



OPERATION MANUAL

Vortex Mixer

Model: VM-96A

Manual No.360215L002 Version :0.0



⚠ 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.

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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.

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.

 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.

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

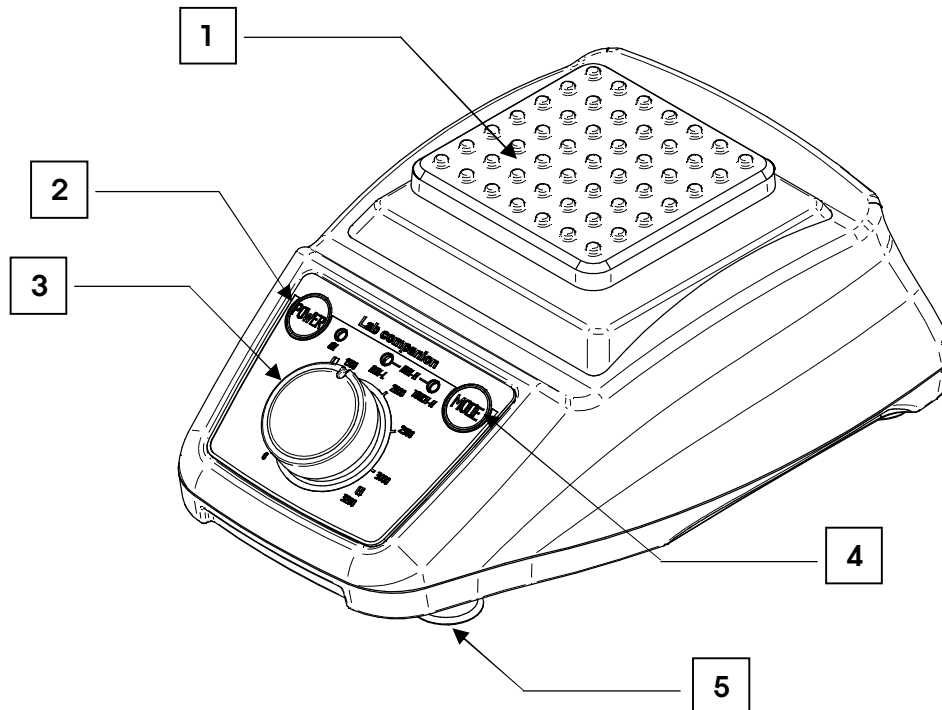
This vortex mixer focus on melting sample or homogenizing concentration by the formation of Forced-vortex motion for fluid in test tube or other experiment vessel etc. For example it is often adopted for experiment of immunoprecipitation using protein, Peptide, manicuring DNA concentration, correction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

2.2 Features

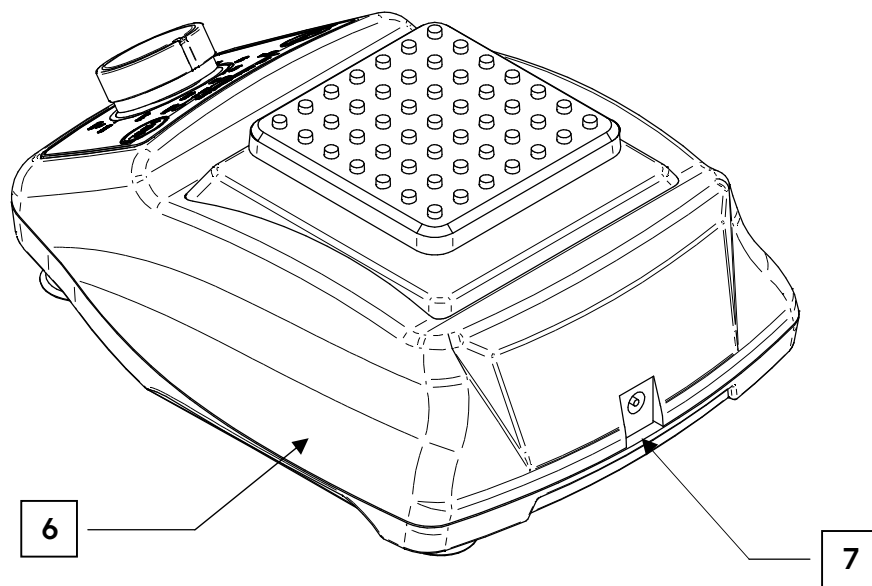
This product is aimed by user safety in laboratory, convenience and follow feature.

