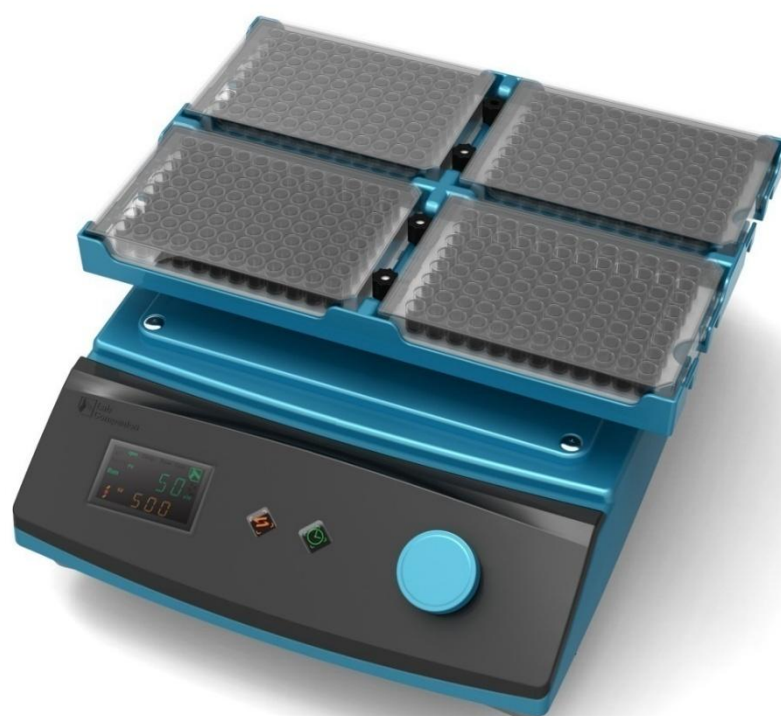




Operation Manual

Microplate Shaker

Model : CPS-350
Manual No.3C115L002 Version : 2.1



WARNING

Please read this user manual carefully before using the product. Users should operate the product according to the operating instructions contained in this user manual. Users should be aware of cautions and warnings for your safety. Failure to follow these guidelines may result in serious injury or damage to your property.

Thank you for purchasing JEIOTECH's products.

JEIOTECH Co., Ltd. is committed to offer the customer service including product sales, Technical service, and follow-up management. If you have any question about this user manual, please contact our sales department.

Quality Management System ISO 9001



ISO 9001 is a standard that defines the requirements for a Quality Management System (QMS). It ensures the suitability of implementation in order for suppliers to continuously provide products and services that meet the buyer's requirements. JEIOTECH Co., Ltd. obtained ISO 9001 certification from *Korean Foundation for Quality (KFQ)* since 1998 to provide better service. Under this certification system, we design, develop, produce and sell a wide range of products related to chemical engineering, environment and life. We also provide reliability testing equipment for electrical and electronic engineering. (Dryer, incubator, constant temperature and humidity chamber, constant temperature water tank, low temperature circulation tank, heat exchanger, stirrer, etc.)

You can download the above image by visiting the following JEIOTECH site.

<http://www.jeitech.com>

Disclaimer

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1.0 Safety

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 instrument. Keep this manual in a safe place nearby for reference and make it easily available to all users.

1.2 WARNING/CAUTION/NOTICE Alerts

This manual highlights WARNING/CAUTION/NOTICE alerts to prevent injury or property damage and also to achieve optimum performance of your instrument.

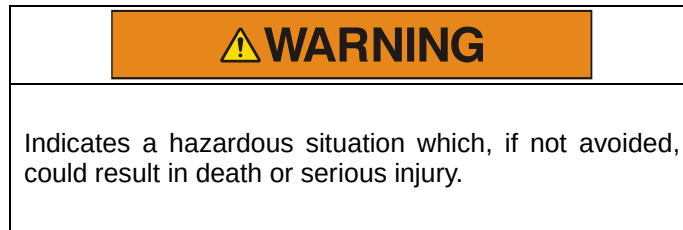
These alerts are classified into three types in this manual depending on the importance and the risk levels as described below:

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

1.3 Exemption for responsibility

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

1.4 Warning statement



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

Power supply must be properly grounded.

