

# OPERATION MANUAL

## POINTER- Manual control series

# OPERATION INSTRUCTION

## POINTER- Manual control series

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Please read this manual carefully prior to using your new Falcon Autoclaves. Following the Simple instructions contained in this manual will help ensure ease of use, trouble free operation, and a longer working life for your Autoclave.

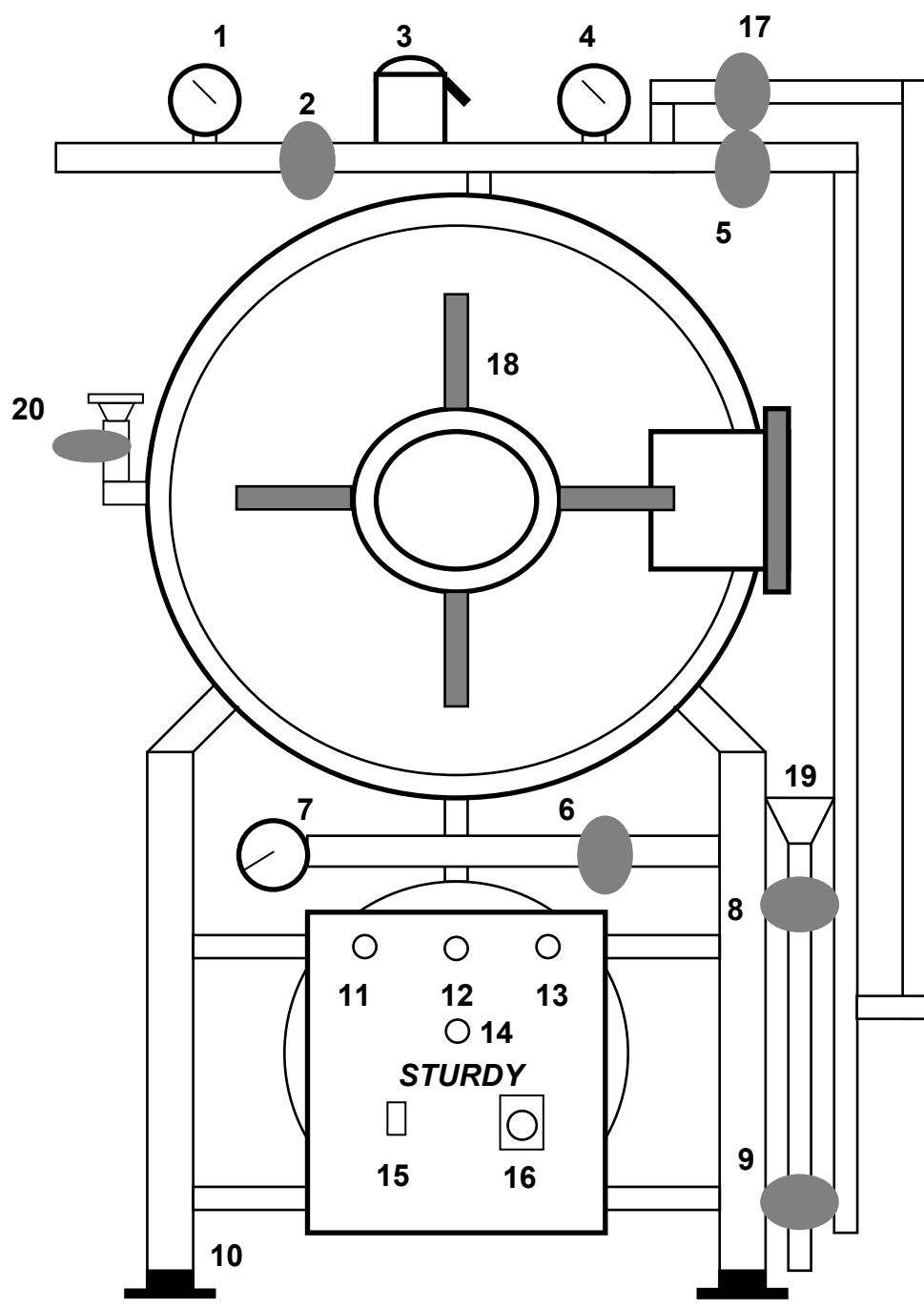
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**STURDY INDUSTRIAL CO., LTD.**

