

# Operating Manual

## Electronic Bed Scale

**ADE**



**M600620**

*M600020-141009-Rev004-UM-en*

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## Contents

Introduction .....	4
Assembly and set up .....	4
<b>Scope of delivery</b> .....	4
<b>Power supply</b> .....	4
<b>Replacing rechargeable batteries</b> .....	4
<b>Tips for handling the batteries</b> .....	5
Quality features .....	5
Display .....	6
<b>Description</b> .....	6
<b>Connecting additional devices</b> .....	6
<b>Housing and connections</b> .....	7
Safety .....	7
Settings .....	7
<b>Setting date and time</b> .....	8
Operation .....	8
<b>Modes of operation</b> .....	8
<b>Before weighing</b> .....	9
<b>Weighing</b> .....	9
<b>Tare function</b> .....	9
<b>Hold function</b> .....	9
<b>Determining the Body Mass Index (BMI)</b> .....	10
<b>Print out a record</b> .....	10
Care, servicing and recalibration .....	10
<b>Cleaning</b> .....	10
<b>Error messages</b> .....	10
<b>Waste disposal</b> .....	11
<b>Storage and transport conditions</b> .....	11
<b>Warranty</b> .....	11
<b>Recalibration</b> .....	11
Technical specifications .....	12
Declaration of conformity .....	13

## Introduction

Your ADE electronic bed-scale is a quality, sturdy and durable product manufactured under the high standards and regulations for calibrated class III scales in accordance with national regulations in Germany. The scale is designed and manufactured primarily for the daily practice in hospitals and dialysis centres.

ADE instruction manuals have been prepared to provide the user with all the necessary knowledge about the safe use of ADE scales and their related accessory equipment.

For further questions about how to use the products or about this or other service manuals, feel free to contact your local ADE representative or visit our web page at [www.ade-hamburg.de](http://www.ade-hamburg.de)

In order to achieve the best possible results kindly read and follow the operation manual in all respects.

## Assembly and set up

The ADE bed scale is supplied in a fully assembled condition. Please insure that your scale is being placed vibration-free at a dry place. Dismantle packaging and foil carefully and remove the transport securing devices. Place the weighing feet on a plain, dry and level surface before the weighing procedure.

### Scope of delivery

- 4 Weighing shoes/ measuring feet with integrated ramp (numbered 1-4)
- 4 Locking aids
- 1 Mains adapter
- Equipment trolley with integrated terminal box for connection to weighing shoes (numbered 1-4) and already mounted indicator
- Operating Manual including “Certificate of Conformity”

### Power supply

Power is supplied either by the rechargeable battery in the display unit or by the mains power via the supplied power unit. The imprinted voltage value at the mains adapter must match the mains voltage at the place of use. Connect the mains cable to the indicator and to a socket.

The wall socket must be located near to the unit and be easily accessible. Please use only the mains adapter supplied by ADE. The mains adapter is charging the battery pack during normal operation.

When the battery is being charged for the first time a sufficient charging period of approx. 24 hours is necessary to achieve a full battery load.

If the unit is in battery mode and the display indicates – **Lo**, the battery needed to be recharged with the mains adapter. For a full battery load a charging period of 12-16 hours is required with the scale being switched off. If –**Lo** still appears at the display inform your service partner.

### Replacing rechargeable batteries

The battery compartment is located at the front of the unit (see right picture).



- 1) Open the battery compartment.
- 2) Remove the battery cable and the corresponding connector carefully from the housing. Disconnect the old battery pack. Connect the wires/plug (red to red, black to black) with the new battery pack and insert the new battery into the housing.
- 3) Close the battery compartment again.

Only use original rechargeable batteries and mains adapter from ADE. The warranty does not cover any damage caused by using other types of batteries or charger units.

## **Tips for handling the batteries**

The life of a battery depends on the frequency of use, temperatures, settings and the accessories being used.

- New batteries or batteries that have been stored for a long period require a longer charging period.
- Charge the batteries at room temperature.
- Never expose the batteries to temperatures below -10°C (14°F) or above 45°C (113°F).
- Rechargeable batteries lose their charging capacity over the time and require a longer charging period the older they are. If the battery performance drops considerably, then it is time to replace the battery.
- New batteries are supplied in partial charged condition. Batteries achieve their full capacity after several complete charge and discharge cycles.
- Do not throw old rechargeable batteries into the domestic waste. Ensure that the valid legal and municipal regulations of your country are being followed.
- Never dispose of batteries in fire as they can leak or explode!

