Labnics

BOD Incubator
NBI-100

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1. Safety Measures

- Do not store volatile, flammable, or explosive materials in the equipment, otherwise, it may cause an explosion or fire.
- Do not place the equipment in a place that is wet, wet or may splash water, otherwise, it may lead to accidents such as leakage, short circuit or electric shock.
- Non-professional technicians shall not disassemble, repair or modify the equipment, otherwise it may cause fire or electric shock accidents due to improper operation.
- The equipment should be installed on a solid ground. If the ground is not solid enough or the installation site is not suitable, injuries may be caused by the equipment tipping over
- The equipment should be installed on solid ground. If the ground is not solid enough or the installation site is not suitable, injuries may be caused by the equipment tipping over.
- Before any repair or maintenance of the equipment, be sure to disconnect the power supply to prevent electric shock or personal injury.
- Be sure to wear gloves when performing equipment repair or maintenance to prevent injury caused by touching edges or sharp corners.
- If the equipment is found abnormal operation, immediately unplug the power plug, and stop the operation of the equipment. Operation under abnormal conditions may cause electric shock or fire.

Operation cautions:

- There is a test hole (Humidity hole), when putting the other equipment into the chamber, kindly through this hole, and make sure the test hole is humid.
- First turn on the machine, kindly do not change the system specification if the manual operation does not refer.
- U.V. lamp close once do no need use to avoid influence the Temperature.
- Before doing the cooling operation, kindly dry the chamber for 1 hour under 50 degrees.
- The Chamber with the vertical air system, kindly do not put full material on the shelf, the test material is less than 1/3 of the shelf.
- Once the test environment > 35℃ or Use Temperature > 50℃, forbid setting the low temperature.
- Use pure water to clean the chamber and surface of the machine. When the machine is not in use, please cut off the Electricity and ensure that the inner and outer surfaces are clean and dry.

2. Introduction

BOD Incubator NBI-100 is designed with a microcomputer-controlled system and offers a 150 L capacity and a 0 to 65 °C temperature range. Equipped with a stainless-steel inner chamber, adjustable shelves, and a glass door for clear visualization. The unit has a double door seal and a light in the inner chamber for convenient observation. Designed with LCD display, an over-temperature alarm function and CFC-free R134a as a cryogen. It has a test hole of 52 mm on the left side of the container.

3. Features

- ✓ Microcomputer-controlled system
- ✓ LCD display
- ✓ 30-stage program controller
- ✓ Stainless steel inner chamber with adjustable shelf
- ✓ Glass door for clear visualization
- ✓ High quality air cooled hermetic compressor for cooling system
- ✓ Cfc free refrigerant
- ✓ Light in the inner chamber for convenient observation
- ✓ Over-temperature alarm function

4. Specifications

Model No.	NBI-100
Temp. range	0 to 65℃
Temp. Resolution Ratio	0.1℃
Temp. Uniformity	±1.5℃
Inner Chamber	Mirror Stainless Steel
Outer Shell	Cold rolling steel electrostatic spraying exterior
Insulation layer	Polyurethane
Heater	Stainless steel heater
Power rating	1.0 kW
Compressor	Air cooled hermetic compressor
Cryogen	R134a
Defrost structure	Automatic control intelligent defrosting
Test hole	Inner diameter 43mm (one)
Controlled external power supply	Outer universal socket (one), inner waterproof socket(one)
Temp. setting mode	Touch button setting
Temp. display mode	Measuring temperature: LCD upper screen; setting temperature: the lower row
Timer	0 to 99.9h
Operation function	Fixed value operation timing function, auto stop.
Sensor	PT100
Additional function	LED light, Deviation correction, Menu key lock, Power failure parameter memory
Inner Chamber size (W × L × H)	490 ×400 ×750 mm
Exterior size (W × L × H)	646 × 641 × 1301 mm
Packing size (W × L × H)	761 × 740 × 1461 mm
Volume	150 L
Load per rack	15 Kg
Shelf number	12
Shelf space	35 mm
Power Supply Current rating	AC220V/3.6A
Net Weight	86 Kg
Gross Weight	114 Kg

5. Applications

BOD Incubator is used to maintain temperature for test tissue culture growth, storage of bacterial cultures and incubation where high degree of constant temperature accuracy is required.