*ISO 13485 Certificated Firm*

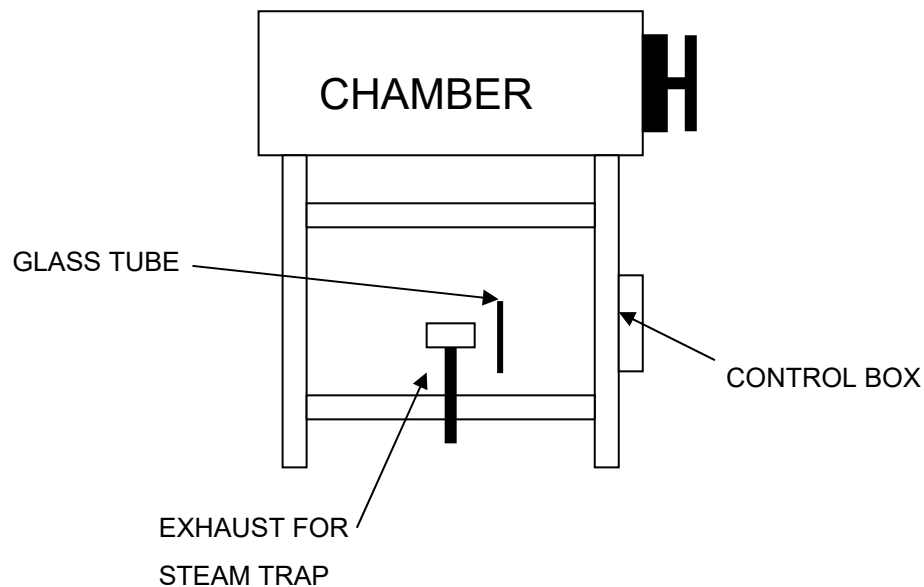
CHAPTER 1. LOCATION



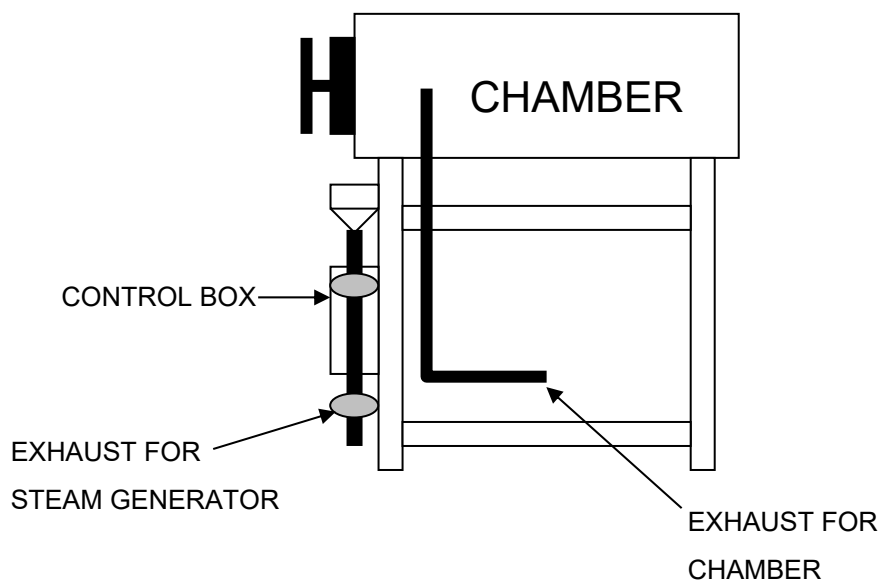
## **LOCATION:**

- |                                   |  |
|-----------------------------------|--|
| 1. PRESSURE GAUGE OF CHAMBER      | 11. POWER LAMP (GREEN).                                |
| 2. VALVE BETWEEN CHAMBER & JACKET | 12. LOW WATER LAMP (WHITE) <b><u>"L" type only</u></b> |
| 3. SAFETY VALVE                   | 13. HEATING LAMP (RED)                                 |
| 4. PRESSURE GAUGE OF JACKET       | 14. OVER HEAT LAMP                                     |
| 5. EXHAUST OF JACKET              | 15. POWER ON/OFF SWITCH                                |
| 6. EXHAUST OF CHAMBER             | 16. TIMER  |
| 7. TEMP. OF CHAMBER               | 17. EMERGENCY VALVE                                    |
| 8. WATER FILLING VALVE            | 18. DOOR HANDLE  |
| 9. BOILWATER EXHAUST VALVE        | 19. WATER FILL INLET                                   |
| 10. EQUIPMENT LEVEL ADJUST SCREW  | 20. VACUUM RELEASE VALVE                               |

### **Left Side**



### **Right Side**



## CHAPTER 2. SPECIFICATION

MODEL NO.	SA-400	SA-450	SA-500	SA-600
CHAMBER SIZE (mm)	Ø400 x 750	Ø450 x 900	Ø500 x 1000	Ø600 x 1200
CHAMBER CAPACITY	94 Liter	141 Liter	196 Liter	350 Liter
HEATING POWER	7.0KW 50/60HZ	7.0KW 50/60HZ	9.0KW 50/60HZ	12.0KW 50/60HZ
CONSTRUCTION	STAINLESS STEEL #304			
DESIGN TEMPERATURE	140°C			
USING PRESSURE / TEMP.	1.4 kgf/ cm <sup>2</sup> ABOUT 122°C			
SAFETY DEVICES	1. TEMP. CONTROL SWITCH 2. PRESSURE CONTROL SWITCH 3. PRESSURE SAFETY VALVE 4. LOW WATER INDICATOR 5. EMERGENCY EXHAUST VALVE			
LIFE TIME	7 Years			
STANDARD ACCESSORIES	HEATER COVER (STAINLESS STEEL #304) * 1 pcs GLASS TUBE FOR WATER LEVEL VIEW * 1 pcs			
OPTIONAL ACCESSORIES	BASKET (STAINLESS STEEL #304) * 1PCS			
SAFETY STANDARD	ISO 13485 APPROVAL QA SYSTEM			
STEAM GENERATOR WATER LEVEL PROTECTION	PTIONAL FUNCTION - "L"			
PRESSURE DOOR AUTO-LOCK DEVICE	OPTIONAL FUNCTION - "K"			

#. FOR REFERENCE: 1 kgf/cm<sup>2</sup> = 0.98 bar = 14.2 psi

#. PS: FOR LIQUID STERILIZATION USE, PLEASE MAKE NOTE  
IN YOUR PURCHASE ORDER

## CHAPTER 3. PREPARATION

### CHECKLIST FOR UNPACKING INSTRUCTIONS:

#### TO UNPACK AUTOCLAVE FROM CARTON

1. Remove top pieces wood.
2. Remove the holder wood (4 pieces).
3. Remove each sidewall pieces (4 pieces) of the case.
4. Remove the fixing holder on each down side.
5. Move the autoclave out from the plank.

**PS: PLEASE CHECK THE ACCESSORIES ENCLOSED, AT FIRST.**

#### INSTALLATION -1 :

1. Fixing Ø1/2" the steam generator exhaust hose. (Connected with Metal Tube.)
2. Fixing Ø1/2" the chamber exhaust hose. (Connected with Metal Tube.)
3. Fixing Ø1/2" the steam trap exhaust hose.

**PS: THE WATER IS HOT ABOUT 100°C AT EXHAUST OUTLET. THE MATERIAL OF CONNECTOR PIPING IS TEMPERATURE RESISTANCE.**

4. Put this autoclave on the ground with level adjustment, and keep the distance more than 60cm between the wall and the case.