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

Please use correct and provided power code

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

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

Explosive materials: Acid, Esther, Nitro compound

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

Please check equipment Permissible environmental condition when you use inside of Temp. & Humid. Chamber or Incubator.

It can be cause fire or trouble by Shaker electricity, electronic, and damage of motor.

Shaker Permissible environmental condition

: Temperature 2°C to 60°C, Maximum relative humidity 80%.

Wear your personal protective equipment in accordance with the hazard category of the medium to be processed.

: Splashing liquids, projectile parts, body parts, hair, clothing and jeweler getting caught.

Unplug, when there is strange sound, smell and smoke from the product.

Please stop operating and request the service.

Keep out of the direct sunlight.

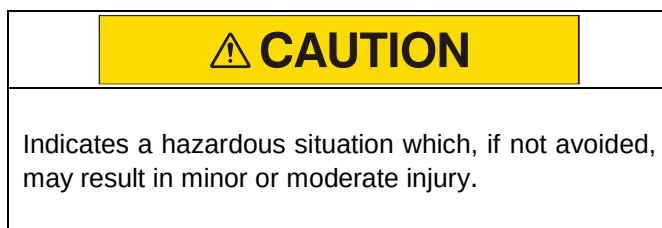
It may influence that product life and operation properly.

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

Do not assemble, repair, modify on your own.

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

1.5 Caution statement



Do not put heavy things on the power line. Do not put the machine on the line.

It may take off the wire coating and causes the electric shock or fire.

Do not touch it with wet hands and put the main plug correctly.

It may cause the electric shock or injuries.

Installation power outlet near instrument and may be convenient.

Do not install the shaker neat machinery generating high frequency noise.

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

Do not inject any liquid and inflammable things inside of product.

Do not pure water or put liquid on the top of the product when cleaning.

Please intercept the main power immediately and request the service when water may be in the product.

Do not let the product take any strong shock or vibration.

It causes abnormal operation or trouble. It may deteriorate the ability of the product and not obtain correct results.

Do not sprinkle insecticide or flammable spray on the product. Use smooth cloths.

Cleaning with solvent can cause fire and deformity.

Please power off while product cleaning.

It may cause the electric shock or fire.

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

Do not let the product take shock and fall down product.

It will be caused by wrong operating and malfunction

2.0 Functional Description

2.1 Introductions

CPS-350 can be operating large amount of sample (4 Microplates in same time). And the shaker is designed for conveniences and safety of the experiment.

2.2 Feature

- **Outstanding Performance**

- (1) Rotation diameter 3mm, 150 ~ 1,200 rpm rotational speed with stable rotation speed can be selected to user suitable purpose.
- (2) The shaker is designed to operate high temp.(~ 60°C) and suitable to use in Hybridization reaction.
- (3) Low profile design, silicon pads, and rubber feet are minimizing noise and vibration to safety of the experiment. During the high mixing sample, the shaker is not be easily slide.

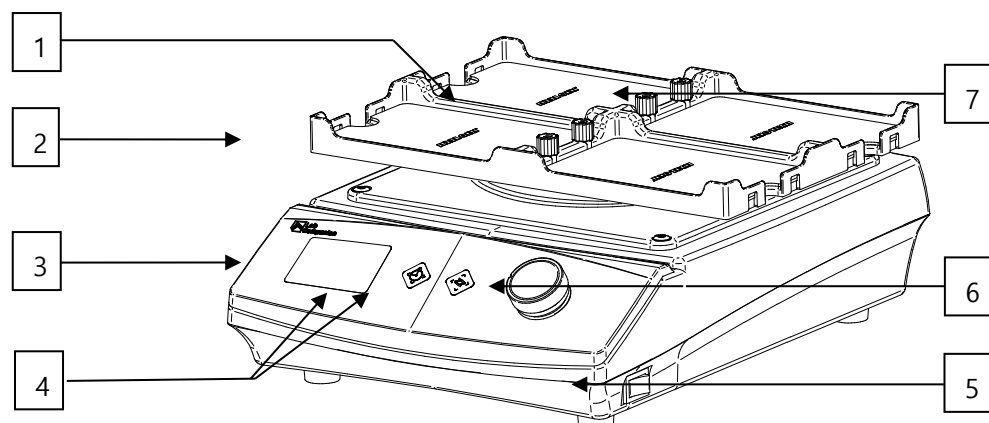
- **Ease of Use**

- (1) The controller display adopts VFD (Vacuum Fluorescent Display). It is easy to indicate shaker set up and operating condition.
- (2) User can do conveniently timer setting. (1 min to 99 hour 59 min) Also, the timer can be check remaining time.
- (3) Possible to use 1.5ml Micro-tube, 15ml, 50ml Conical tube.

