Dentalzone

SUN SERIES AUTOCLAVE

Steam sterilizer（Class B）

LCD Display

Operation Manual



This manual applies to SUN18-Ⅱ、SUN23-Ⅱ autoclave

REV1405ER

Content

1、General Introduction ……2

2、Application Scope ……2

3、Tech. Parameter……2

4、Diagram Specification ……3

5、Installation ……..3

6、Packing accessory……..3

7、Display and keypad description……..4

8、Emergency Condition……6

9、Maintenance and Service……7

10、Transportation and Storage……8

11、 Attention……9

Appendix：

1、Steam loop（Work Description）

2、Circuit diagram of sterilizer

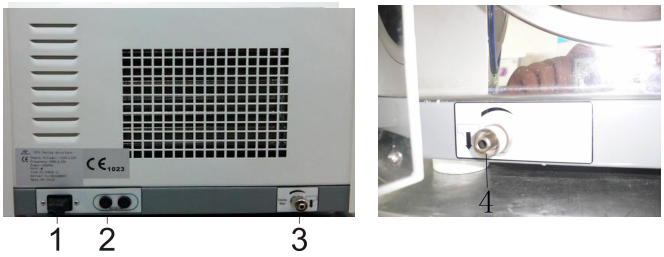
3、BD test method

SUN series Autoclave

1. General Introduction

This Autoclave is a precision instrument specializing in the operation occasion in need of simple, fast and efficient sterilization by the doctor or his/her assistants, and the doctor shall take the responsibility for such work.

This Autoclave is specially designed for the occasions in use of frequent sterilizations. It is equipped with the microprocessor for intelligent control and man-machine interface for convenient operation. With the distinctions in displaying parameter and condition actively, evaluating malfunction automatically, shutting off for self-protection automatically in case of excessive temperature and pressure, this type autoclave is reliable product in sterilizing.



1. Power source socket 2. Fuse
3. Water exit of distilled water tank 4. Used water exit

2. Application Scope

This machine can be applied in sterilizing for the tooth device, operation device, Sanitary Material and other heat-resisting articles existing in the Dept. of Stomatology, Ophthalmology and lab.

3. Tech. Parameter

Chamber size of the autoclave (Diameter X Depth) 12L……200mmX360mm
Chamber size of the autoclave (Diameter X Depth) 16L……230mmX360mm
Chamber size of the autoclave (Diameter X Depth) 18L……249mmX355mm
Chamber size of the autoclave (Diameter X Depth) 22L……249mmX450mm
Rated Voltage……220V±22V, 50Hz±1Hz ☐
……110V±11V, 60Hz±1Hz ☐
Rated Power……1800VA ☐ 2000VA ☐
Sterilizing (Pressure/temp.)……100-120KPa/121° C
200-220KPa/134° C
(Both of above are Under Standard Atmospheric pressure)
Fuse-Melting pipe…….. ……. T15A ☐ T30A☐
Capacity of water tank……2L
Probable water consumption of one cycle …….. . .0.4L
Environment temperature of operate……0-40° C

4. Diagram Specification

 Attention and warning  I Sort B model device  Protective Grounding

5. Installation

The clearance between the outside of autoclave and the around articles shall be 10cm as retained, and the top surface shall be 20cm retained.

The air-cooling window attached to the exterior surface of the autoclave shall be non-clog by dust or articles, and the autoclave shall working in the proper air flowing environment.

The autoclave shall be installed on the horizontal working base.
The 2 front feet of autoclave can be adjusted the height, please ensure the front of machine slightly higher than the back.

PREPARATION BEFORE OPERATION

Before operation, please connect well to the power source. Connect the power source hole under the back left side of the autoclave and the power socket by the attached plug. Press the green switch right bottom corner of the front side, when the indicator light is on, it means that the autoclave get through with the electric power, and the process then is in initialization status and showing "LD" being on the screen. At this time the autoclave is not heating.

