



BT-Series Pressure Steam Sterilizer

Operation Manual (User Manual)

P&T (NINGBO)MEDICAL EQUIPMENT CO.,LTD.

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The operation manual is applicable for specifications and types of BT-Series Pressure Steam Sterilizer as follows: BTD23-A, BTS23-A, BTD18 -A, BTS18-A, BTD17-A, BTS17-A, BTD16-A, BTS16-A, BTD12-A, BTS12-A, BTD8-A, BTS8-A.

I. General

The BT-series Pressure Steam Sterilize is mainly applied by scientific research institutions and units such as surgeries, stomatology, and biomedical of medical units to make sterilization on compression resistance steam articles such as surgical instruments, stomatology instruments, dressings, glassware and injection instruments etc. The sterilizer adopts advanced microcomputer programs to make automatic controls on all the running components. The Sterilizer can make precise control on temperatures and pressures during operation and make realtime display to make the operation status clear at a glance. The product is provided with features of easy operation, precise control and completely sterilization etc.

II. Technical Parameter

Source Voltage and Frequency	220V±22V,50Hz±1Hz
Sterilization Temperature	121°C/134°C
Fuse Tube	F15A 250V
Operational Ambient Temperature	5°C~40°C
Input Power	2000W

III. Symbols



Caution! Please Consult Documents
Provided with the Product or
Warnings



Type B Equipment



Protective Earthing



Caution! Hot.

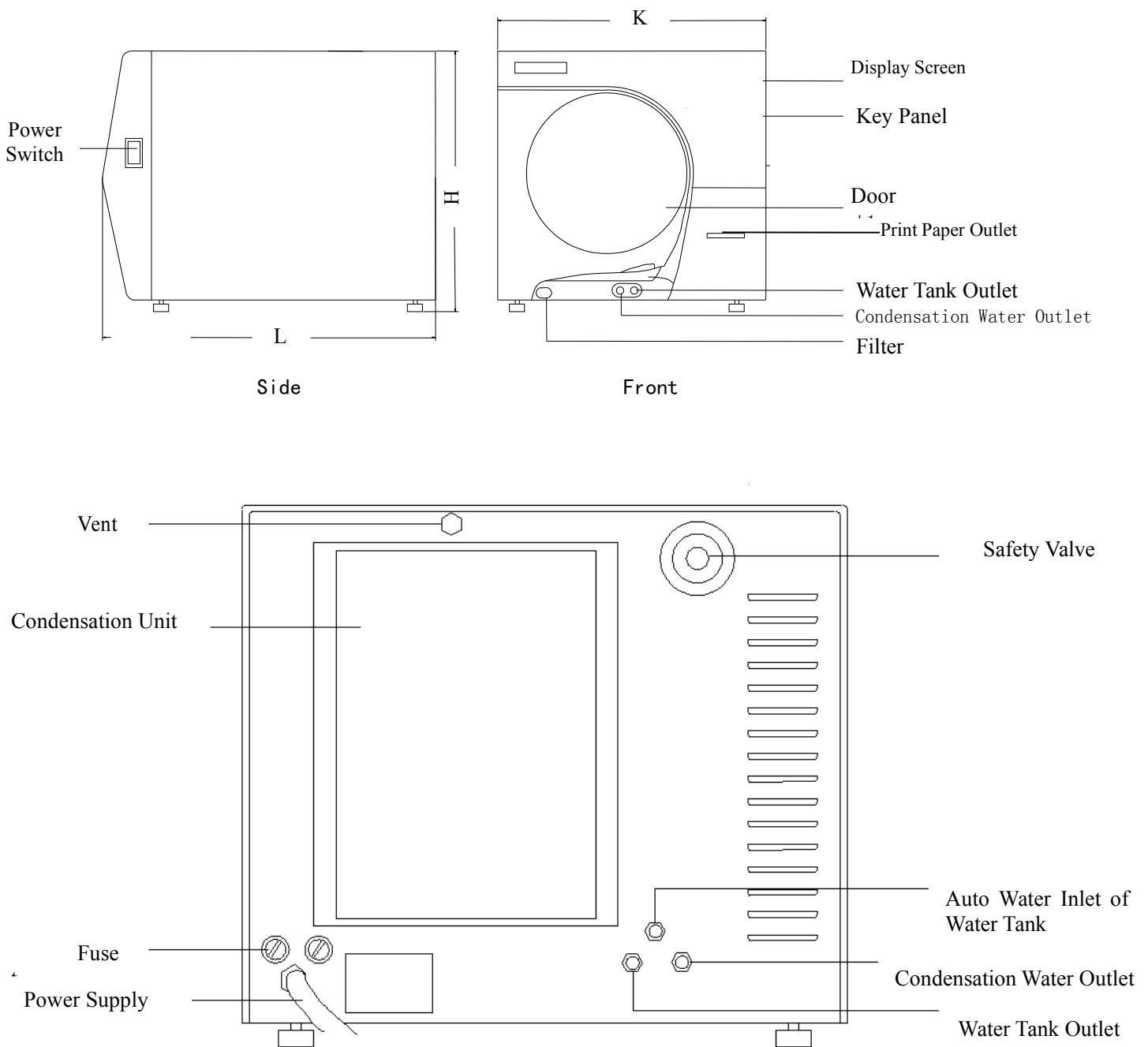
IV. Installation

Keep a distance of at least 10cm to surroundings of the sterilizer; keep a distant of 20cm at the top.

