



LP Vortex Mixer

Catalog #88880017 & 88880018

Operation Manual 9240-11-015

Thermo
SCIENTIFIC



Important 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. ▲

Caution All internal adjustments and maintenance must be performed by qualified service personnel. ▲

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MANUAL NUMBER 9240-11-015

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REV	ECR/ECN	DATE	DESCRIPTION	By

This manual contains important safety and operation information. You must carefully read, understand, and follow all the instructions in this manual prior to operating this instrument. Keep this manual in a safe place nearby for reference and make it easily available to all users.

- 1) This manual highlights WARNING/CAUTION/NOTICE alerts to prevent injury or property damage and also to achieve optimum performance of your instrument.
- (2) These alerts are classified into four types in this manual depending on the importance and the risk levels as described below:

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

- 3) The claim which is out of the quality guarantee published by the Manufacturer is out of Manufacturer's responsibility.
- 4) The damage which is from unexpected fault or damage of user by Acts of God is out of Manufacturer's responsibility.

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Section 1 Important Information

WARNING

Ignoring the following warnings could cause serious injuries or even fatal accidents.

Check the voltage, phase and capacity of power supply on the ID plate before installation. Connect properly.

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

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

Do not install the product in a place that gas could leak. Do not use in a place that has industrial oil smoke or metallic dust. It causes fire or electric shock. Do not use the machine near to places where explosion could happen due to organic evaporating gases.
Explosive materials: acid, ester, nitro compound.
Inflammable materials: salt peroxides, inorganic peroxide, salt acids.

Check equipment for permissible environmental conditions when using inside of Temperature and Humidity Chamber or Incubator. It can be the cause of fire or trouble by stirrer electricity, electronic, and damage of motor. Stirrer's permissible environmental condition. Temperature 5°C to 40°C, Maximum relative humidity 80%.

Unplug if there is a strange sound, smell and/or smoke from the product. Stop operating and request the service.

Keep out of the direct sunlight. It may influence product life and proper operation.

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

Do not assemble, repair, modify on your own. The product may not work well and electric shock is possible with changes in the efficiency of the product. Also this will void the warranty.

 CAUTION

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

Do not put heavy things on the power cord. Do not put the machine on the cord. It may take off the wire coating and cause electric shock or fire.

Do not touch it with wet hands and place the main plug correctly. It could cause the electric shock or injuries.

Installing power outlet near instrument may be convenient.

Do not install the stirrer near machinery generating high frequency noise. Avoid installation close to high frequency- welding machine, sewing machine, or mass SCR controller.

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

Do not pour water or put liquid on the top of the product when cleaning. Disconnect the main power immediately and request the service if water may be in the product.

Do not let the product take any strong shock or vibration. It could cause abnormal operation or trouble. It may deteriorate the ability of the product operation 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.

Power off while product cleaning. It may cause electric shock or fire.

Do not drop or allow the the machine to fall. It will cause wrong operation and malfunction.

Disposing of Product

Dispose the unit with separating plastic mold, and motor.

Section 2 Functional Description

The Vortex Mixer focuses on melting samples 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 used in the experiment of immunoprecipitation using protein, peptide, manicuring DNA concentration, correction and dilution.

Features

This product is designed for 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 depending on user experiment purpose.
- This vortex mixer offers easy converter mode between touch and continuous.
- Mixer offers two speed modes:
 - a) continuous mode; under 1,500rpm by RUN mode
 - b) hi-continuous mode; controlling before 3,000rpm can prevent contamination between samples during the extermination processing.
- Highly sensitive touch switch reduces wrist stress when pushing and holding experiment tools. Also reduces operator fatigue and unpleasant feeling.
- Adopting adjustment knob and easy indicative control panel offer correct RPM control for reproducible experiments.
- Designed with a low center of gravity, it can minimize the vibration and sliding caused by the process of high speed mixing.
- There are various sizes and capacities available (test tube, micro-tube, micro-plate) to adopt variety of accessories.
- Functional BLDC motor offers controlling speed properly, maintaining speed and safety. This motor is suitable for reproducibility sample mixing by eccentricity rotating.

Construction



Figure 2-1. Component Locations on Front

Rubber platform: used for Touch mode only. Designed to mix samples by test tube, or micro tube, or micro-plate

Power button: supplying the electric power.

Dial Knob: Regulating of mixing speed.

Mode button: Selecting one of 3 modes; TOUCH”, “Continuous”, “Hi-Continuous”

- Touch: after installing rubber platform on top of top plate, pushing applying various samples on it activates touch mode.
- Continuous: Continuous mode, speed up to 1,500 rpm.
- Hi- Continuous: High-Continuous mode, speed up to 3,000 rpm.

