



“Sturdy” Autoclave Sterilizer

SA-230M / SA-260M

Instruction Manual

Please read manual carefully before using and keep it well.

CE₂₄₆₀




Contents


1. Important Safety Instructions	1
2. Explanation of Safety Symbols and Notes	10
3. Unpacking	11
4. Installation	12
4.1 Environment	12
4.2 Install the sterilizer	12
5. Introduction	17
5.1 Intended Use	17
5.2 Description of the Sterilizer	17
5.2.1 External View	17
5.2.2 Internal Configuration	18
5.2.3 Control Panel (Re-Dry Program)	19
5.2.4 Control Panel (Liquid Program) / (Optional by order request)	20
5.2.5 Control Panel (Flash Program) / (Optional by order request)	21
6. Operation	22
6.1 Operation Overview	22
6.1.1 Re-Dry Program	22
6.1.2 Liquid Program	23
6.1.3 Flash Program	24
6.2 Prepare Sterilization	25
6.3 Standard Sterilization Program	26
6.4 Re-Dry Program (exclusive either to liquid or flash functions)	28
6.5 Liquid Program (optional, exclusive either to Re-Dry or Flash function)	29
6.6 Flash Program (optional, exclusive either to Re-Dry or Liquid function)	31
6.7 Reset / Stop	32
6.8 Emergency Stop	32
6.9 Placement for items to be sterilized	33
6.10.1 Sterilization for Implements	33
6.10.2 Sterilization for Wrap	35
6.10.3 Placement for sterilization box	35
7 Test Instructions	37
7.1 Biological performance of sterilizers	37
8. Maintenance Instructions	38
8.1 Daily	38
8.2 Weekly	38
8.3 Monthly	40

8.4 Annually	41
8.4.1 SA-260M.....	41
8.4.2 SA-230M.....	43
9. Troubleshooting	44
9.1 Symptoms.....	44
9.2 List of Error Codes (for autoclave)	45
10. Specifications.....	46
11. Warranty	47

1. Important Safety Instructions

In order to clearly indicate the extent of the harm, loss or damage which may result from failing to heed these precautions and the degree of their urgency, the precaution have been classified into the three categories of Danger, Warning and Caution.

-  **Danger :** This indicates an imminently hazardous situation arising from the mishandling or mis-operation of the unit which, if not avoided, might cause the death or serious injury of the operator or other persons.
-  **Warning :** This indicates a potentially hazardous situation arising form the mishandling or mis-operation of the unit which, if not avoided, might cause the death or serious injury of the operator or other persons.
-  **Caution :** This indicates a potentially hazardous situation arising form the mishandling or mis-operation of the unit which, if not avoided, may cause the minor injury of the operator or other persons and property damage.

 **Warning:** Please install, operate and maintain the sterilizer in accordance with this Instruction Manual. Failure to do so could result in serious injury or damage to the unit.

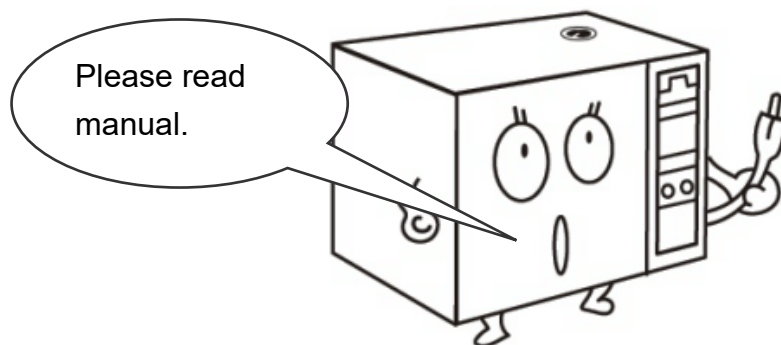


Figure 1

⚠ Warning: DO NOT place alcohol or other flammable items in the sterilizer. An explosion could occur, causing personal injury.

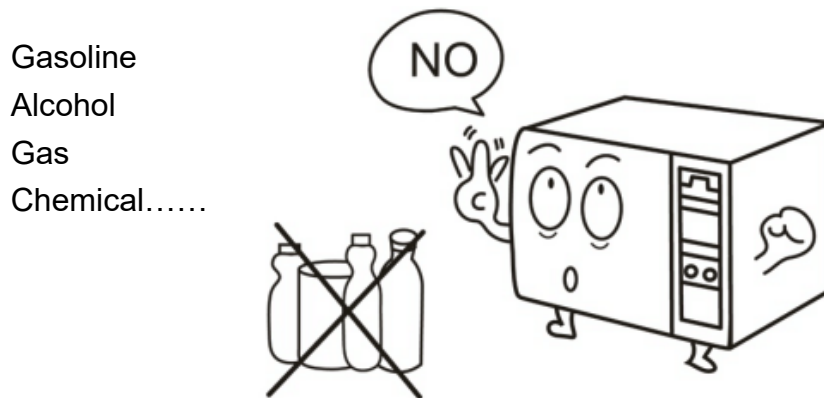


Figure 2

⚠ Warning: A separate (dedicated) circuit is recommended for the sterilizer. The sterilizer should not be connected to an electrical circuit with other appliances or equipment.

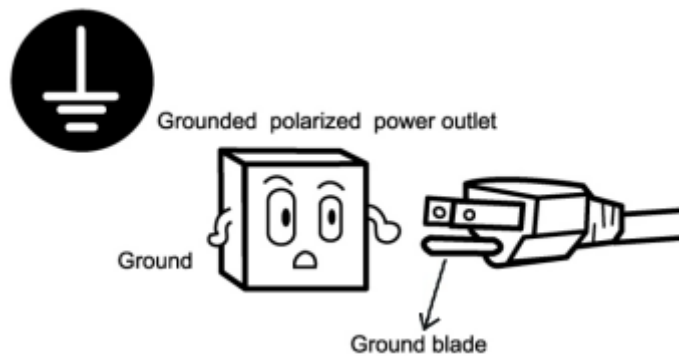


Figure 3

⚠ Warning: Always check the status of the electric wire; unplug the power cord if breakage comes up. Contact your supplier for service support.

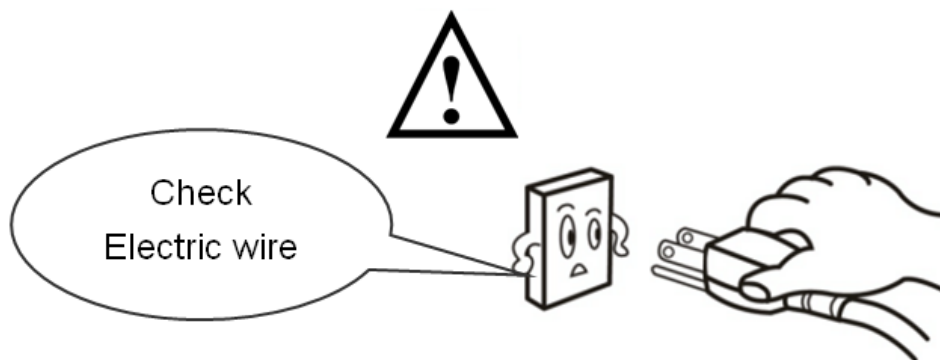


Figure 4

⚠Warning: Children are not allowed to use or play with the unit.

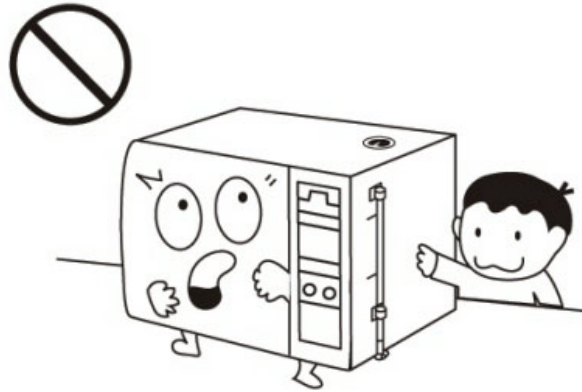


Figure 5

⚠Warning: Do not put your fingers into the gap on the hinged side of the door.

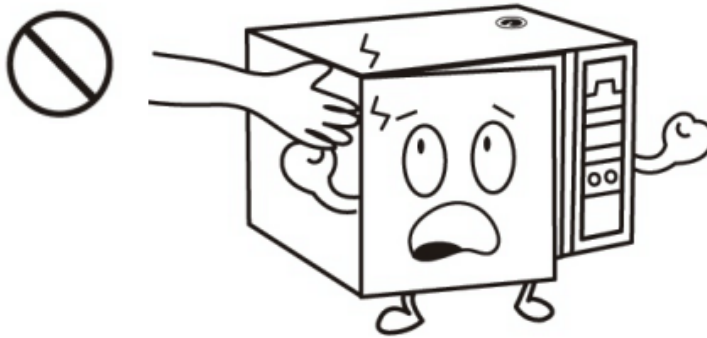


Figure 6

⚠Warning: Always check the pressure gauge before opening the door. DO NOT attempt to open the door if the pressure is not at zero (0).

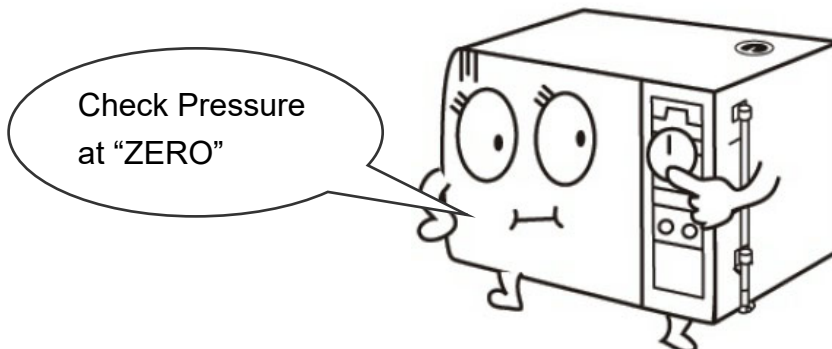


Figure 7

⚠Warning: In an emergency, or before carrying out any maintenance, always disconnect the power cord from the outlet.

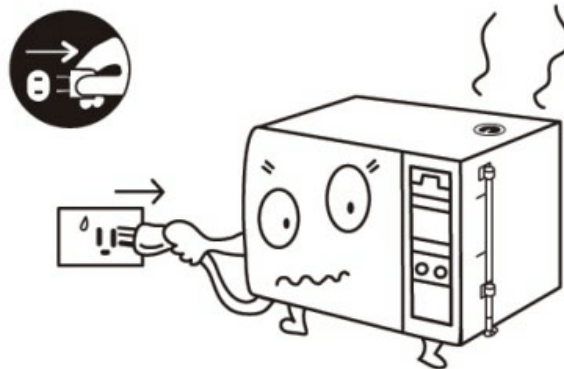


Figure 8

⚠Warning: Use sterilization indicator test strips to check that sterilization has been successful.

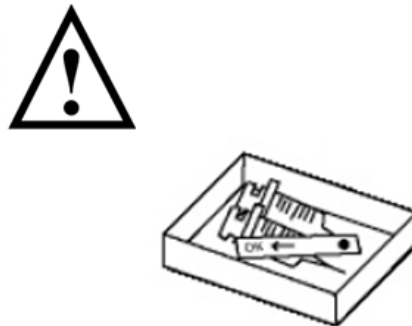



Figure 9

⚠Warning: If the ALARM indicator light  illuminates, the machine is over-pressure or overheated. The sterilizer will shut down automatically. Contact your supplier for service support.

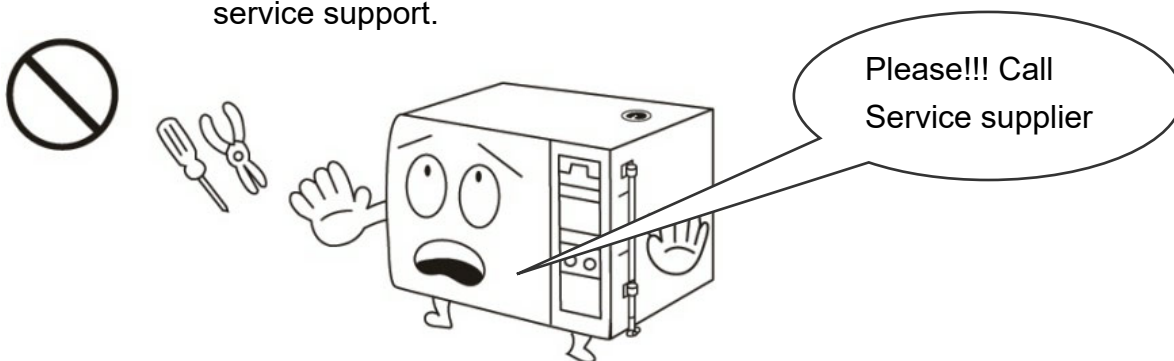


Figure 10

⚠Warning: Use only distilled water. Normal tap water contains minerals, especially chlorides, which have corrosive effects on stainless steel. Failure to use distilled water will invalidate the warranty.

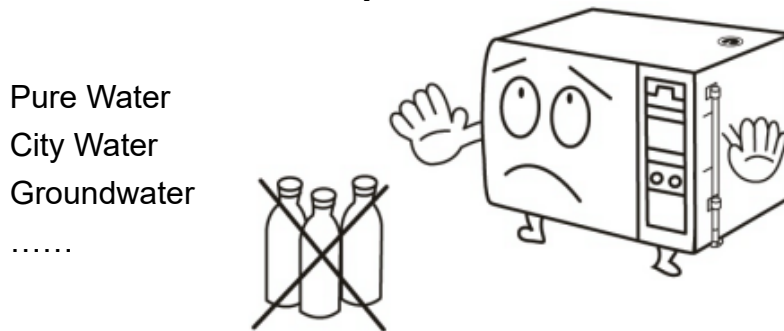


Figure 11

⚠Caution: Do not put objects on the power plug or power cord.

