



BOD Incubator

LB-10BI

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1. Safety Measures

- The workplace should be clean and dirt-free.
- The instrument room should have good ventilation.
- When users place test samples on the cultivating shelves, all bottles, flasks, or containers should keep a proper space to facilitate a cold (hot) air convection cycle.
- Connect the power supply, and then the panel indicator will be light.
- After finishing work, it is better to make control switches in the non-working state and then turn OFF the supply.
- To avoid contamination, avoid condensing into water in the working chamber as far as possible when low temperatures are used.
- Do not use volatile chemical solvents, low-concentration detonatable gas and combustible articles, and toxic articles.
- Kindly check that your power supply is in the range of the incubator voltage needed before the incubator connects to the power supply.
- The voltage range is 187V~242V.
- If your voltage can not meet the above range, it is necessary to adopt a minimum output 1000VA voltage self-regulator.
- The incubator must have reliable grounding.
- If your electrical circuit has no grounding, users must ask qualified personnel to ground separately for the incubator according to electrical safety regulations.
- Do not use gasoline, alcohol, adhesive, and other flammable and detonable articles in incubators to avoid explosion.
- Do not spray water on the incubator to avoid water damage to the insulating electrical components which can accelerate the corrosion of metal parts.

2. Introduction

BOD incubator LB-10BI is a low-temperature incubator, equipped with forced air circulation, a sealed compressor, and an insulated chamber for reproducible results. Digital PID controller and LED display ensure precise control of temperature. Integrated safety features and CFC refrigeration make the system more energy efficient.

3. Features

1. Microprocessor-controlled system (uniform temperature)
2. Operational panel - touch buttons and LED display (temperature and timer)
3. Non-corrosive stainless-steel chamber
4. Glassdoor (sample viewing)
5. Over temperature alarm for safety
6. Auto power off function
7. Optional integrated socket

4. Specifications

Model No.	LB-10BI
Capacity	50 L
Temperature range	5 °C to 60 °C
Temperature accuracy	± 0.5 °C
Timer	0 min ~ 9999 min
Heating power	100 W
Compressor power	124 W
Voltage	220 V/50 Hz
Dimensions	480 x 570 x 920 mm
Weight	36 kgs

5. Applications

Used in microbiology, life science, pharmacy, food processing, chemical industry, research, education institutes for BOD measurement, breeding experiments, culture preservation, plant cultivation, environmental testing, fermentation studies, etc.

6. Instrument Introduction

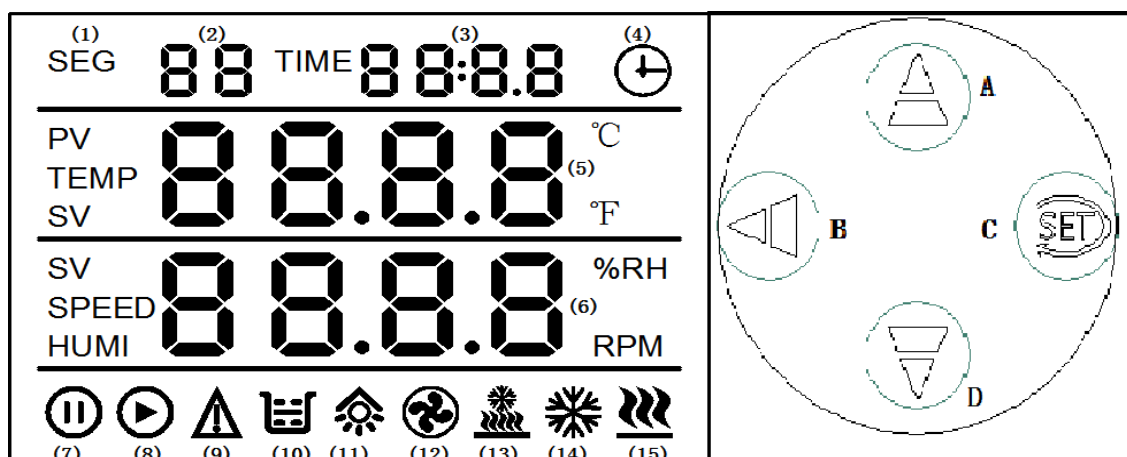


Figure.1

6.1 Control panel

- 1) **SED number of segments symbol:** Setting lit when the block shows the number of segments.
- 2) **Time:** Display time stopped, display running time is running.
- 3) **Pre-reservation time indicator:** Lights when reserving boot.
- 4) **PV symbol:** Temperature measurement value.
- 5) **SV:** Symbol temperature setting value.
- 6) **Running indicator light:** Light when starting the operation.
- 7) **Stop indicator light:** Light when stopped.
- 8) **Alarm indicator light:** Down or blinks when there is an abnormality.
- 9) **Water level indicator:** Light water.
- 10) **Lamps:** Always lighting or flashing.
- 11) **Share on the standby function:** When the cooling indicator has cooling output, it will be ON, and the cooling delay will flash.
- 12) **Heating indicator:** When heating °C symbol: °C is bright when the temperature unit is Celsius, ° F symbol: ° F is bright when it is Fahrenheit.

