Operation manual

[LOW TEMP. INCUBATOR, Multi Chamber]

Model : IL-11-2C/IL-11-4C

Manual No : 28015L001 (Version : 2.0)

This operation manual describes the important subjects to maintain the product's functions and to use it safely. **Especially, be sure to read <Safety Precaution> carefully before you use this equipment.** Please keep this manual close to the equipment to use it after reading through it once. Please place it where the new user can find it easily for the safety use when you hand over or lend the equipment to others.

JEIOtech

Thank you for purchasing Jeio Tech's product.
This operation manual forms a definition of warning marks according to the level of importance and danger in order to use the product safely and correctly and prevent the users from accidents or injuries. Hence, please use the product in accordance with the instructions.

Safety Notice

1. Caution

This product can cause a big accident in case of improper use of inflammable and combustible solvents in the chamber. Also, operation in the high temperature might cause a mechanical trouble and quality deterioration due to the function and the characteristic of the product.

Safety Precautions	
⚠DANGER	"Danger" means that the user may have serious damage and even die by improper handling on this unit.
⚠WARNING	"Warning" means that the user may have serious damage by improper handling on this unit.
⚠CAUTION	"Caution" means that the user may have minor damage and unit may have physical damage by improper handling on this unit.

Although Jeio Tech thoroughly investigates the possibilities of dangerous situations from using the product, it is not possible to know every single danger. Hence, precautions described in this manual do not cover all the dangerous conditions.
However, you can operate this product safer when you follow the directions in this manual. Please, be sure to pay attention to the directions and be cautious so that a mechanical trouble or an accident would not be occurred.

2. Warning mark of product

The most important thing of the warning is a warning label attached to the product. It is located in front of the door.
Be fully aware of the warning contents during operation.

※ Please change to the new warning label when it is unreadable from wearing out. Please request the new label to us.

CONTENTS

1. For Safe Operation

Be fully aware of the safety since this product does not have a hydrostat.

⚠DANGER

Do not put inflammable substances like organic solvents.

In case of operation for the high temperature, the samples might ignite and explode from vaporization in the chamber. Explosive materials are acetic acid ester, nitro compound, and etc. Inflammable materials are inorganic peroxides, acetates, organic solvents, and etc.

This equipment does not have a hydrostat.

2. Use and Feature

1) Purpose

(1) Low temperature incubator is suitable for preservation of culture ground, culture-fluid, and seeds (0℃ ~ 4℃), degeneration test of grain and meat (10℃ ~ 14℃), cultivation of microbes and plants, COD/BOD measurement (20℃ ~ 25℃), suspension of enzyme reaction, preservation of enzyme solution, and desalting of enzyme extract.

(2) It also can be used for high temperature tests (55℃ ~ 60℃) such as environmental variation tests of cultivation, grease, and pigment of high temperature microbes and bacteria.

⚠WARNING

Do not rebuild the equipment.

Do not use it for other purposes.

An electric shock or a mechanical trouble might be occurred from rebuilding or using it for other purposes.

2) Characteristics

(1) This equipment is a multi-purpose low temperature incubator for biotechnology, pharmacy, medical science, chemistry, and biology. It has applied CLS (Custom Logical Safe) – Control System that Jeio Tech originally developed for the convenience in use and the safety.

(2) CLS – Control System means "Control system which has a logical safety device specialized for an individual model." Laboratory must have a thermal safety because there are a lot of inflammable reagents. This system is the highest safety control device (patent applied) and makes the equipment suitable for this kind of environment.

(3) The unit is designed to stop the heater and blower in order to protect the user from heat when the door is opened during the operation.

(4) The unit has insulation for high temperature in the outside of the inner chamber and inside of the door and also has a chamber silicone door for high temperature. Therefore, insulation is perfect, and the level of losing heat is very low.

(5) The inner glass door is good for insulation and observation.

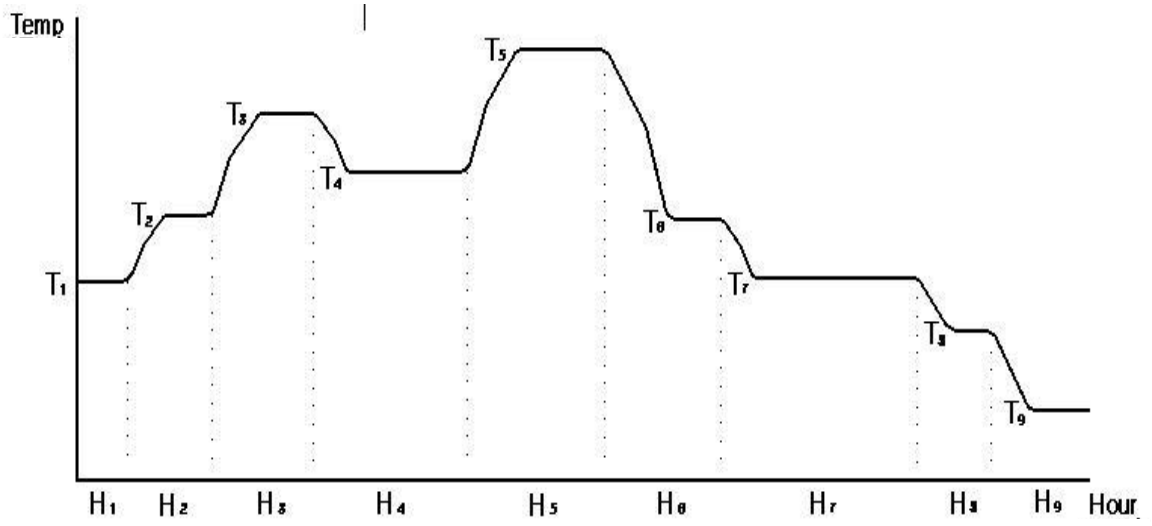
(6) The door attached a magnetic packing has effects on impact relief and double secrecy.