5. Check the elec. power source that must be same as purchase order.

Turn-Open the valve 8, 2, 5.

Pouring the water (DISTILLED WATER or SOFT WATER) into the steam generator (referring chapter 1. location # 19).

Please see water level is between the yellow and red sign at glass tube (see figure 1).

And turn-Close the valve 8, 2, 5.

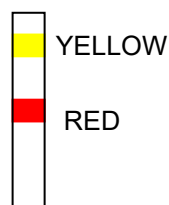


Figure 1

6. You are now, ready to take the power cord out, and connect the elec. power source.

**Please install the No Fuse Breaker between the elec. Power source and autoclave.**

Please refer under specification of No Fuse Breaker to each model:

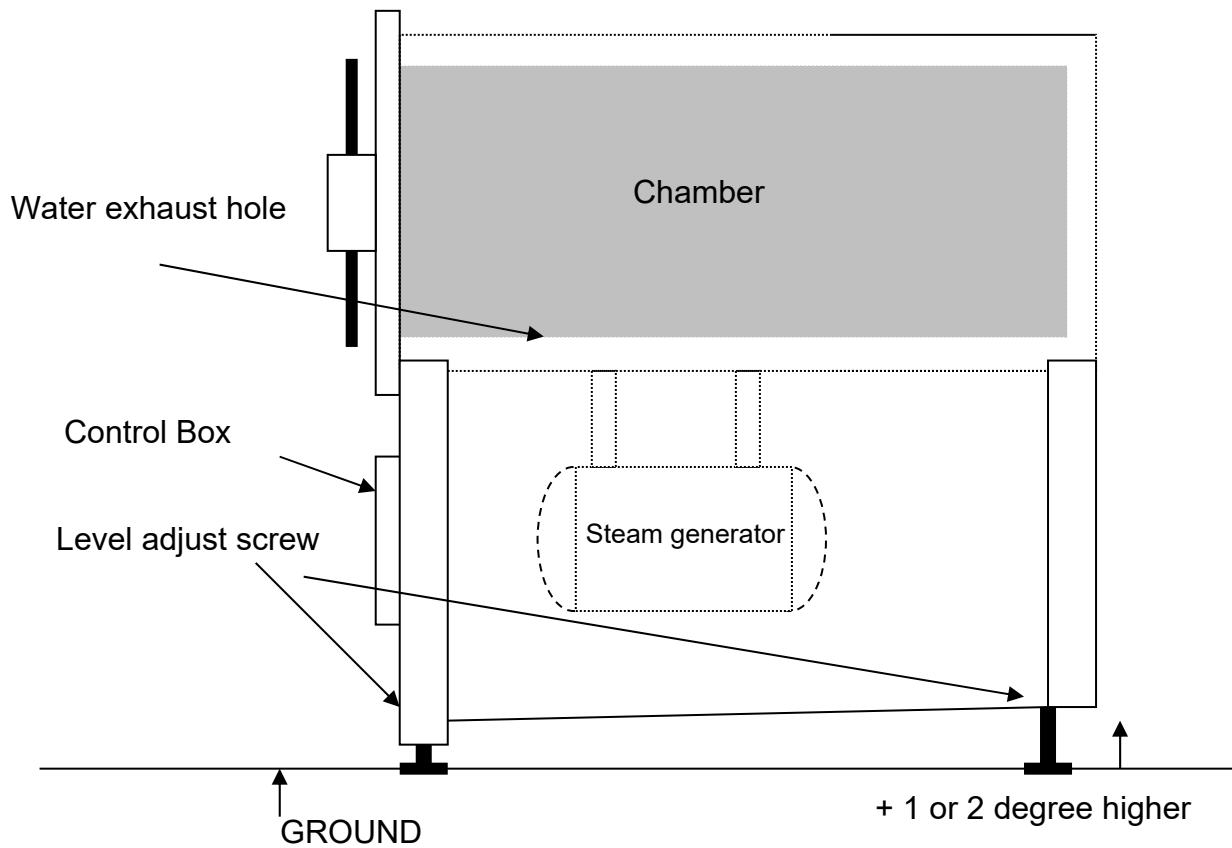
SA-400/ SA-450	220V single phase / 50A N.F.B.	220V 3 phase / 30A	380V 3 phase / 30A
SA-500	220V single phase / 50A N.F.B.	220V 3 phase / 30A	380V 3 phase / 30A
SA-600	220V single phase / 75A N.F.B.	220V 3 phase / 50A	380V 3 phase / 30A

**CAUTION:** Before plug the power cord, please turn-off the power switch.

7. Check the power lamp, if it is light on, that means the power is already stand-by now.

## INSTALLATION -2 :

As to the good dry function, please check the level installation.



If the dry is not so well, please check the ground level and adjust the level adjusts screws as our suggestion;

Adjust the backside leg's screw to make back side higher or adjust the front side leg's screw to make front side lower.

Normally the back will higher than front side about 1 to 2 degree.

**⚠ CAUTION:** The autoclave MUST BE earthed!

**⚠ CAUTION:** The circuit-breaker is also serves as a disconnect device for disconnecting the power, it should be so located that the circuit-breakers are not blocked by any other devices.

## CHAPTER 4. Placement of Items To Be Sterilized



**NOTE:** Refer to infection control, such as sterilization and sterility assurance in health care facilities of your local authority, for load placement guidelines.



**NOTE:** Please place items to be sterilized on the tray properly in order to have the best sterilization and/or drying result.



