MEASURETEK
QUALITY SCALES

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EH-ECS

User / Technical Manual

Contents subject to change without notice

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CONTENTS

1. INTRODUCTION

General Information

- The EH-ECS scale is a Digital Physician Chair Weighing Scale with Body Mass Index (BMI) readout.
- It is an accurate electronic device with advanced design and stable performance.
- It is designed to measure the weight of a person and compute the BMI index once the known height of a person is entered via the Indicator

Specifications

Model	EH-ECS-300
Maximum capacity	300kg /660 lb
Minimum weight	1 kg / 2 lb
Scale division	0.05 kg/0.1 lb
Weighing units	Kg, lb
Division of height measurement	entry via keypad 1cm / 0.5”
Display	LED display
Interface	RS232
Size of Chair (inner size)	410mm x 430mm x 380 mm 16.14” x 16.93” x 14.96”
Overall dimension	635mm x 840mm x 940 mm; 25.00” x 33.07” x 37.00”
Net weight	25 kg / 55 lb.
Environment for Use	Temperature: 5ºC-40ºC; Humidity: <85% RH
Power	12vDC 500mA adapter
Battery	Internal, re-chargeable 6V 4Ah battery

2. Unpacking and Setup

Contents

- 1x Indicator
- 1x Handle
- 1x Chair Assembly
- 5pcs M4x8 Crosshead Screws
- 4pcs M5x30 Crosshead Screws
- 4pcs M6 Washers
- 1x Hex Allen Wrench (small)
- 1x Manual
- 1x RS232 cable
- 1x Pillar
- 1x Foot Rest
- 2x Arm Rests
- 8pcs M5x15 Crosshead Screws
- 4pcs M6x20 Socket Head Screws
- 1x Base
- 1x Hex Allen Wrench (big)
- 1x 12V 500mA adapter

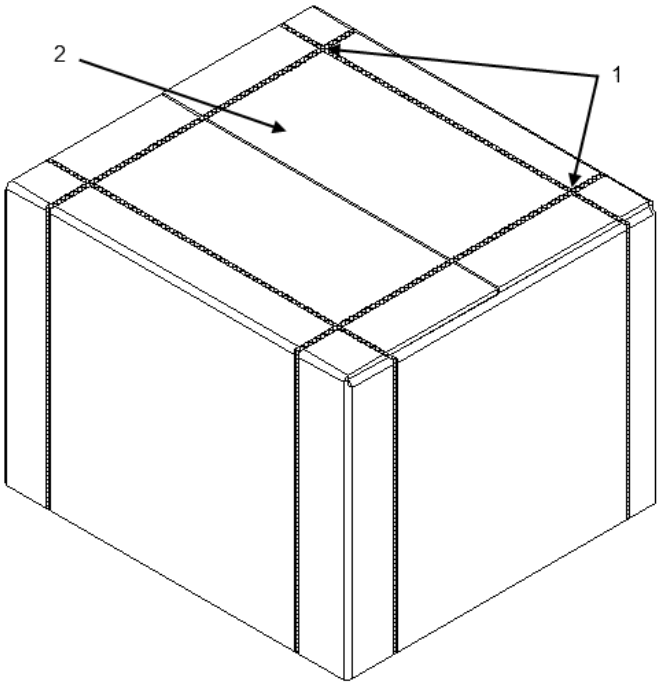
Tools Required

- 1 x Cross Head Screwdriver (not supplied)

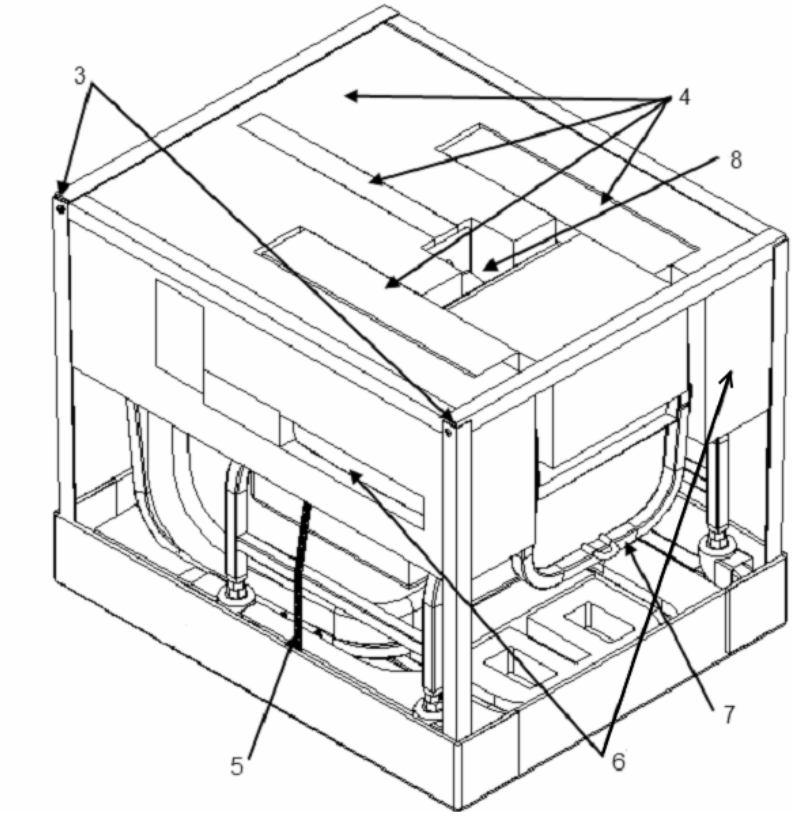
- 1 x Small Hex Allen Wrench and 1x Big Hex Allen Wrench (both supplied)