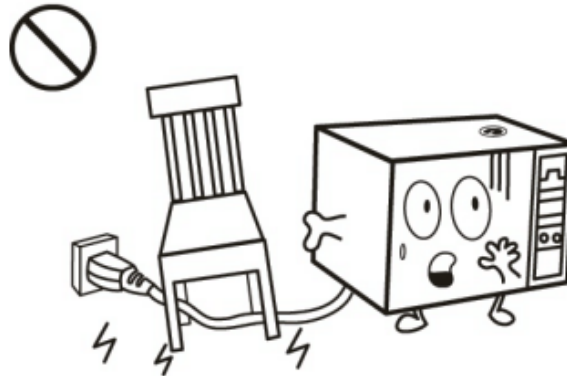


Figure 12

⚠Caution: The outer casing and metal surfaces of the sterilizer will be hot during operation, please do not touch it.



Figure 13

⚠ Caution: Do not place objects on top of the water intake cap.

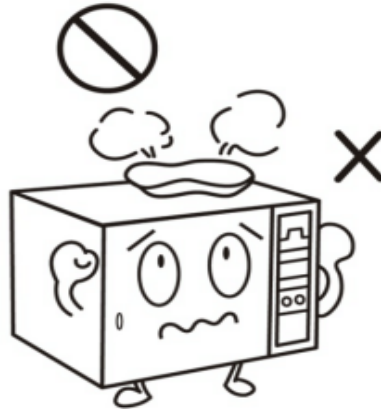


Figure 14

⚠ Caution: Always check the water level in the reservoir before running a sterilization cycle. If the LOW WATER indicator light illuminates, add distilled water. If the water is sufficient, but the LOW WATER indicator light is still illuminating, refer to Troubleshooting.

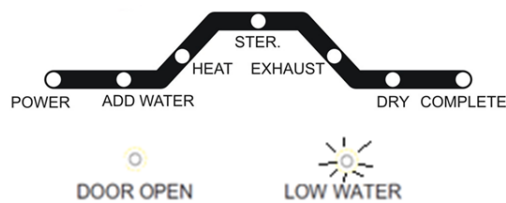


Figure 15

⚠ Caution: Do not overfill the water reservoir. The water level must be maintained between the green Full and Minimum labels on the right hand side of the sterilizer.

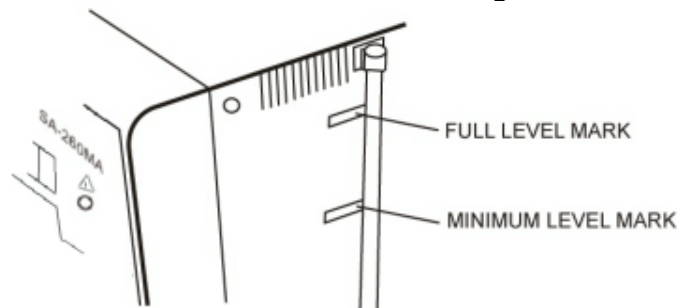


Figure 16

⚠Caution: The ADD WATER indicator light will illuminate during the sterilization cycle. This is part of normal operation and no action on the part of the user is required.



Figure 17

⚠Caution: Steam and hot water will be present when opening the door after a sterilizer cycle. Avoid contact.

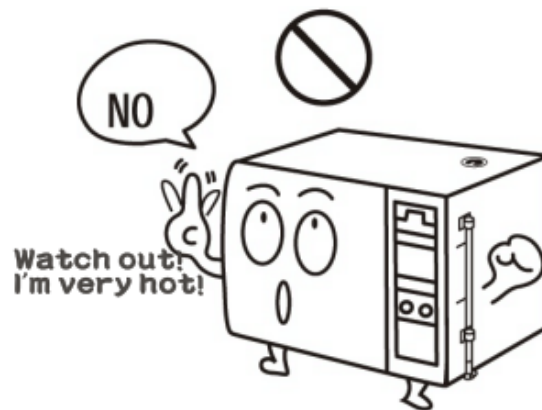


Figure 18

⚠Caution: DO NOT place any objects on the top of the sterilizer.

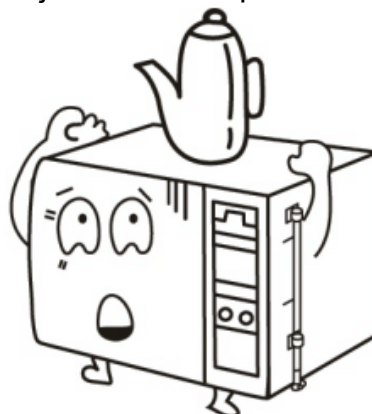


Figure 19

⚠ Caution: Do not tip over the unit or allow it to fall on the power plug.

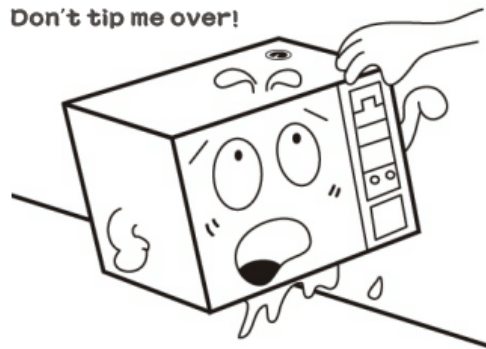


Figure 20

⚠ Caution: It will require at least two (2) or more people to carry the sterilizer to avoid dropping it off by mistake.

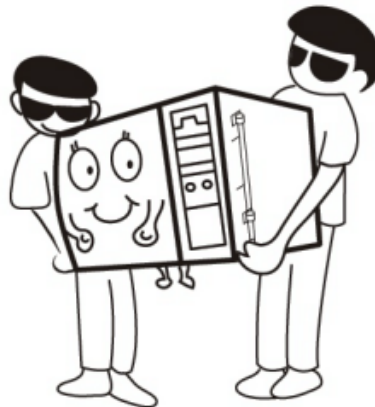


Figure 21

⚠ Caution: Always allow a minimum of 20 min. between each sterilization cycle.

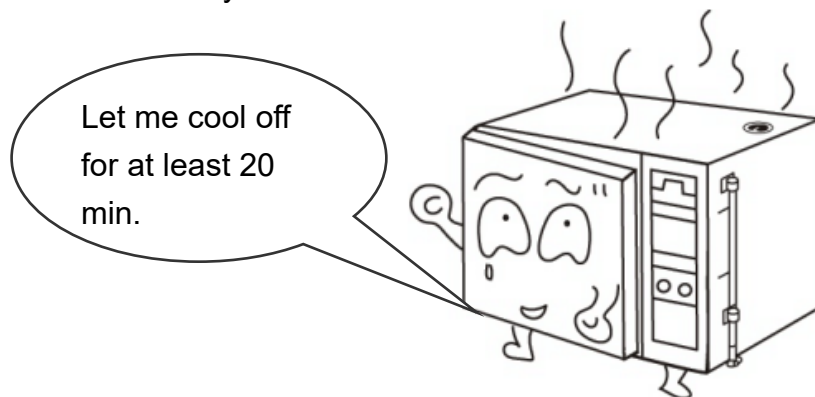


Figure 22

⚠Caution: Please unplug the power cord and drain off water from the reservoir if the sterilizer will not be used regularly.

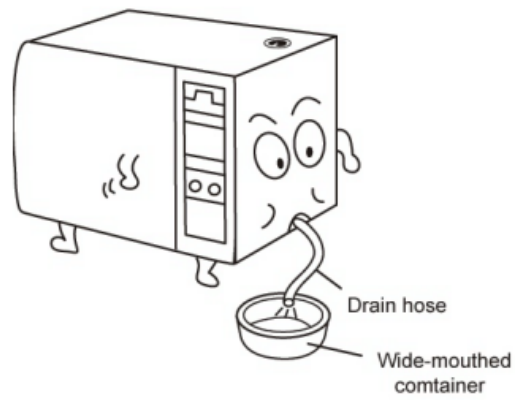







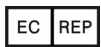





Figure 23

⚠Caution: Always keep the sterilizer clean.



Figure 24

2. Explanation of Safety Symbols and Notes

	Caution, consult instruction manual for use
	Protective earth (ground)
	Alternating Current
	Attention! Hot surface
	Disposal of Electrical & Electronic Equipment (WEEE): This product should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product. (European community only)
	Authorized representative in the European community
	Manufacturer
	Date of manufacture It is a 6-digit number. The first 4 digits represent the year and the last 2 digits represent the month.
	Consult instruction manual for use
	On, connection to the mains
	Off, disconnection from the mains
POWER	Power switch
NOTE	Indicates information that user should pay special attention to.
CAUTION	Indicates correct operating or maintenance procedures in order to prevent damage or destruction of the equipment or other property.
WARNING	Indicates correct operating or maintenance procedures in order to prevent damage or destruction of the equipment or other property.

3. Unpacking



Caution: It will require at least two (2) or more people to carry the sterilizer to avoid dropping it off by mistake.

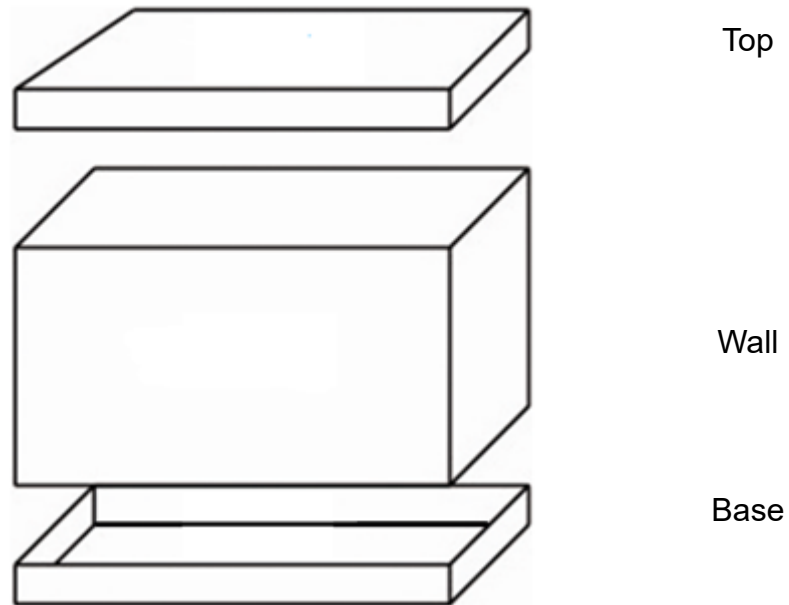


Figure 25 – Unpacking

- A Cut the banding
- B Lift off the top cover of the carton
- C Remove the wall and the foam packaging inserts
- D Carefully lift the sterilizer from the packaging base
- E Check all accessories are present as follows (accessories are packed inside the sterilizer chamber):
 - Instruction Manual × 1
 - Heater Cover × 1
 - Sterilization Box × 1 (Standard)*
 - Tray Set × 1 (Optional) *
 - Tray × 3 (Optional)*
 - Spring Holder/Pouch Rack (Optional)*

*The accessories will be different according to the order request.

Note: We recommend that all packaging material is retained for possible re-use.

Note: For Reduce, Reuse, Recycle information, the packing material is made by corrugating medium-catalogue AA.

4. Installation

4.1 Environment

This equipment has been designed for use in accordance with the International EMC (Electromagnetic Compatibility) Standards. In view of different environments, please follow the instructions given below to eliminate interference, if necessary.

- Move the equipment or rotate its direction;
- Enlarge the space between the equipment and other machines;
- Put the plug into other outlets;
- Please consult with the local distributor or qualified electrician.
- Regarding the environmental temperature for installation, please refer to “9. Specifications”.

4.2 Install the sterilizer



Caution: Please read and follow “5.2” in order to understand the operation of the sterilizer.



Caution: While installation; please make sure that the bearing capacity of installation table is enough to carry the sterilizer. For the weight information of the sterilizer, please refer to “Specifications”.



Caution: Position the sterilizer on a stable bench or work surface, ensuring at least 10 cm clearance between the wall or other pieces of equipment and the sides of the unit for free circulation of air.



Caution: Make sure that the door can be opened freely after installation.



Warning: Do not install or operate the sterilizer in areas where flammable items or volatile substances are used or stored. An explosion could occur, causing personal injury. An installation site with good air circulation is required.

A. Open the water reservoir cap; pour distilled water into the water reservoir as Figure 26.

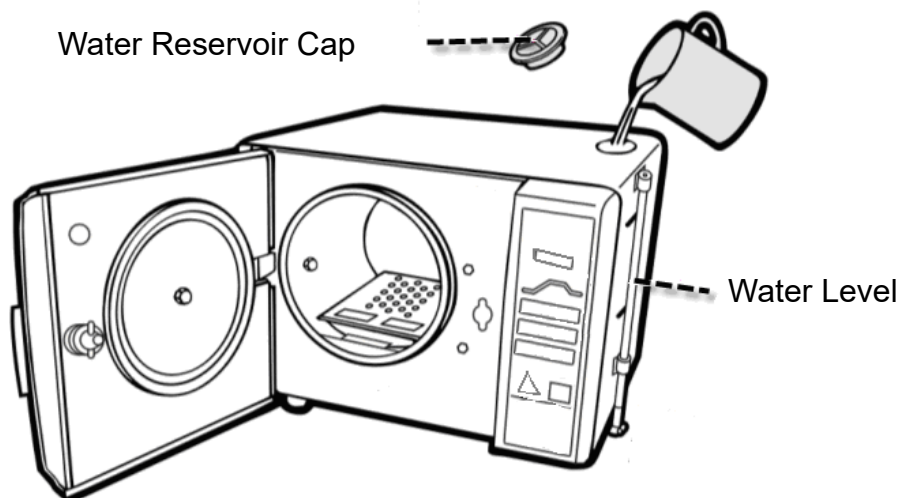


Figure 26

Caution: Please fill Distilled Water Only into the unit. Please do not fill water over the yellow water level mark as Figure 27 and Figure 32.

