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
Medical Chair scale

KERN MCC-NM

Type MCC 250K100NM

Version 1.0
07/2018
GB



GB

KERN MCC-NM

Version 1.0 07/2018

Servicemanual

Content

1 Basic Information 3

2 Introdution 3

3 Appliance overview 4

4 Overview of display 7

4.1 Keyboard overview 8

4.2 Installing the chair scales 9

4.3 Levelling 10

4.4 Mains connection 12

4.5 Safety cable 12

4.6 Rechargeable battery operation 13

4.7 Battery operation 13

4.8 Insert batteries 14

4.9 Initial Commissioning 14

5 Menu 15

5.1 Navigation in the menu 15

5.2 Menu overview 16

6 Verification 17

6.1 Position adjustment switch and seals: 18

6.2 Verification validity period (current status in G) 18

7 Adjustment 19

7.1 Procedure: 20

7.2 Linearity Adjustment 22

7.3 Service, maintenance 23

7.4 Error Codes 23

7.5 Check the Load cell 24

7.6 Checking the different Voltages 24

7.7 Trouble Shooting 26

8 DRAWING 28

..... 28

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.

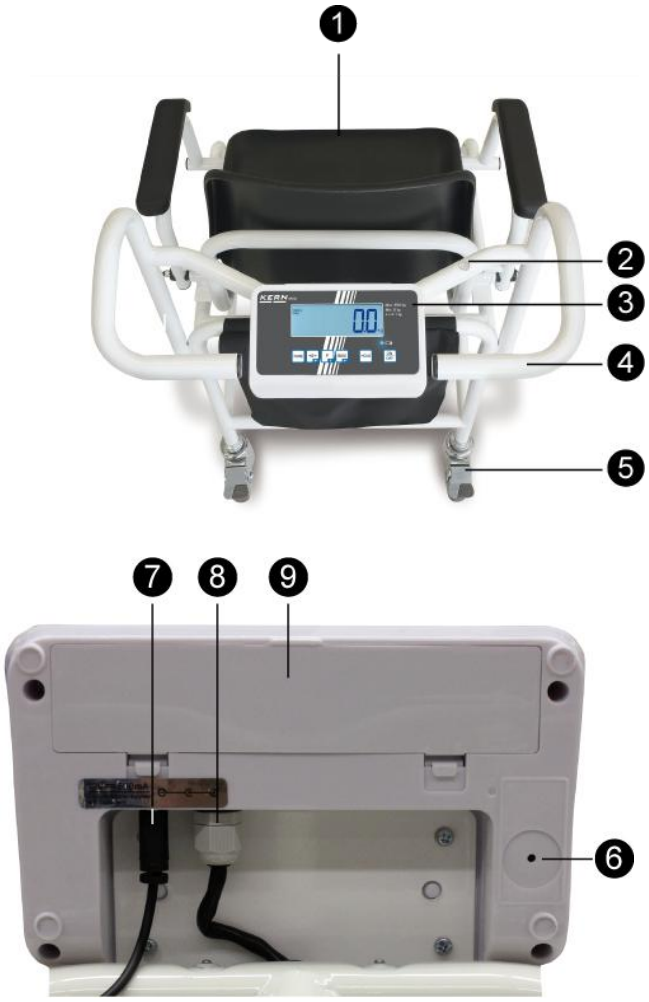
The operation and configuration of each scale is described in the accompanying manual of the scale. Any safety information in respect for verification are also described in the accompanying manual

2 Introdution

This service manual covers the MCC series and is edited for the authorized servicing personnel.

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3 Appliance overview



1. Seat pan
2. Bubble level
3. Display Unit
4. Manipulations
5. Parking brake
6. Adjustment switch
7. Terminal power supply unit
8. Connection cable "Display - Chair"
9. Battery compartment

Details:





Parking brake open



Parking brake closed

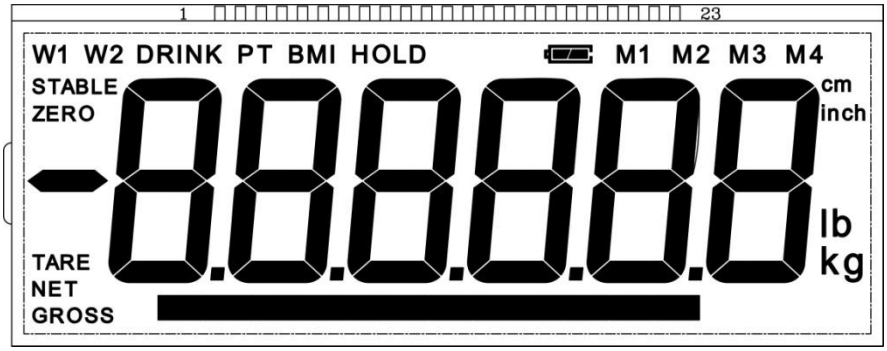


Foot rest and adjustment foot

Folding arm rests

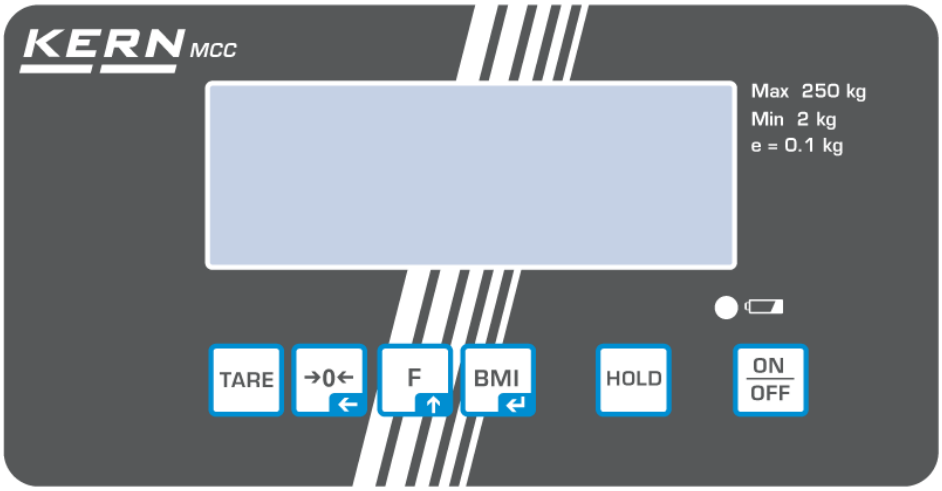


4 Overview of display



Display	Description	Description
GROSS	Gross weight display	Lights up during indication of the gross weight
NET	Net weight display	Lights up during indication of the net weight 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
BMI	Body Mass Index	Is actively displayed during active BMI 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.

4.1 Keyboard overview

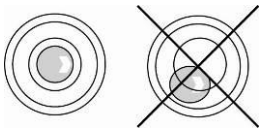


Key	Description	Function
ON/OFF	ON/OFF-switch	Turn on/off
HOLD	HOLD button	Hold function
BMI	BMI key	Calculation of the Body Mass Index **In menu:** • Confirm selection **For numeric entry:** • Confirm numerical value
F	Function key	**In menu:** • Call up menu • How to select menu items **For numeric entry:** • Increase numerical value
→0←	Zero setting key	Weighing scale will be reset to „0.0“ **For numeric entry:** • Change decimal place
TARE	TARE key	Tare balance

4.2 Installing the chair scales



- ⇨ Place scales on an even surface.
- ⇨ Check if the air bubble of the level is within the prescribed circle.



- ⇨ If the air bubble of the bubble level is **not** in the required circle, level the balance using the adjustment feet as specified in the following chapter 8.4.1:

- ⇨ Check levelling regularly.

4.3 Levelling

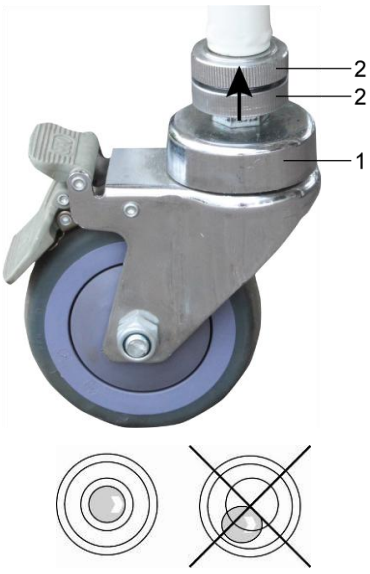
- Levelling is restricted to specialist staff possessing well acquainted with the workings of weighing scales.

⇨ Place scales on an even surface.

