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
Crane scale

KERN HFM

Version 1.1
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GB



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1 Basic information

Grundlegende Hinweise

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.

⚠ **When it becomes necessary to replace a load-bearing part, ALL load-bearing parts need to be replaced for safety reasons.**
The safety bracket on the hook may be changed.

Das Gerät darf nur von geschultem oder beruflich ausgebildetem Fachpersonal (z. B. eichrechtlich anerkannter Instandsetzer) repariert werden.

Die Serviceanleitung ist bindend für Reparaturen.

Das Gerät muss nach erfolgter Reparatur wieder in den Originalzustand zurückversetzt werden.

Es dürfen nur Originalersatzteile verwendet werden.

⚠ Sollte es notwendig sein, ein lasttragendes Teil zu tauschen, so müssen in diesem Falle aus Sicherheitsgründen ALLE lasttragenden Teile getauscht werden. Die Sicherheitslasche am Haken darf getauscht werden.

2 General safety regulations



DANGER

Risk of injury and damage!
The crane scale is part of the lifting device!

→ Read the User manual carefully before you put the crane scale into operation for the first time.

2.1 Owner's duties

▲ Only operate the crane scale in compliance with the instructions given in this Service manual, the User manual or in any other documents provided by the manufacturer.

▲ Observe the national accident prevention regulations and the owner's occupational, operating and safety regulations.

▲ The manufacturer declines any warranty and liability for damages caused as a result of the owner's failure to operate the crane scale in compliance with the instructions given in this Service manual, the User manual or in compliance with any other regulations referred to in this clause or that are otherwise applicable.

▲ Perform periodical safety inspection and maintenance as described in the User manual.

▲ Log test result and file in inspection and test log book.

2.2 Organizational measures

▲ Only entrust trained and instructed personnel with operation.

▲ Make sure that the User manual is available at all times at the crane scale operation location.

▲ Have installation, commissioning and maintenance carried out by specially trained personnel only.

▲ The crane scale may only be repaired by authorized KERN service personnel.

▲ Have all safety inspections and repairs logged in the lists in the User manual.

2.3 Ambient conditions

▲ Do not operate the crane scale in explosion hazardous areas.

▲ Only operate the crane scale in ambient conditions as described in the User manual.

▲ Avoid temperature changes that could cause condensation in the inner of the crane scale.

▲ Do not operate the crane scale in corrosive ambient conditions.

2.4 Intended use

▲ Use the crane scale exclusively for lifting and weighing freely moveable loads.

▲ Danger of injury in case of improper use. For example, the following is not permitted:

–exceeding the permissible nominal load of the crane, crane scale or any type of load attachment equipment,
–transporting persons,
–pulling loads at an angle,
–tearing loose, pulling or dragging loads.

▲ Changes or modifications to the crane scale or the crane are not permitted.

2.5 Safety conscious working methods

▲ Do not stand under suspended loads.

▲ Only position the crane so that the load is lifted vertically.

▲ Wear personal safety equipment (helmet, safety gloves) when working with the crane and crane scale.

▲ Do not leave controls while load is suspended.

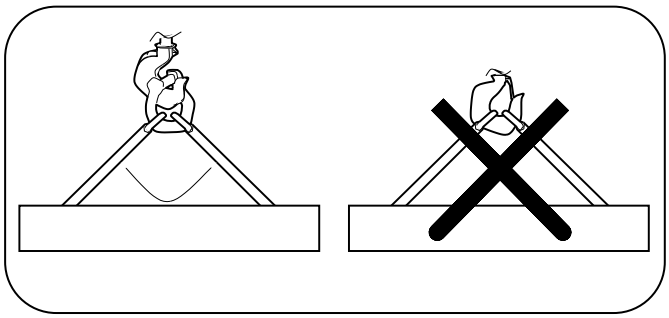
▲ Operate the crane at a safe speed.

