

# Operating Manual Shaking Incubator

Model: ISS-7100(R), ISS-7200(R)

Manual no.: 238130KL002 Version: 7.0



## **MARNING**



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.

Avant d'utiliser ce produit, lisez ce manuel dans son ensemble avec précaution. Les utilisateurs doivent suivre toutes les directives opérationnelles contenues dans ce manuel et prendre toutes les précautions de sécurité nécessaires lors de l'utilisation de ce produit. Le non-respect de ces directives pourrait entraîner des lésions corporelles potentiellement irréparables et / ou des dommages matériels.

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We are doing best for customer's satisfaction.

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# 1 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) The alert marks are for safety operation and protect user and instrument from damage.
- (2) Signal word panels are a method for calling attention to a safety messages or property damage
- (3) messages and designate a degree or level of hazard seriousness.
- (4) Pay attention enough to the contents of alert marks.

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

## 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 Caution statement

## **MARNING**

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

Please use the product in safety facility installing laboratory in case of accident. Installed the product on durable and flat surface.

Please, make sure safety equipment with relevant provision before handling the sample which may cause flammable or toxic gases.

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.

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

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

Be sure to install a 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.

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

Stop the product operation and request service.

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 for safe use

# **A CAUTION**

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

Be sure to disconnect the power after turning off the power switch.

This is the safety regulation for next user.

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.

It may cause the electric shock or injuries.

Do not inject any liquid and inflammable things inside of 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 install the stirrer neat machinery generating high frequency noise.

Please avoid installed from high frequency- welding machine, sewing machine, and mass SCR controller

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



Wear protective gloves.



Wear eye protection.



No water



No corrosive



Electrical shock.



Flammable refrigerants



Foot crush.



Hand crush or pinch.



Lifting hazard.



Do not take the device apart deliberately.

# 2 Functional Description

#### 2.1 Introductions

The cultivation environment such as temperature, pH, oxygen concentration, nutrition supply have a significant impact on cell cultures of animals and plants or proliferation of microorganisms.

This incubated shaker is to provide a suitable environment for the cultivation through controlling constant temperature and shaking speed.

- Cell culture
- Extractions
- Solubility studies
- Hybridization
- Plasmid purification
- Protein expression

#### 2.2 Features

## 2.2.1 High Performance

- (1) Precise and fast temperature / shaking speed control is available by microprocessor PID feedback control. PID feedback control ensures the same experimental environment conditions for the user. The device's deviation of set temperature and set rpm are each under ± 0.1 ℃ (standard: 37 ℃), ± 1% (standard: set rpm) which are regarded as very precise value. If the deviations go above a certain level, alarm will be activated to the user.
- (2) Control range of temperature and stirring speed is wide. Temperature control up to 80 °C and stirring speed control up to 400rpm are available to provide users wider experimental conditions.
- (3) Optimizing the structural design of the product enables stable shaking even with heavy

- load. Low center of gravity minimizes noise and vibration.
- (4) More precise temperature control by 3ea temperature points.
- (5) User can mate temperature measuring instrument and the unit's temperature by 3 temperature points.
- (6) The ISS-7100R/7200R models are designed with the eco-friendly refrigerant R-600a, which minimizes greenhouse gas emissions.

#### 2.2.2 Advanced Convenience

- (1) User friendly interface according to Touch LCD. Eidetic unit operation check and easy to control.
- (2) Timer and operation time check of shaking performance is available. Setting and checking the value is available up to 999 hours and 59 minutes.
- (3) Large window with LED lamp on the door offers the convenience to monitor the samples in the chamber without opening the door in the dark place.
- (4) Easy connection from Unit to PC with RS232 Port and USB port and it allows easy monitoring and control.
- (5) By providing an automatic power failure recovery, even if the product gets power back after a momentary power failure, the auto run function automatically runs the product.
- (6) Adjustable castors for easy mobility during installation or relocation.
- (7) In case of the liquid leakage caused by spilled reagent or cracked flask inside of the chamber, the liquid is designed to be drained out through the drain of the chamber bottom which is connected to the port on the product's side.
- (8) This equipment is more convenient when mounting / desorption of the sample. When shaking performance, operation always starts and stops at a specified location, the platform is fixed to easily replace the sample. When door opening, the chamber height is same level as general sinks to fit to any size of users.

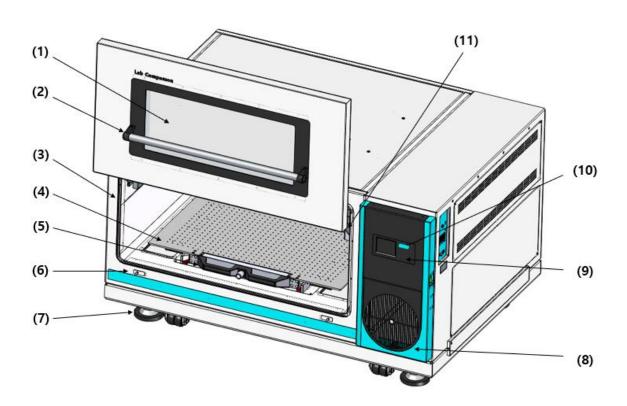
# **A CAUTION**

Motor damage may result from solution leakage, potentially voiding the warranty.
Hence, when utilizing a flask containing a solution for agitation, it is imperative to
prevent solution overflow during agitation. Moreover, utilize a properly sized clamp
to securely stabilize the flask during agitation to mitigate the risk of tipping over.

#### 2.2.3 Advanced Safety

- (1) Smooth shaking start and stop mechanism minimizes the opportunity of reagent leakage.
- (2) There is an independent adjustable temperature limit device in addition to the main controller in this device. If temperature rises more than the specified value due to equipment error, the independent device protects the internal sample and equipment by blocking the power supply of the temperature–related equipment.
- (3) When shaking operation is not possible due to the obstacle interfering the system, over current protection device stops the operation.

## 2.3 Structure



#### (1) Transparent Viewing Window

User can monitor the inner samples without opening the door during operation. Inclined window toward users for easy observation angle.

#### (2) Door Handle

Easily open and close door.

#### (3) Door Packing

It absorbs the shock when opening/closing the door and seals up the chamber.

#### (4) Shaking Table

Shaking table is connected to a shaking system and Accessory such as Universal Platform can be equipped on shaking table. (Universal Platform is equipped in the figure.)

#### (5) Platform Handle

It is used for moving the platform, and when moving, the lock must be unlocked.

#### (6) Door Switch

If the door is opened, Shaking, Blower and Heater operation automatically stops. After 3 minutes at this status, warning sound alarms users to close the door. If a user does not shut a door so that five minutes passes, and an alarm sound continuously rings. And it blocks off the power to be authorized with a power switch, and Off gets a power switch done and all blocks off 2 phase of the power supplied with to an each part of appliances, and configuration does the safe state that only a Ground part is connected.

#### (7) Adjustable Foot and Caster

Adjustable castors for easy mobility during installation and relocation.

#### (8) Filter

Detachable condenser air filter prevents contamination.

#### (9) LED Lamp

Long life span and energy efficient LED lamp offers bright observation of samples.

#### (10) Control Panel

There are independent displays for each Temperature, RPM, Timer and there are and start/stop buttons and LED on/off buttons.

#### (11) Lift up

Door stays open. It's beneficial for users to change samples.



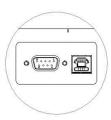
#### (12) Temperature Limiter

Temperature limiter is independently configured from the main controller. The inner temperature of the chamber exceeds more than the set temperature, the device cut off the power to the power switch for the secure condition. (Refer to '4.5 Safety Device')

#### (13) Computer Interface

This unit can connect to PC by USB port and RS232 port.

If it is connected, PC can monitor the unit operation status and start the unit operation. USB is connected preferentially if USB and RS232 are connected at the same time.



#### (14) Power Switch

Power switch provide the main power to the device. Install the unit with enough space left each side for prompt reaction to power off when service issue occurs.

#### (15) Power Input and Fuse

Power input place. Fuse protects the device from instantaneous overcurrent. In case of fuse replacement, check the rated power. (Refer to 5.4 Fuse Replacement)

#### (16) Refrigerating System (ISS-7100R/7200R only)

It circulates refrigerant in the chamber. It is operated in case of low temperature control.

#### (17) Drain Port and Valve for Spilled Liquids

In case of the liquid leakage caused by spilled reagent or cracked flask inside of the chamber, the liquid is designed to be drained out through the drain of the chamber bottom which is connected to the port on the product's side.

# 3 Installation

# 3.1 Unpacking and Checking

- (1) Inspect the shipping container carefully for any damage.
- (2) Remove the outer container.
- (3) Before use, inspect the product carefully for any damage that may have occurred during shipping.
- (4) Report any damage to your local Jeio Tech office or the distributor.

# 3.2 Component

- (1) After unpacking, check the components.
- (2) In the case of omission of components, contact to Jeiotech.

