



BIOSPACE

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Biospace reserves the right to modify the dimensions or exterior of InBody220 to improve the quality of the products, without consent of the customer.

Please register your product at Biospace website before using it.
We will provide you with various products information and customer services.

HOW TO USE THIS MANUAL

This user's manual explains the functions of InBody220. Follow the instructions below for effective use of this manual.

1. Please read all instructions in this manual thoroughly before operation.
2. Fully utilize the aid materials, such as pictures and drawings, to obtain a clear understanding.
3. Before calling Biospace for assistance, please refer to Chapter 4: "Problems and Solutions".
4. To purchase consumable products or optional equipment, please refer to Chapter 5, section 1: "Consumables".
5. If you have clinical issues while using InBody220, please contact us using the E-mail address as shown below.
E-mail : biospace@biospace.co.kr
6. In particular, please read the instructions and become familiar with the following indicators:



Important information to warn you of situations which might cause an imminent risk of death and / or major injury if instructions are not carefully followed.



Important information to warn you of situations which might cause the possibility of major injury and / or damage to property if instructions are not carefully followed.



Important information to warn you of situations which might cause minor injury and / or damage to property if instructions are not carefully followed.



Important helpful information for operating InBody220.

SAFETY INFORMATION



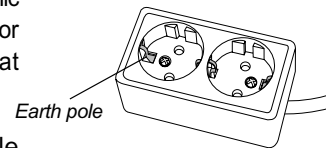
DANGER

1. Never use this equipment in combination with the following medical electronic device.
 - Medical electronic implants such as pacemakers
 - Electronic life support systems such as an artificial heart/lung
 - Portable electronic medical devices such as an electrocardiograph
 - This equipment may cause the above mentioned medical electronic devices to malfunction
2. Do not operate within 1 meter from shockwave or microwave therapy equipment. Avoid simultaneously connecting patients to InBody220 and high frequency surgical equipment.



WARNING

1. Do not operate within 1 meter of other running medical electronic equipment. This will result in electromagnetic interference or possibly other interference between InBody220 and that equipment.
2. This product should always be earthed. A three pole (2pole+1earth) socket/plug must be used.
3. Do not touch InBody220 with wet hands or step on it being wet. It may cause damage of the equipment if the water flows into the inside.
4. To avoid electric shock, be sure to avoid contact between InBody220 and any kind of external connector or other device that might be connected to a power source.
5. Do not dismantle the equipment or open the back cover. Internal parts are not for customer use. If the equipment is dismantled, the warranty is void, and service costs will be charged to you. If service is required, contact Biospace or the supplying agency.
6. When connecting peripherals (printers and other optional device) to InBody220, turn on the power of peripherals before turning on InBody220. When turning the power off, turn off InBody220 first before turning off the peripherals. This process will minimize the harm to the equipment caused by electric shock.
7. The hand module consists of a hand electrode, a joint and a bar. Do not force the hand module strongly in the wrong direction. The resulting damage may affect the function of the internal cable and circuit board.
8. Do not operate this equipment if it has a damaged power cord or plug, if it is not working properly, or if it has been damaged.
9. Do not immerse power cord in water.



-
10. Do not touch signal parts for external communication such as the 9pin serial port and a human body at the same time.
 11. Individuals with any kind of contagious disease or any kind of injury to the palm or sole must not use or come in contact with this product.
 12. Never start weight reduction or exercise therapy without the instructions of a physician or a specialist. Self-diagnosis may damage your health condition.
Consult with your physician.
 13. This equipment is specifically designed to analyze body composition.
Use the equipment only for its intended use as described in this manual.
Do not use the weight measured from InBody220 for other medical use such as a physical examination.



1. While moving, installing or using this product, be sure to protect it against any physical shock or damage. Always use the packing material and the original shipping carton when moving or transporting this product.
2. Always operate this product within prescribed ranges of temperature, humidity, and pressure. Operating in ranges outside of those specified may affect the operation of this product, and may cause malfunction.
3. When pressing the touch screen, use ONLY the stylus pen provided by Biospace. Biospace is not liable for any damages caused by using any other tools.
4. To prevent injury, keep the stylus pen out of children's grasp.
5. Follow local governing ordinances and recycling plans regarding disposal or recycling of device components.
6. Be careful not to spill or drop any residues of food or beverages on this product. It may cause serious damage to the electronic components.
7. Install or locate the equipment only in accordance with the provided installation instructions.
8. This equipment should be serviced only by qualified service personnel.
Contact Biospace for examination, repair or adjustment.







NOTE




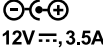


1. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
 - Reorient or relocate the receiving device.
 - Increase the separation between the equipment.
 - Connect the equipment into an outlet on a circuit different from that to which the other device(s) are connected.
 - Consult the manufacturer or field service technician for help.
2. InBody220 has been designed, manufactured, and inspected under the full quality assurance system of Biospace. Biospace fulfills the international standardization system, ISO 9001:2000 and ISO 13485:2003.
3. InBody220 fulfills the Standards of IEC60601-1 (EN60601-1), Safety of Electric Medical Equipment. In addition, InBody220 complies not only with the Level A for Noise Immunity but also with Level A for Noise Emission by the Standard IEC60601-1-2 (EN60601-1-2), Electromagnetic Compatibility requirements.

INDICATION & SAFETY SYMBOLS

A. Indication

	LCD Brightness Control
	9pin Serial port, Male (RS-232C)
	25pin Parallel port, Female (IEEE1284 ; printer)
	USB port

B. Safety Symbols

	Hazardous Voltage		Danger / Warning Caution / Note
	BF Type Equipment		Adapter
	Power On		Power Off

INTRODUCING InBody220 - THE BODY COMPOSITION ANALYZER

Body Composition consists of 4 major components : Water, Protein, Mineral and Fat. These four elements are the fundamental ingredients constituting the body and it is important to balance them for healthy body. Body Composition Analysis means to quantify and measure these ingredients.

Until recently, diagnosing obesity has been focusing on how we look outside, without considering the balance of body compositions. For more reasonable health care, accurate body composition analysis must be performed first to achieve the balance of the four major body compartments.

Biospace has earned recognition in the international market for technical expertise demonstrated through InBody series. Based on the experiences and technology accumulated over the last 10 years, Biospace newly released the body composition analyzer InBody220. InBody220 guarantees high accuracy and reproducibility. InBody220 is equipped with Segmental Bioelectrical Impedance Analysis and the 8-Point Tactile Electrode Method. With these technologies, you will experience convenient and reliable analysis. Furthermore, easy operation such as simple data input with touch screen will help users become familiar with the equipment in short time.

Biospace is committed to providing advanced equipment for health and long life.

Kichul Cha, CEO

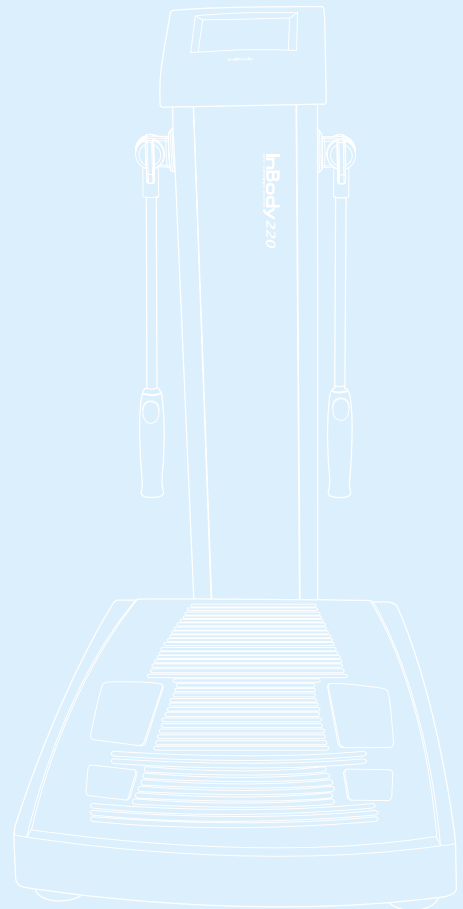


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Chapter 1 Installation and Maintenance

1. Contents in a Carton
2. Overview & Function
3. Installation Instructions
4. Transportation
5. Repacking
6. Maintenance

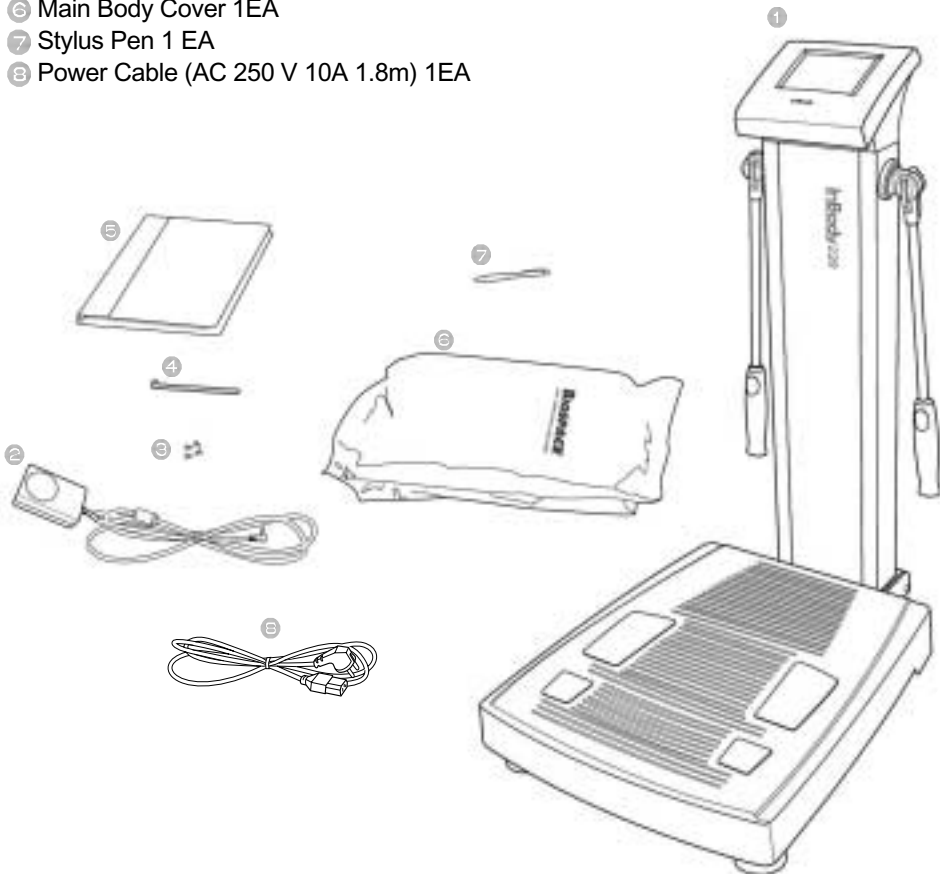


1. Contents in a Carton

When opening the carton, check to be sure all the following items are inside.

A. Product Units

- ① InBody220
- ② Adapter 1EA
- ③ Fixing Bolt 4EA
- ④ Hexagonal Wrench (5mm) 1EA
- ⑤ User's Manual
- ⑥ Main Body Cover 1EA
- ⑦ Stylus Pen 1 EA
- ⑧ Power Cable (AC 250 V 10A 1.8m) 1EA



To prevent injury, keep the stylus pen out of children's grasp.

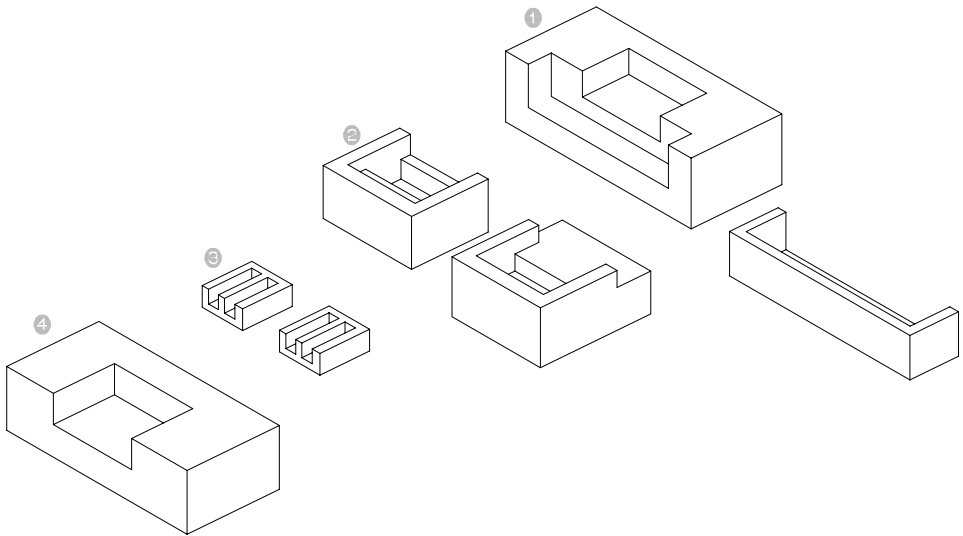
B. Package

(1) Packaging Box

Carton Size : 1150(W) × 575(L) × 335(H), unit : mm

(2) Packing Pad

- ① Bottom Pad 2EA
- ② Head Pad 2EA
- ③ Hand Pad 2EA
- ④ Support Pad 1EA



To prevent physical shock, use packing materials applied by Bisopace when shipping or transporting this equipment. Refer to this chapter, section 4: "Transportation".



