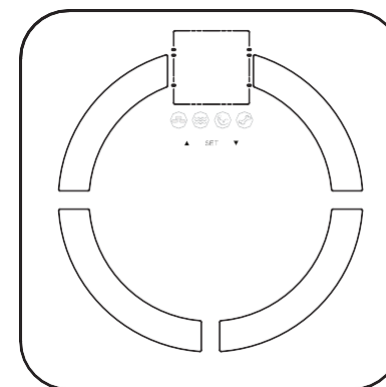


## User Manual

Glass Body Fat Analyzer    **CONTOUR**



**Optima Home Scales**

PO Box 1526, Cumming GA 30028, United States

T:888-688-4833 [www.optimahomescales.com](http://www.optimahomescales.com)








- Thank you very much for selecting the OHS Glass Body Fat Analyzer CONTOUR.
- Please do read the user manual carefully and thoroughly to ensure the safe usage of this product and keep the manual for further reference in case you have problems.

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♥ Safety and Usage Information

The warning signs and symbols are essential to ensure your correct and safe use of this product and protect you and others from injury. Please kindly find the meanings of the warning signs and symbols, which you may encounter in the label and user manual, as follows:

|                                                                                   |                                               |                                                                                   |                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Symbol for "THE OPERATION GUIDE MUST BE READ" |  | Symbol for "MANUFACTURER"                                                                                                                                                                                               |
|  | Symbol for "DIRECT CURRENT"                   |  | Symbol for "COMPLIES WITH EU REQUIREMENTS"                                                                                                                                                                              |
|  | Symbol for "MANUFACTURE DATE"                 |  | Symbol for "ENVIRONMENT PROTECTION – Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your local authority or retailer for recycling advice" |
| <b>SN</b>                                                                         | Symbol for "SERIAL NUMBER"                    |  |                                                                                                                                                                                                                         |

 CAUTION

OHS Body Fat Analyzer CONTOUR offers you a seamless way to manage your health. Please be aware that this device is designed for healthy people over 10 years old self-measuring and self-monitoring body compositions. Any information provided by this device is in no way meant to treat, cure or prevent any disease or illness from happening. If in doubt, contact your physician.

This device is not recommended for any female subject who may be suspected of or is pregnant. Otherwise, the effects of this device on the fetus are unknown.

This device is not recommended for any person who is connected to a wearable or implantable electronic device or instrument such as a pacemaker or defibrillator.

This device should not be used for anyone who is acutely or chronically ill because of suffering from a disease or taking medications that affect your water levels. The accuracy of readings for these patients has not been verified. Specific medical advice should be obtained from a physician.

Manufacturer will make available on request circuit diagrams, component parts listed.

WARNING: No modifications of this equipment are allowed. This may result in increased EMISSIONS or decreased IMMUNITY of CONTOUR.

Please use the device according to the user manual. Any misuse can cause electric shock, burns, fire and other unexpected hazards.

Please use and store the device in the environment as specified in the user manual. Don't expose the device to extreme temperatures, direct sunlight, moist or corrosive environment.

Do not step on the scale when your body or feet are wet, especially after bathing or showering to prevent slipping.

Please keep the device out of reach of infants, children or pets, since inhalation or swallowing of small parts is dangerous or even fatal.

If you have an allergy to stainless steel, please avoid contacting to the electrodes of the device. The patient is an intended operator. The patient can measure, and charge battery under normal circumstances and maintain the device and its accessories according to the user manual.