- **Safety product**

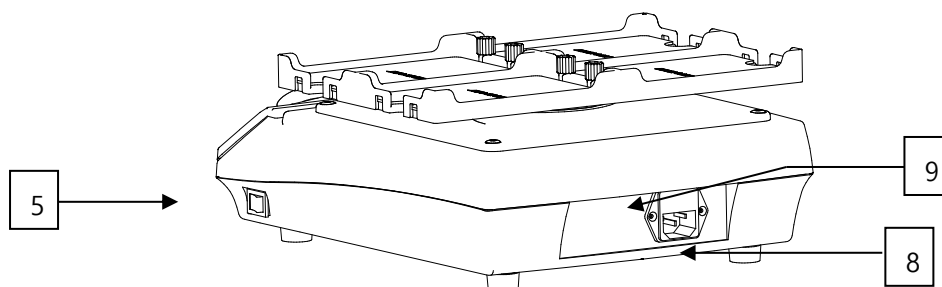
- (1) Smooth Starting function to protect the split out of sample.
- (2) The structure can be minimized some liquid passes through into the product. So the shaker can be protecting user from electrical hazards, fire or explosion.
- (3) During overload situation, the build in safety device can be show overload sign, alarm, and stop operating. After power re-play, the product will operating.
- (4) Use of BLDC motor provides low noise and strong durability.

2.3 Construction



[CPS -350]

- (1) Silicon Pad : to protect sliding of glassy flask.
- (2) Plate Tray : to be placed Microplate, Adapter (Accs. Refer: P19).
- (3) VFD panel & Controller : The panel indicates product setting and control condition.
- (4) Touch Button : to choose RPM or TIMER individually, operating by orange and green LED lamp.
- (5) Power switch : It is the main ON/OFF switch and supplying power of the product.
- (6) Dial Button : to set a shaking speed / timer and start / stop.
- (7) Fixing Rubber : to be placed Microplate on the plate.
- (8) Foot : to prevent from slippery and support main body
- (9) Socket : Connect the power cable on the socket.



3.0 Installations and Caution

3.1 Unpacking the package and Inspecting damage during transportations

- (1) Check to see that the unit is not damaged before unpacking.
- (2) Unpack the unit carefully.
- (3) Inspect to see that the unit is not damaged during transportations.

3.2 Checking the unit components

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

BASIC COMPONENT	QUANTITY / RECEIVED	DESCRIPTION
Body	1/OK	-
Operating Manual	1/OK	-
Power cord	1/OK	-

3.3 Installation

3.3.1 Installing environment

- Temperature: 2°C ~ 60°C
- Relative Humidity: RH 10% ~ 80%
- Maximum attitude: up to 2,000 m

3.3.2 Location conditions

Place the unit table as far as possible when in use, and keep suitable distance not to be placed from other instruments.

WARNING

The unit should be located away from naked flame sources, direct sunlight. It can come with the malfunction or lower the function.

CAUTION

Do not place the unit nearby the other laboratory equipments which can be readily influenced, even by weak motor vibration

3.3.3 Connecting to the mains power supply

Connect the electric power to the unit according to the following process

STEP 1: Switch off the main switch before connecting AC power cable.