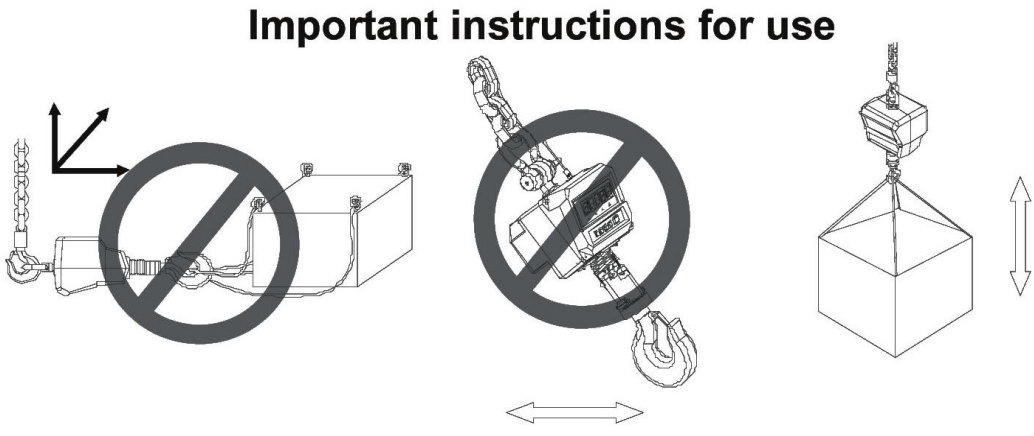
▲ Do not allow the load to swing when it is being moved.

Decommissioning and storage

▲ When the crane scale is not in use, always remove all load attachment equipment from the crane scale and remove the crane scale from the crane.

▲ Do not store the crane scale outdoors.





3 Menu

3.1 Navigation in the menu

Call function	⇨ Switch on the balance and during the self test press the **ZERO** and the d= 1/2/5 kg button once at the same time. „**P1 - - -** “ is displayed. ⇨ Enter password: Select standard password „**000**“. Pressing the d= 1/2/5 kg button increases the numerical value of the blinking digit by one. Pressing the **HOLD** button moves the digit. **or** personal password, see function „F8 Ci” **or** supervisor password „**315**” ⇨ Confirm with **ZERO** button. The first function „F0 di“ is displayed.
Select function	⇨ The d= 1/2/5 kg button allows to select the individual functions one after the other.
Select setting	⇨ Confirm the selected function by the **ZERO** button. The current setting will be displayed.
Change settings	⇨ Use the d= 1/2/5 kg button to switch over into the available settings.
Confirm setting	⇨ Press the **ZERO** button, the balance returns into the menu.
Exit menu / Return to weighing mode	⇨ Press the **HOLD** button.

3.2 Menu overview

<table>
<tr><th>Function</th><th>Available settings</th><th>Description</th></tr>
<tr><td>F0 di
Modification of readability</td><td>Low
High*</td><td></td></tr>
<tr><td colspan="2"><table>
<tr><td>cap</td><td colspan="3">d (low)
d= 1/2/5 kg ⟷</td><td colspan="3">d (high)
d= 1/2/5 kg ⟷</td></tr>
<tr><td>1 t</td><td>2kg</td><td>1kg</td><td>500g</td><td>500g</td><td>200g</td><td>100g</td></tr>
<tr><td>3 t</td><td>10kg</td><td>5kg</td><td>2kg</td><td>2kg</td><td>1kg</td><td>500g</td></tr>
<tr><td>5 t</td><td>10kg</td><td>5kg</td><td>2kg</td><td>2kg</td><td>1kg</td><td>500g</td></tr>
<tr><td>7.5 t</td><td>20kg</td><td>10kg</td><td>5kg</td><td>5kg</td><td>2kg</td><td>1kg</td></tr>
<tr><td>10 t</td><td>20kg</td><td>10kg</td><td>5kg</td><td>5kg</td><td>2kg</td><td>1kg</td></tr>
</table></td><td rowspan="6">Modifications may only be carried out by a specialist with competent knowledge.</td></tr>
<tr><td>F1 A2
Automatic zero point correction
(zero tracking range)</td><td>A2n oF
A2n 0.5
A2n 1
A2n 2 *
A2n 4</td><td>off
0.5 d
1 d
2 d
4 d</td></tr>
<tr><td>F2 bt</td><td colspan="2">Not documented</td></tr>
<tr><td>F3 SP</td><td colspan="2">Not documented</td></tr>
<tr><td>F4 iP</td><td colspan="2">Internal A/D converter value, e.g. 90035</td></tr>
<tr><td>F5 Ut</td><td colspan="2">Not documented</td></tr>
<tr><td>F6 SL
Standby mode</td><td>SLP 0
SLP 1*
SLP 2
SLP 3
SLP 4</td><td>Standby mode switched off
Standby mode after 5 minutes
Standby mode after 10 minutes
Standby mode after 20 minutes
Standby mode after 30 minutes</td></tr>
<tr><td>F7 Gv</td><td colspan="2">Not documented</td></tr>
<tr><td>F8 Ci
Personal password entry
„P1 - - - “</td><td colspan="2">Pressing the d= 1/2/5 kg ⟷ button increases the numerical value of the blinking digit by one.
Pressing the HOLD button moves the digit.
Confirm with ZERO button.</td></tr>
<tr><td>F9 CL</td><td colspan="2">Adjustment, see chapter 4</td></tr>
</table>

