

Operation Manual

Vortex Mixer

Model: VM-96T

Manual No.: 361215L002 Version : 2.0

JEIOtech



⚠WARNING

Before using this product, read this entire Operation 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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Table of contents

1.0 Safety

1.1 How to use the Manual ---------- 5

1.2 Symbols used in this manual ---------- 5

1.3 Exemption for responsibility ---------- 6

1.4 Warning statement ---------- 6

1.5 Caution statements ---------- 8

2.0 Functional Description

2.1 Introduction ---------- 10

2.2 Features ---------- 10

2.3 Structure ---------- 11

3.0 Installation and caution

3.1 Unpacking the package and Inspecting damage during transportations ---------- 12

3.2 Checking the unit components ---------- 12

3.3 Installation ---------- 13

3.3.1 Environmental conditions ---------- 13

3.3.2 Unit location ---------- 13

3.3.3 Arrangement of unit ---------- 13

3.3.4 Mounting Accessories ---------- 13

3.4 Connection to the main power supply ---------- 16

4.0 Operation

4.1 Touch mode ---------- **18**

4.2 Run-mode ---------- **18**

4.3 Stop ---------- **18**

5.0 Safety device ---------- **19**

6.0 Preventive Maintenance

6.1 Periodic maintenance ---------- **20**

6.2 Cleaning for top plate and accessories ---------- **20**

6.3 In case of not using long time ---------- **21**

7.0 Troubleshooting

7.1 Electrical ---------- **21**

7.2 Trouble during operation ---------- **23**

8.0 Appendix

8.1 Technical Specifications ---------- **24**

8.2 Accessories ---------- **25**

8.3 Warranty ---------- **26**

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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 250 V 7 A.

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.

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It can be cause fire or trouble by stirrer electricity, electronic, and damage of motor.
Stirrer Permissible environmental condition
Temperature 5 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 statements.

⚠ 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.

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It may cause the electric shock or fire.

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

This vortex mixer focuses on melting sample or homogenizing concentration by the formation of Forced-vortex motion for fluid in test tube or other experimental vessel etc.
Also, it is often adopted for experiment of immunoprecipitation using protein, Peptide, manicuring DNA concentration, correction and dilution.

2.2 Features

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

- It makes immediate Vortex less than 4 sec with Amplitude of rotation: 4mm and rate of rotation: 200 ~ 3,000 rpm.

- Offering touch and continuous modes support convenient operating depend on user experiment purpose.

- Easy and convenient speed control between 200 ~ 3,000 by dial knob.

- High-sensitive touch switch offer to reduce wrist stress when user is pushing and holding their experiment tools. Also, it reduced operator fatigue and unpleasant feeling.

- Depending on a design for a low center of gravity, it can minimize the vibration and sliding caused by the process of high-speed mixing.