The sterilizer is suggested to be installed in places of fine ventilated. The heat dissipation window on the outer shell of the sterilizer can not be blocked by other things.

The sterilizer should be installed on a level worktable.

1. Externality of the Sterilizer



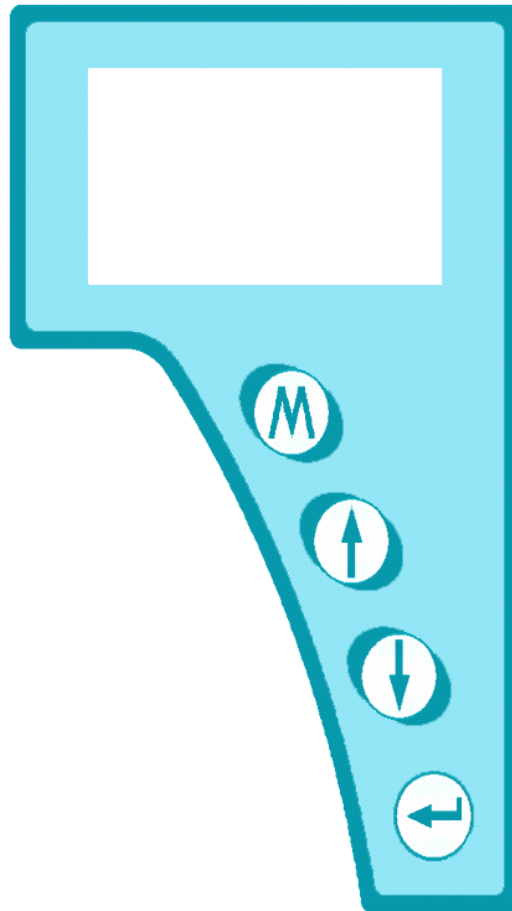
2. External Dimensions of the Sterilizer

External Dimensions Specification	L	K	H
23L	632	475	443
17L	572		

3. List for Accessories




S/N	Item	Qty
1	Apparatus Tray	3
2	Apparatus Tray Support	1
3	Operation Manual, Warranty Card and Certificate of Conformity	Each 1PC
4	Handing Shovel of Apparatus Tray	1
5	Automatic Feed-water Tube of Water Tank Pump (1.5m)	1
6	Water Feed/Discharge Tube (with plug) (1.5m)	1
7	Fuse Tube15A	2
8	O-type Ring $\phi 9 \times 1.8$ Filter	2
9	O-type Ring $\phi 7.3 \times 1.8$ Quick Coupling	2
10	Manual Feed-water Kettle	1
11	Air Filter	1
12	Seal Ring	1


V. Control Panel




1. Display Screen

Display the values of pressures and temperature in various modes or sterilization of the sterilizer.

MODE-----	1、POROUS 134°C	
TEMPERATURE---	35 °C	09—09—08 --DATE
PRESSURE---	0.00 bar	12 : 34 : 56 --TIME
	  	
	Water Level Door State	Operation State

When equipped with printer,  will be displayed on the screen. The status setting and description of the sterilizer are detailed in ”.

2. Function Key 

To enter advanced settings status.

3. Page up/Water Pump 

Normally the key is used for the starting and closing of feed-water pump of water tank – press to open the pump, and press again to close. When in program selection menu or advanced setting menu, the key is used of the up moving of arrows or the adding of parameter values.

4. Page Down 

The key is used to enter sterilization mode menu and indicate the down movement of arrow.

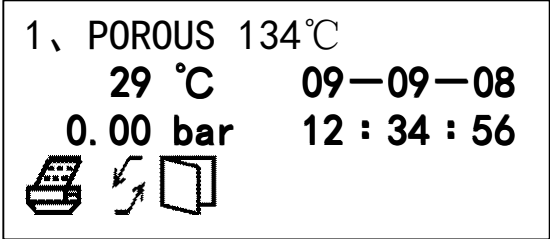
5. Enter 

Confirm the starting program or quit from program settings.

VI. Operation


6.1 Daily Operation




Please connect the power source of the sterilizer before application.

<p>1. Press the main power switch to motivate self-checking of the sterilizer.</p>	
<p>2. Open the door of the sterilizer. the display screen will be as indicated in the right. Load articles needing sterilized into sterilization cavity.</p>	

3. The screen will be as indicated to the right when the articles is loaded and the door is closed. If warning is made for water level, make treatments as prescribed in 6.3 and 6.4,


1、POROUS 134°C
 29 °C 09—09—08
 0.00 bar 12 : 34 : 56




4. Press , to get screen in the right
 Choose from   to decide the sterilization mode. The detailed sterilization mode can be shown in 6.2.


SELECTION

▶ **POROUS 134°C**
POROUS 121°C
HOLLOW 134°C
CUSTOM
B-D TEST
LEAK TEST


5. Choose the SELECTION as POROUS 134°C, that is move the arrow to POROUS 134°C, push the key  to select the mode, and the display screen will be as shown to the right.

1、POROUS 134°C
 29 °C 09—09—08
 0.00 bar 12 : 34 : 56








6. Press , the sterilizer will be operated in automatic sterilization mode, as shown to the right.
 The door will be locked tight automatically by the sterilizer. The door status will be shifted from “Closed” to “Locked”.