6. Packing Accessory

1.	Draining pipe	1 pc	
2.	Mesh tray	2-3 pcs	
3.	Plug	1 pc	
4.	Bracket	1 pc	
5.	Manual holder	1 pc	
6.	Fuse	2 pcs	
7.	Operation manual	1 pc	
8.	Measuring cup	1 pc	
9.	Sealing ring	1 pc	

7. Display and keypad description

7.1 display screen

Real-time displaying the sterilizing status like system pressure and temperature.



7.2 SETTING(PUMP) function keys

Used to enter the advanced settings status

7.3▲SELECT key: When in program selection menu or the Advanced Settings menu, the up arrow used to indicate movement and parameter values increase.

7.4▼SELECT key: Used to enter the sterilization mode selection menu and instructions down arrows move.

7.5 START/STOP confirmation key: Used to identify programs and program settings to quit.

7.6 Sterilizing status settings

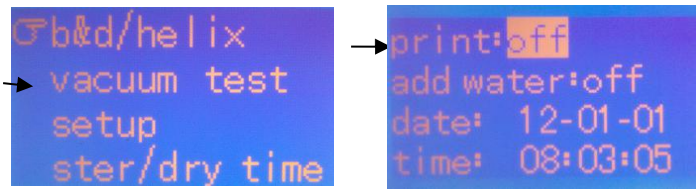
7.6.1 Choose the program



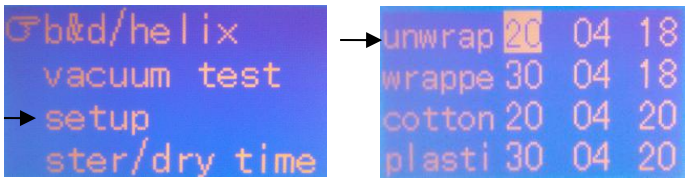
After turn on the power, the machine would display the Load, here keep Press "SETTING" 6 seconds to enter the program menu, use"▲""▼" to choose the program and press START/STOP to confirm it, after closing the door, the machine would display "Ready", then press "Start/stop" button to start working!

7.6.2 Adjust the date and time

In program menu, choose the "SETTING" to adjust the time and printer working status.



7.6.3 Adjust the sterilizing time and dry time, choose the system as right photo, and press Start/Stop to



confirm your choice!
Press "Start/Stop" to quit the setting!

7.7 Fill & drain water

When you install the autoclave for the first time, after turn on the switch, then The machine would displaying lack of the source water. Then you need to use the measuring cup to fill distilled water from the top inlet around 1500ml for the first time, next time do not filling the water too full.

When the machine displaying the used water full, please drain waster water out only after sterilizing in time.

Please clean the brass filter inside the chamber, or it would effect the pressure releasing during the sterilization. Please clean the filter in the same time with you draining the used water.

⚠ **Note: Be sure to fill distilled water .**

1. Before filling the distilled water, you must turn on the switch of the power!
2. Please fill the distilled water only after finish working!

7.8 Function description

Vacuum sterilizer divided into the following process: preheating process;the vacuum step-up process; sterilization process; exhaust drying process; the pressure balance process.

7.8.1 preheating process:

Select the program firstly, then close the door, press start button to enter the preheating process,electrify heated steam generator heater reaches 100 ℃, electrify heated the chamber wall heater to set temperature 50 ℃.

7.8.2 vacuum process:

Chamber wall temperature to 50 ℃, when the steam generator temperature reaches 100 ℃, into the vacuum heating process, open the vacuum selection valve, exhaust valve (normally on) and start the vacuum pump, 300 seconds later Close the vacuum selection valve, exhaust valve (normally on) and the vacuum pump to stop pumping the vacuum. Pot inlet valve intermittent pumping power, as steam generator to generate steam. If the system is set up one pre-vacuum, the pressure rise to +0.5 Bar until the pot stops pumping, open the drain valve to drain the exhaust 0.0Bar to close drain valve, intermittent steam generator to pump water to generate steam, when the pot the temperature reaches the set value, the end of the vacuum and transferred to sterilized itinerary. If the system is set three times pre-vacuum, then when the pressure inside the chamber rise to +0.5 Bar ,end the first pulse. Start the pump again, begin the second pre-vacuum process.

