OPERATING MANUAL

LARGE CAPACITY CO_2 INCUBATOR

MAXCELL™

NB-T203XXL

Design may be changed without prior notice for product improvement.

N-BIOTEK
Leading Life science

1. General Information on Precaution

■ **Safety precautions are intended to prevent accidents or danger in advance by using product safely and correctly.**

■ **Precautions are divided into "Warning" and "Caution", and the meanings of each are as follows.**

■ **Other Marks**

1.1 Precaution for using the power cable

---------- **WARNING** ----------

Do not make the power plug be pressed by back of the product.
(A space between the product and the plug must be 30cm at least.

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 code with wet hands. (It can cause an electric shock.)

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

When you see smoke coming from the product or smell something like burning or see any other strange symptoms, you have to cut off the power code and stop using it.
(It can cause an electric shock and a fire.)

1.2 Precaution for ground connection

WARNING

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

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.

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

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.

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 as well as experimental loss.)

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.)

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.)

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.)


Compliance

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


Compliance

Please be sure to prevent foreign substances from getting into the sealing silicon of the door. (The inflow of open air can cause the change of temperature in chamber and discoloration of the packing part by a foreign substance.)

2. Transportation, Storage and Location of Installation

2.1 Transportation


Compliance

Install the product by sliding it carefully to prevent it from tipping over.


Compliance

Permissible ambient temperature range for transport: -10℃ to 60℃.

2.2 Storage


Compliance

Do not keep it at Place in High Humidity. Permissible ambient humidity: max. 70% storage in a cold location is the place you transfer the unit to the installation site for start-up, condensation may form. In this case, Wait at least one hour until the CO_2 incubator has attained temperature and is completely dry.


Compliance

Please check the voltage & Hertz written on serial label.
(Over-voltage, under-voltage can damage the product and poor performance.)


Prohibition

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 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℃.)

2.3 Location of installation and ambient conditions


Prohibition

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


Compliance

When you install the product, you have to put the distance of at least 30cm from the wall. To completely separate the unit from the power supply, power plug must be disconnected. Install the unit in the way that the power plug is easily accessible and can be easily pulled in case of danger.


Compliance

Install the unit at a flat surface, free from vibration and in a well-ventilated location.
(If the ground is not flat, it can cause an excessive vibration of the product.)


Prohibition

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


Compliance

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

CO_2, as well as O_2, and N_2 are harmful in human when in high concentrations.
Any excess has to be led out via good room ventilation or by connection to a suitable exhaust system.

2.4 Precaution during operation

WARNING


Prohibition

Do not apply shock or movement during product operation.
(It can cause product damage or defects.


Prohibition

Keep the gas regulator pressure properly.
(Appropriate pressure is 1 bar. Please check this before use.
If you use low or high pressure, there may be problems in maintaining the CO_2 concentration.)

2.5 Precaution for maintenance and management

CAUTION


Compliance

When not using the product for a long period of time, remove the power plug, dry it, and package it before storing. (Drying method is to empty the water from tray and remove the samples and clean the tray and chamber with a sterilized dry cloth. And set the instrument temperature about 37~40℃ and operate it for about 30 minutes.)


Prohibition

When cleaning the product, remove the power plug and clean instrument with a sterilized dry cloth, and be careful not to leave any foreign matter on the chamber, shelves, or tray.


Prohibition

If it is difficult to use due to malfunction, contact NBIOTEK and request the claims.
Maintenance and repair may be difficult in case of any repair from distributor other than NBIOTEK.

3. FEATURES

- Precision temperature control by Microprocessor PID.
- IR CO_2 Sensor detects precise density of CO_2.
- 7 Inch Full Color LCD Touch Panel for Data Recording, Real-time Information and every control.
- 6 Side Direct Heating and 4 Air Circulation Fans for Temperature Uniformity and Fast Recovery.
- Various Composition and Divided Glass Door Options
  – 25 Positions of Shelves and 5 Types of Glass Doors are able to choose.
- Internal Observation without condensation and door opening is possible through the Heated Glass Window.