- It makes immediate Vortex less than 4 sec with Amplitude of rotation: 4mm and rate of rotation: 0 ~ 3,000rpm.
- Offering touch and continuous modes support convenient operating depend on user experiment purpose.
- This vortex mixer offer easy converter mode between touch and continuous.
- It offer two speed modes which is low speed mode; under 1,500rpm by RUN mode, and high speed mode; controlling before 3,000rpm can prevent contamination between samples during the extermination processing.
- 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.
- Adopting Adjustment knob and easy indicative controller panel offer correctly RPM controlling for reproducibility experiment.
- 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-96B]



- (1) **Rubber platform:** used for Touch mode only.
Applied to mix the samples by using Test tube, or Micro tube, or Micro-plate
- (2) **Power button:** supplying the electric power.
- (3) **Dial Knob:** Regulating of mixing speed.
- (4) **Mode button:** Selecting one of 3 modes; " RUN", "TOUCH", "RUN-Hi".
 - A. TOUCH: after installing rubber platform on top of top plate, pushing applying various samples on it activates touch mode.
 - B. RUN: Continuous mode, speed up to 1,500 rpm.
 - C. RUN-Hi: Continuous mode, speed up to 3,000 rpm.
- (5) **Foot:** Supporting the body not to slip when operation.



(6) **Body:** made in PP (Polypropylene) featuring excellent chemical resistant material.

(7) **Socket:** Connected to the electric power cable.

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

Accessories	QUANTITY / RECEIVED	DESCRIPTION
Standard Rubber Platform	1/OK	-
Pop-off Rubber Platform	1/OK	-
Sponge Tray	1/OK	-
Micro-plate Tray	1/OK	-
Sponge & Tube Holder	4/OK	For test tubes & conical tubes

3.3 Installation

3.3.1 Environmental conditions

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

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 30cm 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 weak 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

