LBX instruments

LBX INC-R   Refrigerated Incubator

Please read the User Manual carefully before use, and follow all operating and safety instructions!

user manual
english

User Manual

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LBX INC-R   Refrigerated Incubator

Preface

Users should read this Manual carefully, follow the instructions and procedures, and beware of all the cautions when using this instrument.

Service

If help is needed, you can always contact your dealer or Labbox via www.labbox.com (declare an incident). Please, provide the customer service representative with the following information:

- Serial number
- Description of the problem
- Your contact information

Warranty

This instrument is guaranteed to be free from defects in materials and workmanship under normal use and service, for a period of 24 months from the date of invoice. The warranty is extended only to the original purchaser. It shall not apply to any product or parts which have been damaged on account of improper installation, improper connections, misuse, accident or abnormal conditions of operation.

For claim under the warranty, please contact your supplier.

Structural Features

1. The case is constructed from high-quality cold-rolled steel plate with a plastic coating on the surface.
2. Mirror-stainless working room, easy to clean, and with adjustable shelves.
3. Equipped with a Micro-Computer Temperature Controller and an Automatic defrosting system, along with a large LCD screen.
4. Includes a temperature limited alarm system, over-temperature electric cutoff, and a timing function.
5. Utilizes an R134A compressor and fans.
6. Features double doors, with the inner door made of mirror stainless steel and a silicon seal, while the outer door is magnetic silicon.
7. Includes a 50mm diameter test hole.
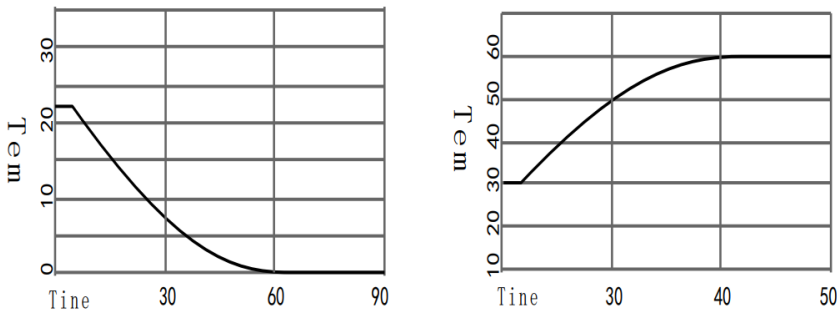
Product Specifications

Model	INCR-070-001	INCR-150-001
Voltage	220 – 240V; 50Hz/60Hz	
Temperature Range	0 – 65 °C	
Temperature Motion	± 0.5 °C	
Temperature Uniformity	± 1.5 °C	
Cryogen	R134a (ca. 180 g)	R134a (ca. 200 g)
Power	800 W	1000 W
Inner Chamber Size	35 x 41.5 x 50 cm	40 x 49 x 75 cm
Exterior Size	56 x 57 x 103 cm	62 x 64 x 129 cm

Inner Chamber Temperature Distribution Map
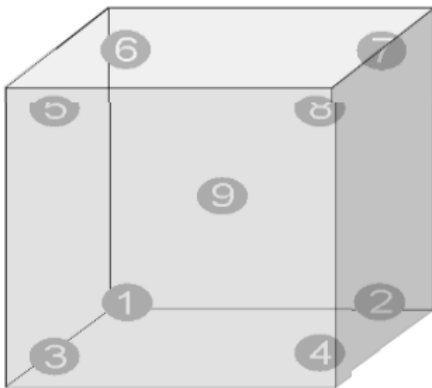
Temperature Point	Temperature (°C)	Temperature Point	Temperature (°C)
1	36.63	5	36.91
2	36.93	6	36.86
3	37.50	7	36.88
4	37.33	8	36.64
9	37.15		

Temperature Graph

Note: The specifications mentioned above have been tested in a 25 °C environment.

Working Conditions

1. Ambient temperature: 5 – 32 °C (if the set temperature ≦ 10 °C, ambient ≦ 28 °C).
2. Humidity: ≦ 80 % RH.
3. Air Pressure: 80 – 106 Kpa.
4. Ensure that the incubator remains stable (avoid shaking movements) and is not exposed to corrosive air.
5. Avoid exposure to light and maintain a controlled temperature environment.
6. Maintain a clear distance from dust, install the equipment horizontally, and ensure there is adequate space between the equipment and the wall.

