



Thermostatic Incubator **LB-11TI**

Operational Manual

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1. Introduction

Thermostatic Incubator LB-11TI offers a 30-liter capacity and operates within a temperature range of 5°C to 65°C, ensuring precise sample storage and incubation. It supports an optimal humidity level of up to 80% for stable incubation conditions. It comes with 2 or 4 adjustable stainless-steel shelves, accommodating different sample sizes. Our incubator features a PID microprocessor controller system for accurate and consistent temperature regulation.

2. Features

- Touch and numeric display
- Adjustable shelves
- Over-temperature alarm
- Self-diagnosing Technology
- Dual door design
- Platinum sensor PT100
- Parameter memory function

3. Specifications

Model No.	LB-11TI
Capacity	30 L
Temperature Range	Ambient + 5°C to 65°C
Temperature Resolution	0.1°C
Temperature Fluctuation	± 0.5°C
Temperature Uniformity	± 1°C at 37°C
Environmental Temperature Range	5 to 30°C
Maximum Humidity Level	80%
Maximum Altitude	Up to 2000 meters
Shelves	2 / 4
Shelf Dimension	292 × 278 mm
Timer	Maximum: 99 hours
Temperature Controller	PID Microprocessor Control
Temperature Sensor	Platinum Gold Resistor PT100
Power Consumption	≤ 155W
Power Supply	AC 220V, 50Hz
Internal Chamber Material	304 Mirror Finished Stainless Steel
External Chamber Material	Iron 08F
Internal Dimension	300 × 300 × 350 mm
External Dimension	450 × 390 × 625 mm
Packaging Dimension	490 × 530 × 770 mm
Net Weight	28 kg
Gross Weight	40 kg

4. Applications

Thermostatic Incubator LB-11TI is used for microbial cultivation, sample incubation, and constant temperature testing. It is widely used in research laboratories, educational institutes, biological, agricultural, and pharmaceutical industries.

5. Instrument Introduction

Instrument Structure:

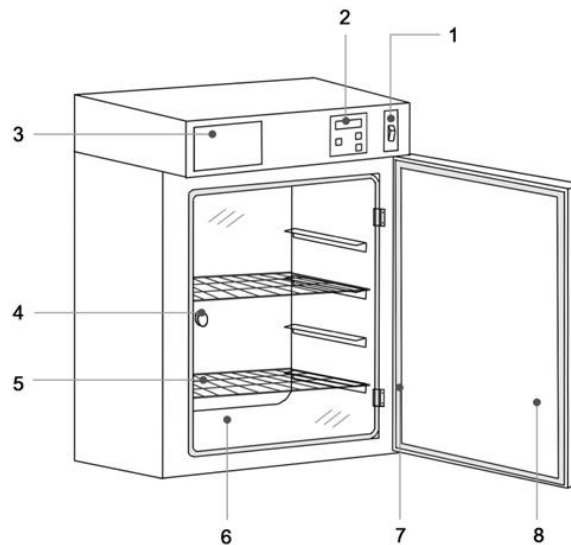


Figure-1

- 1) Power Switch
- 2) Temperature Controller
- 3) Name Plate
- 4) Insider Door Handle
- 5) Shelf
- 6) Toughened Glass Inside Door
- 7) Magnetic Seal of Outside Door
- 8) Outside Door

Structure Description:

Thermostatic incubators have a 30L capacity and are standing type. The door and incubator shell are constructed from premium steel sheets coated with surface plating plastic; the inner layer is filled with extremely thin glass cotton to retain heat. The items inside the chamber are visible without opening the toughened glass inner door. Stainless steel sheets with a mirror surface are used to make working chambers. The chamber's stainless steel wire shelves could be easily shifted, as could the area between them. To preserve the seal between the working chamber and the inside door, it has a high-quality silicone rubber sealed loop between the two. To maintain a consistent temperature throughout the working chamber, three flat heaters are installed on the left, right, and bottom portions of the outer wall. A small, quiet fan is installed on the top. It is simple to use because the temperature controller, power switch, and other components are all attached to one corner of the box.

Traditional temperature controllers are inferior to high-precision microprocessor temperature controllers. It is quick to react, very accurate, has PID parameter control, is simple to use, and has timing and alarm features.

