

# OPERATING MANUAL

## SHAKING WATER BATH MODEL : NB-303/NB-304



# 1. General Information and Precautions





- Please read this manual in its entirety prior to operating the NB-303,304 shaking water bath from N-BIOTEK. The following pages include instructions for proper use. Misuse may cause damage to the unit, as well as harm to property and life. Please store this manual in a safe place for future reference.


- The following marks are used to indicate safety warnings and precautions.





## 1.1 Precautions when connecting the power cable


### **Caution**

-   
Compliance Please ensure that proper electrical conditions and voltages are met prior to plugging in and powering on the unit. Failure to comply may result in critical damage to the instrument or fire.
-   
Compliance Leave a 20cm space between the instrument and the base of the plug. Pressure to the base of the plug may cause damage to the instrument or electrical fire.
-   
Compliance Only use the power cable that was included with the NB-303,304 shaking water bath. Use of other cables may cause damage to the instrument or electrical fire. Please contact N-BIOTEK if a replacement is required.
-   
Compliance Please clean cable with a damp rag and allow drying as needed. Foreign substances on the plug may increase the risk of fire.

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Prohibition Do not over bend or fold the power cable as this may cause a breakage in the line and result in fire.
- 


Prohibition Never plug in or operate the instrument with wet hands as this may result in electrical shock
- 


Prohibition If the instrument appears damaged, or is not working in proper order, please contact Benchmark Scientific immediately.
- 


Remove plug If you see or smell smoke coming from the unit or cord, witness fire, or if the instrument is operating abnormally, please unplug the instrument immediately. Contact N-BIOTEK as soon as possible.


## 1.2. Prior to installation




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Compliance Ensure that the unit matches the voltage and hertz supplied by the wall outlet. Failure to do so may result in damage to the instrument or electrical fire,
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Prohibition Do not install or use in a wet, damp, or overly humid location. Moisture may damage the instrument and cause electrical fire.
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Prohibition Do not place instrument in direct sunlight or an overly warm location. Recommended operating temperature is 20°C to 30°C.
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Prohibition Do not use instrument with flammable substances.
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Compliance Install on flat, even surface. Failure to do so may affect the performance of the instrument.



Prohibition

Instrument should maintain an upright position. Do not store upside down or on the side as this may cause internal damage to the shaking mechanism.



Compliance

Ensure that the hinged lid is secure prior to moving the unit. Failure to secure the lid could cause unexpected movement and damage to the instrument or cause bodily harm to the user.

### 1.3 Prior to use



#### Caution

No  
disassemble

Do not attempt to disassemble or repair this instrument. Incorrect repairs may cause irreparable damage to the instrument or injury to the user. Evidence of disassembly will void all manufacturer warranties, implied or explicit.



Prohibition

Only use this instrument for its intended purpose.



Prohibition

Do not use near any combustible sprays or liquids.



Compliance

Use a damp cloth to clean the control panel and heating element. Do not allow liquid or sample to soak the control panel as this may cause damage to the instrument.



Compliance

Please disconnect the power supply when the unit is not in use for extended periods of time.



Compliance

Always fully support the lid when closing the instrument. Do not allow the lid to fall or be slammed down as this may damage the instrument.



Compliance

Please clean silicone seal surrounding the heating chamber regularly with a damp cloth to prevent corrosion. Failure to do so may cause damage to the seal and affect the performance of the instrument.

## 1.4 Please ensure a proper ground connection



### Caution



Compliance

Please ensure that this product is connected to a ground prior to operation



Compliance

If no ground is available at the facility, please connect the instrument to an external grounding mechanism.



Prohibition

Do not ground the instrument to the following; gas pipe, water pipe, pipe, lighting rod, telephone wire etc.

\* An incorrect ground connection may result in fire.