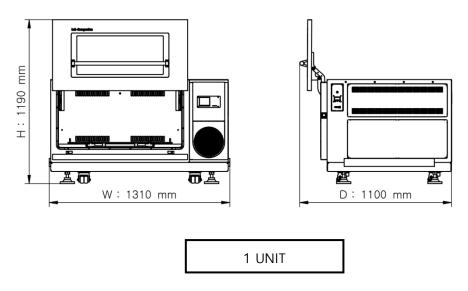
Item	Figure	Quantity	Description
Main Body		1	
Base		1	
Fuse 250V, 10A		2	
Cable for Communication (USB)		1	_
Power Cord		1	-

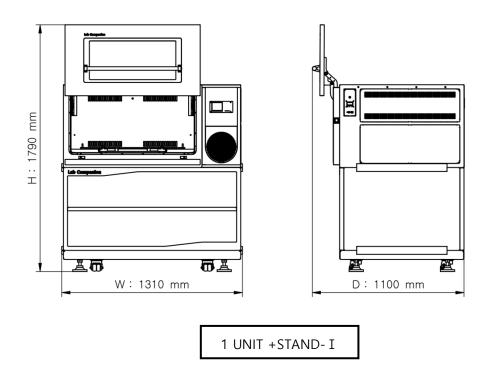
Operating Manual	The same of the sa	1	
Stand- I		1	option
Stand-II		1	option
Stacking kit		1	
Eye Bolt(M10)	50	4	

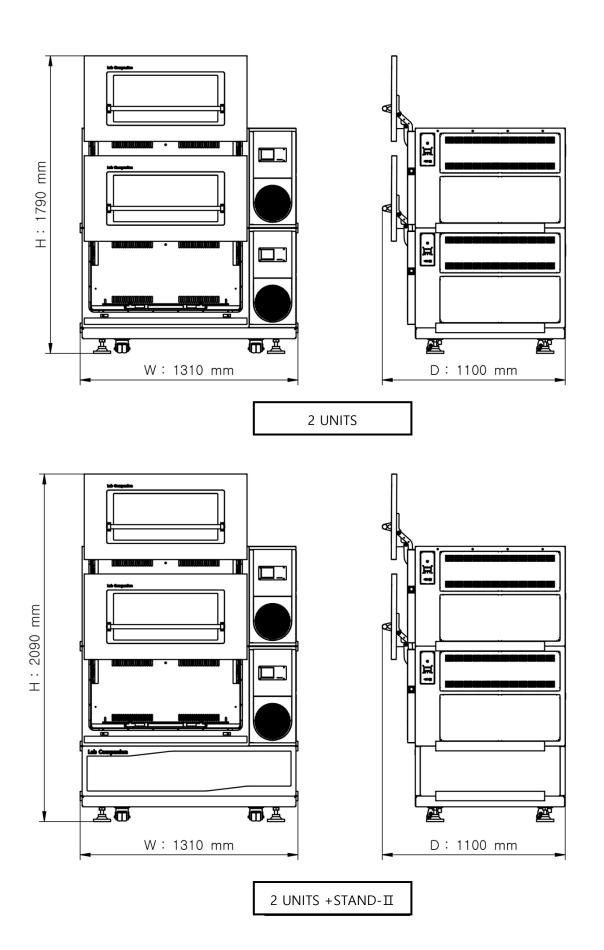
# 3.3 Preparation before installation

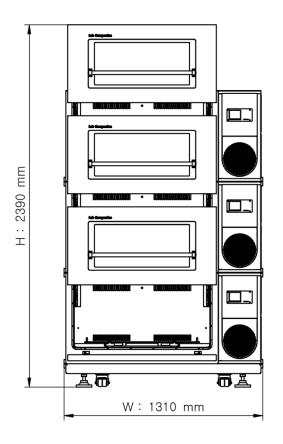
## 3.3.1 Space requirements

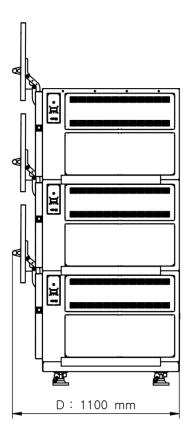
It is essential that the product to be situated in an area where there is sufficient space for the product. Below figures show the minimum space requirements needed to properly operate and maintain the product.











3 UNITS STACKING

# **A** DANGER

• To ensure user safety and product damage prevention, the maximum allowable shaking speed should be limited, depending on the units stacking and loading weight on the Universal Platform.

[Allowable maximum agitating speed of ISS-7200 & ISS-7200R]

Status of layer		2	
J	1 unit position without	2 units are assembled	3 units are assembled
Load weight of shelves	stacking assembly	as stacked position	as stacked position
			200RPM
15kg	-	200RPM	200RPM
		200RPM	200RPM
		ā o o	ā <del>o</del> <del>o</del> ā
			150RPM
20kg		150RPM	150RPM
	300RPM	150RPM	150RPM
	<u> </u>	4 <del>0</del> 04	<u> </u>

Example) If you want to stack the ISS-7200/7200R model and to use up to 250rpm, you can load up to 15kg on the Universal Platform.

- \* The weight of 1L flask attached to Flask clamp (Stainless Steel) is about 0.6kg.
  - If 18 sets of L1 flasks would be installed on the platform, the total weight of the flask and clamp is about 10.8 kg. So, set the total weight of the sample to be agitated within 4kg.
  - When 10 sets of 1L flasks are mounted on the platform, the total weight of the flask and clamp is about 6kg. So, set the total weight of the sample to be shaking within 9kg.

## 3.3.2 Environmental Setting

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



No direct sunlight on the product



Ambient temperature:  $5^{\circ}$ C ~  $40^{\circ}$ C ( $41^{\circ}$ F~ $104^{\circ}$ F)



Relative humidity not to exceed 80%



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



Connect the product to earth grounded terminals only.

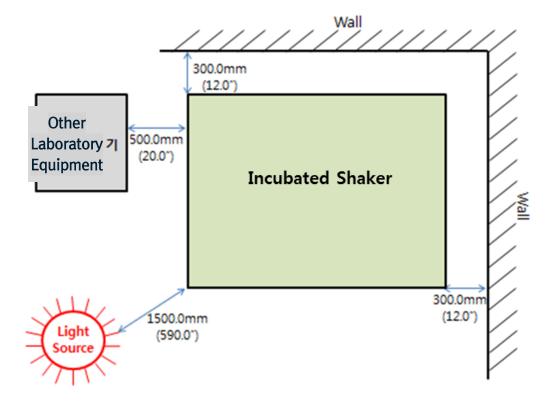
# **WARNING**

- Please install on the sturdy surface laboratory which is set safety facility and make sure horizontal align correctly.
- Do not use the Product near environments where flammable gas may leak.
- Moving casters must be changed height adjustable foots so that the unit is not moving.

#### 3.4 Installation

#### 3.4.1 Caution for Installation

- (1) The device is recommended to use under the room temperature and humidity (30° C, 80%RH) do not install it near the Heat devices like a Heater.
- (2) Door opens up to 435mm. Have enough space for door opening. (refer to 3.3.1)
- (3) Please install it on the sturdy surface laboratory and do not throw down or gives a big shock.
- (4) This product uses a flammable refrigerant, and the installation site must meet the minimum ventilation volume requirements.
- (5) Locate it 1.5m away from any light devices and 30 CM away from the wall.
- (6) Install it on the sturdy leveled surface to prevent abnormal turbulence and noise.



# **A CAUTION**

Danger due to escaping refrigerant!

The refrigerant used in the unit is explosive and pressurized, and can cause serious injury if it comes into contact with the eyes or skin.



- During transport and set-up, do not bend or pierce the tubing and the evaporator.
- Do not damage the surface coat (scratching it off, for example).
- Wear safety glasses and protective gloves when handling the refrigerant circuit.

# **A CAUTION**

The minimum ventilation volume of the installation space is calculated based on the refrigerant charge as follows:



[Example] R600a: Installation space (m³)  $\geq$  Refrigerant charge (g)  $\div$  8.6 (g/m³)

If 80g of refrigerant is used → Minimum required space = 9.3 m<sup>3</sup>

• If the installation space is enclosed or poorly ventilated, the risk of explosion increases in the event of a refrigerant leak.

For the exact refrigerant charge, refer to the Technical Specification chapter.

## **A CAUTION**

Danger due to unauthorised intervention in the cooling circuit!



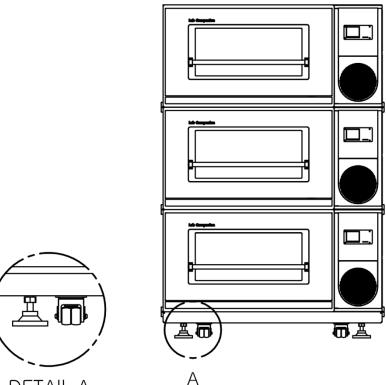
The cooling machine contains the natural refrigerant propane R290 / isobutane R600a. The refrigerant used in the unit is flammable and can cause serious injury if it comes into contact with the eyes or skin. Unauthorized intervention in the cooling circuit poses a danger of injury!

• On site, only the entire cooling machine can be replaced.

The cooling machine is a permanently technically sealed system in line with EN 1127-1.

#### 3.4.2 Unit level adjustment

- (1) Place unit in your preferred location.
- (2) Use spanner. Turn ①nut clockwise to raise level, counter-clockwise to lower the level. Make sure the height of the castor should be adjusted to have at least 5mm space from the ground.
- (3) Place a level checker on the unit. Adjust each castors' level in (2) way.
- (4) After leveling horizontal, Turn up 2 nut of each foot up to fix unit.
- (5) Fix retractable foot higher than castor to move he unit.



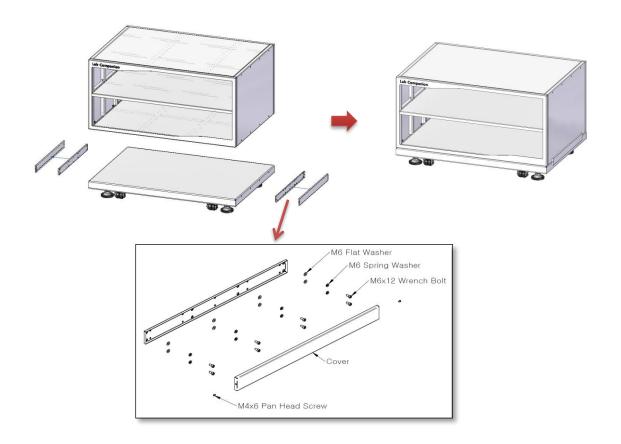


# **A CAUTION**

- Don't use it on not leveled ground.
- Shaking operation without fixing the castor on the ground might cause harm to unit and samples.

#### 3.4.3 How to set STAND with product

- (1) Sat the STAND on BASE.
- (2) Assemble the both side (left and right) STEAKING KIT with M6x12 Wrench Bolt, Spring Washer, Flat Washer. (Total 16 ea: left 8 ea and right 8 ea)
- (3) Covered STACKING KIT, and assemble the M4x6 Pan head Screw. (front and back side)
- (4) Reverse disassembly shall be the reverse of the assembly.

