GX Model

Hot Air Sterilizing Drying Oven

(Intelligent digital display temperature controller)

User Manual

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I. Introduction

GX Hot Air Sterilizing Drying Oven adopts physical method to achieve disinfection and sterilization. It takes advantage of high-temperature and hot air to cause intoxication on microbial oxidation, protein denaturation, and electrolyte concentration. By disinfection principle, it destroys protoplasmic cell to kill all the microorganisms in a certain period of heating time.

II. Characteristics

- ★ Cold rolling steel electrostatic spraying exterior.
- ★ Stainless steel inner chamber; foursquare semicircle transition; flexible positioning and removable shelf, airduct lateral plate and bottom heater covering are easy assembly and disassembly for convenient cleaning.
- ★ Large screen digital intelligent temperature controller with function of temperature setting set time two line display, over-temperature alarm and timing.
- ★ Heater and fan are well constructed by placing them under the chamber; circulation fan will be closed when it reaches the set temperature point to prevent powdery samples blowing away.
- ★ Independent temperature safety device with function of auto-switch with temperature controller and over temperature alarm.
- ★ Door with adjustable airtight buckle lock to ensure good sealability.
- ★ Selectable low, medium and high fan grade.

  Note: model GX230 has no function of speed adjustment.

  Options:

Items	Function
RS485/232 interface	Network connection for convenient temperature control
Micro type printer	Record temperature print.
Independent power failure alarm	Help the operator process sample immediately.

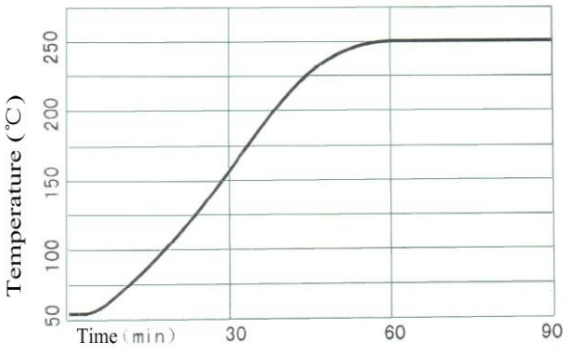
III. Product structure diagram and parameters

1. Structure diagram

2. Main technical parameters

Model	GX30B	GX45B	GX65B	GX85B	GX125 B
voltage	220-240V 50-60Hz				
Temp. variation	RT+10~300℃				
Temp.disting uish ability	0.1℃				
Temp. fluctuation	±1.0℃				
Ambient temp.	5~40℃				
Power (kw)	0.8	1.2	1.6	1.8	2.3
Inner Chamber Size (mm)	310×310×310	350×350×350	400×360×450	450×450×450	500×450×550
Exterior Size (mm)	460×510×695	500×550×735	550×550×840	590×580×830	636×680×915
Load per rack	15/kg				
NW / GM (kg)	39/52	42/55	53/61	52/65	58/73
Number of Shelf	2pcs				

3. Temperature profile



Note: according to the different model type, the time of warming up is different

Ⅳ. Working conditions

The drying oven work under the following conditions:

- ❖ Temperature ranges between 5~40℃;
- ❖ Relative humidity less than 85% RH;
- ❖ Power: voltage 220-240v, frequency 50-60Hz;
- ❖ No violent vibrations and corrosive gas surround the oven.

Ⅴ. Attentions

	Connect the device to an earthed power supply to ensure safety of machine and experiment; connect the power as the machine required.
	This equipment is forbid to use in inflammable and explosive, poisonous and strong corrosive experiments.
	Make sure horizontal installation.
	Non-professionals are not allowed to disassemble and repair this machine.

	The sample should not be put overlapped, leave space between sample for air circulation and air diffusion.
	Thickness of oiling agent and powder should less than 1.3cm, at 160 ℃, every 1.3 cm add need prolong of 30minutes. But it cannot be over 5cm.
	Sterilizing time is started to be counted while the temperature inside chamber reaches required point; the door of container cannot be opened while sterilizing, otherwise, the time needs to be recounted.
	Sample of volatility is not allowed to be sterilized. Besides, cotton goods, synthetic fibre and plstics are easily to be burned, they are not allowed to sterlize with the equipment.
	The glasses need to be sterilized after drying; when finish sterilizing, open the door until temperature inside chamber is lowered below 50℃.
	Read the instruction book before operation.

