KERN & Sohn GmbH
Ziegelei 1
D-72336 Balingen
E-Mail: info@kern-sohn.com

Tel: +49-[0]7433- 9933-0
Fax: +49-[0]7433-9933-149
Internet: www.kern-sohn.com

Service Manual
Baby scale

KERN MBC-(E)

Typ MBC 15K2DNM (DEM)
Typ MBC 20K10NM (EM)

Version 1.1
02/2020
GB





GB

KERN MBC
Version 1.1 02/2020
Servicemanual

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1 Basic Information

The device must be repaired only by trained specialist staff or personnel with professional formation (such as a repair-specialist accredited by law concerning verification). The service manual is obligatory for repair work. After repair, original conditions of the device have to be restored. Only original spare parts should be used.

Instructions about conformity-evaluated scales:

Repair must be carried only at 100% compliance with the type approval. A violation of this specification will result in a loss of the type approval! After successful repair the balance will have to be reverified before it can be used again in a statutorily regulated field.

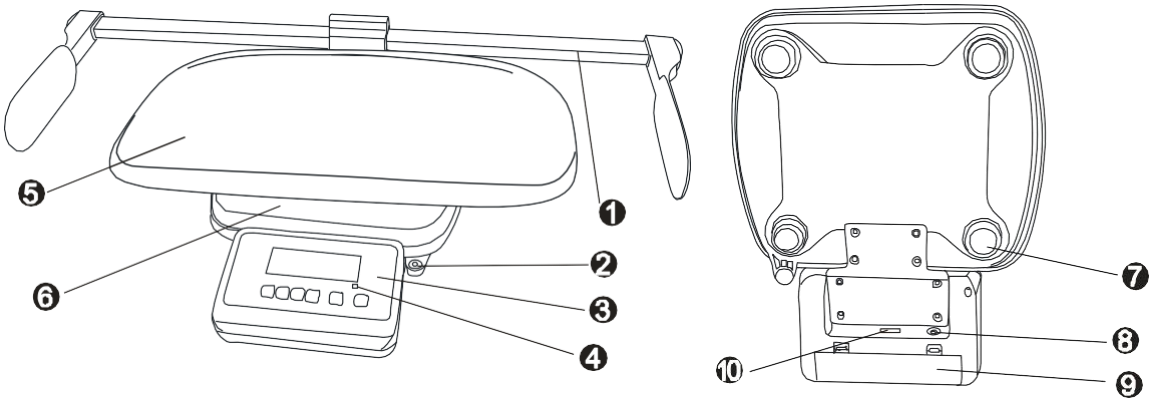
The operation and configuration of each scale is described in the accompanying manual of the scale. Any safety information in respect for verification are also described in the accompanying manual

2 Introdution

This service manual covers the MBC-NM series and is edited for the authorized servicing personnel.

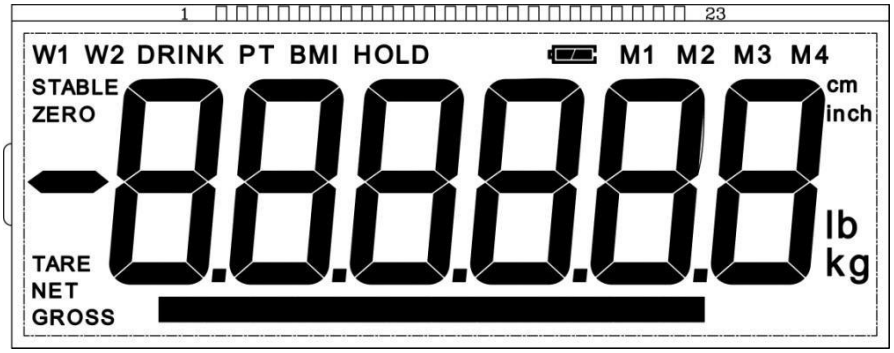
Note all rights are reserved. Copying any part of this manual is prohibited without our permission.