After installing InBody220, keep packing materials for future transportation.

2. Overview & Function

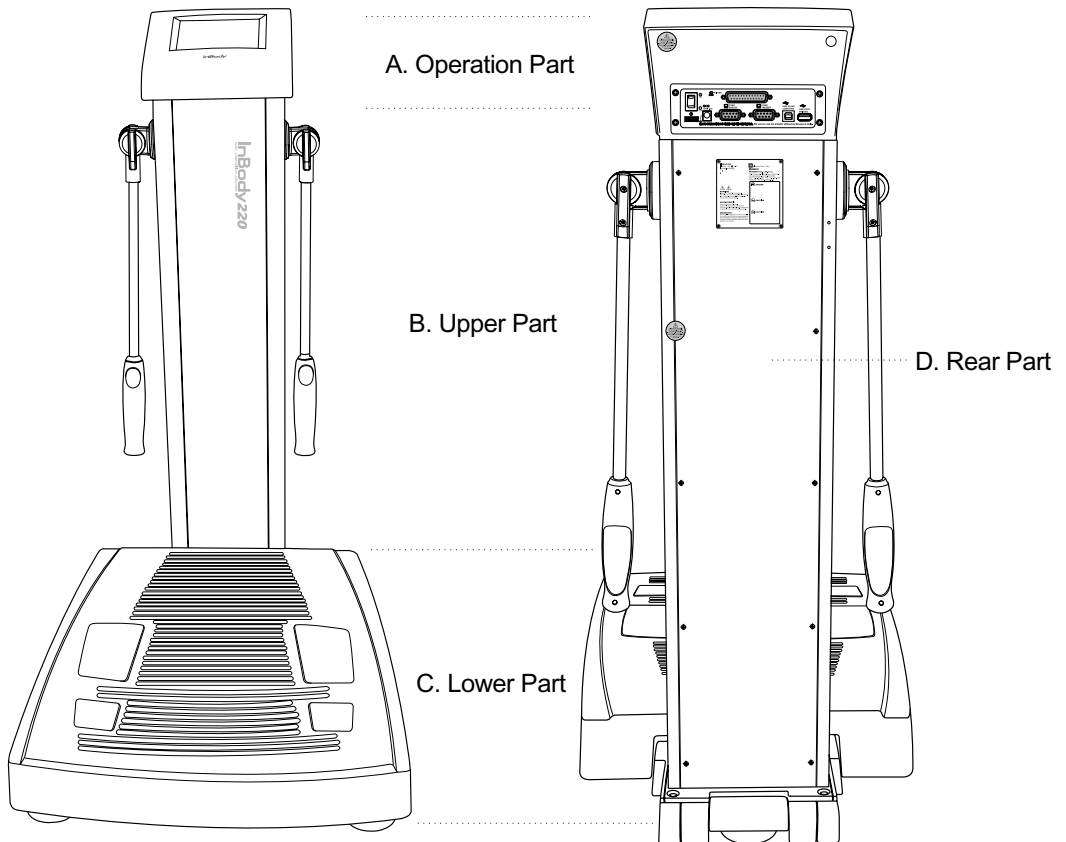
Individual section identification and functions, with schematic sketches, are provided below. Please inspect each component of InBody220 before installation to ensure there are no scratches or damage.

A. Operation Part

B. Upper Part

C. Lower Part

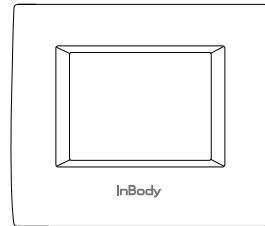
D. Rear Part



A. Operation Part

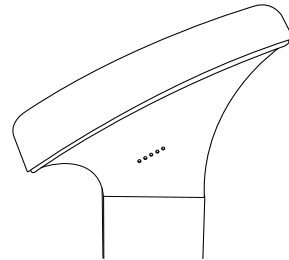
1 Touch Screen

This displays the analysis procedure, messages, and results. It is used to input data for analysis, to modify setup, and to print extra result sheet.



2 Speaker

Signal sound guides a subject during measurement.



B. Upper Part

1 Thumb Electrode

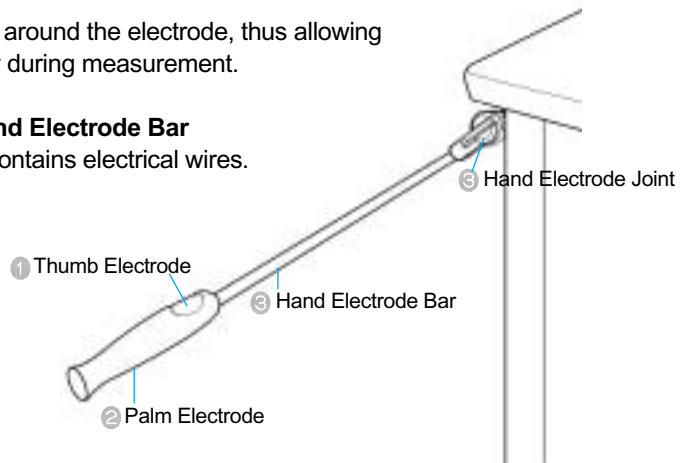
Activated by pressing against the thumb, thus allowing current to flow through the body during measurement.

2 Palm Electrode

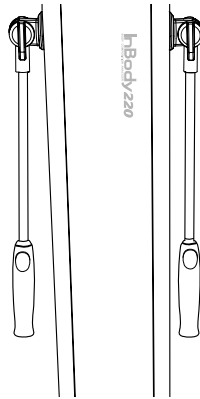
Activated by wrapping the palm around the electrode, thus allowing current to flow through the body during measurement.

3 Hand Electrode Joint and Hand Electrode Bar

Supports Hand Electrode and contains electrical wires.



④ Body Stand



C. Lower Part

① Front Sole Electrode

Activated by placing the fore-foot directly on it. Allows the current to flow through the body.

② Rear Sole Electrode

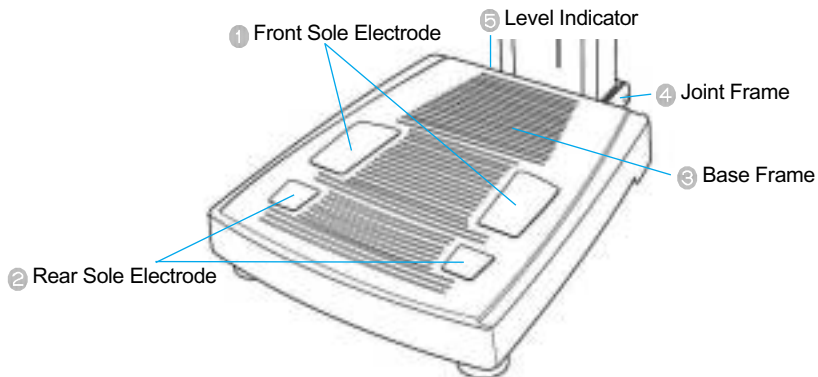
Activated by placing the heel of the foot directly on it.

③ Base Frame

The loadcell, which measures body weight, is connected with the Base Frame. The base frame has non-slip pattern to prevent slipping.

④ Joint Frame

Connects upper part and lower part.

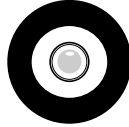


5 Level Indicator

Used to level InBody220 by means of a view glass and bubble.



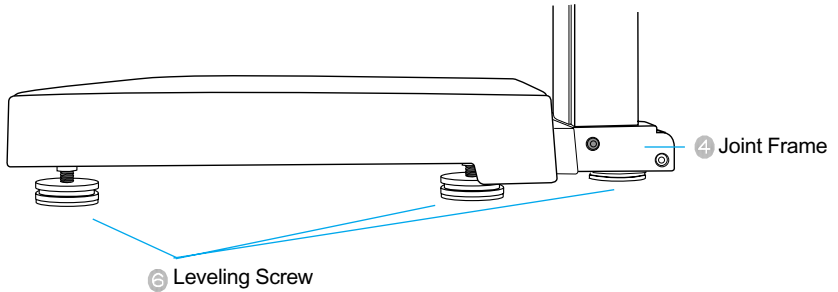
<Un-leveled State>



<Leveled State>

6 Leveling Screw (5EA)

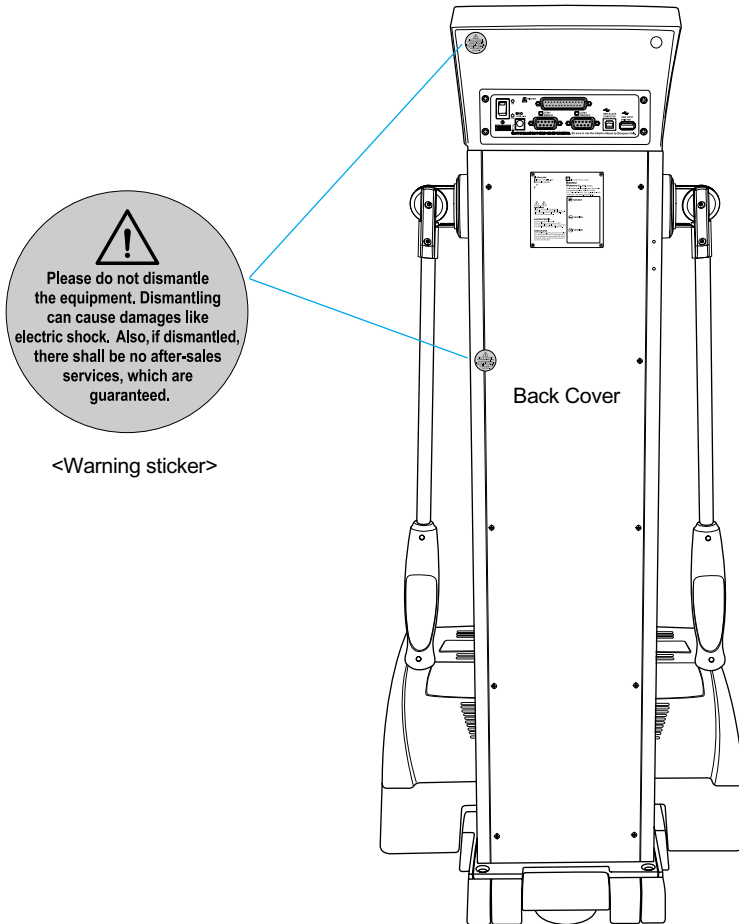
Leveling screws are designed to be turned by hand, so you can easily adjust the height of the equipment.



D. Rear Part

(1) Back Cover

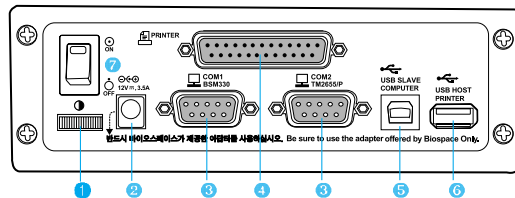
Only qualified personnel is allowed to remove the back cover.



Do not dismantle the equipment or open the back cover. Internal parts are not for customer use and it may cause electric shock. If the equipment is dismantled, the warranty is void, and service costs will be charged to you.