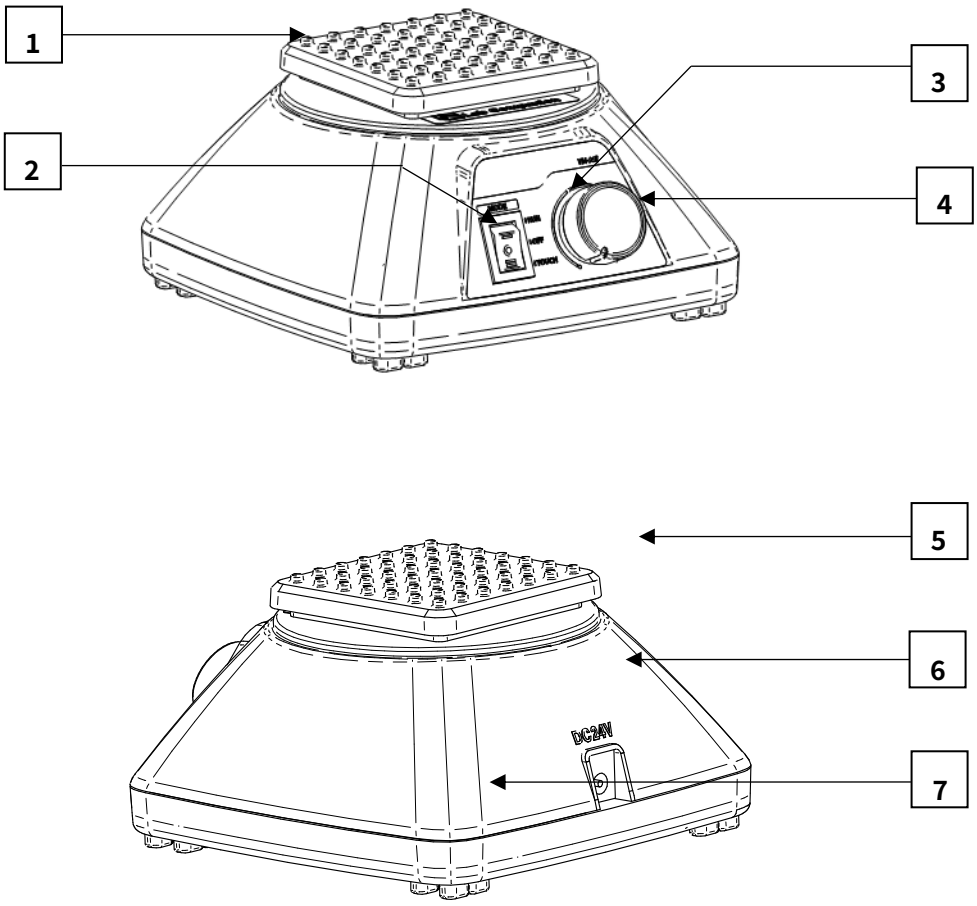
- It is various size and capacity available (Test tube, Micro-tube, Micro-tube) to adopt variety of accessories.

- Functional BLDC motor offers controlling speed correctly, keeping speed, and safety. Also, this motor is suitable for reproducibility sample mixing by eccentricity rotating.

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2.3 Structure [VM-96T]



(1) **Standard Rubber platform :** Used for Touch mode only.

Applied to mix the samples by using Micro tube or Conical tube by putting them on the platform directly.

(2) **Operation mode switch :**

A. TOUCH ; Put the switch to the lower position(=) to operate this mode.

B. OFF ; the switch to the center position(O) to stop the power.

C. Continuous mode ; Put the switch to the upper position(-) and control the dial knob.

(3) **Warning point** :

The upper speed-limit dot is at 11 o'clock position. When using Micro plate or a sponge tube, you should use below the red dot for safety.

(4) **Dial knob :** Regulating of mixing speed.

(5) **Body :** Vortex Mixer Body

(6) **Socket :** Connected to the adaptor.

(7) **Foot** : Supporting the body not to slip when operation.

3.0 Installation and caution

3.1 Unpacking the package and Inspecting damage during transportations.

(1) Check for damages in the package of the unit.
(2) Unpack the unit.
(3) Check to see carefully if there are damages incurred during transit.

3.2 Checking the unit components

(1) Unpack and check the unit and accessories as listed below.
(2) Contact us or our agent in which you purchased the unit if found some components omitted.

COMPONENT	QUANTITY	DESCRIPTION
User manual	1	-
Power code	1	DC 24 V & 2.5 A Power adapter with free voltage and frequency (AC 100 ~ 240 V, 50/60 Hz)
Standard Rubber platform	1	-

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3.3 Installation

3.3.1 Environmental conditions

Install VM-96E in a proper place under the condition below.

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

⚠WARNING
The unit should be located away from naked flame sources, direct sunlight. Which can result in lower performance, or malfunction.

3.3.2 Unit location

This unit must be positioned on the bench, or table and allow at least 30 cm away from the other equipment, or devices.

⚠ CAUTION
Do not place the unit near by the other laboratory equipment which can be readily influenced, even by week motor vibration.

3.3.3 Arrangement of unit

STEP 1: Ensure that the unit will be paralleled to the table.