Unpacking and Installation Procedures

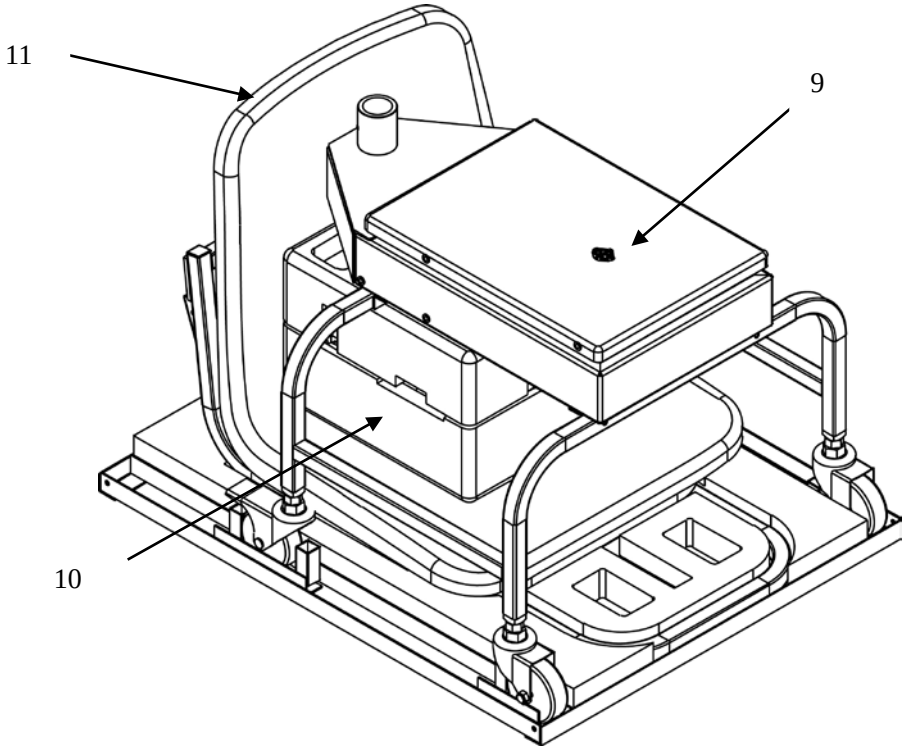
1. Remove all strapping (1).
2. Lift the outer box away (2).



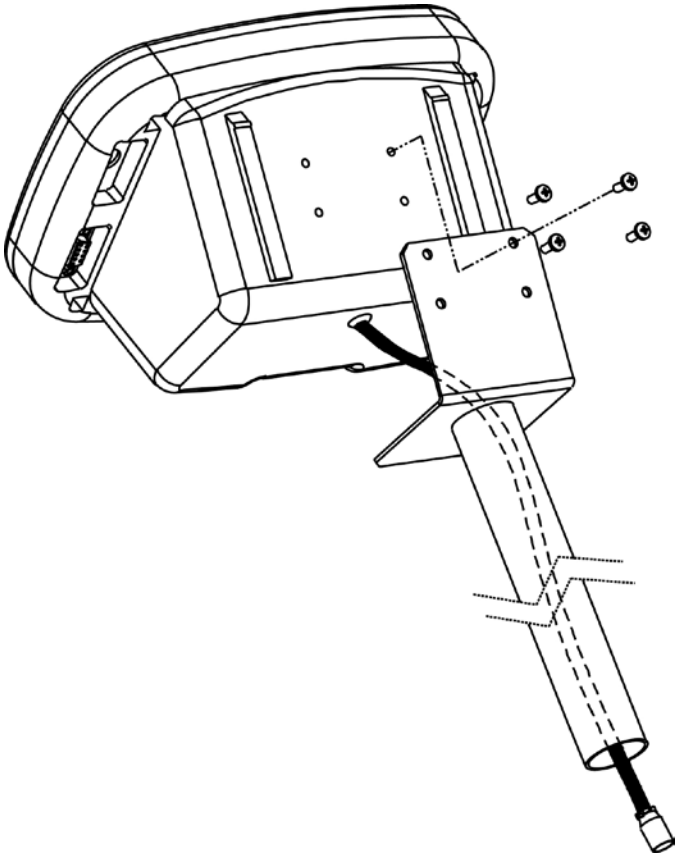
3. Remove all screws (3) from the corners of the frame and place to one side.
4. Remove the top foam pieces (4).
5. Cut the strapping away from the chair (5).
6. Remove the two side pieces (6), then remove the two arm rests and place to one side.
7. Remove the foot rest (7) and pillar assembly (8).



