OPERATING MANUAL

REFRIGERATED SHAKING INCUBATOR

(NB-T207 / NB-T207F)



N-BIOTEK

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Table of Contents	PAGE
<GENERAL INFORMATION AND PRECAUTIONS>	3
<FEATURES>	7
<SPECIFICATION><	7
<CONFIGURATION>	8
<CONTROL PANEL>	9
<OPERATION>	9
<REFRIGERATED SHAKING INCUBATOR OPERATION ORDER>	10
1. POWER ON	10
2. TEMPERATURE SETTING	11
3. RPM SETTING	13
4. TIMER SETTING	15
5. ALARM SETTING	18
6. CYCLE SETTING	21
7. SAFETY SWITCH SETTING	25
8. COOLING AND DEFROSTING TIMER SYSTEM	25
9. END	27
<CALIBRATION>	28
<DISPLAY EVENT SCREEN>	29
<WARRANTY>	30

General Information and Precautions

***This equipment is used to culture cells under certain environmental conditions. Its excellent temperature homeostasis and CO2 control function ensure that cells can be safely cultured and stored.

Safety Symbols:



1. Precautions related to the power cable

Check the power supply of product matches with order specifications.
(If different power supply is used, it can cause fire or malfunction.).

Avoid the back wall to cause pressure on the power cable.
(Always allow at least 10cm between the power cable and the back wall.)

The power outlet must be only for this product.
(Using various products simultaneously can cause a fire.)

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.)

Do not touch the power cord with wet hands.
(It can cause an electric shock.)

Do not use the damaged power cord and outlet.
(It can cause an electric shock and a fire.)



Be sure to use a grounded power outlet.
(Using an ungrounded type outlet may cause electric shock.)



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 cord and stop using it. (It can cause an electric shock and a fire.)

2. Precaution for installation



Use it with the proper voltage. Please check the voltage & hertz written on serial label. (Over-voltage, low-voltage can damage the product and cause poor performance.)



Do not install at a humid place.
(It causes an electric leakage accident and a corrosive of the product.)



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. (The proper indoor temperature is 20℃ ~ 30℃.)



Do not put inflammable substances near the product.
(It can cause a fire.)



When you install the product, you have to put the distance of more than 20cm from the wall. (If ventilation is good, you can use the product satisfactorily in terms of cooling ability, heat generation, etc.)



Install at a flat and solid ground.
(If the ground is not flat, it can cause a vibration of the product.)



When you move the product, do not lay down to its side or reverse the head to bottom. (It can cause the malfunction.)



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.)

3. Precaution for use



Do not disassemble, fix and remodel the product by yourself.

(It can damage the product throughout a fire and malfunction or get a property loss from a different study result than the original purpose.)



Do not use the product for different purpose

(It can cause malfunction or poor function. Consequently, you will get a wrong result.)



Do not use an inflammable spray near the product.
(The switch and other electric connection parts can cause a fire.)



When you use inflammable substances such as benzene, thinner, alcohol and LP gas, please be careful. (It can cause a fire and an explosion.)



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.)



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.)



When you don't use the product or clean it, please pull out the power plug.
(It is to prevent an eclectic leakage.)



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.)



Do not disassemble the lighting or electrical devices within the product.
(It can cause electric shock or fire.)



Take care to prevent foreign substances from getting caught in the door packing.
(Inflow of external air may cause temperature changes and foreign substances may discolor the packing.)

If open the door for a long time and observe during use, condensation may form on the glass and inside.

Permissible ambient temperature range for transport: -10℃ to 60℃.
The product is heavy, so be careful when transporting it.
Use appropriate tools for transport, or be carried by two or more people.

4. Precaution during use

Do not subject the product to shock or movement while operating it.
(This may result in product damage or defects.)

5. Precautions for maintenance and management

If not used for a long period of time, unplug the power plug, dry it, pack and store it.

When cleaning the product, unplug the power plug and wipe it with a soft towel.
Be careful not to leave any foreign substances in the chamber or sample residue.

If the product is difficult to use due to a malfunction, contact the manufacturer and request after-sales service.
Maintenance and repairs may be difficult in case of arbitrary repairs other than our A/S service.

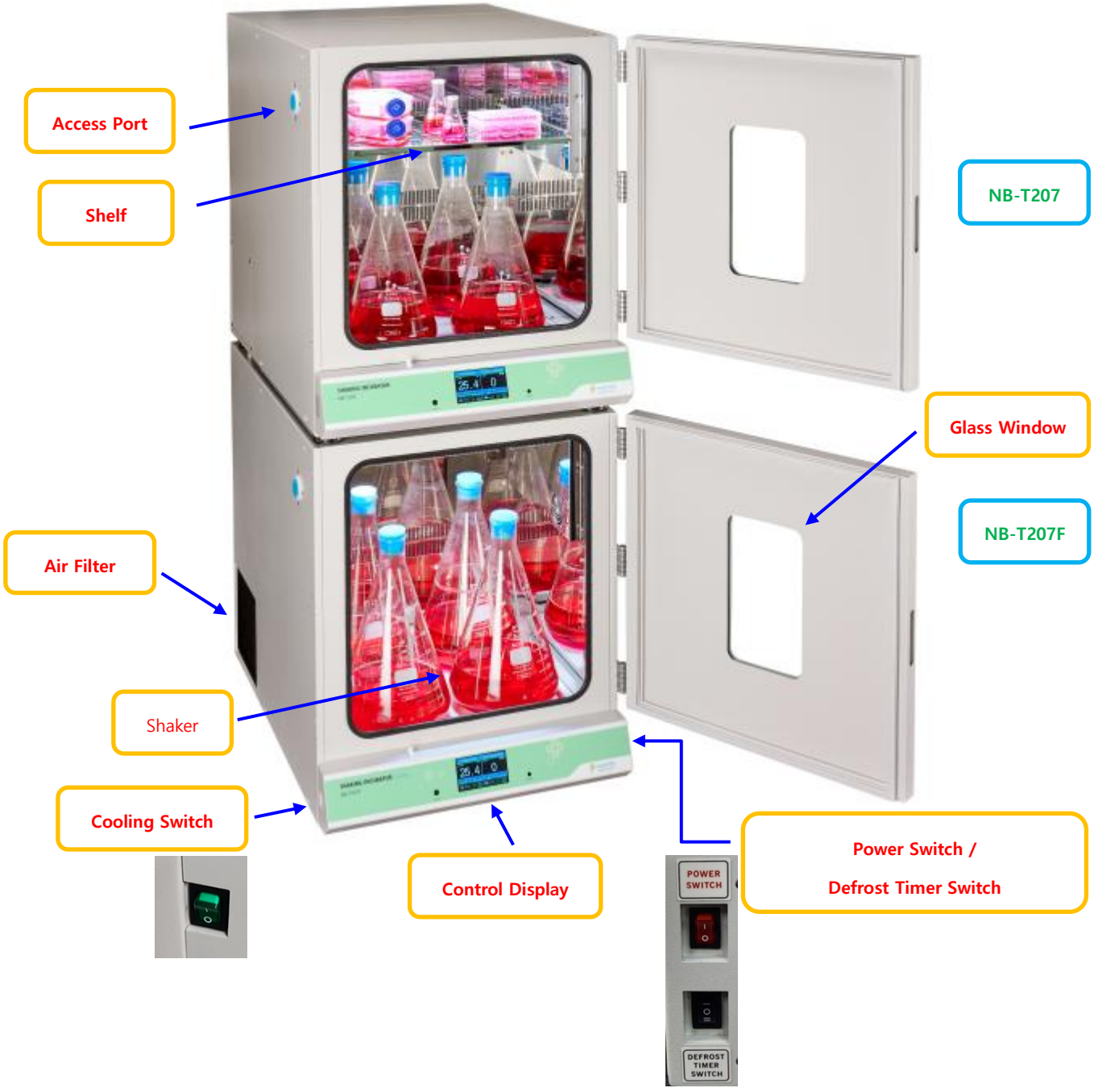
FEATURES

- Magnetic induction drive & Brushless DC motor ensures low vibration and maintenance
- BLDC motor does not interfere with temperature uniformity and provides exceptional stability and minimal noise
- User friendly, intuitive LCD touch panel
- Moisture resistant, epoxy-coated structure
- Automatic stop function on door opening, stops heating and platform shaking for safety and energy conservation
- Transparent window allows internal viewing without opening external door

