BioLAB

Operation Manual

General Purpose Oven

Thank you for Choosing Biolab products. Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation.

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01 Introduction

General Purpose Oven achieves disinfection and sterilization by physical method. It takes advantage of high-temperature and hot air to cause intoxication on microbial oxidation, protein denaturation, and electrolyte concentration. And by disinfection principle, it destroys protoplasmic cell to kill all the microorganisms in a certain period of heating time.

02 Characteristics

• Cold rolling steel electrostatic spraying exterior ensures the aesthetics and longevity of the product.

• Favin stainless steel inner chamber; foursquare semicircle transition; airduct lateral plate and heater cover are easy assembly and disassembly for convenient cleaning.

• Large screen digital display intelligent temperature controller with function of time & temperature dual line display, over-temperature protection and timing.

• Well coordinated bottom fan and heater which are placed under the chamber; the circulation fan would be closed automatically when it reaches the target temperature to prevent powdery sample blowing away.

• Independent temperature safety device, which has function of over temperature protection and auto-switch with temperature controller.

• Air-tight door with adjustable buckle lock ensures good sealability.

• Three options (high, medium and low) for fan positioning to meet experiment needs.

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.

03 Product structure diagram and parameters

1. Structure diagram

2. Main technical parameters

Model		BOGP-301	BOGP-302	BOGP-303	BOGP-304
Function	Temp. Range	RT+10-300℃			
	Temp.Resolution Ratio	0.1℃			
	Temp. Motion	±1℃			
	Temp.Uniformity	±2.5%			
Structure	Inner Chamber	Mirror Stainless Steel			
	Outer Shell	Cold rolling steel electrostatic spraying exterior			
	Insulation layer	High quality rock wool board(with CE)			
	Heater	Stainless steel heater			
	Power rating	0.8kW	1.2kW	1.6kW	2.3kW
	Timer	0-9999min(with timing wait function)			
	Sensor	pt100			
Specification	Inner Chamber size (W*L*H)(mm)	310*310*310	350*350*350	400*360*450	500*450*550
	Exterior size (W*L*H) (mm)	450*500*690	490*540*730	540*550*830	640*640*930
	Packing size (W*L*H) (mm)	550*585*845	590*625*885	640*635*985	740*725*1085
	Volume	30L	45L	65L	125L
	Shelf number	6	7	9	13
	Load per rack	15kg			
	Shelf space	35mm			
	Power rating (50/60HZ)	AC220V/3.6A	AC220V/5.5A	AC220V/7.2A	AC220V/10.5A
	NW/GW (kg)	33/37	37/43	44/49	60/66
Accessory	Shelf	2			
	Shelf frame	4			

3. Temperature profile

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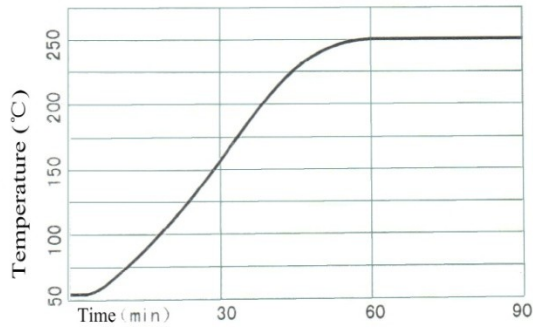
04 Working conditions

The drying oven work under the following conditions:
- Temperature ranges between 5~40°C;
- Relative humidity less than 85% RH;
- Power: voltage 220±10%, frequency 50±1Hz;
- No violent vibrations and corrosive gas surround the oven.

05 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 specimen cannot be overlap piled up, leave spaces between the articles to ensure air convection and air diffusing.
	The oil agent and powder thickness cannot over 1.3cm,under 160℃， every 1.3cm of specimen adding needs 30mins of delay, it can never over 5cm.
	The time of sterilizing is decided by temperature, so don't open the door while it is sterilizing, otherwise it has to start over.
	Volatile articles are not allowed to sterilize, besides, cotton, fiber and plastics things are easy to be burned, which is also not good for this.
	when sterilize glass, dry it up advance, and open the door after the temperature is lowed to 50℃ to avoid explosive accidents.
	Read the instruction book before operation.

06 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. And set the over temperature alarm point 10℃ above using temperature, or set it to 250℃ when it is unused.