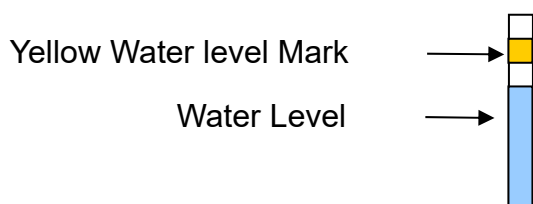


Figure 27

Warning: Do NOT fill water into the reservoir during the sterilization process to avoid overflow. After each sterilization cycle is completed, any remaining water in the chamber will be returned to the reservoir automatically. (*The water will remain in the chamber if Liquid program performed.)

- B. Install the heater cover to the chamber as Figure 28 – Heater Cover (standard accessory)
Ensure the rounded edge is towards the back and the vertical front edge of the cover locates securely into the corresponding slots in the lower part of the chamber opening.

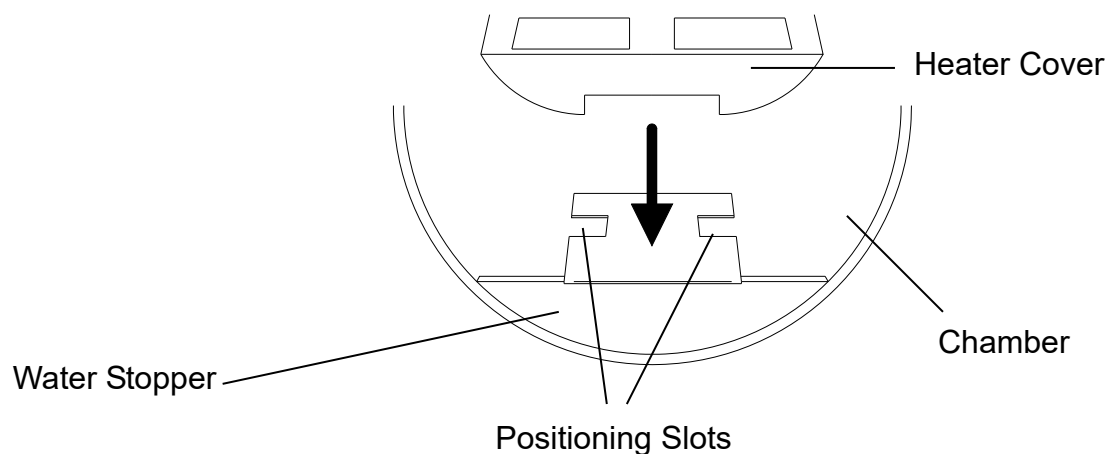


Figure 28 – Heater Cover

- C. Install the Sterilization Box as Figure 29. (standard accessory)

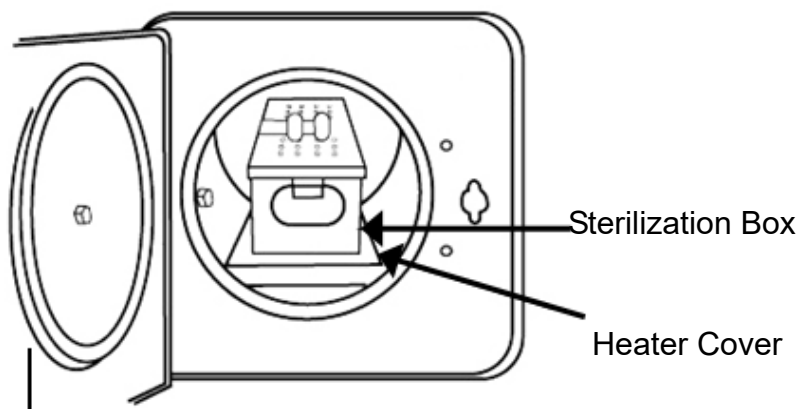


Figure 29 – Sterilization Box

D. Install the tray frame as Figure 30. (optional accessory)

⚠ Caution: The frame should be installed as Figure 30 – Tray Frame below. The indentation of the frame will pass the bushing in the chamber.

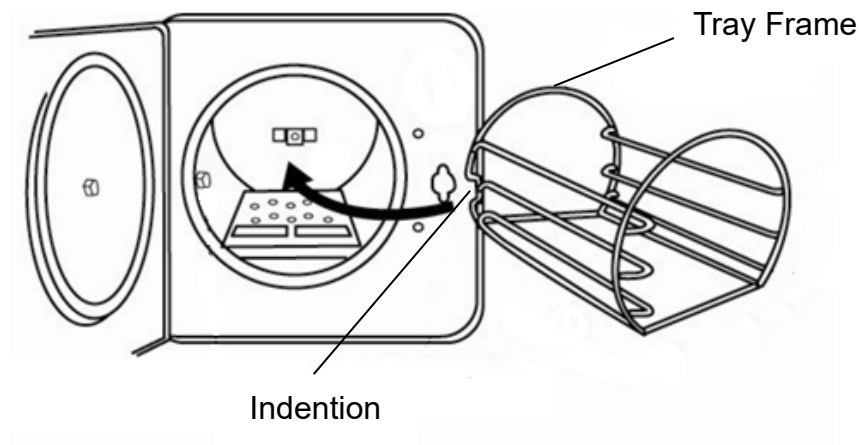


Figure 30 – Tray Frame

E. Install the tray as Figure 31. (optional accessory)

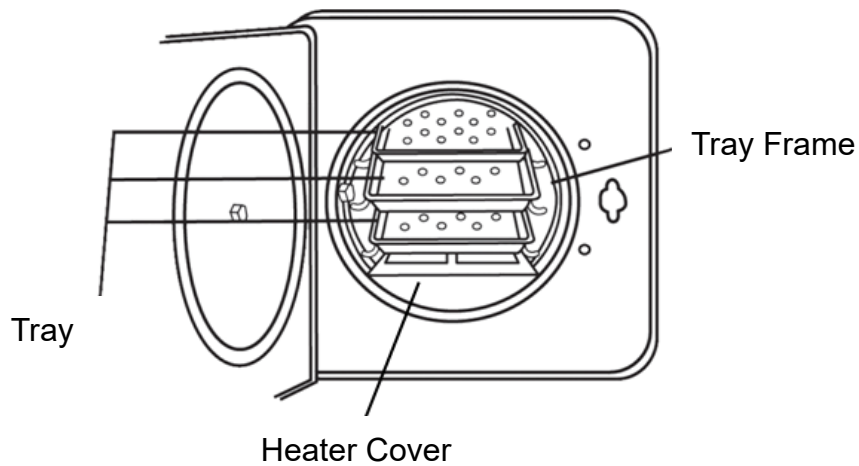


Figure 31 – Tray

F. Close the door and turn the knob clockwise 90° to lock.

- G. Ensure the Power Switch is in OFF “O” position, and then plug the power cord into a separate (dedicated) mains socket.



Warning: A separate (dedicated) socket is required for the sterilizer. Make sure the socket is earthed and can offer the capacity of 15 A / 230V AC.



Warning: The plug is one of the measures of emergency cutoff; please make sure that the plug is accessible after installation.

- H. Press the “POWER” switch to ON “I” position, the power indicator light should illuminate. The “DOOR” indicator light should be off. If the sterilizer does not perform as above-mentioned, please turn off the power and unplug the sterilizer, repeat the steps from 4.2.A to 4.2.F. If the problem still presents, please turn off the power and unplug the sterilizer. Contact the local distributor for help.

5. Introduction

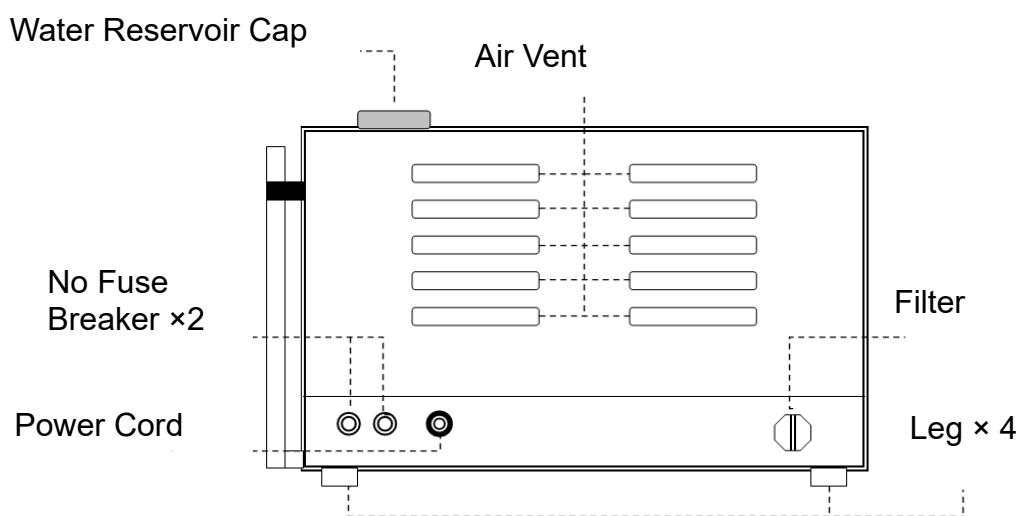
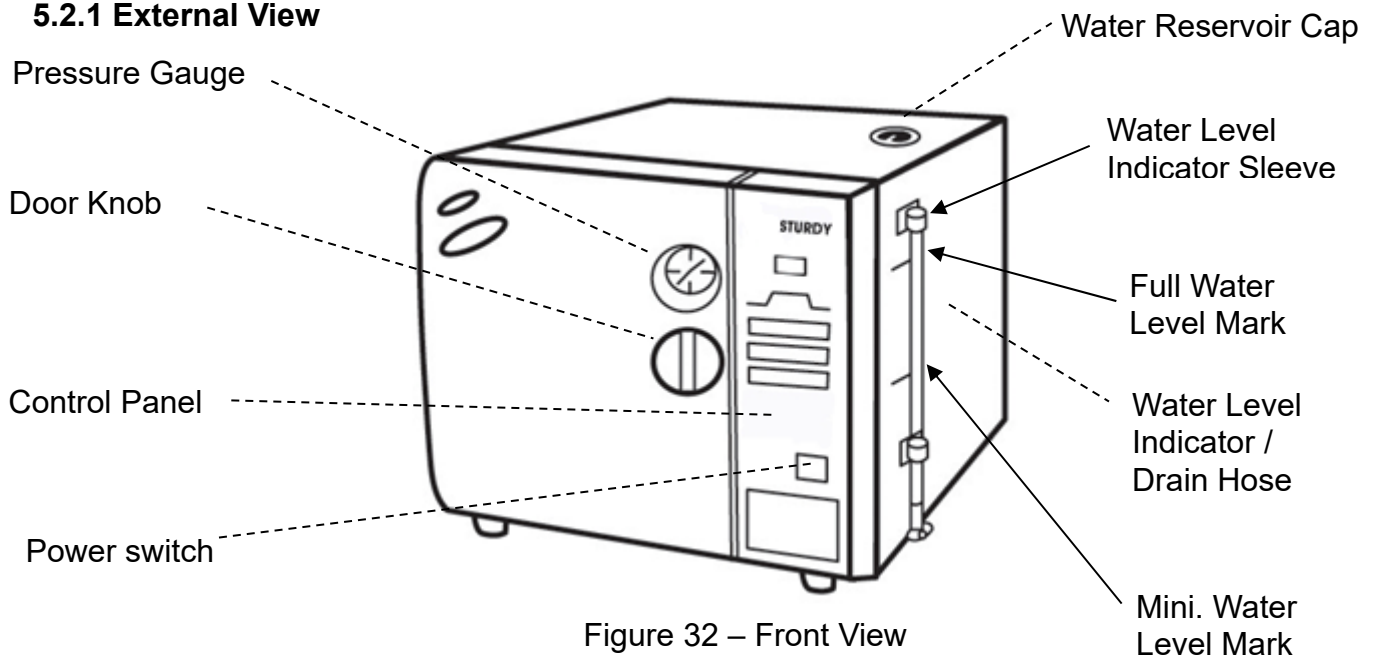
5.1 Intended Use

This product is a tabletop high pressure steam sterilizer which is designed and developed for the sterilization of wrapped and unwrapped items. It can also perform sterilization of liquid which is not for medical purpose*.

(*Liquid, Flash program and recorder are optional by order.)

