STURDY
APEX GROUP

OPERATION MANUAL

POINTER- Automatic control series

PRESSURE ADJUSTABLE

STURDY ***INDUSTRIAL CO., LTD.*** *ISO 13485 CERTIFICATED FIRM*

422-04032 v.02 17 April 2019

OPERATION INSTRUCTION

POINTER- Automatic control series

AUTOMATIC AUTOCLAVE STERILIZER

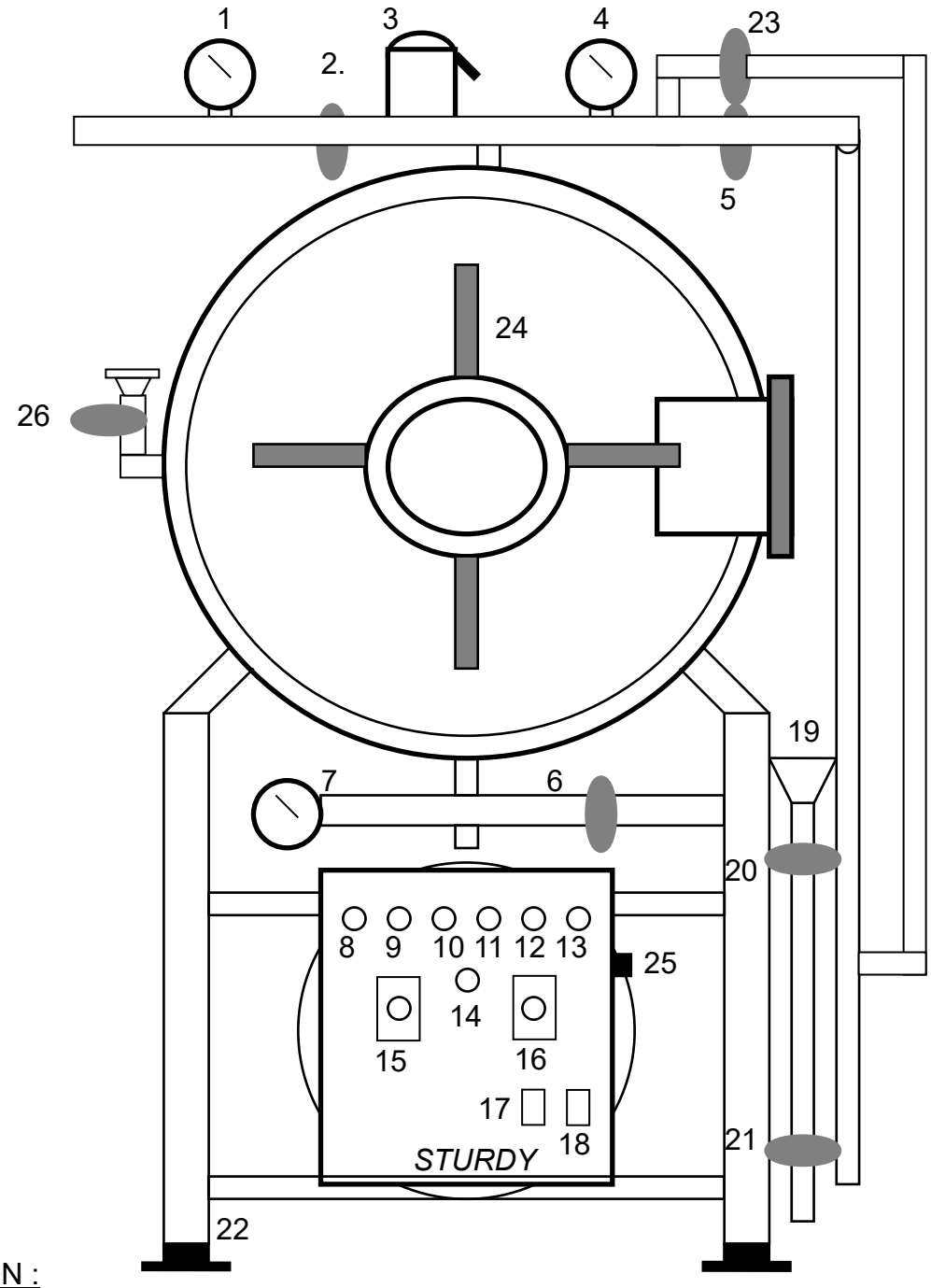
CONTENTS

Please read this manual carefully prior to using your new 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.

STURDY INDUSTRIAL CO., LTD.

