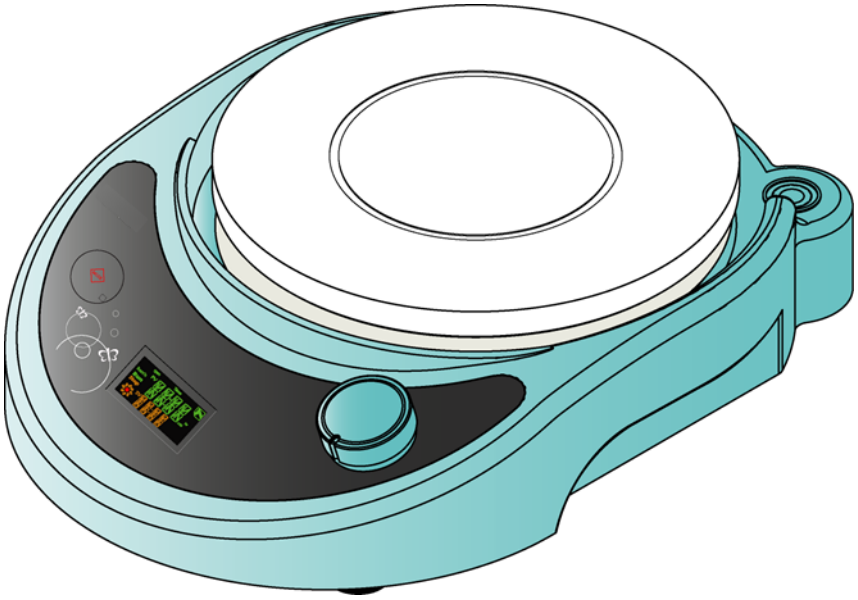


Operating manual

Magnetic Stirrer

Model: MS-17G, MS-22G

Manual No.: 00HAA0001168 Version: 2.0

JEIOtech



⚠WARNING

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.

Thank you for purchasing Jeio Tech’s products.

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1.0 Safety

1.1 How to use the Manual

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

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 messages and designate a degree or level of hazard seriousness.
3. Pay attention enough to the contents of alert marks.

Signal words	Purpose
⚠WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	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 Warning statement.

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

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
Power cord: Wall outlet with grounded terminal power cord 250V 7A.

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.

Stirrer explosive and flammable chemicals (Alcohol, Benzene, and etc), you must use with sufficient safety countermeasure.
The flammable organic solvents, dust, and corrosive gas may explode during stirrer sample. In Accordance with experiment, you should have equipment of explosion-proof and air exhauster in your laboratory. And you should find suitable stirrer RPM defense on your sample.

Please check equipment Permissible environmental condition when you use inside of Temp. & Humid. Chamber or Incubator.
It can be cause fire or trouble by stirrer electricity, electronic, and damage of motor.
Stirrer Permissible environmental condition
Temperature 5°C to 40°C, Maximum relative humidity 80%.

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

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

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 stirrer 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 Introduction

MS-17G, MS-22G is economically compact and light Magnetic stirrer under such kind of experimental lab environment. This magnetic stirrer operates range is 10rpm ~ 2,000 rpm by exact speed and powerful performance provides stirring of high viscosity solution.

2.2 Feature

This magnetic stirrer is aimed by user safety in laboratory, convenience and follow feature.

1. Non-slip silicon plate covers not to be easily slide glass of flask and baker, etc.

2. Each RPM adjust Real-time stirring with quick operation.

3. Non-spark BLDC (Brushless Direct Current) motor stirring to make safety offer and high quality durability in laboratory.

4. Basic White and Black plate cover accommodate to watch various color sample.

5. The controller display adopts VFD (Vacuum Fluorescent Display). It is easy to indicate stirrer set up and operating condition.

6. The timer mode function can reserve stirrer stop time.

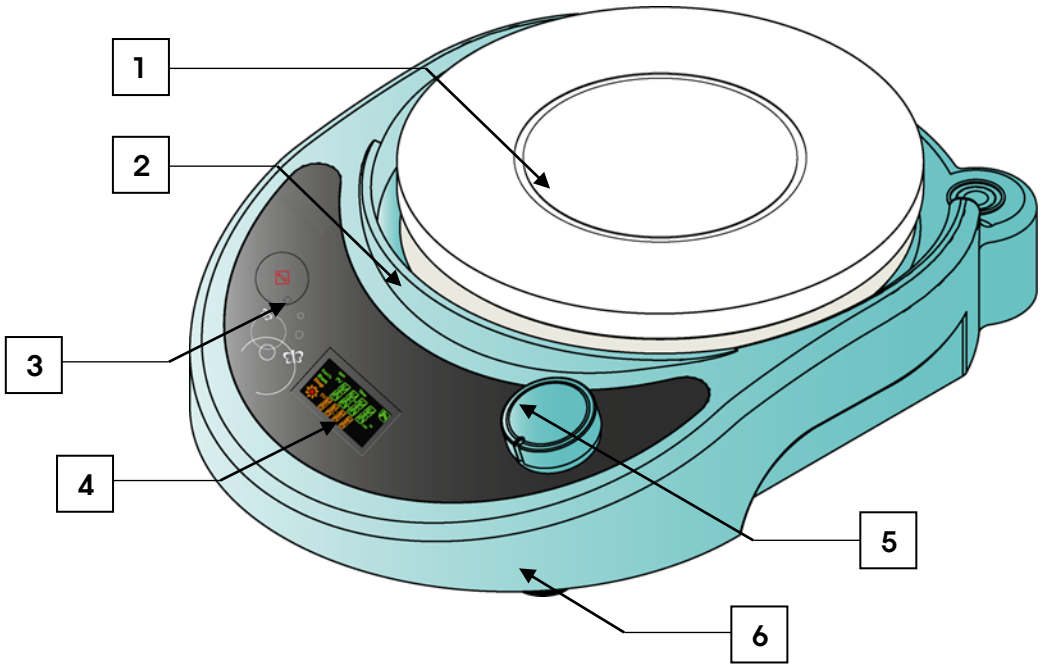
7. It sets 2 different speed and number of repetition to operate stirring.(Program function). Also, it will be able to use the stirrer to the experimental condition which the user is various. The program mode assists the sample solvent easily which is changeable viscosity changes depend on stirrer. (RPM)