Foot: Supporting the body not to slip when operation.



Figure 2-2. Component Locations on Back

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

Socket: Connected to the electric power cable.

Section 3 Unpacking and Installation

Before unpacking the unit, first check for damages in the package of the unit.

Then unpack the unit. Check carefully to see if there were damages incurred during transit.

After unpacking, check that all unit parts and accessories are as listed below. Contact us or the agent from which you purchased the unit if any components were omitted.

Component	Quantity/Received	Description
User manual	1/OK	--
Power cord	1/OK	DC 24V & 2.5A Power adapter with free voltage and frequency (AC 100 ~ 240V, 50/60Hz)
Rubber platform	1/OK	--

Installation

The unit should be installed in a suitable environment, as below.

	Avoid direct sunlight.
	Room temperature should be 5°C ~ 40°C
	Relative Humidity (RH%) should be less 80%.
	Altitude should be less than 2,000m.

Unit Location

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

CAUTION

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

1. Ensure that the unit is parallel to the table.
2. Before locating on the table, ensure the non-slip feet are fixed tightly to the unit.

Mounting the Rubber Platform

In TOUCH mode, or Continuous/ Hi- continuous modes, replace the standard platform when using test tube or micro-tube to mix test sample or specimen.

1. Place rubber platform on top of top plate, parallel with the upper part of top plate.
2. Insert each corner to be fixed tight until rubber platform is installed.

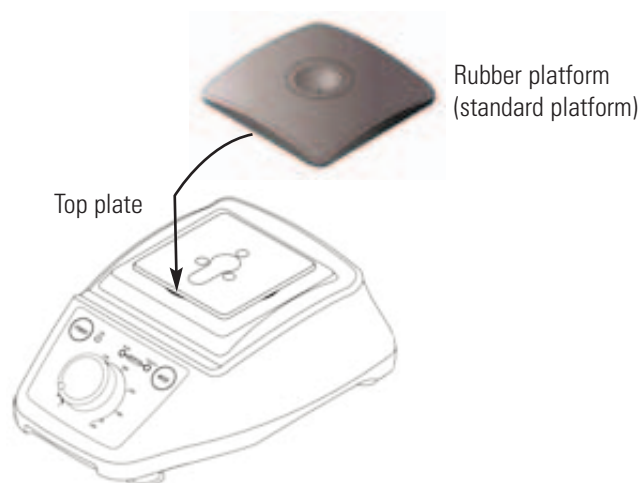


Figure 3-1. Rubber Platform Installation

Mounting Micro-plate Tray

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

1. Place micro-plate tray on top of top plate, parallel with the upper part of top plate.
2. Insert micro-plate tray by pressing in on the left and right side tabs of the tray at the same time. Fit into place on the top plate.

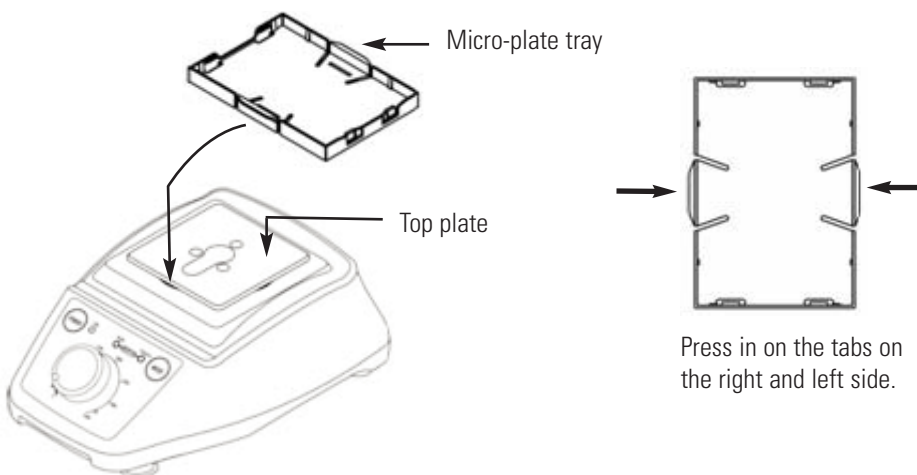


Figure 3-2. Micro-plate Tray Installation

Mounting Test Tube Holder

In Continuous mode, used for mixing test sample by using test tube, or conical tube.

1. Place insert retainer on top of top plate, parallel with the upper part of top plate.
2. Install insert retainer by pressing in on the left and right side tabs of the retainer at the same time. Fit into place on the top plate.

