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Operating instructions

Compact balance

KERN FCF

Version 1.1

08/2016

GB



FCF-BA-e-1611



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Contents

1	Technical data.....	4
2	Basic Information (General).....	5
2.1	Intended use	5
2.2	Improper Use	5
2.3	Warranty	5
2.4	Monitoring of Test Resources.....	5
3	Basic Safety Precautions	6
3.1	Pay attention to the instructions in the Operation Manual	6
3.2	Personnel training	6
4	Transport and storage.....	6
4.1	Testing upon acceptance	6
4.2	Packaging.....	6
5	Unpacking, Setup and Commissioning	6
5.1	Installation Site, Location of Use	6
5.2	Unpacking/installation	7
5.3	Mains connection	7
5.4	Operation using a rechargeable battery (optional).....	8
5.5	Initial Commissioning	9
5.6	Adjustment.....	9
5.7	Adjustment.....	9
6	Operating elements	11
6.1	Overview of display.....	11
6.2	Keyboard overview.....	11

7	Basic Operation	12
	Start-up	12
	Switching Off	12
	Weighing.....	12
	Taring.....	12
	PRE-TARE function	13
	Plus/minus weighings.....	14
	Parts counting	15
	Net-total weighings	16
	Percent determination.....	17
8	Menu	18
8.1	Navigation in the menu	18
8.2	Menu overview	21
8.3	Description of individual menu items	22
	Weighing Units	22
	Dosing and Zero-tracking	24
	Selection adjustment weight.....	25
	Display background illumination.....	26
	Animal weighing function.....	27
	Reset to factory setting.....	28
9	Servicing, maintenance, disposal	29
9.1	Cleaning	29
9.2	Servicing, maintenance	29
9.3	Disposal.....	29
10	Instant help.....	30
11	Declaration of Conformity	31

1 Technical data

KERN	FCF 3K-4	FCF 30K-3
Readability (d)	0.1 g	1 g
Weighing range (max)	3 kg	30 kg
Taring range (subtractive)	3 kg	30 kg
Reproducibility	0.1 g	1 g
Linearity	0.3 g	3 g
Minimum unit weight at piece counting	0.2 g	2 g
Warm-up time	2 hours	2 hours
Reference quantities at piece counting	5, 10, 20, 25, 50	
Weighing Units	Details „ Weighing units “, see chap. 8.3	
Recom. adjustment weight, not added (class) Details about „ Selection of adjustment weight “ see chap. 9.3	3 kg (M1)	30 kg (M1)
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	270 x 323 x 110	
Weighing plate mm	253 x 229	
Weight kg (net)	2.6	

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 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.

2.3 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

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

Keep all parts of the original packaging in case you need to return the appliance.

Only use original packaging for returning.

Before sending, disconnect all connected cables and loose/movable parts.

Attach possibly existing transport safeguards. Secure all parts, e.g. weighing plate, mains adapter etc., to prevent slipping 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 charge of goods to be weighed and 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.

5.2 Unpacking/installation

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

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

- Place the balance on a horizontal and solid base.
- Remove the transport security on the 4-point support.
- Pull off the protection foil from the weighing plate if existing.
- Attach the weighing plate.

Scope of delivery / serial accessories

- Balance
- Weighing pan
- Transport Securing
- Mains adapter
- Protective cover
- Operating instructions

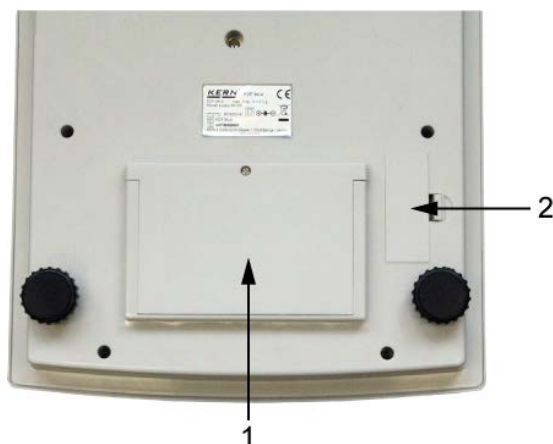
5.3 Mains connection

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.