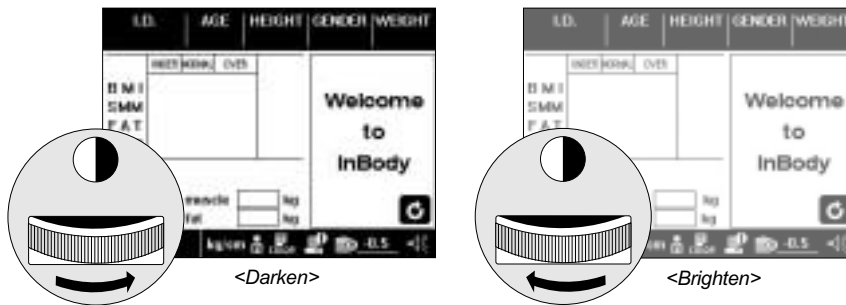
(2) Control & Connection Unit

Connects to peripherals such as PC, printer for data transmission.



1 LCD Bright Control

Used to adjust LCD brightness. Turn left to brighten and turn right to darken.



2 Power Input Port

Used to connect with adapter.

3 9pin Serial Port, Male (RS-232C)

COM1 : used to connect with PC using Lookin 'Body.
COM2 : for additional use.

4 25pin Parallel Port (IEEE1284)

Used to interface with the printer for result sheet output.

5 USB Slave Port

Used to connect with PC using Lookin 'Body.

6 USB Host Port

Used to interface with USB printer.

7 Power Switch

Power on/off InBody220.



CAUTION

Use the only adapter provided by Biospace to connect with the power port.



CAUTION

When you use the adapter cable, insert the adapter cable tightly into InBody220.



NOTE

Including the optional equipments, only the peripherals provided by Biospace can be connected to InBody220. For any inquiry about peripherals, contact Biospace.

3. Installation Instructions

A. Workplace Requirements

- (1) Location : Indoor only. Any outdoor area where the equipment is to be located should meet all the environmental requirements.
- (2) Operation environment : 10 ~ 40 °C (50 ~ 104 °F), 30 ~ 80% RH, 500~1060hPa
- (3) Adapter
Power Input : AC100-240V, 50/60Hz, 1.2A
Power Output : DC12V, 3.5A

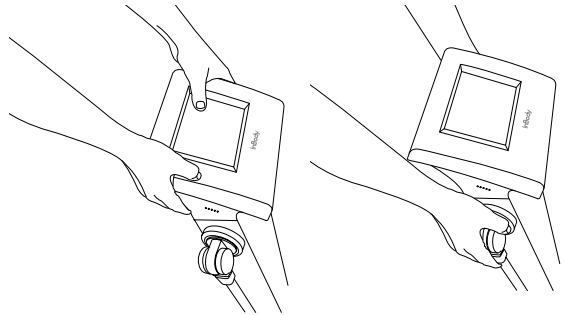
B. Note on Unpacking & Assembling

Be sure to read these suggestions carefully before assembling.

- (1) Place the equipment on the level plane.
- (2) Don't move by holding the hand electrode joints or control part including LCD.



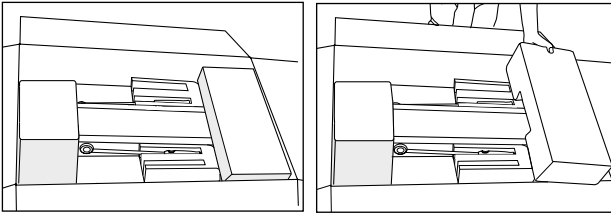
<Correct>



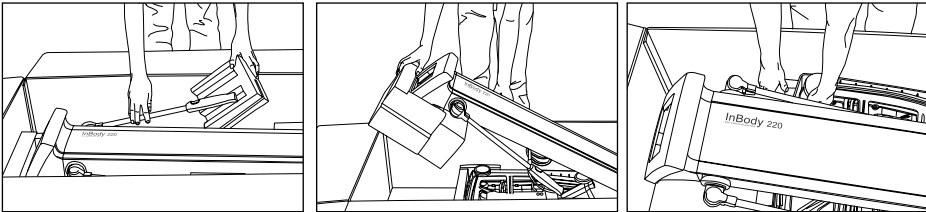
<Incorrect>

C. Unpacking and Assembling

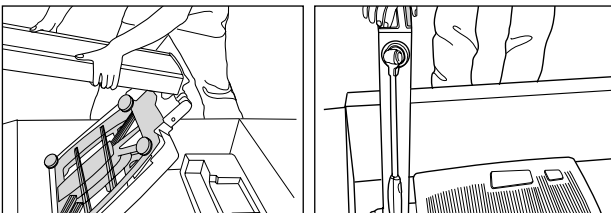
(1) Unpack the box and remove the accessory bag, head pad and the support pad.



(2) Remove the 2 hand pads, the head pad and the bottom pad.



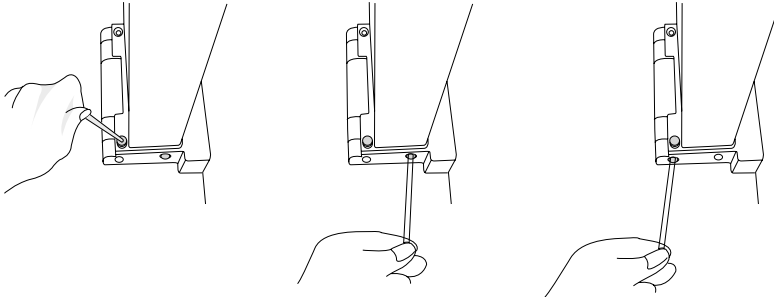
(3) Upright the upper part holding the stand and turning over the lower part, as illustrated below.



Put cables in the stand to keep it from getting stuck between the upper and lower part.

(4) Take out InBody220 from the box.

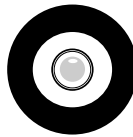
- (5) Tighten up the 6 screws which link the upper and lower part with the hexagonal wrench.



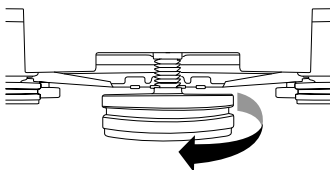
- (6) Check the level indicator located at the center of the joint frame. If it's not level, adjust 5 leveling screws under the lower part.



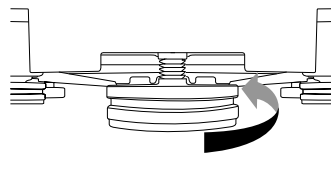
<Un-leveled state>



<Leveled state>



<Raising>



<Lowering>



If you do not use the equipment for an extended period of time, be sure to put the main body cover on it.

4. Transportation

It is strongly recommended not to move InBody220 after it has been installed. If it must be transported, be extra careful to ensure the safe handling. The followings are some tips to safely transport InBody220:

- (1) Before transporting InBody220, turn off the power switch and unplug the adapter.
- (2) Be careful not to damage the hand module.
- (3) After moving InBody220, ensure it is placed on a level plane. If it's not level, adjust leveling screws under the lower part.
- (4) Tighten the connection between the lower and upper part to prevent swaying.

A. Environmental Requirements

- (1) Optimum Temperature : 0~40 °C (32~104 °F)
- (2) Relative Humidity : 30% ~ 80%
- (3) Optimum Pressure : 500 hPa ~ 1060 hPa

B. Transporting Before Installation

Before installation, InBody220 is shipped in the cartons designed by Biospace.

For safety, have two people to move it by holding both sides or use handling equipment such as a cart or dolly.



Be careful with the fragile operating part including LCD, which has the sign 'Attention to the HEAD' on the box.

C. Transporting After Installation

Do not move InBody220 once installed by Biospace or the authorized distributors of Biospace. If the equipment must be moved again after the original installation, it is recommended to pack InBody220 in the original cartons, using the original packing materials.



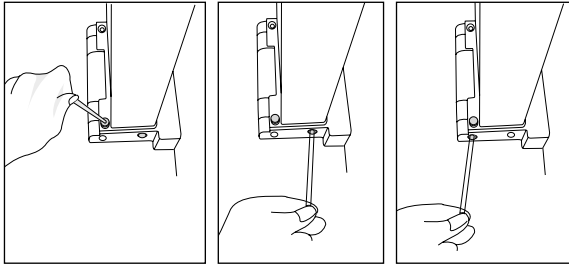
After relocating InBody220, make sure it is placed level again. Inaccurate leveling will affect accuracy of individual weight measurements.

5. Repacking

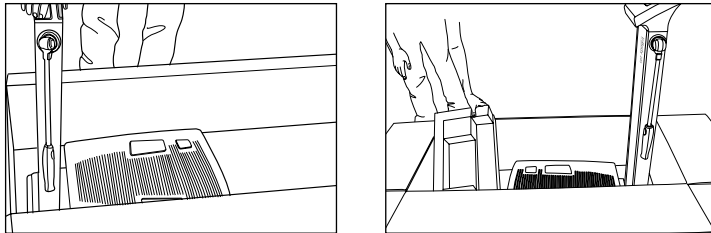
Be sure to turn off the power switch and unplug the adapter before repacking InBody220. Be careful to avoid severe physical shock, jarring or other damage of the hand and foot electrodes while repacking.

(1) Unplug from the power outlet.

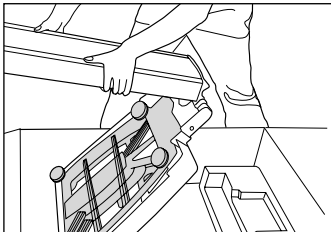
(2) Loosen the 6 screws which link the upper and lower part with the hexagonal wrench.



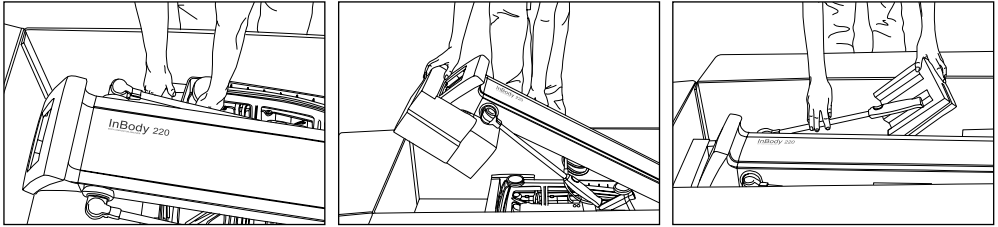
(3) After placing the equipment in the carton box, put the bottom pad in position.



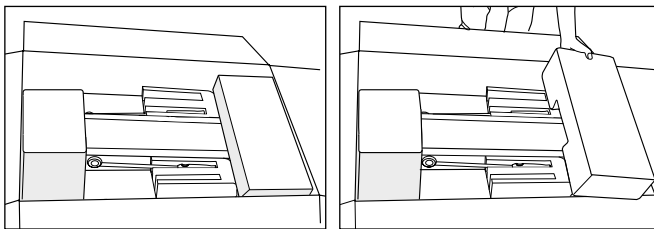
(4) Turn over the lower part holding the stand as illustrated below.



(5) Place the bottom pad, head pad and the 2 hand pads.



(6) Place the head pad and support pad.



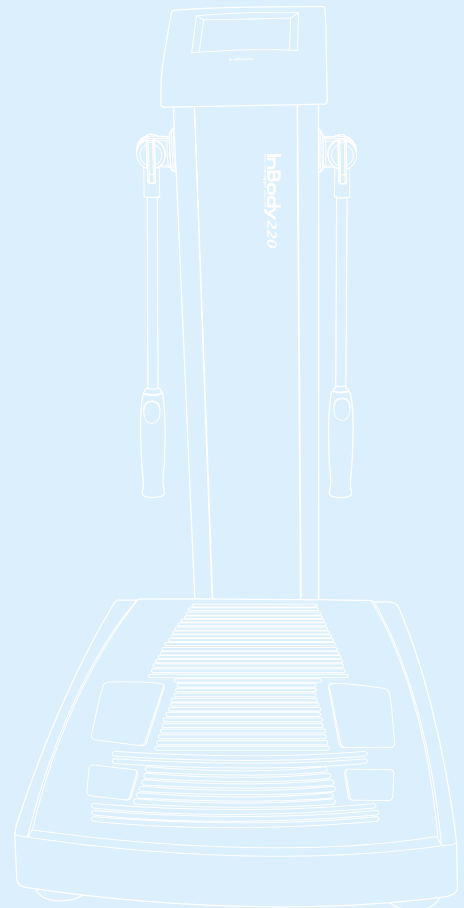
(7) Seal the carton box with tape.

