medi*cal* scale

INDEX

1. DESCRIPTION

(1) Height meter sensor
(2) Height meter arm
(3) LCD display
(4) Weighing platform
(5) Adjustable feet
(6) Height meter arm fixing
(7) Connector panel

(8) Power supply connection
(9) ON/OFF switch
(10) Auxiliar connection
(11) RS232C serial interface for PC connection
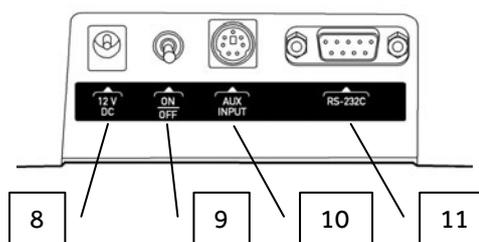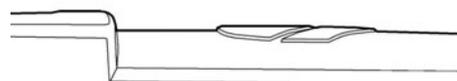
2. INSTALLATION

MEDICAL SCALE scale comes factory configured according to the voltage of each country and is ready for operation immediately after unpacking.
Connect the device to the power supply via the power supply cable. It is necessary that the outlet is provided with grounding. Adapters should not be used without grounding.

2.1. UNPACKING

Remove the packaging as shown in the Figures below:
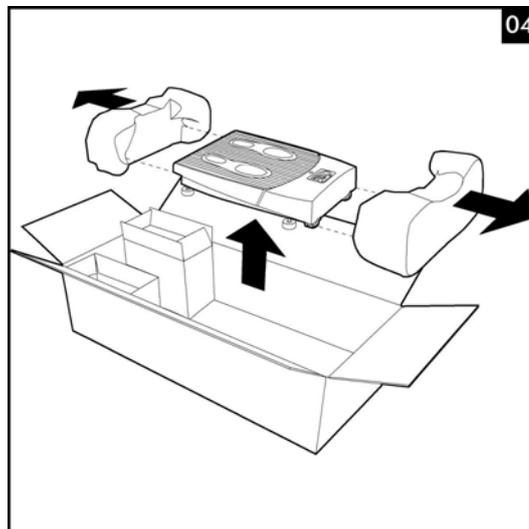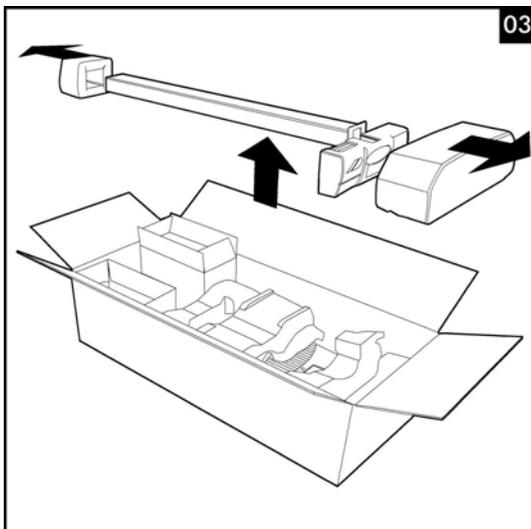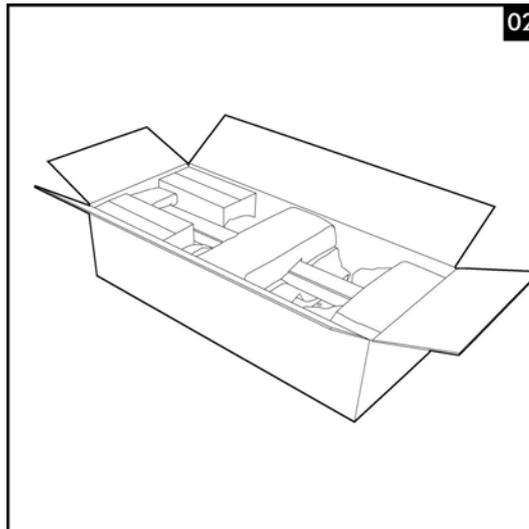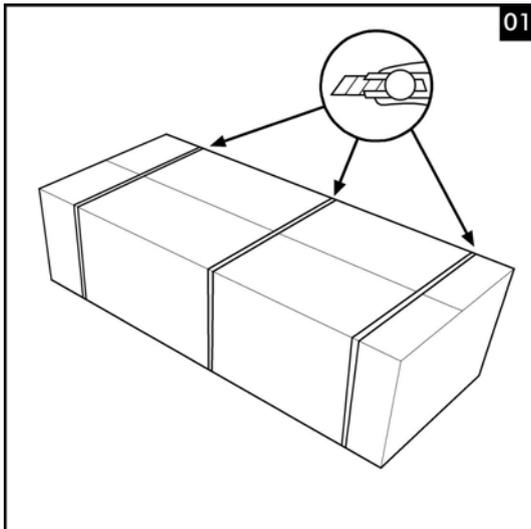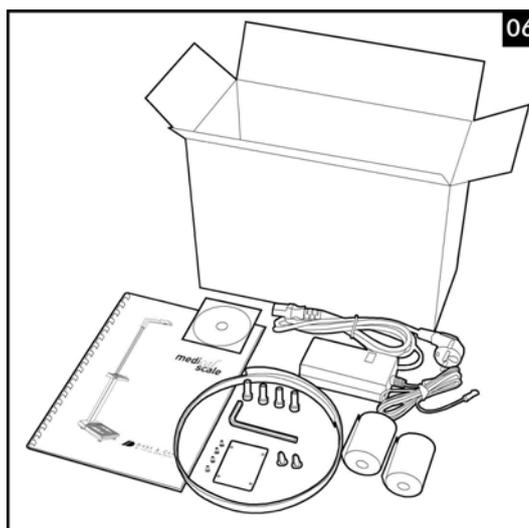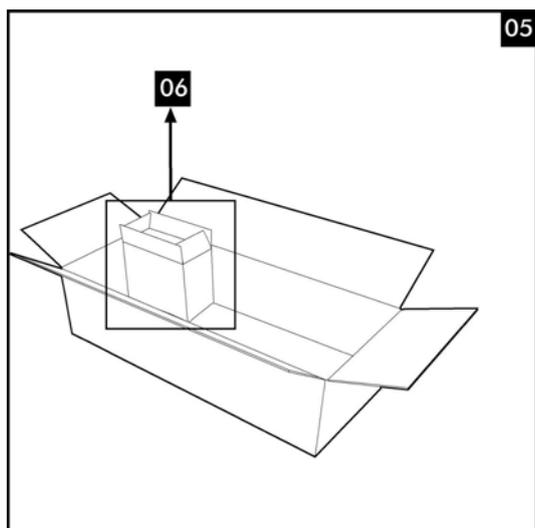
The attached box (06) contains:
- o User manual.
- o Power source with mains lead.
- o 4 Allen screws.
- o Allen key.
- o Metal cover.
- o 4 metal cover screws.
- o 2 plastic plugs.
- o Cable grip strip.
- o 2 rolls of paper. (For model with printer only)