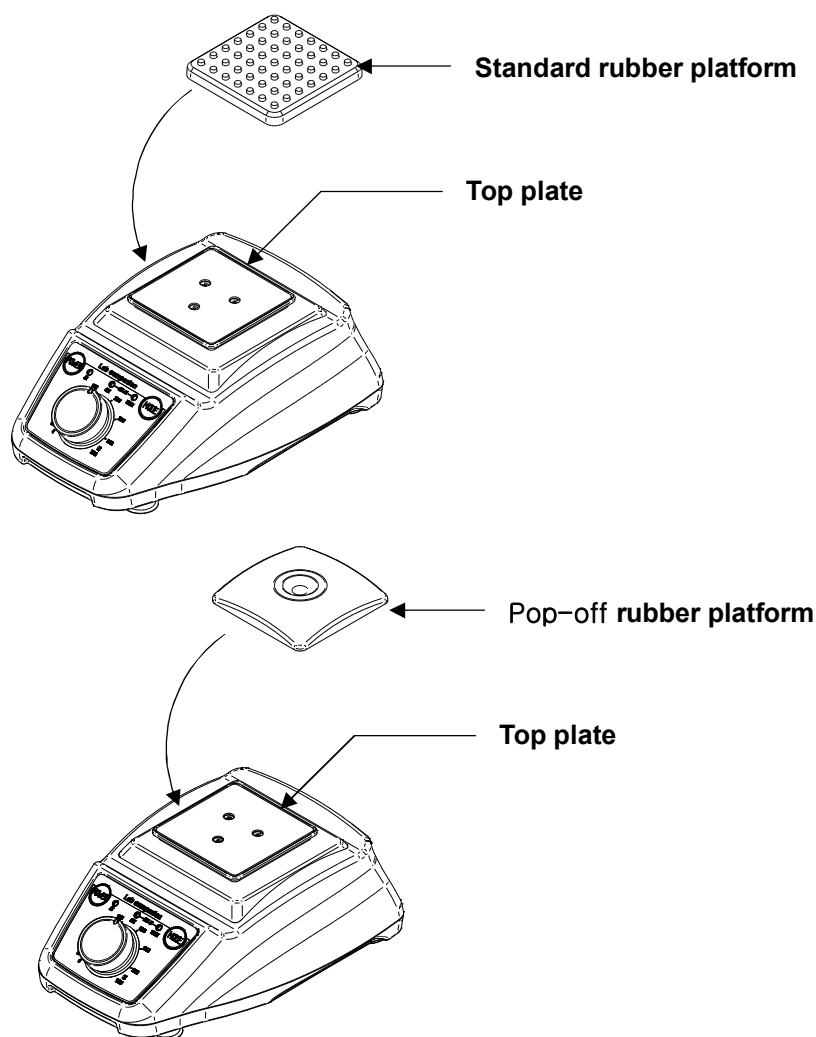
3.3.4.1 Mounting Rubber platform

– Standard rubber platform

This is most common used platform. In TOUCH mode, or RUN mode, used for the standard platform by using test tube, Micro tube and beaker to mix test sample or specimen.

– Pop-off rubber platform

In TOUCH (notch in the center platform) mode, or RUN mode, used for the platform by using test tube, Micro 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.

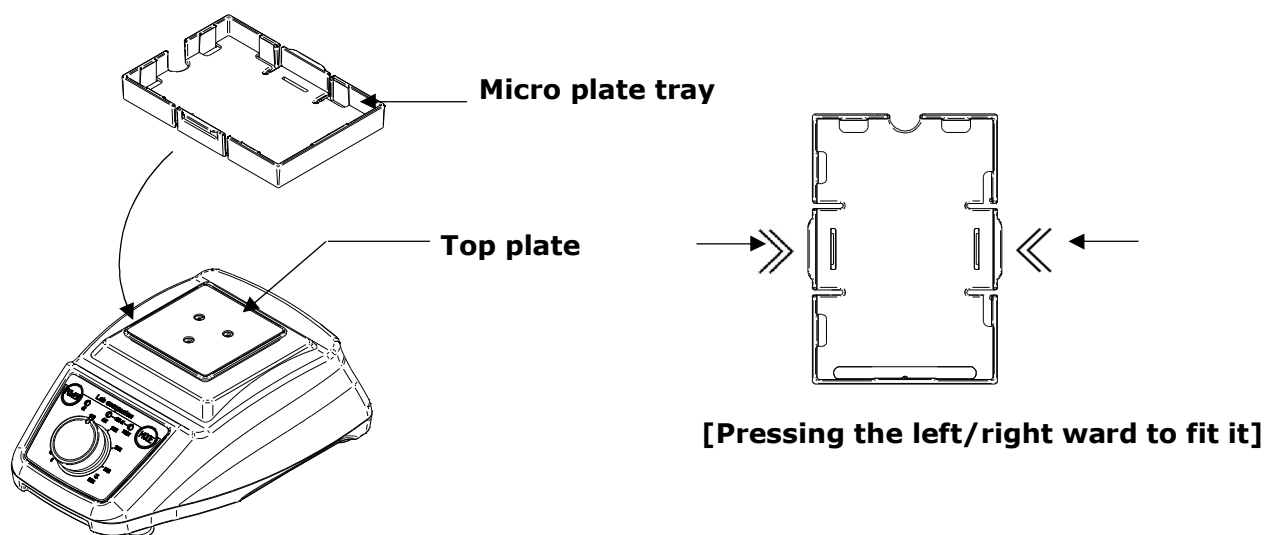
STEP 2: Insert each corner to be fixed tight until Rubber platform should be put it together.

3.3.4.2 Mounting Micro plate tray

In RUN 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.