ISO 13485 *Certificated Firm*

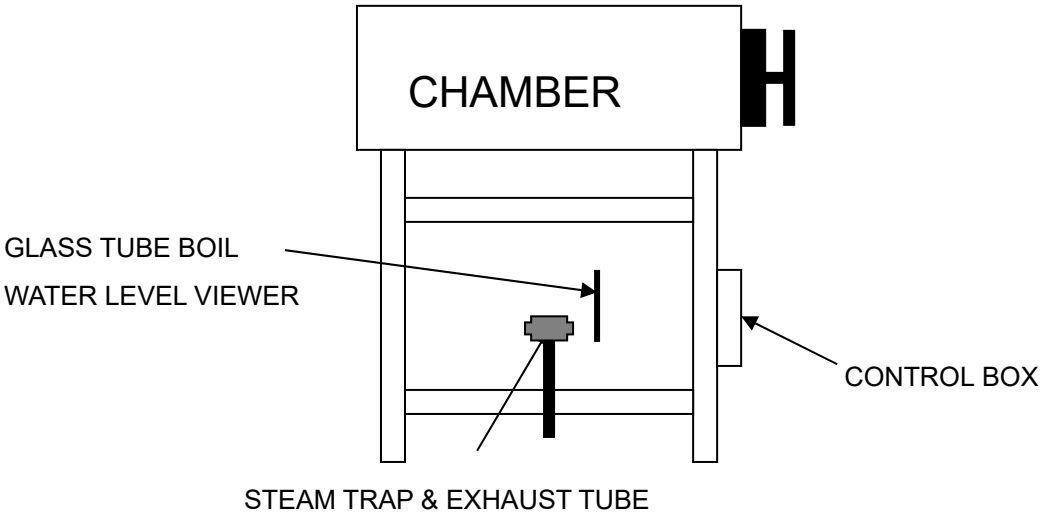
CHAPTER 1 LOCATION OF CONTROLS



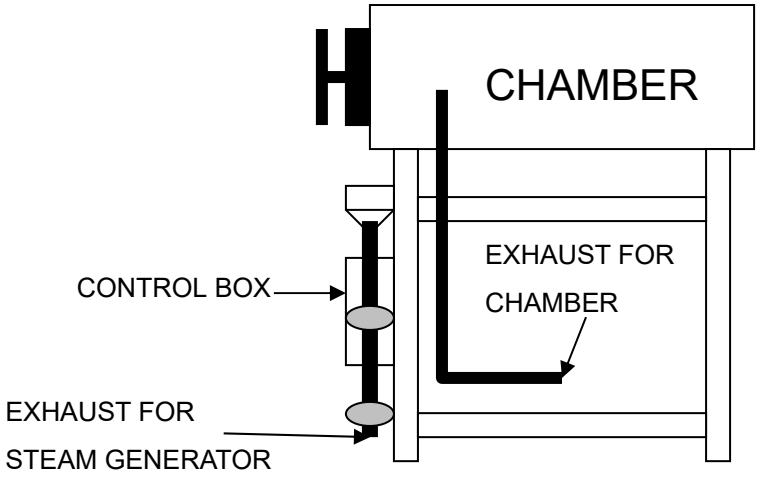
LOCATION :

1	PRESSURE GAUGE OF CHAMBER
2	VALVE BETWEEN CHAMBER & JACKET
3	SAFETY VALVE
4	PRESSURE GAUGE OF JACKET
5	EXHAUST VALVE OF JACKET
6	EXHAUST VALVE OF CHAMBER
7	TEMP. OF CHAMBER
8	POWER LAMP
9	WATER LEVEL LAMP
10	HEATING LAMP
11	STERILIZATION LAMP
12	DRY LAMP
13	COMPLETE LAMP
14	OVER HEAT LAMP
15	STERILIZATION TIMER
16	DRY TIMER
17	POWER ON/OFF/ON SWITCH
18	STEAM SUPPLY SWITCH
19	MANUAL WATER FILL INLET
20	ADD WATER VALVE
21	BOIL WATER EXHAUST VALVE
22	EQUIPMENT LEVEL ADJUST SCREW
23	EMERGENCY VALVE
24	DOOR HANDLE
25	PRESSURE CONTROL SWITCH (WORKING PRESSURE ADJUSTABLE)
26	VACUUM RELEASE VALVE

