Runyes®
FOCUS ON DENTAL.

Small Steam Sterilizers

Operation Manual
Technical Manual

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FOCUS ON DENTAL.

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Runyes®

Small Steam Sterilizers
Operation Manual
(Technical Manual)

Dear End User :

Welcome to Quality Sterilization created by Runyes made autoclaves. Before using the machine, please fill in the “user registration” form.
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 efficient service.

User Registration

On the serial number plate at back of the machine, you can find the unit's model number, serial number and reference number. Please double check the numbers and fill in the form, please quote these numbers when you contact your distributors.

Product name :
Product model :
Serial number :
Date of manufacture :
Voltage :

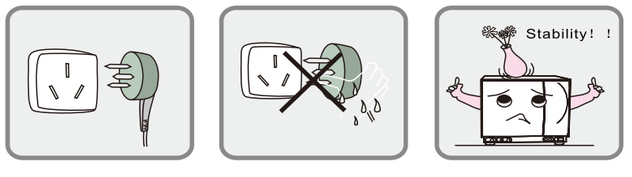
*Before operating the sterilizer, please read carefully all safety cautions and instructions for operation. This operation manual will help you understand all functions of Runyes Autoclaves as far as possible.

*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.

*Should error occur during operation of the machine, please get in touch with your local distributor or us for your best qualified services and assistance.

Important Information on Safety



1. Please check the voltage before plugging in the power cord. Don’ t use electrical outlets unless at correct voltage. Otherwise it might cause fire or electric shock.

2. Make sure you have dry hands before plugging or unplugging the power cord.

3. Never place your autoclave on an unstable, moving, tilted or shaking surface

4. Never cover or block the door or ventilation openings of the autoclave.

5. Never put heavy items or liquid containers that might spill on the top of the autoclave.

6. Please unplug the power cord when the machine will not be used for a long time.

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1.Description & Usage

SEA series steam sterilizers are made for sterilization of surgical equipments, dental equipments, surgical dressing, glassware, injectors and other materials that can be sterilized in high pressure and high temperature.

SEA18、SEA23 Three Times Pre-vacuum Pressurized Steam Sterilizers

With advanced technology of pre-vacuum and vacuum drying, high-temperature steam of SEA18、SEA23 Lcan penet rate narrow pipes and fabric materials. The products should be operated by physicians or nurses. The autoclaves adopt microprocessor intelligent control, friendly interfaces, and easy operation. Parameters and working status will be display dynamically. Automatic fault diagnosis, protection of overheat and overpressure ensure the safety of the machine. It is clean and safe to set the water tanks on the top of the machine. (Figure1-1) The water quality sensor can prevent the machine from inferior distilled water.

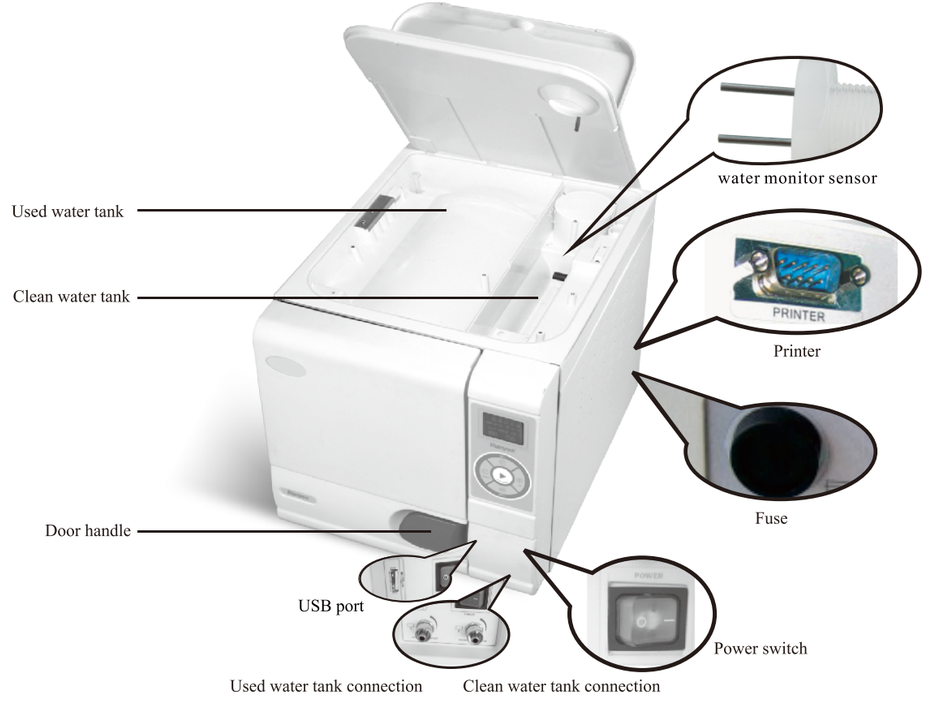


Fig 1-1

2.Specifications

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

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. These value vary under different atmospheric pressure.
Power fuse.....F12AL250V
Water tank capacity.....4L
Minimum water level.....1.3L
Operation temperature.....+5℃ ～ +40℃
Relative humidity range.....≤85%

The maximum wight of instruments which load into the sterilizer chamber during one cycle.

Unwrapped cycle 121℃	Unwrapped cycle 134℃	wrapped cycle 121℃	wrapped cycle 134℃
23L/18L: 6.5kg	**23L/18L**: 6.5kg	**23L/18L**: 3.2/2.5kg	**23L/18L**: 3.2/2.5kg

Figures

Menu select
Step select
Distilled water only
Water outlet
Dry select
Confirmation select
Refer to the operation manual
Note of high temperature
Grounded correctly
Start/Stop select

Tip:

Standard Atmospheric Pressure : It is atmospheric pressure at sea level.which means1 Standard atmospheric pressure. The value is 0.1Mpa=1000Hpa=100Kpa.Atmospheric pressure decreases by higher altitude. An increase of altitude of 1000 mcters will result in a decrease of atmospheric pressure of 10Kpa if under 3 Km.

