

# Operation Manual

## Vortex Mixer

Model: VM-96E

Manual No. : 361115L002 Version : 0.0





 **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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## 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.

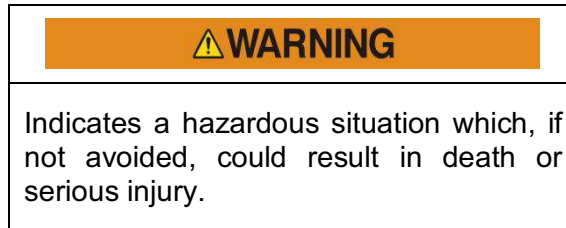
1. The alert marks are for safety operation and protect user and instrument from Damage.
2. Signal word panels are a method for calling attention to a safety messages or property damage messages and designate a degree or level of hazard seriousness.
3. Pay attention enough to the contents of alert marks.

Signal words	Purpose
 <b>WARNING</b>	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
<b>NOTICE</b>	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.



**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.

**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.**

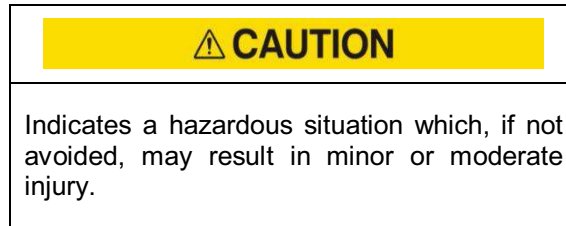
It may influence that product life and operation properly.

**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 statements.



**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.

**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 focus 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.

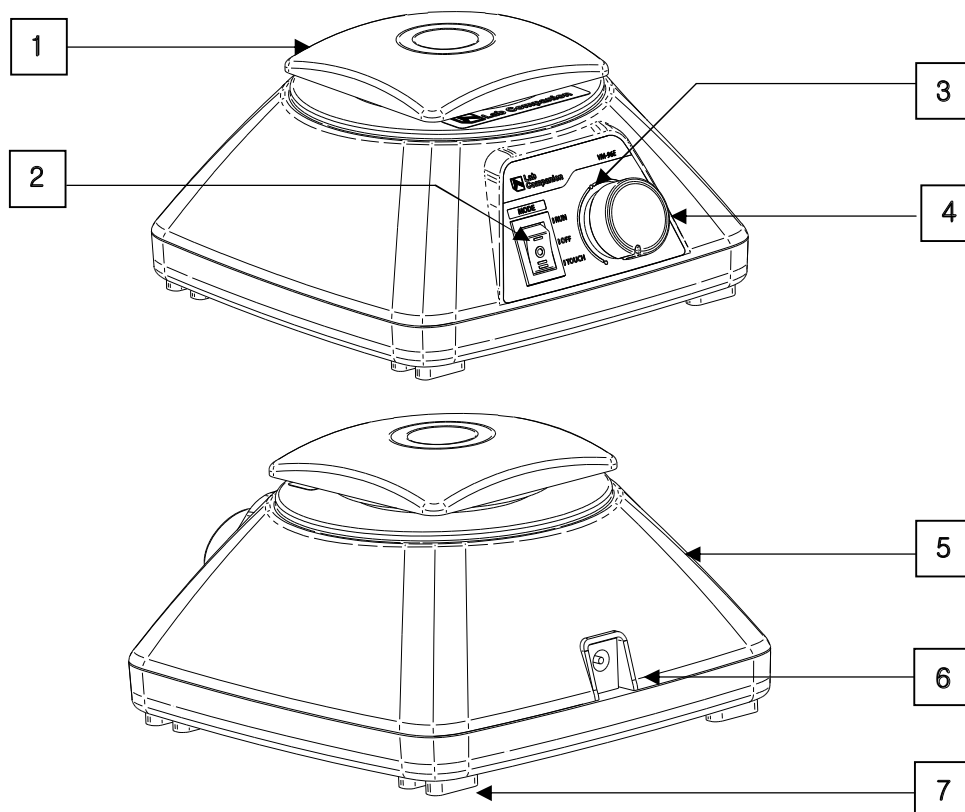
### 2.2 Features

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.



## 2.3 Structure [VM-96E]



- (1) **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 24V, 1A Power adapter with free voltage and frequency (AC 100 ~ 240V, 50/60Hz)
Rubber platform	1	-

### 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 : RH 10 ~ 80%
- Maximum altitude: up to 2,000m

 <b>WARNING</b>
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 30cm away from the other equipments, or devices.