SPECIFICATION

ITEMS		UNIT	NB-T207	NB-T207F
Control	System		Microprocessor digital P.I.D.	
	Operating Panel		Touch display	
Temperature	Ambient	℃	+18℃~ 32℃	
	Range	℃	RT +5℃~ 60℃	4℃~ 60℃
	Accuracy	℃	± 1.0℃ at 37℃	
	Increment	℃	± 0.1℃	
Speed	Range	rpm	30 to 300	
	Accuracy	rpm	± 1	
	Increment	rpm	± 1	
Time	Range	Hour / Minute	Continuous operation or 1 minute to 99 Hours 59 Minutes	
	Accuracy	%	± 1	
Motor	Drive System		Beltless direct drive	
	Orbit Diameter	mm	19	
Dimensions	Platform Size	mm	450 (w) x 450 (d)	
	Platform Capacity	ml/ea	100/36, 250/23, 500/16, 1000/9, 2000/5, 3000/4, 5000/4	
	Rack		Spring rack (option) Microplate rack (option)	
	Chamber (Inner)	mm	510(w)x505(d)x577(h)	
	Chamber (Overall)	mm	600(w)x870(d)x730(h)	
Power	Option	V/Hz	110/220V, 50/60Hz (110V: 540W, 8A) (220V: 690W, 8A)	110/220V, 50/60Hz (110V: 1.3kW, 15A) (220V: 1,470W, 15A)
Ambient operating temperature		℃	0℃ ~ 37℃	
Ambient operating humidity		%	15% to 85% (No dew condensation)	
Altitude above sea level		m	<2,000m	
Condition for storage and transport conditions (recommended)		℃	Room temperature 0℃ to 60℃	
		%	Humidity: 10% to 90%	
		hpa	Permissible air pressure 500hpa to 1060hpa	

CONFIGURATION

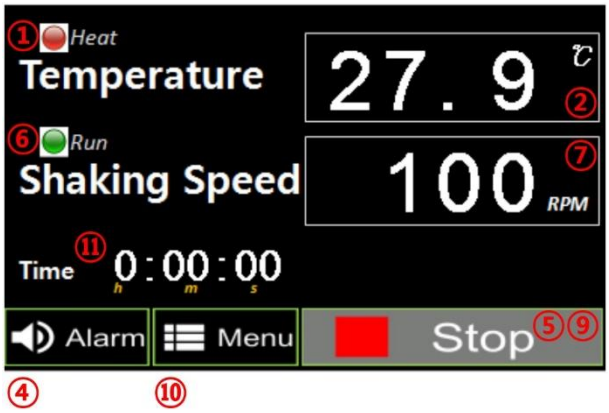


CONTROL PANEL

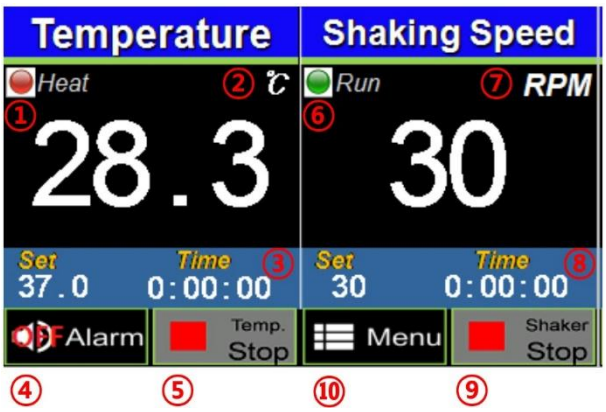


OPERATION

* View Screen



<Basic Mode>



<Advanced Mode>

No.	Function
①	HEAT INDICATOR LED
②	TEMPERATURE VALUE
③	INCUBATION TIME LEFT
④	ALARM SETTING
⑤	TEMPERATURE START/STOP
⑥	SHAKER INDICATOR LED
⑦	RPM VALUE
⑧	SHAKING TIME LEFT
⑨	SHAKER START/STOP
⑩	MENU BUTTON
⑪	PROGRAM TIME LEFT

- **REFRIGERATED SHAKING INCUBATOR OPERATION ORDER**



1. POWER ON

1) After installing the product in a stable location, check that it is level from left to right, front to back, and to the floor.
2) Make sure the power switch is OFF and connect the power plug.
3) When turn ON, a loading window will appear on the control panel display as follows.



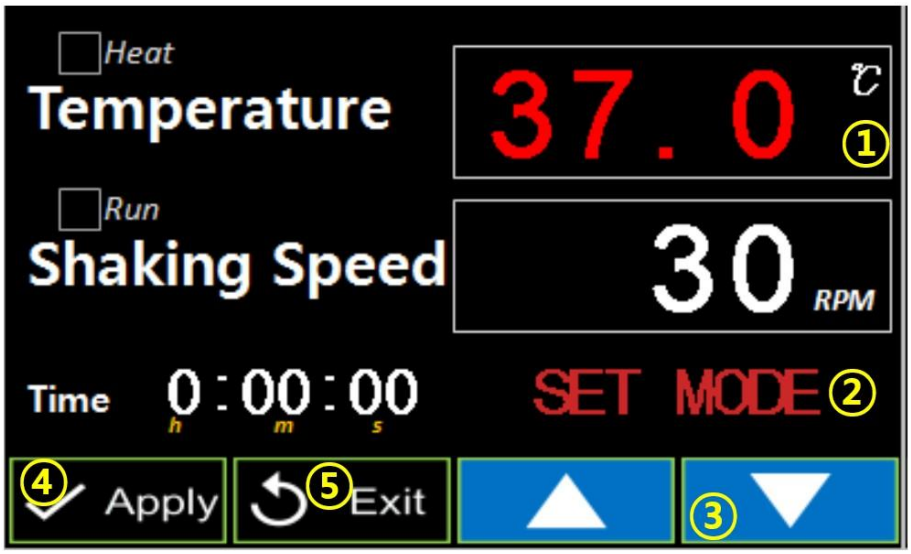
4) When the loading window is over, the display goes to "Basic Mode".
5) To reach "Advanced Mode" or "Basic Mode", go to the menu window and enter.



2. TEMPEARATURE SETTING

Basic Mode

1) When the loading window is over, the display goes to "Basic Mode".



2) When ①pressing the temperature value, the number turns red and ②"SET MODE" is displayed.

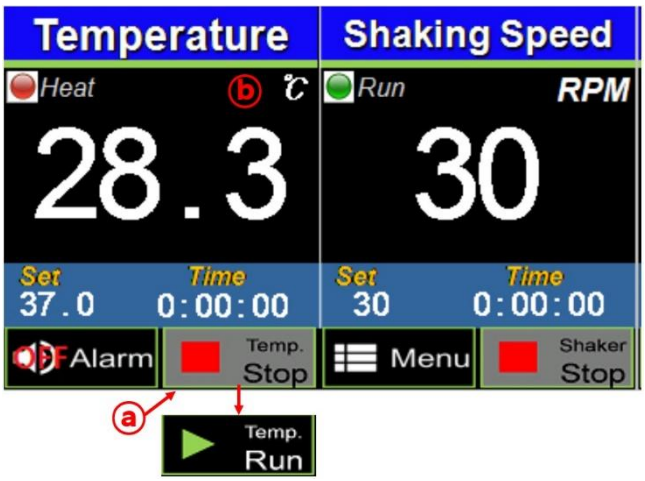
3) Press the ③UP (▲)/DOWN (▼) button and enter the desired value.
   * Long press the button to quickly increase or decrease the value.