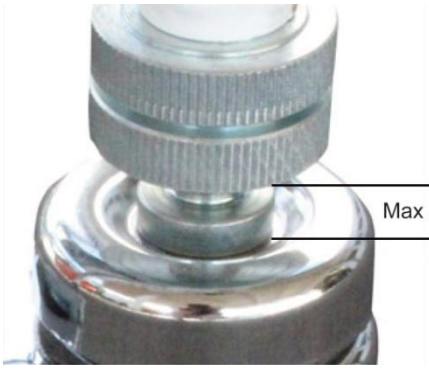
⇨ Lock brakes



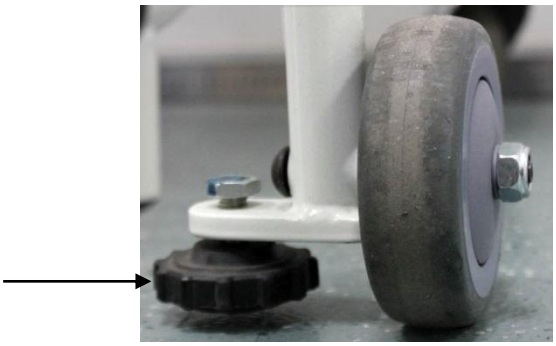
⇨ Turn the wheel (1) until the air bubble of the bubble level is in the black circle



⇨ Turn the counternuts (2) right to the top.

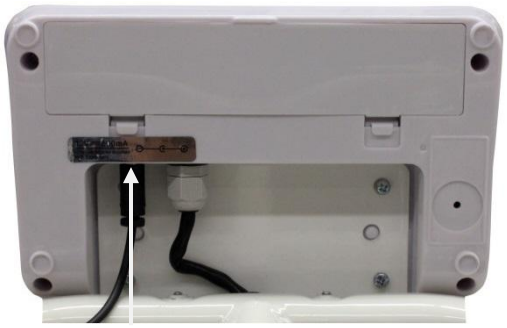


Gap width must not exceed 15 mm!



Use the adjustment feet to fix the chair at the front rollers

4.4 Mains connection



Terminal power supply unit

Power is supplied via the external mains adapter.The printed voltage must correspond to 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

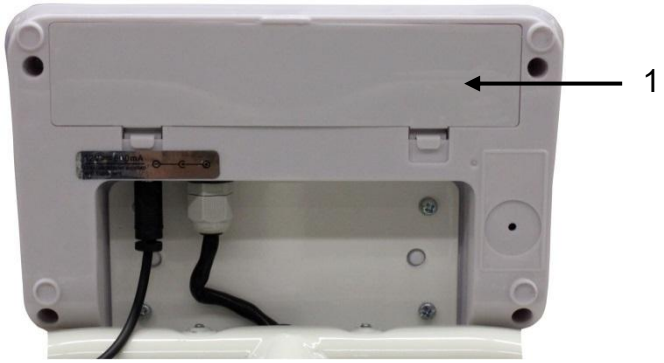
4.5 Safety cable

Safety cable for strain relief of the mains cable.



Application:
Installation for strain relief between mains cable (plug-in power supply unit) and display unit.

4.6 Rechargeable battery operation



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.Charge the battery pack.

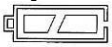
 Voltage has dropped below prescribed minimum.

 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.

4.7 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 chap.11.6 Auto off).

 Capacity of batteries exhausted.

 Batteries will soon be flat.

 Batteries are completely charged

4.8 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.	

4.9 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 balances 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 chap. 15.

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	⇨ In weighing mode, press F and the first function **[F1 oFF]** will be displayed.
Select function	⇨ With help of F , the individual functions can be selected one after the other.
Change settings	⇨ Confirm selected function by BMI .The current setting will be displayed. ⇨ Select desired setting by F and confirm with BMI, the balance returns to the menu.
Exit menu/ **Return to weighing mode**	⇨ Press TARE and the scales 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.
F3 Str **Subsequent tare value, locked in devices with type approval certificate.**	Str on	Following tare ON
	Str oFF*	Following tare OFF
tCH **Service menu**	Pin	It display shows "Pin" adjust switch. Then press subsequently , , 
P1 Spd **Display speed**	15*	Not documented
	30	
	60	
	7.5	
P2 CAL	dESC	
	inC	
	CAP	
	CAL	nonLin
		LinEAr
P3 Pro	tri*	Not documented
	CoUnt	Not documented
	rESEt	Reset weighing scale to factory setting
	SEtGrA	Not documented

* default setting

6 Verification

General introduction:
According to EU directive 2014/31/EU balances must be officially verified if they are used as follows (legally controlled area):

a) For commercial transactions if the price of goods is determined by weighing.
b) For the production of medicines in pharmacies as well as for analyses in the medical and pharmaceutical laboratory.
c) For official purposes
d) For manufacturing final packages
e) Determination of mass in the practice of medicine that is, weighing patients for reasons of medical supervision during medical surveillance, examination and treatment.

