



# Incubator

## User Guide

version 1.0

Model

LI-IS060, LI-IS100, LI-IS150, LI-IS200



Thank you for purchasing this product  
from LK Lab Korea co., Ltd.

This user guide provides explanations of function of product,  
user manual and cautions.

Be sure to read this manual thoroughly before using this product.

Particular attention should be paid  
to the used of the following warnings.



Indicates the situation requires user's attention.  
Be careful when operating or controlling during usage.

[Caution]



Indicates a dangerous situation.  
Failure of this warning could result in serious injury of equipment  
damage.

[Warning]

# [ Contents ]

<b>1. Preparation</b>	<b>3</b>
1.1 Product Introduction .....	3
1.2 Product Features .....	3
1.3 Product Structure .....	4
1.4 Product Installation .....	6
 <b>2. Usage</b>	 <b>7</b>
2.1 Name of Controller and its function .....	7
2.2 Driving Method .....	9
 <b>3. Maintenance</b>	 <b>12</b>
3.1 Management after use .....	12
3.2 Cause of abnormal problem and matter of management .....	12
3.3 Product A/S (Warranty) .....	14
 <b>4. Specification</b>	 <b>15</b>

# 1. Preparation

## 1.1 Instruction

This product is used for bacterial culture and then cultured tissue culture Experiments of various flora and fauna. It is also useful in various experiments Such as thermos plant specimen storage and storage experiments, such as Environmental change experiments.

We consider the convenience and safety of the users through a variety of functions and a maximum of safety.

## 1.2 Feature

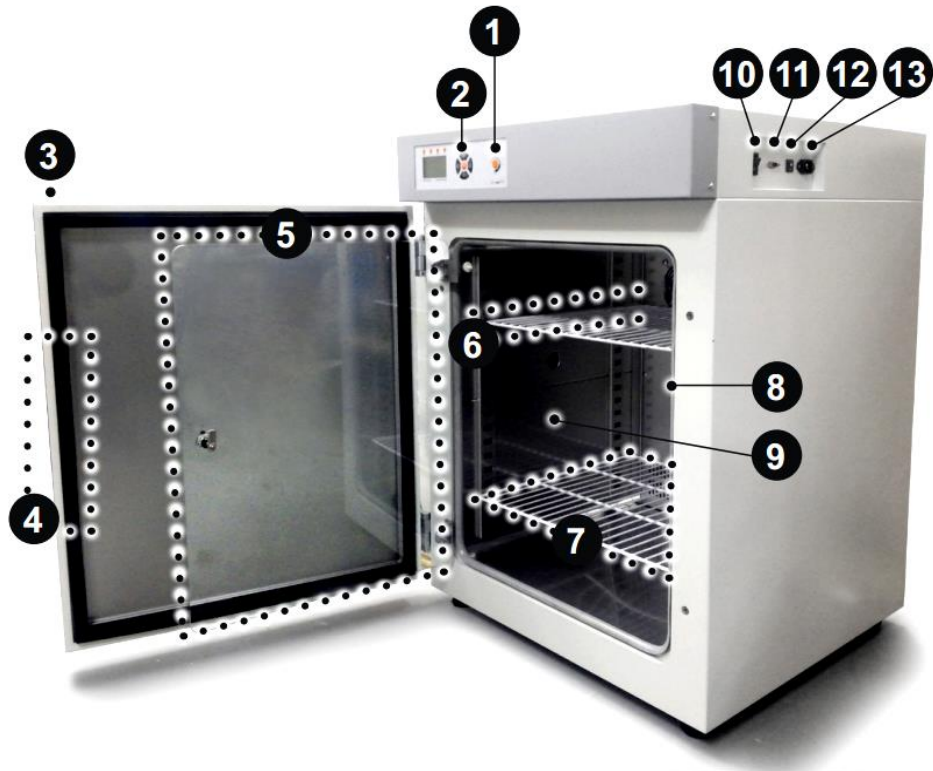
### 1.2.1 Function and Convenience

- Heat Flow Circulation method, provide to equivalent temperature distribution inside chamber.
- 5 steps of Flow Control prevent spreading of samples inside.
- You can observe the internal conveniently through the Glass Door.
- Graphic LCD Display provide handy operation and control.
- PID control system with high performance microprocessor provide quick and Precision temp. control.
- By Auto Tuning installed provide automatic calculation of PID value based on Test environment.
- The experimental data can be freely transferred to a PC via the RS485 port.