1、POROUS 134°C
 29 °C 09—09—08
 0.00 bar 12 : 34 : 56

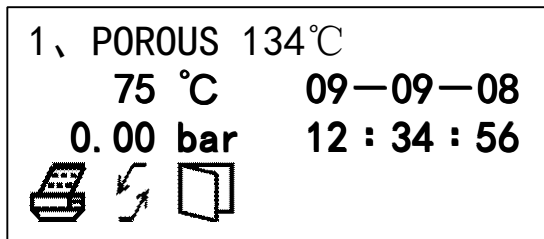


READY

<p>7. Pre-vacuum starting</p>	<div style="border: 1px solid black; padding: 5px;"> <p>1、POROUS 134°C 22 °C -0.02 bar 00 : 00</p>  <p style="text-align: right;">BACUUM</p> </div>
<p>8. The pressure in the sterilization cavity rises.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>1、POROUS 134°C 22 °C -0.02 bar 05 : 00</p>  <p style="text-align: right;">BACUUM</p> </div>
<p>9. The sterilizer reaches the preset temperature, and makes counting down for sterilization, as shown to the right.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>1、POROUS 134°C 134°C 04 : 00 2.04 bar 26 : 00</p>  <p style="text-align: right;">STER</p> </div>
<p>10. The sterilization is shifted to drying Mode after sterilization, as shown in the right.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>1、POROUS 134°C 134°C 15 : 00 -0.02bar 30 : 00</p>  <p style="text-align: right;">DRY</p> </div>
<p>11. After the drying, the pressure of chamber is down to 0, Three reminding rings will be made then. The sterilizer will unlock the door automatically. the screen is shown to the right.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>1、POROUS 134°C 80°C 00 : 00 0.00 bar 45 : 00</p>  <p style="text-align: right;">END</p> </div>

12. Open the door to take out the Sterilized articles, as shown in screen to the right.


















Caution: Take the apparatus tray with shovel instead of take directly by hand to avoid scald.




6.2 Sterilization Mode Prescription

S/N	Procedure	Vacuum Time	Temp. °C	Pressure bar	Ster Time minute	Total Time minute	Articles Loaded	Capacity kg
1	134°C POROUS	3	134	2.1	5	30-45	Unpacked multi-loops substances	1.00
							Packed multi-loops substances	0.65
							Single layer packed solid or hollow substances	3.00
							Double-layer packed solid or hollow substances	1.50
2	121°C POROUS	3	121	1	25	50-60	Unpacked multi-loops substances	1.00
							Packed multi-loops substances	0.65
							Single layer packed solid or hollow substances	3.00
							Double-layer packed solid or hollow substances	1.50
3	134°C HOLLOW	1	134	2.1	4	25-35		
4	CUSTOMER DEFINITION	0-4	105-134		4-40	0-30		
5	B&D TEST	It is for the test of sterilizer.						
6	LEAK TEST	It is for the test of sterilizer.						

6.3 Instruction for the setting of Custom Definition,

<p>1、 Select the mode to CUSTOM by moving the arrow   , the screen is shown to the right.</p>	<p>SELECTION</p> <p>▶ CUSTOM B-D TEST LEAK TEST</p>
<p>2、 Press the key  , the screen is shown as right, move the arrow   to STER, DRY, VACCUM to set the parameter.</p>	<p>CUSTOM</p> <p>▶ STER 04 DRY 00 VACUUM 1</p>
<p>3、 Take the setting of STER as expamle, Adujst the arrow   to STER, push the key  , the number 04 after STER will be flashed and adjust the number by the moving the arroy   , confirm it with key  , setting of STER is finished, it is same for the other SELECTION.</p>	<p>CUSTOM</p> <p>▶ STER 04 DRY 00 VACUUM 1</p>
<p>4、 After setting of parameter, press the key  , the screen is shown to the right.</p>	<p>SELECTION</p> <p>▶ CUSTOM B-D TEST LEAK TEST</p>
<p>5、 Press the key  , the screen is shown to the right. Press the key  , the sterilizer will close the door automatically to run the program as the set parameter.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>CUSTOM</p> <p>29 °C 09—09—08</p> <p>0.00 bar 12 : 34 : 56</p> <p>  </p> </div>


6.4 Water Tank Feed-water


 will be indicated on the display screen if low water level is detected during the self-checking of the sterilizer. Water should be supplied to the water tank by following procedures.


6.4.1 Manual Feed-water Function of the Pump

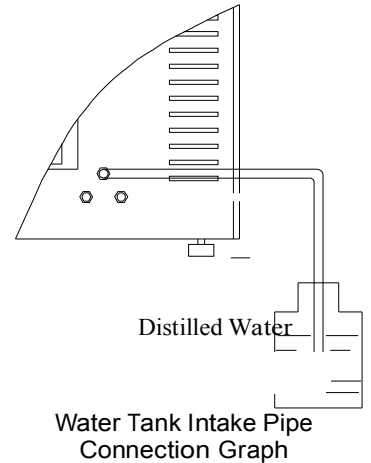
1 Connect the pipe to the water inlet at the back of the tank.

2 Connect the end of intake pipe to the water bucket, as shown in *Water Tank Intake Pipe Connection Graph* to the right.

3 Press  and the pump will inject water to the water tank automatically.

4 When the water in the tank reaches the highest level,  can be found on the display screen, and the pump stops water feeding.

5 Press  again, and the pump can also stop.




6.4.2 Automatic Feed-water Function of the Pump

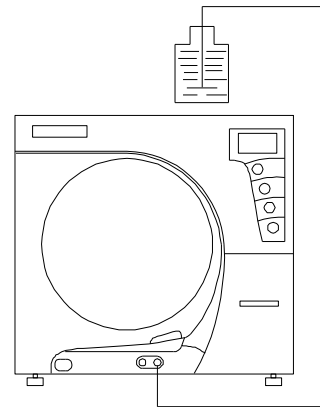
When the water level is detected to be lowest in the water tank of the sterilizer, water can be pumped automatically from the automatic water-feeding port. The water-feeding will stop automatically after the water in the tank is full.