6.2 Key description

- 1) **Add key:** Modify the parameter value (long press 2s to modify the existing running time with the program has this function).
- 2) **Shift key:** The shift of the parameter value is modified then the long press will Start/Stop the temperature auto-tuning and click the query ambient temperature.
- 3) **Door lock:** Users can do this function when needed.

7. Installation

- 1) Do not place the instrument in direct sunlight or near the heat source.
- 2) **Working environment:** Ambient temperature: 16°C - 32°C.
- 3) Place the instrument on solid ground and the rotation of the two bottom sides of the former adjustable foot can be adjusted.
- 4) Do not keep any article on the instrument on the top, bottom, and back so that no air circulation is affected.

8. Operations

8.1 Internal parameter setting operation

1) User parameter setting

In the standard state press the SET button the upper display of the LCD screen displays L K adjust LK= 8 and press the SET button to enter.

Character	Name	Pre-determined area	Description	Initial Value
KS	Power-ON operation selection	0 to 2	0: Stop state when power is on. 1: Run from the first segment when power is on. 2: Run from the last power after power on.	0
Tn	Timing mode	0 to 1	0-start running timing, 1- temp stable Timing (setting only).	1
Hn	Timing unit	0 to 1	0-minute, 1-hour.	0
F n	High and low fan switching	0 to 1 00	High-speed fan start time (set value + Fn) ~ (set point - Fn) of the outside temperature; (set point + Fn) ~ start the fan when a temp between the low-speed (set value - Fn).	
Ly	Lighting delay	0 to 9999	Lights on, the delay time is not automatically closed after 0 time. "When the delay time is 0", the illumination must be turned off manually if the delay is invalid.	0 to 9999 M/h (0)
Srt	Disinfection delay	0 to 9999	The sterilizing lamp is opened, the delay time is not 0, and the time to turn off automatically after. "When the delaytime is 0", the illumination must be turned off manually if the delay is invalid.	0 to 9999 M/h (0)
Mon	Appointment boot time setting/reservation boot month setting	0 to 9999	Function one ; the meter without time automatically starts after mon minute. Function two ; the instruments GMT, and GMT arrive here when a set time (day, Hr, mTn) boot, M on a larger than 12 different functions.	0

2) Temperature control parameter setting

In the standard state press the SET button the upper display of the LCD screen displays LK and adjust LK= 3 then press the SET button to enter the temperature setting.

Character	Name	Predetermine area	Description	Initial value
AL	Lower deviation alarm setting value.	-50.0 ~10.0 °C	0, no alarm is alarm 1, the lower deviation alarm, when the temp is less than (temperature set value - AL) °C, turns off the cooling. The abnormal indicator lights up and the buzzer sounds.	6.0 °C
AH	Upper deviation alarm setting value.	-50.0 ~10.0 °C	Upper deviation alarm, when the temperature exceeds (temperature set value +AL) °C, turns off the heating. When the temperature is less than (temperature set value -AL) °C, turn off the cooling. The abnormal indicator lights up and the buzzer sounds.	6.0 °C
AP	Allow maximum temperature protection of the device.	Highest measured temperature.	When the temperature exceeds AP, the heating is cut off. When the temperature exceeds the parameter for 2 minutes, the buzzer keeps calling and turns off all outputs. It must be powered off before it can be recovered.	120.0 °C
P	Heating proportional band.	1.0 to 60.0 °C	The proportional action is adjusted, and the smaller the Pu, the faster the response.	6.5 °C
I	Heating integration time.	1 to 3600 seconds	Integral action time constant, the smaller the I, the stronger the correction static difference ability.	24 0
d	Heating Differential Time.	0 to 3600 S	The differential action time constant, the greater the du, the stronger the over-temperature prevention ability.	1 8 0
Ar	Heating overshoot suppression.	0 to 100 %	Used to suppress temperature overshoot.	8 0 %
t	Heating control cycle.	1 to 99 seconds	Control heating output cycle.	5 seconds

