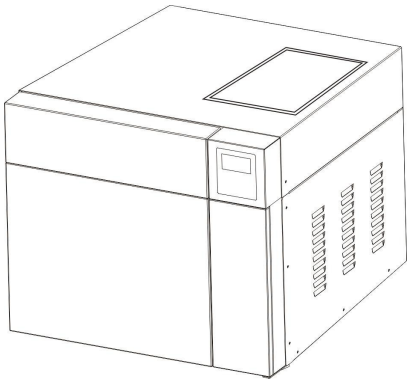
Kalstein®

Steam Sterilizer

Model YR03385B-3.

Instruction Manual



Thank you very much for purchasing our Steam Sterilizer Model YR03385B-3.

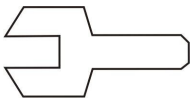
Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” at a hand place for future reference.

Warning: Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.

Thank you for choosing our steam sterilizers.

Prior to operating this instrument, please read the operations manual carefully and followall installation instructions.

Need Maintenance



If this picture appears on the screen when power on or E88 appears on the report, please call yourdealer or local service maintenance. Your steam sterilizer needs a regular maintenance.

Table of Contents

1. General

1.1 Scope of Manual

This manual contains information concerning the installation, operation and maintenance of the steam sterilizers. To ensure proper performance of the autoclave, the instructions given in this manual should be thoroughly understood and followed.Keep the manual near to the sterilization in a readily accessible location for future reference.

1.2 Intended Use

The device designed for the sterilization of instruments, liquids, and the other materials in hospital laboratories, medical laboratories, research institutes and food laboratories.

1.3 General Safety Instructions

-Read and understand this manual before attempting to install or operate the sterilizer.
-Make sure that all the installation conditions are fully complied with.
-Ensure that the supply voltage agrees with the supply voltage specified on the type plate of the sterilizer.
-This appliance must be grounded. Connect only to a properly grounded outlet.
-Do not cover or block any openings on this appliance.
-Use this appliance only for its intended use a described in this manual.
-Do not exceed the maximum weight limit of the loads specified in this manual.
-Do not operate this appliance if it has a damaged cord or plug, if it is not working properly, or if it has been damaged or dropped.
-Never must put into the sterilizer inflammables or explosives products.
-The sterilizer may not be operated in areas in which gas or any other explosive volatile substance is present.
-Installation and repair work should only be performed by authorized service technician. Work by unqualified persons could be dangerous and void warranty.

1.4 Standards and directives

The steam sterilizers were designed and has been produced in conformity with the following directives and standards: Directives:
2014/68/EU Pressure equipment. 93/42/EEC
Medical devices (Class Ⅱ b).Standards:
EN13060 Relative to small steam sterilizers.
EN61010-1 Safety regulations for laboratory devices-Part 1:General regulations.
EN61010-2-040 Safety regulations specific to sterilizers used in the processing of medical material. EN61326-1
Electromagnetic compatibility regulations for laboratory devices.

1.5 Symbols

For safe operation, please pay close attention to the alert symbols below which can be found in the sterilizer or throughout this manual.

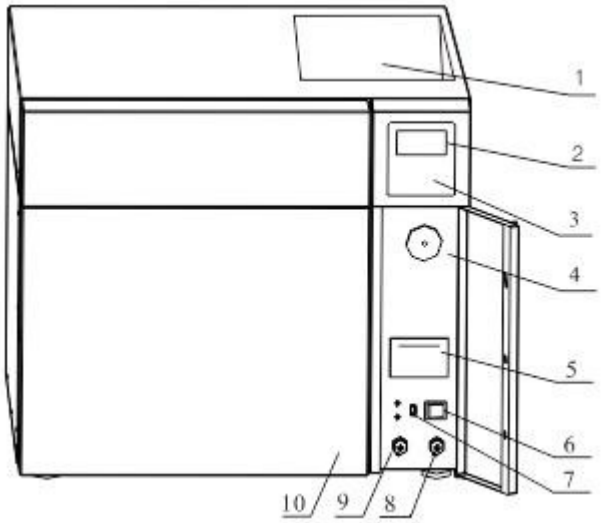
This symbol represents an electrical caution - ground protection.

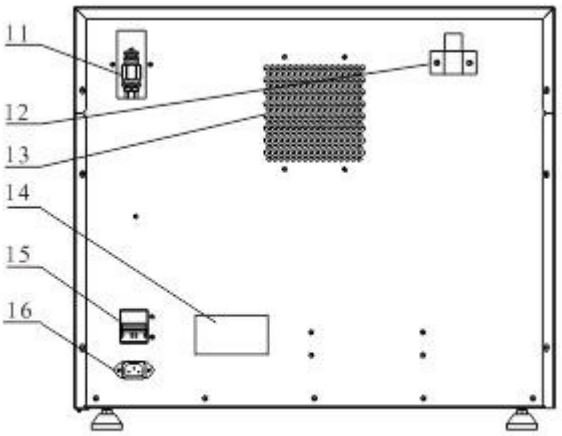
Hot Surface
This symbol represents a warning of a potential hot surface.Important safety information.

This symbol represents a warning for extra caution.

2. Description of the sterilizer

2.1 Sterilizer views





1. Distilled water tank
2. LCD
3. Control Panel
4. Bacteriological filter
5. Printer (Optional)
6. Main power switch
7. USB port
8. Drain connector (Distilled water tank)
9. Drain connector (Used water tank)
10. Door
11. Safety valve
12. Used water tank vent
13. Condenser ventilation
14. Rating plate
15. Circuit breaker
16. Power socket

	Date of manufacture
SN	Manufacture number
	Manufacturer Name
	Manufacturer Address
EC REP	EC-Representative Name
	EC-Representative Address

1	Temperature of the cycle
2	Program
3	Holding time
4	Pressure
5	Fill distilled water tank
	the quality of water is not good
	the filling water pump is working
6	Drain used water tank
7	Printer is connected
8	Door is opened
	Door is closed
	Door is locked
9	Time
10	Current temperature
11	Up button
12	Down button
13	Enter button