5.4 Operation using a rechargeable battery (optional)

Lift-off the battery cover on the lower side of the balance. Connect 9 V compound battery. Replace the battery compartment cover.



- 1 Rechargeable battery compartment
- 2 Battery compartment

For battery / rechargeable battery operation the balance has an automatic switch-off function which can be activated or deactivated in the menu (see chapter 8).

⇒ Keep pressed **MENU** in the weighing mode until **Unit** is displayed.

⇒ Press **MODE**/**CAL**, „AF“ will be displayed.

⇒ Press **SET**/**M**, the setting made as last will be displayed, e.g. „on“.

⇒ Use **MODE**/**CAL** now to select between the following two settings:

„AF on“: In order to save the battery, the balance switches automatically off after 3 minutes without weighing.

„AF off“: Switch-off function deactivated.

⇒ Acknowledge selection by **SET**/**M**. The balance returns to weighing mode. The finished setting is now enabled.



If the batteries are exhausted, „LO“ is displayed; press  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.

If there exists an optional rechargeable battery, it has to be connected in the rechargeable battery compartment via a separate plug-in socket. Load rechargeable battery via the delivered plug-in power supply unit.

5.5 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.

5.6 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.

5.7 Adjustment

The adjustment should be made with the recommended adjustment weight (see chap. 1 "Technical data"). Adjustment is also possible with the weights of other nominal values (see table 1), but not the optimum for measuring technique.

Procedure when adjusting:

Observe stable environmental conditions. A warming up time (see chapter 1) is required for stabilization.

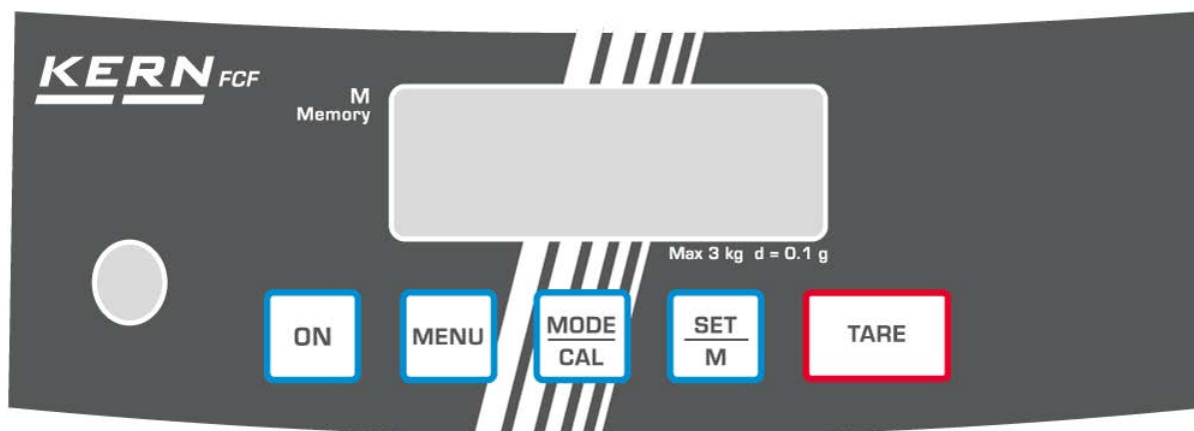
- ⇒ Start balance by pressing .
- ⇒ Press and hold down , the display shows "**CAL**" briefly. After that the size of the adjustment weight appears flashing in the display.
- ⇒ Now set the adjusting weight in the centre of the weighing plate.
- ⇒ Press . Short time later there appears „**CAL F**“, then the automatic return to the weighing mode. In the display there appears the value of the adjustment weight. Adjustment has now been completed successfully.

An error during adjustment or the use of an incorrect adjusting weight will result in an error message „**CAL E**“. Repeat adjustment.

Keep the adjustment close to the balance. Daily control of the weighing exactness is recommended for quality-relevant applications.