(7) Circulated fan of a cross type is attached for the distribution of uniform temperature and creates an indirect air-circulation.

(8) Safety circuit has built-in to protect the equipment from an excess current and an overheating.

(9) Development of exclusive controller allows the user to control the speed (3 steps) of the inner fan and defrosting (period and time). 9-Step Programmed Control allows the user to set and operate 9 different temperature and time (max: 99 hours 59 minutes). Operation is possible to be repeated from once to 999 rounds.

- Program Operation-



3. Setting

(1) Please check the following contents after opening the package.

Main body 1 set, Shelf(IL-11-2C :4EA, IL-11-4C : 8EA), Operation manual(1EA), Fuse 10A (IL-11-2C :4EA, IL-11-4C : 2EA), Silicon Hose ø 6, 0.5M (IL-11-4C:1EA)

(2) This unit is quite heavy. Please carry it with a proper moving tool or 2 people together.

⚠CAUTION

Be aware of carrying since this unit is heavy.

IL-11-2C : over 180 Kg

IL-11-4C : over 350 Kg

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

⚠WARNING

Connect the power properly with correct voltage, phase, and capacity.

Improper connection causes a fire or an electric shock.

⚠WARNING

Use the grounded power supply.

Ungrounded power can give a serious damage to the equipment and the user. For the safety, do not connect a grounding conductor to the gas and water pipes.

(4) Outlet should be located near the unit and shall be easily accessible.

⚠WARNING

Do not use an ejected socket or a double tap.

Cable damages or a fire can occur by an excess current.

(5) Please install the unit in the flat place where prevents vibration and shock.

(6) Please avoid heat sources and direct sun light, and locate the unit where ambient temperature range is 5°C ~ 40°C and relative humidity is lower than 80%.

(7) Please do not let moisture, organic solvents, dust, and corrosive gas enter into the control box.

(8) Please don't install the unit in the dangerous place where there are flammable gases, explosive materials, and organic solvents such as acetone and methylene chloride.

(9) Please secure enough space for installation because the door opens 180° to the left.

(10) Please do not install the unit near by the machines generating a strong high frequency noise.

4. Notice

(1) Please do not touch the power cord and electric parts with wet hands.

(2) Please do not put explosive and flammable chemicals (Alcohol, Benzene, and etc) into the incubator.

(3) Please do not place flammable materials near by the unit.

(4) Please do not pour water on the unit directly when you clean it.

(5) Please do not put conductive and flammable materials through ventilation or power supply port. It is dangerous and might cause fire and electric shock.

(6) Circuit and electric components used in this unit are developed by Jeio Tech. Please do not try to repair by yourself. Incorrect combination of electric parts may cause a fire. You must ask an official Jeio Tech dealer or a distributor in your region.

⚠DANGER

Do not put explosive and flammable materials inside of the chamber.

5. Names

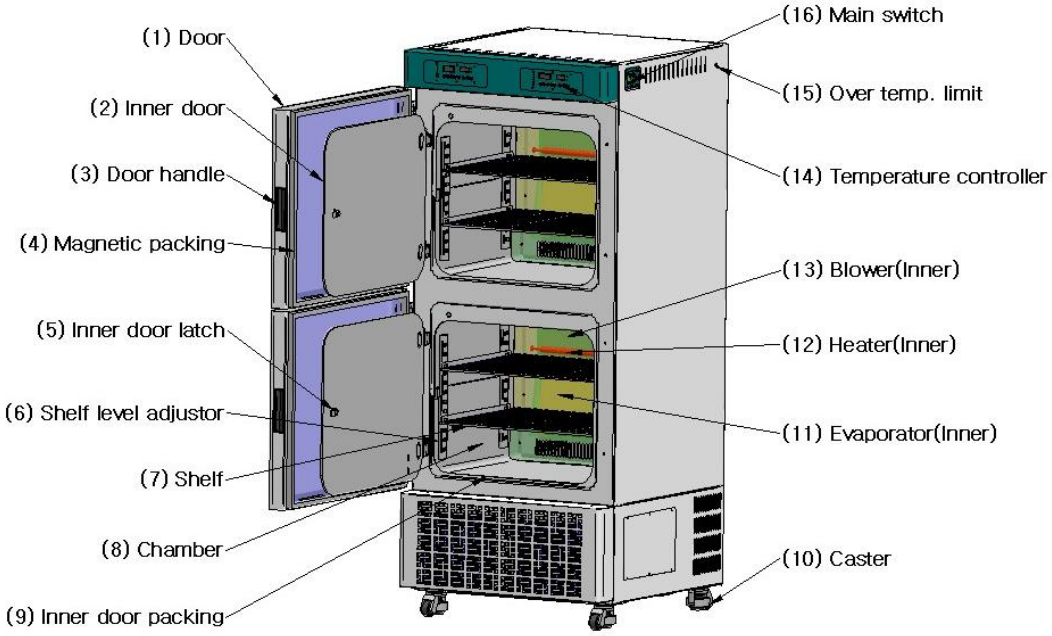


Figure1. IL-11-2C

(1) Door

For using an insulating material, we removed dewdrops on the surface of the door.

(2) Inner door

User can observe the inside of the chamber through this transparent and made of reinforced glass inner door.

(3) Door handle

It is a door handle for opening.

(4) Magnetic packing

It absorbs the impact and protects the samples doubly when door opens and closes.

(5) Inner door latch

It is a handle to fix the inner door.

(6) Shelf level adjustor

Shelf level is easily adjustable by the size of samples.