In cases of doubt, please contact your local trade in standard.

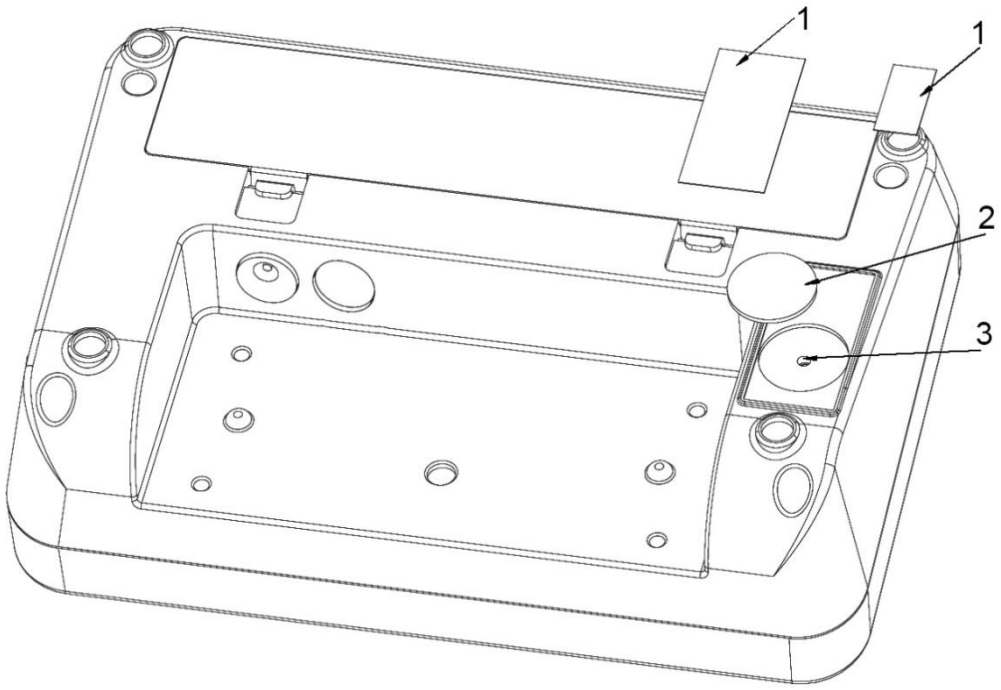
Verification notes:
An EU type approval exists for balances described in their technical data as verifiable.If a balance is used where obligation to verify exists as described above, it must be verified and re-verified at regular intervals.
Re-verification of a balance is carried out according to the respective national regulations.For verification validity period, s. chap. 15.1.
The legal regulation of the country where the balance is used must be observed!

Verification of the balance is invalid without the seal.
The seal marks attached on balances with type approval point out that the balance may only be opened and serviced by trained and authorised specialist staff.If the seal mark is destroyed, verification loses its validity.Please observe all national laws and legal regulations.In Germany a re-verification will be necessary.

Balances with obligation to verify must be taken out of operation if:

- **The weighing result of the balance is outside the error limit.**Therefore, in regular intervals load balance with known test weight (ca. 1/3 of the max. load) and compare with displayed value.
- **The reverification deadline has been exceeded.**

6.1 Position adjustment switch and seals:



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

6.2 Verification validity period (current status in G)

Personal scales (including chair and wheelchair scales) in hospitals	4 year
Personal scales, when not located in hospitals (for example, doctor's offices and nursing homes)	unlimited
Baby weighing scales and mechanical birth weight scales	4 year
Bed scales	2 year
Scales in dialysis stations	unlimited

Rehab clinics and health authorities are treated as hospitals.
(4 years of verification validity)

Not treated as hospitals (verification validity not limited) are dialysis stations, nursing homes and doctor’s surgeries.