6. Maintenance

- (1) Handle the hand module with care. Never apply excessive stress near the hand electrode joint. The damage caused by misuse may affect the function of the internal cable and circuit board.
- (2) Do not place anything on the base frame nor apply any pressure onto it when InBody220 is not in use.
- (3) When InBody220 is not in use for more than one day, simply turn the switch off.
- (4) When InBody220 is not in use for a period longer than one day, unplug the adapter and put the main body cover.
- (5) Do not move or relocate InBody220 while the power is on.
- (6) Do not drop food or drinks on the equipment. They may affect the electrical parts in the equipment or cause damage.
- (7) Once a week, wipe the exterior sides of InBody220 with a dry towel.
In particular, clean the touch screen softly with care not to scratch the surface.
- (8) Do not press the touch screen with a sharp object. It may damage the screen.
- (9) Follow local governing ordinances and recycling plans regarding disposal or recycling of device components.

Chapter 2 Management & Results Description

1. Cautions Before Measurement
2. Power Connection & Getting Started
3. Initial Screen and Input
4. Personal Profile
5. Proper Posture
6. How To Use the Equipment
7. Results



1. Cautions Before Measurement

To observe changes of the human body through body composition analysis, it is crucial to perform the analysis each time under the same conditions, temperature, posture, etc. Bear in mind, the following factors affect the result of body composition analysis, and as a result, affect the reproducibility of analysis.

- (1) Do not exercise or perform any physical tasks. If they have already been physically active or experienced any sudden body movements, a temporary change in body composition will result.
- (2) Do not eat before measurement. If the subject already ate something, please wait for 2 hours for digestion.
- (3) Do not take a bath or shower before measurement. Perspiring (sweating) results in a temporary change in body composition.
- (4) Perform the measurement under normal temperature conditions (20~25 °C, 68~77 °F). If the ambient temperature is too high or too low, the human body responds, resulting in temporary changes in body composition.
- (5) Perform the measurement after urination or excretion, if possible. Residues inside the human body are interpreted as fat mass. Waste in the body means the analysis will be less accurate.
- (6) Measurement should be done before mid-day. The longer we stand, the more body water flows downward and this process speeds up in the afternoon.

2. Power Connection & Getting Started

- (1) Connect the adapter cable to the power input port.
- (2) When system switch is turned on, there is a signal sound and the Biospace logo is displayed on the LCD.
- (3) InBody220 starts warming-up by itself and it lasts for about 1 minute.
During warming-up, it processes the self-testing, zero point setup for the scale, and adjustment of the internal circuit. The time left is shown on the bottom of the LCD.



When connecting peripherals (printers and other optional device) to InBody220, turn on the power of peripherals before turning on InBody220. When turning the power off, turn off InBody220 first before turning off the peripherals. This process will minimize harm to the equipment caused by electric shock.

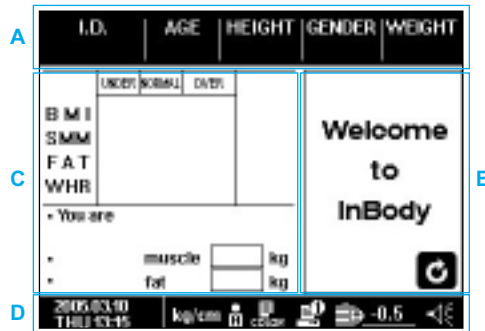


Do not touch the base frame when turning it on and during warming-up. Applying pressure or weight to the base frame during warming-up will result in an inaccurate calibration. And the measurement may be inaccurate.

3. Initial Screen and Input

InBody220 has a touch screen function for data input. To input all information, press the relevant button on LCD screen.

Below is the initial screen of InBody220. The configuration of the initial screen is categorized into four groups by function.



A. Personal Information Window

This is for I.D., age, height, gender and weight. Use number buttons at the right side of the screen or keyboard buttons.

B. Information Window

This area will display guide messages and error messages for weight measurement, proper posture, and the procedure of the measurement. This window will help the subject and the user along the measurement, providing specific information.

C. Analysis Results Window

Before printing out the result sheet, you can check the key figures on this window. All figures shown in the window will be printed on the result sheet.

D. State Window

The state window shows the lists of options registered in InBody220, such as units, race, number of times of printing, weight offset, sound setup and date and time of the measurement.




*When pressing the touch screen, use ONLY the stylus pen applied by Biospace.
Biospace is not liable for any damage caused by using any other tools.*

4. Personal Profile

Age, height, weight, and gender are essential information for body composition analysis. InBody220 analyzes the measurement results based on the input data. To reduce errors and acquire more reliable results, input subject data after read the following carefully.

(1) I.D. (permitted range : 20 characters)

Use number buttons at the right side of the screen. If you want to input alphabet, press the keyboard icon  at the right side of the screen and the screen will be displayed as illustrated below. It is possible to input other information after entering I.D. When you finish with the personal profile, press 'ENTER'.



(2) Age (permitted range : 3 years ~ 99 years)

Use number buttons at the right side of the screen. If a subject's age is less than 18, it is possible to input down to one decimal place for more accurate results.

The decimal digit represents the number of months elapsed since the last birthday and should be decimal expressions of a fractional number with the denominator of 12. For example, the 16.5 years old can be translated into 16 years and 6 months old (6 months/12 months=0.5).

(3) Height (permitted range : 95cm ~ 220cm, 3ft 1.4in. ~ 7ft 2.6in.)

Use number buttons at the right side of the screen. It is possible to input down to one decimal place.

(4) Gender

Use M/F button to input gender. Female is selected as a default. It can be changed in Region setup. Refer to Chapter 3, section 1: "Setup Menu".

(5) Weight (permitted range : 10 ~ 250kg, 22 ~ 551lbs.)

InBody220 begins measuring weight as soon as a subject stands on the base frame. The measured weight is automatically added to 'Weight' column. If weight is increased by clothes or accessories, it is possible to calibrate the weight. Refer to Chapter 3, section 1: "Setup Menu".



After entering two digits for age and three digits for height, it moves on to the next text field automatically. If you want to use a decimal digit, go back to the previous text fields and enter the decimal point and number.



After measuring weight, you can change the units used for height and weight as pressing Quick setup at the state window. The inputted value will be automatically changed when unit is changed. unit changing order : kg/cm \Rightarrow kg/in. \Rightarrow lb./cm \Rightarrow lb./in.



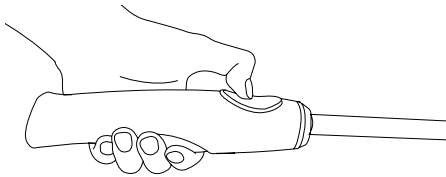
It is impossible to correct personal information while measuring. Step down from InBody220, and start again from the weight measurement.

5. Proper Posture

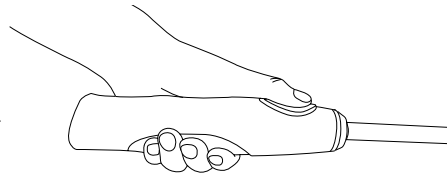
Proper posture is essential to achieve reliable results and high reproducibility. To minimize errors and improve reliability, keep the following in mind.

A. Method for holding hand electrodes

- (1) Make even contact of four fingers on the surface of the electrode.
- (2) Place the thumb on the electrode button and press light. Maintain the pressure while the analysis proceeds. Do not press with nails.
- (3) If the hand is exceptionally small you may slide the thumb forward slightly until it reaches the button.



<Wrong posture>



<Right posture>

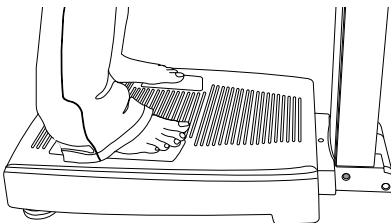


Do not press the button with the fingernails: fingernails may damage the electrodes and results in inaccurate test finding.

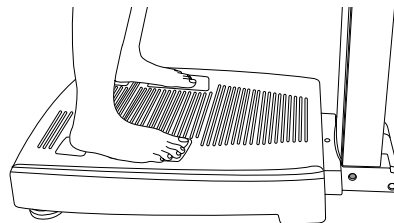
NOTE

B. Method for touching foot electrodes

- (1) Bare foot must contact foot electrodes.
- (2) Place the heel on the circular electrode first.
- (3) Try to place your sole onto the elliptical electrode surface.



<Wrong posture>



<Right posture>



Do not allow pants to disturb connection between heel and electrode.



If the foot is exceptionally small, place it between the electrodes, while ensuring it contacts both sets of electrodes.



Measurement may not be possible due to hardened skin on the palm or sole. In this case, wipe the palm and sole with wet tissue before measuring.



Be careful not to spill water on the electrode in the case of using wet tissue. Excessive water may cause corrosion or other problems.

C. Body Posture

The proper body posture is a normal standing position with the arms and legs extended. For accurate results, please take off heavy clothes and accessories.

- (1) Avoid direct contact between the arm and the body at the armpit and between the legs at the crotch. It is recommended to stretch your arms about 15 degrees off the body during the analysis.
- (2) The subject should remain relaxed and avoid straining or moving the body during the analysis.



In the event the subject cannot maintain proper posture during the analysis, an assistant may be required to ensure proper posture. The assistant or technician must take care not to inadvertently make skin contact with the subject. InBody220 cannot be performed if a subject is missing a hand, a thumb or a foot.



Biospace also provides equipment for subjects who have difficulty with standing during the analysis. Contact us for the further information.

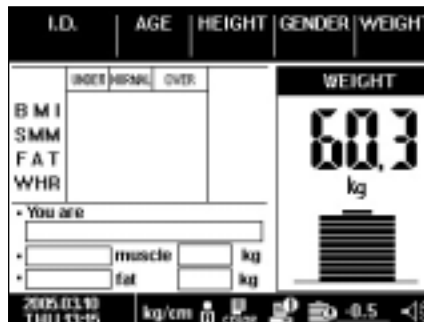
6. How To Use the Equipment

Following procedure is described based on initial releases from factory. If a subject steps down from InBody220 during measurement, the procedure is automatically canceled.

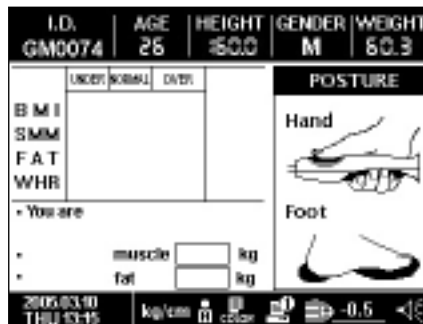
- (1) Confirm InBody220 is ready for measurement. If it's ready, the following initial screen is displayed.



- (2) Remove clothes and accessories as necessary to get the net weight.
- (3) Stand on the base frame of InBody220. Be sure to match subject's heels to heel electrodes and subject's soles to fore-foot electrodes. Bare feet must contact sole electrodes. When a subject steps on, the screen will display weight. Put hands down naturally and stand still. Weight is measured after the fluctuation of weight. The measured weight is automatically shown at 'Weight'. If it is necessary to make adjustments for clothes, use weight control key in Setup or Quick setup menu.

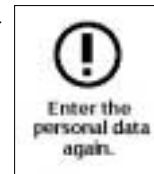


- (4) Input I.D., subject's age, height, and gender using number buttons on the right side of the screen or keyboard. Press 'Enter', then InBody220 makes a signal sound and displays the proper posture screen.
- (5) As indicated on Information Screen, a subject must assume the proper posture. InBody220 checks out the posture continuously. Once measurement is started, the subject should maintain the posture until completed.



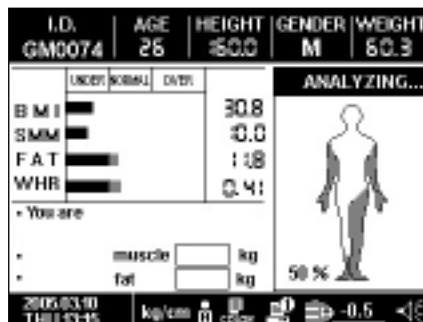
NOTE

If entered data is out of the acceptable data range, the error message will pop up on the monitor. Go back to the text field where you were and re-enter the data. Refer to this chapter, section 4: *Personal Profile* for the acceptable range of each data.



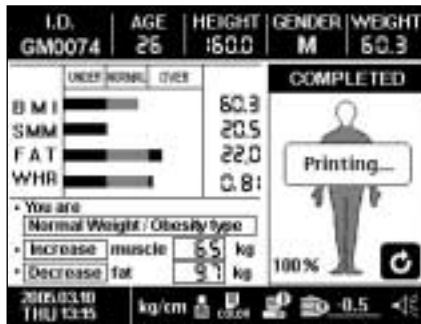
NOTE

Measurement may not be possible if the palm or sole are too dry or have hardened skin. In this case, wipe the palm and sole with wet tissue before measuring.