5.2 Description of the Sterilizer

5.2.1 External View



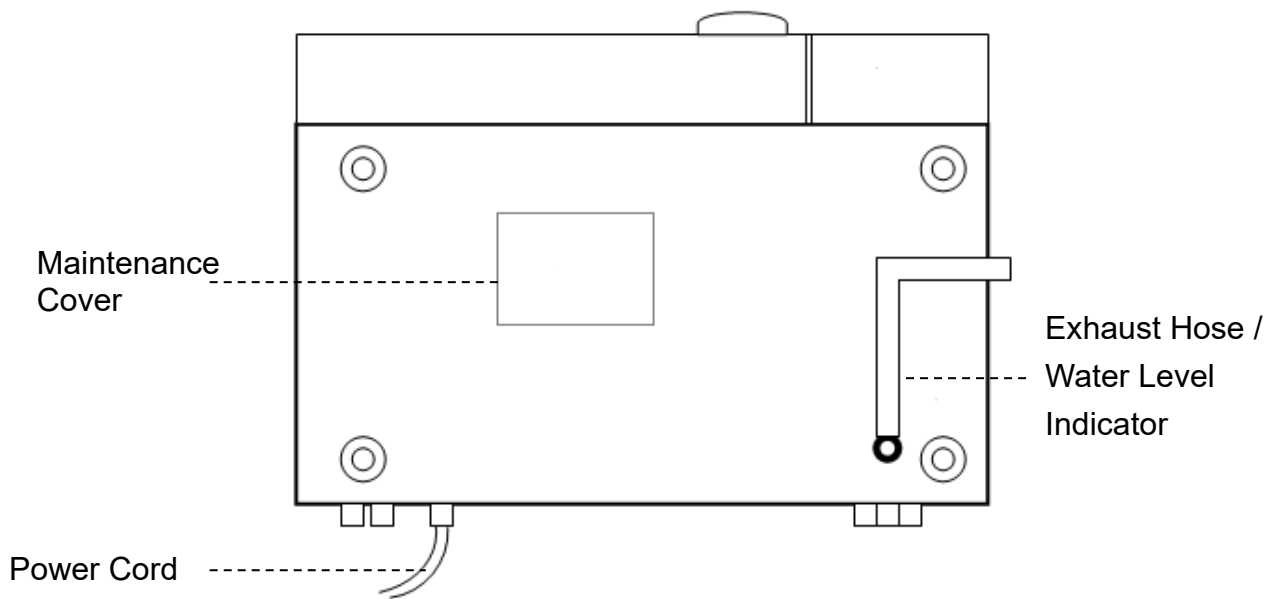


Figure 34 – Bottom View

5.2.2 Internal Configuration

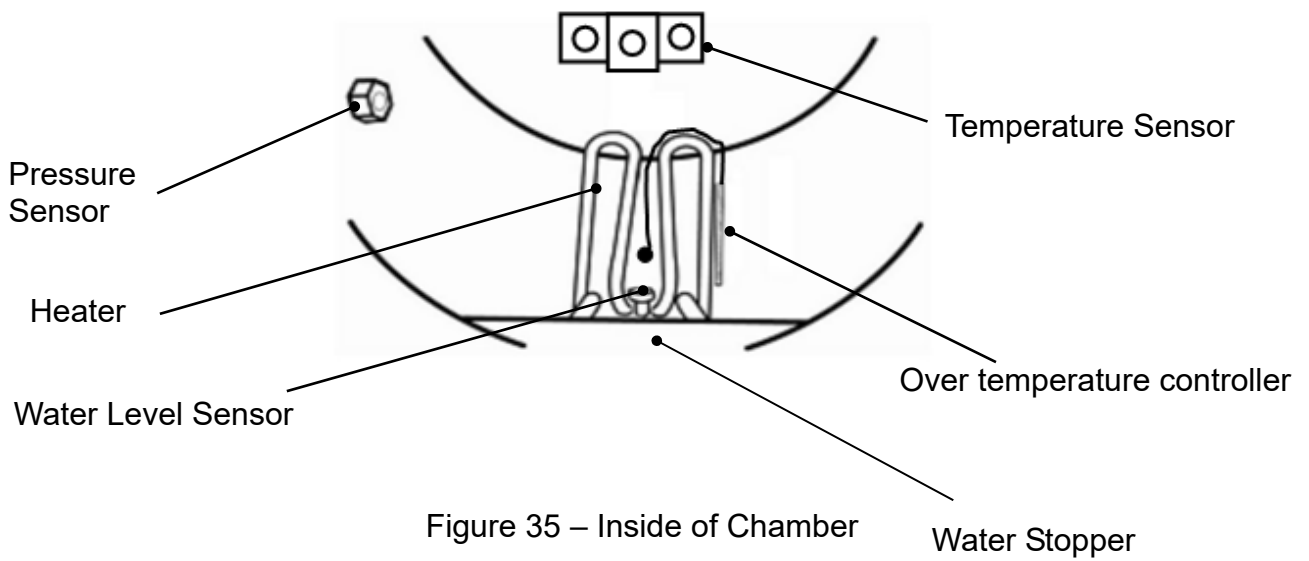


Figure 35 – Inside of Chamber

5.2.3 Control Panel (Re-Dry Program)

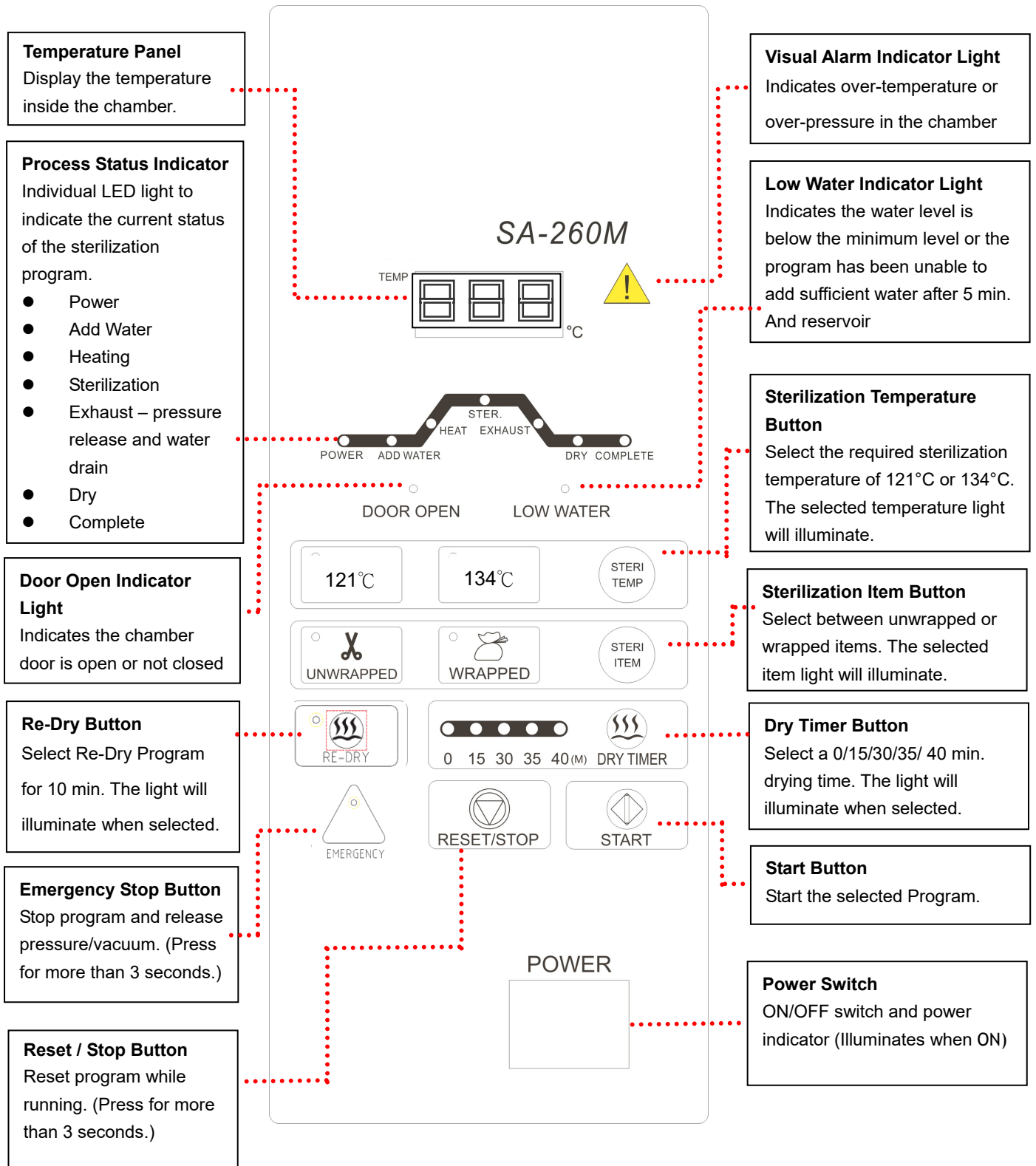


Figure 36 – Control Panel (Re-Dry Program)

5.2.4 Control Panel (Liquid Program) / (Optional by order request)

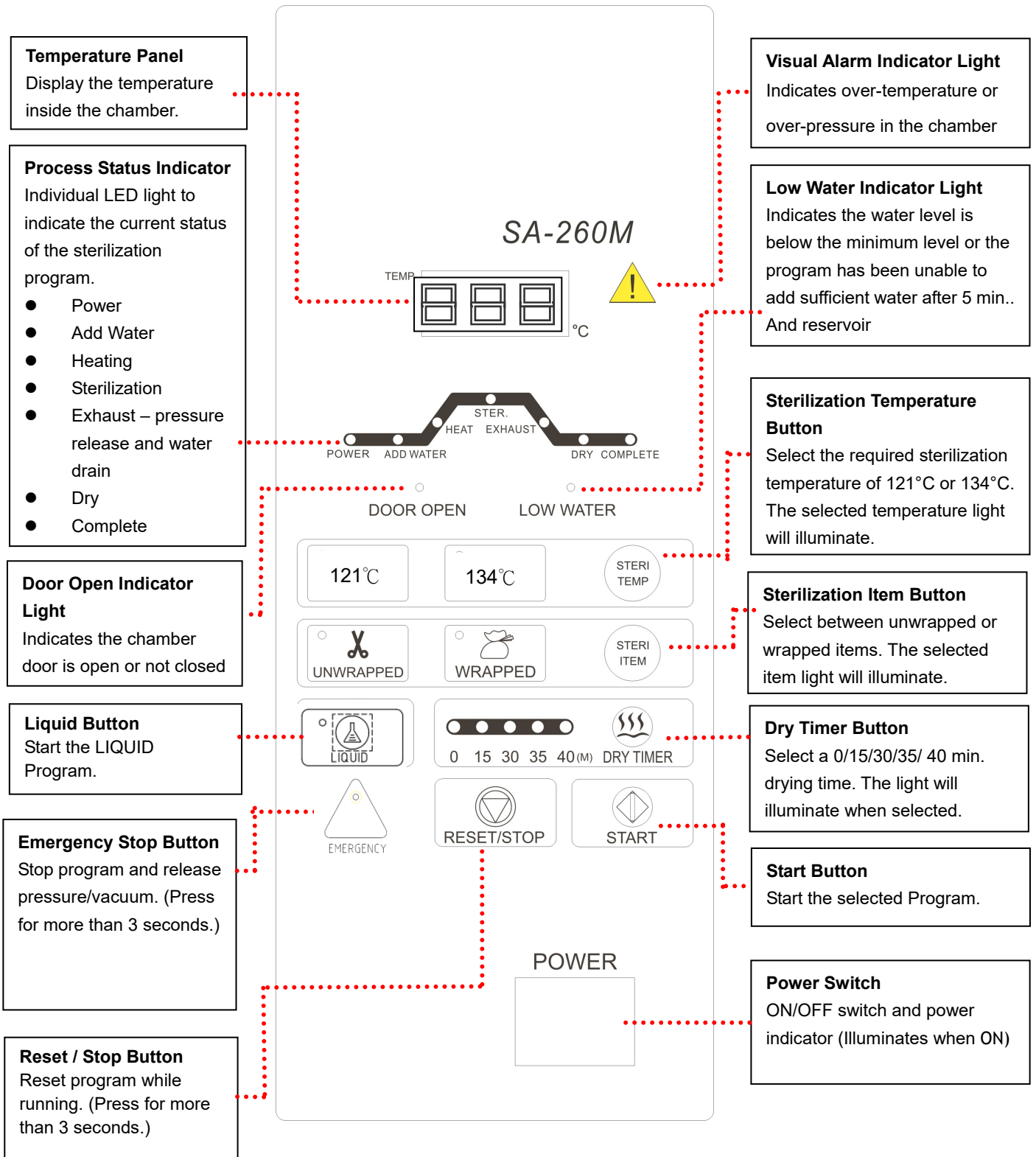


Figure 37 – Control Panel (Liquid Program)