4. SPECIFICATIONS

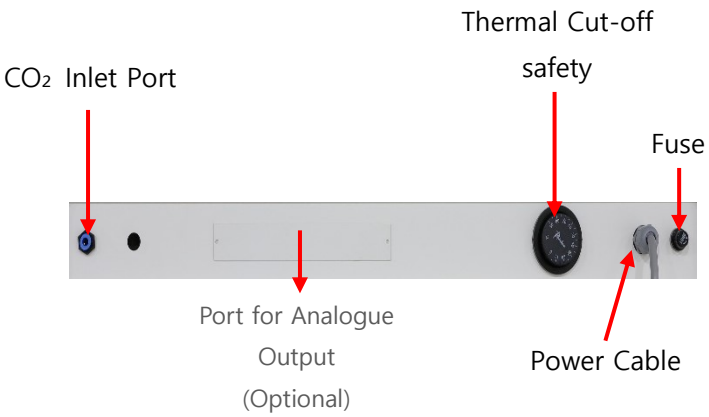
Model	NB-T203XXL-1D	NB-T203XXL -2D	NB-T203XXL -5D
Chamber Volume	880 Liter		
Number of Inner Glass Door	Complete one door	2 Divided Glass Doors	5 Divided Doors
External Dimension	840(W) x 930(D) x 1890(H)mm		
Internal Dimension	720(W) x 800(D) x 1530(H)mm		
Temperature Range	Ambient +7ºC to 60ºC *		
Temp. Uniformity	±0.5ºC at 37ºC		
Temp. Control	±0.1ºC		
Temp. Safety	Independent Analogue Thermostat		
Jacket / Heating	Air Jacket, Dry Wall / 6 Side Direct Heating		
Fan / Air flow	4 x Fans at back bottom-most / Vertical Laminar Airflow		
CO_2 Range	1 ~ 20%		
CO_2 Sensor	Dual Beam Infrared(IR) CO_2 Sensor		
CO_2 Accuracy	±0.1%		
Humidity	80 ~ 90% with Water Tray OR Optional Ultra Sonic Humidifier		
Display	7inch Full Color LCD Touch Panel		
Number of Shelves	0 (Separate Purchase)	3	5
Maximum Number of Shelf	25		
Shelf Size	670(W) x 750(D)mm		
Chamber & Shelf Material	Stainless Steel 304		
Outer door	Powder coated Heated Door (left open) / with Heated Glass Window (Optional)		
Alarm	Temperature, CO_2, Door Open, Sensor Failure		
Electric Safety device	Fuse (built-in with one spare)		
Power Supply	100V ~ 120V, 50,60Hz / 220 ~ 230V, 50~60Hz		
Weight	300 ~ 310kg(Various Depending on number of shelf and divided glass doors)		

5. CONFIGURATION

1) CLOSE STATE

2) OPEN STATE

3) Rear Top of Incubator



4) Main Power Switch at Right Side

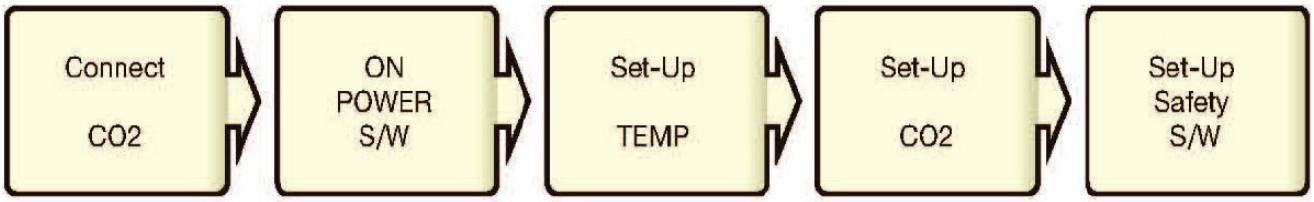
Main Power Switch

6. OPERATION

6.1 Installation

* Please check the connection of gas supply. And open CO_2 gas cylinder for supply with the pressure of regulator set to a certain level.

