

9.4. Clean the seal plate periodically.

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



Fig 9-7



Fig 9-8

Remark: providing with seal packing collar for life.

9.4.1 Change of the seal

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

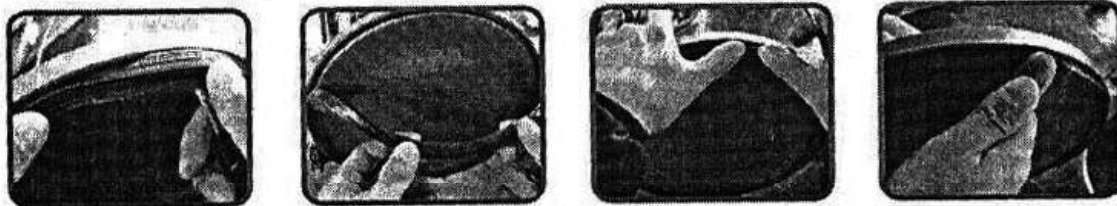


Fig 9-9

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



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

1. Description & Usage

Design and mark pressurized steam autoclaves especially to meet the needs for sterilization of instruments and devices in clinics, departments in a hospital and laboratories.

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

TANGOR-12L Pressurized Steam Autoclave

TANGOR-12L uses thermal pressure to force hot steam onto medical instruments. It is suitable for sterilization of solid medical instruments and 134°C autoclavable devices for Stomatology, Ophthalmology, surgical theaters or research laboratories. It cannot sterilize porous or dressing materials.

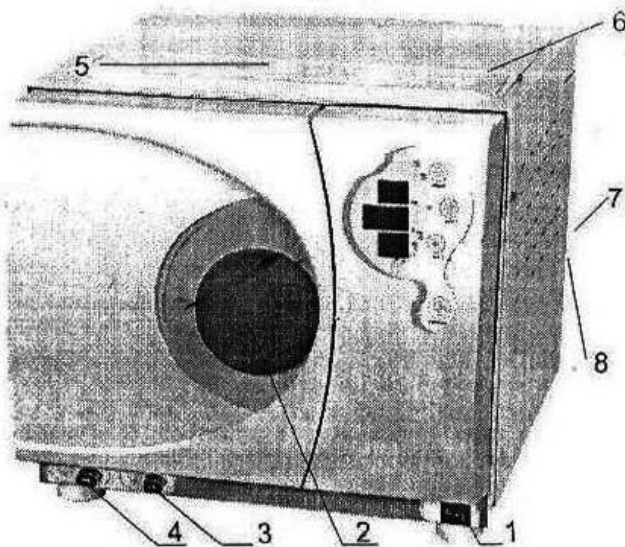


Fig 1-1

- 1. power switch
- 2. door knob
- 3. waste water exit
- 4. water tank exit
- 5. waste water tank
- 6. water tank
- 7. fuse
- 8. printer connection

2.Specifications

Chamber inner dimensions: (Diameter x Depth) -----200mm x 358mm
 Power Supply: -----According to the nameplate
 Sterilizing Temperature/Pressure --121 °C/(1.0-1.3) Bar (Under standard atmospheric pressure)
 -----134 °C/(2.0-2.4) Bar(Under standard Atmospheric pressure)

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

Power Fuse -----T12A
 Water reservoir capacity -----3.5 liters
 Environment temperature-----+5 °C ~ +40 °C
 Relative Humidity Range-----30% ~ 75%

Figures



Package Key



Test Cycle Key



Caution & Warning



Start/Stop key



Used Water Outlet



Type B Device



Select Key



Cycle Step Key



Grounding



Dry Key

Tip:

Standard atmospheric pressure: It is the atmospheric pressure at sea level. It refers to 1 Standard atmospheric pressure.

The value is 0.1Mpa=1000Hpa=1.0 Bar. Atmospheric pressure decreases by higher altitude.

For instance: at 3000 meters or lower, An increase of altitude of 1000 meters will result in a decrease of ATM PR .by 0.1Bar approximately.