1 The "Water-feeding Mode" should be selected to be "AUTO" in the advanced setting if automatic water-feeding is required. Details can be seen in part 3 of "Advanced Settings"


2 The connection method of the intake pipe is the same as part 2 of 6.3.1.

6.4.3 Manual Water-feeding

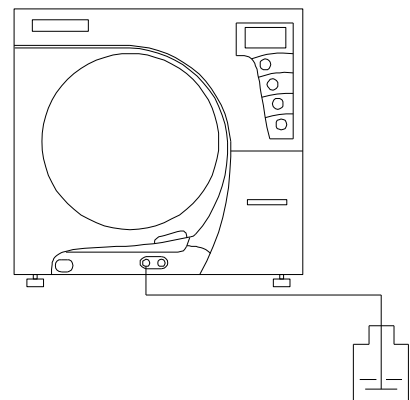
The user can also make manual water feeding from the front water inlet to the water tank. As shown in the graph to the right. Put the distilled water cylinder on or higher to the top. Insert one end of the pipe to the water, and the other to  mark of the quick coupling. The water will flow to water tank by the siphon.




6.5 Drainage of Condensation Water Collecting Box.



When  occurs on the display screen, the alarming of "Beep--Beep" will be made to show that the water in the collecting box is full. The water should be discharged in time from the condensation water collecting box.

Detailed operations are as follows:





























Connect the quick coupling of the drain pipe to the discharge port of the condensation water collecting box. Connect the other end with bucket. The pipeline connection  can be referred to in the right graph.




















6.5 Application Method of Quick Coupling

	
<p>1. Insert of Quick Coupling: Insert the Plug to the socket, push till the plug is clamped,</p>	<p>2. Withdraw of the Quick Coupling: Press The handle on the socket with one finger, then draw out the plug.</p>







VII. Advance Setting

<p>1、 Start the sterilizer, after the self-checking, press the key  for four second to enter the advanced settings interface.</p> <p>Press to move   to move the arrow.</p>	<p>SETTING</p> <p>▶ PRINTER ON</p> <p> FILLING AUTO</p> <p> STANDBY ON</p>
<p>2、“PRINTER” is for the state of printer.</p> <p>“OFF”for no print after the procedure.</p> <p>“ON” is for print the result after the procedure.</p> <p>arrow to the PRINTE, press the key  to switch the state. (MEMO： The function is only for with printer, in case it is shown</p> <p>“ ▶ PRINTER OFF ”, press the key , it will be shown “OFF LINE” after “PRINTER OFF” , that means there is no printer or printer is not connected.</p>	<p>SETTING</p> <p>▶ PRINTER ON</p> <p> FILLING AUTO</p> <p> STANDBY ON</p>
<p>3、“FILLING” is for the way of filling water.</p> <p>“MANUAL” is for manual filling water.</p> <p>“AUTO” is for filling water automatically.</p> <p>When the arrow point to “FILLING” , press the key  to switch the mode.</p>	<p>SETTING</p> <p> PRINTER ON</p> <p>▶ FILLING AUTO</p> <p> STANDBY ON</p>
<p>4、“STANDBY” is for mode of heating preservation.</p> <p>“OFF” is for stop the heating preservation after sterilization.</p> <p>“ON” is for maintain the heating preservation after sterilization.</p> <p>When the arrow point to “STANDBY”, press the key  to switch the mode.</p>	<p>SETTING</p> <p> PRINTER ON</p> <p> FILLING AUTO</p> <p>▶ STANDBY ON</p>

<p>5、 “TIME” is for adjustment of time.</p> <p>When the arrow point to “ TIME ” , press the key  to enter the screen as the right.</p>	<p>TIME SETUP TIME: 12:34:56 DATE: 09-09-08 OBJECT: HOUR</p>
<p>5.1、 “HOUR” is for adjustment of hour</p> <p>Select the OBJECT to HOUR by move the key   , press the key  to confirm it, the number 12 for HOUR will flash, adjust the number as you want by the key   , then press the key  again to confirm it, the flash will be stop.</p>	<p>TIME SETUP TIME: 12:34:56 DATE: 09-09-08 OBJECT: HOUR</p>
<p>5.2、 “MINUTE” is for the adjustment of minute</p> <p>Select the OBJECT to MINUTE by move the key   , press the key  to confirm it, the number 34 for MINUTE will flash, adjust the number as you want by the key   then press the key  again to confirm it, the flash will be stop.</p>	<p>TIME SETUP TIME: 12:34:56 DATE: 09-09-08 OBJECT: SECOND</p>
<p>5.3 、 “ SECOND ” is for the adjustment of second</p> <p>Select the OBJECT to SECOND by move the key   , press the key  to confirm it, the number 56 for SECOND will flash, adjust the number as you want by the key   , then press the key  again to confirm it, the flash will be stop.</p>	<p>TIME SETUP TIME: 12:34:56 DATE: 09-09-08 OBJECT: SECOND</p>