- (6) During analysis, InBody220 displays the information of a subject's body composition on the LCD.


- (7) After all bar graphs are fixed, there will be a signal sound. The measurement is completed and the results are simultaneously displayed.



- (8) Return each hand electrode back to its original position, and step down from the base frame.



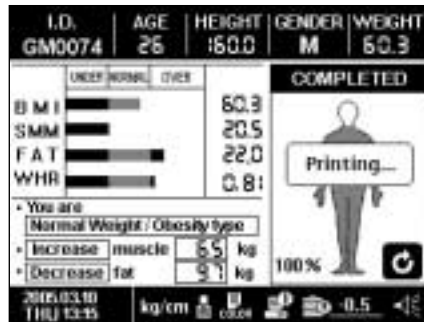
Do not turn the hand electrode bar by force. If bar is turned, InBody220 may malfunction because important cables are located inside of hand electrode bars.

- (9) When a printer is connected, it automatically prints the result sheet. InBody220 goes back to the initial screen. If you want an additional copy of result sheet, press re-print icon .

7. Results

A. Results Screen

During measurement, InBody220 displays information of a subject's body composition on the LCD. The results are showing on LCD while a subject keeps standing on the machine. As soon as a subject steps down, it goes back to the initial screen, and InBody220 is ready for measurement again.



B. Result sheet

With a printer connected to InBody220, it can print out the result sheet.

(1) Printer Connection

Parallel(IEEE1284) or USB printer works. Refer to chapter 5, section 2: "Basic Equipments" and the user's manual provided by the printer manufacturer for installation of a printer.

(2) Result sheet Form

The result sheet is consumable. Please contact Biospace or an authorized distributor of Biospace to place purchase order.

Result sheet

InBody 220 Body Composition Analysis

ID: GNR074 **AGE:** 26 **HEIGHT:** 160cm **GENDER:** F **DATE/TIME:** 2005.01.09/10:23:40(0000)

B. Hospital
Doctor Lee

Body Composition Analysis

Components	Value	Fat Free Mass	Weight	Normal Range
T B W (kg)	28.0	38.3	60.3	27.4 - 33.5
Protein (kg)	7.4			7.3 - 9.0
Mineral (kg)	2.84			2.53 - 3.10
Body Fat Mass (kg)	22.0			10.8 - 17.2

* Mineral is estimated.

Nutritional Evaluation

Protein Normal Deficient

Mineral Normal Deficient

Fat Normal Deficient Over

Muscle - Fat Analysis

	Under	Normal	Over	Unit	Normal Range
Weight (kg)	[Progress bar showing 60.3 kg]				45.7 - 61.8
S M M (kg)	[Progress bar showing 20.5 kg]				20.3 - 24.9
Body Fat Mass (kg)	[Progress bar showing 22.0 kg]				10.8 - 17.2

Obesity Diagnosis

	Under	Normal	Over	Normal Range
B M I (kg/m ²)	[Progress bar showing 23.6]			18.5 - 25.0
P B F (%)	[Progress bar showing 36.5]			18.0 - 28.0
W H R	[Progress bar showing 0.81]			0.70 - 0.80

Exercise Planner

Plan your weekly exercises from the followings and estimate your weight loss from these activities.

Energy expenditure of each activity (Base weight 60.3 kg, Gender: Male, Load: load)

Walking	121	Ashta	211	Brooks	181	Swim	211	Shower	197	Aerobic	211
Table tennis	136	Tennis	181	Football	211	Ornate fencing	302	Cable ball	115	Badminton	136
Racket ball	302	Tae Kwon Do	302	Spayal	302	Handball	181	Play jumping	211	Out	106
Push-ups		50-ups		Weight training		Dumbbell exercise		Chest press		Weight loss	

How to do

1. Choose practices and preferable activities from the left.
2. Energy expenditure for each is calculated when it is done for 30 min.
3. Fill in those fixed space below with your choices for 7 days.
4. Calculate the total energy expenditure for a week.
5. Estimate expected total weight loss for a month using the formula shown below.

Fill-out form

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Calculations for expected total weight loss for a month (one month = 4 weeks)

Total energy expenditure (kcal/week) = 4 weeks × 7700

22000 kcal = 7700 kcal × 3 weeks + 7700 kcal × 1 week

Total energy expenditure for a month	Expected total weight loss for a month	Recommended calorie intake per day
22000 kcal	- 22.0 kg (50.3 kg)	2100 kcal

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C. Output items

The followings are the definitions and explanation for each item analyzed on the result sheet.

(1) Individual Information

Subject's I.D., age, height, gender, and date of measurement are displayed here.

(2) User Information

According to the user's purpose, the name of the hospital or clinic, address, contact number and the doctor in charge can be displayed here.

I.D.	AGE	HEIGHT	GENDER	DATE / TIME
GN0074	26	160cm	F	2005.01.09/10:23:40(0009)

B. Hospital
Doctor Lee



If you want to input or modify user information, contact Biospace or distributor.

NOTE

(3) Body Composition Analysis

The measured values of the subject's body composition are displayed here. The body composition analysis of InBody220 is derived from the 4-compartment model, which divides body composition into 4 components. These 4 compartments have a settled ratio in a healthy body.

Body Composition Analysis

Compartments	Values	Fat Free Mass	Weight	Normal Range
T B W (ℓ) <small>Total Body Water</small>	28.0	38.3	60.3	27.4 - 33.5
Protein (kg)	7.4			7.3 - 9.0
Mineral (kg)	2.84			2.53 - 3.10
Body Fat Mass (kg)	22.0			10.8 - 17.2

▶ Mineral is estimated.

① Total Body Water (ℓ)

The total volume of water in the body. Same with the sum of intracellular water and extracellular water.

*The basic unit of measurement for water is volume. Water is shown with the unit of liter on the result sheet while kilogram (kg) is the basic unit for other body composition components. It seems that the volume unit of water should be converted to a mass unit. However, it is commonly known that 1 liter of water in volume weighs 1kg in mass at room temperature. This fact allows volume and mass to be interchangeable.

② Protein Mass (kg)

The mass of protein. Protein is a major component of limb muscle, intestinal muscle, and skin.

③ Mineral Mass (kg)

The sum of osseous mineral in the bone and non-osseous mineral in body fluid.

④ Body Fat Mass (kg)

The sum of subcutaneous fat, visceral fat, and intramuscular fat.

⑤ Fat Free Mass (kg)

The sum of all body compartments except fat mass.

⑥ Weight (kg)

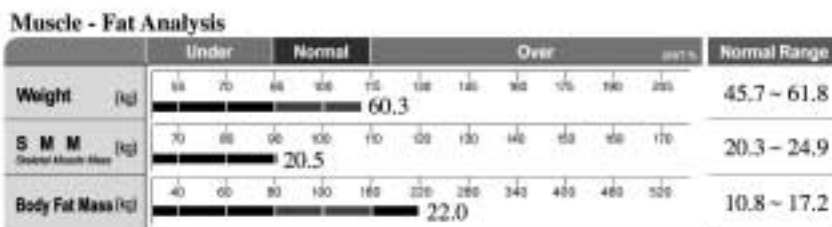
The sum of fat free mass and fat mass.

(4) Muscle-Fat Analysis

Bar graphs and values for weight, Skeletal Muscle Mass and Body Fat Mass are displayed here. The length of bar graph shows a percentage relative to the standard value (100%) and the value at the end of each bar is the measured value.

The standard value (100%) is based on the standard weight of the subject.

When a subject is on a diet or exercising for weight control, body fat mass and skeletal muscle mass get affected among the body compartments. Therefore, you can keep monitoring the changes of body fat mass and skeletal muscle mass performing a weight control program. Also, you can see the body composition goes along your expect.



① Weight (kg)

Ideal weight is based on subject's height. Using the classical BMI method, InBody220 identifies the standard BMI as 22kg/m² for males, 21.5kg/m² for western females and 21kg/m² for Asian females.

Formula to get ideal weight

(male) Ideal weight = height²(m²) x 22

(female) Ideal weight = height²(m²) x 21.5 (or 21)

The standard range is 85~115% based on the standard range of BMI.

② Skeletal Muscle Mass (kg)

Distinctively, skeletal muscle mass, which generally indicates the lean body mass of each arm and leg, can be controlled by exercise and eating habits. Compare the bar graphs' lengths of skeletal muscle mass with body fat mass. If the bar of skeletal muscle is relatively shorter and under the standard value, lean body mass lacks in the body, while the opposite case is proper. 100% signifies ideal lean body mass when subject's weight is normal. The standard range is 90~110% of standard lean body mass based on standard weight.

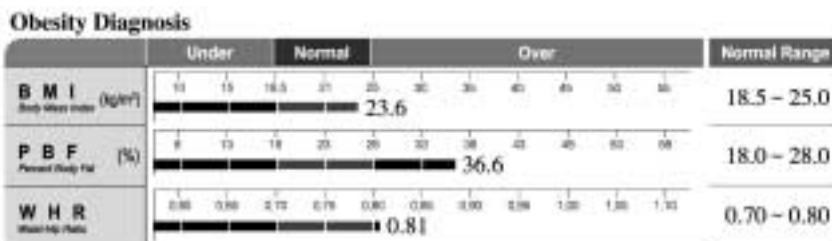
③ Body Fat Mass (kg)

100% signifies ideal body fat mass when the subject has standard weight and standard percent body fat. The standard range is 80~160% of standard percent body fat.

*The standard range varies for the each item because the variation rates of muscle and fat are not same in normal condition.

(5) Obesity Diagnosis

This enables subjects to check BMI, the classical method for obesity diagnosis, percent body fat and waist-hip ratio all at once. Bar graphs and numeric values are provided for each item and both length of bar graph and the number represent the absolute value. The ranges of Under, Standard and Over make easier to compare each graphs.



① BMI (Body Mass Index, kg/m²)

BMI is determined by using only weight and height and diagnoses superficial obesity. The standard values are 22kg/m² for male and 21.5kg/m² for western female and 21kg/m² for Asian female.

Formula) BMI = weight (kg) ÷ height² (m²)

Determination 1) WHO Standard

BMI(kg/m ²)	Classification		Diagnosis
<18.5	Underweight	Under	Infectious disease, malnutrition related disease
18.5~24.9	Normal	Standard	Least risk at most disease
25.0~29.9	Overweight	Over	May cause health problem
30.0~34.9	Obese1		Increase of the risk of cardiac disease, high blood pressure, diabetes, etc
35.0~39.9	Obese2		
>40	Severely Obese		

Ref. WHO and the National Heart, Lung, and Blood Institute : clinical guidelines on the identification, evaluation, and treatment of over weight and obesity in adults, the evidence report. June 1998, xiv

Determination 2) Asian-Pacific Standard

BMI(kg/m ²)	Classification	Risk of associated disease
<18.5	Underweight	Low (high risk of other clinical disease)
18.5~22.9	Normal	Average
>23	Overweight	
23~24.9	Risky Overweight	Increased
25.0~29.9	Obese step1	Moderate
>30	Obese step2	Severe

Ref. Korean Society for the Study of Obesity, chapter 2. Redefining and Evaluation, The Asian-Pacific perspective : Redefining Obesity and its Treatment., 1st edition, Korean Society for the Study of Obesity, 2001, p10.

*For children under the age of 18, children 's standard is used.

② Percent Body Fat (%)

Percent body fat is an obesity determination method considering the ratio of the fat mass in a body. The ratio of the body composition can be different between two people who have same BMI. Therefore, percent body fat is essential for the obesity diagnosis. The standard ranges are 15 ± 5%(10~20%) for male and 23 ± 5%(18~28%)for female.

Ref.

1. Robert D. Lee, David C. Nieman, *Nutritional Assessment*. 2nd edition. p.264, 1990.
2. George A. Bray, MD. *Contemporary Diagnosis and Management of Obesity*. p.13, 1998.
3. L Kathleen Mahan, Sylvia Escott-Stump. *Krause s FOOD, NUTRITION, & DIET THERAPY*. 10th edition.p.488, 1991
4. Judith E. Brown, *Nutrition Now*, p9-3~9-5, Wads worth Publishing Company, 1999.

③ Waist-Hip Ratio

Waist-Hip Ratio (WHR) means ratio of waist and hip circumference.

