Operation Manual

Mini Incubator

Model : IM-10

Manual No. :24311L002 Version :2.0

JEIOtech

Table of Contents

1 Safety Advice

1.1 Operation Manual

This manual contains important safety and operation information. You must carefully read, understand, and follow all the instructions in this manual prior to operating this unit. Keep this manual in a safe place nearby for reference and make it easily available to all users.

1.2 Danger/Caution/Notice Alerts

This manual highlights **Danger/Caution/Notice** alerts to prevent injuries or property damages and also to achieve optimum performance. Ensure to read the danger alerts and caution alerts in 1.3 and 1.4 carefully before use.

These alerts are classified into three types in this manual depending on the importance and the risk levels as described below:

Symbols	Meaning
⚠ DANGER	Ignoring this danger alert can cause serious injury or even fatal accident.
⚠ CAUTION	Ignoring this caution alert can cause injury or property damage.
NOTICE	Ignoring this notice can cause operational problems.

1.3 Danger Alerts

⚠ DANGER
Ignoring the following warnings could cause serious injuries or even fatal accidents.

◆ **Check the required electrical requirements on the ID plate of this equipment before use.**

- **Connect this equipment to a dedicated power outlet nearby.**
- **Make sure to connect this equipment only to properly grounded power outlets to protect you and your instrument. Do not ground to gas pipes or water pipes.**
- **Make sure to use the power cord supplied with this unit. (200~250VAC/15A)**
- **Never install or use this equipment in explosive or flammable atmospheres.**
- **Never use or store flammable or hazardous substances near to this unit.**
- **Never use the equipment to heat flammable, explosive or hazardous substances.**
- **Never expose this equipment to any heat sources including direct sunlight.**
- **Never allow water, organic solvents, dust, or corrosive gases to get inside the equipment**
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- **Never put or insert any objects (especially if conductive or flammable) inside this unit.**
- **If you observe a strange smoke, odor or noise from the equipment, unplug the power cord immediately and turn off the main power switch. After the smoke or odor disappears, contact your dealer or Jeio Tech if any repair is required.**
- **Never disassemble, repair, or modify this equipment on your own. Doing so will void your warranty and may result in injuries or product damages.**
- **Never move this equipment while under operation.**
- **Always wear proper protective gear (such as goggles, gloves, masks or an apron) when using this unit.**

1.4 Caution Alerts

⚠ CAUTION
Ignoring the following cautions could cause injuries or property damages.

- **Do not place heavy objects, including this equipment, on top of the power cord and do not strip, scratch, bend, twist, pull, or heat the power cord. A damaged power cord is a fire and electrical shock hazard.**

- **Make sure to set up this equipment on a flat, stable, clean, non-slip, dry, and fireproof surface inside a lab with proper safety measures.**

- **Do not place any device which can be affected by the motor vibrations near this unit.**

- **Do not touch the power outlet, power socket, or power cord with wet hands. And make sure to connect the power cord directly and firmly to the power outlet and power socket.**

- **Beware that mechanical shock or vibration can damage this equipment and pay extra attention while moving it. Damages caused by mechanical shock or vibration may result in injury or fire.**

- **Do not install this equipment near any device that generates high frequency noise such as high frequency welding machines, high frequency sewing machines, or SCR power controllers.**

- **Before cleaning, make sure to unplug the power cord to avoid electric shock or fire.**

- **Do not use chlorine bleach, ammonia-based cleaners, abrasives, ammonia, or metal scouring pads. Wipe with a soft damped cloth or a sponge soaked in water or diluted neutral detergent.**

2 General Description

2.1 Product Introduction

This Mini Incubator can be use biotechnology, Chemistry, Pharmacy, Biology, etc.

This product functions suitable to use the following purposes;

- Solid microbial culture and growth experiments
- Enzyme experiments
- Serum experiments
- Incubation experiments
- Quality control of food processing
- Seed Germination

Maximum 8 microplates can be inserted to inner chamber for efficiently ELISA.

2.2 Key Features

2.2.1 Superior performance

- Microprocessor PID Feedback Control
  Fast and precise temperature control is provided by the microprocessor PID controller.