2.2. SCALE ASSEMBLY

- o Carefully place the equipment on its side (07) and attach the column from underneath the scales' platform (08) using the screws.
- o The weighing cell cable has to be passed through the pipe. The end of the cable is taped to the cable grip strip supplied and it is threaded through the pipe until it appears out of the top (09-13).
- o Connect the weighing cell cable to the plate connector as shown in the diagram (14).
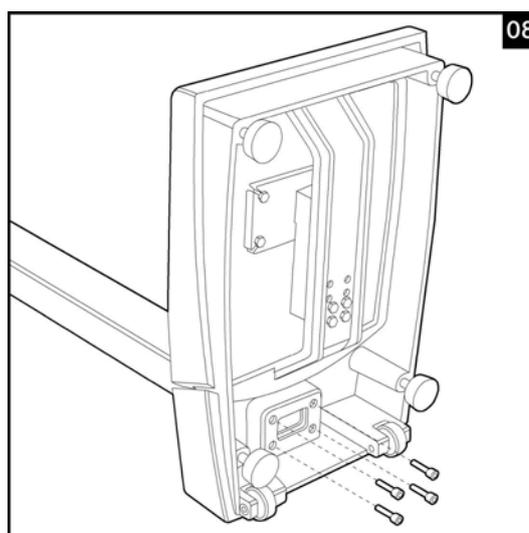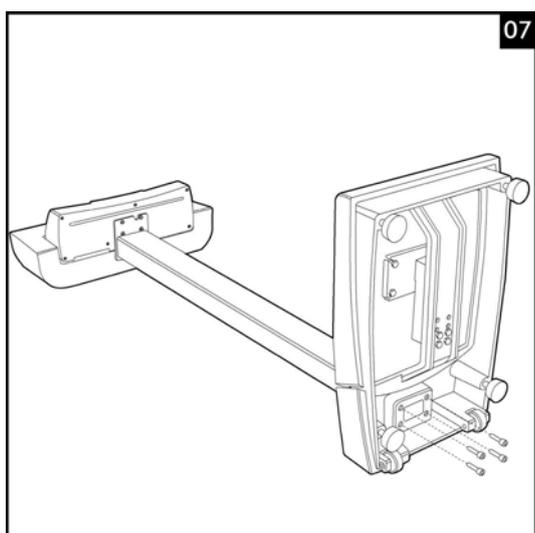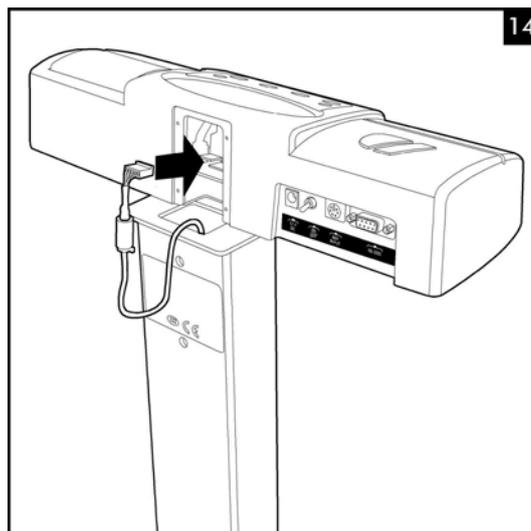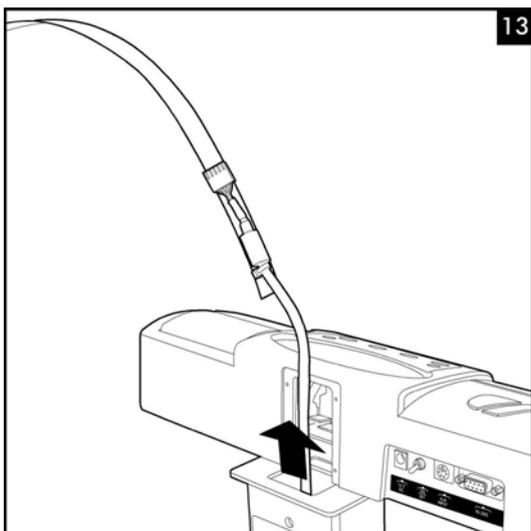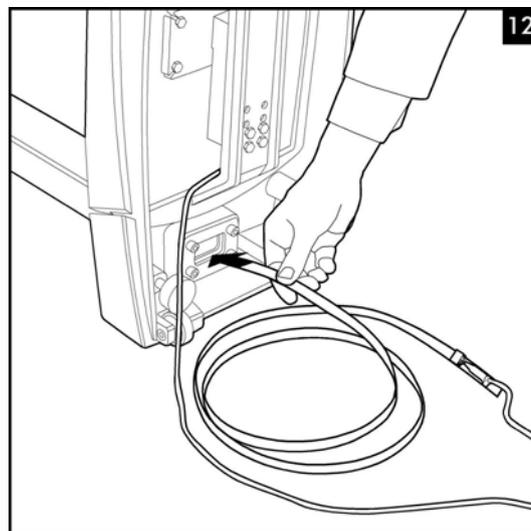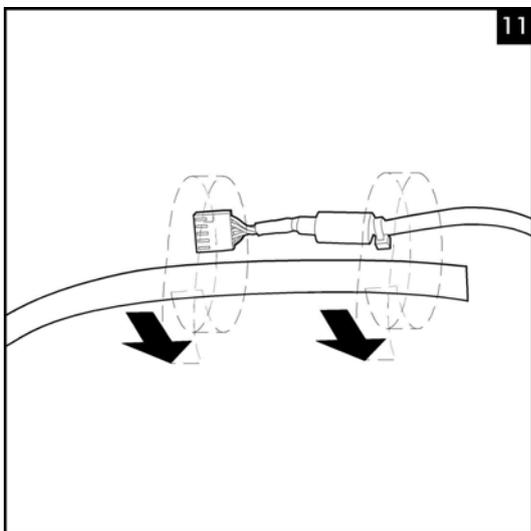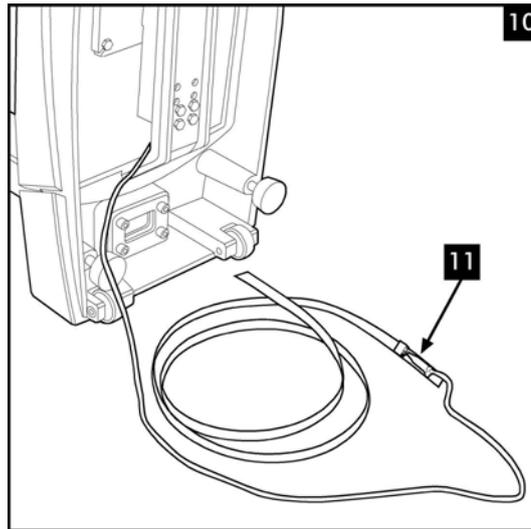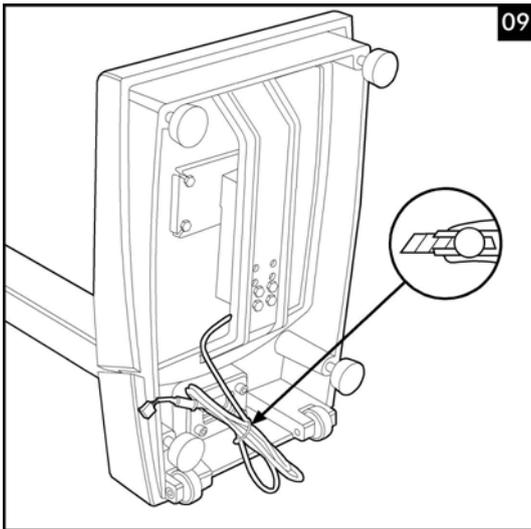