<CO_2 Incubator Set-up Process>



1) **Install the product at the desired place and check the level in all directions (side by side, front to back and ground).**
2) **Prior to connect the power plug, make sure that the POWER S/W is OFF.**
3) **Connect the CO_2 Gas**

1. Regulator Pressure Gauge
2. Bombe Pressure Gauge
3. Flow Meter
4. Regulator Valve
5. Master Valve

✓ Check whether CO_2 gas is leaking at any point of regulator.
If leak is found, please take measures to stop leaking before supply of CO_2 gas to incubator.

✓ Clear the air passage for gas input gasket at the rear of the unit.
Also check the gas tube and get rid of any obstacles for smooth gas flow.

✓ Before supply of CO_2 gas into incubator by gas tube,
check the remaining gas volume in CO_2 Gas cylinder.

✓ When previous stage is cleared, connect the gas tube to regulator and incubator.
At this point, make sure that valves of all the part besides gas cylinder, Regulator are locked.

(④ and ⑤ have the opposite lock direction each other.
④ is clockwise and ⑤ is counter clockwise)

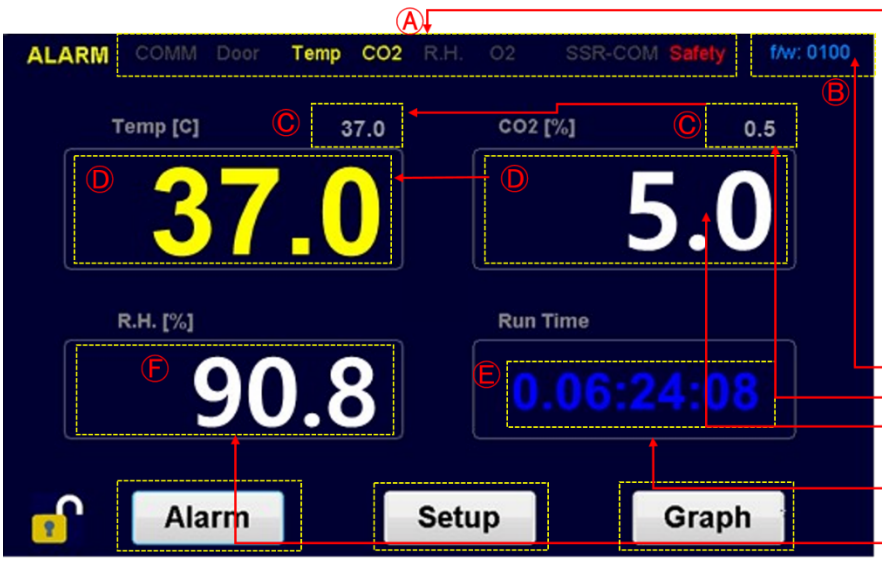
✓ Open ⑤ (Master valve of cylinder) and ④ (the regulator valve), ③ Flow meter.
While Flow meter fully open, do adjust regulator valve up to 1.0 bar).

Compliance

Pressure gauge may be difference from each gauge manufacturer.
If Regulator's pressure is too high, it causes malfunction of the CO_2 control.
Therefore, it is highly recommendable to find a right level of pressure by user.