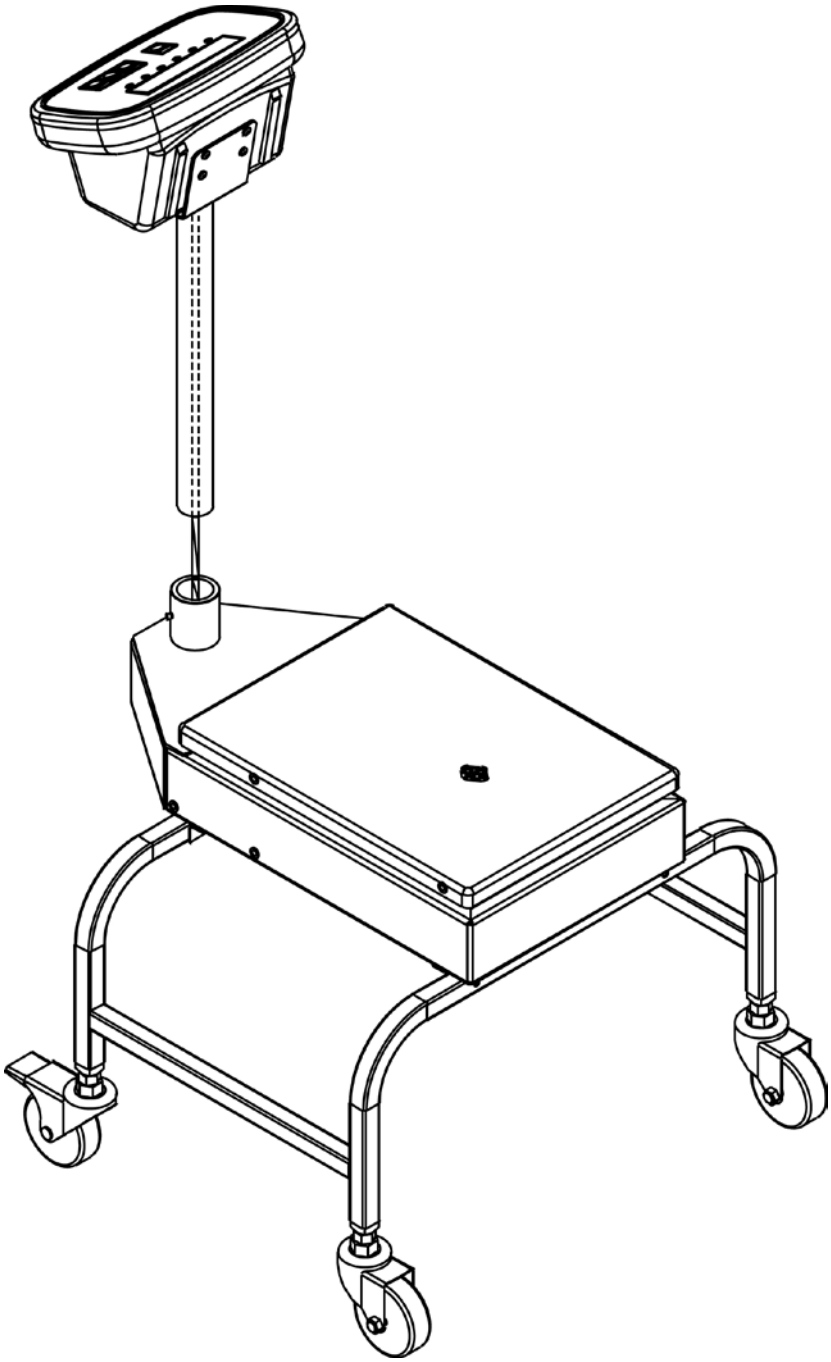
8. Remove the chair base assembly (9) and place to one side.
9. Remove the Indicator (10), seat assembly and handle (11).



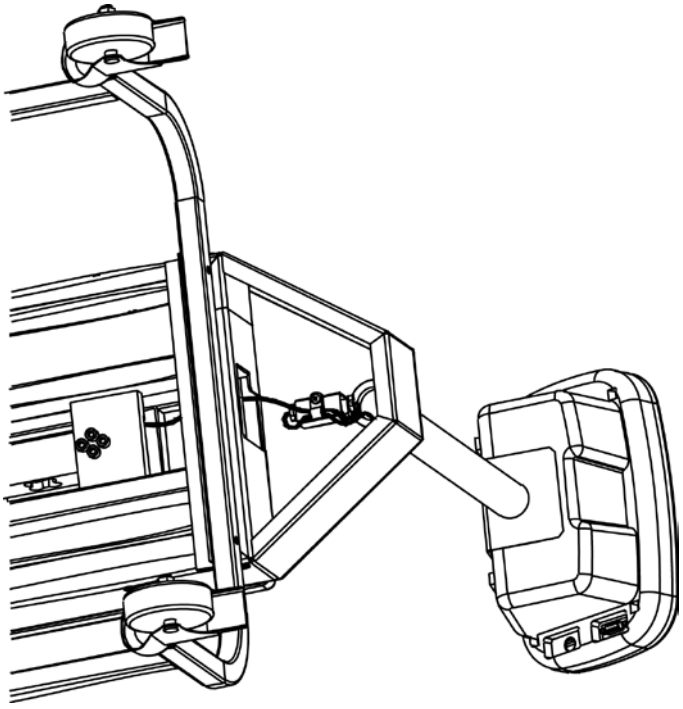
10. Feed the cable from the Indicator through the pillar.
11. Connect the pillar to the Indicator using the 4 x M4 x 8 screws provided.