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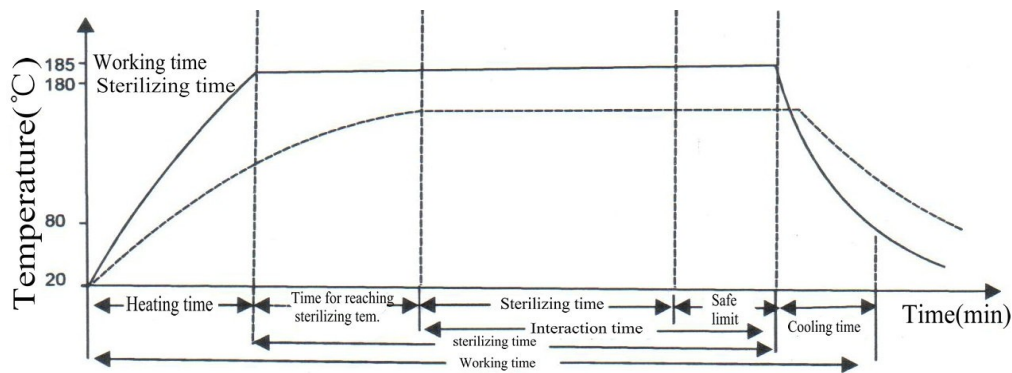
4. After finishing drying, turn off power, and then bring the sample out.

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.

6. If 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.

07 Fault treatment

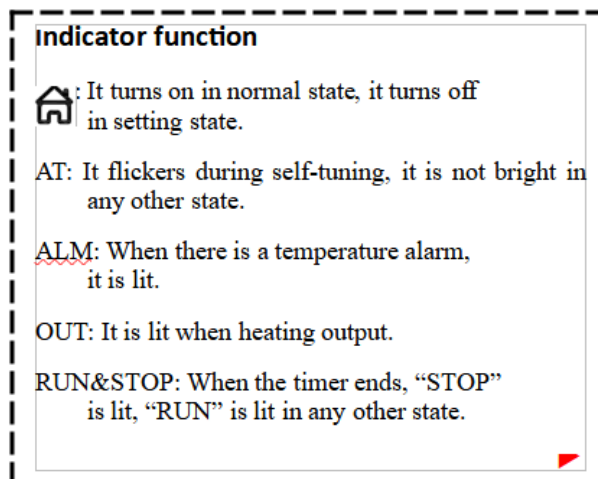| Phenomena	Causation	Treatment Method
No power supply	Plug is poor contact or line broke	Connect the plug and line.
	Fuse protector is broke.	Change the fuse protector.
No temperature rising inside container	Low set temperature	Readjust and set temperature
	Heater is broke.	Change the heater
	Temperature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

08 Meter operation instruction

1. Panel Instructions

【PCD–D8000】

Indicator function

⌂ : It turns on in normal state, it turns off in setting state.

AT: It flickers during self-tuning, it is not bright in any other state.

ALM: When there is a temperature alarm, it is lit.

OUT: It is lit when heating output.

RUN&STOP: When the timer ends, "STOP" is lit, "RUN" is lit in any other state.
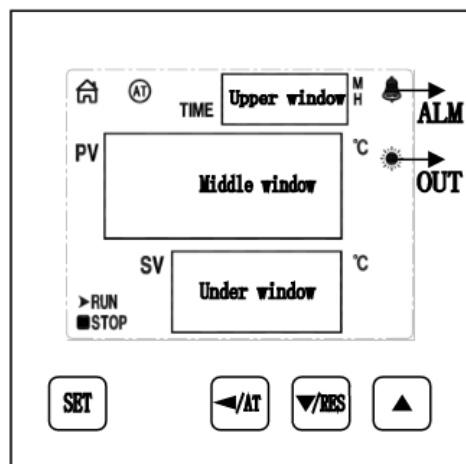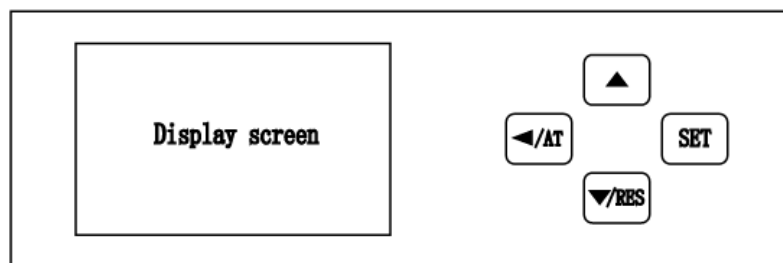
2. Button

【PCH(B)–D8000】

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.

3. Operation and using

1-1. When the controller is switched on, 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, middle window displays the prompt "SP", under window displays 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, middle window displays the prompt "SP", under window displays the temperature set point value. Re-press the "SET" button to enter the time setting state, middle window displays the prompt "ST", upper window displays 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, upper window always displays "0". If there is time set, the upper window will display the running time, when the timer starts, time unit flickers. When the timer ends, upper window will display the "End" prompt, the buzzer will sound for EST (In Parameter Table 2) seconds, 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 middle 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, "ALM" indicator is lit, the heat output is cut off. When under temperature alarm, "ALM" indicator flickers, the buzzer beeps. 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.

Operation and using

1-1. When the controller is switched on, display window shows the version number for 2 seconds, then it starts running.
1-2. Alarm temperature setting
Under the normal state, window displays temperature alarm set value. Click the "INC" or "DEC" button, the set value starts flashing, at this point, the required temperature alarm setting can be modified through the "INC" and "DEC" button. About 2 seconds after stopping operation,

the controller will return to the normal state, the set value will be saved automatically.