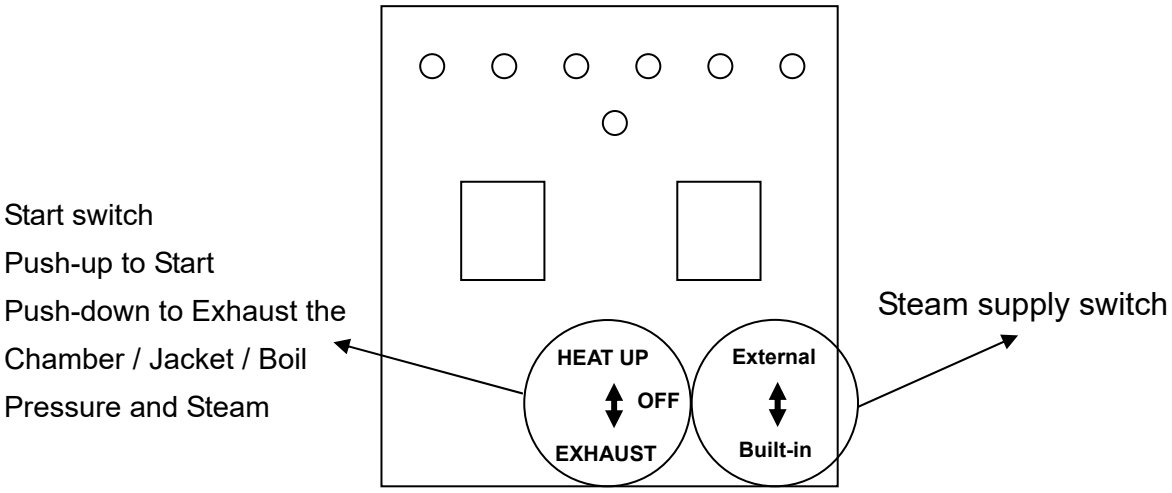
Left Side



Right Side



Control Panel



CHAPTER 2. SPECIFICATION

MODEL NO.	SA-400A	SA-450A	SA-500A	SA-600A
CHAMBER SIZE (mm)	400 x 800	450 x 900	500 x 1000	610 x 1200
CHAMBER CAPACITY	100L	143L	196L	350L
HEATING POWER	7.0KW 50/60Hz	7.0KW 50/60Hz	9.0KW 50/60Hz	12.0KW 50/60Hz
CONSTRUCTION	STAINLESS STEEL #304			
DESIGN TEMPERATURE	140ºC			
USING PRESSURE / TEMP.	1.2 ~ 2.1 kgf/ cm^2 ABOUT 122 ~ 134ºC			
SAFETY DEVICES	PRESSURE CONTROL SWITCH, PRESSURE SAFETY VALVE, LOW WATER INDICATOR, EMERGENCY EXHAUST VALVE, OVER HEAT PROTECTION			
STANDARD ACCESSORIES	HEATER COVER (STAINLESS STEEL #304) x 1 pc, GLASS TUBE FOR LEVEL WATER VIEWER x 1 pc			
OPTIONAL ACCESSORIES	BASKET (STAINLESS STEEL #304) x 1PC			
SAFETY STANDARD	ISO 13485 APPROVAL QA SYSTEM			
PRESSURE DOOR AUTO-LOCK DEVICE	OPTIONAL REQUIREMENT			

#. FOR REFERENCE: 1 kgf / cm2 = 0.98 bar = 14.2 psi

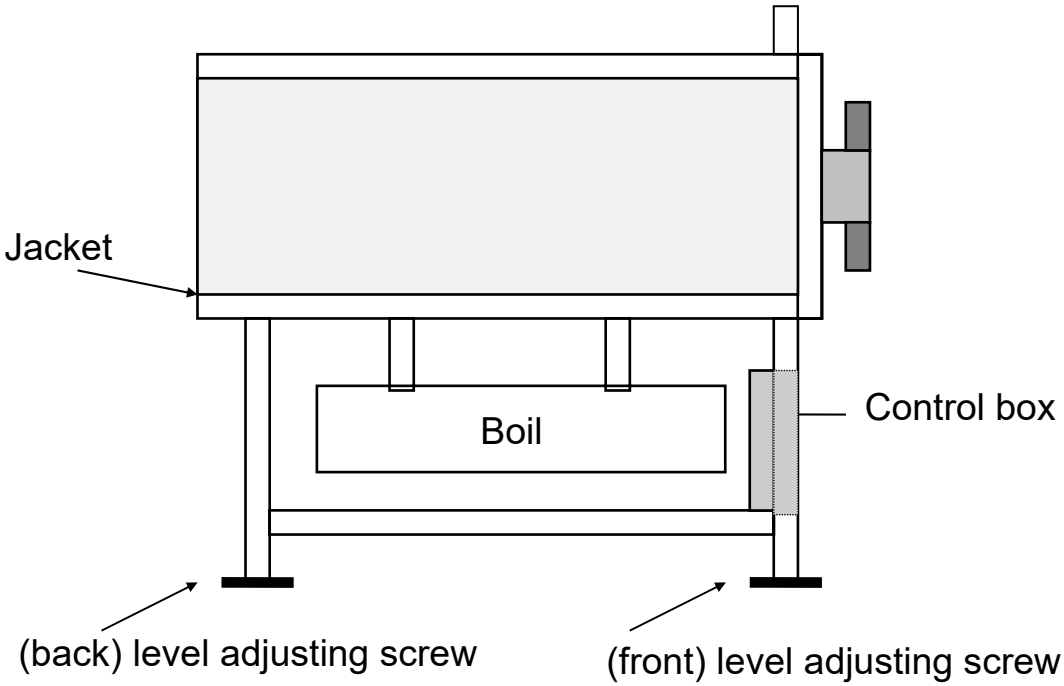
#. PS: FOR LIQUID STERILIZATION USE, PLEASE MAKE NOTE IN YOUR PURCHASE ORDER

#. PS: " A " TYPE MODEL WITH OPTIONAL AUTOMATIC FUNCTION.