Ⅵ. Operation instruction

① Put the material needs drying into container (advice: size of drying material should not over 2/3 of the shelf); then close the container door and switch power, and next switch on the blower.

② Heating

Set the temperature as needs (see details in meter instruction), then the temperature starts to rise; when temperature inside inner chamber reaches the set point, the indication light will go out, after keeping constant temperature for 30min, the temperature inside chamber remains constant state.

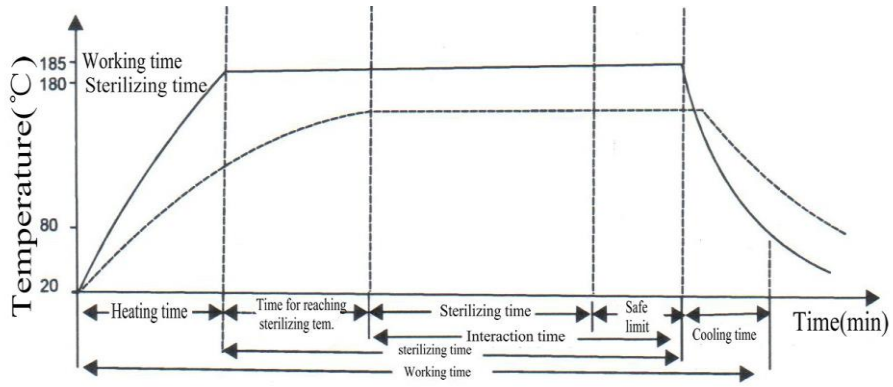
Note: don’t close blower when the temperature is rising, or else it will accelerate ageing of heater. When the independent temperature safety

device is set, generally, the temperature is set 10℃ higher than usual using temperature; if it is not necessary, set the temperature to 250℃.

③ Extinction time for organism need every minute under different temperature

Sterilizing Temp.Sterilize time / Organism name	120℃	130℃	140℃	150℃	160℃	170℃	180℃
Staphylococcus aureus	30	20	15	10	8	5	
Colibacillus	30	20	10-15	10	8	5	
Shigella shigae	10		5		5		
Typhoid bacillus	20		10		5		
Vibrio cholerae	5-10						
Diphtherin	20		10		5		
Braxy bacillus	120		60	30-60	15-30	10-20	10
Clostridium perfringens	50	15-25	5				
Clostridium tetani		40	30	20	12	5	1
Clostridium botulinum	120	60	15-60	25	20	10-15	5-10
Spore				180	30-90	15-60	15

Diagram of sterilizing process:



④ After finishing drying, turn off power, and then bring the sample out.

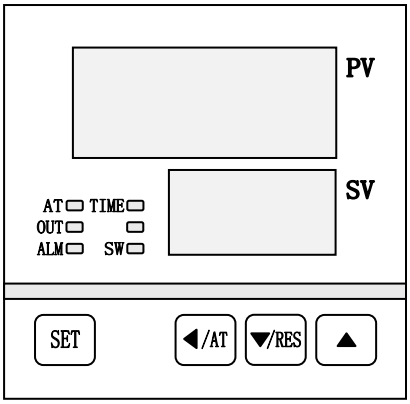
⑤ Keep the drying oven clean, wipe the container sealing rubber strip by soft cloth and clear the dirt out; avoid cleaning it by chemical solution to

prevent chemical reaction damage on sealing rubber strip.

⑥If the oven is unused for a long time, daub neutral grease or Vaseline on galvanized parts to prevent corrosion; cover the oven with plastic dust cap, and store it in the dry room to keep the electric device against wet.

VII. Meter operation instruction

Panel Instructions



Indicator light function

1) AT：It flickers during self-tuning, it is not bright in any other state.
2) OUT：It is lit when heating output.
3) TIME：It is lit when time is set, it flickers in the process of timing.
4) ALM：It is lit when there is a temperature alarm.
5) SW：It is invalid.

Button function

1)【SET】：In normal state, press this button to enter the setting state.
2)【◀/AT】："SHIFT" button. In the setting state, click this button to shift the set value.

In normal state, press this button for 6 seconds to enter the auto-tuning selection state.