 <b>CAUTION</b>
Do not place the unit near by the other laboratory equipments which can be readily influenced, even by week motor vibration.

#### 3.3.3 Arrangement of unit

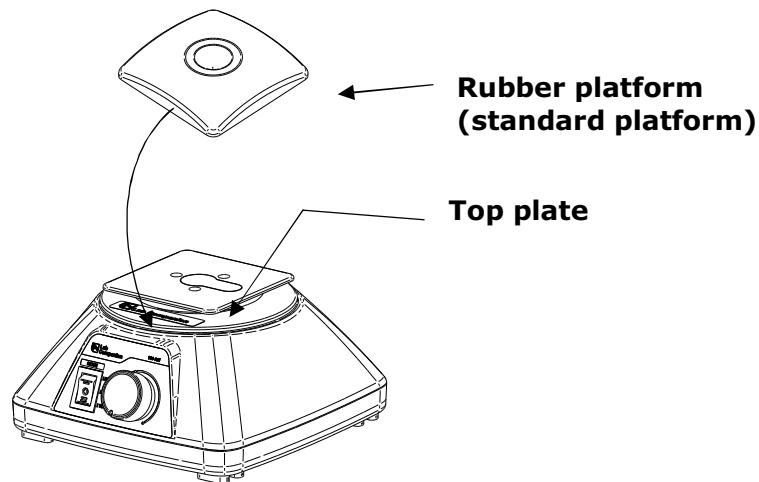
- STEP 1:** Ensure that the unit will be paralleled to the table.
- STEP 2:** Place the unit to be fixed tight to non-slip foot on the table.

### 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.

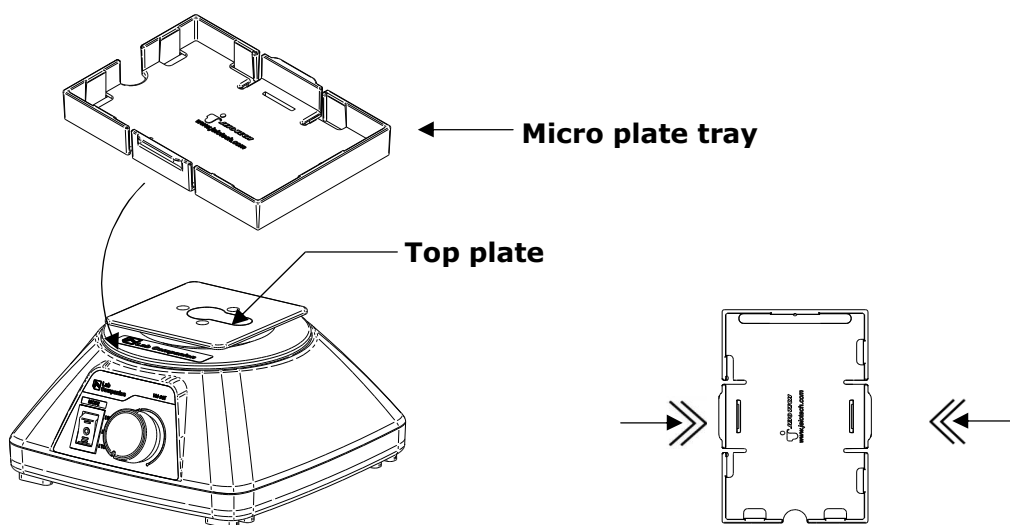
- STEP 1:** Place Rubber platform on top of top plate paralleling with the upper part of top plate.  
**STEP 2:** Insert each corner to be fixed tight until Rubber platform should be put it together.



