

InBody 720

PRECISION IN BODY COMPOSITION ANALYSIS

User's Manual

Thank you for purchasing the InBody720.
Please read this manual carefully and operate with care. Keep for future reference.

BIOSPACE

© 1996-2009 Biospace Co., Ltd. All rights reserved.

Notice

No part of this manual should be reproduced, stored in any retrieval system, or transmitted by any means (electronic, mechanical, photocopied, recorded, etc.) without written permission from Biospace, Inc. (hereinafter Biospace). No Patient liability is assumed with respect to the use of the information contained herein. This User's Manual may contain misprints, which can be modified without prior notice to the readers. Biospace is not liable for any damage caused by a failure to meet the requirements stated in this user's manual.

Biospace, Inc.

4801 Wilshire Blvd., Suite 320 Los Angeles, CA 90010, USA

Tel: 1-310-358-0360 Fax: 1-310-358-0370

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

E-mail: usa@biospaceamerica.com

Acknowledgements

Biospace, the Biospace logo, and the InBody720 are registered trademarks of Biospace Co., Ltd. The names of the companies and products in this manual other than those of Biospace Co., Ltd. are the trademarks of those companies. Stating the products of other companies is strictly for the purpose of providing information, not to guarantee or recommend these products. Biospace is not responsible for the performance or the use of these products.

Biospace reserves the right to modify the dimensions or exterior of the InBody720 to improve the quality of the product(s), without consent of the customer.

How to use this manual

The User's Manual explains the functions of the InBody720. Follow the instructions below for effective use of this manual.

1. Read this manual thoroughly before using the equipment.
2. Take a few moments to look at the pictures of diagrams of the equipment to understand the configuration of the equipment.
3. Read the "Chapter 4 : Problems and Solutions" before requesting a warranty service.
4. Read the "Chapter 5 :Consumables" when you want to purchase supplies or optional devices.
5. If you have clinical issues while using the InBody720, please contact us using the E-mail address as shown below.
E-mail: usa@biospaceamerica.com
6. Read signs of warning, precautions and notes carefully. The following are visual representations of these signs.



Important information to warn you of situations that 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 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 the InBody720.

Safety Information

 **DANGER**

Make sure not to use this equipment with any medical electrical device, such as a pacemaker.

NO USAR USARLO CON EQUIPO MEDICO ELECTRONICO ASI COMO CON MARCAPASOS.

 **CAUTION**

Keep this equipment away from liquid.

MANTENER USARLO LEJOS DEL AGUA.

 **CAUTION**

Do not aggressively grab the hand electrode/bar.

NO AGARRAR LOS ELECTRODOS DE MANO FUERTEMENTE.



WARNING

Please do not dismantle the equipment. Dismantling may cause damage, such as electric shock.

If dismantled, the Warranty will be void.



DANGER

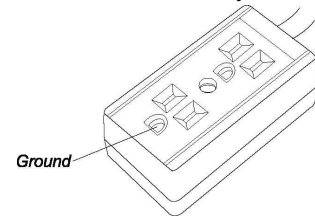
Do not use this equipment in combination with the following electronic medical devices.

- Medical devices, such as a pacemaker
- Electronic life support systems, such as an artificial heart/lung
- Portable electronic medical devices, such as an electrocardiograph



DANGER

Do not operate within 3.5 feet from shockwave or microwave therapy equipment. Avoid simultaneously connecting patients to the InBody720 and any type of high frequency surgical equipment.



WARNING

1. This product should always be placed on the ground and plugged into a secure electrical outlet.
2. Do not operate within 3.5 feet (1meter) of any other powered electronic medical equipment. This will result in electromagnetic interference or possibly other interferences between the InBody720 and other equipment.
3. To prevent electric shock, use a surge protector between the InBody720 and power outlet.
4. 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. If service is required, contact Biospace or the supplying agency. Battery Replacement for service personnel only: Lithium Battery Type: CR2032. CAUTION-Danger of explosion if battery is incorrectly replaced.
5. When connecting peripherals (printers and other optional devices) to the InBody720, turn on the power of the peripherals before turning on the InBody720. When turning the power off, turn off the InBody720 before turning off the peripherals. This process will minimize the harm to the equipment caused by electrical shock.
6. Do not operate this equipment with a damaged power cord or plug, if it is not working properly, or if it has been previously damaged in any way.

7. Do not immerse the power cord in water.

8. Individuals with any kind of contagious disease or any kind of injury on the palm of their hand or sole of their foot should not come in contact with this product.

9. Never start weight reduction or exercise therapy without instruction from a physician or a specialist. Self-diagnosis may damage your health. Consult with your physician first.

10. This equipment is specifically designed to analyze body composition. Use the equipment only for its intended use as described in this manual.



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 box 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 malfunctions.

3. Follow local governing ordinances and recycling plans regarding the disposal or recycling of device components.

4. 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.

5. Install or locate equipment only in accordance with the provided installation instructions.

6. This equipment should be serviced only by qualified personnel. Contact Biospace for examination, repair or adjustment.

7. Do not touch the ports on the back side of the InBody.



This equipment may cause the above mentioned medical devices to malfunction.

This equipment may cause harmful interference to other devices in the vicinity if not installed and used in accordance with the installation specifications. However, there is no guarantee that the interference will not occur for a particular installation.

The InBody720 has been designed, manufactured, and inspected under the full quality assurance system of Biospace. Biospace fulfills the international standardization system, ISO 90001 and ISO 13485 and the InBody720 has achieved FDA approval (Food and Drug Administration).

The InBody720 fulfills the Standards of IEC60601-1(EN60601-1), Safety of Electric Medical Equipment. In addition, the InBody720 complies not only with 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.



1. Potential electromagnetic or other interference between medical equipments and other devices being operated together in the same environment may cause an adverse influence on the function of the medical equipment. Non-medical equipments not in compliance with the requirements of EN 60601-1 and EN 60601-1-2 should not be used together in the same environmental as the medical equipments. This equipment has been tested and found to comply with the limits for medical devices in IEC 60601-1-2:2001.

These limits are designed to provide reasonable protection against harmful interference in a typical medical installation.



2. External equipment intended for connection to signal input, signal output, or other connectors, must comply with the relevant IEC/EN standard (IEC/EN 60601-1 series for medical electrical equipment). In addition, all such connections (system) must comply with the standard IEC/EN 60601-1, Safety requirements for medical electrical systems. Any person who connects external equipment to signal input, signal output, or other connectors has formed a system and is therefore responsible for the system to comply with the requirements of IEC/EN 60601-1-1. If in doubt, speak with a qualified technician.



3. Do not to touch signal input, signal output or other connectors, and the patient simultaneously.

However, there is no guarantee that the interference will not occur for a particular installation.

The InBody720 has been designed, manufactured, and inspected under the full quality assurance system of Biospace. Biospace fulfills the international standardization system, ISO 9001 and ISO 13485 and achieved FDA approval (Food and Drug Administration).

The InBody720 fulfills the Standards of IEC60601-1(EN60601-1), Safety of Electric Medical Equipment. In addition, the InBody720 complies not only with 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.








Disposal of old Electrical & Electronic Equipment

(Application in the European Union and other European countries with separate collection system)









This symbol indicates that this product shall not be treated as household waste. Instead, it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about recycling this product, please refer to local governing ordinances and recycling plans.

Indicators & Safety Symbols

A. Indication

- 2005  Manufacturing Year
-  9pin serial port, (RS232C, Male)
-  Ethernet port (10/100Base-T)
-  USB port (Version 1.1)
-  IEEE 1284 (25pin Parallel), Female (PCL 3, or above; printer)

B. Safety signs

-  Dangerous high voltage
-  Danger / Warning / Caution / Note (refer to the safety information)
-  Fuse specification
-  Equipotential terminal
-  BF type equipment
-  Alternating Current
-  Turn on the power
-  Turn off the power



For 120V input power, use only UL Listed detachable power cord with NEMA configuration 5-15P type, hospital grade plug (parallel blades).
For 240V input power, use only UL Listed detachable power cord with NEMA configuration 6-15P type, hospital grade plug (Tandem blades).

Introducing the InBody720 - BODY COMPOSITION ANALYZER

The human body consists of body water, protein, body fat and minerals. The four elements are the fundamental ingredients constituting the body and the balance between them is essential to our health. Body composition analysis is to quantify and measure these ingredients.

In the past, diagnosing obesity was focused on how we looked outside, without considering the balance among body water, protein, body fat and minerals. From the health point of view, body composition analysis that takes into account the balance between body water, protein, body fat and minerals make more sense than diagnosing obesity based on how we look. In addition, this is where the body composition analyzer with high precision comes in.

Biospace earned recognition in the international market for technical expertise demonstrated through InBody 2.0 and 3.0. Based on the experience and technicality accumulated over the last 10 years, Biospace released the InBody720, taking the body composition analysis to a new height. The body composition analyzer InBody720 is accurate for all body types and for any possible distribution of body water, measuring the progress of clinical treatment, weight loss program or exercise therapies reliably.

Using a diverse range of frequency from 1kHz to 1MHz, the InBody720 measures the amount of body water accurately. Particularly, the InBody720 is the first version to use the reactance analysis method, which is the more advanced technology for the body composition analysis than those used in previous versions. Professional-looking exterior, high-definition monitor and new level of expandability of the InBody720 that were not found in the previous body composition analyzers will usher you into a new chapter of body composition.

Biospace strives to be your partner for health. We are committed to developing high-quality products through transparent management and continuous research and development.



Kichul Cha, CEO

Contents

HOW TO USE THIS MANUAL		I	
SAFETY INFORMATION		II	
INDICATION & SAFETY SYMBOLS		VII	
INTRODUCING InBody720 - THE BODY COMPOSITION ANALYZER		VIII	
Chapter 1 Installation and Maintenance		Chapter 3 Setup Establishment	
1. Contents in a Carton	1	1. Setup	49
2. Exterior and Functions	3	2. Setup Menu	50
3. Installation Instructions	9	3. Quick Setup	53
4. Transportation	13	4. DATABASE	55
5. Repacking	14	5. Modification Example	57
6. Maintenance	15		
Chapter 2 Management & Results Description		Chapter 4 Problems and Solutions	
1. Cautions Before Measurement	16	1. Error Messages	58
2. Exterior and Function of Keypad	17	2. Troubleshooting	59
3. Power Connection & Getting Started	19	3. Frequently Asked Questions (FAQs)	62
4. Standby Screen	21	4. Customer Service Information	64
5. Personal Profile	22		
6. Proper Posture	24	Chapter 5 Consumables	
7. How to Operate the Equipment	26	1. Consumables	65
8. Results	30	2. Basic Equipment	66
9. Facts for Normal Range	42		
		Appendix	
		1. More About InBody720	67
		2. Specifications	70
		3. Worldwide Patents	71

Chapter 1. Installation and Maintenance

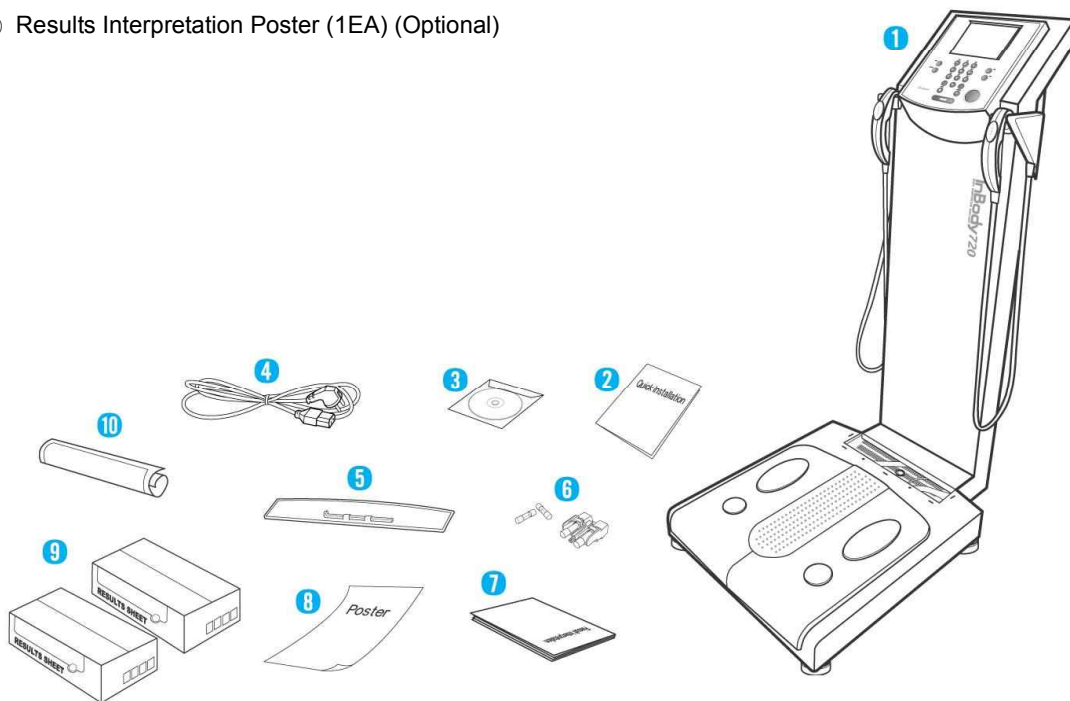
1. Contents in a Carton
2. Exterior and Functions
3. Installation Instructions
4. Transportation
5. Repacking
6. Maintenance

1. Contents in a Carton

When opening the box, check to make sure all the following items are included.

A. Included Items

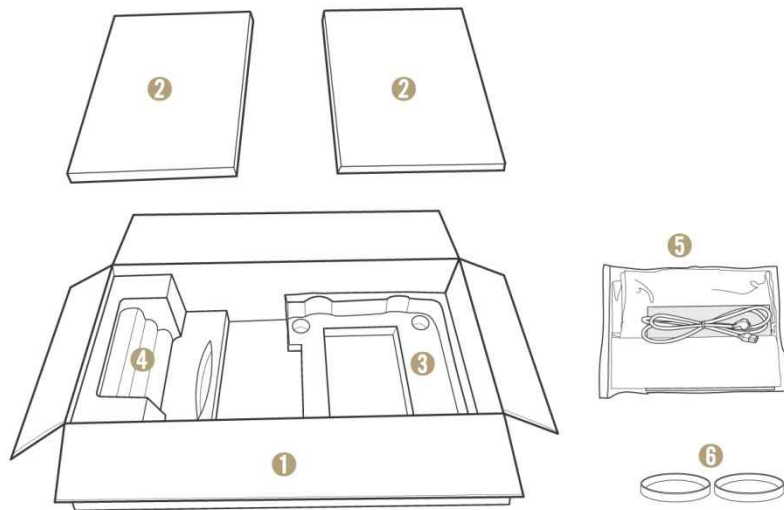
- ① InBody720 unit
- ② Quick Installation Guide
- ③ User's Manual CD
- ④ Power Cord (AC 125V, 10A, 1.8m) 1EA
- ⑤ Hinge cover + Hexagonal wrench (6mm) 1 each
- ⑥ 1 Fuse holder + 2 Fuses (F2.5AH 250V) + 2 spare 2 fuses
- ⑦ Results Interpretation Guide (1EA)
- ⑧ InBody720 Poster (1EA)
- ⑨ Results Sheet Box (500 Sheets/1EA, 2 Box) (Optional)
- ⑩ Results Interpretation Poster (1EA) (Optional)



1. USB Cable is to be purchased separately for connecting to the printer.
2. The printer is needed for printing the result sheets. Please check the compatibility of the printer with Biospace.

B. Package

- ① Packaging Box (1250 × 450 × 280; mm, W × L × H) 1 unit
- ② Upper pad 2 units
- ③ Support pad 1 unit
- ④ Head pad 1 unit
- ⑤ Accessory bag 1 unit
- ⑥ Elastic band 2 unit



To reduce the physical impact on the equipment, use the wrapping material provided by the Biospace during shipment or transit. For information on how to relocate the equipment, refer to the "Chapter1, Section 4. Transportation"



Keep the wrapping material with you after installation in the event of relocation.