Safety Information

1. Upon receiving the equipment, to prevent compressor damage due to extended transportation, please allow the machine to stand still for one day before use. Ensure equipment safety by installing external protection and supplying power as required.
2. Avoid testing flammable, combustible, poisonous, or corrosive materials.
3. Install the equipment horizontally.
4. Disassembly and repair of the equipment should only be carried out by trained personnel.
5. If adding additional equipment to the chamber with a power consumption exceeding 2A, connect the power externally; do not use the equipment's internal power.
6. When the chamber temperature is ≧ 50 °C, refrain from setting low-temperature settings to ensure the compressor's long-term usability.
7. Prior to operating the equipment, all users must read this manual.

Operation Cautions

1. There is a test hole at the top of the incubator. If you need to add additional equipment inside the chamber, please use this hole.
2. If there is no need for U.V. light, turn off the U.V. lamp to avoid affecting the temperature.
3. Before activating the cooling function, dry the chamber for 1 hour at 50 °C.
4. The chamber utilizes a vertical air circulation system. Do not overload the shelves with materials; the test material should occupy less than 1/3 of each shelf.
5. When the test environment exceeds 35 °C or the set temperature is above 50 °C, refrain from setting the low-temperature option.
6. Clean the chamber and the machine's surface with pure water. When the machine is not in use, please disconnect the power supply, ensuring both the interior and exterior are clean and dry.

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Controller Operation Instructions

1. Controller Specifications

- Temperature setting range: 0.0 – 65.0 °C
- Timer setting range: 0 – 99 minutes 59 seconds
- Display error: < 0.5 %
- Sensor: PT100

2. Panel Instructions
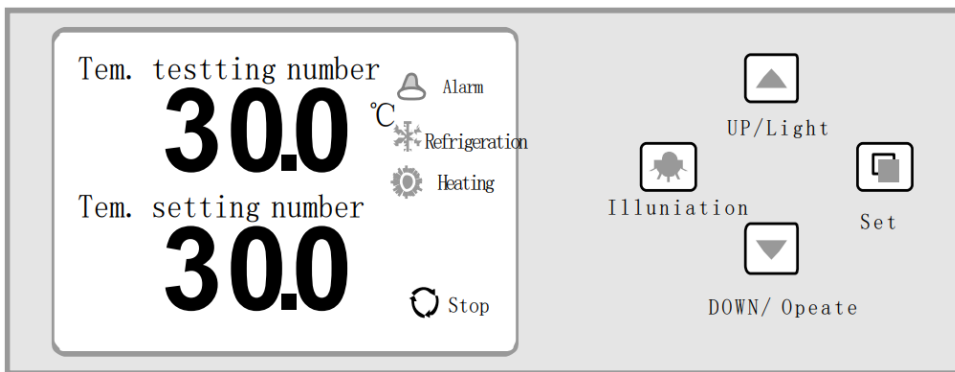
3. Temperature-Time Operation

Example: setting the temperature to 30 °C. Once reached, stop the instrument 5 hours later (T = 30 °C; timer = 5 hours).

1. Click the set button to enter the temperature setting mode and set the temperature to 30 °C using the up and down keys.
2. Click the set button to enter the timer setting mode, change the hours from "0" to "5" using the up and down keys. Once you need to set the minutes, follow the same steps.
   When the timer is set to "0", it means there is no timing function, and the incubator runs continuously.
   When the timer is not set to "0", once the inner chamber temperature reaches the set temperature, the timer will start. When the time expires, the machine will stop. When it stops, the light will turn on, and the buzzer will sound for 30 seconds. Press the down key for 4 seconds, and the system will start working again. When the buzzer sounds, press any key to stop the sound.
3. Illumination: click the illumination button to turn it on and click it again to turn it off.
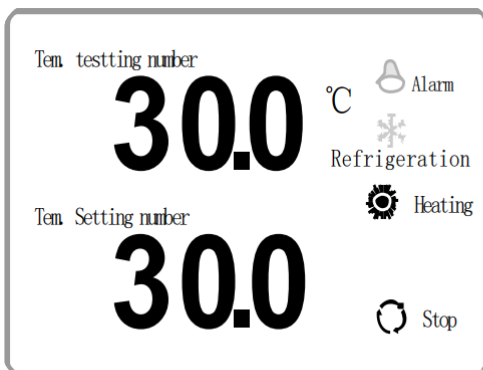
Without timer setting
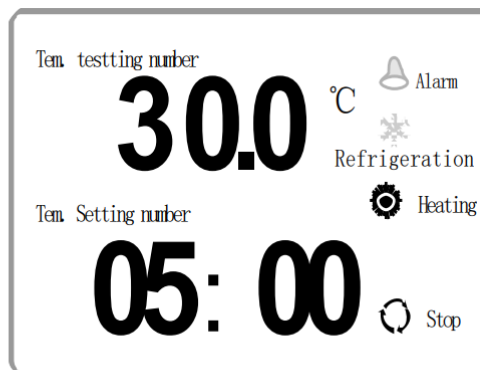
With timer setting