6. Operations

6.1 Control Panel

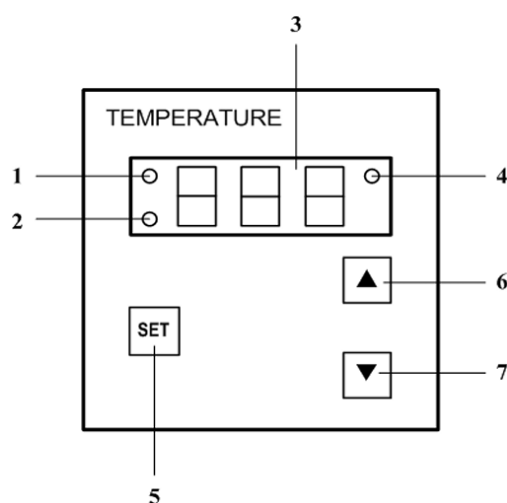


Figure-2

- 1) Heating Indicator (Green)
- 2) Fan Indicator (Yellow)
- 3) LED Digital Display
- 4) Alarm Indicator (Red)
- 5) Function Operational Key
- 6) Plus key
- 7) Minus Key

6.2 Control mode and Operating steps of the temperature controller

6.2.1 Basic Control Mode

6.2.1.1 Setting of working temperature

Steps	Operating ways	Display	Explanations
1. Change the preliminary set working temperature	Press key "SET"	Example 37.0	Initial set temperature display illumination
2. Increase the preliminary set temperature	Press the key "▲"	Figure increased	The figure increased, displaying shining
3. Save the newly set temperature	Press the key "SET"	Example 60.0	The temperature within the chamber is shown when the newly set temperature has been saved.
4. Reduce the preliminary set temperature	Press the key "▼"	Figure reduced	Figure reduced, display shining

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5. Save the newly set temperature	Press the key "SET"	Example 30.0	After saving the newly adjusted temperature, the chamber's temperature is shown.
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Attention: Only use steps 1, 2, and 3 if you are just raising the temperature. Only use steps 1, 4, and 5 if you are just lowering the temperature. After lowering the temperature, turn off the power switch and then reopen it if the temperature controller sounds an alarm.

6.2.1.2 Setting of timing time

The items can be timed in two different ways: either right after setting or after they reach the desired temperature. The latter method of machine clocking has been established by the manufacturer. if users choose to alter the time.

Steps	Operating ways	Display	Explanations
1. Open the timing function	Press the key "SET" for around 3 seconds.	0.00	Timer closed, display bright, and waiting for the setting
2. Setting of timing time	Press the key "▲"	Figure increased	Time can be adjusted between 1 minute and 99 hours
3. Save time	Press the key "SET"	Temperature within the chamber	Timing mode, please refer to Parameter Chart "CEL"

Attention:

- When a yellow light illuminates, the timer has started; in this case, the temperature controller's operating condition cannot be altered. The timer must be switched off if you wish to alter the temperature controller's settings. Press the "▼" key for approximately six seconds until the yellow light stops flashing to terminate the timed progress.
- The controller is in standby mode when timing is complete. The temperature controller alternately shows "OFF" and the chamber's temperature. The alarm goes off simultaneously. To restart the controller, press the "▲" key for approximately 6 seconds until the yellow light turns on. The alarm will sound ten times in a row if the standby mode is not turned off. It will resound ten times after ten minutes.)

6.2.2 Fixed Control Mode

The programming mode of this incubator is fixed. If one-stage programming is necessary, it can be utilized. Using Basic Control Mode without any specific needs is advised.

The heating program, which consists of four phases (P1–P4) and a single state order, can be customized by the users.

Attention: The Incubator can have one program in the memory, and customers need to cancel the old one when they need to new program (PrE). If you need to enter basic control mode, you must delete the fixed control program.