INDICATIONS FOR USE

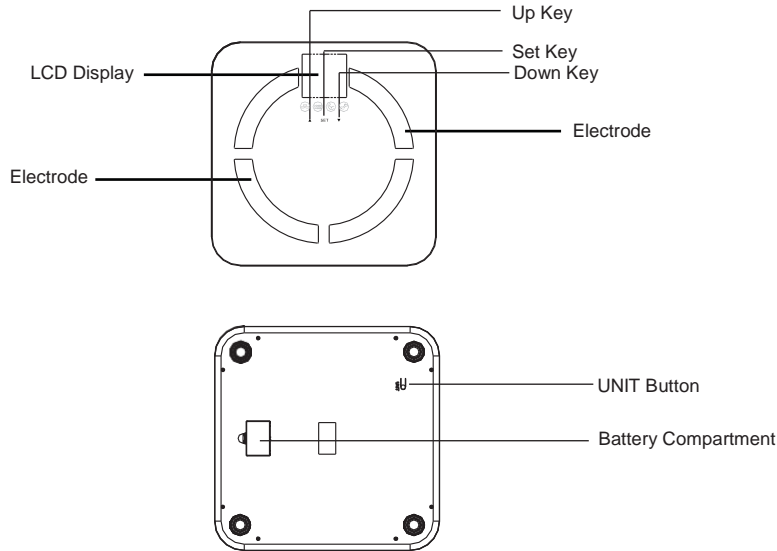
- The OHS Body Fat Analyzer measures weight and uses bio-electrical impedance analysis (BIA) technology to estimate body fat, total body water percentage, bone mass and muscle mass in generally healthy children 10-17 years old and healthy adults.
- It is intended for use in the domestic setting only.

♥ Tips

**To ensure the accuracy of measurement, please follow below instructions when you start measurement.**

- Place the scale on a flat, hard surface. Soft surface such as carpet will affect the performance of the scale.
- Step onto the platform with bare feet. Stand still and keep full contact with the electrodes until the measurement is complete.
- Start measurement at least two hours after Getting up or Dining.
- Avoid measurement immediately after strenuous exercise, sauna or bath, drinking, and dining.
- Always start measurement in the same time slot and on the same scale located on the same flat, hard surface.
- For maximum accuracy and repeatability, it is recommended that you should use the device in the same time of the day and on the same location.
- The condition of the skin on the bottom of your feet can affect the reading. The natural effects of aging or activity can make this skin hard. Take the reading with clean, slightly damp feet for best accuracy. If you are having a problem on operating this scale, please contact customer service.
- Body fat percentage estimates will vary with the amount of water in the body, and can be affected by dehydration or over-hydration due to such factors as alcohol consumption, menstruation, illness, intense exercise, etc.

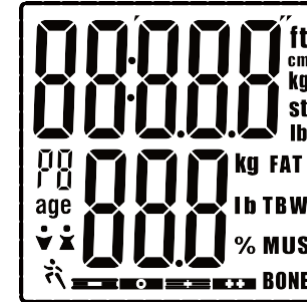
♥ Device Components



♥ List

1. Glass Body Fat Analyzer CONTOUR
2. Two CR2032 Batteries (3V per each)
3. User Manual

♥ LCD Display



|             |                                  |     |                               |
|-------------|----------------------------------|-----|-------------------------------|
| <b>FAT</b>  | Body Fat Analysis Result         | ♂   | Male                          |
| <b>TBW</b>  | Total Body Water Analysis Result | ♂   | Male Athlete                  |
| <b>MUS</b>  | Muscle Mass Analysis Result      | ♀   | Female                        |
| <b>BONE</b> | Bone Mass Analysis Result        | ♀   | Female Athlete                |
|             |                                  | —   | Under Fat                     |
| <b>lb</b>   | Pound                            | ○   | Healthy                       |
| <b>kg</b>   | Kilogram                         | +   | Over fat                      |
| <b>%</b>    | Percentage                       | ++  | Obese                         |
| <b>ft</b>   | Foot                             | P8  | User ID (Range from P1 to P8) |
| <b>cm</b>   | Centimeter                       | age | Age                           |

## ♥ General Instructions

OHS Body Fat Analyzer CONTOUR applies BIA (Bio-impedance Analysis) technology. A small amount of weak current flows through the human body to detect the bio-impedance and estimate body fat, body water, muscle mass and bone mass. The electrical current is small and may not be felt.

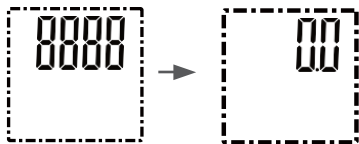
This BIA technology is inexpensive, safe, non-invasive, toxic-free and harmless. It also possesses the characteristics of simple operation and abundant information.

