



# OPERATING MANUAL

## Thermal Bath

**Model : BW-05H, BW-10H, BW-20H  
BW-0505H, BW-0510H, BW-1010H, BW-1020H**

**Manual No. : 45111L002 Version : 0.0**



## **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.

## Quality Management System



Jeio Tech Co, Ltd. is dedicated to providing world-best product quality and customer satisfaction. To ensure we maintain this commitment we have developed and implemented a total quality program, which conforms to the requirements according to DIN EN ISO 9001:2000 for the design, development, production, sales and servicing of biotechnology, environmental chemical engineering related products, and reliable measuring equipment for electric and electronics (ovens, incubators, constant temperature humidity chambers, constant temperature baths, refrigerating bath circulators, heat exchangers and shakers).

Visit our Web site at <http://www.jeiotech.com/eng/support/certificates.html> to view a copy of our certificate.

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# 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 Thermal Bath. Use this manual as a guide and reference for installing, operating, and maintaining your Jeio Tech Thermal 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 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. We can also provide the assistance of a factory-trained technician to help train your operator(s) for a nominal charge. This section includes instructions, checks, and adjustments that should be followed before commencing with operation of the Thermal Bath. These instructions are intended to supplement standard laboratory procedures performed at daily and weekly intervals.

The Operation chapter includes a description of controller features along with temperature and agitation parameter setting instructions, multi-segment program setting instructions and instructions for changing the type of agitation and agitation amplitude.

The Accessories and Option chapter is your source for information on available accessories and option with brief information.

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



## 1.2 Safety Notice.

Be sure that you are completely familiar with the safe operation of this Thermal Bath. This unit may be connected to other machinery, such as a temperature control unit. Improper use can cause serious or fatal injury.

Installation and repair procedures require specialized skills with laboratory equipment and electricity. Any person that installs or repairs this unit must have these specialized skills to ensure that this unit is safe to operate. Contact Jeio Tech or their local authorized distributor for repairs or any questions you may have about the safe installation and operation of this unit.

The precaution statements are general guidelines for the safe use and operation of this instrument. It is not practical to list all unsafe conditions. Therefore, if you use a procedure that is not recommended in this manual you must determine if it is safe for the operator and all personnel in the proximity to the Thermal Bath. If there is any question of the safety of a procedure please contact Jeio Tech before starting or stopping the Thermal Bath.

This equipment contains high voltages. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the startup procedure or troubleshoot this unit.

Documentation must be available to anyone that operates this equipment at all times.

Keep non-qualified personnel at a safe distance from this unit.

Only qualified personnel familiar with the safe installation, operation and maintenance of this unit should attempt start-up or operating procedures.

Always stop the Thermal Bath before making or removing any connections.

## 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.



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



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



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



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 a face mask



Wear gloves



Wear goggles

#### Prohibition



No direct sunlight



No high frequency noise



No corrosive fluid or cleaners



No water

#### WARNING



Safety Alert Symbol. General caution.



Hand crush or pinch



Electrical shock



Foot crush



Flammable or fire could be caused.



Lifting hazard



Sharp points

### 1.3.3 Miscellaneous none safety symbols used in manual

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 Baths or a feature.

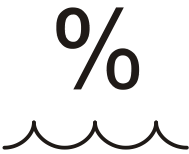


European  
electrical  
compliance.

Union  
directive



Earth ground



Relative humidity.



Note



Altitude

## 1.4 Precautions for the instrument.

Our Bath is designed to provide safe and reliable operation when installed and operated within designed 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 Baths, use good judgment and follow these safe practices.

### 1.4.1 Warning statements

Observe all warning labels.

DO NOT remove warning labels.

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

DO NOT install gas pipes or water pipes around bath.

DO NOT insert multiple plugs into the outlet at the same time.

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 Bath while it is plugged into the power source.

DO NOT use or keep flammable gases near the Bath.

DO NOT install the Bath near environments where flammable gas may leak.

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

DO NOT put explosive and flammable chemicals (Alcohol, Benzene, and etc) into the controller.

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

DO NOT expose the Bath to direct sunlight.

DO NOT expose the Bath to direct heat sources.

DO NOT use the Bath in places where moisture is high and flooding can occur.

DO NOT install the Bath near machinery generating high frequency noise.

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

DO NOT operate damaged or leaking unit.

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

DO NOT disassemble, fix or change the Bath other than for those items described in this operating manual.

### 1.4.2 Caution statements

Use only knobs to lift or stabilize the unit.

DO NOT place heavy objects on the power cord

DO NOT put this unit on the power cord.

DO NOT make the machine wet while cleaning.

DO NOT place water or any liquid on the unit while cleaning.

DO NOT sprinkle insecticide or flammable spray on the unit

DO NOT clean the unit with a strong cleanser (e.g., solvent type) and use a soft cloth.

In addition to the safety warnings listed above, safety messages are posted throughout the manual. These safety messages are designated by the use of a signal word panel followed by text and a safety symbol where applicable. Read and follow these important instructions. Failure to observe these instructions can result in permanent damage to the unit, significant property damage, personal injury or death.

## 1.5 Responsibility

This Bath is constructed for maximum operator safety when used under standard operating conditions and when recommended instructions are followed in the maintenance and operation of the machine.

All personnel engaged in the use of the unit should become familiar with its operation as described in this manual.

Proper operation of the unit promotes safety for the operator and all workers in its vicinity.

Each individual must take responsibility for observing the prescribed safety rules as outlined. All caution, warning and danger labels must be observed and obeyed. All actual or potential danger areas must be reported to your immediate supervisor.