#### 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.



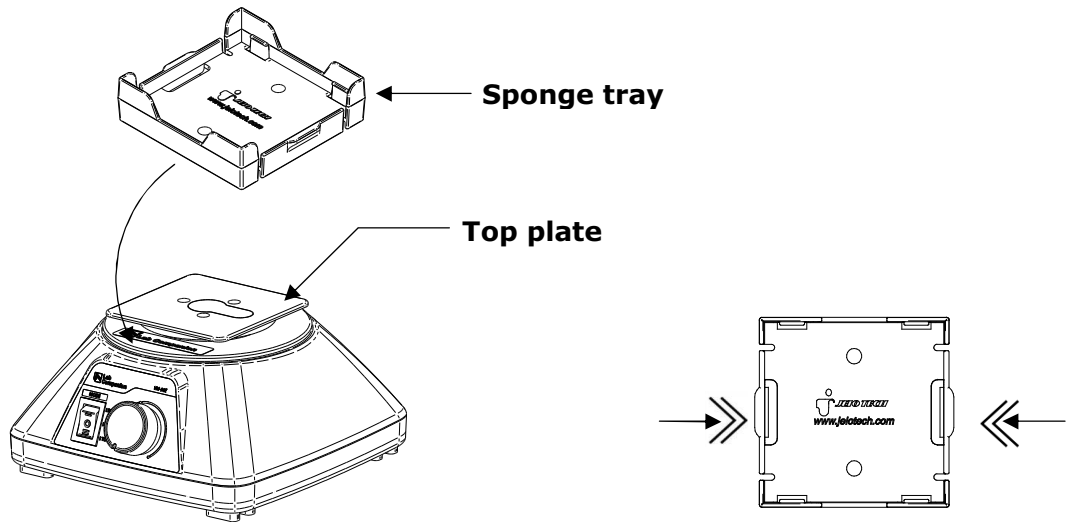
**[Pressing the left/right ward to fit it]**

### 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.

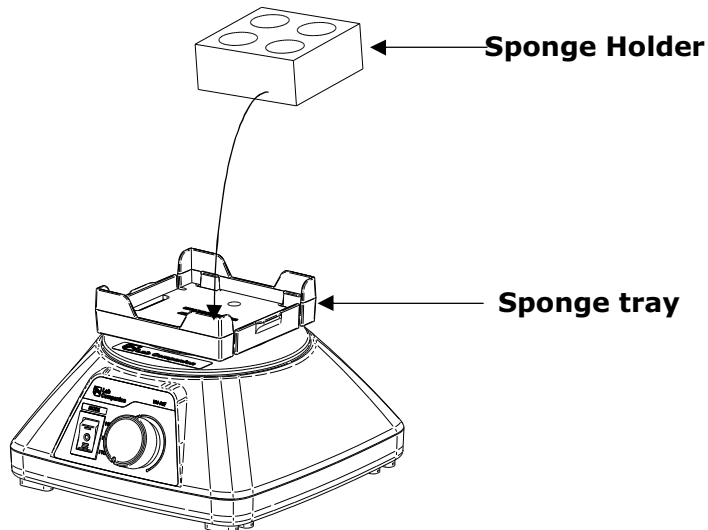
**STEP 2:** Insert Sponge tray by pressing the left/right part of them on top of top plate at the same time.



**[Pressing the left/rightward to fit it]**

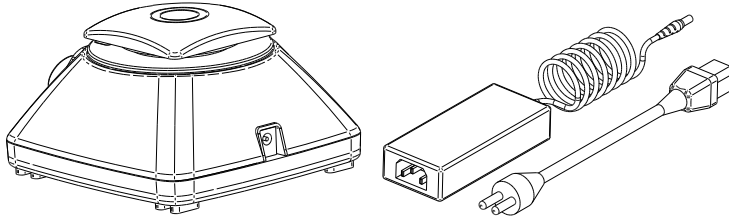
**STEP 3:** Pick up the sponge corresponding to the size of test tube, insert it to the tray.

\* 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 4:** Connect the power cord to the consent of the electric power supply

#### **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 instructions 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 plat form[3.3.4.1]

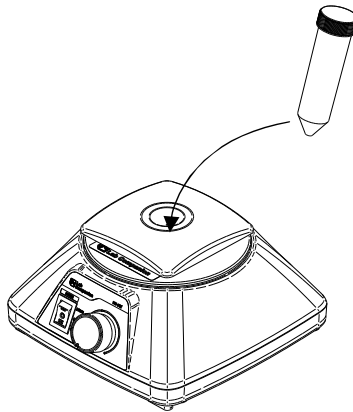
STEP 2: Connect power to unit [3.4 ]

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)

 **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 0.5Kg.  
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
<b>Generals</b>		
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		•
<b>Vortex</b>		
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 using, otherwise it cannot be readily wiped out for a long time.  
Keep the unit clean always without any contaminant.