The current mentioned above is less than 0.5mA. However, please be aware that anyone with a wearable or implantable medical electronic instrument, such as a pacemaker, must avoid using this device.

The intended use of this device is for healthy children 10-17 years old and healthy adults.

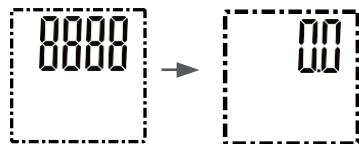
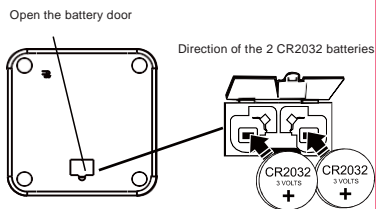
## ♥ Take out the Insulating Strip

- Open the battery door in the back of the scale.
- A new set of batteries has been installed in the battery compartment according to the correct polarity. Please remove the plastic strip before first use. Take out the insulating strip along the direction (shown on insulating strip).
- Close the battery door and wait until the digits "0.0" are shown on the LCD.



## ♥ Replace the Batteries

- Open the battery door in the back of the scale.
- Insert the batteries (2x CR2032) into the battery compartment according to the polarity indications marked inside the compartment.  
\* The digits 8888 will be shown on the LCD.
- Close the battery door and wait until the digits "0.0" are shown on the LCD.

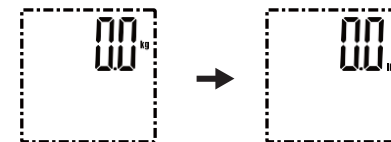


## CAUTION

- When the symbol "Lo" appears, the device will power off soon. Then you shall replace with a new set of batteries. Please replace both batteries at the same time. Do NOT mix the old batteries with the new one.
- Worn batteries are hazardous waste. Do NOT dispose of them together with the household garbage. Please refer to the local ordinances and recycling instructions regarding disposal of the worn batteries and scrapped device.
- If you do not intend to use this unit for a prolonged period, it is advisable to remove the batteries before storing.
- Please properly store the batteries to avoid children swallowing.

## ♥ Select Measurement Unit

With batteries correctly installed, press "UNIT" button in the back of the scale to select measurement unit. The default measurement unit is "kg". You may press "UNIT" button to choose between kilogram and pound.



## CAUTION

- Please put the scale on flat hard ground when finishing the unit selection. Wait for a few seconds, then you may start measuring according to the measuring procedure below. If there is not any operation in weighing mode, the scale will turn off after a few seconds.

## ♥ Initializing Your Scale

1. Press the platform center and remove your foot.
2. "0.0" will be displayed.



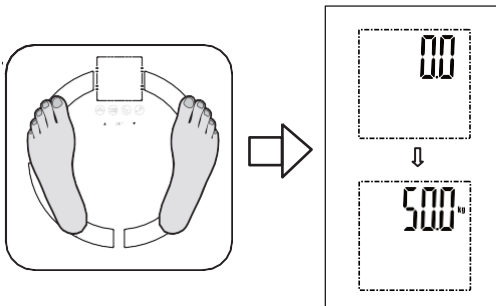
3. The scale will switch off and is now ready for use.  
This initialization process must be repeated if the scale is moved.  
At all other times step straight on the scale.

## ♥ Weight Only Operation

The Body Fat Analyzer will operate as a conventional weight - reading scale. No special programming steps are required.

Once the scale is initialized, as previously described, you may simply step on the scale to measure your current weight. For only weight reading:

1. Position the scale on a flat, hard surface. Carpeted or uneven floors may affect accuracy.
2. Step onto the scale platform and remain still while the scale computes your weight.
3. The scale will display your weight value.
4. The scale will turn off after a few seconds.

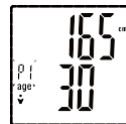


## ♥ Set Up Your Profile

The body fat analyzer CONTOUR supports multiple users (Up to Eight). You may follow below instructions to assign User ID and set up your own profile, including Gender, Stature, and Age.

