



# Digital Glass Oil Bath

User Guide version 1.0

Model  
LO-BG160, LO-BG200



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.



[Caution]

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



[Warning]

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

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# 1. Preparation

## 1.1 Product Introduction

This product is a digital glass oil bath that can be used for temperature control and cooling in various fields of chemistry, biology, medicine, and pharmaceuticals, etc.

Various functions and safety are maximized for user's convenience and safety.

This product has the following features.

## 1.2 Product Features

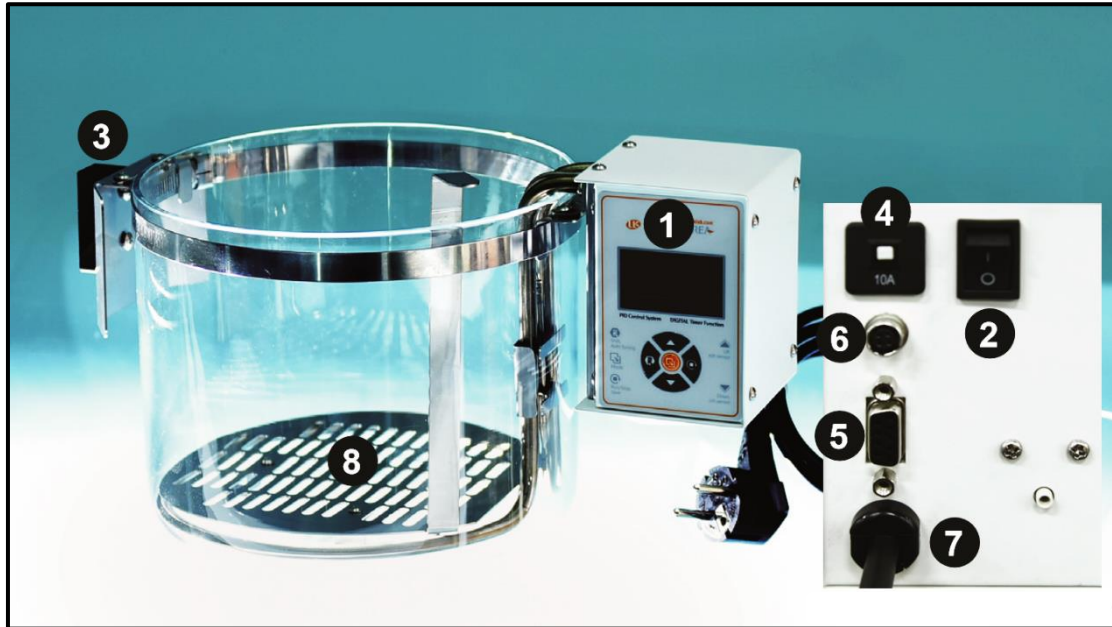
### 1.2.1 Product Performance and Convenience

- The bath is made of transparent glass for easy observation to see inside of bath.
- This product can be used with magnetic stirrer to improve the temperature distribution.
- Can display up to 0.01 °C
- External sensor and RS485 PC communication port attached.
- Graphic LCD Display with simple and intuitive controller operation.
- Auto-Tuning function and temperature calibration function available.
- 2 types of timers, starts at the same time as operating and starts after reaching the target temperature.
- Automatic Fault Sensing System to provide self-monitoring abnormal situation.  
(Patent Registered System)
- 1<sup>st</sup> controller over-temperature alarm and 2<sup>nd</sup> over-temperature cut-off circuit activates as dual over-temperature safety device.

### 1.2.2 Safety

- Dual over-temperature safety system available.  
(1<sup>st</sup> controller over-temp. alarm, 2<sup>nd</sup> over-temp. cut-off circuit)
- In case of emergency, buzzer and message on the screen informs the user.

## 1.3 Product Structure



[ Digital Glass Oil Bath ]

### [1] Temperature Controller

Controls the temperature.

### [2] Power Switch

Main power button for ON/OFF.

### [3] Stand Socket

Socket that settles external sensor stand.

### [4] Circuit Breaker

Overcurrent protection.