## **Quality features**

ADE products correspond to the applicable EC Directives and European standards to manufacture and distribute world-wide medical devices as per the latest technical standards ensuring a long life time and continuous reliability.



Products with this mark comply with the directive 93/42/EEC and 2007/47/EC of the medical device directive.



The ISO Certificate confirms the compliance of the DIN EN ISO 9001 norms and the corresponding high standards for research & development, production, distribution and service.



Approved scales classes III respecting the standards of the European guideline and are being calibrated in accordance with precision class III of EC directive 2009/23/EC.



Scales with this symbol fulfill the EU directive 2009/23/EC on non-automatic weighing scales and furthermore fulfill the requirements of the following norms and directives:

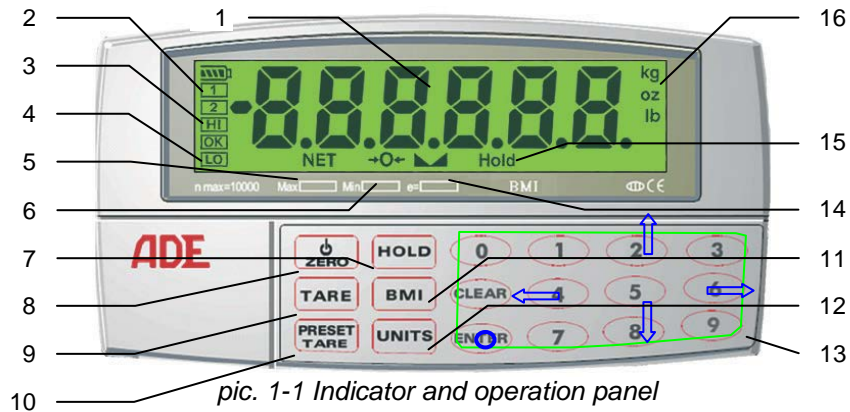
- Directive on non-automatic weighing instruments
- EC directive on electromagnetic compatibility and/or the
- low voltage directive in its current status



Products with this mark comply with the directive 2009/23/EC on non-automatic weighing instruments

## Display

### Description




No.	Name	Description
1	Display	LCD display for weight, mode, settings and configuration information.
2	Battery charge level	Status of the battery charge level.
3	Switching points 1 & 2	In program mode: Status indicator for switching points 1 & 2.
4	BMI status indicator (HI, OK, LO)	Status of the automatic BMI (Body Mass Index) evaluation.
5	Net status indicator	LCD on - net weight is being displayed. LCD off – gross weight is being displayed.
6	Status indicator →0←	The scale is at zero level.
7	Hold – button	Activates the hold function.
8	On/off, zero – button	On and off switch and re-set of the display.
9	Tare- button	Activate/ deactivate the tare function.
10	Preset tare – button	Press briefly to access the tare function. Press for a long period to enter and save the tare value.
11	BMI – Button	Enter to proceed with BMI mode.
12	Units – Button	Switch button between primary and secondary units. Not available for CE approved class III scales
13	Number pad	Figures 0-9, Clear, Enter and Navigation functions: Key 6 menu direction to the right; Key 4 menu direction to the left; Key 8 menu direction down; Key 2 menu direction up. For better understanding see Pic. 1.1 the blue arrows. Used to navigate through menus, to select numerical values and to increase or lower the value.
	<u>Special function:</u> "0" key "Enter" key	In weight mode, you can change between gross and net weight using figure "0" (if any weight have been tared off). Function in weight mode: "Print" if printer has been connected.
14	Standstill status indicator (14) ▲▲:	The scale is at a standstill. The weight is stable with no movement. This is mandatory for functions like reset, print and tare.
15	"Hold"	If displayed is the hold function is activated.
16	"kg"	If displayed is the weight is displayed in kilograms.
	"g"	If displayed is the weight is displayed in grams.

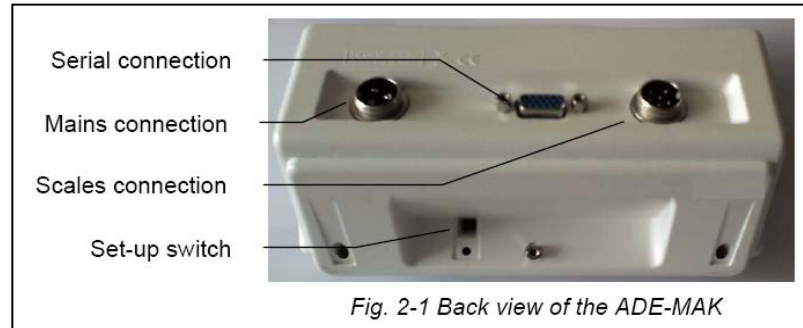
### Connecting additional devices

Printer, PC or remote-display could be connected by the RS-232 interface. For connection of additional devices kindly ask your local representative or authorized ADE dealer for further instructions.

