LABDEX

Biochemical BOD Incubators

LX700BOD

Index

1. Safety Measures

⚠ **Warning:**

1) To assure safety, this incubator's housing should be grounded.
2) The inclined angle of this incubator cannot exceed 45°C during the conveying and moving, the bio-cultivating incubator boot before use should be placed for 48 hours, so as not to damage the compressor.
3) Set aside enough space inside this incubator when putting articles.
4) Keep this incubator in a clean and dry environment. Do not allow the objects into or through the air outlet (groove) block air circulation.
5) This incubator should be placed in a good ventilation room, and kept away from flammable and explosive articles.
6) Incubator temperature is lower than the long-term 10℃, requiring regular maintenance by shutting down the compressor, so reducing the cooling effect.
7) Do the maintenance and protection work well.
8) The incubator box should be used and maintained by a professional person.

2. Introduction

Biochemical BOD Incubator LX700BOD is PID, microprocessor controlled, with dynamically self-diagnostic control technology for prevention of any failures or damage to the equipment as well as making detection easy. Also equipped with a compressor, temperature controller and temperature sensor.

3. Features

- Chamber material - 304 stainless steel and powder steel coating housing material
- Two stainless steel shelves with adjustable space
- Compressor with over-pressure and under-pressure protection, intelligent defrost, self-checking on-and-off control program and internal refrigeration device
- To ensure uniformity of incubator chamber temperature it is provided with Omni-directional 3D heating technology
- Thermostatic controller with high-speed, high-performance CPU chip
- High-sensitivity and high-precision Pt resistance sensor
- Preset programmed control with a timing range of up to 99 hours for power-on, power-off and working
- Multiple alarms for sensor failure, high/low temperature deviation, over temperature
- Can store the parameters given in the memory
- Temperature display calibration
- Having additional features like long life, low noise and temperature fluctuation

4. Specifications

Model No.	LX700BOD
Chamber volume	80 L
Display	LED display
Temperature control range	5℃-60℃
Temperature accuracy	±0.1℃ at 37℃
Temperature fluctuation	±0.3℃
Temperature uniformity	±0.3℃ at 37℃
Temperature sensor	PT100
Timer	1min-99hr
Shelf size	346 x 380
Shelf quantity (std./max)	2/5 pcs
Power consumption	430 W
Power supply	220V / 50Hz
Chamber dimensions	400 x 400 x 500 mm
External dimensions	550 x 650 x 1180 mm
Net weight	82 kg
Packing dimension	770 x 710 x 1370 mm
Gross weight	114 kg

5. Applications

These are designed for analysis of water body, BOD test, cultivation and storage of bacteria, molds and microorganisms, plant cultivation and seed-breeding test in the field of environmental protection, medical and scientific research.