### 1.5.1 General responsibility

No matter who you are safety is important. Owners, operators and maintenance personnel must realize that every day, safety is a vital part of their jobs.

If your main concern is loss of productivity, remember that production is always affected in a negative way following an accident. The following are some of the ways that accidents can affect your production.

- Loss of a skilled operator (temporarily or permanently)
- Breakdown of shop morale
- Costly damage to equipment and laboratory samples
- Downtime

An effective safety program is responsible and economically sound

Organize a safety committee or group, and hold regular meetings. Promote this group from the management level. Through this group, the safety program can be continually reviewed, maintained, and improved. Keep minutes or a record of the meetings.

Hold daily equipment inspections in addition to regular maintenance checks. You will keep your equipment safe for production and exhibit your commitment to safety.

Please read and use this manual as a guide to equipment safety. This manual contains safety warnings throughout, specific to each function and point of operation.

## 1.5.2 Operator responsibility

The operator's responsibility does not end with efficient experimentation and production. Because the person who has the most daily contacts with the equipment and intimately knows its capabilities and limitations is the operator.

Plant and personnel safety is sometimes forgotten in the desire to meet incentive rates, or through a casual attitude toward laboratory equipment formed over a period of months or years. Your employer probably has established a set of safety rules in your workplace. Those rules, this manual, or any other safety information will not keep you from being injured while operating your equipment.

Learn and always use safe operation. Cooperate with co-workers to promote safe practices. Immediately report any potentially dangerous situation to your supervisor or appropriate person.

## REMEMBER

- **NEVER** place your hands or any part of your body in any dangerous location.
- **NEVER** operate, service, or adjust the equipment without appropriate training and first reading and understanding this manual.
- Before you start the portable drying/conveying system check the following:
  - ✓ Remove all tools from this unit.
  - ✓ Be sure no objects, samples or chemicals are lying on the unit.
- If this unit has been inoperative or unattended, check all settings before starting the unit.
- At the beginning of your shift and after breaks, verify that the unit is functioning properly.
- Report the following occurrences **IMMEDIATELY**:
  - ✓ unsafe operation or condition
  - ✓ unusual Shaking action
  - ✓ leakage
  - ✓ improper maintenance
- **DO NOT** wears loose clothing or jewelry, which can be caught while working on the equipment. In addition, cover or tie back long hair.
- Clean the equipment and surrounding area **DAILY**, and inspect the machine for loose, missing or broken parts.



### **1.5.3 Maintenance responsibility**

Proper maintenance is essential to safety. If you are a maintenance worker, you must make safety a priority to effectively repair and maintain equipment..

Before removing, adjusting, or replacing parts on this unit, remember to turn off all electric supplies and all accessory equipment at the machine, and disconnect and lockout electrical power. Attach warning tags where possible.

Be sure that the unit is correctly connected to earth grounded electrical outlet that complies with current codes.

When you have completed the repair or maintenance procedure, check your work and remove your tools.

DO NOT restore power to this unit until all persons are clear of the area, BEFORE you turn this unit over to the operator for production; verify the unit is functioning properly.

### **1.5.4 Reporting a safety defect**

If you believe that your Bath has a defect that could cause injury, you should immediately discontinue its use and inform Jeio Tech or local authorized distributor.

The principle factors that can result in injury are failure to follow proper operating procedures (i.e. lockout/tag out), or failure to maintain a clean and safe working environment.

## 2.0 Functional Description

## 2.1 Introduction

Jeiotech Bath is a multi-purpose water bath used in various fields like medicine, microbiology, biology, pharmaceuticals, chemicals so on. This Bath supplies an excellent test environment with maintaining constant temperature and precise temperature control, temperature uniformity.

This unit is mounted a main CPU with the software which digital PID-Auto tune available and has a temperature correction function for correcting Pt100Ω sensor's error. Also, our Bath has the heat adjusting function through PID control and has the highest safety control system.

### **\* Custom Logical Safe-Control System**

The CLS-Control system (Patent no.0328729) is our enhanced safety controller developed by our engineers. Designed to allow our equipment to be operated in environments that require perfect thermal safety-including areas where flammable chemicals are used.

In most cases with other brands of lab equipment, the CPU comprises both control and safety features together. In the event of the CPU failing, the logic controlling the safety features will often be compromised.

Jeio Tech has separated these two important elements and now has an independent safety system running alongside the performance controller.

When any risk factors are sensed (ex: voltage peaks, short circuit, over temperature etc.) the machine will go into a recoverable safety mode as follows.

The power supply to individual components is isolated by a magnetic switch, leaving only the earth in circuit. Details of the fault are displayed. (Indicator codes)

Audible and visual alarms alert the user and remain on until attended.

**Independent IC logic detects and intercepts electronic interference before the main control board to give added safety to both user and product.**

## 2.2 Feature

### 2.2.1 General Information



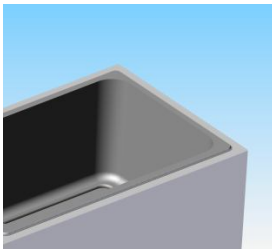
Simple and elegant design, easy to carry and move.



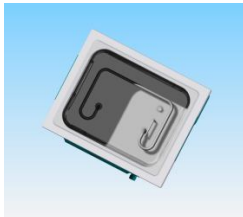
ergonomic design to recognize the panel easily



Supply a porosity panel to protect heater, sensor things. It makes extend unit's lifetime and protect user's safety.



Processed without any weld to prevent from corrosion and easy to cleaning.



