Operation manual

[NATURAL CONVECTION OVEN]

Model : ON-02G / 12G / 22G

Manual No : 00HAA0001115 (Version : 5.0)

JEIO TECH

Thank you for purchasing a Lab companion product. We always do our best to provide customer satisfaction. This unit is designed using our own new technology and materials.

This operation manual describes the performance of the unit and gives instructions for its correct use. All users must read this operation manual carefully before you use this unit. Please use within the recommended parameters as specified.

Please read this operation manual carefully before you use this unit. Especially, please pay close attention to the safety precaution.

Safety Precautions

⚠DANGER	**¡Danger¡ means that the user may have serious damage and even die by wrong handling on this unit.**
⚠WARNING	**¡Warning¡ means that the user may have serious damage by wrong handling on this unit.**
⚠CAUTION	**¡Caution¡ means that the user may have not so serious damage and unit may have physical damage by wrong handling on this unit.**

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Contents

1. Purpose and specificity of this unit

1) Purpose

(1) Natural convection oven is used for rapid dry for glassware test of thermal hardness and thermal variation.

(2) Natural convection oven is used for preheating before heating test and test of dry for architecture component and electric component and thermal durability.

(3) Natural convection oven is used for self life test of food in harshness condition, humidity remove, harden and soften test of food and chemical by heating, moisture removal in the sample and etc.

2) Specificity

(1) Natural convection oven is multi-purpose instrument for Biotechnology, pharmacy, medical, chemical, and biology. This has firstly developed CLS (Custom Logical Safe)-Control system for convinces in use and safety to user.

(2) CLS-Control System 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, 0328729) and makes the unit suitable for this kind of environment.

(3) This unit is designed to stop the Heater and Blower in order to protect the user from heat when its door opened while it works.

(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) Triple observing window is good for insulation and observe. This is Optional

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

(7) Easy to lock door opening system is used.

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

2. Installation

(1) Scope of delivery.

Main body(1set), Operation manual (1EA), Glass fuse (2EA), Shelf(2EA), Shelf guide(4EA)

(2) This unit will work correctly on proper power supply. Please check power supply and ID Plate information are the same. User must use power supply connected earth and power cord must be connected to wall outlet supplying ground point.

⚠WARNING

We don¡t have any responsibility for accident and lose of personal and asset if the ground earth is not connected.

(3) Please install the unit in the flat place where prevent vibration and shock.

(4) Please let the unit avoid heat source and direct sun light and let the unit located in ambient temperature range in 5°C ~ 40°C relative humidity lower than 80%.

(5) Please don¡t install the unit where water and organic solvent is easily penetrates in the unit. They cause short circuit.

(6) Please don¡t install the unit in dangerous place. (Where there are flammable gas and explosive material)

(7) Please secure enough space for installation because the door of it opened 180¡.

(8) Please secure enough space for installation. The blower is back side of the oven.

(9) Please don¡t install the unit near by machines generating strong high frequency noise.

(10) This unit is quite heavy. Please move the unit with proper moving tool or 2 people together.

⚠CAUTION

Please think about the safety of user and instrument when you find out a place to install.

3. Matters that require attention

(1) Please don¡t touch Power cord and electric part with wet hand.

(2) Please don¡t put explosive and flammable chemicals (Alcohol, Benzene and etc) inside of the oven.

(3) The samples inside of the oven are very hot when the oven is works and for a while after it stops. Please take safety glove when you touch samples.

(4) Please don¡t set flammable materials near by oven.

(5) Please don¡t pour water on the unit directly when you clean the unit.

(6) Please don¡t put some conductive and flammable materials through ventilation or power supply port. It is dangerous and causing fire and electric shock.

(7) Circuit and electric component used in this unit are developed by Jeio tech. Please don¡t try to repair by yourself. Wrong combination of electric part may cause fire. You must ask to official Jeio tech dealer or distributor in your region.