STEP 2: Place the unit to be fixed tight to non-slip foot on the table

3.3.4 Mounting Accessories

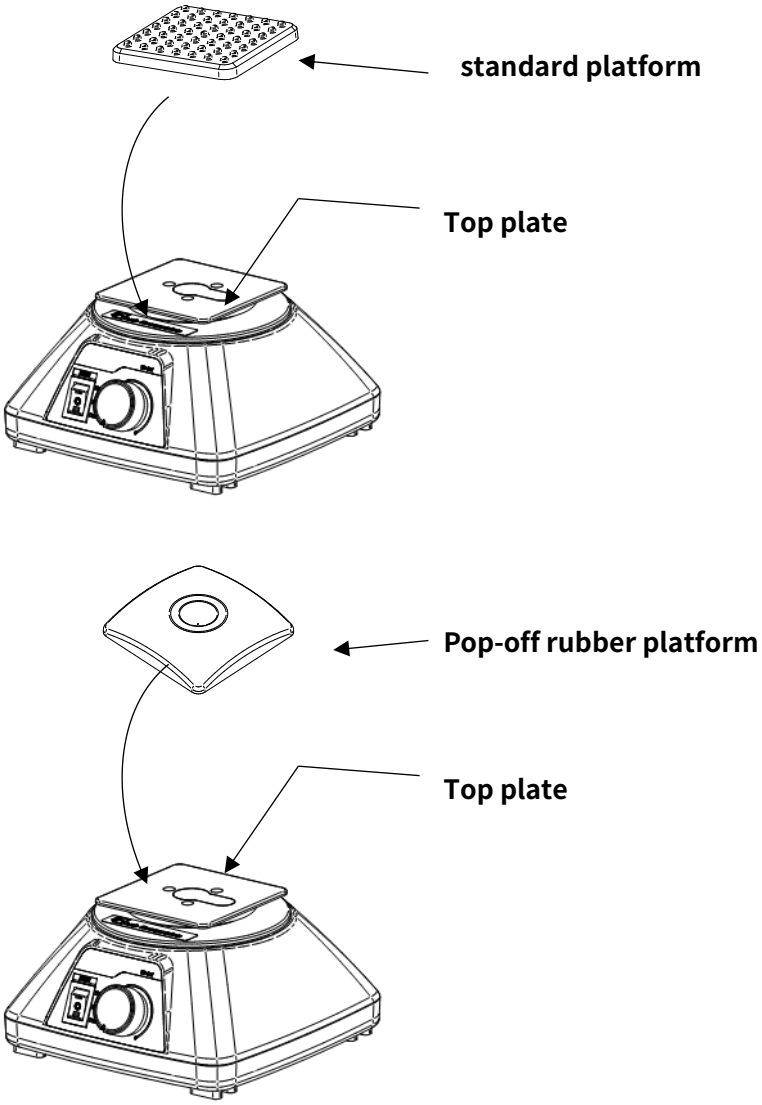
3.3.4.1 Mounting Rubber platform

In TOUCH mode, or Continuous mode, used for the standard platform by using Micro tube, Conical tube to mix test sample or specimen.

STEP 1: Place Rubber platform on top of top plate paralleling with the upper part of top plate.

STEP 2: Insert each corner to be fixed tight until Rubber platform should be put

it together.



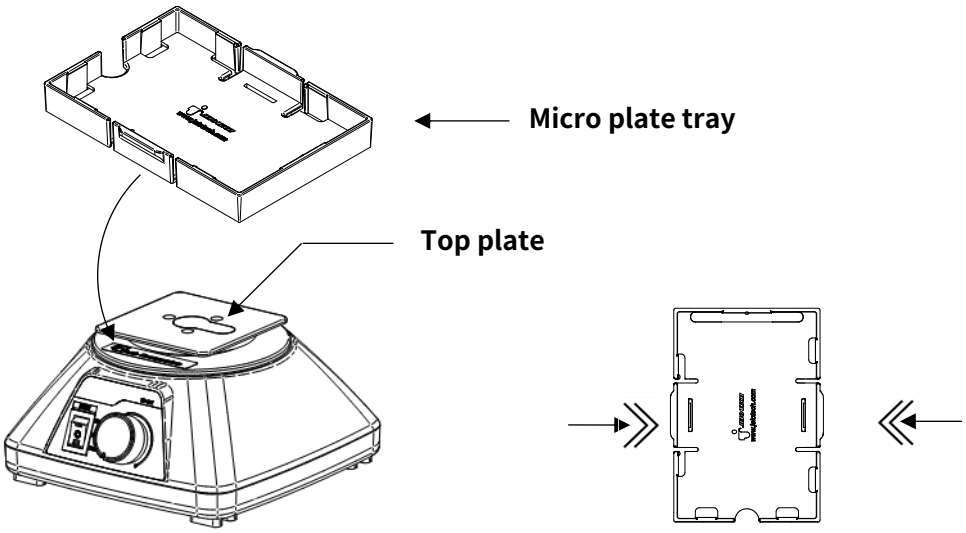
3.3.4.2 Mounting Micro plate tray

In Continuous mode, used for mixing test sample or specimen by using Micro plate tray.

