Digital Extraction COD Water Bath

User Guide

추출용 항온 수조 사용자 설명서 version 1.0

Model

LB-SD410, LB-SD610

www.lklab.com

LK LABKOREA

Thank you for purchasing the product of LK Lab Korea CO.,LTD.

This User Guide describes your product's function,

operation and safe use.

Please read carefully and keep them in mind

before you operate products.

In case some parts which need extra care for users,

we put some marks as below for the occasion.

This is the mark for the Dangerous Situation.
If users ignore this, it might cause of serious personal injury or damage to products.

[Warning Mark]

This is the mark that come up with the situation which needs extra care.
When users recognize this sign, they have to operate more carefully.

[Attention Mark]

Contents

1.Preparation

1.1 Instruction

This Digital Extraction COD Water Bath is designed for distillation, concentration, synthesis , COD measures and many other purposes. With various functions and safety devices are installed, designated for users' convenience and safety as the biggest priority of this circulator.

Feature

1.2 1.2.1 Function and Convenience

- 1/100℃ Temperature control as 1/100 resolutions.
- Available to use in various sizes of flasks with detachable ring covers.
- Operate easily and conveniently with a Graphic LCD Display Controller.
- Program that can control the temperature of different levels is installed (10 steps controls)
- PID control system by high-performance microprocessor afford to faster and more precision temp. control.
- Auto tuning function installed by self-calculating PID value based on research environment afford easier and more convenient control of temperature.

1.2.2 Safety

- Double over temperature safety device installed.
  (1^{st} Controller Alarm, 2^{nd} Over temperature shutdown circuit)
- Abnormal situation occurs, a buzzer and message will notice the situation to the user.

1.3 Installation

1.3.1 Contents of Product

Main Body 1ea, Power Cord 1ea, User Manual 1ea,
Ring Cover 4~6sets, Support Frame 1set

1.3.2 Installation Environment

- Avoid direct light.
- Place where with less vibration and flat surface.
- Maintain the temperature of the surrounding area the product placed between5 to 40℃
- Maintain the humidity of surrounding the product placed below RH 80%
- Avoid the place where may occur flammable gas.
- Avoid the place where may occur noise and high frequency.
- Avoid the place where may occur overcurrent or water leak.
- Avoid the place where may occur corrosive gas or dust.

* Place where within 5 ~ 40 ℃ of temperature and below 80% of humidity.

1.3.3 Connecting of Power

1) Set the power switch as OFF.

2) In case the power cord is separated from the main body, connect them first and plug the cord to the power supply point(outlet).