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Ct	Compressor protection delay.	(0 to 3600) Seconds.	Compressor delay protection time, two start times $\geq$ CT seconds.	120 seconds
Pb	Zero adjustments of temperature.	(-199~999).	Set the upper limit of the measurement temperature.	0
Pk	Temperature fullness adjustment (slope).	(-199~2 000).	When the temperature deviates near the set temperature, the value can be adjusted. $Pk=1000 \times [\text{mercury reading value}-\text{current measurement value}] \div \text{current measurement value}$.	0
Cb	Ambient temperature correction.	-60.0 to 100.0	$Cb = \text{actual ambient temp} - \text{current measured ambient temperature}$.	0
Rl	Lower temperature setting.	-60.0 to 100.0	Set the lower limit of the measurement temperature.	-4 0.0
Rh	Upper-temperature setting.	-60.0 to 100.0	Set the upper limit of the measurement temperature.	100.0

8.2 Control parameter

1) Set the temperature of the refrigerant

In the standard state, the display shows LK press the SET key on the LCD screen LK 12 is transferred and press the SET key to enter the parameter setting temperature of the refrigerant.

Character	Name	Pre-determine area	Description	Initial value
Cm	Cooling option	0 to 1	0: Cooling start and stop type; 1: Cooling balance type. Generally, set to 1 during program control.	0
Eu	Cooling balance selection	0 to 1	0: The balance is judged according to the ambient temperature. It is not cooled above the ambient temperature of +10 degrees and is cooled below the ambient temperature of +10 degrees. 1: Always cool. This parameter takes effect when $Cm=1$. When the program is controlled, it is generally set to $Eu=1$;	0
CF	Celsius Fahrenheit	0 to 1	0: Celsius 1: Fahrenheit	0
Dr	Gated input selection	0 to 2	0: no gate input. 1: External input closed door. 2: external input is open for opening	0

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Dp	Temperature decimal point selection.	0 to 1	0: no decimal point 1: one decimal point.	0
FL t	Filter coefficient.	0 to 9	Filter coefficient.	1
Ht	Defrost interval.	0-999 minutes	After the controller runs H t minutes, the defrosting starts; set 0, no defrosting Function.	No role
H d	Defrost time	0-300	Defrost time interval, after starting the defrost output Hd seconds, stop defrosting.	No role

2) Self-tuning function (set timing time st to 0)

- If the temperature control is not ideal start the temperature self-tuning (with cooling, always open the compressor in the balance mode).
- In the standard state press and hold the shift button for 2 seconds to start the temperature self-tuning at this time the indicator light flashes.
- After the auto-tuning is finished the indicator light is always **ON** and a new set of PID temperature control parameters is obtained and the temperature control effect is greatly improved.
- If you want to cancel the temperature auto-tuning press and hold the shift button for 2 seconds.

3) Allow maximum temperature protection of the device

- When the temperature is higher than the maximum temperature AP allowed by the device turn **OFF** the heating and when the maximum temperature is allowed to exceed 2 minutes the buzzer will beep.
- If the auxiliary function selection is 1 the auxiliary function relay output is turned **ON**.

9. Maintenance

- Clean the instrument after it has been used for a long period.
- Always pull out the power plug before cleaning the incubator.
- Wipe the spare parts and interior of incubator with a soft cloth or sponge with warm water or neutral detergent.
- Do not clean with a hard brush, corrosive detergent, or any cleaning solvent.
- Clean the safety door by lightly lifting it and cleaning it with a soft cloth dipped in warm water.
- Dirt accumulated on the condenser, and compressor will affect the heat output clean the dust with a soft brush or cleaners periodically.
- If the instrument is not in use for a long time remove the power plugged frost, clean, and keep the inside cabinet dry.
- Periodically clean the water in the catchment box.

Defrosting

- The incubator adapts inside the evaporator-refrigerating; the evaporating plate is kept in the back interior.
- When the compressor is working, the back interior will be frosted and after the compressor has stopped, the frosting will be removed automatically without further defrosting.
- Frost water will automatically flow into the evaporation waste slot, which is in the back of the incubator compressor.
- If there is excessive and thick frost, you can turn it **OFF** and do manual defrosting, but at the same time, users should observe whether the frost water in the evaporation waste is too much and causes overflow.
- For example, if there is too much water, you should translate out evaporation waste pour the water away, and later place it back to its original location, while being careful not to injure the refrigeration system pipe.

10. Troubleshooting

1) If the incubator stops running (not refrigerate)

- Check the power cut.
- Check the temperature setting whether in the range of working.
- Check the power plug and socket for poor contact.
- Check the fuse to see if properly connected.

2) If the temperature in the box is not low

- Whether the items stored inside are crowded can hinder air-conditioning circulation.
- The incubator is shined by direct sunlight or not.
- Does the back of the instrument have adequate space or not.
- Closing of the door is too frequent or the door is not closed properly.

3) Instrument causing noise

- Check if the instrument is placed smoothly or not.
- If the instrument is in contact with the wall or some other object.
- Location of spare parts in the incubator is correct or not.

4) Shell with electric induction

Check grounding is whether reliable or not.



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