STEP 1: Place Micro plate tray on top of top plate paralleling with the upper part of top plate.

STEP 2: Insert Micro plate tray by pressing the left and right part of them on top of top plate at the same time.

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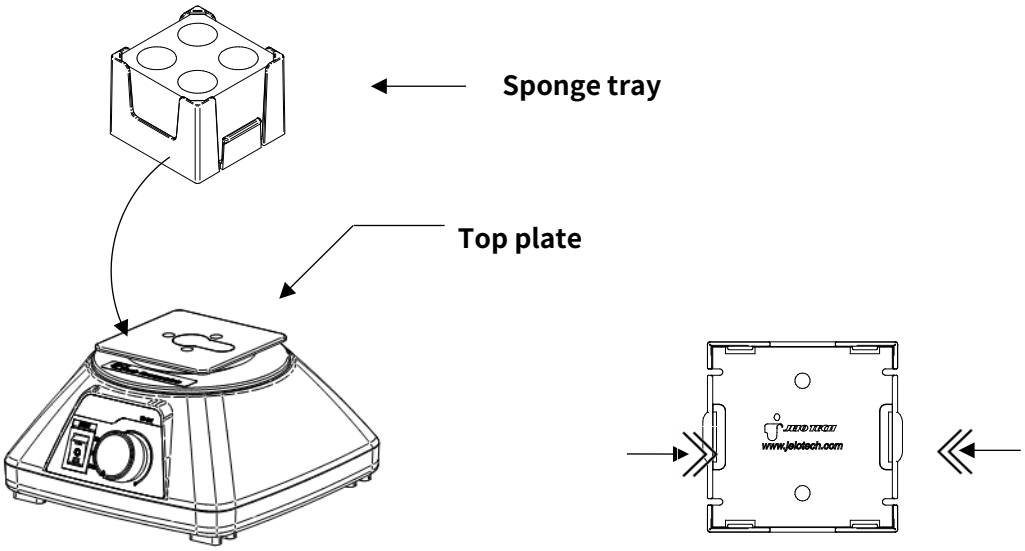
[Pressing the left/right ward to fit it]

3.3.4.3 Mounting Test tube tray

In RUN mode, used for mixing test sample by using Test tube, or Conical tube.

STEP 1: Place Test tube tray on top of top plate paralleling with the upper part of top plate.

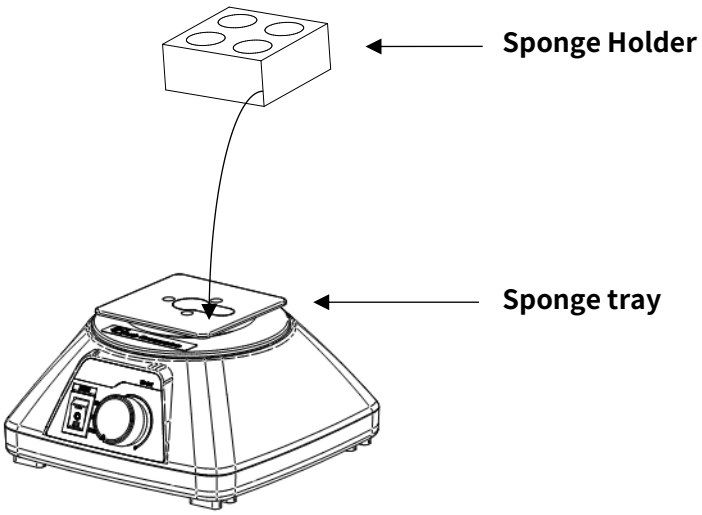
STEP 2: Insert Sponge tray by pressing the left/right part of them on top of top plate at the same time.