#. PS: STEAM SUPPLY PRESSURE MAX 2.5bar.

CHAPTER 3. INSTALLATION

1. Please attention the chamber level adjustment, when you install the autoclave:



PS: The front sight must be a little lower than back sight and adjusted by above two screws.

2. Please don't forget to install the ground (earth) wire (green & white wire) and "No Fuse Breaker"

SA-450, SA-450A	7KW 1 Phase / 220V / 50A; 3 Phases / 220V / 30A; 3 Phases / 380V / 30A
SA-500, SA-450A	9KW 1 Phase; 220V / 50A; 3 Phases / 220V / 30A; 3 Phases / 380V / 30A
SA-600, SA-600A	12KW 1 Phase; 220V / 75A; 3 Phases / 220V / 50A; 3 Phases / 380V / 50A
SA-700, SA-700A	15KW 1 Phase; 220V / 80A; 3 Phases / 220V / 50A; 3 Phases / 380V / 30A

3. Function Test:

Operation one cycle is as our operation manual to test the complete cycle function.

4. Please make notes to the user:

a. Please check the water in the boil, before working.
b. Please check the indicator, after the working cycle.

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 pooch if pooch 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.

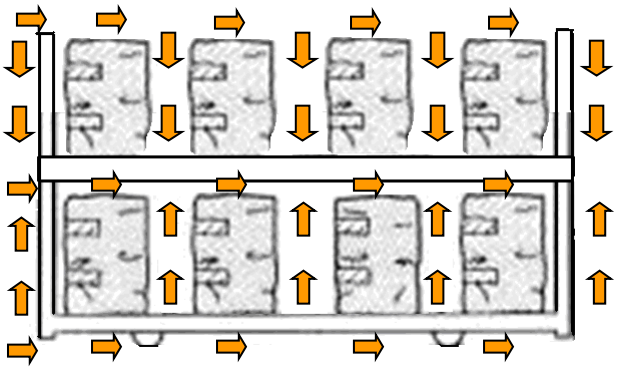


Figure 2

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

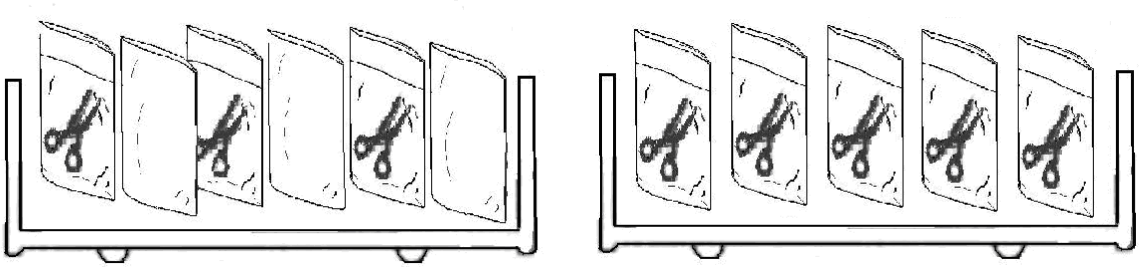


Figure 3

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

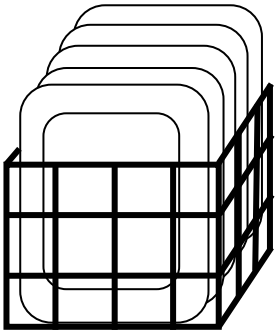


Figure 4

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.

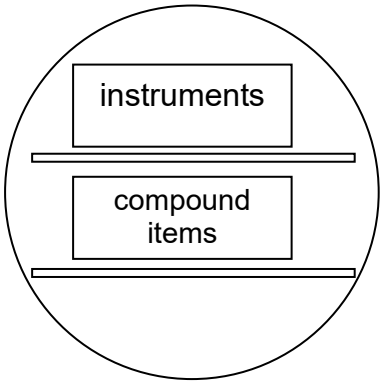


Figure 5

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.

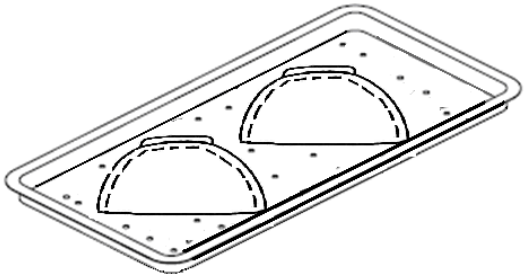


Figure 6

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.

