

	®

OPERATION MANUAL Incubator (Multi Chambers)

Model: IB-02G-2C/4C MANUAL NO.:2A015L002 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.



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1.0 Safety

1.1 How to use the Manual

This manual is intended for individuals requiring information about the use of product. Use this manual as a guide and reference for installing, operating, and maintaining your Jeio Tech product. 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.

1.2 Symbols used in this Manual

- (1) 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.
- (2) It consists of three elements: a safety alert symbol, a signal word and a contrasting rectangular background.
- (3) You must carefully read, understand, and follow all the instructions in this manual prior to operating this instrument

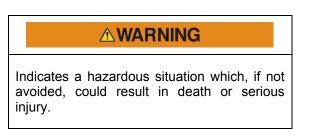
Symbols	Meaning	
▲WARNING	Ignoring this warning could cause serious injury or even death.	
	Ignoring this caution could cause injury or property damage.	
NOTICE	Ignoring this notice could cause operational problems.	

1.3 Exemption for responsibility

- (1) The claim which is out of the quality guaranteed by the manufacturer is out of Manufacturer's responsibility.
- (2) The damage which is from unexpected fault or damage of user by Acts of God is out of Manufacturer's responsibility



1.4 Warning statements



Please check and connect properly -the voltage, phase and capacity of power supply on the ID plate before installation.

Install the separate power wiring and use a dedicated power supply.

Power supply must be properly grounded.

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

Please use correct and provided power code. Power cord: Wall outlet with grounded terminal power cord 250V 15A.

Do not install the product in the place that the gas could leak out. Does not use in the place that has the industrial oil smoke and the metallic dust. It causes fire or electric shock.

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

Explosive materials: Acid, Esther, Nitro compound

Inflammable materials: salt peroxides, inorganic peroxide, salt acids.

Keep out of the direct sunlight.

It may influence that product life and operation properly.

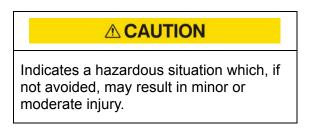
Do not use the machine at places where moisture is high and flooding can be happened.

Do not assemble, repair, modify on your own.

The product may not work well and electric shock in the efficiency of the product. Also you cannot get after service by warranty regulation



1.5 Caution statement



Do not put heavy things on the power line. Do not put the machine on the line. It may take off the wire coating and causes the electric shock or fire.

Do not touch it with wet hands and put the main plug correctly. t may cause the electric shock or injuries.

Installation power outlet near instrument and may be convenient.

Do not install the shaker neat machinery generating high frequency noise. Please avoid installed from high frequency- welding machine, sewing machine, and mass SCR controller.

Do not inject any inflammable things inside of product.

Do not pure water or put liquid on the top of the product when cleaning. Please intercept the main power immediately and request the service when water may be in the product.

Do not let the product take any strong shock or vibration. It causes abnormal operation or trouble. It may deteriorate the ability of the product and not obtain correct results.

Do not sprinkle insecticide or flammable spray on the product. Use smooth cloths. Cleaning with solvent can cause fire and deformity.

Please power off while product cleaning. It may cause the electric shock or fire.

Put off the power plug if some sounds and burning smell, smokes are happened. And request the service.

Do not let the product take shock and fall down product. It will be caused by wrong operating and malfunction.



2.0 Description

2.1 Introductions

- (1) This Incubator is used for cultivation of thermopile micro organism and normal micro organism like e coli and bacteria.
- (2) This Incubator is used for tissue of plant and animal, activating sperm and egg and determination of germfree of sterilized culture medium.
- (3) This Incubator is good for constant temperature test like test of plant storage, environment variation.

2.2 Features

(1) This is a multipurpose Forced Convection Incubator. This Incubator can used in biotechnology, Pharmaceutical, medical, chemical, biology, and various fields. We have firstly developed CLS (Custom Logical Safe)-Control system in this fields for convinces in use and safety to users.

