

INSTRUCTIONS FOR USE

BODYSTAT® 1500

This “Instructions for Use” contains information on how to operate, storage and disposal BODYSTAT®1500



HAND-HELD
BODY COMPOSITION
MONITORING UNIT



Bodystat®

BODY COMPOSITION TECHNOLOGY

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SECTION A

GENERAL

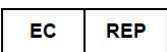
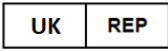
INFORMATION

YOUR HARDWARE UNIT

The **BODYSTAT® 1500** package consists of the following:

- * Bio-electrical Impedance (BIA) Measuring Unit
- * **Red & Black** 1.2 metre Cable Leads (2)
- * Hardware User's Guide
- * Disposable Electrodes (100)
- * Duracell/Procell AA Batteries (4)
- * Bodystat Calibrator
- * Protective Navy Blue Carrying Bag
- * 12 month Warranty on a return to factory basis (**excluding leadwires**)

DEFINITIONS AND SYMBOLS

	Symbol indicating the conformity to the Medical Devices Directive		Symbol indicating UK conformity assessed
	Date of manufacture (yyyy)		Manufacturers address
	Indication that the device is a Medical Device		This device is rated BF as per IEC60601-1
	European Union Authorised Representative		United Kingdom Responsible Person
	Keep dry		Humidity limitation
	Symbol advising those subjects with pace-makers or any implantable electronic device should not be tested		Represents a Warning or Caution message
	Temperature limitation		Consult instructions for use
	Symbol indicating how to dispose of your Bodystat device at the end of its life cycle.		Serial Number

DEFINITIONS

TBW	Total Body Water
BMR	Basal Metabolic Rate
EAR	Estimated Average Requirement for Calories
BMI	Body Mass Index
BIA	Bio-Electrical Impedance Analysis
FFM	Fat –Free Mass (Lean Weight)
WHR	Waist-to-hip ratio

TRANSLATIONS

If this **BODYSTAT 1500** User Guide is required in any of the following languages, please email info@bodystat.com:

Bulgarian	English	Hungarian	Russian
Czech	Finnish	Italian	Slovene
Chinese	French	Irish	Spanish
Danish	German	Polish	
Dutch	Greek	Portuguese	

Latest version of this document

If you want to check about any update or latest version or revision of this document, please email info@boystat.com indicating your model and serial number.

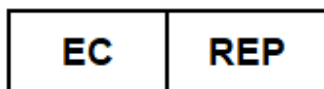
WARRANTY DISCLAIMER

Although all **BODYSTAT** hardware units and software programs are tested before release, no claim is made concerning the accuracy of the product. **BODYSTAT LTD**, as the manufacturers of the product and authors of the software, their distributors and dealers, cannot assume liability or responsibility either implied or expressed for any loss or damage either real or consequential arising out of the use of this product.

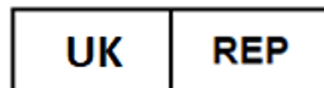
It is a condition of every sale and purchase of the product that the purchaser accepts all such risk, and acceptance thereof shall be deemed to have been given when purchase is made.

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NOTES, CAUTIONS AND WARNINGS FOR USERS



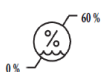
NOT recommended for Females in the early stages of pregnancy



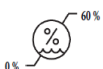
NOT recommended for subjects with pace-makers or any implantable electronic device.



If your **BODYSTAT®1500** unit arrives in cold weather, allow the system to warm up to room temperature before you switch on the unit.



Exposing a cold computerized system to a warm room causes condensation that could damage the system.



Wait at least 24 hours to allow for any possible condensation that may have formed inside the casing to dry before you operate the system.



Do **NOT** attempt to connect the **BODYSTAT®1500** hardware unit nor the Printer to a mains electricity supply.



This instrument is an internally powered, Type BF Applied Part device according to IEC 60601-1.



As with any other common electronic device, the **BODYSTAT®1500** unit of Bodystat Limited emits electromagnetic energy to perform its intended function. Nearby electronic equipment may be affected.



The device is not suitable for oxygen-enriched environments.



The device is not suitable for use with flammable gases, including environment with flammable anesthetics.

Cleaning guidelines: the hardware unit does not have to be sterilized but it is strongly recommended to perform periodic cleaning by wiping with a clean microfiber cloth and follow the recommendations from local health authorities regarding controlling the spread of infections.

SECTION B

HOW TO USE

BODYSTAT® 1500

INTRODUCTION

The **BODYSTAT® 1500** body composition monitoring unit is designed to provide a fast and effective method of measuring body composition using modern technology and is ideal for use in the medical, health and fitness environment.

Using the scientifically validated principle of *Bio-electrical Impedance Analysis (BIA)*, a complete analysis of body composition comprising fat, lean weight, optimal total body weight range and body water levels, is instantly displayed on the touch screen liquid crystal display (LCD) screen of the hand-held unit.

The **BODYSTAT® 1500** unit is battery-operated, lightweight and easy to use requiring no specialist skills. The unit has been electronically precision engineered to the highest quality standards offering the user a safe and efficient means of measurement.

THE MEANING AND IMPORTANCE OF BODY COMPOSITION ANALYSIS

Body composition is the amount of lean and fat that makes up total body weight. Lean comprises muscle, bone and water. Whatever the total weight, lean and fat proportions need to be within established recommended limits in order to avoid the many health problems associated with being "over-fat". These include high blood pressure and cholesterol levels, arteriosclerosis, coronary disease, respiratory problems and kidney disorders.

Equally serious, however, is the problem of having too little body fat, since adipose tissue is vital for normal organic function. The dramatic increase in anorexia nervosa, bulimia and a "fear of obesity" over the last decade demands an awareness of correct body composition.

Therefore, *fat weight, NOT total weight*, determines health risk and needs to be measured for balanced body composition.

WHAT DOES THE BODYSTAT 1500 UNIT MEASURE?

The **Bodystat® 1500** measures/estimates:

Options Displayed on the 1500 unit	Explanation
Fat %* & Normal Range	Fat as a % of Total Body Weight
Fat Weight* & Normal Range	Est. FAT Weight determines Health Risk
Lean %* & Normal Range	Lean as a % of Total Body Weight
Lean Weight* & Normal Range	Est. Lean Muscle Mass includes Muscle, Bone & Water
Water %* & Normal Range	Total Body Water as a % of Total Body Weight
Total Body Water* & Normal Range	Total Body Water Volume in Litres
Dry Lean Weight*	Dry Lean Weight includes Muscle, Bone e.g. Lean minus Total Body Water
Basal Metabolic Rates*	Basal Metabolic Rate (Calories at rest)
BMR/Body Weight*	Basal Metabolic Rate per Kg/LB of Body Weight
Est. Average Requirement*	Estimated Average (Energy) Requirement based on the Activity Level selected
Body Mass Index (BMI) & Normal Range	Body Mass Index (Weight/Ht ² in metric)
Waist-to-Hip ratio (WHR)	The ratio of the circumference of the waist to that of the hips
Impedance Values at 50 kHz	The Resistance to the Flow of the Current at 50 kHz

*estimated

IMPORTANT GUIDELINES FOR EQUIPMENT CARE

It is important to consider that the measurement of bio-impedance involves measuring highly sensitive values. Therefore, care should be exercised when handling the equipment, in particular the Cable Leads.