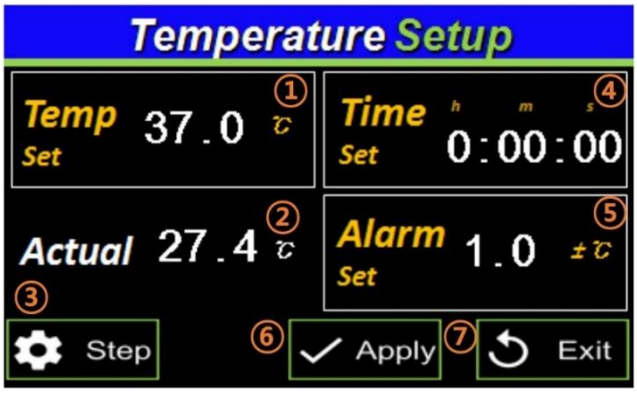
4) To save the newly set value, press the ④Apply button.

5) If press ⑤Exit after changing the value, the value will not be saved and the screen returns to the previous screen.

* The setting temperature range of NB-T207F is 4℃~60℃.
* When setting a low temperature, turn on the "COOL" switch on the left side of the product.

Advanced Mode



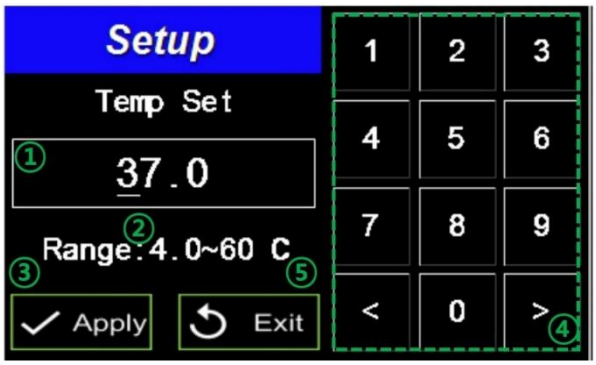


1) When ⓐpressing the heating stop button, the button's display changes to "Temp. Run" status.

2) At "Temp. Stop" state, press the ⓑTemperature display window. Then, "Temperature Setup" screen will be displayed.

3) At "Temperature Setup" screen, press the ①"Temp Set" window to set the temperature.

4) Enter the setting value using the ④keypad on the "Setup" screen.



5) Click ③Apply to save the changed settings and return to the previous screen.

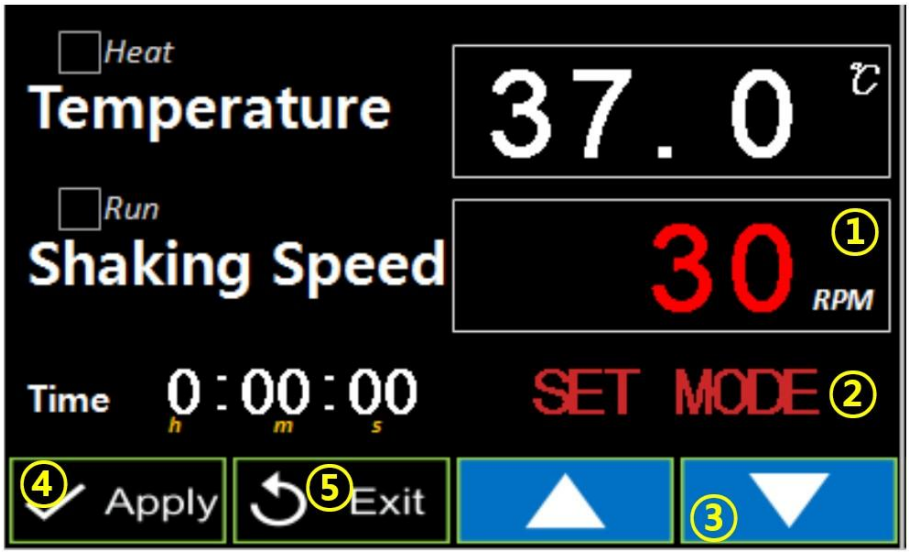
6) If pressing the ⑤Exit button, the changed settings will not be saved and screen goes to the previous screen.

7) To apply the new settings, click ⑥Apply in the "Temperature Setup" window.

3. RPM SETTING

Basic Mode

1) When the loading window is over, the display goes to Basic Mode.



2) When ①pressing the RPM value, the number turns red and ②"SET MODE" is displayed.

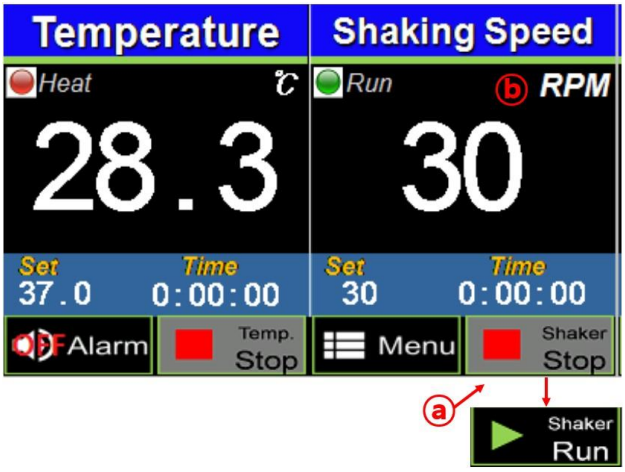
3) Press the ③UP (▲)/DOWN (▼) button and enter the desired value.
   * Long press the button to quickly increase or decrease the value.

4) To save the newly set value, press the ④Apply button.

5) If press ⑤Exit after changing the value, the value will not be saved and the screen returns to the previous screen.

* The setting RPM range of NB-T207F is 30~300rpm.

Advanced Mode





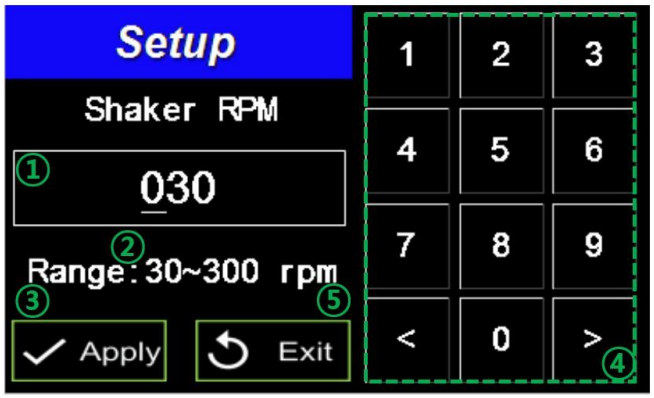
1) When ⓐpressing the Shaker stop button, the button's display changes to "Shaker Run" status.

2) At "Shaker Stop" state, press the ⓑRPM display window. Then, "Shaker Setup" screen will be displayed.

3) At "Shaker Setup" screen, press the ①"RPM Set" window to set the RPM.

4) Enter the setting value using the ④keypad on the "Setup" screen.

5) Click ③Apply to save the changed settings and return to the previous screen.