2.2 Control panel

14	Menu button

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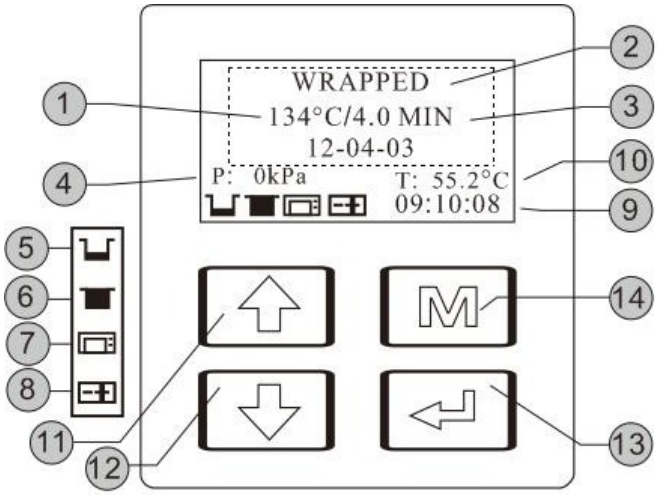


2.3 Technical specifications

Item	YR03385B-3	YR03385B-4
Chamber	φ319mm x 417 mm	φ319mm x 617 mm
Rated Voltage	220-240 VAC; 50 Hz	
Circuit breaker	F16A/400V	
Nominal power	2300VA	2800VA
Sterilization temperature	121°C /134°C	
Capacity of the distilled water tank	Approx 12.0 L (Water at level Max)	
	Approx 2.0 L (Water at level Min)	
Operation temperature	5°C-40°C	
Operation relative Humidity	Max. 80%, non condensing	
Overall dimensions(mm)	640 (W)*560 (H)*640 (D)	640 (W)*560 (H)*840 (D)
Net weight	96 kg	120 kg
Max. Noise level	<70 dB	
Atmospheric pressure	76 kPa - 106 kPa	

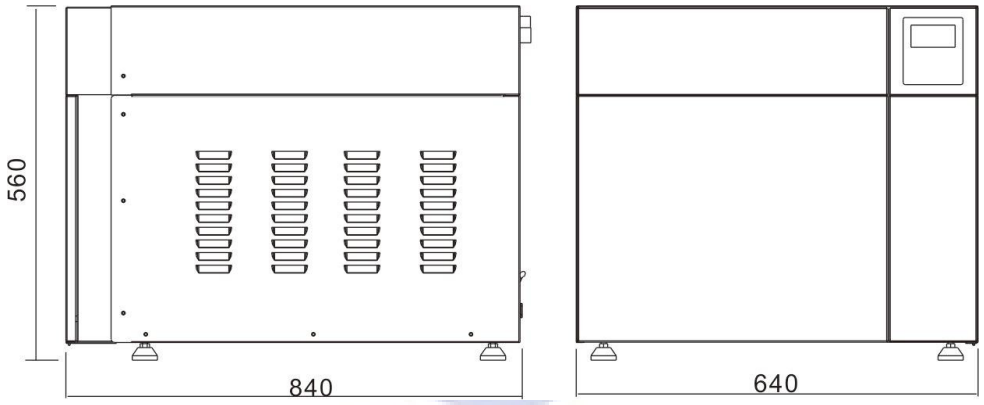
2.4 Packing content

No.	Accessory	Quantity
1	Instrument tray rack	1
2	Draining hose	2
3	Instructions manual	1
4	Door seal	1

3. Installation

3.1 General conditions

Position the device on a plane surface with minimum capacity 120 kgs.The
sterilizer should be placed on a level worktable.
Improper water level in the chamber could cause a sterilizer malfunction.
Leave at least 10cm between the device rear part and the wall. The clearance required to open the door is 40cm.
Position the autoclave at such a height as to make it possible for the operator to check the whole sterilization chamber and carry out the normal cleaning operations.
The room where the device is installed must be enough ventilated.
Do not install the device near washing basins, taps, etc. where it is likely to be splashed.Do not lean on
the door when it is opened.
Do not place trays , papers, fluid containers, etc. on the sterilizer.

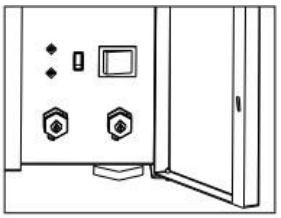


640(for 29)

3.2 Power supply connection

Check the label on back panel o sterilizer to verify voltage rating for the unit. Failure to connect the autoclave to an appropriate power supply could result in damage to the unit, and electrical shock to personnel.
Plug power cord into a properly polarized and grounded receptacle rated. A dedicated circuit only used for the sterilizer is recommended.
Never connect the device pin to reductions of any type.

4 Setup



Open the door and remove all of the inner contents for unpacking.Connect the
power cord to an outlet of the appropriate voltage.
Turn on the main switch on the right side. After switching on, the machine turns on the LCDand shows the door position, water level, working program, date, time and etc.
Holding the ⇧ button for about 3 seconds, it will unlock the door.

Note: The control panel will be locked for the initial 10 seconds after powering up for system initialization.

Notice: Before using the sterilizer or at any time the low water level icon ⌴ blinks, fill the distilled water tank with distilled water.

4.1 Basic Set

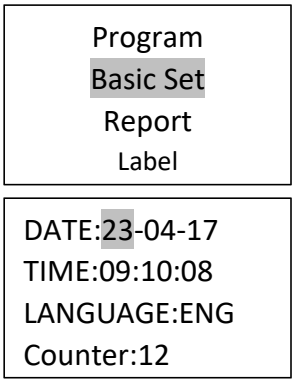
The “Basic Set” Menu permits to set the following options:

*Date *Time *Language

Select the “Basic Set” from the main menu and Tap M button.

Select the item by taping the M button. The unit you selected will be lighted.Adjust the value by Taping ⇧⇩ button. Tap M button to the next item.

Tap ↵ button to save and exit after the data is set.



Note: The Counter (cycle No) can not be set by the operator.

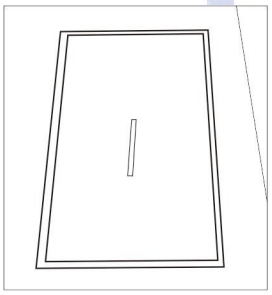
Abbreviation of language options

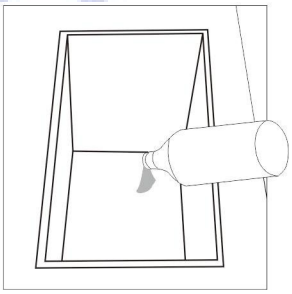
CHN	Chinese	ENG	English	DEU	German	ESP	Spanish
PL	Polish	FR	French	HUN	Hungary	ROM	Romanian
NL	Dutch	LTU	Lithuanian	LAT	Latvian	CZE	Czech
ITA	Italian	RUS	Russian	PT	Portuguese	HR	Croatian

4.2 Fill the distilled water tank

Ensure that the drain valve is closed.

Press the button and open the water tank cover.