- OFFSET functions
  In case you need to use your own thermometer for temperature control for specific applications, there can be some differences between the temperature of your thermometer and the displayed temperature of this unit. If needed, you can offset such temperature differences ranging to ±50℃ by 0.1℃ interval.

2.2.2 Convenience

- Compact design for efficient lab space utilization by eliminating conventional bottle holder carousel

- Ease-of-operation enabled by a vivid and colorful VFD (vacuum fluorescent display), four touch-sensitive buttons, and a jog dial

- Transparent polycarbonate window providing a clear view of the chamber interior

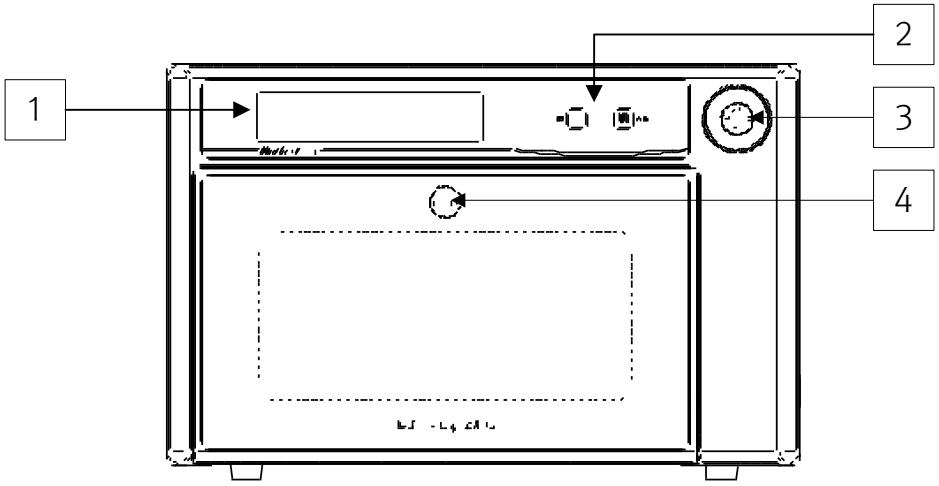
- Standard offer 2 height-adjustable wire shelves

2.2.3 Safety

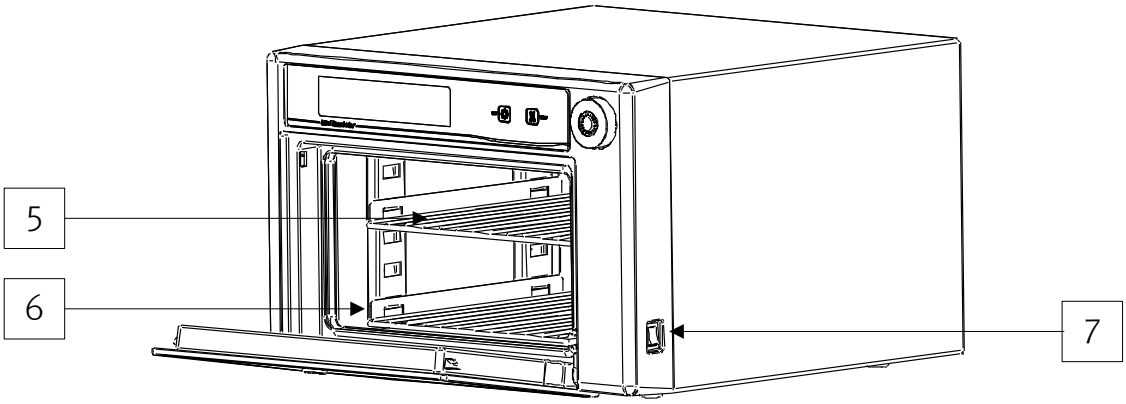
- Overheating prevent device
  Protection of the control panel and heater against overheating by automatic power cutoff together with visual alarms

- Door alarm
  1st : when the door is open, the warning lamp is flickering
  2nd : when the door is open for more than 15 sec, the audible alarm is operating.