### 1.2.2 Safety

- Double over heated safety device installed.  
(1<sup>st</sup> Controller Alarm, 2<sup>nd</sup> Forced Shut Out Circuit)
- No running of Heater and Fan during door open.
- With appearance of disorder, alarm activated with buzzer and message displaying.

## 1.3 Product Structure



[ Incubator ]

### [1] Over Temp. Limiter

If the temperature is going over the set temperature, shut the power of heater so that prevent over heat.

### [2] Temperature Controller

Use for controlling temperature inside.

### [3] Door

Insulation between inside and outside.

**[4] Door Handle**

A handle to open and close the door.

**[5] Glass Door**

Observe the internal through the Glass Door.

**[6] Shelf rail**

Used for fixing shelf, adjustable of height of shelf.

**[7] Shelf**

2type as wire and perforated, used for put on the sample inside chamber.

**[8] Door Packing**

Silicone packing resistant seal the chamber.

**[9] Chamber**

Space for treat made with stainless.

**[10] Power Switch**

ON/OFF switch for main power.

**[11] Communication Port**

RS485 communication for computer connection.

**[12] Circuit Breaker**

Breaker of overcurrent.

**[13] Power Cord**

Supply the power to equipment.

## 1.4 Product Installation

### 1.4.1 Product Component

Main Body (1 EA), User Guide (1 EA)  
Wire Shelf (2 EA), Shelf Rail (8 EA)

### 1.4.2 Product Installation Environment

- Avoid direct sunlight
- Install at a flat place with low vibration
- Do not install in a place where flammable gas may leak
- Do not install in a place where strong and high frequency noise may occur
- Do not install the product where there is a risk of water leakage or short circuit
- Do not install the product where there is high corrosive gas or dust
- Do not install the product in an enclosed area



- Install this product at an ambient temperature of 5 to 40 degrees.
- Install in a place where the ambient humidity is 80% or less.

### 1.4.3 Power Connection

- Set the power switch to OFF
- If the power cord is disconnected from the main body, connect with main body first then plug into the outlet.



- Supply power according to product specification
- Must use a grounded power source



## 2. Usage

### 2.1 Name of controller and its function



#### [1] Graphic LCD

Available to check status of the equipment and display data.

#### [2] Run Lamp

Light on during operation.

#### [3] Heater Lamp

Displaying output of the heater with flashing.

#### [4] Timer Lamp

Light on during timer is operating.

#### [5] A.T Lamp

Light on during auto-tuning.

#### [6] Up Key

Use for increasing of set value, setting of Fix Mode and setting of EXT. Sensor Mode.

**[7] Down Key**

Use for decreasing of set value, setting of Program Mode and setting of INT. Sensor Mode.

**[8] Shift Key**

Use for moving the position of set value and set of Auto-tuning mode.

**[9] RUN / STOP Key**

Use for operating, stop and set values.

**[10] Mode Key**

Use for changing menu.

**[11] MODE Display**

User can select one between FIX Mode and PROGRAM Mode.

**[12] Message Displaying Window**

Display of the message related status of the product.

**[13] PV Display**

Display current temperature of the equipment.

**[14] SV Display**

Display target temperature the user set.

**[15] TIMER Display**

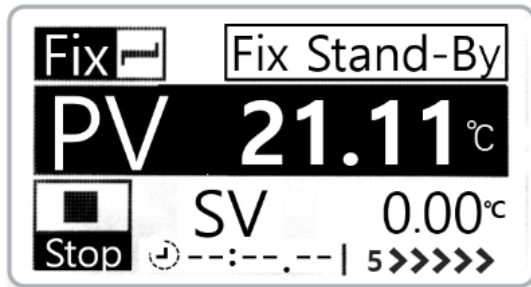
Timer display remain time for operation “--.--.--” means timer off.