The sheath heater good for shock resistant and superior insulation at the bottom of the tank by the most widely installed to make temperature reached set value rapidly and good uniformity.



Agitator for high-speed rotation is equipped. Solvent circulation function can be selected using Mag.Stir dial to implement fast temperature control and better temperature uniformity.



LED Screen shows every function by digital and lamp to make the users monitor it easily. SenS Lerr error message is displayed so that you can recognize easily that the temperature sensor has a problem.



Stainless Steel Spring wire rack doesn't have a risk of corrosion. It consists of two stages for adjusting the height simply and attaching various experimental containers (Optional)



Test tube rack with various perforated size is available adjust the slope and attach various type of test tubes. (Optional)



You can select many kinds of cover like a Plat cover, Open-ring cover, Gable type cover so on, as an optional accessories. Especially Gable type cover is designed in a shape of roof for preventing evaporation and reduce corrosion may be caused by condensed water dropping. (Optional)



CE Certificate.

\*Custom Logical Safe-Control System for user safety.



Bias function. User can correct the temperature difference directly by the user.



AUTO TUNING function is built In. Temperature is controlled by PID control.

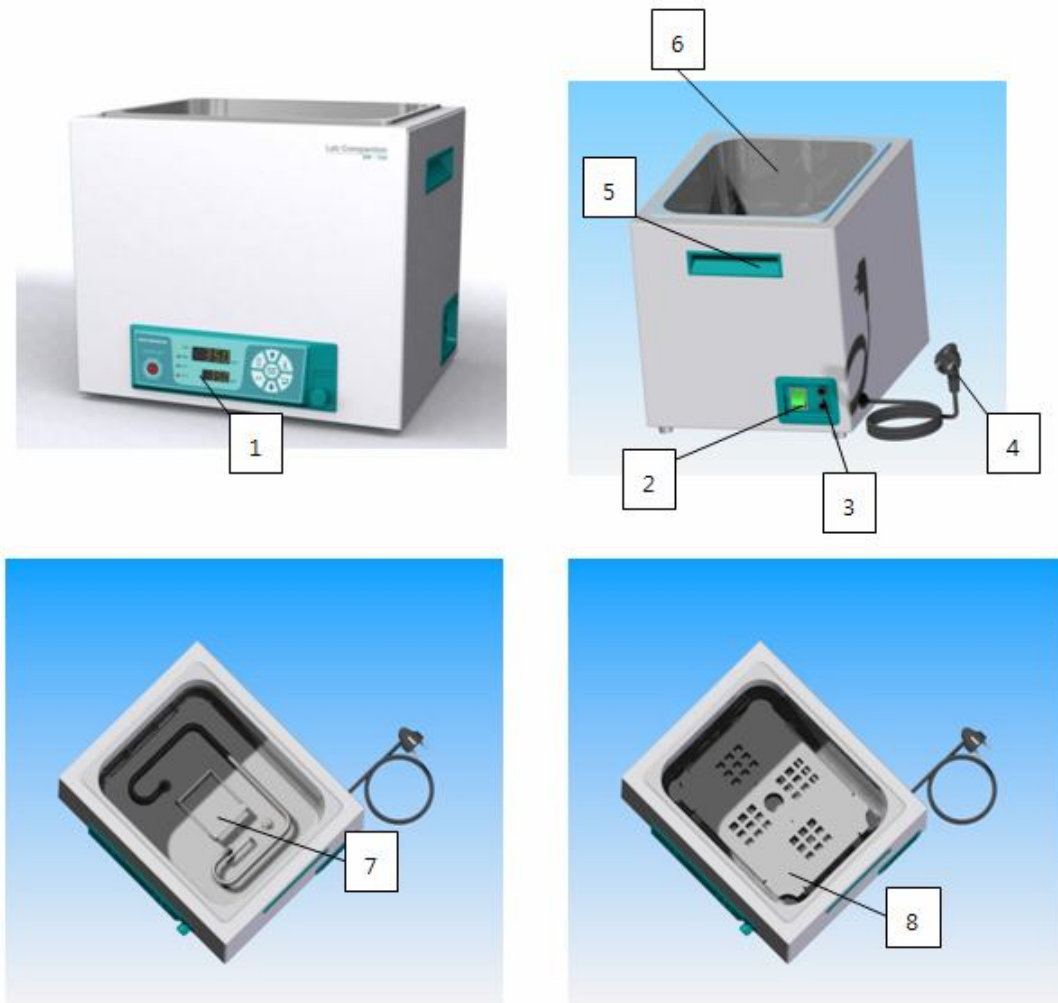


Over Temp. Limit system is built in. It prevents over heat.



Save up to 3 values of temperature often used to operate quick and easily.

## 2.2.2 Construction



### (1) Control Panel

Setting controls and operation

### (2) Main Power Switch

Turn on main switch ON/OFF

### (3) Fuse

Safety device is for preventing internal flow from over-current.

### (4) Power Cord & Cable

### (5) Handle

### (6) Bath

### (7) Agitator Unit

### (8) Screen plate


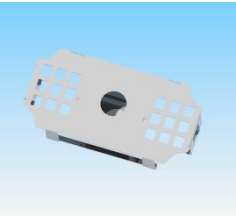
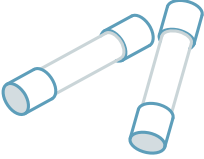
It protects heater, sensor etc.

## 3.0 Installation

### 3.1 Unit Components

After unpacking, please check listed Bath component description as follows.

If you didn't receive one or more component as follow, Contact the Jeio Tech Service center or the distributor where you purchased.