3.Installation

The Autoclave should be installed in a ventilated 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 as Fig 3-1.

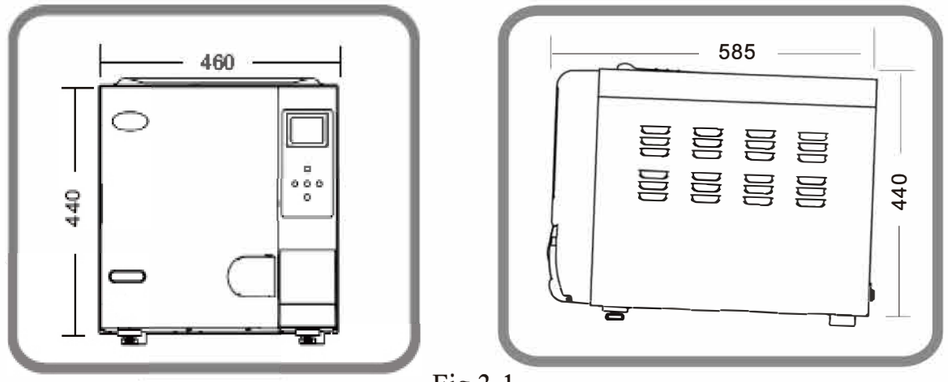


Fig 3-1

⚠Caution

If the front of the machine is lower than the back the control will display “E3” (E3 means it will not dry completely). Adjust the height by adjusting foot pad of the front of Autoclave. The front should be a little higher than the back.

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.

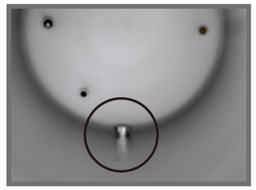


Fig3-3

Fig3-4

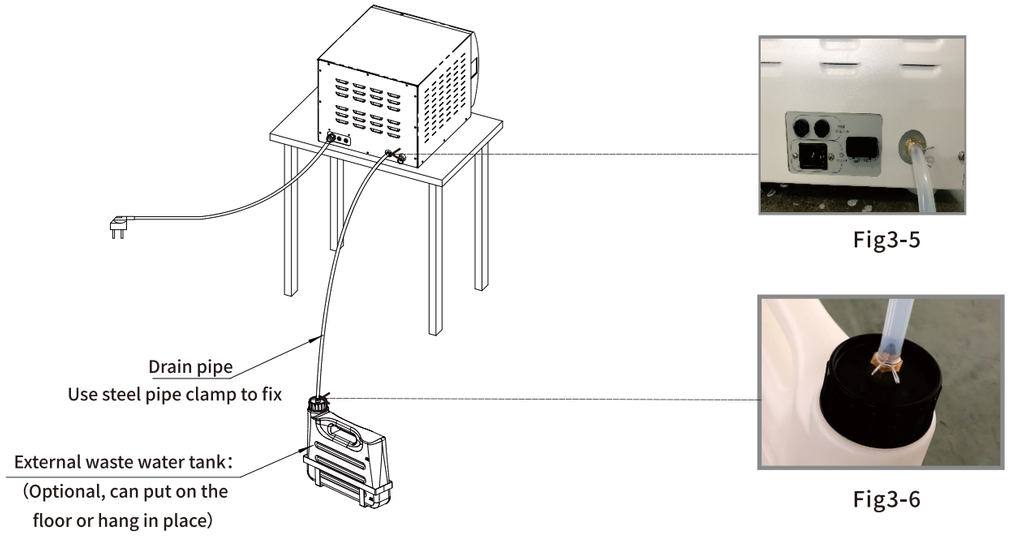


Fig3-5

Fig3-6

图3-7

⚠ Caution

The power supply must be able to afford (23L) 2300VA or (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.LCD Screen（Figure 4-1）

Letter row 1：Working state: show temperature and pressure data
Menu state: show menu row or page layout name
Ready to work state: show sterilizer cycle name

Letter row 2：Working state: show pressure curve
Menu state: show menu row
Ready to work state: show selected cycle parameter

Letter row 3：Working state: show pressure curve
Menu state: show menu row
Ready to work state: show selected cycle parameter

Letter row 4：Show help information

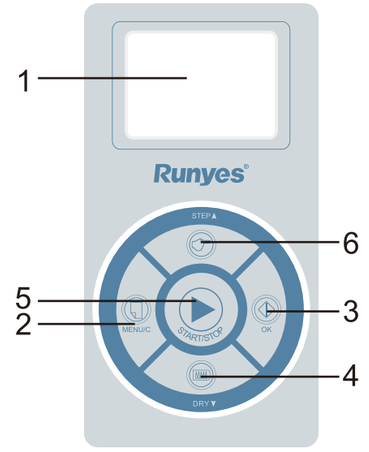


Fig4-1

2.Menu/ C key

Menu/cancel key. In standby, press this key to go to the menu, and press again to exit. There are 7 Selections of cycle,displayed in 3 pages. Choose the right one by pressing STEP▲and DRY▼ keys.

Universal B cycle: 134℃, three times pre-vacuum, 4 min sterilization.

18min B cycle: 134℃, three times pre-vacuum, 18 min sterilization, for instruments that need long time sterilization.

Unwrapped cycle: 134℃, one time pre-vacuum, 4 min sterilization.

Rubber and plastic cycle: 121℃, three times pre-vacuum, 16 min sterilization.

B&D test cycle: BOWIE & DICK, steam penetration test.

Vacuum test cycle: testing sealing performance in vacuum condition.

Cleaning steam generator: clean the steam generator and steam pipe, refer to page20, 9.7 cleaning steam generator.

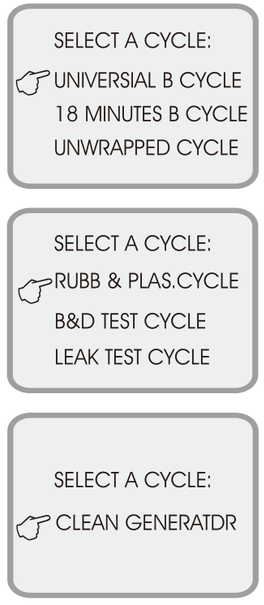


Fig4-2

3.OK key:
Ok key. Set and store parameters. Confirm the cycle chosen on the menu.