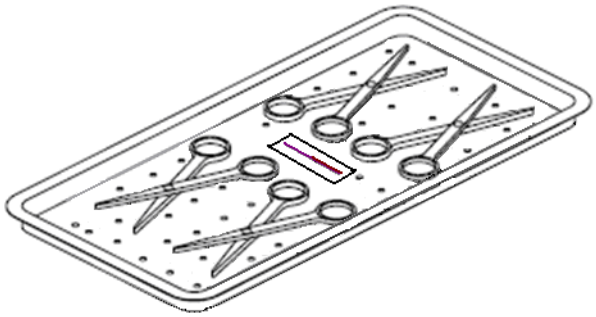


Figure 7

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.

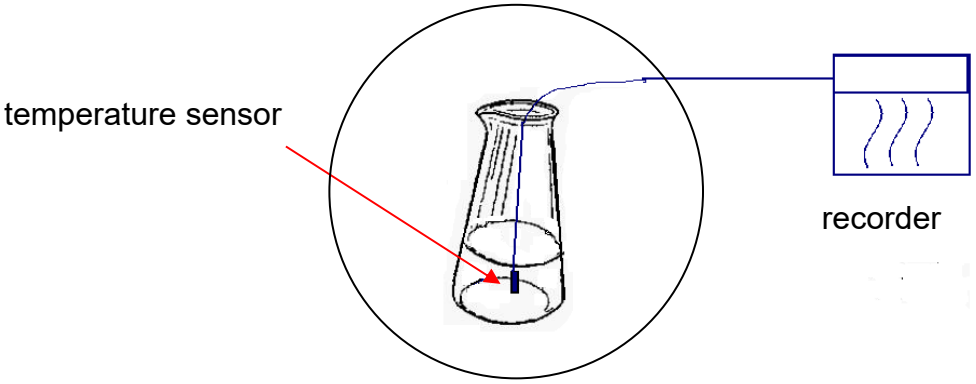


Figure 8

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. Than closed the door.
PLEASE DON'T FORGET TO PUT THE STERILIZATION INDICATOR INTO CHAMBER.

2. Sep-up the sterilization pressure (1.2 kgf/cm^2 to 2.1 kgf/cm^2).

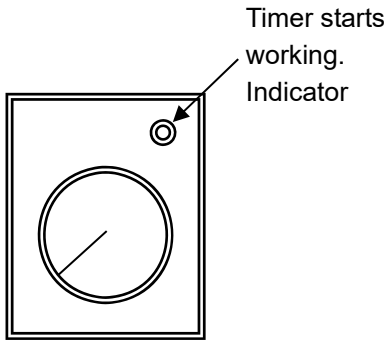
3. Sep-up the sterilization time.
AS TO THE TIME SET, PLEASE REFER THE ENCLOSED APPENDIX.

4. Sep-up the dry time.
AS TO THE TIME SET, PLEASE REFER THE ENCLOSED APPENDIX.

5. Select steam supply model (External or Built-in). Press power switch on to the "HEATER UP" position.

6. Select external model：Steam automatic in to the Jacket.

6-1. Select Built-in model：Open the add water valve and fill in sterile water to the add water lamp stop and close add water valve.



Timer

⚠**CAUTION:** STEAM SUPPLY PRESSURE MAX 2.5bar.

7. Autoclave will automatic heating up to sterilization pressure.

8. After the chamber pressure up-to set-up pressure,
The LED of sterilization timer turn to "flash" that means the Sterilization timer starts work. Then the LED turns light on.
This means the sterilization timer finished working then the the dry-timer starts working.

9. The LED of dry timer turn to "flash" that means the dry timer start work and the "DRY" Indication lamp will be light on. **Meanwhile the jack steam pressure will be exhausted to make the chamber vacuum**. The LED turns light on. This means the dry cycle is finished. Then, the dry-timer stop working, and the "END" (complete) indication lamp light on.

10. About 40 second's buzzer will report you, "MY DEAR MASTER! YOUR COMMAND HAS BEEN COMPLETED."

CAUTION: BEFORE OPENING THE DOOR ENSURE THE PRESSURE GAUGE IS AT "ZERO" POSITION.

CAUTION: PLEASE DON'T FORGET THE CHECK THE STERILIZATION IDICATOR, AFTER STERILIZATION CYCLE.

CAUTION: IFYOU NEED DO THE NEXT RUN. PLEASE TURN OFF THE POWER SWITCH THEN TURN ON POWER SWITCH TO RESET MACHINE AGAIN.

CHAPTER 5-1. BASIC STEP OF STERILIZING

PLEASE CHECK CHAPTER 4. OPERATION AT FIRST.

PUT THE STERILIZED INSTRUMENTS INTO THE CHAMBER. CLOSED THE DOOR.