(2) CLS-Control system¹ means "Control system which has logical safety device specialized for individual model". Laboratory must have Thermal safety secure because there are a lot of inflammable reagent. This system is highest safety secure control device (patent no. 0397583 and 0328729) and makes the unit suitable for this kind of environment.

(3) Automatic shutdown of Heater and Blower for minimization of heat loss and users' safety when the door is opened.

(4) This unit has insulation for high temperature in the outside of the inner chamber and inside of the door and also has Chamber Silicone door for high temperature therefore insulation is perfect and heat lose is very low.

(5) Uniform temperature in the chamber is made by special design.

(6) We install Door lock for easy door open & close.

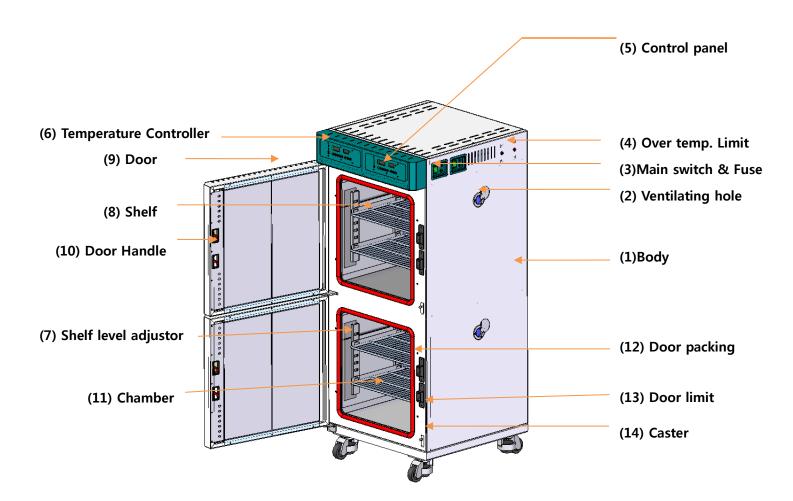
(7) Safety circuit is used to protect the instrument from over charge and over temperature of the heater.

¹ Control system which has logical safety device specialized for individual model



2.3 Construction

[IB-02G-2C]





[IB -02G-4C]



(1) Main Body

Made by iron plate and painted.

(2) Ventilating hole

It changes air volume of ventilation. It's very hot, please wear safety glove when you need to adjust it. The safety gloves must be dry. Wearing wet gloves causes burning and electric shock.

(3) Main swich & Fuse

This is the switch for main power. Fuse protects the instrument from electric shock. Please check out correct power supply when you replace Fuse

(4) Over temp. Limit

If the heater temperature rises higher than set temperature it cut the power of the temperature controller, makes the over temperature LED blinking and alarming beep sounds. If you resume the operation, please set knob of it about 15% higher than set temperature and press Start/Stop switch ones then check run led of temperature controllers on.

(5) Control panel

Controller and the various electrical components are built-in.

(6) Temperature Controller

This equipment loaded the Micro processor (CPU) which had the verified S/W that Digital PID Auto tuning this is possible and is having a temperature revision function for a temperature sensor and a heating control function.



(7) Shelf level adjuster

Shelf level is easily adjustable by the size of sample. (IB-02G-2C->8 levels, IB-02G-4C->8 levels)

(8)Shelf

Stainless steel wire appearance has a fine view & clean body due to electro polishing finish.

(9) Door

There are air barrier between door surface and insulation of the door. Therefore the surface of the door is cool.

(10) Door Handle It is Door handle for door opening.

(11) Chamber

It's made of stainless steel and there are Blower, Heater, Temp. sensor and Temp. regulator inside of the chamber.

(12) Door packing

The packing is made by high temp. silicone rubber for high confidentiality.

(13) Door limit switch

It's installed inside of the unit. The Logic IC of this switch put off the main switch. This cut off all 2 phase currency in the instrument therefore heater and fan stops for safety of user. Door LED blinking to indicate the door is opened.

- If the door is opened more than 1 minute then the alarming buzzer sound with showed warning signal on the display in order to inform the user that the door is opened for a while.