**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.



**NOTE:** It is recommended not to exceed 70% of pouch if pouch are used for sterilization.



**WARNING:** To sterilize absorbent cotton or woolen, please wrap it with sterilizing pouch to avoid piping clog. Place a chemical indicator for



**WARNING:** If implements are packed with sterilizing pouches, please make sure not to pile them up.

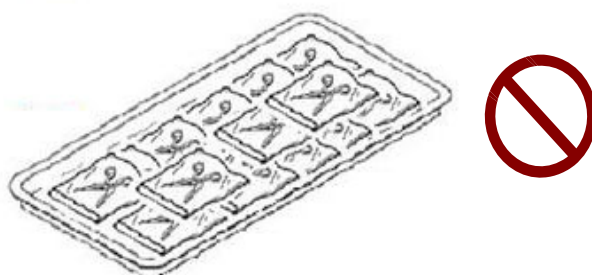


Figure 1

1. Before loading, ensure instruments are cleaned and rinsed.
2. Be sure there will be enough space between each wrap for better air flow as shown in Figure 2.

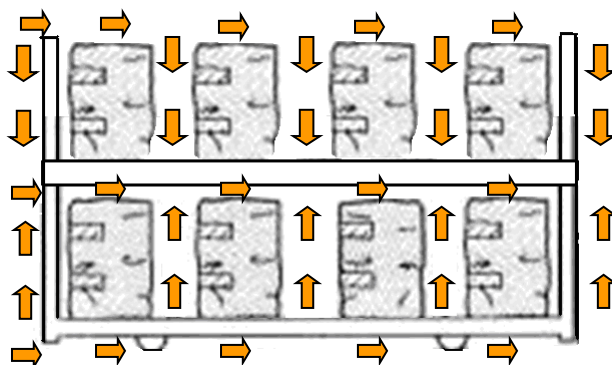


Figure 2



3. If implements are packed with sterilizing pouches and placed inside a sterilization box, make sure to display items as shown in Figure 3.

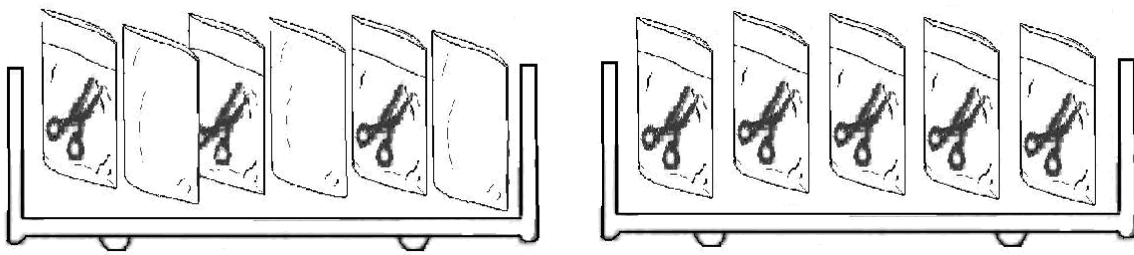


Figure 3

4. If implements are treatment plate, make sure to arrange items as shown in Figure 4.

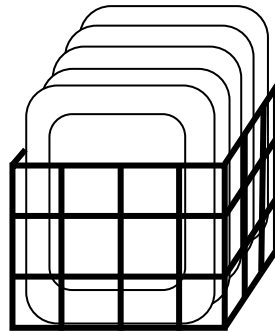


Figure 4

5. If compound items, such as solid loads and porous loads, are packed at the same wrapped, be placed them at the lowest side of the chamber to prevent condensation drops.

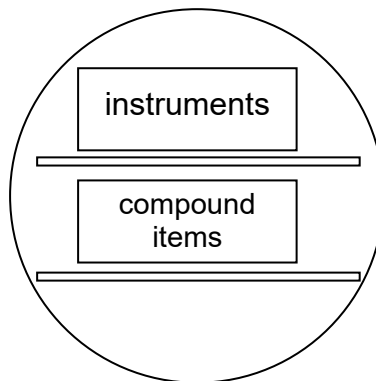


Figure 5

6. Do not exceed to its maximum limit and/or touch the walls of the chamber; and make sure there are enough space for free circulations of steam penetration.
7. Uniform placing of objects that do not overlap.
8. Place tubes or hollows loads horizontal to tray without overlapping. When place sterilizing pouch on the sterilization box or tray, make sure the medical grade paper is facing upward.

9. Round pans, trays, pots pan, etc., should be opening upside down as shown in Figure 6.

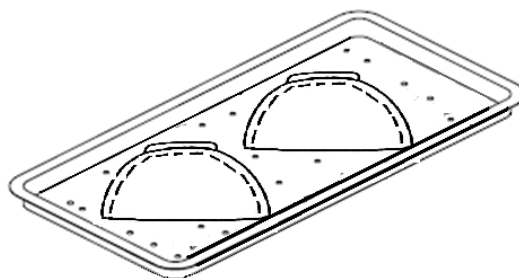


Figure 6

10. Detach caps from can-like items and separated them for sterilization work.
11. If implements are packed with sterilizing pouches, please make sure not to pile them up.

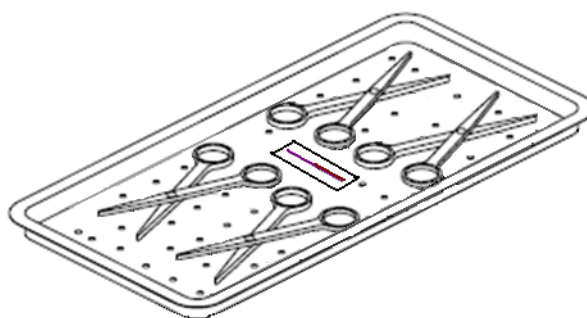


Figure 7

12. Follow the instruction of the instrument to clean and wash the hollow instruments prior sterilizing work, and wipe excess detergents or water. Keep the double ended hollow instrument as straight as possible while keeping two ends opened.
13. An additional temperature sensor and recorder are required for liquid sterilization program as shown in Figure 8.