If the equipment is **not** equipped with the height measure arm:
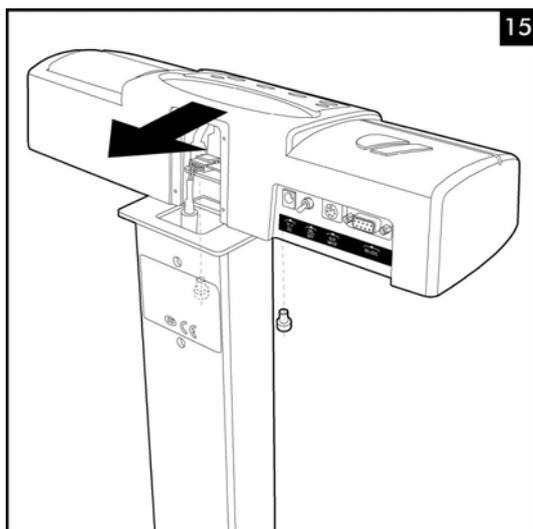
If the equipment is not equipped with the height measurement arm, move the display to cover the hole.
Remove the retaining screws on the lower section, move the console and attach it again in the new position.
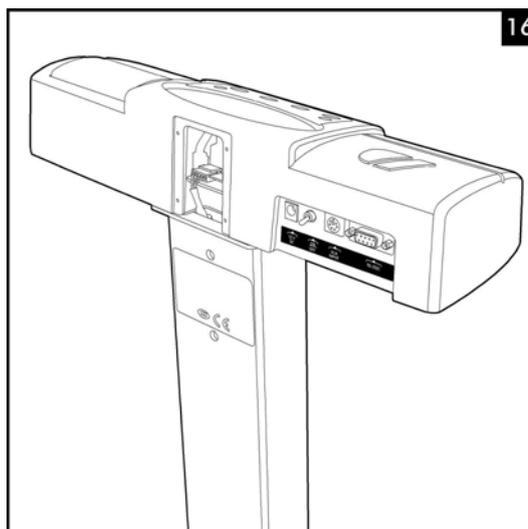
The console has to be properly held in the rear position.
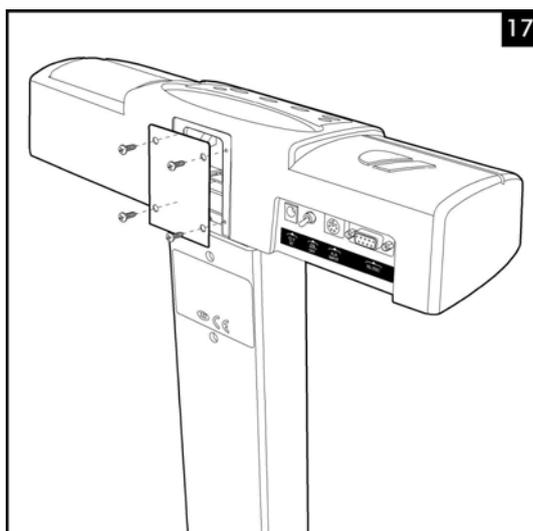
Attach the cover supplied using the 4 screws.
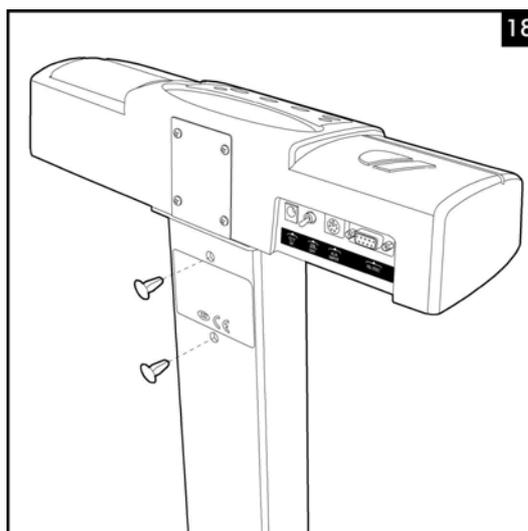
Insert 2 plugs to cover the height measurement arm's holes.