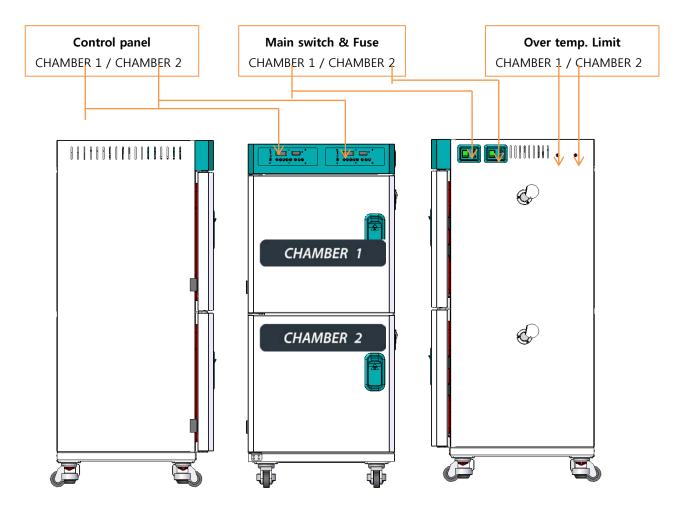
the warning is shown on the display, this equipment will be not operating even door close.

(14) Caster

The unit can be placed on a level on the ground Even if it's not even ground by adjustment of caster foot.

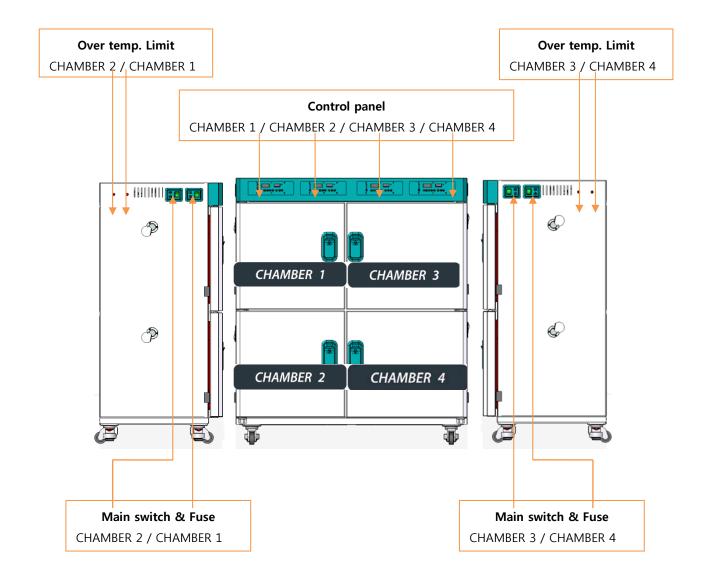


[IB -02G-2C]





[IB -02G-4C]





3.0 Installation

3.1 Unpacking the package and Inspecting damage during transportations

- (1) Check the damaged part before unpacking.
- (2) Unpack the unit carefully.
- (3) Inspect the unit is not damaged during transportations.
- (4) If the unit have a damage, please contact sales or Jeio tech.

3.2 Check the unit components

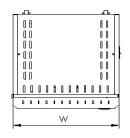
(1) Please check the unit components supplied packaged in the package after unpacking.(2) If noticeable damage or an omission is found, immediately notify your local Jeio Tech dealer's Service Department.

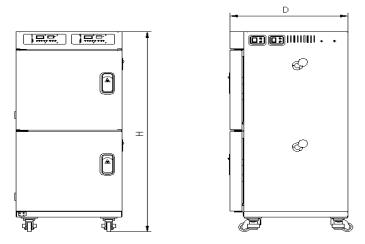
CC	COMPONENT QUANTITY RECEIVE		
Main body		1ea	
Shelf		2C-4ea 4C-8ea	
Shelf Bracket		2C-16ea 4C-32ea	
Operation Manual	The A	1ea	
Fuse		2C-2ea 4C-4ea	



