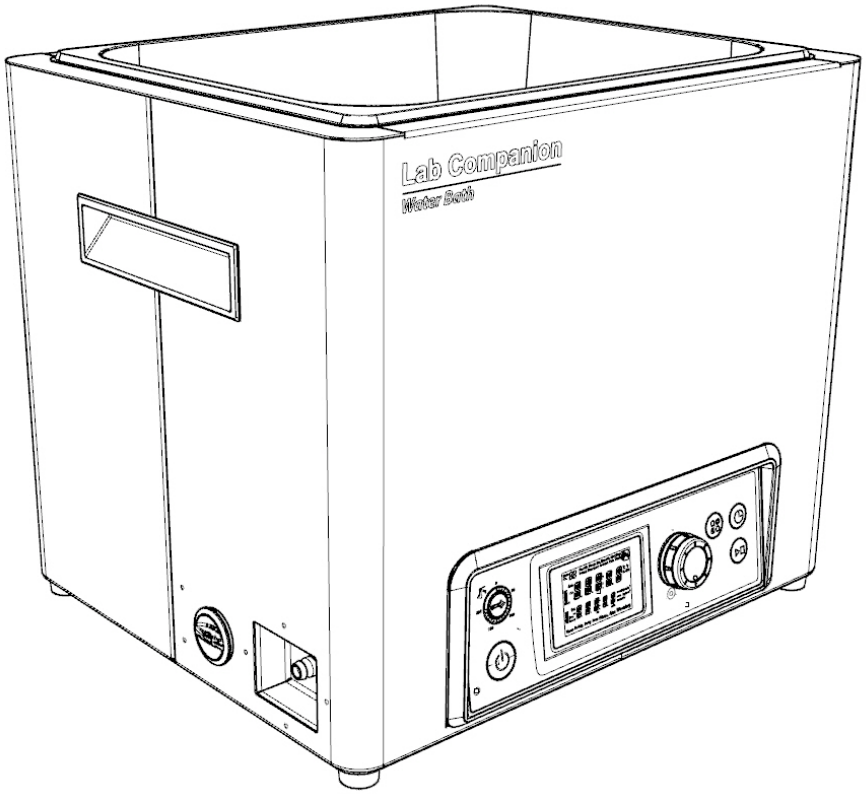

Operation Manual

BW3 series

Model : BW3-05G / 10G / 20G

Manual No. : 41305KL002 Version : 2.0

JEIOtech

⚠WARNING

Before using this product, read this entire Operator's Manual carefully. Users should follow all of the Operational Guidelines contained in this Manual and take all necessary safety precautions while using this product. Failure to follow these guidelines could result in potentially irreparable bodily harm and/or property damage.

Thank you for purchasing Jeio Tech’s products.

Jeio Tech Co., Ltd. is committed to customer service both during and after the sale. If you have questions concerning the operation of your unit or the information in this manual, contact our Sales Department. If your unit fails to operate properly, or if you have questions concerning spare parts or Service Contracts, contact our Service Department.

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Quality Management System ISO 9001

ISO 9001 is a standard that defines the requirements for a Quality Management System (QMS). It ensures the suitability of implementation in order for suppliers to continuously provide products and services that meet the buyer's requirements. JEIOTECH Co., Ltd. obtained ISO 9001 certification from Korean Foundation for Quality (KFQ) since 1998 to provide better service.

Under this certification system, we design, develop, produce and sell a wide range of products related to chemical engineering, environment and life. We also provide reliability testing equipment for electrical and electronic engineering. (Dryer, incubator, constant temperature and humidity chamber, constant temperature water tank, low temperature circulation tank, heat exchanger, stirrer, etc.)

You can download the above image by visiting the following JEIOTECH site.
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Table of contents

1.0 Safety

1.1 How to use the Manual

1.1.1 Introduction

This manual is intended for individuals requiring information about the use Constant Temperature Water Bath (Water bath). Use this manual as a guide and reference for installing, operating, and maintaining your Jeio Tech Constant Temperature Water Bath (Water bath) Series. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity

This manual covers only light corrective maintenance. No installation, service procedure or other maintenance should be undertaken without first contacting a service technician, nor should be carried out by someone other than a service technician with specific experience with laboratory equipment and electricity.

1.1.2 Chapter summary

The safety chapter guides users to use the product with the best caution to prevent any possible accident. Make sure to read the chapter before use.

The Functional Description chapter outlines models covered, standard features, and safety features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.

The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the unit.

The Operation chapter includes a description of controller features, key name, and product operation information.

The Maintenance chapter includes a description of product cleaning, moving, storage.

The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.

The accessories chapter includes all the attachable accessories' information.

The Appendix contains technical specifications, warranty and Jeio Tech technical support contact information.

1.2 Responsibility

This unit has been designed to ensure maximum safety of the user, when used under normal conditions and in compliance with instructions during operation.

All users are required to run the device according to this manual. The user of the device should be fully aware of the safety rules marked on the equipment and all the attention • Warning • Risk on the manual should be complied.

1.2.1 General Liability

In any case, safety is the first priority. The owner of the machine, user, and/or maintenance personnel must be fully aware of the safety which is the most important part of our everyday business.

If you are concern about the loss in efficiency, remember that accidental impact is always negative for the effectiveness of covering human resources and property.

Effective safety program is the most obvious way of increasing efficiency and productivity.

Ensuring and maintaining the safety of the equipment by checking it daily in addition to the regular maintenance of the unit is a shortcut to improving the productivity.

The users must read this manual describing the functions and safety points of each part as a guided for safe operation.

1.2.2 Responsibility of the users

Users are most well- known for the machine's performance and the limit because they are the ones running the machine most of the time.
The safety of the user's maybe be easily be forgotten by the needs of efficiency or familiarity of using the device for a long time.

Precautions with regards to safety in the manual, or by other displayed safety information do not protect the users from injury while they are using the device.

Always read the safety instructions and run the unit safely. In addition, the potential for dangerous situations always should be reported immediately to colleagues and superiors.

< **Things to read** >

• Do not touch any part of the body to the dangerous part of the device.

• Check the voltage, phase and capacity of the power supply and connect properly.

• Do not operate or service, adjust the device until you receive adequate training or are fully aware of the capabilities of the device.

• Remove unnecessary things, sample, or chemicals from this unit.

• When the unit does not operate normally or are neglected from use for a long time check all the settings before operating the equipment.

• Make sure that the unit is operating normally when you move the equipment, or re-use after a long period.

• Stop operating immediately and report to the managers when you find the following states;
- Unsafe operation and status
- Shorts
- Improper maintenance

• When you operating the machine, do not wear loose clothing or jewelry, tie long hair or use hair cap.

• Always keep the equipment clean and peripheral areas, and check if there is a problem with the product or for missing parts.

• When not in use, turn off the power switch or cut off the power to the instrument by disconnecting the power plug.

1.2.3 Preventative Maintenance

Proper maintenance is essential for safety. The maintenance personnel must be aware of the importance of safety in maintenance of the equipment for effectiveness of the unit.

Before removing or adjusting parts of the device, shut off all the electrical supply, remove accessories. The unit must display a warning that it is working.

Please ensure that the device is properly connected to a grounded outlet.
After repair and maintenance, check the work performed and clean tools.

Do not apply the power to the unit until all workers clean the area. The device must be checked if there are no problems with the unit before operating the machine.