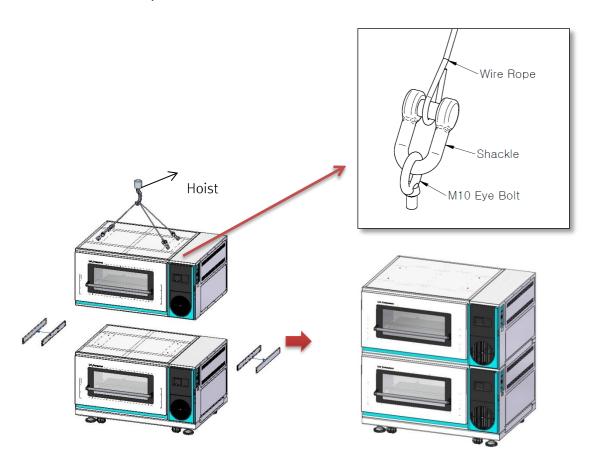


# **A CAUTION**

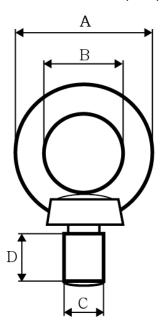
- The STAND weight is as below;
- STAND-I: Approx. 105kg
- STAND-II: Approx. 65kg
- Be careful to injure when lifting.

#### 3.4.4 How to assemble MAIN BODY

- (1) Loaded the MAIN BODY on BASE, STAND(Option), or other MAIN BODY.
  - Loading method
    - 1. Tighten the EYE BOLT (M10) to 4 places on the top of product.
    - 2. Link the EYE BOLT and Wire pope with Shackle.
    - 3. Using the Hoist to load MAIN BODY on desire position.
- (2) Assemble the both side (left and right) STEAKING KIT with M6x12 Wrench Bolt, Spring Washer, Flat Washer. (Total 16 ea: left 8 ea and right 8 ea)
- (3) Covered STACKING KIT, and assemble the M4x6 Pan head Screw. (front and back side).
  - \* Refer. to "How to set STAND with product"
- (4) Reverse disassembly shall be the reverse of the assembly.



#### Provided EYE BOLT (M10)



EYE BOLT	Α	В	С	D
M10	41mm	25mm	10mm	18mm

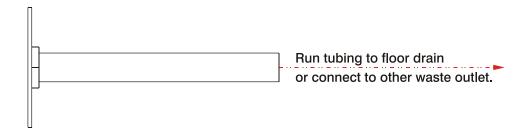
# **▲ DANGER**

- The MAIN BODY weight is approx. 250kg.
- Must using the Hoist to upload product.
- In case of product is dropped by accidentally, may cause the death, serious injury, or property damage.

## 3.5 Attaching Condensate Drain

In case of the liquid leakage caused by spilled reagent or cracked flask inside of the chamber, the liquid is designed to be drained out through the drain of the unit. The drain barb is made of chromium plated copper and it is easy to connect 6mm ID soft-walled tubing to the condensate drain.





# **A CAUTION**

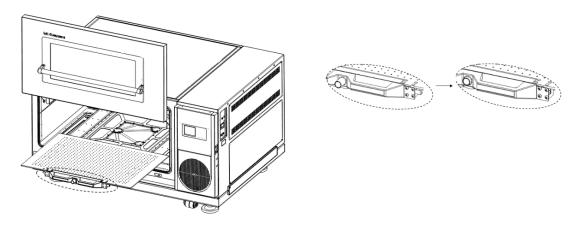
Motor damage may result from solution leakage, potentially voiding the warranty.
Hence, when utilizing a flask containing a solution for agitation, it is imperative to
prevent solution overflow during agitation. Moreover, utilize a properly sized clamp
to securely stabilize the flask during agitation to mitigate the risk of tipping over.

# 3.6 Sliding Platform

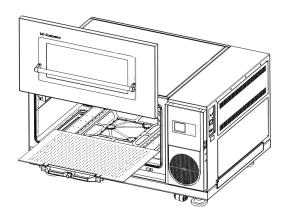
## 3.6.1 How to use sliding platform

Instructions for using the Sliding Platform to mount the sample:

(1) Press the center button on the Platform Handle to unlock it.



 $(2) \ \ Hold \ the \ unlocked \ Platform \ Handle \ and \ pull \ the \ Sliding \ Platform \ forward.$ 

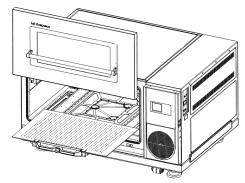


- (3) Attach the sample to the pulled forward Sliding Platform.
- (4) After attaching the sample, hold the Platform Handle and push the Sliding Platform inward.

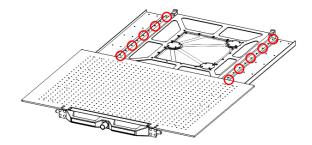
## 3.6.2 Sliding Platform Usage and Disassembly/Installation Instructions

Instructions for disassembling the Sliding Platform for Platform replacement or Accessory attachment:

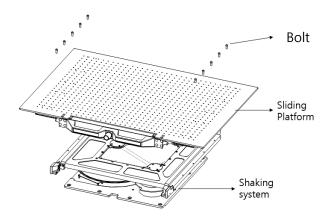
(1) Pull the Sliding Platform as far forward as possible.



(2) Disassemble the total of 10 bolts (5 on each side as indicated by the circles below).



(3) The disassembled appearance is as shown in the figure below.



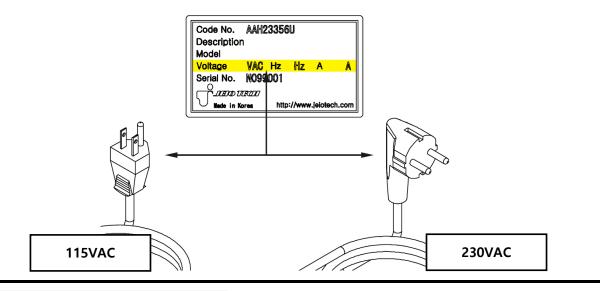
(4) When reinstalling the Platform, use the 10 bolts disassembled in step (2) to secure the Platform to the Shaking System.

# 3.7 Connecting Power

JEIOTECH's Shaking Incubators use a single-phase current.

Use a suitable plug as the picture bellow by Identification label.

Voltage is the 10% of applied voltage.



# **WARNING**

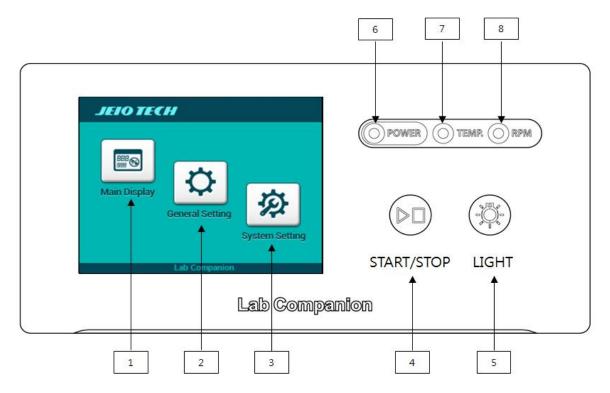


- Connect the power with checking the voltage, Phase,
   Capacity.
- Use the ground power for the connection.
- Do no use the double cap or a current tap socket causing a damage on the cable and fire due to an overcurrent.

# 4 Operation

# 4.1 Controller

The controller is consist of the touch screen, LED, membrane. Once the power is supplied, below display is appeared.

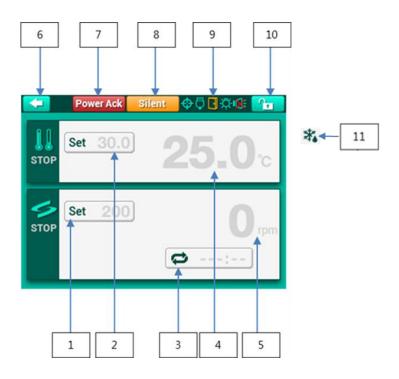


1	Main Display	Main Display for the operation
2	General Setting	General setting.
3	System Setting	Parameter setting is available. For change the parameter, acknowledge the manual.
4	Quick Start/Stop	Touch button is the base. Start/Stop external button is installed on the controller for the user's convenience. Function setting is available on the system setting. (Default: shaking start/stop)
5	LED Lamp	On/Off the LED lamp.
6	Power ON indicator	Power is supplied.

7	Temperature Control ON indicator	Under the temperature controlling.
8	Shaking Control ON indicator	Under the shaking controlling. In the case of the timer is set, it is off

# 4.2 How to use the controller

Setting is available on the main display.



1	Set RPM	Display the setting RPM. Touch the screen, set the RPM.
2	Set Temperature	Display the setting temperature. Touch the screen, set the
		temperature.
3	Set Timer	Display the shaking time. Touch the screen, set the timer. In the case
		of no timer is set, the operating time is displayed.
		(999hours 59minutes)
4	Actual Temperature	Display the temperature of inside of chamber.
5	Actual RPM	Display the present shaking speed.