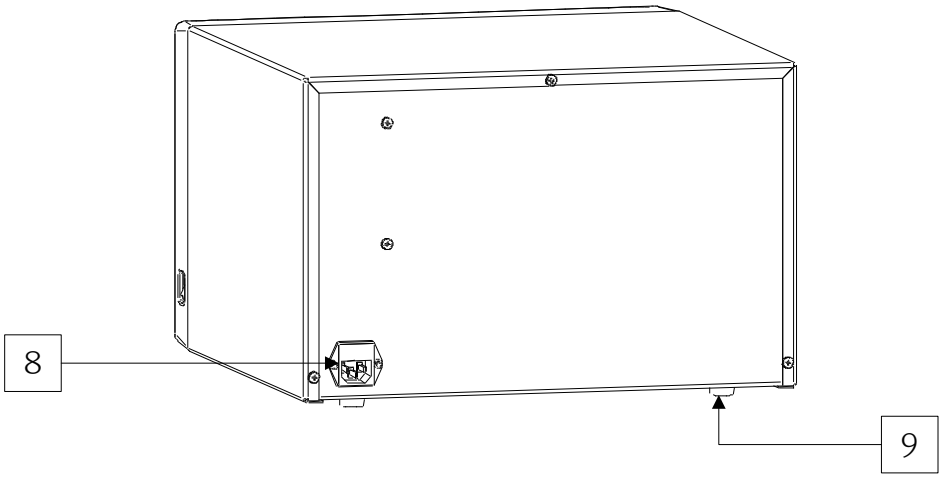
2.3 Construction



(1) **VFD Control Panel**
(2) **Touch-sensitive Buttons**
(3) **Jog Dial**
(4) **Push Button**
(5) **Non-slip Pad**



(6) **Wire Shelves : user can set maximim 4 shelves.**
(7) **Shelve hanger bracket.**
(8) **Power switch**



(9) **Socket**

(10) **Foot**

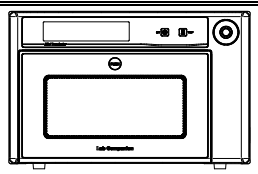
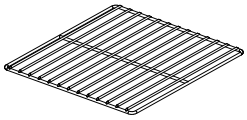
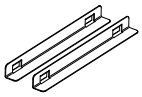
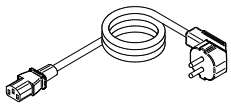
3 Installation

3.1 Checking Shipment Damage and Unpacking

Upon receiving the equipment, check to ensure that no damage has occurred during shipment. It is important that any damage that occurred during shipment must be detected before unpacking. If you find such damage, notify the carrier immediately.

3.2 Checking the Contents of the Package

After unpacking, check to ensure that all the following items are included in the package. If not, contact your dealer or Jeio Tech immediately.

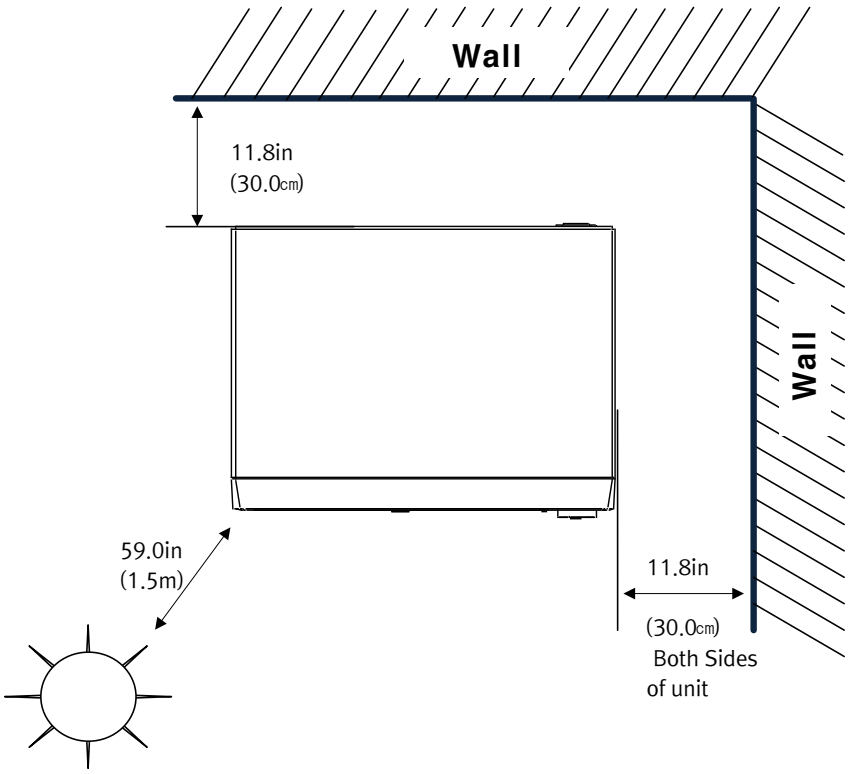
Item	Figure	Quantity	Description
Main Body		1	-
Wire shelf		2	-
Bracket for a shelf		4	-
Power Cord		1	-
User manual		1	-

