Digital Water Bath

User Guide version 1.0

Model

LB-WD316, LB-WD321, LB-WD522

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LK LABKOREA

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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

1. Preparation

1.1 Product Introduction

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

Various functions and safety are maximized for user's convenience and safety.
Tish product has the following features.

1.2 Product Features

1.2.1 Product Performance and Convenience

- Available to control of heated sample or reagent by external sensor.
- Temperature control as 1/100 resolutions.
- Graphic LCD Display with simple and intuitive controller operation.
- Available to fast and precision control with PID controlling system by high performance micro process.
- Auto-tuning function installed by self-calculating PID value based on research environment afford easier and more convenience control of temperature.
- External sensor and RS485 PC communication port attached.

1.2.2 Safety

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

1.3 Product Structure

[Digital Water Bath]

[1] Temperature Controller

Controls the temperature.

[2] Over Temp. Limiter

The temperature go over the set temperature, shut out the power of heater immediately to prevent overheat, user need to set 10 % higher temperature from actual treat.

[3] Power Switch

Main power button for ON/OFF.

[4] Bath Cover

Must be closed during operation with high or low temperature.

[5] Drain

Use for draining solutions inside the bath. To open this valve, rotate to clockwise.

[6] Circuit Breaker

Overcurrent protection.

[7] Communication Port

RS485 Communication Port.

[8] External Sensor Port

Port that connects the external sensor.

[9] Power Cord

Main power cord.

[10] 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), Power Cord (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
- In case the power cord is separated from main body, connect them first and plug the cord to power supply point. (outlet)

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

1.4.4 Initial Setting

- Fill the bath with solution
- Set the value of Over Temp. Limiter.

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

2. Operation

2.1 Naming and Function of Temperature Controller

[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.

[7] Down Key
Use for decreasing of set value.

[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 표시

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.

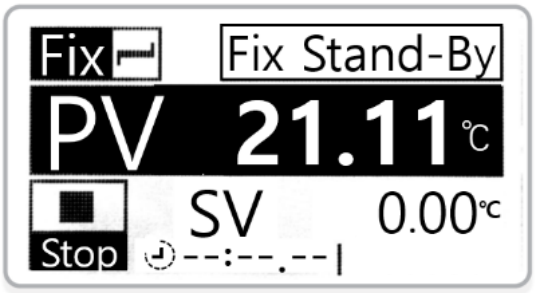
[15] TIMER Display

Timer display remain time for operation " --.--.—" means timer off.

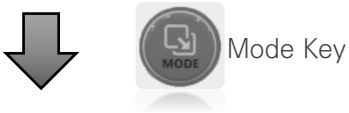
[16] RUN / STOP Display

Display the status RUN or STOP.

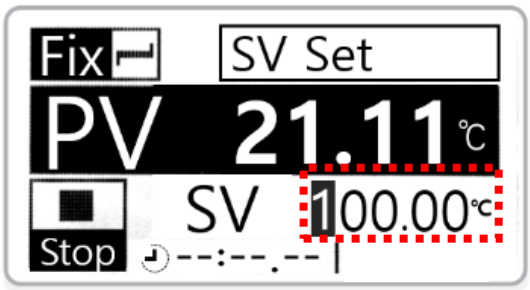
2.2 How to Operate



– Main Screen

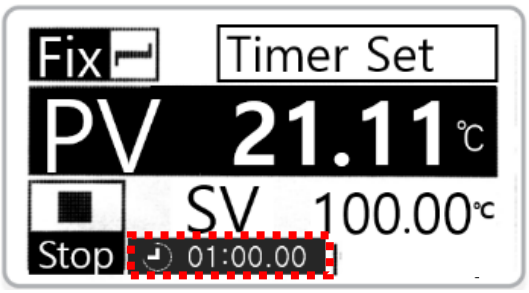


Mode Key



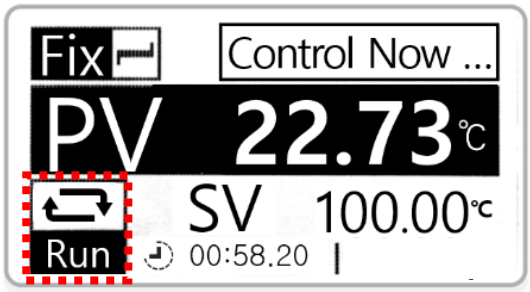
– Set Temperature(SV)

Run/Stop Key



– Set Timer

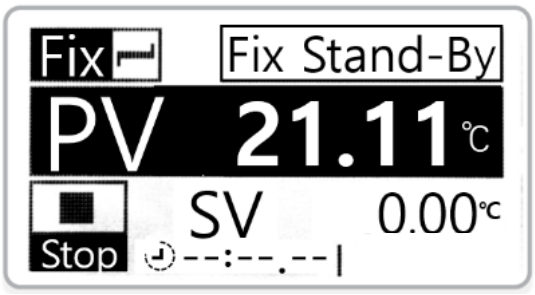
Run/Stop Key (3s)



– Start RUN (Operation)

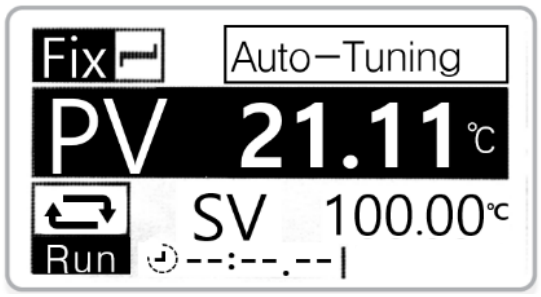
2.3 Auto Tuning

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.