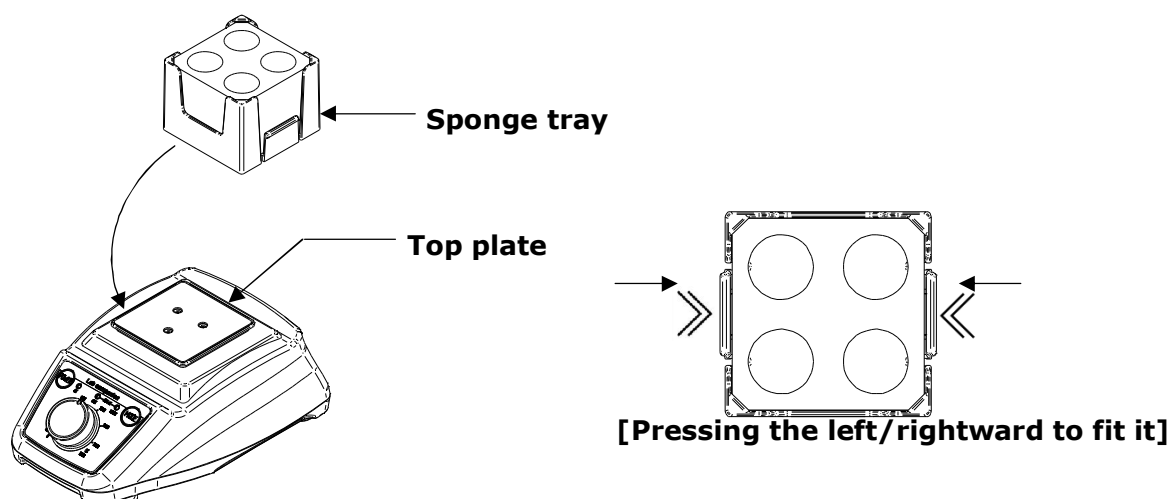


3.3.4.3 Mounting Test tube tray

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

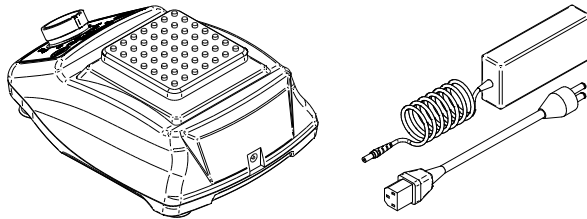
STEP 1: Place mounting test tube tray on top of top plate paralleling with the upper part of top plate.

STEP 2: Pressing the left/right part of them on top of top plate at the same time.



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.

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

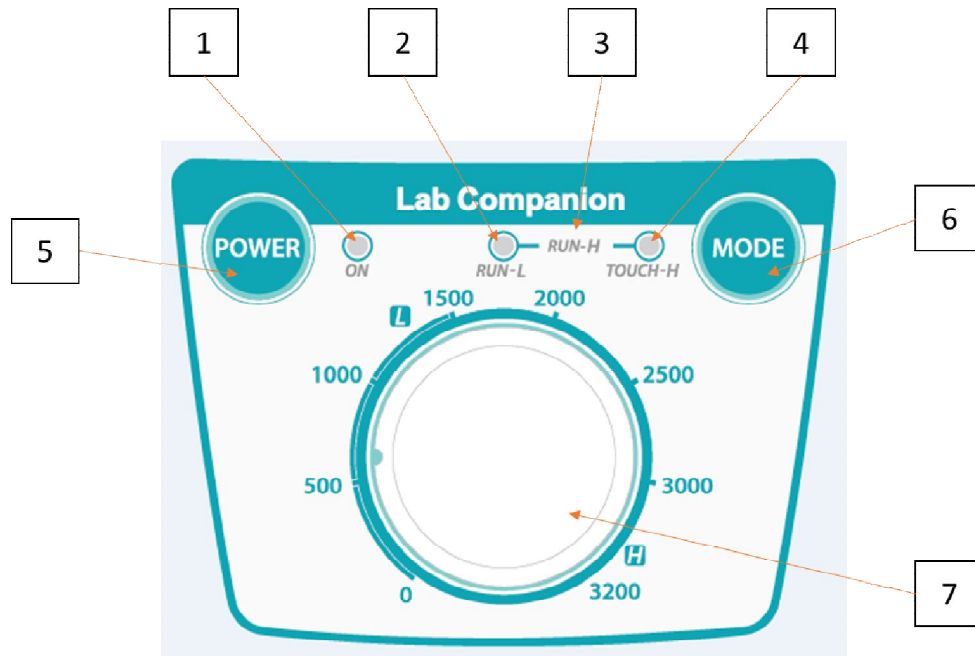
Never use a forked socket, or a double-tapped socket.