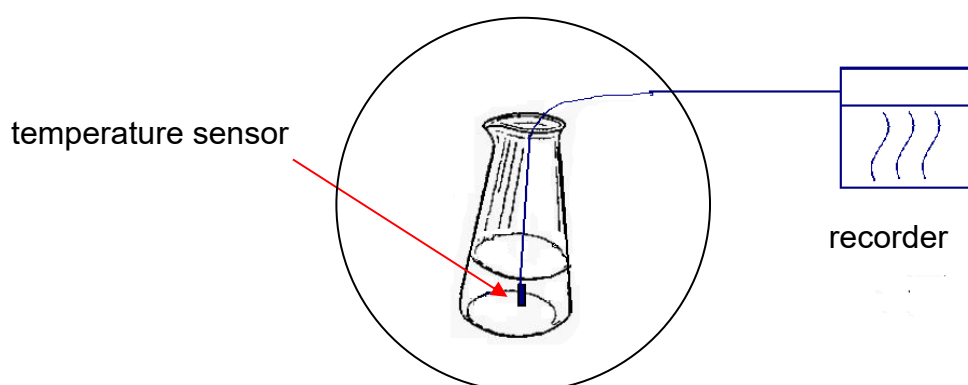


Figure 8

14. Make sure that the items to be sterilized are placed in proper position and then closed the door for sterilization works.

## CHAPTER 5. OPERATION

**PLEASE CHECK CHAPTER 3. AT FIRST.**

1. Open the door and put the sterilized instruments into the chamber. Then closed the door.

***PLEASE DON'T FORGET TO PUT THE STERILIZATION INDICATOR INTO CHAMBER.***

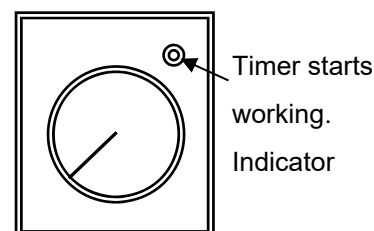
2. Turn-on the No Fuse Breaker, the #11 power lamp ON.

3. Please check water level first ◦ Turn off the valve #2, #5, #6, #8, #9, #17 and then presses the #15 switch on to start the cycle. #13 Heating Lamp ON.

(Please reference position of chapter 1) ◦

4. After the jacket pressure up-to 1.4 kgf/cm<sup>2</sup>, The jacket will keep on the pressure / temperature and stand-by your next commend.

### IC TIMER



5. Set-up the sterilization time ◦ (0~60 minutes for selection.)

**(Please don't set-up sterilization time over than 30 minutes, if you need dry cycle.)**

***AS TO THE TIME SET, PLEASE REFER THE ENCLOSED APPENDIX.***

And turn-Open the valve #2, then the jacket steam will go to chamber. The timer will start working when the chamber pressure arrive 1.4 kgf/cm<sup>2</sup>.

The LED of timer turn to "flash" that means the sterilization timer starts work. Then the LED turns light on and non-flash. That means the timer finished working then start 40 seconds Buzzer, to show you the cycle is completed.

### **The method of the dry function, after sterilization step.**

- (1) Press the #15 switch OFF. Repress the #15 switch ON to restart cycle again ◦
- (2) Set-up the dry time. **(Please don't over than 30 minutes.)**
- (3) When the LED of timer go to "flash" sign that means the dry timer starts work. And now please turn OFF the valve #2 and OPEN the valve #6 and #5 to exhaust steam of chamber in the vacuum condition to offer the perfect dry result.

**Meanwhile the jack steam pressure will be exhausted to make the chamber vacuum.**

The LED turns light on. That means the dry cycle is finished.

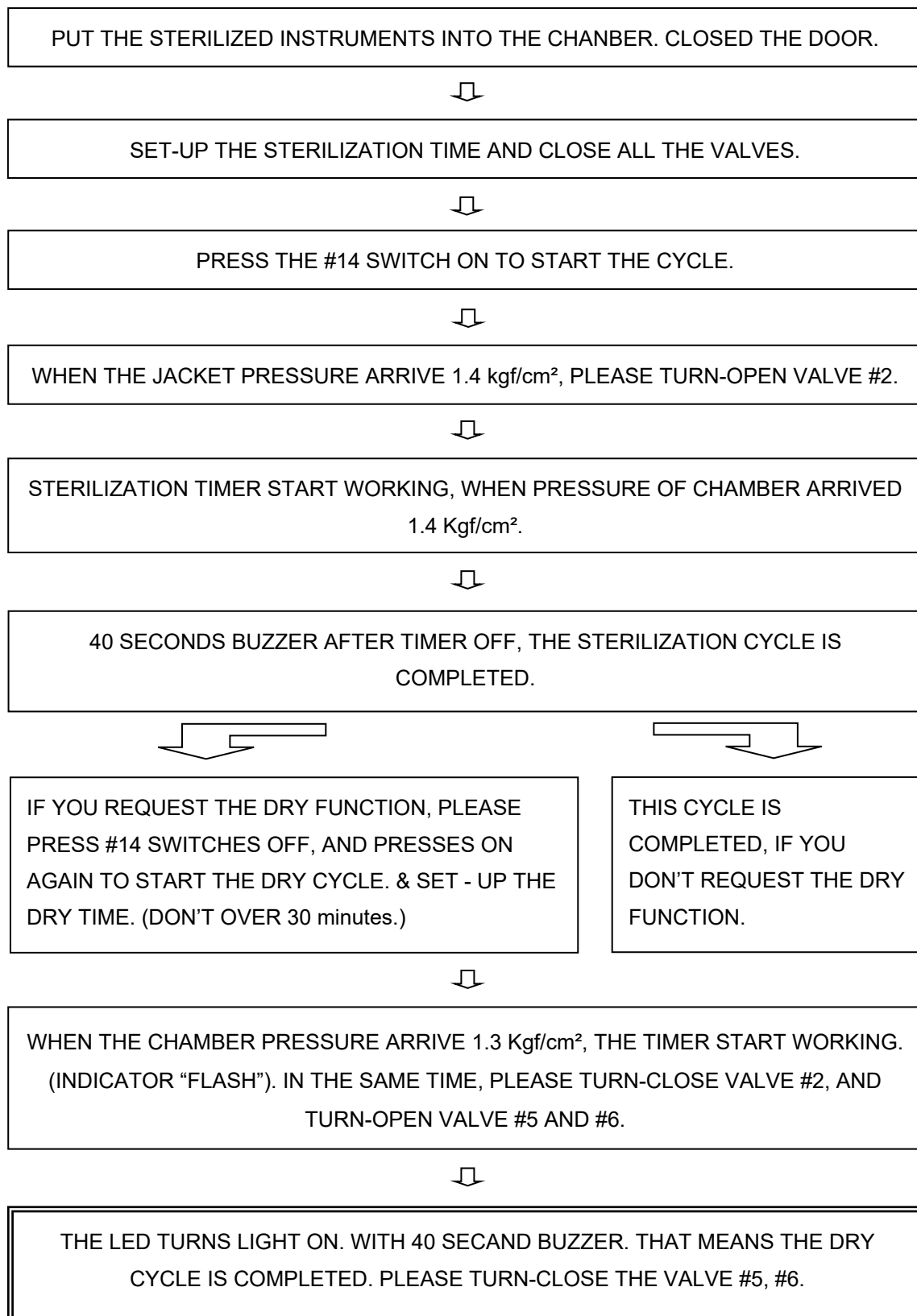
- (4) About 40 seconds buzzer will report you, "THE CYCLE IS COMPLETED."