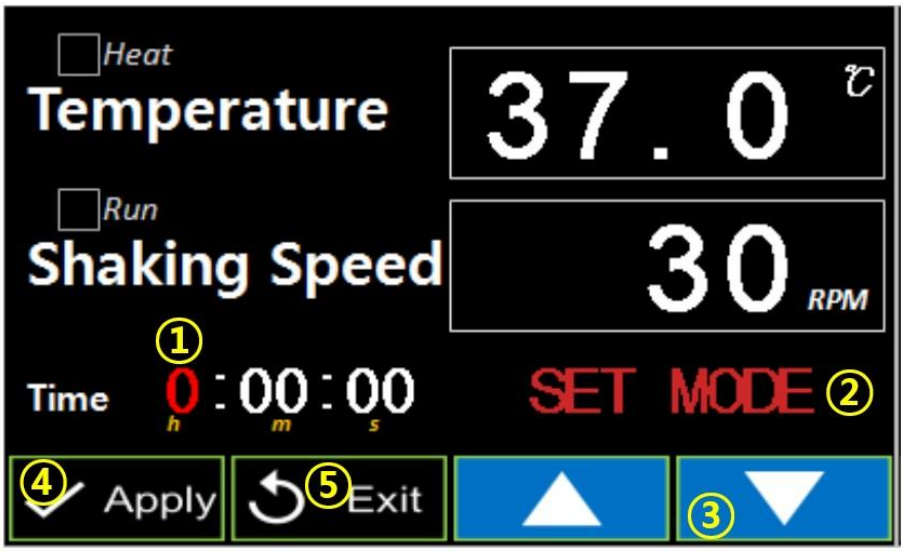
6) If pressing the ⑤Exit button, the changed settings will not be saved and screen goes to the previous screen.

7) To apply the new settings, click ⑥Apply in the "Shaker Setup" window.

4. TIMER SETTING

Basic Mode

1) When the loading window is over, the display goes to Basic Mode.



2) When ①pressing one of the time values "h : m : s", the corresponding value turns red.

3) ②"SET MODE" is displayed.

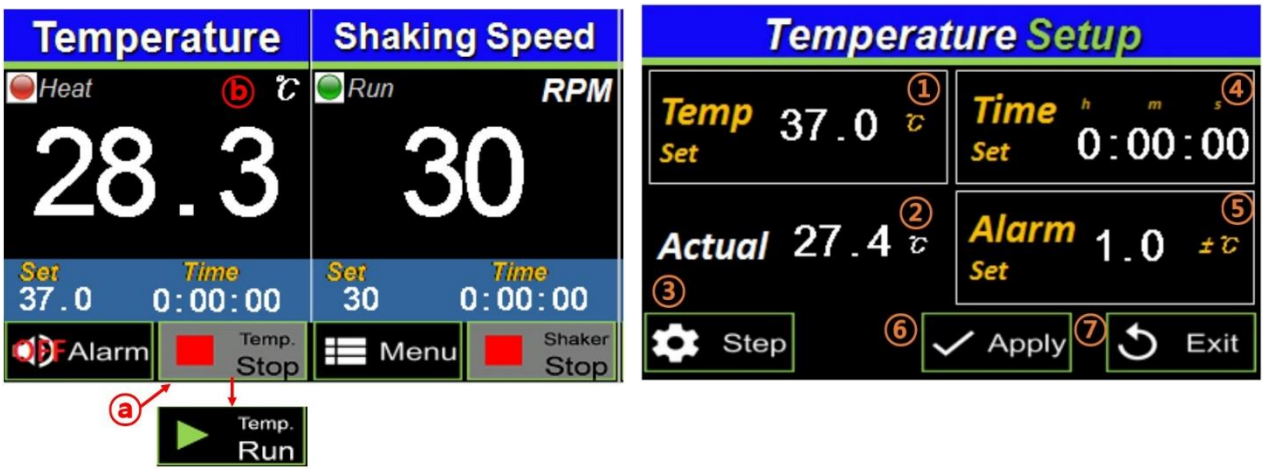
4) Press the ③UP (▲)/DOWN (▼) button and enter the desired value.
   * Long press the button to quickly increase or decrease the value.

5) To save the newly set value, press the ④Apply button.

6) If press ⑤Exit after changing the value, the value will not be saved and the screen returns to the previous screen.

* The setting time range of NB-T207F is 0:00:01 ~ 99:59:59.
  If set to 0:00:00, it will proceed continuously.

Advanced Mode



1) When ⓐpressing the heating stop button, the button's display changes to "Temp. Run" status.

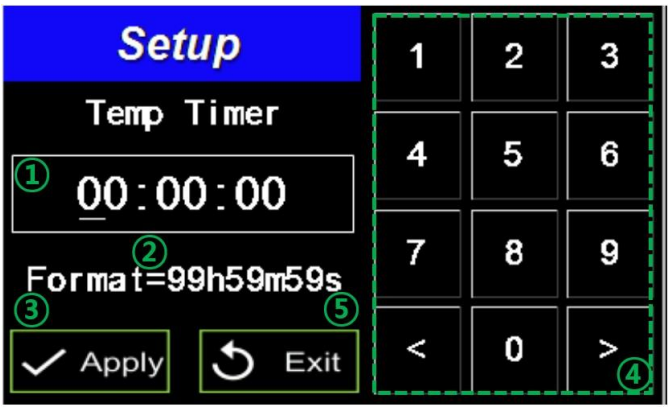
2) At "Temp. Stop" state, press the ⓑTemperature display window. Then, "Temperature Setup" screen will be displayed.

3) At "Temperature Setup" screen, press the ④"Time Set" to adjust the set time value.

4) Enter the setting value using the ④keypad on the "Setup" screen.

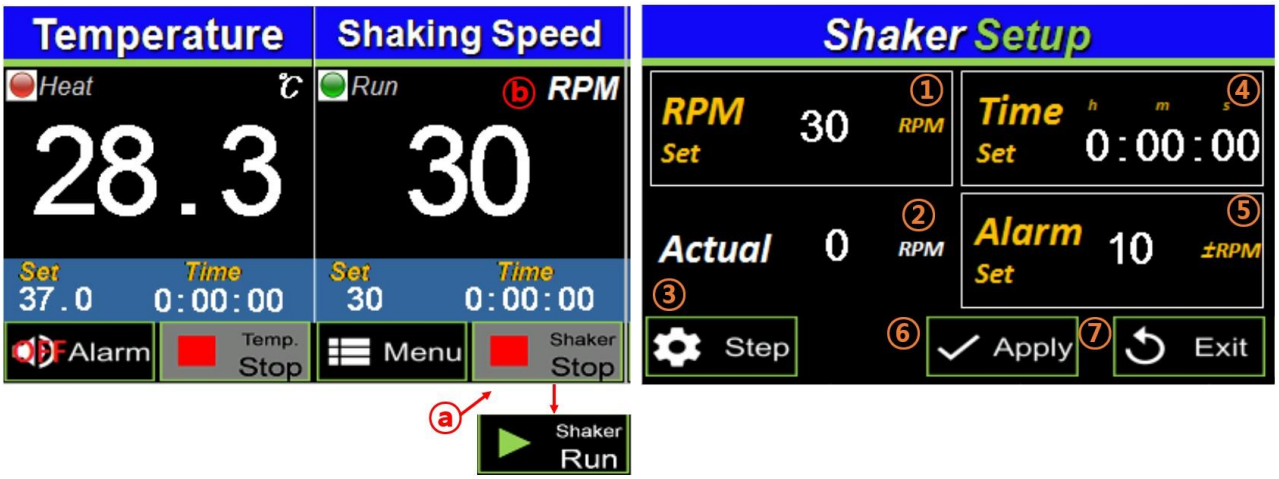
5) Click ③Apply to save the changed settings and return to the previous screen.

6) If pressing the ⑤Exit button, the changed settings will not be saved and screen goes to the previous screen.



7) To apply the new settings, click ⑥Apply in the "Temperature Setup" window.