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 Controller – name and function



- (1) **Power Display LED:** Lighting it on when the power is on.
- (2) **Run-L Mode LED:** Indicating “stand by” and “operation” in continuous mode during the operation from 0 to 1,500rpm.
- (3) **Run-H mode:** Indicating “stand by” and “operation” in continuous mode of High speed during the operation from 0 to 3,000rpm.
- (4) **Touch-H Mode LED:** Indicating “stand by” and “operation” in touch mode, activated by the touch of the platform during the operation from 0 to 3,000rpm.
- (5) **Power Button:** power on/off button.
- (6) **Mode Button:** selection button for the control mode; “RUN-L”, “TOUCH-H” & “RUN-H” mode.
- (7) **Dial Knob:** Adjusting dial button to set the speed of rotation as the strength of a vibration.

4.2 Functional description of controller.

4.2.1 Controller function

(1) Touch H mode:

It stirs when pressing the sunken place on the rubber platform.(standard offer)
Rotate knob to clockwise and counterclockwise and set RPM.

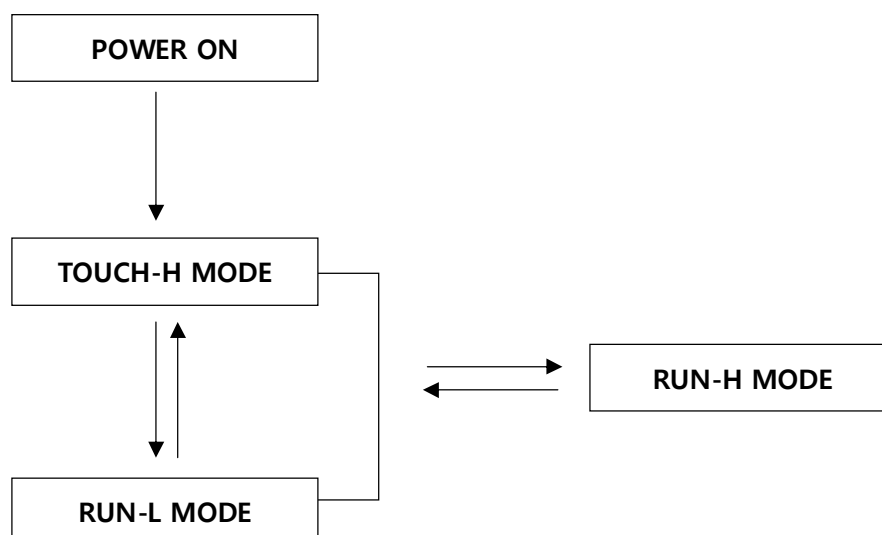
(2) RUN L mode:

Set RPM with dialing knob and it runs continuously. RPM is limited from 0 ~ 1500RPM to prevent cross contamination between samples in micro plate. It stirs high speed with rubber platform, test tubes, or accessories with micro plate.

(3) RUN-H mode:

It stirs over 1500RPM.

4.2.2 Function flow



Mode change between TOUCH-H and RUN-L mode: Press mode button 1 time.

Mode change between TOUCH-H or RUN-L and RUN-Hi: Press mode button 5 seconds.

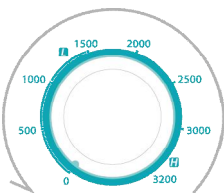
4.3 How to use controller

4.3.1 Touch mode

STEP 1: Equip Rubber Platform on the top.
[Refer to 3.3.4]

STEP 2: Connect power. [Refer to 3.4]

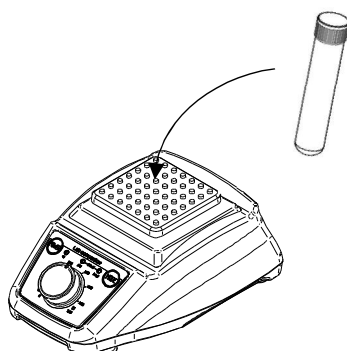
STEP 3: Set RPM at "0" with knob.

Action	LED Status
	   

STEP 4: Press POWER button 1 time.
* ON and TOUCH LED is on.

