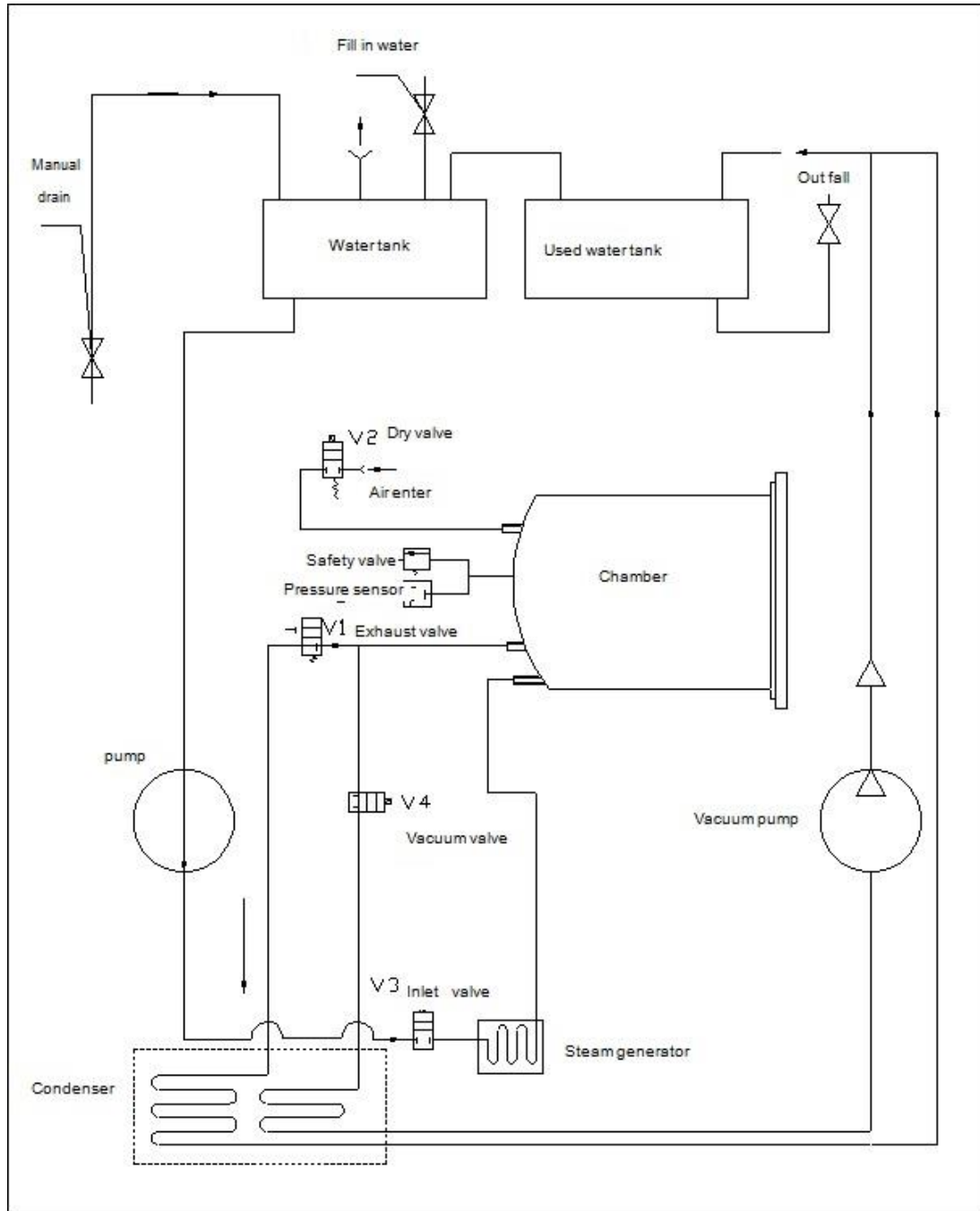
### NO.1 The working status display table:

Code	Display	Status	Status specification
1	LD	Prepare/preheating status	the sterilization readiness work is undertaken by the sterilizer.
2	HEAT	Heating status	the sterilizer is increasing heat and pressure.
3	VACUUM	Vacuumping status	the autoclave is starting the pre-vacuum or triple vacuum.
4	UP	Pressure increase	Sterilizer temperature and pressure increased
5	STER	Sterilizing status	the working time and the count down figure are displayed
6	Dry	Drying status	the autoclave dries on the object apparatus inside the room
7	END	Work over	the process is ended and the door can be opened.
8	Show the malfunction code	Malfunction status	show the malfunction code.