If the equipment **is** equipped with the height measurement arm:

o   Remove the height measurement arm from the packaging
o   Contains:4 Allen screws (2 for each arm), 1 Allen key.
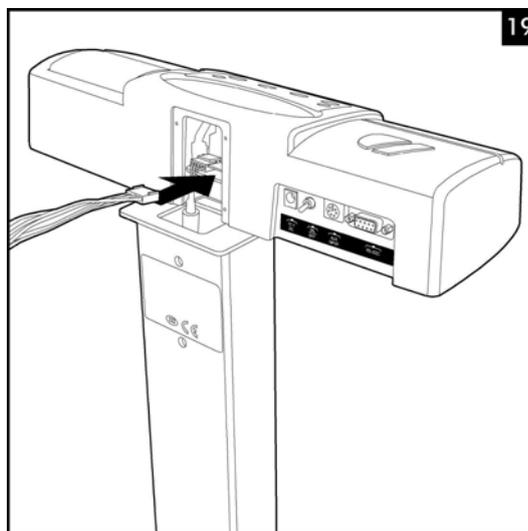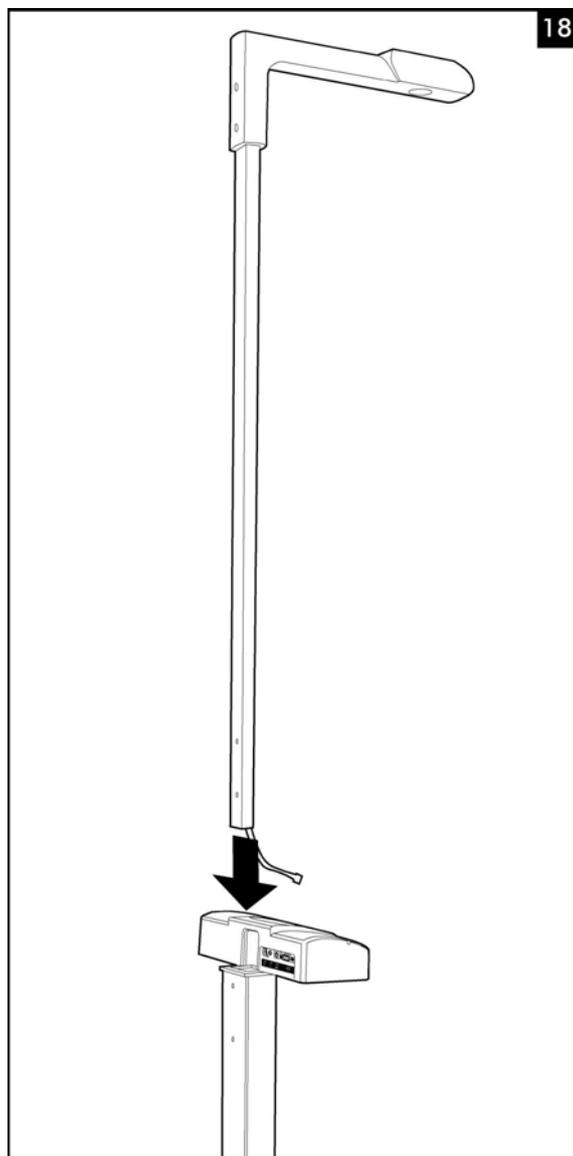
Connect the connector to the CPU board as shown in the diagram.
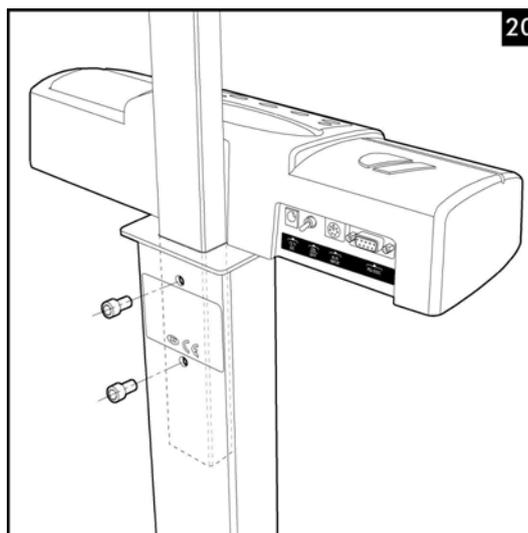
Insert the height measurement arm making sure that the cable is properly attached.
Attach using the 2 Allen screws, so that the height measurement arm is firmly held parallel to the pipe facilitating its mounting.

2.3. LOCATION AND SETTING

Set the equipment in a place flat and level, where it is perfectly supported. This last point is of vital importance to proper operation.
Make sure that within a radius of 70 cm around the equipment there is no interference that might affect the measurement of height.
To make sure that the weighing results are accurate, the scale must be exactly level in the horizontal position. To make the job of levelling the scale easier, it is equipped with a level.

Turn the screw feet on the bottom of the platform until the bubble in the level is in the inner circle.
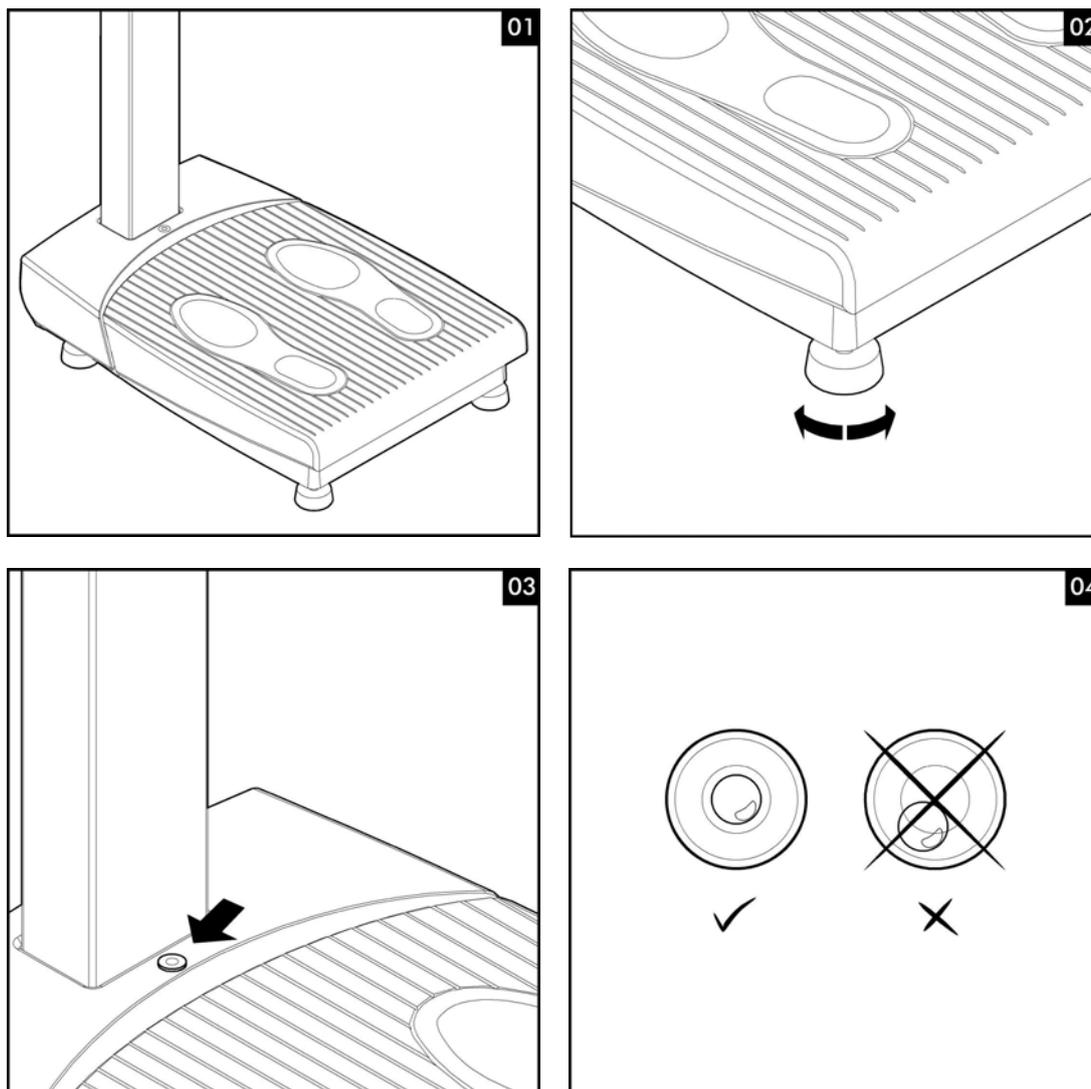
2.2. STARTUP

