

Small steam sterilizers

Operation Manual

Technical Manual



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Runyes®

Small Steam Sterilizers Operation Manual (Technical Manual)

Dear End User :

**Welcome to use the high quality sterilizer created by Runyes!
Please fill in the “User Registration” form before using the machine.
With your record in our files, we will be able to trace the file of the machine you bought and provide you with fast and effective services.**

User Registration

On the inscription plate at back of the machine, you can find the unit's model number, serial and reference number. Please double check the number and fill in the form with them, you should quote the reference number when you are in contact with you distributors.

Product name:

Product model:

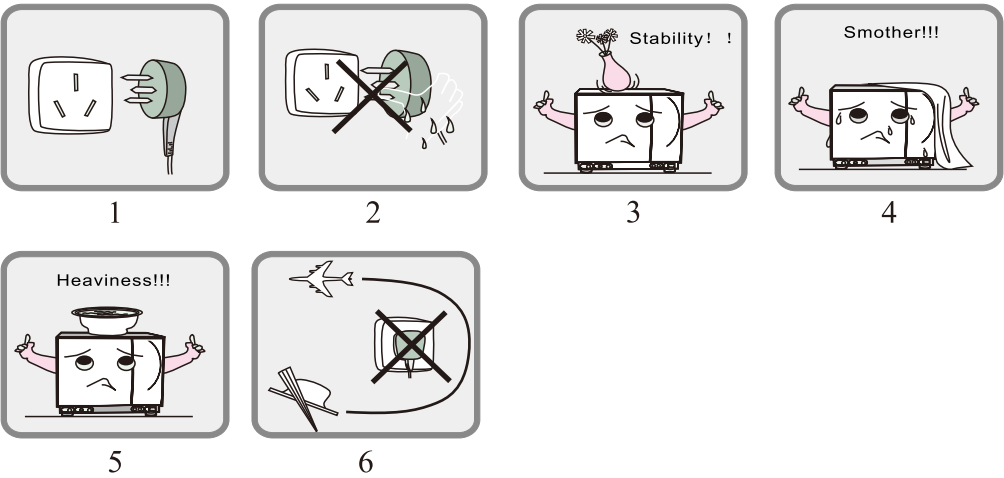
Serial number:

date of manufacture:

Voltage:

- *Before operating the sterilizer, please read carefully all safetycautions and instructions of operation. This operator's manual will help you understand all functions of Runyes Autoclaves as far as possible.
- *Please follow the intructions carefully in this operator's manual while servicing and maintaining the units.
- *Please keep this manual safe for your future references.
- *When error occurs during operation of the machine, please get in touch with your local distributor or us for our best qualified services and assistance.

Important information on Safety



- 1.Please plug the power in a correct voltage (according to nameplate) electrical socket. Don't use electrical outlets unless in the correct voltage; otherwise it might cause fire or electric shock.
- 2.Don't wet your hand before plugging or unplugging the power cord.
- 3.Don't place your sterilizer on an unstable table top, moving desk, tilted or shaking surface
- 4.Don't cover or block the door, ventilation or radiation openings on the sterilizer.
- 5.Don't put heavy stuff or liquid containers that might spill on the top of the machine.
- 6.Please unplug the power cord when the machine will not be used for a long time.

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1 Description & Usage

Runyes design and make pressurized steam autoclaves especially to meet the needs for sterilization of instruments and devices in clinics, departments in hospitals and laboratories.

Runyes sterilizer meets various technical tests, including IEC 61010-1, IEC 61010-2-040, IEC 61326, EN 13060, and also meets 93/42/CEE, 97/23/CEE and 2002/96/CEE directives

Operators include doctors and his/her assistance under doctors supervisions. The autoclave is computerized, user friendly and easy to operate. Its real time display shows all data during the sterilization cycle. The software program provides auto diagnose, protection against over heating or over pressurizing, and thus ensures reliability of the sterilization results. Built - in condenser water collecting system prevents discharge of waste steam and keeps the machine clean and safe.

SEA18、SEA23 Three Times Pre-vacuum Pressurized Small Steam Sterilizers

It uses the advanced technology of 3 times pre -vacuum and vacuum drying. It enables the hot steam to penetrate in thin tube and porous material. This product is suitable for dentistry, ophthalmology, surgical instruments, dressing theatres and laboratories to sterilize dental and other 135°C autoclavable stuffs.



Fig 1-1

2 Specifications

Product Property:

Chamber inner dimensions (Diameter X Depth).....18L:249mm x 355mm
23L:249mm x 450mm

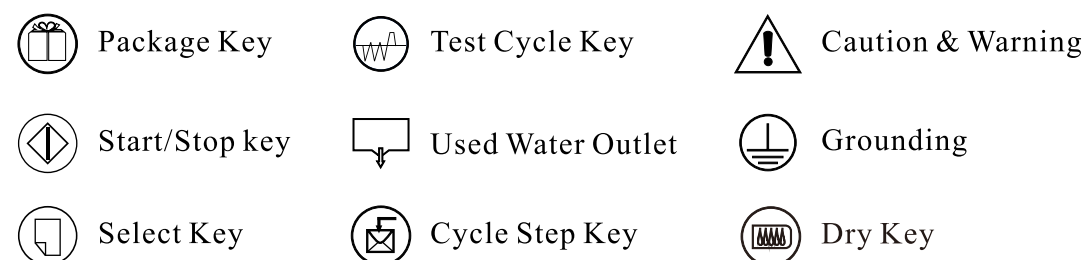
Power supply:According to the nameplate
 Sterilizing temperature /pressure.....121℃/(100~130) Kpa(Under standard atmospheric pressure)
134℃/(210~230) Kpa(Under standard atmospheric pressure)

⚠ Cautions

Note: Temperature/Pressure here means the chamber temperature and pressure during the phase of sterilization. The value varies under different atmospheric pressure.

Power fuse.....F12AL 250V
 Water tank capacity.....3.5L
 Minimum water level.....1.3L
 Environment temperature.....+5℃~+40℃
 Relative Humidity Range.....≤85%
 Micro bacterial filter.....0.3 microns

Figures



Standard Atmospheric Pressure : It is the atmospheric pressure at sea level. Which means 1 Standard atmospheric pressure. The value is 0.1MPa=1000Hpa=100Kpa. Atmospheric pressure decreases by higher altitude. An increase of altitude of 1000 meters will result in a decrease of atmospheric pressure of 10aKpa if under 3 Km.