1-3. View temperature measurement

In the normal state, press the "INC" and "DEC" button for about 3 seconds, The right decimal point will light up. At this point, the window displays the measured temperature value. Click the "INC" or "DEC" button again, the controller will return to the normal state.

1-4. Over temperature alarm

In the normal state, when the temperature measurement exceeds the alarm temperature setting value, the window alternately displays " - A - " and alarm setting value, the controller will cut off the output automatically, the buzzer beeps.

1-5. Abnormal temperature measurement alarm

If the 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 output automatically, the buzzer will sounds continuously. Please check the temperature sensor and its wiring carefully.

1-6. When the buzzer sounds, press any button to mute.

4. Auto-tuning

In the normal state, press the "SHIFT" button for 6 seconds, the controller will enter the auto-tuning selection state, the middle 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.

5. Internal parameters settings

Note:All the internal parameter has been adjusted when factory test. For bidden to modify them except Sensor Correction parameter.

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°C) 20.0
ALL	Under-temp alarm	If "PV<SV–ALL", the ALM indicator flickers, the buzzer sounds. **When "ALL=0", the function is invalid.**	(0～100.0°C) 0
P	Proportional band	Adjustment of proportional function.	(0～300.0°C) 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°C) 0
PL	Temperature slope correction	It is usually used to correct errors in high temperature measurement. PK = 1000 × (Actual value – PV) ÷ PV	(-999～999) 0
Addr	Communication address	The communication address of this instrument.	(1～32) 1
Loc	Setting lock	0: Enable to set temperature and time. 1: Disable to set temperature and time.	(0～1) 0

Parameter table 2

Prompt	Name	Function description	(Setting range) Factory value
Lc-	Password key	When "Lc=9", enter the next parameters.	0

|			
ndA	Temperature alarm mode	0: With over-temp alarm only. 1: With over-temp alarm and under-temp alarm at the same time.	(0~1) 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 controller
		    starts working
			(0~2)
			1

Hn	Timer unit	0: Minute. 1: Hour.	(0~1) 0
SPd	Timer parameter	If "ndT=1", Start timing when "$SV - SPd \leq PV \leq SV + SPd$"	(0.1~50.0°C) 0.5
SPT	Const-Temp buzzer time	If enter the Const-Temp State, the Buzzer will beep for SPT seconds if "SPT=9999", it means the buzzer will beep continuously.	(0~9999S) 0
EST	Timing Over Buzzer time	When the timer ends, the Buzzer will beep for EST seconds. if "EST=9999", it means the buzzer will beep continuously.	(0~9999S) 60
EH	Timer end mode	0: Continue to control the temperature 1: Stop temperature control	(0~1) 0
ndo	Relay output mode	0: When the timer ends. 1: When there is a temperature alarm. 2: When the temperature is constant.	(0~2) 1
oPn	Door parameter	Automatic judge door opening. 0: invalid; 0: valid	(0~1) 0
nP	Power percentage	Percentage of max heating power output.	(0~100%) 100
Co	Heating prohibited deviation	When "PV≥SV+Co", heating output will be cut off	(0~50.0°C) 50.0
SPL	Min set value	The minimum temperature set point value.	0.0

SPH	Max set value	The maximum temperature set point value.	(0～400.0°C) 300.0

Parameter table 3

Prompt	Name	Function description	(Setting range) Factory value
Lc	Password key	When "Lc=27", enter the next parameters.	0
FC	Temperature unit	0: Centigrade; 1: Fahrenheit	(0～1) 0

Parameter table 4

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

Digital Temperature Limiter Panel Instructions
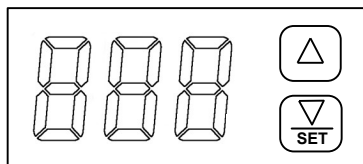
Button function

1）【▲】："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.

2)【▼/SET】："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.

It has the setting function when modifying internal parameters.

6. View and set internal parameters

In the normal state, press the "INC" and "DEC" button for about 6 seconds, the window alternately displays "Lc" and password value, the required password value can be modified only by the "INC" button. Then click the "DEC" button, the controller will enter the internal parameters setting state. Press the "DEC" button for 3 seconds, it will return to the normal state, the set value will be saved automatically.

Parameter table

Prompt	Name	Function description	(Setting range) Factory value
Lc	Password key	When "Lc=3", enter the next parameters.	0
Pb	Temperature deviation correction	It is usually used to correct errors in low temperature measurement. Pb = Actual value – PV	(-50～50°C) 0
PL	Temperature slope correction	It is usually used to correct errors in high temperature measurement. PK = 1000 × (Actual value – PV) ÷ PV	(-199～199) 0
SPH	Max set value	The maximum temperature set point value.	(0～400) 400

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