4. Inner Chamber Specification Setting

Press the set button for more than 3 seconds, and the screen will display "LC." Change the number to "3" using the up and down keys, then click the set button again to access the parameters. By clicking the set button, you can navigate through the parameters in the following table and modify each specification. Press the set button for 3 seconds to exit the settings; the specifications will be saved automatically. If no button is pressed for 30 seconds, it will exit the settings automatically without saving the specifications.

Internal Parameters

Parameter	Name / Function	(Range) Factory Specification
Lc	Password: "Lc=3" allows to modify the specification.	
P--	Proportional band: time-proportional adjustment function: decreasing P heats quickly, increasing P reduces over-adjustment.	(2.0 – 25.0) 15.0
AL--	Over-temperature display error alarm: When "PV < SP+Al", the buzzer will sound, and refrigeration will be activated.	(0.0 – 20.0) 3.0 ℃
CT--	Compressor operating delay: compressor delay protection time, operates twice after a time >= cT minutes.	(0.0 – 10.0 min) 3 min
Up--	Heating refrigeration backlash: in manual mode, when "PV >= SP+uP" and the compressor delay time is up, the compressor will start.	(-50.0 – 50.0) 0.2
Dn--	Cooling refrigeration backlash: in manual mode, when "PV <= SP+dn," the compressor will shut down.	(-51.0 – uP-0.1) 0
T--	Control cycle	(1 – 60 sec) 5
P--	Proportional band	(1.0 – measurement value) 35
I--	Integration time	(1 – 1000 sec) 200
d--	Differential time	(1 – 1000 sec) 200
Pb--	"0" adjustment: sensor zero display error adjustment. Pb = actual temperature-display number.	(-9.9 – 9.9) 0.0
Pk--	Full adjustment: sensor full error adjustment. PK = 1000 * (actual temperature-display number) / meter test number.	(-999 – 999) 0

Note:
1. **To ensure precise results, you can adjust P (within the range of 10.0 – 20.0), but generally, it should not require any changes. Please use the factory specifications.**
2. **If there is a display error, typically, you should adjust Pb and not PK.**

Check Ambient Temperature

Press the set button for more than 3 seconds; it will display "LC." Change it to "18" using the up and down keys. Click the set button, and the screen will show the ambient temperature. Press the set button for 3 seconds to exit this screen, and the specification will be saved automatically. If no button is pressed for 30 seconds, it will exit the settings automatically and will not retain the specification.

Parameter	Name	Function	(Range) Factory Value
Lc-	Password	When "LC=18" is displayed, it is possible to check the ambient temperature.	
Hd-	Ambient Temperature		

Compressor Operating Mode and Frost-Related Parameters

Press the set button for more than 3 seconds; it will display "LC". Change it to "123" using the up and down keyboard. Click the set button to check the internal parameter value. Press the SET key to change parameters, use the up and down arrows to modify each parameter value, and then click the SET button for more than 3 seconds to exit this screen; the specification will be saved automatically. If no button is pressed for 30 seconds, it will exit the settings automatically and will not retain the specification.

Parameter	Function	(Range) Factory Value
Lc	"Lc=123" allows to view and modify each parameter.	
S-H	When the "ambient temp.-SH" is greater than the temperature setting value, the compressor operates in the normally open mode. Conversely, the compressor shuts off. Note: when "S-H=50.0", the compressor does not operate.	(-20.0 – 50.0) 40.0
Ft-	Fan delay: stops the fan when there is frost; after frost melts, the fan delays for Ft seconds before starting.	(0 – 99 s) 50 s
dt1	SP ≤ 15 ℃ frost interval 1	(0 – 250 hours) 12 hours
Hs1	Frost melting output 1	(0 – 250 s) 60 s
dt2	15 ℃ < SP ≤ 30 ℃ frost interval 2	(0 – 250 hours) 12 hours
Hs2	Frost melting output 2	(0 – 250 s) 55 s
HA	Automatic compressor operation: 1 is for automatic compressor control based on ambient temperature, and 0 is for controlling the compressor using uP and dn.	(0 – 1) 1
cH	Frosting and evaporator switching options: 0 for frosting, 1 for evaporator switching.	(0 – 1) 0