3 Installation

The Autoclave should be installed in a drafty place allowing minimum of 10 cm space at all sides and 50 cm at the top. The ventilation openings at the side of the machine should not be blocked. The Autoclave should be placed on a leveled counter top. The dimension of machine is shown in the following figure:

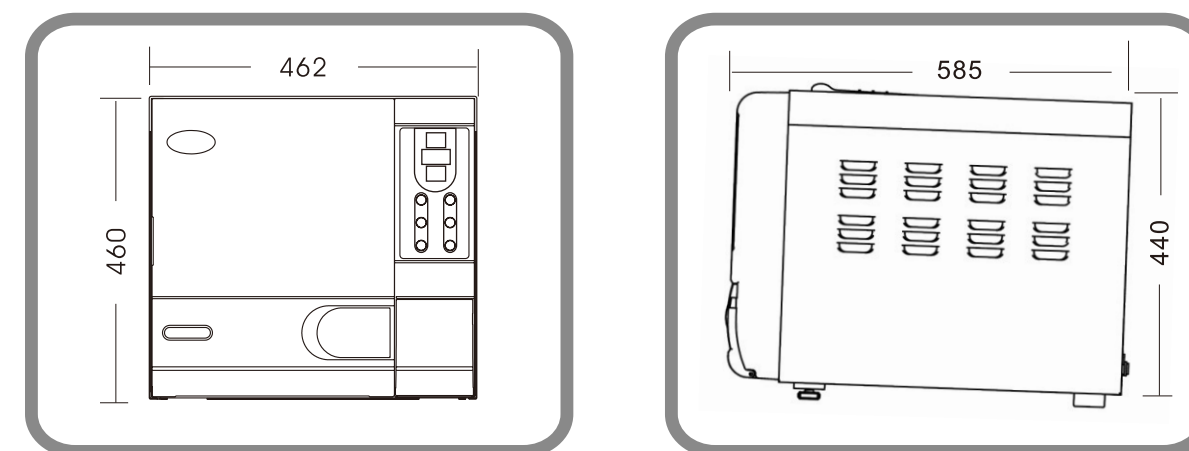


Fig 3-1

⚠ Caution:

If the front of the machine is lower than the back the control will display “E3” (E3 means it does not dry completely)

Preparation before use

We settled the draining filter before the device leaving factory.(See fig 3-3). Water Draining filter needs to be cleaned once per month. For cleaning details, please see page 18:9.3 Water Draining filter cleaning.

Before using the device, you should make electrical connections by using the power cord that comes with the unit. Insert the hollowed end of the power cord in to the inlet of the machine and plug the other end on a power outlet.(See fig 3-5).

If you choose the effluent type steam sterilizer, you need to follow the steps shown below before starting up:

- 1.Put steam sterilizer in place, connect drain pipe to drain outlet. Use steel pipe clamp to fix drain pipe and drain outlet.(see fig 3-5)
- 2.Connect the attached external waste water tank to the drain pipe. Use steel pipe clamp to fix drain pipe.(See fig3-6)
- 3.Put external waste water tank on the floor or hang in place,like wall.
- 4.Installation: fig 3-7.

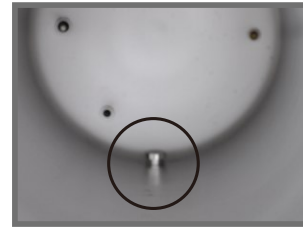


Fig3-3



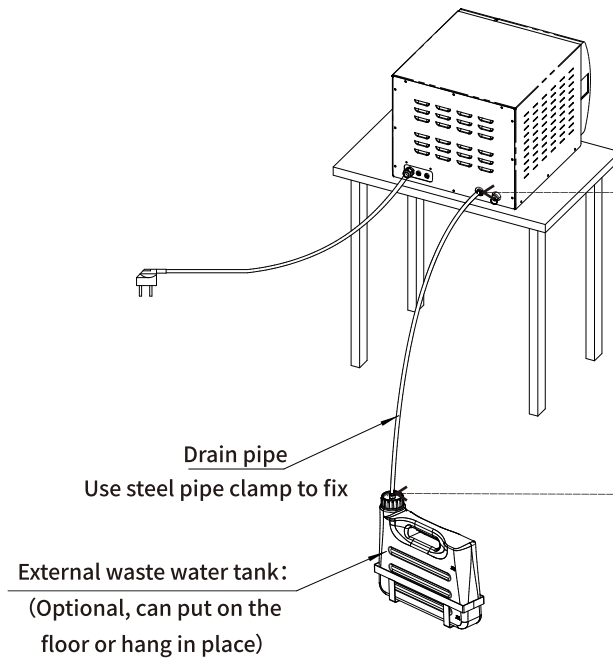
Fig3-4



Fig3-5



Fig3-6



⚠ Caution

The power supply must be able to afford (18L) 1800VA.

Tips: Before starting the Autoclave, please check on the local atmospheric pressure. If the pressure is lower than 0.095 Mpa or the Altitude is higher than 500 meters, you will need to contact your distributor who should reconfigure the controller in the device.

4 Control panel

1. Pressure

It displays actual pressure of chamber, the unit is Kpa

2. Temperature

It displays actual temperature of chamber.

3. State displays/ Error code displays

It displays all the states of cycle (Look at the appendix 1). When it error occurs, it will show the error code, according to error code mode.

Caution: If you have problems, please contact with dealer or manufacture for more details.

4. Select key

Cycle select. Choose different temperature you need according to different things to be sterilized.

5. PACKAGE key

Package select. You can choose package or non package according to the instrument. Non package adopts 3 times pre vacuum, package adopts B class pre vacuum.

6. TEST key

Test key, used to select the testing circle. B&D light goes on if pressed once, meaning B&D cycle is running. LEAK light goes on if pressed again, meaning LEAK cycle is running. Two lights go on at mean time if pressed for 3s, meaning cleaning cycle is running.

7. DRY key

This key selects the fast sterilization cycle. With unwrapped instruments, you may use the fast cycle by pressing the DRY key once, the indication light goes on and it indicates that machine is in fast cycle mode. Using autoclave made by us, you may still use this selection to shorten the cycle time.

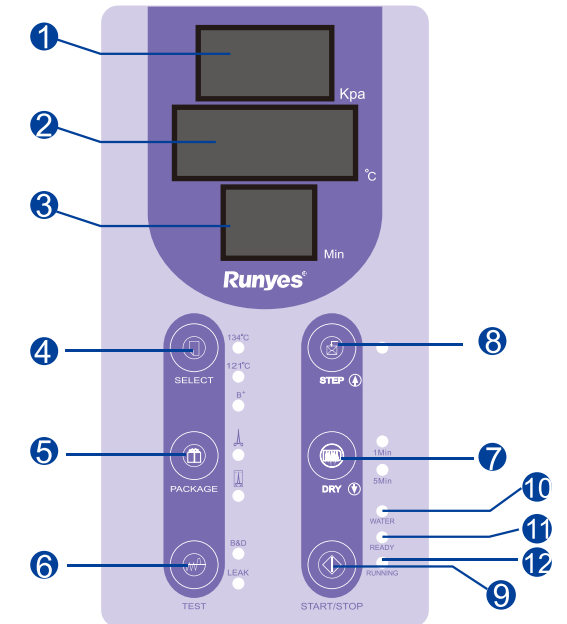


Fig4-1

8、 “STEP” key

This is a post cycle selection key. When a sterilize cycle ends, you can press this key to keep on working or stop working. The indication light goes on, and it means that when the cycle is ends, the heating element will stop before the chamber door is open. When the indication light is off, it means that the chamber will be kept warm after completing a cycle and heating up time is shorter during next cycle. If the user does not start any operation after completing the cycle, the system will enter into last cycle automatically an hour later.

9、 “START/STOP” key

When you choose the right program, push this button then it starts a cycle. Keeping pressing the key 3 seconds before desiccation phase, the cycle of sterilization will be quitted. Then it will enter into 3 minutes dryness. In this program if you press the the key again, the program of dryness will be over at any moment. If you press the key at end of dryness, the cycle will be quitted directly.

10、 “WATER” indication light

When the water level is too low in water tank or too high in used water tank, the light is glinting.