Use only high quality distilled water. (see Appendix 1)

4.3 Preparation of sterilization materials

For the most effective sterilization and to preserve the sample, please follow below:

*Clean instruments immediately after use.

*Treat the instruments by ultrasound cleaner.

*Residual chemicals left over after cleaning and disinfecting process may damage and corrode parts of the autoclave, always rinse off the instruments using distilled water.

*Follow instrument manufacturer’s guidelines and recommendations for handing and cleaning instruments prior to sterilization.

*Check the manufacturer’s instructions as to proper procedure for sterilizing of each item.

*Arrange the samples of different materials on different trays or with at least 3cm of space between them.

*Clean and dry instruments thoroughly before placing them into tray.

*Always insert a sterilization paper or cloth between the tray and sample to avoid direct contact.

*Arrange the containers (glasses, cups, test-tubes, etc) on one side or inverted position, avoiding possible water stagnation.

*Don’t stack the trays one above the other or put them in direct contact with the walls of the sterilization chamber.

*Always use the instrument tray handle.

*Wrap the samples one by one or, if more tools have to be set in the same bag, verify that these are made of the same material.

*Don’t use metallic clips, pins or other, as this jeopardizes the maintenance of the autoclave.

*Don’t overload the trays over the stated limit (see appendix 2).

5. Operation

5.1 Select the program

Tap M button to the main menu, select "Program". You will see the available sterilization programs. See Appendix 2.

5.1.1 Select the program by ⇧⇩ buttons and confirm it by taping M button.

5.1.2 Then you may change the parameter of the items. Tap ⇧⇩ buttons to select the items.

Tap M button to enter the setting interface

Change the parameter by taping the ⇧⇩ buttons.

Ster. Temp: 105-134℃

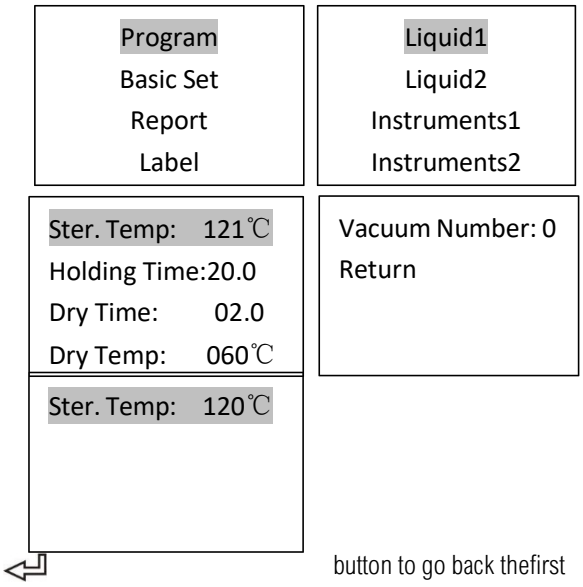
Holding time: 1-99 minutes Dry time: 0-30 minutes

Dry Temp: 45-60℃ or 0

Vacuum Number：1-3 （Liquid is 0）

Then tap M button to save and go to above.

Select to the Return and tap M button go to above. You may tap the ⏎ button to go back thefirst interface directly.



5.2 Running the sterilization program.

After selecting program, the instruments to be sterilized can now be placed on the tray placed inside the chamber.

5.2.1 After the instruments are loaded, you may close the door.

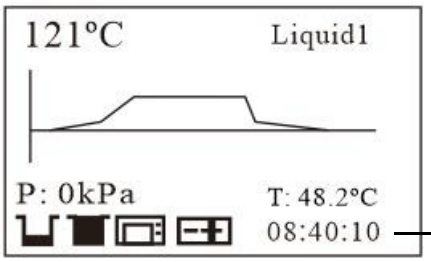
Push the door to be closed, holding for about three seconds, it will lock automatically.

Caution: The door can not be lock if the pressure is higher than 0 kPa. Please wait for the chamber cooling down.

⚠ For Liquid program, filled the glass container no more than 2/3 capacity. The glass container should be covered but unsealed. Place the object sensor under the liquid level inside the glass container. (Optional object sensor)

5.3 Start the sterilization program.

After the ⏎ button is taped, the stage and the status of the current cycle will appear on the display. The sterilizers willperform the program automatically. (See appendix 2).



Total time or count down until completion

5.4 End of cycle

After cycle is completed, the printer will be activated and print out a report of the cycle (if the optional printer has been connected) or save the report in the USB drive (optional).

The " Instruments" program will show END after the pressure is below 0. The "Waste" and "Liquid" program will show END after the temperature is lower than 80℃.

⚠ Caution: Always use the tray handle to load or unload the tray into the autoclave.

5.5 Manual abort of the program

It is possible to interrupt a started cycle prematurely. If you need to interrupt a cycle and remove the items urgently, you may hold the ⏎ button for 3 seconds during the drying time to skip the dry cycle.

If you interrupt a cycle before it reaches the “Drying” step, then the items inside the autoclave must be considered not sterile.
If you need to interrupt a cycle after the holding time of the sterilization cycle and during the drying step then the items inside the autoclave can be considered sterilized.

Caution: Depending on the status of the Cycle, steam can escape from the sterilization chamber when you open the door.

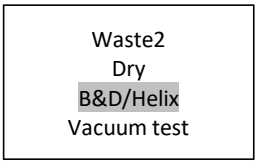
5.6 Test programs

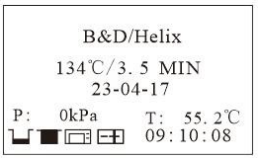
B&D/Helix (Bowie & Dick test and Helix test)

Select ‘programs’ from the main menu, Tap ⇧⇩ button and select the “B&D/ Helix” Test and Tap button to confir[M]

Put the Bowie-Dick pack or Helix test device(PCD) in to the chamber and follow the instructions of the test pack manufacturer. Then close the door and Tap ⏎ button.

After the cycle is finished you may check the indicator and evaluate the result.





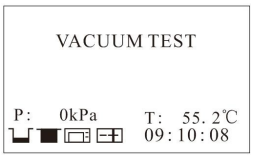
Vacuum Test

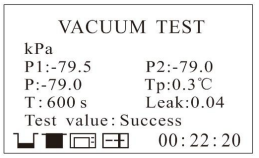
Select the Vacuum Test cycle from the "Programs" menu.Close the door and tap ⏎ button.

In compliance with EN 13060, the test requires that the air leakage rate less than or equal to 0.13 kPa/min. During 10 minutes.

If leakage rate is not greater 0.13, it will show Success.