4.DRY▼key
Fast/Down key. This key is fast dry key when the machine is in standby, and it is down key when the machine is in menu status. You can use the fast dry key to choose the time of dry--1min/5min, in order to shorten cycle. The system has two different sets of dry time, and the default one is 10 min. If you need longer time, you can set on the machine. Refer to 8 System Setup.

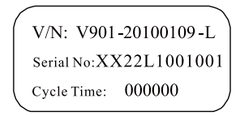
5. START / STOP Key
START / STOP key will start sterilization cycle after selecting the sterilization program.
1. If you want to stop work during the pre-heating, pre-vacuum and sterilization period, press this key for 3s, and the system will directly go to the releasing period and then go to after 3min dry, the cycle will end. Press this key for another 3min, the system will skip all the processes and stop working.
2. If you want to stop it during the dry period and balance period, press this key for 3s and it will end the cycle.

6. STEP ▲ Key
Last cycle/ Up key. When the "MENU" is displayed, this key operates as an "Up" key. When selecting a cycle, pressing this key will switch between “Keeping Warm” and “Last Cycle”. If the display reads “Keeping Warm” the chamber will keep warm after the cycle completes. This will reduce the heating time for the next cycle. If the display reads “Last Cycle” then the chamber will cool automatically when the cycle completes. (If no entry is made, the autoclave will enter “Last Cycle” automatically after one hour.)

⚠ 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. Turn on the autoclave via the ON / OFF switch located behind the small door at the bottom right of the front of the machine. The power switch light turns on, indicating that electric power is connected.1 s later, it enters to work state after automatically examination . The screen will display as (Fig 5-1) shows.



5.1 Select cycle
Press MENU/C key, and choose a right cycle in the menu. Press Ok key to start. Refer to figure 5-2.

Fig5-1

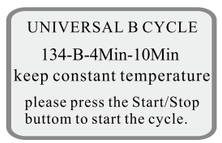


Fig5-2

5.2 Filling Water / Refilling
If the water level is lower than the minimum required, the display will show the refilling page layout (Fig 5-3) with alarm sounding. You should add water. Open the tank cover at the top of autoclave and remove the filler filter. Fill tank with distilled water to cover the red rod.

⚠ The water quality sensor installed in the machine will beep, if the quality of the water is not standard distilled water (electrical conductivity≤20 μ s/cm).

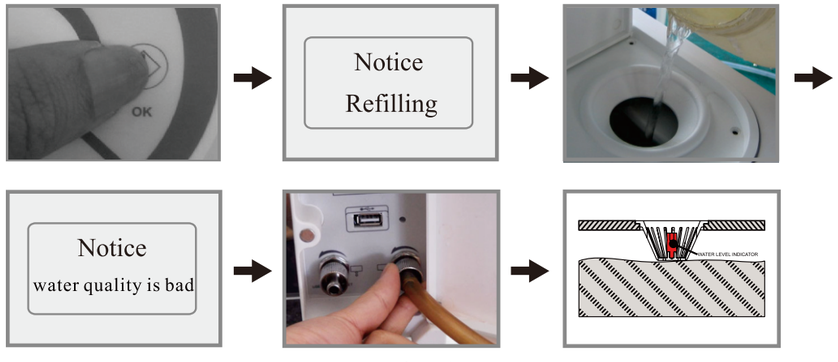


Fig5-3

⚠ Caution
1. Distilled water will prolong the life of the autoclave.
2. Do not tilt the autoclave when there is water in the water reservoir.
The used water tank should be emptied frequently. You should empty the used water reservoir when the clean water reservoir is refilled via the used water outlet located below the ON/OFF switch.(page17,9.2)

5.3 Start Selected Cycle

Close the door after loading the autoclave and press START key to begin the cycle. After 0.5 seconds the electrical lock will engage. If the electrical lock did not close correctly the autoclave will display a door fault. The sterilization cycle will only start after the door is locked successfully (See fig 5-4).To abort a cycle during sterilization press the Start/Stop key for 3 seconds.

There are two different exit modes: 1. If you press the button for 3 seconds during Pre-heating Phase, Pre-vacuum Phase or Sterilization Phase it will enter into an Exhaust Phase. After 3 minutes drying the whole cycle will end. If you need to end the cycle immediately press the Start/Stop button for 3 seconds again. 2. Press the Start/Stop button for 3 seconds during drying Phase to end the cycle immediately. Refer to page 6.

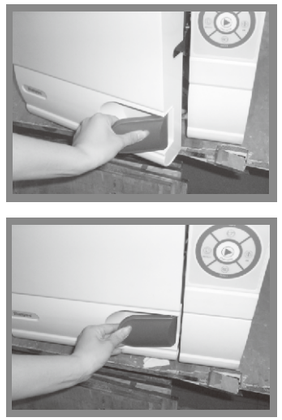


Fig5-4

⚠ Caution

The instruments should be put on the instrument tray. Please leave some space between the instruments to make the air go freely. Please use the tray holder to take the tray out to avoid high temperature.

5.4 Cycle End

After sterilization the display will show as fig 5-5 and an alarm will sound. The door can now be opened and the sterilized instruments unloaded.

If you decide to stop using the autoclave for a while, please turn the main power switch off, or unplug the power cord should you not want to use the machine for a long time.

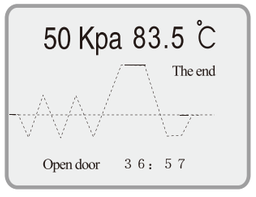


Fig5-5

⚠ Caution

Never try to open the chamber door if and when the pressure display doesn't show 0.0 .

Please use testing paper to ensure the effect of sterilization.

It’s normal that the pressure displayed may be lower than 0 in some high lands and you can change the absolute pressure to relative pressure. Refer to 8 System setting.