6.2 CO_2 Incubator Touch Panel

1) Touch Display Panel Instruction – 1



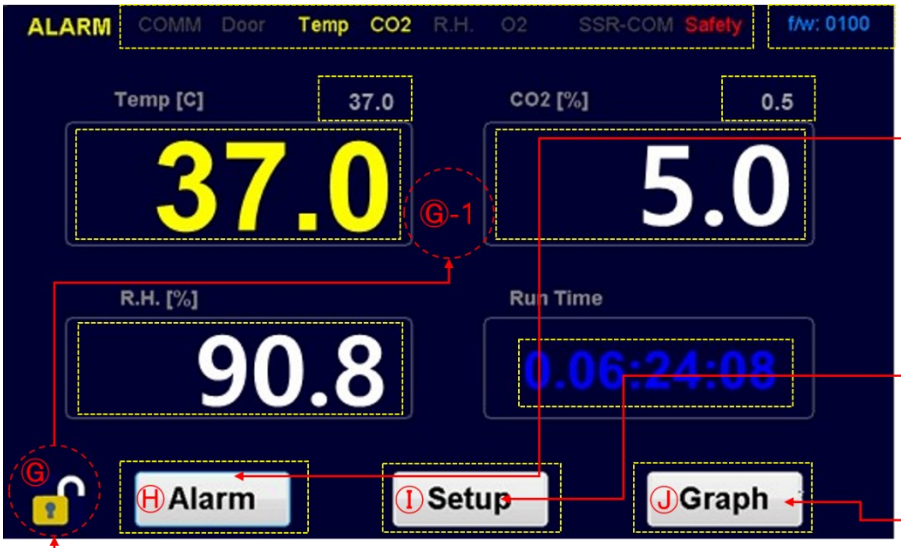
Ⓐ ALARM Event Display
① COMM Displayed when communication error between touch panel and the main-board
② Door Displayed when door open for long time
③ Temp Displayed when low temp or high temp
④ CO_2 Displayed when low CO_2 or high CO_2
⑤ R.H Displayed when lower or higher humidity than set value (OPTION)
⑥ O_2 Displayed when low O_2 or high O_2 (OPTION)
⑦ SSR=COM Displayed when electric short circuit
⑧ Safety Displayed when temp higher than thermal cut off safety set temp

Ⓑ f/w:0100 Current version information
Ⓒ SV Set Value (Temp & CO_2)
Ⓓ PV Present Value (Touch to adjust set value)
Ⓔ R.H.[%] Present Humidity Value (Humidification is Optional)
Ⓕ Run Time Product Running Time

※ When PV value is yellow on the screen, it can be seen that the signal output is ON.

Model : NB-T203 / NB-T203XL / NB-T203XXL

2) Touch Display Panel Instruction – 2



Ⓗ Alarm Setting
(Press Alarm once, ①->②->③-> Repeat ①)
① Normal
② Mute10 (Alarm Mute for 10 min. After 10 min. alarm resume automatically)
③ Off (Alarm OFF)

Ⓘ Setup To adjust Incubator's set values

Ⓙ Graph To see graph of R.H, CO_2 and Temp (Max. 6 months)

Ⓖ Press once to Lock Display

Ⓖ-1 To Unlock the display,
Press the middle part of temp and CO_2 value for more than 1.5 sec.

Model : NB-T203 / NB-T203XL / NB-T203XXL

6.3 CO_2 Incubator Operation and Setting

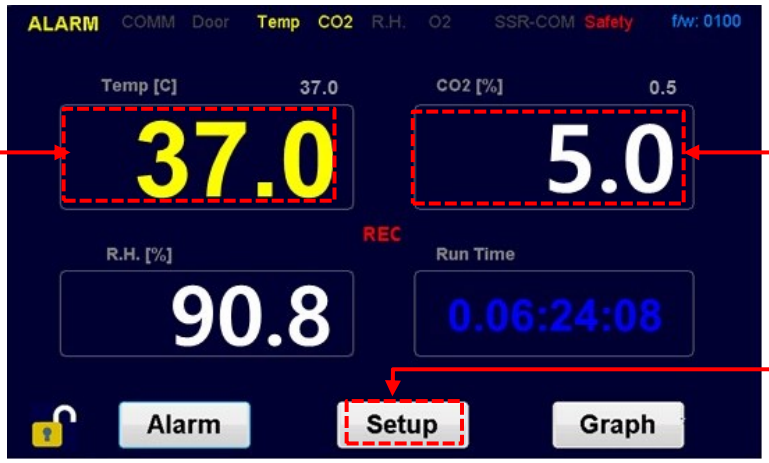
1) Product Power On

When the power is turned on, an alarm sound occurs during booting (about 7~8 seconds), and normal operation starts when there is no alarm sound.

*Caution: If the alarm occurs continuously (COMM display), contact the manufacturer to request repair.