1.3 Symbols used in this Manual

The following signal word panels, safety symbols and non-safety symbols are used to alert you to potential personal injury hazards or information of importance. Obey all safety messages that follow these symbols to avoid possible personal injury or death.

1.3.1 Signal word panels

Signal word panels are a method for calling attention to a safety messages or property damage messages and designate a degree or level of hazard seriousness. It consists of three elements: a safety alert symbol, a signal word and a contrasting rectangular background. The following signal word panels are in accordance with ANSI Z535.4-2007 and ISO 3864 standards.

Signal word panels	Uses
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
⚠WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates a property damage message.

1.3.2 Safety symbols

Safety symbols are graphic representations—of a hazard, a hazardous situation, a precaution to avoid a hazard, a result of not avoiding a hazard, or any combination of these messages—intended to convey a message without the use of words. The following safety symbols are used in this manual.

Mandatory

Read manual

Wear gloves

Wear a face mask

Wear goggles

Prohibition

No direct sunlight

No corrosive fluids or cleaners

No high frequency noise

No water

Warning

Safety alert symbol
General caution

Hand crush or pinch

Electrical shock

Foot crush

Flammable or fire could be caused.

Lifting hazard

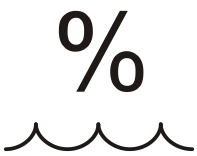
Do not take the device apart deliberately.

1.3.3 Non-safety symbols

The following graphic representations are intended to convey a message without words or to bring your attention to important information about the use of the Product or a feature.

Permissible ambient temperature

Earth ground



Relative humidity

Altitude

1.4 Where to Locate Safety Labels on product

The safety labels are attached to the product important information about potential hazards and how to avoid them. All users must read this operating instruction carefully to operate the product properly.
The following illustrations show where the safety labels should be attached to the product until service of the product is discontinued. If the safety labels are damaged, please contact your local Jeio Tech office or distributor to request new labels.

1.5 Precautions for your product

Our product is designed to provide safe and reliable operation when installed and operated within design specifications. Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your unit. If you have any questions concerning the operation of your unit or the information in this manual, contact our Sales Department.
To avoid possible personal injury or equipment damage when installing, operating, or maintaining this product, use good judgment and follow these safe practices:

1.5.1 Warning statements

⚠WARNING
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Observe all warning labels.

DO NOT remove warning labels.

DO NOT move the product during operation.

Power supply must be properly grounded.
: Abnormal grounded connection causes serious damage. Grounded connection must not be on the water pipe and gas pipe.

Do not insert multiple plugs into the outlet at the same time.
: In case of over current, possible to cable burning, product damage, and fire.

DO NOT operate equipment with damaged line cords.

DO NOT handle or touch electrical cord and electrical parts with wet hands.

DO NOT move the product during operation.

DO NOT use the machine near environments where explosion can occur due to organic evaporating gases.

Do not install the product near environments where flammable gas may leak.

Do not use the machine at places where moisture is high and flooding can be happened.

Do not use the machine near environments where explosion can occur due to organic evaporating gases.

DO NOT use product in environments that contain industrial oil smoke and metallic dust.

Do not install the oven near high- frequency machine. (High-frequency welder, High-frequency sewing machine, large capacity SCR control)

Do not put explosive and flammable chemicals (Alcohol, Benzene, and etc.) into the product.

Do not put any liquid container on product. In case of liquid leaking, the liquid is caused product damage.

Do not expose the product to direct sunlight

Do not expose the product to direct heat sources.

DO NOT let moisture, organic solvents, dust, and corrosive gas enter the control panel.

DO NOT operate the Product when there is strange sound, smell and smoke coming from the unit.

DO NOT operate damaged or leaking unit.

DO NOT disassemble, fix or change the Product other than for those items described in this

operating manual.

In case of inner electronic components service, only the person who is qualified can handle the problem.

1.5.2 Caution statement

⚠ CAUTION
Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

Please install on the sturdy surface laboratory which is set safety facility and make sure horizontal align correctly.

Do not let the product take any strong shock or vibration.

Caution that the artificial heart pulsars, magnetic data devices, or magnet bar are possible to affect the product operating.
Do not move the product by holding the door.

DO NOT operate product and immediately disconnect the main power supply and request service when water may be in the unit.

After use, be sure to turn off the main power switch and unplug the power cord after.

Do not put heavy things on the power line. Do not put the machine on the line.

Installation power outlet near instrument and may be convenient.

Do not sprinkle insecticide or flammable spray on the product.

Please power off while product cleaning.

Do not pour water directly on the outside of product.

Do not clean product by solvent and harsh detergents, please use neutral detergent and smooth cloths.

Do not inject any flammable objects, and conductive objects outside of product hole or vent.

Wear safety gloves and be careful burn from the residual heat from the product.

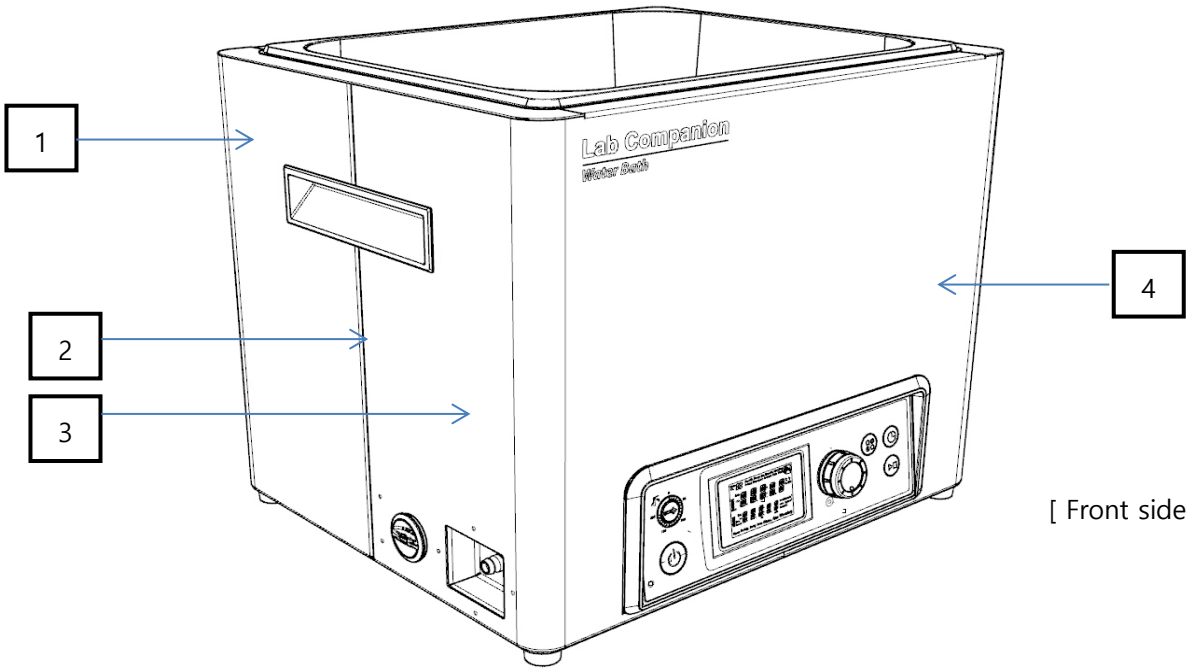
Do not install near other laboratory instrument, electrical devices, or power terminal.

In case of inner electronic components service, only the person who is qualified can handle the problem.

