



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

Operating instructions

School balance

KERN 442

Version 1.5

07/2003

GB



442-BA-e-0315




KERN 442

Version 1.5 07/2003

Operating instructions

School balance

Table of contents:

1	Technical data	3
2	Declaration of conformity	4
3	Fundamental information (general)	5
3.1	Intended use	5
3.2	Inappropriate use	5
3.3	Guarantee	5
3.4	Monitoring the test substances	6
4	Fundamental safety information	6
4.1	Observe the information in the operating instructions	6
4.2	Staff training	6
5	Transport and storage	6
5.1	Acceptance check	6
5.2	Packaging	6
6	Unpacking, installation and commissioning	7
6.1	Place of installation, place of use	7
6.2	Unpacking	8
6.2.1	Installation	8
6.2.2	List of items supplied	8
6.3	Mains supply	8
6.4	Battery Operation	8
6.5	Initial start-up	8
6.6	Adjustment	9
6.7	Adjusting	9
7	Operation	10
7.1	Overview of display	10
7.2	Operating elements	10
7.2.1	Weighing	10
7.2.2	Taring ( key)	10
7.2.3	Plus / Minus Weighings	11
7.2.4	Units	11
8	Maintenance, upkeep, disposal	12
8.1	Cleaning	12
8.2	Maintenance, upkeep	12
8.3	Disposal	12
9	Troubleshooting	13

1 Technical data

KERN	442-43N	442-51N
<i>Readout</i>	0,1 g	1 g
<i>Weighing range</i>	400 g	4.000 g
<i>Taring range (subtractive)</i>	400 g	4.000 g
<i>Reproducibility</i>	0,1 g	1 g
<i>Linearity</i>	± 0,2 g	± 2 g
<i>Adjusting weight (not included) Adjustment tolerance class</i>	200g (M2)	2000g (M2)
<i>Stabilisation time (typical)</i>	3 sec.	
<i>Units</i>	g / tol / tlt	g / tol / tlt
<i>Optimal temp. of operation</i>	+ 10° C ... + 30° C	
<i>Humidity</i>	max. 80 % (non-condensing)	
<i>Casing (W x D x H) mm</i>	145 x 185 x 55	
<i>Weighing pan mm</i>	Ø 125	
<i>Weight kg (net)</i>	0,5	

2 Declaration of conformity



KERN & Sohn GmbH

D-72322 Balingen-Frommern

Postfach 4052

E-Mail: info@kern-sohn.de

Tel: 0049-[0]7433- 9933-0

Fax: 0049-[0]7433-9933-149

Internet: www.kern-sohn.de

Konformitätserklärung

Declaration of conformity for apparatus with CE mark

Konformitätserklärung für Geräte mit CE-Zeichen

Déclaration de conformité pour appareils portant la marque CE

Declaración de conformidad para aparatos con disitintivo CE

Dichiarazione di cofnromità per apparecchi contrassegnati con la marcatura CE

- English** We hereby declare that the product to which this declaration refers conforms with the following standards.
- Deutsch** Wir erklären hiermit, daß das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.
- Français** Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.
- Español** Manifestamos en la presente que el producto al que se refiere esta declaración está de acuerdo con las normas siguientes
- Italiano** Dichiariamo con ciò che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.

Electronic Scale: KERN 442_N

Mark applied	EU Directive	Standards
	89/336EEC EMC	EN 61000-6-3 : 2001 EN 61000-3-2 : 2000 EN 61000-3-3 : 1995+A1 : 2001 EN 61000-6-1 : 2001

Date: 01. July 2003

Signature: 

Gottl. KERN & Sohn GmbH
Management

Gottl. KERN & Sohn GmbH, Ziegelei 1, D-72336 Balingen, Tel. +49-[0]7433/9933-0, Fax +49-[0]7433/9933-149

3 Fundamental information (general)

3.1 Intended use

The balance you have acquired serves to determine the weighing value of the 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 plate. The weighing value can be read off after a stable weighing value has been obtained.

3.2 Inappropriate use

Do not use the 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” in the balance. (Example: Slowly draining fluids from a container on the balance.)

Do not leave a permanent load on the weighing plate. This can damage the measuring equipment.

Be sure to avoid impact shock and overloading the balance in excess of the prescribed maximum load rating (max.), minus any possible tare weight that is already present. This could cause damage to the balance.