The right way to put the tray into the autoclave:

Type 1: refer to figure5-6.5-7

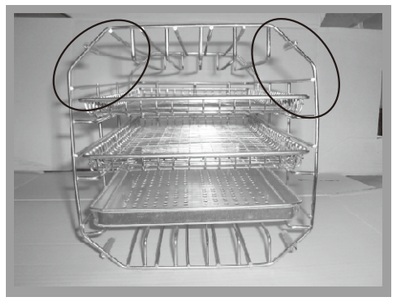


Fig5-6

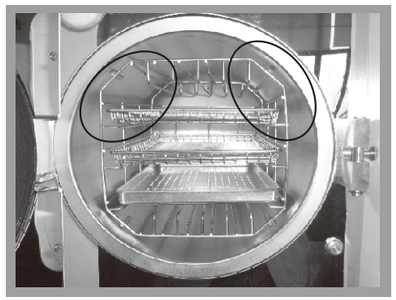


Fig5-7

Type 2: turn 90° clockwise, refer to figure5-8,5-9.

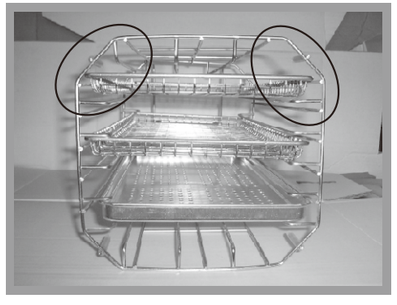


Fig5-8

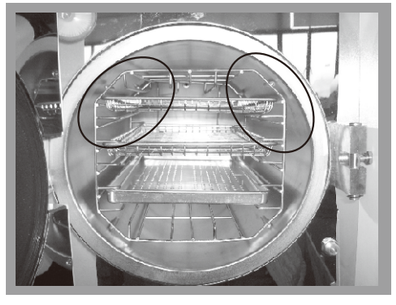


Fig5-9

⚠ Notes:

The above pictures are only for reference. Instrument plate and tray will vary due to different types or equipment renewal. Take the accessories as valid without prior notice.

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

Fig 6-2

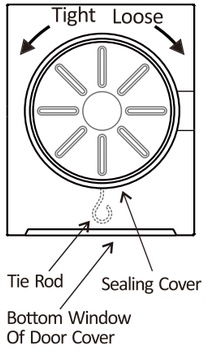


Fig 6-3

⚠ Caution

Never try to readjust the chamber door while the door is locked.When you adjust the door DO NOT touch the sealing cover.

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 wether 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

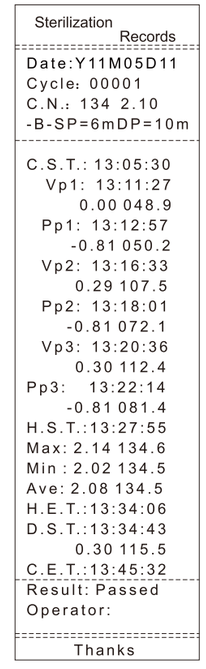


Fig7-3

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.

⚠ 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

7.2.1Main function:

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

7.2.2Basic parameters:

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

7.2.3Operation instruction:

1.Turn on the power, the mode of USB will start automatically. After self-test, it goes into standby with the indicator flickering1 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 finished.
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.
7. USB Mode (According to the flickering times of USB mode indicator) and solution:

Times	Definition	Solution
1	Self-test passed	Normal
2	Operation finishes	Normal
3	No definition now.	No definition now.
4	U-disk needs formation	Format U-disk in FAT files
5	Not enough capacity	Delete the files in U-disk
6	U-disk needs formatting	Format U-disk in FAT files
7	USB mode error	Contact us

Note: This function is optional to the demand of customer.

8. System Setup

Press MENU/C key for 3 seconds on ready state and the autoclave will enter into system setup (See Fig 8 -1).

Press STEP ▲ key and DRY ▼ key to select
and press OK key to enter sub-menu for setup system.
Press MENU/C key to cancel and return to main menu.

Fig8-1

8.1 Date Setup

With 3 sub-menus (Fig 8 - 2).
Press STEP ▲ and DRY ▼ key to select.
Press OK key to enter this sub-menu.
Press STEP ▲ and DRY ▼ key to increase or decrease figures.
Press OK key to save the setup and return to upper level of the menu.
Press MENU/C key to return to upper level of menu without saving setup.

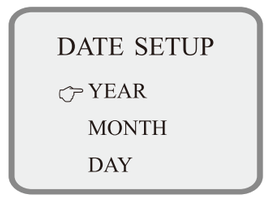


Fig8-2

8.2 Time Setup

With 2 sub-menus (Fig 8 -3).
Press STEP ▲ and DRY ▼ to select sub-menu.
Press OK key to enter this sub-menu.
Press STEP and dry key to insert value.
Press OK key to save the setup and return to upper level of the menu.
Press MENU/C key to return to upper level of menu without saving setup.

Fig8-3

8.3 Printer Setup

Press STEP ▲ and DRY ▼ key to select ON or OFF (See Fig 8-4)
Press OK key to save the setup and return to upper level of the menu.
Press MENU/C key to return to upper level of menu without saving setup.

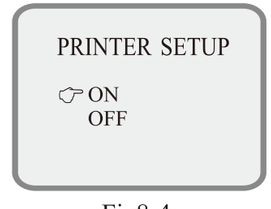


Fig8-4

8.4 Language Setup

With 2 sub-menus (fig 8-5).
Press STEP and DRY key to select language.
Press OK key to save the setup and return to upper level of the menu.
Press MENU/C key to return to upper level of menu without saving setup.
The languages below are supported at present.
Chinese, English, French, German, Spanish, Turkish, Malaysian, Italian, Swedish, Romanian, Polish, latvian(the others is on developing).

Fig8-5

2. User's Setting

When the position of the cursor is on the Language Setting in the system setting menu, press Dry Key for 5s to go to the user's setting menu.