2. Exterior and Functions

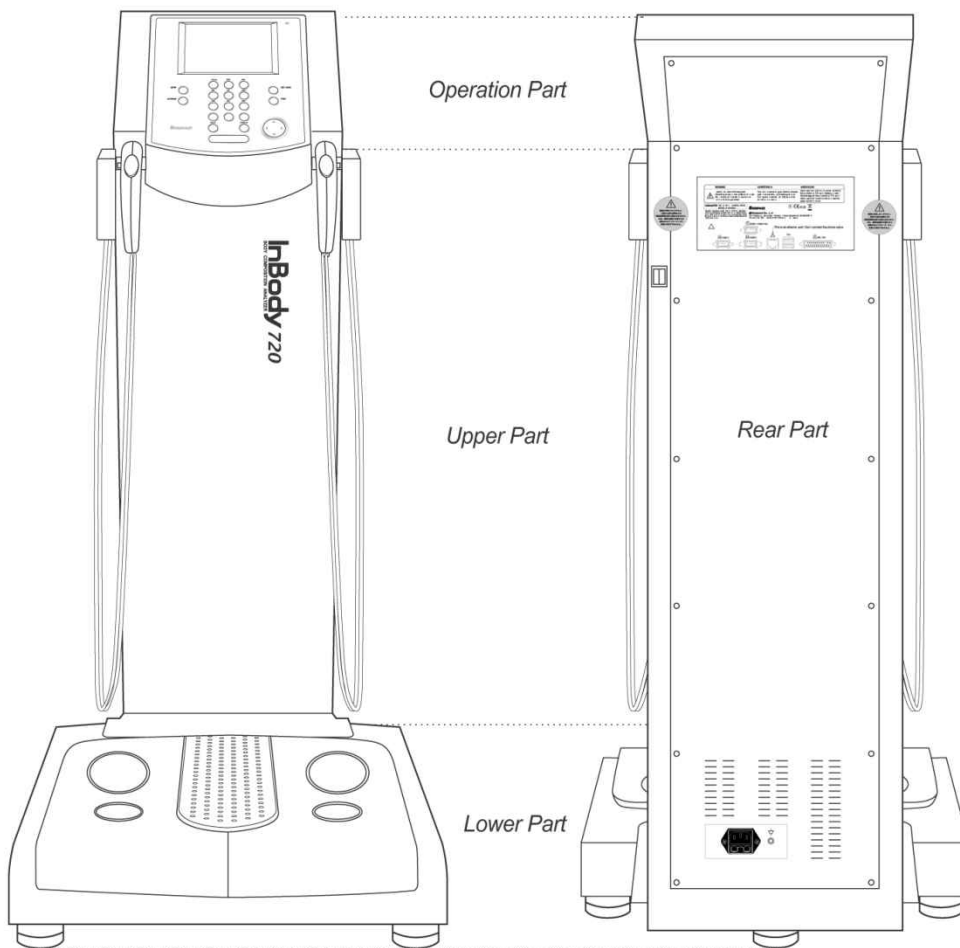
Individual part identification and functions with schematic sketches are provided below. Please inspect each component of the InBody720 before installation to ensure there are no scratches or damage.

A. Operation Part

B. Upper Part

C. Lower Part

D. Rear Part



A. Operation Part

❶ LCD Monitor (640 X 480 TFT Color LCD)

This displays the analysis procedure, messages and results.

❷ Key Pad (20 buttons)

The keypad is divisible into input buttons and function buttons.

These are used to input data required for body composition analysis, to set up the operating environment and to print out test results.



B. Upper Part

❶ Hand Electrode Holder

Place hand electrode here when not in use.

❷ Thumb Electrode

Examinee will place their thumb on this area during testing.

❸ Palm Electrode

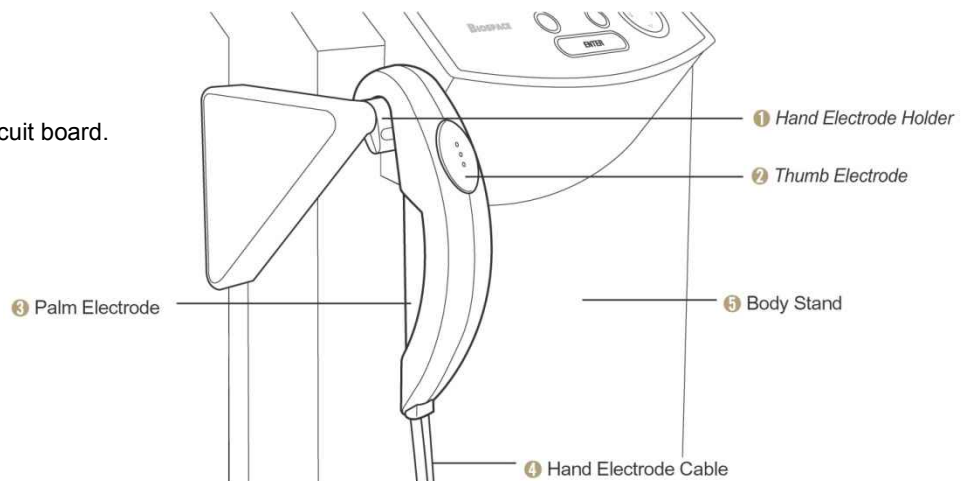
The examinee will place their palm and fingers on this part during testing.

❹ Hand Electrode Cable

The hand electrode cable is connected to the circuit that transfers voltage and electric current.

❺ Body Stand

The body stand contains the circuit board.



C. Lower part

❶ Front Sole Electrode

The examinee stands on the foot electrode placing their forefoot on here during testing.

❷ Rear Sole Electrode

The examinee places their heels on this foot electrode during testing.

❸ Base Frame (Loadcell)

The loadcell is connected to the base frame where the examinee stands.

❹ Hinge Cover

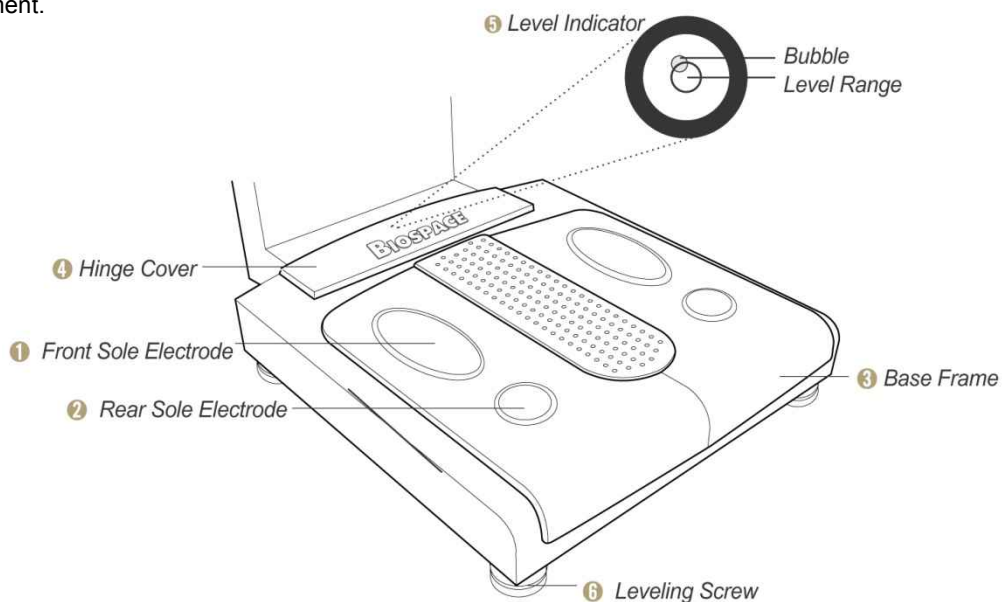
The hinge cover with hinges in the middle separates the area connecting the upper and lower part of the equipment. It can come off the equipment and be folded in half for easy transportation. A body wrench (6mm) is attached underneath the hinge cover.

❺ Level Indicator

The leveler is in the middle of the lower part, which is covered by the hinge cover. Check the bubble level to determine whether the equipment is leveled.

❻ Leveling Screw

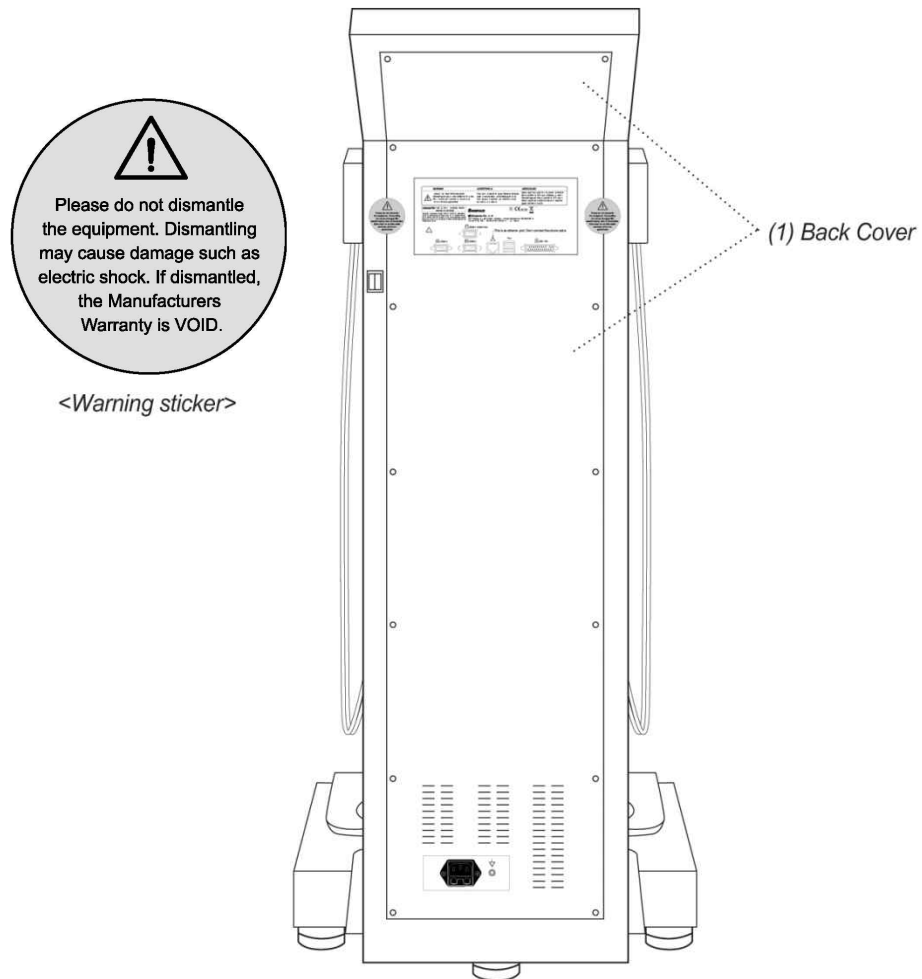
The equipment has five legs screwed into the base. You can use the legs to adjust the height and level of the equipment.



D. Rear part

(1) Back Cover

The back cover should be opened only for the purpose of repair. Only Biospace technicians are allowed to open the cover.



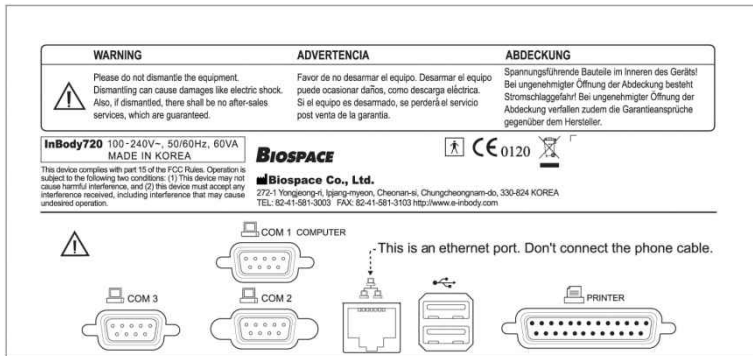
Biospace is not responsible for damages done on the product or injury caused by the user's unauthorized opening of the back cover.



Biospace is not responding to any request for repair or upgrade, when damage is done on the warning sticker or there is any indication that the back cover was previously opened. Do not open the back cover in any case.

(2) Control & Connection Unit

This unit allows the equipment to connect to peripherals such as computers, printers, as well as transferring data back and forth.



❶ 9pin Serial port, Male (RS-232C)

Com 1 port is used to connect to the personal computer.

Com 2 port is used for an additional peripheral.

Com 3 port is used for an additional peripheral.

❷ LAN port (10/100 Base-T)

Through LAN cable, the equipment can communicate with the external systems including computers. The LAN interface supports both 10Mbps and 100Mbps Ethernet connection.

❸ USB port (Version 1.1)

InBody720 communicates with external devices such as computers and printers through the two USB ports and cables.

You can use either of the two USB ports interchangeably. As of now, the equipment supports only printers as a USB device.

❹ 25pin parallel port (IEEE 1284)

The 25pin parallel port is used to connect to printer. If you intend to use USB printer, connect it to the USB port.

Only the peripherals provided by Biospace can be connected to InBody720. For any inquiry about peripherals, contact Biospace.



NOTE

Only the peripherals provide by Biospace can be connected to InBody720. For any inquiry about peripherals, contact Biospace.

(3) Power & Safety Unit

❶ Power Socket

Plug the 3-pin plug to the power socket to supply the power to the equipment.

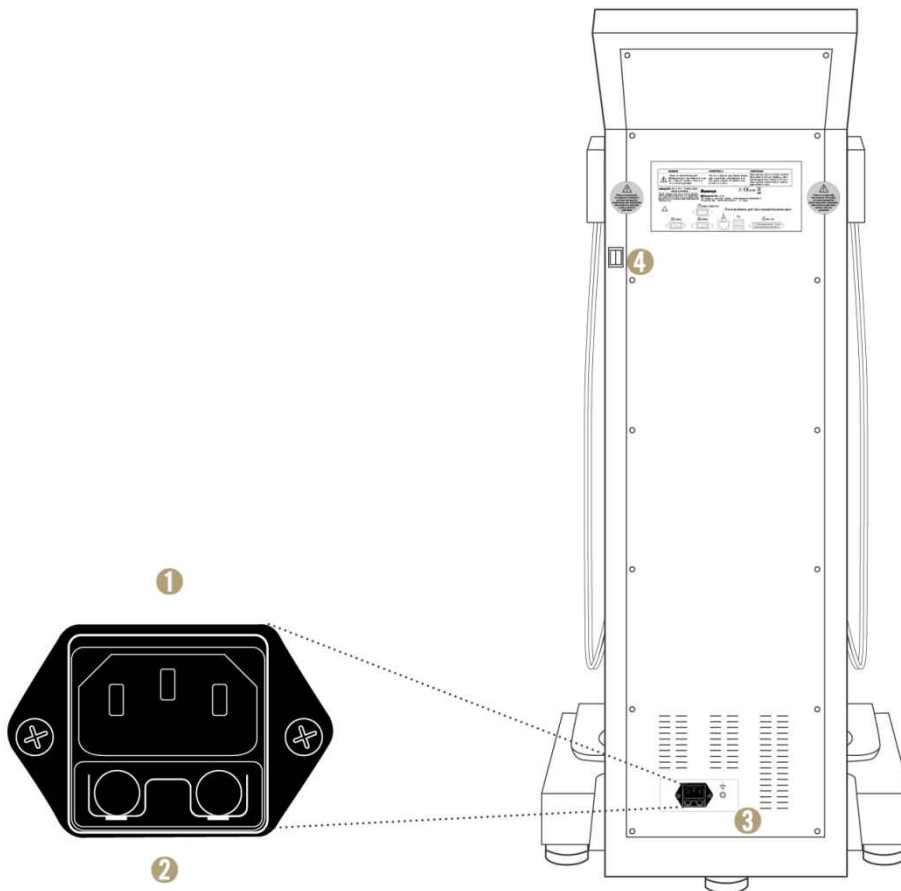
❷ Fuse Socket

The fuse holders (two fuses) are embedded in the equipment.

❸ Equipotential Terminal

The equipotential terminal can be connected to the external equipotential line to prevent danger caused by the difference in the potentials between the other devices.

❹ Power switch



3. Installation Instructions

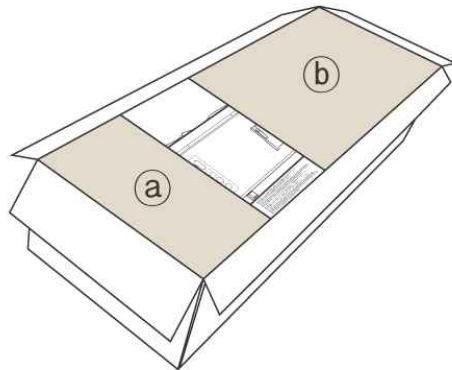
A. Workplace requirements

- (1) Location: Indoor only. Any outdoor area where the equipment is to be located should meet all the conditions below.
- (2) Operation environment: 50 ~ 104°F (10 ~ 40°C), 30 ~ 80% RH
- (3) Optimum pressure: 50 ~ 106kPa

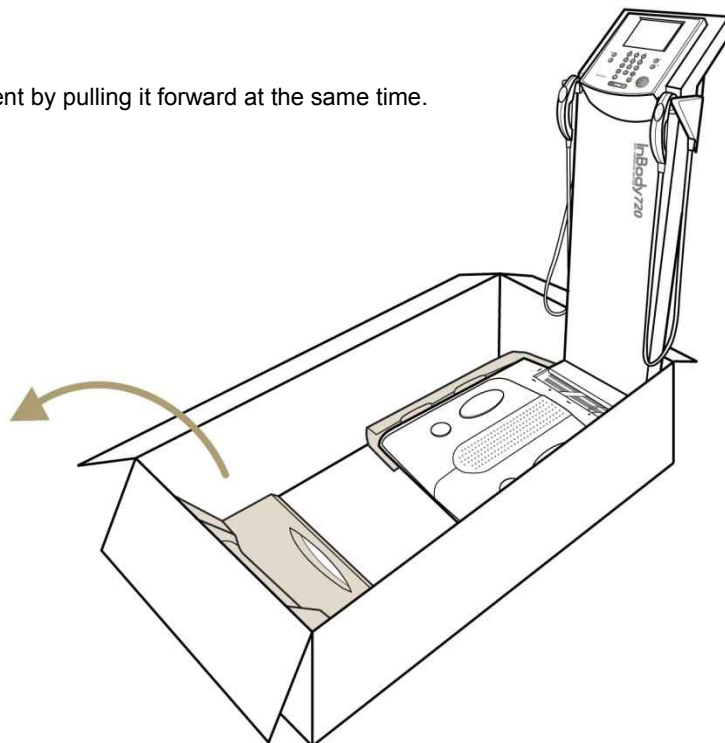
B. Note on Unpacking & Assembling

(1) Remove the pads

- ❶ Unpack the carton and remove the ①, ② upper pads.