<p>5.4 “DATE” is for the adjustment of date</p> <p>Select the OBJECT to DATE by move the key   , press the key  to confirm it, the number 12 for DATE will flash, adjust the number as you want by the key   , then press the key  again to confirm it, the flash will be stop.</p>	<p>TIME SETUP</p> <p>TIME: 12:34:56</p> <p>DATE: 09-09-08</p> <p>OBJECT: DATE</p>
<p>5.5、 “MONTH” is for the adjustment of month</p> <p>Select the OBJECT to DATE by move the key   , press the key  to confirm it, the number 12 for DATE will flash, adjust the number as you want by the key   , then press the key  again to confirm it, the flash will be stop.</p>	<p>TIME SETUP</p> <p>TIME: 12:34:56</p> <p>DATE: 09-09-08</p> <p>OBJECT: MONTH</p>
<p>5.6、 “YEAR” is for the adjustment of year</p> <p>Select the OBJECT to DATE by move the key   , press the key  to confirm it, the number 12 for DATE will flash, adjust the number as you want by the key   , then press the key  again to confirm it, the flash will be stop.</p>	<p>TIME SETUP</p> <p>TIME: 12:34:56</p> <p>DATE: 09-09-08</p> <p>OBJECT: YEAR</p>
<p>5.7、 After the adjustment, press the key  back to the last menu as the screen on the right.</p>	<p>SETUP:</p> <p>▶ TIME SETUP</p> <p>REGION</p>

6、 Language switch

Move the arrow to REGION by the key   , press the key  , the screen will shown as the right, move the arrow to selected language and confirm it by the key  , back to the last menu by the key  , press the key  again to finish the advance setup.

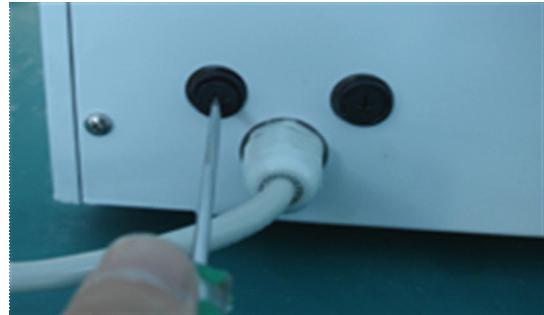
REGION
▶ 简体
English

VIII. Maintenance

8.1 Cleanse the sealing ring every day.

8.2 Cleanse the inner surface of the sterilization cavity with hospital use disinfectant fluid periodically every week.

8.3 Alteration of the fuse



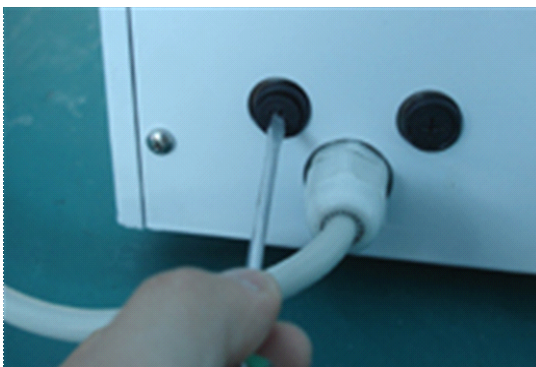
1. Press with slotted screwdriver and contrarotate the fuse support.

2. The fuse support will be ejected after rotating for 90 degree.



3. Take out the ejected fuse support by hand.

4. Pull out the fuse and replace new fuse of the same type.



5. After insert new fuse back to the fuse support, place the support to the fuse basement.

6. Press with slotted screwdriver; make clockwise rotation the basement to 90 degree till it is clamped.

8.4 The connection of inlet tube of water tank

<p>1、 Please connect the water tube before the sterilization.</p>	<p>2、 Please connect one end of tube to the Inlet of Water Tank and put the another end to the Water Bucket.</p>

8.6 The release of Condense Water

<p>1、 Please remove the cover with wrench to release the condense water</p>	<p>2、 Please connect the drainpipe with one end and put the another end to the waste water bucket</p>

IX. Failures and Treatment

The product is provided with functions of automatic inspection and automatic alarming with alarm sounds. The product is double secured; therefore the user need not

worry about safety. If abnormal circumstances occur in the working procedure, turn off the power of the machine immediately and eliminate the failures according to the code and treatment of the failure. Contact the distributors or after service agents if the failure can not be solved. Describe the details to the maintainer to help them quickly shoot the problems, the failure codes and treatments are as follows;

S/N	Warning Code	Alarming	Failure Causes	Treatment
1	E00	Null	No calibration or error in data communication	Have the equipment inspected by professional maintainer
2	E01	Long "Beep"	Temperature sensor error (short circuit)	Have the equipment inspected by professional maintainer
3	E02	Long "Beep"	Exceeding the alarming pressure (over pressure) or the pressure sensor failure	Have the equipment inspected by professional maintainer
4	E03	Long "Beep"	Exceeding the highest temperature (Overheated)	Have the equipment inspected by professional maintainer
5	E04	Long "Beep"	Failure of constant temperature and pressure	Inspect whether there's gas leakage
6	E05	Long "Beep"	The pressure can not be released	Have the equipment inspected by professional maintainer
7	E07	Long "Beep"	Error in relation of temperature and pressure in the model of calibration	Have the equipment inspected by professional maintainer
8	E08	Long "Beep"	Door Interlock switch failure	Have the equipment inspected by professional maintainer
9	E09	Long "Beep"	Electric motor run-time error	Have the equipment inspected by professional maintainer
10	E10	Long "Beep"	Heating up failure	Inspect whether there's gas leakage
11	E11	Long "Beep"	Pressure up failure	Inspect whether there's gas leakage
12	E12	Long "Beep"	Failure of leakage test	Have the equipment inspected by professional maintainer
13	E13	Long "Beep"	Error in water at the clean water tank	Have the equipment inspected by professional maintainer

X. Warranty

The clients can be offered a warranty period of two years after the date of purchase excluding the following circumstances:

- a) Damage made by improper transportation, installation, application and management;
- b) Disassemble the control mainframe of own accord;
- c) alter the invoice or without purchasing invoice;
- d) failed to operate according to operation instruction;
- e) Damage made by exterior causes such as abnormal voltage or fires etc.