6	Back	From main display to home display. It is available when the unit is						
		stop the oper	ating.					
7	Power Ack	In the case of	the power is off for the supply faulty reason and the					
		supply is back	k, the previous operating is back. It is auto restart					
		function. At th	ne time Power–Ack button is appeared on the display. In					
		the case of th	e shaking was operating, the operating time is appeared					
		on the display with red words. Once touch the Power-Ack or change						
		the setting va	lue, The Power Ack display is disappeared.					
8	Silent	In the case of	attention on the unit is required, the unit generates the					
		alarm. Touch	the silent, the unit stops the alarm. Once the problem is					
		not eliminate	d, the unit generates alarm again.					
9	Status Bar		The unit stops the platform on the same position. This					
		$\oplus$	display indicates that the platform is on the right					
		Τ	position. If the platform is not on the right position,					
			the color will be changed as yellow.					
		The unit provide USB port and RS-232 port. The						
		一四	display is on when the computer is connected.					
		<u> </u>	Report Only:  \( \sqrt{Slave Mode} : \sqrt{\frac{1}{2}} \)					
		Door is opened.						
		\B/	LED lamp is on.					
		<u>Q</u>						
			Mute function. The setting is available by the General					
	_	_	Setting.					
10	Lock	The lock func	tion is to prevent the not proper setting change. Once					
		touch the button, the display is changed same as . To						
		unlock it, touch twice of the button. $\bigcirc$						
11	Defrost	In case of refr	igerated model, automatic defrost is activated regularly.					
		When defrost process, defrost mark is shown next to Present						
		temperature	temperature value on display.					

#### 4.2.1 Temperature control

#### (1) Start temperature control

Touch the set temperature button on the main display. Setting display is appeared. Set the temperature with touch pad and touch the start button. The temperature control starts. SV and PV is displayed on the main display with green color.

#### (2) Stop the temperature control

Touch the set temperature button. Setting display is appeared. Touch the stop button. The temperature control stops. The temperature control starts. SV and PV is displayed on the main display with gray color.

#### (3) Change the set temperature

Touch the set temperature button. Setting display is appeared. Put the setting value on the touch pad and touch the enter button. SV is changed.

### **NOTICE**

- Temperature setting is one digit and one decimal point available. Touch the panel and put the numbers.
- Move out from the setting mode with ESC button.
- In the case of no touch for 10 seconds, the display changed to the main automatically.
- Check the PV, RPM on the setting display is available. (right upper side)
- The operating is maintained as previous during the setting.
- Once the door is opened during the shaking operating, the heater and fan is stopped. Close the door before door error generating, the previous operating is back.

## **A CAUTION**

- Refrigerant model can control the inner chamber temperature. In that case, refrigerating is only activated when set temp is below  $40^{\circ}$ C and present temp is below  $46^{\circ}$ C
- If you want to cool down the temperature to 40°C when inner chamber temp is more than 46°C, open door and let it cool down naturally.

### 4.2.2 Shaking Control

#### (1) Start shaking control

Touch the Set RPM Button under the shaking stop status. Setting mode is appeared. Set the value on the display and touch the Start button. Shaking control starts. SV/PV rpm is changed to green color.

(2) Stop the shaking control.

Touch the Set RPM button under the shaking operating status. Setting mode is appeared. Touch the Stop button. Shaking stops. SV/PV rpm is changed to gray color.

(3) Change the shaking speed

Touch Set RPM button. Setting mode is appeared.

Set the value on the display and touch the Enter button. The rpm is changed.

# NOTICE

- Move out from the setting mode with ESC button.
- In the case of no touch for 10 seconds, the display changed to the main automatically.
- Check the PV, RPM on the setting display is available. (right upper side)
- The operating is maintained as previous during the setting.
- Once the door is opened during the shaking operating, the heater and fan is stopped. Close
  the door before door error generating, the previous operating is back.

### **A CAUTION**

 In the case of change the sample, stop the shaking and check whether the platform is completely stopped.

### 4.2.3 Shaking Timer

Timer is only available for shaking. Once the timer is set, the shaking stops after operating the set time and beep is generated. Setting time is on the display once the timer is set and '---:--' is on the display once the timer is not set. Remaining time is on the display once the timer is set and accumulated time is on the display once the timer is not set.

#### (1) Timer ON

Touch the Set timer on the main display. Timer OFF is on the display once the timer is set and Timer on is on the display once the timer is not set. Touch the Timer ON button and set the time on the display. Touch the Enter button. Check the set time on the main display.

#### (2) Timer OFF

Touch the Set timer on the main display. Timer OFF is on the display once the timer is set and Timer on is on the display once the timer is not set. Touch the Timer OFF button and touch the Enter. Time display on the main display is changed to "---:--".

#### (3) Change the setting time

Touch the Set timer on the main display. On the Timer ON status, put the time on the display. Touch the Enter. Check the changed time on the main display.

# **NOTICE**

- Once the setting time is changed during the timer operating, original set time is changed. The
  accumulated time is applied to the new time setting and the remaining time is calculated and
  displayed. If you want whole new time setting, off the timer and set the timer again.
- Timer setting is available for hour:minute. Touch the part you want to change and put the numbers on it.
- Move out from the setting mode with ESC button.
- In the case of no touch for 10 seconds, the display changed to the main automatically.

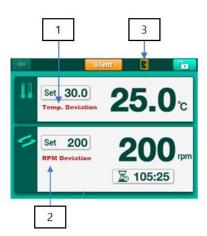
- On the timer set display, you can check the present chamber temperature and rpm. (right upper side of the display)
- Below 1 minutes is displayed as "mmm:ss".
- Timer is not counted during the door open.

### 4.2.4 Alarm and Stop by force

The unit senses the problem on the unit and warn to the user. The warning is visual-audial effect. The alarm is divided into warning and fault.

#### 4.2.4.1 Warnings

Warning generates visual-audial alarm but the unit is operating. Once the warning is generated, Silent button is appeared on the main display. Once the silent button is touched, next 15 minutes there is no alarm. If the problem is on-going after 15 minutes, the alarm is generated again.



1	Temp. Deviation	The temperature difference between setting temperature and present			
		temperature is more than the range of the permission. The unit check it			
		once the present value reached to setting value. Once the gap is over			
		the permission range, the alarm is generated.			
2	RPM Deviation	The rpm difference between setting rpm and present rpm is more than			
		the range of the permission. The unit check it once the present value			

		reached to setting value. Once the gap is over the permission range, the		
		alarm is generated.		
3	Door Open	Once the door is opened, the temperature and rpm are not operated.		
		Once the door is opened, visual–audial alarm is generated. After 3		
		minutes of door opening, the alarm is effective. Once the door is closed,		
		alarm is eliminated and the operating is back.		

# NOTICE

- Alarm is not effective if Sound Off is set on the General Setting.
- Deviation Alarm is not effective once the present value reaches to the setting value. (set time, in permission range)
- Deviation alarm is initialized under the below situation.
  - Set the setting value
  - Get back to the work after stopping the control. (Door open, Stop operating)
  - Defrost is under progress (Temperature control)
- Once the Deviation initialized, the unit check the present value. If the temperature not reaches
  to the SV for 4 hours and the rpm not reaches to the SV for 10 minutes, Deviation check is
  started.
- The range of permission and the period of Deviation is changeable on the System Setting.

#### 4.2.4.2 Faults

Fault Alarm stops the unit and inform it to the user when the unit need forced stop for the protection. Fault alarm are Electronic/Mechanical over-temp protection, Door Open, Sensor Fault, Over Current.

1	Temperature Limit	Electronic/Mechanical over–temp Limiters on the right side of the unit				
		is activated. The inner temperature of the chamber exceeded the set				
		temperature of the limiter. The unit stops operation for protection of				
		the product and the samples. Check the range of the set temperature				
		of the over-temp limiters.				
2	Door Open	If the door is opened for more than 5 minutes during operation, the				
		unit stops operation and activates door open fault alarm.				
3	Sensor Fault	It stops operation due to main controller's temperature sensor				
		malfunction.				
4	Over Current	Automatic shutoff in the situation when there is over-current to the				
		unit. The factors are excessive shaking operation, substance				
		disturbance in the shaking system.				

### 4.2.5 Defrost (Refrigerated model, ISS-7100R, ISS-7200R Only)

The refrigerated model activates automatic defrost when the setting temperature is saved under the certain temperature. The defrost operation can raise the temperature of the chamber. Also the defrost mark \*\* will blink on display to indicate defrost progress.

# **NOTICE**

- The defrost operation can raise the temperature of the chamber.
- If you stop the temperature control or set the temperature out of the range of defrost activation, the defrost period is initialized.
- The monitoring for Temperature deviation alarm is initialized during defrost progress
- User cam set the use of defrost function. (4.4.5 Operating Parameters)

# 4.3 General Settings

Set the general operating. Touch General Setting button and below setting menu is appeared. Touch the ' $\langle$ ' or ' $\rangle$ ' and explore the menu.

1	Shaking Direction	Set the shaking direction		
		CW(clock wise), CCW(counter clock wise)		
2	Temperature Unit	C° /F°		
3	Lock	Use the Lock or not		
4	System Sound	Mute for sound or not		
5	LCD Brightness	Adjust the brightness of LCD		
6	LCD Auto Dim	LCD Dim function (No input, LCD dim)		
7	Dim Brightness	LCD Dim, and the brightness of the dim		
8	Dim Time Out	Waiting time for LCD Dim mode operating		
9	Light Brightness	Select the brightness of LED		
10	Light Auto	Door opened, auto LED light on		
11	Auto Restart	Auto restart function. The unit is back to the operating, before the power		
		out.(Time information is not back)		
12	USB (RS232)	USB and RS-232 port is available for the PC. Select the mode when PC		
		is connected.		
		Report Only: PC received the information from the unit.		
		Slave Mode: PC control the unit.		

# 4.4 System Settings

Set the main variable that effect on the unit. Please read the manual carefully before setting the system. Touch the System setting button on the home display, below clauses are arranged.

1	Control Deviation	Set the deviation limit range. Temperature setting and rpm setting are			
	Limit	available.			
2	External	Start/Stop membrane button is located on the control panel. Set about			
	Start/Stop Key	this key			
3	Calibration	Calibration on the temperature sensor and rpm to the user's reference.			
		Calibration on the LCD touch coordinate is available.			
4	Auto Tuning	Temperature PID parameter update. Optimum control on the main			
		operating temperature is available.			
5	Operating	Set the operating and error check			
	Parameters				
6	Reset	Set the parameter as initial factory value.			

### 4.4.1 Control Deviation Limit

Set the deviation limit between setting value and actual value of the temperature and rpm. The time of out of deviation limit range can be set either.

