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Operating Manual Precision balance

KERN PFB

Version 1.6
08/2011
GB



PFB-BA-e-1116



KERN PFB
Version 1.6 08/2011
Operating Manual
Precision balance

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1 Technical Data

| KERN | PFB 120-3 | PFB 200-3 | PFB 300-3 | PFB 1200-2 |
|--|--|------------|------------|-------------|
| Readability (d) | 0,001 g | 0,001 g | 0,001 g | 0,01 g |
| Weighing range (max) | 120 g | 200 g | 300 g | 1200 g |
| Reproducibility | 0,001 g | 0,001 g | 0,001g | 0,01 g |
| Linearity | ±0,003 g | ±0,003 g | ±0,003 g | ±0,03 g |
| Smallest part weight for piece counting | 2 mg | 2 mg | 2 mg | 20 mg |
| Reference quantities at piece counting | 10, 20, 50, 100, 200 | | | |
| Weighing Units | g, ct, lb, oz, d, ozt, dwt, mo, tl h, tl c, tl t, t, bt, n | | | |
| Recommended adjustment weight, not added (class) | 100 g (F1) | 200 g (F1) | 300 g (F1) | 1000 g (F1) |
| Warm-up time | 2 hours | | | |
| Stabilization time (typical) | 3 sec. | | | |
| Operating temperature | + 5° C + 35° C | | | |
| Humidity of air | max. 80 % (not condensing) | | | |
| Housing (B x D x H) mm | 200 x 257 x 152 (with draft shield) 200 x 257 x 87 (without draft shield) | | | |
| Draft shield (B x D x H) mm, plastic | 158 x 143 x 64 (inside) 167 x 154 x 80 (outside) | | | |
| Weighing plate, stainless steel (mm) | Ø 80 | Ø 80 | Ø 80 | Ø 120 |
| Weight kg (net) | 2 kg | | | |
| Underfloor weighing | optional | | | |
| Voltage | 220-240 V / 50 Hz | | | |

| KERN | PFB 2000-2 | PFB 3000-2 | PFB 6000-1 | PFB 6K0.05 |
|--|--|-------------------|-------------------|-------------------|
| Readability (d) | 0,01 g | 0,01 g | 0,1 g | 0,05 g |
| Weighing range (max) | 2000 g | 3000 g | 6000 g | 6000 g |
| Reproducibility | 0,01 g | 0,01 g | 0,1 g | 0,05 g |
| Linearity | ±0,03 g | ±0,03 g | ± 0,3 g | ± 0,15 g |
| Smallest part weight for piece counting | 20 mg | 20 mg | 200 mg | 200 mg |
| Reference quantities at piece counting | 10, 20, 50, 100, 200 | | | |
| Weighing Units | g, ct, lb, oz, d, ozt, dwt, mo, tl h, tl c, tl t, t, bt, n | | | |
| Recommended adjustment weight, not added (class) | 2000 g (F1) | 3000 g (F1) | 5000 g (F1) | 5000 g (F1) |
| Warm-up time | 2 hours | | | |
| Stabilization time (typical) | 3 sec. | | | |
| Operating temperature | + 5° C + 35° C | | | |
| Humidity of air | max. 80 % (not condensing) | | | |
| Housing (B x D x H) mm | 200 x 257 x 152 (with draft shield) 200 x 257 x 87 (without draft shield) | | - | - |
| Draft shield (B x D x H) mm, plastic | 158 x 143 x 64 (innen) 167 x 154 x 80 (außen) | | - | - |
| Weighing plate, stainless steel (mm) | Ø 120 | Ø 120 | 155 x 145 | 155 x 145 |
| Weight kg (net) | 2 kg | | | |
| Underfloor weighing | optional | | | |
| Voltage | 220-240 V / 50 Hz | | | |

2 Declaration of conformity



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Declaration of conformity

EC-Konformitätserklärung
EC- Déclaration de conformité
EC-Dichiarazione di conformità
EC- Declaração de conformidade
EC-Deklaracja zgodności