## **Housing and connections**

The connections to mains adapter, serial port and to the load cells are located at the back of the ADE display. The set-up switch to start the configuration mode is underneath the housing. It is protected by a cover plate and secured by a screw (not shown in Fig. 2-1).

 **Do not use the set-up button, as otherwise calibration will be lost. This procedure is only allowed by authorized service personnel appointed by ADE (GmbH & Co.). Any unauthorized manipulations made to the configuration mode will affect the warranty agreement.**



## **Safety**

The ADE-display unit (MAK) corresponds to the latest state of the art technology and complies with standard regulations and directives. Kindly follow the safety instructions in this operating manual, the country-specific installation standards as well as the applicable safety conditions and accident prevention regulations in all aspects. Electronic medical devices are restricted to special safety regulations in respect of their electromagnetic compatibility. For positioning and operation, follow the instructions of this operation manual.

- Portable and mobile HF-communication systems may influence electronic medical devices.
- Make sure that the mains cable does not pose any potential trip hazard.
- Do not drop the weighing bridges/shoes or subject them to violent shocks.
- Do not operate the unit in hazardous or unstable conditions.
- Do not dip or submerge the unit into water or other liquids.
- Have all repairs and calibration carried out by professional personnel authorised by ADE.
- Set up the unit as far away as possible from equipment that generates electromagnetic or other interference.
- Only use original rechargeable batteries and mains adapter from ADE. The warranty does not cover any damage caused by using other types of batteries or charger units.

Safe operation is no longer guaranteed:

- If the power unit shows visible damage.
- If the power unit is not working properly.
- After longer periods of storage in damp areas.
- In these cases, contact your service partner for your own safety!

## **Settings**

The following functions are available in setting mode:

- Configuration of the serial interface
- Set up of date, time and consecutive printout numbers
- Set up of print format
- Set up of switching points
- Test functions

The setting mode is not made for metrological parameters. Access the function menu by pressing the CLEAR (13) key until TIME appears on the display. Use the key pad (13) to navigate within the menus, to select numerical values and to increase or lower the values. Press the ENTER key to save the values entered and to return to the super ordinate menu level.

### Menus structure of setting mode:

After entering the clear button following options are available and appear on the screen when moving with the navigation buttons:

FILTER	SERIAL	PROGR	PFORMAT	SETPTS	TEST	TIME	DATE	VERS
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### Setting date and time

- Enter the CLEAR key for approx. 4 sec; **FILTER** appears on the display.
- Press key "6" six times and **TIME** appears on the display.
- Press ENTER key and **SHOW** appears on the display.
- Press key "6" one time and **HOUR** appears on the display.
- Press ENTER key and set the hours using the arrow keys "↑2", "←4", "6→" and "8↓".
- Press the ENTER key and set the minutes and seconds.
- Go back by pressing key "2"; **TIME** appears on the display.
- Press key "6" one time and **DATE** appears on the display like the time entry.
- Press key "2" two times and **EXIT Y** appears on the display.
- Confirm with ENTER and date & time are set.

## Operation

### Modes of operation

- **Weighing mode**

The "weighing mode" is of course the standard mode of your scale. After initial configuration and sealing (by attaching a calibration sticker to the back of the unit), the ADE-scale can only be operated in this mode.

- **Setting mode**

Date, time and consecutive numbers for print commands are being set in this mode. To start setting mode, hold the GROSS/NET key pressed until TIME appears on the display.

- **Configuration mode (set-up mode)**

The values for different parameters including the calibration could be set in the configuration mode. This function is for authorized service personnel only.

- **Test mode**

There are different diagnostic functions for the ADE-MAK in test mode. This is for service personnel only.