3.Installation

The Autoclave should be installed in a drafty place allowing minimum 10 cm space at all sides and 20 cm at the top. The radiation openings at the side of the machine should not be blocked. The Autoclave should be placed on a leveled counter top.(Fig 3-1)

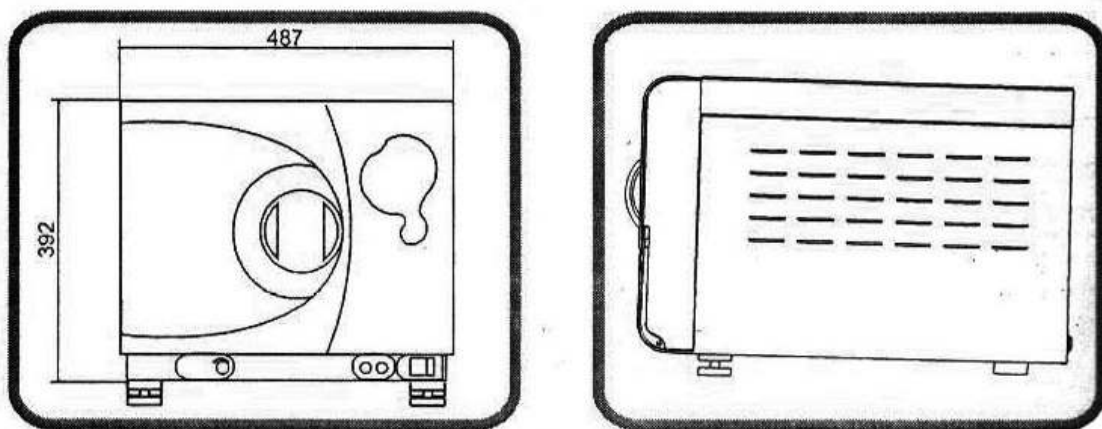


Fig 3-1

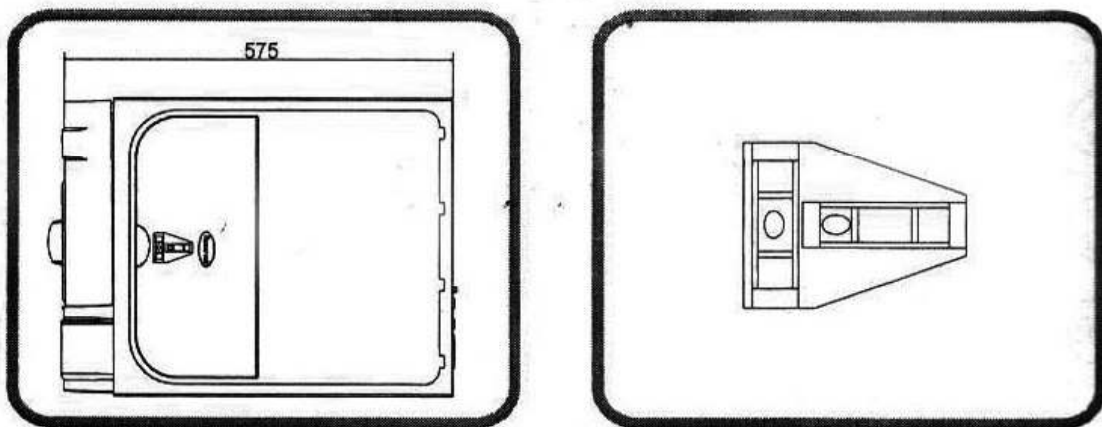


Fig 3-2



Caution:

If the front of the machine is lower than the back Fault "E3" (E3 means it don't dry completely) might occur. You may level up the front to correct this Fault.

4. Control Panel of TANGOR-12L

Control Panel of TENGOR-12L (Fig 4-1).

1、 Pressure Display

It displays chamber relative pressure in real time during a Cycle. The unit is per bar.

2、 Temperature

It displays chamber temperature during a cycle. The unit is per Degrees Centigrade °C.

3、 State display/Error Codes

It displaying all the states of autoclave when autoclave working.(According to the state form) Error Codes when alarm goes on.You may correct the error accordingly by looking it up in the page of error codes and its corrections.

Caution: In the case of faults, please contact your distributor or the manufacturer immediately.

