

# Operation Manual



BOGP 200 series

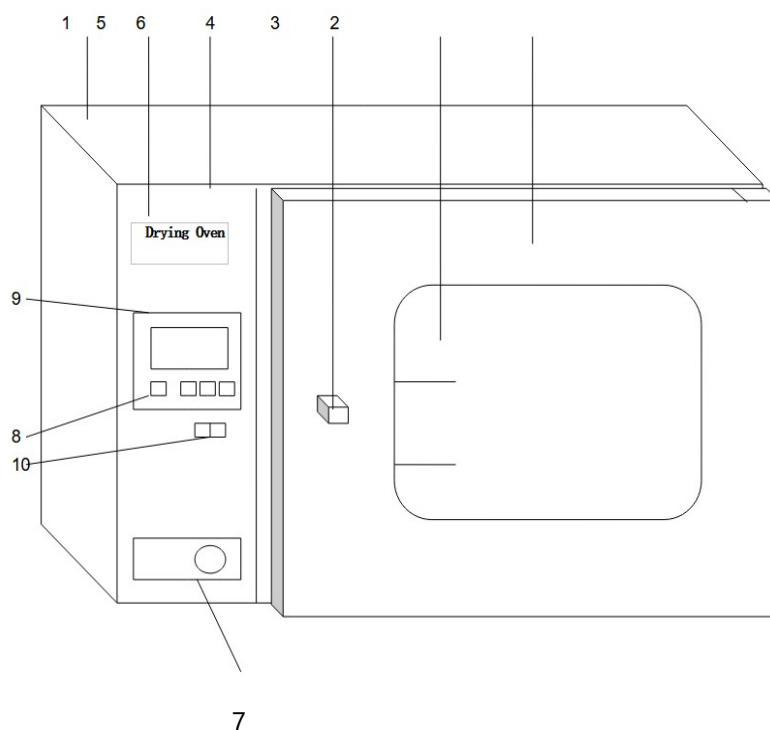
## General Purpose Oven

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 Diagrammatic Sketch



- |                            |                                     |                        |
|----------------------------|-------------------------------------|------------------------|
| 1. Cabinet body            | 2. Cabinet door                     | 3. Shelf               |
| 4. Door handle             | 5. Nameplate                        | 6. Control panel       |
| 7. Air door adjusting knob | 8. Temperature adjusting instrument | 9. Temperature control |
| 10. Power switch           |                                     |                        |

# 02 Scope of Application

Apply to the drying, braking, wax melting and sterilization of the articles in industrial and mining enterprises, colleges and universities, scientific research and medical units, labs, etc.

## 03 Technical Indexes

Model	BOGP-201	BOGP-203	BOGP-205	BOGP-207
Mains voltage of power supply	AC220-240V 50-60Hz			
Temperature range	RT+10~200 (250) °C			
Temperature fluctuation	±1°C			
Power consumed	850W	1100W	2050W	2450W
Dimensions of the working room	250x260x250mm	420x395x350mm	550x450x550mm	600x550x600mm

Model	BOGP-202	BOGP-204	BOGP-206	BOGP-208
Mains voltage of power supply	AC 220-240V 50-60Hz			
Temperature range	RT +10~250 °C			
Temperature fluctuation	±1°C			
Power consumed	850W	1550W	2050W	2450W
Dimensions of the working room	340x320x320mm	450x400x450mm	550x450x550mm	600x500x750mm

Model	BOGP-209	BOGP-210	BOGP-211
Mains voltage of power supply	380 V, 50HZ		
Temperature range	RT+10~250 °C		
Temperature fluctuation	±1°C		
Power consumed	3100W	4000W	5200W
Dimensions of the working room	640x585x1355mm	840x600x1350mm	1000x600x1600mm

## 04 Structural Description

Drying Oven Model forced air drying cabinet includes serial products. They are divided into two categories in appearance: desk-type and vertical-type. The desk type has a relatively smaller capacity, including three types of specifications: 30L, 70L and 120L. The vertical type has a relatively bigger capacity, including 200L, 420L and 620L. The shells of drying cabinets of all specifications are made of excellent steel plates and the surfaces have baking varnishes. The working room is made of stainless steel plates and has 2~5-layered shelves made of stainless steel wires (the middle layer is filled with extra-fine glass wool for insulation). The desk-type cabinet door adopts dual-layer tempered glass door; the vertical cabinet door has dual-layer glass viewing window in the top middle, through which the heating articles in the cabinet can be clearly observed. The connection between the working room and the cabinet door is installed with heat-resistant silicone rubber sealing ring in order to guarantee the sealing between the working room and cabinet door. The power switch, power indicator light, air door adjusting knob, temperature control instrument and other operating parts of drying cabinet are all located on the control panel in the front of cabinet body. For the desk type, the control panel is on the front left side of cabinet body; for the vertical type, it is on the front top side of cabinet body.