(Details derived from: „Information by the verification authority, weighing scales applied in medical use“)

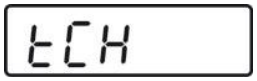
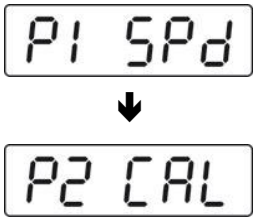
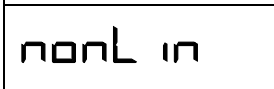
7 Adjustment

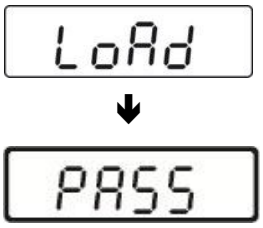
As the acceleration value due to gravity is not the same at every location on earth, each display unit with connected weighing plate must be coordinated - in compliance with the underlying physical weighing principle - to the existing acceleration due to gravity at its place of location (only if the 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 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 MCC-NM Instruction manual see chpt 1.

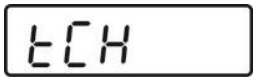
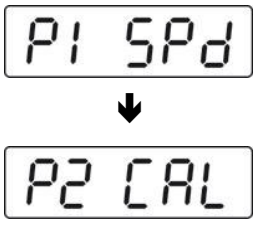
	Access to service menu „tCH“ is locked in verified balances. To disable the access lock, destroy the seal and actuate the adjustment switch. Position of the adjustment switch see MCC-NM Instruction manual chap. 15. **Attention:** After destruction of the seal the weighing system must be re-verified by an authorised agency and a new verification wire/seal mark fitted before it can be reused for applications subject to verification.

7.1 Procedure:

	⇨ In weighing mode, press F repeatedly until **[tCH]** appears.
	⇨ Press BMI, **[Pin]** is displayed
	Press F, TARE and HOLD subsequently, **[P1 SPd]** will appear
	⇨ Press F, „**P2 CAL**“ will be displayed ⇨ **Operate adjustment switch; for position see MCC-NM Instruction manual chap.15**
	⇨ Press BMI, **[dESC]** is displayed
	⇨ Press F repeatedlyuntil **[CAL]** will be displayed. ⇨ Confirm with BMI
	⇨ Confirm with BMI, **[UnloAd]** appears
	⇨ Ensure that there are no objects on the weighing pan. ⇨ Wait for stability display "STABLE", then confirm with BMI
 (example)	⇨ The size of the currently set adjustment weight will be displayed. To change, select the digit to be altered by →0←, and the numerical value by F.

	⇨ Confirm with BMI, **[LoAd]** appears.
	⇨ Carefully place adjusting weight in the centre of the seating pan ⇨ Wait until stability display „STABLE“ appears ⇨ Confirm with BMI [PASS] is displayed.
	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.

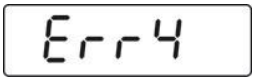
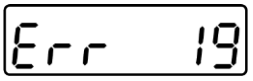
7.2 Linearity Adjustment

	⇨ In weighing mode, press F repeatedly until **[tCH]** appears.
	⇨ Press BMI, **[Pin]** is displayed
	Press F, TARE and HOLD subsequently, **[P1 SPd]** will appear
	⇨ Press F, „**P2 CAL**“ will be displayed ⇨ **Operate adjustment switch; for position see MCC-NM Instruction manual chap.15**
	⇨ Press BMI, **[dESC]** is displayed
	⇨ Press F repeatedlyuntil **[CAL]** will be displayed. ⇨ Confirm with BMI
nonL in	⇨ Press F Linear appears
L inEAr	⇨ Confirm with BMI
LoAd 0	⇨ Confirm with BMI Zero Load Point
LoAd 1	⇨ Confirm with BMI 100 kg Load Point
LoAd 2	⇨ Confirm with BMI 200 kg Load Point
LoAd 3	⇨ Confirm with BMI 250 kg Load Point

7.3 Service, maintenance

The appliance may only be opened by trained service technicians who are authorized by KERN.
Disconnect the scales before opening.

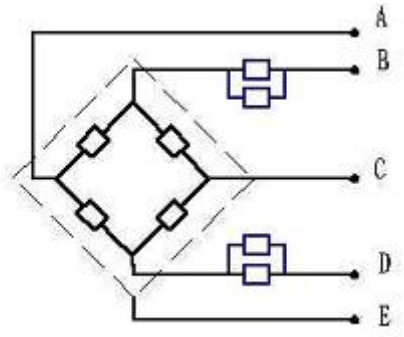
7.4 Error Codes

Display	Description
	**Zero range exceeded** (on start-up or when pressing the →0← key) • Load on weighing pan • Excess load, during zero setting of weighing scale • Incorrect adjusting process • Fault on load cell
	**Value outside the A/D converter range** • Damaged weighing cell • Damaged electronics
	**Unable to initialise zero point** • Measuring cell defective / overloaded • Object on weighing pan / contact • Transport safety device has not been removed • Main board defective