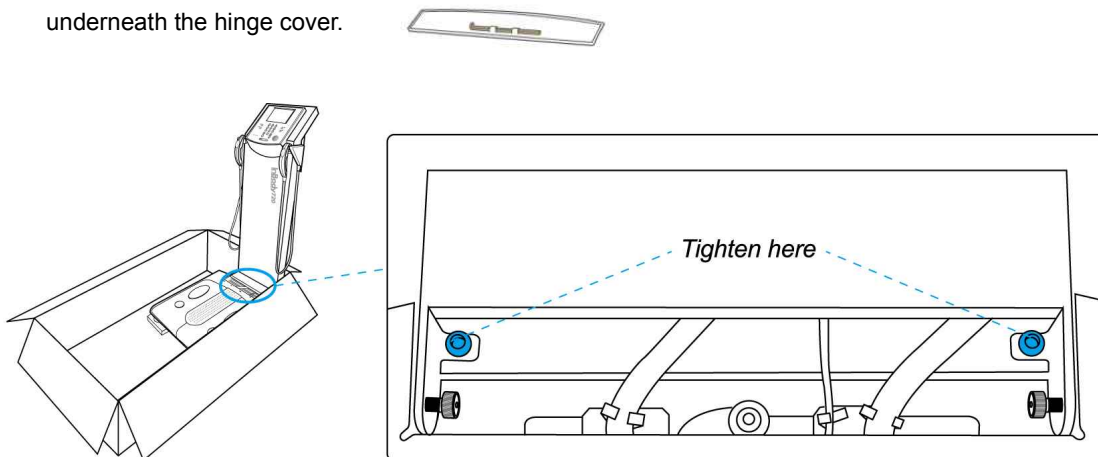


- ❷ Straighten the equipment by pulling it forward at the same time.

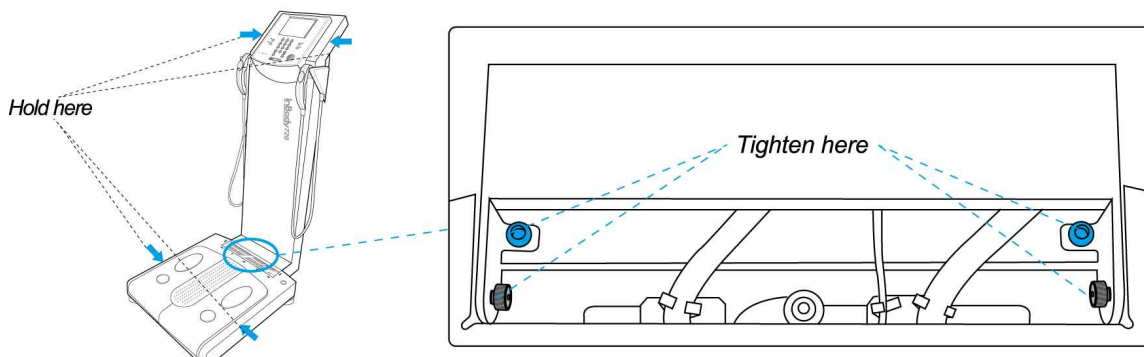


(2) Place the equipment

- ❶ Tighten the screws connecting upper and lower part with a hexagonal wrench. The hexagonal wrench is located underneath the hinge cover.

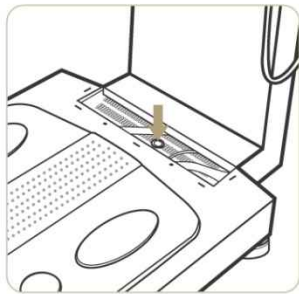


- ❷ Hold the upper part and center of lower part with two people and take the equipment out of the carton. Place the equipment at desired area and tighten the 4 screws connecting upper and lower parts with a hexagonal wrench.



(3) Level InBody720

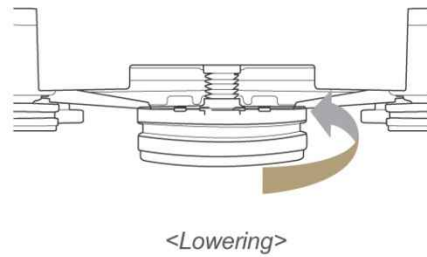
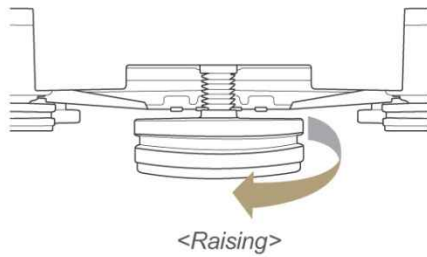
The level indicator is located at the center of connecting part and leveling screws under the lower part. Check the level indicator. You may adjust 5 leveling screws under the lower part to level the equipment.



Unleveled state

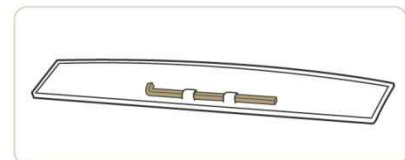


Leveled state

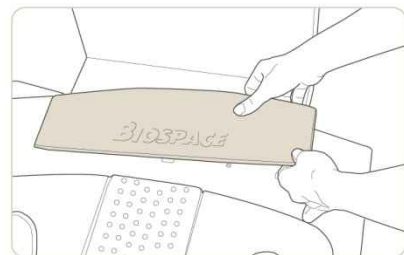


(4) Close the hinge cover

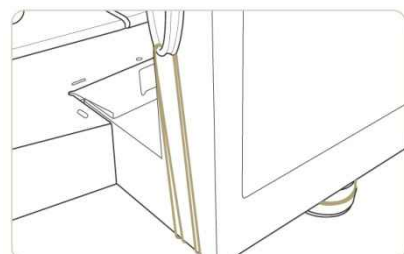
- 1 Attach the hexagonal wrench underneath the hinge cover.



- 2 Close the hinge cover.



- 3 Lift up the rear part and remove the elastic bands pulling the hand electrode cables.

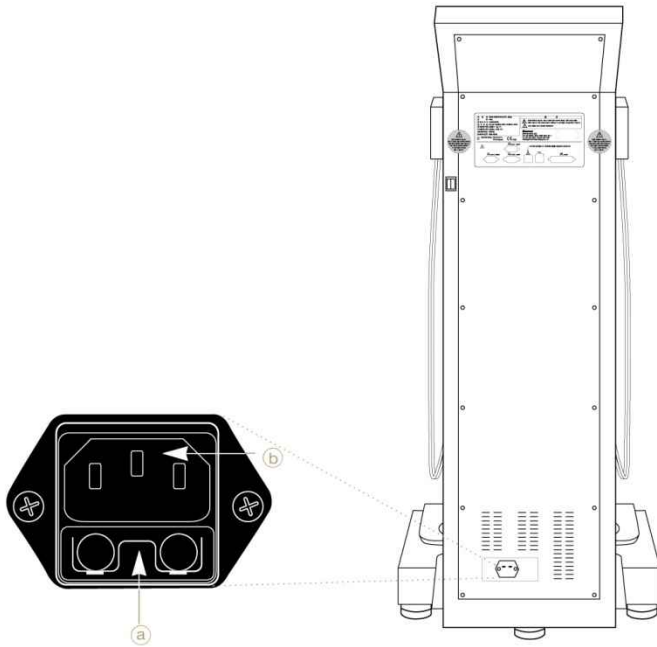
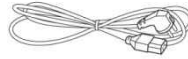


(5) Insert the fuse and connect the power

❶ Insert the fuse holder which contains the rated fuses into the ① fuse socket.



❷ Connect the power cable into the ② power socket.



Put the spare fuses in a small plastic bag and attach it to the back of the equipment with tape. When the fuse is broken, you can easily replace it with the spare fuse.

4. Transportation

It is recommended not to move the equipment once it is installed. If it is inevitable to relocate the equipment, follow the safety requirements that follow.

- (1) Turn the power off and remove plug from the power outlet before moving.
- (2) Take all the possible measures to ensure no physical impact is made on the hand electrode.
- (3) Adjust the level of the equipment using the legs of the equipment after moving.
- (4) Tighten the connection between the lower and upper part with the hexagonal wrench.

A. Environmental Requirements

- (1) Optimum Temperature: $-4^{\circ}\text{F}\sim 158^{\circ}\text{F}$ ($-20^{\circ}\text{C}\sim 70^{\circ}\text{C}$)
- (2) Relative Humidity: 10%~95%
- (3) Optimum Pressure : 50kPa~106kPa(No condensation)

B. Transporting Before Installation

Before installation, the equipment is in a packaging box provided by Biospace. Use a carrier to move the box over or have two people hold both sides for safe transportation.

C. Transporting after installation

It is not recommended to move the equipment installed by Biospace or the authorized distributors of Biospace. If it is inevitable to move the equipment, repack the equipment with the box and wrapping material the equipment came in, to keep the equipment from being damaged during transportation.



After moving the equipment, adjust the level of the equipment using the level indicator and legs of the equipment. The level of the equipment is crucial to accurate testing.



Be careful with fragile freight. The package has fragile operation parts including LCD, which has the sign on the box.



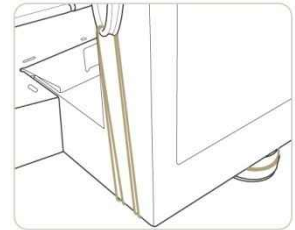
After relocating the InBody720, make sure it is level again. Inaccurate leveling will affect accuracy of individual weight measurements.

5. Repacking

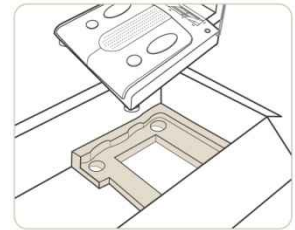
Be sure to turn off the power switch and unplug the power cable before repacking. Be careful not to damage foot and hand electrodes while repacking.

❶ Turn off the power and remove the power cable.

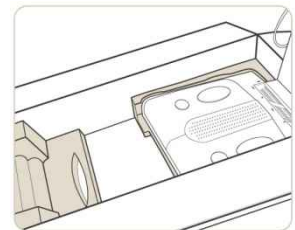
❷ Use elastic bands to hold hand electrode cables. Lift up the rear end slightly, hook the elastic band to the rear level screw, pass it through the cable and hook it again to the rear level screw.



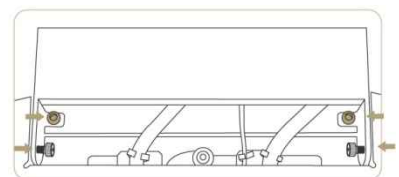
❸ Place the support pad on the bottom of the box and put InBody720 on top.



❹ Place the head pad into the box.



❺ Open the hinge cover and loosen the 4 screws.

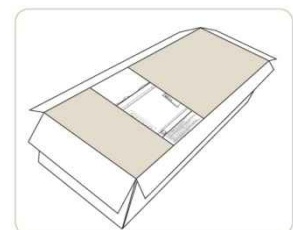


❻ Fold the upper part and rest the head on the pad.

❼ Insert the accessory bag into the box.

❸ Put upper pads on the top.

❹ Close the box and seal it with tape.



6. Maintenance

- (1) Do not pull the electrode cable from the hand electrode or from the mainframe of the equipment. Treat it with care.
- (2) Do not leave anything on the stand or make a physical impact on it.
- (3) Leave the power off, if you do not use the equipment for over a day.
- (4) Unplug, and cover the equipment, if the equipment is not used for an extended period.
- (5) Do not move the equipment with the power on.
- (6) Do not spill liquid or food on the equipment. Substances leaking into the equipment will cause critical damage to the equipment.
- (7) Gently wipe the case of the equipment with a damp cloth once every week. Be careful not to scratch the LCD monitor while cleaning.
- (8) To discard packaging material of InBody720, follow the garbage disposal regulations on packaging materials.

Chapter 2. Management & Results Description

1. Cautions **B**efore Measurement
2. Exterior and Function of Keypad
3. Power Connection & Getting Started
4. Standby **S**creen
5. Personal Profile
6. Proper Posture
7. How to Operate the Equipment
8. Results
9. Facts for **N**ormal **R**ange

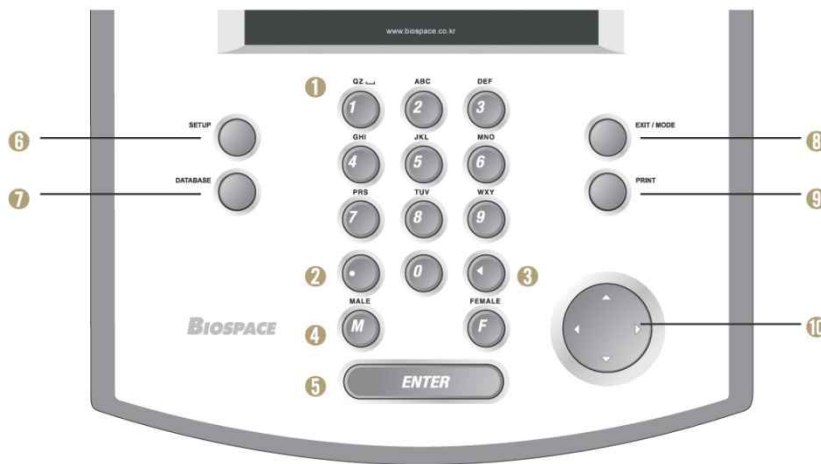
1. Cautions Before Measurement

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 examinee has 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 examinee already ate something, please wait 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. Exterior and Functions of Keypad

The keypad as illustrated below is divided into two sections by their functions.



A. Input Button (15 buttons)

❶ Number buttons (0~9) / Alphabet buttons (A ~ Z)

The input buttons are used to enter numeric and character data such as the examinee's age, height and I.D.. When a button is pressed, the LCD screen shows the numeric and then character representations of the button in the alphabetical order. For instance, press the button 2, then you will see a set of numeric and character representations assigned to the button showing up in the pre-determined order of 2, A, B and C.

❷ Capitalize

The point button is used to enter a decimal point or period, for height, age, I.D. and weight.

❸ Backspace Button

This button is used to delete data that was entered.

❹ Gender Selection Button: F (Female), M (Male)

This button is used to enter the gender of the examinee.

❺ Enter Button

This button is used to tell the system that data input is complete or move on to the next section.

B. Function Button (5 buttons)

6 SETUP

This button is used to update or modify the user environment.

7 DATABASE

This button is used to view the archives.

8 EXIT / MODE Button

The Exit / Mode button is used to modify the user environment easily in the startup window. And this button is used to stop the process that is in progress or go back to the previous process.

9 PRINT Button

This button is used to print the test results. InBody720 only allows for printing of the test results that belong to the last examinee tested. You can print multiple copies of the result sheet, until a next examinee steps onto the equipment to have his/her personal data entered and the test results of the previous examinee is no longer in the memory.

10 Direction Buttons

The direction buttons consist of “up,” “down,” “left” and “right” buttons. The arrow signs on top of the buttons indicate the directions where control will be heading.

3. Power Connection & Getting Started

(1) Plug the power cable to the outlet.

(2) Once power is turned on, the LCD monitor displays a sequence of characters, indicating the sequential process of loading up the operating system to the system. This is equivalent to the process through which PC loads up Windows to the memory and gets the operating systems ready for the user.

(3) As the logo comes up as shown below, the system boots itself up automatically. During this boot-up period that takes up to 5 minutes, InBody720 tests its internal system, sets the initial weight at zero for the scale, adjusts the internal circuits and determines whether the peripherals listed in the setup are still in use. The results of this initialization process will be displayed on the monitor.



Do not put weight on the lower part of the equipment from the point when you turn the power on to when the InBody720 finishes booting process. If you go on the stand or leave a heavy object on it, the system reports error with initializing the weight at zero, resulting in inaccurate measurement.



When connecting peripherals (printers and other optional devices) to the InBody720, turn on the peripherals and then the InBody720. When turning the power off, turn off the InBody720 first before turning off the peripherals. This process will minimize the harm on the equipment caused by electric shock.

(4) When the system boots up, the standby screen comes up, allowing the user to enter data into the system.


I.D.	AGE	HEIGHT	GENDER	WEIGHT
			M	lbs.

Body Composition	Under	Norm.	Over
Weight	0.0		
L B M	0.0		
Body Fat	0.0		
B M I	0.0		
P B F	0.0		

ECW/TBW
Over 0.43
Slightly over 0.40
Normal 0.36
0.33
0.000

Understanding the InBody Test

- LBM**
Lean Body Mass: The body composition which is proportionate to muscle mass. The more, the better.
- Body Fat**: The mass of fat in the body. Excessive body fat causes obesity.
- BMI**
Body Mass Index: An index based on the ratio of weight to height. (Standard: 18.5 ~ 25.0 by WHO)
- PBF**
Percentage of Body Fat: The percentage, by weight, of a person's body fat. (Standard: Male(10 ~20%), Female(18 ~28%))
- ECW/TBW**: The ratio of extracellular water to total body water. (The normal range for healthy people: 0.360 ~ 0.390.)