3.3 Where to Install

Before installing the unit, make sure to observe the following danger alerts for your safety.

⚠ DANGER

- Never install or use this equipment in explosive atmospheres.
- Never install or use this equipment near to hazardous or flammable substances.
- Never install this equipment closer than 30 cm (12 inches) to a wall.
- Observe the minimum distances of 1.5 m from any heat sources.
- Never expose this equipment to direct sunlight.
- Never install this equipment near any device that generates high frequency noises.



3.4 Operating Conditions

This equipment is designed for indoor use in laboratory environments and to be operated only by properly trained staff knowledgeable in safe laboratory practices.

The operating conditions for this equipment are as follows:

Permissible Ambient Temperature	5 to 30℃ (41 to 86°F)
Permissible Relative Humidity	10 to 80%
Permissible Altitude	0 to 2,000 m (6,562 ft)

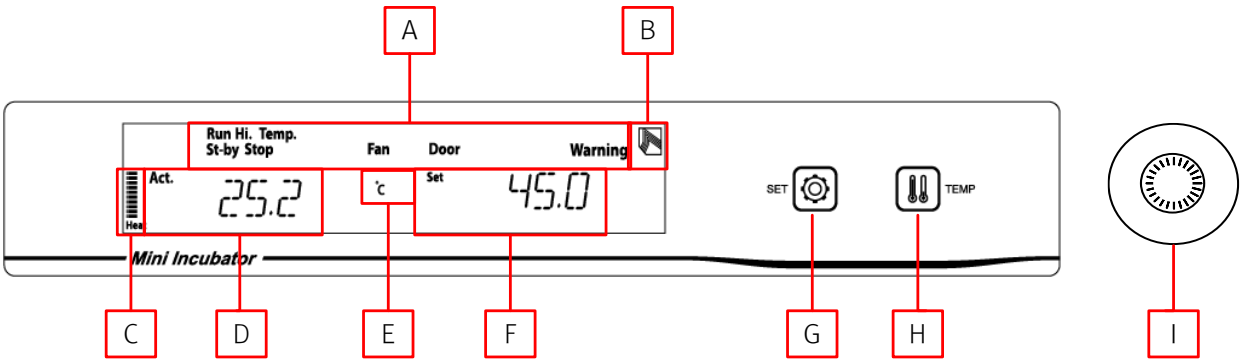
3.5 Required Checking before Operation

⚠ DANGER

- Check whether the unit is installed on a flat, stable, clean, non-slip, dry, and fireproof surface inside a lab with proper safety measures.
- Check whether the equipment is level and fixed properly by the rubber feet.
- Check whether the minimum distances (30 cm or 12 inches) from other devices are observed.
- Check whether any device which can be affected by the motor vibrations is placed near this unit.
- Check whether any flammable, explosive or hazardous substances are inside the equipment.
- Check whether all the power cords are firmly connected.