The following ids displayed on the Control Panel Display (Pic. 1)

◆ Main View



Setup Touch

Setup Touch

Setup Touch

***Above values in panel could differ from the picture depending on the situation.**

2) Incubator Setup

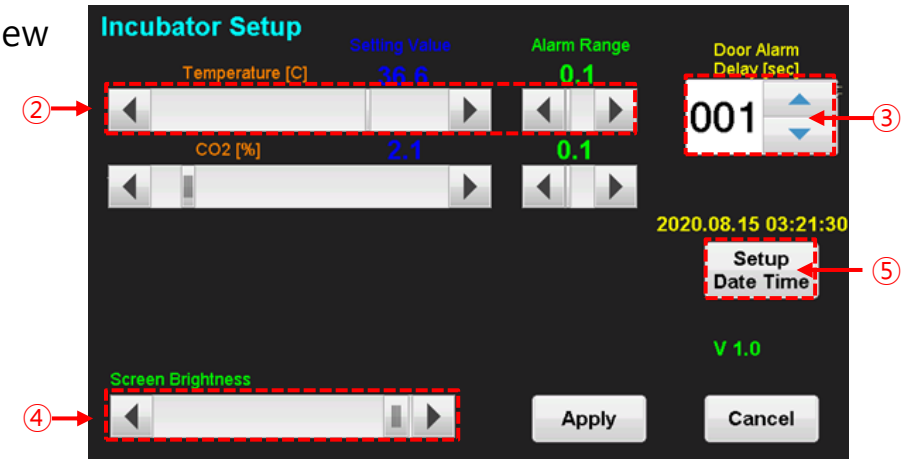
- Temperature Setting (reference- Pic.1)

The temperature range is Amb. +5℃ ~ 60℃.

Heater is activated about 10 sec. after turning on the switch.

① **Press 'Setup' button or 'PV value' part on main screen to switch to the setup display.**

◆ Setup View



② **Temperature[C] Setting**

Set the required temperature value by using the ◀ I ▶ scroll.

(Set the allowable Alarm Range, between ±0.1℃ ~ ±25.1℃)

■ **The maximum temp of this instrument is up to 60℃, but it's not recommended temp for use.**

③ **Door Alarm Delay Setup (Sec.) (001sec ~ 180sec)**

Set the time when alarm doesn't sound while the door is open.

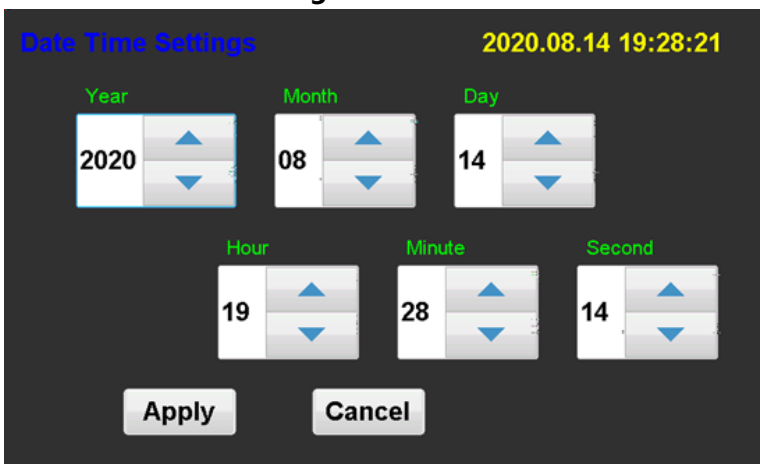
④ **Screen Brightness**

Adjust screen brightness by using the ◀ I ▶ scroll.

⑤ **Setup Date time (Refer to below picture)**

- **Press the icon to enter 'Date Time Setting View'**

◆ Date Time Setting View



By using ▲ ▼ to set the exact 'Year, Month, Day, Hour, Minute, Second'