### 1. Assigning User ID

- With batteries correctly installed, press "SET" key to enter setting when the scale is off.
- The system will request User ID selection first. As pictured below, "P1" blinks. The operator may press the function key ▲ or ▼ to select User ID among P1 to P8.
- Press "SET" key to confirm User ID.

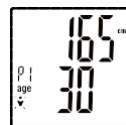


### 2. Setting Gender

- After confirming User ID, the system will divert to Gender setting.
- As pictured below, the portrait ▼ blinks. The operator may press the function key ▲ or ▼ to select Gender (Male/Female/Male Athlete/ Female Athlete).
- Press "SET" key to confirm Gender.

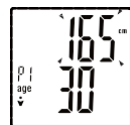
Athlete Mode:

An athlete is considered as a person who does 10 hours or more per week of aerobic activity and has a resting heart rate of 60 beats per minute. These individuals should select Athlete Mode for the most accurate measurement results. The body fat analyzer is not calibrated for professional athletes or body builders.



### 3. Setting Stature

- After confirming Gender, the system will divert to Stature setting automatically.
- As pictured below, the digits "165" blinks. The operator may press the function key ▲ or ▼ to increase or decrease the numeral.
- You may press and hold the function key ▲ or ▼ for fast changing the numeral.
- Press "SET" key to confirm.



4. Setting Age

- After confirming Stature, the system will divert to Age setting.
- As pictured below, the digits “30” blinks. The operator may press the function key ▲ or ▼ to increase or decrease the numeral.
- You may press and hold the function key ▲ or ▼ for fast changing the numeral.
- Press “SET” key to confirm Age.



5. After confirming the Age, the LCD will display “0.0”, then you can start measuring.



6. Repeat procedure for a second user, or to change user details.

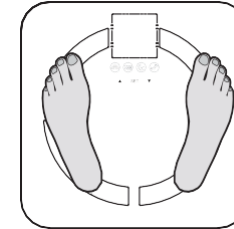
Note: To update or overwrite the memorized data, follow the same procedure, making changes as required.

♥ First Measurement

- Position scale on a firm flat surface.
- Press SET key.
- While the user number of the latest measurement is flashing, select your user number by pressing ▲ or ▼ key. After 3s, the selected number is locked, the scale shows zero reading.

(Note: When the user number is flashing, if you press SET key again, it will enter the setting mode, after all the settings are finished, it will display zero reading.)

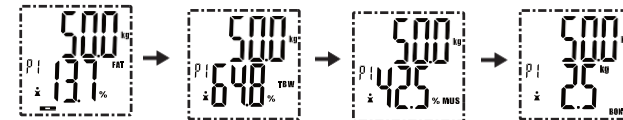
**STEP 1:** Step on the platform barefooted when the LCD displays “0.0”.



**STEP2:** Stand still and the weight data will be locked automatically with showing the unit when stable. Keep full contact with the electrodes until the LCD stop displaying moving “0”.



**STEP 3: Your weight will be displayed followed by** Body Fat, Total Body Water, Muscle Mass, and Bone Mass. The data will be displayed three times and then turn off.



\* When the body fat ratio is displayed, a symbol also appears on the LCD. This symbol ranks your general body fat level: Underfat to Obese.

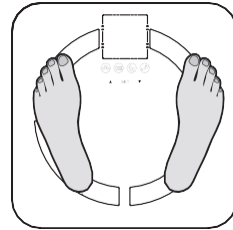


Underfat      Healthy      Overfat      Obese

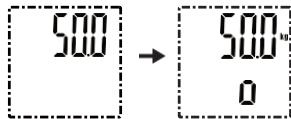
\* If it fails to complete the analysis, the LCD will only display the weight data.  
(To find out the solutions, please refer to [Troubleshooting](#) for more details.)

♥ Daily Measurement

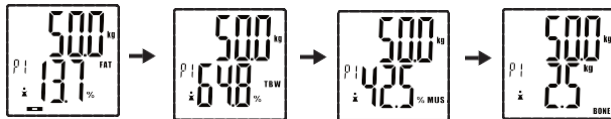
With original SENSE ON patent technology, CONTOUR will automatically switch on as you step on the platform barefooted.



Stand still and keep full contact with the electrodes until the LCD stops displaying moving “o”.