Operation

4.1 Control Panel



VFD (Vacuum Fluorescent Display)

The vivid and colorful VFD allows you to monitor the following operational information:

A	**Run**	indicates active operation
	Hi. Temp.	indicates overheated condition due to malfunction
	St-by	indicates stand-by mode
	Stop	indicates stopped operation
	Fan	indicates fan activation
	Door	indicates opened door
	Warning	indicates alarm activation
B	**Lab companion**	logo
C	**Heat**	indicates heater activation
D	**Act.**	indicates actual (current) value
E	**℃**	indicates temperature unit
F	**Set**	indicates set value

Touch-sensitive Buttons

Note that the colors of these buttons can be changed between orange and green. If the buttons illuminate in orange color, it indicates that the functions related to the buttons are activated.

When the buttons illuminate in green color, you can change the related settings or monitor the related operational status using these buttons.

G	**SET**	allows you to set various settings
H	**TEMP**	allows you to turn the temperature control function on or off

Jog Dial

I	**Jog Dial**	allows you to start/stop the operation, to select desired temperature or rocking speed, to select desired functions, to set the timer, etc.

4.2 Operation

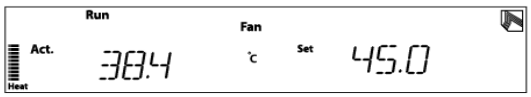
4.2.1 How to operate

Step 1 : Power ON, the button is located product right side of bottom.

Step 2 : Press TEMP button, set the temperature value. (refer 4.2.2 input temperature value)

Step 3 : When you press jog dial, the product is starting to move set temperature.

[Product operation]

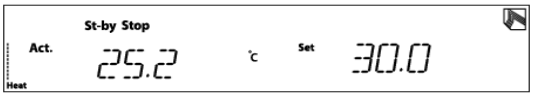


⚠ CAUTION

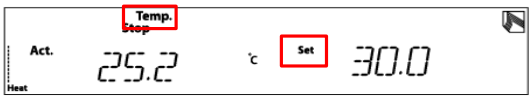
- Touching this equipment carelessly, during operation or even after power cutoff, can cause burns.

4.2.2 Input the setting temperature

You can change temperature value use of TEMP button during the product operating.

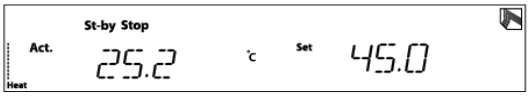


Step 1 : Press TEMP button.



TEMP. SET lamp is flicking.

Step 2 : Change set temperature by jog dial. And press jog dial to save set temperature.

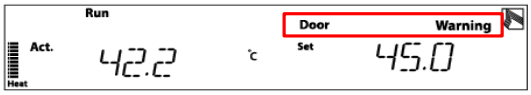


4.2.3 Pause and re-operation

If user decide the product need pause, just open the product door. And when the product door is closed, the product is operating again.

But the door is open for more than 15 sec, the audible alarm is operating.

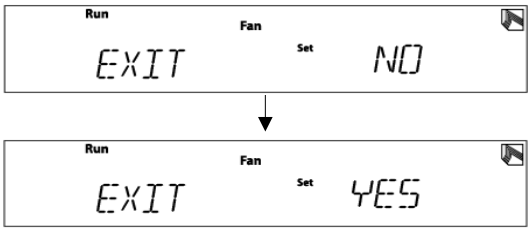
[Pause during the operating]



4.2.4 Operating stop

During the operating, user decides the product need to stop. Press jog dial and turning dial from "EXIT NO → EXIT YES" after then press dial, again

[Product operation stop]



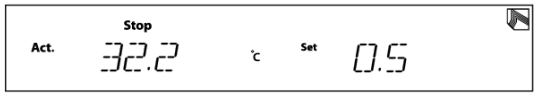
4.3 Temperature Offsetting (Calibration)

The displayed temperature of this equipment can be different from the temperature measured by your own thermometer which you want to use as standards. In such cases, you can offset such temperature differences as follows:

1) Press the **SET Button** under simple mode.

2) Turn the **Jog Dial** to select '**OFFST**' (offsetting).

3) Press the **Jog Dial** again and select the temperature offsetting value by turning it:



[Note that the offsetting value range is ±50℃ at 0.1℃ increments.]

