

# OPERATING MANUAL

## ORBITAL SHAKER

MODEL : NB-101M/101MT/101MC



## 1. GENERAL INFORMATION ON PRECAUTION

- Precaution is to prevent the possible accident or danger during operation.  
So, you must keep it.
- Precaution is separated into caution and warning. And, each of them means like this.











- Other marks



### 1.1 Precaution to connect the power cable







#### Caution




-  Compliance You have to use the product under specified electrical conditions.  
(If you use the product at the place in different power pressure, it causes a fire and malfunction of the product.)
-  Compliance Do not make the power plug be pressed by back of the product.  
(A space between the product and the plug must be 20cm at least.)
-  Compliance The power outlet must be only for this product.  
(Using various products simultaneously can cause a fire)
-  Compliance Clean the power plug with a dry towel and connect it properly.  
(Foreign substances or unsafe connection can cause a fire.)

-  Do not bend the power cable hardly and do not make it to be pressed by heavy products.  
(When it is damaged, it can cause a fire.)  
Prohibition
-  Do not touch the power code with wet hands.  
(It can cause an electric shock.)  
Prohibition
-  Do not use the damaged power code and outlet.  
(It can cause an electric shock and a fire.)  
Prohibition
-  When you see smoke comes out from the product or smells something is burning or see any other strange symptoms, you have to pull out the power code and stop using it.  
(It can cause an electric shock and a fire.)  
Remove plug

## 1.2. Precaution for installation








### Caution

-  Use it with the proper voltage.  
Please check the voltage & hertz written on serial label.  
Compliance  
(Over-voltage, low-voltage can damage the product and poor performance.)
-  Do not install at a humid place.  
(It causes an electric leakage accident and a corrosive of the product.)  
Prohibition
-  Keep this product out of the direct ray of the sun and do not install at a hot place or a place that is near an electric heat.  
Prohibition  
(The proper indoor temperature is 20°C ~ 30°C)
-  Do not put inflammable substances near the product.  
(It can cause a fire.)  
Prohibition
-  When you install the product, you have to put the distance of more than 20cm from the wall.  
Compliance
-  Install at a flat and solid ground.  
(If the ground is not flat, it can cause a vibration of the product.)  
Compliance

-  When you move the product, do not lay down to its side or reverse the head to bottom. (It can cause the malfunction.)  
Prohibition
-  When you move the product, hold the door and other movable parts of the product with a tape. (When the product is moved, the movable door can cause injury of you and damage of the product.)  
Compliance
-  When you move the product, you must hold up the product. (Pushing or pulling the product can damage the bottom part of the product.)  
Compliance

### 1.3 Precaution for use

#### Caution

-  You must not disassemble, fix and remodel the product by yourself. (You can damage the product throughout a fire and malfunction or get a property loss from a different study result than the original purpose.)  
No disassemble
-  Do not use the product for different purpose (It can cause malfunction or poor function. Consequently, you will get a wrong result.)  
Prohibition
-  Do not use an inflammable spray near the product. (The switch and other electric connection parts can cause a fire.)  
Prohibition
-  When you use inflammable substances such as benzene, thinner, alcohol and LP gas, please be careful. (It can cause a fire and an explosion.)  
Prohibition
-  To prevent water and experiment material from going into the control panel during the experiment, make sure to clean the control panel with a dry cloth. (It can cause an electric leakage and a fire.)  
Compliance
-  Do not wash the product with excessive quantity of water, thinner, benzene and Petroleum. (It can cause an electric leakage, and malfunction or damage on the surface.)  
Compliance
-  When you don't use the product or clean it, please pull out the power plug. (It is to prevent an eclectic leakage.)  
Compliance



Compliance

Open and close the door softly and please use a door knob.  
(A heavy shock can damage the product and breakdown the operating part. Also your hands can be stuck between the door and body.)



Compliance

Do not detach the built-in lamp and electrical devices.  
(It can cause an electric shock and a fire.)