Body Composition Analyzer

Body Fat & Lean Body Mass

Body Fat

LBM

Basal Metabolic Rate

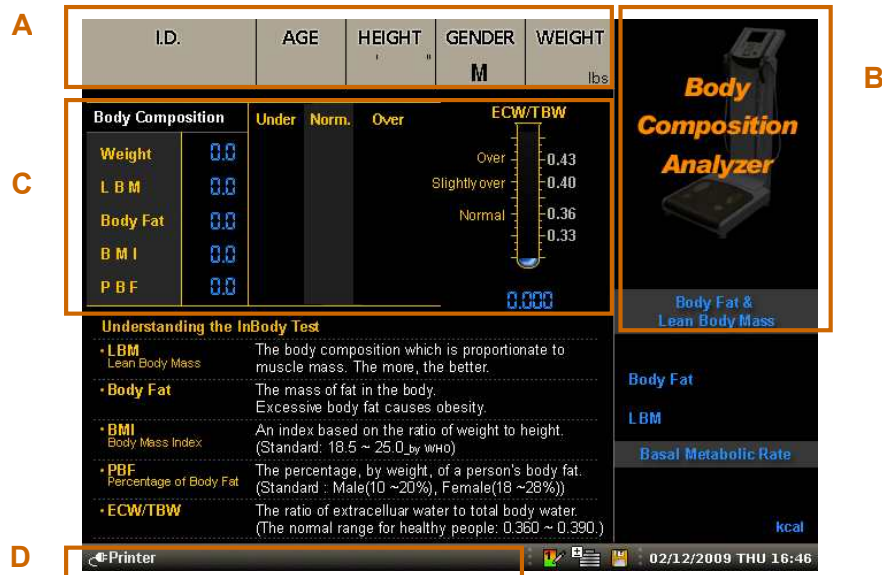
kcal

Printer | 02/12/2009 THU 16:46

4. Standby Screen

The standby screen in the InBody720 provides a variety of the functions for the convenience of the examinee and the user.

The configuration of standby screen is categorized into four groups by function.



A. Personal Information Window

This area is where the personal information of the examinee including I.D., age, height, gender and weight will be entered. Start entering the examinee name or identification number. If you want to leave the name or identification number empty, press the direction button (▶) to move on to the age section.

B. Information Window

The information window displays message guiding the user with weighing the examinee, test methodology, test procedure and error message. This window will help the examinee and the user along the test, by providing detailed and specific information.

C. Analysis Result Window

Before a result sheet is printed out, the analysis result window displays the key figures from the analysis of the test. The figures shown in the window will be in a printed result sheet.

D. Status Window

The status window shows the listing of peripherals registered in the InBody720. The user can modify the user environment easily. The changeable items are weight adjustment, result sheet selection and mode.



NOTE

When power turns on, the InBody720 checks the settings of peripherals listed in the setup applet and display them in the status window. The setup applet checks the connection status of peripherals, before modifying them. If the peripherals are not physically connected to the InBody720 or it is turned off, the setup applet of the InBody720 does not set the status of that particular peripheral as "Enable."

5. Personal Profile

Age, height, gender and weight are the key personal information required to analyze the body composition. To reduce the probabilities of an error and to obtain reliable results, follow the instructions presented below.

I.D.	AGE	HEIGHT	GENDER	WEIGHT
35	25	5' 7.3"	M	154.6 lbs.

A. I.D. (permissible range of input : 20 characters)

Use the numeric buttons to enter data. Each time the button is pressed, numbers or alphabets are displayed in the sequence shown on the keypad.

B. Age (permissible range of input : 3years ~ 99years)

Use the numeric buttons to enter data. For the examinee of under 18 years of age, the user can include one decimal point in the age text field for more accurate testing. 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).

C. Height (permissible range of input : 95cm ~ 220cm ; 3ft. 1.4in. ~ 7ft. 2.6in.)

Use numeric buttons to enter height. Height can have one digit under the decimal point. Measure the height of the examinee before conducting body composition analysis using the InBody720.

D. Gender

Press the button of the gender for the examinee. For men, press the "male" button and for female, press the "female" button.

E. Weight

When the examinee steps on the InBody720, the equipment weighs the examinee immediately and the value for weight is automatically recorded into the weight of the personal information window. To deduct the weight of clothes, go to the "Chapter 3. Setup Establishment" and then to the others setting or "Chapter 2, Section 4. Standby screen and Input."



After entering two digits for age and three digits for height, move on to the next text field. If you want to use the decimal digits for age and height, use the direction button (◀) to back to the previous text fields and enter the values for decimal digits. In entering weight, you can enter a certain number of decimal digits.

NOTE

You can correct the data, when the input data is incorrect.

❶ Error occurs with key operation prior to the entry of data.

Press the backspace key (◀) to delete the entry and enter data again.

❷ Error occurs with the text field data entries before the current text field.

Use the direction button (◀) to move to the text field where an error occurs and press the backspace key (◀) to delete the existing data and re-enter data.

❸ An error occurs in the Standby screen after data entry is completed. Use the direction button (◀) to move to the text field you would like to go to. Press the backspace key (◀) to delete the existing data and re-enter data.

❹ An error with data occurs while analysis is in progress.

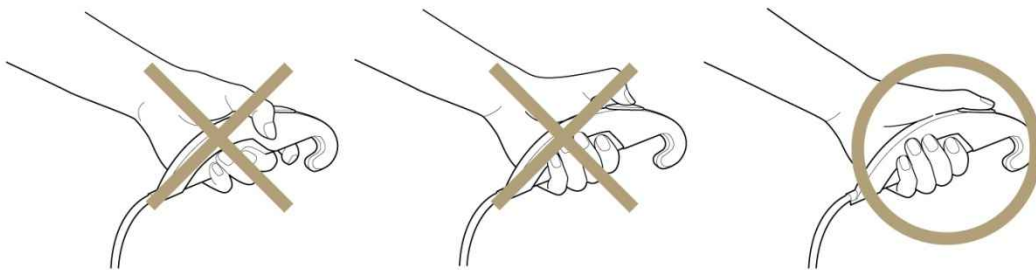
Press the “exit / mode” button to stop the analysis, as it is impossible to re-enter data at this point. Go back to the very beginning and start with weighing the examinee.

6. Proper Posture

Observing the following methodology is essential to achieving reliable results and accuracy. Palms, fingers and soles should be in contact with electrode during the testing. Keep the following instructions in mind during testing.

A. How to hold hand electrodes

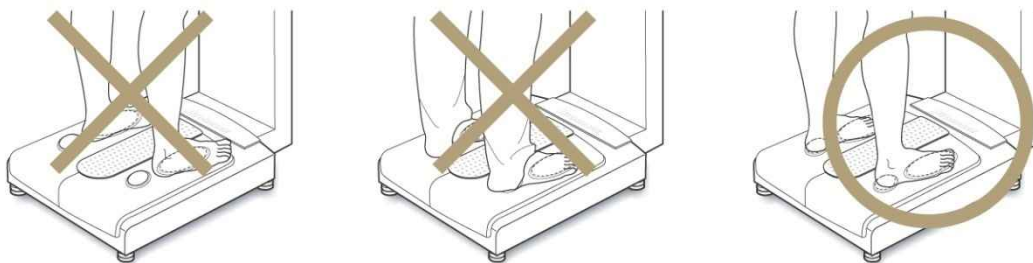
- (1) Four fingers should be touching the surface of the electrode as shown below.
- (2) Put the thumb lightly on top of the thumb electrode and press the button gently. Throughout the test and analysis, the examinee should gently hold the hand electrode.
- (3) If the examinee's hands are a bit too small for hand electrode, pull the hand towards the thumb electrode so that the thumb can touch.



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

B. How to stand on foot electrodes

- (1) Step on the foot electrode with barefeet.
- (2) Heels should land on the circular-shaped foot electrode, before the fore-foot hits the electrode.
- (3) The whole part of soles should be in contact with the foot electrode.



Do not have the hems of pants get in between the heels and electrode. As for the examinee who has too small feet to cover the both electrodes, they should be able to touch at least part of both electrodes.



If the examinee's feet or hands are too dry, or has dead, hard skin built up, InBody720 may prompt the user to re-test the examinee. In this case, wet the palms and soles with electrolyte tissue that comes with the InBody720 and re-test the examinee.



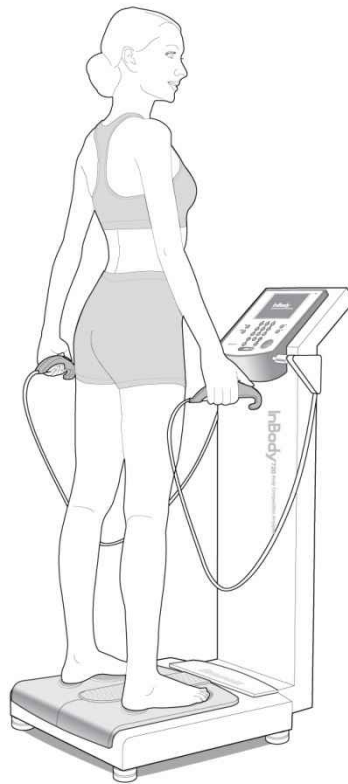
When wetting hands and feet, keep the moisture on hands and feet from dripping to the electrodes. Excessive moisture may cause an erosion of electrode, which in turn may result in breakdown of the equipment. The electrolyte tissues provided by the Biospace are specifically manufactured for InBody and thus is completely different from the generic wet tissues in the market. It is strongly recommended to use the electrolyte tissues specifically designed for InBody720.

C. Body Posture

During the test, the LCD monitors displays information on body composition, allowing the examinee to read the analysis from their stance. When the examinee steps down from the stand, the InBody720 goes back to the standby screen.

(1) Do not leave the arms by your side. Form an angle of 15 degrees between the arms and your side.

(2) Stand comfortably during the testing. Do not flex your muscles.



Disabled people who find standing for minutes a little bit difficult can get support from the back or side. In this case, there should be no skin-to-skin contact between the supporter and the examinee. Testing is impossible with an amputee who has a thumb, an arm or a leg amputated.

7. How to Operate the Equipment

This procedure begins with the standby screen, which is the initial environment settings of the InBody720, when it is factory-released. The InBody720 goes back to the standby screen, as the examinee steps down from the stand.

(1) See if the InBody720 is in test-ready status. The windows that are in test-ready status should look like as shown below.



(2) The less clothes or devices you wear during the test, the more accurate the test results will be. To get as close to the actual weight as possible, take off all accessories before testing.

(3) Both heel and the ball of your feet should touch the foot electrode. Step on the stand barefoot. Once you are on, the LCD monitor will display your weight. Put your hands down naturally and stand still comfortably, until the fluctuation in the weight goes down to zero and the value for weight is stabilized.

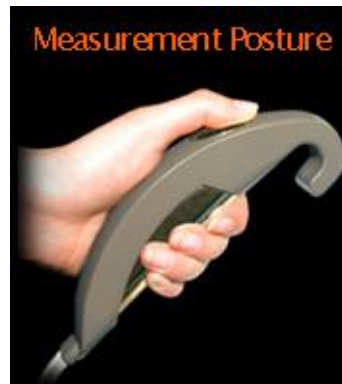
(4) When the value for weight is stabilized, InBody720 displays the weight. The weight is recorded to the weight field in the personal information windows, as the information windows switch to the personal information windows, prompting the user to enter personal information.



(5) Enter the examinee's information including I.D., age, height, and gender using the keypad buttons. After finishing the data entry, press the 'Enter' button and see the information window prompting the examinee to get ready for a test.

I.D.	AGE	HEIGHT	GENDER	WEIGHT
35	25	5' 7.3"	M	154.6 lbs.

(6) Follow the test instructions displayed on the information windows. The InBody720 checks your posture on the equipment continuously. If the examinee is settled on the stand, and his/her posture is right, the testing commences on its own. Once the test is underway, the examinee should keep the same posture until the end of the test.



If the examinee doesn't take the right position, hold the hand electrode or step on the foot electrode properly or if the examinee's palms or soles are dry or have too much dead and hard skin, the testing process may not initiate on its own. In this case, wipe up the examinee's palm or feet with the electrolyte tissues that come with the InBody720 and put the examinee back on the testing stand.



If data entered is out of the permissible data range, the following message will pop up on the monitor. Go back to the test field where you were and re-enter data. Refer to the "Chapter 5. Personal Profile" for the permissible range of each data.

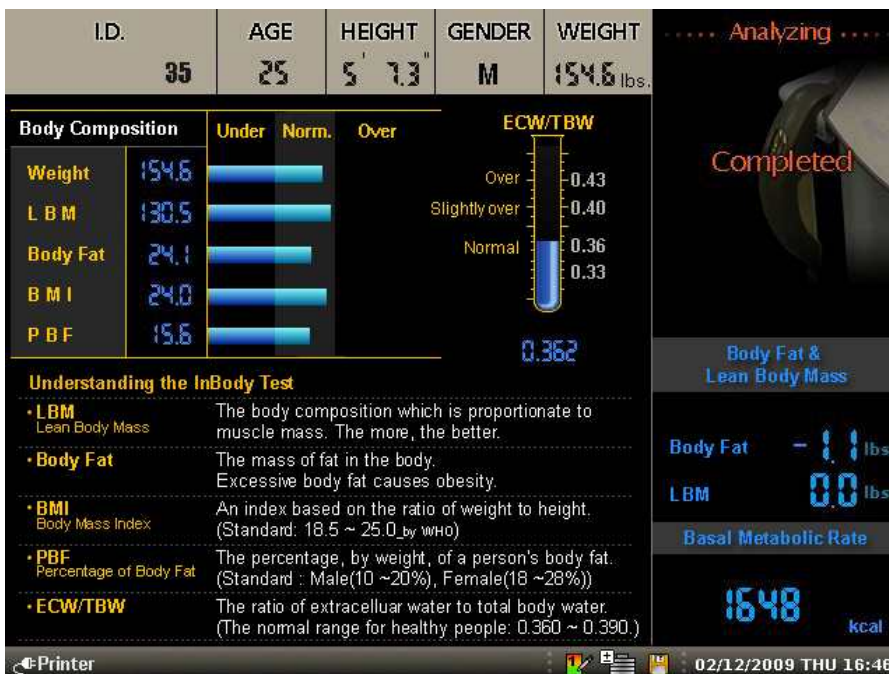


If the examinee's palms or soles are dry, the following message will be shown on the information window and the test stops. In this case, wipe up the examinee's palms or soles with the electrolyte tissues that come with the InBody720 and re-initiate the test process.



(7) During the analysis, the result window on the LCD monitor will display the results of body composition analysis in the order of the test procedure.

(8) When the analysis is completed, the InBody720 informs that the test is completed through the information window.



<Analysis results window>

(9) The examinee should place the hand electrode back to where it was, and step down from the stand.



NOTE

Do not drop the hand electrode, as it contains electronic parts inside.

(10) Soon after the examinee steps down from the equipment, the InBody720 prints out the test result sheet and goes back to the standby screen. For information, refer to the “Chapter 8. Results.”



NOTE

InBody720 is equipped with an archive function, allowing the user to print out the past 10 test results per each examinee.

8. Results

A. Result Screen

During the test, information on body composition analysis is displayed on analysis result window on the LCD. As long as the examinee is on the stand, the monitor retains the data of the body composition analysis. Once the examinee steps down, the InBody720 goes back to the standby screen and sets itself back to test-ready status.