**[16] RUN / STOP Display**

Display the status RUN or STOP

## 2.2 Driving Method

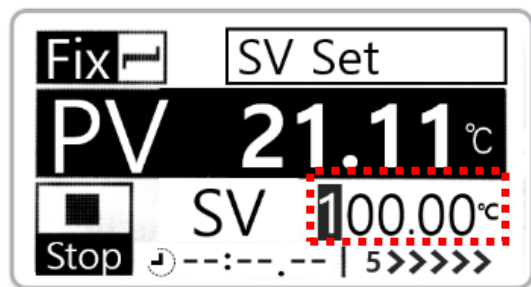
### 2.2.1 How to Set



– Main Menu



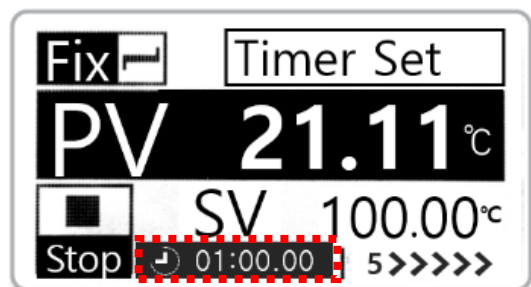
Mode Key



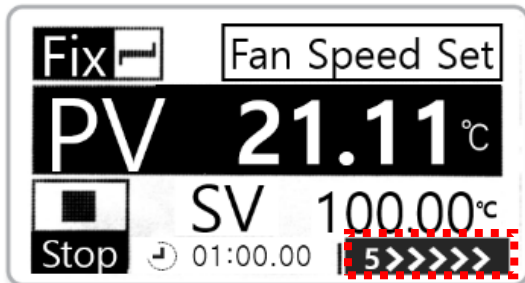
– Set the Temperature



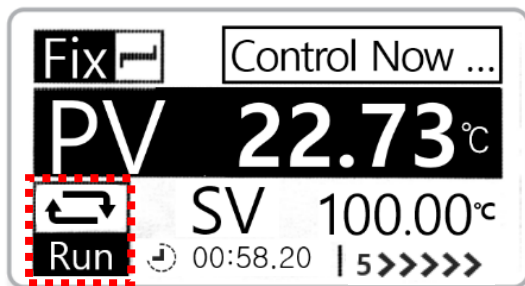
Run/Stop Key



– Set the Timer



– Set the Fan



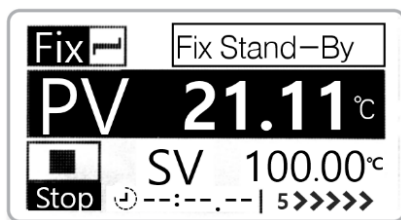
– Start operating RUN

## 2.2.2 Auto Tuning Function

Auto Tuning is provide the best value for PID Gain after calculation with considering Treat environment automatically, so that user can experiment more accuracy And quickly.

Calculated Gain value is saved automatically, if user wish to same experiment once Again, the user need only tuning once.

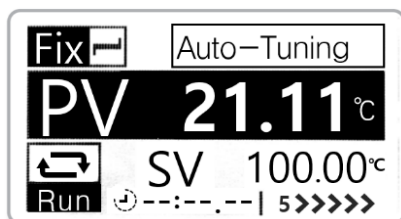
Auto Tuning is only available during RUN session.



\* Fix Control Mode



Press these buttons at the same time for longer than 3 seconds



\* Start with Auto-tuning message

\* After the Auto tuning, the equipment will operate with set temperature.

\* In case stop Auto-tuning, apply Shift and RUN/STOP at the same time.



When Auto-Tuning is activated, temperature can be raised above the set temperature.

# 3. Maintenance

## 3.1 Management after use

- Turn off the power Switch to OFF when experiment is done.
- If the main body becomes dirty, unplug the power cord then clean the contaminated Area with alcohol.
- If the product is not in use for a long time, unplug the power cord and wipe it clean to store.



- Do not use strong acid or strong alkali or volatile solution to clean this product.
- Perfectly dry after cleaning

## 3.2 Cause of abnormal problem and matter of management

### 3.2.1 If the product does not turn on

- Check the power supply.
- Make sure that short circuit breaker is ON which is located on the side of the main body.
- Make sure that the power switch is ON which is located on the side of the main body.
- Make sure that power cord is securely connected.
- Make sure that the breaker of the outlet is turned on which is connected to the main body.
- If all necessary action is made but still having a problem, please contact our A/S department.

### 3.2.2 If Circuit Breaker of main body constantly experiencing short-circuit.

- Please contact our A/S department.

### 3.2.3 Temp. Control Disorder

- Please check if the Over Temp. Limiter set 10% higher than treat value.
- Please operate Auto Tuning.
- Please set the fan speed as 5 step.
- If still not working after those solution above, contact out Technical Support Department.

### 3.2.4 Error Message



#### 〈Door Open〉

When door remains open.



#### 〈Sensor Open Error〉

Occur when there's some problem with sensor.

Please contact our Technical Support Department.



#### 〈LBA; Control Routine Breaking Down Alarm〉

Please set the Over Temp. Limiter set 10% higher than Treat value. If the error message still comes up after set, contact our Technical Support Department.



–is product needs to be fixed, user must contact our A/S department or product purchased store to have it repaired. If disassemble the product or replace the parts on your own, it may not be possible to repair it.

–Damage beyond the normal fixing limit cannot be fixed.