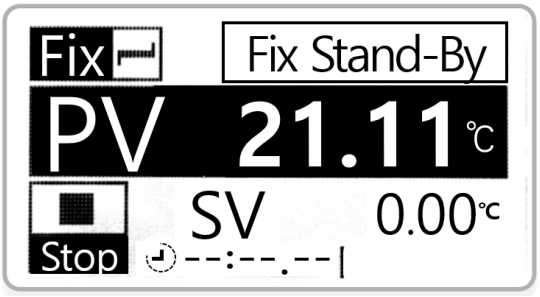
* When auto tuning is finished, it is controlled to set temperature.

* 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.

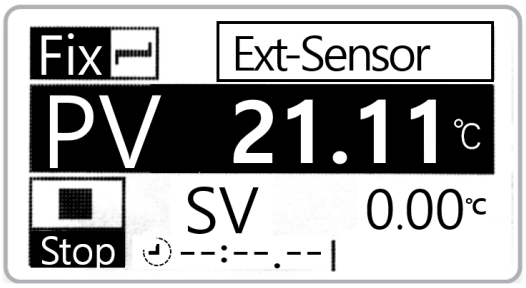
2.4 External sensor

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.



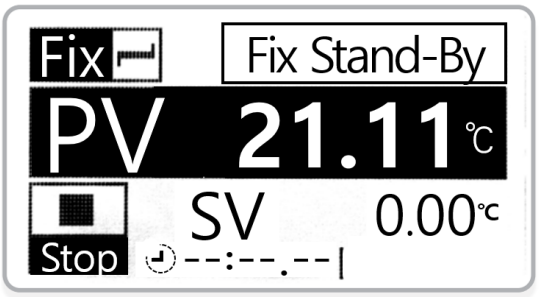
* Fix Control Mode

Key (3s)



* Ext. Sensor Mode

Key (3s)



* 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.

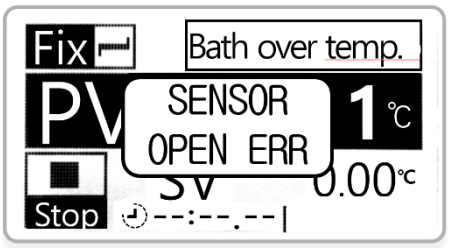
3.2.2 If Circuit Breaker of main body constantly experiencing short-circuit.

- Please contact our A/S department.

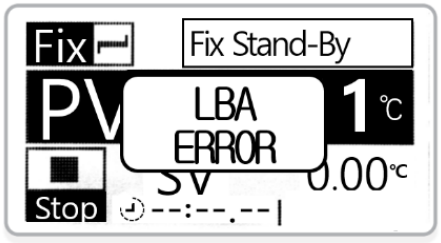
3.2.3 If temperature control is not working

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

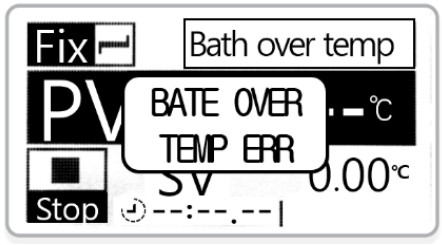
3.2.4 Error Message



〈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.



〈LBA; Control Routine Disconnection Alarm〉
Please set the Over Temp. Limiter set 10 % higher than Treat value. If the error message still comes up after set, 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.

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.

-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.

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

4. Specification

Cat. No.	Model	Type	Capacity
B04-02-050	LB-WD316	PID Controller	6 L
B04-02-100	LB-WD321		11 L
B04-02-150	LB-WD522		22 L

Cat. No.		B04-02-050	B04-02-100	B04-02-150
Model		LB-WD316	LB-WD321	LB-WD522
Capacity		6 L	11 L	22 L
Controller	Control	PID Controller, Auto-tuning		
	Display	GLCD (Graphic LCD)		
	Resolution	0.01 ℃		
Temperature	Range	Ambient +5 to +100 ℃		
	Accuracy (at 50 ℃)	±0.3 ℃		
	Uniformity (at 50 ℃)	±1.12 ℃	±1.42 ℃	±1.84 ℃
Dimension (w x d x h)	Internal (mm)	300 x 155 x 110	300 x 240 x 110	500 x 295 x 110
	External (mm)	325 x 180 x 260	325 x 265 x 260	535 x 330 x 260
Material	Interior	Stainless Steel 304		
	Exterior	Powder Coated Steel		
Electric supply	Power	1 Phase, 220 VAC, 50/60 Hz		
	Max Consumption	800 w (3.6 A)	1 kW (4.6 A)	2 kW (9.1 A)
	Power Line	Standard Plug		
Other	Drain	N/A		1/4" Hose Nipple Male

Memo

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