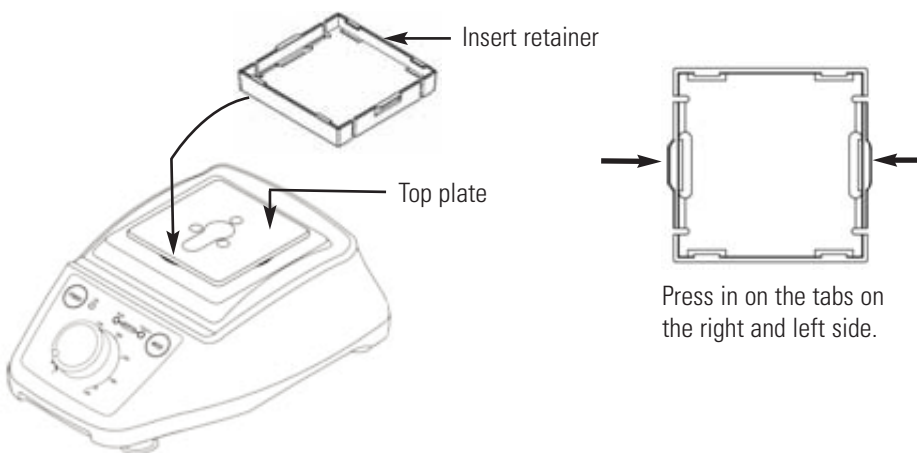


Figure 3-3. Insert Retainer Installation

Mounting Test Tube Holder (continued)

3. Pick up the tube holder corresponding to the size of test tube, insert it into the tray.

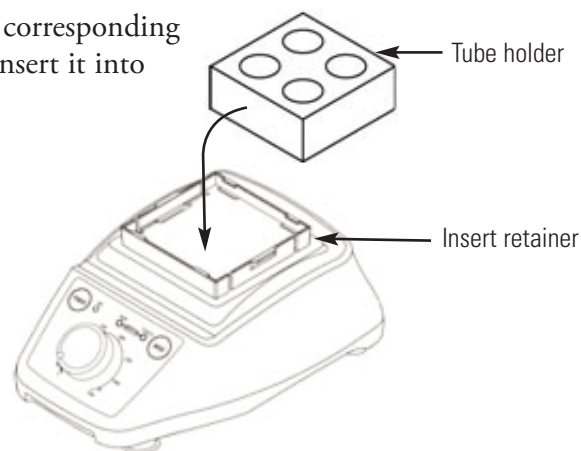


Figure 3-4. Test Tube Holder Installation

Connection to the Main Power Supply

Supply the electric power to the unit per the steps below:

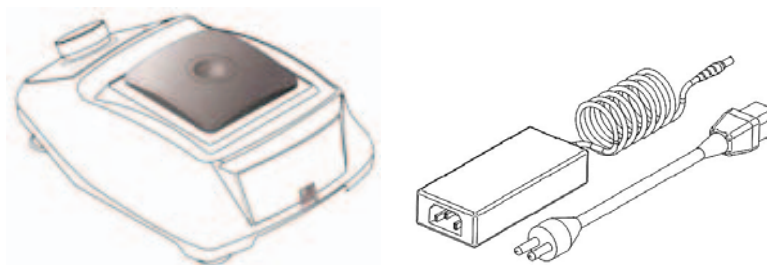


Figure 3-5. Power Cord Installation

1. Position “0” rpm by adjusting dial knob before the power is on.
2. Connect DC plug of the power cord to the socket located on the back of the unit.
3. Connect the power cord to the appropriate electric power supply.

WARNING

- Ensure that the unit should be connected to an appropriate voltage, phase, capacity power source.
- Failure to connect to the proper configuration of power supply will cause the risk of fire, electric shock, and personal injury.
- Never use a forked socket, or a double-tapped socket.
- Failure to obey safety instructions will result in burning the cable, or risk of fire.
- Use only the main power cord recommended by the manufacturer or provided with the unit.

Section 4 Operation

The control panel components and functions are detailed below.