6. Instrument Introduction

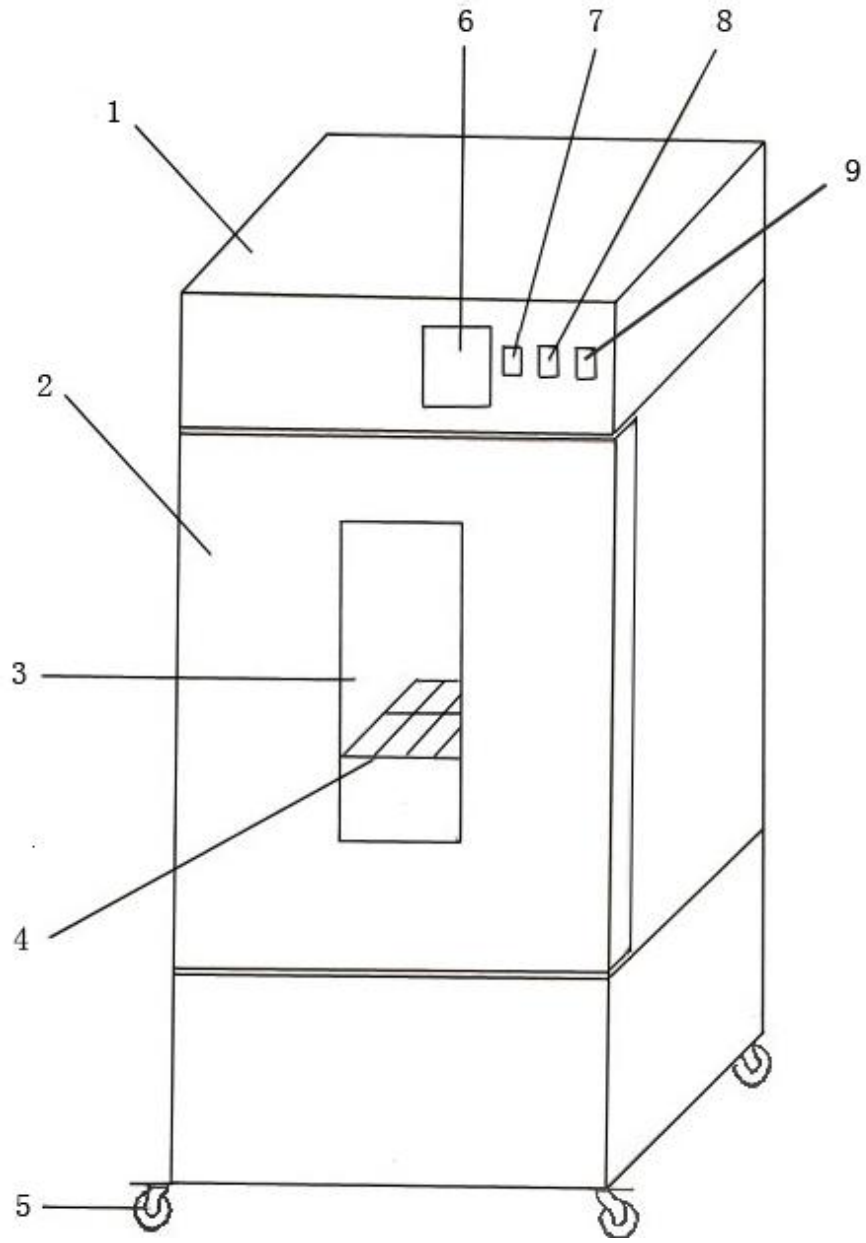


Figure-1

1. Case
2. Door
3. Observation Window
4. Shelf
5. Wheel
6. Temperature Controller
7. Wind Speed Switch
8. Illuminate Switch
9. Power Switch

7. Operations

7.1 Temperature Controller

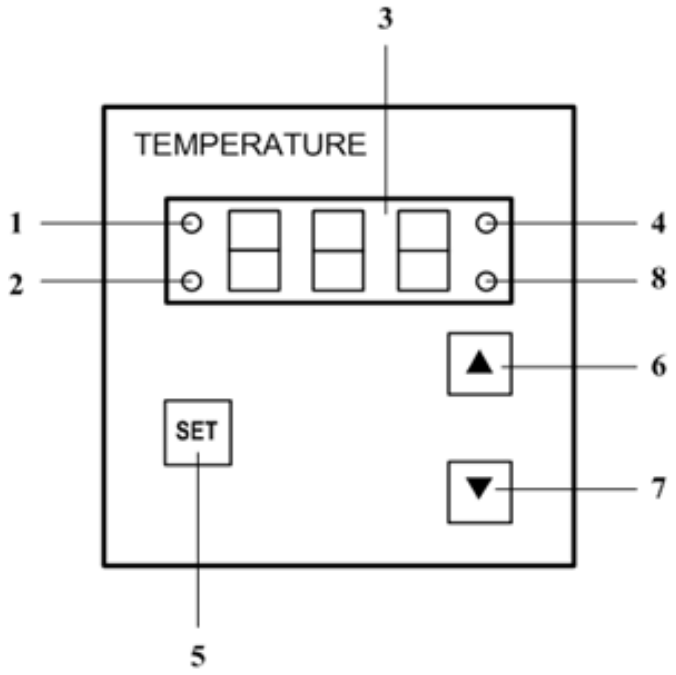


Figure-2

1. Heating Indicator (Green)
2. Fan Indicator (Yellow)
3. Display of the Temperature within the Chamber
4. Alarm Indicator (Red)
5. Function Operational Key
6. Plus Key
7. Minus Key
8. Compressor Operating Indicator (Blue)

7.2 Basic Control mode

7.2.1 Setting of working temperature

Temperature controller has the function of temperature setting and timing function. Working temperature can reach 60℃.