3.3 Preparing before installation 3.3.1 Space requirements

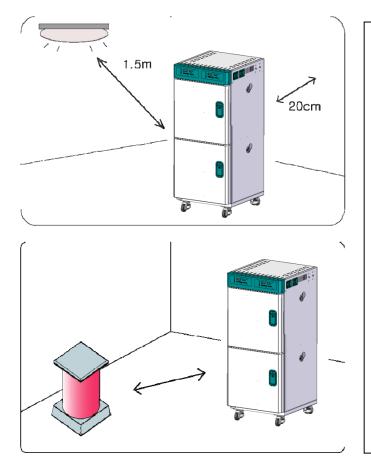
It is essential the unit to be situated in an area where there is minimum space 1.2m for the front-ward.





MODEL		IB -02G-2C	IB -02G-4C
	Internal(mm)	400×360×420	400×360×420
Size(W×D×H)	External(mm)	570×640×1360	1170×640×1360



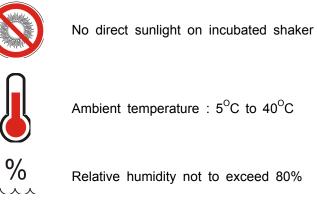


- The surface where you place the unit should be smooth, level and sturdy not to be shocked or fell down.
- The unit requires a minimum space more than 1.5m from the lighting device and more than 30cm from the wall.
- The floor should be level, and of solid construction to prevent from any vibration or a noise.
- Temperature at the location to be installed should be below at 30C, 80%RH, and the place should be located away from the stove or Heater generating heating source..
- 5. Be careful when moving the unit due to its heavy weight.



3.3.2 Environmental setting

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



Ambient temperature : 5°C to 40°C



Relative humidity not to exceed 80%



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



Connect the incubated shaker to earth grounded terminals only.

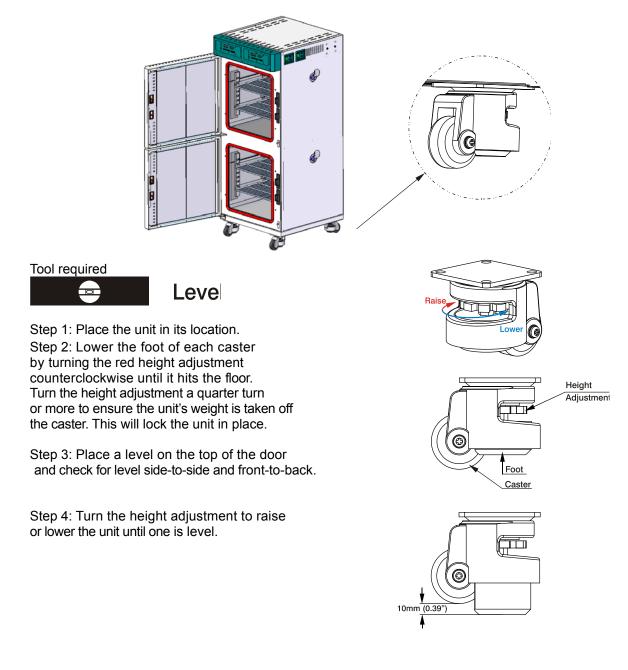


No influence place for the electromagnetic wave.



3.4 Product casters leveling and locking.

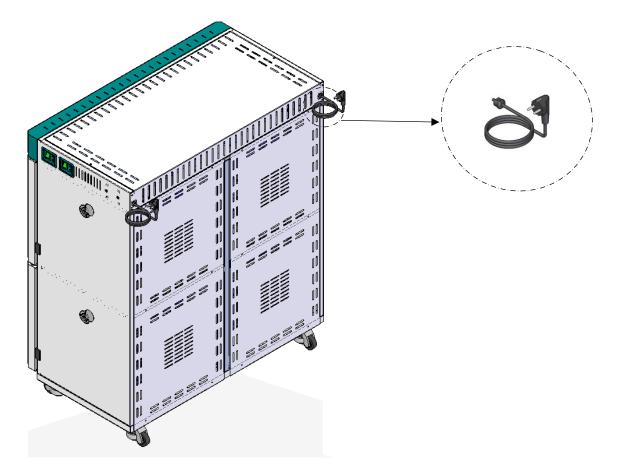
The caster assembly allows for easy movement, locking and leveling of the unit. For proper agitation, it requires the unit to be level side to side and front to back. Use the following instructions to ensure the unit is level.





