Circulating Oil Bath

User Guide

Circulating Precision Thermostatic Bath User Manual – English Version

Model: COB10, COB20, COB30

www.lkiab.com
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 circulating precision constant temperature bath.

This product is designed for use in fields such as chemistry, biology, medicine, and pharmaceuticals.

It offers various functions and safety features for enhanced user convenience and safety.

1.2 Product Features

1.2.1 Performance and Convenience

- Controls the temperature of experimental devices using an external circulation system.
- High-precision temperature control with 0.01°C resolution.
- Allows control of external equipment temperature using an external sensor.
- Equipped with a BLDC motor pump for powerful pressure and flow.
- Adjustable pump levels to match experimental conditions.
- Easy-to-use Graphic LCD Display Controller.
- PID control system via high-performance microprocessor for fast and accurate control.
- Built-in AUTO TUNING function automatically calculates optimal PID values for the experiment.

1.2.2 Safety

- Low Water Alarm prevents overheating due to insufficient liquid.
- Dual over-temperature protection (1st controller alarm, 2nd cutoff circuit)
- Abnormal situations are indicated via buzzer and screen messages.

1.3 Installation

1.3.1 Components

Main unit: 1EA, Power cord: 1EA, User manual: 1 copy

1.3.2 Installation Environment

- Avoid direct sunlight.
- Place on a stable and flat surface.
- Keep ambient temperature between 5°C and 40°C.
- Keep humidity below 80% RH.
- Do not install where flammable gas may leak.
- Avoid locations with strong high-frequency noise.
- Avoid areas with risks of electric leakage or water leakage.
-  Avoid corrosive gas or dusty environments.

1.3.3 Power Connection

1) Turn the power switch OFF.
2) If the power cord is detached, connect it to the main unit first, then to the outlet.

- Ensure power specifications match the rear label of the unit.
- Use a properly grounded power source.
- Do not handle the power cord with wet hands.

1.3.4 Initial Setup

1) Fill the bath with solution (distilled water, oil, alcohol).
2) Connect the Circulation IN/OUT fittings.
3) Set the Over Temp. Limiter.

- Use solutions with suitable viscosity for circulation.
- Excessively high viscosity may cause device malfunction.

1.4 Product Structure

[1] Temperature Controller	[6] Circulation IN/OUT
[2] Over Temp. Limiter	[7] Circuit Breaker
[3] Power Switch	[8] Communication Port (RS485)
[4] Bath Cover	[9] External Sensor Port
[5] Drain	[10] Power Cord

[1] Temperature Controller

[2] Over Temp. Limiter: Cuts off heater power if the temperature exceeds the set limit.

- Set it approximately 10% above the operating temperature

[3] Power Switch: Main power ON/OFF switch.

[4] Bath Cover: Close during low or high-temperature operation to maintain stability.

[5] Drain: Used to empty liquid from the bath.Turn the knob counterclockwise to release the solution

- Always check the temperature before draining to avoid burns

.

[6] Circulation IN/OUT: Fittings for circulating fluid in and out.

- Ensure proper connection of IN/OUT fitting before operation.

[7] Circuit Breaker: Prevents overcurrent damage.

[8] Communication Port (RS485): For external communication.

[9] External Sensor Port: Connects an external sensor for temperature control.

[10] Power Cord: Supplies power to the unit.

2. Operation

2.1 Temperature Controller Overview

[1] Graphic LCD: Displays device status and data.

[2] Heater Lamp: Flashes to indicate heater output.

[3] Comp. Lamp: Lit when compressor is operating.

[4] Pump Lamp: Lit when pump motor is operating.

[5] EXT. Sensor: Lit in external sensor mode.

[6] Up Key: Increases setting value, sets Fix/EXT mode.

[7] Down Key: Decreases setting value, sets Program/INT mode.

[8] Shift Key: Moves digit and sets Auto-Tuning.

[9] RUN/STOP Key: Starts/stops and stores values.

[10] Mode Key: Switches menu.

[11] Message Window: Displays device status messages.

[12] PV Display: Shows current temperature.

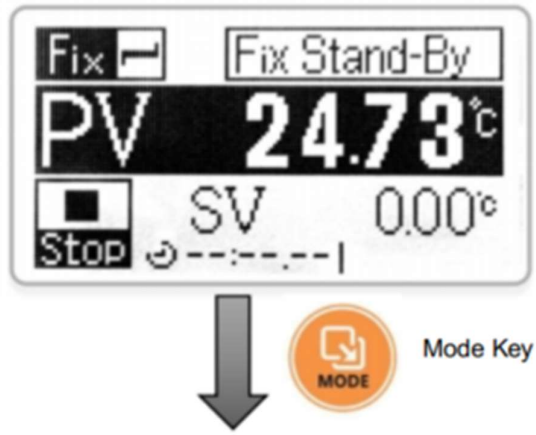
[13] SV Display: Shows set temperature.