1	Temperature	Set the deviation limit between setting value and actual value. Set on		
	Deviation Limit	the key pad.		
2	Temperature	Once the deviation is out of range for alarm delay period, the alarm is		
	Deviation Alarm	generated. Once the actual temp reached to the set temp, the alarm is		
	Delay	disappeared after alarm delay period check.		
3	RPM	Set the deviation limit between setting value and actual value. Set on		
	Deviation Limit	the key pad.		

4	RPM Deviation	Once the deviation is out of range for alarm delay period, the alarm is
	Alarm Delay	generated. Once the actual rpm reached to the set rpm, the alarm is
		disappeared after alarm delay period check.

### 4.4.2 External Start/Stop Key

External Start/Stop button is on the control penal as membrane button. It generates start and stop. Set the applying range of it.



START/STOP

1	Only Shaker	The button only works for shaker's start/stop.
2	Only Incubator	The button only works for incubator's start/stop.
3	Shaker Incubator	The button only works for shaker and incubator's start/stop.

# **NOTICE**

 Shaker and incubator are both available for the external membrane button. Once one of the shaker/incubator is on the generating and touch the button, the stopped part is operated.
 Touch the button again, both of mode are stopped.

#### 4.4.3 Calibration

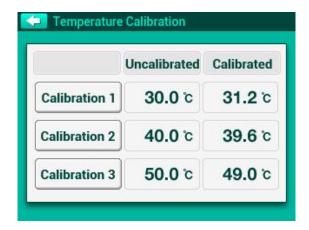
The temperature sensor and rpm reached to the user's reference measure value, accurate experiment circumstance can be made. Calibration for coordinate is available.

#### 4.4.3.1 Temperature Calibration

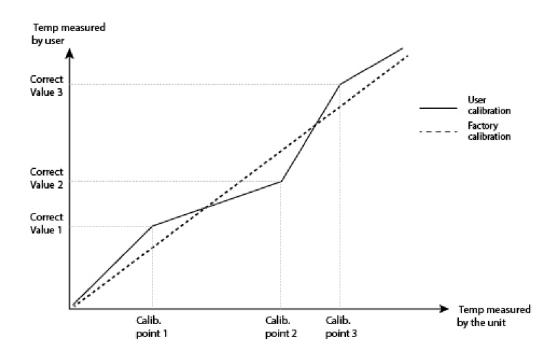
Calibration for temperature sensor of main controller. The unit provides three points calibration.

Each point of three shows the uncalibrated and calibrated status. Touch the point you want to change.

Touch the one point of Calibration 1,2,3. Put the external sensor on the chamber and close the door.



Touch the temperature on Set Temp. and put the desired temperature on it and operate the unit. Wait until the actual temp reaches to the setting temp. Once the actual temp reaches to the setting temp, touch the calibrated temp and put the temperature from the external sensor. Touch the confirm for the saving. The unit stops the operating. The unit read the temp as the external sensor's value.



# **NOTICE**

- Once the door is opened or the temperature is out of range, the temperature control is stopped.
- The calibration is operating on various points so it limits the calibrating that is ou of the logic.
- The result of the calibration is on the uncalibrated and calibrated. Uncalibrated means the
  value from the unit and the calibrated means the temp that calibrated. The calibrated value is
  from the external sensor.
- The calibration setting is available to be initialized on the System Setting Reset.

#### 4.4.3.2 Shaking Speed Calibration

ISS-7100(R)/7200(R) models with direct drive shaking don't need RPM calibration. Therefore, shaking speed calibration is not provided.

# **NOTICE**

- Be careful that the external sensor never touch the platform. Once the external sensor is removed from the platform during the operating, it will be dangerous.
- The calibration setting is available to be initialized on the System Setting Reset.

#### 4.4.3.3 Touch Screen Calibration

Touch penal coordinate could be in the problem for the reason of the older unit and the problem in the unit. The unit has a touch screen coordinate function. Touch the "+" on the screen three time s. And repeat it two times.

### 4.4.4 Auto Tuning

Update the parameter of PID temperature control. Optimum temperature for the main using temperature is available. The unit is set to use the temperature on proper range. Once the temperature is not actual on the main points during the actual use on the field, operating auto tuning will tune the temperature parameter and make the unit operates the temperature on the actual temperature.

Touch the Set Temp. and put the desired value. Touch the START button and start the parameter tuning. Touch the stop button during the tuning and stop the tuning. Once the tuning is completed, touch the ok button and save it.

### 4.4.5 Operating Parameters

Set the parameters for the other operating.

1	Position Sensor	Check the platform stop on the right position.			
2	Stall Check	Check the belt when the platform is not working properly.			
		Not provided for ISS-7100(R)/7200(R) models.			
3	Defrost Use	Refrigerated models (ISS-7100R/7200) provide defrost			
		function. When refrigerator is activated, defrost function starts			
		every 8 hours.			
4	Threshold	The vibration is on the range of not controlling, the automatic			
		adjusting is operated.			

### 4.4.6 Reset

Initialize the changed value to the factory value.

1	Temperature Calibration	Initialize the calibration value.
2	RPM Calibration	Initialize the calibration value.
3	Auto Tuning	Initialize the calibration value.
4	Touch Screen	Initialize the calibration value.
5	Operating Parameters	Initialize the calibration value.
6	Factory Default	Initialize the calibration value of all parts.

# NOTICE

• Auto tuning parameter can be initialized to the factory value.

## 4.5 Safety Tool

### 4.5.1 Over Temp. Limiter

This model has the over temp limit and temp sensor in the main controller.

Over temp limit is located on the right down side of the unit. Set the over temp limit over 15% than normal use temperature by a flat head screwdriver. In case of that the temperature in the chamber over set temp, the operation discontinues.



### 4.5.2 High/Low Temp. Limiter

This model has electric High/Low Temp. Limiter additionally.

Over Temp. limiter is operated mechanically. But Electric High/Low Temp.

Limiter make operation stop by receiving high/low value from user.

If PV is out of high/low value, it is supposed to be stopped.

Please refer to Appendix 9.2 regarding how to use electric High/Low Temp.



#### 4.5.3 Glass Fuse

Limiter

In the case of the over current generating, the fuse is cut and the power is down.

# 5 Maintenance

# 5.1 Inspection Period

Classification		Inspection period				
Classification	Daily	Weekly	Monthly	Quarterly	Yearly	
General						
Power						
Connection between machine and power	•					
Power code	•					
Exterior cleanliness		•				
Drain connection				•		
Outside refrigeration system connection (ISS-7100/ISS-7200)				•		
Incubator						
Set temperature and actual temperature difference	•					
Auto Tuning				•		
Temperature setting						
Temperature correction					•	
Actual temp. / Display temp. correction					•	
Air filter clean (ISS-7100R/ISS-7200R)			•			
PC Sync operation	•					
Controller and timer operation				•		
System						
Connection between platform and accessories	•					
Connection between platform and shaking table	•					
Actual rpm/ Display rpm correction					•	
Malfunction of shaking system			•		_	

# **WARNING**

- Check the general, system(control), and electric wire related checklist according to the inspection cycle.
- If the inspection cycle are not followed, the manufacturer is not liable for any damage to the equipment or fire that may occur.

### 5.2 Cleaning

- (1) After disconnect the power cord, clean the machine with soft and dried towel.
  - Regarding the un-removable point, clean the polluted area only by towel with alcohol solvent (methanol, ethanol) which has low boiling point.
- (2) Do not use Acid solution, sharp one, soapy water, detergent and hot water.

It makes the machine discolored. Rubber and plastic part can be change of shape and color.

Especially, do not use volatile matter.

In case of neutral detergent, clean it with the soft fabric and dry well.

- (3) Do not put the water to exterior of the machine when you clean the surrounding (Especially, socket and controller part, it can make short circuit problem.)
- (4) After discussion the proper cleaning method to avoid any damage for the machine with Jeiotech, if you want to clean the machine or remove the polluted area with not mentioned cleaning method before the clean.
- (5) The inside electric part of the machine should be handled by Jeiotech or person who is delegated by Jeiotech.
- (6) If the parts is required to replace, please use genuine parts only.
- (7) Technical maintenance is not offered in case of abnormal trouble beyond the normal limit.

### **MARNING**



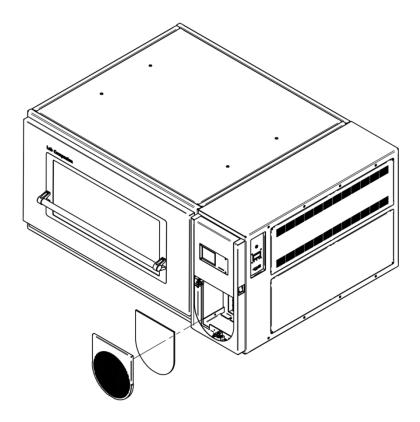
• Do not soak the machine into water and spray the water.

## **A CAUTION**



• Do not clean whole body with chlorine bleaching, detergent with chlorine, an abrasive, ammonia, steel sponge and alcohol solvent (methanol, ethanol) which has low boiling point.

### 5.3 Air filter cleaning (ISS-7100R/ISS-7200R)



- Step 1: Put power switch and turn the machine off.
- Step 2: Loosen the bolt that located in edge of condenser cover
- Step 3: Disassemble condenser cover
- Step 4: Disassemble air filter which is combined with condenser cover.
- Step 5: Vacuum or clean the air filter with the water.
- Step 6: Vacuum or high pressure air clean to the condenser in the machine. It makes better refrigeration effect.
- Step 7: Assemble air filter in reverse order of Step 1~Step4

# **NOTICE**

 When air filter clean, please be careful to avoid fold the condenser pin, It is possible to decrease refrigeration effect.