According to the analysis results, the system will identify the possible User ID with most similar history records. Then the measuring results will be displayed sequentially three times.



When the system finds out two or more users with similar history records, it will notify you to choose between, for example, P1 and P2. You may press **Key** for P1 and or **Key** for P2. The measuring results will then be sorted into the User ID you selected and displayed sequentially three times, then turn off. If you don't select the User ID, the User ID will display sequentially a few seconds, then turn off.



If it fails to identify the possible User ID, the LCD will only display the weight data. (To find out the solutions, please refer to [Troubleshooting](#) for more details.)

♥ Error Prompt

| Error | Description                                             | Solution                                                                                                      |
|-------|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|       | Overload. The device will power off.                    | Stop using this scale for measurement.                                                                        |
|       | Low Battery. The device will power off in four seconds. | Replace both two CR2032 batteries at the same time. Please purchase the authorized batteries for replacement. |

♥ When Measuring ...

| Problem                                                                                                             | Root Cause                                                                        | Solution                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Abnormal measuring results:<br>- Too high; OR<br>- Too low; OR<br>- Huge difference between two recent measurement. | Incorrect posture                                                                 | Please step on the platform barefooted and stand still.                                                       |
|                                                                                                                     | The device is located on the soft ground such as a carpet OR on a rugged surface. | Please place the device on a flat, hard surface.                                                              |
|                                                                                                                     | Your feet are too dry.                                                            | Wipe your feet with a damp cloth, keeping them slightly damp when starting measurement.                       |
| No display on LCD when the device powers on.                                                                        | Batteries not yet installed.                                                      | Install the batteries. (Please refer to <a href="#">Replace the Batteries</a> )                               |
|                                                                                                                     | Worn batteries.                                                                   | Replace both two CR2032 batteries at the same time. Please purchase the authorized batteries for replacement. |



| Problem                                                                          | Root Cause                                                              | Solution                                                                                                      |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| CANNOT proceed to analyze body fat, total body water, muscle mass and bone mass. | Step onto the platform wearing socks or shoes.                          | Please keep barefooted during the measurement and keep full contact with the electrodes as well.              |
|                                                                                  | The system cannot identify the possible User ID with most similar data. | Please assign a User ID following the instruction in <a href="#">Set Up Your Profile</a> .                    |
|                                                                                  | The user fails to select the User ID from what the system found.        | Please assign a User ID following the instruction in <a href="#">Set Up Your Profile</a> .                    |
| The device powers off.                                                           | Low battery.                                                            | Replace both two CR2032 batteries at the same time. Please purchase the authorized batteries for replacement. |

♥ Specifications

|                            |                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------|
| <b>Product Name</b>        | CONTOUR                                                                                        |
| <b>Dimension</b>           | Scale: 310x310x18.8mm (Approx.)                                                                |
| <b>Net Weight</b>          | Approximately 1.9 kg (Excluding the cells)                                                     |
| <b>Display</b>             | Digital LCD                                                                                    |
| <b>Measurement Unit</b>    | Kilogram / Pound                                                                               |
| <b>Measurement Range</b>   | 5 kg to 180 kg / 11 lb to 397 lb                                                               |
| <b>Division</b>            | 0.1kg / 0.2lb                                                                                  |
| <b>Accuracy</b>            | 50 ±0.3kg; 100 ±0.4kg;<br>150 ±0.5kg; 180 ±0.7kg;                                              |
| <b>Working Environment</b> | Temperature: 5°C to 40°C Relative Humidity: ≤90% RH<br>Atmospheric pressure: 86kPa to 106kPa   |
| <b>Storage Environment</b> | Temperature: -20°C to 60°C Relative Humidity: ≤90% RH<br>Atmospheric pressure: 50kPa to 106kPa |
| <b>Power Source</b>        | 6V (2xCR2032 Batteries)                                                                        |
| <b>Turn on Method</b>      | SENSE ON technology                                                                            |
| <b>Auto-OFF</b>            | The scale will turn off after about 10s if there is no operation.                              |
| <b>Accessories</b>         | 1. 2xCR2032 Batteries<br>2. User Manual                                                        |
| <b>Mode of Operation</b>   | Continuous Operation                                                                           |

**About the Accuracy of This Product**

▪ This product passes strict inspection before delivery and therefore its accuracy is guaranteed by the manufacturer. Please refer to the above table for the descriptions on accuracy.