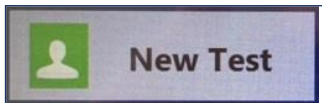
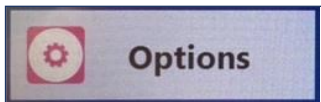
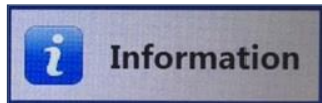
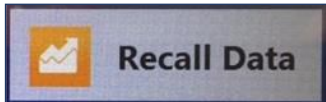
Detailed below are guidelines that we recommend should be followed:

1. The **BODYSTAT®1500** is calibrated with the exact length of leads which are screened/shielded from outside electrical interference and noise to ensure greatest level of measurement accuracy. Therefore, it is recommended that only leads supplied by Bodystat Limited are to be used.
2. Computers and other electrical equipment close by can cause interference with the hardware device which may affect the impedance measurement.
3. Regular calibration checks of the equipment are recommended (refer to **CALIBRATION section**).
4. Care should be taken at all times to avoid damaging the cables, ie they should not be tangled together and avoid tightly rolling them when not in use.
5. It is recommended that the replacement of both sets of cables is made at least annually. However, replacement may be required more frequently if the cables are in constant use. Guidance can be given by the Bodystat Head Office.
6. **Disposal of consumables after use or become exhausted:**
Batteries - these must be disposed of as per local regulations;
Electrodes - these may be disposed of as normal waste.
7. **Duracell® batteries only should be used - NOT re-chargeables.** Batteries should be clicked into place firmly to avoid excessive battery drainage.

OPERATIONAL FEATURES

The **BODYSTAT® 1500** hand-held unit has been specifically designed to facilitate ease of use, speed of input and subsequent access to subject data.

The following operational features are provided:

SELECTION	WHAT TO DO	BUTTON IMAGE
Turning the device ON/OFF	Press and hold briefly the On/Off Button	
Entering Subject Data and performing a measurement	Press the New Test button after switching the device on	
Installation/Options Mode Includes options for: - <i>Language Options</i> - <i>Display Options</i> - <i>Imperial/Metric</i>	Press the Options button after switching the device on.	
Serial Number/Year of Manufacture	Press the Information button after switching the device on.	
Recall Subject Data	Press the Recall Data button after switching the device on.	

Subject data may be entered, displayed and recalled in imperial or metric measurements and may be altered at any time.

The **BODYSTAT® 1500** unit is initially programmed to display ALL measurement data except the Lean % which is not shown as a factory default option. The operator, however, can choose to display specific information only (refer **INSTALLATION MODE, page 14**).

The most recent 100 tests are always automatically stored in the memory of the **BODYSTAT® 1500** unit and subject data may be recalled at any time. Data stored in memory is **not lost** after the unit is switched off (refer **RECALL SUBJECT DATA, page 29**).

If the unit has been switched on and no data has been entered for 60 seconds, an alarm signal sounds to warn the operator that the unit is still on and that battery power is being utilized.

CONNECTING THE CABLE LEADS

Prior to connecting your cable leads we recommend that you read the section of the manual called ***IMPORTANT GUIDELINES FOR EQUIPMENT CARE***.

The **BODYSTAT®1500** unit has two main cable leads. Each lead is to be inserted to the connectors at the rear of the unit. **The red dot on the lead wire should be lined up with the red dot on the device.**

DO NOT insert the leadwire into the device without aligning the red dots. Non-alignment will damage the socket mounted on the PCB. Such damage is not covered by our warranty.



The two main blue cable leads each contain a **RED** and **BLACK** crocodile clip. These can be attached to either the foot or the hand, they are therefore, interchangeable.

INSTALLATION MODE (OPTIONS)

The **1500** unit can be programmed by the operator to display specific information only. Subject data may be entered, displayed and recalled in imperial or metric measurements and may be altered at any time.

OPTIONS MODE

The **Installation Mode** comprises the following:

- **DISPLAY OPTIONS**
- **IMPERIAL / METRIC OPTIONS**
- **MID-RANGE OPTIONS**
- **LANGUAGES OPTIONS**

This facility allows the operator to choose:

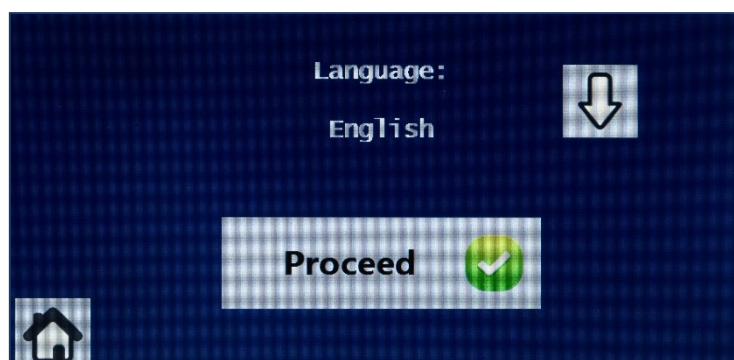
1. **Information** required to be **entered**, e.g., Gender, Age, Height & Weight
2. **Information** required for **display**, e.g. Fat %, etc.
3. Units of measure in **metric or imperial**.
4. The **average expected input measurements** (or mid-range) of subjects to reduce the time of subject data entry.
5. **Data for Input/Display**, e.g., measure and display Impedance values only.
6. Select **language option**.

To access **Options Mode select** the icon from the main screen.

LANGUAGES

Press the **<↓>** key to switch between the language options. Press **PROCEED** to select.

After pressing the proceed button for language, the selection reverts to 4 options for Units, Inputs, Outputs Or Printer. Further selections can be made or alternatively, press the home button to return to the main screen.



UNIT OPTIONS

The Unit option allows the user to select between the options below:

Height:

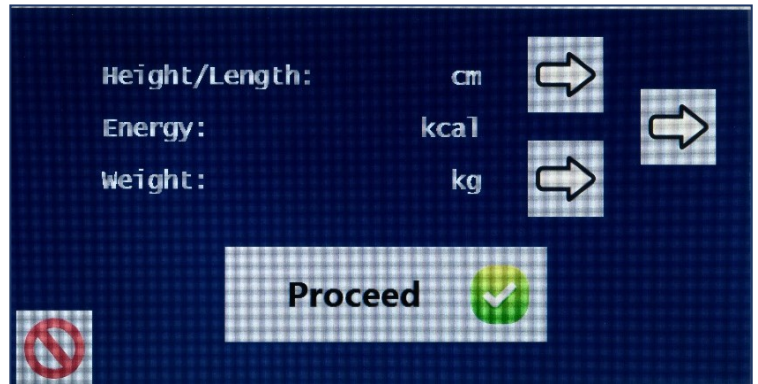
cm (centimetres) or **ft in** (feet & inches)

Calories:

kilocalories (kcal) or **kilojoules (kJ)**

Weight:

kg (kilograms), **st/lb** (stones/pounds) or **lb** (pounds)



Press the **<=>** to change the appropriate unit selection and once complete, press the proceed button to confirm.

After pressing the proceed button, the selection reverts back to the 4 options for Units, Inputs, Outputs or Printer. Further selections can be made or alternatively, press the home button to return to the main screen.

INPUT OPTIONS

The input options can be amended to reduce the time of subject data entry when performing a measurement. For example, if only female subjects are being measured or in the event of a particular age group being constantly measured.

By selecting the input option, the device will then display the standard default measurements required for input.

Subject Defaults														
Gender:			↑	Next ↓										
Age:	45 Yrs		⊘	Proceed ✓										
Height:	175 cm													
Weight:	68.0 kg													
<table border="1"> <tr> <td>-</td> <td>M</td> <td>-</td> <td>F</td> <td>-</td> </tr> <tr> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </table>					-	M	-	F	-	-	-	-	-	-
-	M	-	F	-										
-	-	-	-	-										

The first option available is for gender. Select the M for Male or F for Female.

Press the **<↓>** key to move down to the next input option.

Age, Height and Weight all have numerical selections and can be entered by choosing the appropriate numbers for that field. Once each option has been entered, press the **<↓>** key to move down to the next input option.

Once the weight option has been entered, the user can either select the next button to move to the next screen or the proceed button to save the recently entered options.

If the cursor is flashing on the weight option and the next button has been, the next screen showing waist/hip and activity level is displayed.

The screenshot shows a dark blue interface titled 'Subject Defaults'. It has three input fields: 'Waist:' with '11 cm', 'Hip:' with '102 cm', and 'Activity:' with 'Medium'. To the right of these fields are three buttons: a red circle with a white 'X' (abort), a 'Next' button with a white arrow pointing down, and a 'Proceed' button with a green checkmark. Below these buttons is a numeric keypad with buttons for 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0.