3.5 Power connection

STEP 1: Check the power cord which is located product backside-to.



STEP 2: Connect the plug line to the power consent.

STEP 3: After AC power supply, turn on the main switch.

Check to make sure that the correct line voltage, phase It cause of fire or electric shock.



WARNING

Do not use the branch socket, extension tap. It cause of cable damager, fire by overcurrent.

Please use the only supported power code with product.

3.6 Pre start-up checks

- \rightarrow Make sure all unit and wall outlet electrical connections are tight.
- \rightarrow Make sure caster feet are lowered and have locked the unit in place.
- \rightarrow Make sure the unit is level side to side and front to back.
- \rightarrow Make sure there are no flammable or explosive liquids inside of chamber.

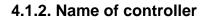


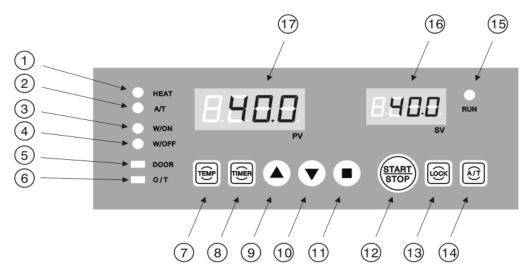
4.0 Operation

4.1 Controller features and name. 4.1.1. Controller features

- (1) CLS-Control System carries out temperature control of equipment and heating control in the Main CPU where precise PID algorithm is possible. All actions for safety are conducted by a selective functional Logic IC which is installed separately. This is designed to conduct safety performance against any electric and electronic shock on the unit.
- (2) CLS-Control System shuts down all 2 phase power supply to each part immediately and informs user instability by audible and visual device, and then it keeps in safety mode until all instability conditions are removed.
- (3) CLS-Control System has wait on/off timer function for the user's convenience. The function starts or stops the operation after the set time.
- (4) CLS-Control System gives user two choices when the unit's operation is terminated by a power failure and then the power recovers. One is a resume of the unit's operation. Another one is to keep the unit in standstill.
- (5) CLS-Control System is composed that feeble electric current streams down to only 5V, 10mA at a point of contact of a used safety device. There is no damage of a point of contact in use of a long time. So, the durability is very long. After it stops the control of the Thyristor which controls electric current stream of the heater that uses a large electric current when a safety device is operated, it shuts down the power through Magnet Switch's disconnection of a point of contact. It prevents the point of contact from damaging and a noise revelation of a power switch. It enforced with the mentioned objection order above when an operation of equipment starts, and it also prevents the point of contact from damaging and a noise revelation of Magnet Switch.







(1) HEATER LED

Indicates the Heater output condition.

(2) Auto Tune LED

Flashes during Auto-tune function.

(3) Wait On Timer LED

Illuminates when wait on timer is set. Flashes during timer countdown. Turns on when timer expires.

(4) Wait Off Timer LED

After PV consistent with SV. This function countdown elapsed setting time and will be stop.

Illuminates when wait off timer is set. Flashes during timer countdown. Turns off when timer expires.

(5) Door warning LED

Illuminates when the door is open.

(6) Over temperature LED

O/T LED flashes, the microprocessor stops all programs and a beep is emitted when the incubator temperature exceeds the over temperature limit setting. Note) Over temp. limit should be set 15% higher from the user limit setting temperature.

(7) TEMP Button

Temperature setting button.

(8) TIMER Button

Timer setting button.

(9) Up Button

Increases the set value.



(10) Down Button

Decreases the set value.

(11) Enter Button

Stores the selected set value.

(12) Start/Stop Button

Synchronized: Starts and stops the incubator. Not Synchronized: Starts and stops the incubator only. Press to clear flashing LED and beeping when the incubator stops operating.