3 Appliance overview



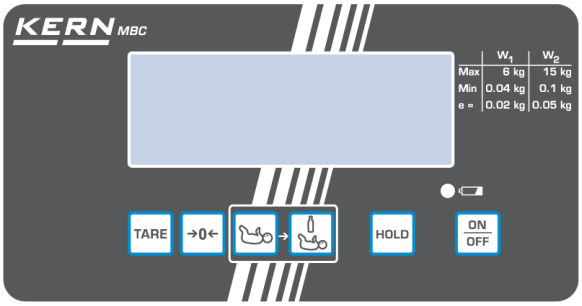
1. Height measuring rod (optional)
2. Bubble level
3. Display Unit
4. LED
5. Baby weighing pan
6. Weighing pan
7. Rubber feet (height adjustable)
8. Mains connection
9. Battery compartment
10. RS232

3.1 Overview of display



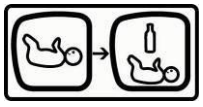
Display	Description	Description
GROSS	Gross weight display	Lights up during indication of the gross weight of the baby (after drinking)
NET	Net weight display	Lights up during indication of the net weight of the baby (before drinking) Illuminated after weighing scale was tared
ZERO	Zeroing display	Should the balance not display exactly zero despite empty scale pan, press the →0← button. Your balance will be set to zero after a short standby time.
STABLE	Stability display	Scales are in a steady state
DRINK	DRINK function	Is displayed with active drink function
HOLD	HOLD function	Is displayed with active hold function
	Rechargeable battery symbol	Lights when the voltage drops below the prescribed minimum.
		Lights when the rechargeable battery capacity is almost exhausted.
		Lights when the rechargeable battery is fully charged.

3.2 Keyboard overview

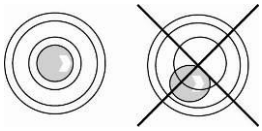


Typ MBC 15K2DNM

Typ MBC 20K10NM

Key	Description	Function
ON/OFF	ON/OFF-switch	Turn on/off
→0←	Zeroing key	Weighing scale will be reset to „0.0“ kg. **For numeric entry:** • Change decimal place
HOLD	**HOLD** button	Hold function
TARE	**TARE** button	Tare balance
	Feeding Function key	Differential weighing before and after the baby drinks
		The net weight of the baby will be shown: Before drinking **In menu:** • Call up menu • How to select menu items **For numeric entry:** Edit numeric value
		The gross weight is displayed: After drinking **In menu:** ⇨ Confirm selection **For numeric entry:** ⇨ Confirm numerical value

4 Levelling



Level balance with foot screws until the air bubble of the water balance is in the prescribed circle.

4.1 Rechargeable battery operation (MBC-A08)

(is possible by obtaining an optional battery power pack)



Open the battery compartment cover (1) at the base of the display unit and insert the rechargeable battery pack. Charge the battery for at least 12 hours before initial use.

The appearance of the symbol  in the weight display indicates that the battery packs is almost exhausted. The weighing scale will remain ready for operation for a few more minutes before switching off in order to save battery. Load rechargeable battery.

 Voltage has dropped below prescribed minimum.

 Rechargeable battery very low.

 Rechargeable battery completely reloaded

If the balance is not used for a longer time, take out the battery pack and store it separately. Leaking liquid could damage the balance.

4.2 Battery operation

As an alternative to rechargeable battery operation, the balance may also be operated with 6x AA batteries.
Open battery compartment cover (1) at the lower side of the display unit and insert batteries according to the example below. Lock the battery cover again. If the batteries are empty, in the balance display appears the symbol . Change batteries. To save battery power, the balance switches off automatically (see Instruction manual MBC chap.11.6 Auto off).

 Capacity of batteries exhausted.

 Batteries will soon be flat.