11、 “READY” indication light

When the light goes on, the machine gets ready for sterilization, and the operator can press “start” key to start a cycle.

12、 “RUNNING” indication light

Working light. It means sterilize program is working .

⚠ Caution

In case of faults, please contact your distributor or the manufacture immediately.

5 Operation

Please connect the power cord before you start the operation. Press the main power switch at right lower corner of the front panel. The power switch light turns on indicating that electric power is connected. Then it carries out self-examination process. If there is nothing wrong, LCD will be on the screen, otherwise error code will be displayed.

5.1 Fill water

If the water level is lower than the lowest water level, WATER light will glint with alarm beeps after turning on the power switch and selecting the sterilize program. Then, you need to add water. Please open the water tank and pour water into it by container. Please pay attention to the water level during filling water, you should stop filling when the surface is close to the red water level mark.

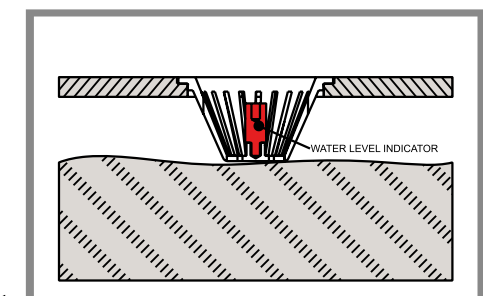


Fig 5-1



1. Use distilled water to prolong the sterilizer's life.
2. Don't tilt the autoclave where there is water in the reservoir.
3. The used water tank should be emptied frequently. You should evacuate the used water reservoir usually when water reservoir is empty.

5.2 Start a cycle

When water indication light is off, the machine can be started.

5.2.1 Press “SELECT” to choose one of the programmes.
The key switches between 121 °C, 134 °C and B⁺ mode.
The indicator light shows the program you chose. (Fig 5-2)

5.2.2 Select instruments package mode according to the instruments you put into the chamber. Press “PACKAGE” to select package mode.

5.2.3 If you have an urgent need for instruments being sterilized, press “DRY” to reduce sterilization time. There are three selections: 1min, 5min and 10 min if you press “DRY”.

5.2.4 After selecting above setup, put the instruments into the Steam Sterilizer
Instruments should be placed in the tray, allowing space for steam to pass through. The tray holder can be used to put the tray with instruments inside the chamber to avoid burns.

5.2.5 After the instruments are loaded, you can close and lock the chamber door by turning the door knob clockwise to it is locking position. (Fig 5-4 5-5 5-6)

Indications:
Door Open : OPEN
Door Close : CLOS



Fig5-4



Fig5-5



Fig5-6

Caution: The door knob must be turned to its lock position, otherwise, there might be steam leak during a cycle and the alarm goes on and displays error code “E6” . If the chamber is in keep warm mode, it is sometimes difficult to close the chamber door because there is still steam inside. You can keep the door open for a while until steam and moisture is vaporized, and the door is easy to close. You may also push the door inwards with some force while turning the door knob to its locking position. If there is still steam leak after you did the above, you may try to read just the door mechanism by a spanner as per item 6. Door adjustments.

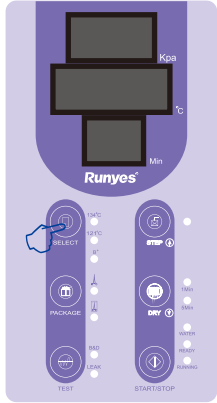


Fig5-2

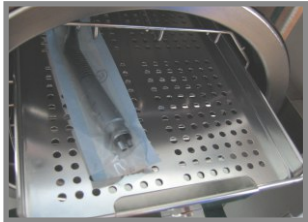


Fig5-3

5.2.6 Press “START/STOP” key, the “ready” light goes off and display “HE” the machine starts a sterilization cycle. It takes about 30-60 minutes to complete an automatic cycle that includes heating up, sterilizing and drying. The cycle time depends on the volume of the instruments loaded, the chamber temperature at the beginning of the cycle and the cycle program you selected.

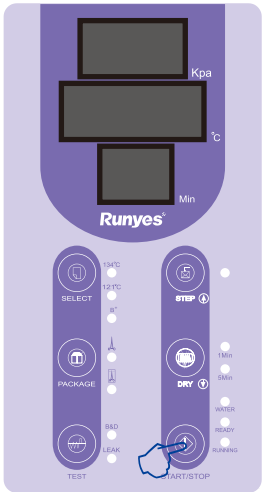


Fig5-7

5.2.7 When a cycle completes, “Ed” is displayed, the light “RUNNING” turns off and the light “READY” turns on with sound. Then you can open the chamber door and take the instruments out (Fig 5-6). At mean time, “prt” is displayed on the temperature screen, which means it is in the process of printing. And it will disappear when printing is over.

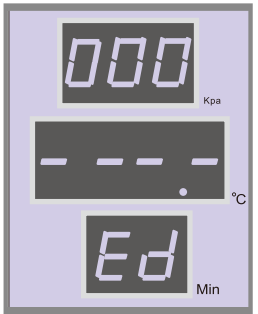


Fig5-8

When low water level alarms, please add some water and don't forget to let condenser water out at the same time.

Use tray holder to load or unload the tray with instruments in it to avoid burning injuries.

Please turn the main power switch off or unplug the power cord if you don't use the machine for a while.

Caution: Never try to open the chamber door if and when the pressure display doesn't show " 0 ". It is suggested that chemical indicator or bio-indicator be used for each and every cycle to ensure the reliability of each sterilization cycle run.

5.4 the instrument rack should be put inside the boiler as the following diagrammatic sketch shows

The first way: (fig1,fig2)

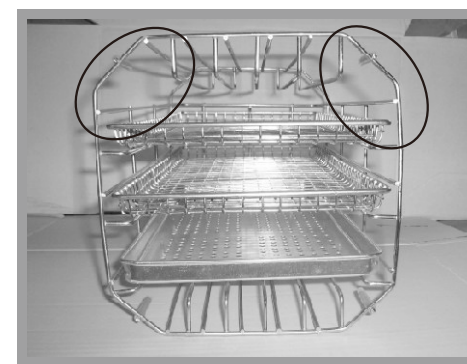


Fig1

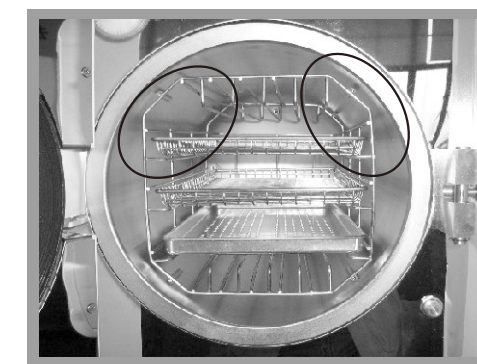


Fig2

The second way: turn the instrument 90° clockwise based on the first way (fig3, fig 4)