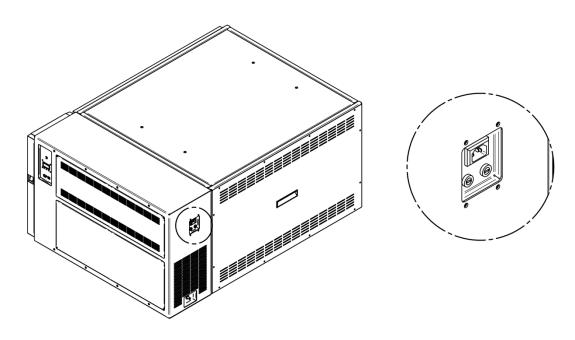
# 5.4 Replacement

### 5.4.1 Fuse Replacement

Replace the fuse which is located in next to power button (Refer to 2.3) if no operation of short circuit breaker and No power. There is extra fuse 2pcs in socket case inside. If you need additional fuse, ask it to sales team or seller.

Model	Voltage	Current consumpti on(A)	Fuse (A)	Fust Cat. No.
ISS-7100 ISS-7200	230VAC, 50/60Hz	3.7	10	00CDE0005543
	115VAC, 60Hz	7.3	15	00CDE0005541
ISS-7100R ISS-7200R	230VAC, 50/60Hz	5.6	10	00CDE0005543
	115VAC, 60Hz	10.0	15	00CDE0005541

Fuse is located in next to power switch. (Side of machine.) Please replace the fuse according the below picture.



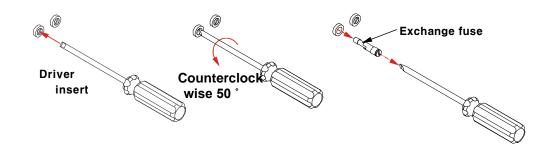
# **MARNING**



#### Caution to Electrical shock.

Before replace the fuse, turn the machine off and check the power connection again.

If the power is connected, serious injury or death can be occurred.



**Step 1:** Press power switch and Power off

Step 2: Connect (-) screw driver to fuse holder

Spin the fuse holder counterclock wise 50 ° then fuse holder is disassembled.

**Step 3:** Compare the fuse specification with the above table and replace it if there is no problem.

**Step 4:** Complete the replacement in reverse order of Step 2

### 5.4.2 Replacing refrigerant

The refrigerant used in this unit is flammable and pressurized, and may cause serious injury upon contact with the eyes or skin. Follow the safety instructions below when handling the refrigerant circuit.

#### (1) Safe Handling of Refrigerant (Based on EN 1127-1 Standard)

To ensure safety when handling flammable refrigerants (R600a, R290), adhere to the following guidelines:

- Avoid mechanical damage to the refrigerant circuit during transportation, installation, and maintenance.
- Do not bend, pierce, or apply excessive force to the tubing and evaporator.
- Avoid scratching or damaging the protective coating of the refrigerant components.
- Ensure proper ventilation when working with the refrigerant circuit.
- Keep all ignition sources, sparks, and open flames away from the refrigerant system.

#### (2) Refrigerant Leak Detection and Emergency Response

- Leak Detection
- Use an approved refrigerant leak detector to identify leaks.
- Check for visible signs of leakage, such as oil stains or hissing sounds.
- Emergency Response
- Ensure proper ventilation: Open doors and windows to dissipate leaked refrigerant.
- Do not use open flames or sparks in the vicinity of a suspected leak.
- Evacuate personnel from the affected area if necessary.
- If refrigerant comes into contact with skin or eyes, rinse immediately with water and seek medical attention.

#### (3) Refrigerant Replacement and Approved Refrigerants

- Use only certified refrigerants (R600a, R290) compliant with EN 1127-1 and ATEX safety regulations.
- Do not mix refrigerants or use unapproved substitutes.
- Refrigerant charging should only be performed by trained professionals following safety protocols.

# **A** CAUTION



 All refrigerant handling and maintenance records should be documented for compliance and safety audits.

# 6 Troubleshooting

# 6.1 Stop during the operating

Display Message	Description	Solution	
Temperature Limit	Analog over temperature regulator is active.	Check the set on the analog over temperature regulator and the operating. Restart after temperature is inside of the range.	
Door Open	Door is opened over 5 minutes during the operating.	Close the door and touch the start button and restart the unit.	
Sensor Fault	Temperature sensor is faulty so the operating is stopped.	Contact the manufacturer or sales point.	
Over Current	Over current is generated so the operating is stopped.	Check the overload, obstacle in the shaking system.	

# 6.2 Another problem and solution

Trouble	Probable Cause & Solution
	① Check the power plug connection to the socket
	② Check if the circuit breaker is operated
The equipment is not on	③ When the fuse is short circuited, replace new one as enclosed.
The equipment is not on	④ Check the power failure
	⑤ If the problem is not fixed with the above method, please request
	A/S
	① Check the power plug connection to the socket
Power on but controller	② Check the panel board circuit breaker and reset it then turn the machine on.
does not operated	③ Request A/S if Display board or Main PCB has problem.
	Request A/S if Power switch has problem.
	(1) Chack the Temperature Central ON indicator is ON
	<ol> <li>Check the Temperature Control ON indicator is ON</li> <li>Check outdoor temperature is too high or low and maintain the right</li> </ol>
	② Check outdoor temperature is too high or low and maintain the right room temperature.
NO TILL	3 Request A/S after check the difference between actual temperature and display temperature.
NO The temperature of	Check the door switch irregularity
incubator rise to setting value	⑤ Request A/S if the heater is out of order
value	Request A/S if the freezer is out of order.
	① Check air filter condition and clean it according to 5.3
	8 Auto tuning if the temperature is unstable according to 4.4.4.
	If the problem is not fixed with the above method, please request A/S.

1		
		If there is extremely intense vibration of the machine than usual during operation, check the horizontality. If you need, please adjust horizontality according 3.4.2
		If there is extremely intense vibration of the machine and shaking speed is slow down, check the sample location and relocate the samples harmoniously
Shaking trouble	3	In case of overloading, control the sample weight according to 9.1(Max load per speed).
	4	Check door switch if shaking is not operated after shaking start button press.
	5	Check Timer close status if shaking is not operated after shaking start button press, cancel timer set-up.
	6	If the problem is not fixed with the above method, please request
		A/S.
Noise		Check fixed condition of platform or sample.
		Check the weight of sample is shifted to one side, relocate the samples evenly.
		If the problem is not fixed with the above method, please request
		A/S.
	1	Use an approved leak detector to check for any refrigerant leakage.
	2	Look for visible signs of leakage such as oil stains or hissing sounds.
In the Event of Refrigerant Leakage		Ensure proper ventilation by opening doors and windows to release the leaked refrigerant outdoors.
		If a leak is suspected, do not use any flames or spark-generating equipment in the area.
		Evacuate personnel from the affected area if necessary.
		If the refrigerant comes into contact with skin or eyes, rinse immediately with clean water and seek medical attention.

# 7 Accessories

# 7.1 Mountable maximum quantity

### 7.1.1 Universal Platform + Flask Clamp

Model Flask Clamp	ISS7000 series
50ml	88
100ml	54
250/300ml	35
500ml	24
1,000ml	15
2,000ml	11
2,800ml	6
4,000ml	6

### 7.1.2 Universal Platform + Plastic Flask Clamp

Model Flask Clamp	ISS-7000 series
50ml	88
100/125ml	48
200ml	35
250ml	35
300ml	35
500ml	23
1,000ml	12
2,000ml	6

# 7.1.3 Universal Platform + Funnel Clamp

Model Funnel Clamp	ISS7000 series
250ml	15
500ml	10
1,000ml	7
2,000ml	5

# 7.1.4 Universal Platform + Microplate Holder

Model Type	ISS7000 series
Single	24
Tower	21
Flat A(large)	4
Flat B(small)	6

### 7.1.5 Universal Platform + Test Tube Rack

Model Type	ISS7000 series
0°	7
15°	7
30°	7
45°	6
60°	6

### 7.1.6 Spring Wire Rack + Flask

Platform Flask	ISS7000 series
50ml	40
100/125ml	28
250/300ml	15
500ml	10
1,000ml	8
2,000ml	4
2,800ml	4

<sup>\*</sup> About the right position for mounting maximum quantity of Accessories, please visit Jeio Tech website or contact our office and distributor..

## 8 S/W

### 8.1 Installing Monitoring Program

- (1) Please visit JEIOTECH's homepage (<a href="https://www.jeiotech.com/">https://www.jeiotech.com/</a>), and download the dedicated software (LC Link2PC) implemented by JEIOTECH.
- (2) Run the LC Link2PC installation file, specify the installation path, and proceed with the installation.
- (3) Launch the LC Link2PC program located on the desktop of your PC.

### 8.2 Connecting the Equipment and Program

- (1) Connect the PC where the program is installed to the equipment using a communication cable.
- (2) On the PC, check the COM port number connected to the equipment via [Control Panel > Devices and Printers > Device Manager > Ports (COM & LPT)]. (e.g., COM3 → 3, COM4 → 4, etc.)
- (3) On the equipment controller, go to [General Settings > Communication], and enter the "Equipment Address" according to the communication method as follows:
- A. For RS-232 or USB communication:

Enter the same number as the COM port confirmed in step (2) as the "Equipment Address." (e.g., If the equipment is connected to COM3, enter 3 as the Equipment Address.)

B. For RS-485 communication (up to 4 units supported):

Assign a unique "Equipment Address" to each connected equipment to avoid duplication. (e.g., Equipment A – Equipment Address 1, Equipment B – Equipment Address 2, etc.)



[Example of entering Equipment Address as 3]

### **NOTICE**

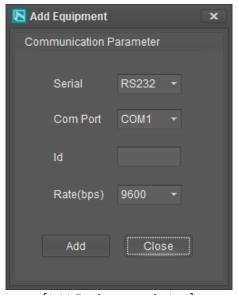
- When multiple equipment units are connected via RS-485 communication, the baud rate must be set identically on all equipment controllers.
- (4) Click the "Add" button at the top-left corner of the program window. In the 'Add Equipment' window, enter the following values based on the selected communication method, then click "Add" to register the equipment.