Advanced Mode (Shaking Time Setting)

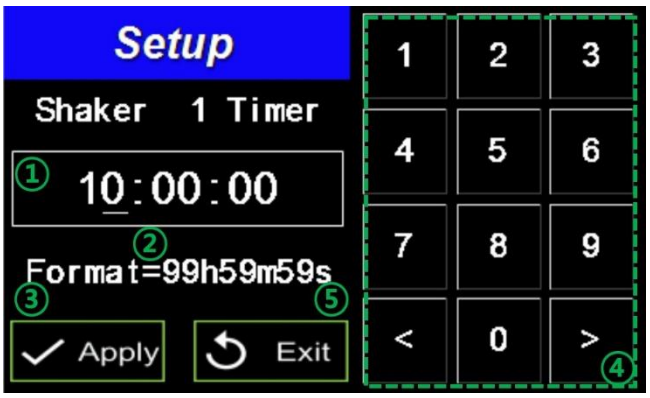


1) When ⓐpressing the Shaker stop button, the button's display changes to "Shaker Run" status.

2) At "Shaker Stop" state, press the ⓑRPM display window. Then, "Shaker Setup" screen will be displayed.

3) At "Shaker Setup" screen, press the ④"Time Set" window to adjust the set time value.

4) Enter the setting value using the ④keypad on the "Setup" screen.



5) Click ③Apply to save the changed settings and return to the previous screen.

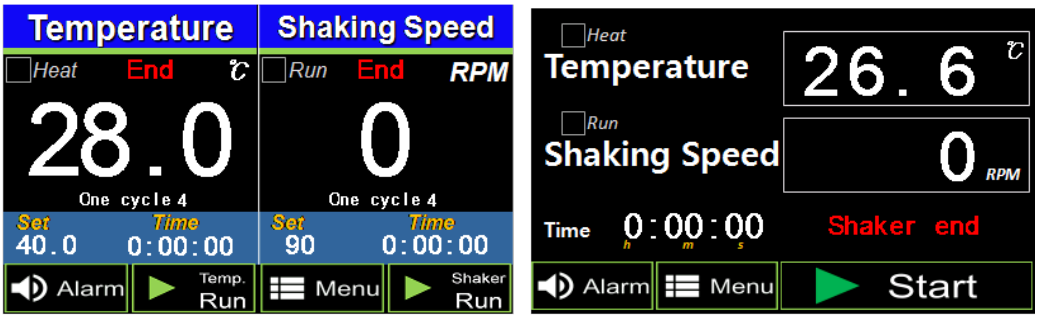
.

6) If pressing the ⑤Exit button, the changed settings will not be saved and screen goes to the previous screen.

7) To apply the new settings, click ⑥Apply in the "Shaker Setup" window.

TIMER END

When the set time ends, shaking is displayed as shown below.



5. ALARM SETTING

ALARM MUTE

1) To stop (mute) the alarm when the product sounds an alarm, press the ① alarm mute button.



2) Press the alarm mute button once to silence the alarm for 10 minutes. However, if the problem is not resolved, it will sound again after 10 minutes.



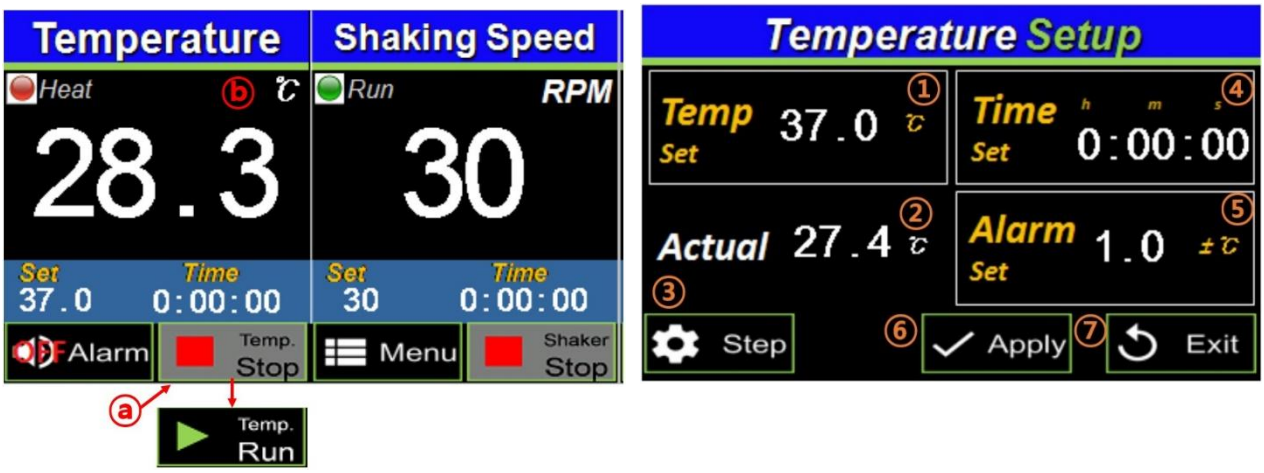
3) If pressing and hold the alarm mute button for 3 seconds, the alarm is switched and remains OFF in a continuous state.



4) Press the alarm mute button again to return to the original state (alarm mute OFF).



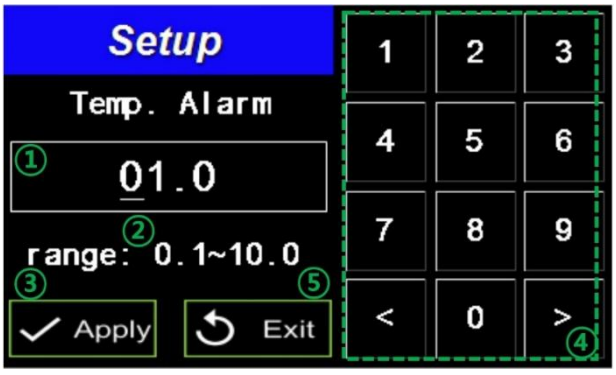
Advanced Mode - Temperature Alarm Setting



1) When ⓐpressing the heating stop button, the button's display changes to "Temp. Run" status.

2) At "Temp. Stop" state, press the ⓑTemperature display window. Then, "Temperature Setup" screen will be displayed.

3) At "Temperature Setup" screen, press the ⑤"Alarm Set" window to set the temperature alarm.



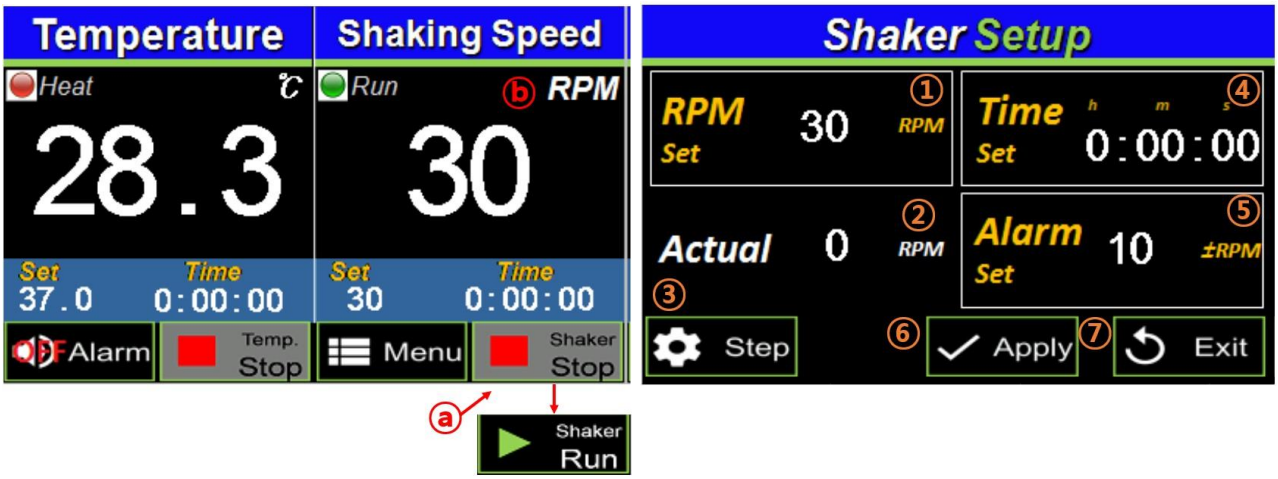
4) Enter the setting value using the ④keypad on the "Setup" screen.