 Batteries are completely charged

4.3 Insert batteries

Remove battery compartment cover	
Connect battery holder to housing contact acc. to illustration	
Insert battery holder	

Insert batteries into battery compartment and lock with battery compartment cover.	

4.4 Mains connection

Power is supplied by the external power unit which also serves to isolate the mains supply from the scale. The stated voltage value must be the same as the local voltage.
Only approved genuine KERN power supply units may be used in compliance with Directive EN 60601-1.

The small sticker attached to the side of the display unit indicates the power port:



The LED remains illuminated as long as the weighing scale remains connected to the mains.
The LED display provides information about the battery's charging status.

Green: battery is fully charged

Blue: battery is charging

4.5 Initial Commissioning

In order to obtain exact results with the electronic balances, your balance must have reached the operating temperature (see warming up time chap. During this warming up time the balance must be connected to the power supply (mains, accumulator or battery) and be switched on.

The accuracy of the balance depends on the local acceleration of gravity.
The value of gravity acceleration is shown on the type plate.

5 Menu



Access to service menu „tCH“is locked in verified balances.

To disable the access lock, destroy the seal and actuate the adjustment switch. For position of adjustment switch, see Instruction manual MBC chap. 13.

Attention:
After destruction of the seal the weighing system must be re-verified by an authorised agency and a new verification wire/seal mark fitted before it can be reused for applications subject to verification.

5.1 Navigation in the menu

Call up menu

⇨ Turn on the scale during the self-test press , the first function **[F1 oFF]** is displayed.

Select function

⇨ With help of , the individual functions can be selected one after the other.

Change settings

⇨ Confirm selected function by . The current setting will be displayed.

⇨ Select the desired setting with  and press  to confirm or  to reject, the balance returns to the menu.

Exit menu/

Return to weighing mode

⇨ Press , the balance will return to weighing mode.

5.2 Menu overview

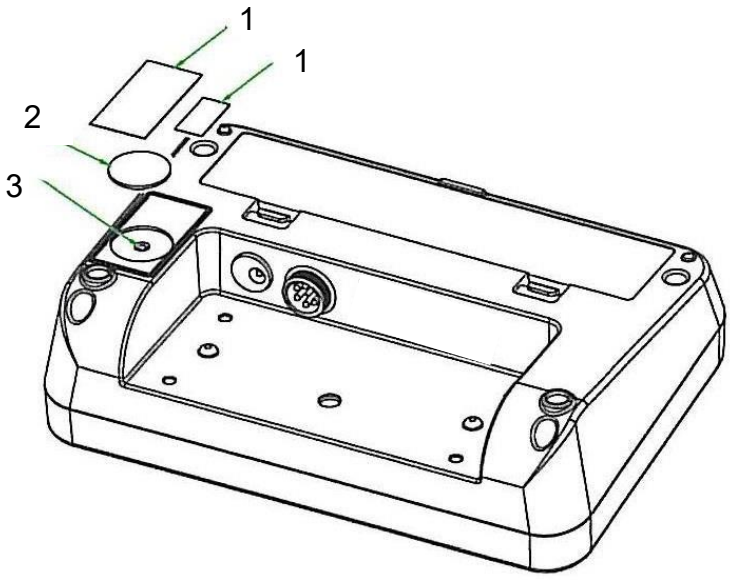
Function	Settings	Description
F1 oFF **Automatic cutout** **Auto Off**	oFF 0*	Automatic shutdown off
	oFF 3	Automatic shutdown after 3 min
	oFF 5	Automatic shutdown after 5 min
	oFF 15	Automatic shutdown after 15 min
	oFF 30	Automatic shutdown after 30 min
F2 bk **Background illumination of display**	bl on	Back lighting for display on
	bl oFF	Display background illumination off
	bl AU*	Backlighting for display will come on automatically as soon as the weighing scale is operated.
tCH **Service menu**	Pin	If display shows "Pin" adjust switch. Then press  ,  .,  subsequently.
P1 Spd **Display speed**	15*	Not documented
	30	
	60	
	7.5	

