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Operating instructions
Precision balances

KERN EMB-S

Version 1.2
12/2016
GB

EMB-S-BA-e-1612

GB

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Version 1.2 12/2016

Operating instructions

Precision balances

English

Contents

1 Technical data

KERN	EMB 200-1S	EMB 500-1S	EMB 2000-0S	EMB 5000-0S
Readability (d)	0,1 g	0,1 g	1 g	1 g
Weighing range (max)	200 g	500 g	2000 g	5000 g
Reproducibility	0.01 g	0.1 g	0.01g	0.01 g
Linearity	± 0.2 g	± 0.2 g	± 2 g	± 2 g
Recommended adjustment weight, not added (class)	200 g (M1)	500 g (M2)	2000 g (M1)	5000 g (M2)
Stabilization time (typical)	2-3 sec.			
AUTO-OFF-function (With battery operation)	3 min.			
Units	dwt, g, oz, ozt			
Operating temperature	+5°C… +35°C			
Humidity of air	max. 80 % (not condensing)			
Housing (B x D x H) mm	145 x 205 x 45			
Weighing plate mm	Ø 120			
Battery operation (Standard)	2 x 1.5 V AA Operating period: 12 h			
Mains adapter (Option)	300 mA / 9 V			
Underfloor weighing	Hooks			

English

2 Basic Information (General)

2.1 Intended use

The balance you purchased is intended to determine the weighing value of material to be weighed. It is intended to be used as a “non-automatic balance”, i.e. the material to be weighed is manually and carefully placed in the centre of the weighing pan. As soon as a stable weighing value is reached the weighing value can be read.

2.2 Improper Use

Do not use balance for dynamic weighing. In the event that small quantities are removed or added to the material to be weighed, incorrect weighing results can be displayed due to the “stability compensation“. (Example: Slowly draining fluids from a container on the balance.)
Do not leave permanent load on the weighing pan. This may damage the measuring system.
Impacts and overloading exceeding the stated maximum load (max) of the balance, minus a possibly existing tare load, must be strictly avoided. Balance may be damage by this.
Never operate balance in explosive environment. The serial version is not explosion protected.
The structure of the balance may not be modified. This may lead to incorrect weighing results, safety-related faults and destruction of the balance.
The balance may only be used according to the described conditions. Other areas of use must be released by KERN in writing.

2.3 Warranty

Warranty claims shall be voided in case

- Our conditions in the operation manual are ignored
- Appliance used outside the described uses
- Appliance modified or opened
- Mechanical damage and damage caused by media, liquids
- Natural wear and tear
- Appliance improperly set up or incorrectly electrically connected
- Measuring system overloaded

2.4 Monitoring of Test Resources

In the framework of quality assurance the measuring-related properties of the balance and, if applicable, the testing weight, must be checked regularly. The responsible user must define a suitable interval as well as type and scope of this test. Information is available on KERN's home page (www.kern-sohn.com) with regard to the monitoring of balance test substances and the test weights required for this. In KERN's accredited DKD calibration laboratory test weights and balances may be calibrated (return to the national standard) fast and at moderate cost.

3 Basic Safety Precautions

3.1 Pay attention to the instructions in the Operation Manual

Carefully read this operation manual before setup and commissioning, even if you are already familiar with KERN balances.

3.2 Personnel training

The appliance may only be operated and maintained by trained personnel.

4 Transport and storage

4.1 Testing upon acceptance

When receiving the appliance, please check packaging immediately, and the appliance itself when unpacking for possible visible damage.

4.2 Packaging / return transport

- ⇨ Keep all parts of the original packaging for a possibly required return.
- ⇨ Only use original packaging for returning.
- ⇨ Prior to dispatch disconnect all cables and remove loose/mobile parts.
- ⇨ Reattach possibly supplied transport securing devices.
- ⇨ Secure all parts such as the glass wind screen, the weighing platform, power unit etc. against shifting and damage.

5 Unpacking, Setup and Commissioning

5.1 Installation Site, Location of Use

The balances are designed in a way that reliable weighing results are achieved in common conditions of use.
You will work accurately and fast, if you select the right location for your balance.

Therefore, observe the following for the installation site:

- Place the balance on a firm, level surface;
- Avoid extreme heat as well as temperature fluctuation caused by installing next to a radiator or in the direct sunlight;
- Protect the balance against direct draughts due to open windows and doors;
- Avoid jarring during weighing;
- Protect the balance against high humidity, vapours and dust;
- Do not expose the device to extreme dampness for longer periods of time. Non-permitted condensation (condensation of air humidity on the appliance) may occur if a cold appliance is taken to a considerably warmer environment. In this case, acclimatize the disconnected appliance for ca. 2 hours at room temperature.
- Avoid static charging of the material to be weighed, weighing container and windshield.