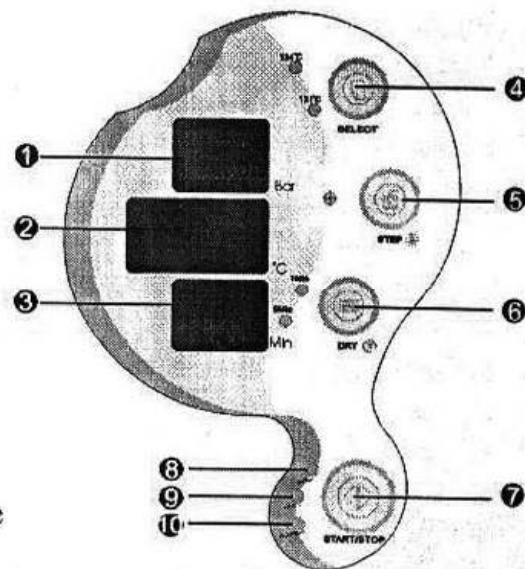


Fig 4-1

4、 “SELECT” key

Program choose key. It is used for choose the temperature. You can choose the right program according to the temperature that instrument can afford. Also you can choose the program of malking cotton.

5、 “STEP” key

This is a last cycle selection key. When a cycle completes, you may press this key to keep warm or stop heating the unit. The indication light goes on, and it means that when the cycle is complete, the heating element will stop before the chamber door is opened. When the indication light is off, it means that the chamber will be kept warm after completing a cycle and heating up time is shorter during next cycle. If you don't want to start the last cycle, you need to press “STEP” key once. Then the indication light will be off.

6、 “DRY” key

This key selects the Fast sterilization cycle. **With** unwrapped instruments, you may use the fast cycle by pressing the DRY key once, **the indication** light goes on and it indicates that machine is in fast cycle mode. It can **shorten the thermal** drying time.

7、 “START/STOP” key

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

8、 “WATER” indication light

When the water volume is low, the light is **glinting.**

9、 “READY” indication light

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

10、 “RUNNING” indication light

Working light. It means sterilize program is **working.**

5. Operation of TANGOR-12L

Please connect the power cord before you start the operation. Press the main power switch at right lower corner of the front panel. The power switch light turns on indicating that power is connected. It will indicate "Ld" when pass examination.

5.1 Fill water

If the water level is lower than the lowest water level. When the power switch is on, select the sterilize program, the "water" indication light may glitting while alarm Beeps. At this time, you need to refill the water reservoir. Please open the water tank and pour water into it by container. Please pay attention to the water level during filling water, you should stop filling when the surface is close to the red water level mark.

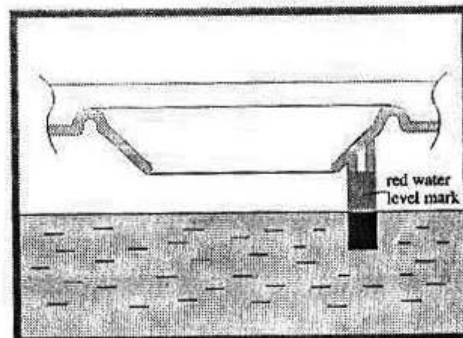
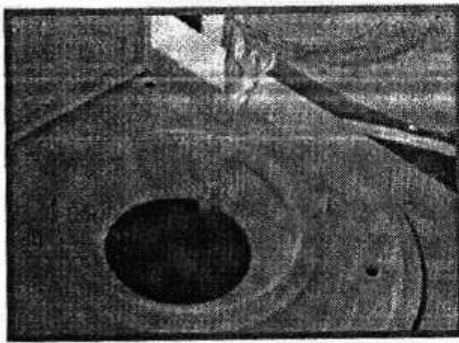


Fig 5-1



Caution:

- 1). Distilled water must be used to prolong life of the machine.
- 2). Don't tilt the autoclave when there is water in the water reservoir.
- 3). The condenser water collector should be emptied frequently. It is suggested that the collector be emptied when refilling the water reservoir.
(Please refer to item 9.2 draining the water.)

5.2 Start a cycle

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

5.2.1 Press "SELECT" to set one of the cycles. The key toggles between the cycles at 121 °C, 134 °C and cotton mode. One of the indication lights turns on to show the cycle you selected. (Fig 5-2)

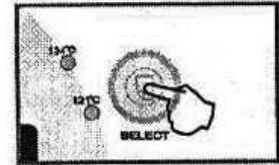


Fig 5-2

5.2.3 You may select "DRY" key whether starts the fast sterilization cycle. Press "DRY" key, it will reduce the sterilization time.