STEP 2: Connect the power cable on the socket located on the back side of the unit

WARNING

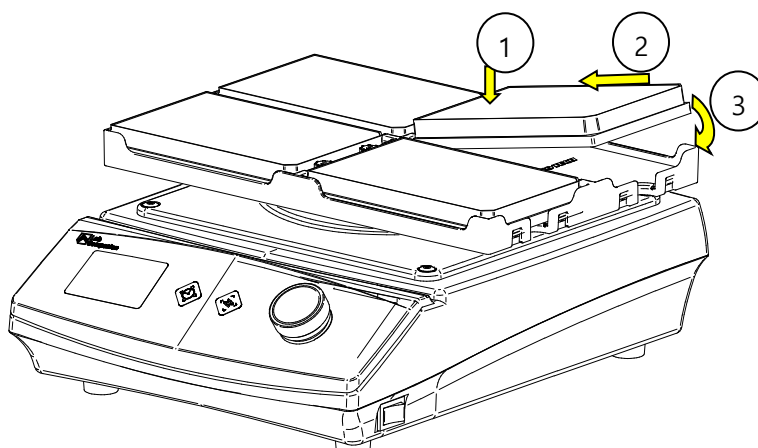
Please check the Voltage, Phase, Volume of power and connect properly.

You must use power that has grounding.

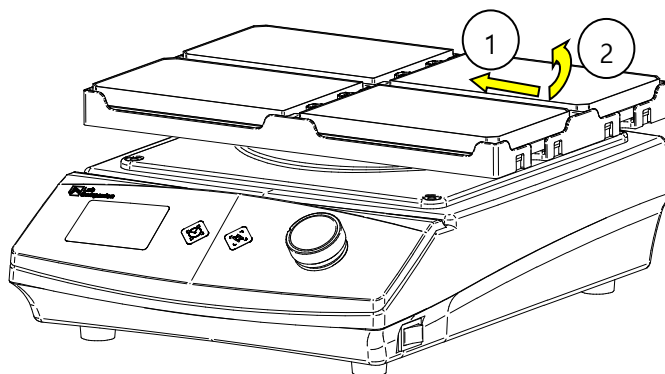
Cable could be damaged by overcurrent and it may cause fire. So, do not use a branch socket or double taps.

3.3.4 Plate installation

Slide and insert Microplate to the direction of the fixing rubber as below. Operate after inserting four Microplates for balancing. If you insert two Microplates, install them diagonally.

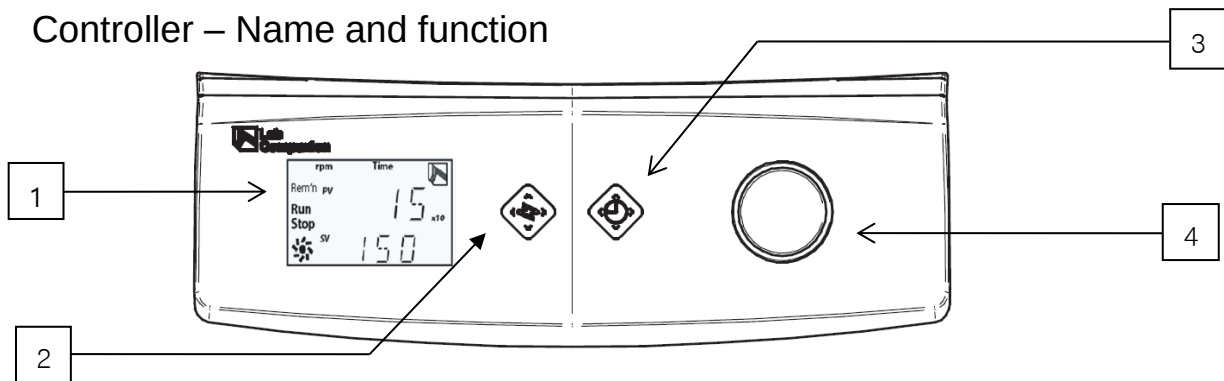


Likewise, when you remove the plate, push the outside home of the plate tray to the direction of the fixing rubber and lift it and remove it.



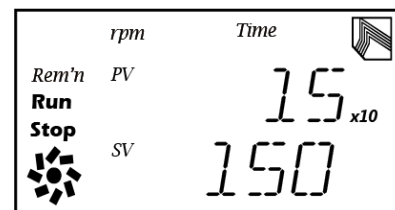
4.0 Operation

4.1 Controller – Name and function



(1) VFD (Vacuum Fluorescent Display): Check out status of unit through VFD display.