If electro-magnetic fields or static charge occur, or if the power supply is unstable major deviations on the display (incorrect weighing results) are possible. In that case, the location must be changed.

5.2 Unpacking

Carefully remove the balance from the packaging, remove plastic cover and setup balance at the intended workstation.

5.2.1 Placing

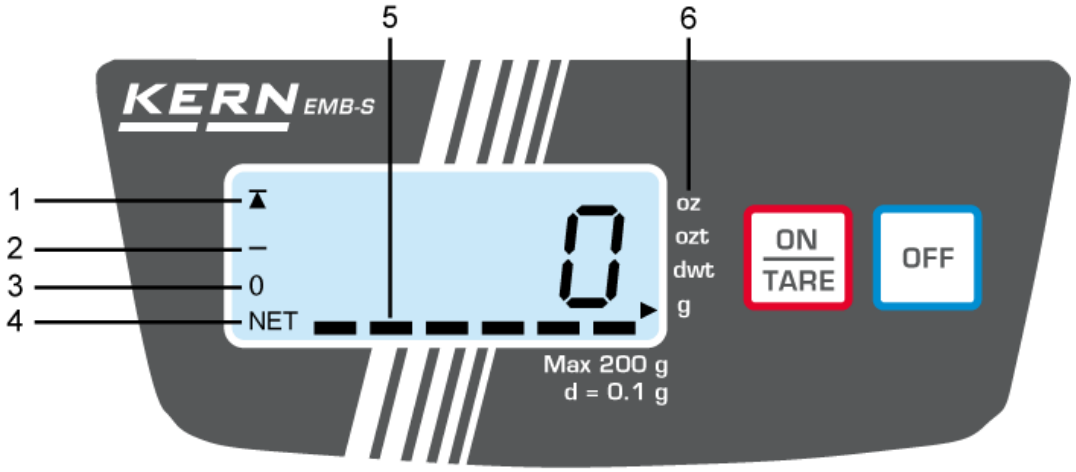
The balance must be installed in a way that the weighing plate is exactly in horizontal position.

5.2.2 Scope of delivery

Serial accessories:

KERN EMB-S
• Balance
• Batteries (2 x 1.5V AA)
• Operating instructions

5.3 Overview of display



1	Stability display
2	Negative value
3	Balance set at zero
4	Net weight
5	Capacity display
6	Weighing Units

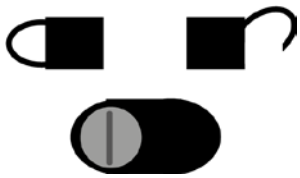
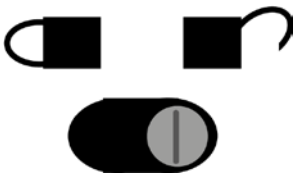
5.4 Keyboard overview

ON / TARE	• Switch on balance • Tare balance • How to change weighing units
OFF	• Switch off the balance • Adjustment menu access (longer pressing of the button)

5.5 Transport Securing

Before putting into operation, unlock the transport locking device on underside of weighing scale, see illustration below:

Transport Securing

	
Transport locking device locked During transport of weighing scale	Transport security loosened In weighing mode

	If the transport locking device remains locked in weighing mode, an error message “E“ will appear on reaching max load.

5.6 Battery operation (Standard)

Remove battery cover on the underside of the weighing pan. Insert 2 x 1.5 V batteries. Reinsert the battery cover.
In order to save the battery, the balance switches automatically off after 3 minutes without weighing.

If the batteries are run down, "**LO**" appears in the display. Press button OFF and replace the batteries immediately.
If the balance is not used for a longer time, take out the batteries and store them separately. Leaking battery liquid could damage the balance.

5.7 Mains connection (option)

Power supply is provided by the external power supply unit KERN YKA-03 (optional).
The stated voltage value must be the same as the local voltage.
Only use original KERN mains adapters. Using other makes requires consent by KERN.

5.8 Initial Commissioning

A warming up time of 3 minutes after switching on stabilizes the measuring values.

The accuracy of the balance depends on the local acceleration of gravity.
Strictly observe hints in chapter “Adjustment”.