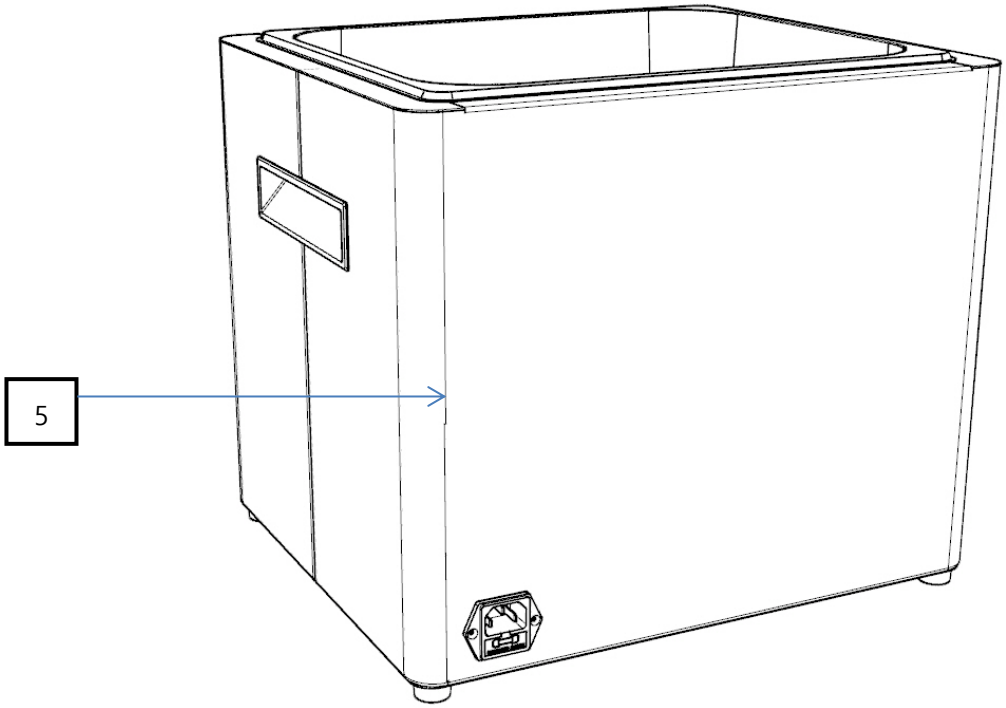
Safety symbols are graphic representations—of a hazard, a hazardous situation, a precaution to avoid a hazard, a result of not avoiding a hazard, or any combination of these messages—intended to convey a message without the use of words. The following safety symbols are used in this manual.

2.0 Functional Description

2.1 Structure



[Front side]



[Back Side]

(1) Handle
Easy and Safety carry by handle.

(2) Drain valve
Turn the drain valve clockwise to drain out the bath fluid. User can easily turn the valve with hand or flat-head screwdriver. After high temperature test, user must wear protective gloves.(BW3-05G model does not have drain valve)

(3) Drain
Bath fluid comes from this part. Turn (2) Drain Valve to open and close the drain hole. Caution that bath fluid may be hot.

(4) Control panel
Controller and other electronical parts are built in.

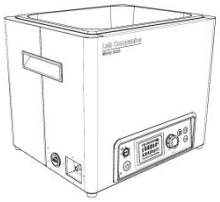
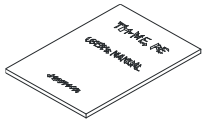
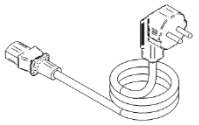
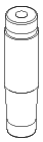
(5) Power socket
Power cord to supply power to the unit.

3.0 Installation

3.1 Components

After unpacking, please check the contents to ensure you have received all of the following unit components. Also, check the identification plate on the side of the unit to make sure you received the model number your ordered.

If you didn't receive one or more of the components or if the model is incorrect, contact your local Jeio Tech office, or the distributor from which the unit was purchased.

Item	Figure	Quantity	Etc
Unit		1	-
Operating & Instruction manual		1	-
Main Code		1	-
Fuse		1	Include in Fuse power socket

3.2 Preparing before installation

The unit can be operated properly under the following environmental conditions for a long time running without any problem.

No direct sunlight.

Check if there is any equipment which comes out strong noise around the unit. If so, remove the causes or move the unit where not to have noise problems.

Please keep Ambient temperature 5℃~40℃

Relative humidity not to exceed 80%

Altitude not to exceed 2000m (6,562 feet)

Check a ground wire of the unit.

3.3 Precautions for use

(1) This product is designed to operate normally on specified power source.

Before installing the product, make sure the suppling power is matched the using power. (refer. ID plate which is located product back side)

The power source must be a grounded more than grand 2. Also the power code must be have ground terminal this product is designed to operate normally on specified power source. Before installing the product, make sure the suppling power to match using power. (refer. ID plate which is located product back side)

(2) An appropriate bath fluid should be non-combustibility. In case of combustibility, the fluid should be over 40 C (Fp : flashing point. On this occasion, for the safety operation, it must be used which is lower than the flashing point of the combustible fluids (more than minimum 5℃ (Fp-5)).

(3) When you transport the product, should be using correct tool and more than one person.

(4) The outlet should be installed near the product to use easily.

(5) Install the product on the flat, level surface which is no vibration and shock-free place.

(6) Please avoided from heat sources and direct sunlight, installed Temperature and humidity condition: 18°C ~ 25°C, below 80%RH condition.

(7) The product should be avoided to use near organic solvents such as Acetone, Methylene Chloride, etc. also do not use near strong and high frequency noise place.

(8) Do not allow any moisture, organic solvents, dust, or corrosive gases to enter the control box of the unit.

⚠WARNING

- Check to make sure that the correct line voltage, phase and capacity correspond to them specified on the identification plate.
- Make sure your earth connection is duly executed
- it must be used which is lower than the flashing point of the combustible fluids (more than minimum 5℃ (Fp-5)).

3.4 Power Supply

Required voltage and current capacity is written on the ID Label of BW3 Series. The user have to check the required specification of electricity in the ID Label before connecting the power. It is possible to use the voltage ±10% of written specification in the ID Label.

After checking the required power, Please check your suitable electric outlet. Electric outlet should be used only for the unit certificated. If you have wrong cord for the unit, please contact to the manufacturer or reseller.

In case of the power code is short for the installation, the user can use the extension code which certificated standard in IEC60320.

Please follow below process to connect the power.

Step 1: Please check the required voltage and current capacity for the product. (ID Label)
Step 2: Please check the suitable socket and plug at the install location.
Step 3: Please check if the length of cord is sufficient for installation to choose the suitable install location.
Step 4: Please check the cord which connected with the unit. Please put the switch off before the power is supplied.
Step 5: Connect the Power cord to the outlet.

Don't damage the ID Label as whole information of the unit is written on it. Please refer to the ID Label when the unit has problem, inquiry for consumables for the unit or the service inquiry.

⚠WARNING

Electrical Shock Hazard.

- Check the voltage, Phase, current capacity exactly to connect the power properly.
- Inappropriate connection of power can occur damage of the unit and serious injury to the user.
- Do not touch or deal with the electric parts and cord with wet hand.
- Use the power with grounded.
- It must be used which is lower than the flashing point of the combustible fluids (more than minimum 5℃ (Fp-5)).

3.5 Operation

3.5.1 Confirmation in advance

(1) Check the connection between the unit and electric outlet.

(2) Check if the unit located at a level with the ground.

(3) Check if the each accessory is attached on the unit properly.

(4) Check if there is any flammable or explosive material inside of the unit.