**Manipulations to test and configuration modes can revoke the calibration status and will result in loss of warranty!**



## **Before weighing**

1. Move the bed onto the weighing feet.
2. The constructions of the weighing feet do not allow to pass over the weighing platform. In any case ensure that the wheels of the bed are secured and the brakes are engaged. Additionally make use of the plastic securing devices in order to fix the wheels.
3. Switch on the scale.
4. An automatic function test will lead to zero indication (0.0). The weight of the bed is being ignored automatically.
5. Place the patient into the bed. The displayed weight is the weight of the patient.
6. If the weight of the patient should be ignored as well (e.g. for dialysis purposes), follow the instruction under the point "Tare function".
7. If the weight of the bed including bed-clothes is already being stored follow the instruction under the point "Restore the preset tara value"

## **Weighing**

Press the ON key for at least 3 seconds to turn the scales on. An automatic function test will be conducted afterwards. The test is done when the display shows zero. The scale is now ready for the weighing procedure.

Resetting the scales back to zero: Wait until the standstill status indicator  $\blacktriangle\blacktriangle$  (14) appears. By entering the ZERO key (8), measuring inaccuracies after switching on the scale are being compensated. The zero key restarts the scale. The status indicator (6)  $\rightarrow 0 \leftarrow$  appears when the scale is being resetted.

## **Tare function**

The TARE key (9) is useful for many weighing operations. Tare might be useful in case the patient is being place on the scale/bed with items (e.g. clothing, bed clothing shoes or other items) which should be ignored by the scale. Weigh these items first. After the weight is displayed, press the TARE key (9) to reset the display back to zero. The display changes to net mode (NET status indicator (5) is on) and shows zero.

### **Entering manually tare - values**

The user is able to insert manually the gross weight, which is for example mentioned at the identification plate of the bed. Enter the appropriate tare value just by using the key pad under normal weighing mode. The value will be stored after use of the ENTER key (or TARE). The ADE-display is now ready for weighing and changes to net mode [NET status indicator (5) is on]. Enter the tare button to leave this mode.

### **Preset tara**

Press and hold the PRESET TARE key (10) for approx. 3 seconds. **PRO PT X** appears on the display. Select the memory location 1-10. Now enter the TARE VALUE which you would like to be ignored by the scale and confirm same with ENTER. The value is displayed as a negative figure and will be deducted when a load is being placed on the scale. Enter the on/off, zero – button (8) to leave this mode.

### **Restore the preset tara value**


Press the PRESET TARE key (10). "Pt x" appears on the display. Enter a number from 0-9 (memory location for the tare value). If no new number will be inserted to change the already displayed value within five seconds, the unit will turn back to weighing mode and displays the last stored value as negative figure as above. Enter the on/off, zero – button (8) to leave this mode.

### **Displaying the gross weight, net weight and tare value**

Press the "0" key to change between the net weight (gross weight minus the tared value) and the gross weight.

## **Hold function**

The determined weight could be continued being displayed even when the load has already been removed. That enables taking care of the patient first before reading the results.

To use the hold function the scale must be at standstill. The standstill status indicator  (14) is on and **Hold** appears at the digital display. Deactivate the HOLD function by pressing the key again.

### **Determining the Body Mass Index (BMI)**

The BMI figure is an index showing the ratio between height and weight.

$$\text{BMI} = \frac{\text{body weight}}{(\text{height})^2}$$


To determine this value you need the height of the person.

Start the scale and weigh the person following the steps under weighing. Then press the BMI key (11) to start BMI mode. The last value entered appears on the display. Use the numerical key pad to enter a new value for the height (in cm) or retain the value, which is already been displayed. Confirm the value entered with the ENTER key or delete same by using the CLEAR key. After the entry has been confirmed by the ENTER key, the BMI value will be calculated using the weight on the scales. The display changes between weight value and BMI value "b xx.x" (every two seconds) for a period of 3 minutes. Press the BMI key (11) to cancel before this time has expired.

### **Evaluating Body Mass Index**

BMI evaluation according to WHO			
BMI	<	16	Severely underweight
	16	- 17	Moderately underweight
	17	- 18.5	Slightly underweight
<hr/>			
BMI	18.5	- 25	Normal weight
<hr/>			
BMI	25	- 30	Overweight
	30	- 35	Obese Class I
	35	- 40	Obese Class II
		> 40	Obese Class III

### **Print out a record**

The scales must be at standstill, e.g. standstill status display  (14) appears at the screen.

Press the ENTER key (13) to send the data to the serial interface.





Note: Printing is not possible if the net weight is 0. The print function only produces one print-out. A reset is required to print out another copy.

## **Care, servicing and recalibration**

### **Cleaning**

Remove the mains plug before cleaning the unit. Do not use any aggressive cleaning materials for cleaning; only use a damp cloth or conventional disinfectant. Ensure that no liquids or any fluid gets into the scale.