8. The stirrers are offer stabilized rotations rate environment even fewer than 50 rpm by BLDC (Brushless Direct Current) motor with joined magnetic bar. The product will use in objective of microbe cultivation. It can provides the optimize environmental condition with minimize of physical damage

9. The control system composed RPM (Revolution Per Minute) setting rate increase progressively, and the system prevents user and product from the splashing of imminently solvent rotation

10. The use of capacitive touch sensor button and the dial button would be user conveniently control and set the stirrer.

2.3 Construction



(1) **Plate cover :** Non-slip silicon covers protect sliding of glassy flask and baker etc.

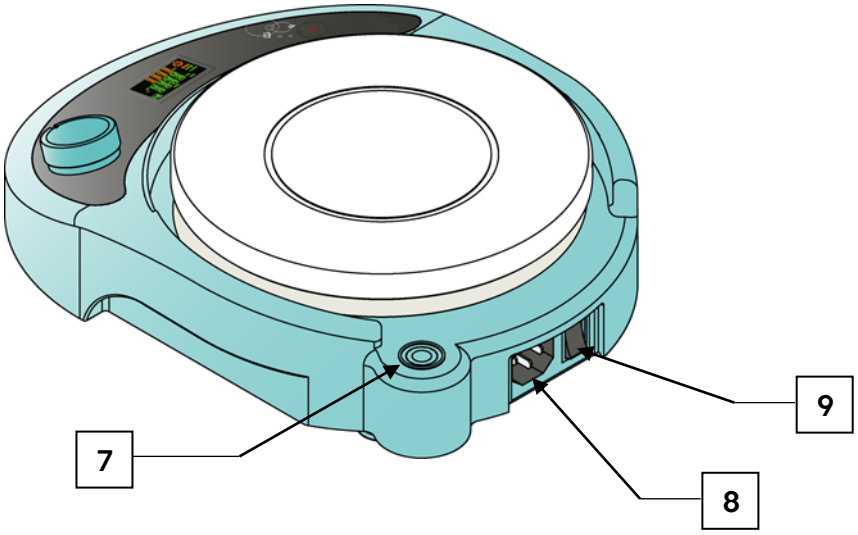
(2) **Top plate :** Protecting stirrer inside and preventing liquid inflow.

(3) **Mode button :** The button adjust controller function mode.

(4) **VFD panel & Controller :**
The panel indicates product setting and control condition.

(5) **Dial type button (Knob):** The dial set up controller function.
- Dial left turn/right turn: Operating rate setting
- Dial push: Operation rate saving, Start / Stop

(6) **Foot :** Non-marking foot allow for easy movement.



(7) **Holder :** It support holder rod. (This holder rod can be installed with a thermometer, temperature sensor, or clamp on top of the body.)

(8) **Socket :** Connect the power cable on the socket located on the back side of the unit.

(9) **Power switch :** It is the main ON/OFF switch and supplying power of the product.

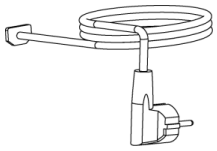
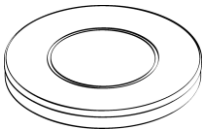
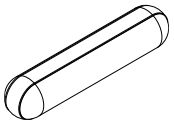
3. Installation and Caution

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 the shipper and contact your local Jeio Tech dealer's Service Department.

COMPONENT/MODEL	QUANTITY	RECEIVED
Operating Manual 	1	OK
Main power cord  Free voltage and frequency (AC 100 ~ 240V, 50/60Hz)	1	OK
Plate Cover  (white 1ea & black 1ea)	White 1ea & black 1ea	OK
Magnetic Stirring Bar  30 x8mm (mm x Ø, Length)	1	OK

3.3 Installation

3.3.1 Environmental conditions

- Temperature: 5°C ~ 40°C
- Relative Humidity: RH 10% ~ 80%
- Maximum attitude: up to 2,000m

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

3.3.2 Location conditions

Place the unit on the wrench, or table when in use, and observe minimum distances in 30cm between the other devices.

⚠ CAUTION
Do not place the unit nearby the other laboratory equipments which can be readily influenced, even by weak motor vibration, and also by magnetic force because the unit causes the magnetic field. The unit can cause the magnetic field. Do not place especially the electric devices on top plate due to inducing the strong magnetic field.

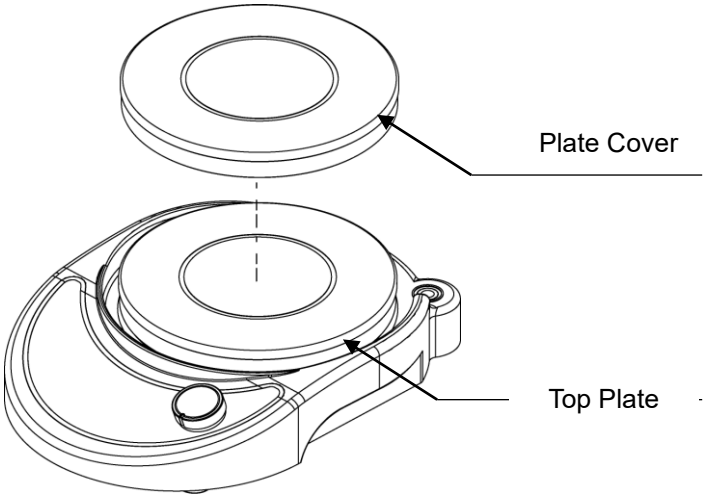
⚠WARNING
Do not use the plastic beaker when operating the unit in explosive atmospheres. The plastic beaker can cause the magnetic field, resulting in igniting to explosive substances.