If the temperature difference between the max. Temperature and the Min. is above 3°C, it will show void. That means the result of the test is fail. You need run the vacuum test again after thechamber has cooled down.





Caution: The “Vacuum” test must be carried out with the chamber of the sterilizer dry and cold.

5.7 Record of the cycle

USB Flash memory (Optional)

A USB drive can be used as a method of storing a report of the cycle. To do so, insert the USB drive into the slot located on the service door of the sterilizer.

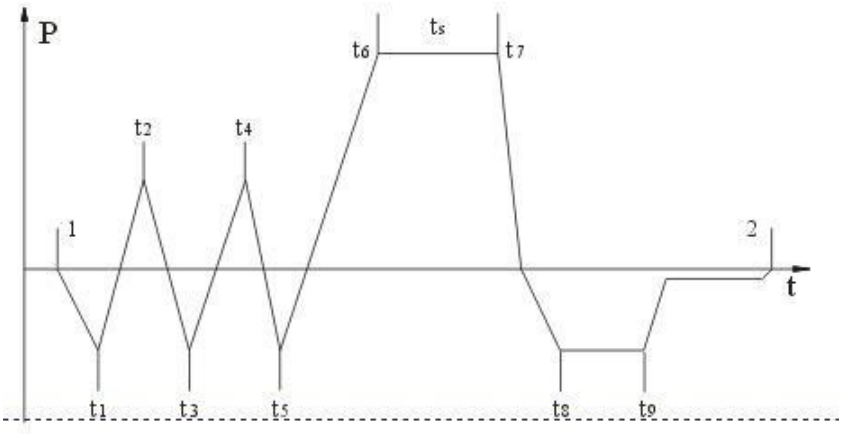
The information will automatically output directly to the USB drive after the cycle has completed. The name of the file is determined by the serial number of the machine and the cycle number.

For example:

The serial number is A12345. The cycle number is 00012.The file name in the USB stick is A12345_00012E00.txt.

The last three numbers represent error code.

For example, E00 means no error. E01 means error E01.



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Program: Instruments1

Temperature: 134 C

Pressure: 2.04 bar

Drying Time: 20.0 MIN

Holding Time: 04.0 MIN

	Time HH:MM:SS	Temp. C	Pressure kPa
Start	14:48:10	077.7	00.0
T1:	14:52:29	072.1	-76.9
T2:	14:53:30	107.4	101.2
T3:	14:57:22	078.8	-79.6
T4:	14:58:40	112.1	105.1
T5:	15:01:39	080.5	-76.4
T6:	15:05:32	134.3	210.1
TS:	15:05:36	134.9	212.3

Max Temperature: 135.1

Min Temperature: 134.1

Max Pressure: 216.2

Min Pressure: 208.1

T7:	15:11:37	136.0	214.5
End	15:33:10	091.2	-05.1

Cycle No.: 00012

Ster. Value: Success

Date: 11-09-2020

SN:A00001

Operator:

3BB23D 00110100V0.0.0.2

0000

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Program:Vacuum test

Tp:1℃

P1:-75.0kPa

P2:-74.0kPa

rate of pressure rise:

0.10 kPa/min

Start Time:08:22

End Time:09:01

Date: 17-09-2020

Cycle No.: 00015

Test Value:Success

SN:AE00001

Operator:

3AB16B 11100110V2.9.1.2

0000

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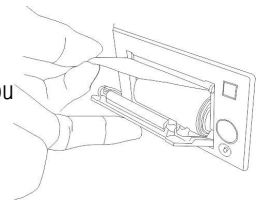
5.8 Printer (Optional)



If installed you can see the Icon in the screen stop flashing.

The printer (Optional) will produce a report of the cycle that just ended. t the end of each cycle theprinter will print ou report of the cycle.

5.9 Report

Internal Memory

In this menu you can read the reports stored in the internal memory of the sterilizer.

5.9.1 Select “Report” from the main menu and tap M button, you will see the list of records.

5.9.2 Select the records by taping ⇧⇩ button.

5.9.3 Tap M button.

Then the record is printed(if the optional printer has been connected) the report or/and issaved in the USB drive (optional).

Tap ⏎ button to exit.

Report
Label
About device
Setup

00012
00013
00014
00015

5.10 Label(Optional)

5.10.1 Connect the label printer and switch on.

5.10.2 Select the “ Label” and tap M button, you will see the list of the records.

5.10.3 Select the records by taping ⇧⇩ button.

5.10.4 Tap the M button to the interface for setting the quantity.

5.10.5Change the quantity of the label that you want to print by taping ⇧⇩ button.The range is 1-99.

5.10.6 Tap the M button to print the label.

5.10.7 Tap the ⏎ button to exit.

Quantity
13

Operator：

Program: Wrapped 134 C

Cycle No.: 00022

SN: A00001N23

Date: 20-05-2019 12:17:47

Expiry date: 20-08-2019

5.11 About device

5.11.1 Select the “ About device “.

5.11.2 Tap the M button to enter the interface.

5.11.3 There is the version of the firmware.

5.11.4 Tap the ⏎ button to exit.

About device
3BB23Z 11110010
V2.9.0.0 - - 00
SN: A23456B45

6. Advance setting

The advance setting interface permits to set the following Options:

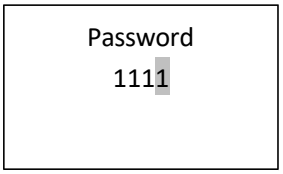
***Parameter:** Permits to change the time of holding time and drying time.

***Unit:** Permits to change the unit of measure temperature and pressure.

***Preheat:** This option allows you to maintain the required temperature in the sterilization chamber and the steam generator to start a new cycle immediately for the next 60 minutes so to run a new cycle should expect preheating time from 3 to 5 minutes upon start.

If the option is disabled (OFF) once the sterilization cycle end immediately the Autoclave is no longer heated, so when you start a new cycle should expect a preheating time between 3 to 5minutes upon start.

Note: To maintain the temperature for longer time it is recommended that after each cyclehold the door closed.



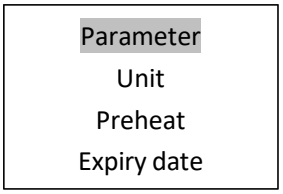
Enter the setting

Select the "Setup", tap the M button to the password interface.

Input the password "1111" by tap ⇧⇩ button, tap M button to select the position. Tap the M button will enter the setting interface after inputting the 4 passwords.

6.1 Parameter

Reserved function.



6.2 Unit

Select the "Unit" to adjust the unit of temperature and pressure. Tap M button to enter the menu.