## 2. Feature & Specification

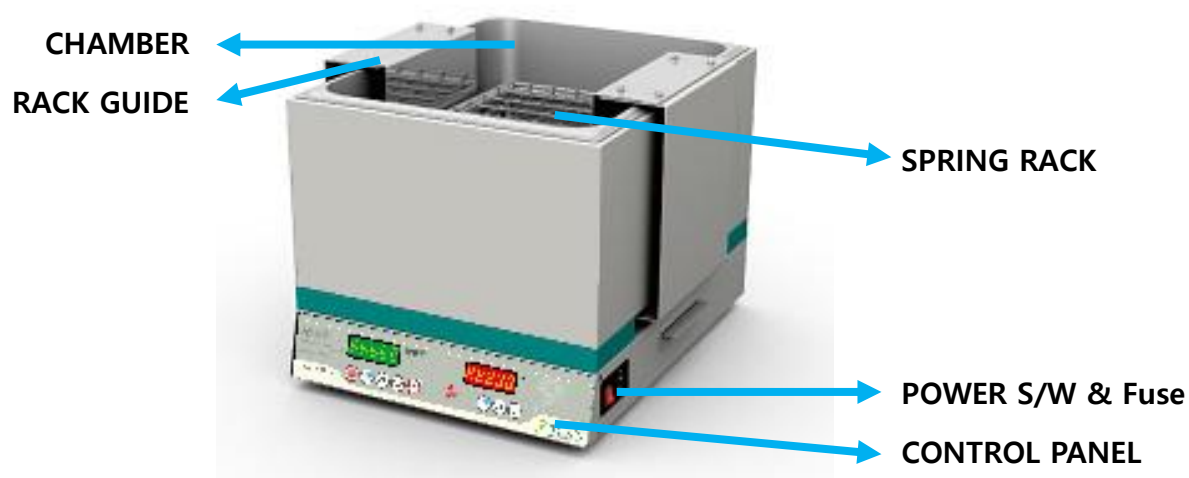
### 2.1 Feature

- An advanced micro-processor confirms and maintains temperature setting and shake speed while unit is in operation.
- Brushless DC motor provides low noise and no vibration.
- LED indicates temperature, speed, time and state of power failure.

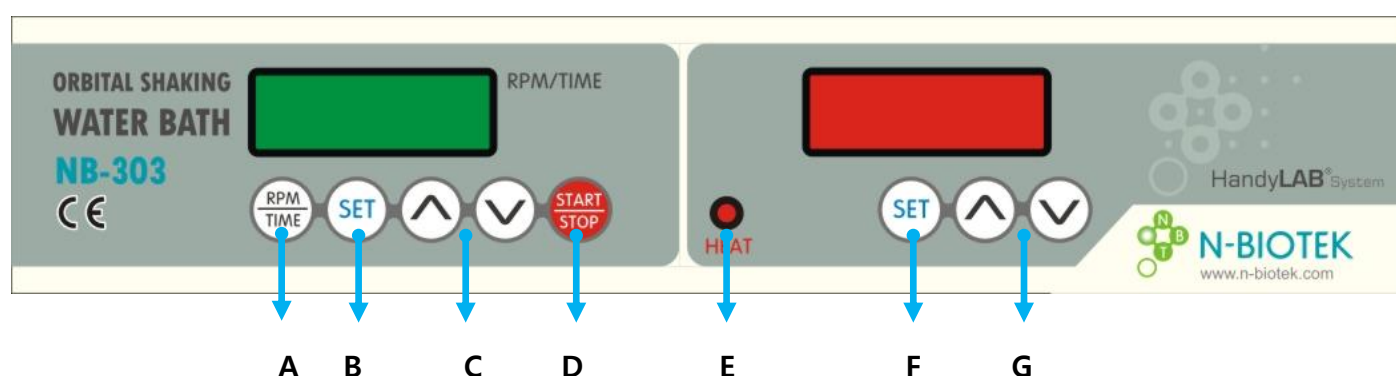
### 2.2 Specification

Items	Unit	NB-303	NB-304
Motion		Orbital	Reciprocating
Temp. range	°C	Ambient +5°C to 80°C	Ambient +5°C to 80°C
Temp. accuracy	°C	±0.3°C at 37°C	±0.3°C at 37°C
Motor		Plate Type Brushless DC Motor	Plate Type Brushless DC Motor
Orbit Diameter	mm	25mm	25mm
Speed range	rpm	30 to 200rpm	30 to 200rpm
Time range		Continuous or up to 47h 59min	Continuous or up to 47h 59min
Controller		Microprocessor Digital PID	Microprocessor Digital PID
Bath capacity	liter	Max 10 liter, Level 6,5 liter	Max 10 liter, Level 6,5 liter
Dimensions	mm	310(W)x345(D)x260(H)mm	310(W)x345(D)x260(H)mm
Power	V/Hz	110/220V, 50/60Hz, 300W	110/220V, 50/60Hz, 300W
Weight	kg	14kg	14kg
Optional acc.		Lid for high temperature	Lid for high temperature

## 2.3 Configuration



## 2.4 Control panel



A	MODE SELECTION	Button for selecting RPM/TIME
B	RPM/TIME SET	Button for input RPM/TIME
C	UP & DOWN	Button for adjusting RPM/TIME value
D	START/STOP	
E	HEAT PILOT LAMP	Display to show heating
F	TEMP. SET	Button for input Temperature
G	UP & DOWN	Button for adjusting Temperature value

### 3. Operation

1) Fill the chamber with DI or tap water until it is at least half-way full.