o   Connect the equipment to the power supply.
o   Check that no objects are placed on the platform of the equipment.
o   Actuate the switch on the bottom.
o   At this point the equipment will perform the process of self-test.
o   Step away from the equipment to not interfere in the process of auto-zero of the systems of weight and height.
o   If the process of self-test completes successfully, the screen displays "0.0 kg"

3. OPERATION

After the equipment startup appears the home screen. **This means that the scale has done the calibration successfully and is ready for use.**

```
   0.000 kg
```
Home screen
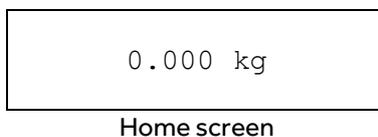
3.1. KEYBOARD FUNCTIONS

WARNING! Never use the membrane keypad with pointed objects such as pencils, pens, finger nails, etc. Breakage or malfunction of the keypad as a result of such improper use is not covered by the guarantee.

Function

Start — Activates the scale when it is in energy-saving mode.
Provides access to the programming menu.

Print — Prints out the ticket with the results.

Down arrow key: lowers the value or the menu option.
Male key: indicates the male gender.

OK key: confirms options.
Hold key: activates/de-activates the Hold function.

Tare — Activates/de-activates the Tare function.

Female key: indicates female gender.
Up arrow key: raises the value or the menu option.

3.2. WEIGHT AND HEIGHT

If the equipment is programmed to work without coins, a few seconds after the user steps up to the weighing platform, measurements are made automatically.

IMPORTANT: During the measurements it's recommended to maintain an upright posture and not moving. Failure to follow directions, the result of the measurement may be altered.

At the end of the measurements appear on the screen the values obtained.

```
68.200 kg
1.71 m
```

3.3. TARING

To enable this feature hold the TARE button for 2 seconds.

o Being the equipment on, place yourself first on the scale without the extra weight and press the TARE key for 2 seconds. The screen is set back to zero showing that the weight is stable and that Tare function is active.
o Upload Now the extra weight on the scale. The scale shows only the value this additional weight. We can make as many weighings as we wish. Stepping off the platform it shows on the screen "----".
o By a further long press of the TARE key, the function Tare is disabled, its indicator disappearing from the screen.

3.4. MOTHER / BABY FUNCTION

This feature allows weighing babies in the arms of his mother or father. Optimal for pediatric use since it calculates the weight of infants and children with an accuracy of 10 g.

o Being the equipment on, place yourself first on the scale without the baby and press the TARE key for 2 seconds. The screen is set back to zero showing that the weight is stable and indicating that Tare function is active.
o Step up now with the baby on the scale platform, the display only shows the baby's weight value with a precision of 10g. We can make as many weighings as we wish. Stepping off the platform it shows on the screen "----".
o By a further long press of the TARE key, the function Tare is disabled, its indicator disappearing from the screen.

3.5. HOLD

Memorizing the value of the displayed weight after getting off the platform, it is possible to assist the patient first before scoring his weight.

To enable this feature you need to press the HOLD key for 2 seconds.

o Press the HOLD key for 2 seconds while on the platform and viewing the current weight on display. Hold function indication appears and the weight value is locked on the screen.
o By a further long press of the HOLD key, the function Hold is disabled, its indicator disappearing from the screen.

3.6. BODY MASS INDEX (BMI)

The Body Mass Index is a ratio of weight to height that provides us with a reference value regarding our weight.

Model with built-in height-meter:

The scale automatically calculates the user's BMI and shows it on the display without the need to press any key.

Model without height-meter:

The scale allows you to enter the patient's height manually via the keypad. After the weight has been calculated, it appears on the display and a reference height of 1.70m flashes on the display. Using the <↑> and <↓> keys, select

the patient's height and then confirm by pressing <OK>. The equipment will automatically display the appropriate BMI.

IMPORTANT: BMI is a valid reference for adults only.

<u>Evaluating the Body Mass Index</u>

Classification of the BMI according to the WHO:

< 16:	Severe thinness.
16 to 17:	Thinness
17 to 18.5:	Underweight
18.5 to 25:	Normal range
25 to 30:	Overweight
30 to 35:	Mild obesity
35 to 40:	Medium obesity
> 40:	Morbid obesity

3.7. PRINTED RESULTS

Upon completion of the selected measurements, the equipment automatically prints a receipt (depending on setup) with the obtained results of the performed measurements.

4. SETUP

The pre-configured settings can be modified and functions activated via the menu in order to adapt them to suit specific needs.

To access the setup menu of the equipment, follow the procedure below:
1. Switching off the equipment.
2. Press and hold down the <Start> key.
3. While still holding the Start key down, switch the equipment on.

The following option screen will appear:

```
>> 1.ADJUST    <<
   2.TEST
```

Keyboard operation

Using the <↑> and <↓> keys, select the menu option and confirm by pressing <OK>.

 Down arrow key: lowers the value or the menu option.