3.3.3 Arrangement of the unit

- **STEP 1:** Place the unit to be fixed tight to non-slip foot on the table
- **STEP 2:** Ensure that the unit will be paralleled to the table.

3.3.4 Setting up plate cover on top plate

It can be possible to cover the top plate sticky material on top plate. It's for prevention of slipping and out of tracking during the test. It's an optional according to user's test purpose.

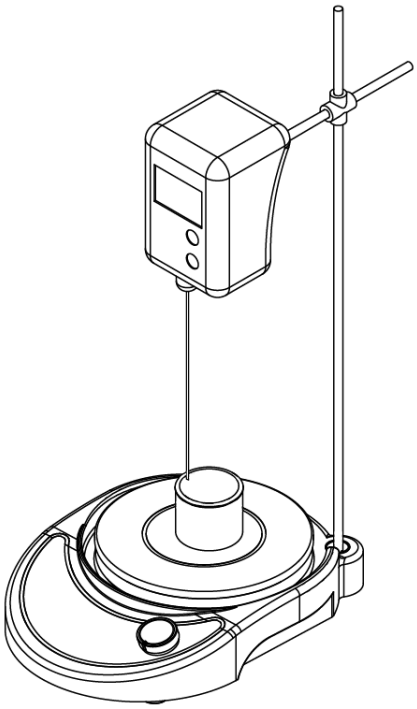


STEP 1: Cover the plate cover on top plate.

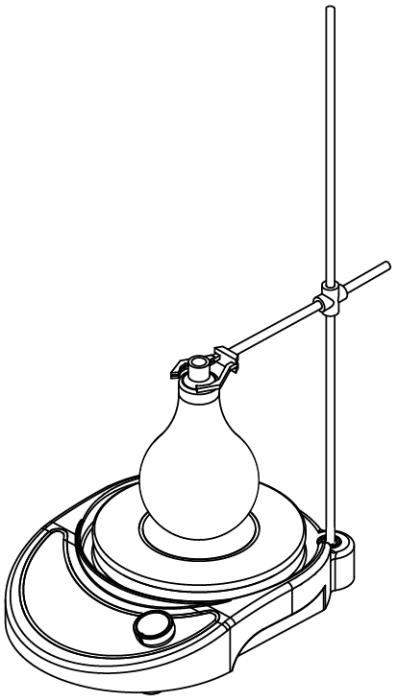
STEP 2: Make sure that the place cover's stuck tight on top plate.

3.3.5 Installation for Holder Rod

According to user's test purpose, this holder rod can be installed with a thermometer, or clamp on top of the body.



[Installing temp. sensor]



[Fixing up the round flask by using clamp]

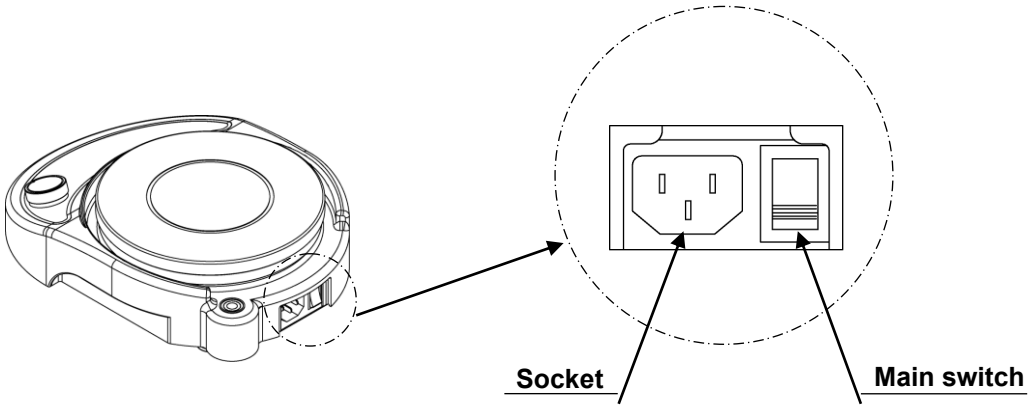
NOTICE

*** List for accessories ***

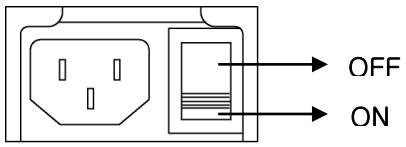
Temp. Sensor for stirring, clamp & holder rod are an optional.

3.4 Connecting to the mains power supply

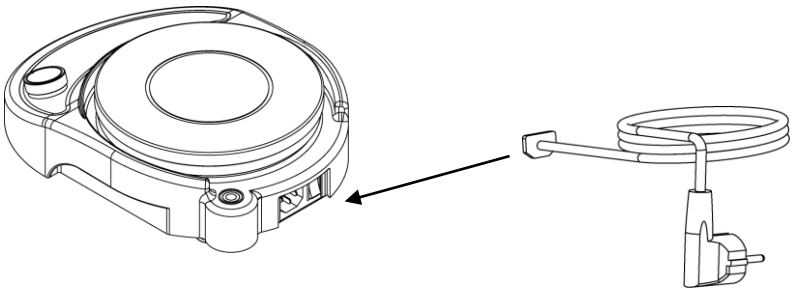
Connect the electric power to the unit according to the following process.



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



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



⚠WARNING

The voltage, phase & power consumption stated on the type plate must correspond to the mains voltage.
Failure to connect to a proper connection of a power supply will cause the risk of fire, electric shock, and personal injury.

⚠WARNING

Never use a forked socket, or a double-tapped socket.
Failure to obey a safety instruction will result in causing burning the cable, or risk of fire.