[Pressing the left/rightward to fit it]

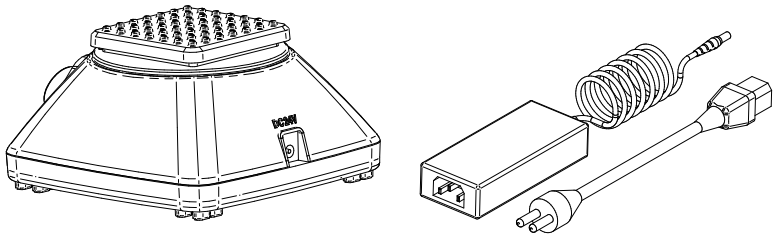
STEP 3: Pick up the sponge corresponding to the size of test tube, insert it to the tray.

* Sponge and sponge rack: [Refer to 8.2 attachment]



3.4 Connection to the main power supply

Please supply the electric power to the unit as below steps



STEP 1: Position “0” rpm by adjusting Dial knob before the power is on

STEP 2: Connect DC plug of the power cord to the socket located on the back side of the unit

STEP 3: Connect the power cord to the consent of the electric power supply

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⚠WARNING

Ensure that the unit should be connected to a power source that is an appropriate voltage, phase, capacity.
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 provided with the unit.

4.0 Operation

4.1 Touch mode

STEP 1 : Mount Rubber platform [3.3.4.1]

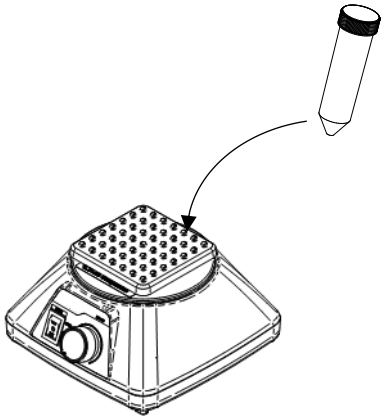
STEP 2 : Connect power to unit [3.4]

STEP 3 : Press operation mode switch down and then convert to Touch Mode.

STEP 4 : Turn dial knob to right and adjust Rpm you want

STEP 5 : Press the sunken round part on rubber platform with test tube, micro tube, or conical tube, and

STEP 6 : It stop once the tube is off on the rubber platform.



4.2 Run-mode

STEP 1 : Place rubber platform, micro plate tray, or conical tube tray on the top [3.3.4]

STEP 2 : Connect power to the unit [3.4]

STEP 3 : If press operation mode switch up, convert to Run mode.

STEP 4 : Turn dial knob to right and adjust Rpm you want.

4.3 Stop

It stops if you turn dial knob to left hand edge or put operation mode switch in the Center (0)

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⚠ CAUTION
Make it sure that micro plate and attachment for conical tube should be placed correctly and tightly before stirring.

⚠ CAUTION
Set 0 rpm and select mode to use RUN. Rotate knob slowly. Contamination can be happened between samples in micro plate due to large quantity in micro plate.

⚠ WARNING
Maximum load on platform is 0.5 kg. Stirring could not work properly excess load and samples are not mixed properly.

5.0 Safety device

Over current protection

If excess force to the top plate is pushed, the unit pauses temporarily to protect motor and the unit.

6.0 Preventive Maintenance

6.1 Periodic maintenance

Classifications	A period of checking time	
	daily	weekly
Generals		
Power cord		
The conditions of connection for power supply	●	
The presence of power supply and an adaptor contact wetting, and cable peeling off, and out of contact.	●	
Top plate and accessories cleaning		●
Condition of surface cleaning		●
Vortex		
Controller function checking : Switch, dial knob	●	
The status of ON/OFF on motor	●	
The status of motor speed up and down	●	
Check accessory attachments to the unit are tight.	●	

6.2 Cleaning for top plate and accessories

6.2.1 Top plate

There is on/off button middle of top plate for touch function mode.

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.

6.2.2 Accessories

Remove a contaminant by cleaning the unit frequently with a soft cloth before and after

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using, otherwise it cannot 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.

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	Check power supply from the outlet and adapter type are correctly matched.
		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	If the socket / plug / main power line are cut, request service.

	line might be cut	
	PCB has demaged 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.
	Short circuit caused by reagents penetrating into internal circuit of the unit.	Request service.
Button doesn't operate well	Power failure	Find out the causes of power failure and recovery.
	Button switch has damaged	Request service.