[14] TIMER Display: Remaining time in TIMER mode. Shows "--.--.--" when inactive.

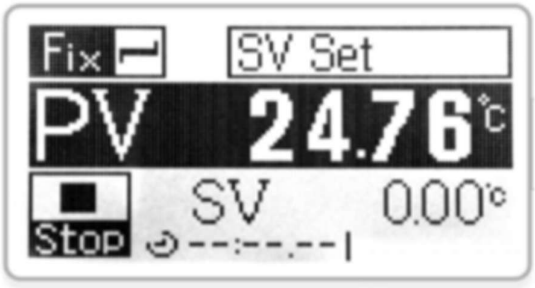
[15] RUN/STOP Display: Indicates operating status.

[16] Pump Level Display: Indicates pump stage (0 to 10).

2.2 Operating Instructions

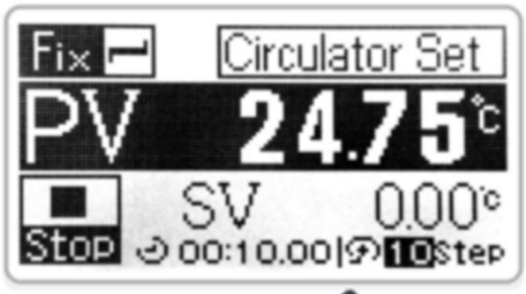


- Stand-By Mode

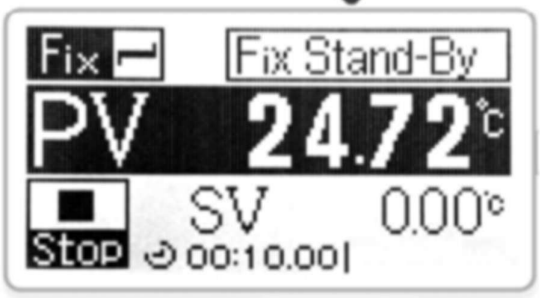


- SV Set Mode: Set target temperature.

- Timer Set Mode: Set timer duration.



- Pump Speed Set Mode: Set pump speed.



- Stand-by

2 second

- Run: Start operation after holding for 2 seconds.

2.3 Auto Tuning Function

Auto-Tuning automatically calculates the optimal P.I.D. gains based on the experimental environment, enabling faster and more accurate operation.

The calculated gains are saved automatically, so tuning only needs to be performed once under the same conditions.

Auto-Tuning can only be started when the device is in RUN mode.

- Run

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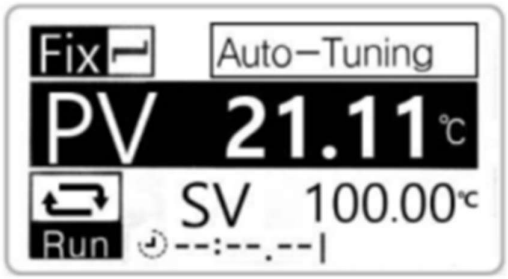
Press Shift + RUN/STOP for 3 seconds to start



- Runs with auto tuning message.

* Device controls to target temperature after Auto tuning.

* Press Shift + RUN/STOP again for 2 seconds to stop Auto Tuning.

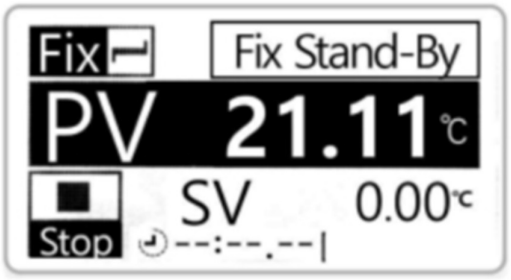
Note: Temperature may rise above set point during tuning.

2.4 External Sensor Usage

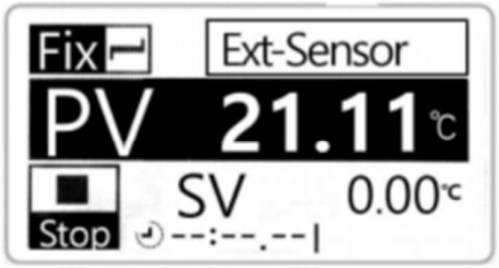
This function is used to directly control the temperature of an external experiment setup.

By connecting an external sensor and switching to EXT. Sensor Mode, the device will control the temperature based on the external sensor input.

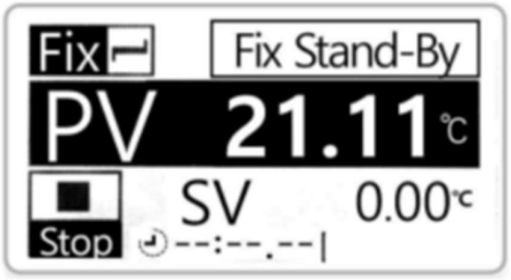
Features such as Program Mode and Auto-Tuning can also be used in the same way as with the internal sensor.