**CAUTION 1.** BEFORE OPENING THE DOOR ENSURES THE PRESSURE GAUGE IS AT "ZERO" POSITION.

**CAUTION 2.** PLEASE DON'T FORGET TO CHECK THE STERILIZATION IDICATOR, AFTER STERILIZATION CYCLE.

## CHAPTER 5-1. BASIC STEP OF STERILIZING

PLEASE CHECK CHAPTER 4. OPERATION AT FIRST.



### **CAUTION**


1. CHECK THE PRESSURE GAUGE RETURN TO "**ZERO**" POSITION BEFORE THE DOOR OPENED.
2. OPEN THE DOOR, IN 10 MINUTES, AFTER ALARM TO MAKE THE DRY FUNCTION IN GOOD CONDITION.
3. THE DOOR CAN'T OPEN, IF THE CHAMBER IN VACUUM CONDITION. PLEASE TURN THE #6 VALVE ANY TIME, TO RELEASE THE CHAMBER VACUUM.
4. **PLEASE REFERENCE THE CHAPTER 1 LOCATION.**

## CHAPTER 6. WARNING


1. Anytime check the pressure gauge, if the pressure over than 0 kgf/cm<sup>2</sup>.  
Please don't open door.
2. **"USE ONLY DISTILLED or SOFT & FILTERED WATER"** Or not, we can't offer the quality guarantee service.
3. Please check the water level. Low water protector will cut-off the elec. power. ("L" type only), Will over-temperature alarm when the tank low water level.
4. Please attend the high temperature on the door. When she is working.
5. The door handle must be closed well, when the unit is in working.
6. **Please install the NFB (No Fuse Breaker), between the elec. Power source and autoclave.**
7. Use only a dedicated power supply.
8. The silicon rubber gasket on the inner door and the front of the chamber should be kept clean.
9. The filter valve inside the chamber, should be cleaned at least every season.
10. We recommend use of chemical indicator strips as a check for sterility. These strips may also be kept as a record of sterilization.
11. In the event of an emergency immediately turn the autoclave off at the mains power (#15) and turn open the exhaust valve. (#17) ◦ Please reference CHAPTER 1 ◦
12. Please keep the chamber clean, anytime ◦


13.  Caution! Hot surface.


14.  Grounding terminal.

15. "  " This label is meaning that indicator for power off


16. "  " This label is meaning that indicator for power on


17.  Consult instructions for use

18.  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.

19.  2008-01 Date of Manufacture. EX: 2008-01 is mean January / 2008.

20.  Authorized Representative at europe.

21.  Manufacturer.

22.  Caution, risk of electric shock.

23 STORAGE ENVIRONMENT: TEMPERATURE: -10°C~50°C / HUMIDITY ≤ 80%

24 WORKING ENVIRONMENT: TEMPERATURE: 5°C~40°C / HUMIDITY ≤ 80%

25 TRANSPORTATION ENVIRONMENT: TEMPERATURE: -10°C~60°C / HUMIDITY ≤ 80%

## CHAPTER 7. APPENDIX

### SETTING UP THE STERILIZATION TIME:

\* PRESSURE ON 1.2 kgf/cm<sup>2</sup> (APPROX. 121 °C / 250 °F)

UNWRAPPED Set-up 22 minutes sterilization time.

WRAPPED Set-up 30 minutes sterilization time.

LIQUIDS Set-up 40 minutes sterilization time.

Liquids sterilization need special optional device. By order request.

\* DRY TIME: 30 minutes

● SPECIAL SELECTION RANGE:

STERILIZATION TIME SELECTION RANGE 0 ~ 60 MINUTES

(PS: Please don't set-up sterilization time over than 30 minutes,  
if you'll request the dry cycle, because the water in the  
steam generator will not enough for dry cycle.)

DRY TIME SELECTION RANGE 0 ~ 30 minutes

# **FOR REFERENCE: 1 kgf/cm<sup>2</sup> = 0.98 bar = 14.2 psi.**

# ***Sterilization instruments must be made by metal without plate, or  
autoclave plastic or rubber material.***

# This machine can use liquid sterilization function. Please do not adjust the  
venting system.



## CHAPTER 8. TROUBLE SHOOTING

### \* **POWER LAMP IS NOT LIGHT ON:**

1. Cause: Power supply is not properly connected.  
Solution: Try to connect power supply until power indicator goes on.
2. Cause: Breaker broken.  
Solution: Replace the breaker.
3. Cause: Bulb broken.  
Solution: Replace the bulb.
4. Cause: Power switch broken.  
Solution: Replace switch.