(13) Lock Button

Screen lock button.

(14) Auto Tune Button

Press the A/T button for one (1) second to begin autotuning the temperature.

(15) RUN LED

Indicates LED for the product operating or not. When the product is operating properly, the LED lamp turn on. But when the product is not operating, the LED lamp turn off.

(16) SV display

Indicates the set (desired) incubator temperature value.

(17) PV display

Indicates the present (current) incubator temperature.



4.2 Controller operation 4.2.1. Temperature Setting

step1 Press button. A set temperature value (SV) blinks. This means you can change the set value.

	HEAT AT W/ON W/OFF	8.40.0	E.4 D.0 sv	
	DOOR)
/ /				

step2 Press () button to change the digit number and then press () button when you save the value.

step3 It goes back to the previous state without saving if you don't touch any button for 10 seconds.

step4 Press we button again when SV display blinks, then following additional functions will be activated.

4.2.2. Additional function of Temp button

(1) Favorite values can be stored at Sv.1, Sv2, Sv3 for each operation.

Press 2 times and set temp. values by pressing () and () and conclude the setting by pressing (

Set temperature is saved on memory and set temperature varies Sv1, Sv 2, Sv 3 are applied the same.

Press button repeatedly then Sv1, Sv2, Sv3 are shown and temperature unit set mode shown by pressing 5 times repeatedly.







(2) This is a function vary the unit of temperature value.
 Initial display is °C and it can be varied °C and °F by pressing ▲ and ▼outtons

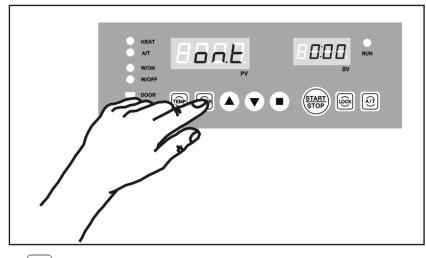


- (3) Next mode is shown by pressing 6 times.
- (4) This compensates the temp. value errors. Requested values are put on PV display. Move to the next mode by pressing and buttons.



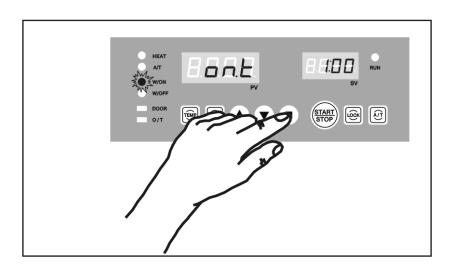
PV is put on the SV display and can be set as exactly as shown on thermometer. Set the value by pressing (and (), and conclude the setting by pressing (

4.2.3. Timer setting

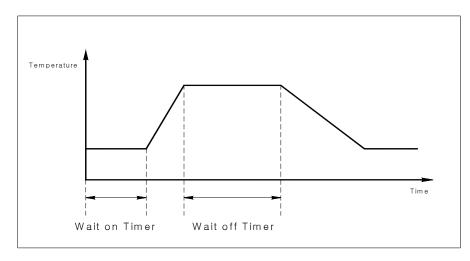


(2) W/ON LED is on with Beep sound after setting





- (3) Press button one more time. You can set the wait off timer. Set the time by pressing button and save and finish by pressing button..
- (4) After the setting is done, a beep sound and W/OFF LED inform that setting has been completed.
- (5) The function of Timer is shown below.
 - Wait on Timer
 - The unit begins to work after the time programmed on Wait On Timer passes.
 - The maximum of adjustable value is 99 hrs 59 min, and the minimum is 1 min.
 - Wait off Timer
 - The unit stops after the time programmed on Wait Off Timer passes since SV and PV meet.
 - Combination of Wait On Timer & Wait Off Timer
 - The unit works as a picture above.



(6) Wait on /off Timer setting deactivation

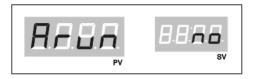
Press button in order to deactivate timer function (Both on/off timer). In order to cancel only one of the timers, set the value of the timer to 0.