- A. rpm: Just indication below PV and SV show RPM.
- B. Time: Run time or Indicating Timer mode
- C. PV: Current RPM
- D. SV: Setting RPM
- E. Run: It indicates the unit works
- F. Stop: It indicates the unit stops
- G. Rem'n: It shows remaining time during Timer mode operation



(2) RPM button : It indicates that the unit works. RPM can be verified during Timer mode operation.



It is Touch Sensitive Capacitive Button. So, when you just touch the button with your hand, it senses the touch. During normal mode operation, the orange light is on and during timer mode operation, the green light is on. When you push the green button, you can check the operating rpm

(3) TIME button : Timer and Run time can be verified.

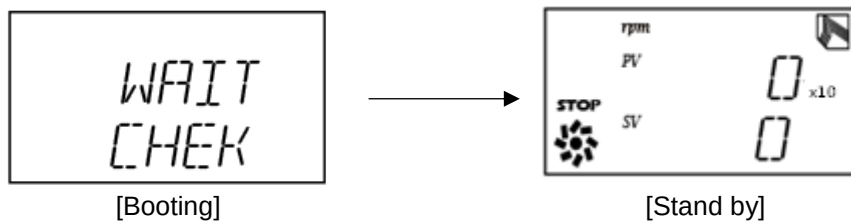


It is Touch Sensitive Capacitive Button. So, when you just touch the button with your hand, it senses the touch. During timer mode operation, the orange light is on. During operation, if you push it, you can check how long it has operated and during stop, if you push it, you can set timer.

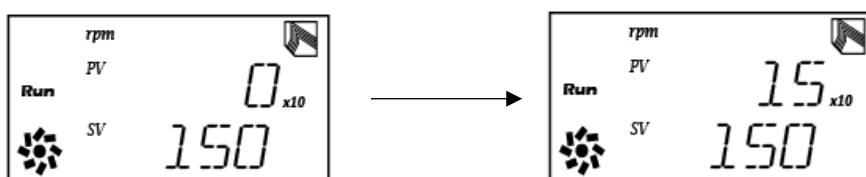
(4) Dial knob : RPM setting, Input time, or stop the unit When you set timer, time and rpm are entered.

4.2 Start and stop

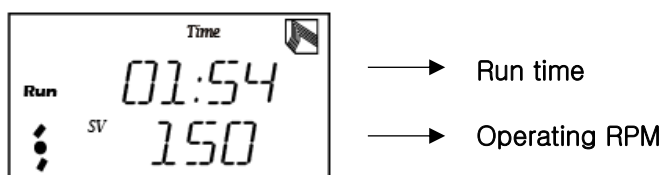
- (1) Turn on the switch at the right bottom of the unit.



- (2) Dial the knob and set the desired RPM. The real speed is the number x 10 rpm on the display. The operating speed can be set from 150rpm by 10 rpm as one unit



- (3) Run time can be verified during shaking if you press  button.



Display returns to previous display about after 10 seconds.

- (4) You can stop the unit if you set SV to 0 or press the dial knob.

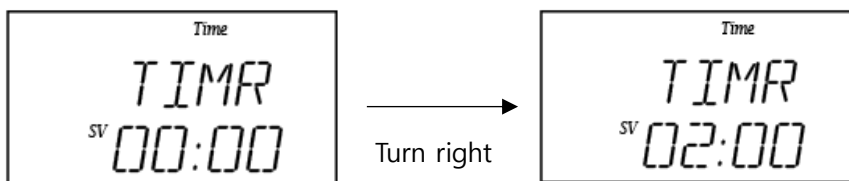
4.3 Timer function

4.3.1 How to set Timer

- (1) Press  Timer button when the unit stops.

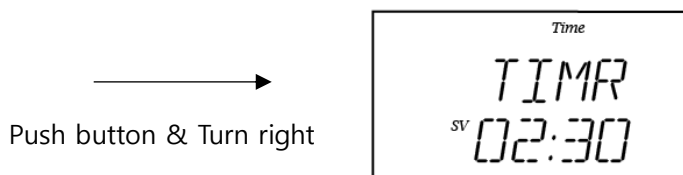


- (2) Time input display shows when you press the dial knob.
STEP 1: Input hour by rotating the dial knob to right or left direction.