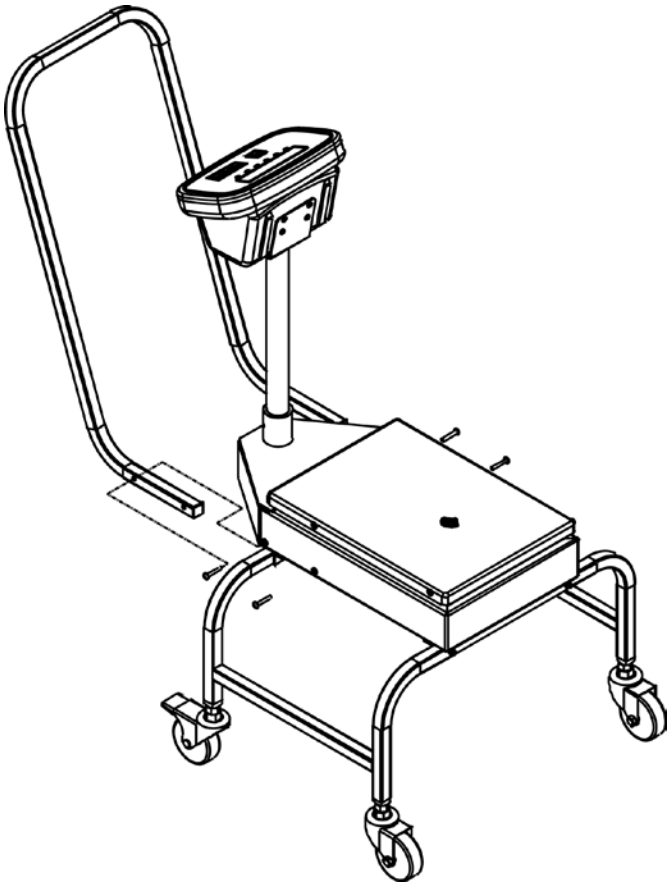
12. Feed the cable through the tube on the base.
13. Connect the pillar to the base and tighten the allen screws by the supplied small hex allen wrench to secure in the correct viewing position.



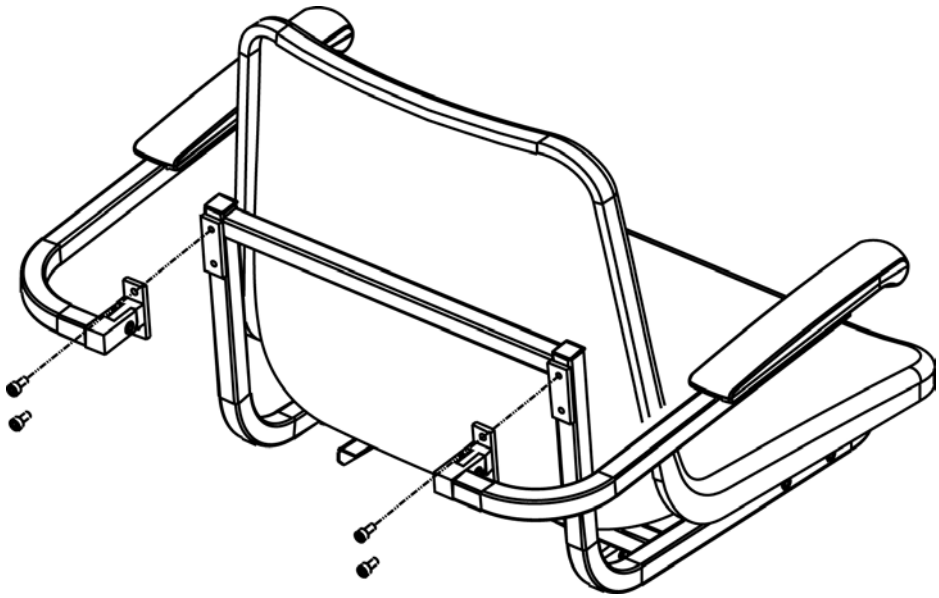
14. Connect the Indicator cable to the load cell cable connector ensuring to thread the cable through the bracket under the base.
15. Secure the cables using the P clip and M4 x 8 screw provided.