5.2.4 After select above settings, put the instruments into the autoclave which need sterilize.

Caution: Instruments that are ready to sterilize should be placed in the tray not touching one another allowing space for steam to pass through. It is suggest that the tray holder be used to put the tray with instruments inside the chamber to avoid scald. (Fig 5-3)

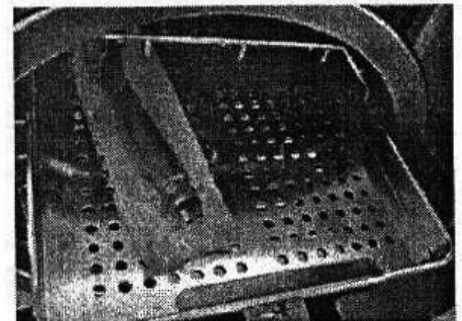


Fig 5-3

5.2.5 After the instruments are loaded, you may close and lock the chamber door by turning the door knob clockwise to its locking position. The "READY" indication light goes on. (Fig 5-4)

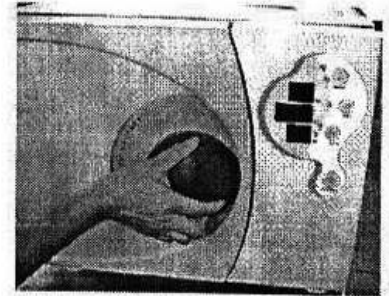


Fig 5-4

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

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

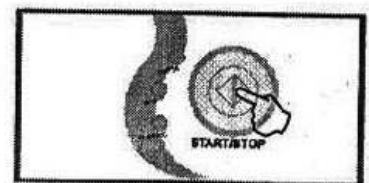
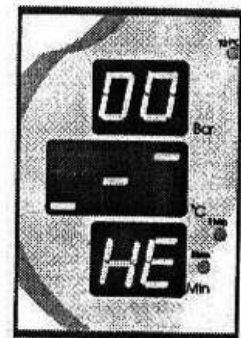


Fig 5-5

5.2.7 When a cycle completes, the display shows "Ed" the indication light "RUNNING" turns off and the indication light "READY" turns on. At this time You may then open the chamber door and unload the Instruments which are sterilized. (Fig 5-6) At the same time, temperature indicate "prt" , it means that it is Performing print, whether you Performing print, whether you Have install printer,the process can not be omitted. But you needn't care about it. It will not effect the process of opening the door and unloading the instruments. Print process will Disappear automatically.

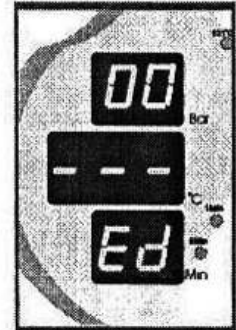


Fig 5-6

Attention: To ensure autoclave is safe, When water level low alarm sounds, Please be advised add some water first. When you add the water, please don't forget to let condenser water out.



Caution: Always use the tray holder to load or unload the tray with instruments in it, in order to avoid burning injuries.

If you didn't press "STEP" key during a cycle and the indication light is off, it means that the machine is keep warm mode. The sterilization Chamber is kept being heated. This will enable faster cycle that follows.

If you press "STEP" key before end of sterilization, "STEP" indication light goes on, it means that the machine is last time cycle. The chamber starts to cool down completely before the chamber door is open. It should normally be used during the very last cycle of the day.

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



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

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

The first way: (fig1,fig2)

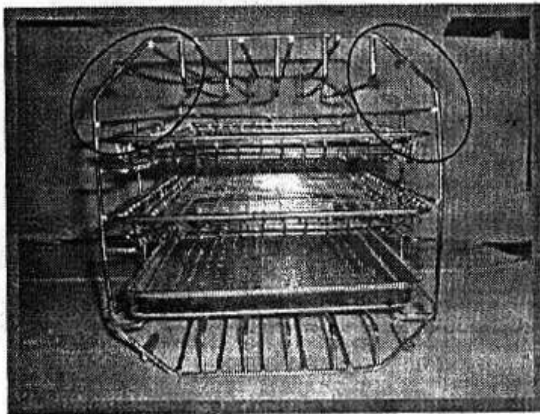


Fig1

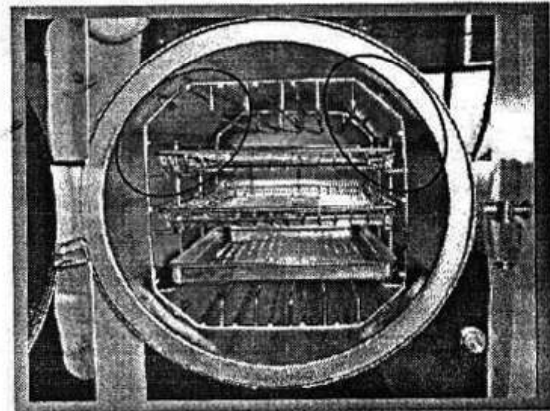


Fig2

The second way: clockwise rotate the instrument rack by 90° , based on the first way (fig3,fig4)