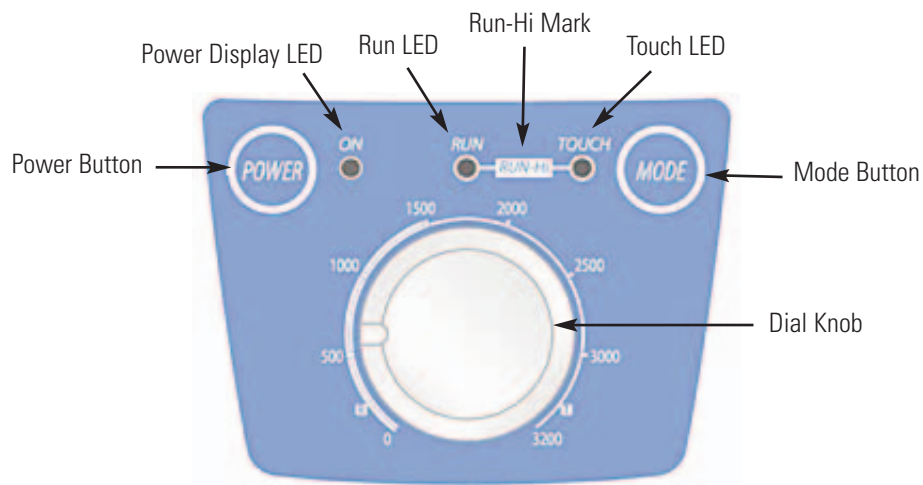


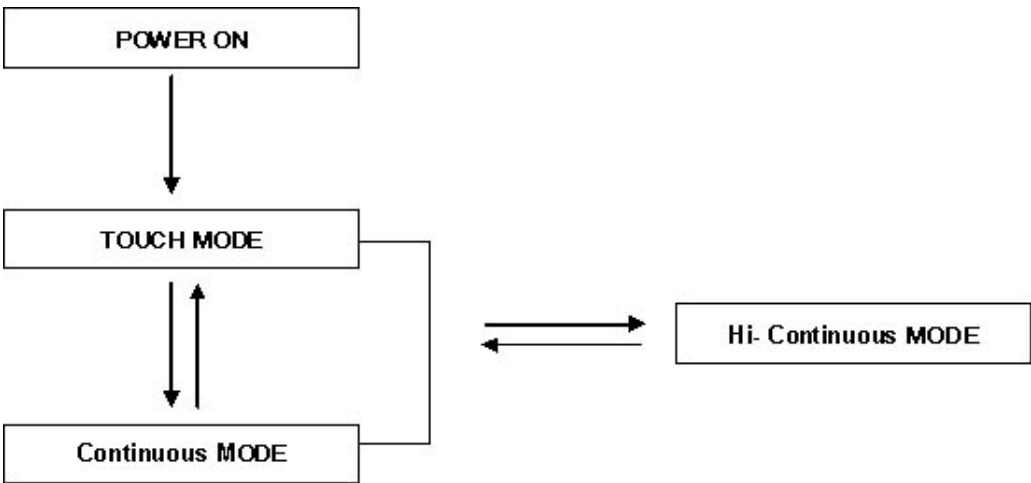
Figure 4-1. Control Panel

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

Controller Functions

- **Touch Mode**
It stirs when pressing the sunken place on the rubber platform (standard offer). Rotate knob to clockwise and counterclockwise and set RPM.
- **Continuous 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.
- **Hi-Continuous Mode**
It stirs over 1500RPM.

Function Flow



- Mode change between TOUCH and Continuous mode:
Press mode button 1 time.
- Mode change between TOUCH or Continuous and Hi- Continuous:
Press mode button 1 time for 3 seconds.

Modes Touch mode

1. Install rubber platform on the top plate (Section 3).
2. Connect power (Section 3).
3. Set RPM at “0” with dial knob.

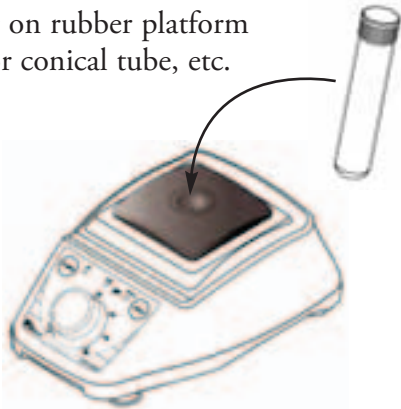
Action	LED Status

Modes (continued)

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

Action	LED Status
	  RUN-HI 

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



NOTICE

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

Figure 4-2. Rubber Platform with Test Tube

Continuous mode

- Place rubber platform, micro-plate tray, or conical tube tray on the top plate (Section 3).
- Connect power (Section3).
- Set RPM at “0” with knob.

Action	LED Status
	  RUN-HI 

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

Action	LED Status
	  RUN-HI 

Modes (continued)

5. Press MODE button 1 time.
* ON and TOUCH LED is on.

Action	LED Status
	  

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

CAUTION

- Make it sure that micro-plate and attachment for conical tube should be placed correctly and securely before stirring.
- Set 0 rpm and select mode to use Continuous/ Hi- Continuous.
- Rotate knob slowly.
- Contamination can occur between samples in micro-plate due to large quantity in micro-plate.