▪ This product is specially designed for body fat analysis as well as weight measurement. It should NOT be used by anyone during the process of transaction for verification of goods' weight.

## ♥ Maintenance

When carrying out usual maintenance, please ensure practice of the following Do's and Don'ts:

- DO use a dry soft cloth to wipe the dust.
- DO use a wet soft cloth, dipped into water and wrung out, to wipe the dirt. Then use a dry soft cloth to dry up the device.
- DON'T wash the device with water or immerse it in water.
- DON'T use propellant, abrasive or other chemicals to wipe the dirt in avoidance of discolor or malfunction.
- DON'T disassemble this device. If you have any problems, please contact OHS.  
(Please refer to Warranty for contact information)

## ♥ Warranty

- OHS warrants its products free of defects in materials and workmanship in normal use for a period of TEN years from the date of retail purchase.
- This warranty does NOT cover damages caused by misuse or abuse, including but not limited to:
  - Failure caused by unauthorized repairs or modifications;
  - Damage caused by shock or drop during transportation;
  - Failure caused by improper operation inconsistent with the instructions stated in this user manual;
  - Malfunction or damage from failure to provide the recommended maintenance;
  - Damage caused by improper use of power supply.
- Should this device require maintenance (or replacement at our option) under warranty, please deliver the original package to OPTIMA HOME SCALES prepaid. Please return the store receipt (with the retail purchase date) and a note with reasons to return on it as well.

### OPTIMA HOME SCALES

PO Box 1526, Cumming GA 30028, United States

T: :888-688-4833 [www.optimahomescales.com](http://www.optimahomescales.com)

## ♥ Health Tips - About Body Fat

Human body is made up of, amongst other things, a percentage of fat. Body fat is vital for a healthy, functioning body, protects vital organs, helps regulate body temperature, stores vitamins and helps the body sustain itself when food is scarce. However, too much body fat or indeed too little body fat will damage your health. It is difficult to gauge how much body fat we have in our bodies simply by looking at ourselves in the mirror.

Therefore, it is important to measure and monitor your body fat percentage. Body fat percentage gives you a better measure of fitness than weight alone—the composition of your weight loss could mean you are losing muscle mass rather than fat—you could still have a high percentage of fat even when a scale indicates 'normal weight'.

The table as follows may be used as a guide:

### The body fat ratio (Unit: %):

| Age   | Female   |         |         |       | Male     |         |         |       |
|-------|----------|---------|---------|-------|----------|---------|---------|-------|
|       | Underfat | Healthy | Overfat | Obese | Underfat | Healthy | Overfat | Obese |
| <39   | <21      | 21.1-33 | 33.1-39 | >39   | <8       | 8.1-20  | 20.1-25 | >25   |
| 40-59 | <23      | 23.1-34 | 34.1-40 | >40   | <11      | 11.1-22 | 22.1-28 | >28   |
| >59   | <24      | 24.1-36 | 36.1-42 | >42   | <13      | 13.1-25 | 25.1-30 | >30   |

### ♥ Health Tips - About Body Water

Body water is the single most important component of body weight. It represents over half of your total weight and almost two thirds of your lean body mass (predominantly muscle). Water performs several important roles in the body:

All the cells in the body, whether in the skin, glands, muscles, brain or anywhere else, can only function properly if they have enough water. Water also plays a vital part in regulating the body's temperature balance, particularly through perspiration.

The combination of your weight and fat measurement could appear to be 'normal' but your body hydration level could be insufficient for healthy living.