The heating constant temperature system in the cabinet mainly consists of motor with centrifugal impellers, electric heater, proper air duct structure and temperature control instrument. When switching on the drying cabinet, the motor rotates and vent upwards the heat produced by the electric heater (at the bottom of the cabinet) through air duct, which is absorbed into the fan after going through the articles to be dried in the working room. Such circulation continues until the temperature becomes even.

The temperature control instrument is a universal-purpose part made meticulously by our company. It is featured by the following functions: precise temperature control; the set temperature and the temperature in the cabinet are digitally displayed; the set temperature has protective device and tracking alarm. When the temperature in the cabinet is 10°C higher than the set temperature, the tracking alarm will switch off the power supply of the heater and send out the sound and light alarms.

Air door regulator can regulate the air inflow and outflow of the cabinet by starting up the air door adjusting knob.

## 05 Method of Use

1. Put the articles to be dried into the drying cabinet, close well the door and turn the air door adjusting knob to "∑" position.
2. Move the power switch to "ON". The power indicator light lights up and figures appear on the temperature control instrument.
3. Select the required set temperature, the numeric temperature displayed at the moment is the temperature in the cabinet and the heating indicator light lights up, showing that the instrument has been in the heating and temperature-rising state. After a period of time, when the displayed temperature is near to the set temperature, the heating indicator light is flickering for many times. Under usual conditions, after heating for 90 minutes, the temperature control will be the constant temperature state.
4. When the required working temperature is lower, adopt the two-stage set method. For example, if the required temperature is 80°C, first set 70°C and after the overshoot temperature starts to drop back, then set 80°C, which can reduce and even eliminate the phenomenon of overshoot temperature, thus enable the inside cabinet to attain the temperature-constant state as early as possible.
5. Select the different drying times according to the different humidity of different articles, e.g., the articles to be dried are more humid, turn the air door adjusting knob to "≡" position so as to vent the humid air in the cabinet.
6. When the drying process being over, if not to immediately take the articles out, first turn the air door adjusting knob to close the air door, or let open the air door and move the power switch to "OFF", then opening the cabinet door immediately to take out articles, but take care not to be scalded.

## 06 Precautions

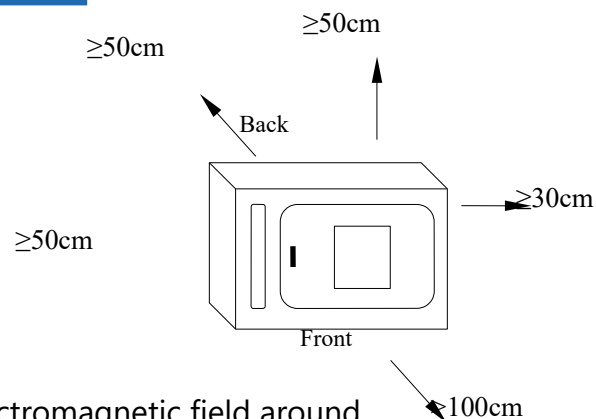
1. The shell of the drying cabinet shall be well grounded to guarantee the safe use.
2. The drying cabinet shall be placed inside one well-ventilated room, surrounding which no inflammable and explosive articles are available.
3. The drying cabinet has no explosion-proof device, so never place inflammable and explosive articles inside for drying.
4. The articles in the cabinet shall not be too crowded. Certain space shall be left so as to facilitate the circulation of hot air.
5. Always keep the internal and external of the cabinet clean. In case it will not be used for a long time, please cover it with a plastic thin film dirt shroud and put it in a drying room.