(IL-11-2C : 12 levels, IL-11-4C : 12 levels)

(7) Shelf

It's made of stainless steel wire. It's easy to clean, and ventilation is good. The surface is electrically polished therefore it has a beautiful view and a good anti-corrosion.

(8) Chamber

It's made of stainless steel. There are a blower, a heater, Evaporator, a temp. sensor and a temp. regulator inside of the chamber.

(9) Inner door packing

A silicone rubber seals the air by adhering the inner door and the chamber together.

(10) Caster (Foot)

High-class caster stops movement and rotation when the break function works.

(11) Evaporator (inner)

Its role is cooling by circulating and evaporating the iced transfer media.

(12) Heater (inner)

The fin-type of heater is installed inside of the unit.

(13) Blower (inner)

Circulating fan is used for the distribution of the uniform temperature.

(14) Temperature controller

This has a micro processor (CPU) which has a digital PID auto tuning function. It also has the highest level of safety control system such as a temperature compensational function for temperature sensor and a heating volume controller.

(15) Over temp. limit

If heater temperature rises higher than set temperature, the unit cuts the power of the temperature controller, makes the over temperature LED blink, and warns with a beep sound. To resume the operation, please turn the knob clockwise to set about 15% higher

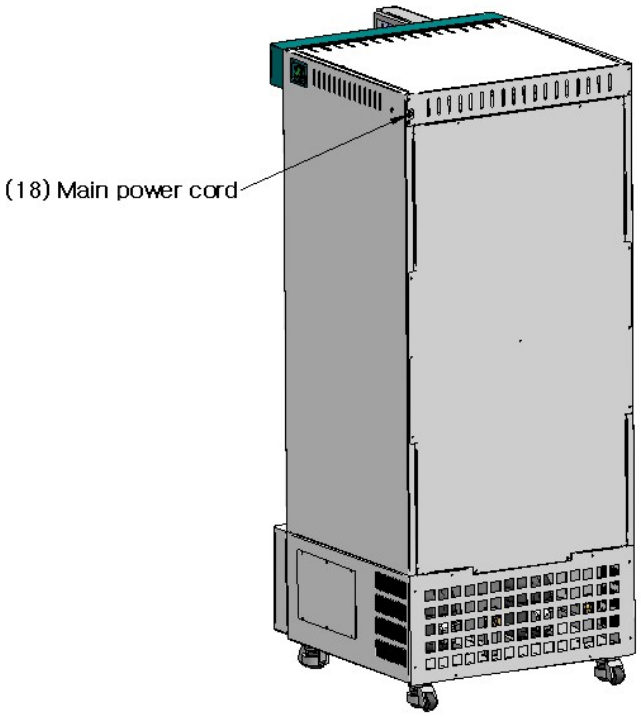
than a set temperature and press a Start/Stop switch ones. Then, check whether the run LED of temperature controller is on.

(16) Main switch

This is a switch for main power.

(18) Main power cord

It is a cord that supplies the main power.