Never operate the balance in hazardous locations. The series design is not explosion-proof.

Structural alterations may not be made to the balance. This can lead to incorrect weighing results, faults concerning safety regulations as well as to destruction of the balance.

The balance may only be used in compliance with the described guidelines. Varying areas of application/planned use must be approved by KERN in writing.

3.3 Guarantee

The guarantee is not valid following

- non-observation of our guidelines in the operating instructions
- use outside the described applications
- alteration to or opening of the device
- mechanical damage and damage caused by media, liquids
- natural wear and tear
- inappropriate erection or electric installation
- overloading of the measuring equipment

3.4 Monitoring the test substances

The metrology features of the balance and any possible available adjusting weight must be checked at regular intervals within the scope of quality assurance. For this purpose, the answerable user must define a suitable interval as well as the nature and scope of this check. 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. Test weights and balances can be adjusted quickly and at a reasonable price in KERN's accredited DKD calibration laboratory (return to national normal).

4 Fundamental safety information

4.1 Observe the information in the operating instructions

Please read the operating instructions carefully before erecting and commissioning, even if you already have experience with KERN balances.

4.2 Staff training

The device may only be operated and looked after by trained members of staff.

5 Transport and storage

5.1 Acceptance check

Please check the packaging immediately upon delivery and the device during unpacking for any visible signs of external damage.

5.2 Packaging

Please retain all parts of the original packaging in case it should be necessary to return items at any time.

Only the original packaging should be used for return consignments.

Before despatch, disconnect all attached cables and loose/movable parts.

Apply any intended transport security devices. Secure all parts, e.g. glass windshield, weighing plate, power unit etc., to prevent slipping and damage.

6 Unpacking, installation and commissioning

6.1 Place of installation, place of use

The balance is constructed in such a way that reliable weighing results can be achieved under normal application conditions.

By selecting the correct location for your balance, you will be able to work quickly and precisely.

Therefore please observe the following at the place of installation:

- 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. Inadmissible bedewing (condensation of air moisture on the device) can occur if a cold device is taken into a significantly warmer environment. In this case, please acclimatise the device for approx. 2 hours at room temperature after it has been disconnected from the mains.
- Avoid static charging of the material to be weighed, weighing container and windshield.

Major display deviations (incorrect weighing results) are possible if electromagnetic fields occur as well as due to static charging, currents and instable power supply. It is then necessary to change the location.

6.2 Unpacking

Carefully remove the balance from its packaging, remove the plastic wrapping and position the balance in its intended working location.

6.2.1 Installation

Install the balance in such a fashion that the weighing plate is absolutely horizontal

6.2.2 List of items supplied

Standard accessories:

- Balance
- Weighing pan
- Battery or mains adapter
- Operating instructions

6.3 Mains supply

Electric power supply is by means of the external mains supply circuit. The printed voltage level must comply with the local voltage.

Only use original KERN mains supply circuits. The use of other makes is subject to approval by Kern.

6.4 Battery Operation

Remove the battery cover from the bottom of the balance.

Connect 9 V block batteries.

Re-insert the battery cover.

Battery conservation through automatic power-off 1 - 2 minutes after the last weighing operation.

When the battery power is used up the display will show "LO". Press the  key and change the batteries at once.

When the balance is not in use for a longer period of time remove batteries and keep them separately. Leakage of battery liquid might damage the balance.

6.5 Initial start-up

A warm-up time of 1 minutes stabilises the measured values after switching on.

The accuracy of the balance depends on the local acceleration of the fall.

Please be sure to observe the information in the chapter on adjusting.

6.6 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 during the initial start-up, after change in location and variation of surrounding temperature. It is also recommendable to adjust the balance periodically during weighing operation in order to obtain exact measured values.


6.7 Adjusting

Using a precision weight, the accuracy of the balance can be checked at any time and adjusted.

Adjustment procedure:

Check that the surrounding conditions are stable.

A short warm-up time of about 1 minutes are recommended for stabilisation.

Press  key approx. 3 seconds, "CAL 0" and then the exact weight of the adjusting weight will appear the display.