The first option is waist, followed by hip. Both options have numerical selections and can be entered by choosing the appropriate numbers for that field. Once each option has been entered, press the <↓> key to move down to the next input option.

For Activity Level select the appropriate option for the activity level required. Select one of five choices of average expected activity level of the subject being tested ranging from Very Low to Very High

Activity Level options:

On-screen	Description	The activity level has no effect on the body composition or hydrational/nutritional results. It is used only in the estimation of the Activity Energy Requirement.
V Low	Very Low	
L/M	Low/Medium	
Medium		
M/H	Medium/High	
V High	Very High	

	Range (Min/Max)
Age	1 to 99 years
Height	1' to 7'6" or metric equivalent of 30 cm to 229 cm.
Weight	2 lb to 660 lb or metric equivalent of 0.9 kg to 300 kg
Waist/Hip	5 cm to 648 cm or 2" or 255".

Once all options have been entered, press the proceed button to save the recently entered options.

Alternatively, press the red abort <> button to exit the screen without saving.

OUTPUT OPTIONS



The green plus button confirms that the selection will be displayed in the results



The red cross button hides the selection and the item chosen will not be displayed in the results.

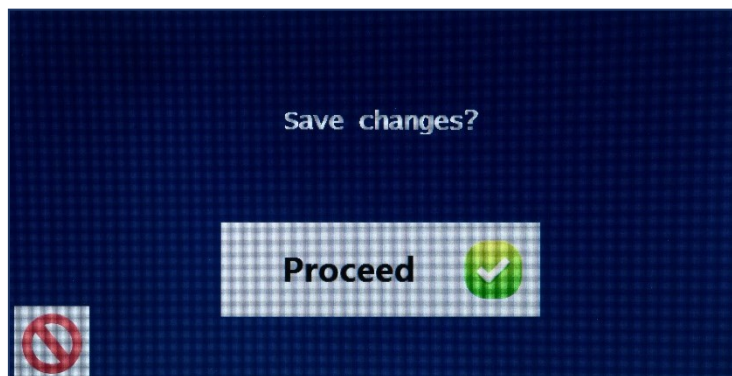
Press **<↓>** proceed. The Output options available are:

BODY COMPOSITION PIE CHART	
FAT %	
FAT WEIGHT	
LEAN %	
LEAN WEIGHT	
DRY LEAN WEIGHT	
WAIST/HIP RATIO	
TOTAL WEIGHT	
TBW %	
TBW	
BASAL. MET. RAT	
BMR/WEIGHT	
EST. AVERAGE REQ	
BMI	

Pie Chart
 Fat %

Fat
 Lean %

Lean
 Dry Lean



Once the options have been saved or aborted, the selection reverts back to the 4 options for Units, Inputs, Outputs or Printer. Further selections can be made or alternatively, press the home button to return to the main screen.

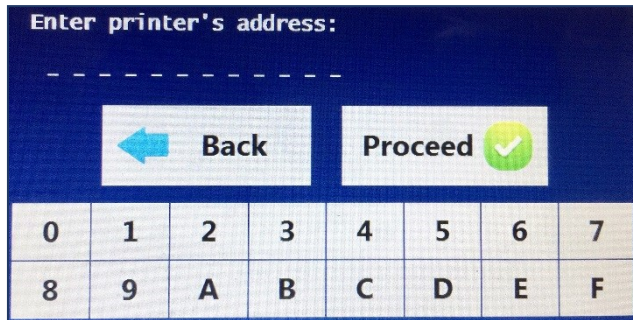
If the Waist Hip Ratio or EAR option is unselected from the output results, then the corresponding Waist Hip and Activity Level input measurements will also not be displayed when performing a test.

If all of the output display options have been removed except for the raw data impedance measurements, then the input screens for age, gender, height and weight, waist and hip will not be displayed. In this instance, the first screen that will appear when performing a test, will be the connect electrodes screen.

PRINTER OPTIONS

The Bodystat®1500 device has the option of printing to a thermal printer. When using the printer for the first time, it is important that the printer is first paired with the Bodystat® 1500 device.

To pair the printer, press the printer button and the screen will ask for printer's address. Ensure that the printer is switched on at this stage.

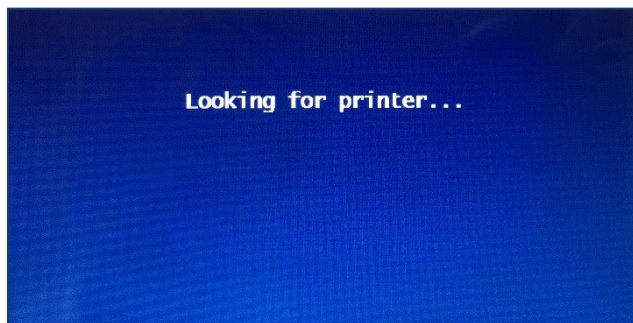


Enter printer's address:

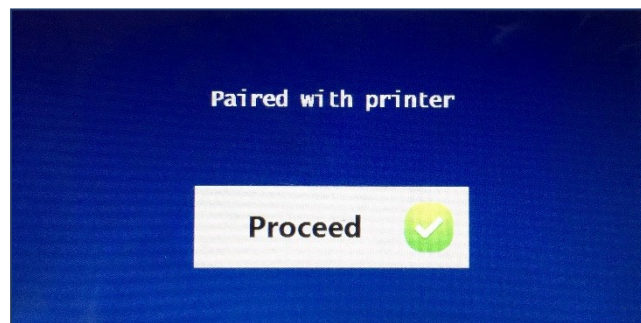
Back Proceed

0	1	2	3	4	5	6	7
8	9	A	B	C	D	E	F

The printer's address can be found on the label on the reverse of the printer. The printer's address is a 12 digit code which must then be typed into the Bodystat device. Once the code has been typed into the device, press the proceed button.



The Bodystat device will then continue to search for the printer. If the device does not find the printer, ensure that the printer is switched on.



Once the device has been paired with the printer, a message will be displayed confirming the pairing has been completed. Press the proceed button to complete and the device will revert you back to the 4 options for Units, Inputs, Outputs or Printer.

BODYSTAT MEASUREMENT



NOT recommended for Females in the early stages of pregnancy



NOT recommended for subjects with pace-makers or any implantable electronic device.

With the application of our single frequency **BODYSTAT®1500** unit, certain pre-test protocols are recommended. However, in the medical environment it is unlikely that these requirements necessarily apply and will vary from circumstance to circumstance.

Nevertheless, these pretest conditions are listed for information purposes only. For accurate and reproducible results on repeat tests, it is very important that the subject is as normally hydrated as possible. The following guidelines should ideally be followed.

- NO eating or drinking 4 to 5 hours prior to the test.
- NO exercise 12 hours prior to the test.
- NO alcohol or caffeine consumption 24 hours prior to the test.

***Proper hydration is essential for a healthy body status.
DO NOT therefore perform a test after strenuous exercise.***

The body would have lost excessive fluid through sweat and an abnormally low fluid level would increase the Impedance measurement resulting in an artificially higher value than would normally be the case.

For best results with repeat tests on the same subject over a period of time, many users try to perform the test the same time of day (e.g. early morning, before lunch) wherever practicable.

Note that variations in body composition are likely to occur in subjects premenstrually, during menstruation, with renal failure, on some prescribed medications (particularly diuretics) and other conditions causing water retention or water loss.

PREPARING SUBJECT FOR MEASUREMENT

Height and weight must first be accurately determined. Note that these input factors are required to determine body composition results of Fat, Lean, etc which is displayed on the **BODYSTAT®1500** unit.

However, where the subject weight is not available, the impedance measurement will still be displayed.

Ensure that the scale being used to measure weight has been accurately calibrated to measure to the nearest 0.1 kg or 0.2 lb.

For greater accuracy, it is preferable to measure height in metric, i.e. centimetres, as opposed to inches or half inches.

When repeat measurements are made on the same subject ensure that the **exact same** height as earlier measurements is used unless the subject has in the interim grown naturally in length.