### **Error messages**

<b>Error message</b>	<b>Description</b>	<b>Problem solution</b>
	Overload display	Weight exceeds max. capacity of the scales.
	Overflow indicator (negative)	Negative weight indicated – weight too low to be displayed (<=99999).
	Overflow indicator (positive)	Positive weight indicated – weight too high to be displayed (>=999999).
AD LOW 	A/D above negative range	Check if the scales are correctly assembled or if they are damaged.

AD HI 	A/D above positive range	Check if the scales are correctly assembled or if they are damaged.
EE SUM 	Parameter or calibration error	Recalibrate – please contact your supplier or service partner:
EE WR 	EEPROM indicates an error	Please contact your supplier or service partner.
PM SUM 	Internal program indicates a check error	Please contact your supplier or service partner.
HOFSET 	Switch on – above zero	Please remove the weight from the scales and restart.
LOFSET 	Switch on – below zero	Check scales for damage and inform your service partner:
UOFSET 	Irregular	Do not touch the scales after they have been switched on.

### **Waste disposal**



**Used electrical equipment and batteries do not belong in the domestic waste. Please dispose of defective or used equipment and batteries according to legal regulations of your specific country!**



**Please make sure that only discharged batteries or batteries with insulated "poles" are disposed of as otherwise they may short-circuit!**

### **Storage and transport conditions**

Keep all packaging in case you need to return the item, in order to avoid any potential transport damage. Disconnect all connected cables before dispatch.

### **Warranty**

ADE will repair or replace this product within a period of 2 years from date of delivery applying to defects occurred due to poor material or workmanship (presentation of invoice is necessary). All moveable parts – batteries, cables, mains units, rechargeable batteries etc. – are excluded. Warranty does not include natural wear, damages caused by incorrect or negligent handling, overuse or unsuitable or improper storage. The cost of transport will be borne by the customer should the equipment be located anywhere other than the customer's premises. In the event of transport damage, claims under warranty can be accepted subject to using the complete original packaging and the equipment secured the way it was packed and secured originally. All the packaging should therefore be retained.

Any warranty claim will be rejected if the equipment is opened by persons not authorized expressly by ADE to do so.

Customers abroad are kindly requested to contact their local dealer for any warranty claim, customer service and spare parts.

### **Recalibration**

Calibration to be done only by an authorised company or authorised person in accordance with national legislative regulations. The CE symbol shows the authorised site and the year of initial calibration. The scale must be recalibrated if:

- the calibration mark has been damaged
- after calibrated scales have been repaired
- or after expiry of a period for recalibration as stipulated by national, legal regulations.

## Technical specifications

### Power supply

#### Mains Adapter:

Mains voltage	115 or 230VAC
Frequency	50 or 60HZ
Power Consumption	11W in-charger, 2W off-charger

#### Main power circuit

Input Voltage	5.0VDC
Max. Current (in-charger)	1000mA

Battery Requirement: Rechargeable Lithium Ion Cylindrical (18650x2) Cell 3.7V 4000mAH

#### Battery Operation:

Charger	7~10 Hours
Saving (350ohm, Backlight-ON 30Sec, Shutdown 5Min)	200Hours

### Serial Communications

EDP Port	Full duplex RS-232 38400,19200,9600, 4800, 2400, 1200 bps
Printer Port	Output-only RS-232 or active 20 mA current loop, 9600, 4800, 2400, 1200 bps
Both Ports	7 or 8 data bits; even, odd, or no parity

### Operator Interface

Display	6-digit LCD display. 7-segment, 0.815 in (21.2 mm) digits
LCD annunciator	net, center of zero, standstill, kg/lb/g/oz/ units, Battery, Set points, Hold, HI/OK/LO
Keyboard	24-key flat membrane panel

### Environmental

Operating Temperature	-10 to +40°C (legal);
Storage Temperature	-25 to +70°C
Humidity	0-95% relative humidity
Altitude	2000 m (6500 ft) maximum

### Housing

Dimensions	18.6 cm x 9.5 cm x 10 cm
Weight	0.4 kg (without battery)
Material	ABS plastic, white

## Declaration of conformity



### Declaration of conformity by the manufacturer

These scales have been manufactured in accordance with the harmonised European standards. They conform to the regulations of the EC-directives listed below:

- EMC Directive 2004/108/EC regarding electromagnetic compatibility
  - Low Voltage Directive 2006/95/EC
  - RoHS Directive 2011/65/EC
- in the currently valid versions.

This declaration loses its validity if modifications are made to the scale without our approval.




Hamburg, August 2014

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