Use only the main power cord recommended by the manufacturer or supplied with the unit.

3.6 Stirring operation

STEP 1: Pour the liquids to be mixed into the flask, or the beaker.

STEP 2: Place the stirring bar at the center of the container.

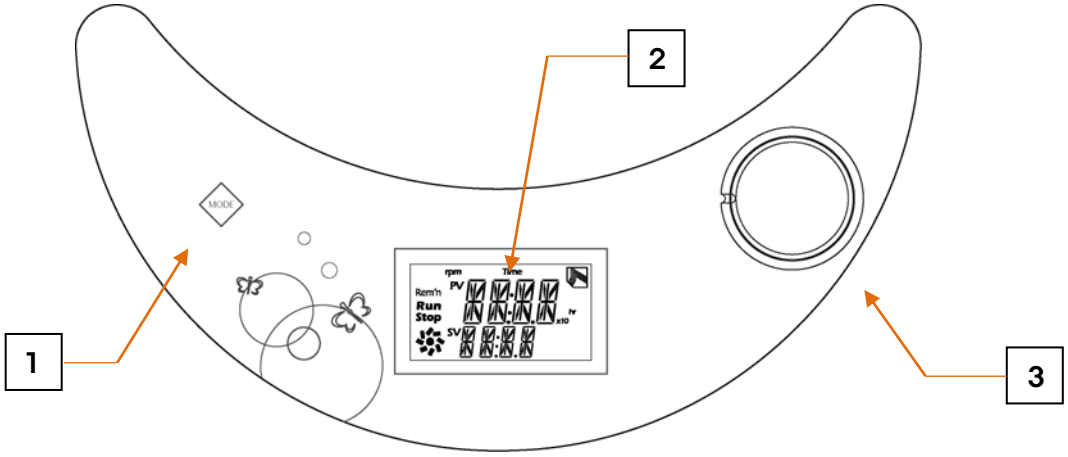
STEP 3: Place a beaker or glass container on top of top plate, or plate cover.

⚠WARNING

Maximum load to be placed on top of top plate cannot exceed in the total 25Kg

4.0 Operation

4.1 Controller – Name and function



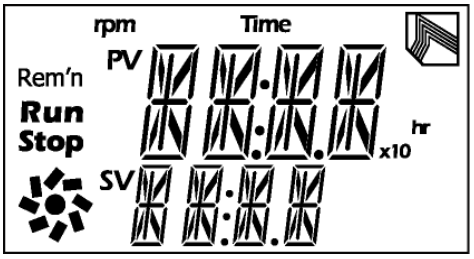
(1) **Mode key**

The Mode key selects timer and program mode. It senses and responds with even very light touch because of adoption of Electric capacity type.

A. **Start and stop :** Red color
B. **Mode selection :** Blue color
C. **During inputting value :** Pink color

(2) **Controller with VFD type display**

It helps monitoring, adjusting, and verifying set value and control status.



A. **Rem'n:** Remaining time
B. **Run:** Unit is operating.
C. **Stop: it indicates unit is stop status.**
D. **Rpm: It indicates stirring speed status.**
E. **Time: It displays Timer status.**
F. **PV: It indicates the present (current) stirring speed.**
G. **SV: It indicates the set (desired) stirring speed.**
H. **hr: HH:MM**

I. **x 10: Conversion stirring value of current RPM**

(3) **Dial Knob :** The knob is start, stop, and input and set value.

4.2 Functional description of controller

4.2.1 General

(1) **RPM mode:** Set speed to operate stirring.

(2) **TIME mode:** Set both timer and speed to operate stirring.

(3) **PROG. mode :** It sets 2 different speed and number of repetition to operate stirring.(Program function)

(4) **EXIT mode:** It returns unit to standby status.

4.2.2 Description of controller

(1) **RPM:** stirring speed

(2) **TIME:** Hour/Minute

(3) **TIME MODE:** Timer mode

(4) **PROG MODE:** Program mode

A.1 ST: 1st step stirring speed.
B. 2 ND: 2nd step stirring speed.
C.INFI: Unlimited repetition
D. CONT: Number of repetition

(5) **STOP**

(6) **CONT:** 연 Continuous operation

(7) **SUCC SET:** Setting completion and saved.