### [5] Communication Port

RS485 communication port.

### [6] External Sensor Port

Port that connects the external sensor.

### [7] Power Cord

Main power cord.

### [8] Heater Cover

Cover that prevent from direct connection with heater on the bottom when using items such as flask, etc.

## 1.4 Product Installation

### 1.4.1 Product Component

Main Body (1 EA), User Guide (1 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

### 1.4.4 Initial Setting

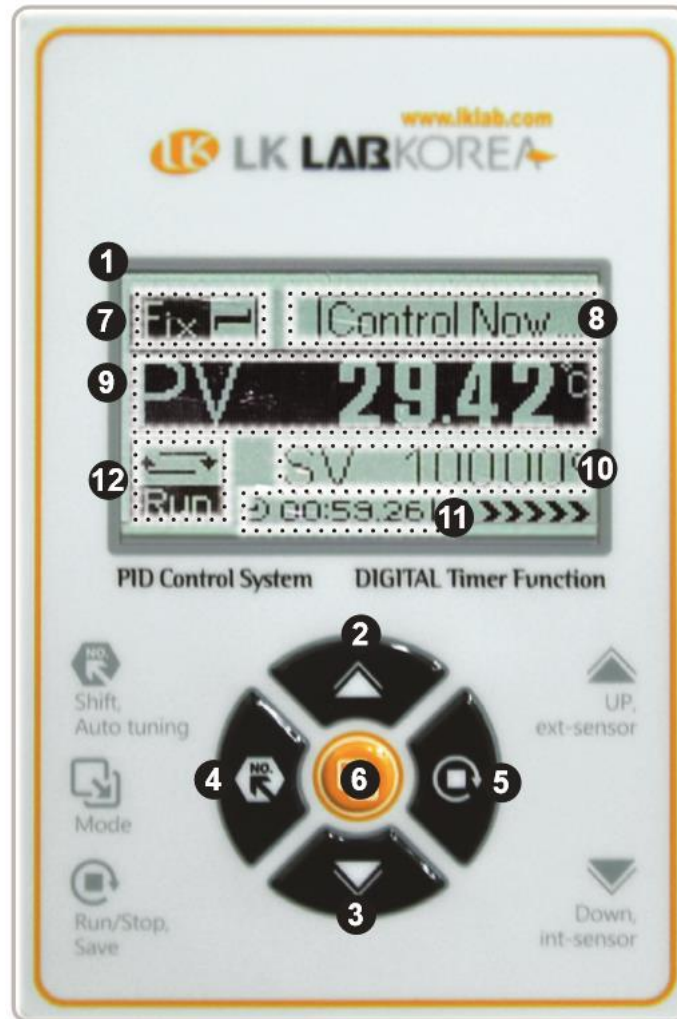
- Install the cover for heater.
- Fill the bath with solution.



- When using oil, do not fill more than Supply power according to product specification
- Must use a grounded power source

## 2. Usage

### 2.1 Name of temperature controller and its function



#### [1] Graphic LCD

Displays the status of machine and various data.

#### [2] UP key

Key to increase the set value and to set the fix mode.

#### [3] Down key

Key to decrease the set value and to set the Program mode.



**[4] RUN / STOP Key**

Key to set RUN / STOP and saving the set value.

**[5] Shift key**

Key to move the cursor between digits of set value.

**[6] Mode Key**

Key to change the function.

**[7] MODE Display**

FIX mode and PROGRAM mode are available.

**[8] Message Display**

Displays the current status of the machine.

**[9] PV Display**

Displays the current temperature.

**[10] SV Display**

Displays the target temperature.

**[11] TIMER Display**

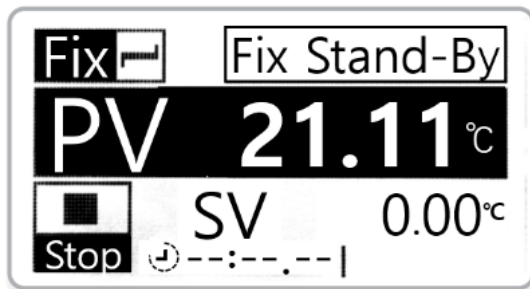
Displays the remaining time during operation.