P2 CAL	duA in	dESC	C 0.00	
			C 0.000	
			C 0.0000	
			C 0	
			C 0.0	
		inC	Sd iv 1	div 1, 2, 5, 10, 20, 50
			Sd iv 2	div 1, 2, 5, 10, 20, 50
		CAP	CAP 1	
			CAP 2	
		CAL	UnLoAd. nonLin, LinEAr	
		StrAnG	St 100	
			St 200	
			St 500	
	duA rA	dESC	C 0.00	
			C 0.000	
			C 0.0000	
			C 0	
			C 0.0	
		inC	Sd iv 1	div 1, 2, 5, 10, 20, 50
			Sd iv 2	div 1, 2, 5, 10, 20, 50
		CAP	CAP 1	
			CAP 2	
		CAL Justierung	UnLoAd	
		StrAnG	St 100	
			St 200	
			St 500	
	SnG rA	dESC	C 0.00	
			C 0.000	
			C 0.0000	
			C 0	
			C 0.0	
		inC	Sd iv 1	div 1, 2, 5, 10, 20, 50
			Sd iv 2	div 1, 2, 5, 10, 20, 50
		CAP	CAP 1	
			CAP 2	
		CAL	UnLoAd	
		StrAnG	St 100	
			St 200	
			St 500	

P3 Pro	tri	Not documented
	CoUnt	Not documented
	rESEt	Reset weighing scale to factory setting
	SEtGrA	Not documented

* default setting

6 Position adjustment switch and seals:



1. Self-destroying seal mark
2. Cover
3. Adjustment switch

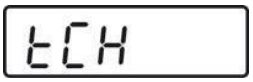
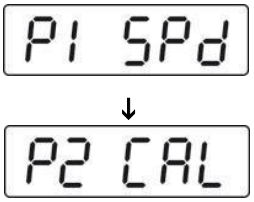
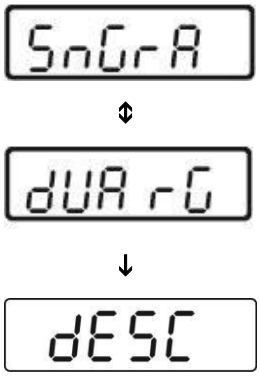
7 Adjustment

As the acceleration value due to gravity is not the same at every location on earth, each display unit with connected weighing plate must be coordinated - in compliance with the underlying physical weighing principle - to the existing acceleration due to gravity at its place of location (only if the weighing system has not already been adjusted to the location in the factory). This adjustment process must be carried out for the first commissioning, after each change of location as well as in case of fluctuating environment temperature. To receive accurate measuring values it is also recommended to adjust the display unit periodically in weighing operation.

	• Prepare the required adjustment weight. The adjustment weight to be applied depends on the capacity of a weighing scale, see Instruction manual MBC chap. 1. Carry out adjustment as closely as possible to admissible maximum load of weighing scale. Information about test weights you will find in the internet under http://www.kern-sohn.com • Observe stable environmental conditions. For warm-up time required for stabilisation see Instruction manual MBC chpt 1.

	Access to service menu „tCH“is locked in verified balances. To disable the access lock, destroy the seal and actuate the adjustment switch. Position of the adjustment switch see nstruction manual MBC chap. 13. **Attention:** After destruction of the seal the weighing system must be re-verified by an authorised agency and a new verification wire/seal mark fitted before it can be reused for applications subject to verification.