5.9 Adjustment

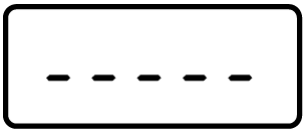
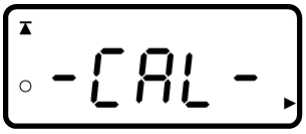
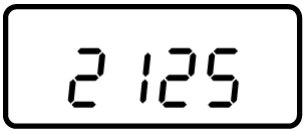
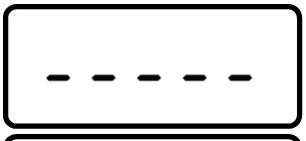
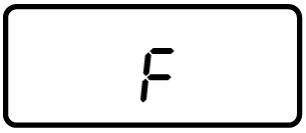
As the acceleration value due to gravity is not the same at every location on earth, each balance must be coordinated - in compliance with the underlying physical weighing principle - to the existing acceleration due to gravity at its place of location (only if the balance has not already been adjusted 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 balance periodically in weighing operation.

With an adjustment weight, the weighing accuracy can be checked and re-adjusted at any time.

Procedure when adjusting:

Observe stable environmental conditions. Stabilisation requires a certain warm-up time.

English

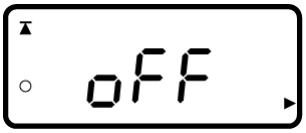
Start balance by ON TARE	
Press OFF and hold for approx. 5 sec until "--------", followed by "**CAL**" briefly appears on the screen.	 
Afterwards an internal value will be shown.	 (example)
Press OFF briefly and the size for the adjusting weight (See chap. 1, Specifications) will be displayed on the screen.	 (example)
Now set the adjusting weight in the centre of the weighing plate. "--------" will be shortly displayed, followed by "F".	 

This completes adjustment and the weighing scale will change automatically to weighing mode.	 (example)
Remove adjustment weight, adjustment complete.	

An error during adjustment or the use of an incorrect adjusting weight will result in an error message „**E**“. Repeat adjustment.
Keep the adjustment close to the balance. Daily control of the weighing exactness is recommended for quality-relevant applications.

6 Operation

6.1 Weighing

Start balance by pressing ON/TARE. The weighing scale will perform a self-test and change to zero display.	
If the material to be weighed is heavier than the weighing range, the display will show "**E**" (=Overload).	
To turn off weighing scale, press the button OFF. “oFF“ will appear on the screen before the weighing scale is turned off automatically.	 

6.2 Taring

In weighing mode, put tare vessel on weighing pan and press ON/TARE. The display will show “0“, indicating that the weight of the vessel has been saved internally.	 (example) 
Place material to be weighed; read measured result.	 (example)

If one after finishing the weighing process presses again the ON/TARE button, „**0**“ appears anew in the display.

The taring process can be repeated any number of times, e.g. when adding several components for a mixture (adding).

The limit is reached when the whole weighing range is exhausted.

After removing the taring container the total weight is displayed as negative display.

6.3 Weighing Units

Weighing results can be displayed in different units.

Change by pressing the ON/TARE button.

Press and hold the ON/TARE button when the weighing plate is loaded and the unit will change after a few seconds.

	Display screen	**Conversion factor 1 g =**
Grams *	**g**	**1.**
Ounce	oz	0.035273962
Troy ounce	ozt	0.032150747
Pennyweight	dwt	0.643014931

6.4 Zero-Tracking

The Auto-Zero function is used to tare small variations in weight automatically.
In the event that small quantities are removed or added to the material to be weighed, incorrect weighing results can be displayed due to the "stability compensation". (Example: Slowly draining fluids from a container on the balance).
When apportioning involves small variations of weight, it is advisable to switch off this function.
If **Zero-Tracking** however is switched off, the weighing display becomes more busy.

Activate/deactivate Zero-Tracking:

- ⇨ When the balance is switched off, press the **OFF**-button and keep it pressed
- ⇨ Do not release **OFF** -button. Press also the **ON/TARE**-button and keep it pressed
- ⇨ Release **OFF** –button briefly and press again
- ⇨ "**AF**" will appear on the screen
- ⇨ Release both buttons. The balance is situated in the menu.
- ⇨ Select "**tr**" with the help of the **ON/TARE**-button
- ⇨ Confirm by pressing the **OFF**-button. The current setting will be shown on the screen.

⇨ Now you can use the **ON/TARE**-button to select between the following settings:

Display	Adjustment
„tr Y“	Auto-Zero activated
„tr n“	Auto Zero switched off

⇨ Confirm your selection with the **OFF**-button. After a short period the balance returns automatically to weighing mode.