### \* **#14 HEATING-UP LAMP IS NOT LIGHT ON:**

1. Cause: Lamp Broken.  
Solution: Replace the bulb.
2. Cause: Heater broken  
Solution: Replace the heater

### \* **LOW WATER (OVER HEAT) INDICATION AND ALARM:**

1. Cause: Water is not enough.  
Solution: Check the water level
2. Cause: Temperature protector broken.  
Solution: Replace the temperature protector switch.
3. Cause: Water Level sensor dirties (no connection).  
Solution: Clean the sensor. ("L" type only.)
4. Cause: Water level switch broken.  
Solution: Replace the water level switch. ("L" type only.)

***PS: THE FILTER MUST BE CLEAN PER EACH SEASON.***

### \* **THE CHAMBER PRESSURE CAN'T EXHAUSE FLUENTLY WHEN YOU OPEN THE EXHAUST VALVE #6:**

1. Cause: Steam valve unclean.  
Solution: Clean the filter.  
Solution: Replace valve

### \* **PRESSURE CAN'T UP:**

1. Cause: Steam valve leaking.  
Solution: Check valve #2, #5, #6, #8, #9, #17 and clean or replace it.
2. Cause: Heater broken  
Solution: Replace it.

### **DRY FUNCTION NOT PERFECT :**

Please open the door in 10 minutes, after alarm. If still have same problem, please call engineer.



### \* **DOOR CANNOT BE OPENED:**

1. Cause: Air filter clogged with dusts.  
Solution: Replace with a new air filter.

2. Cause: Vacuum release vale not in half-open position.  
Solution: Adjust vacuum release valve in half-open position.
3. Cause: Malfunction of check valve.  
Solution: Replace with a new check valve.

***PS: ANY PROBLEMS PLEASE CHECK THE WIRE CONNECTION AT FIRST.***

**Due to the “PRESSURE DOOR LOCK DEVICE”, so if you can’t open the door after work finished, please do following step:**

- a. Please turn the handle “  ” to tight the door.
- b. Then, turn the handle ”  “back to open it.

**PS: This is for “K” type only.**

## CHAPTER 9. MAINTENANCE REQUIREMENTS

### **DAILY:**

- WIPE THE INSIDE OF THE CHAMBER AND THE INSIDE OF THE DOOR WITH NON LINT CLOTH SUCH AS A WETTEX.
- CHECK WATER LEVEL.

### **WEEKLY:**

- CLEAN THE RACK AND TRAYS.
- CLEAN THE FILTER IN THE CHAMBER. (ON THE EXHAUST HOLE)

### **MONTHLY:**

- AFTER STERILIZATION, WHEN THE CHAMBER PRESSURE STILL OVER THAN 0 kgf/cm<sup>2</sup>, PLEASE TURN-OPEN THE JACKET EXHAUST VALVE KNOB. THEN, THE PRESSURE WILL EXHAUST THE BALANCE WATER AND STEAM FROM THE JACKET AND THE BOIL. THIS WAY WILL KEEP THE JACKET AND BOILER CLEAN. AND REFILL THE WATER. TO THE BOIL AGAIN. AFTER 10 MINUTES, PLEASE PUCH-OFF THE POWER SWITCH, AND TURN-OPEN THE EXHAUST VALVE (KNOB) AGAIN. AFTER 2-3 TIMES, THE BOIL AND JACKET WILL BE CLEAN WELL.

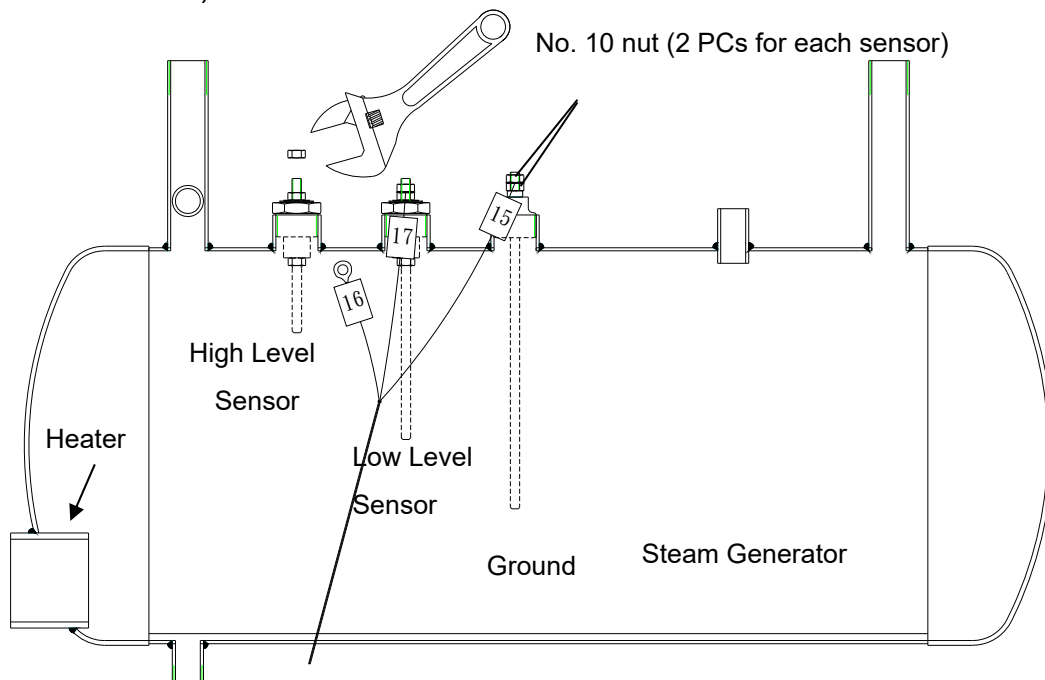
### **YEARLY:** (CHECK BY ENGINEER)

- REMOVE, CLEAN AND REPLACE THE WIRE MESH FILTER AT INSIDE OF THE HOUSING. THEN, FIX RETURNS THE FILTER.
- CHECK THE ELECTRIC WIRE SYSTEM, FUSE, AND CONNECTORS.
- CHECK THE TUBING SYSTEM.
- CLEAN THE SOLENOID VALVE.
- CHECK THE INDICATION LAMPS, AND ALL CYCLE FUNCTION.
- CHECK THE DOOR GASKET. (SUGGESTION: REPLACE IT PER YEAR.)
- CHECK THE FUNCTION OF THE SAFETY VALVE.
- CLEAN THE SURFACE OF THE WATER LEVEL SENSOR.
- CHECK IF AIR FILTER CLOGGED WITH DUSTS.