6. Operations

6.1 Instrument operation and display instructions

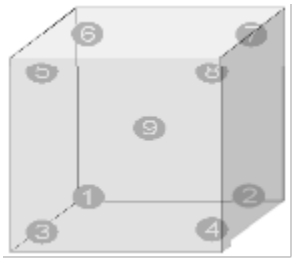


Figure -1

Temperature point	Temperature (℃)	Temperature point	Temperature (℃)
①	36.63	⑤	36.91
②	36.93	⑥	36.86
③	37.50	⑦	36.88
④	37.33	⑧	36.64
⑨	37.15		

Freeze Graph

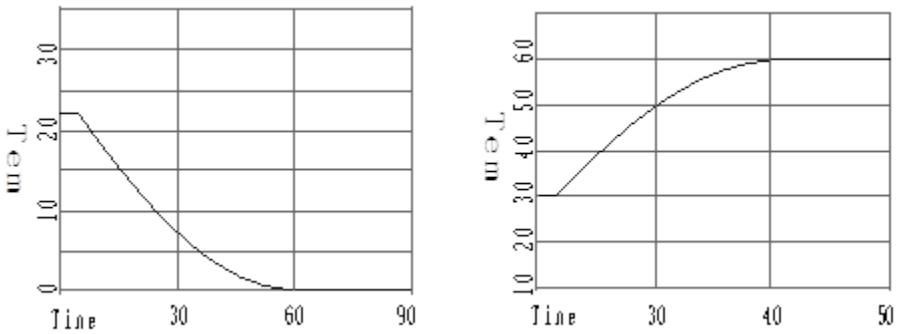


Figure-2 Freeze characteristic graph

Note:
The above specification testing environment temperature is ≤25℃, the data is just for our products.
It is normal when the Temperature Motion belongs to the above graph under the condition of automatic defrosting.

6.2 Controller operation instruction

6.2.1 Controller specification

1) **RS485/232 communication:** At one time, only one can contact 32 units of meter.
2) **Temperature setting range:** 0.0-60.0℃.
3) **Timer setting range:** 0-99 minutes; 59 minutes.
4) **Display error:** < 0.5%
5) **Sensor：** PT100.

6.2.2 Instruction of panel

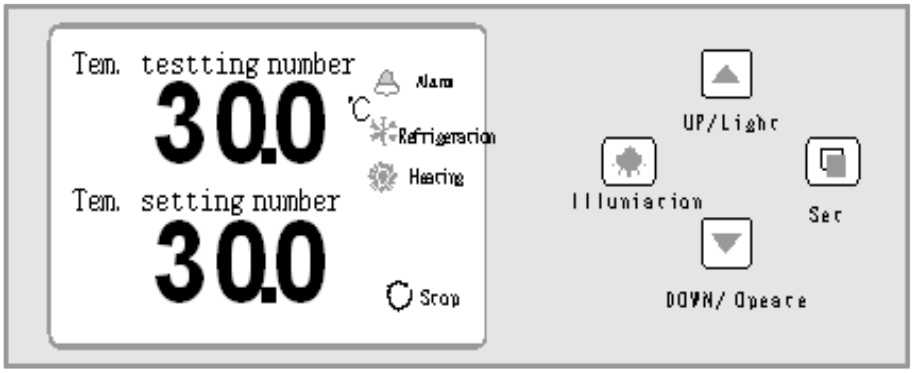
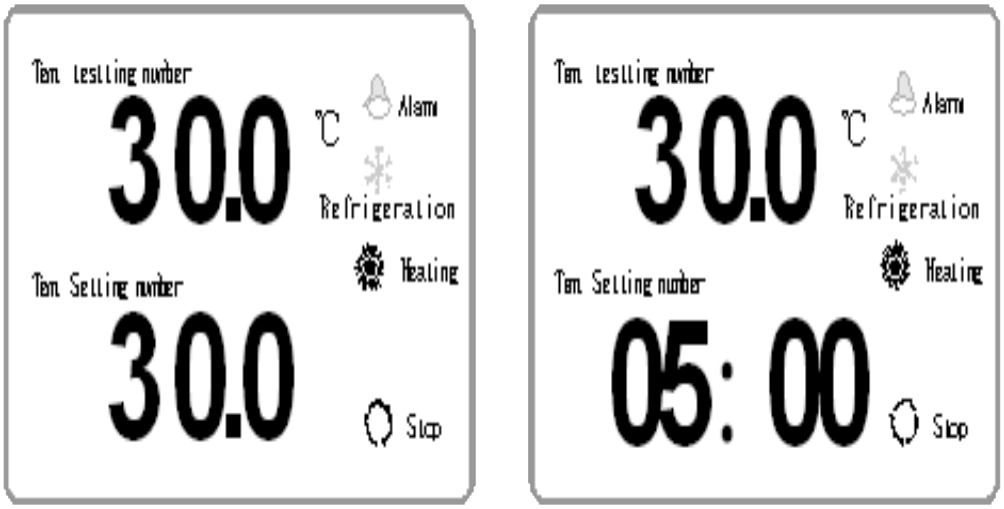