## 1.4 Precaution for ground connection



### Caution



Compliance

Please ground before use the product, if you don't ground, you can get an electrocution when malfunction or an electric leakage occurs.



Compliance

At the place where you can't ground,

- \* Please buy the equipment to prevent any electrical leakage.
- \* An electric shock, an electric leakage and a fire can be occurred without an electric leakage breaker.



Prohibition

Do not ground to these places; Gas Pipe, water pipe, pipe, lighting rod, telephone wire etc.

- \* Wrong ground connection can cause electrical leakage which eventually results in fire.



Compliance

If you don't have the outlet for AC 220V, then bury it under the ground after connecting the ground line to copper plate.

- \* No ground connection can bring an electrocution, an electric leakage and a Fire.

## 2. FEATURE & SPECIFICATION

### 2.1 Feature

- Magnetic induction drive & Brush less DC motor provides less vibration and maintenance.
- Artificial intelligence system which maintains precise speed & adjust time.
- LED indicates temperature, speed, time and state of power failure.
- No heat generated during operation.
- Easy to change accessory platform.

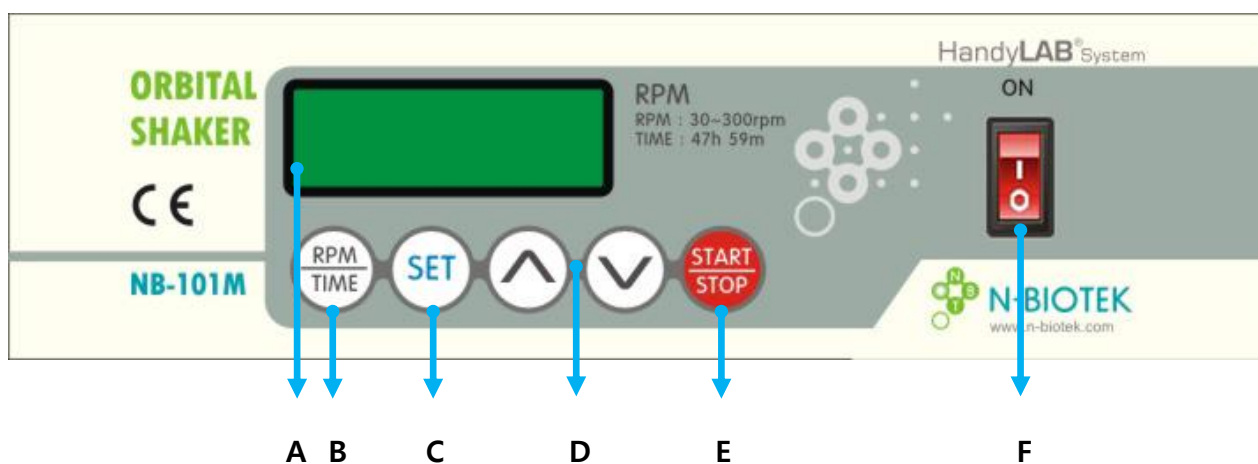
### 2.2 Specification

Items	Unit	NB-101M	NB-101MT	NB-101MC
<b>Motion</b>		Orbital	Orbital or Reciprocating	Orbital & Reciprocating
<b>Speed</b>				
range	rpm	30 to 300 rpm (up to 400rpm:high speed type)	30 to 300 rpm	30 to 300 rpm
accuracy	rpm	±1rpm	±1rpm	±1rpm
increment	rpm	1 rpm	1 rpm	1 rpm
<b>Time</b>				
range	min	Continuous or up to 47h 59min	Continuous or up to 47h 59min	Continuous or up to 47h 59min
accuracy	%	±1%	±1%	±1%
increment	min	1 minute	1 minute	1 minute
<b>Control</b>		Microprocessor Digital	Microprocessor Digital	Microprocessor Digital
<b>Motion control</b>		—	Lever Operate	Lever Operate
<b>Operating panel</b>		Touch Button	Touch Button	Touch Button
<b>Display</b>		LED Display	LED Display	LED Display