Component	Quantity	Received
Operating Manual 	1	
Screen Plate 	1	
Spare Fuse1) 	2(4)	
Magnetic Bar 	1	

**BW-05H, BW-10H, BW-20H : 2EA**

**BW-0505H, BW-0510H, BW-1010H, BW-1020H : 4EA**



## 3.2 Check Points

### 3.2.1 Select a Proper place

When it is stalled, it should be placed 1.5m far from lights, 20cm far from wall.  
Do not put next to equipment. Please Keep the distance 30cm more between each units.



### CAUTION



Do not place where happens high frequency noise near like high frequency welding machine etc.

The unit makes magnetic field. Do not put near machine which can be affected by.

### 3.2.2 Environmental Setting

Working properly when the conditions and circumstances as below are satisfied.



Avoid from direct radiation



Remain the temperature from 5°C to 40°C near the unit



Remain the relative humidity 10% to 80%.



Remain an altitude of installation place under 2,000m above sea level



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.



Check a ground wire of the unit

 **WARNING**



**Don't install the machine near to places where inflammable gas can be leaked.**

Do not use the machine near to places where explosion can be happened due to organic evaporating gases.

**Do not install this unit on the complicated path and near heater or pressure tank.**

### 3.2.3 Leveling the unit

When you set up the unit, balancing is very important. If the balance of the unit is not in a good condition, it causes vibration and noise and the user could be in danger.

### 3.2.4 Power supply

Jeio tech Thermal Baths are designed to use a single phase power with a ground wire. Required voltage and power consumption are mentioned on the ID label beside of power switch right side of this unit.

Connect the electricity power using right voltage after checking ID label. Less than  $\pm 10\%$  of marked voltage on the label is available.

 **DANGER**



**ELECTRICAL SHOCK HAZARD**

Connecting Power improperly may causes damage to equipment and serious injury or death.

Check an outlet to insert a proper plug as following picture before connect the power. If a power cord is not suitable, please contact a local distributor of Jeio tech.

We recommend an extension cord following IEC60320 standard in case the power cord is short

 **WARNING**



**Sources of electricity should be separately wired.**

It can cause fire and electrical shock if the connection is not proper.

**The sources of electricity should be grounded.**

The sources of electricity without ground connection can cause serious damage to users or the machine

 **WARNING**

**Please use the correct power cord that has been provided for you.**



**Do not use multiple plugs or current tap socket.**  
It may cause damage with wire or fire due to over-current.

**Do not put heavy things on the power cord.**  
It may strip off the wire coating and may cause an electric shock or fire.

**Do not touch the cord with wet hands.**  
**Plug in the main power cord correctly.**  
It may cause an electric shock or injuries.

### 3.2.5 Safety

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

Unplug the power cord if there is a popping sound, burning smell, or smoke.

Do not disassemble, fix or change and repair.

Do not move the machine when running water heated.  
Must drain running water completely when moving the machine.  
Overflowing running water can cause malfunction and burn

Be careful to enter moisture, organic solvents, dust and corrosiveness gas into controller.  
If moisture into the controller, please ask for after sales service after power off.

Do not put inflammables and explosives in the machine.

Do not drain out if the heated water is hot. When you drain it out, you need to wear gloves.  
Running water recommended must be non-flammability.

In case of flammability, the flashing point of running water must be over 40°C.

Running water circulated and pumped can be used below ambient 20°C. Running water must be lower 5°C from the flashing point. (Fp-5)

## 3.3 Initial Operating

### 3.3.1 Pre start up check

- Check the connecting with unit and outlet is in a good condition.
- Check the unit is balanced well.
- Check if there is a flammable or explosive material.
- Check if there is flammable or explosive liquid on the unit.
- Check if you set knob of Over Temp.Limit above 10-15°C than set point.
- Check all of accessories are fixed firmly.
- Check the accessories on platform are fixed exactly.
- Fill water or oil up before connecting power cord.

### 3.3.2 Start Operating

Turn on power switch, it will show as below.

- The power switch light up
- Sound “beep” and shows JEIO in ACT display, TECH in SET display.



- Then, standard screen shows up 2 sec later as below.
  - ✓ ACT Display : Display temperature of this unit at present.
  - ✓ SET Display : Display set temperature of this unit.



### 3.3.3 Stop operating

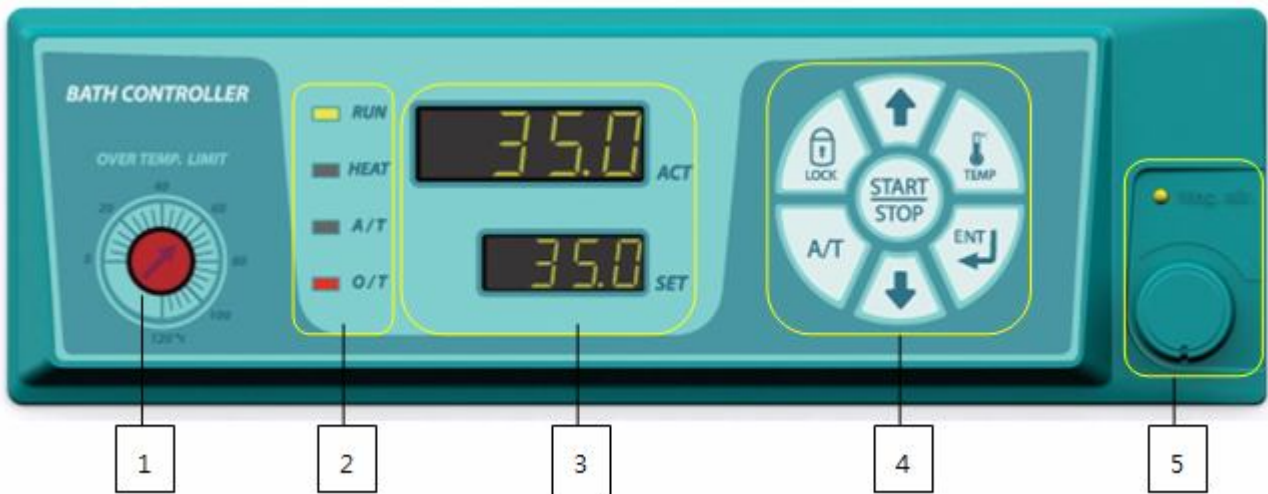
Turn off when you don't use it as following steps.