- Stand-By mode.



- Ext. Sensor Mode



- Int. Sensor Mode

Note: Switchable only when device is stopped.

3. Maintenance

3.1 Post-Use Maintenance

- Turn off Power Switch after experiment.
- If contaminated, unplug and clean with alcohol.
- For long-term storage, unplug and clean thoroughly.

Do not use strong acids, bases, or volatile solvents.

Ensure full drying after cleaning.

3.2 Troubleshooting

3.2.1 Device won't power on

1) Check the power source being used.
2) Make sure the Power Switch on the front of the device is set to ON.
3) Ensure the Power Cord is securely connected.
4) Verify that the circuit breaker of the outlet is turned ON.
5) If the device still does not operate after checking all of the above, please contact our service center.

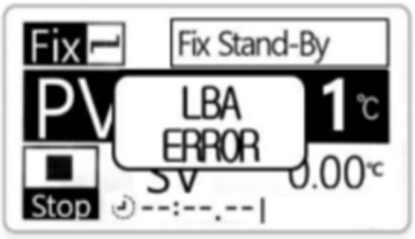
3.2.2 Circuit breaker keeps tripping

1) Contact our service center.

3.2.3 Temperature not controlled

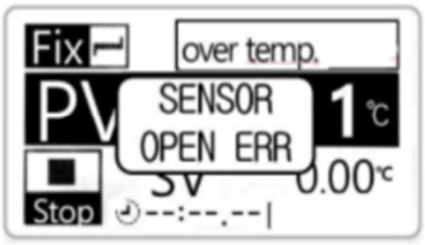
1) Run Auto Tuning.
2) If the device still does not operate after checking all of the above, please contact our service center.

3.2.4 Error Messages



<LBA: Control Routine Disconnection Warning>

If this message appears, please contact our service center.



<Sensor Open Error>

This error occurs when there is a problem with the sensor.

If using External Sensor Mode, check the sensor connection.

If External Sensor Mode is not being used, verify the mode setting.

<Over Temp. Error>

This error appears when the temperature exceeds the device's allowable operating range. Stop the operation and wait until the temperature drops. Once the temperature has returned to a safe level, press the Mode Key to resume normal operation.

3.3 After Service

3.3.1 Warranty Period

The warranty period is one year from the date of purchase.

After one year, free repair service will no longer be provided, and repair or part replacement fees may apply.

During the warranty period, service can be received from LK Lab Korea’s SERVICE Center or the authorized distributor from which the product was purchased.

3.3.2 Cases Not Covered by Warranty

The following cases are not eligible for free service:

Damage caused by fire, flooding, or contamination due to external factors during use, use of incorrect power supply or voltage, operation under abnormal or inappropriate conditions, malfunction due to improper handling, misuse, or user error

3.3.3 How to Request Service

First, contact LK Lab Korea’s Service Center or the distributor where the product was purchased.

Send the product along with a description of the issue and your contact information.

After receiving the product, a repair estimate will be sent to you.

Based on the estimate, you may decide whether to proceed with the repair.

If no response is received within two weeks after the estimate is sent, the product will be returned without repair.

- If you disassemble or replace parts of the product on your own, service may not be possible.
- Malfunctions caused by usage beyond the product’s normal limits are not eligible for service.

Service Center Contact Information

LK Lab Korea Service Center: exp@lklab.com

4. Specification

Cat. No.		B04-01-050	B04-01-060	B04-01-070
Model		COB10	COB20	COB30
Capacity		10 L	20 L	30 L
Controller	Control	PID Control, Auto-tuning		
	Display	GLCD (Graphic LCD)		
	Resolution	0.01℃		
	Timer	Run start / Wait start (99 hr 59 min)		
Temperature	Range	주변온도 +10℃ to +250℃		
	Accuracy at 100°C	±0.3℃		
	Uniformity at 100°C	±0.42℃	±0.85℃	±1.23℃
Pump	Capacity	22 L/min (at water 25℃)		
	Pressure	0.47 bar / 6.8 psi (at water 25℃)		
Size	Interior	w240×d300×h150 mm	w250×d450×h180 mm	w300×d450×h230 mm
	Exterior	w310×d370×h425 mm	w320×d520×h465 mm	w370×d520×h505 mm
	Top Open	w240×d130 mm	w250×d270 mm	w320×d270 mm
Material	Interior	Stainless Steel 304		
	Exterior	Powder Coated Steel		
Electric Supply	Power	1 Phase, 220 VAC, 50/60 Hz		
	Max Consumption	1.1 kW (5 A)	2.1 kW (9.6 A)	2.8 kW (12.8 A)
	Power Line	Standard Plug		
Other	Drain	1/4" Hose Nipple Male		
	Circulating IN / OUT	1/2" Stainless Steel Tubing		
Safety		Over Temp. & Current Protection, Automatical Fault Sensing System		

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