⚠ Note

At the end of the cycle the autoclave displays Fig 8 - 8 and the alarm sounds. Open the door and unload the sterilized instruments
Always use the tray holder to load or unload the tray with instruments in it in order to avoid burning injuries.

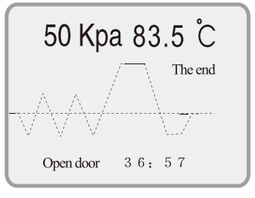


Fig8-8

Option1-Adjustment of displayed temperature

In some cases, the temperature of the autoclave will have some deviation.
You can go to this menu and set by STEP and DRY keys.
(If the temperature displayed is 134.5℃, and the real temperature is 135.0℃, you can set the option to 5 to adjust.)

Option2-Adjustment of displayed pressure

The same as the above.(If the pressure displayed is 2.10Bar, and the real pressure is 2.15 Bar, you can set the option to 5 to adjust.)

Option3-Vacuum mode setup

Users should not set this item by themselves.

Option4-Vacuum mode setup

Users should not set this item by themselves.

Option5-Vacuum mode setup

This option is to set the mode of pressure display, absolute pressure or relative pressure.
It is demanded by some customers. The door should stay open when setting.
Press DRY for 5s to change between the two modes.

Option6-Dry time setup

This option is to set the mode of dry time-ordinary mode(1-5-10min) and long mode(10-15-20min).

Other Functions
(Not available yet)

9.Service and Maintainance

9.1 Clean Water Tank

Please clean both tanks regularly following the process below:

1. Empty the tanks (please refer to item 9.2).

2. Open the tank cover board. Use a screw driver to loosen the five screws as per Fig 9-1

Fig9-1

3. Pull up the water tank cover board as per Fig 9-2

Fig9-2

4. Clean the tank. Use cotton dipped in alcohol or medical disinfectant to scour the tank wall. Wash it with distilled water then empty and dry the tank. Take the filter out and wash it, If it is too dirty,replace with a new one. Don't forget to put it back. (figure 9-3)

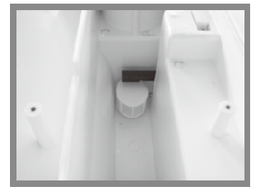


Fig9-3

5. After you clean the tank and filter, reassemble the tank cover and tighten the screws.

9.2 Draining of Water from the Machine

Drain the condenser water collector and water reservoir. Connect the end of the tube without a connector to the water outlet and the other end of the tube to a drainage sink.
Turn the draining knob anti-clockwise to drain the water from the machine (See Fig 9-4).

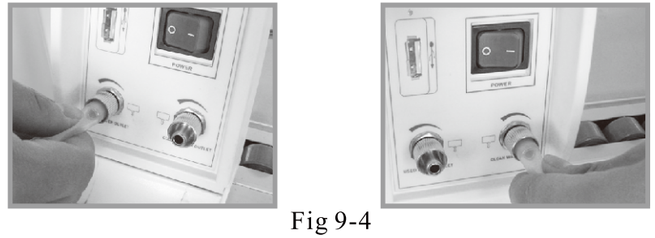


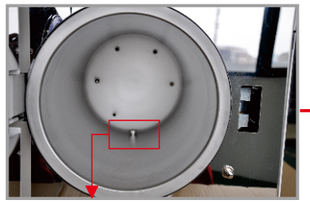
Fig 9-4

⚠ 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 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 (Fig 9-5)

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

Over time the seal plate will have some scale build-up that may cause leaking.
You should clean the seal plate regularly using a soft cloth soaked with distilled water to wipe the rubber seal and the seal plate (Fig 9-6 & 9-7). If there is still leaking, you may need to take the rubber seal out for cleaning.
If the seal is broken you will need to replace it with a new one.
It is suggested to clean the seal plate every 2000 cycles.

Fig9-6

Fig 9-7

9.6 Change the Seal

You will need a flat screw driver without a sharp tip. Refer to figure9-8.

Fig 9-8

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

9.7 Cleaning the Steam Generator

1. Purpose:
To clean the steam generator and steam pipes, to prevent incrustant blocking the pipe.

2. Cycle:
20 min cleaning + 10 min drying

3. Effect:
It can clean the water scale of the steam generator and take it to the used water tank by vacuum.

4. Cleaning Cycle Operation:
Press MENU/C key in the ready status, and choose "Clean the generator".(figure9-9) Press Ok key, and then press START/STOP to start the cycle. After cleaning, it will go back to the ready status with 3 times of beeping.

5. Cleaning Reminder:
Every 100 cycles the B&D light and LEAK light will go on to remind you to clean the steam generator.

6. Please clean the steam generator frequently to prolong the usage time

Fig 9-9

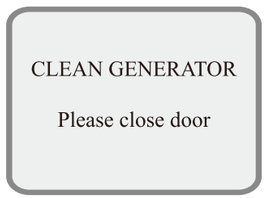


Fig9-10

Fig9-11

⚠ **Note:** Cleaning function will not affect the autoclave cycle, only a remind message.

10. Transportation & Storage

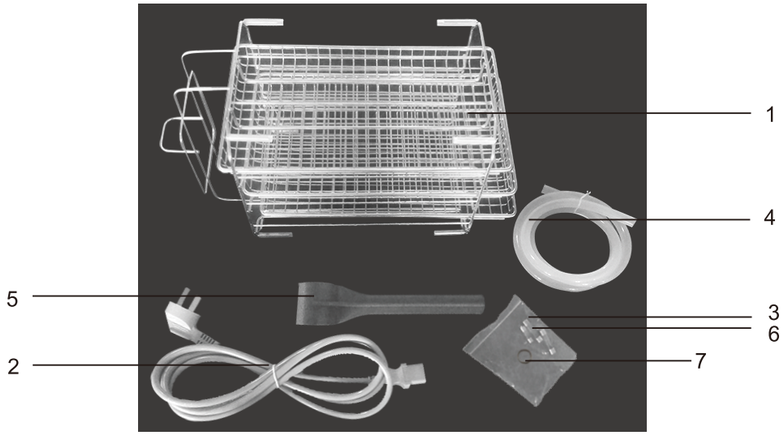
Power the machine off, unplug the power cord and allow the chamber to cool.
The autoclave should be transported and stored in the following conditions:

Temperature: -40℃ ~ +55℃
Humidity: ⩽85%
Atmospheric pressure: 500Hpa ~ 1060 Hpa

⚠ **Caution**

When moving the unit **DO NOT DRAG**.