⇩

1. SET-UP THE STERILIZATION PRESSURE
2. SET-UP THE STERILIZATION TIMER
3. SET-UP THE DRY TIMER
4. SELECT STEAM SUPPLY MODEL (EXTERNAL OR BUILT-IN)

⇩

PRESS THE POWER SWITCH TO “HEATER UP” POSITION.

⇩

SELECT EXTERNAL MODEL：STEAM AUTOMATIC IN TO THE JACKET.
SELECT BUILT-IN MODEL：ADD WATER AND MAIN HEATER START WORK.

⇩

STERILIZATION TIMER START WORKING, WHEN PRESSURE OF CHAMBER ARRIVED SET UP.

⇩

THE CHAMBER PRESSURE EXHAUST, WHEN STERILIZATION TIMER-OFF.

⇩

THE DRY TIMER START WORKING, WHEN THE CHAMBER PRESSURE EXHAUST COMPLETED.

⇩

AFTER 40 SECONDS BUZZER, THE COMPLETE INDICATION LAMP TURNS LIGHT ON.

⇩

IF THE COMPLETE INDICATION LAMP NOT LIGHT ON PLEASE RE-CYCLE AGAIN.

NOTE

FOR STERILIZER IS EQUIPPED WITH VACUUM PUMP, PLEASE TURN ON THE VACUUM RELEASE VALVE WHEN THE STERILIZATION CYCLE IS COMPLETED. THEN, PLEASE OPEN THE DOOR AFTER THE PRESSURE FOR CHAMBER RETURN TO ZERO.

CAUTION

1. CHECK THE PRESSURE GAUGE (CHAMBER) 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. IF YOU NEED DO THE NEXT RUN. FIRST TURN THE "START" SWITCH TO "OFF" POSITION THEN TURN ON THE POWER SWITCH TO RESET MACHIN.
   `

4. WHEN SELECT "EXTERNAL" MODE, WILL NEED TO EXHAUST THE WATER FROM STEAM GENERATOR FIRST. BECAUSE IF THERE'S WATER INSIDE THE STEAM GENERATOR, IT WILL ABSORB THE HEAT OF STEAM, THEN IT WILL TAKE LONGER TIME TO HEAT UP THE CHAMBER. AFTER WATER DRAIN COMPLETELY, PLEASE TURN IT OFF.

CHAPTER 6. WARNING

1. Anytime check the pressure gauge, if the pressure over than 0 kgf/cm^2.
   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 keep open the water source, or not, the low-water protector wills cut-off the elec. power.

4. Please attend the high temperature on the door of the chamber. When she is working.

5. **External model :the steam supply pressure max 2.5bar. Don’t exceed the max pressure.**

6 The door handle must be closed well, when the unit is in sterilization.

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

8. Use only a dedicated power supply.

9. The silicon rubber gasket on the inner door and the front of the chamber should be kept clean.

10. The filter valve inside the chamber, should be cleaned at least every season.

11. We recommend use of chemical indicator strips as a check for sterility. These strips may also be kept as a record of sterilization.

12. In the event of an emergency immediately turn the autoclave off at the mains power point. Then, turn open the exhaust valve.

13. Please keep the chamber clean, anytime.

14. Movement: This machine over than 200KG to 450KG. Anytime, move this machine must by 6 person at least.

15. The sign of caution and indication:

Caution! Hot surface.

Grounding terminal.

This label means indicator for power on

This label means indicator for power off

Consult instructions for use

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.

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

Authorized Representative at europe.

Manufacturer.

Caution, risk of electric shock.

16. STORAGE ENVIRONMENT: TEMPERATURE:-10℃~+50℃ / HUMIDITY ≤ 80%

17. WORKING ENVIRONMENT: TEMPERATURE: 5℃~+40℃ / HUMIDITY ≤ 80%

18. TRANSPORTATION ENVIRONMENT: TEMPERATURE: -10℃~+60℃ / HUMIDITY ≤ 80%

CHAPTER 7. APPENDIX

SETTING UP THE STERILIZATION TIME:

※ STERILIZATION PRESSURE SELECTION RANGE 0.9~2.1 kgf/cm^2

※ STERILIZATION TEMPERATURE SELECTION RANGE 118ºC~134ºC.

※ STERILIZATION TIME SELECTION RANGE 0 ~ 60 minutes

※ DRY TIME SELECTION RANGE 0 ~ 60 minutes adjustable.

Please don't set-up the dry time over than 30 minutes. Because Sometime the boil water will be not enough.

Liquids sterilization need special optional device. By order request.

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

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

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: No Fuse Breaker broken.
   Solution: Replace the No Fuse Breaker.
3. Cause: Bulb broken.
   Solution: Replace the bulb.
4. Cause: Start switch broken.
   Solution: Replace start switch.