#### A. For RS-232 or USB communication:

- Serial: RS-232
- Port Number: The COM port number identified in step (2)
- Baud Rate: Same as the value set under [General Settings > Communication]
   on the equipment controller

#### B. For RS-485 communication:

- Serial: RS-485
- Port Number: The COM port number identified in step (2)
- ID: The "Equipment Address" assigned to each unit in [General Settings > Communication] on the equipment controller
- Baud Rate: Same as the value set under [General Settings > Communication]
   on the equipment controller



[Add Equipment window]

### 8.3 Communication Protocol

The unit communicates with PC through RS-232C port. Software save the duplex communication, operating status, date. If you want to change on software, refer to below reference.

Communicatioin Reference:

http://www.modbus.org/docs/Modbus\_Application\_Protocol\_V1\_1b3.pdf

### 8.3.1 Physical Layer

- Communication port: RS-232C /USB

### 8.3.2 Model System number

ITEM	System Number	System	Model Number	
Incubated Shaker	1621H	Shaking incubator	ISS-3075	
	1622H	Shaking incubator	ISS-3075R	
	1623H	Shaking incubator	ISS-4075	
	1624H	Shaking incubator	ISS-4075R	

### 8.3.3 Modbus Protocol Address Definition

modbus		command	data	description	data length	
function code	audiess	Command	uata	description	word	byte
W/S 1		1 Down	0x0001	BEEP_SYS_BOOT(for communication test)	1	2
W/S	'	Beep	0x0002	BEEP_KEY(for communication test))	1	2
R/I	2	MOD_SYS_NA ME	Х	Equipment name	1	2
R/I	3	MOD_SYS_VER	Х	Firmware Version	1	2
R/I	4	MOD_SYS_PAR AM	х	system parameter(requirement for setting ui.)	20	40
W/S, R/I	25	MOD_SYS_SO UND	0/1	system sound	1	2
W/S, R/I	26	MOD_SYS_LA MP	1~3	lamp bright	1	2

	1	140D CVC 14			I	1
W/S, R/I	27	MOD_SYS_LA MP_AUTO	0/1	lamp auto onoff	1	2
W/S, R/I	28	MOD_AUTO_R ESTART	0/1	system auto restart	1	2
W/M, R/I	29	MOD_TEMP_D EVI	temp devi min ~ temp devi max	temperature deviation	4	8
W/S, R/I	33	MOD_TEMP_D EVI_ALARM	0 ~ 3599	temp devi alarm time	1	2
W/S, R/I	34	MOD_RPM_DE VI	rpm devi min ~ rpm devi max	rpm deviation	1	2
W/S, R/I	35	MOD_RPM_DE VI_ALARM	0 ~ 3599	rpm devi alarm time	1	2
W/S, R/I	36	MOD_EXT_KEY	0 ~ 2	external key operation	1	2
W/M, R/I	37	MOD_SET_TEM P	low temp lmt ~ high temp lmt	incubator set temp	4	8
W/S, R/I	41	MOD_SET_RP M	rpm min ~ rpm max	shaker set rpm	1	2
W/M, R/I	42	MOD_SHAKER _TIME	60L ~ 3599940L	shaker set time	2	4
W/S	44	MOD_SHAKER _TIME_ONOFF	0 ~ 1	shaker timer set	1	2
W/S	45	MOD_INCUBAT OR_RUN_STOP	0 ~ 1	incubator operation set	1	2
W/S	46	MOD_SHAKER _RUN_STOP	0 ~ 1	shaker operation set	1	2
R/I	47	MOD_SYS_REP ORT	Х	system report	18	36
W/S	65	MOD_WARN_A CK	1	system warning ack	1	2
W/S	66	MOD_SILENT_ ACK	1	system silent ack	1	2
W/S	67	MOD_AUTO_A CK	1	auto run ack	1	2

# 8.3.4 Modbus Protocol Description

Command	[	Description	]																			
			Modbu	us func	ction code	0		W	/rite	1	Syste	em bo	ot beep									
Beep	Bee	ep generating		W.S	5	Data			ata	2	Syst	em ke	ey beep									
MOD CVC N	A A 4 E	Return the unit				0		Б. 1			Upper	0										
MOD_SYS_N	AIVIE	Refer to Syst number	em	Tunc	R.I	address		Ret	urn d	ata		odel n	Lower um									
MOD_SYS_\	√ER	Return the firm	nware	ware Modbus function code		0	0 Return		eturn data Upper Lowe													
		version			R.I	address						ersio/										
					odbus					0 ~ 3 high	_	~ 7	8 ~ 11 temp_d	12 ~ 15								
MOD_SYS_\	VER	Return the sy	ystem		nction code	0			turn	temp	te	emp lmt	evi_ma	temp_d evi_min								
		parameter						da	ata	16		17	18	19								
					R.I	address				max rpm		min pm	rpm_de vi_max	rpm_de vi_min								
				mod	lbuc functi	ion codo	0						0	]								
		Set the system sound		modbus function		ion code		ddress		return	111	pper	lower									
MOD_SYS_S	CUNIO									data		sound flag										
WOD_515_5	OOND			modbus function code			0		Ī				1									
						ion code				r/w data		0	sound off	-								
					W.S		dat	data				1	sound on									
						. ,																
		Set the lamp		modbus function code		ion code		0 address		return		0										
					K.1		address		]	data		lamp bright										
MOD_SYS_	LAMP	brightnes	-						L			-										
				mod	bus funct	ion code	0			,			1~3									
		W.S		da	data		r/w dat	.a 1	1 : Min. 3 : Max.													
MOD_SYS_LAMP_AU TO				modbus function code on R.I												0					0	
						addres s			return data	upp r	oe .	lower										
											l	amp	auto flag									

		modbus function code	0	r/w	0	lamp auto	
		W.S data		data	1	lamp auto on	
		modbus function code	0		0		
		R.I	addres s	return data	uppe r	lower	
MOD_AUTO_RESTAR	Auto run setting				au	to run flag	
T							
		modbus function code	0	r/w	0	auto run off	
		W.S	data	data	1	auto run on	
			<u>.                                      </u>	<u>.</u>	1		
		modbus function code	0	return		0~3	
	temperature	R.I	addres s	data	temp devi		
MOD_TEMP_DEVI	deviation			<u> </u>	•		
		modbus function code	0~3	value	temp devi min ~ max		
		W.M	value	<u>-</u>			
			•				
		modbus function	0			0	
		code	addres	return data	1		
MOD_TEMP_DEVI_ALAR	temp devi alarm time	R.I	S	uata	ten	np devi alarm	
M							
		modbus function code	0	value	0 ~	3599(Unit/ 1 sec.)	
		W.S	value				
		modbus function	0	المحي		0	
		code R.I	addres	return data		rnm dovi	
MOD DDM DEVI	rom doviction	K.I	S			rpm devi	
MOD_RPM_DEVI	rpm deviation						
		modbus function code	0	value rpm devi r max		m devi min ~ max	
		W.S	value				
MOD_RPM_DEVI_ALAR	rpm devi alarm time	modbus function code	0	return	ı	0	
M	ipin ucvi ataini tiille	R.I	addres s	data	rpm devi alarm		

				modbus func	tion	0			value	0 ~ 3599	(Unit/ 1
				code		U			value	sec	.)
				W.S		val	ue				
			mod	bus function code	0		ret	ur		0	
				R.I	addre s	es	da		E	ext key value	
MOD_EXT_KE Y		rnal key eration									
ľ	Oρι	eration	mod	bus function code	0				0	1	2
				W.S	valu	e	val	ue	shake r	incubato r	bot h
		•				1				Ţ	
				modbus fun code	ction	0			return	0~3	
				R.I		ado ss			data	set temp	
MOD_SET_	TEMP	incubator	incubator set temp								
					ction	0 ~	3		value	high temp temp	
					W.M			_		<u> </u>	
				•							
					modbus function code R.I		0 addre ss		return	0	
		MOD_SHAKER_RUN							data	set rp	m
MOD_SET_	_RPM	_STOP nee						L			
		shaker set rpm		modbus fun code	ction	tion 0			value	rpm min -	~ max
				W.S		val	ue L				
				modbus function code		0		return		0 ~ 1	
				R.I			addre		data	set time	
MOD_SHAKE	R TIME	shaker se	at tima			SS		<u> </u>		time	
MOD_SHARL		Silunei 30	e cillic		-1:					0 ~	
				modbus fun code	ction	tion 0 ~		value		3599940L0 min.	
				W.M		val	ue				
		<u>. l</u>		L			1				
MOD_SHAKER_	TIME ONO	shaker time	er on/off	modbus fun code	ction	0	)			0:shaker	timer
FF	Se'			W.S		da	ta	data		1: shaker on	timer
		I		_ I		1	1		l l		CF

MOD_INCUBATOR_RUN_S TOP		incubator operation set		ion	nodbus fui code	nction	0	data		0 : incubator sto	
		360			W.S		data		1 : inc	1: incubator start	
MOD_SHAKER_RUN_STOP		incubator operation set		ion	nodbus fui code	nction	0	data		0: shaker stop 1: shaker start	
					W.S		data		1 . S	naker	Start
		modbus co		0			0~3	4 ~ 7	8	9	
								set temp	act temp	set rpm	act rpm
	system re	eport	R.I		addre		return data	10 ~11	12 ~ 13	14 ~ 15	16 ~ 17
			K	.1	SS			set time	remai n time	syst dum indi my cate	
	system		MSB	30	29	28	27	26	25	2	!4
			dumm y	dumm y	dumm y	dum my	usb_m ode	temp delay	auto tune	sk ov	er cur
MOD_SYS_R							0: report 1: slave	-			
EPORT					1	1		ı		1	
			23	22	21	20	19	18	17	16	
		4byt	rpm hold	temp hold	silent	ext otp	sk load warn	sk load	rpm devi	tem	p devi
	indicate	e									
					1	1		ı		1	1
			15	14	13	12	11	10	9		8
			auto run	mute	refrig	sens or	opt warn	door warn	otp		oor pen
						error					
		c	7					1 2	1	1	CD
			7 usb connec t	6 silent disp	5 sk pos er	4 lamp	3 timer	2 shaker	1 incubat or		SB ration
						on/o ff	on/off	op_fla g	op_flag	sy	s op