### 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
<b>The unit does not turn on</b>	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 line might be cut	If the socket / plug / main power line are cut, request service.
	PCB has damaged by reagent	Request service.
<b>Room circuit breaker trips often when the unit is turned on or running</b>	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.
<b>Button doesn't operate well</b>	Power failure	Find out the causes of power failure and recovery.
	Button switch has damaged	Request service.

## 7.2 Trouble during operation

Trouble	Causes	Solution
<b>Normal Vortex formation and mixing are not attained</b>	Too much solution(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.
<b>Some kind of bumping sound from inside</b>	Something could be loosened..	Request service.
<b>unit suddenly stops the action</b>	Motor stop by excessive pressure	mix the material with proper pressure in order to prevent the operation of the overpressure sensor.
<b>In case where the rotation speed will not be controlled normally</b>	Too much solution(solvent)	Reduce volume of solution(solvent) or increase RPM slowly.
	BLDC motors and circuit troubles.	Request service.
<b>Dial button doesn't operate well.</b>	Button error	Request service.

## 8.0 Appendix

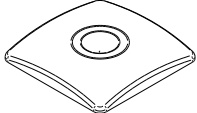
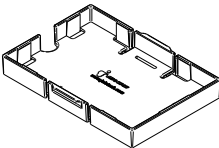
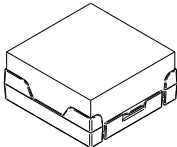
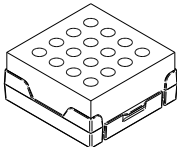
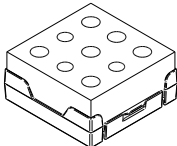
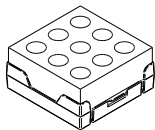
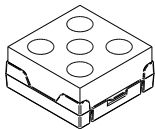
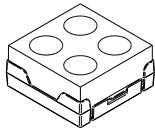
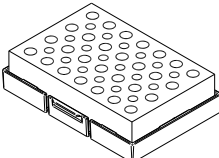
### 8.1 Technical Specifications

Model		VM-96E
<b>Technical data</b>	Motion	Orbital
	Speed range(rpm) with rubber platform	200 ~ 3,000
	Speed control type	Scale
	Orbital diameter (mm)	4
	Operating mode	Touch & Continuous
	Maximum power dissipation (W) Include power adapter (no load)	7
	Motor type	BLDC motor
	Drive system	Eccentric drive & support arm with vibrating motion
<b>General data</b>	Overall dimension with rubber mat (W×D×H mm)	148 x 159 x 85
	Electrical requirement	Product input : DC 24V, 1A Power adapter input : 110V ~ 240V, 1.5A, 50 / 60 Hz
	Permissible ambient temperature (°C)	+5 ~ 40
	Permissible Relative Humidity (%)	80
	Safety device	Current limit protection
	Max. supported load include attachment (kg)	0.5
	Electrical requirements	AC 100V~240V, 50/60Hz
	New weight(kg)	2.6
<b>Materials</b>	Body, Tube & Micro-plate tray	Polypropylene
	Rubber platform	Silicone
	Test tube sponge rack	Polyethylene

※ 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.

## 8.2 Accessories

Designation	Order No.	Description
	VMS0011	Rubber platform, Test tube & small vessel up to Ø 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 25mm
	AAA36526	Tube Holder with Insert Retainer For 28 Test tubes Ø 10mm And 18 Test tubes Ø 8mm

## 8.3 Warranty

### 8.3.1 General

- (1) The warranty period of two (24 months) years, covering for defects in workmanship and material when used under recommended conditions, as set forth in the operating manuals for such equipment.
- (2) Jeio Tech needs to know for better and quick service when service needs.

- Purchasing date
- Serial number on Identification plate.
- Defect and trouble
- Application and using condition.

### 8.3.2 Warranty exception

This warranty does not cover any unit even under warranty period.

- Abuse, ▪ Misuse, neglect, and accident
- Improper application, repair or attempt repair not authorized by Jeio Tech
- Fire, water, power outage, power surge, lighting, or other acts of nature.
- Damage as the result of not being complied by manual.

## 8.4 Service & Technical assistance

Jeio tech provides best service based on perfect customer system which we always think at customer side. Please let us know product model, trouble conditions, your contact number, so we can provide rapid service on your request. In addition, regarding purchasing product's accessories, please contact headquarters or authorized agents.

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