7.8.3 Sterilization process:

This trip is insulation packing process, when the pot temperature dropped to the set sterilization temperature of +0.5 ℃ , the pump starts pumping water to the steam generator, the pot temperature rise to the set sterilization temperature of +0.9 ℃ ,open the exhaust exhaust valve, allowing the pot temperature is kept between the set sterilization temperature +0.3 ℃ to the set sterilization temperature +0.9 ℃.

7.8.4 Exhaust drying process:

When the sterilization time, reduced to zero, into the exhaust stroke dry, open the drain valve to drain the pressure reduced to +0.0then the vacuum pump to start. When the drying time only 3 minutes ,open the intake valve to vacuum drying.

7.8.5 pressure equilibrium process:

When the drying time is reduced to zero, turn off the exhaust, dry intake valve opens, so that the pressure to achieve and external balance, open the automatic doors, complete sterilization.

7.8.6 Sterilization program is as follows:

	1	2	3	4	5	6	7
	134℃ UNWRAPPED	121℃ UNWRAPPED	134℃ WRAPPED	121℃ WRAPPED	134℃ COTTON	121℃ COTTON	121℃ PLASTIC
Sterilizing temperature	134℃	121℃	134℃	121℃	134℃	121℃	121℃
Sterilizing pressure	210	110	210	110	210	110	110
Vacuum times	1	1	3	3	3	3	1
Sterilizing time	4	20	4	20	20	20	20
Drying time	12	12	18	18	20	20	18

8. Emergency Condition

During the working time, the autoclave will automatically alarming, then release pressure, stop heating and display the error code (The definition of the error code is as the below table: error code and resolving method). It would ensure the safety of the operator if the emergency occur.
Any emergency happen, please check the warning code table for resolving the according malfunctions. If not possible to resolve, please contact the dealers. We will try our best to provide help to you in short time.

Error code and resolving measures

NO	Code display	Alarm Tone	Malfunction content	Resolving Measures
1	E1	long "du"	Fault of temperature sensor inside the chamber	Inspect if anything effected the sensor or wire not connecting well or sensor was broken
2	E2	long "du"	Pressure over 240 KPa	Inspect pressure sensor or vacuum pump working
3	E3	long "du"	Fault of temperature sensor outside the chamber	Inspect the temperature sensor outside of the chamber
4	E4	long "du"	Super high inner temperature when pressure rising	Inspect inside temperature sensor or pressure sensor
5	E5	long "du"	Pressure releasing slowly	Inspect the filter inside the chamber keep it clean and no jam
6	E6	long "du"	Problem of door switch or door being opened when working	Inspect door switch or if door handle were revolved to the right MAX position
7	E7	long "du"	Fault of temperature senor on steam generator	Inspecting the temperature sensor on steam generator
8	E8	long "du"	Fail on pressure rising	Inspect water flowing road and steam leaking.
9	EH	long "du"	Steam generator not heating	Inspect connecting wire or resistance of steam generator
10	EF	long "du"	Pressure not over than 0 KPa	Inspect water pump/steam generator
11	EL	long "du"	Pressure not over than 20 KPa	Inspect if electric valve causing steam leak, or replace water pump
12	Eo	long "du"	Pressure not over than 65 KPa	Inspect if the water pump working weakly. Or replace it
13	E9	long "du"	Fail on keeping pressure and temperature	Inspect the steam leaking

9. Maintenance and Service

9.1 Clean the top water tank by disinfectant or alcohol once a week.
9.2 Disinfect and clean the interior surface of the autoclave chamber monthly.
9.3 Replace the fuse.
1) Shut off the power.
2) Revolve the fuse base by counter-clockwise by screwdriver to bring out the melting fuse to be replaced;

3) Replace the new fuse and reset the fuse base on the original position, then use the screwdriver to fasten the base by clockwise.
4)Check the correctness of the data of the new fuse replaced.