3.5.2 End operation of the equipment

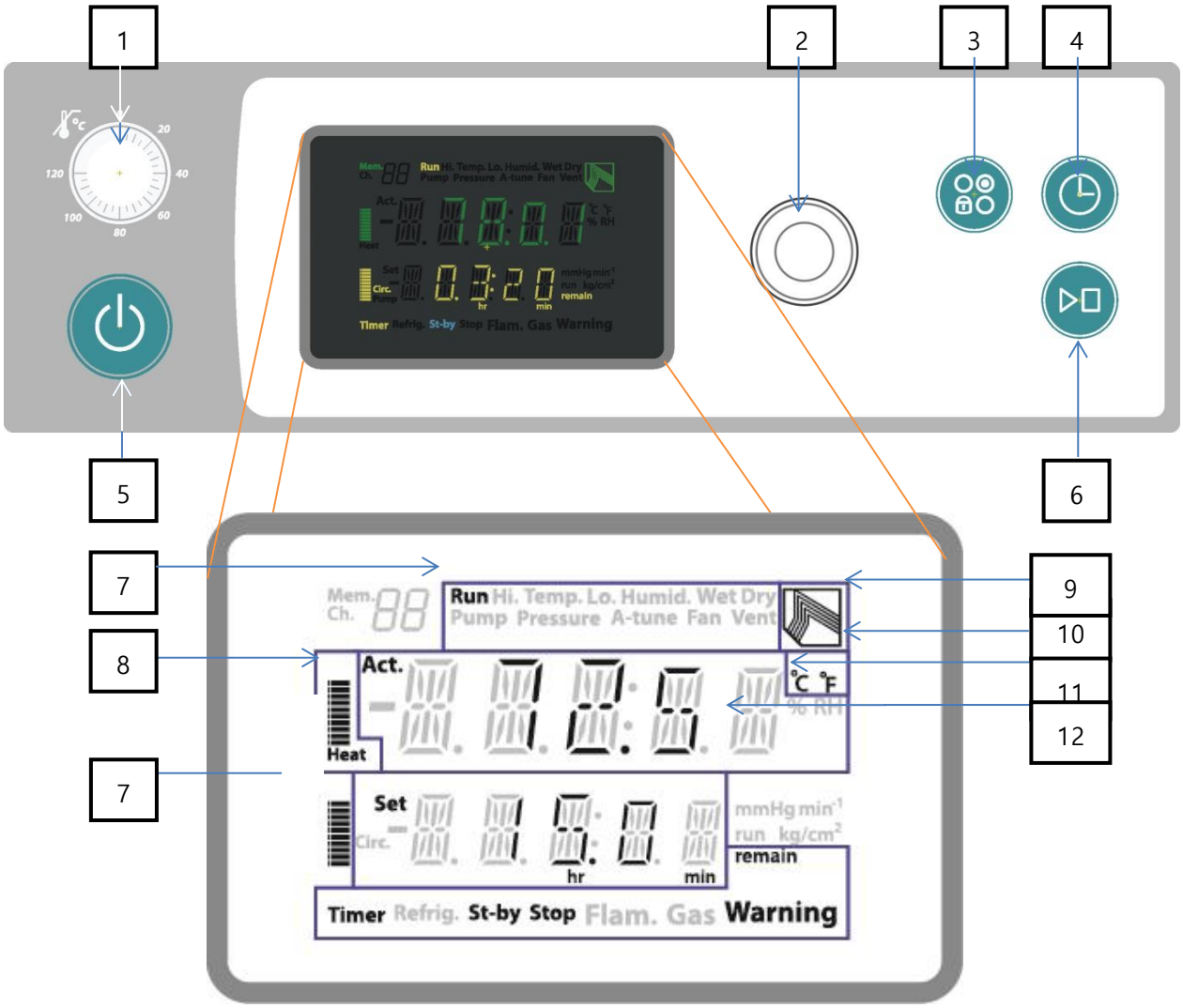
Turn off the unit when you don’t operate it.

In case you don’t operate the unit for long time, disconnect the plug from the socket.

4.0 Operation

4.1 Name and function of control panel

The control panel consists of VFD, the basic display, Dial Knob for operation setting, and Membrane button, the auxiliary input device.



1	Over-temp Protection	In addition to the temperature sensor connected to the main controller, it is a device that can set the overheat prevention temperature value by the overheat prevention device.
2	Dial Knob	Turn Knob to increase or decrease value for setting. User can turn knob during operation, to check the set value or remain time. T urn Knob to search Menu. Press knob and select menu. After changing the value, press knob to save it. If you push knob long to load the saved temperature value.
3	Menu Button	User can set the unit's condition.

		If you want to cancel any setting during temperature or menu setting, then press menu button. If you push menu button for 3 seconds during operation, the controller can be locked or unlocked. (but, when controller locked status, stopping operation is possible.
4	Timer Button	Timer setting
5	Power Switch	Power ON/OFF
6	Start/Stop Button	Start/stop operation.
7	Status Display	Current status of the unit is displayed. • Run: Running status • St-by: Stand-by status or indication during ON Timer • Stop: Stop status • Warning: Warning indication • hr/min: hour/minute indication • remain: remain time during timer ON
8	Heating Rate	Heating rate of the heater.
9	Logo(Lab Companion)	Brand logo. During computer interface communication, The logo flickers.
10	℃, ℉	Temperature units.
11	Actual Display	Present temperature. During setting menu, each menu is indicated instead of present temperature.
12	Set Display	Set temperature or menu setting value is indicated.

4.2 Basic operation

4.2.1 Operation

Turn on the power switch located at the bottom left of the control panel.

When the power switch is turned on, the entire display light is turned on. After displaying the manufacturer and the software version, the main screen (current temperature / set temperature display) appears.

4.2.2 Temperature control

(1) Start temperature control

STEP1. Press Start/Stop button when the unit is in stand-by mode.

STEP2. Start temperature control

(2) Stop temperature control

STEP1. Press Start/Stop button during the operation.

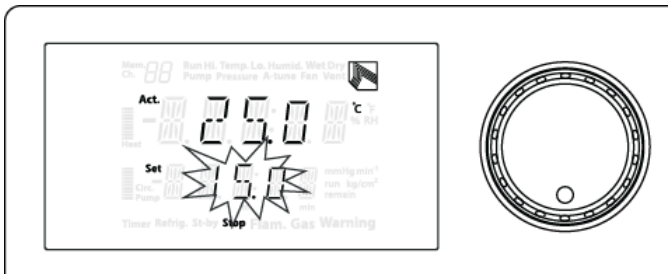
STEP2. The unit stops controlling

(3) Temperature setting

How to change set temperature ;

STEP1. Press Dial Knob (or simply Knob) once.

The value to be set blinks.



STEP2. Adjust the value by wheeling Knob. Setting value doesn't blink.

If there is no action of Knob for 3seconds, the value blinks again.

If there is no additional action of Knob for 20seconds, setting value will be canceled.

STEP3. Press the Knob. The unit save the setting value.

NOTICE

If you want to cancel the setting, press the MENU button. If you press the MENU button while changing the setting value, it moves to the previous step. When MENU is selected, it moves to the main screen.

4.2.3 Temp. set value recall

This product has the convenience of storing and recalling three frequently used temperatures. The initial values of the three stored temperatures are 50, 80, and 100 ° C. You can use the Fixed temp set menu in 4.4 Device Configuration to change the temperature to the user's most commonly used temperature.