## **3.3** Product A/S

### **3.3.1 Warranty Period**

The warranty period is 1 year from the date of purchase. After 1 year, warranty service without charges are done and user needs to pay for repair or replacement of parts. Within warranty period, user can receive A/S customer service from LK Lab Korea co., Ltd. or product purchased store

### **3.3.2 Exception from Warranty Period**

Damage caused by fire or flooding, contamination due to unauthorized usage, not using liner power supply, usage during abnormal situation, misuse or malfunction will be the exceptions from receiving warranty service

### **3.3.3 How to receive A/S**

First, contact our A/S department of product purchased store then enclose your contact information along with the detailed symptoms of the product that you are sending. You will receive a quotation of repair for you to make a decision for repairing. If we do not hear from you within 2 weeks of submitting your quotation, the product will be returned

A/S Department of LK Lab Korea co., Ltd. +82-(0)31-572-4952



## 4. Specification

Cat. No.	Model	용량	Range
I03-91-015	LI-IS060	60 L	Ambient +5 to 70 °C
I03-91-020	LI-IS100	100 L	
I03-91-025	LI-IS150	150 L	
I03-91-035	LI-IS200	200 L	

Cat. No.		I03-91-015	I03-91-020	I03-91-025	I03-91-035
Model		LI-IS060	LI-IS100	LI-IS150	LI-IS200
Capacity		60 L	100 L	150 L	200 L
Controller	Control	PID Control, Auto-tuning			
	Display	GLCD (Graphic LCD)			
	Resolution	0.01 °C			
	Timer	Wait on / off or Run Start (99 hr 59 min 59 sec)			
Fan Speed		1~5 Step			
Temperature	Range	Ambient +5 to 70 °C			
	Accuracy	±0.3 °C			
	Uniformity	±0.54 °C	±0.65 °C	±0.63 °C	±0.68 °C
Dimension (w x d x h)	Internal (mm)	420 x 350 x 450	480 x 410 x 520	505 x 505 x 600	630 x 515 x 630
	External (mm)	580 x 560 x 780	640 x 620 x 850	670 x715 x 930	790 x 720 x 960
Electric supply	Power	1 Phase, 220 VAC, 50/60 Hz			
	Max Consumption	400 W (1.9 A)	600 W (2.8 A)		800 W (3.7 A)
	Power Line	Standard Plug			
Material	Interior	304 Stainless Steel			
	Exterior	Powder Coated Steel			
Other	Wire Shelf	1ea	2ea		

## 생산물배상책임보험 증권

증권 번호	P151400668
계약자	(주)엘케이랩코리아
주소	[ 136-075 ] 서울특별시 성북구 계원사길 57 - 3(안암동5가)
대표자	(주)엘케이랩코리아
주소	[ 136-075 ] 서울특별시 성북구 계원사길 57 - 3(안암동5가)
가입기간	2014년 04월 10일 00:00 ~ 2015년 04월 09일 24:00 (증권발행지의 표준시 기준)

## [계약일반사항]

제품종류(영)	각종실험기기		
소급담보일	2014년 04월 10일		
재판관할지역	대한민국	대 출 액	₩ 2,682,000,000

## [가입조건]

## [생산물배상책임]

대인, 대물 일괄 연간 총 보상한도: ₩ 100,000,000  
 대인, 대물 일괄 1회당 보상한도: ₩ 100,000,000  
 자기부담금: ₩ 1,000,000

## [사용약관]

생산물배상책임(PL)약관보험 공제약관  
 생산물배상책임보험(PL) 보험약관 - 배상청구기준  
 알파인식오류 부담보 추가약관  
 품질저하부담보험약관  
 화재위험부담보험약관

## [보험료 납입] 일시납

총 보험료: ₩ 1,827,000  
 납입보험료: ₩ 1,827,000 (2014년 04월 09일)

이 보험은 만기 환급금이 없는 소멸성 상품입니다.

발행처: 중소기업중앙회  
 손해공제부 (www.pikorea.com)

전화번호: 1666-9988  
 팩스번호: (0502) 397-0200

2014년 04월 09일  
 중소기업중앙회  
 회장 김기문



**77-9, Toegyewon-ro, Toegyewon-myeon,  
Namyangju-si, Gyeonggi-do, Korea**

Tel. +82 31 573 4952

Fax. +82 31 527 4958

---

# Incubator User Guide

---

77-9, Toegyewon-ro, Toegyewon-myeon,  
Namyangju-si, Gyeonggi-do, Korea

Tel. +82 31 573 4952

Fax. +82 31 527 4958