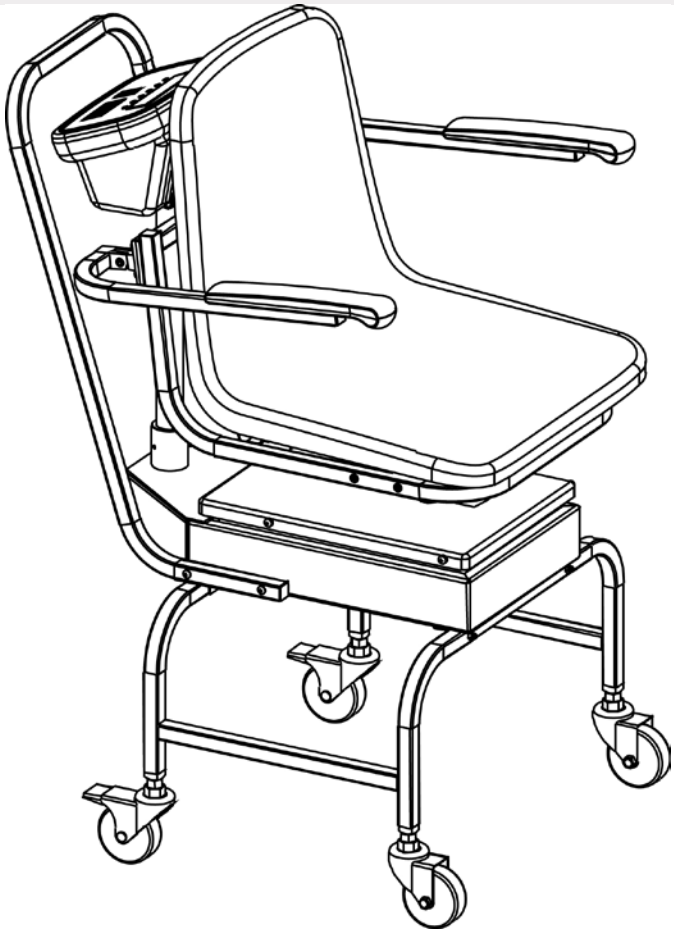
16. Connect the handle using the 4 x M5 x 30 screws provided.



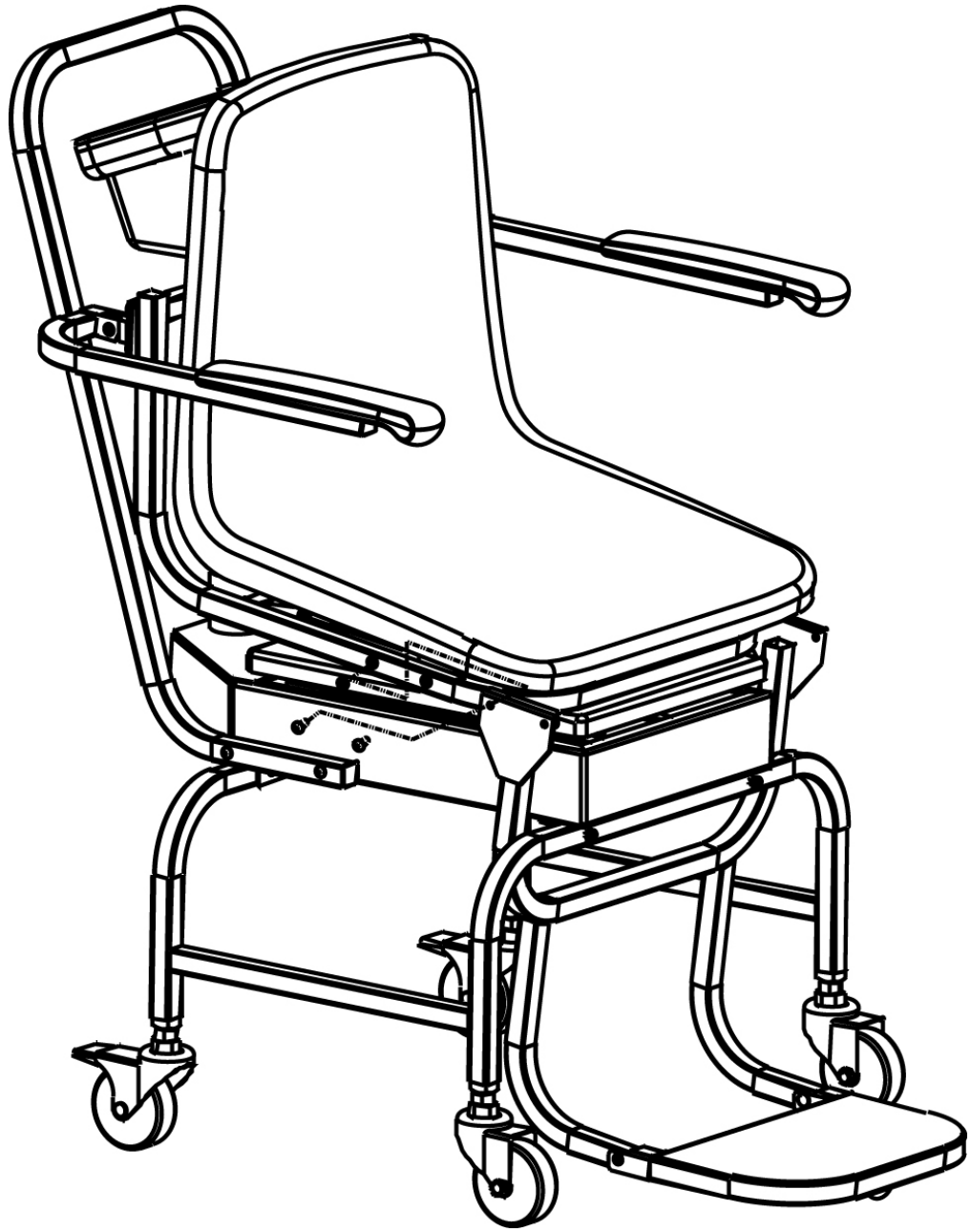
17. Connect the two arm rests using the 4 x M6 washers and 4 x M6 x 20 socket head screws provided. Tighten the screws by supplied big hex allen wrench.