**Step 1** : Push Start/Stop key to stop operating.

**Step 2** : Turn off the power switch and confirm it light off.

## 4.0 Operation

## 4.1 Keypad over view and description



### 1. OVER TEMP. LIMIT

This controller is completely independent of the main temperature controller as a safety device which would not allow raising more than the temperature of set point to protect the unit and their test sample. If temperature goes up more than that of the set point due to malfunction, or un-experienced user's operation, it automatically stop the unit and give a signal to the user with alarming and O/T LED's blinking to be aware of overheating of the unit..

### 2. State Display

**RUN LED** : Indicates whether the unit is active or not. When the unit is active, LED turns on green, the unit is turned off, when it's stopped.

**HEAT LED** : Indicates the output status of heater. LED turns on green when heater is active.

**A/T LED** : LED turns on green during Auto tuning.

**O/T LED** : Lights on red when bath temperature exceeds the set point of over temp. limit and the unit's stopped at the same time.

### 3. Temperature display

**ACT temp. display** : indicates the actual temperature(ACT) of liquids inside of bath.

**SET temp. display** : Indicates the setting temperature(SET) of liquids inside of bath.

### 4. Operation button

**START/STOP button** : Used to turn the unit on and off. In case the unit is automatically stopped due to instability of the unit, you can remove the alarming and LED's blinking by press this button and start the unit again after problem is solved.

**LOCK button** : used to lock the button of the controller.

**A/T button** : Used to optimize the unit at user's temperature by pressing and holding this button for 3 seconds.

**UP button** : Used to increase temperature settings and option values. In order to make it fast, just hold the button a little bit longer.

**DOWN button** : Used to decrease temperature settings and option values. In order to make it fast, just hold the button a little bit longer.

**ENTER button** : used to save the temperature settings and option values by using the button UP/DOWN.

**TEMP button** : used to set the temperature settings.

## **5. Agitation Operation**

**AGITATOR Dial** : used to control the speed and operation of agitation by turning Agitator dial in Clockwise  
And counterclockwise directions

**AGITATOR Operation LED** : LED turns on green during the agitation operation.





## 4.2 Controller Feature

### 4.2.1 Temperature setting

**Step 1 :** Press the button “ TEMP “ once.

- Then, numbers will be activated with blinking on SET temperature display.



**Step 2:** Press to change the set point by using the button “  UP/  DOWN “.

- Enter the set point to change.
- Setting temperature range from -10°C to 110°C.



#### Working Temperature Range

Amb. +5°C to 95°C

**Step 3:** Press the button “  ENT “to finish.

- Then, Entering the set point has been finished.

**Step 4:** Press the button “START/STOP “.

- Displays the output status of heater with lighting on “ RUN LED ” .
- Press the button “ START/STOP “ once more, then the unit is off.



If there is no input for about 10 seconds, the display will be back to the first state without changing the values.



#### Saving the set point.



If the unit is running again without saving the set point, it will be running at the same previous set point.

## 4.2.2 How to save / fetch the frequently used temperature.

**Step 1:** Press the button “TEMP” twice.

- Indicates SET.1 on ACT displays.
- Numbers will be activated with blinking on SET display.



**Step 2:** Press to change the set point by using the button “ UP/ DOWN “.

- Enter the set point to change.
- Setting temperature range from -10°C to 110°C.



### Working Temperature Range

Amb.+5°C to 95°C

**Step 3:** Press the button “ ENT “to finish.

- Then, Entering the set point has been finished.





This function used to save/fetch the frequently used temperature to SET1, SET2 & SET3 respectively as a convenient function.

You can see SET2 if press the button “TEMP” 3times, and also you see SET3 if press the button “TEMP” 4 times.

### 4.2.3 How to change the temperature display unit.

**Step 1:** Press the button “TEMP” 5 times.

- Indicates “°C” on ACT display.
- °C will be activated with blinking on SET display.

**Step 2:** Press to change the temperature unit by using the button “ UP/ DOWN “.

- Enter the temperature unit to change.
- Selectable temperature units between °C and °F.



The default setting is °C.

**Step 3:** Press the button “ ENT “to finish.



- Then, Entering the set value has been finished.

### 4.2.4 Temperature compensation method (BIAS)



**Step 1:** Press the button “TEMP” 6 times.

- Indicates “0.0” on ACT display.
- Indicates “biAS” on SET display.



**Step 2:** Press to change by using the button “ UP/ DOWN “.

- Indicates “AJST” on ACT display.
- Indicates the current temperature inside of bath on SET display.

**Step 3:** Press to change by using the button “ UP/ DOWN “.

- Change to the same temperature as the temperature measured by the external probe.
- Setting temperature :  $\pm 9.9^{\circ}\text{C}$ .