7.5 Check the Load cell

- Remove power from the system, and disconnect the PCB from the Load cell.
- Check the moisture, or foreign material inside.
- Make sure all leads are connected and correctly.
- Check load cell for proper input and output resistances

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

7.6 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;

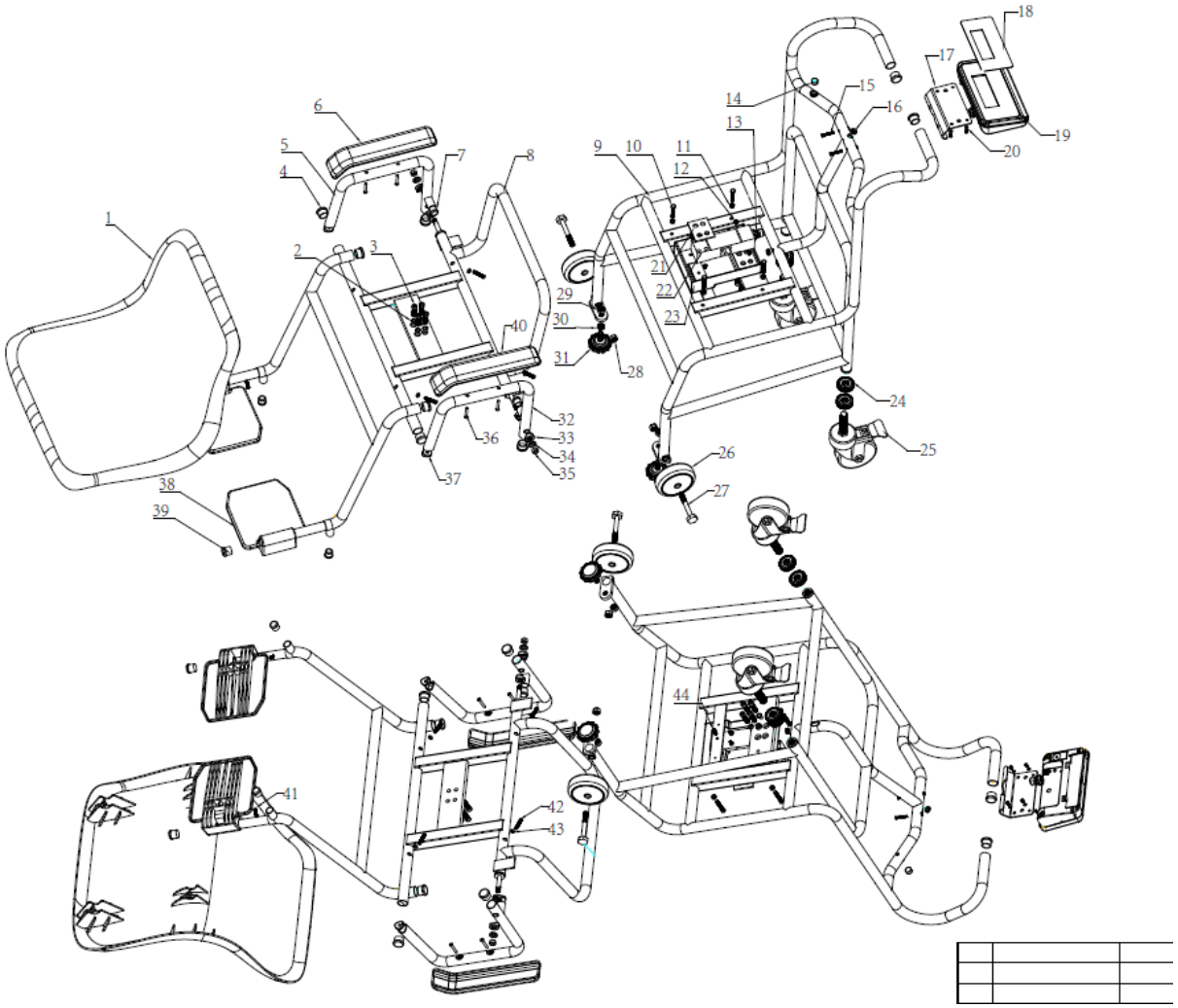
Remove the battery connection terminals (Red and Black) from the battery. Connect the power and turn on the scale Voltage into the terminal minimum 6.5VDC

7.7 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

8 DRAWING


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4
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