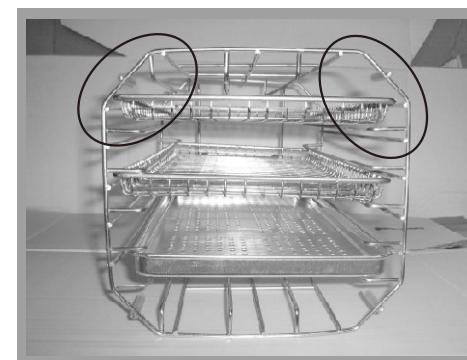


Fig3

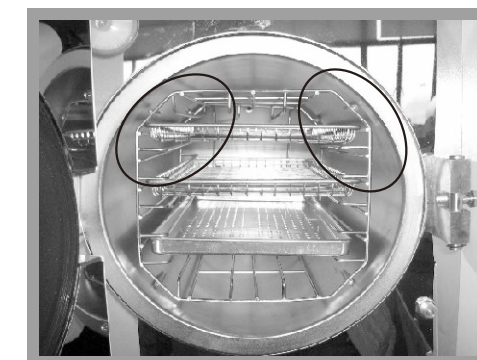


Fig4

notes: the circle stamped angle is up along

6.Door Adjustment

- 1、 Adjust tie rod which is located inside door cover and could be seen from bottom window of door cover.
- 2、 Pull down the tie rod and meanwhile, turn the sealing cover to some angle (not too much). (Fig 6-3)
- 3、 Loose tie rod, then continue to turn sealing cover slightly till tie rod automatically back to lock sealing cover, then adjustment is done.

Caution:
1.Do not make sealing cover too loose, it may cause steam leakage when sterilization.
2.Do not adjust until the sealing door gets chucking.

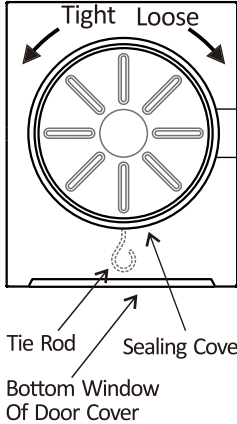


Fig 6-1



Bottom Window
Of Door Cover

Fig 6-2



Tie Rod
Sealing Cover
Bottom Window
Of Door Cover

Fig 6-3

7 Printer Installation and Use(Optional)

Runyes sterilizer can be equipped with an external printer or built-in printer according to customer needs.
Connect the external printer to the lower left side of the sterilizer with the matching printer cable, as shown in Figure 7-1. Turn on the power switch and the two lights on the front panel of the printer are on, indicating that the printer has been installed.
The built-in printing is integrated into the sterilizer operator panel, with no need to connect the printer cable, as shown in Figure 7-2.
After the sterilization cycle is completed, you can set to decide whether it needs to be printed or not. For details, see page 14: 8. Function setting. The built-in printer and the external printer operate in the same way.



Fig7-1



Fig7-2

7.1 Print Information

Date:Date
C.N: Cycle name
C.S.T: Cycle start time
Vp1、 Vp2、 Vp31: Pressure strengthen
Pp1、 Pp2、 Pp31: Vacuum
H.S.T: Sterilization start time
Max、 Min、 Ave: Max. Min and average pressure or temperature of chamber
H.E.T: Sterilization end time
D.S.T: Drying cycle start time
C.E.T: Cycle end time
Result: Result
Operator: Operator, you can sign your name if needed.

Sterilization Records	
Date:	Y11M05D11
Cycle:	00001
C.N.:	134 2.10
-B-SP=	6mDP=10m
C.S.T.:	13:05:30
Vp1:	13:11:27
	0.00 048.9
Pp1:	13:12:57
	-0.81 050.2
Vp2:	13:16:33
	0.29 107.5
Pp2:	13:18:01
	-0.81 072.1
Vp3:	13:20:36
	0.30 112.4
Pp3:	13:22:14
	-0.81 081.4
H.S.T.:	13:27:55
Max:	2.14 134.6
Min:	2.02 134.5
Ave:	2.08 134.5
H.E.T.:	13:34:06
D.S.T.:	13:34:43
	0.30 115.5
C.E.T.:	13:45:32
Result:	Passed
Operator:	
Thanks	

Fig7-3

⚠ Caution

Runyes sterilizer can only be selected with external or built-in printers provided by our company.
External printers can only use thermal paper with a width of 57mm and a maximum diameter of 50mm.
Built-in printer can only use thermal paper with a width of 57mm and a maximum diameter of 40mm.

7.2 USB Module Function

7.2.1 Main function:

Storage of printed data of sterilization
Built-in FLASH memorizer
Download with U-disk

7.2.2 Basic parameters:

Storage Capacity: 2M bytes
Quantity of printed data could be stored: 2048
Support FAT files

7.2.3 Operation instruction:

1. Turn on the power, the mode of USB will start automatically. After self-test, it goes into alert with the indicator flickering-1 time.
2. After the sterilization cycle ends, the data of sterilizer is sent to the USB mode (The printer program should be turned on). Indicator will flicker-1 time after the data-transfer is finish.
3. During the alert, insert U-disk. The mode indicator will be on, with the U-disk indicator flickering. And now, it is in the process of data-download. Don't turn the power off or draw out the USB-disk, which will cause the data loss.
4. After the download ends, USB mode indicator will flicker twice, reminding the user to draw out the U-disk.
5. Don't download data during the sterilization cycle to avoid data loss.
6. Connect U-disk to computer. You will see files like _2000_, where the downloaded data is kept, following turns of Year, Month and Day. Easy to print it out.

8 System Setup

8.1 Enter function setup mode: Press “STEP” key for 5s when on non-work state (time display “Ld”) pressure display “1”, enter function setup mode.

8.2 Function mode setup: With 7 options, press SELECT key, you can select 1-7-1 cycle display. The definition and display of 7 options are as following:

Option 1: year, display “yer”, press “STEP” or “↑” key increase, press “DRY” or “↓” Key decrease, setup numerical value.
Option 2: month, display “nth”, press “STEP” or “↑” key increase, press “DRY” or “↓” Key decrease, setup numerical value.
Option 3: day, display “day”, press “STEP” or “↑” key increase, press “DRY” or “↓” Key decrease, setup numerical value.
Option 4: hour, display “hor”, press “STEP” or “↑” key increase, press “DRY” or “↓” Key decrease, setup numerical value.
Option 5: minute, display “nin”, press “STEP” or “↑” key increase, press “DRY” or “↓” Key decrease, setup numerical value.

Option 6: Printing, it display “Pvt”, press “STEP” key then you can choose the cycle between “on” and “of”. “on” stands for “print”, “of” stands for “no printing”.

Option 7: Exit, when “Eit” displays, please press “START/STOP” to save and exit setup mode.

Option 8: Adjust sterilization time, display “S-T” when you press “SELECT” the sterilization time (SP) will increase at former value. The adjustable ranges are following 3 kinds. One is increased by 1 minute, Second is increased by 2 minutes. Third is increased by 3 minutes.

Option 9: Temperature adjustment setup. D-P is displayed. You can adjust temperature ranging from 2°C to 3°C by pressing “START”. You are suggested to follow the guidance of technician in this step.

Press “SELECT” key after setup, you will come back to option 1. At this time, you must press STEP key 3 seconds in option 7. Then you can start the setup of option 8 and option 9. Otherwise it only can start cycle between option 1 and option 7.

Caution: If some function setup was changed by pressing the key without intention, please switch off the power, then restart it. It will exit from the wrong setup. In this case, the function won't be affected by this.