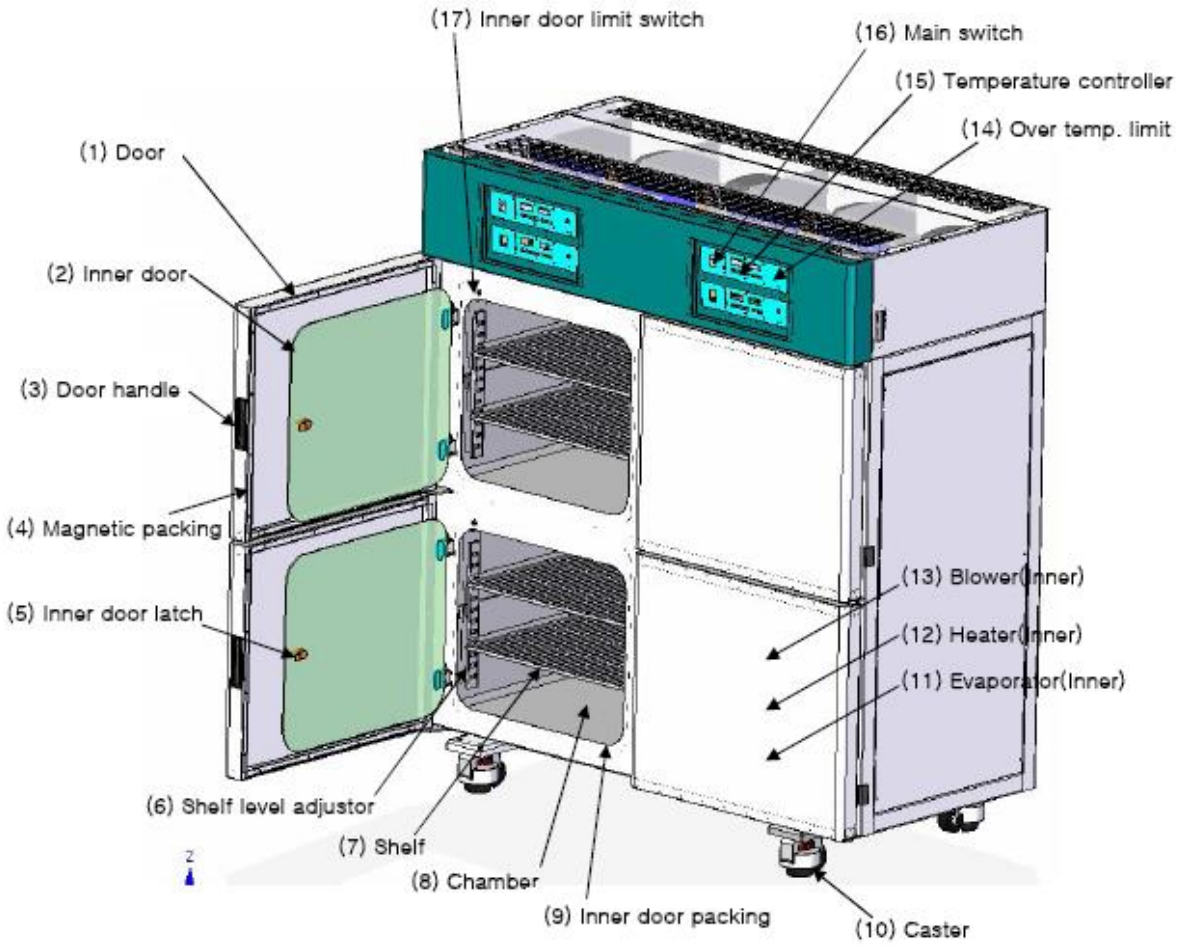


Figure2. IL-11-4C

(1) Door

For using an insulating material, we removed dewdrops on the surface of the door.

(2) Inner door

User can observe the inside of the chamber through this transparent and made of reinforced glass inner door.

(3) Door handle

It is a door handle for opening.

(4) Magnetic packing

It absorbs the impact and protects the samples doubly when door opens and closes.

(5) Inner door latch

It is a handle to fix the inner door.

(6) Shelf level adjustor

Shelf level is easily adjustable by the size of samples.

(IL-11-2C : 12 levels, IL-11-4C : 12 levels)

(7) Shelf

It's made of stainless steel wire. It's easy to clean, and ventilation is good. The surface is electrically polished therefore it has a beautiful view and a good anti-corrosion.

(8) Chamber

It's made of stainless steel. There are a blower, a heater, Evaporator, a temp. sensor and a temp. regulator inside of the chamber.

(9) Inner door packing

A silicone rubber seals the air by adhering the inner door and the chamber together.

(10) Caster (Foot)

High-class caster stops movement and rotation when the break function works.

(11) Evaporator (inner)

Its role is cooling by circulating and evaporating the iced transfer media.

(12) Heater (inner)

The fin-type of heater is installed inside of the unit.

(13) Blower (inner)

Circulating fan is used for the distribution of the uniform temperature.

(14) Over temp. limit

If heater temperature rises higher than set temperature, the unit cuts the power of the temperature controller, makes the over temperature LED blink, and warns with a beep sound. To resume the operation, please turn the knob clockwise to set about 15% higher than a set temperature and press a Start/Stop switch ones. Then, check whether the run LED of temperature controller is on.

(15) Temperature controller

This has a micro processor (CPU) which has a digital PID auto tuning function. It also has

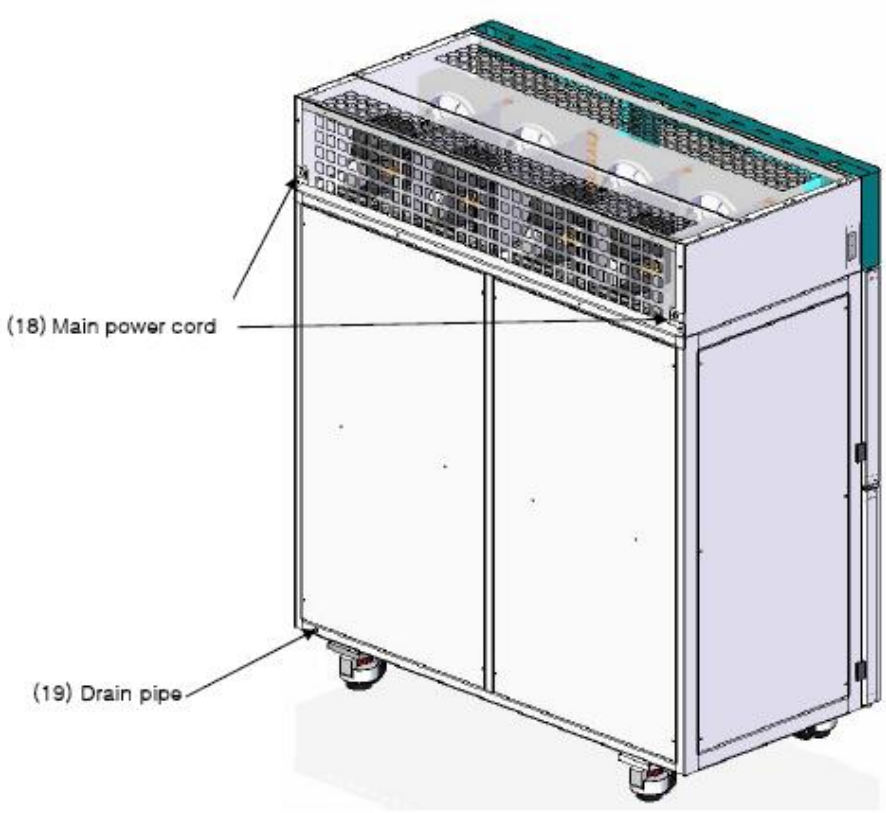
the highest level of safety control system such as a temperature compensational function for temperature sensor and a heating volume controller.

(16) Main switch

This is a switch for main power.

(17) Inner door limit switch

It's installed inside of the unit. The Logic IC of this switch puts off the main switch. It cuts off all 2 phase currency in the instrument therefore heater and blower stops for the safety of user. Door LED blinks to indicate the door is opened. If the door is opened more than 5 minutes, then the alarming buzzer rings in order to inform the user that the door is opened for a while. The Door LED and buzzer turns off when the door is closed. Then, the instrument works again



(18) Main power cord

It is a cord that supplies the main power.

(19) Drain Pipe

You can drain the water in evaporator to outside. The tank made by chrome painting. Hose caliber is 6mm with soft material. You can easy to removable it.