*** HEATING-UP LAMP IS NOT LIGHT ON:**

1. Cause: Lamp Broken.
   Solution: Replace the bulb.
2. Cause: Heater broken.
   Solution: Replace the heater
3. Cause: Power relay broken
   Solution: Replace the power relay

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

1. Cause: Water is not enough.
   Solution: Check the water level
2. Cause: Water level sensor surface dirty and non-conductive
   Solution: Clean the sensor
3. Cause: Water level sensor switch broken
   Solution: Replace the switch
4. Cause: Check manual valves #23, #20, #21 are closed completed, or valve leaking
   Solution: If valve leaking, please replace it.
5. Cause: Check the solenoid valve #2, #5, #6 have lock function or not, and valve leaking
   Solution-1: If no lock function, please check the elec. wire system and valve coil.
   Solution-2: If valve leak, please replace it, If coil burn down, change the coil.

PS: THE FILTER MUST BE CLEAN PER EACH SEASON.

*** PRESSURE IN THE CHAMBER CAN'T EXHAUSE AUTOMATICALLY AFTER STERILIZATION:**

1. Cause: Check solenoid valve #6, Ifno function
   Solution: The valve broken, replace it.
2. Cause: The wire system broken
   Solution: Repair the wire system.

*** PRESSURE CAN‘T UP:**

1. Cause: Check solenoid valve #2, Ifno function
   Solution: The valve broken, replace it.
2. Cause: The wire system broken
   Solution: Repair the wire system.
3. Cause: Check Heater function, if it is broken
   Solution: Replace the heater
4. Cause: Check the power relay, if it is broken
   Solution: Replace the power relay
5. Cause: Water level switch broken, to cut the power for heater
   Solution: Replace the switch
6. Check steam supply source.

*** DRY FUNCTION NOT PERFECT:**

1. Please open the door in 10 minutes, after alarm. If still have same problem, please call engineer.
2. Check the chamber vacuum condition, if the pressure can’t under -0.6 kgf/cm², Please call engineer. **(For optional function “V” type only.)**

*** 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.

*** For optional function “K” type only.**

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. ◦

*** The sterilization indicator can’t change the color completely.**

1. Cause: The steam traps no function
   Solution: Replace the steam trap.
2. Cause: The steam trap dirty inside
   Solution: Clean the steam trap as Figure 1.

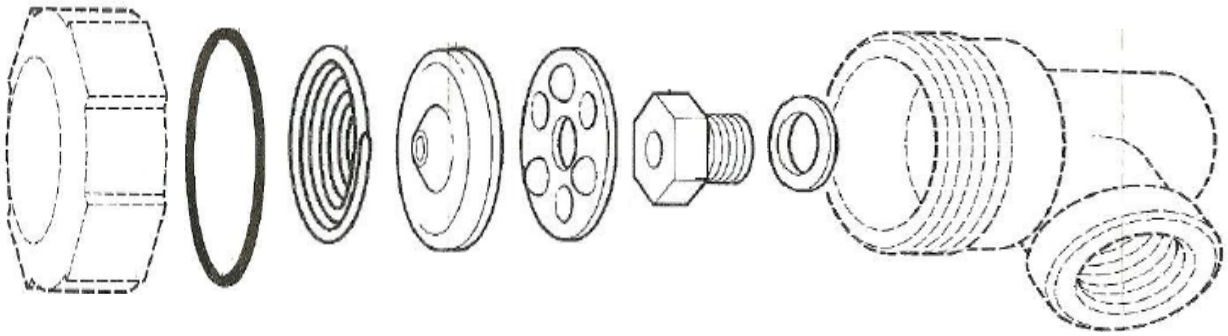


Figure 1

Note 1: Early spacer plates were uni-directional (see Fig. 2) and must be fitted with the high points uppermost. This does not apply to later models.

Fig. 2

3. Cause: The chamber or jacket pressure control switch out of order to make chamber In low pressure and low temperature.
   Solution: Replace it.

*** For "B" or "W" function type only:**

1. Cause: No auto-add water function
   Solution: Add water solenoid valve broken, replace it.
2. Cause: Water pumps broken
   Solution: Replace it.

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

CHAPTER 9. MAINTENANCE REQUIREMENTS

DAILY:

- WIPE THE INSIDE OF THE CHAMBER AND THE INSIDE OF THE DOOR WITH A 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/cm², 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 CENSOR.
- CHECK IF AIR FILTER CLOGGED WITH DUSTS.

Cleaning Steps to the Water Sensors of the Steam Generator - Model SA-A 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).