And press 'Apply' to save data

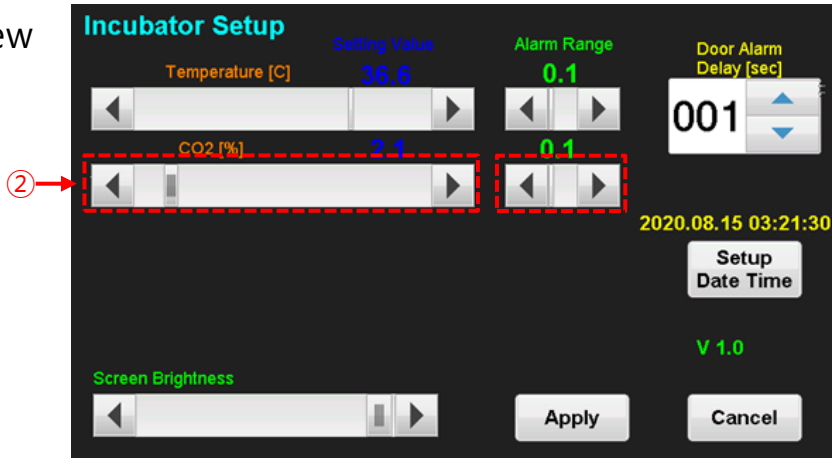
3) CO_2 Gas Setup (reference- Pic.1)

CO_2 range is 0.1% ~ 20%.

Product's CO_2 is set to 0% before the shipment.

① Press 'Setup' button or 'PV value' part on main screen to switch to the setup display.

◆ Setup View



② CO_2 [%] Setting

Set the required CO_2 value by using the ◀ I ▶ scroll.

(Set the allowable Alarm Range, between ±0.1% ~ ±10.1%)

Press 'Apply' to save the adjusted CO_2 value.

Then, Main View will be displayed. (Press 'Cancel' to keep previous setting)

■ **If CO_2 gas pressure is too high, SOLENOID VALVE could be damaged.**

■ **If Recovery Time takes long or Over shooting occurs, control gas pressure appropriately.**

4) Humidity (reference- Pic.1)

R.H. [%] – Displays the Humidity Value inside of chamber.

■ **Humidity is a natural humidification system by using water tray,**
So, controlling and setting humidification is not possible.

5) Run Time (reference- Pic.1)

■ **Run time displays the time in use after the power is turned on.**

■ **If the power off during use, Run Time will restart at 0.00:00:00.**
(* Through this system, you can check the power failure status.)

0. 06 : 24 : 08 (EX)

Day H M S

6) Alarm Function (reference- Pic.1)

① **Normal** *Basic Setting before the shipment (adjustable from 'Factory Setup')

② **Mute10** *It is silent for 10mins even alarm activates, and after 10min, it is automatically deactivated by program and restored to 'Normal' state.

③ **Off** *Alarm Off for continually.

[Press Alarm once, ① -> ② -> ③ -> repeat ①]

7) Display Lock (reference- Pic.1)