4.2.4. Additional function of timer button.

When you press $\widehat{}_{max}$ button three times from the initial state, following function operates.

This is to select the machine mode in case of a power failure. This function operates the equipment automatically after a power recovery in case of a block out during operation or a power cut by mistakes. When the user sets to 'Yes', the equipment operates the moment the power is recovered.



4.2.5. Auto Tune setting

Auto Tuning is performed for more exact and faster temp. controlling. PID values are stored Automatically after tuning.

W/ON W/OFF	Raea, e	
O/T		START OF ST
	/ /	

- step1 Set the user common use Temp.
- step2 A /T LED is on with Auto Tune signal on displays by buttoning for 1 second.

step3

Auto Tune works with being on of RUN LED and flashing A/T LED by buttoning.

step4 Auto Tune time can be changed by working condition. LED is off by finishing

Auto Tune and control Auto Tune temp continually.

Ref) While operating, if buttoning for 1 second, the machine auto tunes by itself with display shows Auto Tune on it.



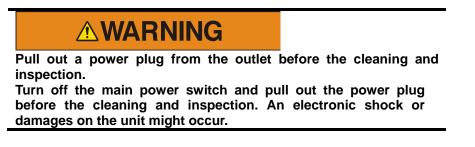
4.2.6. Lock Function

This is to lock controller buttons.

- (1) Press with Beep sound and the button for a while (3seconds), then Lock function is set with Beep sound and the unit wouldn't corresponding any more key pressing.
- (2) In order to deactivate this function please Press button for 3 seconds again.
 (3) This protects improper pressing of the controller buttons while operation.



5.0 Maintenance



- (1) When you clean the unit, pull out the power cord from the outlet and wipe it with a soft and dry cloth. Wipe the dirt with a cloth containing the solvents that have a low boiling point (methanol and ethanol).
- (2) Do not use acid solvents, benzene, sharp materials, soapy water, washing solvents, and hot water. They can cause the damage or discoloration of the unit. Parts with rubber and plastic can be changed, degenerated, or discolored. Wipe the unit with a dry cloth after using a natural detergent. Then, dry it completely



Use proper methods and materials for cleaning and inspection. Do not pour the water directly or use polishing powder, kerosene, acid on the unit. An electronic shock or damages on the unit might occur.

- (3) Use appropriate safety gloves for harmful chemicals and a safety mask for harmful gasses in the event of cleaning accidental chemical spills from the unit.
- (4) Do not pour the water directly on the equipment (especially control panel). Short-circuit can be occurred.
- (5) If the user tries to clean this unit with other method not mentioned on this manual, please contact us in order not to damage the unit.
- (6) Only authorized technician can treat the electronic parts inside of the equipment.
- (7) Use only the original parts for replacing.



- (8) The mechanical trouble that is deviated from normal limit cannot be repaired.
- (9) When you do not use the equipment for a long period of time, keep it in the dry place after pulling out the plug and packing.



6.0 Troubleshooting

6.1 Main power

Symptom	Check	What to Do	
The unit does not turn on.	 Incorrect electric power. Socket / plug / main. power line might be cut The power cord connect with havery electrical load place. Power failure or circuit breaker shuts down. 	 Compare power source and voltage on the ID plate and make sure they are the same. ID plate is found on the right side of unit. 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. Use the dedicated outlet to supply power. Find out the causes of power failure and recovery. If you can not solve the problem, please request A/S service. 	
Circuit breaker is shorten constantely.	 Fuses maybe wrong size (amperage) Electrical cord maybe cut or frayed. Humidity might inflow into the main power inserting part 	 Check the voltage and ampere rating of the fuses, contact Jeio Tech or reseller for correct fuses. Check electrical cord for cuts or fraying, if found to be defective, contact Jeio Tech or reseller for new cord. If there is humidity on the inserting part, clear it and reconnect. If you can not solve the problem, please request A/S service. 	
Room circuit breaker trips often when the unit is turned on or running	 Too many plugs connect at the same time 	 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 you can not solve the problem, please request A/S service. 	