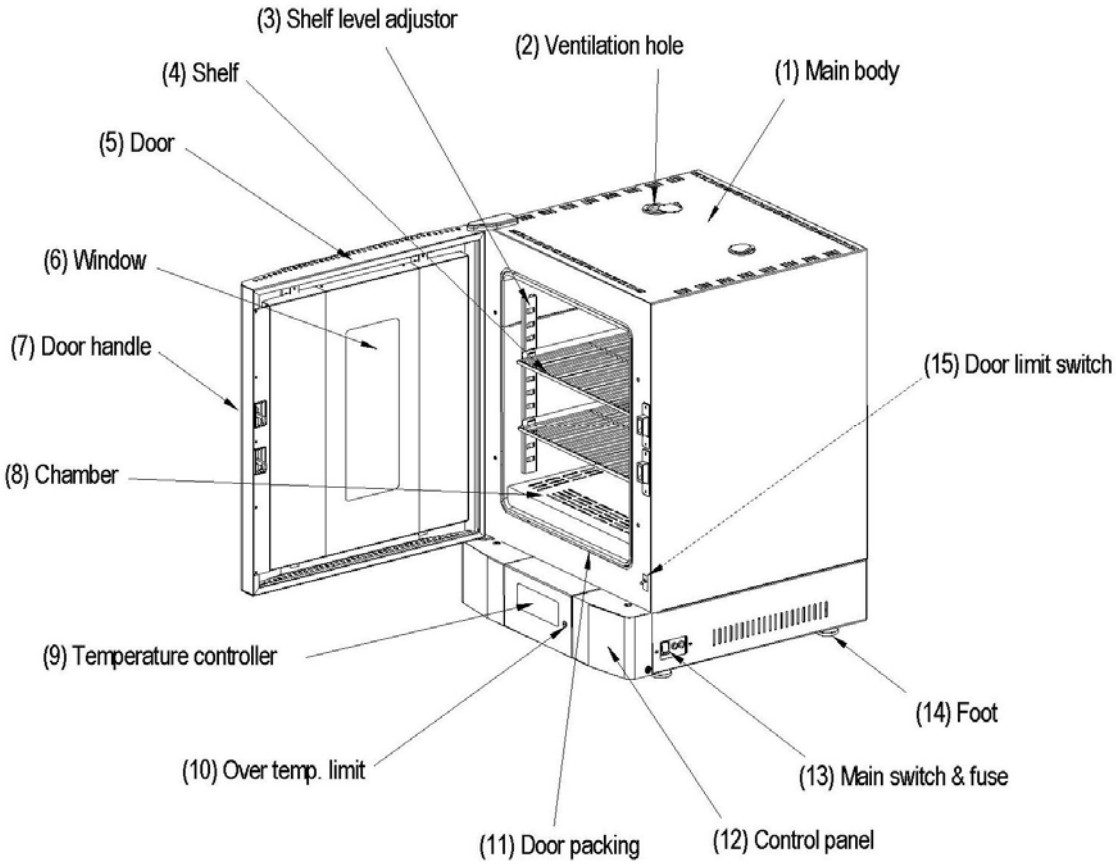
⚠DANGER

Don¡t put explosive and flammable materials inside of the Chamber.

⚠DANGER

Never put the sample dn the bo Hom of chamser (heater blmd - patch) It can be danger of overheat or a fire.

4. Name of each part



(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) Shelf level adjustor

Shelf level is easily adjustable by the size of sample.

(ON-02G →8 levels, ON-12G →12 levels, ON-22G →12 levels)

(4) Shelf

It¡s made by Stainless steel wire. It¡s easy to clean and ventilation is good. The surface of it is electrically polished therefore it has beautiful face good anti-corrosion.

(5) Door

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

(6) Window (option)

Observing glass is made by triple glass therefore it¡s easy to observe.

(7) Door Handle

It is Door handle for door opening.