Fault Analysis

Problem	Cause Analysis	Solution
Power button is not lighting up	No power	Inspect the plug
	Broken fuse	Change the fuse
Temperature controller displays "□□□□"	Broken sensor	Change the sensor
	Broken controller	Change the controller
Evaporator frost or chamber with frost	Frequent opening of the door during low-temperature tests	If the temperature exceeds 50 degrees, dry the chamber and reduce the frequency of opening the door
	Poor seal on the left hole	Inject rubber into the inner hole
	Door left open	Close the door
Difficulty in reducing the temperature	Evaporator frost	Dry the chamber
	Environment temperature too high	Lower the environmental temperature
	Malfunctioning fan	Check the fuse and the fan
	Compressor not working	Replace the compressor
	Compressor working, but refrigeration is not	Check the cryogen Check for ice or oil blockages
	Mixed specifications	Ensure correct settings and restart
Continuous increase in temperature	Evaporator frost	Dry the chamber
Abnormal knocking	Loose circulation fans	Inspect and adjust
	Loose condenser, fan and compressor	Inspect and adjust, or contact with your supplier
Poor temperature evenness	Hot sample	Reduce the sample quantity
	Evaporator frost and wind blockage	Dry the chamber and restart
Controller instability	Power mismatch	Change the power source
	Voltage instability	Ensure voltage stability
Difficulty in raising the temperature	Over-temperature setting too low	Correct the temperature setting
	Meter setting too low	Set the temperature correctly
	Meter heating director on, but without input function	Change the meter
	Meter heating, but the heater does not work	Change the heater
	Fan does not work	Change the fan or fuse
	Broken sensor	Change the sensor
Temperature exceeds the set value	Incorrect meter setting	Reset and refer to the manual
	Heater working, but does not stop	Replace the controller

Nota importante para los aparatos electrónicos vendidos en España
Instrucciones sobre la protección del medio ambiente y la eliminación de aparatos electrónicos:

Los aparatos eléctricos y electrónicos marcados con este símbolo no pueden ser eliminados en forma de residuos urbanos.

De conformidad con la Directiva 2012/19/UE, los usuarios de la Unión Europea de aparatos eléctricos y electrónicos, tienen la posibilidad de devolver sus RAEE para su eliminación al distribuidor o fabricante del equipo después de la compra de uno nuevo. La eliminación ilegal de aparatos eléctricos y electrónicos es castigada con multa administrativa.

Remarque importante pour les appareils électroniques vendus en France
Informations sur la protection du milieu environnemental et élimination des déchets électroniques :

Les appareils électriques et électroniques portant ce symbole ne peuvent pas être jetés dans les décharges.
En réponse à la règlementation, Labbox remplit ses obligations relatives à la fin de vie des équipements électriques de laboratoire qu'il met sur le marché en finançant la filière de recyclage de ecosystem dédiée aux DEEE Pro qui les reprend gratuitement (plus d'informations sur www.ecosystem.eco).
L'élimination illégale d'appareils électriques et électroniques est punie d'amende administrative.
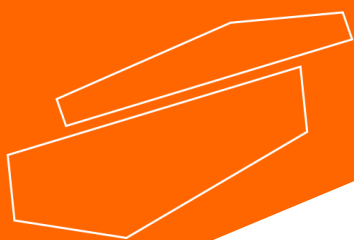
Nota importante per le apparecchiature elettroniche vendute in Italia
Istruzioni sulla protezione ambientale e sullo smaltimento dei dispositivi elettronici:

Le apparecchiature elettriche ed elettroniche contrassegnate con questo simbolo non possono essere smaltite come rifiuti urbani.
In conformità con la Direttiva 2012/19 / UE, gli utenti dell'Unione Europea di apparecchiature elettriche ed elettroniche hanno la possibilità di restituire i propri RAEE per lo smaltimento al distributore o al produttore di apparecchiature dopo averne acquistato uno nuovo. La rimozione illegale di apparecchiature elettriche ed elettroniche è punibile con una sanzione amministrativa.

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