Unit control stops, power instability, un stable or blinking display, or LED functioning improperly without cutting main power or pressing any buttons.	 Might be influenced by high frequency electrical noise. 	 Move the unit away appliances, SCR controller, induction heating systems, welders, or other equipment that may produce high frequency electrical noise. If you can not solve the problem, please request A/S service
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6.2 Temperature

Symptom	Check	What to Do	
If the unit is not in operation when you push the START / STOP button.	Check the Timer is On condition.	 You can push the Timer button and go into Wait on Timer, Wait off Timer setting and set the 0(Zero) and push the Enter button. If you do not change anything and just push Enter button, W/ON, W/OFF LED will be canceled. Controller malfunction. Calling for service assistance, check the function of the controller. 	
Can not control the temperature.	 Does not operating the Auto Tun. 	 After Auto tune fuction, try again the operating. If you can not solve the problem, please request A/S service. 	
When temp. does not increase.	 Check whether the Run LED is on Check the Door LED is flashes. 	 When the Run LED is off, press the start/stop button Check if the inner door is open. If you can not solve the problem, please request A/S service. 	
The buzzer continuously rings.	 Over temp. limiter setting temperature wrong. Inner door opened. 	 After turn the over temp. limit knob clockwise with (-) screwdriver to the point that is at least 15% higher than the PV, press the start/stop button once. Then, red light on O/T LED and a beep sound will be turned off. When you press start/stop button once, lights on Run LED and Heater LED will be turned on and the unit will re- operate. If you can not solve the problem, please request A/S service. 	



7.0 Accessories

classification	Description		Cat No.
Wire Shelves	2 (Included) 8 (Maximum)		EDA8136
Perforated Shelves	8 (Maximum)		AAA12531



8.0 Appendix 8.1 Technical Specifications

Model		IB-02G-2C	IB-02G-4C
Chamber volume(L/cu ft)		60 / 2.1 x 2 chamber	60 / 2.1 x 4 chamber
Temperature	Range (°C/°F)	Amb.+5 to 70/ Amb. +9 to 158	
	Fluctuation at 37°C (±°C/°F)	0.1 /0.18	
	Variation at 37°C(±°C/°F)	0.6 /1.08	
	Controller	Digital PID auto tuning	
	Sensor	ΡΤ 100Ω	
	Heat up time	37℃ Within 16 min	
Material	Internal	Stainless steel, 0.8t	
	External	Steel, 0.8t power coating	
	Shelves	Stainless steel wire, electro polished	
	Insulation	Polystyrene (20mm)	
	Door gasket	High temperature grade foamed silicone rubber	
	Ventilation slide	Stainless steel, dia 38mm×1EA	
Safety device		CLS(Custom Logical Safe)-control system, Class ${\mathbb I}$	
Over temp. limit		Hydraulic over temp. limit	
Heater		Incoloy sheath 450W x 2ea(230V)	Incoloy sheath 450W x 4ea(230V)
Size(W×D×H	Internal(mm/inch)	400×360×420 / 15.7×14.2×16.5× 2Chamber	400×360×420 / 15.7×14.2×16.5 × 4Chamber
	External(mm/inch)	570×640×1360 / 22.4×25.2×53.5	1170×640×1360 / 46.1×25.2×53.5
Net Weight(Kg /lbs)		110 / 242.5	168 / 70.4
Electric requirement(230V, 50/60Hz)		4.1A	8.2A (Main cord 4.1A x 2ea)
Electric requirement(120V, 60Hz)		7.5A	15A (Main cord 7.5A x 2ea)

% Permissible ambient Condition: Temperature 5 to $40^\circ\!C$, Maximum relative humidity 80%



8.2 Disposing of Incubated Shaker

Before disposing of the incubated shaker 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 incubated shaker 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

8.3.1 Terms of Warranty Service

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

8.3.2 Warranty Exceptions

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



8.4 Technical Assistance 8.4.1 Oversea

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♦ The contents of this manual is received by this Task.

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