B. Result sheet

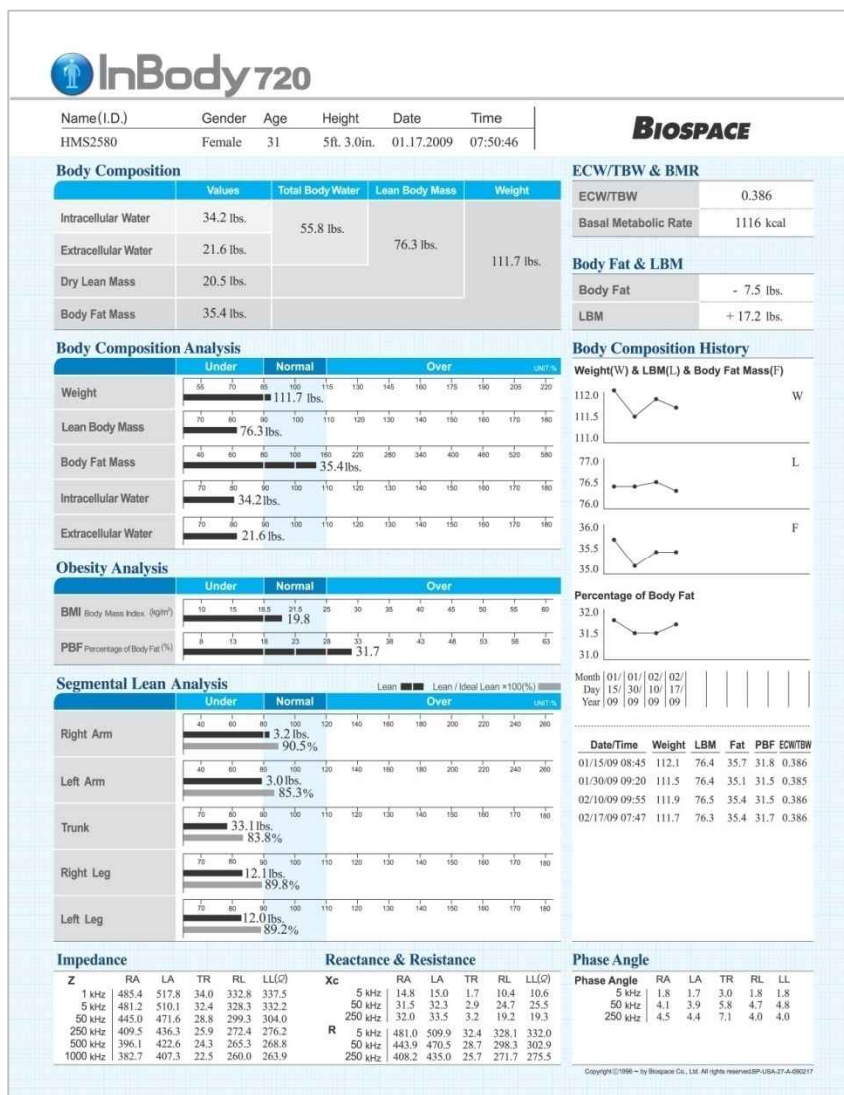
With a printer connected to the InBody720, the InBody720 can print out the result sheet, providing the details on test results.

(1) Connecting to the printer

Use a printer that connects to 25pin parallel port (IEEE1284) or USB1.1 port. InBody720 can use any printer that supports PCL3 interface or higher version. For details on printer, refer to the “Chapter 5.Consumables.” As for the installation of a printer, consult the User’s Manual provided by the printer manufacturer.

(2) Result sheet Form

The result sheet is shown below. It is one of the consumable products provided by Biospace.



C. Output Items

The following are the explanations for each item.



The normal range on the result sheet is the standard provided by Biospace based on reference data.



Basically the result sheet shows measured values for each test item. Regarding the standard result as 100%, it shows the ratio of measured value to standard value with the bar graph's length. The normal range will be set according to the standard value to enhance examinee's ease of understanding the result sheet.

(1) Personal Information

The examinee's name ID, gender, age, height, exam date and time are displayed here.

Name(I.D.)	Gender	Age	Height	Date	Time
HMS2580	Female	31	5ft. 3.0in.	01.17.2009	07:50:46

(2) User Information

The name of the hospital or clinic and the doctor in charge are displayed here.

Name(I.D.)	Gender	Age	Height	Date	Time
HMS2580	Female	31	5ft. 3.0in.	01.17.2009	07:50:46

BIOSPACE

(3) Body Composition

Body Composition				
	Values	Total Body Water	Lean Body Mass	Weight
Intracellular Water	34.2 lbs.	55.8 lbs.	76.3 lbs.	111.7 lbs.
Extracellular Water	21.6 lbs.			
Dry Lean Mass	20.5 lbs.			
Body Fat Mass	35.4 lbs.			

The body composition analysis of InBody720 is derived from the 4-compartment model, which divides body composition into 4 components comprising Total Body Water, Dry Lean Mass(Protein, Mineral) and Body Fat. Your own data is displayed here. Total body weight is the sum of Body Fat and Lean Body Mass (LBM). LBM is the sum of Dry Lean Mass and Total Body Water consisting of Intracellular Water (ICW) and Extracellular Water (ECW), which are separated by cell membranes.

① Intracellular Water, Extracellular Water and Total Body Water (lbs.)

InBody720 measures Total Body Water by using a multi-frequency technique that separates TBW into Intracellular Water and Extracellular Water. Intracellular water (ICW) indicates the quantity of water within the cellular membrane. Extracellular water (ECW) indicates the total quantity of water in the interstitial fluid and blood. In the case of a healthy body, the proportion of ICW and ECW should be maintained at about 3:2.

② Dry Lean Mass (lbs.)

Dry Lean Mass is the sum of protein and minerals. Protein is solid in body cells, comprised of polymers of organic compounds, including nitrogen, and is a major component of muscle. Protein is also the main component of Dry Lean Mass. Minerals, the other component of Dry Lean Mass, help preserve the body and play an important role in the human body. The quantity of minerals is closely related to the level of exercise of an examinee. When the muscle mass increases, the weight of the bone also increases. The InBody720 uses the following formula to measure Dry Lean Mass:

$$\text{Dry Lean Mass} = \text{Lean Body Mass} - \text{Total Body Water}$$

Protein is directly related to intracellular water. A lack of protein indicates poor nutrition, but contrary to what one may think, this protein is not the same as the one found in food. Dry Lean Mass is proportionate to the quantity of muscle. Protein and intracellular water are indications of the level of muscle content an individual has.

③ Body Fat Mass (lbs.)

Body Fat Mass indicates the total quantity of lipids that can be extracted from fat and other cells. Body Fat Mass is not directly measured using the BIA method, but is the remaining value after subtracting Lean Body Mass from the total body weight. The InBody720 uses the following formula to measure Body Fat Mass:

$$\text{Body Fat Mass} = \text{Body Weight} - \text{Lean Body Mass}$$

Body Fat Mass is stored under the skin, in visceral areas and between muscles. When an examinee's fat mass is higher than the normal range, he/she is diagnosed as being obese (excess body fat). The range of diseases that can result from obesity include hypertension, arteriosclerosis, hyperlipemia, fatty liver, cholelithiasis, diabetes, obstetrical diseases, breast cancer, and endometritis.

④ Lean Body Mass (lbs.)

Lean Body Mass refers to the entire body weight with exception of Body Fat Mass. Athletes have a higher proportion of Lean Body Mass than regular people. As such, it is important for athletes to measure their Lean Body Mass. The InBody720 provides both basic and comprehensive data which can be used to evaluate the health of an examinee.

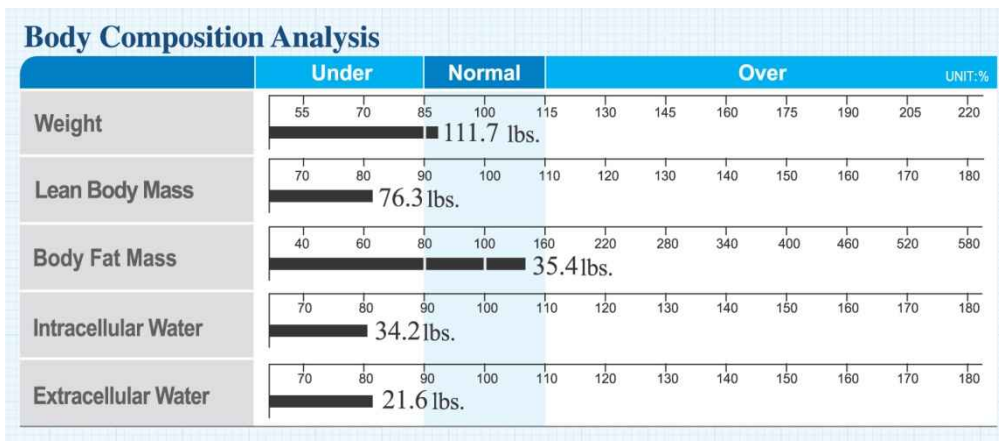
⑤ Weight (lbs.)

The InBody720 technology separates body weight into Total Body Water, Dry Lean Mass, and Body Fat. Body weight is the total sum of these three components.

$$\text{Weight} = \text{Total Body Water} + \text{Dry Lean Mass} + \text{Body Fat Mass}$$

(4) Body Composition Analysis

The horizontal bar graph helps you understand your body composition state compared to standard values. The numbers next to the bar graphs indicate the numerical values for the specific field. The length on the bar graph indicates where the examinee falls in relationship to the normal range.



Each compositional element has its own absolute value. The lengths of the bar graphs indicate the percentage of the standard value for each compositional element. Therefore, a score of 100% indicates the standard value calculated based on the standard weight for that particular individual. When an individual controls his/her exercise levels and diet as part of a weight management program, the body composition of Body Fat Mass and Lean Body Mass change.

① Weight

Standard weight indicates the ideal value in accordance with the examinee's height. The InBody720 provides the standard weight, based on the BMI(Body Mass Index) Standard Weight Index.

***BMI method**

$$\text{Standard Weight(kg)} = \text{ideal BMI} * \text{Height}^2 (m^2)$$

The Obesity Index indicates the level of obesity. Generally, a BMI of 18.5 – 24.9 is used to determine the normal weight range. With the InBody720, the normal weight range is $\pm 15\%$ of standard value, very similar to one based on BMI (18.5 – 25). Standard weight is determined according to a BMI of 22 for males, a BMI of 21.5 for females.

② Lean Body Mass (lbs.)

100% Lean Body Mass indicates that the examinee being measured has reached his/her standard weight and standard Lean Body Mass. The standard proportion of LBM is 85% of the standard weight for males, and 77% of the standard weight for females. The normal range of LBM is 90-110% of the standard LBM. Change in muscle is the most effective indicator of health improvements as a result of exercise. The UCLA definition of obesity is based on the level of muscle development. This definition is based on a proactive approach to obesity, one in which obesity is regarded as a problem involving the proportion of Lean Body Mass to Body Fat Mass.

Lean Body Mass refers to the entire body weight with the exception of Body Fat Mass. Athletes have a higher proportion of Lean Body Mass than regular people. As such, it is important for athletes to measure their Lean Body Mass. InBody720 provides comprehensive data which can be used to evaluate the health of an examinee.

③ Body Fat Mass (lbs.)

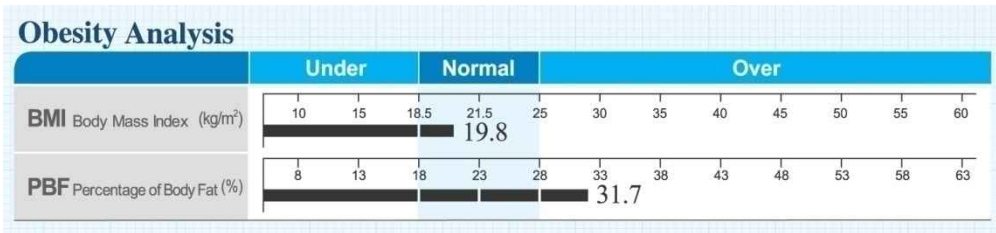
The normal range of Body Fat Mass is ascertained by calculating an examinee's body fat mass as compared to the standard weight and standard Body Fat Mass. The InBody720 displays the percentage of the standard value of Body Fat Mass in a bar graph.

④ Intracellular Water and Extracellular Water (lbs.)

A healthy person's weight has a consistent proportion of Total Body Water. If this proportion of Intracellular and Extracellular Water becomes unbalanced a person may be diagnosed with edema. Edema refers to a state in which the interstitial fluid found in the extracellular water has abnormally increased. When edema is discovered only in a certain part of the body, this is known as localized edema. However, when edemas are discovered throughout the body, this is known as generalized edema. Total Body Water is consistently distributed in a healthy body. Therefore, if an imbalance in Total Body Water is discovered, a comprehensive health examination should be carried out.

(5) Obesity Analysis

By analyzing the examinee’s weight using BMI and Percentage of Body Fat, the InBody720 Analyzer makes it possible to screen for sarcopenic obesity. People included in this sarcopenic obesity type fall within the normal range when it comes to BMI and weight, but are regarded as obese when their percentage of body fat is calculated.



Normal range	Males	Females
BMI	22 (normal range: 18.5-24.9)	21.5 (normal range: 18.5 – 24.9)
Percentage of Body Fat	10-20%	18%-28%

① BMI (Body Mass Index, kg/m²)

As we can see from the formula, BMI = weight (kg) ÷ height² (m²), BMI is used to approximate obesity levels. The BMI method has been widely applied in the general medicine, dietary, and sports medicine fields as the main means of diagnosing obesity. However, this method is flawed in that it cannot be applied to adults with high levels of LBM, children, those over the age of 65, or pregnant females. Nevertheless, as the BMI has been the most commonly used index, much research on using the BMI method to prevent adult diseases has been conducted. This is why the InBody720 also includes BMI based information. Differences have emerged among researchers as to which standards should be used to determine the BMI of examinees of different age and gender. The InBody720 uses the World Health Organization (WHO) standards as the standard ranges for BMI(1998).

The InBody720 identifies the standard BMI as 22 for males, 21.5 for females and the normal ranges as 18.5 – 24.9 for both males and females.

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 Severely Obese	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			

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

② Percentage of Body Fat (%)

Percentage of Body Fat indicates the percentage of Body Fat to Body Weight.

Percentage of Body Fat (%) = Body Fat Mass / Body Weight x 100

The standard Percentage of Body Fat is 15% for males and 23% for females. When a person's Percentage of Body Fat is calculated as being beyond the normal range, he/she is regarded as being obese. When a person's Percentage of Body Fat falls below the normal range, he/she is regarded as having a low level of body fat. This low level of body fat can be separated into two types: The first is a person whose muscle type is deemed to account for a desirable proportion of the body composition. Such people's weight is regarded as being within the normal range or falling within the overweight range. The second type, the poor nutrition type, is one in which a person's body is deemed to be in an unhealthy state because of a lack of Body Fat Mass and LBM. This type has a higher possibility of contracting clinical diseases.

Ref. Lee RD, Nieman DC, Nutritional Assessment, 2nd edition, pp.264
Ref. Bray GA, Contemporary Diagnosis and Management of Obesity, pp.13, 1998

cf. In case of children less than 18 years old, different standards are applied as it is necessary to consider the difference in physical characteristics form adults.

Ref. Samuel J. Fomon, M.D., et al. Body Composition of reference children from birth to age 10 years. The American Journal of Clinical Nutrition, 35, 1169-1175, 1982.

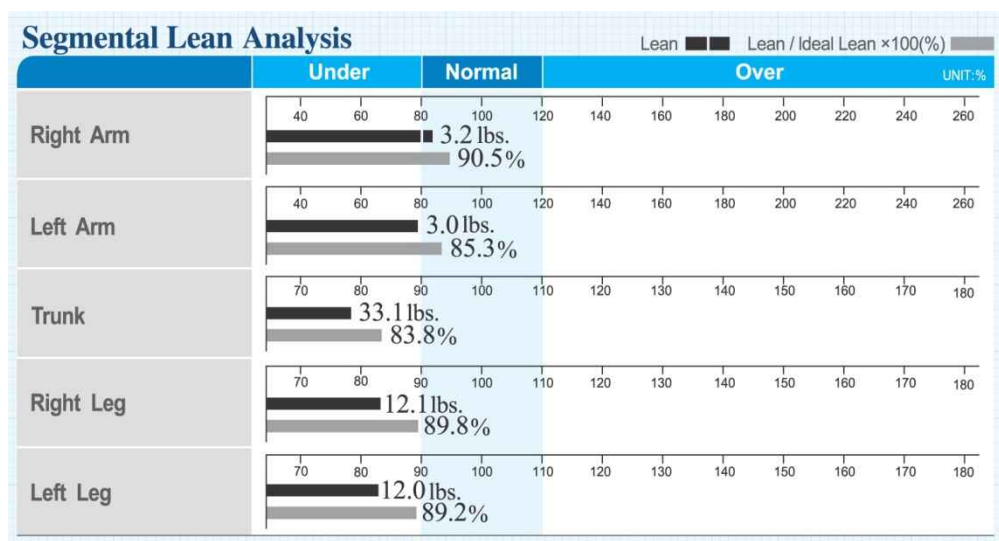
(6) Segmental Lean Analysis

With the InBody720, you can measure the lean mass of your body parts. It is achieved through the use of one of the InBody720's measuring principles, bioelectrical impedance measurements of body parts. The measurement of soft lean mass for body parts is based on the following theory.

$$\text{Segmental Soft Lean Mass} \propto (\text{Height}) / (\text{Segmental Resistance})$$

Ref. Samuel J. Fomon, M.D., et al. *Body composition of reference children from birth to age 10 years. The American journal of Clinical Nutrition*, 35, 1169-1175, 1982.

Re5f. Henry C. Lukaski, Phyllis E. Johnson, William W. Bolonchuk and Glenn I. Lykken, *Assessment of fat-free mass using bioelectrical impedance measurements of the human body, The American J. of Clinical Nutrition*, Vol.41, pp810-817, 1985



There are two bar graphs for each body part in the Segmental Lean Analysis graph. The two graphs have different meanings, respectively. The numbers beside the upper bar graph indicates the actual soft lean mass of a examinee. If the upper bar graph reaches 100%, it means that the examinee has ideal lean mass for his or her ideal weight, which is derived from the examinee's height. Therefore, the length of the upper bar graph shows the relative ratio of the ideal lean mass for his or her ideal weight. If the lower bar graph reaches 100%, it denotes the ideal lean mass for the examinee in relation to his or her actual weight. Therefore, the length of the lower bar graph indicates the relative ratio of the ideal lean mass for the actual weight, while the number beside the lower bar graph shows that ratio.