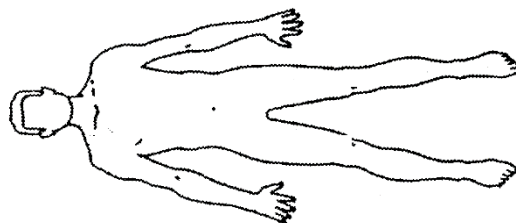
Have the subject remove the right shoe and sock or stocking, and lie flat with the arms and legs spread slightly as shown in the diagram.



NO parts of the body should be touching one another.

In some overweight cases the inner thighs may touch in spite of the legs being spread slightly. Ensure that this does not happen by further spreading the legs. The client should be in a comfortable relaxed position and then proceed to place the electrodes.

SUBJECT POSITION



PLACEMENT OF ELECTRODES AND LEADS

The self-adhesive disposable electrodes are attached to the **RIGHT** hand and **RIGHT** foot, in order to avoid the battery current (low voltage) passing through the side of the body where the heart is situated.

The **BODYSTAT 1500MDD** has two sets of main leads which are then divided into a **RED** and a BLACK lead. *It does NOT matter which of the two sets of main leads is connected to the right hand or right foot.* The two sets of main leads are therefore interchangeable.

However, it is important to ensure that the **RED** (injecting) leads are connected to the electrodes just behind the **finger** and **toe** as shown in the illustration.

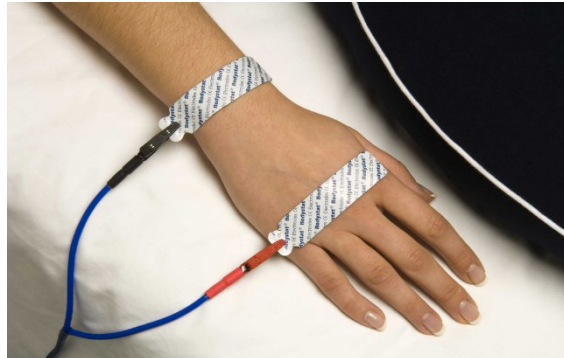
Attach the crocodile clips to the exposed metal tab strip of the electrode. For convenience, the metal tab on the electrode should point in the direction from which the leadwire tension will occur as illustrated.

The **BLACK** (measuring) leads are then connected to the electrodes on the right **wrist** and right **ankle**. Placement of the electrodes is as follows:

RIGHT HAND

RED LEAD: Behind the knuckle of the middle finger.

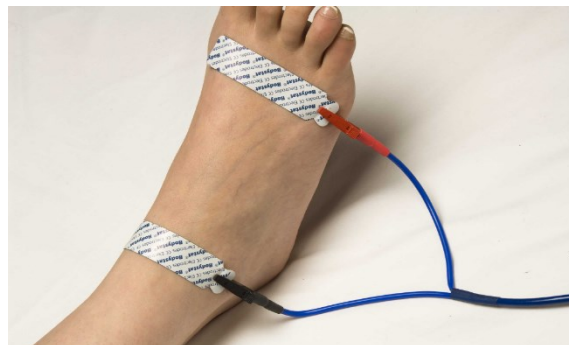
BLACK LEAD: On the wrist next to the ulna head.



RIGHT FOOT

RED LEAD: Behind the 2nd toe next to the big toe.

BLACK LEAD: On the ankle at the level of and between the medial and lateral malleoli (the large protruding bones on the sides of the ankle).

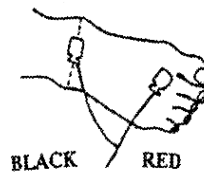
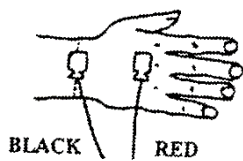


Once the subject is the PROCEED button on the equipment.

This is to ensure that the fluid levels have stabilized in the body before a measurement is performed.

IMPORTANT POINTS REGARDING MEASUREMENT

- Subjects should be measured on a non-conductive surface.
- **Correct placement of the BLACK INNER electrode on the wrist and the ankle is critical.** The electrode placement behind the fingers and toes is not as critical.
- Another easy way to find the correct position of **the black inner electrodes** is to **draw an imaginary straight line** between the protruding bones on the wrist and ankle as described above. Then place each electrode in the centre of that line with the line also passing through the centre of the electrode tab.



BLACK leads are placed on the **BACK** (rear) of the hand and foot

- Once the electrode sites have been selected it may be necessary to apply a solvent to remove excess skin oil. In research conditions it might be considered necessary to shave the site of excess hair. This is to ensure that good contact is made between the skin and the electrode. Poor contact will result in higher Impedance values resulting in an over-determination of body fat levels.
- The skin should be at normal body temperature and not be sweating.
- Once in place, press down on the electrodes to ensure good contact. The electrodes may be repositioned if necessary but should not be used on another subject since they may dry out thereby artificially increasing the Impedance values.
- Keep unused electrodes in the bag to ensure freshness. **DO NOT** cut the electrodes in half to increase their utilization. This will result in inaccurate measurements and poor reproducibility.
- Only the **best quality BODYSTAT electrodes** as those supplied by **BODYSTAT LTD**, or their accredited distributors, should be used and **used only once**. This is to ensure accuracy of measurement and good reproducibility of tests.
- Pins in bones will not affect the body composition measurements.

ENTER SUBJECT DATA

Switch the **BODYSTAT® 1500** unit **ON**. No message will be displayed on the touch screen LCD screen if the battery is flat, in which case replace the batteries with new Duracell/Procell Batteries.

Select the New Test button on the screen to perform a Bodystat measurement.

Once the new test option has been selected, the following screen will be displayed:

Test Number:	2	↑	Next ↓	
Gender:	Male			
Age:	5 Yrs	⊘	Proceed ✓	
Height:	175 cm			
Weight:	68.0 kg			
1	2	3	4	5
6	7	8	9	0

The **BODYSTAT® 1500** unit automatically allocates the next available number. The test number is used to identify the subjects' data if tests are to be recalled for viewing. It is, therefore, recommended that a manual record of the test numbers should be maintained against the respective subjects.

The first option available is for gender. Select the M for Male or F for Female. Press the **<↓>** key to move down to the next input option.

Test Number:	2	↑	Next ↓	
Gender:	Male			
Age:	5 Yrs	⊘	Proceed ✓	
Height:	175 cm			
Weight:	68.0 kg			
1	2	3	4	5
6	7	8	9	0

Age, Height and Weight all have numerical selections and can be entered by choosing the appropriate numbers for that field. Once each option has been entered, press the **<↓>** key to move down to the next input option.

Height and weight may be displayed either in imperial or metric (refer **CUSTOMISING YOUR UNIT**).

Once the weight option has been entered, the user can either select the next button to move to the next screen or the proceed button to move to the measurement screen (without entering waist/hip or activity levels). If the waist/hip and activity screen is skipped at this stage, then the device will use the

defaulted option for those results (unless these have been omitted in the options menu).

If the cursor is flashing on the weight option and the next button has been, the next screen showing waist/hip and activity level is displayed.

Test Number: 2

Waist: 11 cm

Hip: 102 cm

Activity: Medium

Next

Proceed

1	2	3	4	5
6	7	8	9	0

The first option is waist, followed by hip. Both options have numerical selections and can be entered by choosing the appropriate numbers for that field. Once each option has been entered, press the <↓> key to move down to the next input option.

Test Number: 2

Waist: 11 cm

Hip: 102 cm

Activity: Medium

Next

Proceed

1	2	3	4	5
6	7	8	9	0

For Activity Level select the appropriate option for the activity level required. Select one of five choices of average expected activity level of the subject being tested ranging from Very Low to Very High.

The activity level has no effect on the body composition or hydrational/nutritional results. It is used only in the estimation of the Activity Energy Requirement

See the [Input options](#) section ([page 15](#)) for details about choices available for the activity level

If the Waist Hip Ratio or EAR option is unselected from the output results, then the corresponding Waist Hip and Activity Level input measurements will also not be displayed when performing a test.