5.2.5 Control Panel (Flash Program) / (Optional by order request)

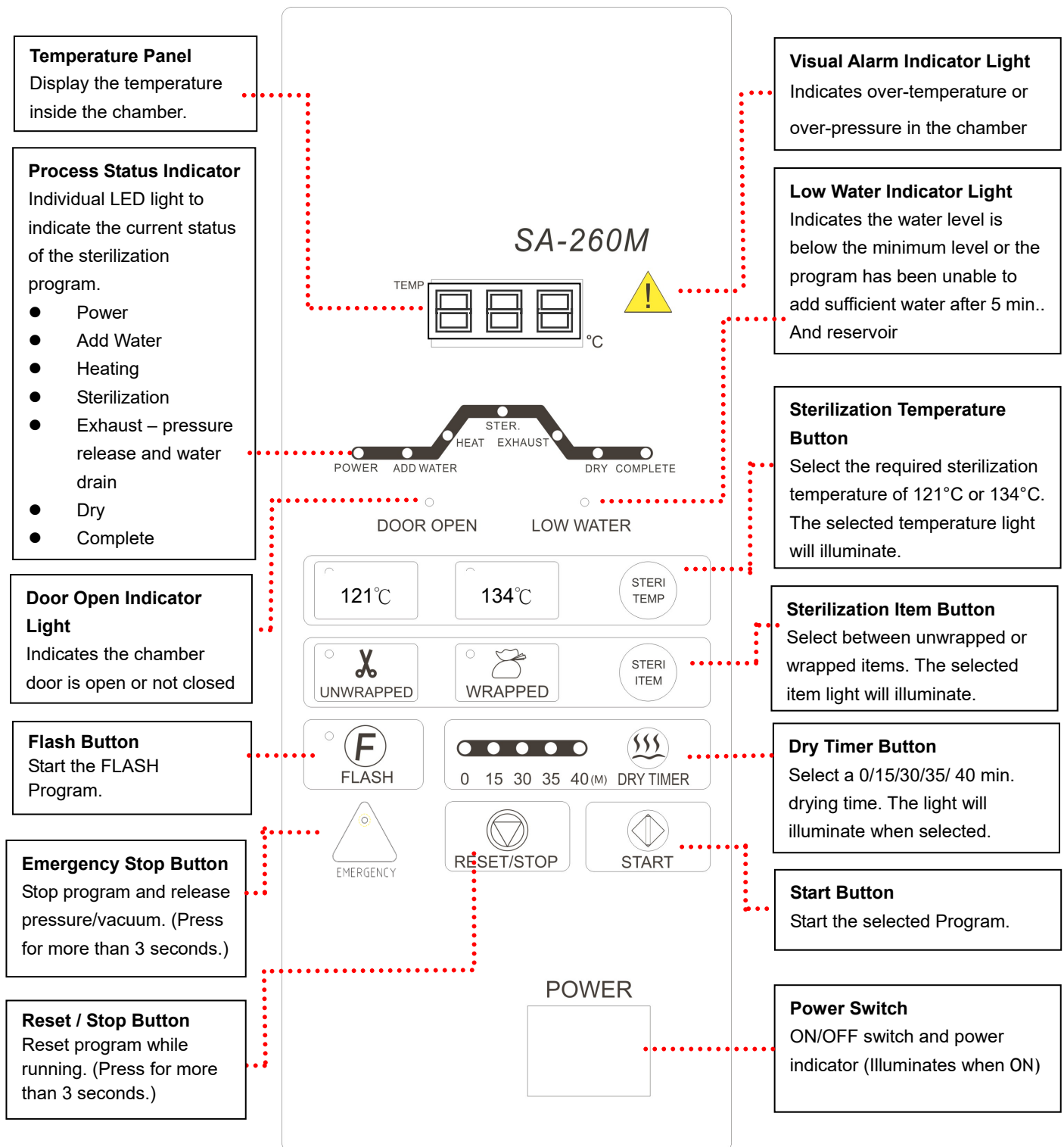
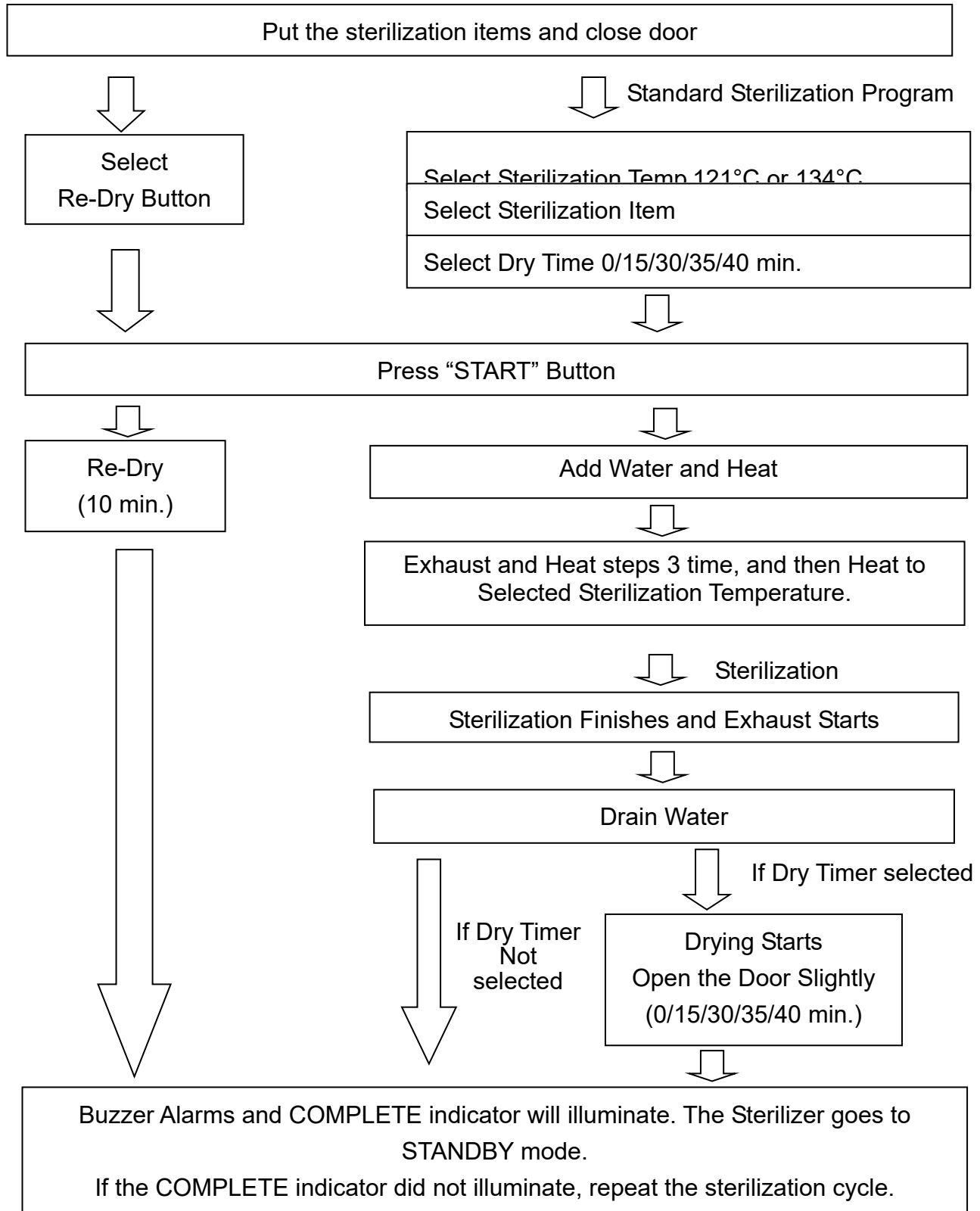


Figure 38 – Control Panel (Flash Program)

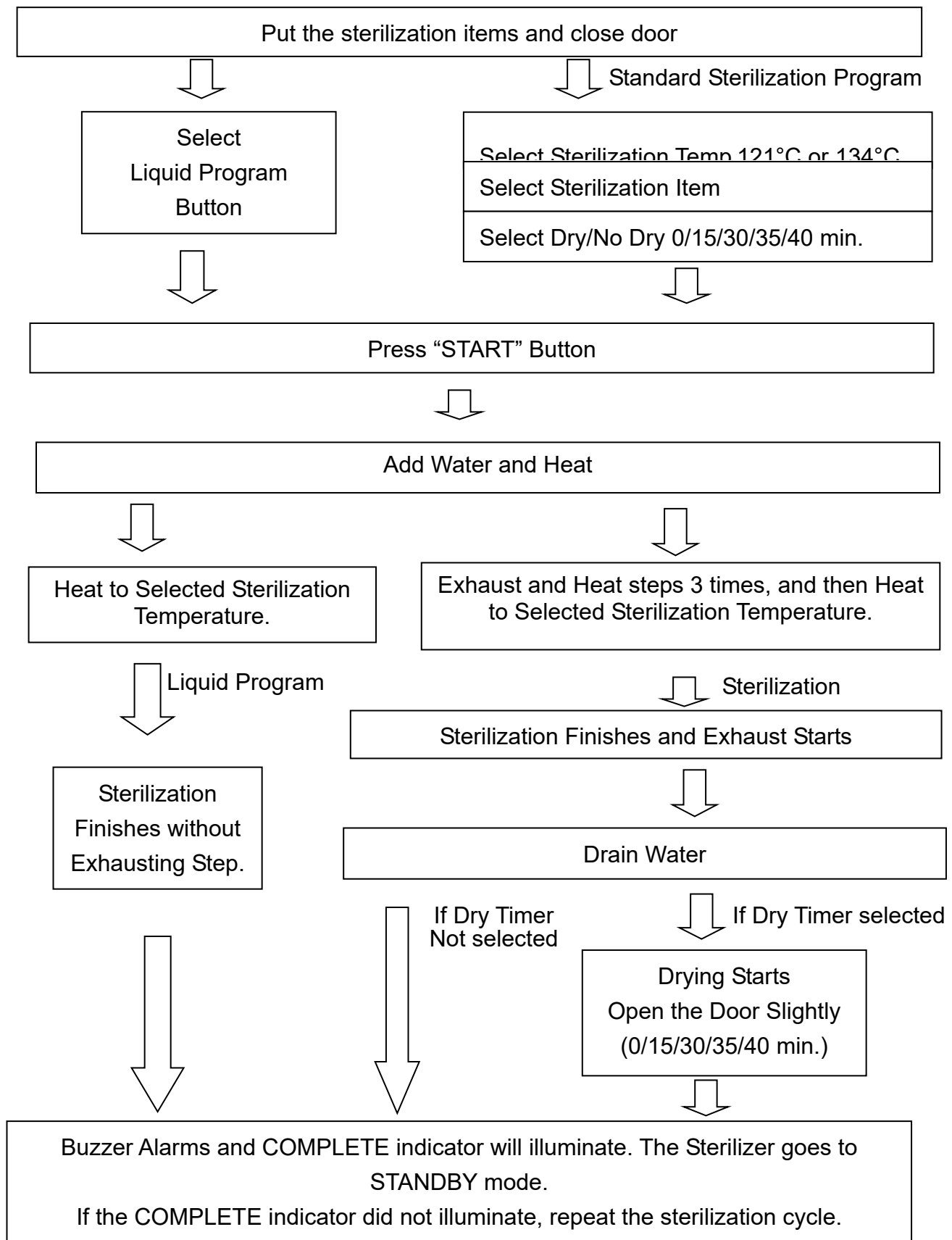
6. Operation

6.1 Operation Overview

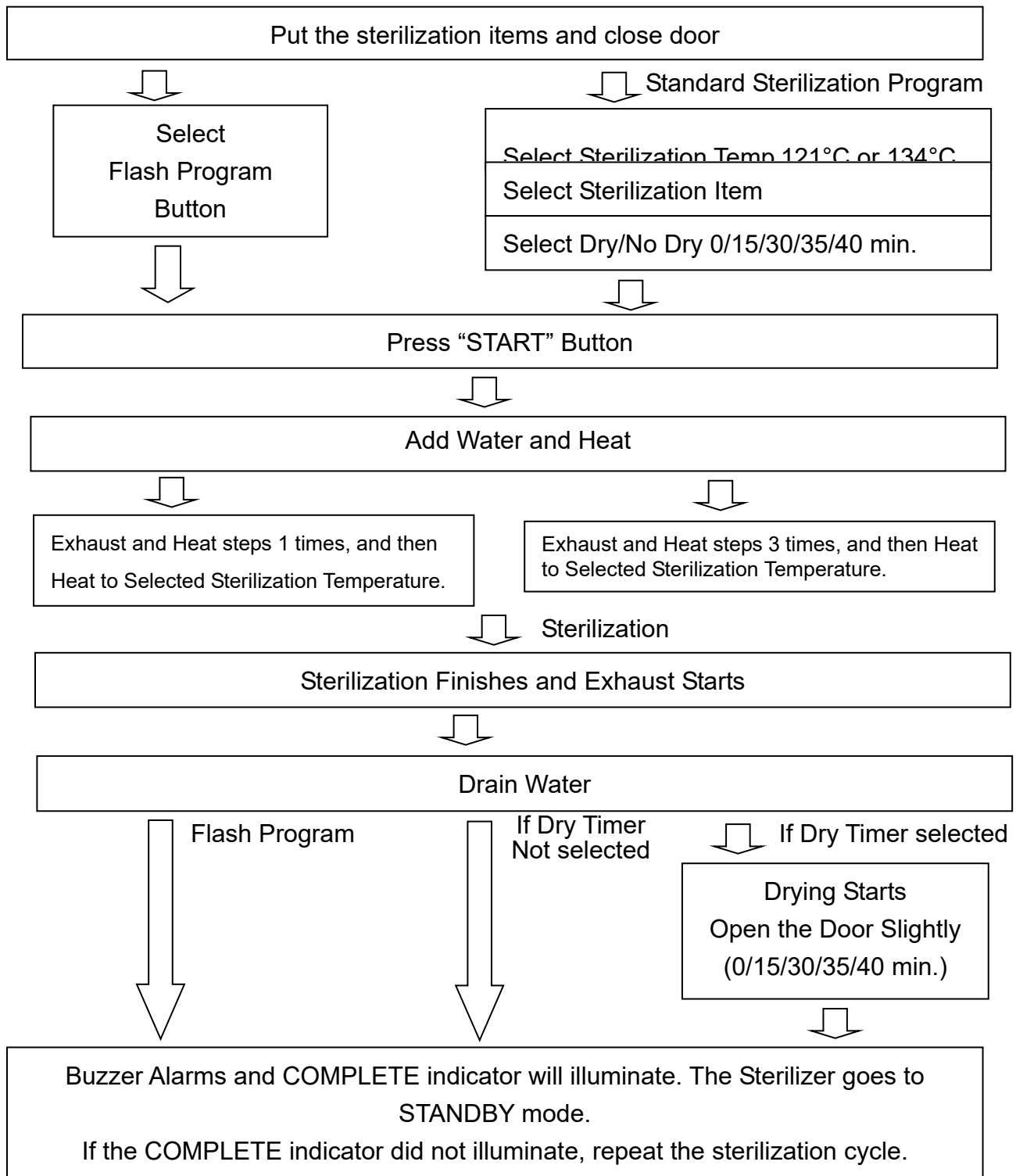
6.1.1 Re-Dry Program



6.1.2 Liquid Program



6.1.3 Flash Program



Warning:

1. Voltage fluctuation AC230±10 V.
2. The Max. 1.5 kg loading (unwrapped, solid load).
3. The water temperature is over 23°C at tank, otherwise cycle time is over 20 minutes only for flash type.

6.2 Prepare Sterilization

- A. Follow “4. Installation” to finish installation first.
- B. Follow “4.2 Install the sterilizer” to make sure the water inside reservoir is sufficient.
- C. Check the Pressure Gauge is reading ZERO, and then open the door by turning the door knob 90° counterclockwise.
- D. Place the items to be sterilized and the sterilization indicator strips (or biological indicator) into the box as required. Remember to open both side windows before placing the box into the sterilizer as Figure 39.

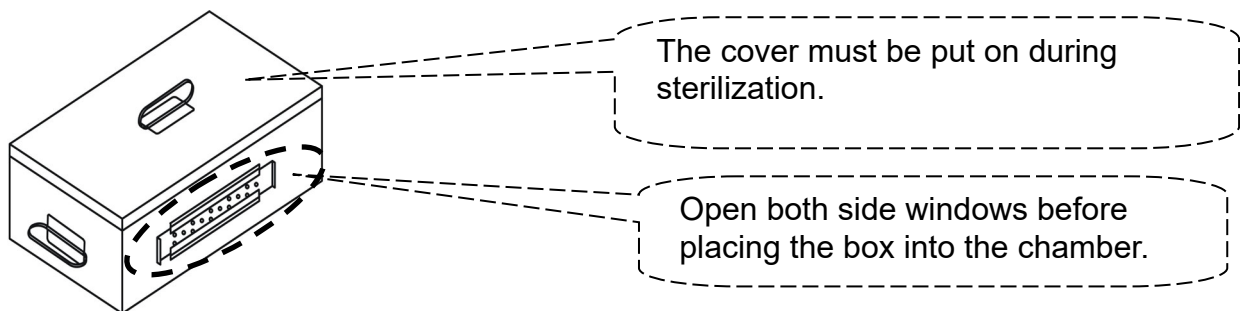


Figure 39

Caution: Before loading, ensure instruments are cleaned and rinsed.