6. Operating Controller

1) Characteristics

(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.

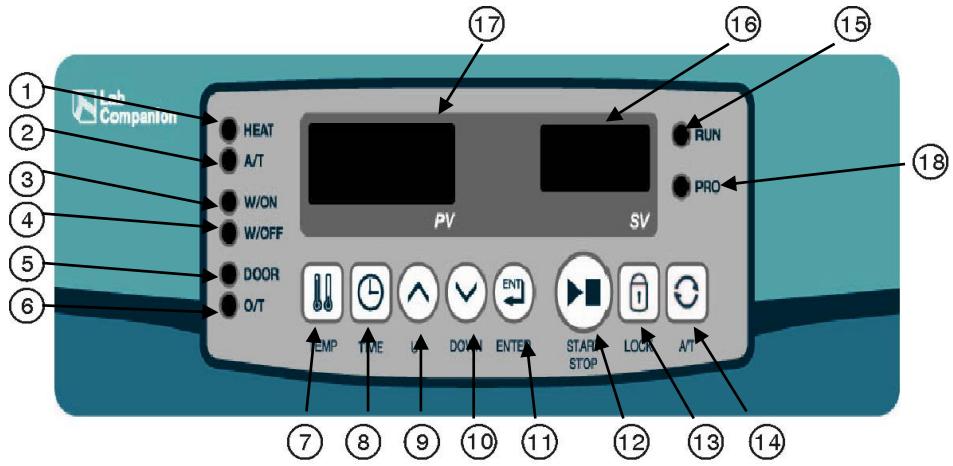
(2) CLS-Control System shuts down all 2 phase power supply to each part immediately and informs user instability by audible and visual device, and then it keeps in safety mode until all instability conditions are removed.

(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.

2) Name and Function



Main CPU of this unit has certified S/W which allows Digital PID-Auto tuning. The unit has a temperature deviation/correction function for the Pt-100Ω sensor and the highest safety level of control system.

(1) Heater LED

It shows whether heating function is on.

(2) Auto Tune LED

It blinks during auto-tuning.

(3) Wait On Timer LED

This LED shows when the unit is on a timed 'on' function. The LED blinks when the timer is activated, and it is completely turned on when the timer is on stand by.

(4) Wait Off Timer LED

This LED shows when the unit is on a timed 'off' function. The LED blinks when the timer is activated and is completely turned on when the timer is on stand by.

(5) Door Open LED

Door LED blinks to indicate the door is opened. If the door is opened more than 5 minutes, then the alarming buzzer rings in order to inform the user that the door is opened for a while. The Door LED and Buzzer turns off when the door is closed. The instrument will work again.

(6) Over Temp. LED

If the heater temperature rises higher than set temperature, it cuts the power of the

temperature controller, makes the over temperature LED blink, and an alarming beep rings. To resume the operation, please turn the knob about 15% higher than a set temperature and press a Start/Stop switch once. Then, check whether the run led of temperature is on.

(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 the set value.

(10) Down Button

This button is for decreasing the set value.

(11) Enter Button

This button is for saving value after changing the 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.

(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 off when the unit stops.

(16) SV Display

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

(17) PV Display

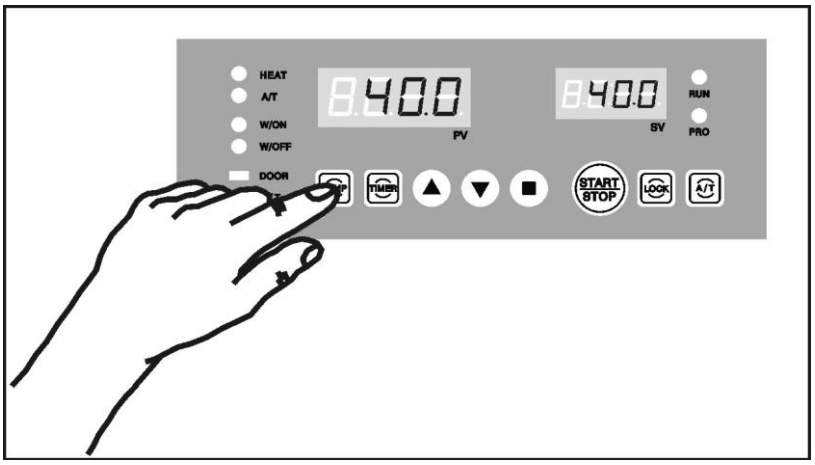
This display is for showing present temperatures.

(18) PROGRAM LED

This LED indicates whether the operation is in program or normal status. The LED blinks when the operation is in program status, and it turned off when the operation is in normal status.

3) Temperature Setting Method

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

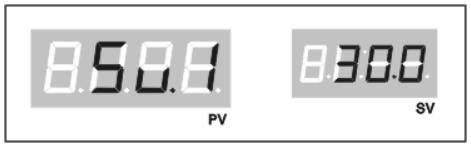


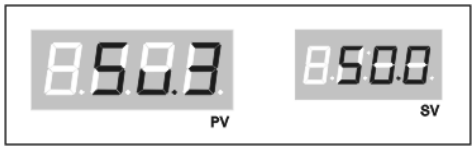
(2) Press ▲ ▼ button to change the digit number and then press ■ button when you save the value.

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

(4) Press TEMP button again when SV display blinks, then following additional functions will be activated.