Notes about activity levels:

NOTE 1: Very Low - for a person with light energy expenditure at work and who has non-active leisure pursuits.

NOTE 2: Very High - for a person in energy-demanding work whose leisure time pursuits are also energy-demanding.

Refer [METABOLIC RATES](#) for detailed description for each of the five Activity Levels.

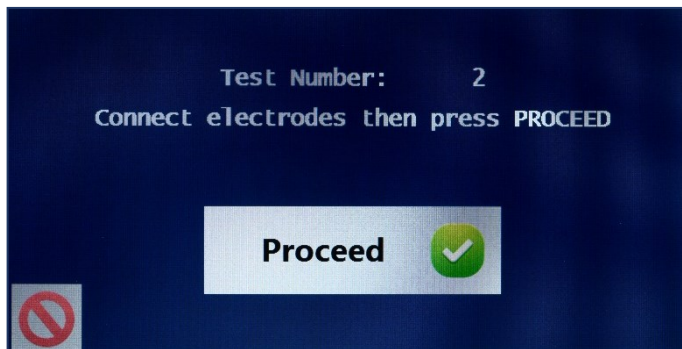
Once all options have been entered, press the proceed button to move to the measurement screen.

Alternatively, press the red abort <> button to exit the screen without measuring.

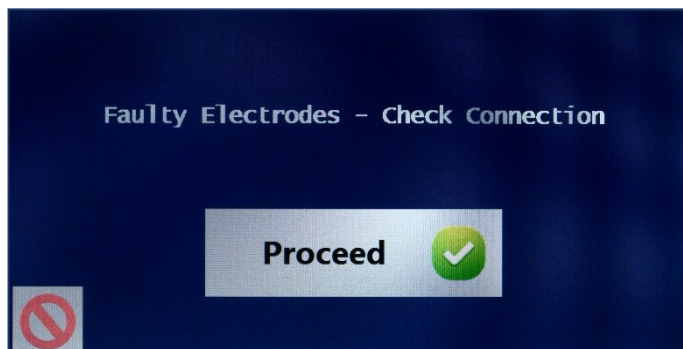
The next screen displayed is for connecting the electrodes. The unit has already been connected to the four surface electrodes as fully explained in the **PERFORMING A MEASUREMENT** section of this manual and the required subject data has now been entered.

Ensure that the subject has been lying down for approx. 3 to 4 minutes for greatest accuracy of measurement and reproducibility of results.

Check the subject to ensure that all the electrodes and leads are firmly connected and that the subject is still lying flat in the correct position.



Press the **<Proceed>** key.



If the leads have not been properly attached to the electrodes, a message will be displayed:

Re-check the electrode and lead connections. Ensure that the subject is still in the correct position and press the **<Proceed>** key as before.



Wait a few seconds for the results to be displayed on the LCD screen.

The data has now automatically been saved and stored enabling both input and output subject data to be recalled at a later date.

The electrodes and leads may at this stage be removed.

The next screen that is automatically displayed is dependent on how the operator has set up the user selectable **DISPLAY OPTIONS** (refer **INSTALLATION MODE, page 14**) as defined in that section.

REPEATING A MEASUREMENT

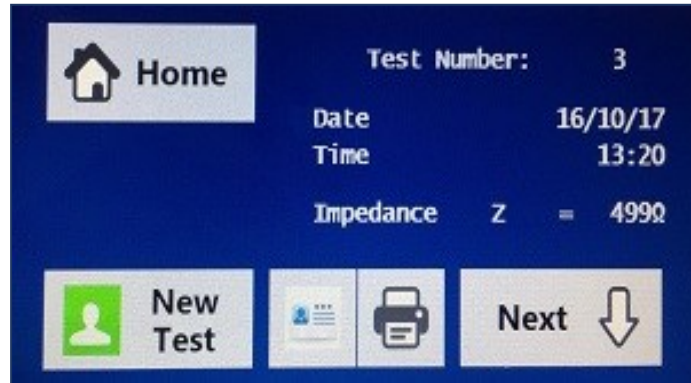
In the event that you wish to repeat a measurement and provided that the unit **is not switched OFF**, it will hold the previous input data in it's memory. This will allow a quick re-test or simple amendment to an incorrectly keyed in parameter. Once the unit is switched off, it will revert to the default settings.

The user can select to change the default settings, refer to **INSTALLATION MODE**. This facility is useful if the same subject is being constantly measured over a period of time. This will allow the testing to be performed quickly, saving time for maximum operational efficiency.

DISPLAY RESULTS

After successful measurement and processing of the subject data, the results are displayed as selected by the operator.

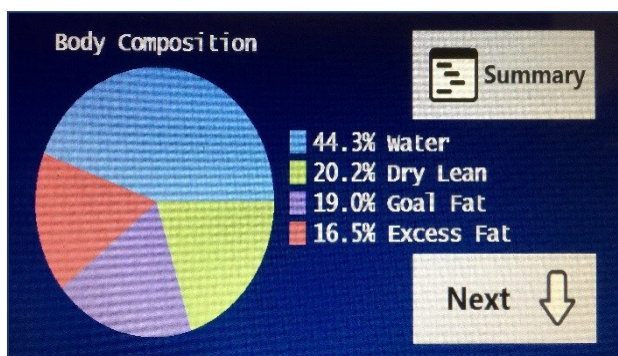
The first screen displayed is the test summary screen which shows the Impedance at 50 kHz.



	Once the summary screen has been displayed, a new test can now be performed by selecting the new test button.
	Alternatively, the results for that particular test can be viewed by selecting the results icon.
	To print the results to the paired thermal printer, select the print icon.

RESULTS ICON

If the results icon has been pressed, then the first screen displayed is the input data that was entered for that particular test. By pressing the next button the result output data is now displayed. If the next arrow was pressed from the summary screen, then the first screen displayed is the actual results for that subject.



The first result screen displayed is the body composition pie chart for that particular test. Each pie chart shows the Fat, Water and Dry Lean.

Each result displays the **Estimated Measured Result**. Underneath the result displays the **Recommended** or **Normal Level** (where appropriate) for the subject measured.

Select the Next button to move to the next results screen or alternatively press the summary button to move back to the summary page.

The display results are automatically stored in memory and the operator can safely scroll forwards through the data by using the <↓> key.

Fat % 35.5 % Normal 13 - 19 % Fat 36.4 kg Normal 10 kg - 15 kg Lean % 64.5 % Normal 81 - 87 % Lean 66.2 kg Normal 64 kg - 69 kg Dry Lean 20.7 kg	Summary Next ↓	Fat as a % of Total Body Fat Weight Lean Weight (muscle, bone & water) Dry Lean Weight (muscle, bone)
---	--------------------------------------	---

Total Weight

Body Mass Index (BMI)

Total Body Water %

Total Body Water Volume

Waist/Hip*

Total weight 102.6 kg Normal 76 kg - 82 kg	BMI 36.4 Normal 20 - 25	TBW % 44.3 % Normal 55 - 65 %	TBW 45.4 lt Normal 56 - 67 lt	Waist/Hip 0.84 High Risk 1.00
Summary				Next ↓

← Back	Basal Metabolic Rate 2021 kcal
Summary	BMR/Body weight 19.7 kcal/lb
	Est. Average Req. 3233 kcal

Basal Metabolic Rate

BMR/Body Weight

Est. Average Requirement

RECALL SUBJECT DATA

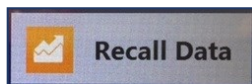
This feature allows an operator to recall, at a later stage, the test data for manual recording purposes or entry into other computer software programs such as spreadsheets, etc.

At the time of subject data entry, a test number is automatically allocated by the **BODYSTAT® 1500** unit. It is advisable to manually record the name of the subject being tested against that number. This will enable an operator to subsequently recall data of the correct subject number.

A maximum of 100 tests will be stored in the memory of the **BODYSTAT® 1500** unit at any one time. When the memory reaches its maximum capacity FOR THE FIRST TIME, and a further test (number 101) is performed, the oldest number, i.e. test number 1, is automatically dropped from the memory.