## Cleaning Steps to the Water Sensors of the Steam Generator – Model SA-L Series

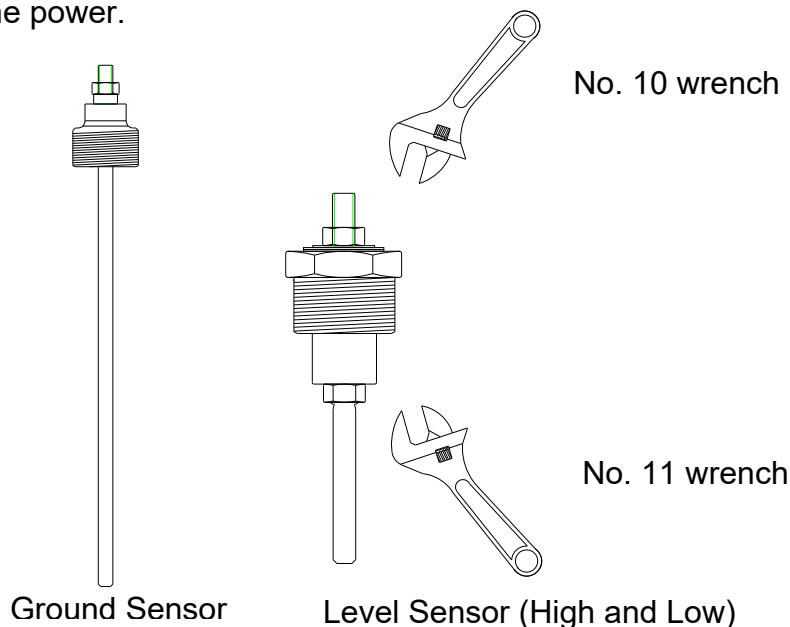
**⚠ Warning:** Danger of Electric Shock! Disconnect the power prior to the maintenance works.

- 1 Mark and record the wiring number for subsequent reinstallation works. Do not mix the High-Level-Sensor, Low-Level-Sensor and Ground sensors.
- 2 Disconnect the three wirings counter-clockwise by using a No. 10 wrench (or an adjustable wrench), as shown in Fig- 1
- 3 Loosen the two sensors nuts (High-Level-Sensor and Low-Level-Sensor) counter-clockwise by using a No. 27 wrench (or an adjustable wrench), and then loosen the Ground screw nut counter-clockwise by using a No. 17 wrench (or an adjustable wrench).

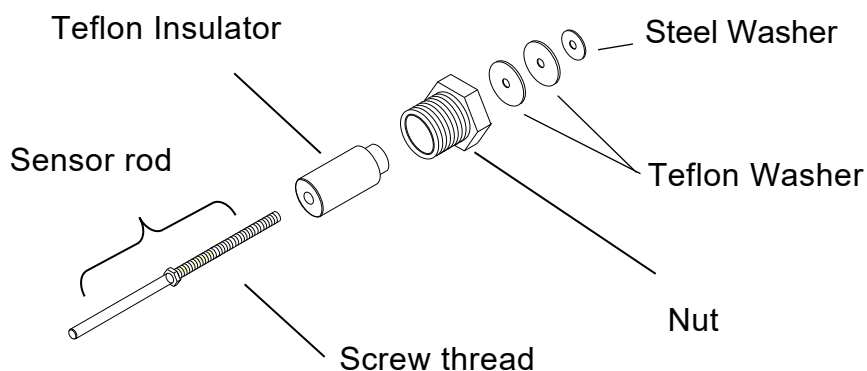


**Fig- 1 Layout**

- 4 Disassemble the High-Level-Sensor and Low-Level-Sensor as shown in Fig - 2 and Fig - 3.
- 5 Clean each part very careful to remove the scale and deposit with clean water, a small brush or scrub sponge may help to the cleaning works. Also clean the Ground Sensor Rod as described above.  
**Note:** Each part must be clean completely; there should be no dirt on the surface of the Teflon Insulator.
- 6 Dry all of the components after the cleaning work. Wrap the screw thread of the High-Level-Sensor and Low-Level-Sensor rods (Fig- 3) with sealing tape so that they can be tighten with Teflon Insulators.
- 7 Assemble the components as shown in Fig- 2 and Fig- 3
- 8 Wrap the screw thread of the nut with sealing tape for assembly purpose.
- 9 Install the three sensors and their associated wiring with the tools used in step 1. Visual inspect that the position and wiring identification are match to Fig- 1.
- 10 Restore the power.



**Fig- 2 Sensors**



**Fig- 3 Sensor Assembly**

## **WARRANTY**

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You “**STURDY**” product are in guaranteed to be from the defects in materials and workmanship for one (1) year under normal use from the date of purpose.

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

The liability of Sturdy Industrial Co., Ltd. is limited to repair of 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. Responsible for the sales of this instrument. 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 13485 CERTIFICATE FIRM.)



<b>Name</b>	Sturdy Autoclave Sterilizer
<b>Model</b>	SA Series
<b>Manufacturer</b> 	Sturdy Industrial Co. Ltd.
<b>Address</b>	168, Sec. 1, Zhongxing Rd., Wugu District, New Taipei City, 24872, Taiwan