By displaying these two bar graphs, it makes it more effective to diagnose the actual lean mass of the examinee. The upper bar graph is based on the soft lean mass of the examinee's ideal weight, so that the 100% value will not vary unless there is a change in his or her height. Thus, it is easier to see the increase or decrease of the lean mass while providing an enduring goal. Since the lower bar graph is only based on the lean mass of the actual weight, the 100% value will alter in accordance with the weight change.

Hence, though it is not possible to check the increase or decrease of the lean mass as with the upper graph, it will directly reflect changes in the examinee's weight, thereby allowing you to determine whether or not there is actual lean mass appropriate to his or her weight. Throughout the lean balance muscle graph for body parts, you can see if upper • lower • left • right muscle developments are balanced and if body parts' lean mass is appropriate (muscle strength). The normal range of the graph is: for right and left arms, 80~120%; for trunk, right and left legs, 90~110%.

(7) ECW/TBW & BMR

ECW/TBW & BMR	
ECW/TBW	0.386
Basal Metabolic Rate	1116 kcal

① ECW/TBW

With the cell membrane as a barrier, TBW is divided into ICW and ECW. A healthy person has a balanced ratio of ECW and ICW. Some factors can increase ECW, causing the balance between ECW and ICW to change. A large increase of ECW may cause edema.

Examining ECW/TBW in our body is an efficient way to detect an unusual increase in ECW. In a healthy person's body, the ratio of ICW to ECW is 3 to 2, which is 0.38 when calculated as ECW/TBW. A healthy person's ECW/TBW is around 0.38.

② BMR

The Basal Metabolic Rate (BMR) indicates the minimum energy requirements needed to sustain vital functions while at rest. The InBody720 makes it possible to estimate BMR using a known regression equation based on LBM (Lean Body Mass). LBM is known to be closely related to BMR.

$$\text{REE} (\approx \text{BMR}) = 21.6 \times \text{LBM}(\text{kg}) + 370 \quad (\text{LBM} = \text{Lean Body Mass, kg})$$

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

Ref. Eric Ravussin and Clifton Bogardus. Relationship of genetics, age, and physical fitness to daily energy expenditure and fuel utilization. Am J. Clin Nutr. Vol.54, 968-975, 1989

(8) Body Fat & LBM

The InBody720 also offers the body fat and Lean Body Mass control guide that is aimed at optimizing the examinee's body composition rather than simply increasing or decreasing his/her weight. Here, '+' refers to the mass that must be increased, and '-' refers to the mass which should be decreased.

Body Fat & LBM	
Body Fat	- 7.5 lbs.
LBM	+ 17.2 lbs.

① Fat Control (lbs.)

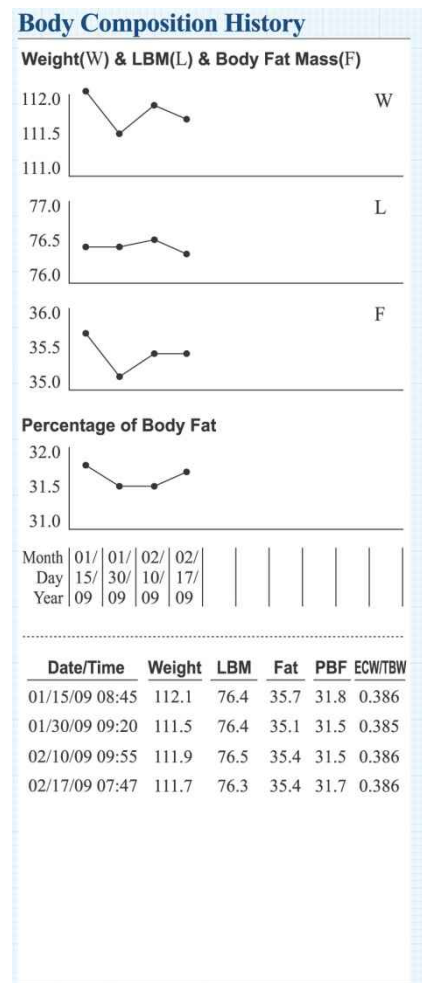
The amount of fat mass to be gained or lost. The (+) and (-) signs are an increase or decrease in the amount of control.

② Lean Body Mass (lbs.)

The amount of Lean Body Mass to be gained or maintain. The (+) sign is an increase in the amount of control. "0.0lbs." means he/she need to maintain current LBM.

(9) Body Composition History

In the InBody720, the test result will be saved if an I.D. is input at the beginning of the test. From the various test result data saved on the machine, weight, LBM, Body Fat Mass, Percentage of Body Fat and ECW/TBW will be presented in a cumulative graph. Up to 10 variables can be presented in the graph. Below the cumulative graph, it also has a table of data. The cumulative graph helps for a quick and easy understanding of changes in the examinee's body composition and current condition.



(10) Impedance , Reactance & Resistance, Phase Angle

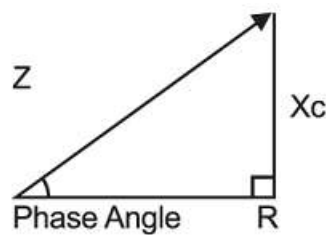
The InBody720 measures each body part’s impedance, reactance, resistance, and phase angle separately with different frequencies; right arm, left arm, trunk, right leg, left leg. It uses 6 different frequencies to measure impedance; 1kHz, 5 kHz, 50 kHz, 250 kHz, 500 kHz, 1000 kHz. For reactance, resistance, and phase angle, it uses 5 kHz, 50 kHz, 250 kHz.

Impedance						Reactance & Resistance						Phase Angle					
Z	RA	LA	TR	RL	LL(Ω)	Xc	RA	LA	TR	RL	LL(Ω)	Phase Angle	RA	LA	TR	RL	LL
1 kHz	485.4	517.8	34.0	332.8	337.5	5 kHz	14.8	15.0	1.7	10.4	10.6	5 kHz	1.8	1.7	3.0	1.8	1.8
5 kHz	481.2	510.1	32.4	328.3	332.2	50 kHz	31.5	32.3	2.9	24.7	25.5	50 kHz	4.1	3.9	5.8	4.7	4.8
50 kHz	445.0	471.6	28.8	299.3	304.0	250 kHz	32.0	33.5	3.2	19.2	19.3	250 kHz	4.5	4.4	7.1	4.0	4.0
250 kHz	409.5	436.3	25.9	272.4	276.2	R	5 kHz	481.0	509.9	32.4	328.1	332.0					
500 kHz	396.1	422.6	24.3	265.3	268.8	50 kHz	443.9	470.5	28.7	298.3	302.9						
1000 kHz	382.7	407.3	22.5	260.0	263.9	250 kHz	408.2	435.0	25.7	271.7	275.5						

Bioelectrical Impedance Analysis - The method by which low electrical currents are introduced to the body. The human body forms the resistance (R) and reactance (Xc) when an alternating current is transmitted through the body. R is the interrupting force that occurs when the current flows through body water. Xc is the interrupting force of alternating current flow at the cell membrane. The unit by which these three values are measured is the Ω(ohm), the relationship of these characteristics are as follows:

$$Z^2 = R^2 + Xc^2, Z = \sqrt{R^2 + Xc^2}$$

Impedance vector value can also be applied. Having Z, Xc, R the relationship of the trigonometrical function, we can arrive at the phase angle, the angle from R and Z.



$$\text{Phase Angle} = \arctan \frac{\text{Reactance}(Xc)}{\text{Resistance}(R)}$$

Phase angle value can begin at a min. of 0° to max 90°. As reactance increases, the phase angle value also increases and vice versa.

Since reactance is the interrupting force of alternating current flow, it increases in proportion to the integrity of cell membrane. Therefore, reactance and phase angle decrease when the number of cells is small or cell membrane is more permeable or unhealthy.

9. Facts for Normal Range

InBody provides an analysis value for each test item. In addition, it gives guidelines for each test item's normal range to evaluate the current status of the body composition ratio. The examinee's body composition analysis value is at the end of the graph and the graph's length is a relative % of the standard result. The standard results and normal ranges are determined in related studies and research.

InBody's normal range data is based on reference documents. When we could not find any references for a certain test item's normal range, we calculated it using our collected data considering balance with other body compositions.

1. TBW (Total Body Water)

The normal range of TBW is 90%~110% of standard TBW. Standard TBW is around 73% of standard lean body mass of a body with adequate weight for the examinee's height. For children under the age of 18 years old, standard TBW is 73~77% of standard lean body mass.

■ Used Reference

1. Heyward VH and Stolarczyk LM. Applied Body Composition Assessment. Human Kinetics pp 44, 1996
2. Fomon SJ, Haschke F, Ziegler EE. Body composition of reference children from birth to age 10 years. Am J Clin Nutr 35:1169-1175, 1982

2. ICW (Intracellular Water) & ECW(Extracellular Water)

Normal ranges of ICW and ECW are calculated by converting the normal range of TBW into ICW and ECW based on normal ECW/TBW. Normal ranges of ICW and ECW are 90%~110% of the standard value of each one. Standard values of ICW and ECW are calculated by dividing TBW into ICW and ECW based on normal ECW/TBW.

■ Used Reference

1. Harvey AM, Johns RJ, McKusick VA, Owens AH, and Ross RS. The principle and practice of medicine 22nd edition pp 686
2. Ganong WF. Review of medical physiology 11th edition. pp14. Lange medical publications

3. Weight

For adults over the age of 18, normal weight range is about 85%~115% of standard weight according to the BMI standard. Standard weight is calculated by multiplying the square of height by standard BMI. Standard BMI is 22 for males and 21.5 for females. 85%~115% is the range corresponding to 18.5~25 which is the normal BMI range specified by the WHO.

Cf. For children under the age of 18, 85~115% of standard weight is the normal range. Children's standard weight in the result sheet refers to Biospace's own BMI data. Since children have various development levels and body shapes because they keep growing, it is recommended to use standard BMI per height.

■ Used Reference

1. Characteristics of obesity : An overview. Ann NY Acad Sci. 499:4-13, 1987
2. WHO and the National Heart, Lung, and Blood Institute : Clinical guideline on the Identification, Evaluation, and treatment of overweight and obesity in adults, the evidence report. 1998 (Obes Res 6(suppl 2):51S, 1998)

*** The following is a summary of technical key points explained in the above reference.**

1) Characteristics of obesity: An overview. Ann NY Acad Sci. 499:4-13, 1987

As can be seen in these tables, the mean desirable BMI is 22.0 for men and 21.5 for women, and the range is 20-25 for men and 19-26 for women.

2) WHO and the National Heart, Lung, and Blood Institute: Clinical guideline on the Identification, Evaluation, and treatment of overweight and obesity in adults, the evidence report. 1998

	obesity class	BMI(kg/m ²)
Underweight		under 18.5
Normal		18.5~24.9
overweight		25~29.9
obesity	I	30~34.9
	II	35~39.9
Extreme obesity	III	over 40

4. Lean Body Mass

Normal range of LBM is 90%~110% of standard Lean Body Mass. Standard LBM is 85% of standard weight for males, and 77% for females. (Standard value of LBM, the value that deducts body fat from body weight is directly related to the standard value of body fat. So research papers about LBM refer to papers related to Section 5. Body Fat)

5. Body Fat

Normal range of body fat is 80~160% of standard body fat. Standard body fat mass is 15% of standard weight for males and 23% for females. As compared with other body compositions, body fat differs for each person even at normal weight. When body fat increases, its normal range is wider than others because it increases with a higher rate than muscle.

■ Used reference

1. Lohman TG. Advanced in body composition assessment - Current issues in exercise science series. Champaign-IL: Human Kinetics. pp 80. 1992

**For children under the age of 18, standard % body fat differs by age and height because height keeps changing with growth. In this age group, standard body fat is 15~17% of standard weight for males, and 16~23% for females.*

■ Used reference

1. Fomon SJ, Haschke F, Ziegler EE. Body composition of reference children from birth to age 10 years. Am J Clin Nutr 35:1169-1175, 1982

6. BMI

For adults, the normal range of BMI is 18.5~25 specified by the WHO standard. The standard result is 22 for males, and 21.5 for females.

■ Used Reference

1. Simopoulos AP. Characteristics of obesity : An overview. Ann NY Acad Sci. 499:4-13, 1987

*For children under the age of 18, the normal range of BMI is ± 3 of the standard BMI per height.

7. Percentage of Body Fat

The normal range of % body fat is 10~20% for males, and 18~28% for females. The standard result is 15% for males, and 23% for females.

■ Used Reference

There are various opinions on the normal range according to different references and scholars. We chose the following data for references.

1. Heyward VH and Stolarczyk LM. Applied body composition assessment. Human Kinetics. pp.8
2. Lohman TG. Advanced in body composition assessment - Current issues in exercise science series. Champaign-IL: Human Kinetics. pp 80. 1992
3. Lee RD and Nieman DC. Nutritional Assessment(second edition), pp.264
4. Bray GA. Contemporary Diagnosis and Management of Obesity. pp.13, 1998
5. Mahan LK and Escott-stump S. Krause's Food, nutrition & diet therapy 9th edition. WB Saunders Co. pp 455
6. Brown JE. Nutrition Now 2nd edition. Wadsworth Publishing Company. pp 9-3. 1999
7. Tahara Y, Moji K, Aoyagi K, Tsunawake N, Muraki S, Mascie-Taylor CG. Age-related pattern of body density and body composition of Japanese men and women 18-59 years of age. Am J Hum Biol. 14(6):743-52, 2002
8. Advanced fitness assessment and exercise prescription. Heyward VH. Human Kinetics. pp. 162

Detailed contents are here referred from the original documents.

1) Heyward VH and Stolarczyk LM. Applied body composition assessment. Human Kinetics. pp.8

Table 1.4 Assumed Values for fat and fat-free body(FFB) Components

Component	Density(g/cc)	Proportion(%)
Fat	0.9007	15.3
FFB	1.1000	84.7
Water	0.9937	73.8
Protein	1.34	19.4
Mineral	3.038	6.8

2) Lohman TG. Advanced in body composition assessment - Current issues in exercise science series. Champaign-IL: Human Kinetics. pp 80. 1992

Figure 7.1 Percent body fat standards for men and women in relation to health

<u>Men</u>	5%	15%	20%
Minimal weight	Below average	Above average	At risk

<u>Women</u>	8%	14%	23%	32%
Minimal weight	Below average	Above average	At risk	

3) Lee RD, Nieman DC. Nutritional Assessment(second edition), pp.264

Table 6-13 Suggested percent body fat standard for adults

Classification	Males	Female
Lean	<8%	<13%
Optimal	8-15%	13-23%
Slightly overfat	16-20%	24-27%
Fat	21-24%	28-33%
Obese	≥25%	≥33%

4) Bray GA. Contemporary Diagnosis and Management of Obesity. Handbooks in Health Care Publisher. pp.13, 1998

Table 1. Criteria for Obesity in Males and Females

Category	Body Fat	
	Males	Females
Normal	12%-20%	20%-30%
Borderline	21%-25%	31%-33%
Obesity	>25%	>33%

5) Mahan LK and Escott-stump S. Krause's Food, nutrition & diet therapy 9th edition. WB Saunders Co. pp 455

Appropriate body fatness for an adult women ranges from 20% to 25% of body weight with about 12% as essential fat. In men, appropriate body fatness is 12% to 15% of body weight, and approximately 3% is essential fat. ...

6) Brown JE. Nutrition Now 2nd edition. Wadsworth Publishing Company. pp 9-3. 1999

Obesity is defined by science as excess of body fat. An “excess” is an amount that interferes with health. For women, having more than 28% of body weight as fat is considered excessive. For men, the figure is 20%.

Also defined as a BMI of 30 or higher, or a weight-for-height over 120% of standard.

7) Tahara Y, Moji K, Aoyagi K, Tsunawake N, Muraki S, Mascie-Taylor CG. Age-related pattern of body density and body composition of Japanese men and women 18-59 years of age. *Am J Hum Biol.* 14(6):743-52, 2002

Mean %Fat of young adult males 18-29 years in the present study was 14.4%, and similar to the value of 14.7% for Japanese men in their 20s. The mean %Fat of females <30 years of age in the present study was 23.3% and was similar to values reported in the past three decades. Mean %Fat of females of >30 years of age in the present study was 26.7%, which was slightly greater than the value of 26.0% reported by Kitagawa et al.

Table 8.1 Percent body fat standards for adults, Children, and Physically Active adults

Recommended %BF levels for adults and children					
	NR	Low	Mid	Upper	Obesity
Males					
18-34years	<8	8	13	22	>22
33-55years	<10	10	18	25	>25
55+years	<10	10	16	23	>23
6-17years	<5	5-10	11-25	26-31	>31
Females					
18-34years	<20	20	28	35	>35
33-55years	<25	25	32	38	>38
55+years	<25	25	30	35	>35
6-17years	<12	12-15	16-30	31-36	>36
Recommended %BF levels for physically active adults					
	Low	Mid	Upper		
Males					
18-34years	5	10	15		
33-55years	7	11	18		
55+years	9	12	18		
Females					
18-34years	16	23	28		
33-55years	20	27	33		
55+years	20	27	33		

* For children under the age of 18, the normal range of % body fat is $\pm 5\%$ of standard % body fat. In this age group, standard % body fat is 15~17% for males, and 16~23% for females.