XI. Transportation and Storage

If the product will be left unused for long terms or needs to be transported, pull off the power supply of the product and discharge the waters in water tank and condensation water collecting box. The water outlet of water tank is on the back; the outlet of condensation water collecting box can either be on the front or the back.

The machine should be transported and stored under conditions as follows;

- a) Environmental Temperature: -4055;
- b) Relative Humidity Range: $\leq 85\%$;
- c) 500hPa1060hPa Atmospheric Pressure Range: 500hPa1060hPa

XII. Precautions

1. The sterilizer should be installed on a level worktable;
2. Please use distilled water to extend the service life of the sterilizer;
3. Do not block the heat dissipation port on the outer shell of the sterilizer by other things,
4. Substances to be sterilized should be put on the apparatus tray. Leave space between the instruments to facilitate the air circulation of the sterilizer;
5. Operations such as wiping, assembling or disassembling sealing rings etc should be made after the sterilizer is cooled down to avoid scald.
6. Do not drag the sterilizer during transportation.
7. The sterilizer should be cleansed at least every six months to avoid blocking (See detailed in 8.4 Filter Cleansing Method of Maintenance)
8. Take out the apparatus tray with handling shovel instead of with hand after the sterilization to avoid scald.



Use distilled water ONLY, or the machine will be seriously damaged.

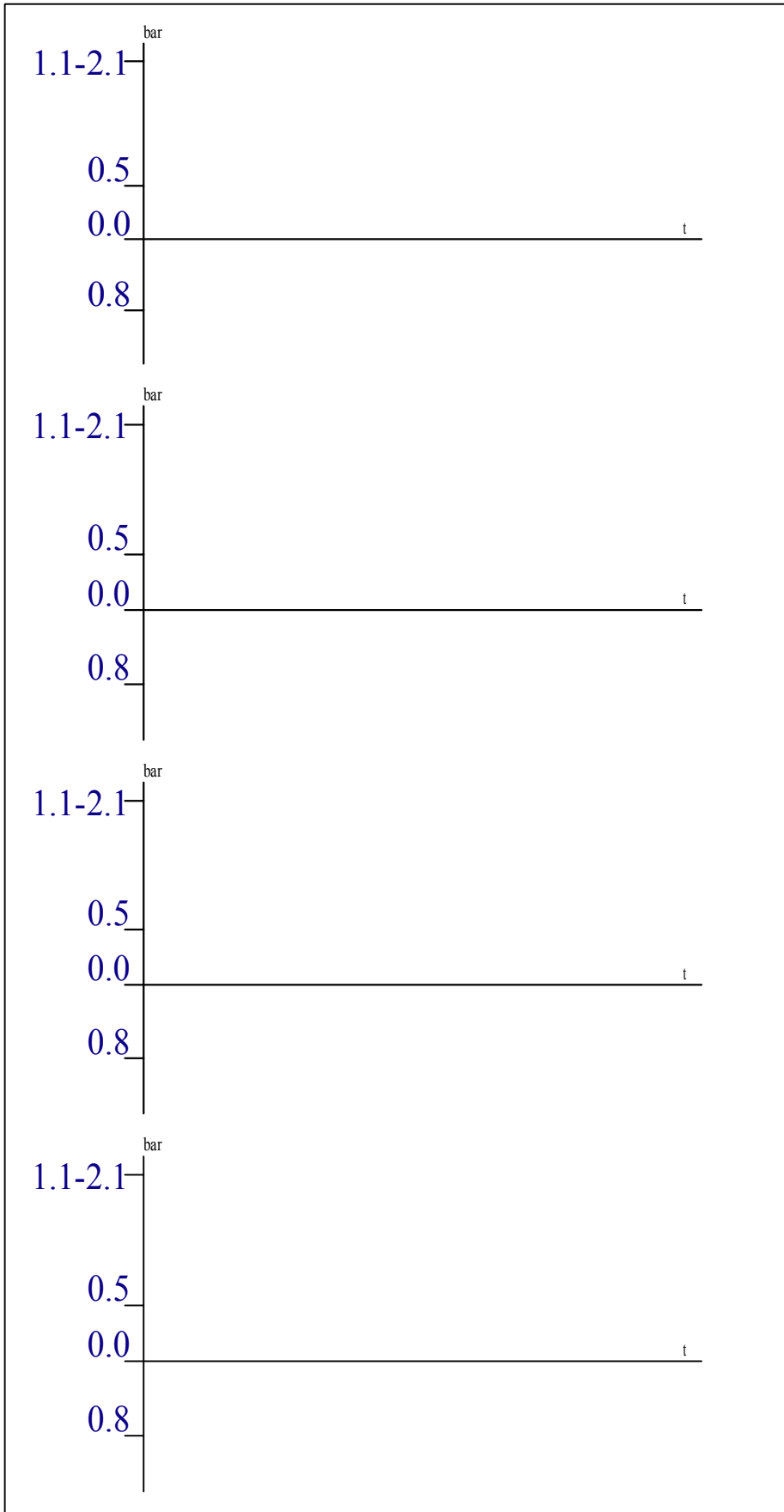
XIII. Explanation for installation of sterilizer