EC-Declaration of -Conformity
EC-Declaración de Conformidad
EC-Conformiteitverklaring
EC- Prohlášení o shode
ЕС-Заявление о соответствии

| | | |
|------------|--------------------------------|--|
| D | Konformitäts- erklärung | Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt. |
| GB | Declaration of conformity | We hereby declare that the product to which this declaration refers conforms to the following standards. |
| CZ | Prohlášení o shode | Tímto prohlašujeme, že výrobek, kterého se toto prohlášení týká, je v souladu s níže uvedenými normami. |
| E | Declaración de conformidad | Manifetamos en la presente que el producto al que se refiere esta declaración está de acuerdo con las normas siguientes |
| F | Déclaration de conformité | Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après. |
| I | Dichiarazione di conformità | Dichiariamo con ciò che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate. |
| NL | Conformiteit- verklaring | Wij verklaren hiermede dat het product, waarop deze verklaring betrekking heeft, met de hierna vermelde normen overeenstemt. |
| P | Declaração de conformidade | Declaramos por meio da presente que o produto no qual se refere esta declaração, corresponde às normas seguintes. |
| PL | Deklaracja zgodności | Niniejszym oświadczamy, że produkt, którego niniejsze oświadczenie dotyczy, jest zgodny z poniższymi normami. |
| RUS | Заявление о соответствии | Мы заявляем, что продукт, к которому относится данная декларация, соответствует перечисленным ниже нормам. |

Electronic Balance: KERN PFB

| Mark applied | EU Directive | Standards |
|--------------|--------------------|---|
| CE | 2004/108/EC EMC | EN 61000-6-1 :2007 EN 61000-6-3 :2007 EN 61000-3-3 : 1995+A1 :2001+A2 :2005 EN 61000-3-2 :2006 |

Date: 18.09.2008

Signature: _____

KERN & Sohn GmbH
Management

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English

3 Basic Information (General)

3.1 Proper 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 plate. As soon as a stable weighing value is reached the weighing value can be read.

3.2 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” in the balance. (Example: Slowly draining fluids from a container on the balance.)

Do not leave permanent load on the weighing plate. 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 damaged 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.

3.3 Warranty

Warranty claims shall be voided in case

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

3.4 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.

4 Basic Safety Precautions

4.1 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.

4.2 Personnel training

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

5 Transportation & Storage

5.1 Testing upon acceptance

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

5.2 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.

6 Unpacking, Setup and Commissioning

6.1 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, vapors 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 charge of goods to be weighed or weighing container.

Major display deviations (incorrect weighing results) may be experienced should electromagnetic fields (e.g. due to mobile phones or radio equipment), static electricity accumulations or instable power supply occur. Change location or remove source of interference.

6.2 Unpacking

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

6.2.1 Placing/ Remove the transportation lock

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

Remove the transportation lock [1] (PFB 120-3, PFB 1200-2, PFB 2000-2, PFB 6000-1, PFB 6K0.05):



6.2.2 Scope of delivery

Serial accessories:

- Balance
- Weighing plate
- Mains power supply
- Operating Manual
- Draft shield (only models PFB 120-3, PFB 1200-2)

6.3 Mains connection

Power is supplied via the external mains adapter. 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.

6.4 Connection of peripheral devices

Before connecting or disconnecting of additional devices (printer, PC) to the data interface, always disconnect the balance from the power supply.

With your balance, only use accessories and peripheral devices by KERN, as they are ideally tuned to your balance.

6.5 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. 1). During this warming up time the balance must be connected to the power supply (mains, accumulator or battery).

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

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 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.

6.7 Adjusting

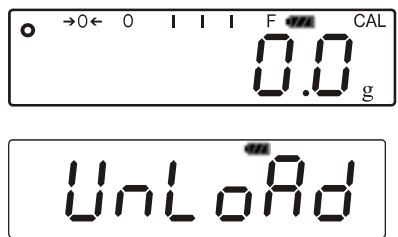

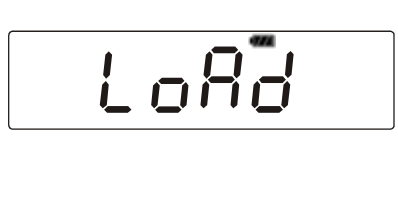
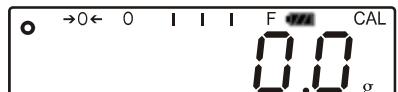
The adjustment should be made with the recommended adjustment weight (see chap. 1 "Technical data").

Procedure when adjusting:

Observe stable environmental conditions.

A warming up time (see chapter 1; Technical Data) is required for stabilization.