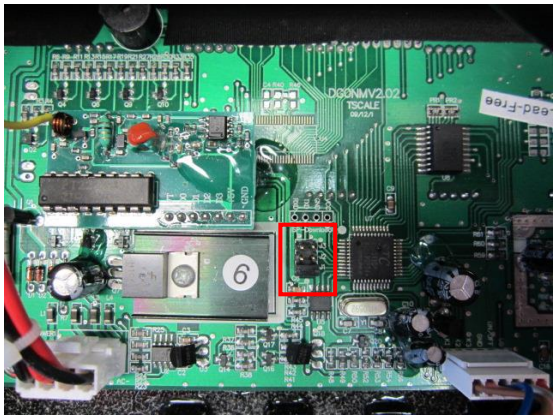
* = default setting

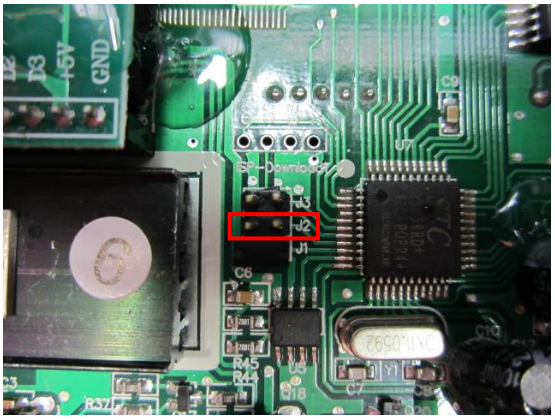
3.3 Setup of capacity (maximum load)

1) Switch off the balance.

2) Open the top cover of housing.

3) Set jumper on pin **J2**.





4) Switch on the balance and during the self test press the **ZERO** and the d= 1/2/5 kg button once at the same time.

„**P3 - - -** " is displayed.

5) Enter password „**999**" and confirm with **ZERO** button.

Pressing the d= 1/2/5 kg button increases the numerical value of the blinking digit by one.
Pressing the **HOLD** button moves the digit.

6) The current capacity is displayed, e.g. 1000

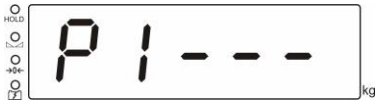
Press d= 1/2/5 kg button to change the capacity and confirm with **ZERO** button.

7) Now balance will return to normal weighing mode.

8) Switch off the balance and remove the jumper **J2**.

4 Adjustment

⇨ Switch-on balance and during the self test press the **ZERO** and the d= 1/2/5 kg button once at the same time. „**P1 - - -** “is displayed.



⇨ Enter password:
Select standard password „**000**“.

Pressing the d= 1/2/5 kg button increases the numerical value of the blinking digit by one.

Pressing the **HOLD** button moves the digit.

or
personal password, see function „F8 Ci”

or
supervisor password „**315**”

⇨ Confirm with **ZERO** button, the first function „F0 di“ is displayed.



⇨ Press the d= 1/2/5 kg button repeatedly until „**F9 CL**“ will be displayed.



⇨ Press the **ZERO** button, „UnLD“ will be displayed.

⇨ Unload the balance and wait until the LED ◺◿ lights up.



⇨ Press the **ZERO** button, the currently set adjustment weight is displayed.

⇨ In order to change, select the number to be changed using the **HOLD** button and set the desired value using the d= 1/2/5 kg button, the respective active digit flashes.

⇨ Confirm by the **ZERO** button, „Load“ will be displayed.

⇨ Attach the adjustment weight and wait until the LED ◺◿ lights up.



⇨ Press the **ZERO** button.

⇨ After successful adjustment the balance carries out a selftest, then it automatically returns to weighing mode.
An adjusting error or incorrect adjusting weight will be indicated by the error message; repeat adjustment procedure

5 Trouble shooting

Error Code	Fault	Remedy
-ol-	Overload	Remove weight from the Scale. Check with mass Weight and do the calibration.
Err 4	Zero Setting Error	The scale was outside the normal auto zero setting range (4% of capacity), please check the hook is empty, or calibrate zero point again.
Err 5	Key board error	Key board short circuit. Check the cable, the connector and the keys.
Err 6	A/D converter out of range	If overloaded, remove the weight, make sure that the hook is proper and check the load cell and PCB.
bA lo	Battery low	Charge the battery

No display:

- Mains power is turned off or power supply not plugged proper.
- Power supply faulty.
- Internal Battery is not charged.
- Check On/OFF switch is turned on and faulty or not.
- Check the PCB power connecters and cable.