Warning: Refer to “9. Specifications” for the maximum permissible load. Failure to follow these instructions may cause the sterilizer to malfunction and result in an unsuccessful sterilization cycle.

- E. Close the door and turn the knob clockwise 90° to lock.
- F. Press the “POWER” switch to ON “I” position, the power indicator light should illuminate. The “DOOR OPEN” indicator light should be off.

Warning: The door must be closed completely during operation of the unit. If the “DOOR” indicator light illuminates, it means that the door is not closed properly.

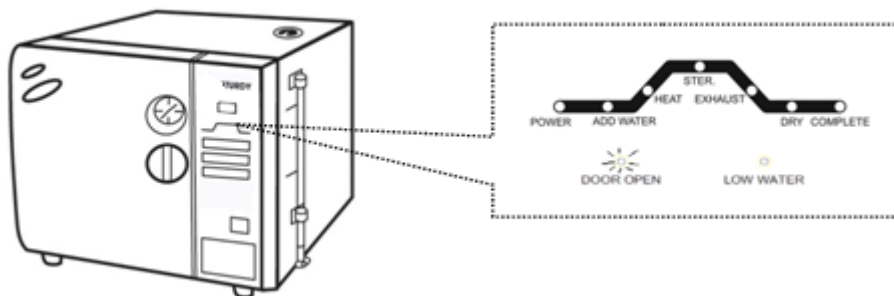


Figure 40

6.3 Standard Sterilization Program

- A. Before start Sterilization program please refer to “6.2 Prepare Sterilization” section.
- B. How to set the Standard Sterilization program

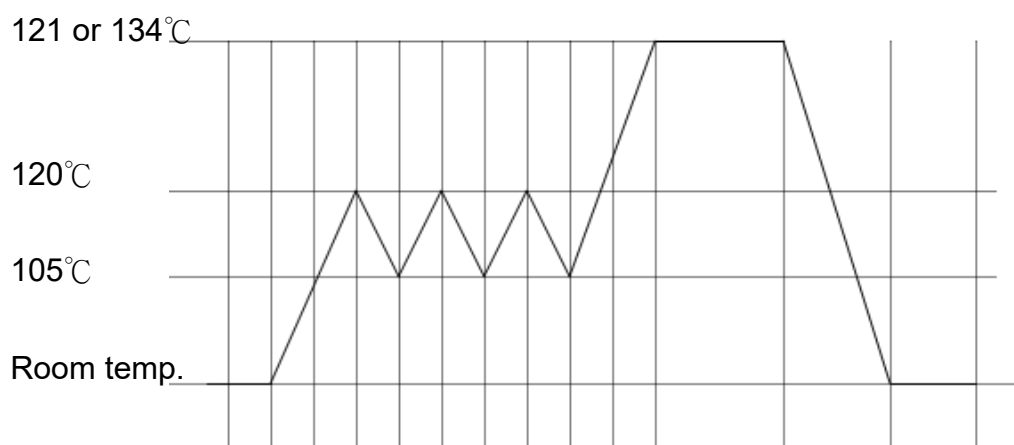






Figure 41

- C. Press “STERI TEMP”  to select 121°C or 134°C
- D. Press “STERI ITEM”  to select unwrapped instruments or wrapped items. The corresponding parameters will be:

	Sterilization Temperature 121°C	Sterilization Temperature 134°C
Unwrapped	22 min.	4 min.
Wrapped	30 min.	15 min.

- E. Press Dry Timer Button  to select a maximum 40 min. drying time. (*If drying is required.)

- A. Press the START button , the setting temperature, duration, and dry time displayed two times on the three-digit display, and then the sterilizer will automatically run through the selected program. The current progress of the sterilization cycle is indicated by the illuminated LED on the Process Status Indicator. (Figure 42)

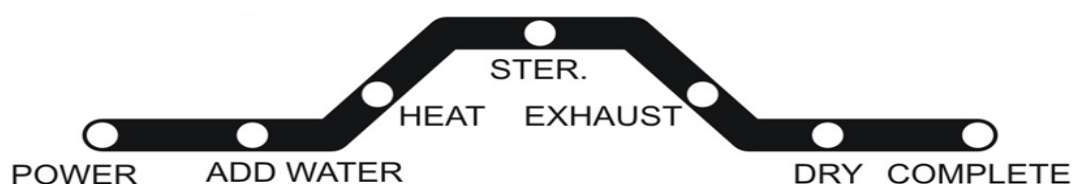


Figure 42



Warning: The buzzer will sound (about 1 minute) after exhaust step is finish. Please Check the Pressure Gauge is reading ZERO before opening the door, and then it will automatically enter dry step.

On completion, the buzzer will sound same time the display will flash. The program has finished when the buzzer STOPS and the COMPLETE indicator light is illuminated on the Process Status Indicator.



Warning: If the COMPLETE indicator light was not lit, the cycle has failed and should be run again.

- B. Open the door and take out the sterilized items. Check the status of the indicators. If failed, repeat the cycle. Consult with the qualified technician for calibration if necessary. Please refer to “8. Troubleshooting”.



Warning: Check the Pressure Gauge is reading ZERO before opening the door.



Warning: Beware of steam when opening door after a sterilization cycle.



Warning: Be careful when removing the sterilized items as the metal surfaces might still be hot. Always wear suitable hand protection to remove the box or use the appropriate aids (tray holder) to lift the trays.



Warning: If using the sterilizer continuously, it's required to have a 20 min. interval between each sterilization cycle to allow the unit to cool.

6.4 Re-Dry Program (exclusive either to liquid or flash functions)

Press Re-Dry  button and the indicator light will illuminate. Then press START button



to run a 10 min. re-dry program. During the re-dry process, the DRY indicator light will flash on the Process Status Indicator.

On completion, the buzzer will sound same time the display will flash. The program has finished when the buzzer STOPS and the COMPLETE indicator light is illuminated on the Process Status Indicator.

6.5 Liquid Program (optional, exclusive either to Re-Dry or Flash function)

- A. Before start Sterilization program please refer to “6.2 Prepare Sterilization” section.
- B. How to set the Liquid program

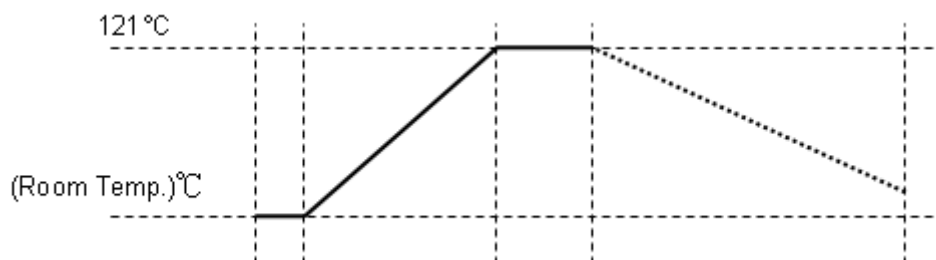




Figure 43



Caution: After the sterilization step finished, the unit will take to exhaust spontaneously. Then the COMPLETE indicator light is illuminated on the Process Status Indicator.

- C. Press  to start “Liquid Program”. The corresponding sterilization time will be:

Sterilization Time	40 min.
Sterilization Temperature	121°C
Dry Time	N/A

- D. Press the START button , the setting temperature, duration, and dry time displayed two times on the three-digit display, and then the sterilizer will automatically run through the selected program. The current progress of the sterilization cycle is indicated by the illuminated LED on the Process Status Indicator. (Figure 44)

Note: The DRY step won't be performed.



Figure 44

On completion, the buzzer will sound same time the display will flash. The program has finished when the buzzer STOPS and the COMPLETE indicator light is illuminated on the Process Status Indicator.



Warning: If the COMPLETE indicator light was not lit, the cycle has failed and should be run again.

E. Open the door and take out the sterilized items.



Warning: Check the Pressure Gauge is reading ZERO before opening the door.



Warning: Beware of steam when opening door after a sterilization cycle.



Warning: Be careful when removing the sterilized items as the metal surfaces might still be hot. Always wear suitable hand protection to remove the box or use the appropriate aids (tray holder) to lift the trays.



Warning: If using the sterilizer continuously, it's required to have a 20 min. interval between each sterilization cycle to allow the unit to cool.



Caution: After the Liquid program, please take out the sterilized items, and then run again the "Normal" program to let the water inside chamber return to the water reservoir.

6.6 Flash Program (optional, exclusive either to Re-Dry or Liquid function)



Caution: The maximum load of the Flash Program is 1.5 kg. for unwrapped or solid.

- A. Before start Sterilization program please refer to “6.2 Prepare Sterilization” section.
- B. How to set the Flash program

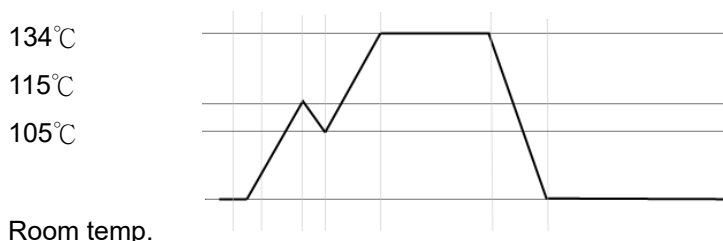



Figure 45

- C. Press  **FLASH** to start “Flash Program”. The corresponding sterilization time will be:

Sterilization Time	4 min.
Sterilization Temperature	134°C
Dry Time	NA



- D. Press the **START** button , the setting temperature, duration, and dry time displayed two times on the three-digit display, and then the sterilizer will automatically run through the selected program. The current progress of the sterilization cycle is indicated by the illuminated LED on the Process Status Indicator. (Figure 46)





Figure 46


On completion, the buzzer will sound at the same time and the temperature panel will flash. The program has finished when the buzzer STOPS and the COMPLETE indicator light is illuminated on the Process Status Indicator.


 **Warning:** If the COMPLETE indicator light was not lit, the cycle has failed and should be run again.

E. Open the door and take out the sterilized items.


 **Warning:** Check the Pressure Gauge is reading ZERO before opening the door.


 **Warning:** Beware of steam when opening door after a sterilization cycle.


 **Warning:** Be careful when removing the sterilized items as the metal surfaces might still be hot. Always wear suitable hand protection to remove the box or use the appropriate aids (tray holder) to lift the trays.

 **Warning:** If using the sterilizer continuously, it's required to have a 20 min. interval between each sterilization cycle to allow the unit to cool.


6.7 Reset / Stop



Press the RESET/STOP Button  3 seconds to suspend the current step of a sterilization program.


Note: You may press the Vacuum / Pressure release Button  to release the chamber pressure.


 **Warning:** Check the Pressure Gauge is reading ZERO before opening the door.

6.8 Emergency Stop

Press the Emergency Stop Button  3 seconds to stop the program and release the pressure/vacuum. The sterilizer will sound to alert, and the Error message E07 will be displayed to notify an emergency operation. Please wait till the pressure gauge is reading ZERO, then

 press the Reset/Stop Button  to stop the error message and also to reset the program.


 **Warning:** The Emergency Stop Button can only be pressed when there's an unusual event or emergency. The sterility of the sterilized items should be verified again.

 **Warning:** Disposal of the items which is sterilized by unfinished cycle should be in accordance with the local laws. Do not handle them as general waste.

Note: If the Emergency Stop Button had been pressed without opening the door, you may require repeating this emergency to release the pressure.

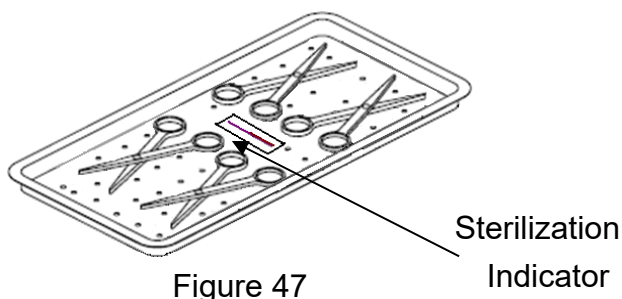
6.9 Placement for items to be sterilized


Please place items to be sterilized on the tray properly in order to have the best drying result.

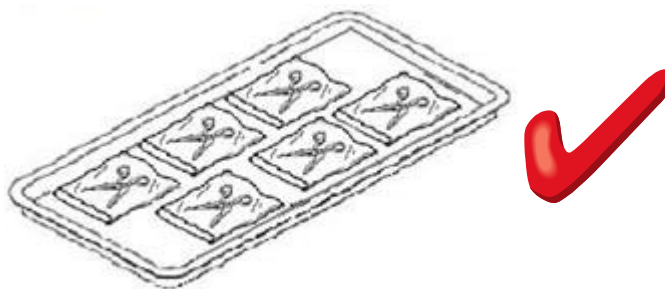
 **Warning:** To sterilize absorbent cotton or woolen, please wrap it with sterilizing pouch to avoid piping clog.

6.10.1 Sterilization for Implements

Place implements on the tray evenly according to Figure 47. Do not pile up nor overlap each implement.



 **Warning:** If implements are packed with sterilizing pouches, please make sure not to pile them up. Follow Figure 48 for correct placement and do not overlap pouches like to Figure 49 ensure the sterilization quality.