(8) Chamber

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

(9) Temperature Controller

This has a Micro-processor (CPU) that has Digital PID Auto tuning function. It also has temperature compensation function for temperature sensor and the highest safety level control system such as heating volume controller.

(10) 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 controller is on.

(11) Door sealing

A silicone rubber for high temperature keeps high air sealing.

(12) Control panel

Controller and electric component are there.

(13) Main switch & 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.

(14) Foot

This adjusts level of the instrument.

(15) 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 blower 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 in order to inform the user that the door is opened for a while. (Restart the equipment by pressing START/STOP button after closing the door)

5. Operation

1) CLS-Control System

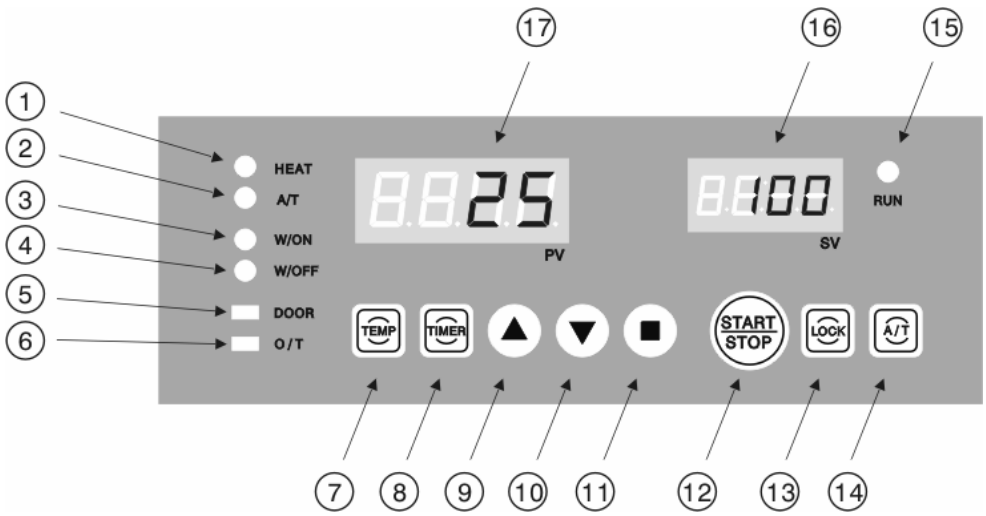
(1) CLS-Control System temperature and heater output are controlled in Main CPU which can do precise PID calculation. All control for safety is conducted by selective functional Logic IC which is installed separately. This is designed to conduct safety performance against any electric and electronic shock on the unit.

(2) CLS-Control System shuts down all 2 phase power supply to each part immediately and informs user instability by audio and visual device then keeps in safe mode until all instability conditions removed.

(3) CLS-Control System gives user two choice, one is resume operation of the unit and another is keeps the unit in standstill when the unit operation were terminated by power failure and then recovered.

(4) CLS-Control System, the safety device designed to keep very small amount of currency (only 5V, 10mA) in contact point. This makes durability of contact point very long.

2) Name and operation



(1) HEATER LED

It shows Heating function is ¡ON¡

(2) Auto Tune LED

Flickering begins on Auto-tuning.

(3) Wait On Timer LED

This is the LED indicating operation start time. The LED is blinking when the timer works and the LED off when the timer is in waiting condition.

(4) Wait Off Timer LED

This is the LED indicating operation stop time. The LED is blinking when the timer works and the LED off when the timer is in waiting condition.

(5) Door open LED

The LED is on when the door is open.

(6) Over heating alarm LED

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.

(7) Temp. button.

This button is for temperature setting.

(8) Timer button.

This button is for timer setting.

(9) Up button.

This button is for increasing set value.

(10) Down button.

This button is for decreasing set value.

(11) Enter button.

This button is for saving value after varying set value.

(12) Start/Stop button.

This button is for start/stop of unit and for resuming operation after removing some unstable factors when operation is terminated because of it.

(13) Lock button.

This is lock the controller buttons.