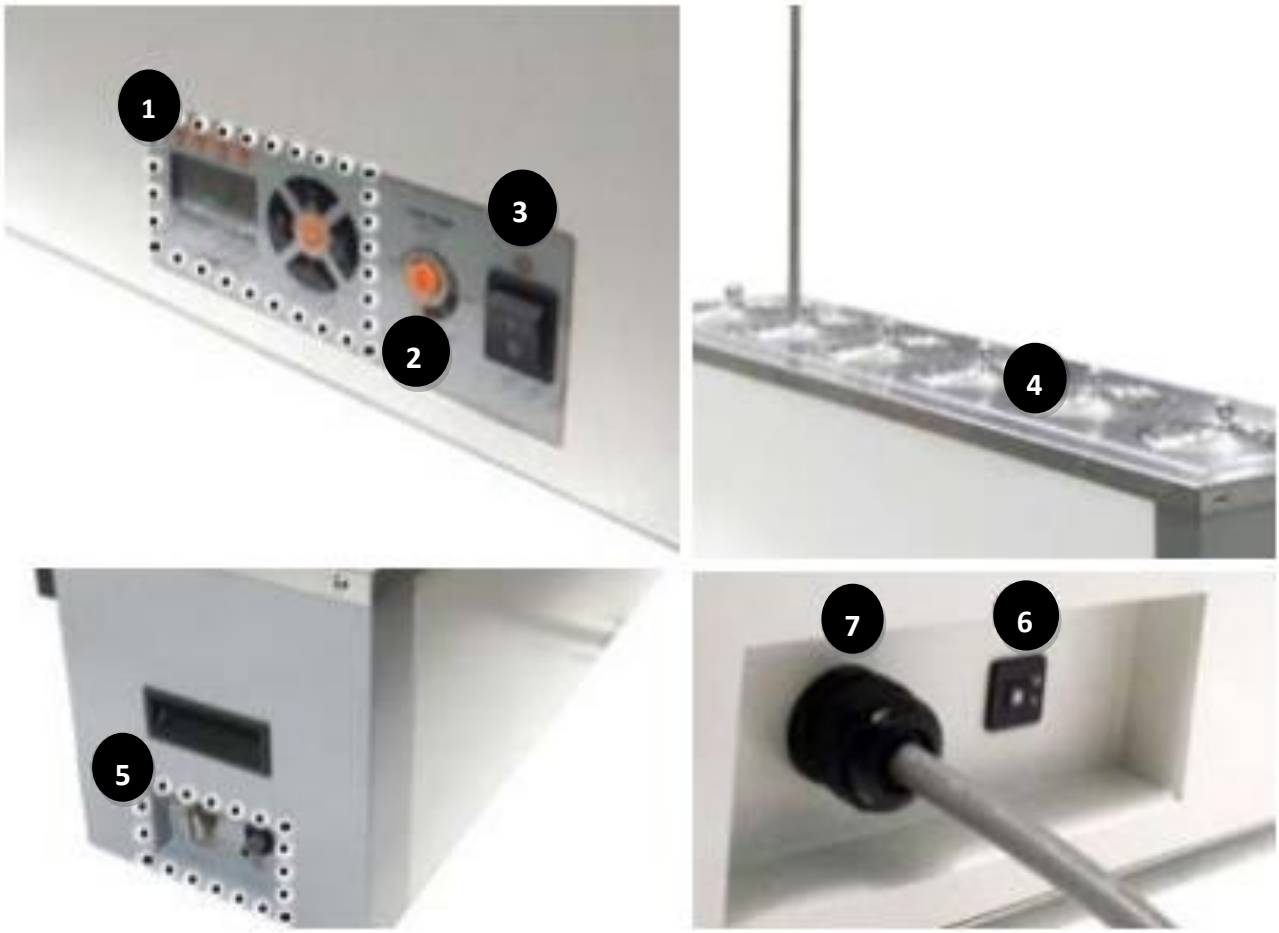
* Before you plug in to supply electronic power, please carefully check for electrical specifications of the equipment and considerthe specification.
* Must use a power supply point that is completely ground-connected.
* Do not touch the power cord with a wet hand.

1.3.4 Initial Setting

1) Fully fill the solutions into the bath

2) Set the Over Temp. Limiter.

1.4 Structure



[COD Water Bath]

[1] Temperature Controller

[2] Over Temp. Limiter

[3] Power Switch

[4] Ring Cover

[5] Drain

[6] Circuit Breaker

[7] Power Cord

[1] Temperature Controller

Use for controlling the temperature

[2] Over-Temp. Limiter

If the temperature is going over the set temperature, prevents overheating by shutting the power of heater.

* Must be set 10% more that the temperature needed for the purpose

[3] Power Switch

ON/OFF switch for the main power.

[4] Ring Cover

Available to use in various sizes of flasks.

[5] Drain

Use for draining solutions insde the bath.