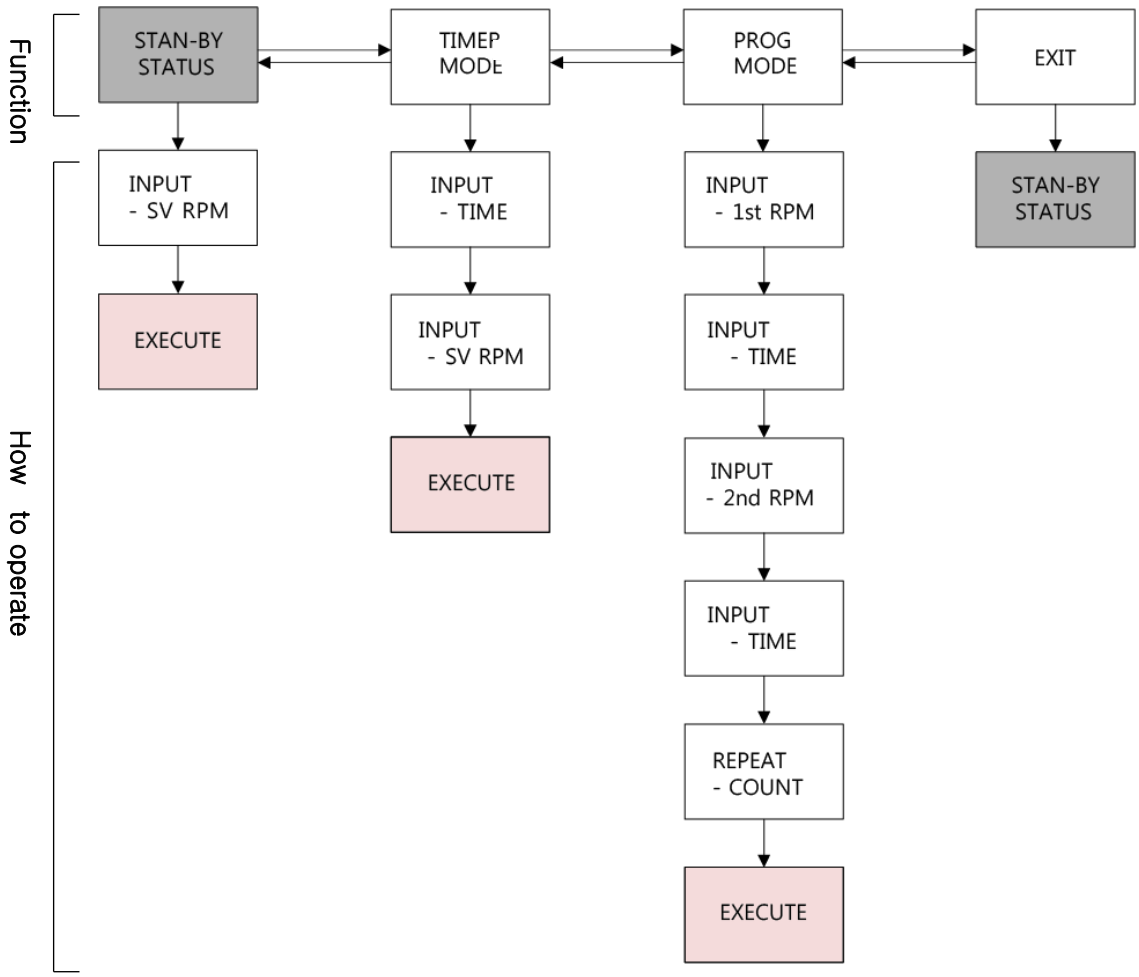
(8) **EXIT:** Returns to standby status

(9) **END:** This indicates expiration of Timer mode or Program mode.

4.3 Flow chart of controller setting

There are 3 operation modes.

Control status can be moved and chosen from standby status to each RPM mode, Timer mode, Program mode top operate stirrer.

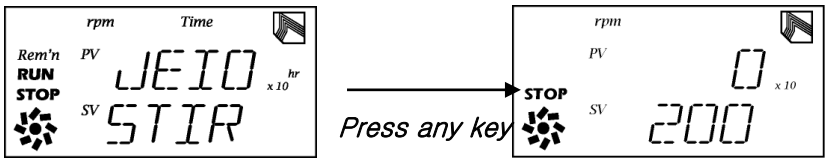


4.4 RPM mode

Set RPM to operate stirring.

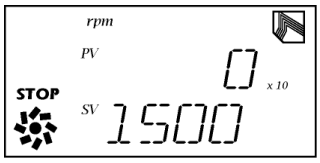
4.4.1 How to set

STEP 1: Press power switch to turn on. (Refer to 3.4 power connection, Page 12)

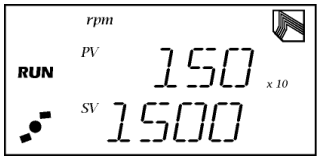


[Booting display] **[Standby display]**

STEP 2: Rotate dial knob to set and adjust RPM.



STEP 3: Press dial knob 1 time to start stirring.



STEP 4: Actual RPM reaches set value.

STEP 5: Press dial knob to stop stirring.

4.4.2 Operating other functions during stirring.

4.4.2.1 RPM change during stirring

STEP 1: Rotate dial knob to change RPM.

STEP 2: Actual RPM reaches modified RPM value.

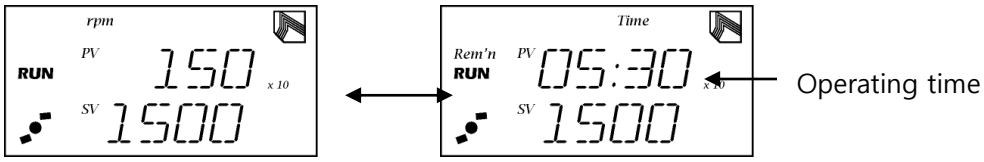
4.4.2.2 Verification of timer

STEP 1: Press mode key.

* Operating time and set RPM display.

STEP 2: Press mode key again.

* it returns to RPM display.



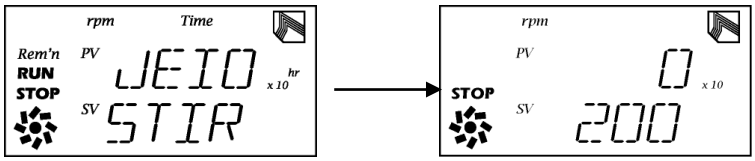
[RPM display] **[Operating time display]**

4.5. Timer mode

Set RPM and stirring time.

4.5.1 How to set

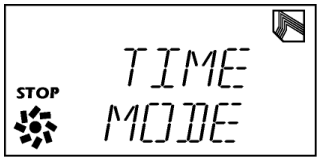
STEP 1: Press power switch to turn on. (refer to 3.4 power connection, Page 12)



[Booting display] **[Standby display]**

STEP 2: Press Mode key.

* Display converts to Timer mode.



NOTICE

If mode key does not work, turn off power switch and turn it on again.

*** Repetition of STEP 1.**

STEP 3: Press dial knob and display converts to input display of hour and minute.



*** How to input hour and minute**

- numbers are blink which means standby status.

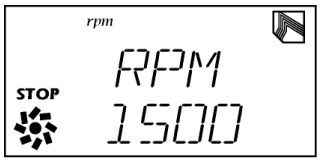
STEP 3-1. Rotate dial knob to set hour.