InBody220 yields WHR value saving the effort of tape measurement, using the principle which figures out body size with segmental bioimpedance and reference of empirical factors.

The WHR value measured from InBody220 is found to be $r=0.899$ and $SEE=0.033$ comparing with the value measured by anthropometry. The standard ranges are 0.80~0.90 for male and 0.75~0.85 for female. Abdominal obesity is diagnosed in case of over 0.90 for male and 0.85 for female. For Asian, the normal range of WHR is 0.75 ~ 0.85 for male and 0.70 ~0.80 for female.

Measuring Waist-Hip Ratio

Waist circumference : at the umbilical point

Hip circumference : at the widest point of hip

Ref.

1. Judith E. Brown, *Nutrition Now*, 2nd edition, pp9-8, published by West/Wadsworth, 1999.
2. NIH, *Bioelectrical impedance analysis in body composition measurement* : National Institute of Health, 1996. Technology Assessment Conference Statement, 524S-532S, December 12-14, 1994.

(6) Various Comprehensive Evaluations

A summary of the body composition analysis displayed

on the result sheet enables to check the results at a glance.

This will help clients to comprehend their health condition.

As using different colors, it even distinguishes the poor and the fine conditions.

- ① Nutritional Evaluation
- ② Weight Management
- ③ Obesity Diagnosis

Nutritional Evaluation			
Protein	<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Deficient	
Mineral	<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Deficient	
Fat	<input type="checkbox"/> Normal	<input type="checkbox"/> Deficient	<input checked="" type="checkbox"/> Excessive
Weight Management			
Weight	<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Under	<input type="checkbox"/> Over
SMM	<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Strong	<input type="checkbox"/> Under
Fat	<input type="checkbox"/> Normal	<input type="checkbox"/> Under	<input checked="" type="checkbox"/> Over
Obesity Diagnosis			
BMI	<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Under	<input type="checkbox"/> Over
		<input type="checkbox"/> Extremely Over	
PBF	<input type="checkbox"/> Normal	<input type="checkbox"/> Over	<input checked="" type="checkbox"/> Extremely Over
WHR	<input type="checkbox"/> Normal	<input checked="" type="checkbox"/> Over	<input type="checkbox"/> Extremely Over

(7) Weight Control

Weight control suggests fat and muscle control that leads to the balanced body composition to achieve ideal body composition.

The (+) and (-) signs indicate an increase or decrease in the amount of control.

Weight Control	
Target Weight	53.8 kg
Weight Control	-6.5 kg
Fat Control	-9.7 kg
Muscle Control	+3.1 kg

1 Target Weight (kg)

This is calculated as considering the body composition. This is not merely showing an ideal weight based on superficial obesity value. Instead, the calculation of the target weight is based on the complete evaluation of the body composition.

Thus, it gives more useful information to individual than ideal weight.

$$\text{Target weight} = \text{present weight} + \text{weight control}$$

2 Weight Control (kg)

The sum of fat and muscle control value, showing amount of weight to be controlled.

$$\text{Weight Control} = \text{Fat Control} + \text{Muscle Control}$$

3 Fat Control (kg)

The amount of fat to be controlled for optimum body fat mass based on the results of body composition analysis.

4 Muscle Control (kg)

The amount of muscle to be controlled for optimum muscle mass based on the results of body composition analysis.

* *If fat mass is over the standard, it is suggested to lose fat. However, no suggestion for muscle loss is offered in the case of muscle excess. Although muscle is often lost during weight control, there is no document supporting intended muscle loss.*

Therefore, InBody220 proposes 0.0kg for muscle control, which means 'no muscle control needed', when a subject is overweight for excessive muscle mass. That is why the target weight is heavier than the height-based ideal weight in the case of muscle excess.

(8) Fitness Score

The Fitness Score is offered in numeric value to help people remember the status of their body composition easily.

Fitness Score	67 Points
---------------	-----------

This is the peculiar index of Biospace without any document or reference. Setting 80 as standard, less than 70 means 'weakness', from 70 to 90 means 'normal', greater than 90 means 'athletic type'.

(9) Basal Metabolic Rate (kcal)

Basal Metabolic Rate is the minimal energy required to maintain life and homeostasis i.e. energy for breathing, heart activity, body temperature regulation and so on. InBody220 calculates BMR as referring to Fat Free Mass (FFM) mentioned in the reference below.

BMR	1196 kcal
------------	-----------

Ref. John J Cunningham. Body composition as a determinant of energy expenditure : a synthetic review and proposed general prediction equation. Am J Clin Nutr. Vol.54, 963-969, 1991.

* In general, Harris-Benedict Equation is used for BMR. This equation concerns gender, age, height and weight. However, calculating BMR with Fat Free Mass, which is the most active mass in a body, brings out more analogous results closed to the directly measured BMR.

(10) Bioelectrical Impedance

InBody220 provides impedance of each segment at each frequency.

Impedance						
Z	RA	LA	TR	RL	LL	
20kHz	458.0	474.0	27.5	284.3	290.6	
100kHz	422.5	441.2	26.5	257.2	263.3	

(11) Exercise Planner

The number by the exercise picture is calorie spent when a subject exercises for 30 minutes. The amount of body fat consumption for 4 weeks can be calculated as following example. Refer to the example given in gray letter. Next to the example, recommended calorie for the subject is also offered.

Exercise Planner Plan your weekly exercises from the followings and estimate your weight loss from those activities.

Energy expenditure of each activity (kcal/30 min) / Duration 30 min / unit kcal

Walking 121	Jogging 211	Bicycle 181	Swim 211	Women Climbing 197	Aerobic 211
Table tennis 136	Tennis 181	Football 211	Oriental Fencing 302	Golf ball 115	Ski/snowboard 136
Weight lift 302	Tennis racquet 302	Squash 302	Basketball 181	Free jumping 211	Golf 106
Push-ups 121	Shin-pan 121	Weight training 121	Quarterback exercise 121	Flexic band 121	squats 121

How to do

1. Choose practicable and preferable activities from the left.
2. Energy expenditure for each is calculated when it is done for 30 min.
3. Fill in those lined space below with your choices for 7 days.
4. Calculate the total energy expenditure for a week.
5. Estimate expected total weight loss for a month using the formula shown below.

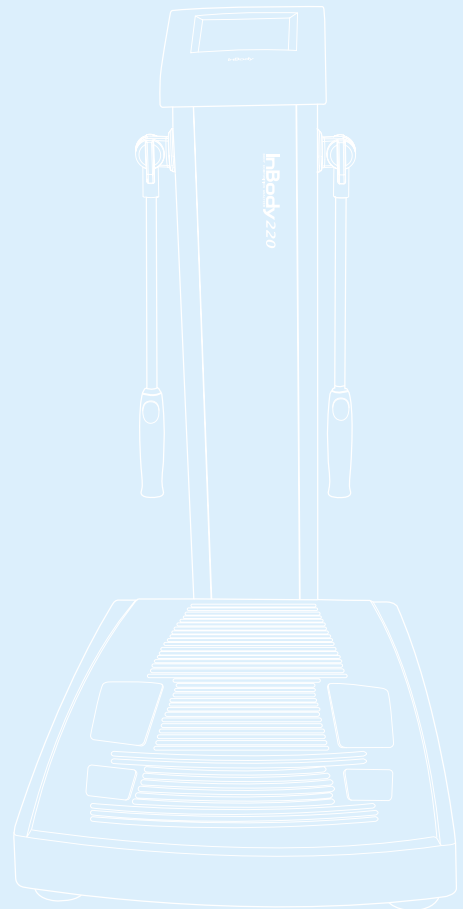
Fill-out form

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
Walking 121	Jogging 211	Bicycle 181	Swim 211	Women Climbing 197	Aerobic 211		
Table tennis 136	Tennis 181	Football 211	Oriental Fencing 302	Golf ball 115	Ski/snowboard 136		
Weight lift 302	Tennis racquet 302	Squash 302	Basketball 181	Free jumping 211	Golf 106		
Push-ups 121	Shin-pan 121	Weight training 121	Quarterback exercise 121	Flexic band 121	squats 121		
Calculation for expected total weight loss for a month (one month = 4 weeks): Total energy expenditure (kcal/week) = 4 weeks × 7700						Total energy expenditure for a week: 7700 kcal	Expected total weight loss for a month: 1600 kcal

Formula: $(2500 \times 4) - (7700 \times 4) = 2500 \times 4 - 7700 \times 4 = 1600 \text{ kcal}$

Chapter 3 Setup Establishment

1. Setup Menu
2. Quick Setup

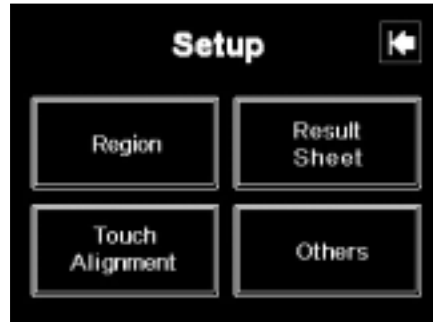


1. Setup Menu

Customizing several functions by modification, the setup enables to operate more conveniently. Press the Quick Setup area at the bottom of the screen until the initial screen turns to Setup menu. The setup mode of InBody220 consists of 4 items; Region, Result sheet, Touch Alignment, Others.



<Initial Screen>



<Setup Menu>



Turning to Setup menu is possible only at the initial screen.

NOTE

A. Region

It is possible to modify the regional conditions such as time, format, race, language, unit and gender. Each item is changed by touching the screen (except time).



(1) Time

When pressing the time display area in the screen, the following screen is displayed. Select the sub-item you want to modify, and adjust the number using arrow keys (▲▼).

**(2) Format**

Refers to the display type of time. (yy-mm-dd, mm-dd-yy, dd-mm-yy)

(3) Race

Refers to the races. (Asian-Caucasian-African-Hispanic)

(4) Language

Refers to the used language. (English / Korean)

(5) Unit

Refers to the unit of the measured items. (lb./cm, lb./in., kg/cm, kg/in.)

(6) Gender

Select the default displayed in the initial screen. (Female, Male)

B. Result sheet

It is possible to set the number of result sheet and to calibrate the printing alignment.

(1) Number

There are 0 ~ 3 page options for the result sheet. If 0 page is selected, InBody220 does not print the result sheet.

(2) Printer

Select a kind of printer. (Inkjet, Laserjet)

(3) Printing Alignment

The printing position can be aligned for proper printing. After alignment, press Test icon to check that it is right. (Alignment range : left, right, up, down, +50 ~ -50)



C. Touch Alignment

If a related function does not operate when pressing a part of the touch screen, there is a problem with the input system. 'Touch Alignment' enables the user to solve this problem. Press the '+' mark at the upper right corner until InBody220 makes a beep sound, and then, press the '+' mark at the bottom left corner.



CAUTION

The stylus pen is specially designed not to damage the touch screen. When pressing the touch screen, do not use other objects. Biospace is not liable for any damage caused by using any other tools.



CAUTION

To prevent injuries when using the stylus pen, keep it out of children's reach.

D. Others

There are sub-menus such as Adjust Weight, BMI, Beep and S/W Version.



(1) Adjust Weight

This is to calibrate the weight offset value. When you need to calibrate the added weight by clothes or accessories, use this function.

Calibration range : +5kg ~ -5kg, step : 0.1kg (+10lb. ~ -10lb., step : 0.2lb.)

(2) BMI

Select standard range of BMI.

WHO : The standard range is 18.5~24.9kg/ m².

Asian : The standard range is 18.5~23kg/ m².

(3) Beep

Guide information is offered with beep sound during measurement.

You can also choose 'OFF'.

(4) S/W Version

The current version of InBody220 program is displayed.

2. Quick Setup

Users can easily modify the frequently changed functions in Quick setup.

A. How to modify

- (1) Press the Quick setup area at the bottom of the initial screen.
- (2) Press the icon of item which you want to change.
- (3) When you press 'ENTER' after selection, it goes back to the initial screen.
All values you have modified are automatically saved.



< The screen Quick Setup is popped up >

B. Items

(1) Unit

Select units for weight and height.

(2) Race

Select the subject's race.

(3) Result sheet Number


Decide the printing numbers of result sheet.

(4) Weight Adjustment

It is possible to calibrate the measured weight. If weight adjustment is needed due to clothes or accessories, select how much you want to deduct.
(weight adjustment range : +5kg ~ -5kg, step : 0.1kg or +10lb. ~ -10lb., step : 0.2lb.)