1. Preparation: Prepare two 10 liters or over 10 liters bucket, one is for the clean water bucket to fill with distilled water, another is for the collection of the condense water. Open the sterilizer packaging, take out the accessories in the chamber and clean the chamber, put in the sterilization articles according to the explanation, turn off the sterilizer door.
2. Take out feed water tube (1.5m) from the accessories, connect it to the Water Inlet at rear of the sterilizer directly, another end insert into the distilled water bucket, the bucket should leave one air vent otherwise water of inside is hard to get out, mean while it should be kept the dust out of the air vent and the water Inlet of the distilled water bucket.
3. Take out the water discharge tube (1.5m) with direct plug in the accessories, demount the cover of the outlet of condense water and connect with the direct plug , insert the another end of water discharge tube into the other water bucket for the collection of condense water.
4. Connect with the power supply (220VAC, 50Hz) and open the switch, after the self-examining (the sterilizer will produce the alarm sound to show the clean water tank has no water now, it could be ignored.). Press and " rise // " key, the sterilizer begins to feed water to water tank, the sterilizer will stop the alarm sound and stop the water feed when water reach the water level, press " decline | " key to reveal 1- 6 optional procedures available, it is sterilization procedure in 1, 2, 3, 4, and the procedure 5, 6 is for the test procedure, choose the procedure through " rise // " and " decline | " key, and confirm the procedure with the " enter ✓ " key, then press the " enter key " again to lock the door to begin the work of sterilizer.

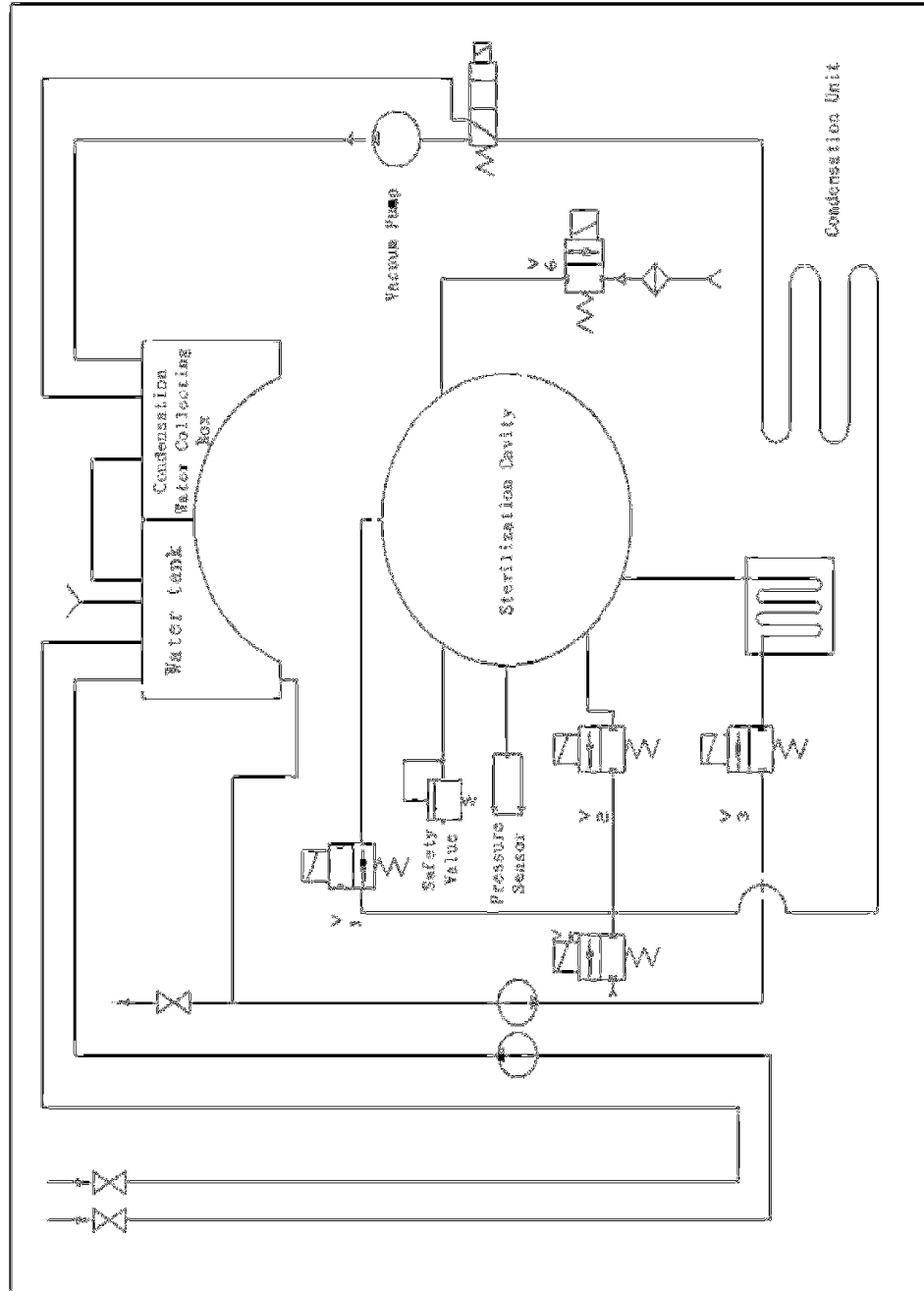
XIV. MEMO:

1. Please prepare two bucket for feed the clean water and discharge the condense water, and clean the two bucket periodically.
2. Open the door of sterilizer, it could be seen the label " Filter should be cleaned once per month " , please check the detail in the manual and follow the instruction.