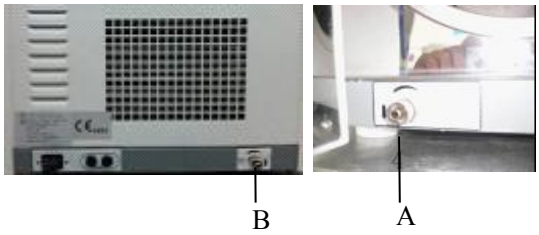
9.4 Clean the sealing ring periodically
The operator shall clean the sealing ring periodically for avoiding the influence to the seal caused by the dust/dirt left due to the long period use. Use the smooth cloth with distilled water to wipe the surface of the sealing ring or sealing cap gently. The user shall discharge the sealing ring for further cleaning or replacement if the air-leaking problem can not be resolved after the above process (The user shall discharge the sealing ring periodically for cleaning and inspection as recommendation by the supplier).

9.5 The replacement work for sealing ring
Tool: One flat screwdriver (No sharp edge at the head)
1) One hand catches the lip of the sealing ring, the other hand insert the screwdriver into the clearance between the sealing ring and the door for raise up the sealing ring.
2)After raising up part of the ring, you can use hand to draw the whole ring out. Wash its groove after drawing out the ring and pay attention to see whether it's spoiled or not in consideration of the necessity of replacement.
3)Put back the ring to the original door groove after cleaning. Most Important: the inset work must be done equably to the groove During the installation, the laid four equal points of the ring must be inserted to the groove firstly, later for the same work for the remaining segments of the ring. After finishing, press the sealing ring equally by the force of hand.
4)Note: The inner circle of the ring may be raised up when insert the ring into the groove. Please press it to the groove by using the screwdriver carefully.
Shut off the power and cooling the autoclave sufficiently before inserting the ring for avoiding scald.

9.6 Shut off the power before service or components' replacement, and the service or replacement work shall be done by the technician.

10. Transportation and Storage

10.1 The preparatory work before transportation and storage:
Shut off the power, draw out the plug and cool the autoclave down.



10.2 Draining
Empty the water storing tank after the machine become colling; use the pipe packing together with the machine, connecting to the valve showing in the above picture A or B, A is the water exiting mouth for used water collecting tank, B is

the water exiting mouth of the distilled source water storing tank. Revolving the water exit button by anticlockwise direction so as to release the water.

10.3 The autoclave shall be transferred and stored with the below conditions:
Ambiance temperature: -40ºC -+55ºC
Relative humidity: ≤ 85%
Atmospheric pressure: 500HPA-1060HPA