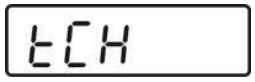
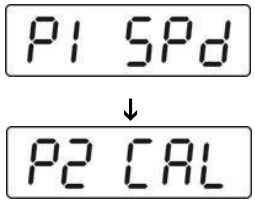
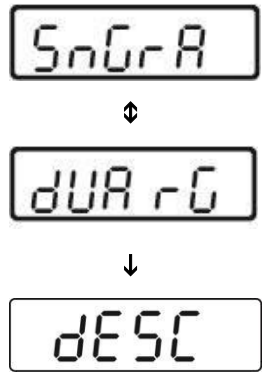
7.1 Procedure:

	⇨ Turn on the scale during the self-test press, the first function [F1 oFF] is displayed. ⇨ Press repeatedly until "t CH" is displayed.
	⇨ Press, **[Pin]** is displayed
	**Operate adjustment switch; for position see chap.13** Press, TARE and HOLD subsequently, **[P1 SPd]** will appear
	⇨ Press, „**P2 CAL**“ will be displayed
	⇨ Press, the currently set balance type is displayed. SnGrA = single range balance dUArG = dual range balance ⇨ To change select scale type with and confirm with, **[dESC]** appears.
	⇨ Press repeatedly until „CAL“ will be displayed. ⇨ Confirm with

nonL in	⇨ Confirm with , **[UnloAd]** appears

UnLoAd	⇨ Ensure that there are no objects on the weighing pan. ⇨ Wait for stability display "STABLE", then confirm with
0020.00 kg (example)	⇨ The size of the currently set adjustment weight is displayed, the active site flashes. If required, select with →0← the digit to be altered and change the digit with . Confirm with , **[LoAd]** appears
LoAd ⬇ PASS	⇨ Put the required adjustment weight carefully in the centre of the weighing pan. ⇨ Wait until stability display „STABLE“ appears ⇨ Confirm with **[PASS**] is displayed.
STABLE ZERO GROSS 0.0 kg	After the adjustment the balance will carry out a self-test. Remove adjusting weight **during** selftest, balance will return into weighing mode automatically. An adjusting error or incorrect adjusting weight will be indicated by the error message; repeat adjustment procedure. An adjusting error or incorrect adjustment weight will generate an error message („Err 4“), repeat the adjustment process.

7.2 Linearity Adjustment

	⇨ Turn on the scale during the self-test press , the first function [F1 oFF] is displayed. ⇨ Press repeatedly until "t CH" is displayed.
	⇨ Press , **[Pin]** is displayed
	**Operate adjustment switch; for position see chap.13** Press , and subsequently, **[P1 SPd]** will appear
	⇨ Press , „**P2 CAL**“ will be displayed
	⇨ Press , the currently set balance type is displayed. SnGrA = single range balance dUArG = dual range balance ⇨ To change select scale type with and confirm with , **[dESC]** appears.
	⇨ Press repeatedly until „CAL“ will be displayed. ⇨ Confirm with
nonL in	⇨ Press **Linear** appears
L inEAr	⇨ Confirm with ,
LoAd 0	⇨ Confirm with , Zero Load Point

LoAd 1	⇨ Confirm with  1/3 Load Point
LoAd 2	⇨ Confirm with  2/3 Load Point
LoAd 3	⇨ Confirm with  Full Load Point

8 MAINTENANCE

8.1 General

Please clean the scale each week and do calibration every year.
If the scale does not operate properly, find out the problem as possible.
Determine whether the problem is constant or alternate. Be aware that problems can be caused by mechanical or electrical influences.

Check the following.

- Water
- Corrosive materials
- Vibrations or temperature or wind
- Physical damage

Check the scale cables for damage, and check all connections and connecters for any loose contact or incorrect connection

8.2 Error Codes

Error Code	Description	POSSIBLE CAUSES
Err 4	Zero range exceeded, due to turning on or by pressing 	• Goods on the platform • Overload, when zeroing the scale. • Improper calibration • Load cell problem • PCB problem
Err 6	A/D Count out of the range	• Platform not installed • Load cell problem • PCB problem