18. Place the chair assembly onto the base and secure using the 4 x M5 x 15 screws provided.

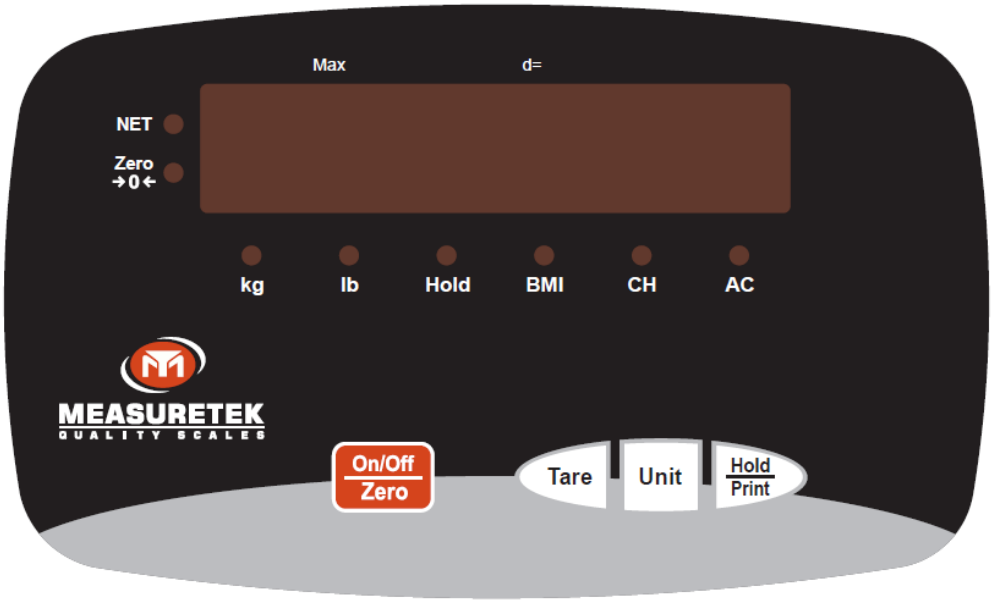


19. Place the foot rest onto the assembly and secure using the 4 x M5 x 15 screws provided.



3. OVERVIEW OF CONTROLS AND FUNCTIONS

3.1 Front Display and Key Descriptions



KEYS	FUNCTIONS
[On/Off / Zero]	To turn the scale on or off. To zero the scale if the display drifts from zero.
[Tare] ↵	To tare the scale, if necessary. Accept settings as required
[Units/BMI] ➔	To toggle the weighing unit between Kg and Lb. and to select the BMI function. Move active digit to the right when required.
[Print/Hold] ↑	To lock the reading even if the person to be weighed is moving and also to print the weight via the RS232 interface. Increase value or settings when required.

DISPLAY	DESCRIPTIONS
Kg	Indicates when the scale is weighing in Kilograms.
Lb	Indicates when the scale is weighing in Pounds.
Hold	Indicates when the scale has held the weight reading shown on the display. It will flash until it locks into the stable reading when it will then remain on for a preset time when it has held the displayed reading.
BMI	Indicates when the scale is displaying the Body Mass Index value.
CH	The charge light will be on when the battery is recharging.
AC	This indicates when the scale is being used with the AC adapter.
ZERO	This indicator will be displayed in the left corner when the scale reaches zero.

NET	The Net weight is displayed, Tare weight is at zero.

3.2 Indicator Display Character Definitions

ASCII	LCD/LED Show	ASCII	LCD/LED Show	ASCII	LCD/LED Show
0		A		N	
1		B		O	
2		C		P	
3		D		Q	
4		E		R	
5		F		S	
6		G		T	
7		H		U	
8		I		V	
9		J		W	
		K		X	
		L		Y	
		M		Z	

4. OPERATIONS

4.1WEIGHING

- Position the Physician Scale on an even floor and press the **[On/Off]** key.
- The instrument performs a self-test after which it is ready for operation.
- Press the **[On/Off]** key and the machine switches off.
- The person to be weighed can sit on to the chair once the scale shows 0.0 on the display. The weight will be display in Kg. or lb. depending on the units chosen by the user.
- If the weighing value is to be tared press the tare key to remove the weight value from the display.
- Press the **[Unit]** key for changing the weighing unit to kg or lb. The LED will indicate the chosen weighing unit.
- **Overload display**: When "FULL" appears on the display, it shows that the load on the chair is over the maximum capacity. Under these circumstances, it is necessary to reduce the load otherwise the sensor or the chair will be damaged.
- **Hold Function:** To lock the weighing result, press the **[Print/Hold]** key. The LED will flash until a stable reading has been obtained and then it will light up constantly. The weight will be displayed until the hold time has expired (see Sec 6.0) or to manually release the function, press the **[Print/Hold]** key again.
- **Print Function:** To send the weighing result to a printer or computer press the **[Print/Hold]** key when the **[Print/Hold]** key has been set up in the parameter section to work as print function.