(14) Auto Tune button.

The auto tune begins if you press this button for 1 second.

(15) RUN LED

This LED indicates Work/Stop state of unit. It turns on when the unit runs and turns down when the unit stops.

(16) SV display

This display is for showing set temperature and showing remaining time when the timer function is activated.

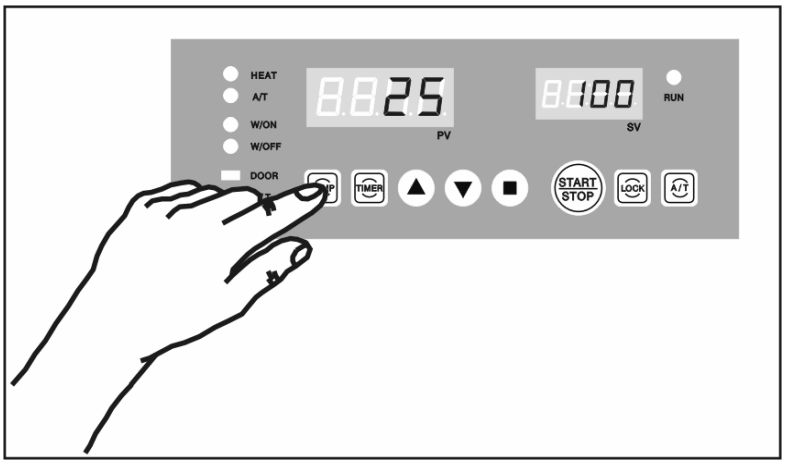
(17) PV display

This display is for showing present temperature.

3) Temperature setting

(1) Press TEMP button.

Set temperature value (SV) is blinking. This means you can vary set value.

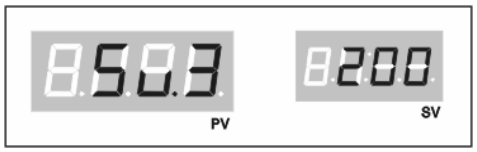


(2) Press ▲ ▼ button to vary digit number and press ■ button when you save the value.

(3) It goes back to previous state without saving if you don¡t touch any button for 10 seconds.

(4) Press TEMP button again when it is in SV set state then following additional functions are activated

4) Additional function of TEMP button

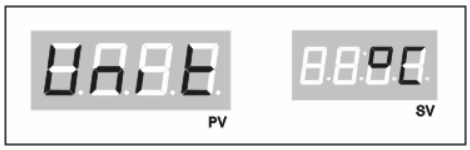


(1) Favorite values can be stored at Sv.1, Sv2, Sv3 for each operation.

Press TEMP 2 times and set temp. values by pressing ▲ and ▼, and conclude the setting by pressing ■

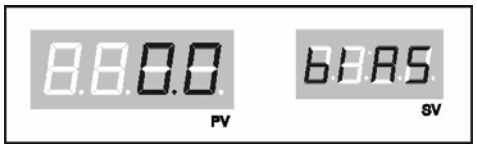
Set temperature is saved on memory and set temperature varies Sv1, Sv 2, Sv 3 are applied the same.

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

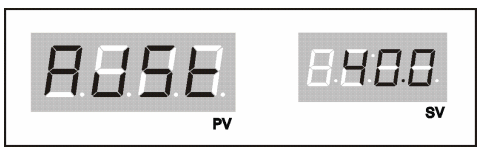


(2) This is a function vary the unit of temperature value.

Initial display is ℃ and it can be varied ℃ and ℉ by pressing ▲ and ▼ buttons.