“--.--.--” represents that timer is off.

**[12] RUN / STOP Display**

Displays the machine is on operation or stop.

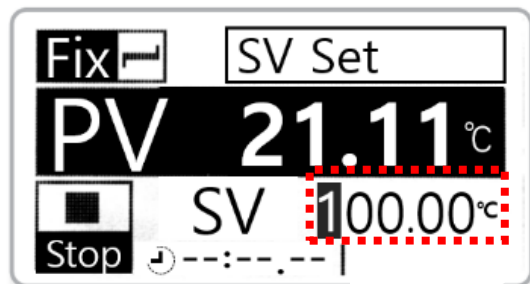
## 2.2 How to Operate



– Main Screen



Mode Key



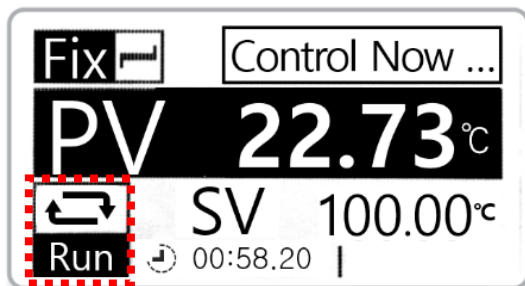
– Set Temperature(SV)



Run/Stop Key



– Set Timer



– Start RUN (Operation)

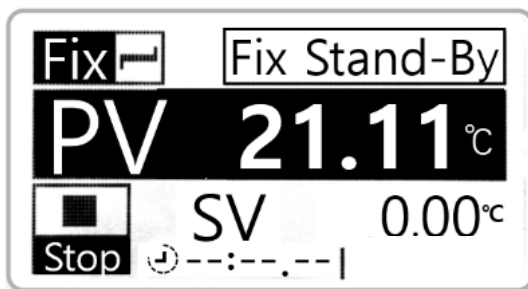


When the oil is heated at a high temperature such as 100 to 150 °C for 30 minutes or longer, the temperature should be increased over the stabilization time.  
(Bubbles can cause oil splashing)

## 2.3 Auto Tuning

Auto Tuning can calculate the optimized P.I.D gain for the experiment environment in order to have an accurate and quick experiment. Since the calculated gain is saved automatically, the experiment with the same condition can be performed more than once if the tuning is set once.

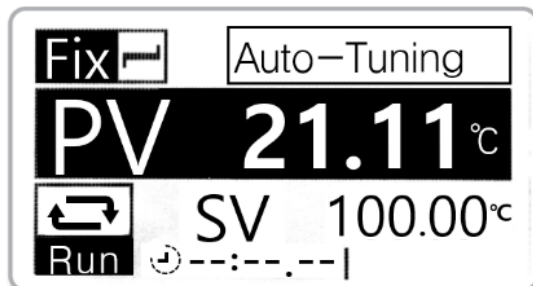
Auto-Tuning can be stated only in the RUN state.



\* Fix Control Mode



Key (3s)



\* Auto-tuning message shows up to start the operation.

\* When auto tuning is finished, it is controlled to set temperature.

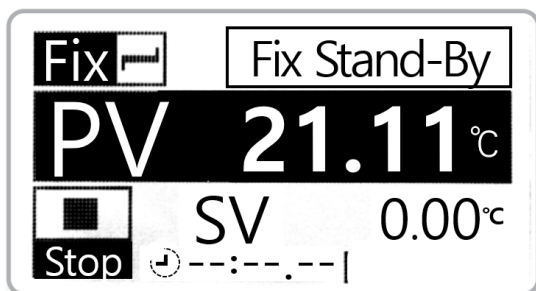
\* To stop auto tuning, Press Shift Key and Run/Stop Key at the same for 2 seconds.