4.2 MEASURING BODY MASS INDEX (BMI)

- Once the height has been determined it is possible to enter the height reading into the display ready for the scale to compute the BMI.
- Press and hold the **[Unit/BMI] /➔** key to enter the BMI mode. The display will show the last height value used, "Cm123" or "In123" depending on which weighing unit you are currently using.
- The height entry unit (Cm or In) will be flashing to show you which unit you are currently in, use the Up arrow key to change the height entry unit between Cm to In as required

- Enter your height using the arrow keys, the **[Print/Hold] /↑** key will increment the flashing digit, the right arrow, the **[Unit/BMI] /➔** key, will move the flashing digit to the adjacent digit.

- Press the **[Tare]/↵** key to confirm the value.

- The display will now show the BMI based on the current weight on the scale and the height entered.

- Press the **[Unit/BMI]** key to exit the BMI mode and return to normal weighing.

- The Hold function will work as described above whilst in the BMI mode.

5. Calibration

Before calibrating the scale, you should ensure that you have a suitable known weight for calibration.

1. When in normal weighing mode with the scale at zero press and hold down **[TARE]** and **[ON/OFF]** keys to enter the calibration mode.

2. If the calibration switch is in the off position on the main PCB inside the scale, the indicator will show "CAL.OFF" and then exit this mode. If the indicator shows "CAL- ? ", the scale is ready for calibration.

3. When the indicator shows "CAL- ? ", press the **[TARE]** key to confirm and go to next step, or press the **[ON/OFF]** key to exit the calibration mode.

4. When '**0.0**' is displayed the scale will begin to calibrate the scale's zero-point. Ensure that there is no load or weight on the scale's chair. Press the **[TARE]** key to confirm, or press the **[ON/OFF]** key to exit this mode.

5. A few seconds after the **[TARE]** key has been pressed in step 4 the scale will show "300.0" and the kg LED, or "600.0" and the lb LED depending on which unit you chosen, this is the default calibration weight from the factory. Press the **[UNIT]** key to select the calibration weight unit that you want to calibrate in. Press the **[ON/OFF]** key to exit the calibration mode at this point or press the **[Print/Hold]** key to choose a different calibration weight value (50kg, 100kg, 150kg, 200kg, 250kg, 300kg or 100lb, 200lb, 300lb, 400lb, 500lb, 600lb); Then put on the weight that you selected and press the **[TARE]** key to confirm the chosen standard weight that was selected earlier. The displayed data will flash on the display and if the scale accepts the calibration data it will calculate and store the information into the EEPROM. If an error has occurred, the scale will display "CAL. Er" and return back to step 4 for re-calibration. If the loaded weight is not within the range of 95% to 105% of the weight value you selected, the scale will not calibrate but display "CAL. Er" and return back to step 4 for re-calibration.)

6. Check the calibration by putting the weight that you calibrated at back on the scale, if it is off repeat the calibration process again.

6. User Parameters

This indicator has 4 parameter settings that can be selected.

1. When the scale is in normal weighing mode, press and hold down the **[ON / OFF]** key and the **[UNIT]** key for 3 seconds until '**Setup**' is shown on the display.

2. When in the SETUP mode, press the **[Print/Hold]** key to change the flashing digits, and **[TARE]** key to confirm the flashing digits and move to the next parameter setting. Press the **[ON / OFF]** key to exit the set up mode.

3. Parameters setting summary:

Parameter	x/xy	Factory Set	Setting
A.o.t.	00-15	05	Auto-off time: No auto-off = 00. 01-15 minutes auto-off time.
P.H.	0,1,2	1	0 = Only Print Function 1 = Only Hold Function 2 = both HOLD and PRINT function (pressed down less 3s,this key works as Print function; pressed down more than 3s,this key works as HOLD function)
H.t	0-4	0	Hold time: 0 = no time limit. 1 = 10 seconds 2 = 30 seconds 3 = 60 seconds 4 = 120 seconds
S.F.	0-3	0	0 = No RS232 Function. 1 = Continuously outputs display data. 2 = Output display data when PRINT pressed 3 = Bi-directional communication (the scale receives and executes commands from the HOST device)

7. RS232 Communications

The Interface parameters are:	Connection details are:
RS-232 output of weighing data ASCII code 9600 Baud rate (fixed) 1 start bit, 8 data bits,1 stop bit No Parity	Connector: 9 pin d-subminiature socket Pin 2 Output Pin 3 Input Pin 5 Signal Ground

1. RS-232 connection between the Scale and the Host:

DB9 female

RXD pin 3

TXD pin 2

GND pin 5

Note: Pins 1,4,6,7,8 and 9 are not connected.

The RS232 function will only operate if PH has been set to 0 or 2.

2. *When Parameter S.F. in section 6 is set to 0 :*

No RS232 function. It will not transmit or receive any data although the scale is equipped with RS232. The RS232 function can be only activated when scale is in normal weighing mode.