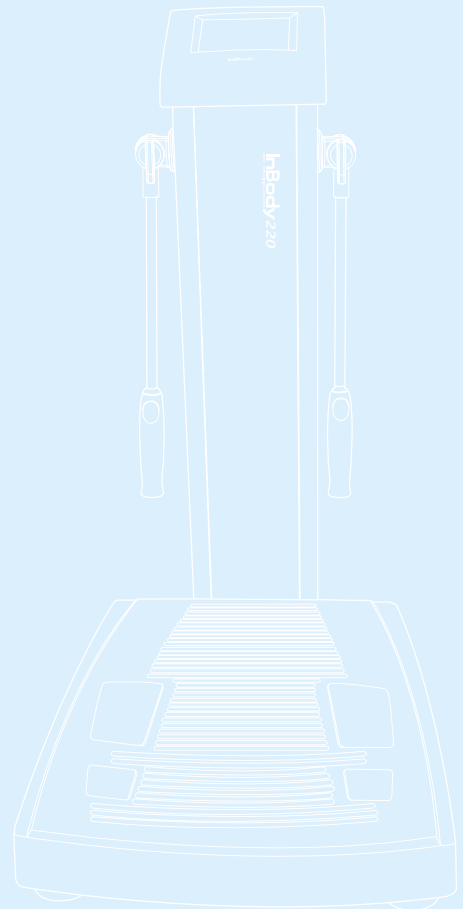
(5) Volume

Press 'Signal Sound ON' button () to increase the volume.

Press 'Signal Sound OFF' button () to decrease the volume. If you press it several times, it finally turns to OFF status.

Chapter 4 Problems and Solutions

1. Error messages
2. Trouble Shooting
3. Frequently Asked Questions (FAQs)
4. Customer Service Information



1. Error Messages

InBody220 displays an error message to alert the operator problems and to recommend correct action.

A. "Remove any objects on or nearby the footboard"

When pressure or weight is applied to the base frame during warming-up, this message appears. Turn InBody220 off and on again after removing the material on the base frame. Please do not apply pressure or weight to the base frame during warming-up.



B. "Enter the Personal data again"

If entered subject data are beyond acceptable ranges, this error message appears. When entering subject data, do not exceed the acceptable ranges of 'Age' and 'Height', please refer to Chapter 2, section 4: "Personal Profile".



C. "Try again after wiping hands and feet"

If this message still displays on the LCD after checking subject's posture at a second trial, a subject's sole and palm are too dry to be measured precisely. In this case, a subject should wipe his/her sole and palm with wet tissue and try again.



2. Trouble Shooting

This section lays out the order of steps you have to take in case of malfunction, with the assumption that you have some basic knowledge about how to operate the equipment. If you still have the problem after taking the following steps, contact our customer service representatives listed in the warranty certificate appended to the end of this user's manual.

A. The equipment doesn't seem to run, even after the power is on.

(In normal situation, the beep sounds and the LCD is turned on.)

Cause 1 The plugs are not pushed all the way into an electrical outlet.

Action 1 Push the plug all the way into the electrical outlet.

Cause 2 Extension is not turned on (when using a power bar) or the power doesn't flow into the extension.

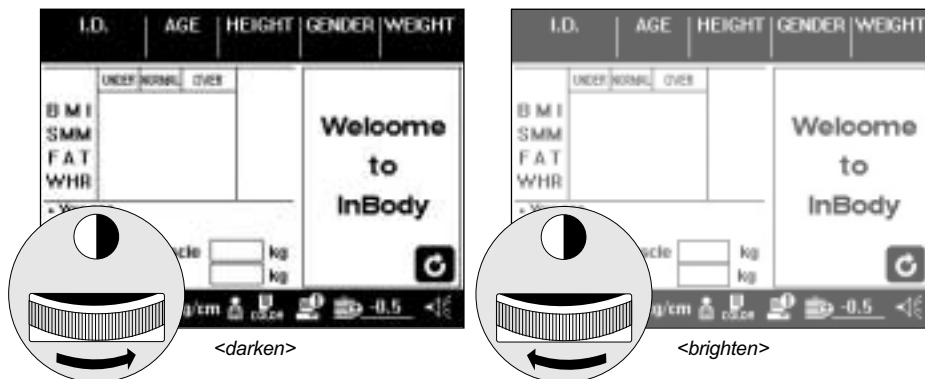
Action 2 Check if the power flows into the extension and an electrical outlet which the extension is connected to.

B. The LCD is turned on, but there is no picture on the LCD.

(In normal situation, the Biospace logo is displayed on the LCD with the signal sound and warming-up starts.)

Cause 1 If the brightness control is not set properly, the LCD will not display icons/image clearly.

Action 1 Adjust the brightness control at the rear of InBody220 by rotating it to the right or to the left until the image becomes clear.



C. The measured weight value seems very low, or shows a negative value.

(Normally the measured weight is not much different from what the subject believes is his/ her actual weight).

Cause 1 The weight sensor (loadcell) calibration was performed wrong during warming-up.

Action 1 During warming-up, the loadcell inside of the base frame is calibrated under a zero weight condition. When pressure or weight is applied to the base frame during warming-up, even a small amount of weight will negatively affect the calibration. Therefore, turn off the power of InBody220, then turn it on again with no weight or pressure on the base frame.

D. The analysis results are unexpected or unusual.

(The value of Percent Body Fat or Skeletal Muscle Mass is too high or too low.)

Cause 1 A subject failed to maintain proper posture. He/she removed fingers or the sole of the foot from the tactile point of the electrodes.

Action 1 He/She must maintain proper posture until the analysis is complete. Refer to Chapter 2, section 5: "Proper Posture" for more information.

E. The result sheet is not printed out from a printer.

(In normal situation, the result sheet is automatically printed out after the measurement.)

Cause 1 Occurs when the paper tray is empty.

Action 1 Check if there is an indicator light or messages on the printer. If the tray is empty then refill it with results paper. Be sure to place the paper properly in the tray (proper direction and surface orientation).

Cause 2 Occurs when the printer cable is unplugged.

Action 2 Ensure the cable is connected tightly to InBody220. Occasionally this may occur as a result of a defective cable. In this case, you must replace the cable.

Cause 3 Occurs when the paper is jammed inside the printer.

Action 3 Check if the paper is jammed inside. Normally, you will be alerted by the indicator light or messages. Remove the paper jam and try again. Refer to the manual provided by the printer manufacturer.

Cause 4 Occurs when the printer or InBody220 setup is incorrect.

Action 4 If the printer type is wrong, the printer will not receive a signal from InBody220. There is also a possibility that the printer setup is incorrect. Sometimes '0' page is selected for result sheet at the Result sheet setup.

F. Printing alignment needs to be adjusted

(Normally, printing alignment correlates with each results item shown on the result sheet).

Cause 1 Occurs when printing location has not been set normally.

Action 1 Refer to chapter 3, section 1: "Setup Menu" for the printer alignment.



CAUTION

Occasionally the printing direction can be problematic. Refer to the printer manual provided by the manufacturer. InBody220 will print in the "portrait" format/orientation.



NOTE

Error messages and misprints are things that technical service representatives can examine in the process of troubleshooting. Keep them in a safe spot or keep records of them.

3. Frequently Asked Questions (FAQs)

Even when no problems are experienced with the equipment, users may still have many questions especially regarding clinical procedures. Below, just a few of the more common questions are listed with answers. If additional questions or more clarification is desired, please contact us by E-mail. The E-mail address for clinical questions is as follows:

E-mail : biospace@biospace.co.kr

A. Must socks or stockings be removed from the feet for analysis?

Bare skin contact is essential in the analysis using the BIA method. Socks or stockings may cause a certain amount of results distortion. Socks and Stockings must be removed to obtain accurate data.

B. What are the circumstances where an analysis cannot be performed?

- Subjects who are using a pacemaker or other internal electronic medical devices should never use InBody220.
- An accurate analysis cannot be obtained for children weighing less than 10kg(22lb.) or people over 250kg(551 lb.), or whom is shorter than 95cm(3ft.1.4in.) or taller than 220cm(7ft. 2.6in.) in height.
- If the subject has a metal device embedded in the body then the electrical current flow rate may be affected. Since InBody220 calculates body composition based on flow rate from each part of the body, the error will be slight.

C. Can amputees or people who cannot stretch their hands or feet to the electrode be tested?

It is impossible to measure people who cannot contact the electrodes. Biospace has a lineup of products that conduct body composition analysis on the patients in bed, without having patients get out of bed during measurement. For more information, contact Biospace.

D. Is the electrical current applied to a human body through electrodes safe?

The BIA method uses 330 μA of current which is negligible and will cause no harm to the human body. InBody220 has acquired the CE mark and other certificates that assure the safety of the medical equipment.

E. Do accessories (jewelry, watches, rings, etc.) or any other metal objects worn by a subject affect the analysis?

The ideal condition for the analysis is simply standing with no clothes (naked) and wearing of no accessories. However, this may not always be possible. Therefore, we recommend a subject remove as many clothing items and accessories that may affect the weight as possible. No problems will result as long as the accessories do not interfere with proper electrode contact.

F. How often does the subject perform the analysis?

When the subject is taking treatment related to body composition, such as exercise advice, hormone prescription, or treatment for obesity and rehabilitation, perform the analysis once per two weeks or four weeks.

G. What does the subject follow for accurate analysis?

For accurate analysis, Biospace recommends the following:

- measure with an empty stomach
- measure 2 hours after a meal
- measure after urination and excretion
- to get net weight, remove heavy clothes or accessory
- do not exercise or take a shower before measurement
- measure after standing for at least 5 minutes
- do not measure after abruptly standing
- do not measure while taking a diuretic
- for female, avoid having measurement during menstrual period.
- input accurate height
- keep room temperature at 20 ~ 25 °C (68 ~ 77 °F)

F. How reliable is WHR value?

The WHR value obtained from InBody220 has the correlation rate of 0.899 in comparison with the real value. This correlation rate is little lower than those of other values, but the WHR value saves the user from measuring the circumferences of each body part with tape-measure. Most of all, it guarantees high reproducibility of measurement. WHR is one of the values that only InBody provides among impedance equipments.

4. Customer Service Information

Corporate agents of InBody220 and addresses are listed below. Contact us for assistance or more information about InBody220.

Biospace Co., Ltd.

10th Floor, Poonglim Bldg., 823 Yeoksam 1-dong, Gangnam-gu, Seoul 135-784 KOREA

TEL : 82-2-501-3939

FAX : 82-2-501-3978

Homepage : <http://www.biospace.co.kr>

E-mail : biospace@biospace.co.kr

Biospace Inc.

8820 Wilshire Blvd. Suite 310 Beverly Hills, CA 90211 U.S.A

TEL : 1-310-358-0360

FAX : 1-310-358-0370

Homepage : <http://www.biospaceamerica.com>

E-mail : USA@biospaceamerica.com

Biospace Japan Inc.

2nd Floor Ayabe Bldg., 2-17-3 Sotokanda, Chiyoda-ku, Tokyo JAPAN

TEL : 81-3-5298-7667

FAX : 81-3-5298-7668

Homepage : <http://www.biospace.co.jp>

E-mail : biospace@biospace.co.jp

EC Representative

DongBang Acuprime Ltd. [EU]

PO Box 192, Exeter EX2 4WU, United Kingdom

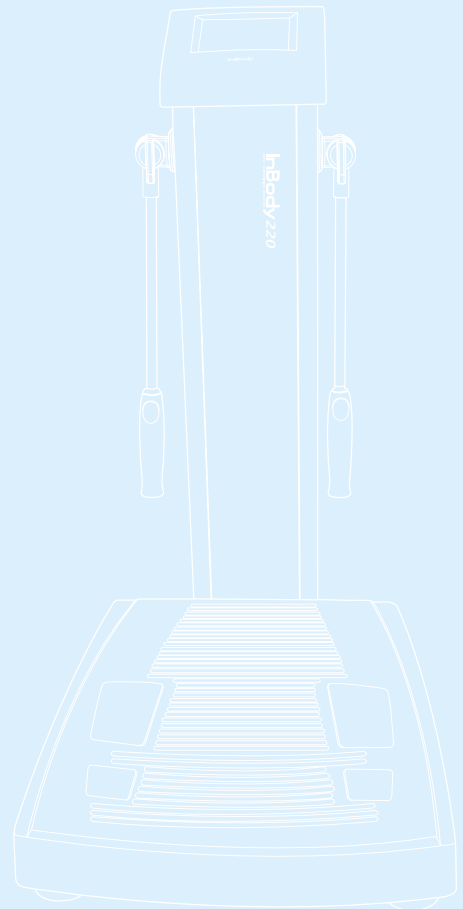
TEL : +44 1392-671543

FAX : +44 1392-671541

E-mail : info@acuprime.com

Chapter 5 Consumables

1. Consumables
2. Basic Equipments
3. Options



1. Consumables

Following illustrations and specifications are for equipment under normal condition. If any malfunction or abnormality is found, contact Biospace or distributor.