Figure-3

6.2.3 Temperature time operation

Example: Temperature Setting 30°Cm, Thermostatic 5 hours later, will cut off the Electricity.

1) Click the set keyboard then into the setting temperature condition, and set the temperature is 30°C through up and down. Click this set keyboard, and then come into the timer set condition, the hour time flicker, change to 5 from 0, once you need to set the minutes, also need to use the above step. When the timer shows "0", it means without the setting function. When the setting does not show "0", when the test temperature is up to the setting temperature the timer will calculate, when the time is up to the setting time, the machine will stop. When stopped, the light is on, and the buzzer tweets for 30 seconds, press the down keyboard for 4 seconds, and the system works again, when the buzzer is tweeting, can click the other keyboard to stop the tweeting.
2) Illumination (Operate), can click the illumine keyboard and then on, click again will close.
3) LCD Screen, once click add/light keyboard and then can open or close the light.



Without timer setting **With timer setting**

Figure-4

6.2.4 Inner chamber specification setting

Press the set keyboard for more than 3 seconds, will show "LC", make it to "3" through the up and down keyboard, click this keyboard, and come into the chamber temperature Specification. Click the set keyboard and modify each specification, press this keyboard for 3 seconds and then leave this screen, the specification will keep automatic. Once in 30 seconds, do not click this keyboard, will leave this screen automatically, and will not keep the specifications.

Note:
All the internal parameters were adjusted in the factory test, and modification was forbidden except for sensor correction parameters.

The internal parameters are as follows:

Parameter	Name Function	Factory specification
Lc	Password: "Lc=3" can modify the specification	
P--	Proportional band: Time proportional adjust function: Down P, can heat fast, UP P will reduce the over-adjust	(2.0～25.0) 15.0
AL--	Over-Temp. Display error alarm: Under "PV < SP+Al", buzzer tweeting and refrigeration	(0.0～20.0) 3.0℃
CT--	Compressors operate delay:	(0～10.0Min) 3 Min

	Compressor delay protects time, operate twice time > = cT minutes	
Up--	Heating refrigeration backlash: compressor in manual mode, when "PV > = SP+uP" and compressor delay time out, then compressor begin to work	(-50.0～50.0) 0.2
Dn--	Cooling refrigeration backlash: compressor in manual mode, when "PV<= SP+dn", the compressor shuts down.	(-51.0~uP-0.1) 0
T--	Control cycle	(1～60sec) 5
P--	Proportional band	(1.0～measure value) 35
I--	Integration time	(1～1000sec)200
d--	Differential time	(1～1000sec)200
Pb--	"0" adjust: Sensor zero display error adjusts. Pb= actual temp.-display number	(-9.9～9.9)0.0
Pk--	Full adjust: Sensor full error adjusts. PK=1000× (Actual temp-Display number)/Meter test number	(-999～999)0

Parameter	Parameter Function	(Range) Factory value
Lc-	"Lc=123" can see and modify each parameter.	
S-H	When "ambient temp.-SH" > Temp. Setting value, the compressor normally opens operation. On the contrary, the compressor break-off works. Note: when" S-H=50.0", the compressor doesn't work.	(-20.0～50.0) 40.0
Ft-	Fan delay, stop the fan when frost; After frost melts, fan delay Ft- second start.	(0～99s)50S
dt1	SP≤15℃ Frost interval 1	(0～250Hours) 12Hours
Hs1	Frost melting output 1	(0～250S) 60S
dt2	15℃<SP≤30℃ Frost interval 2	(0～250Hours) 12Hours
Hs2	Frost melting output 2	(0～250S) 55S
HA	The compressor is switched on and off automatically. 1 is to automatically judge the switch compressor according to the ambient temperature. 0 is to control the compressor on and off according to uP and dn.	(0～1) 1
cH	Frosting and evaporator switching options, 0 for frosting, 1 for evaporation switching	(0～1) 0