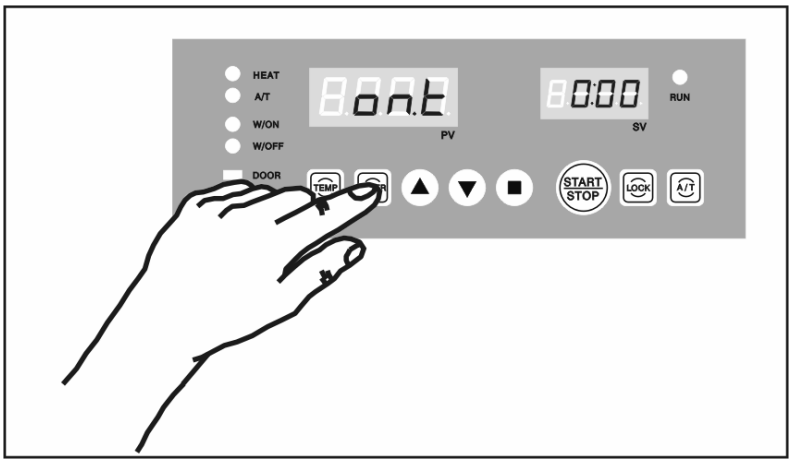


(3) Next mode is shown by pressing TEMP 6 times. This compensates the temp. value errors. Requested values are put on PV display. Move to the next mode by pressing ▼ and ▲ buttons.



(4) 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 ■

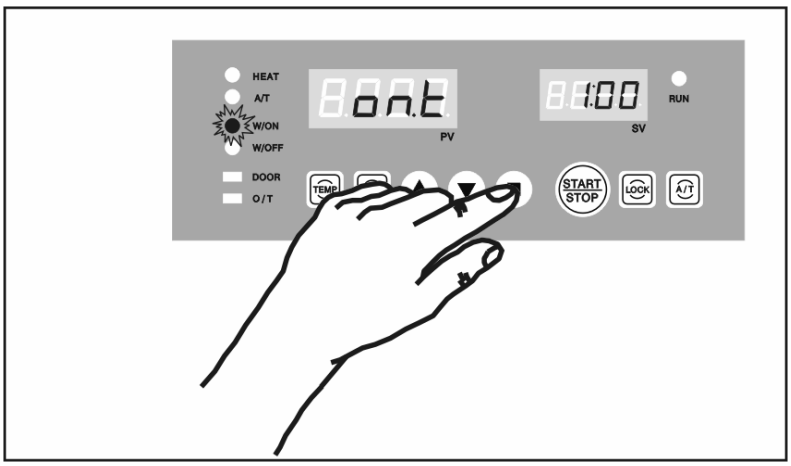
5) Timer setting



(1) Press TIMER button.

Timer (On Timer / Off Timer) is shown on PV and time is shown on SV. Set time by pressing ▲ ▼ button and Save and finish by pressing ■ button.

(2) W/ON LED turns on with Beep sound after finishing wait on timer set.

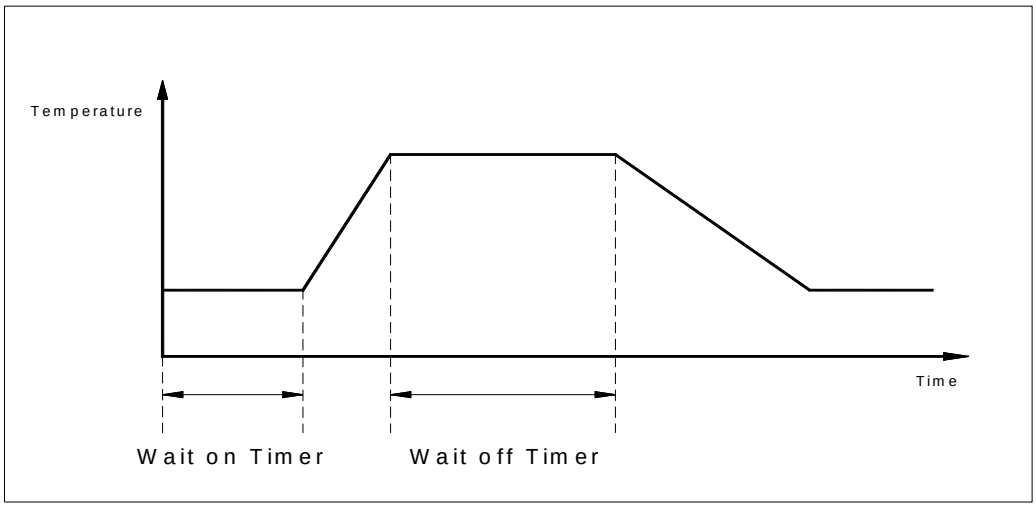


(3) Press TIMER button one more time. You can set wait off timer.