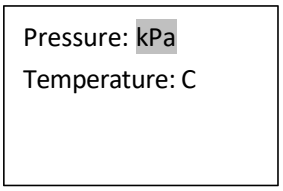
Select the item by Taping M button.

Change the unit by Taping ⇧⇩ button.

Pressure: kPa/bar/psi

Temperature: ℃/F

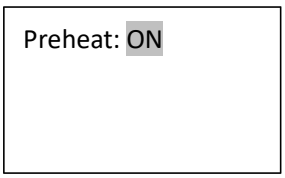
Tap ⏎ button to save and exit.



6.3 Preheat

Select the "Preheat" to adjust the preheat setting. Tap M button to enter the menu.

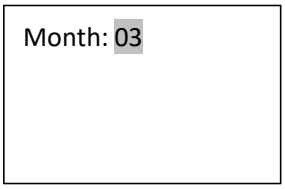
If you don't want to preheat after switch on, set the value to OFF by Taping ⇧⇩ button. Tap ⏎ button to save.



6.4 Expiry date

Select the " Expiry date" to adjust the expiry date that be printed on the label. Tap M button to enter the menu.

Adjust the value by taping the ⇧⇩ button. The range is 1-12. Tap ⏎ button to save and exit.

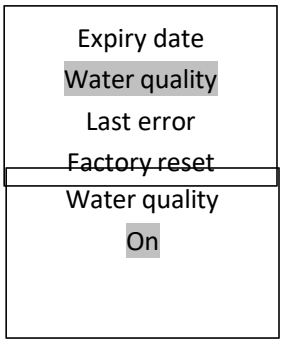


6.5 Water quality(Optional)

Select the “Water quality” to change the function.Tap M button to enter the menu.

If you don’t want to have a alarm if the quality of water is bad, set the value to Off by Tapingbutton. ⇧⇩

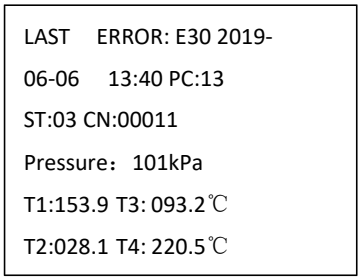
Tap ⏎ button to save and exit.



6.6 Last error

Select the “Last error” to see the information of the last cycle that is failure.Tap M button to enter the interface.

It will record the parameters of the sensors when the alarm appears.Tap ⏎ button to save and exit.

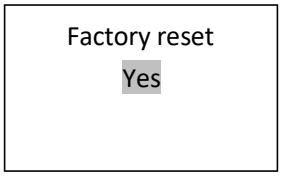


6.7 Factory reset

Select the “Factory reset” to recover the parameters of the programs.Tap M button to enter the interface.

Change Yes/No by taping ⇧⇩ button.Tap ⏎ button to confirm and exit ..

The value of holding time and drying time will restore the default value if you confirm “Yes”..



7.Maintenance

To assure proper operation and maximum autoclave life, carefully follow all recommendations for periodic maintenance. One of the MOST important steps you can take to prevent problems with your sterilizer is to use ONLY distilled water.

Frequency	Number of cycles	Maintenance operation
Monthly	50	Clean the door seal
		Clean the filter inside the chamber and in the clean water tank
		Clean the chamber the trays and the rack
		Clean the external surface
Every 3 months	200	Clean the distilled water tank
		Replace the bacteriological filter.
Every year	800	Replace the door seal

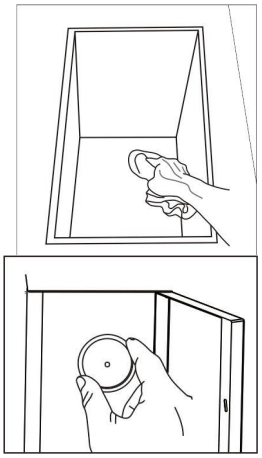
7.1 Clean the distilled water tank

Disconnect the main cable.

Drain the tank completely using the drain tube and leave it connected into the connector in aopen position.

Clean the internal surface with a soft sponge and a small soft brush for the areas that aredifficult to reach using and a mild soap.

Remove the filter and clean it with a small soft brush and mild soap, rinse it with distilled water and put it back in to the position.



7.2 Replacement of the bacteriological filter.

The bacteriological filter is in the front of the sterilizer. Unscrew the filter by handanti-clockwise.

Place the new bacteriological filter. Screw the new filter by hand clockwise.

Note: Do not operate sterilizer without filters in place.

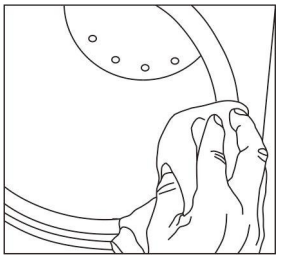
7.3 Clean Chamber, door seal, trays and tray Rack.

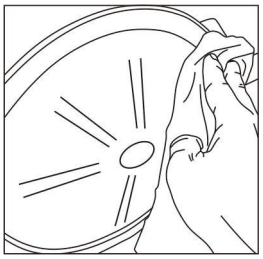
Remove the trays and tray rack from the chamber. Clean trays, rack and inside of chamber with mild soap.

Rinse the trays, rack and inside of chamber with a smooth clothand distilled water.

Examine door seal for possible damage.

Clean door seal and mating surfaces with a damp cloth.

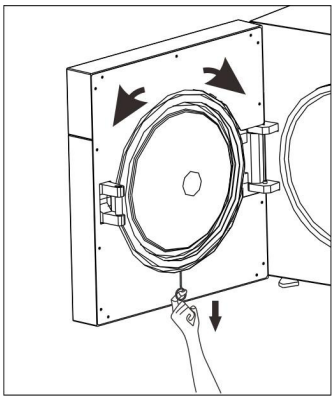




Note: Do not use bleaching agents or any abrasive materials / substances in chamber. Failure to comply may result in damage to the chamber and/or other components.

Caution: To prevent burns, let unit to cool before cleaning gaskets and touch the surface.

7.4 Door adjustment



Under normal circumstances, the chamber door does not require adjustments. However, if the seal fails (resulting in steam leaking from the front of the chamber), youmay adjust it.