MOD_WARN_ACK	warn maccago cloar	modbus function code	0		data	1: message clear	
MOD_WARN_ACK	warn message clear	W.S	data	data		0: operation none	
MOD_SILENT_ACK	mute	modbus function code	0		data	1: beep stop	
	mute	W.S	data		uala	0: operation none	
MOD ALITO ACK	auto run ack	modbus function code	0		data	1: auto run clear	
MOD_AUTO_ACK	auto full dek	W.S	data			0: operation none	

# 9 Appendix

# 9.1 Technical Specifications

	MODEL	100 -100	166 -100	166 7000	166				
	MODEL	ISS-7100	ISS-7100R	ISS-7200	ISS-7200R				
	Range	Amb.+10~80℃	Amb20 (Min. +4)~80℃	Amb.+10~80℃	+4)~80°C				
Temperature	Accuracy	±0.1℃ in flask at 37℃							
remperature	Uniformity	±0.5°C in flask at 37°C							
	Refrigerator (Hp)	_	1/6Hp	-	1/6Hp				
	Sensor Type		Pt 1	00Ω					
	Motion		Or	bital					
	Amplitude Size (mm,	25	. <i>I</i> 1	5.0	0.8				
	dia.)	2,	.4	)(	7.0				
	Speed Range (RPM)	30 to		30 to					
Shaking	Accuracy	±1°	% of set speed (>1	00rpm) / ±1 (<100	rpm)				
Silaking	Timer			99 hr 59 min.					
	Max. Load (kg)	400 rpm (r	•	300 rpm (r	-				
			15kg)-Stacked	200 rpm (max.					
			20kg)-Stacked	150 rpm (max.					
	Driving System	DD(Direct		Motor and Triple Ca	am system				
	Internal	Stainless Steel							
	External	Steel, powder coating							
Material	Platform	Anodized aluminum plate, 5.0t							
Material	Insulation	EPDM rubber							
	Lid	Viewing window							
	Heater	Incoloy, Fin Type (400W X 2EA = 800W)							
		CLS(Custom Logical Safe)-control system							
Sa	fety Device	Electronic temperature limiter, Hydraulic over-temperature limiter							
		Temperature deviation alarm (High/Low)							
Commui	nication Interface	USB, RS232							
	efrigerant	_	R600a	-	R600a				
Refrige	erant Charge(g)	_	70	-	70				
	Volume (L)		1	98					
	Platform (W×D) (mm)	755×520							
	Internal (W×D×H)	900 v (2/ v 202							
	(mm)	809 × 624 × 393							
Dimension	Overall $(W \times D \times H)$	1307 x 996 × 755(1unit)							
	(mm)	$1307 \times 996 \times 1355(1$ unit + Stand-I or 2units stacked)							
		1307	7 x 996 × 1655(2ı	units + Stand-II sta	cked)				
				955(3units stacked)					
	Net Weight (Kg)	300	320	300	320				
	c requirements	3.7	5.6	3.7	5.6				
	30 V~, 50/60 Hz, A)	5.1	J.0	٠,,١	J.U				
	c requirements 5V~, 60Hz, A)	7.1	-	7.1	-				

### 9.2 How to use High/Low Temp. Limit

As the standard (the temperature of NTC sensor), Circuit switch is off when out of limit of High/Low temperature.

Basic display: showing allowed High temp (H), allowed Low temp (L).

H:112 ℃

T:0 ℃

Checking current temperature by Up/Down.

Actual PV: XX

Stand by over 10sec or, back to basic display by SET button.

Status indicator color changes from Green to Orange when current temp is out of allowed temp range.

And if this status (out of allowed temp) keep going >

- 1) Indicator color is changed to Red.
- 2) Protect HIGH.T(High temp)/LTP(Low temp) shows up.
- 3) Thermostat connect to temp limiter will be off.

After checking the matters, back to basic display by Up/Down and SET button simultaneously.

It is available to set the range of limit (H/L temp) in Parameter setting display (press SET button over 2sec in Basic display)

LOW. T  $\langle - \rangle$  HIGH T.  $\langle - \rangle$  Unit

Checking parameter value by SET button and set the value by Up/Down.

High Limit : −10 ~ High Limit (C')

Low Limit: Low Limit ~ 120 (C')

Stand by over 5 sec or, back to basic display by SET button.

Revise the temperature as below, when current temperature is not matched with displaying temperature.

Turn off first,

Press Set button, Up/Down button at the same time and then turn on.

After pressing Set button, Up/Down button for 4sec, all set will be initialized and OFFSET will be showed up.

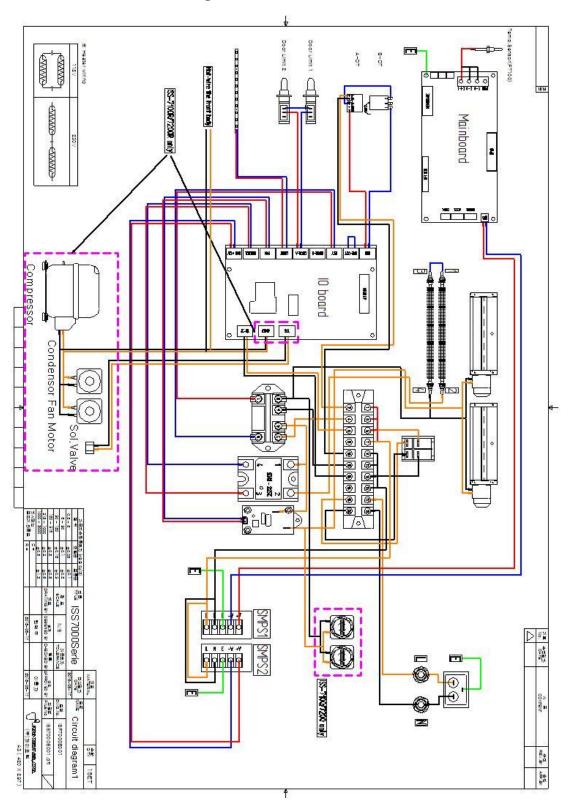
And press SET button to set OFFSET value.

Adjust OFFSET value ( $-10\sim10$  'C) by Up/Down button, and press SET to save.

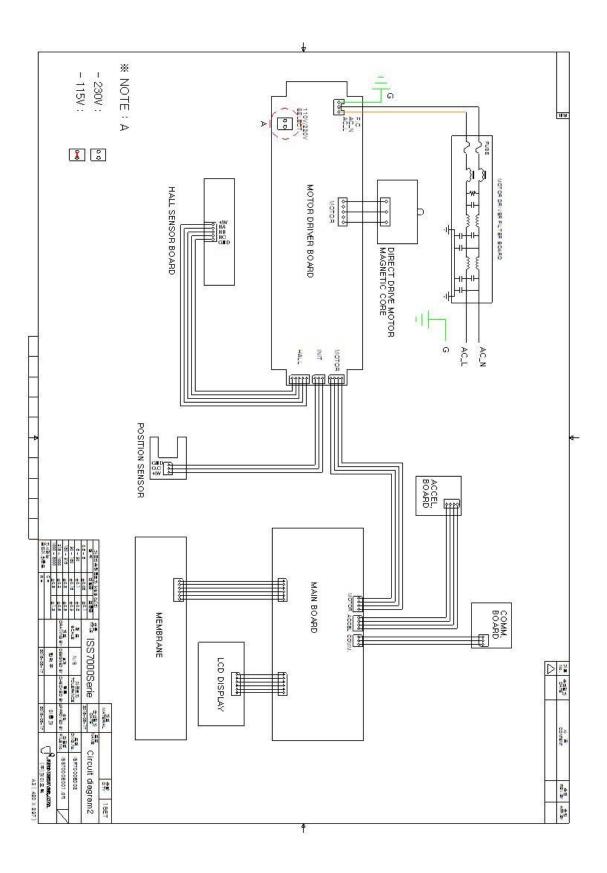
Check the revised OFFSET (saved) value after reset.

# 9.3 Circuit Diagrams

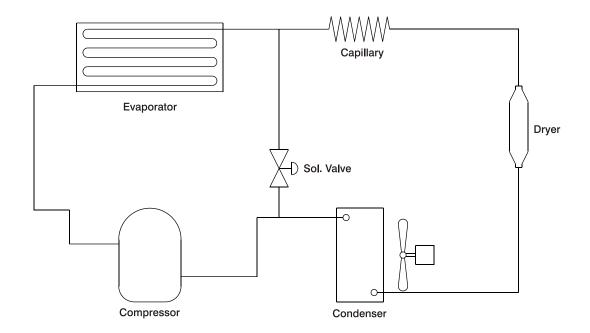
### 9.3.1 Incubator circuit diagram



### 9.3.2 Shaker circuit diagram



# 9.3.3 Internal Refrigeration connection system (ISS-7100R/ISS-7200R)



### 9.4 Disposing of products

Before you dispose product or the 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.

# **A CAUTION**



- The refrigerant used in the unit is explosive and pressurized, and can cause serious injury if it comes into contact with the eyes or skin.
- On-site, only the entire cooling machine can be replaced. The cooling machine is a permanently technically sealed system in line with EN 1127-1.
- If substances hazardous to the environment (refrigerant, for example)
  accidentally enter the environment, take suitable measures immediately.
- Dispose of the unit in accordance with the regional regulations for electrical and electronic units.

### 9.5 Warranty

#### 9.5.1 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

#### 9.5.2 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: <u>overseas@JeioTech.com</u>

### 9.5.3 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.

- The contents of this manual can be changed without prior notice to improve product performance and deliver accurate information.
- The copyright of this manual belongs to JEIOTECH.