The table as follows may be used as a guide:

#### The body water ratio (Unit: %):

| Age   | Female |         |      | Male |         |      |
|-------|--------|---------|------|------|---------|------|
|       | Low    | Normal  | High | Low  | Normal  | High |
| 10-15 | <57    | 57.1-67 | >67  | <58  | 58.1-72 | >72  |
| 16-30 | <47    | 47.1-57 | >57  | <53  | 53.1-67 | >67  |
| 31-60 | <42    | 42.1-52 | >52  | <47  | 47.1-61 | >61  |
| 61-80 | <37    | 37.1-47 | >47  | <42  | 42.1-56 | >56  |

### ♥ Health Tips - About Muscle Mass

According to the American College of Sports Medicine (ACSM), lean muscle mass may decrease by nearly 50 percent between the age of 20 and 90. If you do nothing with it you're losing muscle and increasing fat. It is also important to know your muscle mass % during weight reduction. At rest, the body burns approximately 110 additional calories for each kilo of muscle gained. Benefits of gaining muscle mass include:

- Reversing the decline in strength, bone density and muscle mass with aging
- Maintenance of flexible joints
- Guide weight reduction when combined with a healthy diet.

The table as follows may be used as a guide:

#### The body muscle ratio (%):

|         | Female | Male |
|---------|--------|------|
| Healthy | >34    | >40  |

### ♥ Health Tips - About Bone Mass

Regular exercise and a balanced diet can help maintain healthy bones. Like muscle, bone is a living tissue that can respond to exercise by becoming stronger. For most people, bone mass peaks in their thirties. Then people begin to lose bone. Regular exercise can help prevent that loss.

Calcium and vitamin D, good sources of which are dairy products, green leafy vegetables and fish, contribute to healthy bones.

The bone mass readings given by this product are an estimation of the amount of bone in your body. Those with osteoporosis or low bone densities may not get accurate estimations. If you have any concern regarding your bones, please consult your doctor timely.

#### The bone range (kg) ≤ 10.0kg

## ♥ EMC Guidance

Table 1 Guidance and MANUFACTURER's declaration – ELECTROMAGNETIC EMISSIONS- for all ME EQUIPMENT and ME SYSTEMS

| Guidance and manufacturer's declaration – electromagnetic emissions                                                                                                             |                |                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment. |                |                                                                                                                                                                                 |
| Emissions test                                                                                                                                                                  | Compliance     | Electromagnetic environment - guidance                                                                                                                                          |
| RF emissions<br>CISPR 11                                                                                                                                                        | Group 1        | The device uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. |
| RF emissions<br>CISPR 11                                                                                                                                                        | Class B        |                                                                                                                                                                                 |
| Harmonic emissions<br>IEC 61000-3-2                                                                                                                                             | Not applicable |                                                                                                                                                                                 |
| Voltage fluctuations/<br>flicker emissions IEC<br>61000-3-3                                                                                                                     | Not applicable |                                                                                                                                                                                 |

Table 2 Guidance and MANUFACTURER's declaration – electromagnetic IMMUNITY – for all ME EQUIPMENT and ME SYSTEMS

| Guidance and manufacturer's declaration – electromagnetic immunity                                                                                                             |                                                                                                                                                                                                 |                            |                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment |                                                                                                                                                                                                 |                            |                                                                                                                                                                                                                                                                              |
| IMMUNITY test                                                                                                                                                                  | IEC 60601 test level                                                                                                                                                                            | Compliance level           | Electromagnetic environment - guidance                                                                                                                                                                                                                                       |
| Electrostatic discharge (ESD)<br>IEC 61000-4-2                                                                                                                                 | ±6 kV contact<br>±8 kV air                                                                                                                                                                      | ±6 kV contact<br>±8 kV air | Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.                                                                                                                                |
| Electrical fast transient/burst<br>IEC 61000-4-4                                                                                                                               | ±2 kV for power supply lines<br>±1 kV for input/output lines                                                                                                                                    | Not applicable             | Mains power quality should be that of a typical commercial or hospital environment.                                                                                                                                                                                          |
| Surge IEC<br>61000-4-5                                                                                                                                                         | ±1 kV line(s) to line(s)<br>±2 kV line(s) to earth                                                                                                                                              | Not applicable             | Mains power quality should be that of a typical commercial or hospital environment.                                                                                                                                                                                          |
| Voltage dips, short interruptions and voltage variations on power supply input lines<br>IEC 61000-4-11                                                                         | <5% $U_T$<br>(>95% dip in $U_T$ ) for 0.5 cycle<br>40% $U_T$<br>(60% dip in $U_T$ ) for 5 cycles<br>70% $U_T$<br>(30% dip in $U_T$ ) for 25 cycles<br><5% $U_T$<br>(>95% dip in $U_T$ ) for 5 s | Not applicable             | Mains power quality should be that of a typical commercial or hospital environment. If the user of the device requires continued operation during power mains interruptions, it is recommended that the device be powered from an uninterruptible power supply or a battery. |
| Power frequency (50/60Hz) magnetic field<br>IEC 61000-4-8                                                                                                                      | 3A/m                                                                                                                                                                                            | 3A/m                       | Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.                                                                                                                                    |
| NOTE $U_T$ is the a.c. mains voltage prior to application of the test level.                                                                                                   |                                                                                                                                                                                                 |                            |                                                                                                                                                                                                                                                                              |