①  **Display is locked. (Operation impossible)**

②  **Display is unlocked. (Operation available)**

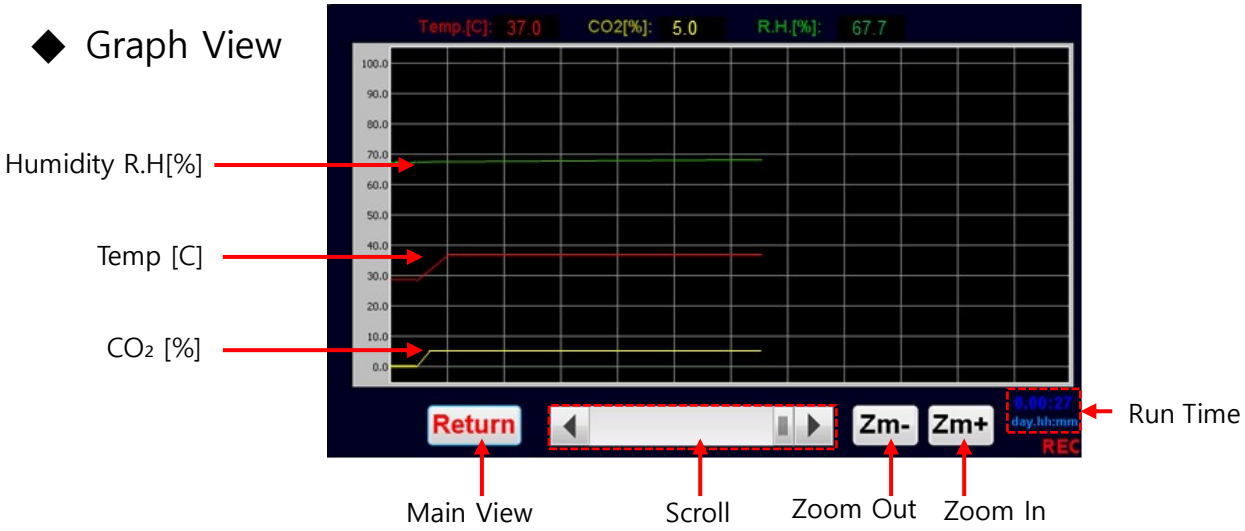
③ **To unlock the display** 

■ **Press more than 1.5 seconds ● the part between 'Temp[C]' and 'CO2[%]' to unlock the display.**

8) Graph (reference- Pic.1)

- Press Graph icon to check Graph View.

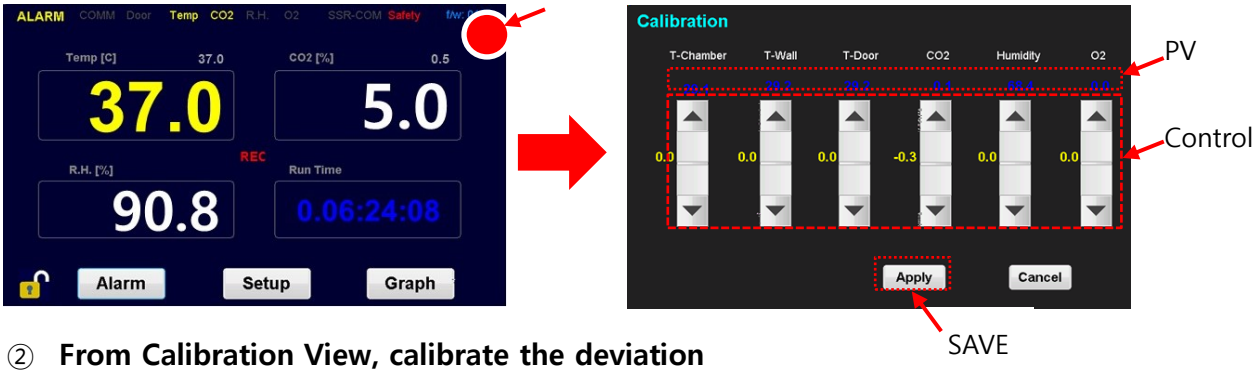
◆ Graph View



- If the power is on continuously, the data for up to 6 months can be displayed.
- When the instrument is turned off and on, Graph starts anew.
- Each color displays temperature, CO_2, and Humidity.
- Each displayed time interval is 1 minute.
- The vertical line grid is 1 hour apart.
- Using **'Zoom Out / Zoom In'** or use finger to up/down the graph, if all values are not invisible at once.
- By moving left/right **Scroll Bar**, you can see the horizontal time axis of the graph. (Max. 6 months)
  At this time, blue Run-Time at the bottom right is showing the time zone for graph.
- **Run-Time** at the bottom right is referring values on the graph from instrument turned on.
- When using **USB Data Backup**, the data saving interval is 1 minute, and alarm status is also recorded.
  Also, Door Open/Close and setting changes are recorded.
- **USB File** starts when a new file is created by date/time is changed through the **Setup** screen.
  Also, when USB is inserted or power is turned on, a new file is started.
  And new files are distinguished by serial number and date/time.
- When purchasing a new USB Memory Stick and using it for the first time, insert it into a Windows PC and <Open> to initialize the disk before use. Disk Format supports FAT12/16/32.
- The file format is Excel CSV. So, it can be opened in Excel from Windows PC.
- ***'IncuData'*** folder will create in USB and then File is created in that folder.

9) Calibration Setting

① To enter **'Calibration View'**, Press **'f/w:0100'**, the upper right corner of Main View more than 1.5 sec.