4) Press the **Jog Dial** again to save the desired temperature offsetting value.

5) Press the **SET Button** to finish the temperature offsetting.

NOTICE

- The temperature offsetting value is calculated by subtracting the displayed temperature from the temperature of your own thermometer.
- Pressing the **SET Button** during temperature offsetting procedures allows you to return to the previous step.

5 Maintenace

5.1 Cleaning

⚠WARNING

- Never immerse this equipment in water or any other liquid.
- Do not allow any liquid or wet material to get inside the unit when cleaning.
- Do not reconnect this equipment to power outlets until all cleaned surfaces have dried.

⚠CAUTION

- Do not use chlorine bleach, ammonia-based cleaners, abrasives, ammonia, or metal scouring pads when cleaning.

Always make sure to keep the equipment and accessories clean. Dirt and other foreign substances can cause fire or electric shock. Before attempting cleaning,

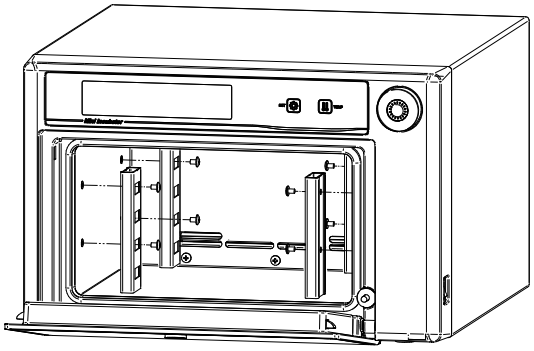
(1) disconnect the power cord from the power outlet and ensure that the equipment is cool enough,

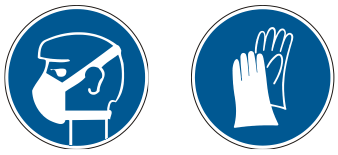
(2) wipe with a soft dry cloth first to remove any foreign matter and, if not enough,

(3) wipe with a soft damp cloth or a sponge soaked in water or diluted neutral detergent when necessary.

Note also that cleaning is made much easier if spills are attended to promptly.

[Shelf level adjuster decomposition method]
The shelf level adjuster can be disassembled like follow pictures;





Step 1 : Take out cord from power supply and Cut off power.
Step 2 : Remove the screw which is located internal top and bottom use of screw driver.
Step 3 : Remove Shelf level adjuster

5.2 Relocation

If you need to move the equipment to another place,

(1) disconnect the power cord from the power outlet,

(2) pack the equipment and its accessories into the original packaging or any other suitable container before moving

⚠ CAUTION
Pay attention to avoid mechanical shock or vibration while moving the equipment. Damages caused by mechanical shock or vibration may result in injury or fire.

5.3 Storage

If you know you will not use this equipment for an extended period of time,

(1) disconnect the power cord from the power outlet and

(2) clean the equipment with soft cloth.

(3) pack the equipment properly and make sure to store it in dry place.

6 Troubleshooting

6.1 Power Troubles

Problem	Cause	Corrective Action
No power	Unsuitable power supply	Meet the electrical requirements of this equipment before use.
	Power cutoff by a circuit breaker or power blackout	Find out why blackout or cutoff happened and restore power. If there is a short circuit or leakage, trace the source of the problem and fix it.
	Loose power connection	Reconnect the power cord firmly to the power outlet as well as to the power socket at the back of the equipment.
	Damages in power cords, power outlets, plugs, or power switches	Replace the damaged part with a proper one.
	Internal circuit failure	Contact Jeio Tech for service.
Repetitive tripping of the circuit breaker	Electrical overload	Disconnect all the appliances connected to the breaker first and reconnect them one by one to find the reason for the overload.
	Wet power cords, power outlets, or plugs	Dry the wet parts thoroughly and reconnect them. .
	Damages in power cords, power outlets, plugs, or power switches	Replace the damaged part with a proper one.
	Internal circuit failure	Contact Jeio Tech for service.