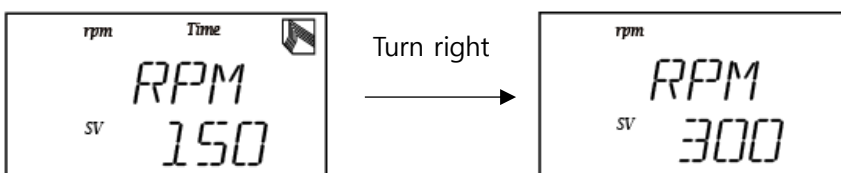
STEP 2: Press the dial knob 1 time.

STEP 3: Input minute by rotating the dial knob to right or left direction.



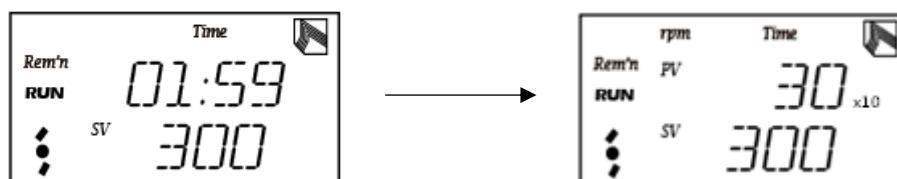
STEP 4: Press the dial knob 1 time.
Display moves to next mode (RPM setting).

- (3) Input RPM by dialing the knob.



Press dial knob 1 time to save set value and unit starts shaking. Remaining time and set value (RPM) shows on display

- (4) During operation You can check RPM by pressing  RPM button.



Display returns to previous display in 10 sec.

- (5) Shaking stops and alarms when the time is terminated. If you press dial knob or touch button, display returns to stand by status.



4.3.2 Stop Timer

Timer operation can be stopped as following steps

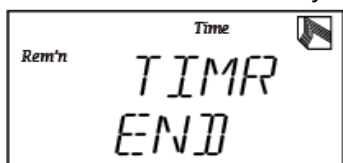
STEP 1: Press the dial knob during operation



STEP 2: Turn the dial knob to right to choose STOP / YES.



STEP 3: Press the dial knob. And you can see below display and hear ending sound.



If you press dial knob or timer button, the ending sound ends.

- You can cancel timer function in any step if you press timer button and get back to standby mode. If you press timer button again, you can set time or rpm.
- You can stop timer function as above 4.3.2 Stop Timer.

 WARNING

The unit can get damage if it get overload.

 WARNING

Sample cannot be over 4kg.
In case of using over 4kg sample, enough forced vortex cannot be generated and cannot be uniformed.

 CAUTION

Please use the unit after you check if the main body connected with plate tray and other attachments exactly.

 CAUTION

Please do not put too much sample in the tray for preventing by contamination each samples.

5.0 Safety Device

Safety device for overload

Performance of motor is not working well by overload, inserted safety circuit stops operating with the alarming.
The unit operates fine after re-booting.

6.0 Maintenance

6.1 Periodic maintenance

classifications	A period of checking time	
	daily	weekly
Generals		
Power cord		
- The conditions of connection for power supply and an adaptor	•	
- The presence of power supply and an adaptor contact wetting, and cable peeling off, and out of contact	•	
Tray, accessory cleaning		•
Surface cleaning		•
Main body		
Controller display status	•	
Controller function checking	•	
The status of ON/OFF on motor	•	
Check accessory attachments to the unit are tight.	•	

6.2 Cleaning for tray and accessories

Remove a contaminant by cleaning the unit frequently with a soft cloth before and after using, otherwise it cannot be readily wiped out for a long time. Keep the unit clean always without any contaminant.



Do not soak the product in the water to clean.

6.3 In case of not using long time

- (1) Unplug the unit from the main power.
- (2) Clean the unit with a soft cloth neatly.
- (3) Store in a dry place after packing.