9. Repair & Maintenance

9.1 Water Tank Cleaning

9.1.1 Please clean the sterilizer water tank and waste water tank regularly. The process is following:

- 1) Empty water in tanks. Refer to item 9.2 for draining the water.
- 2) Open the tank cover board, you can use screw driver to loosen the five screws just as fig9-1 indication.
- 3) Pull up the water tank cover board by one hand, just, as fig9-2 indicates .
- 4) Pull up the tank cover completely and you can disassemble the tank cover. As fig9-3 indicates .
- 5) Now you can start to clean the tank, use cotton to dip in some alcohol or medical disinfectant to scour the tank wall, wash it by distilled water, then empty the tank and dry the tank. After it you should take out the filter net and clean it.
- 6) After cleaning the tank, assemble the tank cover and tighten the screws.

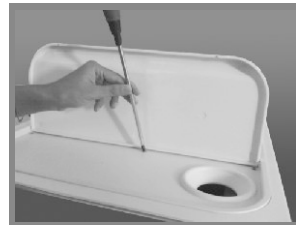


Fig9-1

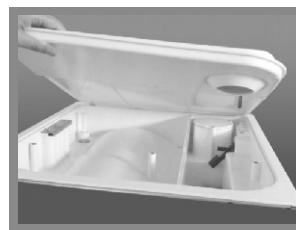


Fig9-2



Fig9-3

9.2 Drain of water from the condenser water collector and water reservoir.

Connect the water outlet using the one end of the tube without a connector and the other end of the tube to a drainage sink. Then turn the draining knob anti- clock wise to drain the water from the machine.(Fig 9-4)



Fig 9-4

⚠ Caution

- *Turn off the power and cool it down before any kind of maintenance.
- *Use only distilled water for sterilizing and cleaning.
- *The instruments being sterilized must be cleaned. Instruments with oil or impurities must be packed in a sterilization bag.

9.3 Cleaning Chamber Water Filter

After the machine used for a while, there may be some tiny impurity blocking the chamber water filter, which will affect sterilizer performance. To prolong the lifetime of chamber water filter, back-out the water filter, take out the filter net, and clean it by soft brush every month.



1. Chamber water filter



2. Back-out the water filter



3. Take out the filter net, clean it by soft brush or replace a new one.

9.4 Change Fuse



Fig9-5

1. Unplug the autoclave before changing the fuse
2. Unscrew the fuse holder with a screw driver counter clockwise.
3. After screwing the fuse holder, pull the fuse out.
4. Make sure to replace the faulty fuse with a correct fuse.
5. Put the correct fuse back to the fuse holder, plug into the holder lightly.
6. Put back the fuse holder and screw it on clockwise with a screw driver, make sure it will not pop-up.

9.5. Clean the Seal Plate Periodically.

After using some time , the seal plate might have some scale build-up that might cause leaking. You should clean the seal plate periodically, using a soft cloth soaked with distilled water to wipe the rubber seal and the seal plate clean (Fig 9-7 & 9-8). If there is still leaking, you may need to take the rubber seal out for cleaning. Should the seal be broken, you need to change a new one.



Fig 9-6



Fig 9-7

Remark: providing with seal packing collar for life.

9.6 Change the Seal

You will need a flat screw driver without a sharp tip. Pay attention to the head of the flat screw driver. The install step according to Fig 9-9.



Fig 9-9

- 1). Hold the edge of the seal with one hand and insert the screw driver beneath the seal with your other hand and then pull out the seal slowly.
- 2). Once a section of the seal is out, you may pull the whole seal out slowly with both of your hands. You can now clean the seal groove and the seal. If the seal is broken or damaged, you must replace it with a new one.
- 3). After the groove and the seal are cleaned, you may remount the seal back in place
Caution: The seal should be mounted evenly inside the groove with first 4 positioning points in place. You may use your hand to press the seal in place evenly.
- 4). Attention: When inserting the seal, the inner edge might evaginate. You may use a screw driver to press the edge down in the groove.



Caution: Power the machine off and let it cool down before you change the seal and avoid any burning injuries.

9.7 Steam Generator Cleaning

9.7.1 Aim: Clean the steam generator and steam pipe, to avoid the incrustant block the pipe.

9.7.2 Description: 20 min cleaning + 10 min drying

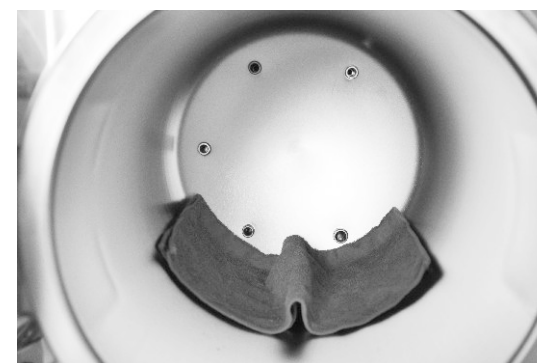
9.7.3 Purpose: to clean the steam generator incrustant, take it out of the machine through pre vacuum.

9.7.4 Operation: when the machine is in standby, press SELECT for 5 seconds, the B&D light and LEAK light will go on at mean time, meaning you chose the cleaning cycle. Close the door and press START, it will start to clean.

9.7.5 Cleaning remind: B&D light and LEAK light will glitter at the mean time after 100 cycles to remind you to clean the steam generator.

9.7.6 Please keep regular cleaning of steam generator to prolong the service life of the steam generator.

9.7.7 Before executing clean steam generator program, we suggest to mat a wet towel on the bottom of the chamber (As shown in below picture), prevent excessive impurities adsorption on the draining filter, which may influence pre-vacuum and dry effect.



Friendly Reminder: Cleaning reminder function will not affect the autoclave cycle.

9.8 If the machine needs to be maintained or the electric spare parts needs to be changed, please cut off the power first. And ask your dealer or manufacturer to change it.

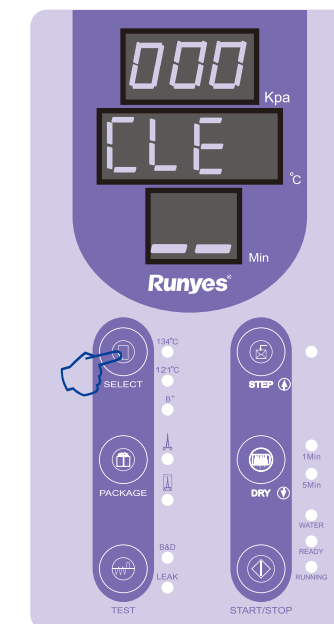


Fig9-8

10 Transport & Storage

10.1 Preparation for transportation and storage.Power the machine off, unplug the power cord and let the chamber cool down.

10.2 The autoclave should be transported and stored in the follow conditions:

Temperature: -40 ~ +55℃

Humidity: ≤ 85%

Atmospheric pressure: 500hPa~1060hPa

Caution: Don't drag the machine while moving.

11 Warranty

Sterilizer is under warranty for two years and the following are not covered by the warranty.