8.3 Determine the Problem

Determine whether the problem is in the PCB or the Load Cell

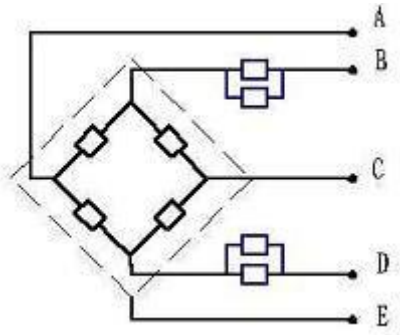
- Disconnect the power supply from the scale, and disconnect the load cell connection from the PCB
- Reapply power and test the PCB
- If problem goes away, its source is probably in the Load cell. Check the wiring, connecter, load cell and mechanical components of the load cell.
- If problem persists, its source is probably in the PCB. Check the PCB voltages, connecters, cables and function programs

8.4 Check the Load cell

- Remove power from the system, and disconnect the PCB from the Load cell
- Make sure all leads are connected and correctly.

- Check load cell for proper input and output resistances

8.5 Load Cell Connections



Signal + Green
Supply + Red

Signal - Black

Supply - White
Shield

Measuring Points	Resistance
Red (+ Exc) to White (–Exc)	420 ±20Ω
Green (+Sig) to Black (–Sig)	350Ω ±5Ω

8.6 Checking the different Voltages

If the problem is in the PCB, use a multimeter to check the following voltages

AC Power
Check the AC power socket out put voltage.

Adaptor Voltage
Check the adaptor output cable connecter voltage
Compare the value with the name plate on the scale

PCB Input Voltage
Check the PCB input power connecter voltage
Voltage must be minimum 9VDC in to the pin AD+

Check Battery Voltage and Charging Voltage
Check the Battery Voltage**,**
Voltage must be minimum 6VDC. If below the 6VDC connect the adaptor for charging
The battery voltage below the 5.5VDC, replace the battery and install new 6V/3.4Ah battery.

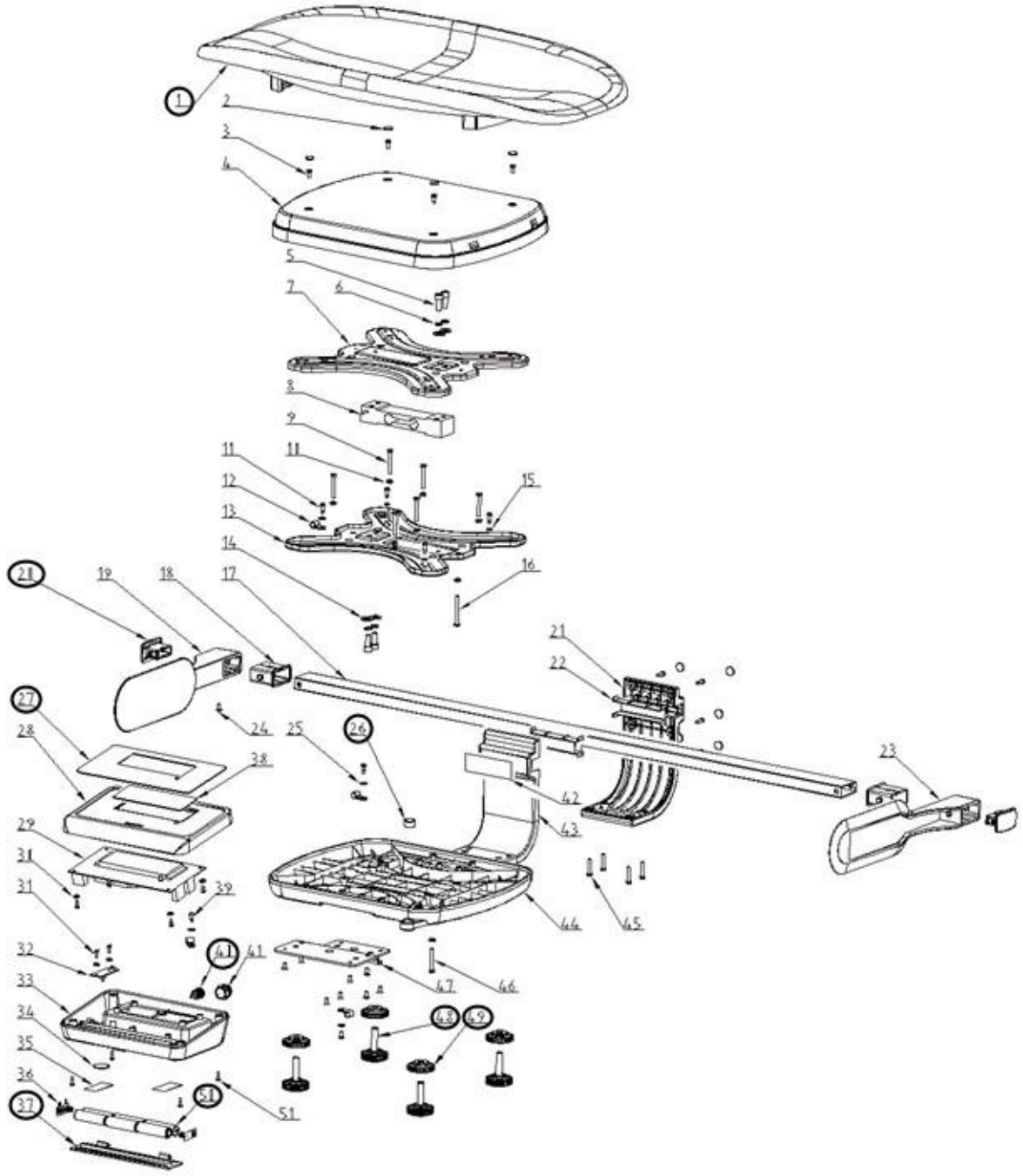
Check the Battery Charging Voltage;
Remove the battery connection terminals (Red and Black) from the battery. Connect the power and turn on the scale Voltage into the terminal minimum 6.5VDC