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6.2.2.1 Temperature/Time Control Chart as follows

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 for starting the program.										
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°C/h	20°C/h	30°C/h	40°C/h	50°C/h	60°C/h	80°C/h	100°C/h	120°C/h	200°C/h
Appoint one parameter from them (0.....9) could set the heating temperature increase 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) could 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°C/h	2°C/h	5°C/h	10°C/h	20°C/h	30°C/h	40°C/h	50°C/h	60°C/h	80°C/h
Appoint one parameter from them (0.....9) could set the temperature decreasing speed, then finish the working program										
State Order										
P.on			P.oF				PrE			
Program ready			Program off				Program delete			

6.2.2.2 Programming a fixed control program

Steps	Operation	Display	Remark
1. Set the working temperature	Refer to 6.2.1.1 Setting of working temperature		Must set the working temperature first
2. Temperature controller waiting	Press the key “▼” for around 6 seconds		Green and yellow light dark, chamber temperature, and “off” flash alternately
3. Begin programming	Press the key “SET” for around 6 seconds	P1. –	“1” flash, if skip P1 then press “▲”
4. Select P1 parameter	Press the key “SET”	P1. –	“ – ” flash
	Press the key “▲”	P1.5	Selected figure flash (from 0~9)
5. Setting P1 parameter	Press the key “SET”	P1.5	Parameter (P1.5 value) confirmed
6. Parameter (P1.5 value) confirmed	Press the key “▲”	P2. –	“2” flash
Repeat step 3, 4, 5, select P2, P3, P4 by sequence, then enter status command operating			
Steps	Operation	Display	Remark
1. Enter the status command	Press key “▲”	P.oF	Display P.oF

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2. Select status command	Press key "SET"	P.oF	"oF" flash
	Press the key "▲"	P.on	"on" flash
3. Confirm status command	Press key "SET"	P.on	Display P.on
4. Wait for execute fixed control mode	Press "▲" and "▼" together	e.g. 25.0	Oven temperature and "Pro" flash alternately
Begin performing fixed control mode			
Steps	Operation	Display	Remark
Begin performing the program	Press the key "▲" for around 3 seconds	P1.5	Fixed control mode begins to work, chamber temperature and relevant program parameters flash alternately
Stop performing fixed control mode			
Steps	Operation	Display	Remark
Stop performing the program	Press the key "▼" for around 3 seconds	Pro	Chamber temperature and "Pro" flash alternately
Delete the performing fixed control mode			
1. Enter the status command	Press the key "SET" for around 6 seconds	P1.5	Display the programmed fixed control program
2. Select the status command	Press the key "▼"	P.on	Display P.on
	Press the key "SET"	P.on	"on" flash
3. Confirm the status command	Press the key "▲"	PrE	"rE" flash
	Press the key "SET"	0.00	The program has been deleted
4. Quit status command	Press "▲" and "▼" together	e.g. 25.0	Display the chamber temperature for

For example: Need 6 hours. After turning on the incubator, the incubator begins to increase temperature, according to 20°C /h's increased rate, reaching 37°C, then constant temperature for 8 hours, and finishes. The customer can select different programs' parameters according to the demand, and 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. The incubator is in the status of waiting stage. After 6 hours, incubator begin to heat according to 20°C/h „s increased temperature rate. When the incubator temperature reaches 37°C and remains constant for 8 hours, the incubator shuts off the heater and fan automatically. A fixed control program is performed successfully, incubator enters waiting status again.