STEP 3-2. Press dial knob.

STEP 3-3. Rotate dial knob to set minute.

STEP 3-4. Press dial knob to save time and display converts to next step, RPM set status.

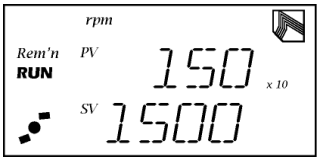
STEP 4: Rotate dial knob to set RPM.



STEP 5: Press dial knob to save and operate RPM.

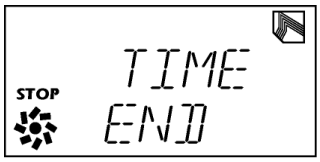


[Save display]



[Operating display]

STEP 6: When the timer expires, stirring stops with alarming for 3 seconds.



NOTICE

All kind of input or set status are cancelled when mode key is pressed. And unit returns to standby status.

*** Possible cancellation steps**

: STEP 2 ~ STEP 4

4.5.2 Operating other functions during stirring

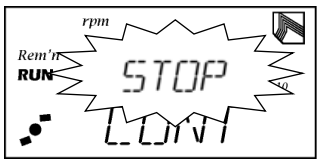
4.5.2.1 Stop manually

Stirring can stop before timer expires.

STEP 1: Press dial knob.
STOP/CONT display and STOP blinks.

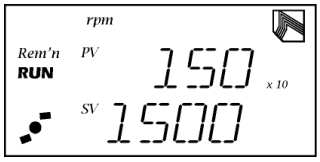


STEP 2: Rotate dial knob. Either STOP or CONT blinks when you rotate dial knob. Stop rotating dial knob when STOP blinks.

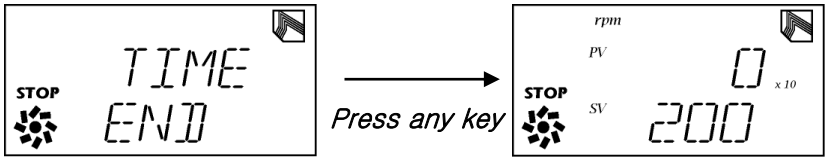


STEP 3: Press dial knob and stirring stops.

*** If you choose CONT** – Stirring continues until timer expires.



*** If you choose STOP** – Stirring stops.



[Standby display]

* Press Mode key or dial knob to convert from Timer expiration display to Standby display.

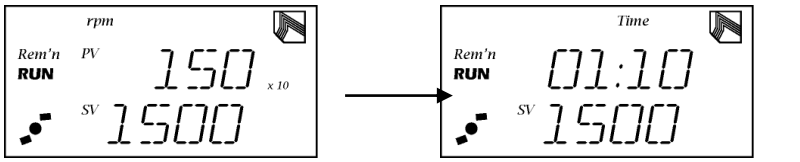
4.5.2.2 Monitoring operation status during stirring.

STEP 1: Press mode key.

* Remaining time and set RPM.

STEP 2: Press mode key.

* It returns to RPM display.



[RPM display] **[Remaining time display]**

NOTICE

*** Stirring ends***

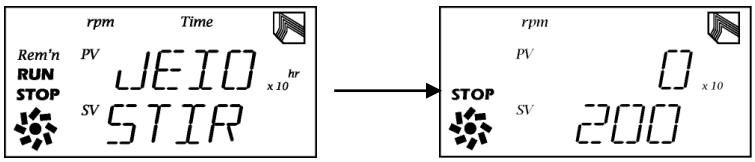
When timer expires, TIME END displays. Once you press mode key or dial knob, it returns to standby status.

4.6. Program mode

2 set of different RPM and Timer can be programmed and repeated.

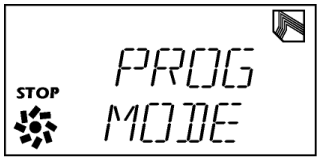
4.6.1 How to set

STEP 1: Press power switch to turn on. (Refer to 3.4 power connection, Page 12)



[Booting display] **[Standby display]**

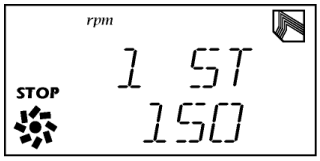
STEP 2: Press mode key and rotate dial knob to clockwise 1time.
The following displays



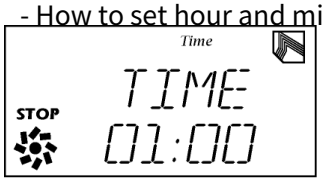
NOTICE

If Program mode does not display even touch and press mode key and dial knob, turn off power switch and turn it on again.
*** Repetition of STEP 1.**

STEP 3: **Press dial knob.**
Rotate dial knob to set 1st RPM and press dial knob after completion of RPM setting.
* 1st step RPM setting.

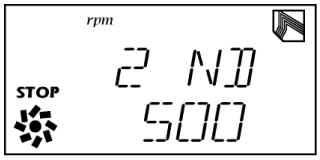


STEP 4: **Rotate dial knob to set hour and minute.**
* This is to set timer of 1st step RPM.(RPM of STEP 3)
- How to set hour and minute – refer to Page 18.



STEP 5: Rotate dial knob to set 2nd RPM and press dial knob after completion of RPM setting.

* 2nd step RPM setting

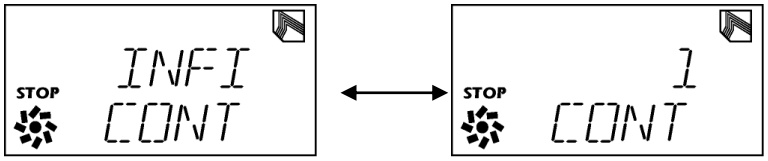


STEP 6: Rotate dial knob to set hour and minute.