# 07 Operating Methods

## 1. Preparation before use

The product should work under the following conditions of use:

- 1.1 Ambient temperature: 5°C~40°C.
- 1.2 The relative humidity is not more than 85%.
- 1.3 Atmospheric pressure: (86~106) KPa.
- 1.4 The altitude is not higher than 2000 meters.
- 1.5 There is no strong vibration source and strong electromagnetic field around.
- 1.6 It should be placed on a stable, level, without serious dust, Indoors without direct sunlight and no corrosive gas.
- 1.7 Leave enough space around the product, as shown in the upper right figure, and should not be placed under the fire alarm.
- 1.8 The power supply voltage of the product is shown in the technical indicators (Attached Table 1 to Table 3).
- 1.9 Place reasonably, adjust the position and quantity of the shelves, and put in the work items. It is necessary to maintain a certain gap (>100mm) around the upper and lower sides, and the weight should be such that the shelves are not deformed by bending.



## 2. Power on

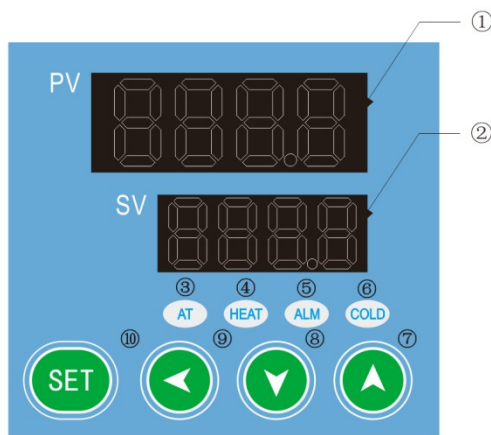


Figure 1

- ① (PV) display
  - \* Display measured value
  - \* Various prompts are displayed according to the status of the instrument.
- ② (SV) display
  - \* Display set value
  - \* Display various parameter values according to the status of the instrument.
- ③ AT (running indicator light): It lights up when the controller is working, flashes during auto-tuning, and goes off when it stops.
- ④ HEAT (heating indicator light): It lights up when there is heating output.
- ⑤ ALM (alarm indicator light): Lights up when there is an alarm output, and the buzzer sounds.
- ⑥ COLD (refrigeration indicator light): on when there is refrigeration output. (Note: this product has no COLD refrigeration function)
- ⑦ Used to adjust various parameter values or enter the auto-tuning state.
- ⑧ Used to adjust the internal parameter value or enter the self-tuning state.
- ⑨ Shift key: used to shift the set value, internal parameter and observe the timing running time.
- ⑩ Function keys:
  - \* Setting value modification.
  - \* Recall of parameter symbols and confirmation of parameter modification.

- 2.1 The layout of the product temperature controller panel (see Figure 1).
- 2.2 Close the door of the box, and the handle should be vertically downward.
- 2.3 Adjust the air door to a suitable position according to the moisture level of the item.
- 2.4 Turn on the power, the indicator light is on and the fan running sound can be heard.
- 2.5 The temperature controller enters the working mode after about 4 seconds of self-checking procedure, that is, the PV screen displays the measured temperature, and the SV screen displays the set temperature. When  $PV < SV$ , the HEAT light should be on, indicating that the temperature controller enters the heating state.
- 2.6 Check temperature control accuracy.
  - 2.6.1 Put a 0.5°C indexed mercury thermometer (or a digital thermometer with a resolution of 0.1°C) into the product working room.  
The mercury probe of the thermometer should be in the geometric center of the effective space of the studio
  - 2.6.2 Choose a point within the temperature control range of the product and set the SV temperature control value. When the PV measurement value is equal to the set value, keep it at constant temperature (1 ~ 2) hours or so (depending on product specifications, the constant temperature time may vary) , Observe that the difference between the actual measured temperature value of the mercury thermometer and the measured value displayed by the temperature controller PV should be  $\leq \pm 1.0^{\circ}\text{C}$ .

### 3. Temperature and timing setting



- 3.1 In the working mode, press the key **SET** once, the PV screen will display **SP** characters, press **▲** or **▼** key, to make the SV screen display the required temperature value. (Refer to Appendix 2 for the process of recalling each function)
- 3.2 Press the key **SET** again, the PV screen will display **St** characters, press **▲** or **▼** key, make the SV screen display the required time value. (Refer to Appendix 2 for each function call process)
  - 3.2.1 When the setting **St** is 0, the controller cancels the timing function and the controller runs all the time; when the ST setting is not 0, the controller has the timing function. When the running time of the controller is up, the SV screen displays "END", The buzzer buzzes, the controller stops working, press any key to mute the sound, press and key **▲** and **SET** at the same time for 4 seconds to restart.
  - 3.2.2 When the controller is in the working mode, just press the key **▼** , the PV screen will display "TIME", and the SV screen will display the running time of the controller. Press the shift key again, and the controller will return to the working mode.
- 3.3 In the timing state, press the key **SET** again to return to the working mode and enter the working state.