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7.2 Trouble during operation

Trouble	Causes	Solution
Normal Vortex formation and mixing are not attained	Too much soultion(solvent)	Reduce volume of solution (solvent) or increase RPM slowly.
	Tube and correct point of contact are not attained.	stick the tube exactly in case of use rubber platform for mixing. Insert the tube exactly in the hall in case of use sponge lac.
	High viscosity Substance is mixing	High viscosity Substance doesn't be mixed properly.
Some kind of bumping sound from inside	Something could be loosened..	Request service.
unit suddenly stops the action	Motor stop by excessive pressure	mix the material with proper pressure in order to prevent the operation of the overpressure sensor.
In case where the rotation speed will not be controlled normally	Too much soultion(solvent)	Reduce volume of solution (solvent) or increase RPM slowly.
	BLDC motors and circuit troubles.	Request service.
Dial button doesn't operate well.	Button error	Request service.

8.0 Appendix

8.1 Technical Specifications

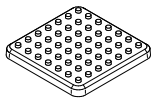
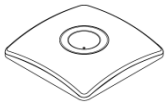
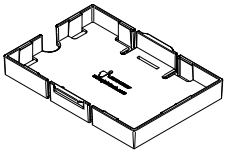
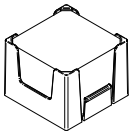
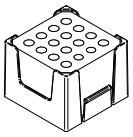
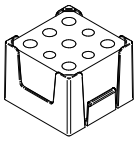
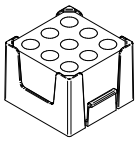
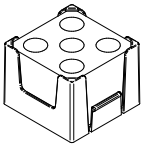
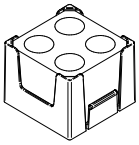
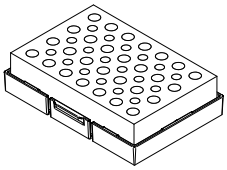
Model		VM-96T
Technical Data	Motion	Orbital
	Speed range(rpm)	Max, 3,000
	Speed setting/display	Analog/Scale
	Speed control type	Adjustment knob
	Orbit(mm, dia.)	4
	Motor rating input(W)	12
	Motor rating output(W)	6
	Maximum power dissipation (W) Include power adapter (no load)	7
	Motor type	BLDC(Brushless Direct Current) motor
	Drive system	Eccentric drive & support arm with vibrating motion
General Data	Exterior dimension with Standard Rubber Platform (W×D×H) (mm/inch)	148 x 159 x 77 / 5.8 x 6.3 x 3
	Electrical requirement	DC 24V & 2.5A Power adapter with free voltage and frequency (AC 100 ~ 240V, 50/60Hz)
	Permissible ambient temperature (°C)	+5 ~ 40
	Permissible Relative Humidity (%)	80
	Safety device	Current limit protection
	New weight(kg/lbs)	2.6 / 5.7
Materials	Body	Polypropylene
	Rubber platform	Silicone rubber
	Tube & Micro-plate tray	POM
	Test tube sponge rack	POM

※ Data that is not specifically marked 25 °C, 60 % RH in the value.

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

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8.2 Accessories

Designation	Order No.	Description
	VMS0058	Standard Rubber Platform
	VMS0011	Pop-off Rubber Platform, Test tube & small vessel up to Φ 50mm
	VMS0008	Micro-plate Tray
	AAA36520	Tube Holder with Insert Retainer For shaking test tube & small vessel(tube) up to Ø 50mm
	AAA36521	Tube Holder with Insert Retainer For 16 Test tubes & 1.5 to 2.0mL micro tubes Ø 10mm
	AAA36522	Tube Holder with Insert Retainer For 9 Test tubes Ø 12mm
	AAA36523	Tube Holder with Insert Retainer For 9 Test tubes Ø 15mm
	AAA36524	Tube Holder with Insert Retainer For 5 Test tubes Ø 20mm
	AAA36525	Tube Holder with Insert Retainer For 4 Test tubes Ø 25~29mm
	AAA36526	Tube Holder with Insert Retainer For 28 Test tubes Ø 10mm And 18 Test tubes Ø 8mm

8.3 Warranty

8.3.1 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.

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

8.3.2 Technical Service Contact Points

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

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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.

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