[6] Circuit Breaker

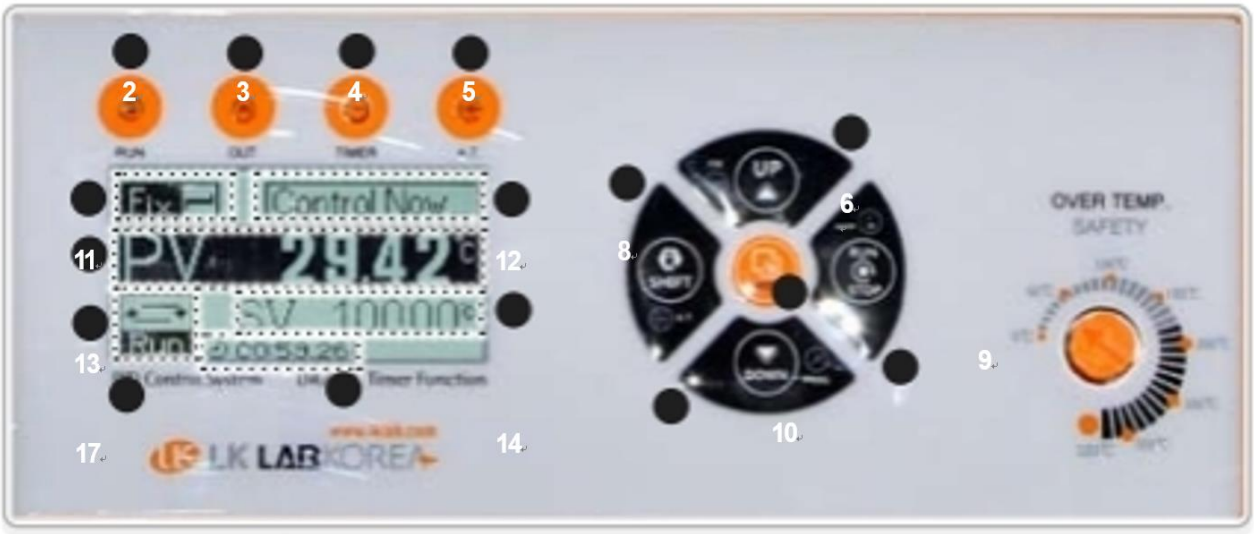
Breaker of overcurrent protection

[7] Power Cord

Supply the power to the equipment.

2.Operation

2.1 Naming and Function of Temperature Controller



[1] Graphic LCD

Available to check the status of the equipment and display data.

[2] Run Lamp

Light on during the equipment operates.

[3] Heater Lamp

Displaying output of the heater with flashing.

[4] Timer Lamp

Light on during the equipment operates with timer.

[5] A.T Lamp

Light on during equipment operates with auto-tuning.

[6] Up Key

Use for increasing the set value and setting Fix mode.

[7] Down Key

Use for decreasing the set value, setting Program 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] Display MODE
Users can select one between FIX(one temp.) and Program(multiple temps.)Mode.

[12] Message Displaying Window
Display of the message-related status of the product.

[13] PV Display
Display the current temperature of the equipment.

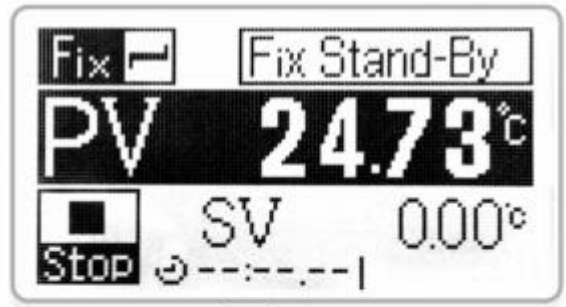
[14] SV Display
Display the target temperature the user set.

[15] TIMER Display
Timer display remains a time for the operation.
“—.—.—“means timer “off”.

[16] RUN / STOP Display Display the status
RUN or STOP.

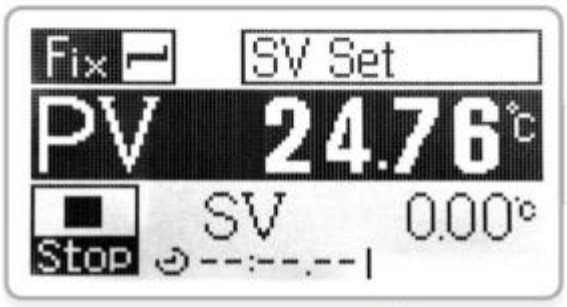
2.2 Operation Method / FIX MODE (Operating with One temperature)

Check the MODE status, and change to FIX MODE by pressing the <UP key> for 3 seconds if it is not in FIX mode.