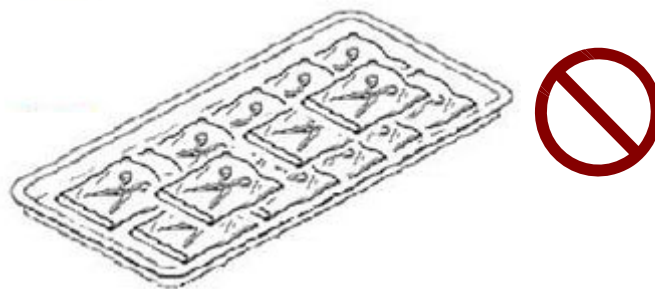


Figure 49

Warning: We suggest using Spring Holder for items with sterilizing pouches to assure sterilization result. Follow Figure 50 or Figure 51 to place each pouch separately. Spring holder is available as an optional accessory.

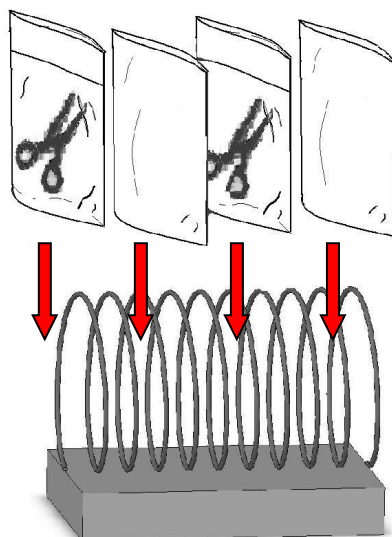


Figure 50

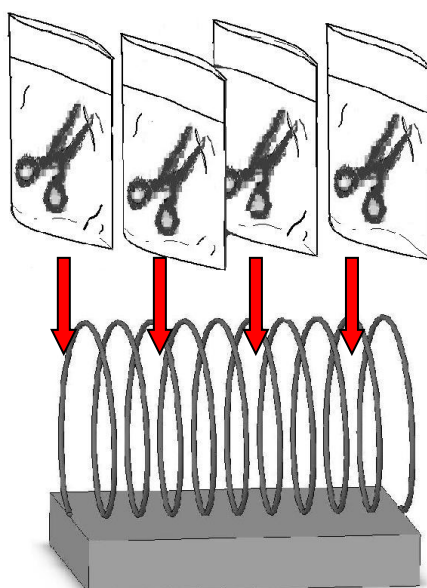


Figure 51

Warning: If implements are packed with sterilizing pouches and placed inside a sterilization box, make sure to display items as Figure 52.

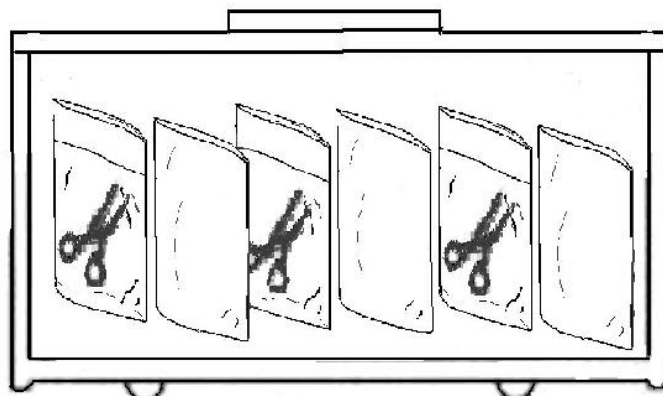


Figure 52

6.10.2 Sterilization for Wrap

Warning: To sterilize absorbent cotton or woolen, please wrap it with a thin towel, covering cloth, linen, or sterilizing pouch to avoid piping clog according to Figure 53.

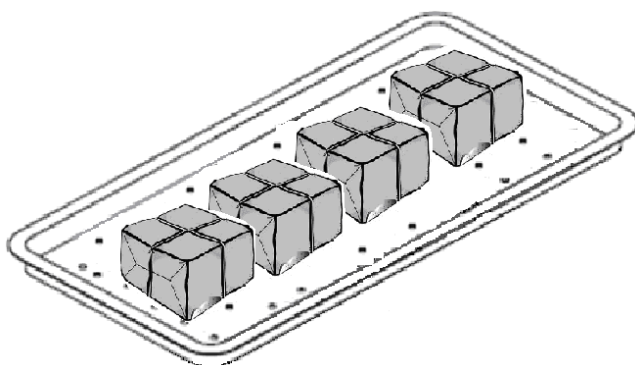


Figure 53


- Place wrap upright on the tray.
- Be careful not to let wrap touching the inner side of chamber.
- Make sure the openings of wraps are perpendicular to the tray in order to improve sterilization performance.
- Arrange openings of wraps toward same direction.
- When place sterilizing pouch on the sterilization box or tray, make sure the medical grade paper is facing upward.

6.10.3 Placement for sterilization box

- Insert chemical indicator into wrap, then place wrap inside the sterilization box.
- Be sure there will be enough space between each wrap for better air flow.
- Make sure to close the cover of sterilization box properly.



Figure 54

 **Warning:** Please follow above Figure 54 and place wrap vertically inside the sterilization box.

7 Test Instructions

7.1 Biological performance of sterilizers

It is commonly used as a challenge organism for sterilization validation studies and periodic check of sterilization cycles. The biological indicator contains spores of the organism on filter paper inside a vial. After sterilizing, the cap is closed, an ampoule of growth medium inside of the vial is crushed and the whole vial is incubated. A color and/or turbidity change indicates the results of the sterilization process; no change indicates that the sterilization conditions were achieved; otherwise the growth of the spores indicates that the sterilization process has not been met.

An example of Raven ProTest is description as following:

1. Please put one or more Raven ProTest units in a horizontal position in the most difficult to sterilize locations and run cycle.



Warning: After sterilization, handle unit (biological indicator) with care.



Warning: Raven ProTest is trademark of Mesa Laboratories, Inc.

1. After the Biological indicator has cooled, crush the media ampoule by squeezing the sides of the plastic tube or by using the tool provide.
2. Place processed unit(s) and one unprocessed (control) unit in a vertical position in an incubator at 58-62°C for steam (*Geobacillus steaothermophilus*) for 24hours.
3. Begin monitoring the incubated units after 12-18hours. Record observations.
4. The control unit should exhibit turbidity and/or color change to or toward yellow.
5. A fail sterilization cycle is indicated by turbidity and/or color change to or toward yellow. A test unit that retains its original color indicates the sterilization parameters have been met.
6. More detail information please asks your dealer of biological test.

8. Maintenance Instructions



Warning: Failure to follow the Maintenance Instructions will adversely affect performance and lifespan of the sterilizer, and may invalidate the warranty.



Warning: Before conducting maintenance, please turn off the sterilizer and disconnect from the power supply. Check the sterilizer has cooled down to room temperature.



Warning: Make sure that pressure gauge is reading ZERO before opening the door.



Caution: Before conducting maintenance, confirm that the chamber is empty without loads.

Correct and regular maintenance is required to optimize the performance of the sterilizer.

Failure to follow the Maintenance Instructions will adversely affect performance and lifespan of the sterilizer.

8.1 Daily

- Clean the external surfaces with soft cloth.
Note: Use only quaternary disinfectants to clean the units. Use of alcohol cleaner containing substantial of alcohol in the formula may damage the faceplate.
- Wipe the inside of the chamber, door and the gasket with a damp, lint-free cloth.
- Check the water level. Top up with distilled water only.
- Ensure the vent holes in the water reservoir cap (Figure 32 – Front View) are not blocked.
- Check the status of the power cord. Call for service if breakage comes up.

8.2 Weekly

- Clean the box, tray frame and trays with detergent, or a non-corrosive stainless steel cleaner and water, using cloth or sponge.
- Replace the distilled water in water reservoir:
Drain water from the water reservoir using Water Level/Drain Hose (Figure 32 – Front View) located on the right side of the unit. Fill clean distilled water.

Clean the filter

Use a wrench to unscrew the filter nut counterclockwise as Figure 55 and Figure 56.



Caution: Place a towel underneath the filter tap to avoid leakage.

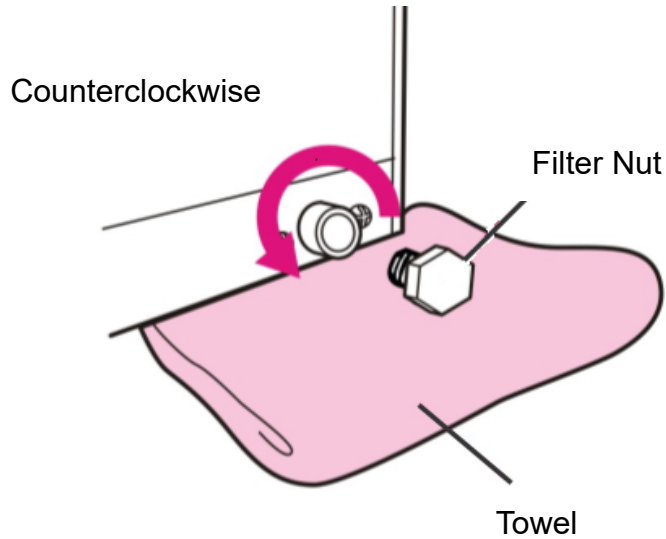


Figure 55

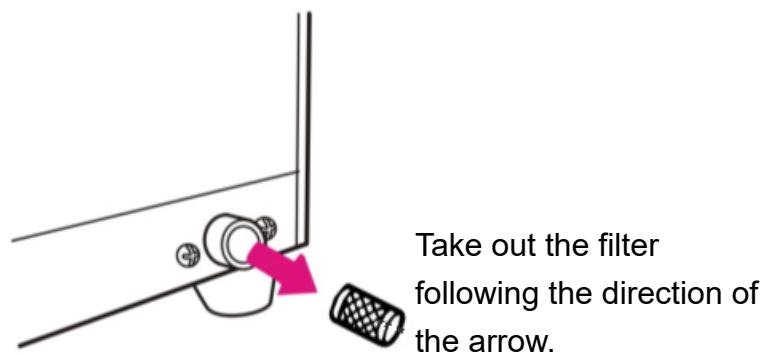


Figure 56

Take out the filter carefully, and flush it with water to clean it. Assemble it back as Figure 57.

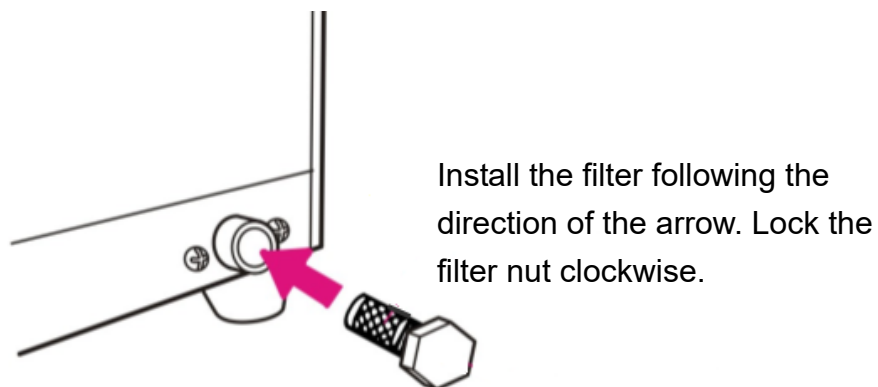


Figure 57

8.3 Monthly

- Use the non-corrosive cleaner and stiff bristled brush or sponge to clean the water level sensor at the rear of the chamber as Figure 58.

⚠ Caution: Clean the dirt off from the sides of the sensor is more important than the tip. Use a damp cloth to wipe the surface after cleaning.

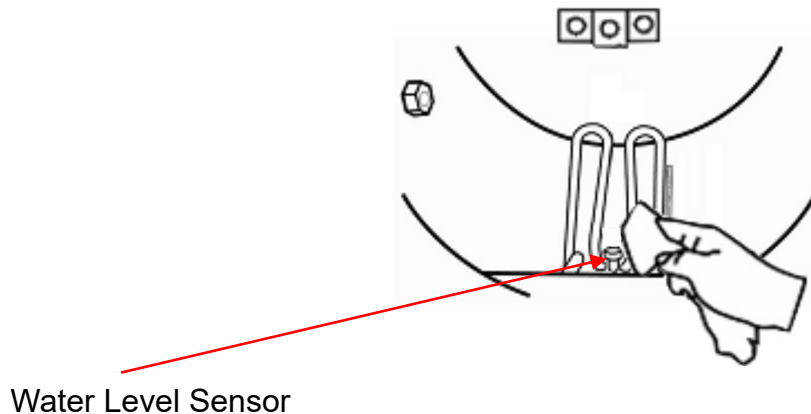


Figure 58

- Clean the chamber and piping system with “CHAM-MATE” following the instructions on the sachet.
- Check the safety valve

Turn off the power and unplug the sterilizer. Remove the water reservoir cap as Figure 59. Use a screw driver to pull the metal ring of the safety valve for approx. 3 seconds; then release. Perform the check 3 times. Put the water reservoir cover back.

⚠ Warning: If excessive force is required to pull the safety valve, it must be replaced. Call for service.

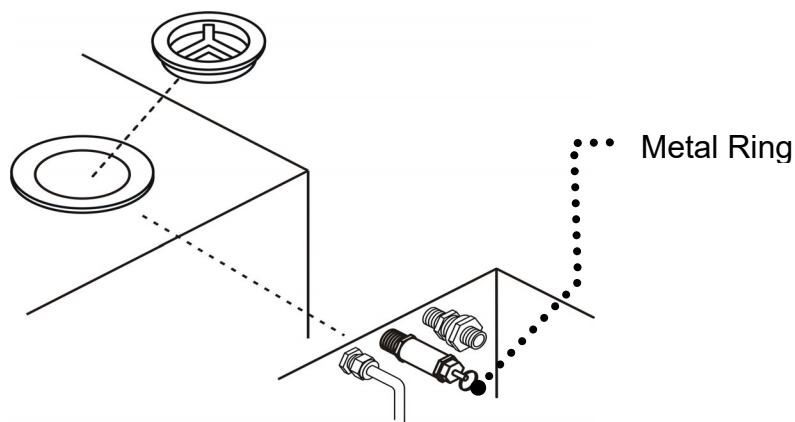


Figure 59

8.4 Annually



Caution: An annual maintenance service by a trained engineer is necessary. Contact your distributor for details. The following maintenance instructions are for your reference only.