Timing setting: 0~99 hours.

Steps	Operating Ways	Display	Explanations
Change preliminary-set working temperature	Press key “SET”	Example: 37.0	Preliminary-set temperature display shining
Increase preliminary-set temperature	Press key “▲”	Fig. increased	Figure increased, display shining

Save newly-set temperature	Press key "SET"	Example: 45.0	Newly-set temperature saved, and then display the temperature within the chamber
Reduce preliminary-set temperature	Press key "▼"	Figure reduced	Figure increased, display shining
Save newly-set temperature	Press key "SET"	Example: 25.0	Newly-set temperature saved, and then display the temperature within the chamber

Attention: If only increasing temperature, only operate steps: 1, 2, 3. If only reducing temperature, only operate steps: 1, 4, 5. If the temperature controller alarm occurs after reducing the temperature, turn off the power switch, then re-open the power switch.

7.2.2 Setting of timing time

These products have two ways of timing; immediately beginning to timing after set and beginning to timing after reaching the set temperature. It has set the latter way of timing for the machine. If the users want to change the timing way, refer to the parameter chart.

Steps	Operating Ways	Display	Remark
Open timing function	Press key "SET" for around 3 sec.	0.00	Display shining, Timer at close state, wait for setting
Setting of timing	Press key "▲"	Figure increased	Time can be adjusted between 1 min and 99 hr
Save timing time	Press key "SET"	Temp. within the chamber	Timing mode refers to the parameter chart. "CEL"

Attention:

①Yellow light shining indicates timer has begun working, under this situation, cannot change the working situation of temperature controller. If user want to change the situation of the temperature controller, you must turn off the timer firstly. For interrupted during timing progress, press "▼" key.

②When timing finished, the controller is in standby status, the temperature controller displays the temperature within the chamber and "**OFF**" by turning off. If the user needs to work again, press the key "▲" for 3 seconds, then the controller will begin to work！

7.3 Program Operating

7.3.1 Fixed control mode

Users can set the heating program as they need, and the program includes 4 steps P1-P4 and one state order. Ovens can have one program in the memory, and customers need to cancel the old one when they need a new program (P.rE). If need to enter basic control mode, the user must delete the fixed control programmed.

7.3.2 Temperature/time control charts

Program "P1.—"（0……9）										
P1.-	P1.0	P1.1	P1.2	P1.3	P1.4	P1.5	P1.6	P1.7	P1.8	P1.9
OFF	2h	4h	6h	8h	10h	12h	16h	20h	24h	72h
Appoint one parameter from them (0……9)could set the timing of opening the machine's time.										
Program "P2. - " (0……9)										
P2.-	P2.0	P2.1	P2.2	P2.3	P2.4	P2.5	P2.6	P2.7	P2.8	P2.9
OFF	10℃/h	20℃/h	30℃/h	40℃/h	50℃/h	60℃/h	80℃/h	100℃/h	120℃/h	200℃/h
Appoint one parameter from them (0……9) could set the heating temperature increased rate.										
Program "P3.—"（0……9）										
P3.-	P3.0	P3.1	P3.2	P3.3	P3.4	P3.5	P3.6	P3.7	P3.8	P3.9
OFF	15min	30min	1h	1.5h	2h	4h	6h	8h	12h	24h
Appoint one parameter from them (0……9) to set the constant temperature time										
Program "P4.—" (0……9)										
P4.-	P4.0	P4.1	P4.2	P4.3	P4.4	P4.5	P4.6	P4.7	P4.8	P4.9
OFF	1℃/h	2℃/h	5℃/h	10℃/h	20℃/h	30℃/h	40℃/h	50℃/h	60℃/h	80℃/h
Appoint one parameter from them (0….9) to set the temperature decreasing speed, then finish the working program										
State Order										
P.on				P.oF			P.rE			
Program ready				Program off			Cancel old program			