Ensure that there are no objects on the weighing plate.








| Balance display | Operation |
|---|--|
|  <p>The display shows a balance scale icon, a zero with left and right arrows, a full battery indicator, and 'CAL'. The main display shows '0.0 g'. Below it, 'UnLoAd' is displayed in a large font.</p> | <p>⇒ In weighing mode press  approx. 3 sec. until „UnLoAd“ appears.</p> |
|  <p>The display shows 'LoAd' in a large font.</p> | <p>When display „LoAd“ appears, put the necessary adjustment weight (see chap.1; Technical Data) on the center of the weighing plate.</p> <p>Adjustment will be carried out automatically after dead stop control.</p> |
| | <p>⇒ Wait for stability display</p> |
| | <p>„Pass“ appears, the adjustment process has been finished successfully.</p> <p>⇒ Take away adjustment weight</p> |
|  <p>The display shows the same icons as the first row, with the main display showing '0.0 g'.</p> | <p>Wait until the balance is again in the weighing mode.</p> |

7 Controls

7.1 Keyboard overview

Buttons specification:



| Key | Designation | Pressed once and released |
|---|--------------------|---|
|  | [ON/OFF] | ⇒ Turn on/off |
|  | [ZERO] | <ul style="list-style-type: none"> ⇒ Set weight display at zero ⇒ Activate the current element in the menu ⇒ Select in Weighing units (menu F UNIT): change to the next unit |
|  | [TARE] | ⇒ Taring |
|  | [%] | <ul style="list-style-type: none"> ⇒ Call-up %-function ⇒ In the percent mode back to weighing mode ⇒ Only % function |
|  | [PCS] | <ul style="list-style-type: none"> ⇒ Call-up piece counting mode ⇒ In the piece count mode back to weighing mode |
|  | [MODE] | <ul style="list-style-type: none"> ⇒ Weighing units switch-over; ⇒ At weighing unit switch-over (menu „F UNIT“): Set weighing unit on/off ⇒ Counting up in piece counting mode ⇒ Select menu and pass through menu items from top to bottom ⇒ Changing readability |
|  | [PRINT/ESC] | <ul style="list-style-type: none"> ⇒ Print out weighing result ⇒ Exit menu (jumping back to weighing mode) |

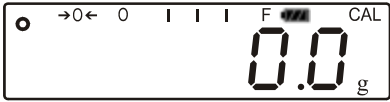

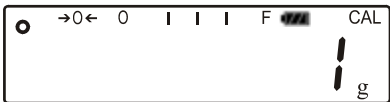
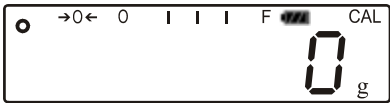




7.2 Overview of display



| Display | Description |
|---------------------|--|
| g | Gram |
| kg | Kilogram |
| →0← | Zeroing display |
| →T← | Taring |
| o | Stability display |
| Pcs | Display for piece counting |
| % | Percent weighing display |
| ◀ | Display for tolerance weighing |
| (mom) | Momme |
| CAL | Display for adjustment. Signals the adjustment function |
| 0 F | Bar graph |
| Weight unit display | g (Gramm) (ct) Carat (oz) Ounce (ozt) Fine ounce (d) Dram (dwt) Penny weight (tl.h) Tael (Taiwan) (tl.c) Tael (Chin.) (t.lt) Troy Tael (t) Tola |

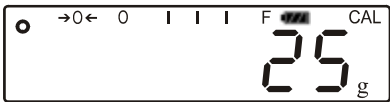
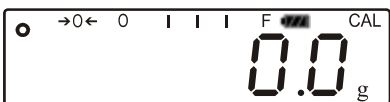


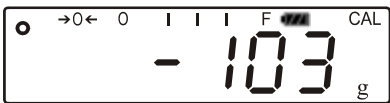
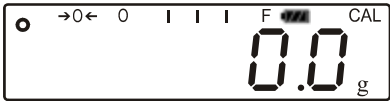

8 Operation

8.1 Simple weighing

| Balance display | Operation |
|--|---|
|  <p>The display shows a small circle on the left, followed by a zero, four vertical bars, a battery level indicator, and 'CAL'. The main display shows '0.0' with a 'g' below it.</p> | <p>⇒ Start balance by pressing . The balance will carry out a self-test. Wait for „0.0“ display</p> |
|   <p>The first display shows a small circle, zero, four vertical bars, battery level, and 'CAL'. The main display shows '1' with a 'g' below it. The second display is identical but the main display shows '0' with a 'g' below it.</p> | <p>⇒ Should the balance not display exactly „0.0“ despite empty scale pan, press the  button. The balance starts with resetting to „0“</p> |
|  <p>The display shows a small circle, zero, four vertical bars, battery level, and 'CAL'. The main display shows '103' with a 'g' below it.</p> | <p>⇒ Place goods to be weighed on balance. Wait until the stability display appears []. Read weighing result.</p> |
| | <p>⇒ To switch off the balance press shortly .</p> |