 Up arrow key: raises the value or the menu option.

 Confirms options.

Setup menu

ADJUST	WEIGHT	Weight settings
	HEIGHT	Height settings
	EXIT	Exit settings menu
TEST	WEIGHT	Weight test
	HEIGHT	Height test
	ADC	ADC test
	EXIT	Exit Test submenu
PROGRAM	BMI	Activate BMI
	UNITS	Select units
	CLOCK	Program date and time
	DATE MODE	Date format
	PRINTOUT	Printout mode
	TICKET	Program lines of ticket
	COINS	Program coins
	LANGUAGE	Select language
	EXIT	Exit programming submenu
EXIT		Exit menu

4.1. PROGRAMMING

To access the programming menu, select the **PROGRAM** option and the following screen will appear:

```
>> 1.BMI        <<
   2.UNITS
```

4.1.1. BMI programming

This option turns the BMI function on and off. When the BMI function is on, the scale automatically calculates the BMI.
Select the **BMI** option and the following screen will appear:

```
>> BMI ON          <<
   BMI OFF
```

Use the arrow keys to select the option you want and confirm by pressing <OK>.

BMI ON	BMI function on
BMI OFF	BMI function off

4.1.2. Changing units

This option allows you to change the weight and height units.
Select the **UNITS** option and the following screen will appear:

```
>> kg - m        <<
   lb - ft/in
```

Use the arrow keys to select the option you want and confirm by pressing <OK>.

kg - m	Kilos - meters
lb - ft/in	Pounds - feet/inches
st - ft/in	Stones - feet/inches

4.1.3. Clock setting

This option allows you to program the date and time.
Select the **CLOCK** option and the following screen will appear:

```
     DD/MM/YY
     0
```

Enter the date digit by digit using the arrow keys and confirm by pressing <OK>.
After you enter the date, the following screen will appear for you to enter the time:

```
     HH:MM
     0
```

Enter the hour digit by digit using the arrow keys and confirm by pressing <OK>.

4.1.4. Date format

This option allows you to select the date format.
Select the **DATE MODE** option and the following screen will appear:

```
>>  dd/mm/yy       <<
    mm/dd/yy
```

Use the arrow keys to select the option you want and confirm by pressing <OK>.

dd/mm/yy	Day / Month / Year
mm/dd/yy	Month / Day / Year

4.1.5. Printout mode

This option allows you to select the printout mode: automatic or manual.
Select the **PRINTOUT** option and the following screen will appear:

```
>> MANUAL          <<
     AUTO
```

Use the arrow keys to select the option you want and confirm by pressing <OK>.

MANUAL — The equipment does not print out the ticket unless the person presses the <Print> key while still on the platform.

AUTO — The equipment prints out the ticket once it has made the measurements.

4.1.6. Programming the ticket

This option allows you to programme the 4 lines at the top of the ticket.
Select the **TICKET** option and the following screen will appear:

```
Line?: 1
```

Use the arrow keys to select the line (from 1 to 4) you want to programme and confirm by pressing <OK>. The following screen will then appear:

```
L01/01>>_
```

The first line tells you the line number and the position of the character. You can now start to enter the data for that line using the keypad.

You can use up to 24 characters per line. Use the arrow keys to select a character and press <OK> to confirm and move on to the next position.

The equipment automatically centres the text, so there is no need to programme all 24 positions. When you have finished entering the text for that line, press <Start> to end the editing process.

If you want to enter another line, you have to select the new line. The 4 lines are programmed separately, so that you can edit any line you want.

Keyboard operation

Function

Start — Ends line editing.

Print — Exits without recording the line.

Down arrow key: lowers the value.

OK Hold — OK key: confirms character, forward

Tare — Deletes character, back

Up arrow key: raises the value.

4.1.7. Coin operated

This option allows you to programme the number of coins to indicate the price of the service if the equipment has a coin selector.
Select the **COINS** option. The display will show the following message:

```
COINS NUMBER: 0
```

Indicate the number of coins using the arrow keys and confirm by pressing <OK>.

NOTE: To programme the equipment in free mode, set the number of coins at zero.

4.1.8. Language

This option allows you to programme the language for the printed ticket.
Select the **LANGUAGE** option. The display will show the following message:

```
>>1.CASTELLANO <<
  2.ENGLISH
```

Indicate the language using the arrow keys and confirm by pressing <OK>.

4.2. ADJUST

DAVI equipments have been perfectly calibrated and tested, so there is no need to make any prior adjustments for them to function correctly.

To access the adjust menu, select the **ADJUST** option and a screen will appear asking for an access code (password).

Access code: Press the keys <Tare> <Mujer> <Start> <Print>

Enter the password and press <OK>. The following screen will appear:

```
>> 1.WEIGHT   <<
   2.HEIGHT
```

4.2.1. Weight adjust

To adjust the weight, select the **ADJUST** option and the following screen will appear:

```
    NO WEIGHT
   PRESS <OK>
```

With no weight on the platform, press <OK>.
The equipment memorises the tare and the display shows:

```
         STANDARD MASS
         PRESS <OK>
```

Now place a standard mass on the platform. We recommend using a mass of at least 20 kg to ensure a correct adjustment. Then press <OK>.

```
         STANDARD MASS
         _000000 g
```

Use the keypad to enter the value (in grams) of the standard mass you have placed on the platform. For example, 20 kg. Enter 020000 g and press <OK> to confirm.

IMPORTANT: To make sure the adjustment is accurate, always enter the weight of the standard mass in grams. If you do not have a standard mass whose weight you already know in grams, you must first calculate the value of the mass you are using.
1 lb = 453.59 g

```
         STANDARD MASS
         020.000 kg
```

The equipment is now adjusted. Press <OK> to exit.

4.2.2. Height adjust

To adjust it, select the **HEIGHT** option and the following screen will appear:

```
        PROGRAM HEIGHT
      ↓>-      0 cm     +<↑
```

Using the arrow keys, you can increase or decrease the reference value. Confirm it by pressing <OK>.

4.3. TEST

To access the test menu, select the **TEST** option and the following options screen will appear:

```
      >> 1.WEIGHT       <<
         2.HEIGHT
```

4.3.1. Test of weight

To access the weight test, select the **WEIGHT** option and the following screen will appear:

```
      19870g       43,87lb
            19,900 kg
```

The equipment is now in automatic weight mode and displays the weight on the platform. You can check the weight function by placing masses of various different weights on the platform and seeing whether the correct weight is shown.

Press <OK> to exit.