How to use this function is as follows.

(1) Press the knob for more than 3seconds.

(2) You can see ’TEMP1’ on the display and saved temperature as below.

(3) Wheel the Knob toward right side, you can move on ‘TEMP2’, ‘TEMP3’, ‘ESC’ menu.

(4) Press the knob to select the saved setting. You can cancel the function choosing ESC.

(5) Press Start/Stop to run the unit.

4.3 Timer function

The timer can be set by pressing the TIMER button. There are two types of timers.

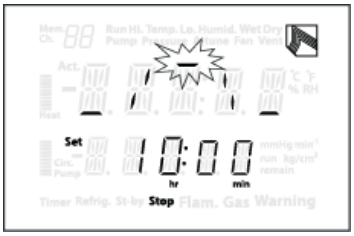
Wait On Timer: The unit will operate after the set time has elapsed.

Wait Off Timer: The device stops after the set time

When the timer is set, the Timer is displayed on the lower left of the main screen.

4.3.1 Wait On Timer setting

(1) Press Timer button once. You can see the timer value on the display.



(Wait On Timer) (Wait Off Timer)

(2) Wheel the Knob to select the timer mode (Wait on, Wait off) and go to timer setting pressing the Knob.

(3) Choose “TIMER SET” to set the time. The value (Hr) blinks.

(4) After setting hour, press knob. The value (Min) blinks.

(5) After setting minute, press knob.

(6) Go back to Stand-by display pressing TIMER button or wheel the knob to “ESC”

(Press Start button after timer setting to start (activate) Timer function)

NOTICE

If you change the timer setting, the unit modify total running time after calculate pass-period. If you want to reset the timer, OFF the timer or stop the unit at first.

User can set Wait Off Timer only during the operation.

4.3.2 Wait Off Timer setting

(1) Press Timer once. The set value of Timer will be on the display.

(2) Press Knob to set Timer.

(3) Choose “TIMER OFF” and press knob.

(4) Press Timer or choose ESC to go back to Main display.

(Press Start button after timer setting to start (activate) Timer function

4.3.3 Timer end

(1) Alarm is on when Wait On timer ends.
(2) “TIMER END”will be on the display with sound alarm when Wait Off timer ends.
Press Knob to turn off the alarm and go back to Main display.

4.4 Device configuration

Change the device configuration

Configuring with pressing the main button

1	Fixed Temp Set	Set the frequently used temperature value. The value can be saved of 3 types
2	Temp Unit	Select Celsius or Fahrenheit.
3	Sound	Select whether to silence the system's audible sound.
4	Run Display	When the machine is operating, if you wan to show the temperature set value and time turnning the Knob, Select the screen status as below • Return: Go back to the previous screen after 3 seconds • Fix: Fixed to the moved screen • Auto: Two values alternating every 3 seconds
5	System Configuration	Configuring referring to the system

4.5 System Configuration

Set the main parameters that affect the operation of the equipment. Please familiarize yourself with this manual before changing the system configuration.

Press the MENU button to select SYSTM CONF.

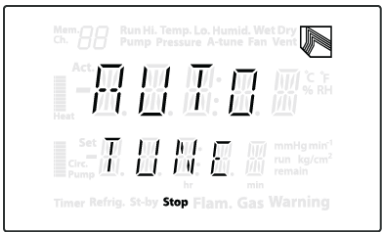
1	Auto Run	Select whether to use the power failure compensation function. • If the power is forcibly shut off and then supplied again during the operation of the equipment, restore the previous operation state (time information can not be restored)
2	Auto Tune	Updates the PID parameters for temperature control. Optimal temperature control can be performed at the main operating temperature.
3	Temp Calibration	It calibrates the measured temperature of the temperature sensor installed in the instrument and the user's reference measurement.
4	Temp Deviation	Set tolerance and delay time between setting value and actual value. • Temperature setting: Deviation Limit setting • Alarm Delay: If the set value is out of tolerance Deviation Alarm Occurs
5	Temp Limit	You can limit the temperature setting depending on the temperature range or solvent which are used mainly by the user.
6	System Reset	Various parameters of the equipment can be entered as factory default values.

4.5.1 Auto Tune

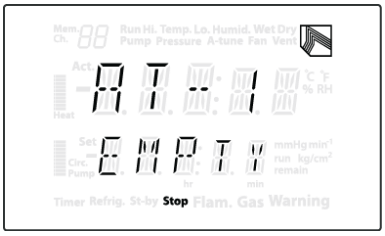
Performs updates to parameters of PID control for temperature control. Optimal temperature control can be performed at the main operating temperature. When the product is dispatched from the factory It is set to perform temperature control in the temperature control area. When using the machine, if the unit does not perform the proper temperature control for the user's operating temperature, you can perform better temperature control by newly tuning the temperature control parameter through Auto Tuning.

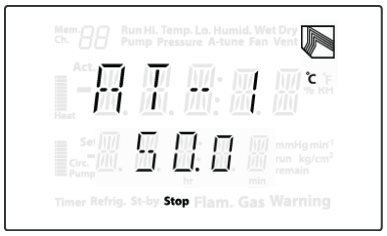
Enter the setting and set the value of the operating temperature. Press Knob to start parameter tuning with the entered temperature value. During tuning, you can always cancel the tuning by pressing Knob or by pressing the STOP button. After tuning is complete, the completion message appears and press Knob to save it.

(1) Manu butten > SYSTEM CONFI > AUTO TUNE to enter the corresponding menu and press the control knob in the screen below.



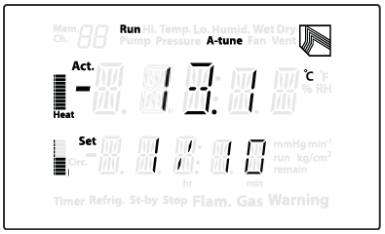
(2) Select the AT-1~3 using the control know in the screen below, and input the main temperature.





[AT-1 is selected and the main use temperature is input at 50.0 degrees]

(3) Once you press the control knob, it would be started with the input temperature value and the 'Auto tuning' would be started.



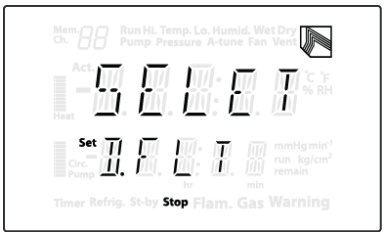
The current temperature during Auto tuning

And showing the progress step of Auto tuning

During tuning, you can always cancel the tuning by pressing Knob or by pressing the STOP button.

(4) When the tuning is completed, the following completion message appears and press Knob to save tuning value.

(5) To select the saved tuning value, select the menu button> SYSTEM CONFI> AUTO TUNE> SELECT as order. If you want to use the default values of the unit without using separate tuning values saved in AT-1 ~ 3, select the screen below.



(6) If you want to reset the tuning values of AT-1 ~ 3, you can use RESET menu. You can reset each of AT-1 ~ 3 individually by selecting the menu button> SYSTEM CONFI> AUTO TUNE> RESET as order.