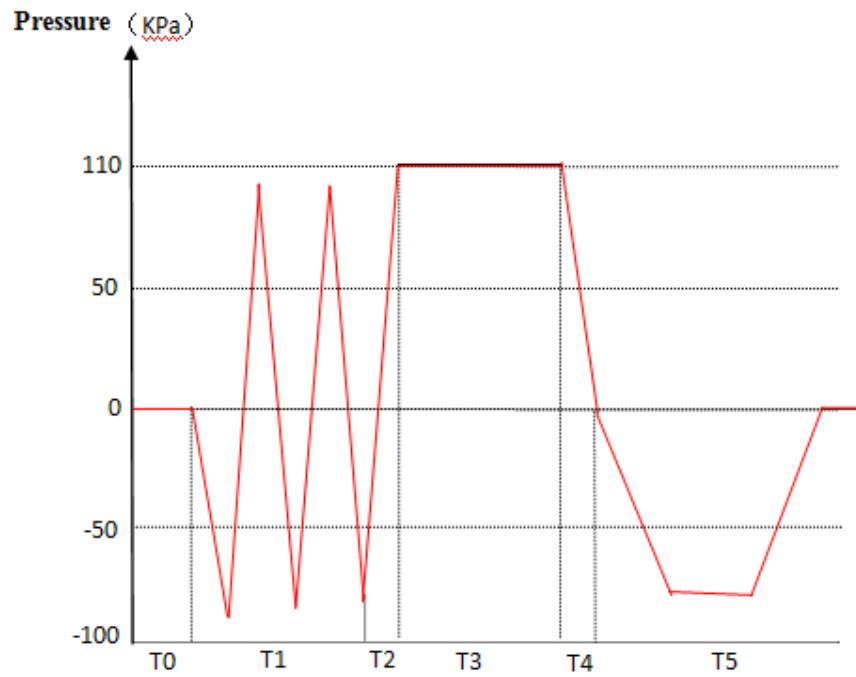
### No. 2 Accessory list

code	Name	qty	Unit	remark
1	Machine	1	pc	
2	Manual	1	pc	
3	Shovel	1	pc	
4	Silicone pipe	1	pc	
5	Measuring cup	1	pc	
6	fuse	2	pcs	
7	Loading frame	1	pc	
8	Sealing ring	1	pc	

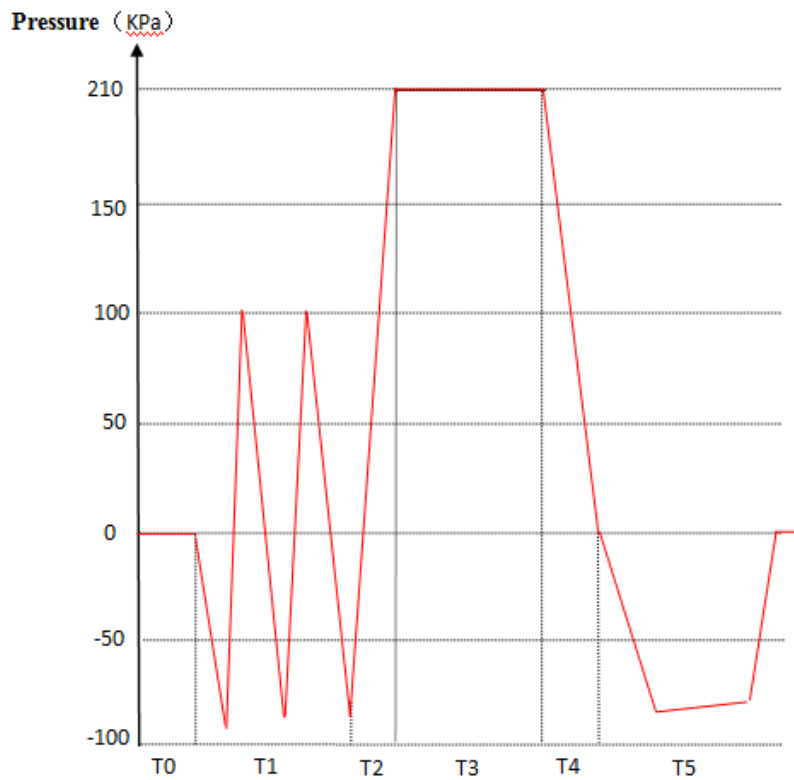
### NO.3 Steam Loop



#### No.4 Workflow graph



121 Degree working temperature



134 Degree working temperature

T0--warm      T1-- Pulsating vacuum      T2--Temperature and pressure increasing)  
 T3-- Sterilization      T4--exhaust      T5-- dry