Action	LED Status
	   

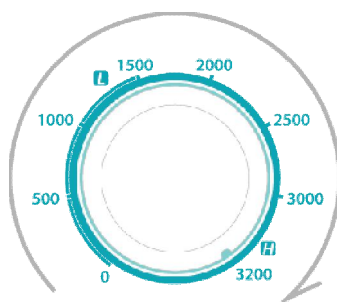
STEP 5: Press the sunken round part on rubber platform with test tube, micro tube, or conical tube, and etc.



NOTICE

TOUCH mode is basic model. Initial mode is TOUCH mode when power is on.

In case of Pop-off rubber platform, available to using touch mode by press the center of notch on platform.



NOTICE

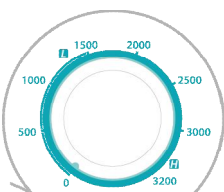
In case of touch mode, Max. operation range is max. 3000rpm

4.3.2 RUN mode

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

STEP 2: **Connect power.** [Refer to 3.4]

STEP 3: Set RPM at “0” with knob.

Action	LED Status
	   

STEP 4: Press POWER button 1 time.

* ON, TOUCH-H LED is on.

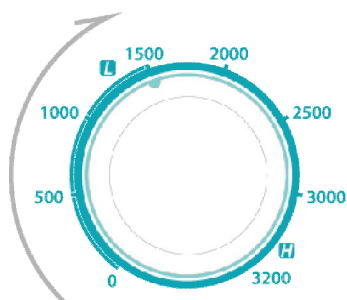
Action	LED Status
	   

STEP 5: Press MODE button 1 time.

* ON, RUN-L LED is on.

Action	LED Status
	   

STEP 4: Rotate knob to clockwise and set RPM to stir.. .



NOTICE

Run-L mode only offer max. 1500 RPM for user safety. In case of user want to use more high speed than 1500 rpm, change to operating mode to Run-H mode.

⚠ 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.

NOTICE

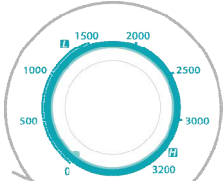
When you press the mode button continually, the mode will be change between TOUCH-H to RUN-L mode.

4.3.3 RUN H-Mode

STEP 1: Choose rubber platform, micro-plate tray, or conical tube tray and put it on the top. [Refer to 3.3.4 Accessories]

STEP 2: **Connect power** [Refer to 3.4]

STEP 3: Set RPM at “0” with knob.

Action	LED Status
	   

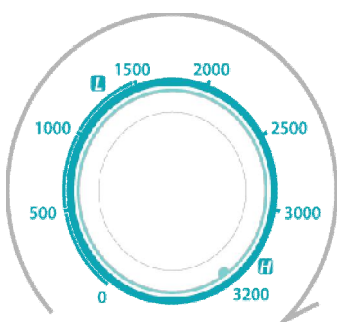
STEP 4: Press POWER button 1 time
* ON and TOUCH-L LED are on.

Action	LED Status
	   

STEP 5: Press MODE button 1 time for 3 seconds.
* ON, RUN, TOUCH-H LED are no.

Action	LED Status
	   

STEP 6: Rotate knob to clockwise and set RPM to stir.



NOTICE

To return previous MODE from RUN Hi-Mode, press MODE button 1 time.

 CAUTION

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

 CAUTION

During Run-H mode operating, Please do not use continually over 3 hours.

 CAUTION

Set 0 rpm and press MODE button to select a mode.

Rotate knob slowly.

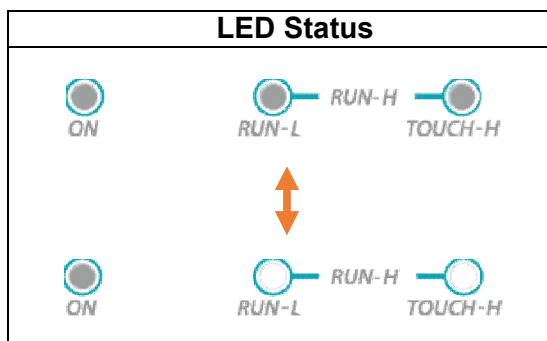
Contamination can be happened between samples in micro plate due to large quantity in micro plate.