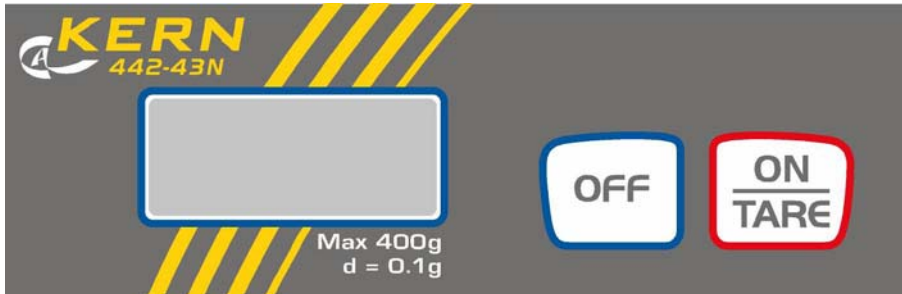
Place the adjusting weight on the centre of the weighing plate.

Shortly after "CAL F" appears, and then the balance switched off.

In case of an adjusting error or a wrong adjusting weight "E" appears in the display, and then turn off.

7 Operation

7.1 Overview of display



7.2 Operating elements

7.2.1 Weighing

Switch the balance on by pressing the  key.

The balance will show “8888” for approx. 3 seconds and then change to “0”. Now it is ready for use.

Important: If the display flashes or does not show “0” press the  key.


Only now (!) place object on the weighing pan. Make sure that the weighing object does not stripe or touch the housing or base.


Now the weight will be indicated. After a successful stability control a small triangle will appear on the far right at the bottom of the display.

If the object should be heavier than the weighing range allowance, the symbol “E” (overload) will appear on the display.

7.2.2 Taring (key)

Switch the balance on by pressing the  key, then wait for the “0” indication.

Place the tare cup on the weighing pan and press the  key. Display again shows “0”. Now the weight of the tare cup is memorised internally.

By pressing the  key after a weighing procedure, “0” will appear on the display again.

The taring procedure can be repeated continuously, for instance when mixing several components.


The limit is reached when the full weighing range is used.

After having removed the tare cup the total weight will appear as a negative value.

7.2.3 Plus / Minus Weighings

For instance to control piece-weights, filling process control etc..


Switch the balance on by pressing the  key, then wait until "0" is indicated.

Place rated weight on the weighing pan and tare on "0" by pressing the  key.

Remove rated weight.


Place the objects on the weighing pan successively, the balance will show any deviation from the rated weight.


According to the same procedure packages with the same weight, related to a rated weight, can be produced.

Return to the weighing mode by pressing the  key.

7.2.4 Units

Different foreign weighing units are integrated into the various balance models (details capture „ **Technical data** “).

Change the Units with the  key.

Press an hold the  key , few seconds later change the unit.

8 Maintenance, upkeep, disposal

8.1 Cleaning

Please disconnect the device from the operating voltage before cleaning.

Only use a cloth dampened with mild suds and not aggressive cleaning agents (solvents or similar). Please ensure that fluids are not able to get into the device and rub off using a clean, soft cloth.

Loose sample residue/powder can be removed carefully using a brush or hand vacuum cleaner.

Remove any spilt material to be weighed immediately.

8.2 Maintenance, upkeep

The device may only be opened by trained service engineers authorised by KERN. Disconnect from the mains supply before opening.

8.3 Disposal

The operating company shall dispose of the packaging and the device in compliance with the valid national or regional law of the operating location.

9 Troubleshooting

The balance should be switched off for a short time following an interruption in the programme sequence and disconnected from the mains supply. It is then necessary to repeat the weighing process from the beginning.

Help:

Interruption

Weight display is not illuminated.

Possible cause

- *The balance is not switched on.*
- *The mains supply connection has been interrupted (mains cable not plugged in/faulty).*
- *Power supply interrupted. .*
- *The batteries are wrongly inserted, the batteries are empty*
- *No batteries are attached*

The weight display changes continually

- *Draught/air movement*
- *Table/floor vibrations*
- *The weighing plate is in contact with foreign matter.*
- *Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)*

The weighing result is obviously incorrect

- *The balance display is not set to zero*
- *Adjustment is no longer correct.*
- *Great fluctuations in temperature.*
- *Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)*

Switch the balance off if other error messages should appear and then switch on again. Contact the manufacturer if the error message does not disappear.