3)【▼/RES】："DEC" button. In the setting state, click this button to reduce the set value.

If you keep pressing this button, the value will reduce continuously. In the normal state, when the timer ends, press this button for 3 seconds, the controller will restart to work .

4)【▲】："INC" button. In the setting state, click this button to increase the set value. If you keep pressing this button, the value will increase continuously.

1. Operation and using

1-1. When the controller is switched on, All displays light up for 2 seconds, display windows show the version number and controller model for 2 seconds, then it starts running.

1-2. Temperature and Time Setting

1) Without Timing Function :

In the normal state , press the “SET” button to enter the temperature setting state, windows display the prompt "SP" and the temperature set point value. Using the “SHIFT”、“DEC” and “INC” buttons, user can edit the temperature set value. Press the “SET” button again, the controller will return to its normal state, the setting value will be saved automatically.

2) With Timing Function :

In the normal state , press the “SET” button to enter the temperature setting state, windows display the prompt “SP” and the temperature set point value. Re-press the “SET” button to enter the time setting state, windows display the prompt “ST” and the time set point value. Press the “SET” button again, the controller will return to its normal state, the set values will be saved automatically.

When the time is set to "0", it indicates the timer is inoperative, the controller will run continuously, the under window will display the temperature set point value. If there is time set, the under window will display the running time, its decimal point and the “TIME” indicator are lit, when the timer starts, its decimal point and the “TIME” indicator flickers. When the timer ends, the under window will display the “End” prompt, the buzzer will sound for 5 minutes, it can be muted by pressing any button, press the “DEC” button for 3 seconds, the controller will restart to work .

1-3. If the upper window show the prompt “---”, it indicates that the temperature sensor has faults or temperature exceeds the measuring range or the controller itself is faulty, the controller will cut off the heat output automatically, the buzzer will sounds continuously, “ALM” indicator is lit, Please check the temperature sensor and its wiring carefully.

1-4. When over temperature alarm, the buzzer beeps continuously, "ALM" indicator is lit, the heat output is cut off. If the over temperature alarm is caused by the change of the temperature setting value, "ALM" indicator is lit, but the buzzer does not beep.

1-5. When the buzzer sounds, press any key to mute.

2. Auto-tuning

In the normal state, press the “SHIFT” button for 6 seconds, the controller will enter the auto-tuning selection state, the upper window displays the prompt “AT”, the under window displays "0", change "0" to "1" by pressing the “INC” button, then press the “SET” button, the controller will run the auto-tuning program, the “AT” indicator flickers. After auto-tuning end, the indicator stops flickering, PID parameter value is saved automatically. In the auto-tuning process, press the “SHIFT” button for another 6 seconds, the controller will stop the auto-tuning program.

During the Auto-tuning process, if over temperature alarm, the buzzer does not beep, "ALM" indicator is not lit, the heat output will be cut off, the “SET” button is invalid, the under window always displays temperature set point value.

3．Internal parameters settings

In the normal state, press the “SET” button for 3 seconds, windows will display the prompt “Lc” and the password value. Adjust the password to the required value, then press the “SET” button again, it will enter the internal parameters setting state. Press the “SET” button for another 3 seconds, it will return to the normal state, the set value will be saved automatically.

Parameter table 1

Prompt	Name	Function description	(Setting range) Factory value
Lc	Password key	When “Lc=3”, enter the next parameters.	0
ALH	Over-temp alarm	If “PV>SV+ALH”, the ALM indicator turns on. The buzzer sounds and the heat output turn off.	(0～100.0℃) 20.0
P	Proportional band	Adjustment of proportional function.	(0～300.0℃) 35.0
I	Integration time	Adjustment of integration function.	(1～2000S) 300
D	Differential time	Adjustment of differential function.	(0～1000S) 200
T	Control cycle	The temperature control cycle.	(1～60S)
Pb	Temperature deviation correction	It is usually used to correct errors in low temperature measurement. Pb = Actual value – PV	(-50.0～50.0℃)0

PL	Temperature slope correction	It is usually used to correct errors in high temperature measurement. PK = 1000 × (Actual value –	(-999～999) 0