② **From Calibration View, calibrate the deviation measured by the measuring instrument with ▲▼ button.**

■ **Temperature (T-Chamber / T-Wall / T-Door / CO_2) calibrate individually.**

■ **Humidity & O_2 is optional.**

③ **After adjustment value, press 'Apply' to save changed values.**

④ **Press 'Cancel' to exit Calibration view without any adjustment.**

✓ **Temperature Calibration** (T-Chamber, T-Wall, T-Door)

Ex) When temp is set at 37℃ and measured temp for each Chamber, Door, Wall is 38℃, adjust 1.0 for each section and press 'Apply' to save the data.

✓ **CO_2 Calibration**

Ex) When CO_2 range is set for 5% and measured CO_2 is 4%,
adjust -1.0 for CO_2 section and press 'Apply' to save the data.

■ **The adjusted value is saved only when you press 'Apply' icon.**

10) Safety Switch

The safety thermal cut-off device to prevent the heater from overheating when the temperature controller is malfunctioning.
(Please set this device +5℃ higher than setting temperature.)

■ **Set the Safety Switch higher than setting point.**
(Product set temp is 37℃, Safety Switch set at about 45℃ or higher.

■ **Safety Switch is set at 45℃ at the time of shipment,**
but there is possibility that it may have changed when transportation, so, please check Safety Switch.

7. ALARM

- **Alarm warns audibly in case of Door Open, fault of Temperature and CO_2 Gas.**
- **Alarm is applied after product is on and the set value is maintained for more than 3 minutes after the setting.**

① **Door (short Beep sound / Beep- Beep- Beep-)**

A. Alarm occurs when the outer door is open for longer than a minute.
B. Alarm stops when the door closed in a minute.
C. Door is open more than 1 minute.
   - Alarm will end after 3 seconds when door is closed.
   - Press 'Alarm' icon to change to 'Alarm Mute'.

Door Alarm operates regardless of temperature or CO_2 stablility

② **Temperature (short Beep sound / Beep- Beep- Beep-)**

A. Alarm recognition range: After temp exceeds 36℃ (lower limit) and 38℃ (upper limit), the alarm will occur after more than 8 minutes.
B. To stop alarm ringing, press 'Alarm' icon to change to 'Alarm Mute'.
C. If the range is out of ±1℃ even after 10 minutes from pressing the alarm mute, The alarm continues to sound until Alarm Mute is pressed.
D. Alarm stops automatically when value is stable within ±1℃.

③ **CO_2 (short Beep sound / Beep- Beep- Beep-)**

A. Alarm recognition range: After temp exceeds 4% (lower limit) and 6% (upper limit), the alarm will occur after more than 8 minutes.
B. To stop alarm ringing, press 'Alarm' icon to change to 'Alarm Mute'.
C. If the range is out of ±1% even after 10 minutes from pressing the alarm mute, The alarm continues to sound until Alarm Mute is pressed.
D. Alarm stops automatically when value is stable within ±1%.

④ **Sensor Error Alarm (short Beep sound / Beep- Beep- Beep-)**

A. Alarm sounds when there is an error or disconnection of temperature sensor or CO_2 sensor.
B. Even if another alarm (temperature or CO_2) occurs, the previous sensor alarm rings.
C. To stop sensor alarm, turn off the product and then turn it on again or turn off the Alarm On/Off. Alarm Mute can't stop ringing for sensor alarm.
D. If sensor's disconnection had fixed normally, alarm will not occur when power is on again.

※Display Signal and Alarm Sound when sensor disconnection

Category	Signal on Display / Alarm Sound
Temp Sensor 1 (Chamber)	911.0 / Beep~ Beep~ Beep (Repeat)
CO2 Sensor 2	119.0 / Beep~ Beep~ Beep (Repeat)
Humidity Sensor 3	0.0 / Beep~ Beep~ Beep (Repeat)
Event	Event / Beep~ Beep~ Beep (Repeat)

Thank you for purchasing our MaxCell CO2 Incubator

This operation manual describes practical information such as performance, usage, and 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.

W A R R A N T Y

ITEM	MAXCELL CO2 INCUBATOR	**MODEL**	NB-T203XXL
DATE OF INSTALLATION	MM – DD – YY	**SUPPLIER**	
SERIAL NO.		**PERIOD**	1 Year after installation

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.

Signed By

President Daeyong Kim
N-BIOTEK,INC.

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