#### 4. Upper deviation alarm setting.


The upper deviation setting is reasonable, which can protect the system from over-tolerance or out-of-control temperature control. It must be used when the product is working.

4.1 When the product leaves the factory, AL=10 ~ 15 is generally set, that is, the alarm temperature is: (SV+AL)°C.

4.2 Press the "SET" key for about 4 seconds. When the PV screen displays the characters , release it and open the electronic lock  before you can modify the relevant parameters.

Unlock procedure: Press and hold  for 4 seconds. When the PV screen displays  characters, use the key   to change the value of the SV screen from "0" to "Unlock password=3" (user layer password), and then open the electronic lock (After 1 minute without any operation, the temperature controller will automatically return to working mode).

4.3 Press the key  a few times, when the PV screen displays characters , use the key   to set a reasonable upper deviation value (AL).

4.4 After over-temperature, the buzzer will alarm intermittently, and the over-temperature light  will be on for a long time, press any key to silence.


4.5 When the temperature exceeds the AL value from the high temperature operating value set to the low temperature, it will also give an alarm, which is a normal situation, just press Mute.

#### 5. Methods to improve the accuracy of temperature control.


5.1 After the product has been used for a period of time, the temperature control accuracy should be checked according to the method 2.6, if it exceeds  $\pm 1.0^{\circ}\text{C}$ , it can be corrected according to the following method:

5.1.1 Enter the temperature controller parameter menu (see item 4.2)

5.1.2 Opening the electronic lock (see item 4.3)

5.1.3 Long press the "SET" key, go to the symbol , enter LK=3 for accuracy correction, the correction method is as follows:

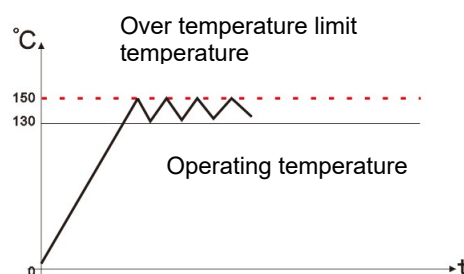
$$\text{Press PK} = 4000 \times \frac{(\text{Measured value PV} - \text{standardable value})}{\text{PV Measurements}}$$

After the formula is calculated, use the key  to modify on the basis of the original PK value at the factory (Note: One correction is inaccurate, and the correction can be repeated until it meets).

## 6. Use of optional accessories "independent temperature limit controller"

The over-temperature protector is an independent protection system. When the temperature controller fails and the temperature is out of control, when the temperature in the working room reaches the temperature limit setting value of the over-temperature dial, the over-temperature protector will automatically cut off the heating and sound an alarm.

(As shown in the right picture) When the temperature in the working room is lower than the temperature limit. After the set value, the protection system is eliminated and the instrument resumes work. Repeat this way until the fault is eliminated.



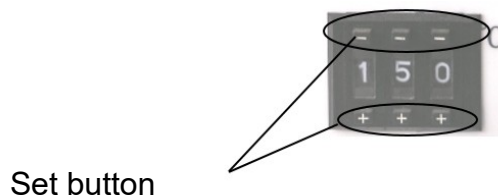
The specific operations are as follows:

6.1 The temperature limit setting value should be greater than or equal to  $(SV + AL) + (10 \sim 15)^{\circ}\text{C}$

6.2 See Figure 2, use the + and - buttons on the over-temperature setting dial on the panel to set the required temperature limit.