Parameter table 2

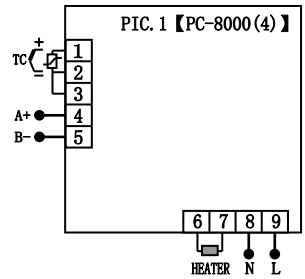
Prompt	**Name**	**Function description**	**(Setting range) Factory value**
Lc-	Password key	When “Lc=9”, enter the next	0
doT	Temperature decimal point	0: No decimal point display 1: With decimal point display	(0～1) 1
ndT	Timer mode	0: No timer function. 1: Start timing when the temp reaches the set value. 2: Start timing as soon as the	(0～2) 1
Hn	Timer unit	0: Minute. 1: Hour.	(0～1) 0
SPd	Timer parameter	If “ndT=1”, Start timing when “SV－SPd<PV<SV＋SPd”	(0.1～50.0℃) 0.5
EH	Timer end mode	0: Continue to control the temperature	(0～1) 0
oPn	Door parameter	Automatic judge door opening. 0: invalid; 0: valid	(0～1) 0
nP	Power	Percentage of max heating	(0～100%) 100
Co	Heating prohibited	When “PV≥SV+Co”, heating output will be cut off	(0～50.0℃) 50.0
SPH	Max set value	The maximum temperature set point value.	(0～400℃) 300.0

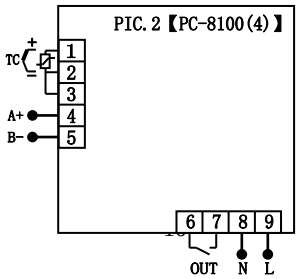
Parameter table 3

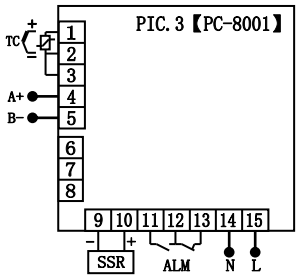
Prompt	**Name**	**Function description**	**(Setting range) Factory value**
Lc	Password key	When “Lc=567”, enter the next	0
rST	Factory reset	0: cancel; 1: confirm	(0~1) 0

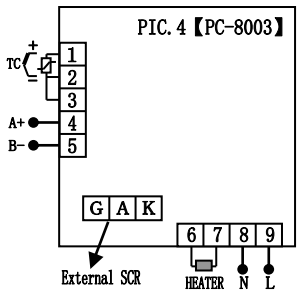
6. Wiring

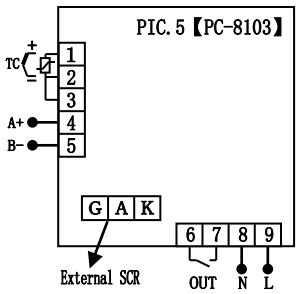
“ ”：Represents the charged output, should be directly connected to the load.
“ ”：Represents the switch output without charge.

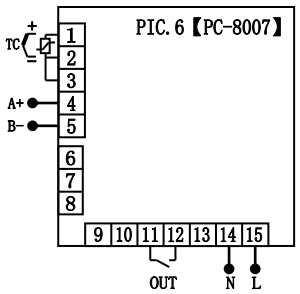












Ⅷ. Fault treatment

Phenomena	Causation	Treatment Method
1.No power supply	1.Plug is poor contact or line broke	1. Connect the plug and line.
	2. Fuse protector is broke.	2. Change the fuse protector.
2. No temperature rising inside container	1. Low set temperature	1. Readjust and set temperature
	2. Heater is broke.	2. Change the heater
	3.Temperature controller is broke	3. Change the temperature controller
	4. Temperature sensor is loose.	4. Screw up the sensor nut.
	5. Temperature sensor is broke	5. Change the temperature sensor.
3. No temperature rising alarm	1. Setting temperature of Detached temp. limiter is low	1. Readjust the temperature 30℃ above setting temperature.
	2. Detached temperature limiter sensor is broke.	2. Change the detached temperature limiter sensor
4. Temperature cannot reach the setting point.	1. Exhaust port is fully opened	1. Shut off the exhaust port.
	2. The container is overfilled, hot air cannot convect.	2. Decrease amount of sample to improve convection condition.
5. The fan does not work.	The fan motor is broke	Stop work and check electric capacity and motor
6.Displaying-------	The sensor is broke	Change the sensor
7.Display STOP	Time-up	Press the program key for 3s to start