5) Click ③Apply to save the changed settings and return to the previous screen.

6) If pressing the ⑤Exit button, the changed settings will not be saved and screen goes to the previous screen.

7) To apply the new settings, click ⑥Apply in the "Temperature Setup" window.

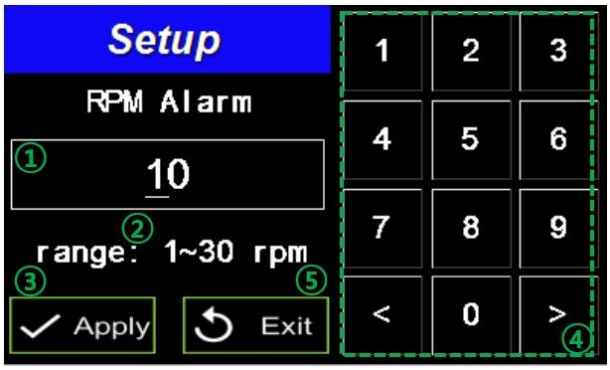
Advanced Mode - RPM Alarm Setting



1) When ⓐpressing the Shaker stop button, the button's display changes to "Shaker Run" status.

2) At "Shaker Stop" state, press the ⓑRPM display window. Then, "Shaker Setup" screen will be displayed.

3) At "Shaker Setup" screen, press the ⑤"Alarm Set" window to set the temperature alarm.



4) Enter the setting value using the ④keypad on the "Setup" screen.

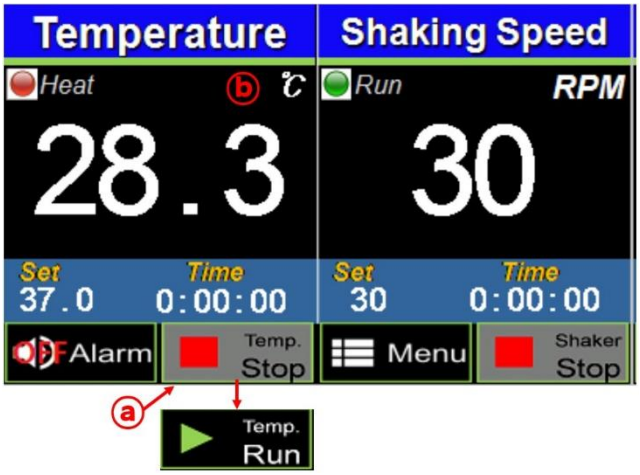
5) Click ③Apply to save the changed settings and return to the previous screen.

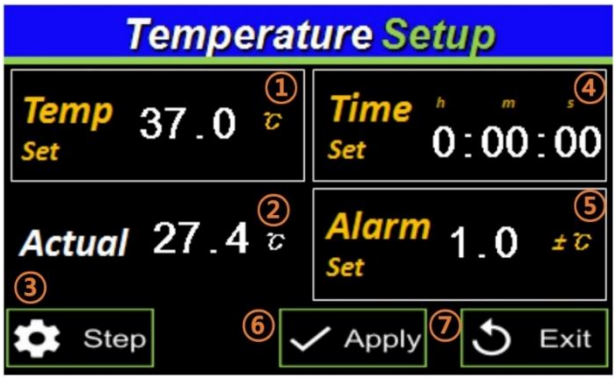
6) If pressing the ⑤Exit button, the changed settings will not be saved and screen goes to the previous screen.

7) To apply the new settings, click ⑥Apply in the "Shaker Setup" window.

6. CYCLE SETTING

Advanced Mode - Temperature Cycle Setting



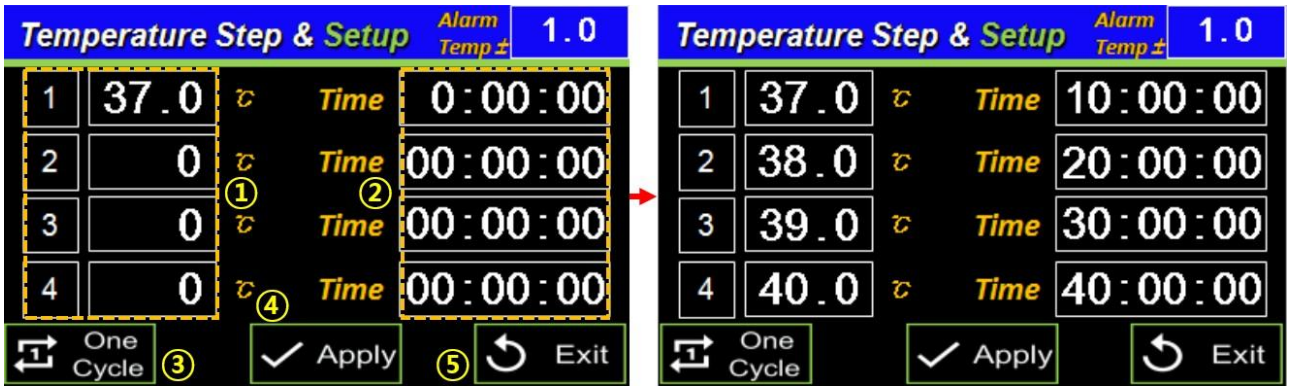


1) When ⓐpressing the heating stop button, the button's display changes to "Temp. Run" status.

2) At "Temp. Stop" state, press the ⓑTemperature display window. Then, "Temperature Setup" screen will be displayed.

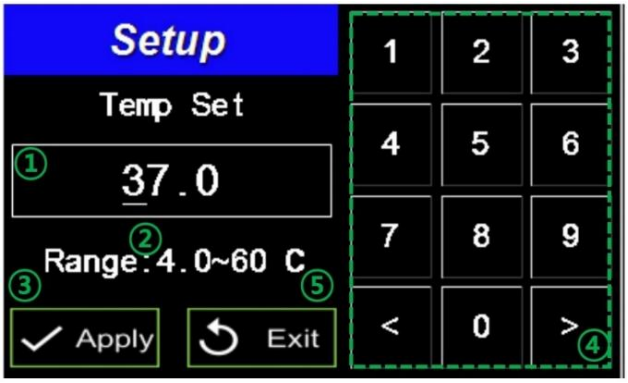
3) Press ③"Step" to go to "Temperature Step & Setup" window.

4) At "Temperature Step & Setup" screen, ①press the temperature value to set each of the four desired temperatures.
(If there are less than 4 temperature values in the cycle, leave the time and temperature values at "0".)

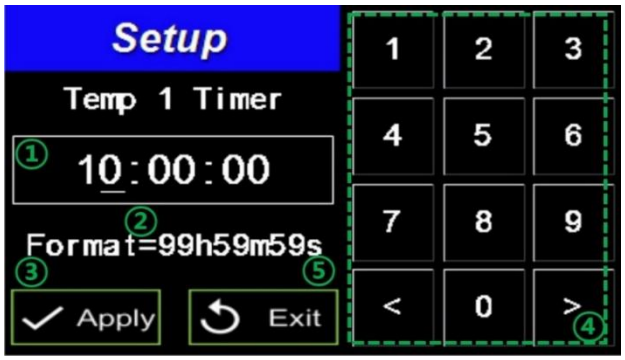


5) Enter the setting value using the ④keypad on the "Setup" screen.

6) Click ③Apply to save the changed settings and return to the previous screen.