Example:  $SV = 130^{\circ}\text{C}$ ,  $AL = 10$

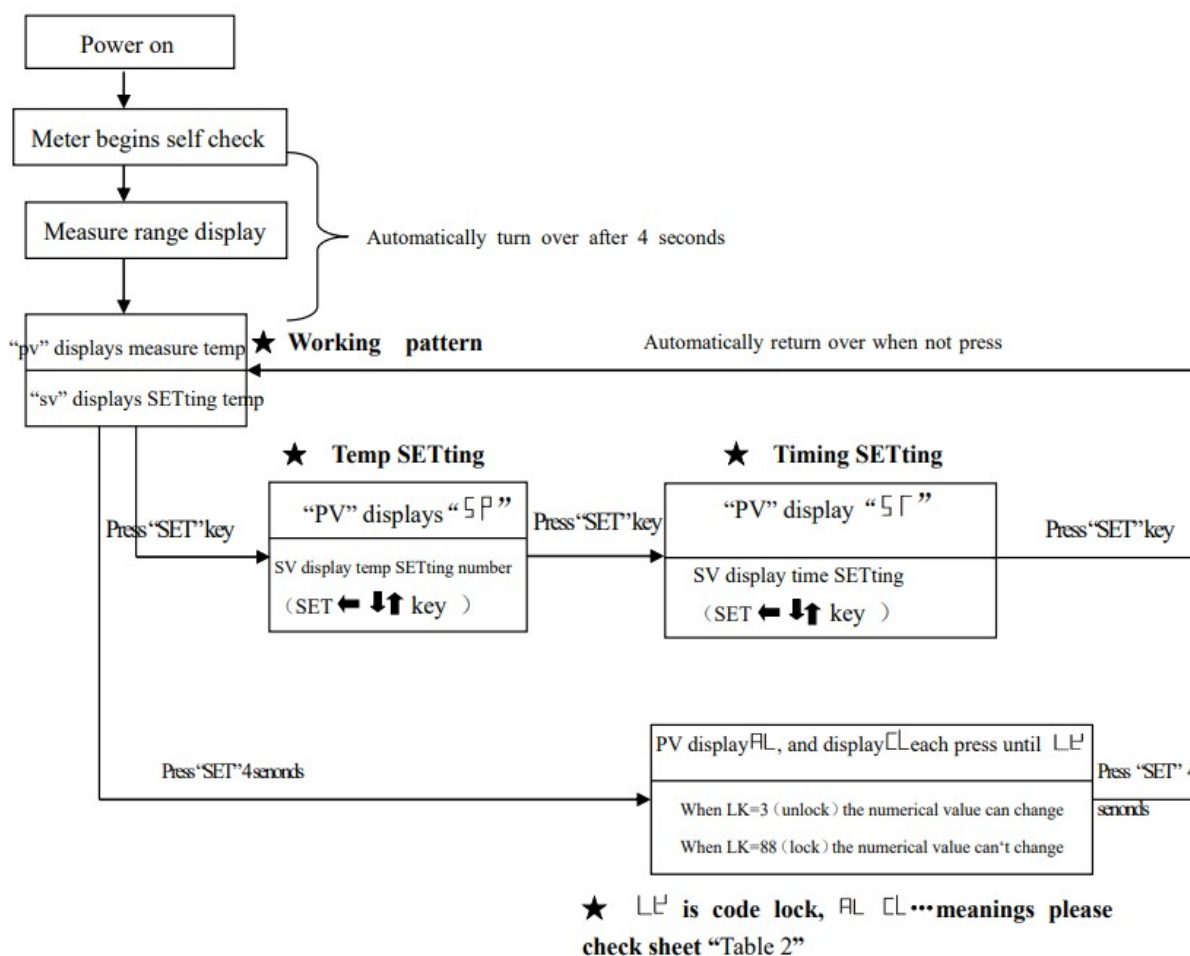
Then  $150^{\circ}\text{C}$  should be set up.









## 7. Maintenance and Instructions.

1. Upon completion of each operation, first switch off the power. Open the box door and wait till the temperature is cooled down in the box before taking out the cultivated goods.
2. In case of keeping the product idle for a long period of time, it is necessary to clean the product in and out. Pull out the power plug and cover it with the plastic anti-dust cap.
3. If the environment for storage has a high humidity, it is necessary to regularly (about 1 month) power on for heating to dehumidify.
4. Before using it again or in case of any change in technical requirement, it is necessary to check the accuracy of thermal control (see the relevant sections).
5. Except for change of such parameters as **SV**, **AL**, **Pk**, **Lk** to change other control parameters, it is necessary to obtain consent from our Service Center or such parameters can be adjusted by the special personages.