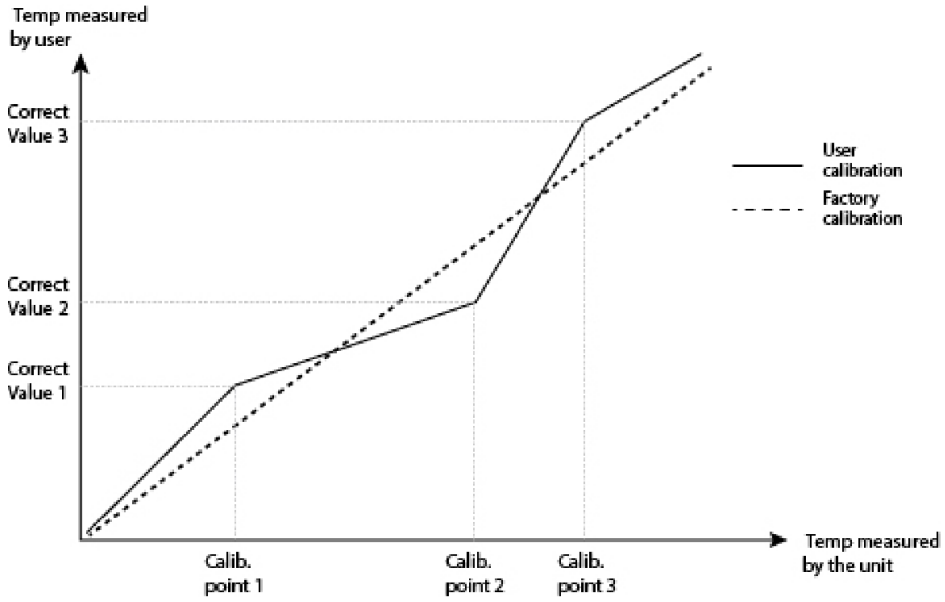
(7) Turn the control knob all the way to select ESC or return to the main screen if there is no input for 20 seconds.

4.5.2 Temp Calibration

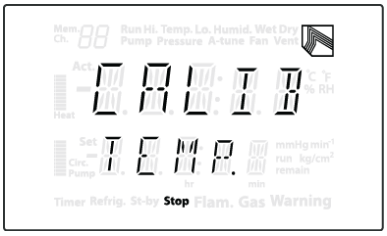
Can calibration temperature sensor of main controller. This equipment especially at 3 temp points, can match the temp point with user's reference device.

At the system Configuration you can check the set value that user had done calibration. Among the three temperature, choose the temperature to change. Put the sensor of user's reference device in the Bath and put a lid on.

After setting, run the unit. Wait till being matched when actual temperature and set temperature are same. When the actual temperature would be matched with set temperature, press the Knob and enter the setting, input the value that device is reading and press the Knob once again. Then the product would stop the control temperature. After then, it remembers actual temperature in the bath as value that reference device was reading.



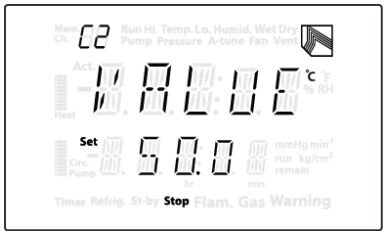
(1) Menu > SYSTEM CONFI > CALIB TEMP.



(2) Choose the CALI 1~3, input the temperatue that be needed to calibration.

[Choose CALI 2, set 50.2℃ as needed temperature to calibrate]

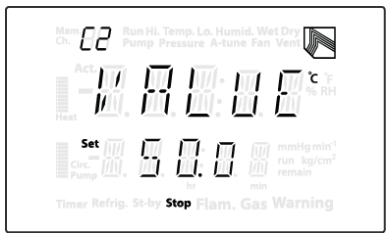
(3) When the actual temperature of product approaches set temperature, press the control knob and put the temperature to be adjusted.



[Setting 50℃ as calibration set]

(4) Menu > SYSTEM CONFI > CALIB TEMP > CALIB VIEW

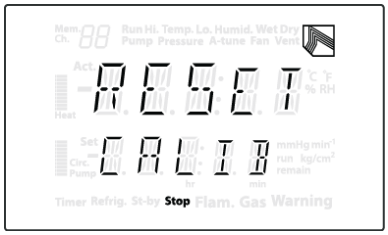
You can check the set calibration value.



[In the CALI 2, calibrate 50.2℃ as 50.0℃]

(5) Menu > SYSTEM CONFI > CALIB TEMP > RESET CALIB

You can reset setting value.



(6) Turn the control knob to the end and choose the ESC, or if there is no any action, it returns to main display.

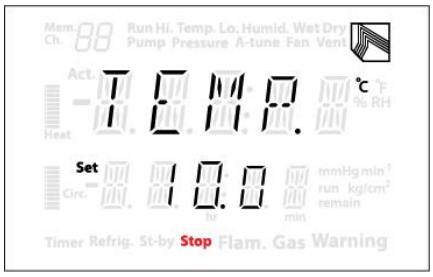
NOTICE

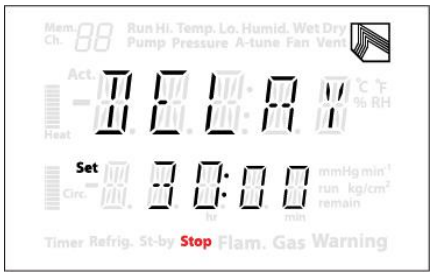
- The temperature control stops when an error such as exceeding the temperature limit range occurs during temperature control.
- Since the temperature is calibrated at multiple points, it has the function to limit the user's input (ex: input of two different temperature calibration values at the same temperature point) that is not logical.
- The result of the temperature calibration can always be checked with CALIB VIEW. C1, C2, and C3 are displayed in the upper left corner to confirm the calibration point. POINT represents the instrument temperature measurement point, VALUE represents the input value that you calibrated for that temperature point. In other words, the value you enter for VALUE is your reference measurement temperature, and the instrument accurately represents the temperature.
- You can reset items for each calibration in RESET CALIB.

4.5.3 Temp Deviation

This equipment generates a Deviation Warning alarm when the difference between the actual temperature and the set temperature exceeds the deviation limit for more than the Alarm Delay period. Even if the problem is resolved after the alarm is generated and the actual temperature converges to the tolerance within the set temperature, the check is performed for more than the Alarm Delay and the Deviation alarm is ended. When the set value can be matched with the current value(within the allowable range for a certain period of time), Deviation Alarm’s warning indication disappears. Deviation alarm is initialized in the following cases.

- Reset setting value
- Restart after stopping control operation (door open, stop operation, etc.)





4.6 Warning and Fault Messages

This equipment has the function to detect the abnormal condition of the equipment and notify the user. The equipment draws the user's attention through audiovisual notifications. Anomalies can be divided into two categories according to their severity: a Warning and a Fault.

4.6.1 Warning

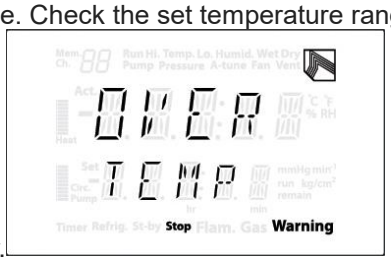
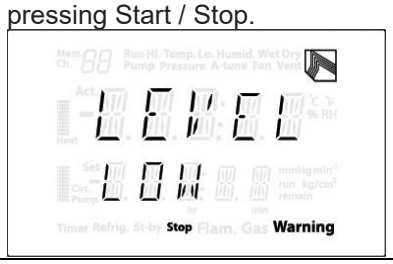
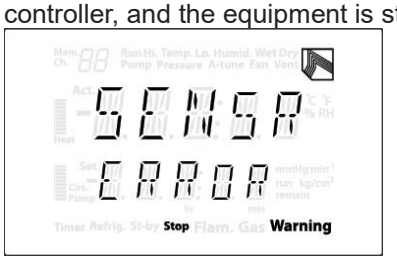
Warning causes audible and visual notification, but product operation status continues. When a warning occurs, a sound notification and a visual notification appear. When you press Knob, the sound notification disappears and the visual notification continues until the cause is resolved.