11 Accessories



1). Tray rack, trays(3 piece) 1set

2). Power cord 1 piece

3). Fuse for main board(F3AL 250V)1 piece

4). Draining pipe 1 piece

5). Tray holder 1 piece

6). Fuse ((F12AL 250V) 2 pieces

7). Chamber water filter 1 piece

8).Output waste water tank (Option for draining waste water outside type)-------One set

9).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.

12 Appendix.

Form 1 Error code chart(In case of faults, please contact your distributor immediately**)**

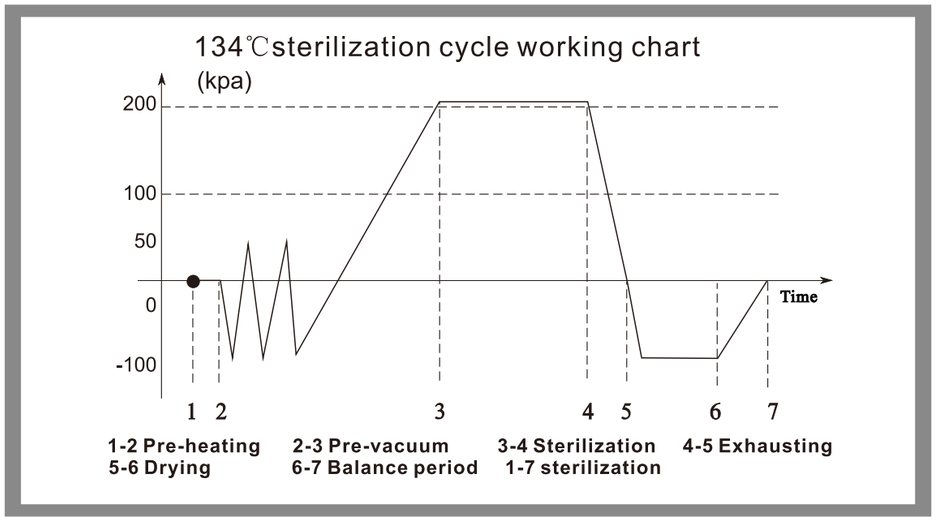
Error Code	Fault type	Causes	Alarm Phase	Alarm Phase
E00	Exit halfway	Manually opt out during operation		Rerun the program
E10	Pressure sensor failure	Detection room to sterilization room pressure ≥300KPA,	In all phases, the alarm will be issued when the condition is reached for 5 consecutive seconds	Check pressure sensor or mainboard
E11	Internal temperature sensor failure	Detected abnormal temperature in sterilization room, ≥210 degrees	In all phases, the alarm will be issued when the condition is reached for 5 consecutive seconds	Check temperature sensor in sterilization roomor mainboard.
E12	Steam generator sensor failure	Abnormal temperature of steam generator detected, ≥210 degrees	1. Standby phase, it will alarm when the condition is reached for 5 seconds. 2. During the pressurization process, the T1 temperature is still> 205 degrees after 30 consecutive draws.	Check steam generator temperature sensor or mainboard
E13	Pot sensor failure	Abnormal temperature of the pot was detected, ≥210 degrees	In the standby phase, the alarm is issued when the condition is reached for 5 consecutive seconds	Check pot temperature sensor or mainboard
E41	Constant temperature and pressure failure	During the sterilization process, the temperature exceeds + 4 ° C.	In the sterilization stage, the sterilization temperature exceeds 4 degrees.	Check whether the temperature sensor, main board and pipeline are blocked
E42	Constant temperature and pressure failure	The temperature during sterilization is lower than the sterilization temperature.	Sterilization stage, below the sterilization temperature.	Inspect whether the temperature sensor or main board, door seal, solenoid valve and other places appear air leakage
E02	Overpressure in the pot	The sterilization chamber pressure exceeds the preset value (≥265KPA)	In all phases, the alarm will be issued when the condition is reached for 5 consecutive seconds	Check whether the pressure sensor, main board, steam exhaust valve, drain valve, and related pipes are blocked.
E03	Overtemperature in the pot	The temperature of the pot exceeds the set value (≥200 degrees)	In all phases, the alarm will be issued when the condition is reached for 15 consecutiveseconds	Check pot temperature sensor or motherboard
E05	Exhaust steam failure	(The pressure discharge rate in the sterilization chamber is lower than the preset value.)	The pressure release speed is lower than the preset value under the pressure of 30KPA in the pressure relief stage. The pressure drops <10KPA every 30 seconds.	Check whether the exhaust valve, drain valve, and related pipes are blocked.