7.0 Troubleshooting

7.1 Electrical

Trouble	Causes	Solution
The unit does not turn on	Incorrect electric power	Compare power source and voltage on the ID plate and make sure they are the same. ID plate is found on the bottom of unit.
	Power failure or circuit breaker shuts down	Find out the causes of power failure and recovery.
	Main plug not seated properly.	Check the electrical cord connection at the unit to ensure it is fully seated.
	Check the electrical cord connection at the unit to ensure it is fully seated.	If the socket / plug / main power line are cut, request service.
	PCB has damaged by reagent	Request service.
Room circuit breaker trips often when the unit is turned on or running	Too many plugs connect at the same time	1. Check the circuit breaker size along with the voltage and current supplied to it. 2. Check that several similar units are inserted together, if so you should not use overly.
	Inner circuit defect	Request service.
No VFD	Main plug not seated properly	Check the electrical cord connection at the unit to ensure it is fully seated
	Inner circuit defect	Request service.
Button doesn't operate well	Button switch has damaged.	Pull out the button to check connector and than retry operating. Otherwise, request service.

7.2 Trouble during operation

Symptom	Cause	Action
Dial button doesn't operate well	Capacitive Sensing Initialization Error	Request service.
Touch button doesn't operate well	Capacitance sensor initialization errors	Off the power switch on the power supply is blocked. In a few moments to initialize the controller power supply.
Spinning speed cannot be controllable properly.	DC Motor and circuit problem.	Request service.
	Motor and circuit defect.	Request service.
In case the severity of changes in rotational speed	Heavy leaning to one side of the sample tray is located	Reduce the load or tray in the center
Proper vortexing and mixing is not formed	Overloaded by the amount of work overload on the motor	Use in a fixed range of uses
Noise at operating	Combination between plate tray and plate or adapter is loosen	Operate the unit after combining micro-plate or adapter with the plate tray.
	Tube is not seated well in the hole	Mix after inserting holder and tube to the hole correctly
	Inner rotating support defect	Request service.
Operating suddenly stops	Motor stops by over pressure	Set proper max. load value to limit overload safety device. Please re-boot for normal operating
	BLDC motor and circuit defect	Request service.

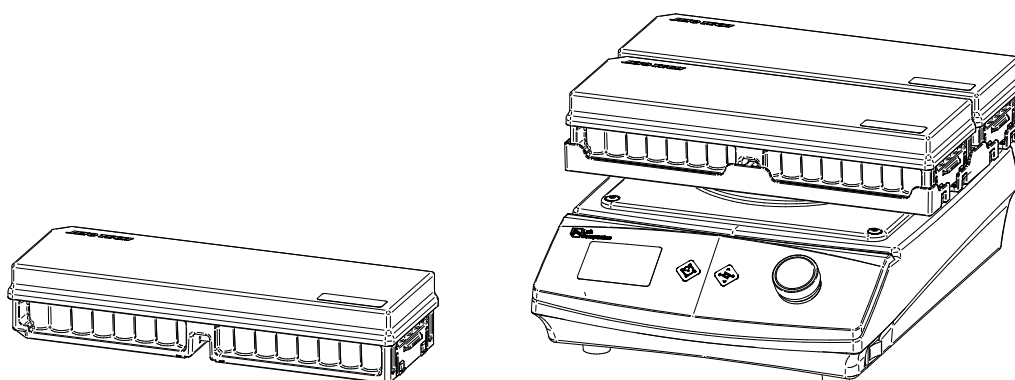
8.0 Accessories

Maximum four of microplates are provided as standard. If you attach any of below optional adapters, 1.5ml Micro-tube, 15ml 50ml Conical tube can be used as well. In that case, rpm should be lower than the speed range of the technical specifications.

In order to purchase optional accessories, please refer to our website (<http://www.labcompanion.com>)

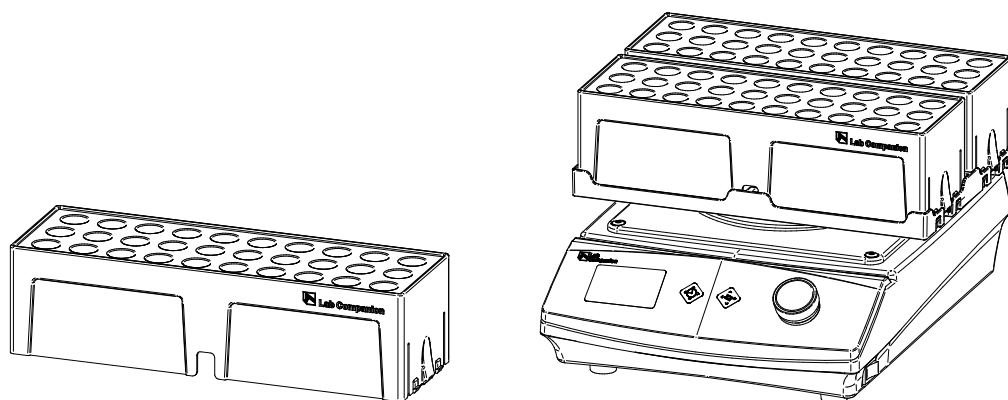
Item	Cat. No.	Material	Description
Microplate			Refer to below website (http://www.labcompanion.com/)
1.5ml Micro-tube rack	CPS0010	PC	1.5ml Micro-tube 3 x 8 EA adapter including one cap.
15ml Conical tube rack	CPS0011	ABS	15ml Conical tube 3 x 10 EA adapter
50ml Conical tube rack	CPS0012	ABS	50ml Conical tube 2 x 6 EA adapter