Display is Blank after the self test / Err stuck:

- Unstable weight.
- Release the hook and check the hook is lying correctly.
- Try again to turning on.
- Check the load cell is not touching any where.
- Load cell is damaged. Check the load cell connections and all.

OL or(-------) appear the display:

- Maximum capacity exceeded.
- Power supply faulty. Check all power cables and connecters.

- Calibrate again with correct calibration weights.
- Load cell damaged. Check load cell connections.

(------) or Lo:

- Weight is below permissible limit.
- Check loop and hook seated proper and installed correctly.
- Calibrate again with correct calibration weights.
- Power Supply faulty. Check all power cables and connecters.
- Load cell damaged. Check load cell connections and connecters.
- Try to turn on again.

Unstable display:

- Check loop is seated proper
- Check any vibrations, noises, sudden temperature changes.
- Check power supply.
- Check battery and connect to charging.
- Check the hook and load weight is proper.
- Check the load cell connections and connecters.

Incorrect value:

- Calibration error.
- Calibrate again with exact calibration mass weights.
- Check the weight sample is hanging proper and avoids touching the cover or surface.
- Check power supply and battery.
- Check load cell connections and connectors.

Can not use scale full capacity:

- Before weighing make sure zero indication is showing and scale is empty.
- Check the weighing mode.
- Check the load cell is fitted proper and touching housing or hitting somewhere.
- Calibrate again with exact calibration mass weights.
- Load cell damaged. Check load cell connections and connectors.
- Main Board problem.

Battery not charging:

- Mains voltage problem. Check the power supply voltage and adaptor voltage.

- Charging circuit failure.
- Battery failure. Check the battery connections.

6 Maintenance

6.1 Cleaning

Disconnect the power before cleaning.
Use a cloth with mild suds and light cleaning agents. Make sure that fluid not able to get into the device. Use a clean and soft cloth for rub off.

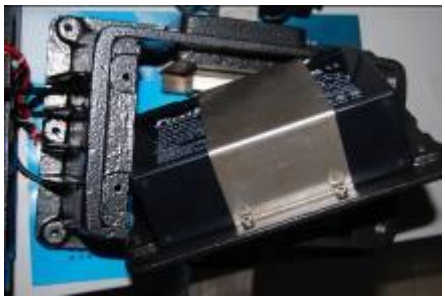
This devise does not require any routine maintenance. It may be necessary to perform periodic checks of the calibration of the scale due to mechanical reasons. The frequency of the checks depends on the conditions to use.

6.2 Replacement of rechargeable battery

1. Remove the four screws from the back cover.



2. Open the battery case and replace the rechargeable battery.



3. After replacement close the battery case.
4. Fix the four screws from the back cover.

6.3 Regular maintenance

Initial Commissioning, every **3 months** or anyway after **12 500 weighings**	▪ Check all dimensions, ▪ Check the shackle or the eyelet for wear and tear, such as e.g. plastic deformation, mechanical damage (unevenness), notches, striation, cracks, corrosion, thread damage and torsions. ▪ Check the application of the safety bracket on the hook, moreover check for fault and correct function ▪ For balances of big construction size: Check that the split pin and the nut on the shackle are not loose If a dimension exceeds the admitted deviation from the original dimension or if other discrepancies have been found, the balance must be repaired at once by trained specialized staff (KERN customer service). Never do repair it by yourself! Take balance out of operation immediately! All repairs and spare parts must be documented by the service partner .
Every **12 months** or in any case after **50 000 weighings**	▪ If the enhanced maintenance has to be carried out by trained staff (KERN customer service). At this general revision all load carrying parts must be checked for gaps with magnetic powder
Every **5 years** or anyway after **250 000 weighings**	▪ All load carrying parts have to be exchanged by trained specialized staff (KERN customer service).
Every **10 years** or anyway after **500 000 weighings**	▪ Replace the crane scales entirely

Note
During the revision watch out for wear and tear according to the following drawings .



DANGER Risk of injury due to falling loads!

➜ After service work the crane scale must not be taken into operation unless a 3-months periodical safety inspection has been passed successfully, see User manual.