3. *When Parameter S.F. in section 6 is set to 1 :*

Continuous output of the current displayed reading and unit, and it does not receive any data. The output format is as below:

<LF>< reading, minus, decimal point, weight unit>GR<CR><EXT>

Or <LF>< reading, minus, decimal point, weight unit>NT<CR><EXT>

4. *When Parameter S.F. in section 6 is set to 2 :*

Manually outputs display data when PRINT is pressed. The output format is as below:

<LF>< reading, minus, decimal point, weight unit>GR<CR><EXT>

Or <LF>< reading, minus, decimal point, weight unit>NT<CR><EXT>

5. *When Parameter S.F. in section 6 is set to 3 :*

The baud rate and data format are fixed with responses to serial commands being within 300 milliseconds. One second should be adequate for use as a time-out value by remote (controlling) device.

5.1 The length of the weight field will be 7 digit weight data, one for minus sign, one for decimal point, two for measure unit (e.g. “lb”, “kg”). Units of measure abbreviations are always lower case.

If the weight is overcapacity, the scale will return nine ‘^’ characters (the field of minus sign, decimal point, weight
data is filled by ‘^’).

If the weight is under capacity, it will return nine '-' characters (the field of minus sign, decimal point, and weight data is filled by '_').

If the zero point has an error, it will return nine '-' characters.

The character will be '-' for negative weight or a space character for positive weight. Minus sign follows after the first digit.

Useless leading zero before digits are suppressed.

5.2 Key to symbols used

<LF> Line Feed character (hex 0AH)

<CR> Carriage Return character (hex 0DH)

<ETX> End of Text character (hex 03)

<SP> Space (hex 20H)

H1H2H3 Three status bytes. Refer to Table1 for definition.

<p> Polarity character including minus sign for negative weight and a space character for positive weight

W1-W7 weight data

<dp> decimal point

U1U2: measure units, kg, lb

5.3 Commands and response

(1) Command: W<CR> (57h 0dh)

Response:

①<LF>^^^^^^u1u2<CR><LF>H1H2H3<CR><ETX>---over capacity

②<LF>_____u1u2<CR><LF> H1H2H3 <CR><ETX>---under capacity

③<LF>---------u1u2<CR><LF> H1H2H3<CR><ETX>---zero-point error

④ <LF><p>w1w2w3w4w5w6<dp>w7u1u2<CR><LF>H1H2H3<CR> <ETX> ---Scale is stable, and the current weight unit is kg or lb. With or without decimal point and the position is as per the P9 setting and current unit.

(2) Command: S<CR> (53h 0dh)

Response: <LF> H1H2H3<CR><ETX>

(3) Command: Z<CR> (5ah 0dh)

Response: Zero function is activated and it returns to current scale status. just like pressing **ZERO/ON/OFF** button:

<LF> H1H2H3<CR><ETX>

If ZERO function cannot be activated, it will return to current scale status.

(4) Command: T<CR> (54h 0dh)

Response: TARE function is activated, and then returns scale status. just like pressing

TARE button:
<LF> H1H2H3<CR><ETX>
If TARE function cannot be activated, it will return to current scale status.

(5) Command: U<CR> (55h 0dh)
Response: Changes units of measure and return scale status with new units, just like pressing **UNIT** button. The new measure unit should be allowed to use as per P11 setting.
<LF>u1u2<CR><LF> H1H2H3<CR><ETX>
(6) Command: X<CR> (58h 0dh)
Response: power off the scale, just like press down the **ON/OFF** key to turn off the scale.
(7) Command: all others
Response: Unrecognized command
<LF>?<CR><ETX>
Table1: The status bits definition:

Bit	Byte 1 (H1)	Byte 2 (H2)	Byte 3 (H3)
0	0=stable	0= not under capacity	01=normal work mode 10= hold work mode 00=not define 11= not define
	1= not stable	1= under capacity	
1	0= not at zero point	0= not over capacity	
	1= at zero point	1= over capacity	
2	always 0	always 0	0= gross weight
			1= net weight
3	0= eeprom OK	always 0	always 0
	1= eeprom error		
4	always 1	always 1	always 1
5	always 1	always 1	always 1
6	always 0	always 1	always 0
7	parity	Parity	parity

8. Error Message

0- - - - - Zero point is over the setting range
0_ _ _ _ _ Zero is below the setting range
Ad- - -- ADC is over max. range;
Ad _ _ _ _ ADC is below min. range;
EEP.Er There is an error in EEPROM
[AL.Er There is an error in calibration
[AP.- - The capacity will be displayed
Lo.bAt The voltage of batteries or input power is below 5.6V.
FULL The capacity has been exceeded by the person standing on the scale.

9. Warning

- Do not dismantle the weighing machine without following the necessary instructions.

- Do not bounce up and down whilst sitting in the chair. This may damage the sensor inside.
- Do not move the weighing machine violently and abruptly. Always move and put down the weighing machine gently.
- Wipe any stains with a soft damp cloth using a detergent, then wipe clean with a dry soft cloth. Do not use organic solutions or boiling water to clean stains. Do not use a water spray for cleaning.
- Keep the weighing machine in a dry and clean environment. Do not expose it to outdoor use or use it in locations near fire, under direct sunshine or with high temperature.