— Fix Mode Stand-By

Mode Key



— SV Set Mode

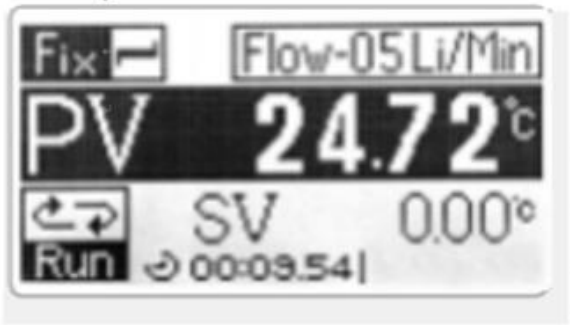
Set the SV value.

— Timer Set Mode

Set the Time.

— Fix Mode Stand-By

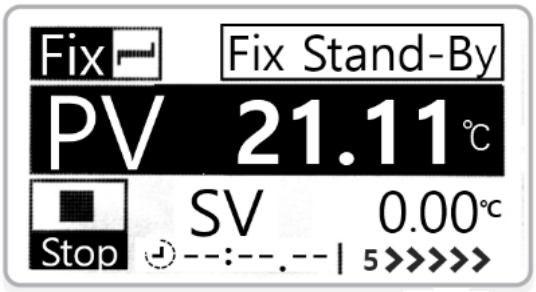
2 seconds



— Start Run mode

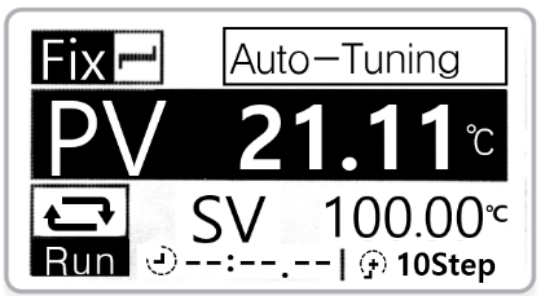
2.3 Other Function

Auto Tuning can perform more accurate and faster experiments by self-calculating the optimal "P.I.D. Gain" for the experimental environment. The calculated Gain value is saved automatically so that the user needs only tuning once if the user wishes to proceed with the same experiment once again. Auto-Tuing is only allowed to operate on the "RUN" state.



— Fix Control Mode

Key (Pressing at once for 3 seconds)



— Start with Auto Turing message

* After the Auto-Tuning, the equipment will operate with the set temperature.
* In case stop Auto-Tuning, press the **Shift** and **RUN/STOP** buttons at the same time for 2 seconds. .

*During Auto-Tuning, due to calculating, in order to reach set temperature Heater gives 100% output, so temperature go higher than the set value.

3.Maintenance

3.1 Maintenance after Use

— After use, Power Switch has to be turned off.

— If the equipment is contaminated, plug off the Power Cord and cleaning with Alcoholic liquid. — If the equipment would not be used for a long time, plug off the Power Cord, clean, and store the equipment.

* Do not use strong acid ,alkaline or volatility solution for cleaning the equipment.
* Also completely dry the equipment after cleaning.

3.2 Disorder and Solution

3.2.1 Power On Disorder

1) Please check the power supply.

2) Please check if the Power switch is “ON”

3) Please check if the circuit breaker is protruded forward

4) Please check the Power cord is well connected with the main body.

5) Please check the earth leakage breaker on the outlet connected to the main body is in the “ON” state.

6) Please contact our Technical Support Department if still not working despite all actions taken.

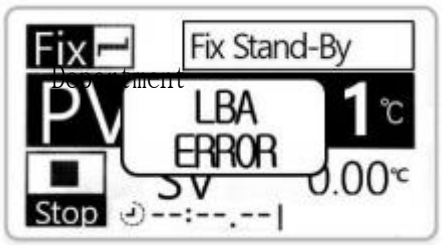
3.2.2 Earth Leakage Breaker is keeping short continuously

1) Contact our Technical Support Department.

3.2.3 Out of Control the Temperature

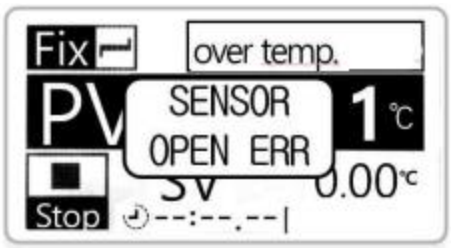
1) Must be set Over Temp. Limiter 10% more than the temperature needed for the purpose.
2) Please operate Auto-Tuning.
3) Please contact our Technical Support Department if still not working despite all actions taken.