* This is to set timer of 2nd step RPM. (RPM of STEP 5)



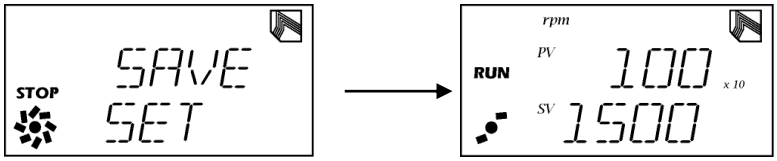
STEP 7: Rotate dial knob and set number of repetition of 1st and 2nd of RPM and Timer



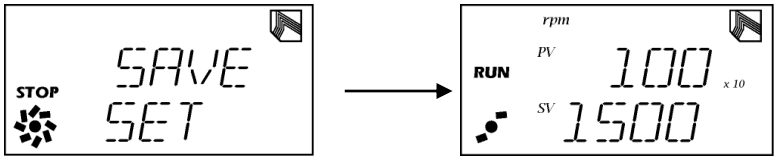
[INFI: Unlimited repetition] **[Set number of repetition]**

* Set number of repletion of saved 1st, 2nd RPM and Timer.

STEP 8: Press dial knob to save and operate stirring as programmed.



STEP 9: When program expires, stirring stops with alarming for 3 seconds.



NOTICE
All kind of input or set status are cancelled when mode key is pressed. And unit returns to standby status. *** Possible cancellation steps: STEP 2 ~ STEP 8**

4.6.2 Operating other functions during stirring

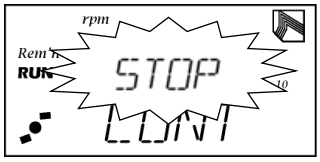
4.6.2.1 Stop manually

Stirring can stop before program expires.

STEP 1: Press dial knob. STOP and CONT displays.

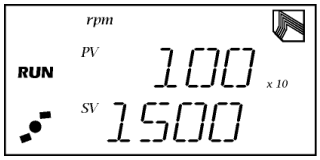


STEP 2: Rotate dial knob. Either STOP or CONT blinks when you rotate dial knob. Stop rotating dial knob when STOP blinks.

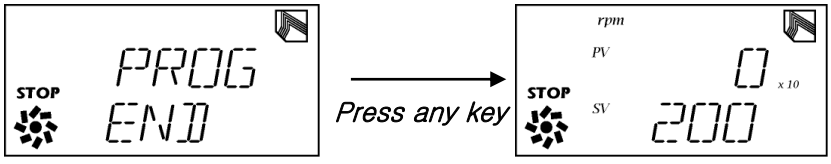


STEP 3: Press dial knob and stirring stops.

*** If you choose CONT –** Stirring continues until program expires.



*** If you choose STOP –** Stirring stops.



[Standby display]

* Press Mode key or dial knob to return to Standby display.

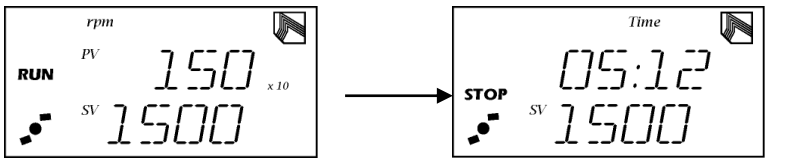
4.6.2.2 Monitoring operation status during stirring

STEP 1: Press mode key.

* Remaining time and set RPM display.

STEP 2: Press mode key.

* It returns to RPM display.



[RPM display] **[Remaining time display]**

NOTICE

*** Stirring ends***

When program expires, TIME END displays. Once you press mode key or dial knob, it returns to standby status.

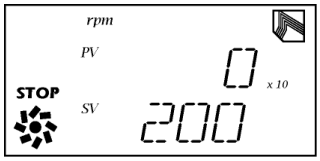
4.7 EXIT mode

During set of either Timer mode or Program mode, it can be cancelled and returns to standby mode in cases.

STEP 1: Rotate dial knob and choose EXIT.



STEP 2: Press dial knob to return to standby status.



5.0 Preventive Maintenance

5.1 Periodic maintenance

Classification	A period of checking time	
	Daily	Weekly
General		
Power cord		
- Inspect power cord connection at unit and receptacle.	●	
- Inspect power cord for wear, cracks or cuts.	●	
Top plate and plate cover cleaning		●
Magnetic stirrer		
Controller display checking	●	
Controller function		●
Motor on/off checking	●	
Motor speed checking	●	

5.2 Cleaning of Top plate and plate cover

5.2.1 Top plate

■ Remove a contaminant by cleaning the unit with a wet soft cloth.

■ Keep the unit clean always by cleaning the unit with a dry soft cloth.

5.2.2 Plate cover

■ Remove a contaminant by cleaning the unit frequently with a soft cloth before and after using, otherwise it can not be readily wiped out for a long time.

■ Keep the unit clean always without any contaminant.

⚠WARNING
Do not soak the product in the water to clean.

5.3 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.

6.0 Troubleshooting

6.1 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 back 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.
	Socket / plug / main power line might be cut	If the socket / plug / main power line are cut, request service.
	PCB has demaged by reagent	Request service.
	Fuse shorts inside product.	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.
With the POWER switch ON, the main display does not illuminate.	Power interruption	Check for power interruption.
	Main plug does not insert correctly	Make sure electrical cord connections at the outlet and the unit are firmly in place.

VFD display cracks	VFD segment Fault	Request service.
Trouble	Causes	Solution
Dial button doesn't operate well	Button problem.	Request service.
Dial button doesn't work out	Controller problem	Request service.
	Button demaged.	Request service.