Please note that the external probe calibrated by an accredited agency is recommendable. In case the correct temperature compensation has not been completed by this BIAS function, you should call to service immediately..



- Step 4:** Press the button “ ENT “to finish.  
■ Then, Entering the set value has been finished.



Please make it sure that you check the revised set value on BIAS window.

#### 4.2.5 How to set “ AUTO RUN “

- Step 1:** Press the button “TEMP “ 7 times.  
■ Indicates “ Arun “ on ACT display..  
■ Indicates “ no “ on SET display.

- Step 2:** Press to change by using the button “ UP/ DOWN “.  
■ Select YES or NO on SET display.



If you select Yes, the unit will start again automatically as soon as the power is restored.

- Step 3:** Press the button “ ENT “to finish.  
■ Then, Entering the set value has been finished.



It's a kind of power compensation. The unit will start again automatically when the power is restore while the unit is stopped or, if it accidentally got off power due to out of power.

## 4.2.6 How to set " AUTO TUNE "

**Step 1:** Press the button "TEMP " and select the temperature to change.



Press and hold the button " A/T " for 3 seconds during the unit is working, then the procedure of Auto Tune will start automatically.

**Step 2:** Press and hold the button " A/T " for 3 seconds.

- lights on A/T LED.

**Step 3:** Press the button " START/STOP ".

- Indicates " Atun " on ACT display.
- Indicates the current temperature on SET display.
- A/T LED blinking.



A/T LED will be off when the procedure of A/T is finished and the unit will keep the temperature auto tuned.



Please note that Auto Tuning should be done right after finish the installation of the unit. And it also should be done in case there are changes in thermal properties on the unit occurred by the long-term use.

## 4.2.7 How to lock

### 4.2.7.1 How to lock

**Step 1:** Press and hold the button “LOCK “for 3 seconds during the unit is working.

- Indicates “ sys “ on ACT display and disappear.
- Indicates “LoCK “ on SET display and disappear.



Lockout allows the user to lock all controls on the controller, except “START/STOP “button. While this function is activated, all the bath controller buttons cannot be changed to avoid accidental mistake occurred by pressing undesired button.

### 4.2.7.2 How to unlock

**Step 1:** Press and hold the button “LOCK “again for 3 seconds during the unit is working.

- Lockout function will be off with Beeping sound.

## 4.2.8 How to use Agitator system

### Step 1: Turn Agitator Dial clockwise

- Once click sounds, Agitator system is on.
- Agitator LED turns off.
- The more you turns Agitator Dial clockwise, the faster circulation of thermal oil is.



## 4.2.9 How to use Over Temperature Limit

**Step 1:** Press TEMP button to set the desired temperature.

- When the initial power is on, the equipment starts operating by the set value of the volume switch.
- When the equipment reaches the set temperature it need a certain time to stabilize.
- Turn the red knob counterclockwise by a screwdriver.
- Stop knob, when display O/T LED flickers, the alarm rings.
- After seeing the displayed value, turn the knob clockwise to set Over temp. limit 10 ~ 15°C higher than set temperature

(If you turn the knob clockwise, Over Temp. Limit contacts in the sense that you can sense that contact works at Over Temp. Limit.)

- Press START/STOP to turn off the alarm.

### **Protection function for the safety of the equipment**



Unstable factors such as overheating is detected, Turn off the equipment's main power to stop the operation.

And when the Bath's internal temperature is higher than the setting value of knob, the alarm rings and the controller O/T LED blinks and the unit stops operation.



## 5.0 Preventive Maintenance

## 5.1 Inspection cycle

Classification	Inspection cycle frame				
	Daily	Weekly	Monthly	Quarterly	Yearly
General					
Power cord					
Inspect power cord connection between unit and power.	•				
Inspect power cord for wear, cracks or cuts.	•				
Appearance cleanness		•			
Bath					
Check the connection of the accessories.	•				
Check the operating status of the agitator in the bath.		•			
Check the condition of "Over Temp. Limit".			•		
Check the button input condition, set values are input correctly.				•	
Check the temperature is controlled properly.					•

## 5.2 Storage and cleaning

Regular cleaning of the unit is simply good practice. It preserves the surfaces, adds life to the unit and lets the unit run more efficiently. We recommend the unit be cleaned at least once a week. Please use the following instructions to clean your unit.

### 5.2.1 Exterior surfaces

#### 5.2.1.1 Normal status

Wear chemical resistant gloves. Clean the surface with neutral detergent and dry clothes.

#### 5.2.1.2 Serious status

If the unit is contaminated with toxic chemicals or gas, please clean the unit the following instruction.

**Step 1** : Wear chemical resistant gloves and mask.

**Step 2** : Clean the surface with dry clothes slowly.

### **WARNING**



When cleaning the equipment, do not place liquids on top and swell water on the equipment.  
If water enters the equipment, immediately disconnect the power and request service. This can cause electric shock and fire.

When you clean the equipment, unplug the power cord.  
This can cause electric shock and fire.

### **CAUTION**



Stop draining water if the water in the bath is hot.  
User can be burnt. Put gloves when draining.  
Do not clean the bath with sulfuric acid, hydrochloric acid or organic solvent  
It can cause damage to the surface of the equipment and fire.