8.2 Taring












The dead weight of any weighing container may be tared away by pressing a button, so that the following weighings show the net weight of the goods to be weighed.

| Balance display | Operation |
|---|--|
|  <p>The display shows a small circle icon, a zero with a left arrow, four vertical bars, 'F' with a battery icon, and 'CAL'. The main display shows '25' with a 'g' below it.</p> | <p>⇒ Deposit weighing receptacles. The weight of the container is displayed.</p> |
|  <p>The display shows a small circle icon, a zero with a left arrow, four vertical bars, 'F' with a battery icon, and 'CAL'. The main display shows '0.0' with a 'g' below it.</p> | <p>⇒ Press , the zero display appears. The pictogram →T← is displayed. The pictogram →0← goes out. The weight of the container is now internally saved.</p> |
|  <p>The display shows a small circle icon, a zero with a left arrow, four vertical bars, 'F' with a battery icon, and 'CAL'. The main display shows '103' with a 'g' below it.</p> | <p>⇒ Place goods to be weighed in the weighing container. The net weight of the goods to be weighed is displayed.</p> |
|  <p>The display shows a small circle icon, a zero with a left arrow, four vertical bars, 'F' with a battery icon, and 'CAL'. The main display shows '- 103' with a 'g' below it.</p> | <p>⇒ The weight of the weighing container will be displayed as a minus number after removing the weighing container.</p> |
|  <p>The display shows a small circle icon, a zero with a left arrow, four vertical bars, 'F' with a battery icon, and 'CAL'. The main display shows '0.0' with a 'g' below it.</p> | <p>⇒ The tare weight is saved until it is deleted. Remove the load from the balance and press . The zero display appears, the pictogram →T← goes out and →0← will be displayed again.</p> |

8.3 Parts counting

Before the balance can count parts, it must know the average part weight (i.e. reference). Proceed by putting on a certain number of the parts to be counted. The balance determines the total weight and divides it by the number of parts (the so-called reference quantity). Counting is then carried out on the basis of the calculated average piece weight.

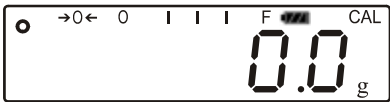








| | |
|----------|---|
| i | The higher the reference quantity the higher the counting exactness. |
|----------|---|

| Balance display | Operation |
|---|--|
|  | ⇒ Start balance by pressing  The balance will carry out a self-test. Wait for „0.0“ display. |
|  | ⇒ Press  Appears the reference quantity „10“. |
| i | By pressing the  key several times, the reference quantities 10, 20, 50, 100, 200 can be set |
|  | ⇒ Place as many parts to count on the weighing plate as the set reference quantity requires. ⇒ Confirm by pressing  |
| | The balance is now in parts counting mode and counts all units on the weighing plate. |
|  | ⇒ Press  The balance is in weighing mode and displays the weight of the counted parts. |
|  | ⇒ Remove the load ⇒ Back to weighing mode by pressing again the  button. |

8.4 Adding

It is useful, when a mixture of various components is weighed in a tare container and finally for control purposes the sum weight of all weighed components is required.

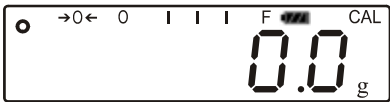




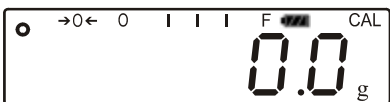

Example:

| Balance display | Operation |
|--|--|
|  | <p>⇒ Start balance by pressing </p> <p>The balance will carry out a self-test.</p> <p>Wait for „0.0“ display.</p> <p>⇒ Put on the first test item</p> |
|  <p>(Example)</p> | <p>The weight of the first test item is displayed</p> <p>⇒ Press </p> |
|  | <p>„ACC 1“ is shortly displayed, then appears once more the weight of the first test item.</p> |
|  <p>(Example)</p> | <p>⇒ Remove the first test item</p> <p>⇒ Put on the second test item</p> <p>The weight of the second test item is displayed.</p> <p>⇒ Press </p> |
| | <p>„ACC 2“ is shortly displayed</p> |
|   | <p>Then appears for 2 seconds the weight of both test items, before the weight of the second test item will appear again.</p> |

| | |
|-----------------|--|
| <p>i</p> | <p>In order to delete the stored values, press  and as long as the sum of the test items is displayed, press , the balance will return to „0.0g“.</p> |
|-----------------|--|