Set time by pressing ▲ ▼ button and save and finish by pressing ■ button.

(4) W/OFF LED turns on with Beep sound after finishing wait on timer set.

(5) The function of Timer is as follows.



① Wait On Timer

- The unit begins to work after time passed programmed on Wait On Timer.
- Maximum is 99hr 59mim. and minimum is 1min.

② Wait Off Timer

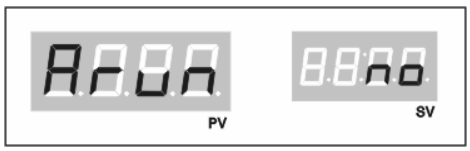
- The unit stops after time passed programmed on Wait Off Timer since SV and PV meet.
- Combination of Wait On Timer & Wait Off Timer. The unit works as picture above

(6) Timer set deactivation

Press START STOP button in order to deactivate timer function then LED turns off and set timer deactivated (Both On/Off timer deactivated). If you want only one timer set time of timer for 0 then the timer is deactivated.

6) Additional function of TIMER button.

Press TIMER button once again on wait On/Off Timer function then following additional function displayed.



(1) This is selection of unit state after power failure.

If you set yes the unit will run or else the unit will not run after power failure situation finished.

7) Auto Tuning

Perform Auto Tuning in order to get precise and rapid temperature control. PID value saved automatically after Auto Tuning.

(1) Set temperature you want.

(2) Press A/T button for a while(3seconds) then Auto Tune shown display like right hand side picture and A/T LED blinking.

(3) Auto Tune time is various according to installed environment.

LED turns off after finishing Auto Tune and Present temperature & Set temperature meet.

8) Key Lock

This is to lock controller buttons.

(1) Press LOCK 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 LOCK button for 3 seconds again.

(3) This protects improper pressing of the controller buttons while operation.

6. Maintenance

(1) Turn off the main power switch and pull out a power plug from wall outlet.

(2) Remove all liquid in the bath

(3) Wash with soft cloth containing neutral detergent.

(4) Wash with soft cloth containing distilled water.

(5) Dry with dry cloth.

(6) Don¡t use organic solvent.

(7) If user try to clean this unit with other method not mentioned on this manual please contact us in order not to damage to the unit.

(8) Put on Safety glove for harmful chemicals and Safety Mask for harmful gas and then wash out pollutant with dried cloth when harmful chemicals and gases are spread out on the unit.

7. Action for malfunction

1) Check points when the unit doesn¡t work.

(1) Check out power supply.

(2) Check out fuse if off.

(3) Check out Run LED on display is off. Please press Start / Stop button if it is off.

(4) Please check the power is out.

2) Malfunction check list.

Malfunction symptom	What to check and what to do.
Buzzer sound continuously(1)	- If Door is opened, Press START/STOP Switch once and check out Run LED turns on.
No temperature control.	- Check if there are machines generating strong high frequency noise near by the unit. - Check if Some contaminants are in the control panel. - Do Auto tune again.
No power	- Check the Main power Switch is on. - Check the power supply is on in the room. - Check the power failure. - Check the fuse is OK
Temperature wouldn¡t rise	- Check the RUN LED is on. - Press the START/STOP Switch once if the RUN LED is off. - Check the door is opened.
Buzzer sound continuously(2)	- Check the Over temp. limit is set lower than current set value of the temperature. - If it is, please set the value of the Over temp. limit at least 15% higher than PV. - Press the START/STOP Switch once and the check the RUN LED.