## 5.2.2 Inner cleaning

**Step 1** : Power off and unplug

**Step 2** : Takes off accessories.

**Step 3** : Clean the inner bath, perforated screen plate, magnetic bar with dry towel.



 **WARNING**

**When you clean the equipment, unplug the power cord.  
This can cause electric shock and fire.**

## 5.2.3 Clean Accessories

**Step 1** : Soak accessories in detergent.

**Step 2** : Clean it with pure water.

**Step 3** : Keep it after drying.



 **WARNING**

**When getting rid of toxic chemical materials or gases  
licked out from the equipment, close safety gloves and  
mask for protection.**

## 5.3 Replacing Fuses

The unit is supplied with spare fuse in case a fuse needs to be replaced.

If you need additional fuses, the following table to find the correct fuse part number and contact your local Jeio Tech office, or distributor to purchase.

Model	Voltage	Fuse(A)	quantity	remarks
BW-05H	120V	8A	2EA	
	220V/230V	5A	2EA	
BW-10H	120V	10A	2EA	
	220V/230V	5A	2EA	
BW-20H	120V	10A	2EA	
	220V/230V	10A	2EA	
BW-0505H	120V	8A	4EA	
	220V/230V	5A	4EA	
BW-0510H	120V	5A/10A	2EA/2EA	
	220V/230V	5A/5A	2EA/2EA	
BW-1010H	120V	10A/10A	2EA/2EA	
	220V/230V	5A/5A	2EA/2EA	
BW-1020H	120V	10A/10A	2EA/2EA	
	220V/230V	10A/10A	2EA/2EA	

## 6.0 Troubleshooting

## 6.1 Solutions for Troubles

Follow the below when problems happen.

Please ask service if problems not included in the table happen or can't be solved by the mentioned solutions.

TROUBLE	CAUSES	SOLUTION
The unit does not turn on	<p>Incorrect electric power. Power failure or circuit breaker shuts down. Main plug not seated properly. Socket / plug / main power line might be cut Blown fuse(s)</p>	<p>Compare power source and voltage on the ID plate and make sure they are the same. ID plate is found on the back of the unit. Find out the causes of power failure and recovery. Check the electrical cord connection at the unit to ensure it is fully seated. If the socket / plug / main power line are cut, request service. Check the fuses and replace If the problems persists, request service.</p>
Fuses burn out often	<p>Fuses maybe wrong size(ampereage). Electrical cord maybe cut or frayed. Humidity might inflow into the main power inserting part.</p>	<p>Check the voltage and ampere rating of the fuses. Check electrical cord for cuts or fraying, if found to be defective, replace the cord. If there is humidity on the inserting part, clear it and reconnect. If the problems persists, request service.</p>
Room circuit breaker trips often or continuously.	<p>Too many plugs connect at the same time.</p>	<p>Check the circuit breaker size along with the voltage and current supplied to it. Check that several similar units are inserted together, if so you should not use overly. If the problems persists, request service.</p>

TROUBLE	CAUSES	SOLUTION
With the POWER switch ON, the switch does not illuminate.	Power interruption Main plug does not insert correctly Blown fuse(s) Faulty connection at the POWER switch POWER switch malfunction	Check for power interruption. Make sure electrical cord connections at the outlet and the unit are firmly in place. Check the fuses and replace, if necessary. If the problems persists, request service.
Display does not show anything when power is on.	Innter harness fails Trans fails Controller & Display fails.	Check the equipment by contacting the local dealer.
Unit control stops without cutting power or pressing any buttons.	Might be influenced by high frequency electrical noise.	Move the unit away appliances that may produce high frequency electrical noise. If the problems persists, request service.
The equipment stops working by "Over Temp Limit".	Over Temp. Limit is set wrongly.	1. Reset the "Over Temp. Limit". Operate the equipment again to find any problems. 2. Contact your local dealer to fix the equipment if the problems are not yet solved.
MOT switch on, power switch light off, but MAGNETIC BAR does not move.	MAGNETIC BAR is not in a fixed position. Stuffs around equipment in a strong magnetic components. The motor life runs out.	1. Put MAGNETIC BAR back in the position and turn MAG. STIR. Will switch on. 2. Remove Peripheral stuffs of the magnet components 3. Replace motor. 4. Contact your local dealer to fix the equipment if the problems are not yet solved.
"SenS LErr" displays and the alarm rings	Faulty sensor contacts	1. Contact your local dealer to fix the equipment if the problems are not yet solved.



## 7.0 Accessories

## 7.1 Optional Accessories

### 7.1.1 Spring wire Rack

Cat. No.	Suitable for
AAA45502	BW-10H
AAA45503	BW-20H

### 7.1.2 Half shelf adjuster

Cat. No.	Suitable for
AAA45511	BW-05H
AAA45512	BW-10H
AAA45513	BW-20H

### 7.1.3 Polypropylene gable type cover

Cat. No.	Suitable for
AAA45531	BW-05H
AAA45532	BW-10H
AAA45533	BW-20H

### 7.1.4 Stainless steel flat type cover

Cat. No.	Suitable for
AAA45541	BW-05H
AAA45542	BW-10H
AAA45543	BW-20H

### 7.1.5 Open-rings cover

Cat. No.	Description	Insert capacity of racks
AAA45521	with 2 openings 80mm dia.	BW-05H
AAA45524	with 1 opening 110mm dia.	
AAA45522	with 4 openings 80mm dia.	BW-10H
AAA45525	with 2 openings 110mm dia.	
AAA45526	with 1 opening 185mm dia.	

AAA45523	with 8 openings 80mm dia.	BW-20H
AAA45527	with 6 openings 110mm dia.	
AAA45548	with 2 openings 185mm dia.	