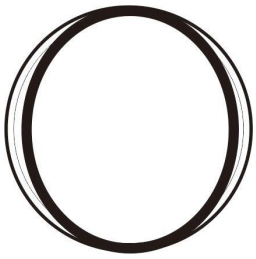
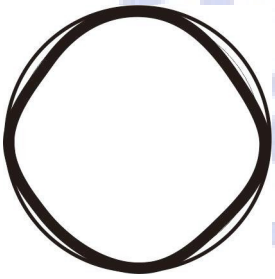
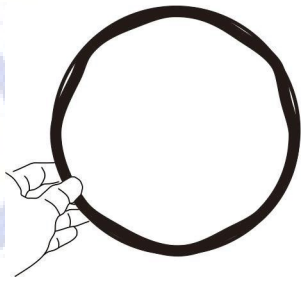
Open the door, insert your finger into the bottom of the door, and pull the ring to unlock the mechanism. Turn the lid counterclockwise to tighten it. If it is too tight, youmay also turn the lid clockwise to loosen it.

Caution: Never adjust the chamber door while the door is closed.

7.5 Replacement of the door seal

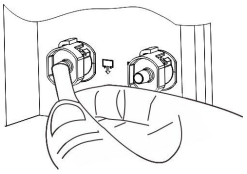
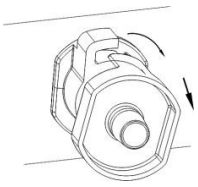
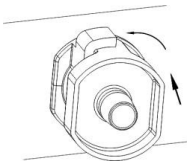
Open the chamber door. Remove the door seal ring carefully by hand. Clean the door seal ring carefully with a smooth cloth with distilled water.Moisten the new seal with medical disinfectant or isopropyl alcohol.

Insert the new seal and press in sequence as follows:

		
1) Press in the top and bottomof the door seal.	2) Press in the left and right sides of the door seal.	3) Press the remaining sections of the seal.

Caution: Please ensure the chamber and the door are cooled prior to replacing the seal ring.

7.6 The drain valve

		
1.Press the included hose onto the drain valve firmly.	2. Turn the drain valve ,it will stretch out to drain the tank.	3. Push the drain valve back and turn anticlockwise after draining the tank.

8.Error codes

Code	Description	Proposed solution
E1	Steam generator tempreture sensor error	Power off & run a new cycle Contact your supplier if error persists
E2	Inner temperature sensor error	Power off & run a new cycle Contact your supplier if error persists.
E3	Temperature sensor of the chamber wall error	Carefully ensure that the chamber wall is heated and cotact your supplier
E5	Fail to release the pressure	Power off & run a new cycle Contact your supplier if error persists.
E6	Door lock problem during the cycle	Check the door close switch.
E7	The pressure is too lower during holding time.	Contact your supplier if error persists.
E8	The pressure is too high during holding time.	Contact your supplier if error persists.
E9	Failure to hold temperature	Ensure the distilled tank isn't empty. Check the inner temperature sensor. Check somewhere for leaking.
E11	Failure to perheat the steam generator	Power off & run a new cycle Contact your supplier if error persists.
E12	Faulure to preheat the chamber	Power off & run a new cycle Contact your supplier if error persists.
E13	Vacuum failed	Power off & run a new cycle Contact your supplier if error persists.
E16	The pressure doesn't reach 0 in 5 minutes after drying period.	Contact your supplier if error persist
E18	The filling water pump working time is overime	Check the water pump or Contact your supplier if error persist
N20	Program manually interrupted	holding the M button for 3 seconds after the pressure is lower than 10kPa.
E22	Vacuum test failure	Somewhere is leaking. Check the door seal. Or contact your supplier if error persist.
N23	Result of vacuum test is void	The temperature of the chamber is high. Try again after the chamber has cooled down.
E24	It takes too long time to enter the next status.	Check somewhere leaking. Or contact your supplier if error persists.
E25	There is a problem of locking the door.	The door is too tighten. Or Check the door locking switch. Check the door motor. Contact your supplier if error persists.
E26	There is a problem of unlocking thedoor.	Check the door unlocking switch. Check the door motor. Contact your supplier if error persists.
N27	The vacuum test is forbade	Switch off. Then switch on after the chamber cool down and try again.
E28	The pressure is over 240kPa	Power off and contact your supplier if error persists

Code	Description	Proposed solution
N29	Power failure during working.	A notification message.
N32	The pressure is not lower than -1 kPa in 30 seconds during locking the door.	Open the door and try again. Or contact your supplier if error persists
E30	Vacuum test failure during the first 300 seconds	Somewhere is leaking. Check the door seal. Or contact your supplier if error persists.
N33	The pressure is not lower than 1 kPa in 30 seconds during unlocking the door.	Open the door and try again. Or contact your supplier if error persists.
E34	The pressure is higher than 50kPa during drying.	The solenoid valves are blocked.

Caution: You may cancel the voice of alarm by pressing any button. And cancel the alarm by holding the M button for 3 seconds after you repair it and the pressure is lower than 10kPa.

9. Transportation and storage

9.1 Switch off the sterilizer before transportation or storage.
9.2 Pull out the plug. Let the machine cool down.
9.3 Drain the distilled water tank and the used water tank.Condition for transport and storage
Temperature: -20°C ~ +50°C
Relative humidity: ≤ 85%
Atmospheric pressure: 50kPa~ 106kPa.

10. Safety devices

1. Main fuses: Protection the instrument against possible failures of the heating resistor.Action: Interruption of the electric power supply.

2. Thermal cutouts on the main transformer windings: protection against possible short circuit and main transformer primarywinding overheating Action: Temporary interruption of winding.

3. Safety valve: Protection against possible sterilization chamber over-pressure.Action: Release of the steam and restoration of the safety pressure.

4. Safety micro-switch for the door status: Comparison for the correct closing position of the door. Action: Signal of the wrong position of the door

5. Thermostat on chamber heating resistors: Protection for possible over heating of the chamber heating resistors.Action: Interruption of the power supply of the chamber resistors.

6. Thermostat on steam generator heating resistors: Protection for possible overheating of the steam generator heatingresistors. Action: Interruption of the power supply of the steam generator resistors.

7. Door safety lock: Protection against accidental opening of the door. Action: Impediment of the accidental opening if the door during the program.

8. Self-leveling hydraulic system: Hydraulic system for the natural pressure leveling in case of manual cycle interruption, alarm or black-out.
Action: Automatic restoration of the atmospheric pressure inside chamber.