6.2 Problems occurs during operation

Trouble	Causes	Solution
Magnetic bar is out of position	Too much soultion(solvent) in flask.	Reduce volume of solution(solvent) or increase RPM slowly.
	High density of solution(solvent) in flask..	From low speed it raises a rotation speed slowly at high speed and find a proper speed.
	The magnetic force of magnet bar becoming weak.	Replace the magnetic bar
Makes bumping noise when operating	Magnetic bar inside the machine troubles	Request service.
Dial button doesn't operate well or doesn't work out	restart error of electrostatic capacity sensor	Turn off switch and intercepts power after supply power and controller will restart.
In case where the rotation speed will not be controlled normally	Using a program function.	Check the functional set and a normal operation presence. Set the controller function according to use objective.
	BLDC motors and circuit troubles.	Request service.
In case where magnet agitation stirring bar does not rotate	The low-speed rotation speed set which does not hold in control scope	use small size of stirring bar or raise rotation speed a little bit and fine proper rotation speed.

7.0 Accessories

7. 1 Description and Order Number

7.1.1 Plate cover

Cat. No.	Description
MTT0003	White, Silicone for MS-17G (Φ170 mm)
MTT0004	White, Silicone for MS-22G (Φ220 mm)
MTT0006	Black, Silicone for MS-17G (Φ170 mm)
MTT0007	Black, Silicone for MS-22G (Φ220 mm)

7.1.2 Magnetic stirring bar

Cat. No.	Description
MTT0008	Octagon type (Φ8 x 12.7, mm)
MTT0009	Octagon type (Φ8 x 16.0, mm)
MTT0010	Octagon type (Φ8 x 22.0, mm)
MTT0011	Octagon type (Φ8 x 25.4, mm)
MTT0012	Octagon type (Φ8 x 28.6, mm)
MTT0013	Octagon type (Φ8 x 38.0, mm)
MTT0014	Octagon type (Φ9.5 x 50.8, mm)
MTT0015	Polygon type (Φ5 x 15, mm)
MTT0016	Polygon type (Φ5 x 20, mm)
MTT0017	Polygon type (Φ5 x 25, mm)
MTT0018	Polygon type (Φ5 x 30, mm)
MTT0019	Polygon type (Φ5 x 40, mm)
MTT0020	Polygon type (Φ5 x 50, mm)

Cat. No.	Description
MTT0021	Egg type (16.0 mm)
MTT0022	Egg type (19.0 mm)
MTT0023	Egg type (25.4 mm)
MTT0024	Egg type (31.8 mm)
MTT0025	Egg type (41.28 mm)

7.1.3 Retrievers

Cat. No.	Description
MTT0026	Plastic Retriever (PE, 300 mm)
MTT0027	Plastic Retriever (PE, 500 mm)
MTT0028	Plastic Retriever (Yellow, Teflon, 510 mm)
MTT0029	Plastic Retriever (Blue, Teflon, 510 mm)

8.0 Appendix

8.1 Technical Specifications

MODEL		MS-17G	MS-22G
Technical data	Stirring capacity (Liter, H2O)	4	5
	Speed range (rpm)	30 ~ 2,000	
	Speed Stability (%)	±1	
	Timer	1 min to 100 hours	
	Program control	Two-step repeatable pattern	
	Speed display	VFD(Vacuum Fluorescent Display)	
	Motor rating input / output (W)	2.9/1.6	
	Magnetic bar (mm x Ø, Length), Max.	40×8mm	50×10mm
	Load, Max (kg)	20	25
Set-up plate	Material	Polypropylene with non-slip plate cover	
	Dimension (mm, Ø)	170	220
General data	Body material	Polypropylene	
	Body color	Persian Blue(BB), Yellow(BY), Blue Gray(BG), Pink(BP)	
	Dimension (mm, W x D x H)	210×280×72	260×360×72
	Weight (kg)	1.35	1.75
	Permissible ambient temperature (°C)	+5 ~ 40	
	Permissible relative humidity (%)	up to 80	
	Electrical requirements	Free voltage and frequency (AC 100 ~ 240V, 50/60Hz)	
	Power consumption (W)	6	
	Motor	Long life BLDC(Brushless Direct Current)	
	Control type	Electronic speed control	
	Adjustment tool	Touch key , adjustment knob	
	Safety Device	Thermal Shutdown, Current limit protection	
	Protection class acc. to DIN EN 60529	IP 42	

※ The upper specification could be changed in compliance with the quality and an efficiency improvement of the product.

※ Speed range(rpm): The set point starts from 10rpm. With Magnetic bar according to the capacity of the reagent could be controlled below 30rpm.

※ Test standard

(1) Stirring capacity: Stirring capacity (Liter) of the water (H2O) at maximum speed (RPM).

(2) Speed range: maximum stirring speed range with maximum stirring capacity and magnetic bar

(3) Magnetic bar: maximum Magnetic bar size which is not disconnected at the maximum speed and capacity.

(4) Load Max. : Maximum load capacity of flask and solution (H2O) which is unit can bear in the normal circumstance.

(5) Protection class acc. to DIN EN 60529: water proof, vibration proof test.

8.2 Disposing of Magnetic stirrer

Please dispose the unit with separating plastic mold, motor, and magnet.

8.3 Warranty

8.3.1 General

(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

8.3.2 Technical Service Contact Points

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

8.3.3 Certificate of Product Warranty

This is a guide to the product quality warranty and service terms provided by Jeio Tech 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, Jeio Tech 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, Jeio Tech's liability under this warranty is limited to replacing the product or refunding the original purchase price at Jeio Tech'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 Jeio Tech Co., Ltd. Additionally, the warranty period is not extended due to free repairs. Jeio Tech 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 Jeio Tech Co., Ltd.
   * Malfunctions caused by using consumables or optional components not specified by Jeio Tech Co., Ltd.

* Repairs performed by personnel other than Jeio Tech 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 Jeio Tech 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.
- Jeio Tech 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.
- Jeio Tech 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 Jeio Tech unless explicitly labeled as a "Warranty Amendment" and signed by an authorized representative of Jeio Tech.

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

The contents of the operation manual could be changed without notice for product improvement and accurate information.

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