Table 4 Guidance and MANUFACTURER's declaration – electromagnetic IMMUNITY – for ME EQUIPMENT and ME SYSTEMS that are not LIFE-SUPPORTING


| Guidance and manufacturer's declaration – electromagnetic immunity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The device is intended for use in the electromagnetic environment specified below.<br>The customer or the user of the device should assure that it is used in such an environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| IMMUNITY test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | IEC 60601 TEST LEVEL                                                                                                                                        | Compliance level | Electromagnetic environment - guidance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Conducted RF<br>IEC 61000-4-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3 Vrms<br>150 kHz to<br>80 MHz                                                                                                                              | Not applicable   | Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.<br><b>Recommended separation distance</b><br>$d = \left[ \frac{3.5}{V_1} \sqrt{P} \right]$                                                                                                                                                                                                                                                                                                                   |
| Radiated RF<br>IEC 61000-4-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3 V/m<br>80 MHz to<br>2.5 GHz                                                                                                                               | 3 V/m            | $d = 1.167 \sqrt{P} \sqrt{f}$ 80 MHz to 800 MHz<br>$d = 2.333 \sqrt{P} \sqrt{f}$ 800 MHz to 2.5 GHz<br>where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and $d$ is the recommended separation distance in meters (m).<br><br>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, a should be less than the compliance level in each frequency range. <sup>b</sup><br><br>Interference may occur near equipment marked with the following symbol:<br><br> |
| NOTE 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | At 80 MHz and 800 MHz, the higher frequency range applies.                                                                                                  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NOTE 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular / cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the device.<br><sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than $[V_1]$ V/m. |                                                                                                                                                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Table 6 Recommended separation distances between portable and mobile RF communications equipment and the ME EQUIPMENT or ME SYSTEM – for ME EQUIPMENT and ME SYSTEMS that are not LIFE-SUPPORTING

| Recommended separation distances between portable and mobile RF communications equipment and the device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                    |                                                    |                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------|
| The device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the device as recommended below, according to the maximum output power of the communications equipment.                                                                                                                                                                              |                                                                    |                                                    |                                                     |
| Rated maximum output power of transmitter (W)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Separation distance according to frequency of transmitter (m)      |                                                    |                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 150 kHz to 80 MHz<br>$d = \left[ \frac{3.5}{V_1} \sqrt{P} \right]$ | 80 MHz to 800 MHz<br>$d = 1.167 \sqrt{P} \sqrt{f}$ | 800 MHz to 2.5 GHz<br>$d = 2.333 \sqrt{P} \sqrt{f}$ |
| 0.01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Not applicable                                                     | 0.117                                              | 0.233                                               |
| 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Not applicable                                                     | 0.369                                              | 0.738                                               |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Not applicable                                                     | 1.167                                              | 2.333                                               |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Not applicable                                                     | 3.690                                              | 7.378                                               |
| 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Not applicable                                                     | 11.67                                              | 23.33                                               |
| For transmitters rated at a maximum output power not listed above, the recommended separation distance $d$ in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.<br>NOTE 1 At 80MHz and 800MHz, the separation distance for the higher frequency range applies.<br>NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. |                                                                    |                                                    |                                                     |