■ Used Reference

1. Fomon SJ, Haschke F, Ziegler EE. Body composition of reference children from birth to age 10 years. Am J Clin Nutr 35:1169-1175, 1982
2. Mahan LK and Escott-stump S. Krause's Food, nutrition & diet therapy 9th edition. WB Saunders Co. pp 276
3. Roche A, Heymsfield SB and Lohman TG. Human body composition. Human kinetics. pp.207

-
4. Heymsfield SB, Lohman TG, Wang Z and Going SB. Human body composition. pp271-284
 5. Malina Rm. Bouchard C and Beunen G. Human growth: Selected aspects of current research on well nourished children. Ann. Rev. Anthropol. 17:187-219, 1988
 6. Tahara Y, Moji K, Aoyagi K, Tsunawake N, Muraki S, Mascie-Taylor CG. Age-related pattern of body density and body composition in Japanese males and females, 11 and 18 years of age. Am J Hum Biol. 14(3):327-337, 2002

8. Segmental Lean Analysis

In Segmental Lean Analysis, the normal range of an arm's lean mass is 80~120% of the standard, while the normal ranges of trunk and leg lean mass are 90~120% of the standard of each one. Each body part's standard lean mass means the lean mass that is supposed to be in each body part at the standard weight. In the lower bar graph, the standard is the standard mean mass that each body part is supposed to have at the current weight.

Since there is no released reference on segmental lean mass, we provided its normal range and standard value based on our clinical data research. Standard value $\pm 2SD$ (standard deviation) is the normal range. As distribution of arm's lean mass is larger than leg's lean mass, the normal range of arm's lean mass is wider than leg's lean mass.

9. ECW/TBW

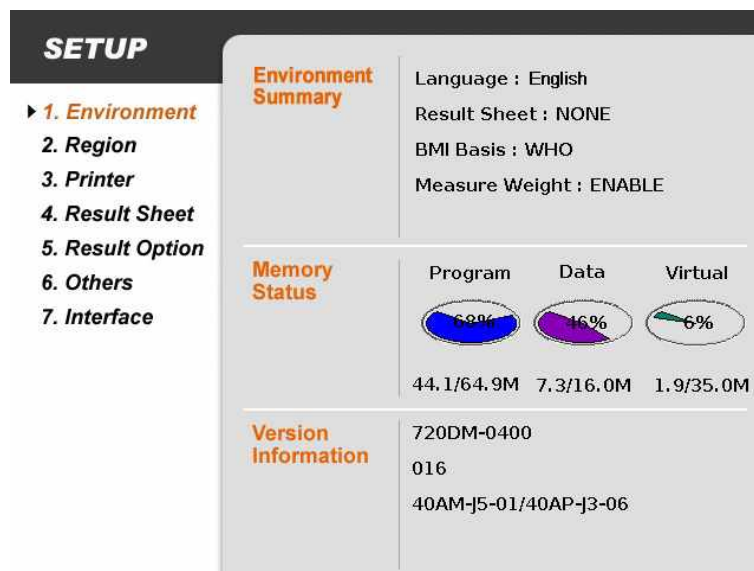
The normal range of ECW/TBW is higher than 0.36 and less than 0.39. When it is higher than 0.39 and less than 0.40, it is likely to cause mild edema. When it is higher than 0.40, it is highly possible to cause edema.

Chapter 3. Setup Establishment

1. Setup Menu
2. Quick Setup
3. DATABASE
4. Modification Example

1. Setup

The InBody720 has a function to modify the setting for the user's preference. The below setup screen appears after pressing the 'SETUP' key at the standby screen. The setup menu consists of Environment, Region, Printer, Result Sheet, Result Option, Others and Interface.



How to modify settings

(1) Use the direction buttons (▲▼) to move and select one option of Environment, Region, Printer, Result Sheet, Result Option, Others and Interface.

(2) Use the direction button (▶) at a particular setting to move to the sub-categories. Use the direction buttons (▲▼) to move into a sub-category of the setting you want to modify.

(3) Each sub-category has a list of further sub-categories. Previously selected items will be displayed. Use the direction button (▶) to move to the category you want to select and modify using the direction buttons (▲▼).

(4) If you have more categories to select, use the direction buttons (▲▼◀▶) again to move and select the category. If you are finished modifying the settings, move out to one of Environment, Region, Printer, Result Sheet, Result Option, Others and Interface using 'EXIT/MODE' button. Then press 'Exit/MODE' button again.

(5) When the screen asks whether or not you want to save modified contents, press 'ENTER' to save or 'EXIT/MODE' button to quit the setup menu.

2. Setup Menu

A. Environment

It shows the environmental status of the InBody720. No items can be changed by users.

(1) Environment Summary

- ❶ Language : displays the current language.
- ❷ Result Sheet : displays the number of result sheet automatically printed after measurement.
- ❸ BMI Basis : displays a selected standard range of BMI.
- ❹ Measure Weight : displays the current selection of weight measurement.

(2) Memory Status

- ❶ Program : shows capacity in use for program.
- ❷ Data : shows capacity in use for data storage.
- ❸ Virtual : shows capacity in use for virtual memory.

(3) Version Information :

Shows the current version of the InBody720.

B. Region

Set the Date, Time, Display Mode, Unit and Language.

- (1) Set Date : Set the current date.
- (2) Set Time : Set the current time in the order of OO(hour)/OO(min)/OO(sec)
- (3) Display Mode : Select the data display mode. 'yy' is for year, 'mm' is for month and 'dd' is for date.
- (4) Unit : Select units to be used.(kg/in., kg /cm, lbs./in., lbs./cm)
- (5) Language : Language is fixed to English only.

C. Printer

It is used to set the type of printer, adjust the printing alignment of result sheets and test print.

(1) Printer

Select the type of printer. Printers that support PCL3 above or higher are compatible with the InBody720.

(PCL3, SPL, HP PCL)

(2) Alignment

It is possible to adjust the coordinates on the result sheet. After adjustment, you can check whether the alignment has done properly by “test print.” The adjustment range: X (left, right), Y (upper, lower) +50~-50)

(3) Test Print

You can check the printing coordinates by printing out a sample.

D. Result Sheet

(1) Mode

Select the type of result sheet.

- ❶ Printed : to use printed result sheet provided by Biospace.
- ❷ Built-in : to use Letter size. All formatting of the result sheet will be printed out.

(2) Number of Result Sheet Printing

You can decide the numbers of result sheet automatically printed after measurement. (0~2 sheets)



No result sheet is printed out when '0' is selected.

E. Result Sheet

Select the standard range for BMI and result sheet printing mode.

(1) BMI Standard

Select the standard range of BMI.

- ❶ WHO Standard: The standard range is 18.5~25.0kg/m².
- ❷ Asian: The standard range is 18.5~23kg/m².

(2) Mode

- ❶ Medical Purpose : The measurement duration is approximately 1minute. Reactance, resistance, phase angle are not printed out.
- ❷ Research Purpose : The measurement duration is approximately 2 minutes. Impedance, reactance, resistance, phase angle are printed out.

F. Others

(1) Measure Weight

- ❶ Enable : Weight is automatically measured and added to the personal information window.
- ❷ Disable : Directly enter the examinee's weight in the personal information window.

(2) Adjust Weight

Used to adjust weight offset value. When you want to adjust weight due to heavy clothes or accessories, set the offset value. It will be automatically applied to weight measurement.

(Adjustment Range : +10.0lbs. ~ -10.0lbs., unit : 0.2lbs. or +5.0kg ~ -5.0kg, unit: 0.1kg)

(3) Adjust Volume

Used to control sound volume.(0~100%)

(4) Sound Type

Beep : Use Beep sound to inform measurement status.

(5) Initialize History

Used to erase the entire history data.

(6) Gender Default

Select the Gender automatically added to the personal information window. (Female, Male, Last Gender)

G. Interface

(1) Manual

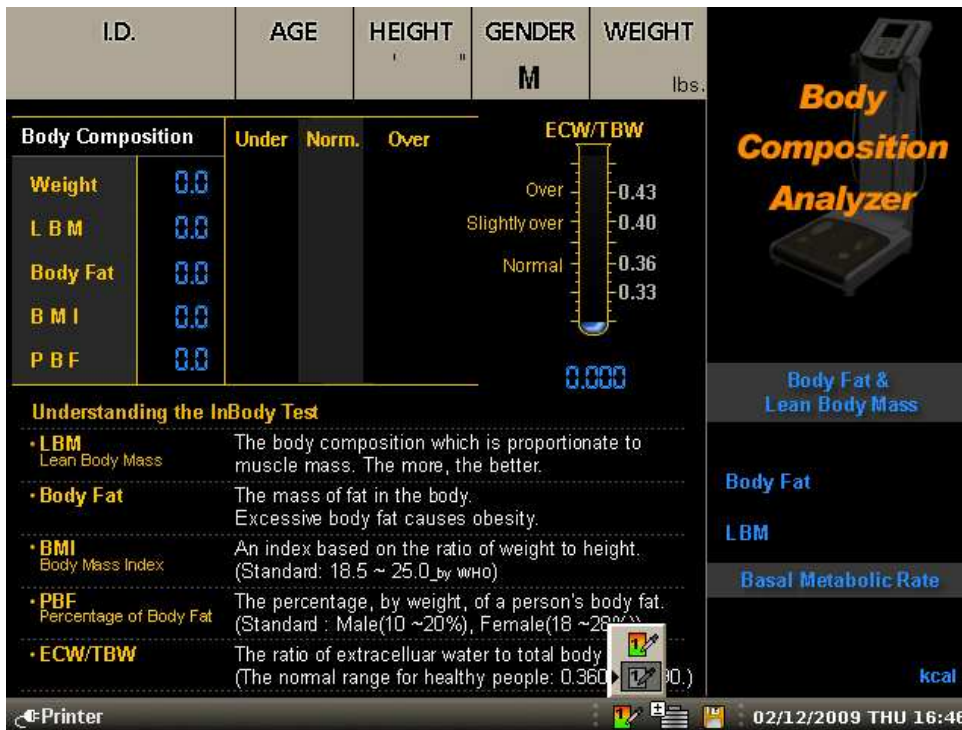
DNS, Netmask, Gateway, IP, Host IP : Connect in the same way as connect general PC to the network.

(2) Lookin'Body (PC)

- ❶ Ethernet Enable : to connect the InBody720 and PC by LAN cable.
- ❷ Serial cable : to connect the InBody720 and PC by Serial cable.
- ❸ Disable : Not use Lookin'Body.

3. Quick setup

Users can modify the user environment easily. The changeable items are result sheet selection, weight adjustment and mode.



<In the case of 'Result sheet selection' is selected >

A. How to modify the quick setup

- ① Press the 'EXIT/MODE' button in the standby screen..
- ② Select the item to change.
 - Use the "Left, Right direction button (◀ ▶)" to select the item.
 - Use the "Up, Down direction button (▲ ▼)" to adjust the item.
- ③ The change is saved automatically. To go back to the standby screen, press the 'ENTER' button or 'EXIT/MODE' button.
- ④ The saved value is used until the next change.

B. Items

(1) Result sheet selection

This option is used to select the type of result sheet.



: The results are printed on the custom - made test result sheet.



: The results are printed on the Letter – size plain paper.

(2) Weight adjustment

You can adjust the measured weight. If the clothes or jewelry the examinee is wearing during the testing significantly adds to the weight, use this option to deduct some weight from the default reading of the scale.

(permissible range of offset value : +10.0lbs. ~ -10.0lbs., unit : 0.2lbs. or +5.0kg ~ -5.0kg, unit: 0.1kg)

(3) Mode



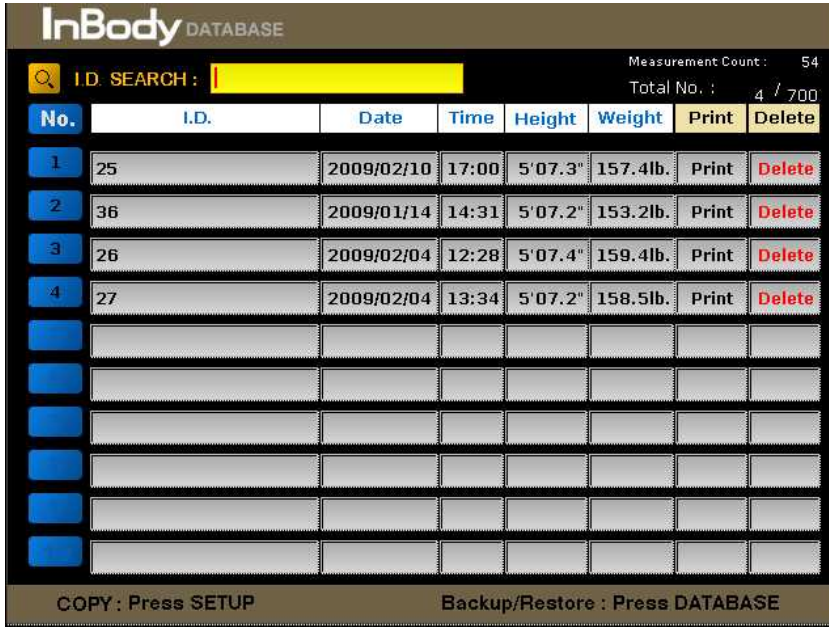
: It is for medical purpose. The measurement duration is 1 minute and reactance, resistance, phase angle are not measured.



: It is for research purpose. The measurement duration is 2 minutes and impedance, reactance, resistance, phase angle are measured.

4. DATABASE

Press the DATABASE key on the Keypad to bring up the database screen as shown below.



InBody DATABASE

Measurement Count : 54
Total No. : 4 / 700

I.D. SEARCH : [Yellow Search Field]

No.	I.D.	Date	Time	Height	Weight	Print	Delete
1	25	2009/02/10	17:00	5'07.3"	157.4lb.	Print	Delete
2	36	2009/01/14	14:31	5'07.2"	153.2lb.	Print	Delete
3	26	2009/02/04	12:28	5'07.4"	159.4lb.	Print	Delete
4	27	2009/02/04	13:34	5'07.2"	158.5lb.	Print	Delete

COPY : Press SETUP Backup/Restore : Press DATABASE

On the top right of the screen, the current number of examinee and the total number of examinee that can be saved are displayed. To move through the database screen, use the direction keys.

(1) I.D. search

The cursor is located in the I.D. search field. Type a key word or a set of characters in the text field and press ENTER to search the matching data.

Example) '12'+ ENTER : Find all I.D.s including '12'.

ENTER : Displays the entire database in the InBody720.

(2) Print

To print out the test result of a particular person, move the cursor to the record of that person. Press the direction key (▶) to move to 'Print' and then press ENTER.

(3) Delete

To delete the record of a particular person, move the delete cursor to the record of that person. Press the direction key (▶) to move to 'Delete' and then press ENTER. To delete the entire records existing, select the option of 'Initialize History' in the 'Others' from the Setup menu.



The deleted data cannot be restored.

NOTE

(4) Copy

You can easily copy the test results in the USB storage device. Move the cursor to the record of a particular person you want to copy and press SETUP. If you would like to copy the entire database in the InBody720, move the cursor to the I.D. search field and then press SETUP.



Contact Biospace or an authorized distributor for information of the compatible USB storage devices with the InBody720.

(5) Backup/Restore

You can easily backup or restore all the data saved in the InBody720 using an USB storage device. Press 'DATABASE' at the database screen. When a window pops up, press '1' for the Backup and '2' for the Restore. Press 'EXIT/MODE' to quit. Users can not use the backup files. It is only used for the result restoration when necessary.



Periodically back up the results in case of user's misuse or disorder of the equipment.



Note that the previous data in the InBody720 is automatically deleted when restoring new data from USB.



An individual can save 10 test results. It is possible to save up to 7,000 results in total.

5. Modification Example

(1) When using Letter-size paper for result sheet.

- ❶ Press the 'SETUP' button.
- ❷ Move to 'Result Sheet' using the direction buttons. (▲▼)
- ❸ Move to 'Mode' using a direction button. (▶)
- ❹ Select 'Built-in' using a direction buttons. (▲▼)
- ❺ After pressing EXIT/MODE button 3 times, the screen asking whether you want to save modified settings will pop up.
Press 'Enter' button to quit setup. The analysis result will be printed out on the A4 paper. Use the standarg Letter-size only.
 - Use the "Left, Right direction button (◀ ▶)" to select the item.
 - Use the "Up, Down direction button (▲ ▼)" to adjust the item.

(2) When using the printed result sheet

- ❶ Press the 'SETUP' button.
- ❷ Move to 'Result Sheet' using the direction buttons. (▲▼)
- ❸ Move to 'Mode' using a direction button. (▶)
- ❹ Select 'Printed' using a direction buttons. (▲▼)
- ❺ After pressing EXIT/MODE button 3 times, the screen asking whether you want to save modified settings will pop up.
Press 'Enter' button to quit setup. Use the printed result sheet provided by Biospace only.

Chapter 4. Problems and Solutions

1. Error Messages
2. Troubleshooting
3. Frequently Asked Questions (FAQs)
4. Customer Service Information

1. Error Messages

The InBody720 displays the following error messages to warn the user of the problems run into during operations and to guide the users to take steps. The following are the most common error messages and the steps to handle the corresponding errors.