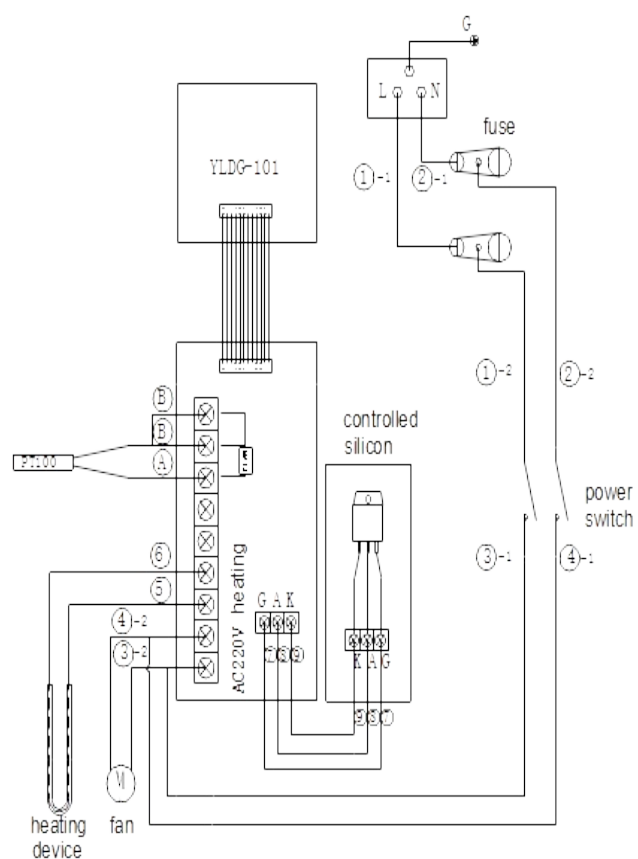
## 8. Sequence to pick up the functions of the instrument



**9. Following table lists the function parameters:**

Symbol	Name	Setting range	Description	Factory set value
 /tM	Setup of maxi temperature permissible by the instrument	37.0-320.0	Stop heating beyond maxi temperature and give alarm.	
 /Po	Boot mode	0~1	** Expression is faulty **when PO =0, after open the power, the controller in a stopped state, need to press the set key + increase key at the same time for more than 4 seconds to start running. ** Expression is faulty **when PO =1, after open the power, the controller will be running.	
 /AL	Alarming setting	0-Full Range 0.0-Full Range	When temperature is beyond SV+AL, the ALM indicator turns on. The buzzer sounds and the heating power turn off.	
 /Pb	Zero point adjust (intersection)	-100-100 -100.0-100.0	When the zero error comparatively smaller and the full point error comparatively larger, to update this value should be needed. Ordinary for pt100, updating this value is rarely needed.	
 /PK	Full point adjust(intercept)	-1000-1000 seconds	When the zero error comparatively larger and the full point error also comparatively larger, to update this value should be needed. PK=4000× (setting value-actual value)/actual value. For pt100 adjusting this value is need at first time.	
 /LK	Password key	0-255	Input the password LK=3, the above parameters can be updated.	

# 08 Wiring Diagram



## 09 Failure Handling Methods

Problems	Causes	Handling methods
1. No supply	1. The plug is not inserted well or the wire is disconnected.	1. Insert the plug and connect the wire.
	2. Fuse is open.	2. Replace the fuse.
2. The temperature in the cabinet does not increase.	1. The set temperature is low.	1. Adjust the set temperature.
	2. The electric heater does not work.	2. Replace the electric heater.
	3. The temperature control instrument does not work.	3. Replace temperature control instrument.
	4. The cyclic fan does not work.	4. Replace the fan.
3. The set temperature has a big difference from the temperature in the cabinet.	1. The temperature sensor does not work.	1. Change temperature sensor.
	2. The fine tuning potentiometer for setting temperature is not adjusted well.	2. Adjust the potentiometer.
4. The over-temperature alarm is abnormal.	1. The set temperature is low.	1. Adjust the set temperature.
	2. The temperature control instrument does not work.	2. Replace the temperature control instrument.

### Packing list

No.	Type	Name	Unit	Qty.	Remarks
1	Document	Operating instructions		1	
2	Document	Packing list		1	
3	Spare part	Fuse core		2	
4	Spare part	Shelf		2	

The articles in this list conform to those loaded in the box.

Packing worker: No.2



**BIOLAB SCIENTIFIC LTD.**

3660 Midland Avenue, Suite 300, Toronto, Ontario M1V 0B8 Canada

Email: [contact@biolabscientific.com](mailto:contact@biolabscientific.com) Tel: +1 707 533 1445

Website: [www.biolabscientific.com](http://www.biolabscientific.com)