11.1 Damage due to improper moving, installing and operating the machine;

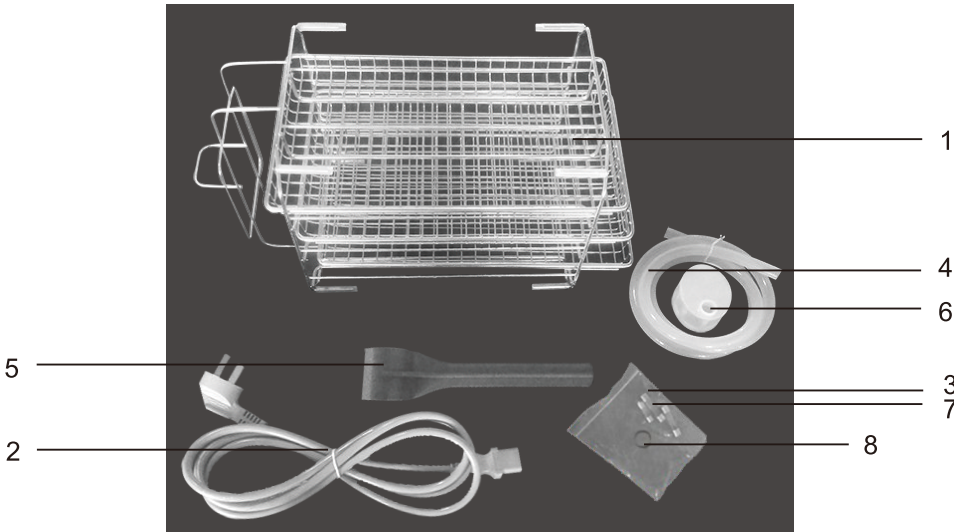
11.2 Damage due to dismantling the machine by unauthorized personal;

11.3 Don't have guarantee of end user.

11.4 Inappropriate operation on the machine without following the operator's manual

11.5 Damage caused by power surge, fire or other external matters.

12 Accessories



- | | |
|---|---|
| 1). Tray rack, trays(3 piece) 1set | 6). Water filter in water tank 1 piece |
| 2). Power cord 1 piece | 7). Fuse ((F12AL 250V) 2 pieces |
| 3). Fuse for main board(F3AL 250V)1 piece | 8). Chamber water filter 1 piece |
| 4). Draining pipe 1 piece | 9).Output waste water tank (Option for draining waste water outside type)-----One set |
| 5). Tray holder 1 piece | 10).Steel wire hoop (Option for draining waste water outside type)-----Two sets |

Note

1. The picture of spare parts in the attachment may be a little different to the parts supplied. Runyes keeps the right of changeing the accessories. Please check the spare parts supplied with autoclave.
2. Please contact with professional recycle company to dispose the obsolete devices and do not discard them casually.

13 Appendix

Form 1 Work mode chart

	134 °C package	134 °C non package	121 °C package	121 °C non package	134B+	BD test	Vacuum test cycle	CLEAN test
Sterilizing temperature	134	134	121	121	134	134	—	—
Sterilizing pressure	2.10	2.10	1.10	1.10	2.10	2.10	—	—
Classes	B	S	B	S	B	B	—	—
Pre-heating min	0-7	0-7	0-7	0-7	0-7	0-7	—	—
Vaccumize time min	10	4	10	4	10	10	4	Clean 20
Admission time min	5	5	5	5	5	5	—	Drying
Sterilizing time min	6	4	20	16	18	3.5	Keep pressure 10	—
Drying time min	10	10	10	10	10	1	—	10
Quick drying time	1/5	1/5	1/5	1/5	1/5	—	—	—
Total time min	38(29/33)	30(21/25)	52(43/47)	42(33/37)	50(41/45)	26.5	14	30