NOTICE

If you set Sound OFF in the menu, warning sound would not alarm.

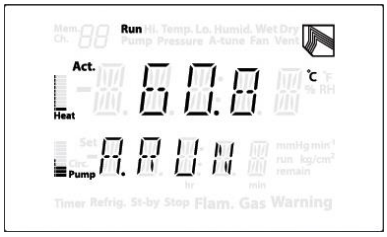
4.6.2 Fault

The anomalies classified as faults is the major ones to force the product to stop.
Press Knob to turn off sound and visual notifications. To protect the unit, stop operation of the unit.

1	Over temperature	The mechanical thermostat located at the bottom of the right side of the equipment has been activated. The temperature inside the chamber is out of the temperature range set by the temperature limiter. Stop the equipment to protect the product and protect the sample. Check the set temperature range of the temperature limiter. 
2	Low Level	When the liquid level of the sample liquid is detected, the machine stops and informs. After you have replenished the solution, you can restart it by pressing Start / Stop. 
2	Sensor Fault	There is a problem with the temperature sensor of the main controller, and the equipment is stopped. 

4.6.3 Other notifications

When the other notification appears, press Knob to recognize it as confirmation, and the visual notification will disappear and move to the Main Display.

1	Auto Start	During the operation of the equipment, the power is forcibly cut off and the power is supplied again. If A.RUN setting value is set to ON in the environment setting, "A.RUN" is displayed and auto start is started. When set to OFF, "PWR.F" is displayed.  

5.0 Maintenance

5.1 Maintenance period

Classification	Period	
	Daily	Weekly
Connection between machine and power	●	
Exterior cleanliness	●	
Damage and cleanness of inside of the bath		●
Cleanness of surface of the unit and accessories.		●
Check defects of Start/Stop button and Dial knob		●
Check Over Temperature limiter	●	
Check Low fluid level alarm		●
Connection between the unit and accessories.		●

5.2 Cleanness

The unit maintains the best condition and operates with full efficiency and extend the life expectancy, only satisfied with periodical cleaning. We suggest that checking cleanliness every day, cleaning the chamber once a week, cleaning the surface of the unit once a month. And immediate cleaning is required when the unit is contaminated.

5.2.1 Cleaning the Unit

Unplug the power cord and discharge the thermal liquid clean it with soft and dry towel. Clean bath with neutral detergent soft cloth and distilled water soft cloth. Dry unit with dry cloth.

⚠ CAUTION

- Do not pour the water on the outside of unit (especially Control Panel), The water could cause short-circuit problem and etc.
- Be caution on the damage of parts inside of chamber and system.
- Do not use acid liquid, benzene, sharp stuff, soap water, cleaner, and hot water. It causes color change or damage on the unit surface. Rubber and plastics parts could be changed in color, shape, and feature. Especially do not use the volatile materials. Use the neutral detergent only with towel. And dry it completely.
- Clean up the inside of chamber with dry towel and wear toxic free glove and mask, when the toxic chemical material or gas generated in inside of chamber.
- In the case of clean up the unit using the method that different form manual, contact to the manufacturer and confirm whether the method damage the unit or not.

5.2.2 Accessories

(1) Check the foreign substance and put the accessories in the neutral detergent.

(2) Clean it with distilled water.

(3) Store it after dry the unit completely.

5.3 Moving the placement of the unit

(1) Unplug the power cord.

(2) Discharge all the thermal fluid in the bath.

(3) Pack the unit and accessories as initial packing. Or pack it to prevent damage during the move.

⚠ CAUTION

- Do not move the unit in plugged.
- Do not make mechanical shock or vibration on the unit.
- It could cause problem on the later use because of the inner damage

5.4 Storage

In the case of no long time use

(1) Unplug the power cord.

(2) Clean up the unit with dry towel.

(3) Pack it and place it in the dry area

1) Unit

(1) Switch Main Power Switch off, take power out.
(2) Remove requid in Bath.
(3) Clean bath with neutral detergent soft cloth.
(4) Clean bath with distilled water soft cloth.
(5) Dry unit with dry cloth.
(6) Do not use organic solvent.
(7) If you want to clean the unit in the way that is not stated in this manual, contact us first to find the proper way to do it.
(8) In case of toxic material or gas is exposed out, clean it with dry cloth after wearing mask and gloves.

2) Accessory

(1) Put Spring Wire Rack, Half Shelf Adjuster, Test Tube Rack in neutral detergent.

(2) Linse them with distilled water.

(3) Dry them fully and store.

5.5 Replacement of fuse

The fuse be shorten and the unit turned off when the overcurrent occur on the unit. Then replace the fuse refer to below procedure. (Two fuse is included in the manual pocket.)

⚠WARNING

Must turn off the power and check the power connection before replacing the fuse. In the case of the power is on, there could be severe injury and lead death.

(1) Turn off the power.

(2) Insert "-" driver into the fuse holder. The fuse holder is separated when the driver move the holder 50 degrees to counterclockwise.

(3) Replace the shorted fuse into spare fuse.

6.0 Troubleshooting

6.1 Power

Symptoms	Check list	Measures
The instrument does not turn on.	Check for improper power	Check the ID plate which is attached to the unit and properly connect the power supply type (voltage, phase, and capacity) supplied to the outlet.
	Power failure, Check the operation of the distribution board breaker	Check the panel board breaker and restore it to its original state.
	Check for earth leakage breaker or power failure	If the building's earth leakage breaker is blocked, find and repair the source of the leakage. Or if there is a power outage, identify the cause and repair it.
	Check electrical cord connection	Make sure that the power cord is properly connected to the unit and the outlet.
	Check for bad electrical cord	Check the damage about electrical cord, plug, and socket. If there is damage, request the service
	Check for the fuse	Check if the fuse is blown. If necessary, replace with the enclosed spare fuse.
	Internal circuit failure of the device	Apply for the service.
The controller does not light up even when the power switch is turned on.	Check the power plug connection	Turn off the power switch, then plug the power plug into the outlet.
	Check for earth leakage breaker	Check whether the circuit breaker is OFF. If it is OFF, change the circuit breaker to ON state.
	Controller power failure	Apply for the service.
The instrument does not work cause of over Temp. Limit Error	"Beep" beeping inside the device	The setting value of over temp. Limit controller which is located on the right side of the instrument should be 10 ~ 15% higher than SV.
All operations are stopped without any other display or button operation.	Check for high-frequency equipment around the equipment	If a high-frequency welder, high-frequency sewing machine, or large-capacity SCR controller is installed that generates strong noise in the machine, change the position of the machine. If you have the same symptoms, please apply for service.