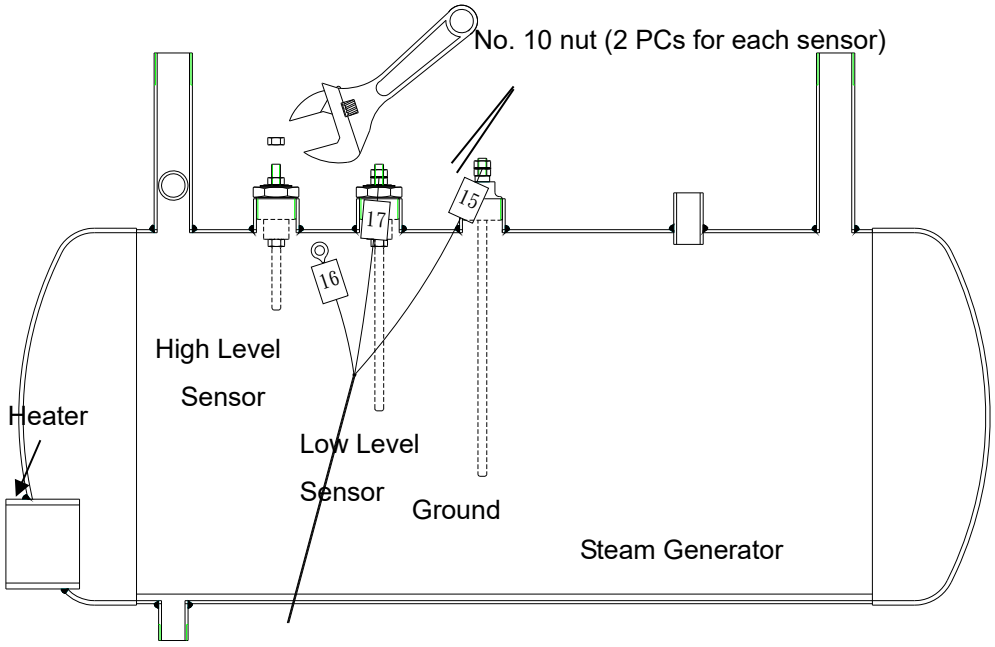


Fig- 1 Layout

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.

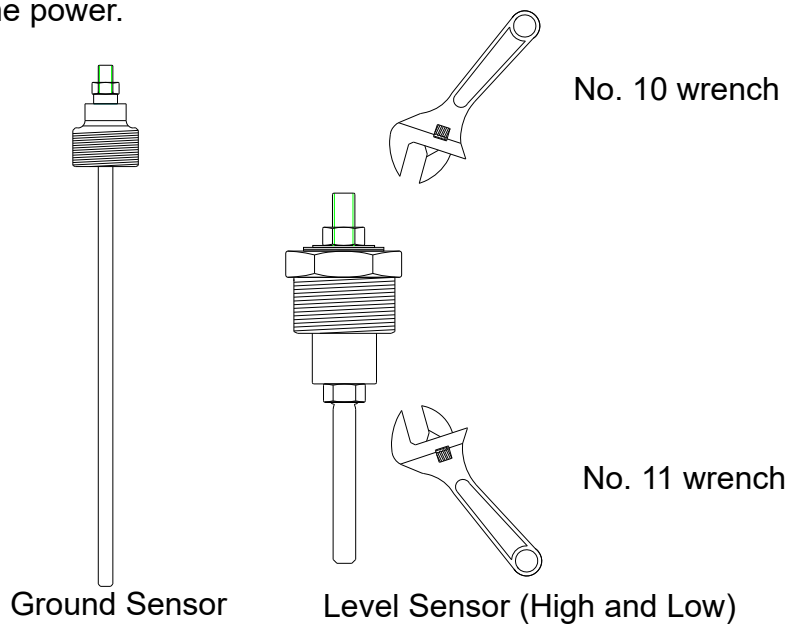


Fig- 2 Sensors

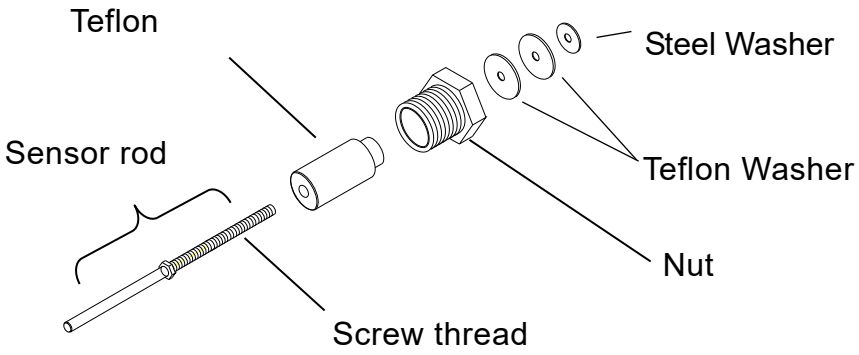


Fig- 3 Sensor Assembly

WARRANTY

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.

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Address:

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Country:_____ Tel:_____ Fax:_____

Date of Purchase:_____ Model No.:_____

Series No.:_____

Distributor:

Manufacturer: STURDY INDUSTRIAL CO.,LTD. (ISO 13485 CERTIFICATE FIRM.)

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Model	SA-A Series
Manufacturer 	Sturdy Industrial Co. Ltd.
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