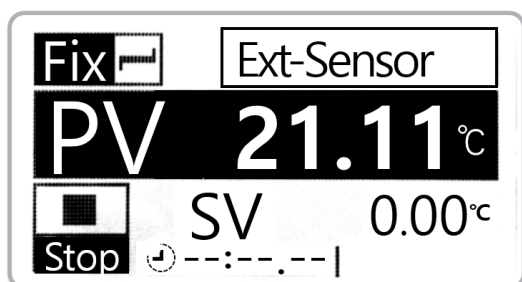
During Auto Tuning operation, temperature can be higher than set temperature.

## 2.4 External sensor

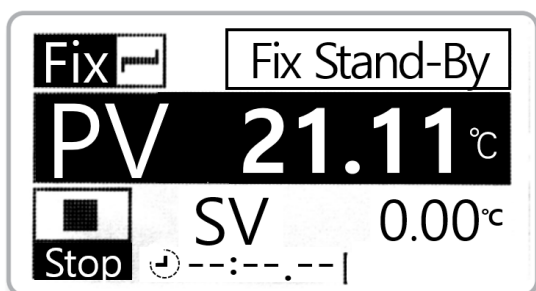
External sensor is used to directly control the external test temperature with the machine. Attach the external sensor and set EXT. Sensor mode to control the temperature with external sensor. Also, it can be used in the same way as internal sensor with functions such as program mode, auto-tuning mode, etc.



\* Fix Control Mode



\* Ext. Sensor Mode



\* Int. Sensor Mode



Change the sensor when machine is not in operation.

# 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 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.

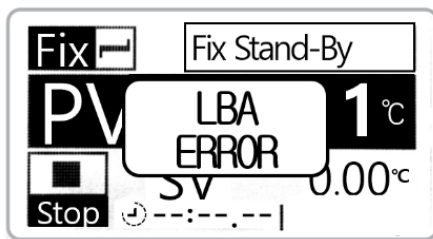
### 3.2.2 If Circuit Breaker of main body constantly experiencing short-circuit.

- Please contact our A/S department.

### 3.2.3 If temperature control is not working

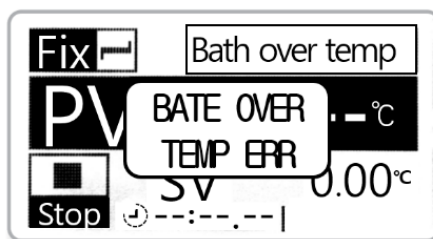
- Activate Auto-tuning.
- If all necessary action is made but still having a problem, please contact our A/S department.

### 3.2.4 Error Message



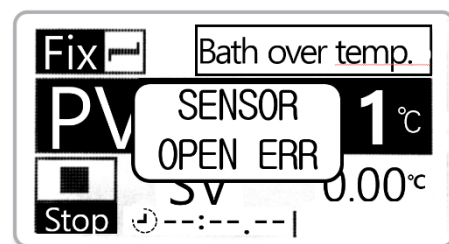
#### 〈LBA; Control Routine Disconnection Alarm〉

When this message displays, please contact our A/S department.



#### 〈Over Temp. Error〉

This occurs when the temperature of the machine exceeds the operating temperature range. Stop the machine and wait until the temperature decreases. After temperature drops, press the Mode Key to return to the normal state.



#### 〈Sensor Open Error〉

This occurs sensor is in abnormal status. When using external sensor mode, check the connection.  
If external sensor mode is not in use, check the mode setting.



–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	Capacity	Type
B04-811-249	LO-BG160	2 L	PID Control
B04-811-259	LO-BG200	4.5 L	

Cat. No.		B04-811-249	B04-811-259
Model		LO-BG160	LO-BG200
Capacity		2.0 L	4.5 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)	
Temperature (at 100 °C)	Range	Ambient +5 to +250 °C	
	Accuracy	±0.3 °C	
	Uniformity	±0.85 °C	±1.52 °C
Electric Supply	Power	1 Phase, 220 VAC, 50/60 Hz	
	Max Consumption	450 W (2.1 A)	550 W (2.5 A)
	Power Line	Standard Plug	
Safety		Over Temp. & Current Protection, Automatic Fault Sensing System	

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 자기부담금: ₩ 1,000,000

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 화재위험부담보특별약관

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