 **Note: Do not drag or drop during transportation.**

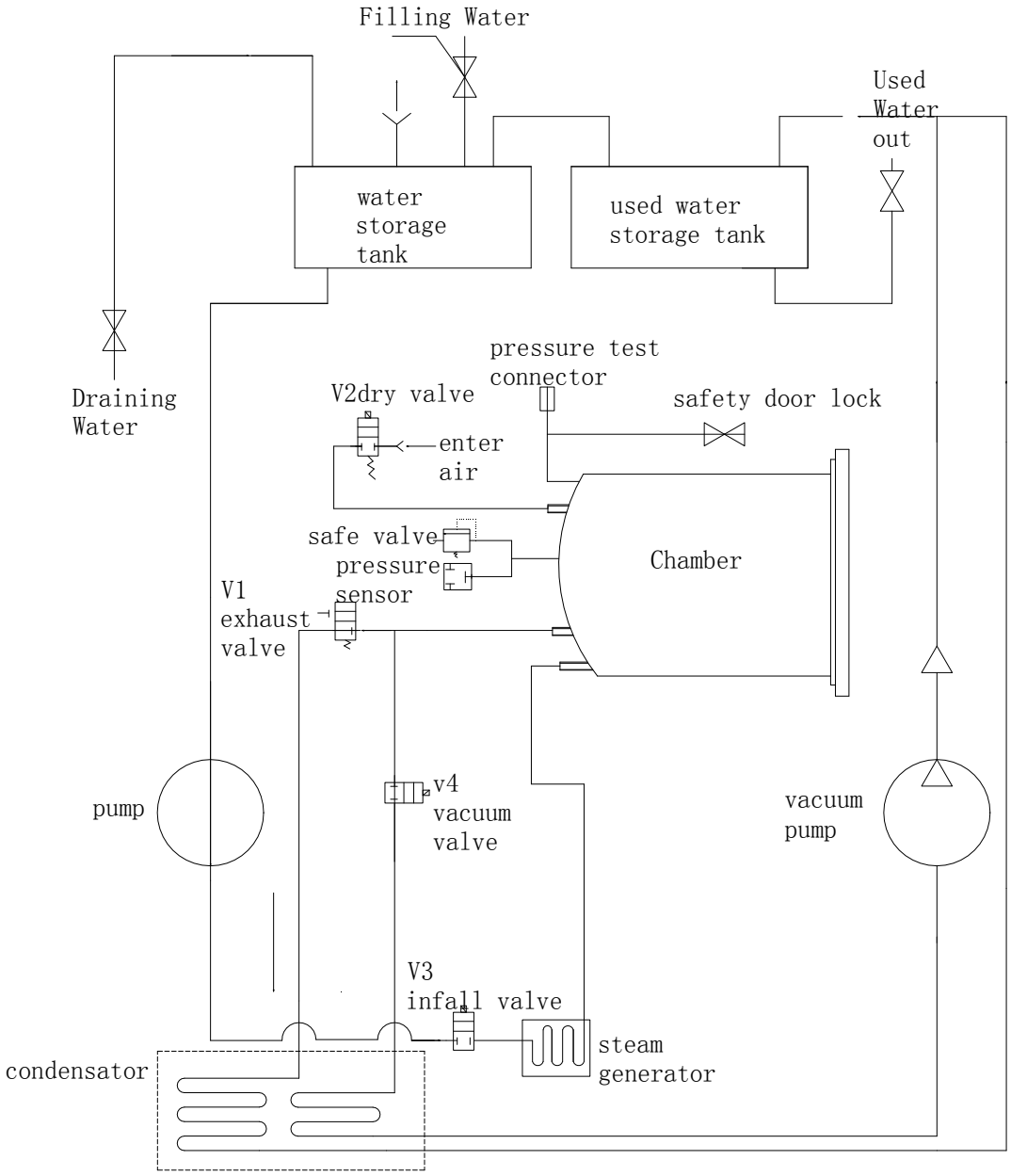
11. Attention

 **ATTENTION**

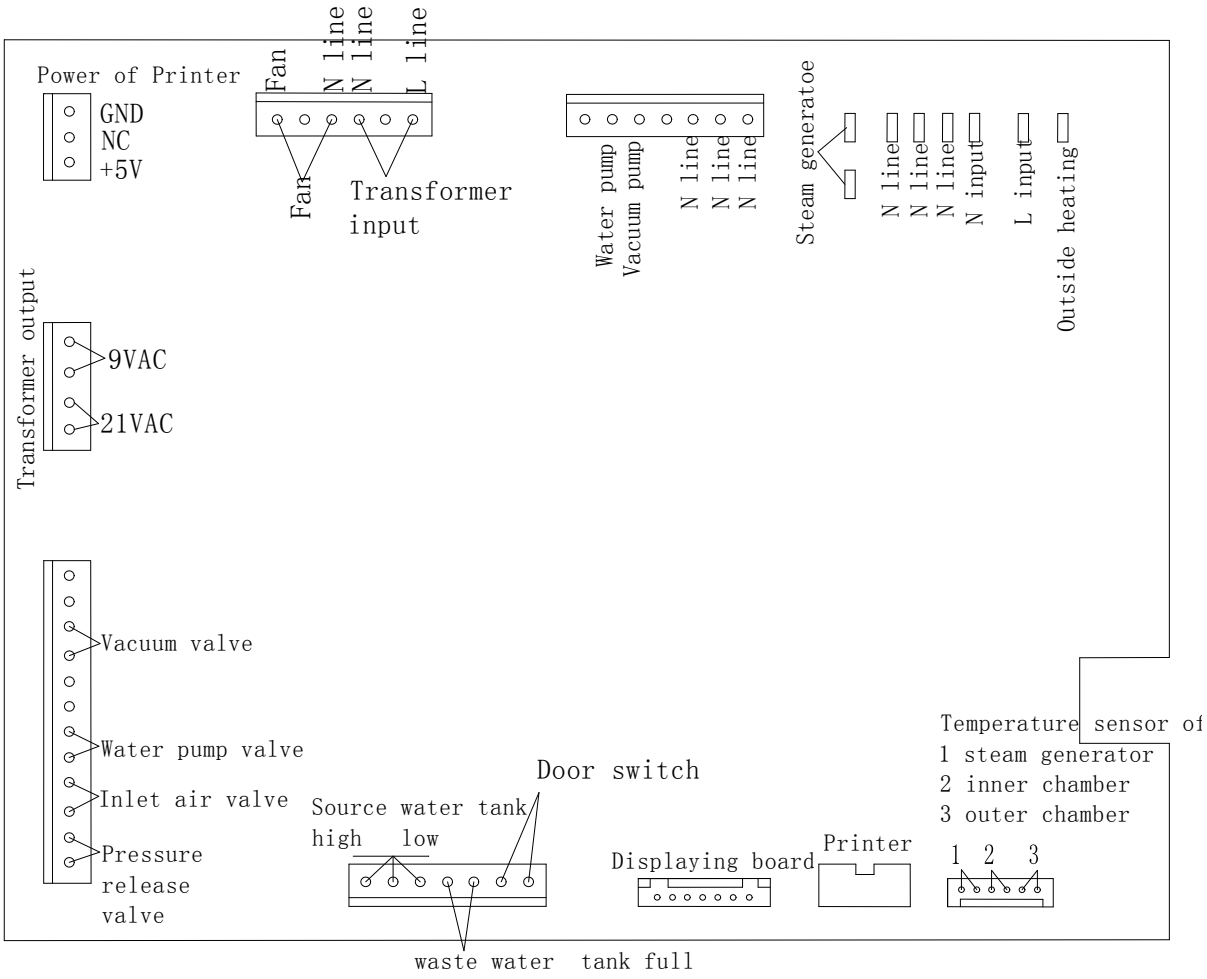
1. The autoclave must be placed on the horizontal working base.
2. Must use the distilled water for the purpose of lasting the operation life of the autoclave.
3. There shall be no clog to the air cooling window on the outer surface of the autoclave.
4. The object apparatus to be sterilized shall be placed on the device plate with enough clearance retained in favor of the air circulation inside the sterilizing room.
5. Empty the water inside the cooling water collecting tank frequently. Usually, the cooling water collecting tank shall be emptied once the water storing tank emptied.
6. The door handle must be buttoned up before working.
7. Don't open the door of autoclave before seeing the "0" bar displayed on the pressure indicator.
8. Not be too closed to the door of the autoclave in case of scald when open the door.
9. Shut off the power before discharging/installing the sealing ring, and the work shall be carried out after further sufficient cooling in case of scald.
10. Don't drag or drop the autoclave during relocation period of the autoclave.
11. The protecting ground shall be reliable.
12. Equipment must be used away from the magnetic field.
13、The device end of life must be for processing scrapped in accordance with the local environmental protection laws and regulations.
14、Such as power failure occurs during the working, need to disinfect the equipment out, it must be open the door 2 minutes later.

Appendix：

1、Steam loop（Work Description）



2、Circuit diagram of sterilizer



3、BD test method

Press "▲ / ▼" button to choose the BD test system before sterilizing, close the door, then press "START/STOP" button to start.