4.3.2. Test of height

To access the height test, select the **HEIGHT** option and the following screen will appear:

```
                1,85 m
                6'0.7"
```

The equipment is now automatically measuring height. Place an object of known height and check that the measurement given by the equipment is correct.

Press <OK> to exit.

4.3.3. Test of ADC

To access the ADC test, select the **ADC** option and the following screen will appear:

```
                weight
                519478
```

This test tells you whether the analogue digital converter (ADC) is working properly. With no weight on the platform the equipment will show a value between 500000 and 600000 approximately. It is important to make sure that the value is constant and any variations are less than 50 units.

Press <OK> to exit.

5. MAINTENANCE AND CLEANING

The only maintenance that can be performed by unqualified personnel is the change of paper roll.

Do not perform repairs on your own. In case of breakdown contact the Technical Support Service.

If the power cable is damaged, it must be replaced by the Technical Support Service or qualified personnel in order to avoid dangerous malfunctioning.

To ensure accurate results, the equipment MEDICAL SCALE **requires an annual maintenance check that only authorized personnel from the Davi & Cia Technical Support Service can perform.**

Clean the unit using only a soft cloth. Do not use gasoline or any similar solvent.

5.1. PAPER ROLL CHANGE

When the paper is finish, the printer is deactivated and the machine continues working without printing the ticket.

To change the paper roll, we open the cover, we put the paper roll as indicated in the figure and we close the cover. We must switch off and switch on again the machine to restart the scale and detect the new paper roll.
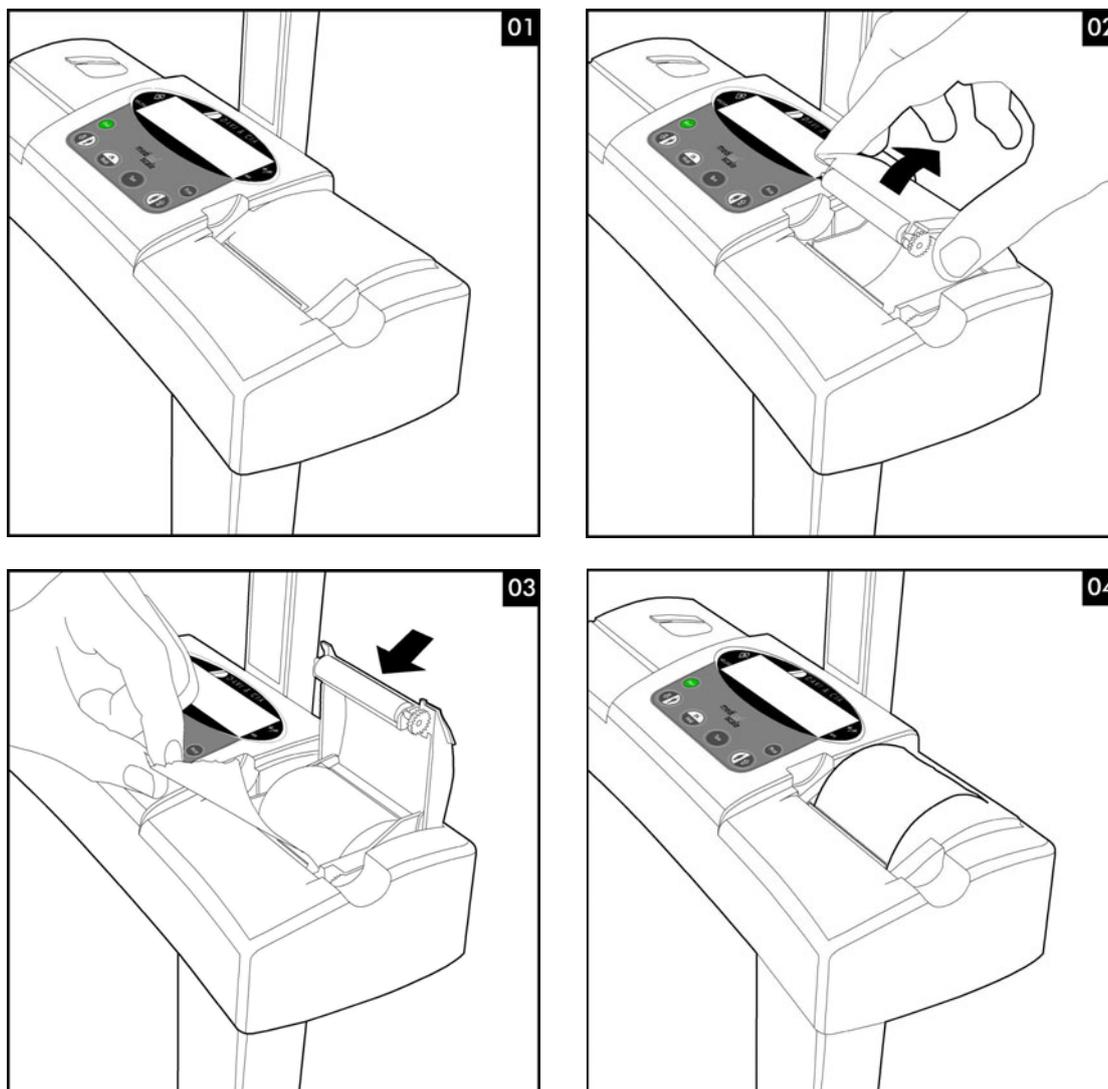
5.2. EQUIPMENT DISPOSAL

All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.

This crossed-out wheeled bin symbol on the product means the product is covered by the European Directive 2002/96/EC.