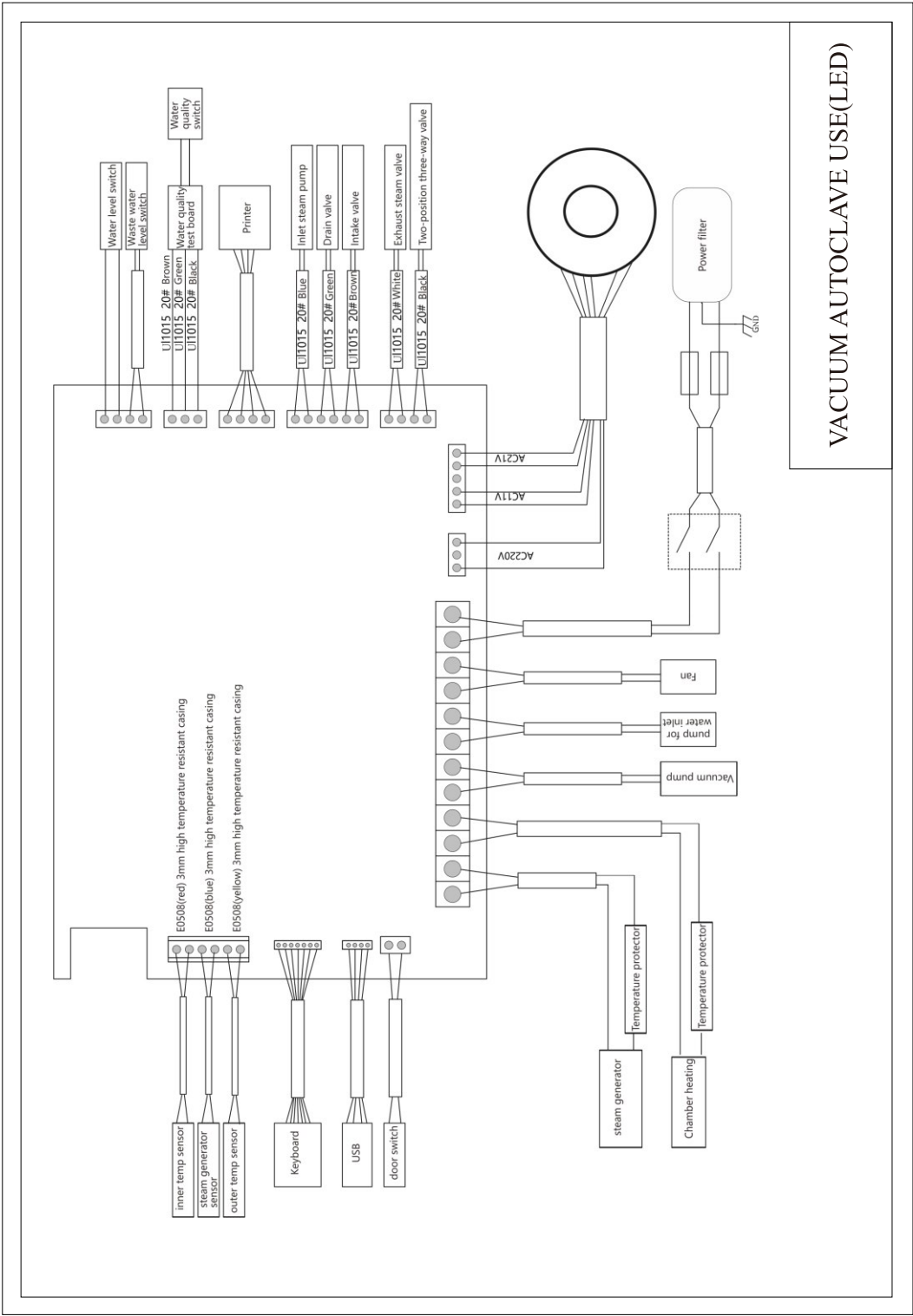
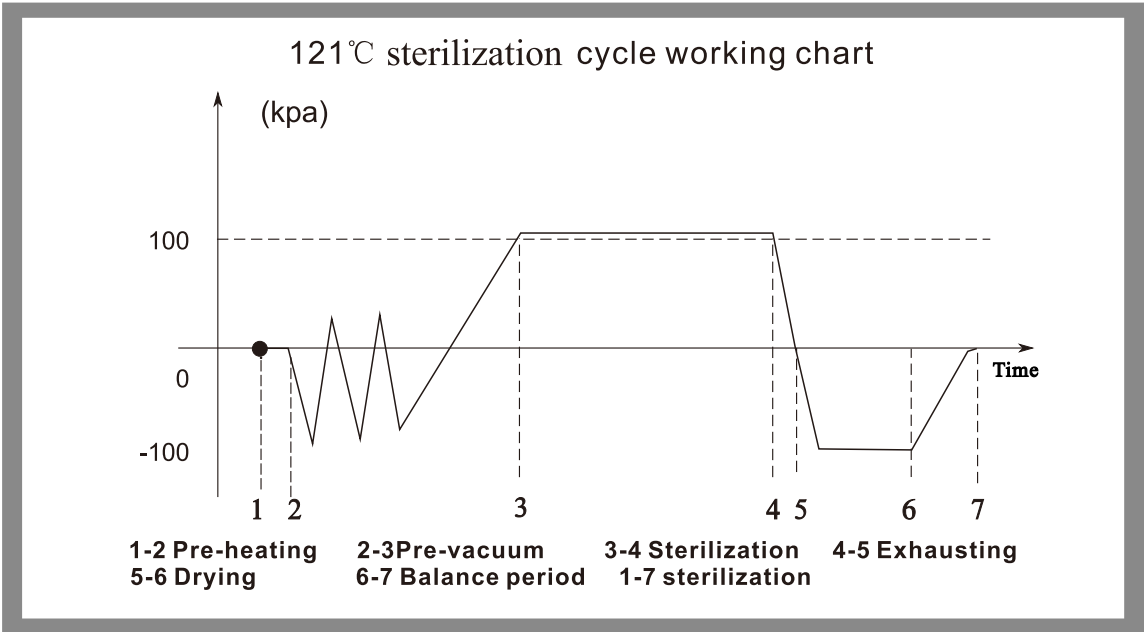
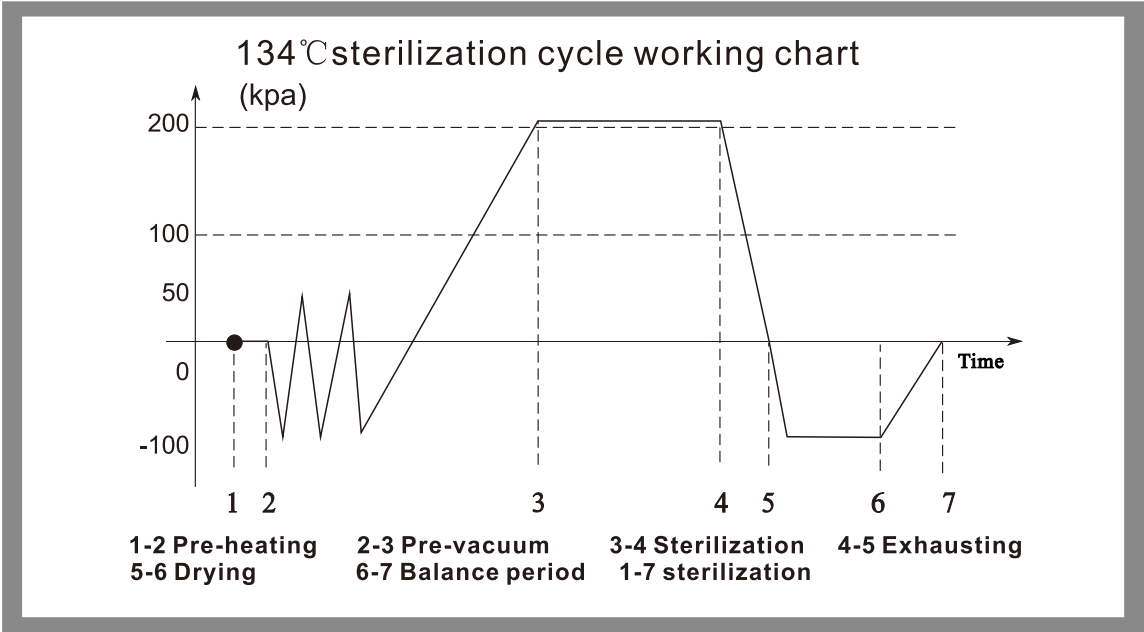
Form 2 Error code chart

Autoclave error code list (when you encounter these error codes, please contact the distributor or manufacturer)