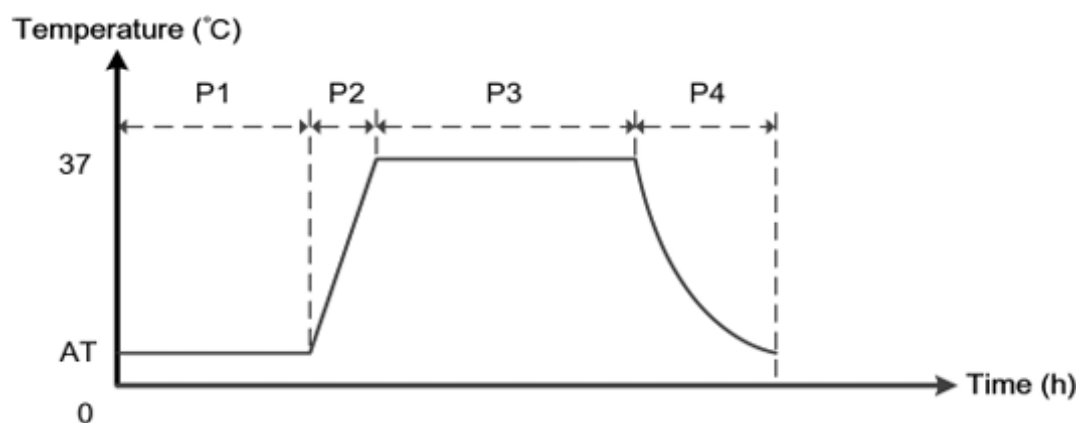


Figure-3

Attention: On the incubator, program parameters "P2.3-P2.9" and "P4.4-P4.9" are not accessible.

6.3 Alarm Function

The two alarm features of the LB-11TI are deviation and over-temperature. The over-temperature alarm function (+2°C) has been established by the manufacturer following incubator industry standards. Thus, the clients do not have to reset it. Refer to the parameter chart if users wish to modify it.

6.4 Closing fan function

The LB-11TI includes a closing fan feature; the fan is set to normal operating conditions by the manufacturer. To turn off the fan, users can consult the Parameter Chart.

Note: Use caution when using this function as it could cause suddenness and harm to the machine.

6.5 Other explanation

Probable Display	Explanation
888	Currently, the temperature controller is undergoing self-inspection.
oFF	The temperature controller is waiting (off state).
Shining of a series of numbers	The shining numbers can be changed
P1.5 (e.g.)	Enter fixed control mode setting
P1.5 (e.g.) and oven temperature flash alternately	Performing fixed control mode
Pro and oven temperature flash alternately	Press "▲" for approximately 3 seconds after entering a preset program, and then start performing.
E – 3	Error in inputting data
E – 4	Wrong measured data

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E – 5	Above the temperature controller's maximum measurement temperature
E – 6	Below the lowest measuring temperature of the temperature controller
E – 7	Error with the temperature sensor or in inputting data

6.6 Parameter chart

Code	Original Data	Explanation	Remark
CAL		Chamber temperature display	Adjust the temperature differential between the chamber and the display.
CON	2.0	Working cycle period	No adjust
P	6.0	Adjust the proportion action	-
I	1.0	Integral action time parameter	-
d	0.25	Differential coefficient action time parameter	-
Ir	2.5	-	-
Cy	0	-	No adjust
LI	65	Highest working temperature	-
OF		Zero	Adjust measure error caused by the sensor
SL		Magnify coefficient	Adjust the difference in temperature
b7	2.0	Alarm temperature	-
b7L	1	Over-temperature alarm	0: Deviation alarm, 1: Over-temperature alarm
CEL	1	The timer begins after reaching the set temperature	0: Timer immediately begin after setting 1: Timer begins after reaching setting temperature
FSC	0	Fan normal working	0: Fan on, 1: Fan off

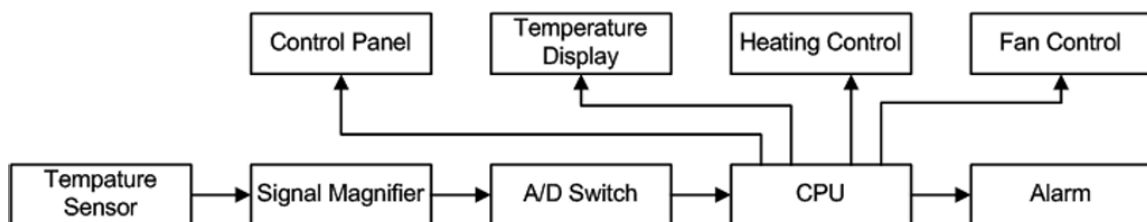
- 1) If the machine displays "E-3" after opening (in this case, the temperature controller is operating normally, but the power is abruptly cut off or the electricity net is disrupted, causing it to close), turn off the power and simultaneously press the keys "▲" and "▼" to open the power switch again and restore the temperature controller to normal.
- 2) All the temperature controller's preset, fixed data parameters appear in the "1" state and need to be adjusted immediately (if not, the controller's precision requirements will not be met). To do this, follow these steps:
 - Press the keys "▲" and "▼" simultaneously, then "SET" and "CAL" 10 seconds later, then finally let go.