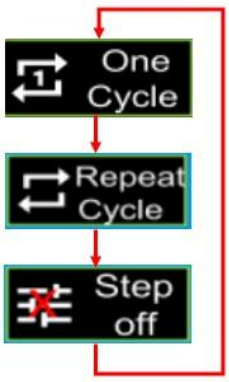
7) If pressing the ⑤Exit button, the changed settings will not be saved and screen goes to the previous screen.



8) Follow the same steps to adjust the ②Time value in the "Temperature Step & Setup" window.

9) ③ There are 3 cycle modes available:

- 1 Cycle
- Repeat cycle
- Step OFF

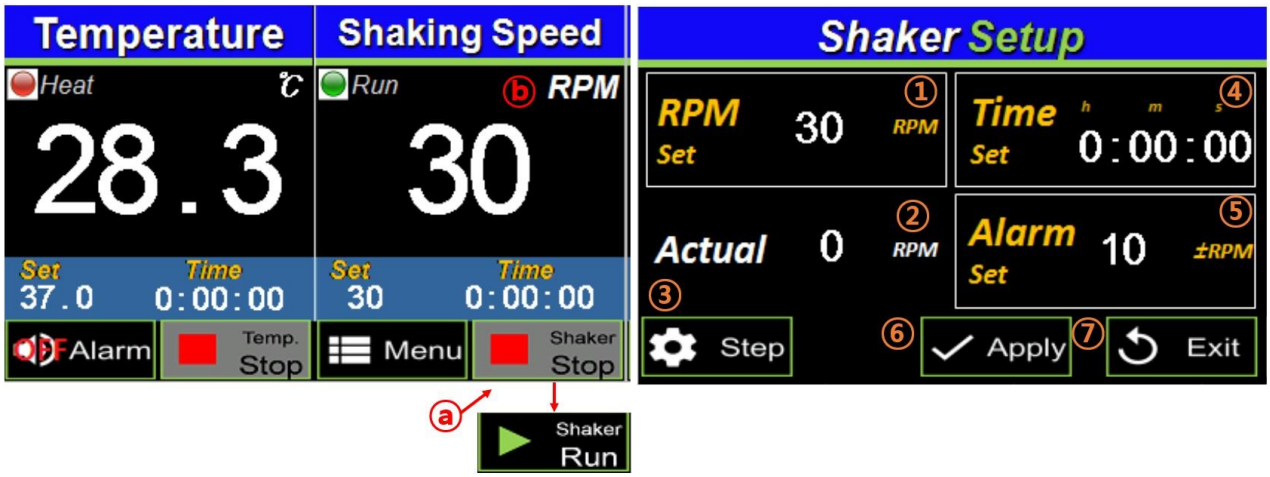


* Performing a repeat cycle will continue to repeat all programmed steps until you press the stop button.

10) Press ④Apply to save the changed set value at "Temperature Step & Setup" screen.

Advanced Mode - RPM Cycle Setting

1) When you go to Advanced Mode, the following window will appear.



2) When ⓐpressing the Shaker stop button, the button's display changes to "Shaker Run" status.

3) At "Shaker Stop" state, press the ⓑRPM display window. Then, "Shaker Setup" screen will be displayed.

4) Press ③"Step" to go to the "Shaker Step & Setup" window.



5) At "Shaker Step & Setup" screen, ①press the RPM value to set each of the four desired RPM.
(If there are less than 4 RPM values in the cycle, leave the time and RPM values at "0".)

6) Enter the setting value using the ④keypad on the "Setup" screen.

7) Click ③Apply to save the changed settings and return to the previous screen.

8) If pressing the ⑤Exit button, the changed settings will not be saved and screen goes to the previous screen.

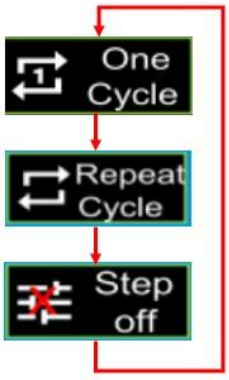




9) Follow the same steps to adjust the ②Time value in the "Shaker Step & Setup" window.

10) ③ There are 3 cycle modes available:

- 1 Cycle
- Repeat cycle
- Step OFF



* Performing a repeat cycle will continue to repeat all programmed steps until you press the stop button.

11) Press ④Apply to save the changed set value at "Shaker Step & Setup" screen.

7. SAFETY SWITCH SETTING

Prevents excessive temperature rise inside the chamber due to product operation errors.



<Safety Switch: upper right side>



<Safety LED>

- The temperature is set to 45℃ at the time of shipment, but it may have changed during transportation, so be sure to check before use.
- The safety switch is a safety device to prevent overheating from the heater when a temperature control problem occurs.
- When the safety switch is activated, the SAFETY LED next to the control panel turns ON and the heating is turns off, preventing the temperature from rising above the user's set temperature.

8. COOLING AND DEFROSTING TIMER SYSTEM

A device to maintain temperature uniformity in the chamber at low set temperature conditions.

1) Cooling System

- When cooling system is needed depending on Room Temperature and Set Temperature
- How to use
  ① Turn ON the Cooling Switch on the lower left side of the unit.
  ② Set the defrosting timer switch on the lower right side to level 1.



<Cooling On>



<Level 1 setting>

2) Defrosting Timer System

- When using the cooling function, set a defrost time for an appropriate period to prevent freezing of the refrigeration device.

- When to use:

(1) The defrost timer function is not necessary when:

① The set temperature is higher than Ambient +5℃.
(When the cooling system is OFF)

② The set temperature is higher than 15℃.
- The Cooling system is ON but no need of defrost timer function.

③ The set temperature is lower than 15℃(4℃ ~ 14℃),
but the cooling is used for less than 24 hours.
(It can however be different depending on the environmental factors.)

(2) The defrost timer function is necessary when:

Set temperature is lower than 15℃ (4℃ ~ 14℃)
+ The cooling system is used for more than 24 hours

(3) How to use

- The basic set condition of defrost timer function is:
- 6 hours cooling / 6 ~ 8 minutes stop cooling(defrost)

① Turn ON the cooling switch on the lower left side of the unit.
② Set the defrosting timer switch on the lower right side to level 2.