A. “After removing any objects on InBody720, press “Enter” button.

This message comes up when weight is detected from the base frame between the power-on and the completion of boot-up process. Remove the object from the base frame and restart the equipment.



B. “Enter personal data correctly.”

This message appears when the value for age or height of the examinee is out of the permissible range for these data. Check your entry again. As for the permissible range of each data, refer to the “Chapter 2, section 5 : Personal Profile.”



C. “Wipe hands and feet using electrolyte tissue.”

This message fires up when the posture of the examinee is not appropriate or the examinee’s palms or soles are too dry or have too much hard skin, making it impossible to start the test. Correct the posture of examinee or wet his/her palms and soles with electrolyte tissues, before reinitiating the test.



2. Troubleshooting

This section lays out the order of steps you have to take for each particular problem, on the assumption that you have some basic knowledge on how to operate the InBody720. 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 LCD is turned on.)

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

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

Cause 2 Power bar is not turned on (when using a power bar) or the power doesn't come on to the power bar.

Action 2 Check if the power comes on to the power bar and an electrical outlet the power bar is connected to.

Cause 3 Fuse blows.

Action 3 Check to see if the fuse in a fuse holder is functioning. If necessary, replace the blown fuse with a spare fuse.
The InBody720 comes with 4 spare fuses or you can purchase at an electrical store.

B. Weight comes up as a negative number (-) or is widely different from the reasonably anticipated weight of the examinee.

(Usually the weight displayed on the InBody720 is close to what the examinee knows.)

Cause 1 This happens when the boot-up was not completed normally.

Action 1 Initialize the weight to zero during the boot-up. If there is an object on the base frame, the initialization process doesn't take place normally, preventing the normal weighing process from happening. Remove an object on the base frame and make sure there is nothing on the base frame and then restart the InBody720.

C. The measurements don't seem right.

(When the measurements seem too high or too low)

Cause 1 The examinee loses contact with the electrodes or fails to maintain the recommended posture during the testing.

Action 1 Refer to the "Chapter 2, Section 6. Proper Posture" to correct the examinee's posture and maintain the recommended posture until after the testing is finished.

D. Result sheet doesn't print.

(Normally when the testing is done, the result sheet prints out automatically.)

Cause 1 The printer is out of Letter-sized paper and the printer has the warning LED light on or displays the message saying it is out of paper.

Action 1 Check if there is Letter-sized paper in paper tray.

Cause 2 The cables to the printers are not connected properly.

Action 2 Check if the printer cables are connected to the InBody720 and to the power outlets. If any problem with the cables causes a connection failure, replace or fix the cables.

Cause 3 Paper gets stuck inside a printer, with the warning LED on or the printer displaying a message reporting paper jam.

Action 3 Check to see if paper is jammed in the printer.

Cause 4 A wrong printer is selected in the printer settings, or the number of result sheet to be printed is set at "none".

Action 4 Check if the model number of printer currently in use is selected in the printer settings of InBody720 and if the printer is compatible with the InBody720.

E. The prints are off balance.

(The prints don't normally go off balance to one direction.)

Cause 1 Coordinates of objects in the result sheet are placed in wrong locations.

Action 1 Refer to "Chapter 3, Section 1: Setup Menu" for hands-on explanation on how to move the coordinates of objects on result sheet and adjust accordingly.



A problem arises when the orientations of printing set in the printer doesn't correspond with that of the InBody720. Refer to the user's manual of the printer to change the orientations of printing in the printer. The orientation of printing set in the InBody720 is portrait.



As error message, the misprints, and burnt-out fuse are something 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 Question (FAQs)

As InBody720 is used in clinical environment, we receive many clinical questions involving InBody720, which has nothing to do with malfunctions of the equipment itself. Before you ask us clinical questions, read the following list of frequently asked questions and the answers to them. If you have any clinical questions regarding InBody720, contact us at the following email address:

E-mail: USA@biospaceamerica.com

A. Do I have to take off socks or pantyhose?

Socks or pantyhose block the electric current used to analyze the body composition, making an accurate analysis impossible. Bare skin should be in direct contact with the electrodes.

B. Who should not use InBody720 or who cannot have body composition analyzed?

- Examinee who has cardiac pacemaker or other electric medical devices embedded in the body must not be tested using InBody720.
- Those who may experience difficulty being tested are: the examinee who weighs less than 10kg or over 250kg or who is shorter than 95cm in height is out of the permissible range of measurements and might see the accuracy of body composition analysis drop.
- Testing is difficult with the children who cannot hold on to the hand or foot electrode during testing, or amputees or elderly who have trouble standing still during testing.
- Examinee who have metallic core embedded in the body may see the bodily conductivity affected by the metallic element. However, the InBody720 retrieves the body composition information from various parts of body, reducing the probability of erroneous analysis significantly.

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

It is impossible to test people who cannot contact the electrode. Biospace has a line of products that conduct body composition analysis on the examinee in bed, without having to get examinee out of bed during the tests. For more information on this product line, contact Biospace.

D. Is the electric current harmful to the body?

The physiological electric impedance method uses very subtle current that is not harmful to the human body (refer to the product specifications). Its safety is proven through the certifications from Korea and Europe. Many medical institutions are using the InBody720.

E. Can the jewelry or other metallic wear affect the testing?

The ideal test methodology is where the examinee doesn't wear anything metallic. As the weight of clothes and other wear affects the results of body composition analysis, it is strongly recommended to take off any heavy clothing or metallic wear. Except for the weight, jewelry doesn't exact any effects on the body composition analysis, as the contact points with InBody720 are hands and feet that are usually free of jewelry.

F. How often do I have to get body composition test?

Examinees who are undergoing treatments that may affect the body composition (e.g. exercise, obesity, rehabilitation, hormone treatment) are strongly recommended to have the body composition analysis done every two to four weeks.

G. What are the requirements for the examinee for accurate testing?

Keep in mind the following requirements for accurate body composition analysis.

- Do not have a meal before testing.
- If you had a meal, wait 2 hours before having a test.
- Go to bathroom before testing.
- To get closer to pure weight, wear light clothes and remove jewelry or other wear before testing.
- Do not exercise or have a bath before a test.
- Stand up for 5 minutes before tests.
- Do not sit down and stand up right before a test.
- Do not have a test while taking diuretic.
- Avoid testing during menstrual period.
- Enter the exact height.
- Keep the room temperature between 20°C and 25°C. Warm up yourself for 20 minutes before a test in winter.

H. Do I have to use electrolyte tissue? Can I just use wet cloth?

The electrolyte tissue provided by the InBody720 is specially designed for optimal testing, as opposed to other wet cloth. Always use the electrolyte tissue for accurate testing.

4. Customer Service Information

Corporate agents of the InBody720 and addresses are listed below. Contact us for assistance or more information about the InBody720.

Biospace, Inc.

4801 Wilshire Blvd., Suite 320 Los Angeles, CA 90010, USA

TEL: 1-310-358-0360

FAX: 1-310-358-0370

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

E-mail: USA@biospaceamerica.com

Biospace Co., Ltd.

518-10, Dogok 2-Dong, Gangnam-gu, Seoul 135-784 KOREA

TEL: 82-2-501-3939

FAX: 82-2-501-3978

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

E-mail: biospace@biospace.co.kr

Chapter 5. Consumables

1. Consumables

2. Basic Equipment

1. Consumables

A. Result Sheet

When using the InBody720 with a printer, it is strongly recommended to use the result sheets supplied by Biospace. If more result sheets are needed, please contact Biospace.

Result sheet Size : 8.5 * 11 " (Letter type)

Number of Sheets : 1000 / 1box

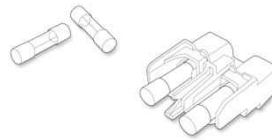
Printed Condition : 4 colors

Manufacturer : Biospace Co., Ltd

B. Fuse

Fuse holder is located inside the fuse socket, which is at the bottom of the back of the InBody720.

Type	Fast-Acting
Rated current	2.5A
Rated voltage	250V



Turn off the equipment, when changing fuses.

C. Li Battery

Type	CR2032 (3V)
Manufacturer	Hitachi Maxell Ltd., Sony Fukushima Corp.

The internal battery has an extended life period, therefore, there is no need to be worried about replacing it. However, just in case, when it needs replacing, call Biospace A/S Center or distributor.



Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by our distributor. Dispose of used batteries according to the manufacturer's instructions.

2. Basic Equipment

InBody720 provides custom-made printers and printer desks as basic option equipment and devices. If you want to use a different printer for InBody720, consult with Biospace first.

A. Printer

Printers using PCL3 or above would be compatible. If you have a printer using PCL3 or above but is not listed on the compatible printer list provided by Biospace, please contact us to check compatibility. Most of the printers do not include a USB cable, please purchase it separately.



Only use the printers recommended by Biospace

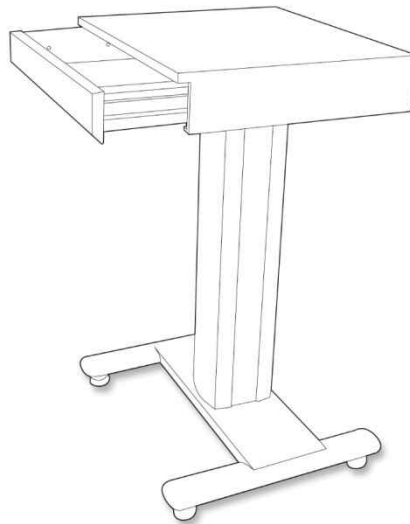
B. Printer desk

The printer desk makes for the optimal printing environment, with drawers where you can put result sheets, convenience and the minimized vibration during printing. The exterior and specifications of the printer desks are:

Material: E.G.I.

Dimensions: 480 x 400 x 710 (W x L x H; mm)

Weight: 13kg



For the instructions as to assembling the printer desk, refer to the product assembly guide printed on its carton.

Appendix

1. More About InBody720
2. Specifications
3. Worldwide Patents

1. More about the InBody720

A. More About InBody720

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

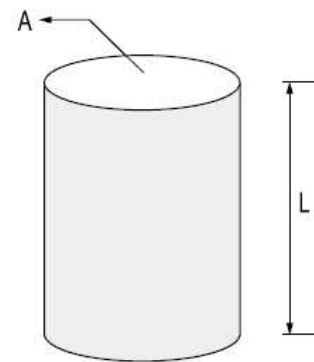
Generally 50~70% of the human body consists of water which functions as a conductor, whereas body fat functions as a non-conductor.

The classic BIA method measures the impedance of the whole body on the assumption that the human body can be considered 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.

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



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 represents examinee's height. Therefore, the two directly used variables in body composition analysis are impedance and height.

The principle of the InBody720's body composition analysis is explained by the following; the volume of body water, an electrolyte, is calculated first with a measured impedance value. Then, we can get the value of fat free mass using the volume of body water. Body fat mass is determined by deducting the lean body mass from the measured weight.

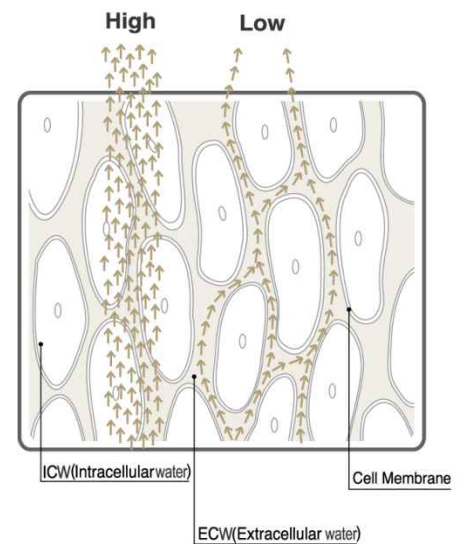
Height should be entered by the user. Weight can be directly measured on the InBody720.

B. Core technology

The body composition analyzer InBody720 is precision clinical diagnostic tool featuring the world-leading technology of Biospace. The advanced technology used in the InBody720 is recognized both in Korea and abroad, as Biospace obtained CE for exports to Europe and signed a technology royalty agreement with Yamato of Japan. The key features of the InBody720 built on the advanced technologies patented both in Korea and abroad.

Multi-frequency Measurement

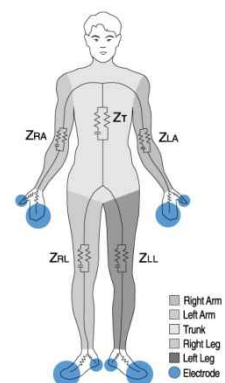
The traditional body fat measurement tools using the impedance uses one, single frequency at 50kHz to determine the impedance of the human body. On the other hand, the precision body composition analyzer InBody720 emits multitude of frequencies including 1kHz, 5kHz, 50kHz, 250kHz, 500kHz, 1MHz, using the multi-frequency technology that is a way more advanced than the single-frequency technology. The multi-frequency technology separates the intracellular water from the extracellular water, minimizing the probability of errors caused by individual variations in the distribution of the body water or changes of it over the period. The InBody720 can be reliably used on the examinee suffering from diseases and is capable of diagnosing diseases such as edema.



The frequency of 5kHz, 50kHz and 250kHz are used to measure the resistance and reactance, components of body impedance, enabling it to measure the body water accurately. This technology, exclusive to Biospace, overcomes the limitations with the body composition analysis.

Tetrapolar 8-Point Tactile Electrode

The traditional way was to attach a tape such as ECG electrode to the skin and connect the tape to the impedance reader. The biggest problem with this methodology is a low level of accuracy, because the measurements vary with the locations of electrodes and how firmly the electrodes are attached. The body composition analysis InBody720 uses 8-point tactile electrodes method that is easy to implement and is known to maintain consistency regardless of variations in the test environment. The patented technology in the InBody720 takes the accuracy of body composition analysis.



C. Outputs

Weight

Intracellular Water, Extracellular Water,

Dry Lean Mass, Lean Body Mass

Body Fat Mass,

BMI, Percentage of Body Fat

Segmental Soft Lean Mass, The Ratio of Segmental Soft Lean Mass

ECW/TBW

Body Composition History(Results of 10 measurement)

Impedance, Reactance, Resistance and Phase angle of Each Segments & Frequencies

D. Classifications

- Type of protection against electric shock : Class I
- Type of the applied parts : BF Type
- Degree of protection against water infiltration : IPX0
- EMC Immunity : Level A
- EMC Emission : Level A
- Equipment not suitable for use in the presence of flammable mixture



CAUTION

Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.



NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2. Specifications

Bioelectrical Impedance(BIA) Measurement Items	Bioelectrical Impedance(Z)	30 Impedance Measurements by Using 6 Different Frequencies (1 kHz, 5 kHz, 50 kHz, 250 kHz, 500 kHz, 1000 kHz) at Each 5 Segments (Right Arm, Left Arm, Trunk, Right Leg, Left Leg)
	Reactance(Xc) Resistance(R) Phase Angle	15 Reactance, 15 Resistance and 15 Phase Angle Measurements by Using 3 Different Frequencies (5 kHz, 50 kHz, 250 kHz) at each 5 segments (Right Arm, Left Arm, Trunk, Right Leg, Left Leg)
Electrode Method	Tetrapolar 8-Point Tactile Electrode System	
Measurement Method	Direct Segmental Multi-frequency Bioelectrical Impedance Analysis Method ;DSM-BIA Method	
Body Composition Calculation Method	No Empirical Estimation	
Outputs	Intracellular Water, Extracellular Water, Dry Lean Mass, Body Fat Mass Lean Body Mass, Weight BMI, Percentage of Body Fat Segmental Soft Lean Mass, The Ratio of Segmental Soft Lean Mass ECW/TBW Body Composition History(Results of 10 measurement) Impedance, Reactance, Resistance and Phase angle of Each Segments & Frequencies	
Applied Rating Current	90 μ A(1kHz), 400 μ A(others)	
Power Consumption	60VA	
Power Source	100-240V~, 50/60 Hz	
Display Type	640 X 480 Color TFT LCD	
External Interface	RS-232C 3EA, USB Host 2EA, Ethernet(10/100 Base-T) 1EA, IEEE1284 (25pin parallel) 1EA	
Compatible Printer	Laser/Inkjet Printer (with PCL 3 or above, the printers recommended by Biospace)	
Dimensions	20.4(W) X 34.3(L) X 47.2(H) : inch 520(W) X 870(L) X 1200(H) : mm	
Machine Weight	99lbs.(45 kg)	
Measurement Duration	Less than 1 minute for medical mode(Less than 2 minutes for research purpose mode)	
Operation Environment	10 ~ 40 $^{\circ}$ C (50 ~ 104 $^{\circ}$ F), 30 ~ 75%RH, 70 ~ 106kPa	
Storage Environment	-20~ 70 $^{\circ}$ C (-4 ~ 158 $^{\circ}$ F), 30 ~ 95%RH, 50 ~ 106kPa	
Weight Range	22 ~ 551lbs.(10 ~ 250kg)	
Age Range	3 ~ 99years	
Height Range	3ft. 1.4in. ~ 7ft. 2.6in.(95 ~ 220cm)	

* Specifications are examinee to be changed without prior notice.

3. 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)

2003. 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)