7.3.3 Programming fixed control program

Steps	Operation	Display	Remark
Working temp.	Setting of working temp.		Must set working temperature first
Temp. controller waiting	Press key "▼" for around 3 seconds		Green and yellow light dark, oven temperature and "Off" flash alternately
Begin programming	Press key "SET" for around 6 seconds	**P1.—**	"1" flash, if skip, press "▲"
Select P1 parameter	Press key "SET"	**P1.—**	"—" flash
	Press key "▲"	**P1.5**	Selected figure flash
Setting P1 parameter	Press key "SET"	**P1.5**	Parameter (P1.5 value confirmed)
Select P2 parameter	Press key "▲"	**P2.—**	"2" flash

Repeat step 3,4,5, select P2, P3, P4 by sequence; then enter state command operating

Steps	Operation	Display	Remark
Enter state command	Press key "▲"	**P.oF**	Display P.oF
Select state command	Press key "SET"	**P.oF**	"oF" flash
	Or press key "▲"	**P.on**	"on" flash
Confirm state command	Press key "SET"	**P.on**	Display P.on
Quit fixed control mode	Press"▲" and "▼" together	**e.g: 25.0**	Oven temp. & "P.ro" flash alternately

Begin performing fixed control mode

Steps	Operation	Display	Remark
Begin performing the program	Press key "▲" or around 3 sec	P1.5	Fixed control mode began to work, the oven temperature and the relevant program parameter flashed alternately

Stop performing fixed control mode

Steps	Operation	Display	Remark
Stop performing the program	Press key "▼" for around 3 sec	P.ro	Oven temperature and "P.ro" flash alternately

For example: It takes 6 hours after turning on the incubator, the incubator begins to increase temperature, according to a 20°C/h increased rate, reaching 37°C, then constant temperature for 8 hours, finished. Customer can select different program's parameters according to the demand, edit a fixed program, see the method as follows:

When you turn on the power switch, firstly set the working temperature to 37°C according to basic control mode, then enter fixed control mode, select P1.2, P2.1, P3.7, P4.- and P.on. Incubator is in the status of waiting. After 6 hours, the incubator began to heat according to a 20°C/h rate of increased temperature rate. When the oven temperature reaches 37°C and keeps constant temperature for 8 hours, the oven shuts off the heater and fan automatically. A fixed control program was performed successfully, the incubator entered the waiting status again.

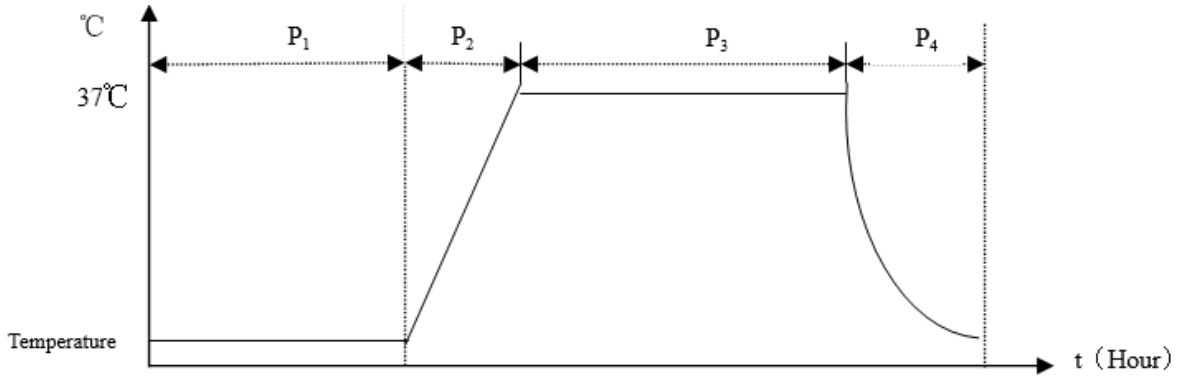


Figure-3

Attention: Program parameter "P2.3～P2.9","P4.6—P4.9" is not available on the incubator.