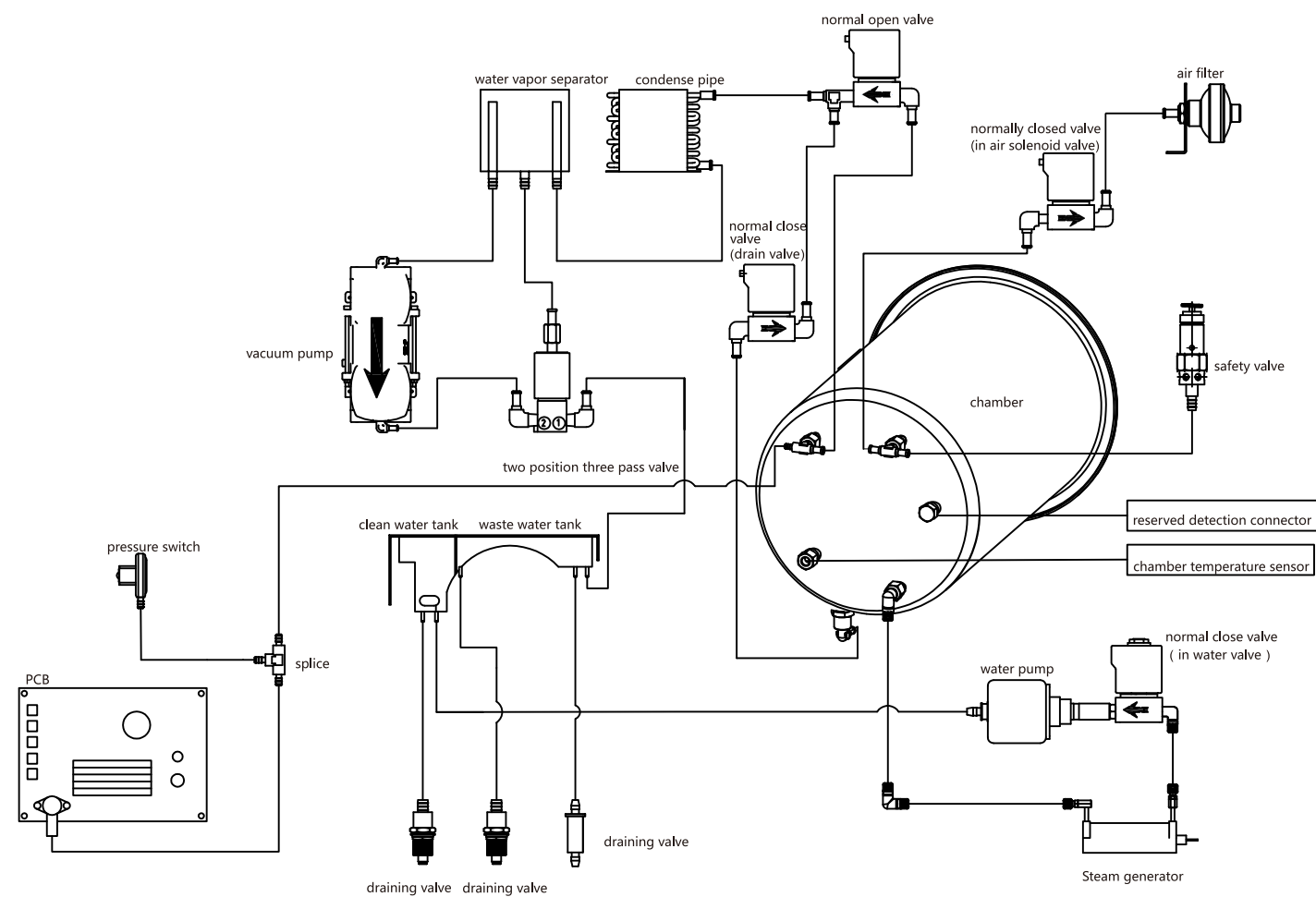
Error Code	Malfunction	Cause	Troubleshooting
E00	Program Exit	Manually exit during the operation	Restart the Program
E10	Pressure Sensor Malfunction	Pressure over detected, ≥300KPA	Check the pressure sensor or main board
E11	Internal Temp. Sensor Malfunction	Internal Chamber temp. over detected, ≥200℃	Check the temperature sensor of the sterilization room or main board
E12	Steam Generator Sensor Malfunction	Steam generator temp. over detected, ≥250℃	Check the temperature sensor of the steam generator or main board
E13	External Temp. Sensor Malfunction	External chamber temp. over detected, ≥200℃	Check the temperature sensor of the chamber or main board
E41	St.Failure	Actual temp.exceeds sterilization temp. +4℃	Check the temperature sensor or main board, Whether or not the pipe is blocked
E42	St.Failure	Actual temp.is lower than sterilization temp.	Check the temperature sensor or main board, door sealing ring, solenoid valve and related pipes to see if they are leaking
E02	Pressure Over	Actual pressure.exceeds sterilization temp.	Check the pressure sensor, main board, exhaust valve, drain valve and related pipes to see if they are blocked
E03	Chamber Temp. Over	Chamber temperature exceeding set value	Check the temperature sensor of the chamber or main board
E05	Steam Exhaust Failure	Pressure discharge rate in chamber is lower than preset value	Check whether exhaust valve, drain valve and related pipes are blocked
E06	Door Malfunction	Door switch loosened	Check whether the door switch, door switch wire and door body are adjusted in right place
E07	Steam generator Temp. Over	The temperature of the steam generator is over 210 degrees	Check the temperature sensor or main board, inlet valve, water pump
E08	Heating Time Over	Sterilization preheating time exceeds preset value	Check the temperature sensor, main board, temperature protector, connecting wires to see if they are falling off
E91	The First Time Vacuum Failure	During the first vacuuming, the vacuum degree in the chamber cannot reach the preset value within the prescribed time	Check the vacuum pump, main board, two positions three ways valve, drain valve, exhaust valve and the filter in the chamber to see if it's blocked
E92	The Second Time Vacuum Failure	During the second vacuuming, the vacuum degree in the chamber cannot reach the preset value within the prescribed time	Check the vacuum pump, main board, two positions three ways valve, drain valve, exhaust valve and the filter in the chamber to see if it's blocked
E93	The Third Time Vacuum Failure	During the third vacuuming, the vacuum degree in the chamber cannot reach the preset value within the prescribed time	Check the vacuum pump, main board, two positions three ways valve, drain valve, exhaust valve and the filter in the chamber to see if it's blocked
E94	LEAK Program Vacuum Failure	The vacuum degree in the chamber cannot reach the preset value within the prescribed time	Check the vacuum pump, main board, two positions three ways valve, drain valve, exhaust valve and the filter in the chamber to see if it's blocked
E95	The First Time Pressurization Over	For the first time pressure boost, the pressure is less than 100KPA in 30 minutes	Check water pump, inlet valve, steam generator, intake pipe or water tank to see if it's short of water
E96	The Second Time Pressurization Over	For the second time pressure boost, the pressure is less than 100KPA in 30 minutes	Check water pump, inlet valve, steam generator, intake pipe or water tank to see if it's short of water
E97	The Third Time Pressurization Over	For the third time pressure boost, the pressure is less than 100KPA in 30 minutes	Check water pump, inlet valve, steam generator, intake pipe or water tank to see if it's short of water
A01	Water Quality Alert	Water quality in water tank is unqualified	Please use distilled water and still check the main board
A02	Water Refill Alert	Water shortage in water tank	Please add water, still check water level switch, main board
A03	Wasted Water Tank Full Alert	Water full in used water tank	Discharge used water, still check water level switch, main board
USB error indication	light flashing 1 time	Self-test passed	Normal
	light flashing 2 time	Operation finish	Normal
	light flashing 3 time	No definition now	No definition now
	light flashing 4 time	U-disk needs formation	Format U-disk in FAT files
	light flashing 5 time	Not enough capacity	Delete the files in U-disk
	light flashing 6 time	U-disk needs formation	Format U-disk in FAT files
	light flashing 7 time	USB mode error	Contact us

Circuit diagram

Working chart



Piping Diagram



14 Troubleshooting

1. During venting or drying, the thump sounds. It means that the condensed water collector is full. You must drain the water from the collector.
 2. Hissing from the chamber door. (Solving this problem according to item 6 Door Adjustment)
 3. During a cycle, a banging sounds and a large quantity of steam leaks from the chamber door and display “E6” code. Please verify whether the door knob is properly turned and locked. If the steam leaks at the beginning of a cycle, you need to change the seal according to instructions at page 18.
 4. When a cycle completes, there are water drops on the instruments.
- You may correct the problem by:
- 1). Please check the drain filter.
 - 2). Reduce the load of the instrument in the chamber, especially the porous and dressing and other water absorbent materials.
 - 3). You may also wait for a while at the end of a cycle “Ed” for better drying result. The autoclave will continue heating the chamber until you open the door.

15 Important information

- 1.The autoclave must be installed on a leveled counter top.
- 2.When operated at a higher elevation of more than 500 meters,The machine must be reprogrammed. Please get in touch with your distributor for instructions.
- 3.Distilled water must be used to prolong the life of the machine.
- 4.The radiation openings in the machine must not be blocked or covered.
- 5.Instruments should be placed on the tray allowing space between one another and thus allowing steam to pass through.
- 6.Condensed water collector must be emptied from time to time.It should be emptied when refilling the water reservoir.(Draining of the collector can be followed as per item 9.2)
- 7.Chamber door knob must be turned to its locking position.
- 8.Never try to open the chamber door before pressure displays “ 0 ” .
- 9.To avoid burning injuries, power off the machine and let it cool down before replacing the seal.
- 10.No dragging when the machine is moving.
- 11.Power connection must be grounded properly.
- 12.Must be provided enough power.(1800VA)
- 13.While the temperature of outside is lower, please pre-heating the machine without instruments for 30minutes before sterilize.
14. It is normal if the machine alarms when it starts for the first time. If it alarms again , please contact us.