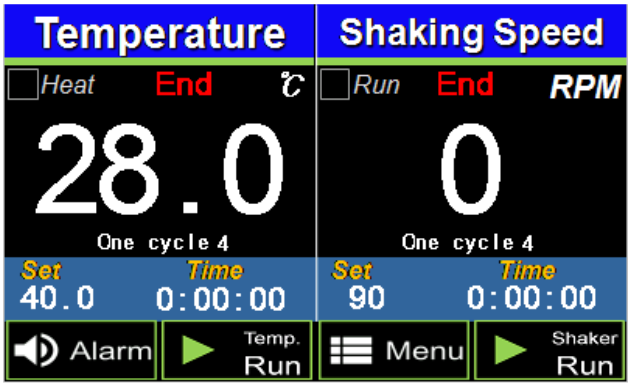
<Cooling On>

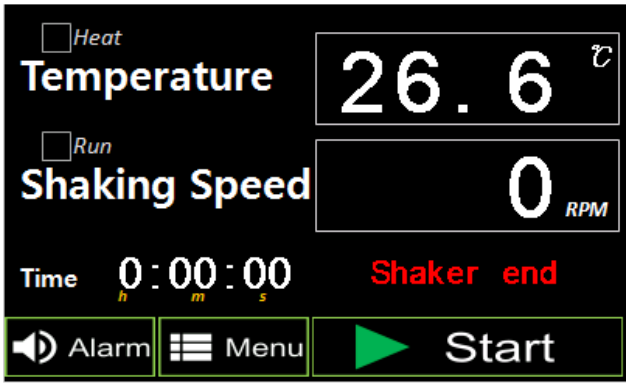


<Level 2 setting>

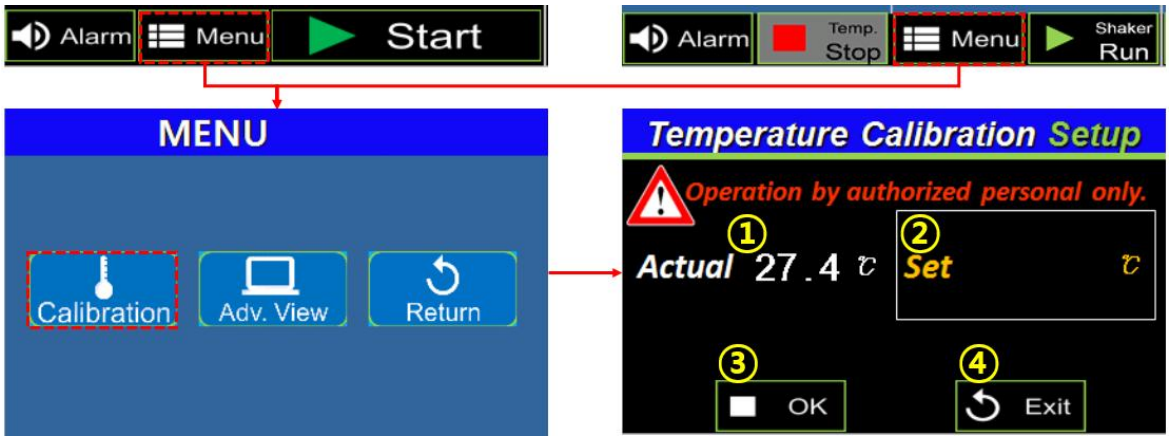
9. END

When the shaking program ends, there is “END” signal such as in below.





● CALIBRATION



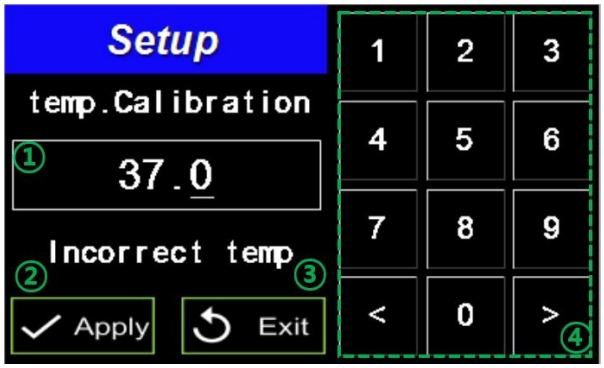
1) Apply "Menu" window to go to "Temperature Calibration Setup" screen.

2) At "Temperature Calibration Setup" screen, Apply ②Set to go to "Setup" screen.

3) Enter the setting value using the ④keypad on the "Setup" screen.

4) Click ②Apply to save the changed settings and return to previous screen.

5) If pressing the ③Exit button, the changed settings will not be saved and screen goes to the previous screen.



6) Press ③OK to save the changed set value at "Temperature Calibration Setup".

7) If pressing the ④Exit button, the changed settings will not be saved and screen goes to the previous screen.

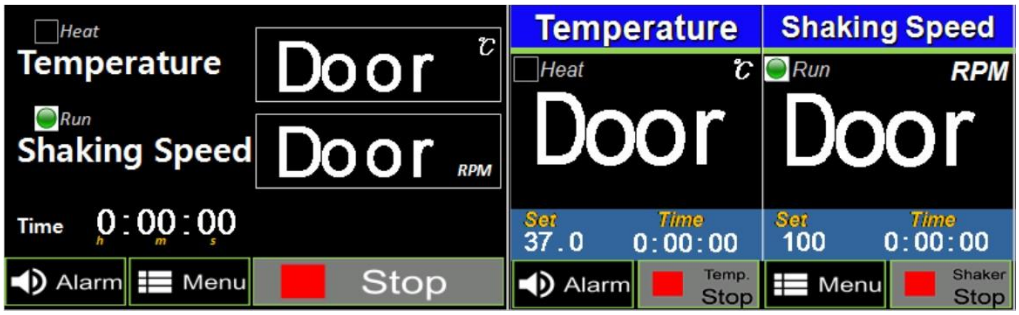
8) The last calibration value of Set ℃ will continue to be displayed until power off and on.

* The inner temperature must be measured after it is stabilized using a calibrated instrument.
* When measuring with more than 1 point instrument, it is recommended to apply the average value.

● DISPLAY EVENT SCREEN

1. DOOR OPEN MESSAGE

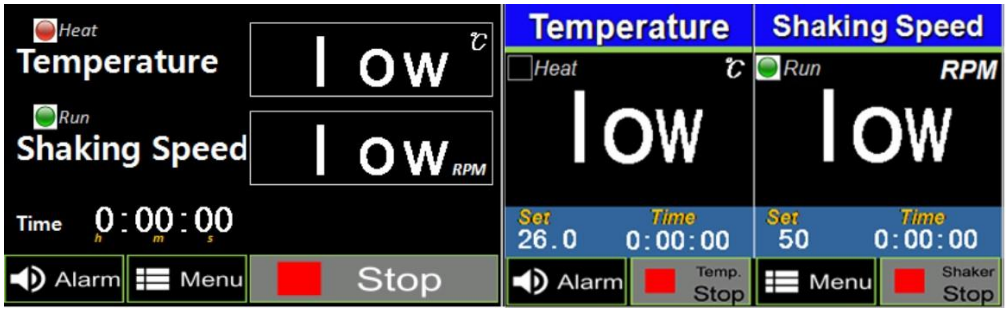
When the door is opened, the display shows a door message as shown below. The alarm starts sounding when the door is left open for over 1 minute.

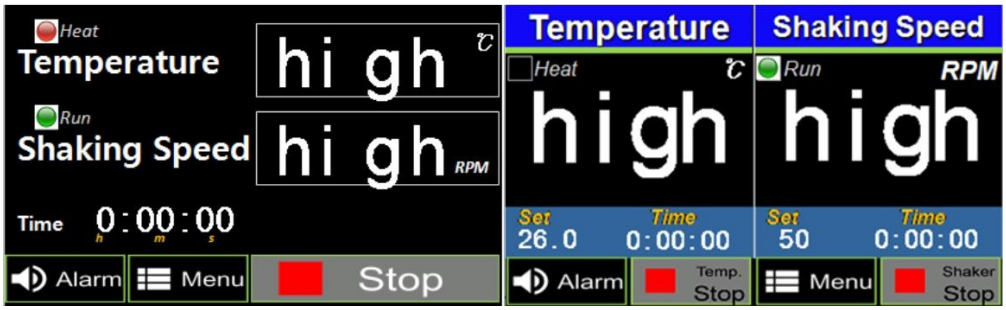


* When door is open, the shaker stops automatically.

2. TEMPERATURE / RPM MESSAGE

"low" / "high" message appears on the display and an alarm sound starts when the measured value deviates from the set value (the value difference exceeds the value programmed for the alarm).





* This message is cleared when the instrument remains within the set value for 1 minute after the alarm is activated.

Thank you for purchasing GLOBAL N-BIOTEK shaking incubator.
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

ITEM	Refrigerated Shaking Incubator	**MODEL**	NB-T207 / T207F
DATE OF INSTALLATION	mm-dd-year	**SUPPLIER**	
SERIAL NO.		**PERIOD**	1 year

GLOBAL 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 GLOBAL N-BIOTEK or reliable distributor's examination.
2. The warranty period is 1 year from date of installation or 18 months from the date of shipment from GLOBAL N-BIOTEK, whichever is sooner as indicated in above table. This period is proved by serial number.
3. GLOBAL 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 GLOBAL N-BIOTEK when warranty repair is needed.

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