A. Result sheet

Basic specifications are :

Result sheet Size : 210mm × 297mm(A4 type)

Number of Sheets : 1,000 / 1box

Printed Condition : 4 colors

Manufacturer : Biospace Co., Ltd.



2. Basic Equipments

We recommend you to use InBody220 compatible printer and a designated printer desk. Please contact Biospace or an authorized distributor for the further details.

A. Printer

The InBody220 compatible printer should meet the intent of IEC 60950(EN 60950). InBody220 supports Parallel (IEEE1284) or USB printer. For installation and usage of printer, refer to the user's manual of the printer provided by the printer manufacturer.

Compatible Printers:Laser/Inkjet printers



Use the only printers recommended by Biospace.

B. Printer Desk

Printer desk minimizes vibration during printing. The exterior and specifications of the printer desks are:

Materials : E.G.I

Size : 460(W) × 410(L) × 630(H), unit : mm

Weight :11kg



To assemble the printer desk, refer to assembling guide printed on its carton.

3. Options

Biospace provides optional devices to make the operation of InBody220 more efficient and convenient. For more information, contact the head office or authorized distributors of Biospace.

A. Lookin' Body

Lookin' Body is a database management software, which stores the measurement results generated by InBody220. In addition, Lookin' Body keeps track of the measurement history of patients as well as illustrating the results by period and category, with a lot of visual explanations. Lookin' Body will help you provide more valuable consultation to your clients. System requirements for installation are:

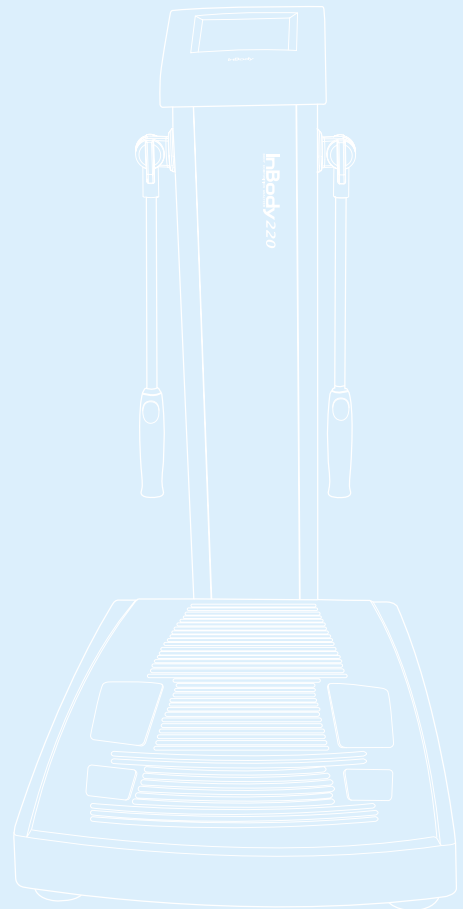


- Operating system : Microsoft Windows 2000/XP compatible
- CPU : IBM-PC compatible computer with Intel Pentium III 700MHz or higher
- Hard disk : 800MB or more of available hard-disk space
- Memory (RAM) : 256MB or more recommended
- Graphic cards and monitor: Screen resolution 1024 ×768, color depth 16 bit or higher
- Input devices : Keyboard and mouse
- Communication : Serial port (RS-232C), USB

Appendix

1. More About InBody220
2. Classifications
3. Specification
4. Worldwide Patents

Limited Warranties



1. More About InBody220

A. How does BIA Work?

The Bioelectrical Impedance Analysis (BIA) method is based on the fact that the human body consists of conductors, and non-conductors.

Generally 50 ~ 70% of the human body consists of water which functions as a conductor, whereas body fat functions as a non-conductor.

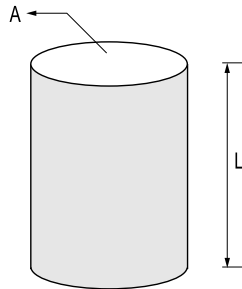
The classic whole body BIA method measures the impedance on the assumption that the human body can be considered as a cylinder for application of this model.

If A is the cross sectional area, and L is the length, the Impedance of the cylinder can be expressed as follows.

$$Z = \rho \frac{L}{A} \quad (\rho = \text{resistivity})$$

If both sides are multiplied by L, we get the new expression as follows.

$$V = \rho \frac{L^2}{Z} \quad (V(\text{volume}) = A(\text{Area}) \times L(\text{Length}))$$



According to this expression, if we know the L and the impedance value, we get the volume. That is to say, if we know the height of the human body (acting as a conductor), and know the impedance value, we can get the volume of body water. Here, the volume of water in the cylinder represents the volume of body water and the length of the cylinder represents subject's height. Therefore, the two directly used variables in body composition analysis are impedance and height.

The principle of InBody220's body composition analysis is explained as the following; The volume of body water, an electrolyte, is calculated first with measured impedance value. Then, we can get the value of fat free mass using the volume of body water. Fat mass is determined by direct measurement or deducting the fat free mass from entered weight.

Height should be entered by user. Weight can be directly measured on InBody220 or entered.

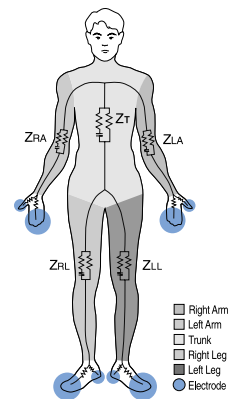
B. Core Technology

InBody220, the most advanced Body Composition Analyzer available, utilizes state of the art technology, providing extremely reproducible accurate data and diverse composition analysis that is of great use to professionals. This new technology is patented worldwide and has obtained CE license, royalty agreement with Yamato corporation and FDA approval.

The following are key features that make InBody220 extremely convenient, timely, and most importantly, accurate.

(1) Tetrapolar 8-Point Tactile Electrode

It was a complex and inconvenient procedure to attach and detach the electrodes to a specific spot everytime. Trained technicians were needed for each measurement. InBody220 uses tactile electrodes to avoid the possibility of errors and inaccuracies resulting from the above procedure. The 8-point Tactile Electrode method enables InBody220 to efficiently produce accurate data every time.



(2) No Statistical Estimations

With conventional BIA, results are distorted by statistics, based on personal data input such as age, gender, body type, etc. When repetitive tests are performed using different inputs, results are altered. The conventional BIA measures a few parts of body or uses only low frequency causing inaccuracy of measurement. However, InBody220's technology has overcome the limitations of the conventional BIA method, which needs revision with statistical factors. It accurately assesses intracellular water using multi-frequency, a technology not used by other BIA equipment, and measures bioimpedance of trunk as well as the rest of the body. InBody220 uses actual measurements to yield accurate results unique to the individual regardless of statistical estimations.

C. Outputs

Total Body Water (ℓ)

Protein (kg)

Mineral (kg)

Body Fat Mass (kg)

Fat Free Mass (kg)

Weight (kg)

Skeletal Muscle Mass (kg)

Body Fat mass (kg)

BMI (Body Mass Index, kg/m²)

Percent Body Fat (%)

Waist- Hip Ratio

Various comprehensive evaluations

- Nutritional Evaluation
- Weight Management
- Obesity Diagnosis

Weight Control

- Target Weight (kg)
- Weight Control (kg)
- Fat Control (kg)
- Muscle Control (kg)

Fitness Score

Basal Metabolic Rate (kcal)

Impedance (Ω)

Exercise Planner

2. Classifications

Type of protection against electric shock : Class I

Type of the applied parts : BF Type

Degree of protection against water infiltration : IPXO

EMC Immunity : Level A

EMC Emission : Level A

Equipment not suitable for use in the presence of flammable mixture

3. Specification

Measurement Method	Direct Segmental Multi-frequency Bioelectrical Impedance Analysis Method, DSM-BIA Method
Measurement Items	Impedance(Z) 10 Impedance Measurements by Using 2 Different Frequencies (20 _{KHz} , 100 _{KHz}) at Each 5 Segments (Right Arm, Left Arm, Trunk, Right Leg, Left Leg)
Electrode Method	Tetrapolar 8-Point Tactile Electrode System
Body Composition	No Empirical Estimation
Calculation Method	
Outputs	Total Body Water, Protein, Mineral, Body Fat Mass, Skeletal Muscle Mass Fat Free Mass, Weight BMI, Percent Body Fat, Waist-Hip Ratio(WHR) Nutritional Evaluation(Protein, Mineral, Fat) Target Weight, Weight Control, Fat Control, Muscle Control, Fitness Score, Basal Metabolic Rate(BMR) Exercise Planner(Energy Expenditure for each Exercise) Recommended calorie intake per day Impedance of Each Segments & Frequencies
Applied Rating Current	330 μ A
Adapter	Power Input AC100-240V, 50/60Hz, 1.2A Power Output DC 12V, 3.5A
Display Type	320 × 240 STN LCD
Input Interface	Touch screen
External Interface	RS-232C 2EA, USB Slave 1EA, USB Host 1EA, IEEE1284(25pin parallel)
Compatible Printer	Laser / Inkjet Printer (with PCL 3 or above the printers recommended by Biospace)
Dimensions	19.9(W) × 30.7(L) × 40.7(H) : inch (505(W) × 780(L) × 1035(H) : mm)
Machine Weight	57.3lbs(26kg)
Measurement Duration	35 seconds
Operation Environment	10 ~ 40 ℃ (50 ~ 104 ℉), 30 ~ 80% RH, 500 ~ 1060hPa
Storage Environment	0 ~ 40 ℃ (32 ~ 104 ℉), 30 ~ 80% RH, 500 ~ 1060hPa
Weight Range	22 ~ 551lbs.(10 ~ 250kg)
Age Range	3 ~ 99years
Height Range	3ft. 1.4in.~7ft. 2.6in.(95 ~ 220cm)

*Specifications may be subject to change without notice.

4. Worldwide Patents

1998. 02 U.S. patent

Apparatus and method for analyzing body composition based on bioelectrical impedance analysis (US 5,720,296)

2000. 08 Canadian patent

Apparatus and method for analyzing body composition using a new electrode system based on bioelectrical impedance analysis (CN 2,225,184)

2001. 07 U.S. patent

Apparatus for analyzing body composition based on bioelectrical impedance analysis and method thereof (US 6,256,532B1)

2002. 03 Japanese patent

Apparatus for analyzing body composition based on bioelectrical impedance analysis (3,292,373)

2002. 06 U.S. patent

Apparatus for analyzing body composition using novel hand electrodes and method thereof. (US 6,400,983B1)

2002. 09 EPO patent (Germany, France, U.K. and Italy)

Apparatus and method for analyzing body composition using a new electrode system based on bioelectrical impedance analysis (EP 0,835,074)

Limited Warranties

Product :

Serial Number :

Purchase Date :

Institute Name :

Biospace Co., Ltd.

10th Floor, Poonglim Bldg., 823 Yeoksam 1-dong, Gangnam-gu, Seoul 135-784 KOREA

TEL : 82-2-501-3939

FAX : 82-2-501-3978

Homepage : <http://www.biospace.co.kr>

E-mail : biospace@biospace.co.kr

1. Biospace guarantees that the product has been approved with the qualified test procedure under the severe condition.
2. The one year factory warranty begins on the day of purchase.
3. During the one - year warranty period, Biospace remedies any original defect in material or workmanship.
4. The following defects or malfunctions will not be covered under the one year warranty :
 - Any defect caused by user's fault.
 - Any defect or damage caused by not following the instructions described in the user's manual.
 - Any defect or damage caused by natural disasters (storm, flood, earthquake, etc.)
 - Any defect or damage caused by disassembly of InBody220 or by modifying internal parts or program by unauthorized person.
5. An extended warranty may be purchased by executing an extended warranty contract after the initial warranty period.
6. No return is allowed after a product is opened. The proof of purchase must be accompanied before requesting service.
7. Please contact an authorized service for any service calls.
8. Please register your product at Biospace website before using it.
We will provide you with various products information and customer services.
Homepage : <http://www.biospace.co.kr>