4) Additional function of TEMP button





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

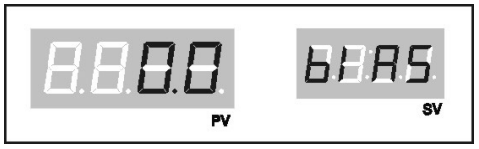
Press TEMP 2 times and set temp. values by pressing ▲ and ▼, and conclude the setting by pressing ■

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

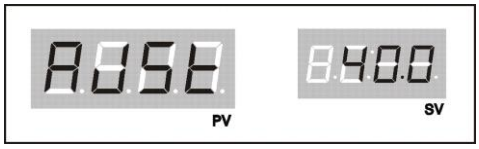
Press TEMP button repeatedly then Sv1, Sv2, Sv3 are shown and temperature unit set mode shown by pressing 5 times repeatedly.

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

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

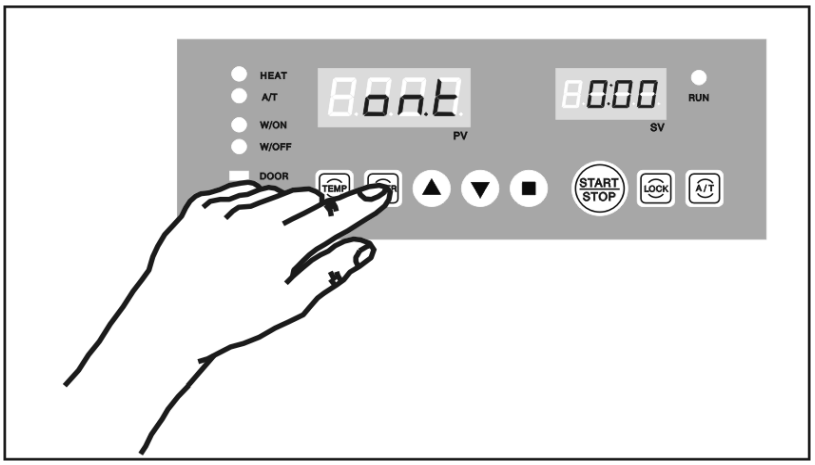


(3) Next mode is shown by pressing TEMP 6 times. This compensates the temp. value errors. Requested values are put on PV display. Move to the next mode by pressing ▲ and 0▼0buttons.



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 ■

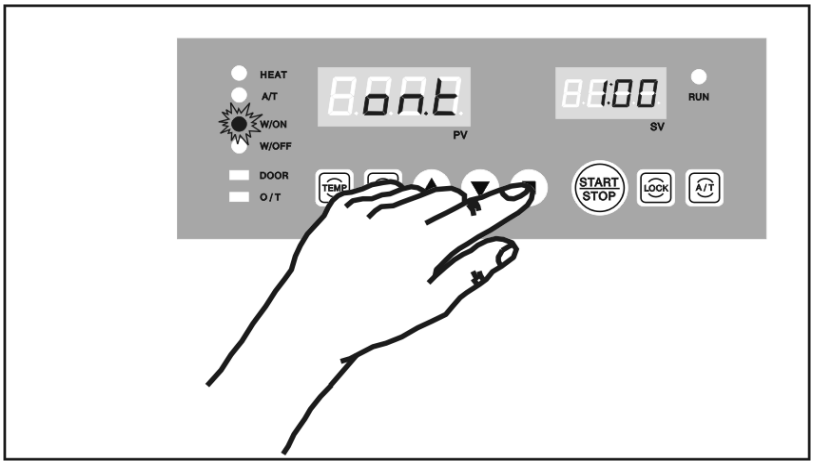
5) Setting Timer



(1) Button TIMER 1 time at early stage.

(On Timer / Off Timer) can be displayed on PV display and Time can be displayed on SV display. Input necessary time by buttoning ▲ and ▼ and store by buttoning ■

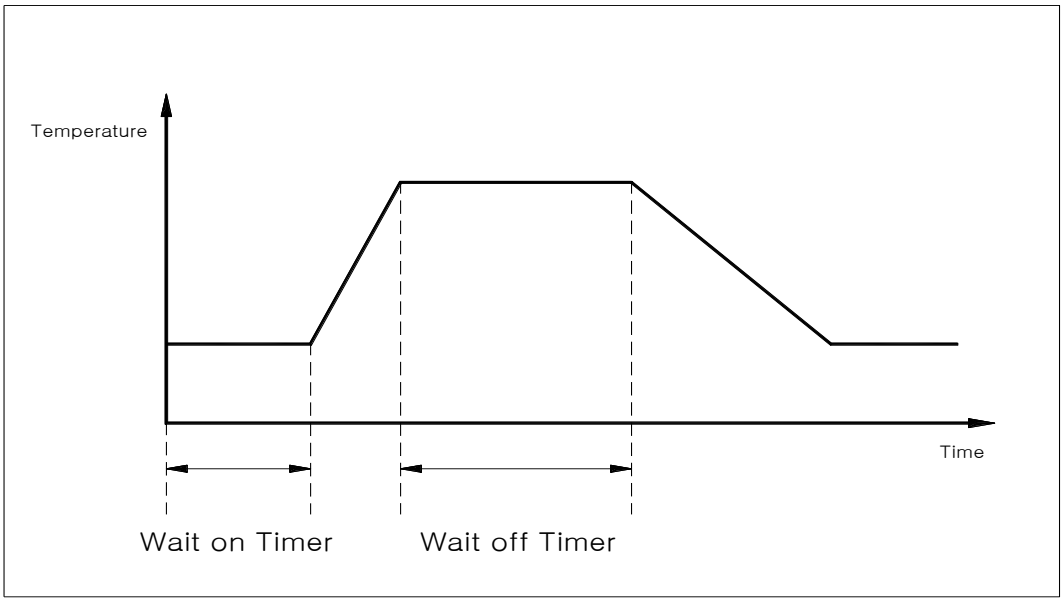
(2) W/ON LED is on with Beep sound after setting



(3) Press TIMER 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 1min.

■ 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.