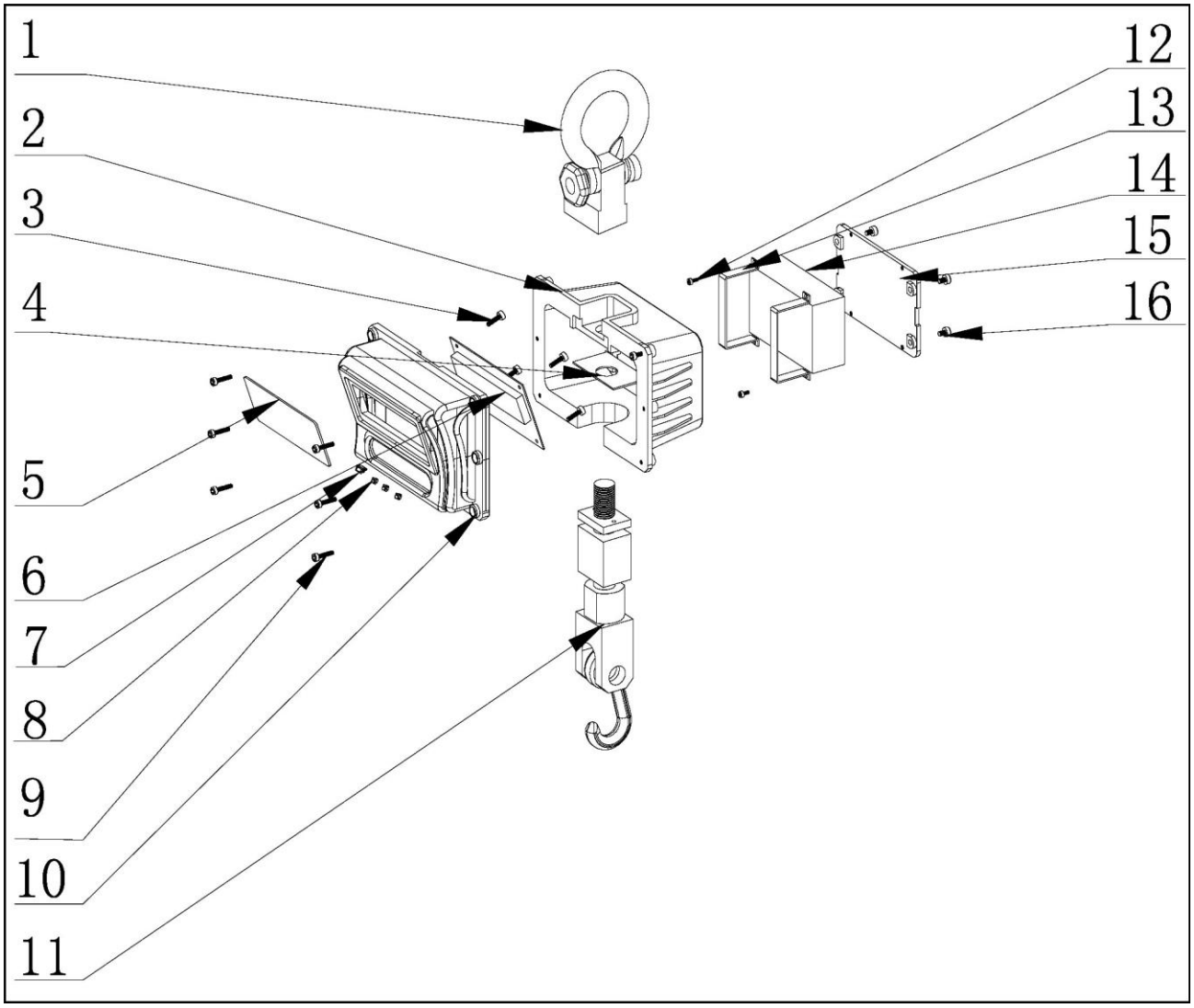
➜ Always operate with great care according to the general rules for operating a crane, see User manual.

➜ Never stay under hanging loads.

➜ Do not exceed the rated load capacity of the crane, crane scale or any load bearing item attached to the crane scale.

7 Spare parts

7.1 Exploded drawing



7.2 Parts list

No	Parts	Qty	Material	Spec
1	Loop	1		
2	Back Cover	1	Al	
3	Screw(internal hexagon)	4		M4x10
4	Washer	1	SUS	
5	Overlay	1		
6	PCBA	1		
7	Power Switch	1		
8	Function Switch	3		
9	Screw	4		M6x15
10	Front Cover	1	Al	
11	Load Cell	1		
12	Screw	4		M4x10
13	Battery Bar	2	SUS	
14	Battery	1	Lead Acid	
15	Battery Cover	1	Al	
16	Screw	4	SUS	M4x8

When it becomes necessary to replace a load-bearing part, ALL load-bearing parts need to be replaced for safety reasons.

Therefore position 1 and 11 are only available as a complete kit and not separately.

The safety bracket on the hook may be changed.

8 Circuit diagram