At all times thereafter, the most recent 100 tests will always be stored but successive tests will be numbered in ascending order, i.e. 101, 102, 103, etc to a maximum number of 99,999. Thereafter, the numerical series will automatically revert back to number 1. Thus each test will maintain its own unique allocated number for subsequent recall purposes.

NOTE: Tests are automatically stored in memory after subject data has been entered and the **BODYSTAT® 1500** unit has successfully performed a measurement. ***Data is not lost after the unit is switched off or during battery replacement.***

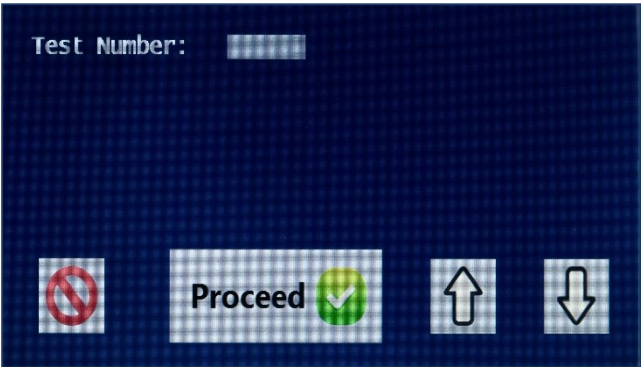


To access this recall option, select the recall data button from the home screen.

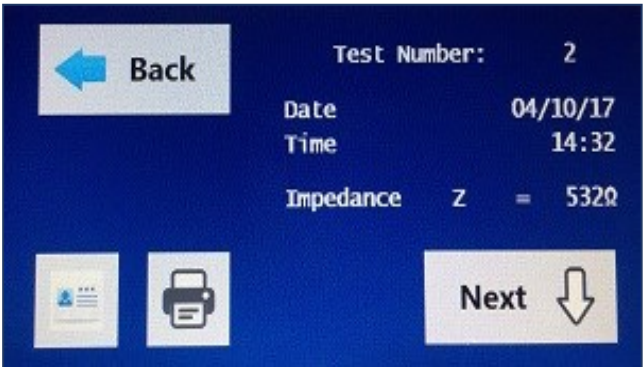
The screen on the right is displayed on the LCD screen:

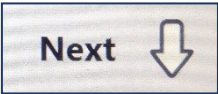
The number that will be displayed at the top shall be the most recent test that was tested and saved immediately prior to selecting this option. Ten tests are displayed per page and it may be necessary to use the up and down arrow keys at the bottom to scroll through the pages.

Select the test to display and press the proceed button to view the Input details and Results information.



The first screen displayed is the test summary screen which shows the Impedance at 50 kHz.



	The results for that particular test can be viewed by selecting the results icon.
	To view the results for that particular test without viewing the input data, select the next button.
	To print the results to the paired thermal printer, select the print icon.

Press the home button to return to the main screen.

The first screen displayed is the input data that was entered for that particular test. By pressing the next button the result output data is then displayed.

Once all the results have been reviewed, the user has the option of selecting the back arrow or alternatively going back to summary screen. The back arrow allows the user to go back to the recall screen to select a further test.

NOTE:

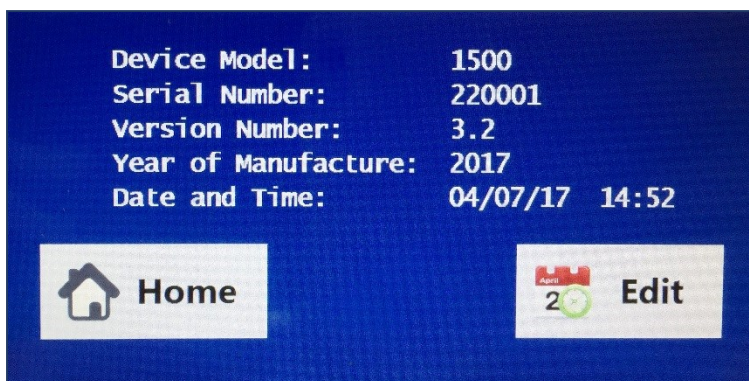
- The **OUTPUT** data displayed will depend on what has last been saved in **DISPLAY OPTIONS** (refer **INSTALLATION MODE, page 14**) of the program. If the operator wishes to display, for example, only **FAT %**, the **DISPLAY OPTIONS** must first be amended.
- Test data originally stored in **kg** weights may be recalled in **lb** or **st/lb** and vice versa. Similarly, height may be entered in **ft/ins** and recalled in **cm**. In each case, simply change the options in **INSTALLATION MODE**.

INFORMATION ABOUT THE DEVICE

Access to the **BODYSTAT® 1500** unit serial number may be necessary from time to time. This will be required for warranty purposes and when the upgrade **Bodystat® WINDOWS** software programs are purchased.

The serial number may be accessed as follows:

While switching the unit **ON** and then select the information button from the home screen.



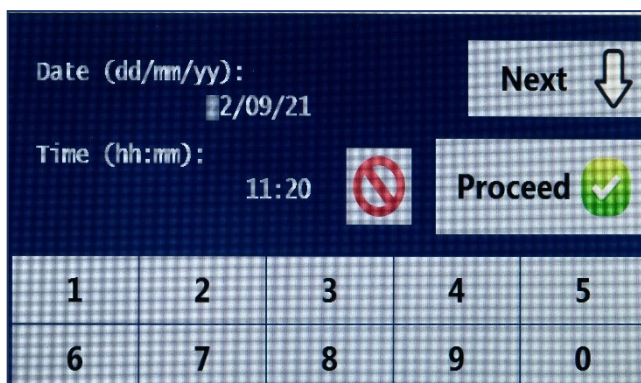
Press the home button to return to the main screen.

LABEL ON REVERSE OF DEVICE:

Each device has a label on the rear of the machine detailing the serial number and the date of manufacturer. The number following the 10 is the serial number of the device. The number following 11 is the date of manufacturer (year, month, day).

EDIT DATE AND TIME

To edit the time, select the edit button at the bottom of the screen. The cursor will flash over the number in question and use the numerical keypad at the bottom of the screen to enter the date. Press the next key to move down the time option and the numerical keypad can be used to change the time option.



To exit the screen without entering a date or time, press the red abort <  > button.

Once complete select the proceed button and the information screen will again be displayed.

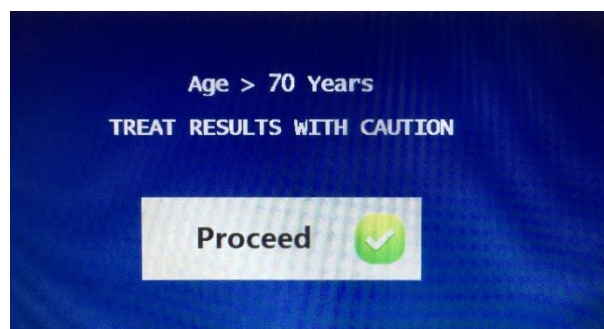
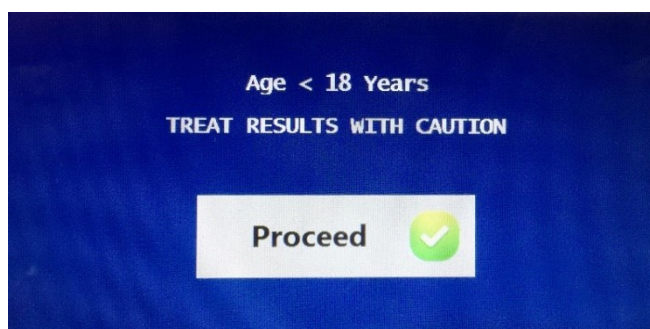
ADDITIONAL INFORMATION

AGE OUT OF RANGE

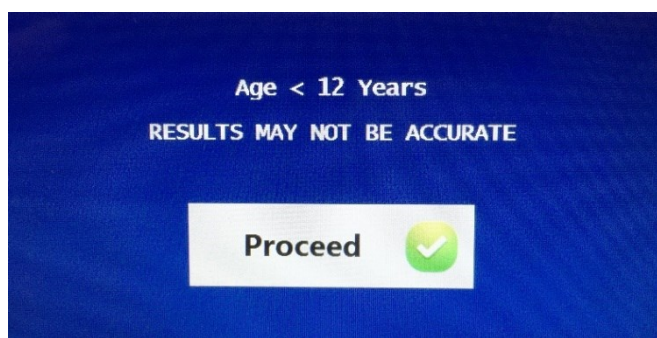
The regression equation or formula used in the program of the **BODYSTAT® 1500** unit for the determination of body composition, is suited for the age groups 18 to 70 years.