Appendix 1

Water properties / Characteristics

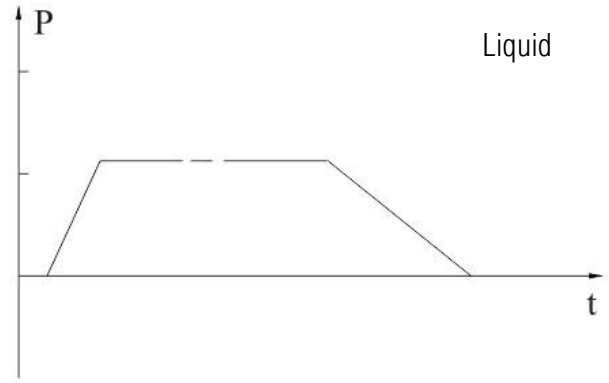
Description	Feed water	Condensate
Evaporate residue	≤ 10mg/ l	≤ 1.0mg/kg
Silicium oxide sio2	≤ 1mg/ l	≤ 1.0mg/kg
Iron	≤ 0.2mg/ l	≤ 0.1mg/kg
Cadmiun	≤ 0.005mg/ l	≤ 0.05mg/kg
Lead	≤ 0.05mg/ l	≤ 0.1mg/kg
Rest of heavy metals	≤ 0.1mg/ l	≤ 0.1mg/kg
Chloride	≤ 2mg/ l	≤ 0.1mg/kg
Phosphates	≤ 0.5 mg/ l	≤ 0.1mg/kg
Conductivity	≤ 15µs /cm	≤ 3 µs /cm
PH Value	5 – 7.5	5-7
Appearance	Colorless, clean	Colorless, clean
Hardness	0.02 mmol/ l	0.02 mmol/ l

Appendix 2

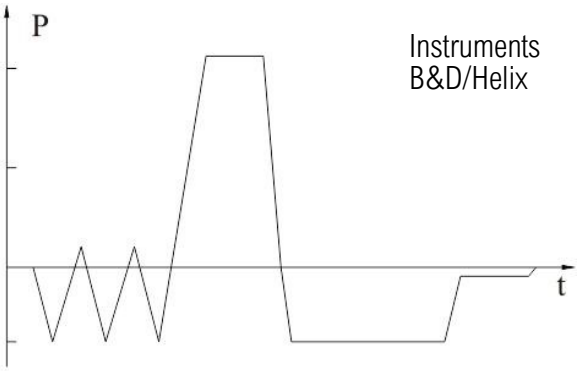
Diagrams of the sterilization programs

Programs	Temperature (°C)	Holding time (min)	Vacuum number	Drying time (min)	Drying temperature (°C)	Intended use
Liquid	105-134	1-99	0	0-30	0 or 45-60	This program can be used to sterilize liquids or media.
Instruments	105-134	1-99	1-3	0-30	0 or 45-60	This program can be used to sterilize **solid items** (e.g. glassware, instruments, pipette tips or filters
Waste	105-134	1-99	1-3	0-30	0 or 45-60	This program can be used to sterilize **laboratory waste** or **mixed loads with a low liquid content,** especiallyconsumables (pipette tips, culture dishes, etc.).
Drying (optional)	—	—	—	0-30	0 or 45-60	—
B&D test	134	3.5	3	1	—	—
Helix test	134	3.5	3	1	—	—
Vacuum test	—	—	—	—	—	—

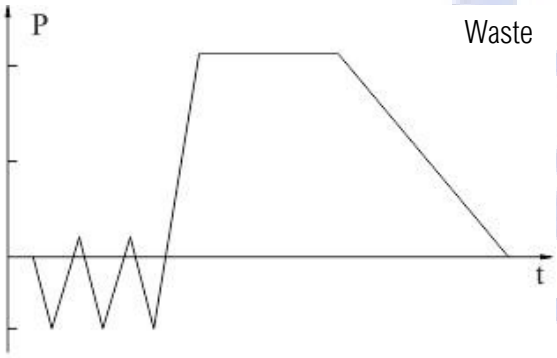
Note: Drying time is 0. This means the chamber heater will no work after sterilization.