8.1 1.5ml Micro-tube rack



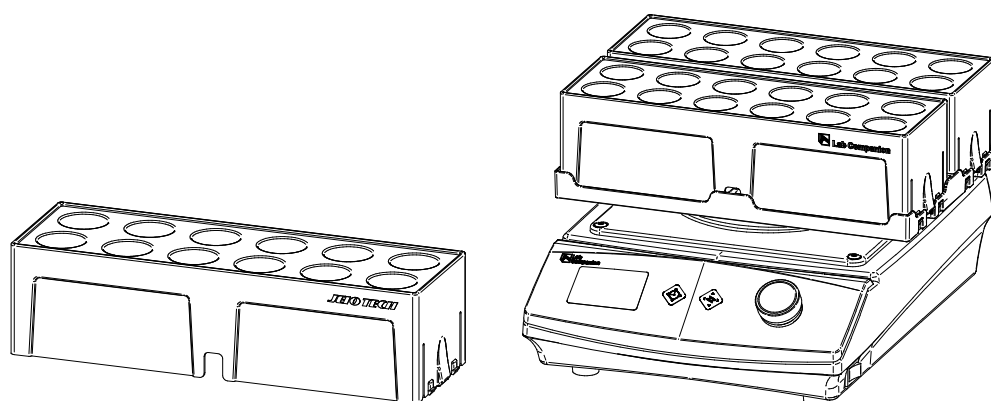
Attach two racks on the plate. For balanced fit, micro-tubes should be attached to the racks With bilateral symmetry. Please use the cap to prevent micro-tube's break away.

8.2 15ml Conical tube rack



Attach two racks on the plate. For balanced fit, conical tubes should be attached to the racks With bilateral symmetry.

8.3 50ml Conical tube rack



Attach two racks on the plate. For balanced fit, conical tubes should be attached to the racks With bilateral symmetry.

9.0 Appendix

9.1 Technical Specification

Item / Model		CPS – 350
Shaking System	Speed range(rpm) with 4 microplates	150~ 1,200
	Speed control type	Feedback Control
	Orbital diameter (mm)	3
	Timer	1min to 99 hrs 59 min
Safety device		Over current protection
Max. Load including attachment (kg)		4
Motor type		BLDC motor
Control panel		VFD(Vacuum Fluorescent Display), Touch key, Dial Button
Dimension	Overall Dimension (W×D×H, mm)	249 x 329 x 127
	Tray dimension (W x D, mm)	267x 185
	Net Weight (kg)	7.7
Materials		PP, PET, Powder coated steel
Electrical requirement (100V ~ 240V, 50 / 60 Hz, A)		1.5

※ If not specially mentioned, the standard value is from statues of 25°C, 60%R.H.

※ Specifications can be changed without prior notice for quality upgrade

9.2 Instrument Disposal

Disposing of your instrument must be done in environmentally responsible way if it has been potentially exposed to bio-agents or radioactive samples. Failure to follow stringent requirements for instrument 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.

9.3 Warranty

9.3.1 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.

- | |
|---|
| <ul style="list-style-type: none">• Date of purchase:• Customer name / address / phone number / E-mail:• Fault status• Model• Serial number |
|---|

9.3.2 Service Contact Points

Technical Services

Address : 153 (Yongsan-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

9.3.3 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 or upgraded without prior notice.
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