8.5 Percent weighing

Percent weighing allows to display weight in percent, in relation to a reference weight.

| Balance display | Operation |
|---|---|
|  | ⇒ Start balance by pressing  The balance will carry out a self-test. Wait for the „ 0.0g “ display. |
| | ⇒ Put a reference weight on the weighing plate, which corresponds to 100% |
|  | ⇒ Press  In the display appears „ 100.00% “ |
| | ⇒ Remove reference weight The display returns to „ 0.0g “ |
| | ⇒ Put on specimen |
|  | In the display appears the percentage of the specimen with reference to the reference weight. |
|  | ⇒ Back to weighing mode by pressing again the  button. |

9 The menu




9.1 Menu map

In the menu can be made 8 different settings and the adjustment.




9.2 Call up menu

The menu is called-up by pressing the  key, while the balance is carrying out the self test. In the display appears the message „F1 UNT“

9.3 Navigation in the menu

| Key | Direction in the menu | Description |
|---|-----------------------|--|
|  | ↓ | Select menu and pass through menu items from top to bottom |
|  | → | Select current element |
|  | ↑ | Exit the current element, return to weighing mode |

9.4 Menu overview

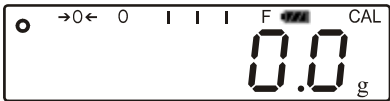







| Balance display | Operation |
|---|--|
|  | Selection of weighing units |
|  | Background lighting on/automatic/off <ul style="list-style-type: none"> • EL on: Background lighting on • EL Au: Background lighting switches on automatically EL off: Background lighting off |
|  | RS-232-interface <ul style="list-style-type: none"> • P prt: connect with printer • Pcont: for remote control orders • P auto: autom. printout |

9.5 Menu settings


9.5.1 Switch over weighing units (Unit)

The weighing units are switched on or off via the menu.

Activate function:

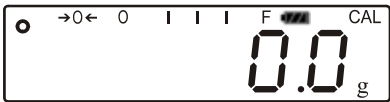









| Balance display | Operation |
|--|---|
|  | ⇒ Start balance by pressing  As long as the balance carries out a self test, press  . |
|  | „F1 Unt“ is displayed. |
|  | ⇒ Press  Weighing unit is switched on or off. ⇒ Use  to switch weighing unit on or off ⇒ Using  change to the next unit. |

Switch-over weighing unit:

By pressing the  key in the weighing mode it is possible to switch over between the activated units.


9.5.2 Display background illumination

In the menu the display background illumination can be switched on or off.
To achieve this, follow the sequence of operations below:

| Balance display | Operation |
|---|---|
|  | ⇒ Start balance by pressing  As long as the balance carries out a self test, press  . |
|  | „F1 Unt“ is displayed. |
|  | ⇒ Press  „F2 bL“ is displayed. |
|  (Example) | ⇒ Press  „EL on“ or „EL off“ resp. „EL AU“ is displayed ⇒ Press  to switch over between the three settings ⇒ Press  to activate the displayed setting. |

| Display | Adjustment | Function |
|----------|---|--|
| „EL on“ | Background illumination on | Contrastful display which can also be red in the darkness. |
| „EL off“ | Background illumination off | Battery saving |
| „EL AU“ | The background illumination will be switched off automatically 10 sec after having reached a stable weighing value. | Battery saving |

10 Error messages

| | | |
|--------------|----------------------------|---|
| Err 3 | Incorrect adjusting weight | Put on correct adjustment weight (see chap. 1; Technical Data) |
| Err 4 | Zero range exceeded | Remove load and press  to reset balance to zero. |
| Err 5 | Keyboard error | Inadmissible input |
| Err 6 | Electronic error | Switch balance off and on again. If the error message remains displayed, please contact your dealer. |

11 Service, maintenance, disposal

11.1 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.

11.2 Service, maintenance

The appliance may only be opened by trained service technicians who are authorized by KERN.

Before opening, disconnect from power supply.

11.3 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.

12 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.
- The mains supply connection has been interrupted (mains cable not plugged in/faulty).
- Power supply interrupted.
- (Rechargeable) batteries are inserted incorrectly or empty
- No (rechargeable) batteries inserted.

The displayed weight is permanently changing

- Draught/air movement
- Table/floor vibrations
- Weighing plate 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.
- Warm-up time was ignored.
- 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.