The correct disposal and separate collection of the equipment will help prevent potential negative consequences for the environment and human health. It is a precondition for reuse and recycling of used electrical and electronic equipment.
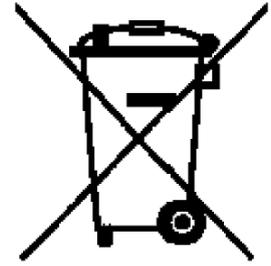
6. LISTADO DE ERRORES

Error Indicator	Cause	Correction
WEIGHT ERROR CODE 01	Error weight reading	- Failure in load cell - Failure in A/D - Failure in load cell wires
OVERFLOW CODE 02	Weight over 225 kg	- Failure in load cell - Failure in A/D - Failure in load cell wires
UNDERFLOW CODE 03	Weight under 0 kg	- Failure in load cell - Failure in A/D - Failure in load cell wires - Failure in load cell mounting
ZERO WEIGHT ERROR CODE 04	Error in Zero reading at machine start.	- Failure in load cell - Failure in A/D - Failure in load cell wires - Failure in load cell mounting - Knocks in load cell
HEIGHT ERROR CODE 05	Height reading error.	- Failure in height cell. - Failure in height circuit. - Failure in height wires. - Failure in power supply +12V
E2PROM BASE CODE 30	Error data in E2PROM BASE	- Error in E2PROM BASE
ERROR PRINTER CODE 40	Failure in PRN	- Comms error in PRN - Power failure in PRN
NO PAPER CODE 41	Paper feed failure	- Paper finished - Paper feed failure - Paper detector failure
UNKNOWN ERROR CODE 99	Unknown error	

7. TECHNICAL SPECIFICATIONS

Model:	MEDICAL SCALE
Manufacturer:	DAVI & CIA C/Murcia 35 nave G E08830 Sant Boi de Llobregat Barcelona – SPAIN
Display:	LCD alphanumeric 2 x 16 characters
Weight (with / without height meter):	33 kg / 36 kg (aprox.)
Maximum external dimensions (with / without height meter)::	34,5 x 49,5 x 113 cm / 34,5 x 49,5 x 224 cm
Measurement range: Weight: Height:	 2.5 to 225 kg in div.100 g 0 to 200 cm in div. 1 cm
Measurement methods: Weight: Height:	 300 kg load cell Ultrasound
Measurement accuracy: Weight: Height:	 +/- 100 g , n=3000 +/- 1 cm
Power supply:	230V~ , 50 Hz 115V~, 50/60 Hz
Consumption:	In operation, max. 40 VA

In operation:
    Temperature:
    Humidity:
	
	0 °C to +40 °C
	30 % to 75 %

Printer:	Thermal printhead 8 dots/mm. 384 dots/line, 32 characters per line. Speed = 40 mm/s. Paper end detection using a photoelectric cell.
Paper width:	60 mm
e: d: Min: Max. Class:	100 g / 0.2 lb 100 g / 0.2 lb 2.5 kg / 5.5 lb 225 kg / 500 lb III
Fuses primary circuit: Power supply 230V: Power supply 115V:	 2 x 0,315 A 5 x 20 mm, type T 2 x 0,630 A 5 x 20 mm, type T
Classification according to EN 60601-1	Electronic scale with height meter. Equipment with metallic envelope and Class I of protection against electric shock. Protection against electric shocks Type BF.
Applicable Standards:	*SEGURIDAD ELÉCTRICA / Electrical Security* UNE EN 60601-1: 2008+ERRATUM:2008 EN 60601-1-2 (2007): *EMISIÓN ELECTROMAGNÉTICA / EM Emission.* -EN 55011 (2007) / A2 (2007): Radiada / Radiated (Clase B/Class B). -EN 55011 (2007) / A2 (2007): Conducida / Conducted (Clase B/Class B). -EN 55014-1 (2006): Conducida discontínua / Discontinuous Conducted (Clase B/Class B). -EN 61000-3-2 (2006): Armónicos / Harmonics (Clase A/Class A). -EN 61000-3-3 (1995) / A1 (2001) / A2 (2005): Fluctuaciones de tensión y flickers / Fluctuations and flickers.

	INMUNIDAD ELECTROMAGNÉTICA / EM Immunity. -EN 61000-4-2 (1995) / A1 (1998) / A2 (2001): Descarga electrostática / ESD; -EN 61000-4-3 (2006): Campo radiado EM de RF / EM radiated field of RF; -EN 61000-4-4 (2004); Ráfagas de transitorios rápidos / EFT burst; -EN 61000-4-5 (2006); Ondas de choque / Surges; -EN 61000-4-6 (2007): RF en modo común / RF common mode; -EN 61000-4-8 (1996) / A1 (2001); Campo magnético a 50 Hz / 50 Hz H field; -EN 61000-4-11 (2004); Interrupciones de alimentación / Dips, interruptions.

8. WARRANTY CERTIFICATE

We provide a **1-year** guarantee from the date of purchase. The guarantee covers manufacturing defects or defects occurring as a result of normal use and operation.

It excludes all removable parts such as batteries, wires, power supply devices, etc. Faults falling within the guarantee period shall be rectified free of charge upon presentation of the purchase receipt for the equipment. No other rights can be taken into consideration.
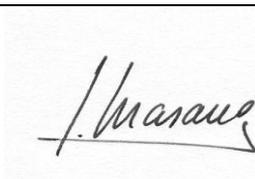
Return shipment is at the customer's expense if the equipment is anywhere other than at the customer's headquarters.

In the event of damage during shipment, guarantee rights will be granted only if the equipment is shipped in the original packaging. You are therefore recommended to keep the original packaging.

Following expiry of the guarantee period, all services requested will be dealt with by our specialist technicians at the user's expense.

9. CE DECLARATION OF CONFORMITY

FABRICANTE PRODUCTO: DAVI & CIA S.L.
PRODUCT MANUFACTURER:

DIRECCIÓN: C/ Murcia, 35, Nave G
ADDRESS   Polígono Industrial Can Calderón
          E08830 Sant Boi de Llobregat
          BARCELONA - ESPAÑA

DECLARAN BAJO SU RESPONSABILIDAD QUE EL PRODUCTO:
DECLARE UNDER THEIR RESPONSIBILITY THAT THE PRODUCT

> **Nombre**   MEDICAL SCALE
> *Name*
>
> **Tipo**   EQUIPO ELECTROMÉDICO / MECÁNICO
> *Type*   Electromedical / mechanical equipment
>
> **Finalidad Prevista**   Equipo pesapersonas incorporando tallímetro
> *Intended Use*   *Weighing scales incorporating height rod*

CUMPLE LOS REQUISITOS DE LAS DIRECTIVAS:
CONFORMS WITH THE REQUISITES OF THE DIRECTIVES

> **Pesapersonas, Tallímetro (*Weighing scales, Height rod*)**
>
> **EC Directive 2004/108/CE**   Directiva de Compatibilidad Electromagnética *(Electromagnetic Compatibility Directive)*
>
> **EC Directive 90/384/CEE**   Directiva de Instrumentos de Pesaje No Automático *(Non-Automatic Weighing Instruments Directive)*

FECHA: 15 de Abril de 2010   ***DATE:*** 15th April 2010

Nombre: *Name*	J.Masana
Firmado: *Signed*	
Cargo: *Function*	**Director** DAVI & CIA

This manual and other support documents are available on the web

www.davicia.com

DAVI & CIA