Age groups outside of this range may of course still be measured (for example, for regular monitoring of changes in body composition) but the results, in particular the recommended or optimal results, may have to be treated with caution.

If the age of the subject being measured is **between 12 and 17** or **older than 70 years**, the following message will be displayed before the first output message is displayed:



If the age of the subject being measured is **under 12 years**, the following message will be displayed:



An accurately measured Impedance value and the BMI equation will still be displayed in either of the above eventualities.

IMPORTANCE OF TRACKING CHANGES

It may be important to note, even if the absolute percentage fat figures, for example, are suspect for a particular subject, that accurate measurements can still nevertheless be made on a regular basis to **monitor the changes in body composition** over a period of time.

Since the **BODYSTAT® 1500** unit measures the Impedance value very accurately it has excellent reproducible qualities. This enables an operator to track whether fat or lean weight (for example) on the same subject is on the increase or decline. Thus even if there is some doubt as to the accuracy of the absolute figures, tracking the changes of body composition can help to determine whether any weight reducing or nutritional program, for example, is having the desired effect in that fat weight is reducing and/or lean weight is increasing.

The **Impedance value** on its own may also give the first signs of **changes in the nutritional status of a patient**. If the Impedance value increases over consecutive measurements (in terms of days, weeks or months, etc) it may indicate that the body is losing fluid (assuming that there is not a significant change in total body weight). This is because the electronic resistance to the flow of the current in the body when the measurement is taken has increased. Water is a good conductor of electricity and the less fluid in the body the higher therefore the resistance factor in the body. This results in a higher Impedance value being registered by the **BODYSTAT® 1500** unit and hence higher fat % figures and lower body fluid volumes.

SECTION C

TECHNICAL

INFORMATION

METABOLIC RATES - BASAL (At Rest) and ACTIVITY LEVELS

ESTIMATED AVERAGE (Energy) REQUIREMENT (E.A.R.)

To estimate the total daily energy expenditure level of a person, an assessment of the average activity level during a 24 hour period should be made when entering the data in the **BODYSTAT® 1500** unit. This can only be a subjective assessment, but the following table may help:

ACTIVITY LEVEL

Level of Activity	General	Activities
Very Low <i>Movement Restricted</i>	Generally inactive.	Laying at ease, sitting, writing, standing, driving.
Low/Medium <i>Office/Light Work</i>	Recreational activities for short duration and at low intensity.	Cycling (5.5 mph/9 kph), bowling, golf, hiking, tennis, walking (2.5 mph/4 kph).
Medium <i>Weekend Recreation</i>	Sporadic involvement in recreational activities for short duration and at moderate intensity.	Aerobics (low intensity), badminton, cycling (9 mph/14 kph), gymnastics (light), skiing (alpine), swimming, tennis (competitive), ballroom dancing.
Medium/High <i>Moderate Exercise</i>	Moderate job activity and moderate exercise 3 times per week.	Basketball, cycling (11-14 mph/18-22 kph), canoeing (vigorously), disco dancing, martial arts, handball, rope skipping (60-80 rpm), running (5-6 mph/8-10kph), walking (5-6 mph/8-10kph).
Very High <i>Vigorous Exercise at Competitive Level</i>	Consistent job activity and vigorous exercise 4 times per week.	Aerobic (high-intensity), cycling (15-20 mph/24-32 kph), circuit weight training, calisthenics, field hockey, gymnastics (heavy), squash, ice hockey, handball, racquetball, rope skipping (120-140 rpm), soccer, running (7-9 mph/11-14 kph), cross-country skiing (7-9 mph/11-14 kph), swimming (55-70 yds/min / 46-64 metres/min)

CALIBRATION

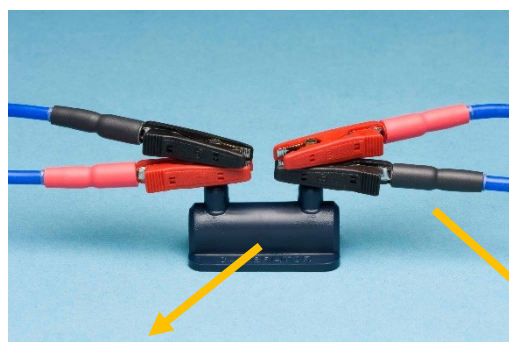
To ensure that correct results of body composition are displayed at all times, a **BODYSTAT** calibrator is supplied with each **BODYSTAT** unit to enable the operator to independently verify that the unit remains in calibration at all times.

This should be done from time to time perhaps weekly depending on frequency of use. However, this is only an independent check and an operator will not be able to physically re-calibrate the unit nor will there be a need to do so.

It is also recommended that the operator use their own body as another independent check. This should be performed on a subject whose body composition does not fluctuate greatly and remains fairly constant.

PROCEDURE

1. Attach one pair of red and black leads from either of the main leadwires to any one terminal of the calibration unit.
2. Attach the other pair of red and black leads from the remaining main leadwire to the other terminal of the calibration unit.
3. Switch the unit **ON**. The leads have already been attached to "**ELECTRODES**" (i.e. the calibrator) and after "**MEASURING**" is displayed, the Impedance value **should reflect a reading of between 496 to 503**. If the reading is outside of this range, first replace **BOTH** lead wires.
4. If the unit remains outside the calibration range, replace ALL 4 batteries with **ONLY** Duracell® or Procell® batteries (**DO NOT use RECHARGABLES**).
5. If the unit still remains out of range, contact **BODYSTAT LTD** or your local **BODYSTAT dealer**.



Bodystat Calibrator

Red & Black Crocodile Clips

Impedance to read between 496 and 503

BATTERY REPLACEMENT

Due to its unique electronic design, **BODYSTAT LIMITED** estimates an approximate **16** hours battery life from the batteries supplied with the **BODYSTAT 1500** unit.

The exact specification for batteries is:

AA Type (LR6) batteries : 4 units

Alkaline 1.5V (NON-rechargeable)

ONLY Duracell® (Model MN1500) or Procell® batteries are recommended



Do not use Type R6 Carbon zinc batteries.



When the device is switched **ON**, a battery symbol is displayed in the top right hand corner of the screen. The battery indicator will show as full with a new set of batteries. As power is consumed fewer black squares will fill the battery indicator. When the battery indicator is empty or on one square it may become necessary for replacement of **ALL** of the batteries.

However, when the batteries need immediate replacement, the device will simply shut down. The batteries need IMMEDIATE replacement before further use is made of the **BODYSTAT 1500** unit:

If the unit has been switched **ON** and no data has been entered for 60 seconds, an **alarm signal** sounds to warn the operator that the unit is still on and that battery power is being utilized. If there is no activity on the device for 3 minutes, then system will turn itself off to conserve battery power.

It is highly recommended that the batteries should be removed from the Bodystat unit should the unit not be used for some time.

Keep battery contact surfaces and battery compartment contacts clean by rubbing them with a clean pencil eraser or a rough cloth each time you replace batteries.



Ensure the unit is switched OFF when replacing the batteries.



Batteries should be clicked into place to avoid excessive battery drainage.

SUPPORT

Useful information and links can be found on our website at www.bodystat.com. Some of these have been listed below along with contact details:

TECHNICAL SUPPORT:

Technical Support including trouble shooting guides and frequently asked questions (FAQ) can be found on our website under the support tab.