- Calibrate the temperature during sterilization process. (Use biological indicators to test the validity of sterilization)
- Check if there's any leakage of the piping.
- Check if the Process Status Indicator lights are functioning normally.
- Check the working status of steam trap, safety valve, and heater.
- Check if the silicone door gasket is chapped or worn. Silicone door gaskets are consumable parts, replace the silicone door gasket every year is recommended.

8.4.1 SA-260M

How to replace the silicone door gasket:

1. Remove the old gasket from the door, and then take out the gasket o-ring from the gasket. Install the gasket o-ring to the new gasket as Figure 60.

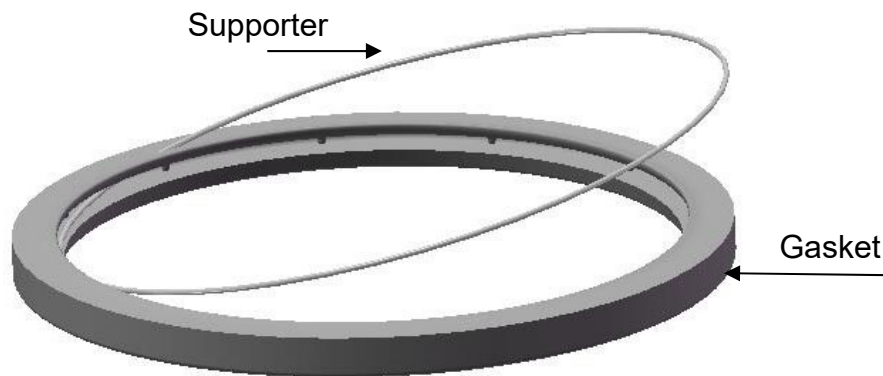


Figure 60

2. Check if the supporter is installed into the gasket completely as Figure 61.



Figure 61

3. Install the gasket with the supporter inside to the door groove. Press the gasket into the door groove evenly as Figure 62. Take notice of the installation direction while pressing the gasket into the groove as the gasket is designed with a trapezoidal section. Refer to
- 4.
5. Figure 63 for the correct direction.

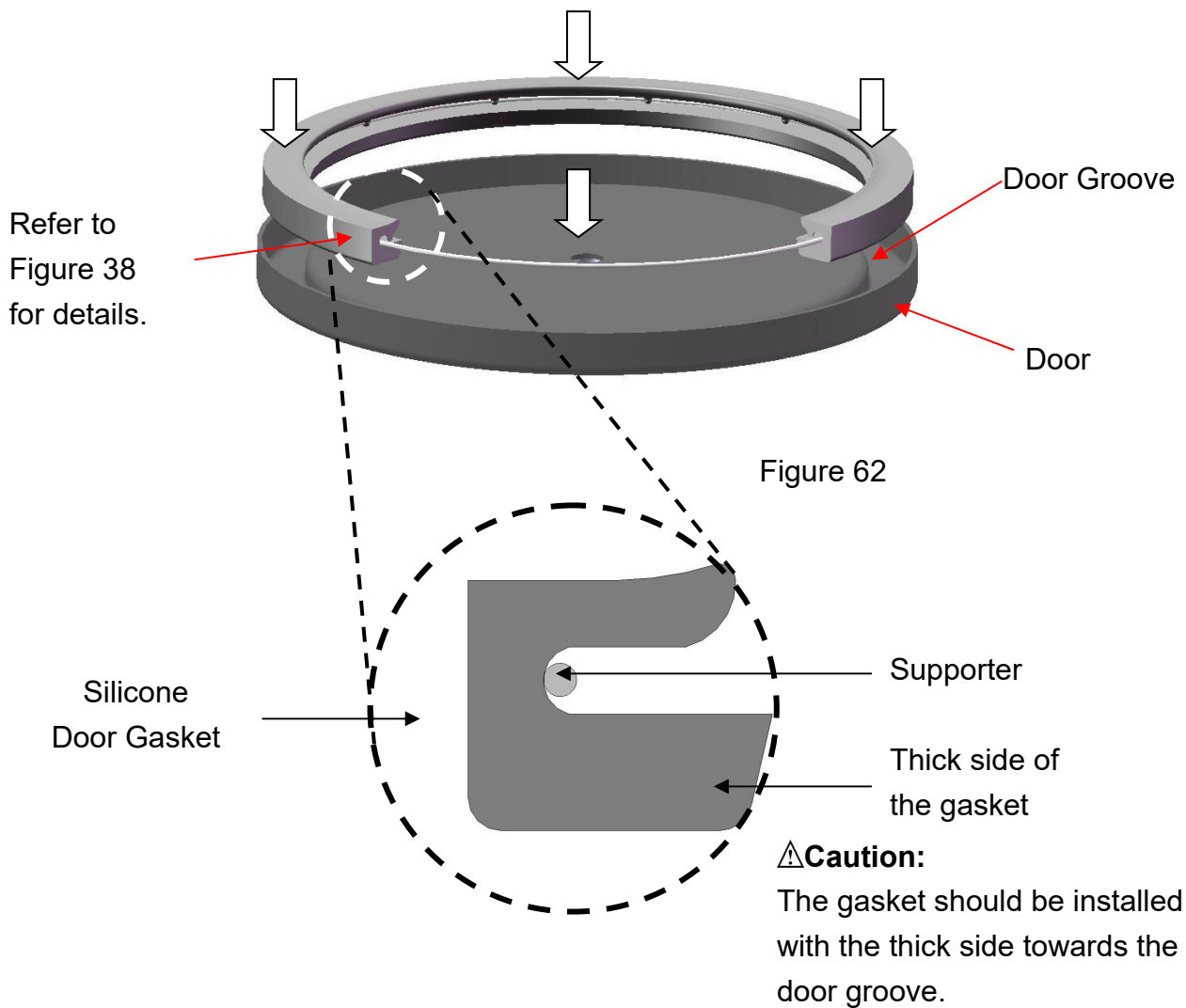


Figure 63

⚠ Caution: The old gasket should be disposed in accordance with the local laws.

8.4.2 SA-230M

How to replace the silicone door gasket:

Install the gasket to the door groove by using a non-sharp tool to push the gasket into the door groove in the direction of clockwise or counter-clockwise as shown in Figure 64.

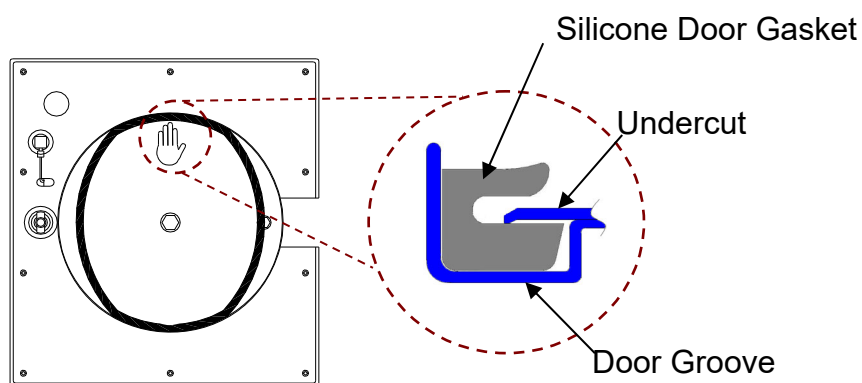


Figure 64



Caution: The old gasket should be disposed in accordance with the local laws.

9. Troubleshooting

9.1 Symptoms

Problem	Possible Cause	Solution
Power indicator isn't illuminated	The main cable is unplugged or the socket switch is off.	Plug in the sterilizer and turn on the socket switch.
	Forget to turn on the switch.	Press the Power switch to ON "I" position.
	No Fuse Breaker tripped.	Wait till the sterilizer cool down the room temperature. Press the buttons of two No Fuse Breakers on rear of unit to reset.
Low water indicator light ON and buzzer sounds	Insufficient water inside the water reservoir	Follow "4.2 " to refill distilled water.
	Water level sensor inside chamber	Follow "7.3 Monthly" maintenance to clean the sensor.
	Filter blocked	Follow "7.2 Weekly" maintenance to clean the filter.
	Water level sensor inside water reservoir	Contact local distributor for service.
Steam leaks from the door	Dirty or worn silicone door gasket	Clean the silicone door gasket. If the silicone door gasket was used over one (1) year, please follow "7.4 Annually" maintenance to replace it.
Door cannot be opened	Pressure persists inside chamber	Follow "6.8" to press the Vacuum Release Button" and release the pressure. Contact local distributor for service if problem persists.
Water inside chamber doesn't automatically return to the reservoir	1. Piping system of filter blocked.	1. Contact local distributor for service.
	2. Faulty exhaust solenoid valve.	2. Contact local distributor for service.
	3. Liquid program performed. (*Optional program)	3. Run "STANDARD" program to let the water inside chamber return to the water reservoir.
Excessive force is required to pull the safety valve	1. Do not use the tool.	1. Please use the tool (e.g. screw driver or pliers) to pull the ring.
	2. Faulty safety valve	2. Contact local distributor for service.



Caution: Contact local distributor for service anytime if encountered other any other problems. Please do not attempt to disassemble the sterilizer by yourself Failure to do so could result in serious injury or damage to the unit.

9.2 List of Error Codes (for autoclave)

ERROR CODE	Description
E01	K-type sensor in chamber is out of connection (Emergency light illuminates)
E02	The door is not closed completely (Door light illuminates)
E03	Sterilization temperature over than 137°C (Emergency light illuminates)
E04	The water tank is in LOW WATER condition (LOW-WATER light illuminates)
E05	Water in the chamber is not enough in first 5 min. during add-water step.
E06	Sterilization temperature down under than 2°C over 5 min. in sterilization step (EMERGENCY light illuminates)
E07	EMERGENCY water/pressure exhaust (EMERGENCY light illuminates)

10. Specifications

Model	SA-230M	SA-260M
Chamber Capacity (L)	16	24
Maximum Instrument Length (mm)	300	350
Maximum Load (un-pouched) (g)	5,000	7,000 1500 (For Flash type)
Maximum Load (pouched) (g)	1,000	1,300
External Dimensions (mm)	594 (D) × 522 (W) × 410 (H)	655 (D) × 533 (W) × 442 (H)
Chamber Size (mm)	230 Diameter × 410 Depth	260 Diameter × 450 Depth
Gross Weight (kg)	44	54
Voltage/Wattage (Heater)	1) 230V AC, 50/60Hz 1400W	1) 230V AC, 50/60Hz 1800W (Normal type) 2) 230V AC, 50/60Hz 2300W (For Flash type)
Fuses	1) 10A × 2, No Fuse Breaker	1) 15A × 2, No Fuse Breaker (Normal type) 2) 13A × 2, No Fuse Breaker (For Flash type)
Water Reservoir Capacity (ml)	4200	
Water Capacity per Cycle (ml)	250	300
Sterilization Temperature (°C)	121 / 134	
Working Environment	<ul style="list-style-type: none"> ● Indoor use; ● Under 1,000m (altitude); ● Temperature 5°C to 40°C; ● Relative Humidity 80%RH@31°C to Relative Humidity 50%RH@40°C; ● Voltage fluctuation ±10 %; ● Transient overvoltages category II; ● Pollution degree 2 ● Voltage fluctuation AC230±10 V, only for flash type. ● The water temperature is over 23°C at tank, otherwise cycle time is over 20 minutes only for flash type. 	
Transportation Conditions	-10°C to 70°C, 10%RH to 90%RH	
Storage Conditions	-10°C to 50°C, 10%RH - 70%RH	
Over Pressure Protection	Safety valve 2.6 kgf/cm ² (2.55 bar)	
Over Pressure Indication	Pressure protection switch with warning LED	
Over Temperature Indication	Independent temperature protection device with warning LED	
Water Level Indication	Water level sensor in reservoir and chamber with warning LED	
Door Lock Indication	Micro switch sensor with warning LED	
Pressure Display	Analog pressure gauge	
Function Display	LED	
Program Selections	Wrapped/unwrapped, Dry/no dry, Re-Dry (or Liquid, Flash)*. * Optional function by order request	
Temperature Selection	121°C/134°C	
Drying Function	0, 15, 30, 35, 40 min. (Re-Dry: 10 min.)	
Additional controls	Reset/Stop, Emergency	

11. Warranty

WARRANTY

Your “**STURDY**” product has a one (1) year guarantee of defective in materials and workmanship under normal use from the date of purchase.

This warranty does not apply to any product damaged by accident, misuse, abuse, neglect, improper line voltage, drop, fire, flood. Or the products were altered or repaired by anyone other than qualified service personnel.


The liability of Sturdy Industrial Co., Ltd. is limited to repair or replacement and under no circumstances shall “**STURDY**” be liable for any collateral consequential damages or loss. This guarantee specifically excludes the expendables and consumable.

All warranty claims must be directed to the distributors or agents authorized by Sturdy Industrial Co.,Ltd. whom are responsible for the sales of this equipment. The customers are responsible for shipping expense.

User's Name: _____		
Address: _____		

Country: _____	Tel: _____	Fax: _____
Date of Purchase: _____	Model No.: _____	
Series No.: _____		
Distributor: _____		

Manufacturer: Sturdy Industrial Co.,Ltd. (ISO 9001 & 13485 Certificated Firm)

Name	Sturdy Autoclave Sterilizer
Model	SA-230M / SA-260M
Manufacturer 	Sturdy Industrial Co. Ltd.
Address	168, Sec. 1, Zhongxing Rd., Wugu District, New Taipei City, 24872, Taiwan
EC Representative <div> <div>EC</div> <div>REP</div> </div>	APEX MEDICAL S.L. Elcano 9, 6 ^a planta 48008 Bilbao. Vizcaya SPAIN