Leakage of the building If the circuit breaker continues to be short-circuited	Too many plugs are connected.	Remove all the devices connected to the breaker and connect them one by one to find out the cause. Do not exceed the capacity of the earth leakage breaker current.
	Internal circuit failure of the device	Apply for the service.
The test room earth leakage breaker goes down when the instrument is turned on or in operation.	Check power line overload	Compare the maximum power consumption of the circuit breaker and the total power consumption of the electrical equipment connected to the breaker line. Please check if there are multiple similar devices connected. If unnecessary equipment is connected, unplug it. If the breaker continues to go down, please apply for service.
The device's earth leakage breaker which is located inside of instrument goes down.	Check the leakage breaker capacity	The voltage and power consumption of the circuit breaker should be compared with the device ID plate and the correct circuit breaker must be checked at JEIO-TECH Co., Ltd. or place of purchase.
	Check electrical cord damage	Please check if the electric cord is broken or the wire cover is damaged. If this happens, you must obtain a new code from JEIO-TECH Co., Ltd. or place of purchase.
	Check the moisture on the power supply side	If there is moisture in the connection between the unit and the electric cord, remove it, clean it, and reconnect it.
Turning on the power switch immediately turns off..	Check for short circuit	Stop operation immediately and contact your dealer.

⚠WARNING

- If the unit does not operate normally, turn off the power immediately.
- If you need to apply for service, you must contact JEIO-TECH Co., Ltd. Do not disassemble the unit arbitrarily.
- Only qualified persons are to be handled when handling electrical parts inside the machine.
- If parts need to be replaced, use genuine parts only.
- Failure beyond normal limits can not be maintained technically.

7.0 Appendix

7.1 Technical Specifications

Model		BW3 – 05G	BW3 – 10G	BW3 – 20G
Temperature[1)]				
Working Temperature Range(℃/℉)		Amb +7 to 100/ Amb +12.6 to 212		
Temperature Stability at 50℃ (Bath fluid : water) (±℃/℉)		0.4/0.72	0.3/0.54	0.3/0.54
Heat up time to 70℃ (Bath fluid : water)		34min	36min	44min
Dimensions				
Bath volume(L/cu ft)		3.5/0.1	11.5/0.4	20/0.7
Bath opening, depth (WXL, D mm/inch)		240 X 136,150/ 9.4 X 5.4, 5.9	300 X 240,200/ 11.8 X 9.5, 7.9	498 X 300,200/ 19.6 X 11.8, 7.9
Overall (WXLXH mm/inch)		307 X 200 X 264/ 12.1 X 7.9 X 10.4	360 X 300 X 294/ 14.2 X 11.8 X 11.6	564 X 356 X 294/ 22.2 X 14 X 11.6
Net weight(kg/lbs)		6.5/14.3	10.0 /22	18.5 /40.8
Electrical data				
Electrical requirements (230V/50/60Hz, A)		3.0	4.3	8.7
Electrical requirements (120V/60Hz, A)		5.8	8.3	8.3
Material	Internal	Stainless steel, 1.0t, Cubic Type		
	External	Steel, 1.0t, Double painted and baked		
	Sensor	Pt 100		

※ Above specifications are subject to change without notice due to improvement in product quality and performance.

7.2 Disposal of instrument

Before disposing of the device or its components, observe the following precautions.

(1) This equipment is enough to potentially exposed to biological, chemical, or radioactive material, so the person responsible for disposing of the equipment and the waste disposer need to check essentially that the equipment should be cleaned for the purpose of protecting the environment

(2) Please refer to the person in charge of disposal of the equipment to check the electrical, electronic and material disposal standards. If you request to external agency it is advisable to refer to a testing equipment company that can properly dispose of its branch, vendor, or laboratory equipment and its components

7.3 Warranty

7.3.1 Warranty period

(1) If the product fails during normal and proper use, the warranty period for manufacturing liability shall be two years from the date of delivery.

(2) If you request a repair, please check the items below and let us know so that you can get a quicker and more accurate repair.

- Date of purchase:
- Customer name / address / phone number / E-mail:
- Fault status
- Model
- Serial number

7.3.2 Technical Service Contact Points

- Technical Services
- Address : 153 (Youngsan-dong), Techno 2-ro Yuseong-gu, Daejeon-city, 34025, Republic of Korea
- Tel : +82 (0)2 -2627-3824
- Website : https://www.JeioTech.com/eng/
- E-mail : overseas@JeioTech.com

7.3.3 Certificate of Product Warranty

This is a guide to the product quality warranty and service terms provided by JEIOTECH Co., Ltd.

All products are guaranteed to operate normally when installed under proper conditions, as specified in the user manual for each product, and used according to the intended purposes and permissible operating conditions.

The warranty period for product quality starts from the delivery date and is indicated in the catalog provided for each product or in the purchase order agreed upon with the customer. If a product malfunctions within the warranty period, JEIOTECH Co., Ltd. provides free repair services. However, among the transportation costs incurred during the repair process, any special costs resulting from the customer's site conditions (e.g., door or wall modifications, use of special handling equipment) are not covered under the warranty. Furthermore, JEIOTECH's liability under this warranty is limited to replacing the product or refunding the original purchase price at JEIOTECH's sole discretion if reasonable attempts to repair or replace the product fail.

Parts replaced during free repairs within the warranty period become the property of JEIOTECH Co., Ltd. Additionally, the warranty period is not extended due to free repairs. JEIOTECH is not responsible for any losses incurred by the customer due to delays in repairs caused by issues such as part shortages or shipping delays.

The following cases will be handled as paid repairs, even within the warranty period:

1. Non-defective cases

* Requests to resolve issues arising from improper operating environments or abnormal installations.
* Reinstallation requests or connections with external equipment other than the initial installation.
* Requests for usage instructions or simple adjustments that do not require disassembly.

* Inspections of non-defective products.
* Cleaning or debris removal service requests.

2. Failures caused by user errors:
* Malfunctions due to usage not in accordance with the user manual.
* Issues resulting from improper operating environments or abnormal installations.
* Malfunctions caused by incompatible chemical usage.
* Malfunctions caused by irregular or improper electrical or utility supplies.
* Damage due to product movement, storage, external impact, or dropping by the customer.
* Malfunctions resulting from unauthorized modifications or repairs without prior written approval from JEIOTECH Co., Ltd.
* Malfunctions caused by using consumables or optional components not specified by JEIOTECH Co., Ltd.
* Repairs performed by personnel other than JEIOTECH or its authorized service agents.

3. Other cases
* When the product model or serial number has been damaged, removed, manipulated, or altered.
* Malfunctions caused by fire, flooding, or other natural disasters.
* Failure due to consumable parts reaching the end of their lifespan (e.g., lamps, filters, fuses, gaskets, packings, hoses, heat transfer fluids).
* Natural wear and tear (e.g., discoloration, screen printing degradation).
* Damage or malfunction of product accessories (e.g., power cables, data cables, glass components) or options.
* Malfunctions caused by errors in computers, computer components, or connected network systems.

- Before JEIOTECH performs free or paid repairs or accepts the return of a product, the customer must ensure the product has been decontaminated of chemical and biological hazards.
- Replacement parts used during repairs may differ from the original but will function correctly and be equivalent in performance.
- JEIOTECH does not bear any responsibility for damage to stored samples, data loss, or any other direct or indirect damages caused by product malfunctions, regardless of the warranty period.
- JEIOTECH does not guarantee issues related to computers, computer components, or network systems connected to the product, regardless of the warranty period.
- This warranty is the sole and exclusive warranty provided. Any implied warranties imposed by applicable laws are limited to the warranty period stated herein. This warranty cannot be modified by any verbal advice, statements, or documents on behalf of JEIOTECH unless explicitly labeled as a "Warranty Amendment" and signed by an authorized representative of JEIOTECH.

- This warranty applies only to products purchased for direct use by the customer. It does not cover products purchased for resale purposes without prior written approval from JEIOTECH.
- This warranty does not apply to consumables and is non-transferable.