RESEARCH & VALIDATION:

Refer to the **BODYSTAT** web page for the principles of [Bioelectrical Impedance Analysis \(BIA\)](#), validation of the accuracy of the **BODYSTAT** technology, the most recent updated **BODYSTAT** research papers and its use in a variety of applications.

CONTACTS:

For Sales Enquiries – sales@bodystat.com

For Research Enquiries – research@bodystat.com

For Hardware/Software Support Enquiries – support@bodystat.com

For Account Enquiries – accounts@bodystat.com

SPECIFICATIONS

MEASUREMENT:

Measuring Principle	Bioelectrical Impedance Analysis (BIA) Technology
Impedance Measuring Range	20 - 1300 Ω (ohms)
Accuracy	$\pm 2 \Omega$ (ohm)

TEST CURRENT 620 Micro-Amps R.M.S.(Root Mean Square)

WAVEFORM Sinusoidal

PC COMMUNICATION Bluetooth Wireless Interface, USB

FREQUENCY 50 KHz (KiloHertz)

INTERNAL POWER SOURCE
Battery powered: 4 x AA (LR6)
Type: Alkaline
Battery preference: Duracell® model MN1500



Do not use type R6 Carbon zinc batteries.

DO NOT CONNECT AN EXTERNAL POWER SUPPLY

OPERATING TEMPERATURE +5°C to +40°C

STORAGE TEMPERATURE 0°C to +60°C

HUMIDITY Less than 70% R.H. (relative humidity)
up to +60°C - non-condensing

ATMOSPHERIC PRESSURE 860 hPa to 1060 hPa

There are no serviceable components

Environmental Responsibility

Disposal of Bodystat devices at the end of its life cycle



For devices located within the European Union

Refer to your local Environmental Agency taking into consideration the [*Directive 2002/96/EC on waste electrical and electronic equipment \(WEEE\)*](#) and, if the case, any other relevant Community legislation in that regards.

For devices located within the UK

Refer to your relevant regulator: Environment Agency (England) / Natural Resources Wales (Wales) / Northern Ireland Environment Agency (Northern Ireland) / Scottish Environmental Protection Agency (Scotland)

Further details can be found in the following statutory instrument: [*The waste Electrical and Electronic Equipment Regulations 2013*](#)

For all other countries/regions

- Dispose of Bodystat devices properly at the end of its life cycle.
- Observe current regulations in force in your country for the disposal of electronic devices.

Other considerations:

All Bodystat devices (including Printed Circuit Boards -PCBs- and polymeric enclosures) meet RoHS compliance (please refer to our website for details)

Cardboard packaging and another packing/storage material should be recycled where possible.

At the end of the life cycle of your **Bodystat** device, it is important that all batteries are removed & recycled according the battery manufacturer's instructions.

Please refer to the local authorities for the disposal of batteries.

It is important not to dispose of large amounts of alkaline batteries in a group. Used batteries are often not completely “dead”. Grouping used batteries together can bring these “live” batteries into contact with one another, creating safety risks. Never dispose of batteries in a fire because of the risk of explosion.

For updated information about Bodystat's environmental policy please refer to the following link: www.bodystat.com/support/

EMC – ELECTROMAGNETIC COMPATIBILITY

Table 1 - Guidance and manufacturers declaration – electromagnetic immunity		
The Bodystat 1500 is intended for use in the electromagnetic environment specified below. The customer or the user of the Bodystat 1500 should assure that it is used in such an environment.		
Emissions test	Compliance	
RF Emissions CISPR 11 EN 55011: 2016 + A11: 2020	Group 1	The 1500 must emit electromagnetic energy in order to perform its intended function. Nearby electronic equipment may be affected
RF Emissions CISPR 11 EN 55011: 2016 + A11: 2020	Class A	The Bodystat 1500 is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2 EN 61000-3-2: 2019	Not applicable	
Voltage fluctuations / flicker emissions IEC 61000-3-3 EN 61000-3-3: 2013 +A1:2019	Not applicable	

Table 2 - Guidance and manufacturers declaration – electromagnetic immunity			
The Bodystat 1500 is intended for use in the electromagnetic environment specified below. The customer or the user of the Bodystat 1500 should assure that it is used in such an environment.			
Immunity Test	IEC 60601 Test Level	Compliance	Electromagnetic environment - guidance
Electrostatic Discharge (ESD)	± 6 kV contact	±2, 4 & 6 kV contact	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
IEC 61000-4-2 EN 61000-4-2: 2009	± 8 kV air	±2, 4, & 8 kV air	
Electrical fast transient/burst	± 2 kV for power supply lines	Not applicable	Mains power quality should be that of a typical commercial or hospital environment.
IEC 61000-4-4	± 1 kV for input/output lines		
Surge	± 1 kV lines(s) to lines(s)	Not applicable	Mains power quality should be that of a typical commercial or hospital environment.
IEC 61000-4-5	± 2 kV lines(s) to earth		
Voltage dips, short interruptions and voltage variations on power supply input lines	<5 % U_T (>95% dip in U_T for 0,5 cycle 40 % U_T (60 % dip in U_T for 5 cycles 70 % U_T (30 % dip in U_T for 25 cycles 5 % U_T (>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 Bodystat 1500 requires continued operation during power mains interruptions, it is recommended that the Bodystat 1500 be powered from an uninterruptible power supply or battery.
IEC 61000-4-11			
Power Frequency (50/60 Hz) magnetic field	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
IEC 61000-4-8			
NOTE U_T is the a.c. mains voltage prior to application of the test level.			

Table 3 - Guidance and manufacturers declaration – electromagnetic immunity

The Bodystat 1500 is intended for use in the electromagnetic environment specified below. The customer or the user of the Bodystat 1500 should assure that it is used in such an environment			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	Not applicable	$d = [1.17]\sqrt{P}$ 80 MHz to 800 MHz $d = [2.33]\sqrt{P}$ 800 MHz to 2,5 GHz Were P is maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). 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.^b Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF	3 V/m	3 V/m	
IEC 61000-4-3 EN 61000-4-3: 2020	80 MHz to 2,7 GHz	80 MHz to 2,7 GHz	
	27 V/m, 18 Hz PM 385 MHz	27 V/m, 18 Hz PM 385 MHz	
	28 V/m, 50 %18 Hz PM 450 MHz	28 V/m, 50 %18 Hz PM 450 MHz	
	9 V/m, 217 Hz PM 710 MHz	9 V/m, 217 Hz PM 710 MHz	
	9 V/m, 217 Hz PM 745 MHz	9 V/m, 217 Hz PM 745 MHz	
	9 V/m, 217 Hz PM 780 MHz	9 V/m, 217 Hz PM 780 MHz	
	28V/m, 18 Hz PM 810 MHz	28V/m, 18 Hz PM 810 MHz	
	28 V/m, 18 Hz PM 870 MHz	28 V/m, 18 Hz PM 870 MHz	
	28 V/m, 18 Hz PM 930 MHz	28 V/m, 18 Hz PM 930 MHz	
	28V/m, 217 Hz PM 1720 MHz	28V/m, 217 Hz PM 1720 MHz	
	28 V/m, 217 Hz PM 1845 MHz	28 V/m, 217 Hz PM 1845 MHz	
	28 V/m, 217 Hz PM 1970 MHz	28 V/m, 217 Hz PM 1970 MHz	
	27 V/m, 217 Hz PM	27 V/m, 217 Hz PM	

	2450 MHz	2450 MHz	
	9V/m, 217 Hz PM 5240 MHz	9V/m, 217 Hz PM 5240 MHz	
	9 V/m, 217 Hz PM 5500 MHz	9 V/m, 217 Hz PM 5500 MHz	
	9 V/m, 217 Hz PM 5785 MHz	9 V/m, 217 Hz PM 5785 MHz	

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.

^a 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 PB840 Ventilator is used exceeds the applicable RF compliance level above, the Bodystat 1500 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orientating or relocating the Bodystat 1500.

^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than $[V_1]$ V/m.