7.4 Alarm Function

These series products have two alarm functions of over-temperature and warp. It has set the warp alarm function (±2℃). If the user wants to set over-temperature alarm function, refer to the parameter chart.

Closing fan function: These series products have a closing fan function; the fan is set to the normal working condition. If the user wants to shut off the fan, refer to the parameter chart and temperature controller parameter setting manual (Take care about this function, which may damage the machine and cause suddenness).

7.5 Other explanation (Temperature controller)

Probable Display	Explanation
888	Temperature-controller under process of self-inspection
OFF	Temperature-controller under waiting condition (Off condition), press key "▲" for more than 3 seconds will resume the working condition.
Shining of a series of numbers	The shining numbers can be changed
E—3	Error in inputting data, refer to the parameter chart
E—4	Wrong measured data.
E—5	Over the highest measuring temperature of the temperature controller.
E—6	Below the lowest measuring temperature of the temperature controller.
E—7	Error with temperature sensor or in inputting data.

7.6 Method of Use

1) Dial power switch to "1", power indicator light shines, figure indicated on the temperature controller.
2) Operation of Temperature Controller-select working mode. After setting, each data will be kept.
3) **Wind speed switch:** There are fast and slow wind speeds to choose from.
4) BOD incubator enters working condition, heating or refrigerating working indicator light shines. When the chamber inside temperature approaches the setting temperature, the heating indicator light shines, when reaching the setting temperature, enter the thermostatic condition. To keep precision of controlling temperature, the temperature controller's all control parameters must be the same as the machine's original setting data, if a special situation (E－3), the temperature controller needs to set the control parameters again after replacement, please refer to parameters.
5) When opening the door and putting the article inside the chamber, first press the temperature controller's key "▼" for 3 seconds, make the temperature controller at the close condition. After putting articles, please press key "▲" for 3 seconds, make the temperature controller at normal working condition, thus avoiding temperature fluctuations within the chamber. If opening the door too long, the temperature within chamber fluctuates a little, this is a normal situation.
6) If want to observe the articles within chamber, please dial lighting power switch to "1", the light within the chamber will lighten. After using, please dial lighting power switch to "0".
7) After cultivating, dial power switch to "0". If don't want to take out the samples at once, don't open the chamber.

7.7 Parameter Chart

Code	Original Data	Explanation	Remark
CAL		Chamber temperature display	Adjust the difference between chamber temperature display and the actual temperature
CON	0	Working Cycle Period	No adjust
P	2.0	Adjust proportion action	—
I	0.8	Integral action time parameter	—
d	0.2	differential coefficient action time parameter	—
Ir	2.0	—	—
Cy	0	—	No adjust
LI	60	Highest Working Temperature	—
OF		zero	Adjust the measure error caused by the sensor

SL		Magnify coefficient	Adjust the difference in temperature
b7	2.0	Alarm Temperature	—
b7L	0	Warp Alarm	0: warp alarm 1: Over-temperature Alarm
CEL	1	Timer begins after reaching the setting temperature	0: Timer immediately begins after setting 1: Timer begins after reaching setting temperature
FSC	0	Fan Normal Working	0: Fan on, 1: Fan off. **caution !**

8. Troubleshooting

Phenomenon	Causes	Solutions
No Power	Unplugged or snagged wire	Link the plug or wire properly
	Fuse unlinked	Change fuse
The temperature within the chamber does not climb	Low set temperature	Adjust set temperature
	Disorder of electric heater	Change electric heater
	Disorder of temperature controller	Change temperature-controller
A wide difference between the set temperature and the temperature within chamber	Disorder of the sensor	Change temperature sensor
	Disorder of the circular fan	Change fan
Abnormal following-up alarm	Set temperature is turned down after entering the thermostatic condition	Adjust set temperature or shut off power to restart
	Disorder of temperature controller	Change temperature-controller