7. Troubleshooting

Phenomenon	Cause analysis	Treatment
The power director does not show	Without power	Inspect the plug
	Fuse broken	Replace the fuse
Temperature Controller shows "□□□□"	Sensor broken	Replace the sensor
	Controller broken	Replace the controller
Evaporator frost or Chamber with frost	Open the door frequently when doing the Low-Temp. test	When the temperature is over 50 degrees, the air becomes dry and it's better to keep the door closed.
	Left hole with a bad seal	Inject the inner hole with rubber
	Door opening	Close the door
Hard to make the Temp. down	Evaporator frost	Dry the chamber
	Environment Temp. too high	Down environment Temp.
	Fan works or not	Check the fuse and fan
	Compressor works or not	Replace the Compressor
	Compressor works but not refrigeration	Check the cryogen Check the ice or oil block
	Specification mixed	Correct the setting and restart
Temperature up continues	Evaporator frost	Dry the chamber
Abnormal Knocking	Circle Fans loose	Check and adjust
	Condenser, Fan, and compressor loose	Check and adjust
Bad evenness degree	Sample hot	Reduce sample quantity
	Evaporator frost、wind block	Dry the chamber and Restart
Controller instability	Power do not match	Change the Power
	Voltage instability	Make sure the stability voltage
Hard to raise the temperature	Over-Temp. setting too low	Adjust the Temp. correct
	The meter setting is too low	Set the Temp. correct
	The meter heating director is on but without an input function	Change the meter
	Meter heating but the heater doesn't work	Change the heater
	The fan doesn't work	Change fan or fuse
	Sensor broken	Change sensor
Temperature over bigger than setting	Meter setting incorrect	Set again and the manual
	The heater does not stop	Change Controller

8. Accessories

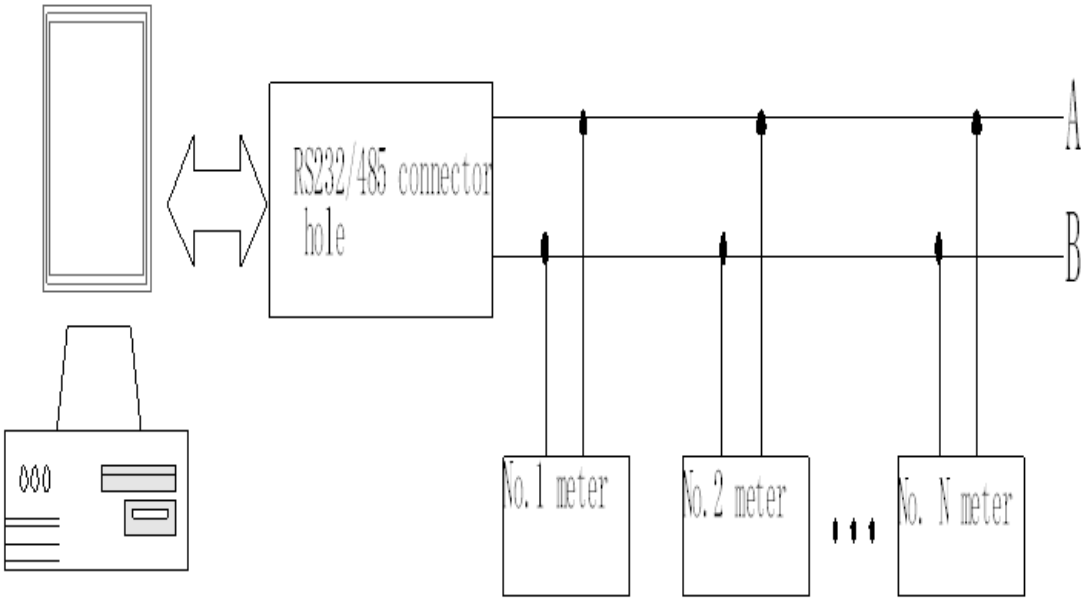
Standard Accessories

S. No	Accessory Name	Quantity
1	Shelf	2
2	Shelf Frame	4

Optional Accessories

S. No	Accessory Name
1	Shelf
2	RS485 port
3	Printer
4	Recorder
5	Remote control
6	U-Disk data storage

9. Circuit Diagram



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