6 Operating elements

6.1 Overview of display



6.2 Keyboard overview

Button	Designation	Function
	ON-button	Start-up
	MENU button	- Confirm settings in the menu - Save and exit menu
	MODE/CAL button	- Select menu items - Change settings in the menu - Adjustment
	SET/M button	- Acknowledge menu item - Return to weighing mode
	TARE button	Taring

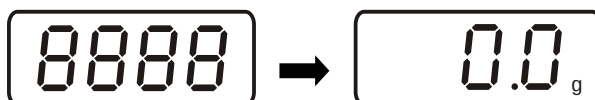
7 Basic Operation

Start-up



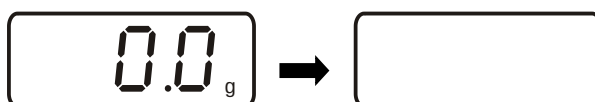
⇒ Press .

The balance will carry out a self-test. As soon as the weight display appears, the balance is ready for weighing.



Switching Off

⇒ Press  again, the display will extinguish.



Weighing

- ⇒ Place goods to be weighed on balance.
- ⇒ Wait for standstill control, after the standstill control, the weighing unit appears right hand in the display (e.g. g or kg)
- ⇒ Read weighing result.

If the goods are heavier than the weighing range, the display will show "**Error**" (=Overload), and a whistle is sounded.

Taring

- ⇒ Place an empty weighing container, the weight of the weighing container will be displayed.



⇒ Press , the zero display appears. The tare weight is saved until it is deleted.



- ⇒ Weigh the material, the net weight will be indicated.

47.2_g

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 weighing container, the weight of the weighing container appears as negative display.

The tare weight is saved until it is deleted.

Delete tare



- ⇒ Unload the balance and press , the zero display appears.

0.0_g

PRE-TARE function



Using this function the weight of a tare vessel is stored. Even after turning off/on the weighing balance will continue working with the saved tare value.

- ⇒ In weighing mode put tare vessel on the weighing plate
- ⇒ Press  repeatedly until „PtArE“ will appear flashing.
- ⇒ Use  to save the current weight on the weighing plate as a PRE-TARE value.

Delete PRE-TARE value



- ⇒ Remove all loads from the balance and press  repeatedly until „PtArE“ will appear flashing.
- ⇒ Acknowledge with . The PRE-TARE value is deleted, the zero display appears.

Plus/minus weighings



For example unit weight control, fabrication control etc.

⇒ Put the nominal weight on the weighing plate and tare using



⇒ Remove the nominal weight

⇒ Put the specimens subsequently on the weighing plate, the respective deviation from the nominal weight is displayed with the respective sign to „+“ and „-“.

According to the same procedure also packages with the same weight can be produced, referring to a nominal weight.

⇒ Back to weighing mode by pressing the



button.

Parts counting

During piece counting parts can either be counted into a container or out of a container. To count a greater number of parts the average weight per part has to be determined with a small quantity (reference quantity).

The larger the reference quantity, the higher the counting exactness. High reference must be selected for small parts or parts with considerably different sizes.

The larger the reference quantity, the more accurate the parts counting.

The process has four steps:

- Tare the weighing container
- Determine the reference unit
- Original weighing of reference weight
- Count the items



⇒ In weighing mode press . Reference piece number „5^{PCS}“ appears flashing.

⇒ By pressing several times other reference quantities **10, 20, 25** and **50** can be called up. Place as many pieces to count on the weighing plate as the set reference quantity requires.

⇒ Acknowledge with . The balance is now in parts counting mode counting all units on the weighing plate.



- **Return to weighing mode**

Press .

- **Error message „Er 1“**

Piece below minimum weight of piece, see chap. 1

“Technical data”; press and restart Reference determination.

- **Taring**

The tare vessels can also be used for piece counting. Before

starting piece counting use to tare out the tare container.

Net-total weighings

It is useful if a mixture of several components is weighed into a tare vessel and finally the sum weight of all weighed components is necessary for control purposes (net-total, i.e. the weight of the tare vessel).

Example:



1. Place tare container on the weighing plate; press , the zero display appears.

2. Weigh-in the component ❶. Press , the zero display appears. [▲] is displayed on the right border of the display.

3. Weigh-in the component ❷, press . Net-total (sum weight of the components ❶ and ❷) is displayed.

4. Press  again, the zero display appears.

5. Weigh-in the component ❸, press . Net-total (sum weight of the components ❶ and ❷ and ❸) is displayed.

⇒ If necessary, also fill the formula up to the desired final value. For every component more repeat the steps 4-5.