\* Temperature control will not be accurate if the chamber is less than half full.



Warning

Please ensure the unit is switched to the off position before plugging in.

2) Plug the unit into a wall outlet with the appropriate power supply and ground. Position the power switch (located on the right of the unit) to the on position.

\* The NB-303,304 will begin to heat approximately 30 seconds after the unit is switched on.



Compliance

**Never operate the water bath when the water level is not above the minimum marking.**

**Failure to do so may result in damage to the heater.**

#### 3) Speed (RPM) Set-up



Compliance

RPM and Time are only adjustable when the instrument is stopped, or in stand-by mode. If unit is in operation, please press the stop key to adjust these settings.





- (1) Press the “RPM/TIME” key during the approximately 1 or 2 seconds until LED displayed “r 000” as below.



Warning

Do not set RPM to 000 or under 30 rpm. This may result in a shaking error.

- (2) Press the “SET” key to adjust the RPM. The display will begin to flicker.

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

Press “SET” key again RPM adjustment is complete; the LED will display “r SAVE” as seen below.



\* RPM set point range is from 30 to 300.

\* After set-up is finished, push the start/stop button to begin run.

#### 4) Time Set-up



Compliance

RPM and Time are only adjustable when the instrument is stopped, or in stand-by mode.

If unit is in operation, please press the stop key to adjust these settings.

- (1) Press the “RPM/TIME” key two times for approximately 1 or 2 seconds until LED displays “t 00.00” as below.



- (2) Press the “SET” key. The LED will begin to flicker allowing for adjustment. Push the UP(▲) DOWN(▼) key until desired set point time is reached.

Set the hour first by using UP(▲), DOWN(▼) key until desired time is reached and press “SET” key. Set the minutes by using the UP(▲), DOWN(▼) key after setting the hour.

Press the “SET” key again after setting time (hour and minute), and the LED will then display as “t SAVE” as shown below.



\* The time set point range is a maximum of 47 hr 59 min.

**\*NB-303 and 304 can be used continually by setting the time to 00:00:00.**

“tEnd” will be displayed when unit is set in continuous mode, however, shaking will continue until operation is ended by user.

## 5) Temperature Set-up



(1) Toggle the power switch to the on position. The LED will display the current chamber temperature.

(2) Press and hold the “SET” key. The LED screen will display “Set-up” temperature and flicker continually.

(3) Adjust the temperature using the UP (▲) and DOWN (▼) key until desired Set-point temperature is reached.

(4) Press the “SET” key again to store the desired temperature. The screen will stop flashing when the temperature has been confirmed.

\* If you do not press the “SET” key after selecting the new temperature, it will not be stored.

\* Set-up temperature range is Ambient +5°C to 80°C.

\* Appropriate water level is 2/3 full (if water level is low, the temperature on the display will not be accurate).



Compliance

If temperature control is not needed, set the temperature below ambient.



Warning

Never operate the water bath when the water level is not above the minimum marking. Failure to do so may result in damage to the heater.

## 4. Warning Messages



1) This message may be displayed when:

- RPM is set to "0" or less than minimum RPM.
- The platform is blocked.
- Solution: Manually move the platform while pushing the "STOP" button simultaneously.  
Then push the "SET" button to increase speed above 30 rpm.



2) This message may be displayed when:

- If weight is suddenly removed from a shaking platform.
- When the platform is manually moved faster than RPM which was set.  
(This message may occur from below 200 RPM)
- Solution: This message will automatically be resolved after three minutes, or with a manual restart.



3) This message may be displayed when:

- The instrument has completed a set time cycle.



4) This message may be marked when:

- There is a power failure during operation.
- Solution : Press start when power is restored and re-enter desired settings.

## 5. Service & Check Point



Warning

Service should only be performed by qualified service personnel.

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

1) If the instrument is not working, please troubleshoot as follows:

(1) Check the electrical connection

Please disconnect main power cable and then reconnect it to confirm that it is plugged in securely.

(2) Voltage supply

Please check the voltage supplied to the instrument.

(3) Check the fuse.

## Warranty

The NB-303 or 304 includes a one-year warranty from the purchase date. N-BIOTEK reserves the right to repair or replace the unit at its sole discretion. Any disassembly or evident misuse of the instrument will void all warranty. For service please contact local distributor of N-BIOTEK or international sales team of N-BIOTEK. Contact detail is like below.



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