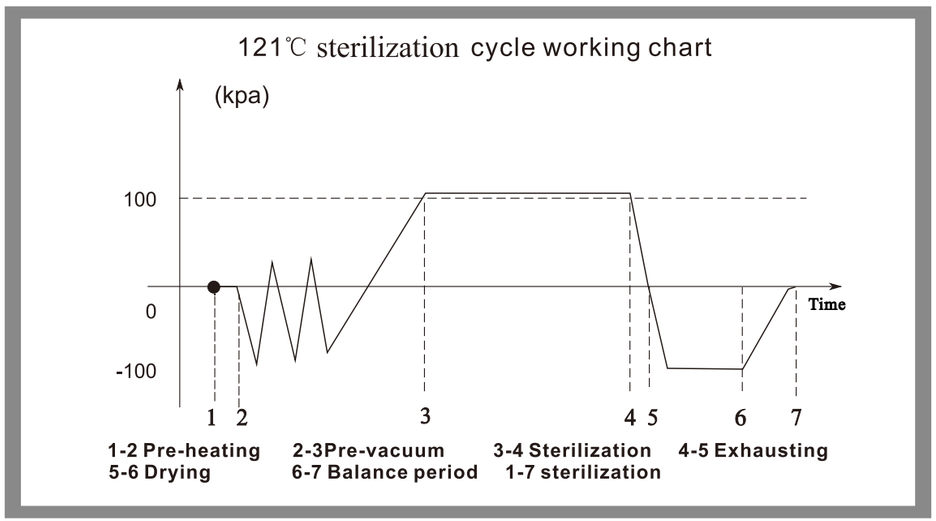
E06	Door failure	Door switch released	The alarm will be issued when the door is open for 2 consecutive seco nds, during the period from warm up to the end of the serilization.	Check whether the door switch, door switch wire and door body are adjusted in place.
E07	Steam generator over temperature	Steam generator temperature exceeds 210 degrees	No alarm for the time being, heating will stop when T1> 1800.	Check temperature sensor or main board, water inlet valve, water pump.
E08	Heating timeout	Sterilization preheat time exceeds preset value	In the preheating phase, the time for heating the heating coil and the heating rod to reach the predetermined temperature is> 25 minutes.	Check whether the temperature sensor, main board, temperature protector, and connecting wires are disconnected.
E91	The first vacuum failed	When vacuuming for the first time, the vacuum degree in the sterilization chamber cannot be set to the preset value within the specified time.	The first vacuum is less than -20 KPA in 6 minutes / less than -70 KPA in 8 minutes in pressure mode	Check whether the vacuum pump, main board, two-position three-way valve, drain valve, exhaust valve, and filter in the sterilization room are blocked
E92	Second vacuum failure	During the second evacuation, the vacuum in the sterilization cham ber cannot be set to the preset val ue within the specified time.	Vacuum is less than -20KPA in 4 minutes during the second vacuu m / less than -70KPA in 8 minutes in the pressure mode	Check whether the vacuum pump, main board, two-position three-way valve, drain valve, exhaust valve, and filter in the sterilization room are blocked
E93	Third vacuum failure	During the third vacuum, the vacuum degree in the sterilization room cannot be set to the preset value	The third vacuum, less than -20 KPA in 4 minutes, and less than -70KPA in 8 minutes in pressure mode	Check whether the vacuum pump, main board, two-position three-way valve, drain valve, exhaust valve, and filter in the sterilization room are blocked
E94	Leak program vacuum failed	The vacuum in the sterilization room cannot be set to the preset value within the specified time	1. The vacuum is less than -20KPA in 4 minutes during the LEAK test. 2. The pressure returns to -20KPA after the equilibrium and holding pressure stages.	Check whether the vacuum pump, main board, two-position three-way valve, drain valve, exhaust valve, and filter in the sterilization room are blocked
E95	First boost timeout	During the first boost	The pressure cannot reach 100KPA in 30 minutes	Inspect the pump, water inlet val ve, steam generator, water inlet line or whether water tank is lack of water
E96	Second boost timeout	During the second boost	The pressure cannot reach 100KPA in 30 minutes	Inspect the pump, water inlet valve, steam generator, water inlet line or whether water tank is lack of water
E97	Third boost timeout	During the third boost	The pressure cannot reach 100KPA in 30 minutes	Inspect the pump, water inlet valve, steam generator, water inlet line or whether water tank is lack of water
A01	Water quality alarm	Water quality alarm	All phases, check once every 0.5 seconds	Please use distilled water, check the main board for failure
A02	Water shortage in water tank	Water shortage in water tank	All phases, check once every 0.5 seconds	Please add water, and still check the water level switch and main board
A03	The waste water tank is full	The waste water tank is full	All phases, check once every 0.5 seconds	Drain the waste water and check the water level switch and main board

Form 2 Work mode chart

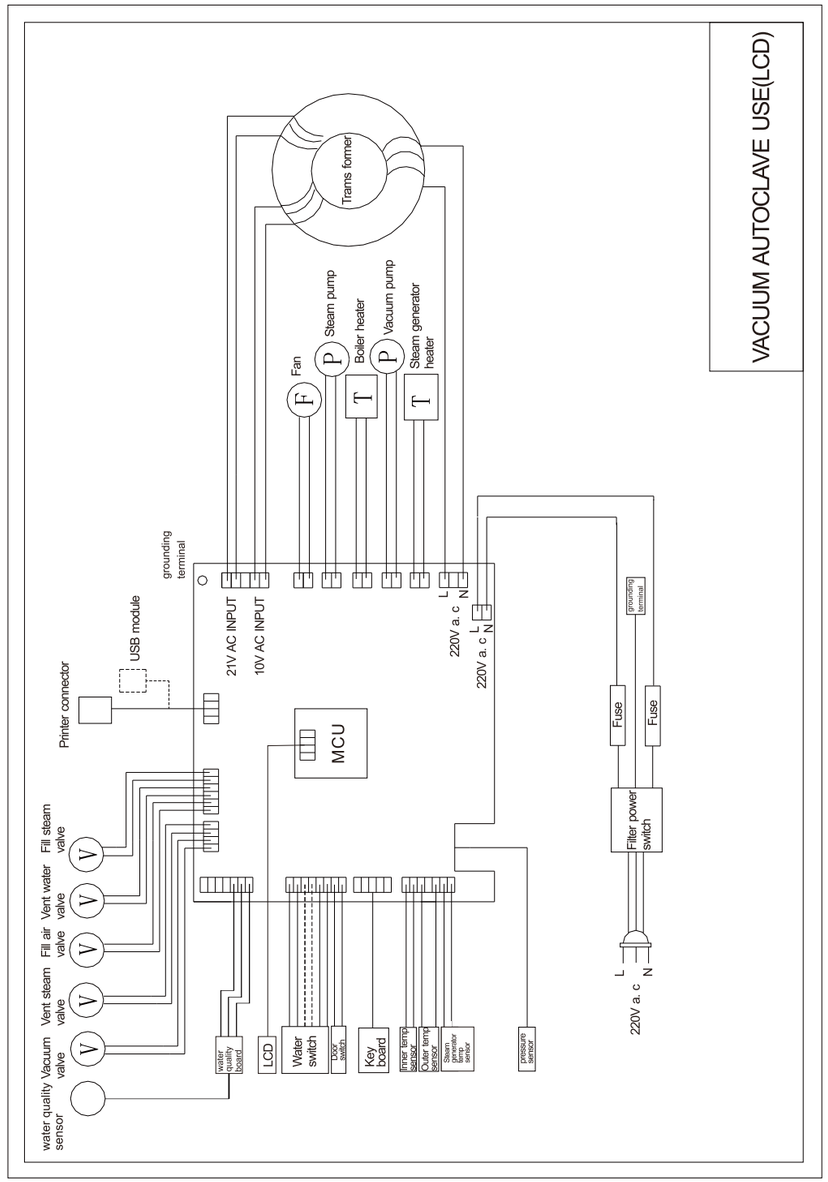
	134 ℃ package	134 ℃ non package	121 ℃ package	121 ℃ non package	134B+	BD test	Vacuum test cycle	CLEAN test
Sterilizing temperature	134	134	134	121	134	134	——	——
Sterilizing pressure	2.10	2.10	2.10	1.10	2.10	2.10	——	——
Class	B	S	B	S	B	B	——	——
Pre-heating	0-10min	0-10min	0-10min	0-10min	0-10min	0-10min	——	——
Vaeuuning time	24min	16min	25min	4min	27min	25min	6min	Clean 20 min
Admission time	5min	5min	5min	5min	5min	5min	——	——
Sterilizing time	6min	4min	20min	16min	18min	3.5min	Keep pressure 10min	——
Drying time	15min	10min	15min	10min	15min	1min	——	Drying 10 min
Total time	60min	45min	75min	45min	75min	45min	16min	30min