<b>Motor</b>		Plate Type BL/DC Motor	Plate Type BL/DC Motor	Plate Type BL/DC Motor
<b>Drive system</b>		Beltless Direct Drive	Beltless Direct Drive	Beltless Direct Drive
<b>Orbit Diameter</b>	mm	22mm	22mm	22mm
<b>Platform size</b>	mm,ea	460(W)x455(D)mm with Rubber Pad	460(W)x455(D)mm with Rubber Pad	220(W)x455(D)mmx2
<b>Dimensions</b>	mm	465(W)x540(D)x125(H)mm	465(W)x540(D)x145(H)mm	465(W)x540(D)x195(H)mm
<b>Holder/Rack</b>		Rubber Pad	Rubber Pad	Spring Rack
<b>Weight</b>	kg	29kg	35kg	38kg
<b>Power</b>	V/Hz	110/220V, 50/60Hz, 20W	110/220V, 50/60Hz, 30W	110/220V, 50/60Hz, 30W

## 2.3 Configuration



## 2.4 Control panel



A	<b>DISPLAY</b>	For displaying RPM and TIME
B	<b>RPM/TIME</b>	Key for selecting RPM and TIME
C	<b>SET</b>	Key for saving desired RPM and TIME
D	<b>UP, DOWN</b>	Key for adjusting RPM and TIME value
E	<b>START/STOP</b>	Operation START / STOP
F	<b>POWER S/W</b>	Power On/Off

### 3. OPERATION

- 1) Place the Power switch “ON” position which locates at Control panel.

The digital readout will display as below.



Warning

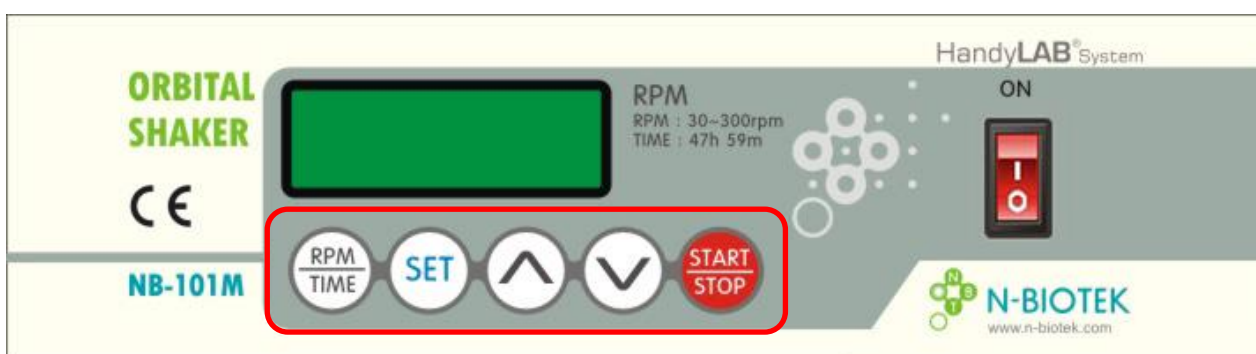
Before connect the power cable to the plug, turn off the power switch.

- 2) Press “START/STOP” key in the front control panel for Start or Stop.

- 3) Speed (RPM) Set-up

RPM and TIME are able to be set-up, when machine is in status of STOP.

If the instrument is on running, please stop the instrument with pushing START/STOP key.



- (1) Press the “RPM/TIME” key for approximately 1 or 2 seconds until blinking LED (initial RPM value) displayed.



Warning

Don't set RPM as 000 or below 30.

If you set the RPM as 000 and operate instrument, error message will be displayed.

In the case, please turn the power off and on, press the “SET” key while “n-bio” is displayed as below.



(2) You can set the RPM using UP(▲), DOWN(▼) key

Press "SET" key again after set RPM, then LED displayed as "r SAVE" as below.



RPM and Time must be saved when user push set-key again.