- Press the "SET" key while simultaneously pressing the "▲" or "▼" keys to correct the chamber temperature error; release the "SET" key once the parameter data has been changed.
- Press key "▲" appear "CON".
- Pressing the "▲" key will make the letter "P" appear. Pressing the "SET" key simultaneously will change the proportion action. After making changes to this parameter data, release the "SET" key.
- Press again key "▲" appear "I", adjust "I" according to the above method. All the parameter data could be changed in this way.
- After all parameter data settled, press key "▲", "▼", "SET" at the same time to quit.

6.7 Operation Procedure

- 1) Setting the power switch to "1" causes the temperature controller's figure to change and the power indicator light to illuminate.
- 2) Choose the operating mode by referring to the Temperature Controller Operation. Each data point will be retained after setup.
- 3) The heating indicator light turns on when the incubator's temperature rises. The heating indicator light turns on when the chamber temperature gets close to the setting value. Enter the thermostatic condition once the temperature has reached the desired setting. The control parameters of all temperature controllers must match the machine's initial setting data to maintain temperature control precision. After replacement, the temperature controller's parameters must be reset in the event of a specific circumstance (E-3).
- 4) Press the "▼" key on the temperature controller for approximately six seconds before placing the device in a waiting mode and opening the door to place the item inside the chamber. After inserting the articles, press the "▲" key for around 6 seconds to return the temperature controller to its usual operating mode and prevent temperature swings inside the chamber. The temperature in the chamber may vary slightly if the door is opened for an extended period; this is a typical occurrence.
- 5) Set the power switch to "0" after cultivating. Do not open the chamber door if you do not wish to remove the samples all at once.

6.8 Diagram of the Electric Principle



7. Troubleshooting

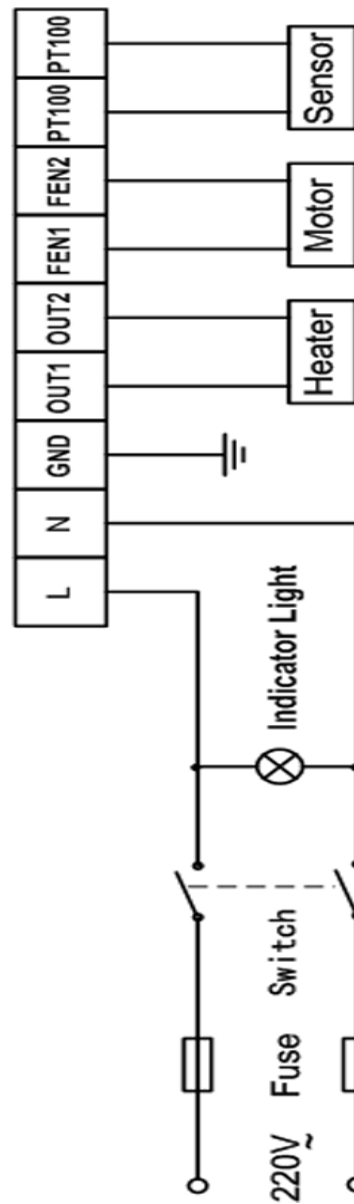
Phenomenon	Cause	Solution
No power	Unplugged or snagged wire	Link the plug or wire properly
	Fuse unlinked	Replace the fuse
The chamber's temperature does not rise.	Low set temperature	Adjust the set temperature
	Disorder of the electric heater	Replace the electric heater
	Disorder of the temperature controller	Replace the temperature controller
A significant discrepancy between the chamber's internal temperature and the fixed temperature	Disorder of the sensor	Change the temperature sensor
	Disorder of the circulation fan	Change the circulation fan
Abnormal follow-up alarm	Once the thermostatic condition is reached, the predetermined temperature is lowered.	Adjust the set temperature
		Change temperature-controller

8. Accessories

Optional Accessories

S. No	Accessory Name
1	Shelf
2	Controller
3	Motor
4	Heater

9. Circuit Diagram



Labotronics Scientific. 1007 N Orange St., Wilmington, DE 19801, USA.
info@labotronics.com | www.labotronics.com