☞ If you can¡t recover the instrument please call a repair service.

8. Warranty

1) Warranty Period

Each Product of Jeio Tech purchased by customer will be free from defects in material and workmanship for 1 year. Jeio Tech will replace faulty parts for a fee based on then current component acquisition costs after warranty period.

Jeio Tech will, at its option, repair at no charge, replace or refund the purchase price of a defective product purchased through a Jeio Tech authorized sales outlet and at the applicable price during warranty period. Jeio Tech will pay all costs for product repaired or replaced in-warranty in case of exported items.

2) Limitation

This warranty does not cover fuses, disposable batteries and damage from accident, neglect, contamination, misuse or abnormal conditions of operation or handling, including over-voltage failures caused by use outside the Products¡ specified rating, or normal wear and tear of mechanical components. This warranty covers the original purchaser only and is not transferable. Warranty is limited to the repair or replacement of the original unit. For inspection, return the units freight pre-paid to the nearest Dealer of Jeio tech. Upon Jeio Tech¡s evaluation, defective units will be repaired or replaced at no charge. Jeio Tech will not accept responsibility for unauthorized expenditures or losses.

3) General

Send defective product with a description of the problem to the nearest Jeio Tech Service Center, postage and insurance prepaid. Jeio Tech will pay return transportation for product repaired or replaced in-warranty. Before making any non-warranty repair, Jeio Tech will estimate cost and obtain authorization, then invoice you for repair and return transportation. This warranty is your only remedy. No other warranties, such as fitness for a particular purpose, are expressed or implied. Jeio Tech is not liable for any special, indirect, incidental or consequential damages or loses, including loss of data, arising from any cause or theory. Authorized resellers are not authorized to extend any different warranty on Jeio Tech¡s behalf. Since some states do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

4) Required things for service

- Serial Number, - Model, - Purchase date from, - Claim & Service claim form

9. Specifications

Model		ON-02G	ON-12G	ON-22G
Chamber volume		52L	91L	135L
Permissible environmental condition		Temperature 5℃ to 40℃ Maximum relative humidity 80% Altitude up to 2,000m		
Temperature	Range	Amb.+15℃ ~ 250℃		
	Uniformity	¡ 4℃ at 100℃		
	Accuracy	¡ 1℃ at 100℃		
	Controller	Digital PID auto tuning		
	Sensor	K-CA		
	Heat up time	100℃ Within 45min		
Material	Internal	Stainless steel, 0.8t		
	External	Steel, 0.8t power coating		
	Shelves	Stainless steel wire, electro polished		
	Insulation	Mineral wool (50mm)		
	Door gasket	High temperature grade foamed silicone rubber		
	Viewing window (Option)	Tempered safety glass, three fold, 5mm		
	Ventilation slide	Stainless steel, dia 38mm¡ 2EA		
Timer		Wait on time, Wait off time (Max. 99hr 59min, Min. 1min)		
Safety device		CLS(Custom Logical Safe)-control system, Class II		
Over temp. limit		Hydraulic over temp. limit		
Heater		Incoloy sheath 230VAC/1000W 120VAC/800w	Incoloy sheath 230VAC/1400W 120VAC/1000W	Incoloy sheath 230VAC/1700W 120VAC/1200W
Size (W¡ D¡ H)	Internal(㎜)	400¡ 360¡ 365	480¡ 410¡ 465	610¡ 460¡ 485
	External(㎜)	577¡ 542¡ 760	657¡ 592¡ 870	785¡ 642¡ 897
	Window(㎜)	5t¡ 150¡ 280	5t¡ 150¡ 380	
Electric requirement		230VAC,50 / 60Hz (120VAC, 60Hz)		
Power consumption(Max.)		4.3 A (6.7A)	6.0 A (8.3A)	7.3 A(10.0A)
Weight(net)		49kg	59kg	68kg