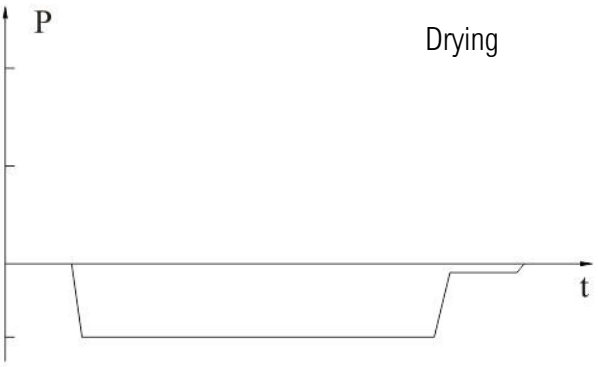
Liquid



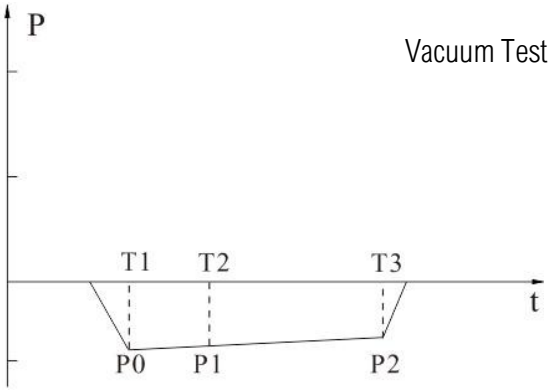
Instruments
B&D/Helix



Waste



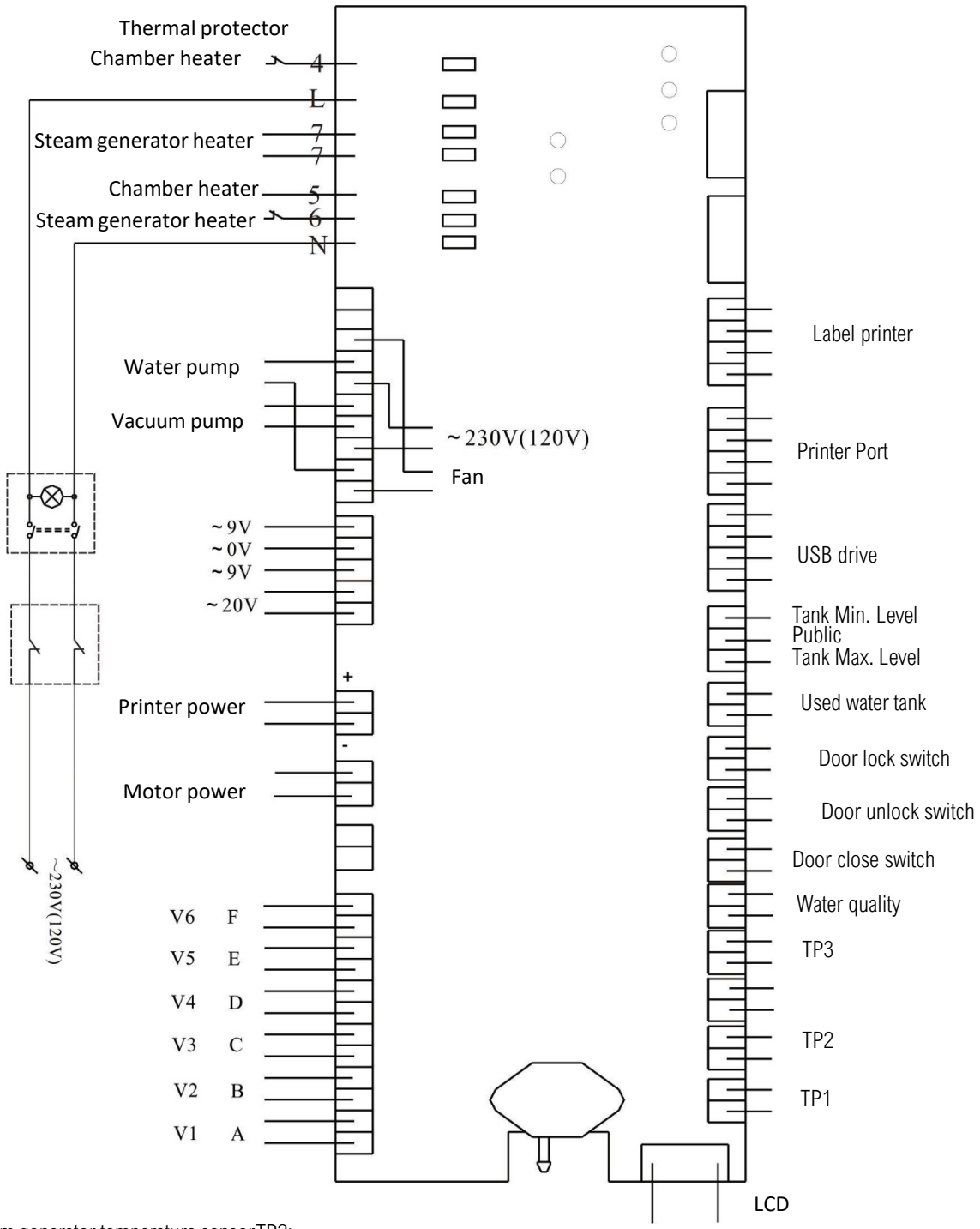
Drying



Vacuum Test

Appendix 3

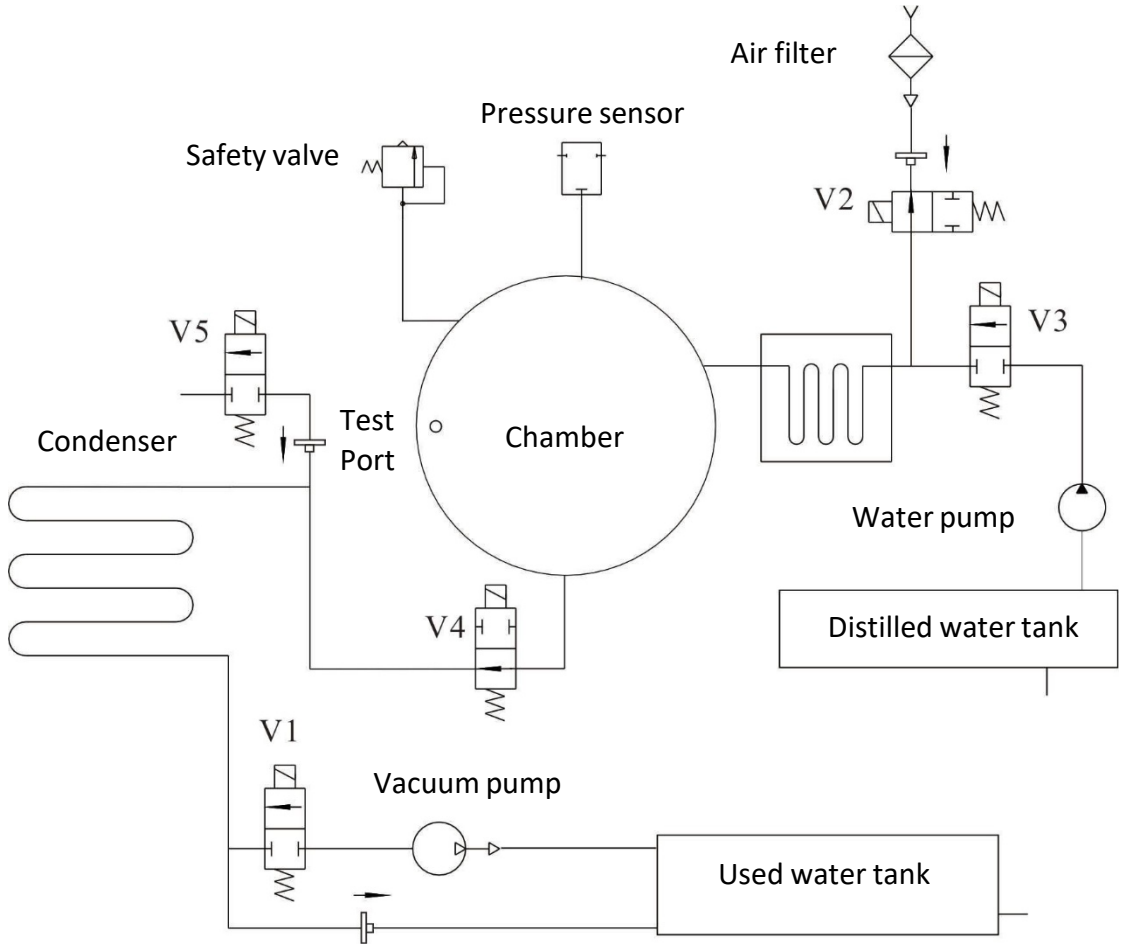
Wiring diagram



TP1: Steam generator temperature sensorTP2:
Inner temperature sensor 1
TP3: Temperature sensor of chamber wallV1:
Vacuum pump valve
V2: Air filter valve
V3: Water pump valve V4:
Water release valve
V5: Vacuum pump start valve

Appendix 4

Hydraulic diagram



V1: Vacuum pump valveV2:
Air filter valve
V3: Water pump valve V4:
Water release valve
V5: Vacuum pump start valve