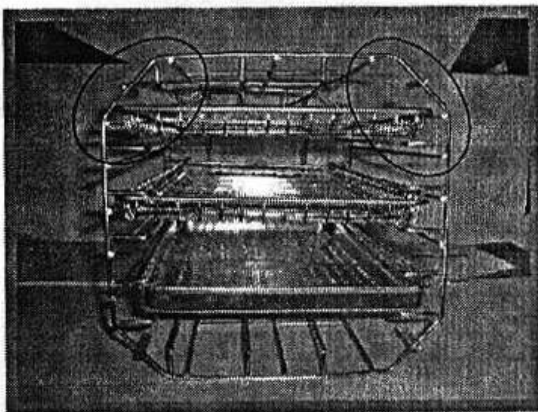


Fig3

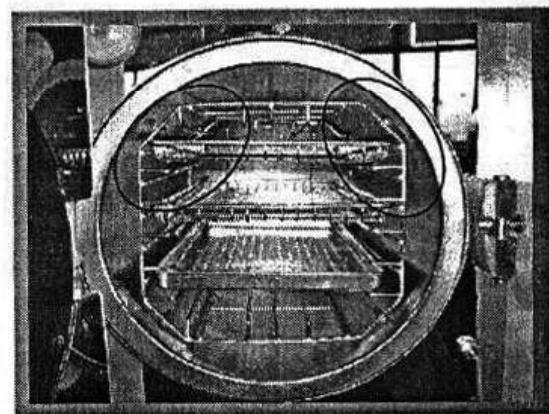


Fig4

Notes: the circle stamped angle is up along

6. Door Adjustment

Under normal circumstance the chamber door lock needs no readjustment. Once steam leaking occurs (the seal fails), you may use the spanner to turn the door seal tightener.

6.1 Open the door first.

6.2 Insert the spanner in the gap beneath the plastic cover; use the spanner to lock on the adjusting nut (Fig 6-2). Turn the nut counter clockwise as the figure below (Fig 6-1). This will tighten the sealing plate.

6.3 Turn the nut until the sealing plate is tight. If the door knob is too tight, you may also turn the nut clockwise to loosen it as long as the seal does not leak.

Caution:

Never try to readjust the chamber door while the door is locked.

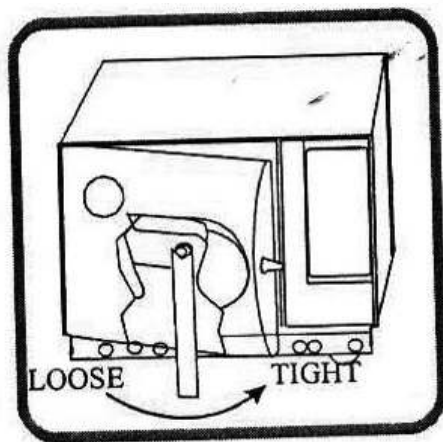


Fig 6-1

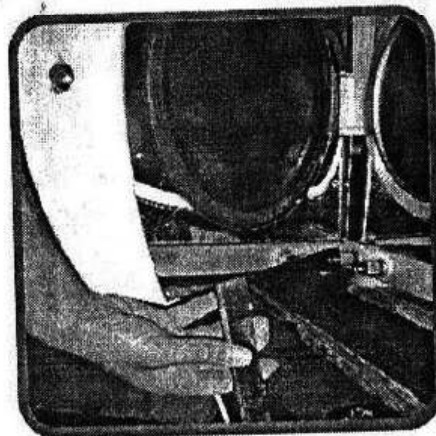


Fig 6-2

7. Printer User's Guide

According to the requirement of customer, steam sterilizer can adopt prescriptive printer. Connect the printer and the steam sterilizer with prescriptive cord. Switch on the power, two lights on the printer Panel will goes on, means printer has been installed.

Caution: steam sterilizer can only select micro printer offered by us.