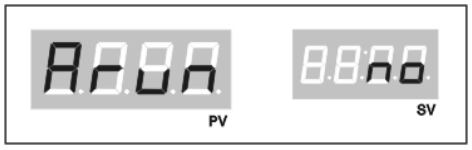
- The unit works as a picture above.

(6) Timer set deactivation

Press TIMER 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.

6) Additional Function of TIMER Button (Auto Run)

When you press TIMER button three times from the initial state, following function operates.



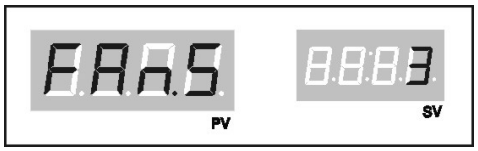
(1) This is to select the machine mode in case of a power failure. This function operates the

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.

7) Additional Function of TIMER Button (Fan speed control)

(Applicable for only IL-11, IL-21 model)

When you press TIMER button four times from the initial state, following function operates.

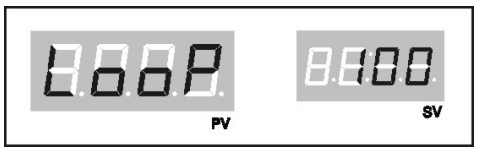


(1) This function is to control the speed of inner circulating fan. It is recommended to be set as a third stage since slow speed does not contribute the temperature distribution. (0 to 3 stage is possible.) 3 stage recommended.

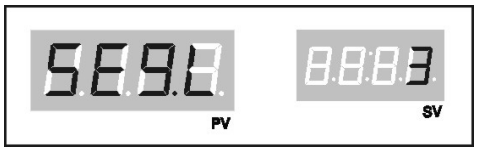
8) Additional Function of TIMER Button (Programmed Control)

9-Step Programmed Control allows the user to set and operate 9 different temperature and time (max: 99 hours 59 minutes). Operation is possible to be repeated from once to 200 rounds.

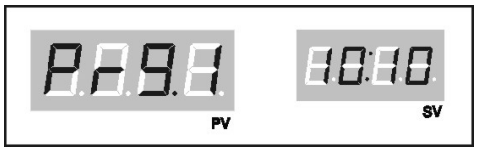
When you press TIMER button five times from the initial state, following function operates.



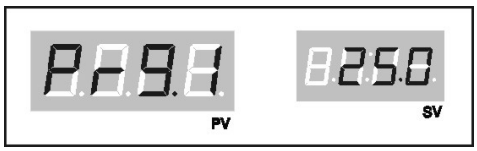
(1) It indicates the entire repetitive number of program. Loop 100 means that it will operate 100 times. Set the number by pressing ▲ ▼ button and save by pressing ■ button. The next function operates when you input more than 1. Input 0 when you do not want to operate this program.



(2) SEg.L is a segment logic that divides the section's boundary. When you input 3 here, third program is repeated from second repetition. Set the section by pressing ▲ ▼ button and save by pressing ■ button.



(3) This function is to set the maintaining time of the first program. When you input 10:10, operation maintains for 10 hours and 10 minutes (max: 99 hours 59 minutes). Set the time by pressing ▲ ▼ button and save by pressing ■ button.

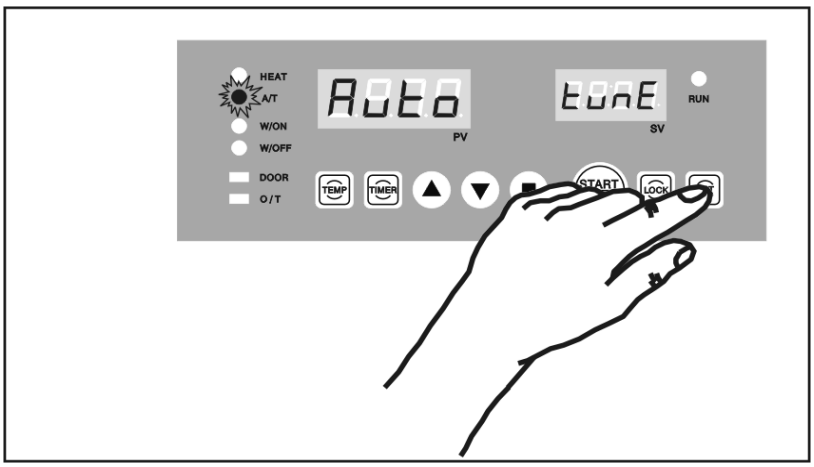


(4) This function is to set the maintaining temperature of the first program (4℃ ~ 60℃). Set the temperature by pressing ▲ ▼ button and save by pressing ■ button.

(5) You can set the 9 step program by operating (3) ~ (4). That is, you can set time 2 and temperature 2 at program 2 and set the time 3 and temperature 3 at program3 and so on (till program 9). You can input 0 to cancel the setting.

9) Operating Auto Tuning (Recommended below 40 ℃)

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



(1) Set the user common use Temp.

(2) A/T LED is on with Auto Tune signal on displays by buttoning A/T for 1 second.

(3) Auto Tune works with being on of RUN LED and flashing A/T LED by buttoning START STOP

(4) 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.

10) Lock Function

This is to lock controller buttons.

(1) Press  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.

7. Maintenance

⚠CAUTION

Pull out a power plug from the outlet before the cleaning and inspection.

Turn off the main power switch and pull out the power plug before the cleaning and inspection. An electronic shock or damages on the unit might occur.

(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.

⚠CAUTION

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.

⚠WARNING

Do not disassemble the equipment.

An electronic shock or an injury might occur when you disassemble since there are parts where high voltage flows and high temperature locates inside of the equipment.

(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.

8. Dealing with abnormal Condition

1) If the equipment does not operate

(1) Check out the power supply.

(2) Check out the fuse.