5.0 Safety device

`Self-resetting & Over current protection`

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

- **High pressure shut-off safety device. Ex) (RUN-L LED and TOUCH-H LED lamp is cross-flashing)**



Each LED alternates between TOUCH and RUN. The unit pauses for 5 seconds at the same time.

Unit is back to previous mode after 5 seconds pause.

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 and an adaptor.	•	
- The presence of power supply and an adaptor contact wetting, and cable peeling off, and out of contact.	•	
top plate and accessories cleaning		•
Surface cleaning		•
Vortex		
Controller function checking		•
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.

 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	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.
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. 1. Check that several similar units are inserted together, if so you should not use overly.
No LED	Power failure	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.
Button doesn't operate well	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
Normal Vortex formation and mixing are not attained	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.
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	BLDC motors and circuit troubles.	Request service.
Dial button doesn't operate well.	Button error	Request service.
Dial button doesn't work out	controller error	Request service.
	Button has damaged.	Request service.

8.0 Appendix

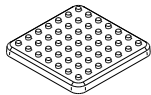
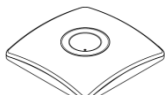
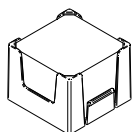
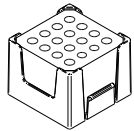
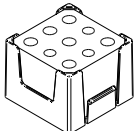
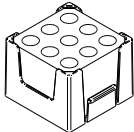
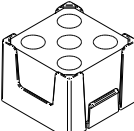
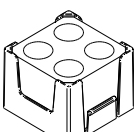
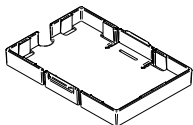
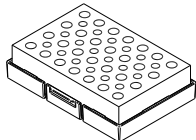
8.1 Technical Specifications

Model		VM-96A
Technical data	Motion	Orbital
	Speed range(rpm)	Max, 3,000
	Speed setting/display	Analog/Scale
	Speed control type	Adjustment knob
	Orbit(mm/inch, dia.)	4/0.16
	Operating mode	Touch-H, Run-L, Run-H
	Motor rating input(Wi)	12
	Motor rating output(Wo)	6
	Motor type	BLDC(Brushless Direct Current) motor
	Drive system	Eccentric drive & support arm with vibrating motion
General data	Exterior dimension without attachment(W×D×H) (mm/inch)	154 x 210 x 84/6.1 x 8.3 x 3.3
	Electrical requirement	DC 24V & 2.5A Power adapter with free voltage and frequency (AC 100 ~ 240V, 50/60Hz)
	Permissible relative temperature(℃)	+5 ~ 40
	Permissible relative humidity(%)	80
	Safety device	Self-resetting/Current limit protection
	Protection class acc. to DIN EN 60529	IP 42
	Body	Polypropylene
Materials	platform	Silicone
	Tube & Micro-plate tray	POM
	Test tube sponge rack	POM

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

※ Protection class acc. to DIN EN 60529: water proof, vibration proof test according to DIN

8.2 Accessories

Designation	Order No.	Description
	VMS0058	Standard Rubber Platform
	VMS0011	Pop-off Rubber Platform, Test tube & small vessel up to Ø50mm
	AAA36520	Tube Holder with tray For shaking test tube & small vessel(tube) up to Ø 50mm
	AAA36521	Tube Holder with tray For 16 Test tubes & 1.5 to 2.0mL micro tubes Ø 10mm
	AAA36522	Tube Holder with tray For 9 Test tubes Ø 12mm
	AAA36523	Tube Holder with tray For 9 Test tubes Ø 15mm
	AAA36524	Tube Holder with tray For 5 Test tubes Ø 20mm
	AAA36525	Tube Holder with tray For 4 Test tubes Ø 25~29mm
	VMS0008	Micro-plate Tray
	AAA36526	Tube Holder with tray For 28 Test tubes Ø 10mm And 18 Test tubes Ø 8mm

8.3 Disposing of unit

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

8.4 Warranty

8.4.1 General

- (1) The warranty period of twelve (24) months, 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.

8.4.2 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.

8.5 Service & Technical assistance

Jeio tech provides best service based on perfect customer system which we always think at customer side.

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