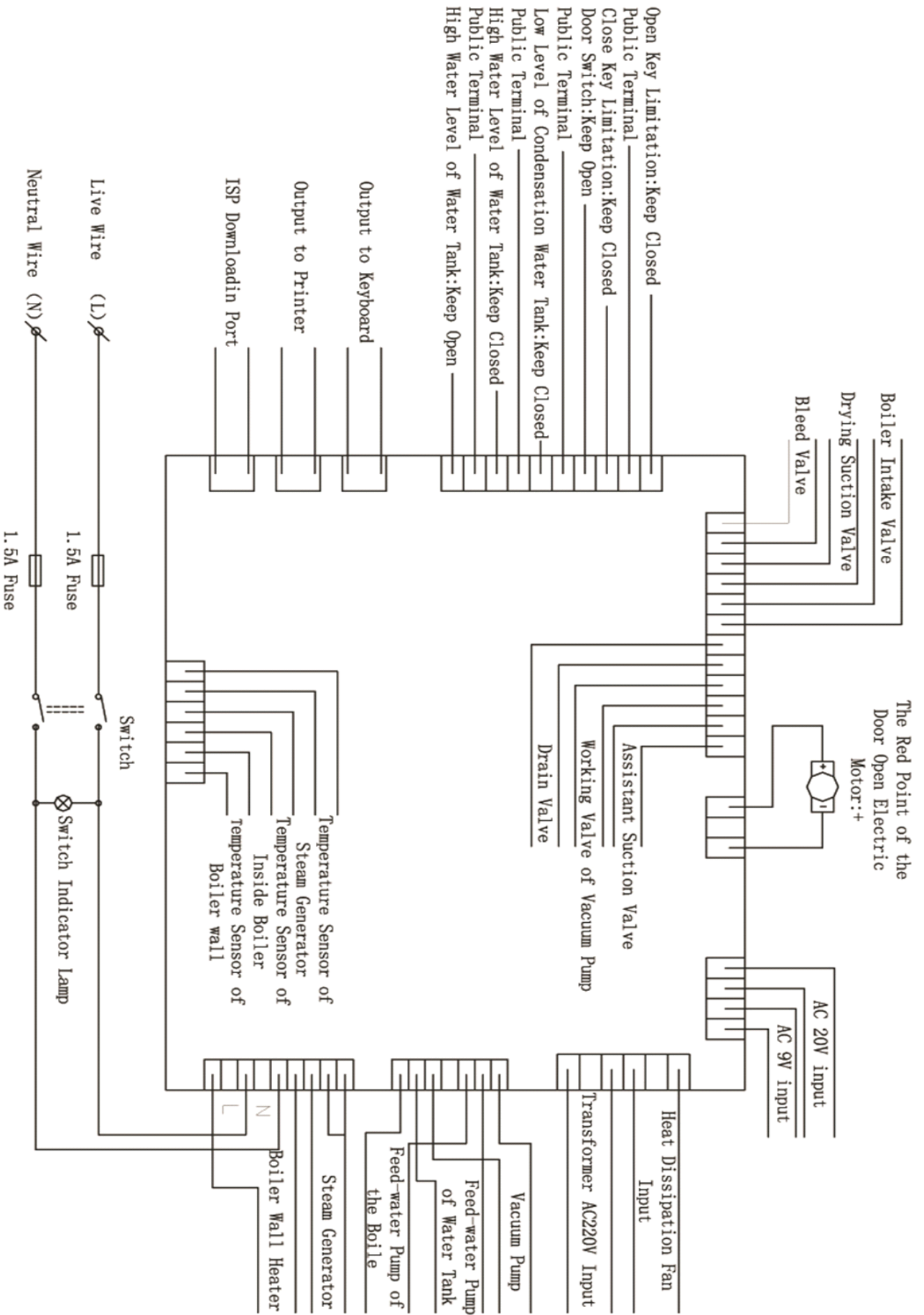
Appendix 1: Chart for Running Status of Sterilizer
(Modification should be made on the following operation chart)



Appendix 2: Pipeline Chart



Appendix 3: Circuit Diagram



Appendix 4: Classification

1. According to Type of Electric Shock Resistance: Type
2. According to Degree of Electric Shock Resistance: Type B
3. According to protective degree of hazard liquid: General equipment (closing device without protection of liquid injection)
4. According to the safety degree of the mixed gas of flammable anesthesia gas and air, oxygen or nitrous oxide: Equipment can not be used in mixed gas of flammable anesthesia gas and air, oxygen or nitrous oxide
5. According to the Duty: Constant running.

Name of Manufacturer: P&T (NINGBO) MEDICAL EQUIPMENT CO., LTD
Registered Address: Houcang Section, Yinxian Avenue, Ningbo, China
Production Address: Houcang Section, Yinxian Avenue, Ningbo, China
License No. of Medical Machine Productive Enterprises: Zhejiang FDA Machine
Production Approval No. [2010]0261.
Standard Code of the Product: YZB/Zhejiang 1311-2010
Registration No.: Ningbo FDA Approval No. [2010] 2570518
Tel: +86-574-8826-6999
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