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

(4) Please check whether the power is out.

2) Malfunction check list (refrigeration)

Symptom	Check	What to Do
When temp. does not decrease.	Check the TEMP. LED is whether operation or not	Press the START/STOP Button, 1 more.
	Check the W/ON LED is whether operation or not	Cancel the TIMER setting.
	There is dust in the filter	Clean the filter and the condenser fin
	Check the inner chamber fan speed is whether too much slower or not	Increase the Blower speed.
TEMP. is unstable	Check PID values is whether set or not	Operate the Auto Tuning
Between displaying temp. and actual temp. is different (deviation)	Check the Blower speed	Increase the Blower speed.
	Check the inner chamber is whether stored too much staff or not	Put the suitable amount of sample and make condition inner chamber the air stream is smoothly.
	Check the compensation value.	Correct the error between actual temp. and display temp.

3) Malfunction check list (electricity)

Symptom	Check	What to Do
When the power switch shuts down although you turn it on	A short circuit	Stop the operation and contact the dealer
Display panel does not work although power switch is on	The power plug is not inserted completely	Turn off the power and insert the plug on the outlet
	The power switch is broken	Open the control panel and check the main board, switch, and display board
	Temperature controller is broken	
When temp. does not increase	Check whether the Run LED is on	When the Run LED is off, press the start/stop button
When temp. is not controlled	Check the “Err.S” on PV display	Open the control panel and check the connection between the main board and the temp. sensor
When the unit does not operate due to over temp.	① Check if O/T LED is red, ② Check if a beep continuously rings	① 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. ② When you press start/stop button once, lights on Run LED and Heater LED will be turned on and the unit will re-operate.
When the operation by door limit switch stops	① Check if Door LED is red, ② Check if a beep continuously rings	① Check if the inner door is open ② Check if the light on Run LED is turned on after pressing the start/stop button
When the entire control is stopped without the situation or the button control stated above	Strong noise affects the user from the power line	Move the equipment that causes the problem or relocate the incubator
	Check if high frequency welding machine, sewing machine, or large SCR controller is installed near the unit	

☞ If you can’t find the solution in this check list, please call a repair service.

9. Warranty

1) Warranty period

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

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

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

2) Technical Service Contact Points

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

3) Certificate of Product Warranty

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

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

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

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

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

1. Non-defective cases
   * Requests to resolve issues arising from improper operating environments or abnormal installations.
   * Reinstallation requests or connections with external equipment other than the initial installation.
   * Requests for usage instructions or simple adjustments that do not require disassembly.
   * Inspections of non-defective products.
   * Cleaning or debris removal service requests.

2. Failures caused by user errors:
   * Malfunctions due to usage not in accordance with the user manual.
   * Issues resulting from improper operating environments or abnormal installations.

* Malfunctions caused by incompatible chemical usage.

* Malfunctions caused by irregular or improper electrical or utility supplies.

* Damage due to product movement, storage, external impact, or dropping by the customer.

* Malfunctions resulting from unauthorized modifications or repairs without prior written approval from JEIOTECH Co., Ltd.

* Malfunctions caused by using consumables or optional components not specified by JEIOTECH Co., Ltd.

* Repairs performed by personnel other than JEIOTECH or its authorized service agents.

3. Other cases

* When the product model or serial number has been damaged, removed, manipulated, or altered.

* Malfunctions caused by fire, flooding, or other natural disasters.

* Failure due to consumable parts reaching the end of their lifespan (e.g., lamps, filters, fuses, gaskets, packings, hoses, heat transfer fluids).

* Natural wear and tear (e.g., discoloration, screen printing degradation).

* Damage or malfunction of product accessories (e.g., power cables, data cables, glass components) or options.

* Malfunctions caused by errors in computers, computer components, or connected network systems.

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

- This warranty applies only to products purchased for direct use by the customer. It does not

cover products purchased for resale purposes without prior written approval from JEIOTECH.

• This warranty does not apply to consumables and is non-transferable.

10. Specifications

Model		IL-11-2C	IL-11-4C
Type (Convection)		Forced	
Chamber volume (L)		150 (x2 room)	150 (x4 room)
Permissible environmental condition		Temperature 5℃ to 40℃ Maximum relative humidity 80% Altitude up to 2,000m	
Temperature	Range	0℃ ~ 60℃	
	Fluctuation[1)]	±0.1℃ at 25℃	
	Variation[1)]	±0.5℃ at 25℃	
	Controller	Digital PID auto tuning	
	Timer	Wait on time, Wait off time(Max. 99hr 59min, Min. 1min)	
	Sensor type	Pt 100 Ω	
Material	Internal	Stainless steel, 0.8t	
	External	Steel, 1.0t, 2.0t, powder coating	
	Shelves (standard/max)	Stainless steel wire, electro polished	
		2/12 EA (x2 room)	2/12 EA (x4 room)
	Heater (W)	700 x 2EA	700 x 4EA
	Insulation	Nonflammable polystyrene foam	
	Inner door	Tempered safety glass, 5t	
	Over temp. limit	Hydraulic over temp. limit	
	Refrigerator	1/8Hp(HBP) x 2EA	1/8Hp(HBP) x 4EA
Safety device		CLS(Custom Logical Safe)-control system	
Dimensions (mm) (W×D×H)	Interior	600×500×500 (each)	600×500×500 (each)
	Exterior	740x760x1790	1500×760×1690
	Inner door	5t×615×530(x 2EA)	5t×615×530(x 4EA)
Electric requirements	AC 220 V, 60 Hz	9.0A (Main cord 9A x 1EA)	18.0A (Main cord 9A x 2EA)
Weight(net) (kg)		(over) 180	(over) 350

※ 1) Technical data (according to DIN 12880)