#### 4) Time Set-up

(1) Press the "RPM/TIME" key for the approximately 1 or 2 seconds until LED displayed "t 00.00" as below.



(2) Press the "SET" key. Then LED will display setting time and can be set the time using UP(▲), DOWN(▼) key as desired set point time.

At first, you can set the hour using UP(▲), DOWN(▼) key and press "SET" key.

You can set the minute using UP(▲), DOWN(▼) key after set the hour.

Press "SET" key again after set time (hour and minute), then LED display as "t SAVE" as below.



\* Time set point range is maximum 47 hr 59 min.

If you want to use this incubator continually, you must set value as 00:00.

When you set the time like above and operate instrument, -END- is displayed after a minutes.

But shaking is well running without stop till reaching desired time.

After pushing start button under time set-up, the instrument would be stopped with displaying -END- when the time is reached at set time.

## 4. HOW TO CHANGE THE FUNCTION (NB-101MT, NB-101MC)

1) You can change shaking motion with moving conversion lever to another poll like below.



**Reciprocating**



**Orbital Motion**



**MULTI SHAKER  
(NB-101MT)**



**COMBINATION SHAKER  
(NB-101MT)**



- In case of NB-101MC, Reciprocating and Orbital Motion are working individually at same time and two plate.

## 5. TROUBLE SHOOTING AND GUIDE



Warning

Service should be only performed by qualified service personnel

Before replacing any electrical or mechanical components, disconnection unit from its electrical power source. If electrical power is required for service exercise extreme caution as LINE VOLTAGE is present.

1) Unit is not working (Check below before thinking this as malfunction)

(1) Electrical connection

Please disconnect main power cable and then reconnect.

(2) Voltage supply

Please check to voltage.

(3) Fuse check.

(4) Verify voltage on unit.

(5) Defective power switch (check voltage at switch)



2) This message may be displayed as to

- RPM is being set "0" or less than minimum RPM.
- Something forced not to move when the platform is moving.
- Solution : Use your hands to move platform and push "STOP" button simultaneously and than push the "SET" button to increase RPM you want.



3) This message may be displayed as to

- Momentary noise symptom.
- When the platform is being moved faster than RPM which you set.  
(This message may occur from 200 RPM)
- Solution : These symptoms will be recovered automatically within 3 min or restart it.



- 4) This message may be displayed as to
- Finish operation after "TIME" Setting Mode.



- 5) This message may be displayed as to
- The electricity is on from power failure during "TIME" Momentary noise symptom.
  - When the platform is being moved faster than RPM which



- 5) This message may be marked as to
- The electricity is off during operation.
  - Solution : "n"(new record) will be changed to "r"(RPM) if you push "START" button.

Thank you for purchasing N-BIOTEK shaker.

This operation manual describes practical information such as performance, usage, cautions and notices for use of the product. Prior to using the product, please read it carefully all the safety instructions described in this manual and keep this manual near equipment.

## WARRANTY

<b>ITEM</b>	Shaker	<b>MODEL</b>	NB-101M/101MT/101MC
<b>DATE OF INSTALLATION</b>	mm-dd-year	<b>SUPPLIER</b>	
<b>SERIAL NO.</b>		<b>PERIOD</b>	1 year

**N-BIOTEK** provides a warranty on all parts and factory workmanship. The warranty includes areas of defective material and workmanship, provided such defect results from normal and proper use of the equipment.

1. The free warranty service will be provided once the unit is proved to be defective by wrong workmanship after N-BIOTEK or reliable distributor's examination.
2. The warranty period is 1 year from date of installation or 16Month year from the date of shipment from N-BIOTEK, whichever is sooner as indicated in above table. This period is proved by serial no.
3. N-BIOTEK will not be responsible of free warranty service for the faulty caused by user's improper operation, excessive use, use of incorrect voltage & frequency, storage in wrong environment mentioned in Manual.
4. Complete the above table after installation and keep this card. Then, present it to a dealer or N-BIOTEK when warranty repair is needed.



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