NOTICE

- TOUCH mode and Continuous/ Hi- Continuous mode exchange after pressing the Mode button.

WARNING

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

Hi-Continuous Mode

1. Choose rubber platform, micro-plate tray, or conical tube tray and put it on the top (Section 3).
2. Connect power (Section 3).
3. Set RPM at “0” with knob.

Modes (continued)

Action	LED Status
	  

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

Action	LED Status
	  

5. Press MODE button 1 time for 3 seconds.
* ON, RUN, and TOUCH LED are ON.

Action	LED Status
	  

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

NOTICE

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

CAUTION

- Make it sure that micro-plate and attachment for conical tube are placed correctly and securely before stirring.
- Set 0 rpm and press MODE button to select a mode.
- Rotate knob slowly.
- Contamination can occur between samples in micro-plate due to large quantity in micro-plate.

WARNING

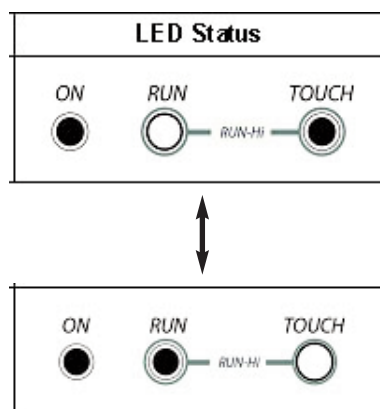
- Maximum load on platform is 0.5kg.
- Stirring could not work properly with an excess load and samples are not mixed properly.

Section 5 Safety Device

Self-resetting & Over current protection

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

Example:



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.

Section 6 Preventative Maintenance

Classifications	A period of checking time	
	daily	weekly
General		
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.	•	

Cleaning for Top Plate and Accessories

Top plate

There is on/off button middle of top plate for touch function mode. Remove any contaminant by cleaning the unit with a wet soft cloth. Keep the unit clean always by cleaning the unit with a dry soft cloth.

Accessories

Remove any 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 water to clean.

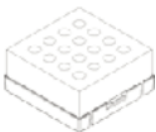
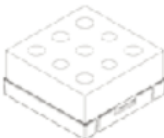
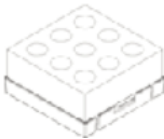
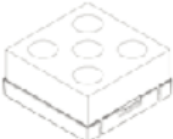
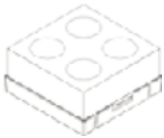
Section 7 Troubleshooting

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. 2. 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.

Section 7
Troubleshooting

Trouble During Operation	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 mix 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.

Section 8 Accessories

Designation	Cat. No.	Description
	88880118	Rubber Platform
	88880119	Tube Holder with insert Retainer
	88880120	Tube Holder with Insert Retainer (Φ10mm)
	88880121	Tube Holder with Insert Retainer (Φ12mm)
	88880122	Tube Holder with Insert Retainer (Φ15mm)
	88880123	Tube Holder with Insert Retainer (Φ20mm)
	88880124	Tube Holder with Insert Retainer (Φ25mm)
	88880117	Micro Plate Tray

Section 9 Specifications

Model		LP Vortex Mixer
Technical data	Motion	Orbital
	Speed range (rpm)	0 ~ 3,000
	Speed setting/display	Analog
	Speed control type	Adjustment knob
	Orbit (mm/inch, dia.)	4 / 0.16
	Operating mode	Touch, Continuous, High-continuous
	Motor rating input (w)	12
	Motor rating output (w)	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)	154×210×83 / 6.1×8.3×3.3
	Electrical requirement	DC 24V & 2.5A Power adapter with free voltage and frequency (AC 100 ~ 240V, 50/60Hz)
	Permissible relative temperature (°C)	+5 ~ 40
	Max. supported load including attachment (kg/lbs)	0.5 / 1.1
	New weight (kg / lbs)	3.1 / 6.8
	Permissible relative humidity (%)	80
	Safety device	Self-resetting/Current limit protection
	Protection class acc. to DIN EN 60529	IP 42
Materials	Body	Polypropylene
	Rubber platform	Silicone rubber
	Tube & Micro-plate tray	Polypropylene
	Test tube with Insert Retainer	Polyethylene
* 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		

THERMO FISHER SCIENTIFIC STANDARD PRODUCT WARRANTY

The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period.

During the first two (2) years, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor included. Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters and gaskets are excluded from this warranty.

Replacement or repair of components parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment. At Thermo's option, all non-conforming parts must be returned to Thermo Fisher Scientific postage paid and replacement parts are shipped FOB destination.

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