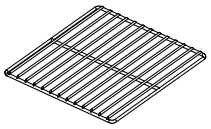
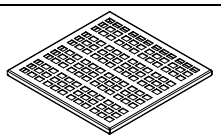
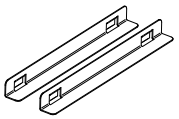
Display malfunction with power on	No illumination on the power switch LED	Check whether power blackout or cutoff happened and restore power, if possible.
	Loose power connection	Reconnect the power cord firmly to the power outlet as well as to the power socket at the back of the equipment.
	Internal circuit failure	Contact Jeio Tech for service.
No operation with power on	Power cutoff by built-in overheat prevention circuit	If the equipment is overheated, the built-in overheat prevention circuit stops heating to protect the equipment. In such cases, let the equipment cool down for some time before power reconnection.
	Internal circuit failure	Contact Jeio Tech for service.
Unexpected termination of operation	Strong noise nearby	Check whether any device is generating strong noise. If so, relocate either this equipment or the device. .

6.2 Malfunctions during Operation

Problem	Cause	Corrective Action
Jog dial manfunction	Damaged jog dial	Contact Jeio Tech for service.
VFD display manfunction	Internal circuit failure	Contact Jeio Tech for service.
Temperature control failure	Damaged temperature sensor, fan, bimetal sensor, or heater	Contact Jeio Tech for service.
Button malfunction	Damaged button	Contact Jeio Tech for service.

Temperature overshoot	Lack of water in the water tray	Add water to the water tray.
No temperature increase	Damaged fan, heater, or door alarm switch	Contact Jeio Tech for service.

7 Accessories

Component	Figure	Description	Cat. No.
Wire shelf (W x D x H , mm)		427 x 427 x 7, Stainless steel	EDA8244
Perforated shelf (W x D x H , mm)		427 x 427 x 12, Stainless steel	AAA24511
Bracket for a shelf (W x D x H , mm)		230 x 18 x 20, Stainless steel	–

8 Appendix

8.1 Technical Specifications

Item / Model		Mini Incubator / IM-10
Temp.	range (℃/℉)	Amb.+5 to 65/+9 to 149
	Fluctuation at 37℃ (±℃/℉)	0.5/0.9
	Variation at 37℃ (±℃/℉)	0.5/0.9
	Heating time to 37℃ (min)	5
	Recovery time at 37℃ (min)	< 2 minutes after door opening of 30sec.
	Heater output, max. (W)	200
	Controller	PID feedback control
Chamber volume(L/cu ft)		10/0.4
Safety device		Over current protection, Over temp. protection
System warning		Door open, Over temp.
Control panel		VFD(Vacuum Fluorescent Display), 2 Touch key, Jog dial
Material		Polycarbonate, ABS, Powder coated Steel, Stainless Steel
Weight (kg/lbs)		12.8/28.2
Dimension (W x D x H)	Overall (mm/inch)	400 x 410 x 264 / 15.7 x 16.1 x 10.4
	Chamber inner (mm/inch)	278 x 262 x 160 / 11 x 10.4x 6.3
Electrical requirements (230V/50/60 Hz, A)		1.0
Electrical requirements (120V/50/60 Hz, A)		2.1
Electrical requirements (120V/50/60 Hz, A)		1.9
Permissible ambient temperature (℃)		5 to 30
Permissible relative humidity (%)		80
Permissible Altitude (m)		2000

※ Unless otherwise specified, the above-mentioned data represent values at 25℃ and 60% RH.

※ Permissible environmental conditions: 5 to 40℃, maximum 80% RH.

※ Jeio Tech reserves the right to make changes in design and specifications without prior notice.

8.2 Equipment Disposal

Disposing of this equipment must be done in an environmentally responsible way if it has been potentially exposed to bio-agents or radioactive samples. Failure to follow stringent requirements for equipment disposal may lead to actions against you and your organization.

(1) First, check with your laboratory or organization to ensure that you are following all the policies and procedures for disposal of laboratory equipments.

(2) If not possible, contact your local governing body for regulations regarding disposal of laboratory equipments. Jeio Tech highly recommends you to find a local service provider that can properly dispose of your instrument.

8.3 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.