Working chart

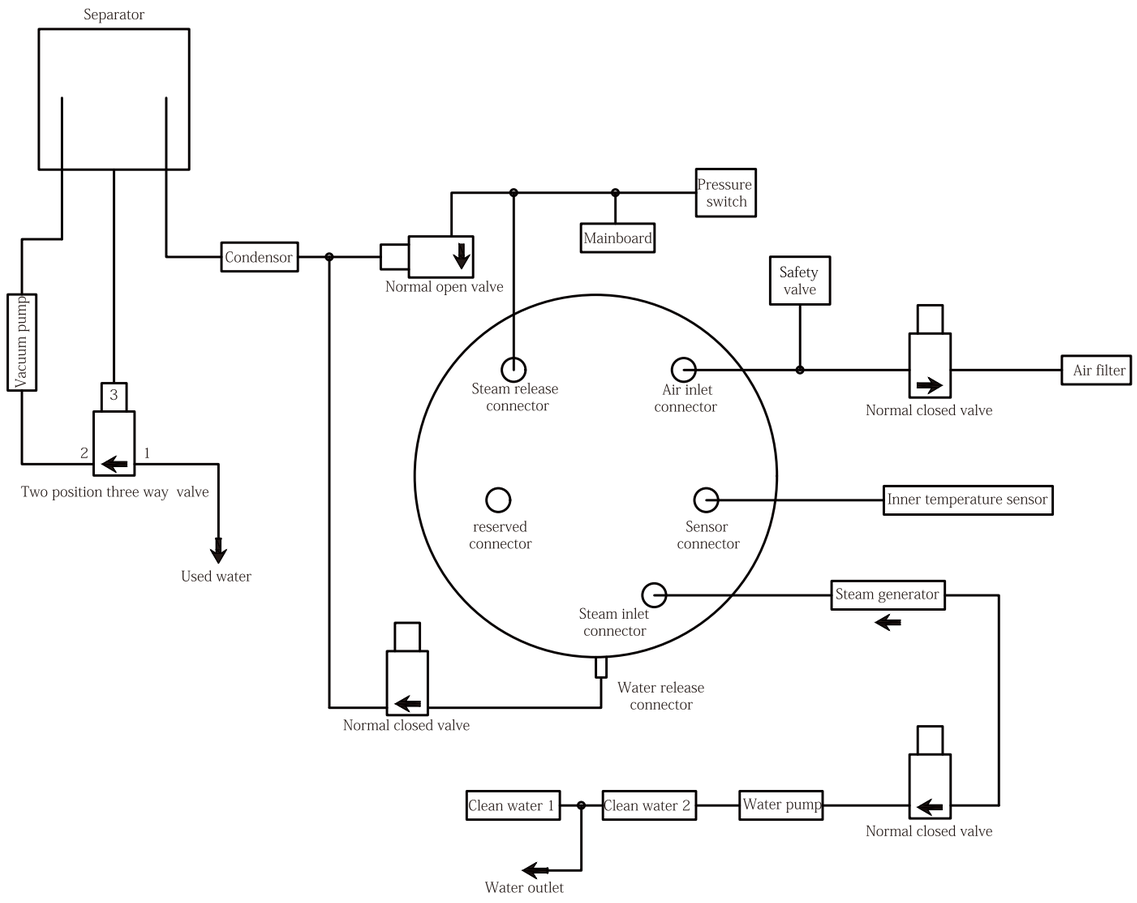




Circuit connection chart



Piping Diagram



13 Important information

1.The autoclave must be installed on a leveled surface.

2.Distilled water must be used for prolonging the life of the machine.

3.The ventilation openings in the machine must not be blocked or covered.

4.Instruments should be placed on tray with space between one another allowing steam to pass through.

5.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)

6. Keep the door closed when working.

7.Never try to open the chamber door if and when the pressure display doesn't show 0.0 .

8.Before any kind of maintenance turn off the power to the autoclave and allow it to cool down.

9.DO NOT drag the autoclave when it is being moved.

10.Power connection must be grounded properly.

11.Must be provided enough power .

12.If the ambient temperature is low please pre-heat the autoclave without instruments for 30 minutes before sterilizing.

13.DO NOT power off the unit during sterilization,.
To abort a cycle during sterilization press the Start/Stop key for 3 seconds.

14.The charts in the operation manual are for reference only.