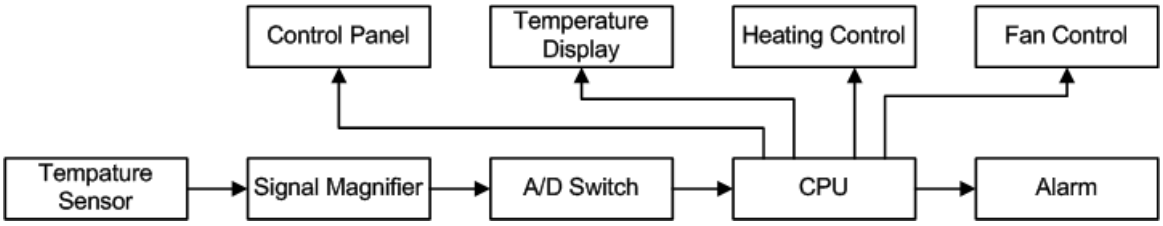
9. Accessories

Optional Accessories

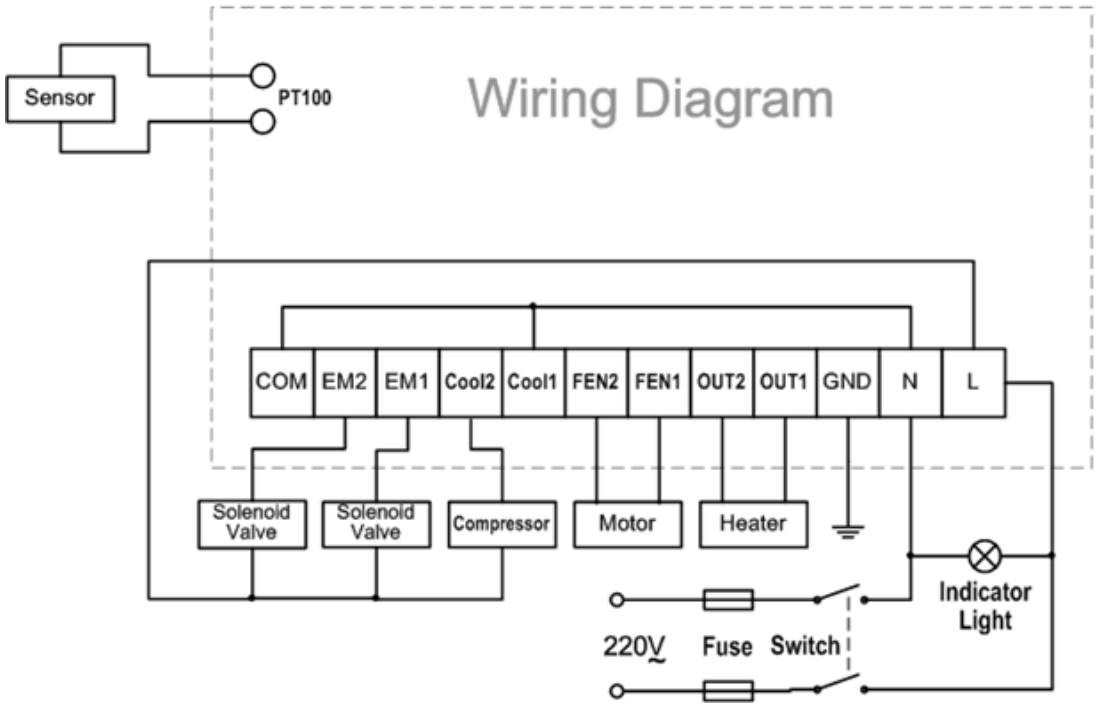
- Independent temperature control and alarming system to provide dual protections
- UV lamp

10. Circuit Diagram

1) Diagram of Electric principle



2) Wiring Diagram for the Temperature-controller



3) Wiring Diagram for the Compressor