8.7 Trouble Shooting

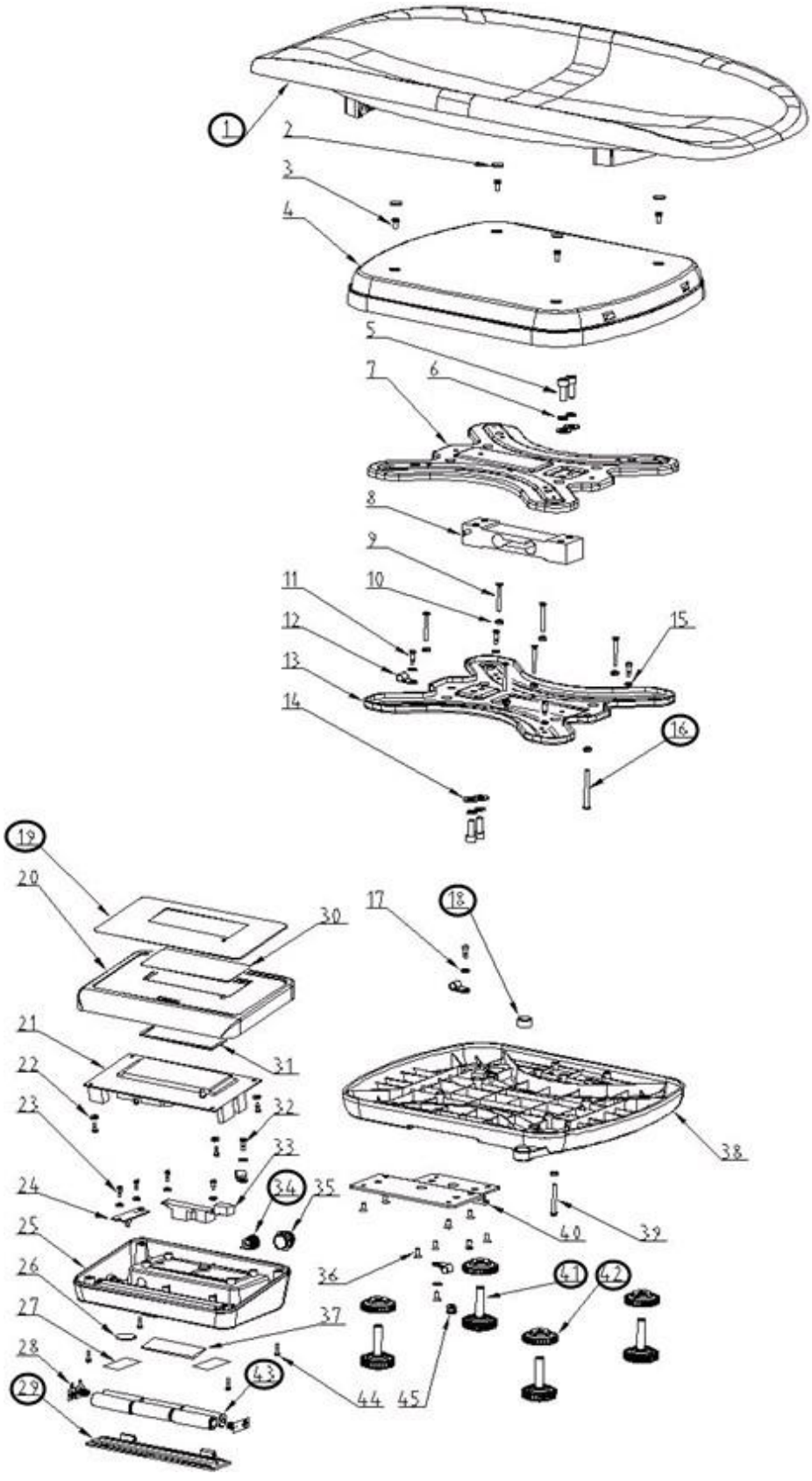
Problems	Possible cause	Common Solutions
Display is blank. No self test	Mains power is turned off. Power supply faulty or not plugged. Internal battery is not charged. On/Off switch problem	Check power is getting inside the scale and on/off switch is working. Verify the voltages, which is on the power labels.
Blank display after self test	Pan not installed. Unstable weight, load cell damaged	Check the pans are installed correctly. Try to turning on again.
OL or -------	Maximum capacity exceeded. Load cell or mechanics damaged. Power supply faulty	Check the platform is installed correctly. Try to turn on the scale again. Do the calibration again
------- or NULL displayed	Weight is on the platform is below permissible limit. Pan not installed correctly. Power supply faulty. Load cell or mechanism faulty	Check the platform is installed correctly. Try to turn on the scale again. Do the calibration again
Display is unstable	Goods touching somewhere. Air variation or any vibrations. Temperature changed . Load cell or connections faulty. Power supply faulty	Check the scale is in acceptable location. Check the connecters and load cell. Check the power supply and battery
Weight value incorrect	Calibration error. Platform of load cell touching somewhere. Wrong weighing unit	Use accurate weight for to do the calibration Check the pan and load cell is installed proper and touching. Check the parameter settings. Check the load cell and connecters
Can not use full capacity	Over load protection stoppers or transport locks are not removed. Parameters are set incorrectly. AD problem. Load cell or mechanism damaged	Check the stoppers and locks under the platform. Check the weighing unit and parameter settings. Check the load cell.
Platform Corner Weight different	Over load protection stoppers or transport locks are not removed. Load cell or mechanism damaged	Check the stoppers and locks under the platform. Use accurate weight for to do the calibration Check the load cell.
Battery not charging	Mains voltage problem Charging circuit problem Battery Problem	Check the mains and adaptor. Check the battery. Check the charging circuit

9 DRAWING

9.1 MBC HM



9.2 MBC oHM


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