### 7.1.6 Test tube rack

Cat. No.	Description	Insert capacity of racks
AAA44581	for 86 test tubes 8mm dia.	BW-05H
AAA44582	for 86 test tubes 10mm dia.	
AAA44583	for 58 test tubes 12mm dia.	
AAA44585	for 32 test tubes 16mm dia.	
AAA44586	for 19 test tubes 25mm dia.	
AAA45551	for 176 test tubes 8mm dia.	BW-10H : 1EA BW-20H : 2EA
AAA45552	for 176 test tubes 10mm dia.	
AAA45554	for 84 test tubes 12mm dia.	
AAA45556	for 68 test tubes 16mm dia.	
AAA45561	for 33 test tubes 25mm dia.	

### 7.1.7 Magnetic stirring bar

Cat. No.	Description
MTT0017	Polygon type (Φ8 x 25, mm)
MTT0018	Polygon type (Φ8 x 30, mm)
MTT0019	Polygon type (Φ8 x 40, mm)

## 8.0 Appendix

## 8.1 Technical Specifications

Model	BW-05H	BW-10H	BW-20H
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Temperature			
Working range	Amb.+5°C to 100°C		
Temperature Stability at 50°C (Bath fluid: water, using agitator)	±0.1°C		
Heat up time to 70°C from 25°C (Bath fluid: water, without the lid)	25min	45min	50min

Dimension			
Volume	3.5L	11.5L	20L
Bath opening, depth (WXL, D)	240X136,150 (mm)	300X240,200 (mm)	498X300,200 (mm)
Overall (WXLXH)	307X216X266 (mm)	364X316X318 (mm)	564X372X318 (mm)
Net weight	6.5kg	9.5kg	15.5kg

Electrical data			
Normal voltage, Hz	230VAC, 50/60Hz		
Power consumption	3.0A	4.3A	8.7A
Normal voltage, Hz	120VAC, 60Hz		
Power consumption	5.8A	8.3A	8.3A
Heater power	700W	1000W	2000W

Model	BW-0505H	BW-0510H	BW-1010H	BW-1020H
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Temperature				
Working range	Amb.+5°C to 100°C			
Temperature Stability at 50°C (Bath fluid: water, using agitator)	±0.1°C			
Heat up time to 70°C from 25°C (Bath fluid: water, without the lid)	25min/25min	25min/45min	45min/45min	45min/50min

Dimension				
Volume	3.5L & 3.5L	3.5L & 11.5L	11.5L & 11.5L	11.5L & 20L
Bath opening, depth (WXL, D)	240X136,150 & 240X136,150 (mm)	240X136,150 & 300X240,200 (mm)	300X240,200 & 300X240,200 (mm)	300X240,200 & 498X300,200 (mm)
Overall (WXDXH)	590X216X266 (mm)	544X316X318 (mm)	706X316X318 (mm)	844X372X318 (mm)
Net weight	12.3kg	15kg	17.3kg	20.7kg

Electrical data				
Normal voltage, Hz	230VAC, 50/60Hz			
Power consumption	3.0A & 3.0A	3.0A & 4.3A	4.3A & 4.3A	4.3A & 8.7A
Heater power	700W & 700W	700W & 1000W	1000W & 1000W	1000W & 2000W
Normal voltage, Hz	120VAC, 60Hz			
Power consumption	5.8A & 5.8A	5.8A & 8.3A	8.3A & 8.3A	8.3A & 8.3A
Heater power	700W & 700W	700W & 1000W	1000W & 1000W	1000W & 1000W

## 8.2 Disposing of the bath



Before disposing of the Bath or any of its components:

1. The equipment should be cleaned and decontaminated to protect workers servicing the equipment, the environment or the public purchasing surplus equipment because the bath can potentially be contaminated with biological material, chemicals or radioisotopes. Check with your institution or laboratory for individual policies and procedures for disposal of laboratory equipment.

2. Please contact your local governing body for regulations regarding disposal of electrical, electronic, metal (brass, aluminum, steel and stainless steel), refrigeration and rubber components. Jeio Tech recommends the user find a local scavenger or laboratory equipment recycler to properly dispose of the unit and its components.

## 8.3 Warranty standard

### 8.3.1 Warranty standard

Customer can get free warranty service for 2 year limited warranty from the date of purchase when the machine is broken while operating.

### 8.3.2 Customer can't get free warranty service in case of as below.

- ① If the machine is broken due to the Act's of God.
- ② If the machine is broken due to overuse of voltage
- ③ If there is some shock to the machine.
- ④ If the outer part is damaged by solvent
- ⑤ If the machine is broken without taking care of the "Notice" alerted on the manual
- ⑥ If persons who are not under the authority of service of Jeio tech fixed or changed parts of the machine
- ⑦ If the broken machine is due to customer's fault

### 8.3.3 Contact your regional dealer for after service.

Jeio Tech needs to know for better and quick service when service needs.

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Purchase date  
Serial number  
A trouble part and trouble state  
Use name/ address / e-mail

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## 8.4 Service & Technical assistance

### 8.4.1 Overseas

#### Korea **(International Headquarters – Overseas Department)**

#1005, Byucksan Digital Valley 6-cha, 481-4 Gasan-Dong, Geumcheon-Gu, Seoul  
153-803, Korea.

TEL: +82 (0)2 - 2627 - 3816

FAX: +82 (0)2 - 3143 - 1824

<http://www.jeiotech.com>

E-mail: [overseas@jeiotech.com](mailto:overseas@jeiotech.com)

#### U.S.A.

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FAX: +1 781-376-0704

E-mail: [info@jeiotech.com](mailto:info@jeiotech.com)

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