Print information explaining:

Date: Sterilize date

CN: Name of cycle

C.S.T: The starting time of cycle

Pp: The phase of pressure

H.S.T: the starting time of sterilization.

H.E.T: the end time of sterilization.

D.S.T: the starting time of drying.

C.E.T: the end time of cycle.

Operator: Operator, You can signature name according to practicality instance

Caution: Chinses characters provided by us. The mini-autoclave of is only to equip with the mini-printer of Chinese characters provided by us.



Fig7-1

Sterilization Records
Date: 07.09.40 Dycle: 00006 C.N.: 134 2.10 -N-: SP4m DP10m
C.S.T: 23:15:16 Pp: 23:23:57 0.0 099.9
H.S.T: 23:50:24 Min: 2.10 134.1 Min: 2.00 134.0 Ave: 2.05 134.0 H.E.T: 00:08:27
D.S.T: 00:10:44 0.30 106.9 C.E.T: 00:10:45
Result: Passed
Operator:
Thanks

8.Function setup:

8.1、 Enter function setup mode:Press “STEP” key for 20s when on non-work state (time display “Ld”) pressure display “1” , enter function setup mode.

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

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

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

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

Option 8: sterilization time adjust,display “S-T” when you setup this option,the sterilization time(SP)win increase at former value.The adjustable range are following 3 kinds.One is increased by 1 minute,Second is increased by 2 minutes.Third is increased by 3 minutes.

Option 9: temperature data adjust automatically option, display D-P ,When you setup this option,you can adjust the temperature more or less than 2C-3C inorder to meet your request. But we suggest user should setup under guidance of teahnician or not setup.

Press “ SELECT” key after setup,you will come back to option 1.At this time,you must press STEP key 3 seconds in option7.Then you can start the setup of option8 and option.Otherwise it only can start cycle between option1and option7.

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

9. Maintenance & Maintain

9.1 How to clean the water tank.

9.1.1 Please clean the sterilizer water tank and waste water tank regularly.

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

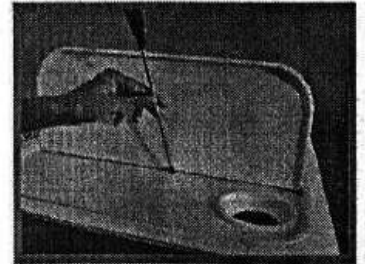


Fig9-1

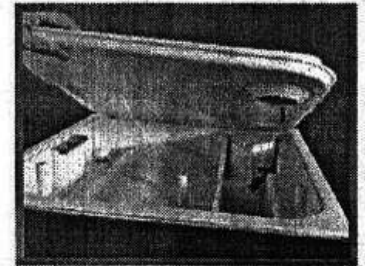


Fig9-2

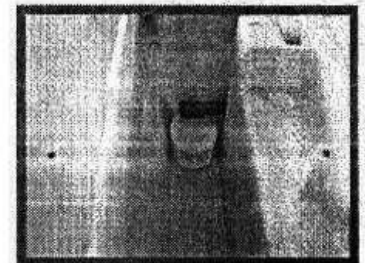


Fig9-3

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

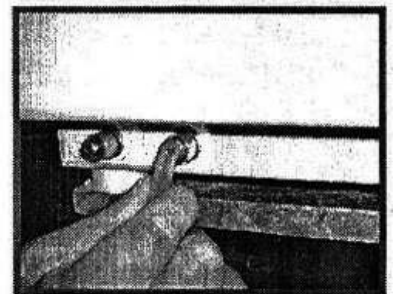
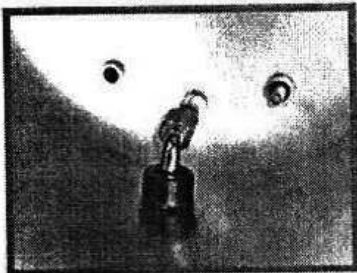


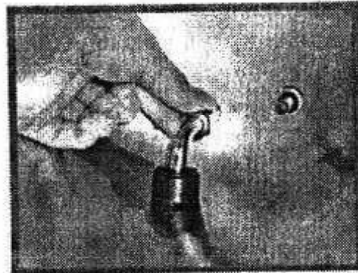
Fig 9-4

After a long time usage, maybe some small impurity will deposit on the drain filter, it will affect vacuum and drying. All the impurity is comes from the oil or dirt or dust of the instrument which need sterilization, also maybe comes from the water. In order to prolong the life of the drain filter, please note the following items:

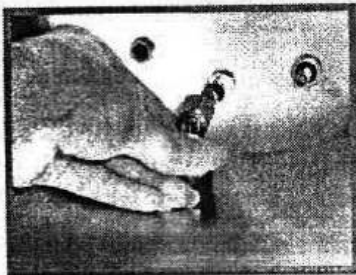
If draining filter plug up, you can solve according to fig 9-5.:



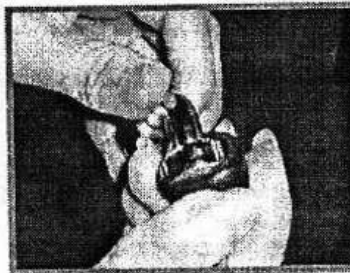
1、 find the water filter.



2、 rotate off the filter screw



3、 pull out the filter from the connection..



4、 take off the blue rubber which on the filter clean, or change a new one as you need.

5、 after you clean or change a new filter shim, plug in the water filter back on the chamber connection. Notice: please put the blue rubber down and touch the chamber and rotate tighten the screw nut.

Fig9-5

9.3 Change fuse (Fig 9-6)

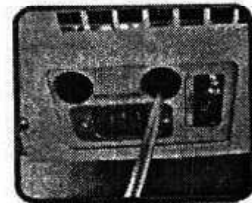
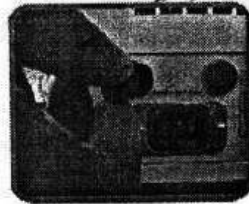
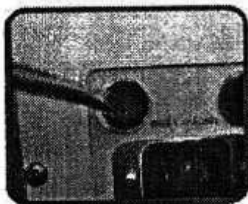


Fig9-6

- 1). Switch off the power.
- 2). Unscrew the fuse holder with a screw driver counter anti-clockwise.
- 3). Pull the fuse holder out with your fingers.
- 4). Make sure to replace the cooked fuse with a correct fuse.
- 5). Put back the fuse holder and screw it on clockwise with a screw driver.
- 6). You may use your hand to change the fuse.

9.5 Cleaning Steam generator

9.5.1 Aim: Clean the steam generator and steam pipe, to avoid the furring block the pipe.

9.5.2 Description: 20 min cleaning + 5 min drying

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

9.5.4 Operation: when the machine is inactivity, press SELECT for 5 seconds, the 134°C light and 121°C light will go on at mean time, it means you chose the cleaning cycle. Close the door and press START, it will start to clean.

9.5.5 Cleaning remind: after cleaning, every 100 cycles, 134°C light and 121°C light will go on at the mean time and glitter. Remind you to clean the steam generator.

Friendly remind: Cleaning function will not affect the autoclave cycle, only remind message.

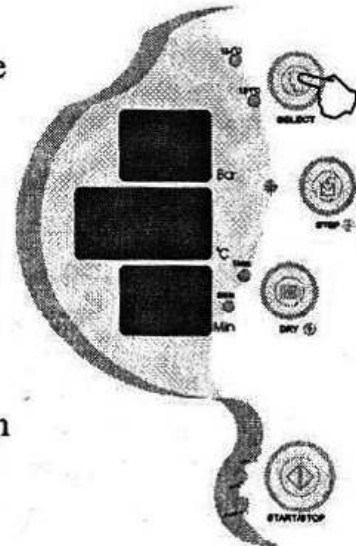


Fig 9-10

10. Transportation & Storage

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

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

Temperature: $-40 \sim +55^{\circ}\text{C}$

Humidity: $\leq 85\%$

Atmospheric pressure: 500Hpa \sim 1060 Hpa

Caution: Don't drag the machine while moving.

11. Warranty

The manufacturer provides a warranty for repair at not change to the customer for two years after the invoice date with presentation of the invoice. Following are the disclaimers:

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

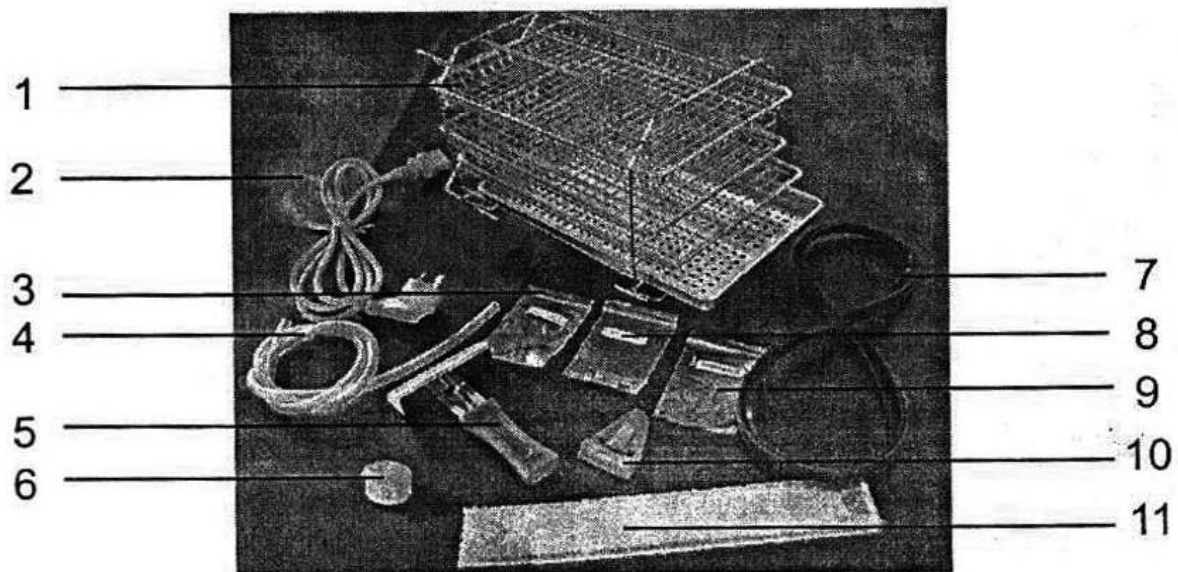
11.2 Damage due to dismantling the machine by unauthorized personal;

11.3 Don't have guarantee of end user.

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

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

12. Accessories



- 1). Instrument tray rack 1 pc and Instrument tray 3 pcs .
- 2). Power cord. 1 pc.
- 3). Mainboard Fuse 1 pc.
- 4). Water outlet tube 1 pc.
- 5). Tray holder 1 pc.

- 6). Filtrable net 1 pc.
- 7). Sealing ring 1 pc.
- 8). Fuse 2 pcs .
- 9). Draining O ring 2 pcs .
- 10). Level instrument 1 pc.
- 11). Door adjustment spanner 1 pc.

Appendix.

Form1 Cycle mode Chart

Item	Digital display	Mode	Description
1	Ld	Pre-heating	Preparation and conditioning of the autoclave
2	HE	Heating	Chamber is being heated and pressurized
3	Cycle time	Sterilizing	Counting down of sterilizing
4	Dr	Venting	Chamber starts to vent and dry
5	Drying time	Drying	Instruments are being dried.
6	Ed	Complete	Cycle is complete and chamber door can be opened
7	Faults & Error codes	Error codes	Displays error codes, resets and alarm
8	LE	Balance state	When change the state, the pressure of inside and outside the Autoclave should be the same.

Form 2 Work mode chart

Sterilize mode, as following(TANGOR-12L):

	134 °C	121 °C	CLEAN test
Sterilizing temperature	134	121	---
Sterilizing pressure	2.10	1.10	---
Classes	N	N	---
Pre-heating min	0-7	0-7	Clean 20
Admission time min	5	5	---
Sterilizing time min	4	16	---
Drying time min	10	10	---
Quick drying time	1/5	1/5	5
Total time min	26(16/20)	38(29/33)	25

Form 3 ERROR CODE CHART

Serial number	Code	Error	Solution
1	E1	Sensor error	Examine sensor
2	E2	Super pressure(>2.6 Bar)	Examine inner temperature sensor
3	E3	Chamber temperature(>145 °C)	Examine outer temperature sensor
4	E4	Constant temperature and constant pressure failed	Rerun parameter autoadjust program
5	E5	Puts the steam defeat(20S<0.3Mba)	Inspect puts the steam valve, the vacuum valve
6	E6	Door is opened when on working	Examine door switch
7	E7	Steam generator ultra warm(>240 °C)	Inspect steam generator temperature sensor
8	E8	Pre-heating failed(>20 min)	Examine the electric connection of temperature sensor, heat ring and heat stick
9	E9	Admission defeat(>30 min)	Examine electric connection of heat stick, Admission pipeline