6.5 AUTO OFF function

For battery operation the balance has an automatic switch-off function which can be activated or deactivated in the menu. Proceed as follows:

⇨ When the balance is switched off, press the **OFF**-button and keep it pressed

⇨ Do not release **OFF** -button. Press also the **ON/TARE**-button and keep it pressed

⇨ Release **OFF**-button briefly and press again briefly

⇨ “**AF**“ will appear on the screen

⇨ Confirm by pressing the **OFF**-button

⇨ Now you can use the **ON/TARE**-button to select between the following settings:

Display	Adjustment
„AF Y“	In order to save the battery, the balance switches automatically off after 3 minutes without weighing.
„AF n“	Continuous operation

⇨ Confirm your selection with the **OFF**-button. After a short period the balance returns automatically to weighing mode.

6.6 Reset function

Reset menu to default settings.

⇨ When the balance is switched off, press the **OFF**-button and keep it pressed

⇨ Do not release **OFF** -button. Press also the **ON/TARE**-button and keep it pressed

⇨ Release **OFF**-button briefly and press again briefly

⇨ "**AF**" will appear on the screen

⇨ Release both buttons. The balance is situated in the menu.

⇨ Press the **ON/TARE**-button to select "**rSt**"

⇨ Confirm by pressing the **OFF**-button. The current setting will be shown on the screen.

⇨ Now you can use the **ON/TARE**-button to select between the following settings:

Display	Adjustment
„rst Y"	Reset menu to default settings.
„rst n"	No reset of menu to default settings.

⇨ Confirm your selection with the **OFF**-button. After a short period the balance returns automatically to weighing mode.

7 Servicing, maintenance, disposal

7.1 Cleaning

Before cleaning, please disconnect the appliance from the operating voltage.

Please do not use aggressive cleaning agents (solvents or similar agents), but a cloth dampened with mild soap suds. Ensure that no liquid penetrates into the device and wipe with a dry soft cloth.
Loose residue sample/powder can be removed carefully with a brush or manual vacuum cleaner.
Spilled weighing goods must be removed immediately.

7.2 Servicing, maintenance

The appliance may only be opened by trained service technicians who are authorized by KERN.
Before opening, disconnect from power supply.

7.3 Disposal

Disposal of packaging and appliance must be carried out by operator according to valid national or regional law of the location where the appliance is used.

Note on battery recycling regulations (BattV)

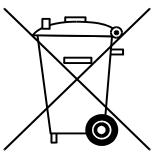
Applies to Germany only!

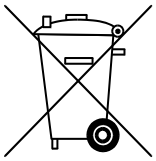
In our capacity as retailers we are obliged in connection with the distribution of batteries and storage batteries to inform our end users as follows:

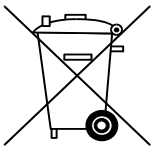
End users are bound by law to return waste batteries / storage batteries. Batteries / storage batteries can be returned to municipal collection points or specialist shops whilst taking into account common expiration times.

Precautions against short circuit must be taken in cases where the service life of the batteries / storage batteries has not yet expired.

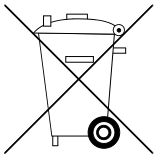
⇨ Batteries containing noxious substances bear a symbol consisting of a **crossed-out bin** plus the **chemical symbol (Cd = cadmium, Hg = quicksilver, or Pb = lead)** of the heavy metal crucial for the classification of the noxious substance.


Cd


Hg


Pb

⇨ Batteries with a low degree of noxious substances bear merely a **crossed out bin**.



Return options are restricted to the types of battery that we keep or used to keep in stock as well as the quantity commonly disposed of by end users.

8 Instant help

In case of an error in the program process, briefly turn off the balance and disconnect from power supply. The weighing process must then be restarted from the beginning.

Help:

Fault	**Possible cause**
The displayed weight does not glow.	• The balance is not switched on. • Batteries are inserted incorrectly or empty • No batteries inserted. • The mains supply connection has been interrupted (mains cable not plugged in/faulty). • Power supply interrupted.
The displayed weight is permanently changing	• Draught/air movement • Table/floor vibrations • Weighing pan has contact with other objects. • Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)
The weighing result is obviously incorrect	• The display of the balance is not at zero • Adjustment is no longer correct. • Great fluctuations in temperature. • Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)

Should other error messages occur, switch balance off and then on again. If the error message remains inform manufacturer.

English

9 Declaration of Conformity

To view the current EC/EU Declaration of Conformity go to:

www.kern-sohn.com/ce

The scope of delivery for verified weighing balances (= conformity-rated weighing balances) includes a Declaration of Conformity.