3.2.4 Error Message



< LBA; Control Routine Breaking Down Alarm >

Please set the Over temp. Limiter 10% higher than the set temperature. If the error message "LBA" comes up, contact our Technical Support

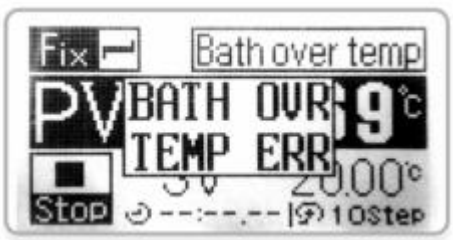


< Sensor Open Error >

Occurs when there is an abnormality in the sensor.

If using external sensor mode, Check well connected with the main body.

If not using external sensor mode, Check the setting mode.



< Over Temp. Error >

The Error message will be displayed if it is overheated beyond the set temperature range. Please stop the equipment and wait until the temperature drops sufficiently.
The status will be back to normal if press the Mode key after the temperature drop.

3.3 After Sales Service

3.3.1 Warranty

The warranty period is expired by 1 year after purchasing equipment. After 1 year, cannot get warranty repairing service. The user has to pay for replacing parts or repairing work. Within the warranty period, the user can get service from LK Lab Korea's Technical Support Department or the Supplier of the equipment.

3.3.2 Exceptional case of Warranty

Damage or defective by fire or inundation, carelessness usage, don't use standard liner power supply recommended, operation at abnormal condition, misuse or unskilled usage cannot get warranty service

3.3.3 Applying After Sales Service

Firstly, contact our Technical Support Department or Supplier of the products and inform detailed symptoms with the contact of the user by mail or fax. After receipt of after-sales service inquiry, our technician quotes and the user decides after getting quoted. In case of not responding after 2 weeks from receipt of the after-sales service inquiry, the product will be returned to the user.

* In case apply after-sales service, the user has to inquire to our Technical Support Department or Supplier of the equipment. If the user randomly disassembles or changes parts inside, repair of equipment cannot be available.

* Disorder or defective out of reasonable ranges, cannot be available to repair.

Tehchnical Support Department of LK Lab Korea Co., Ltd: +82 031-572-4952

4.Specification

Cat. No	Model	Type	Capacity
B04-01-010	DCWB05	PID Controller	5 L
B04-01-020	DCWB10		10 L
B04-01-030	DCWB20		20 L
B04-01-040	DCWB30		30 L

Cat. No.		B04-01-010	B04-01-020	B04-01-030	B04-01-040
Model		DCWB05	DCWB10	DCWB20	DCWB30
Capacity		5 L	10 L	20 L	30 L
Controller	Control	PID Control, Autotuning			
	Display	GLCD (Graphic LCD)			
	Resolution	0.01℃			
Fan Speed		1 ~ 5단			
Temperature	Range	Ambient +5℃ to +100℃			
	Accuracy at 50℃	±0.05℃			
	Uniformity at 50℃	±0.25℃	±0.37℃	±0.58℃	±0.68℃
Dimension	Internal (w×d×h)	150×165×150 mm	240×300×150 mm	290×495×150 mm	320×470×200 mm
	External (w×d×h)	180×330×527 mm	270×330×527 mm	330×540×527 mm	360×515×577 mm
Pump	Capacity / Pressure	22 L/min / 0.47 bar (6.8psi), Water at 25℃			
Electric Supply	Power	1 Phase / 220VAC / 60 Hz			
	Max Consu-mption	700 W (3.2 A)	1.1 Kw (5 A)	2.1 Kw (9.6 A)	2.8 Kw (12.8 A)
Other	Drain	1/4" Hose Nipple male			

KBIZ중소기업중앙회

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가 입 기 간	2014년 04월 10일 00:00 ~ 2015년 04월 09일 24:00 (증권발행지의 표준시 기준)

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[생산물배상책임]

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2014년 04월 09일
중 소 기 업 중 앙 회
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Circulating Water Bath User Guide

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