⇒ Back to weighing mode by pressing the  button.

Percent determination



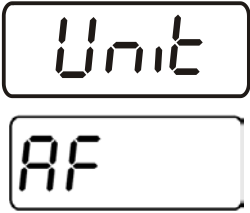
Percentage calculation facilitates weight display in percent related to a reference weight equivalent to 100 %.

- ⇒ In weighing mode press  repeatedly, until "100 %" is displayed flashing.
- ⇒ Put a reference weight which corresponds to 100 %.
- ⇒ Save reference by . Remove reference weight.
- ⇒ Place goods to be weighed on balance.
The weight of the sample is displayed in percentage in terms of the reference weight.

Back to weighing mode by pressing the  button.

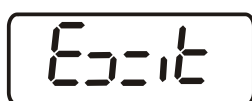
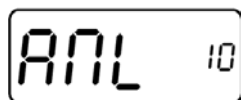
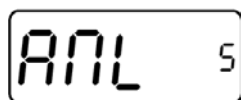
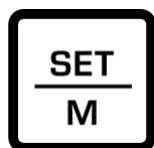
8 Menu

8.1 Navigation in the menu

Access to menu  	 Keep pressed  in weighing mode until “Unit” is displayed.
Select menu items   (example)	 With help of , the individual menu items can be selected one after the other.
Change settings (example)    	 Confirm selected menu item by , the current setting will be shown. Press  to change the setting. Every time  is pressed, the next setting will be displayed, see chap.8.2 „Menu overview“.
1. Save change of a menu item and exit the menu  	⇒ Press  and the balance will return to weighing mode.

2. Change settings of several menu items

(example)



Confirm selected menu item by , the current setting will be shown.

Press  to change setting

Press , „Exit“ will be displayed.

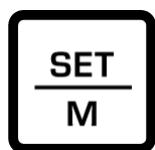
Either

Confirm by  (yes), „Store“ will be displayed. Save () or discard () and exit the menu,

or

Press  (No) and make the changes on the other menu items as described above

Save/reject and exit the menu



Exit

Store

⇒ Save

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⇒ Reject

0.0_g

Either

Save the changes carried out by  (yes). The balance returns automatically into weighing mode.

or

To discard the changes, press  (No). The balance returns automatically into weighing mode.

8.2 Menu overview

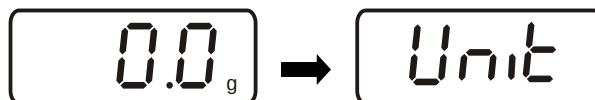
Description of function	Function	Parameters	Description of options
Weighing units switching over (see chapter 8.3).	UNIT	g*	Gram
		kg	Kilogram (dependent on model)
		oz	Pound
		ozt	Ounce
		lb	Troy ounce
		tlh	Tael Hongkong
		tlt	Tael Taiwan
		gn	Grain (dependent on model)
		dwt	Pennyweight (dependent on model)
		mo	Momme
		Tol	Tola
		ct	Carat (dependent on model)
		FFA	Freely selectable factor
Auto off (battery operation), see chap. 5.4	AF	on*	Automatic switch-off function after 3 min without changing load ON
		off	Automatic switch-off function after 3 min without changing load OFF
Auto Zero (see chapter 8.3)	tr	on*	ON
		off	Off
Selection adjustment weight (see chapter 9.3)	CAL	1000	*dependent on model
		2000	
		3000	
Background illumination of the display, (see chap. 8.3)	bL	on*	Background illumination on
		off	Background illumination off
		CH	The background illumination will be switched off automatically 10 sec after having reached a stable weighing value.
Animal weighing function (see chapter 8.3)	ANL	off*	Off
		3	Period 3 seconds
		5	Period 5 seconds
		10	Period 10 seconds
		15	Period 15 seconds
Reset to factory setting (see chap. 8.3)	rSt	no*	no
		yes	yes

* = default setting

8.3 Description of individual menu items

Weighing Units

- ⇒ Keep pressed  in the weighing mode until “Unit” is displayed.



- ⇒ Press , the selected unit is displayed.

- ⇒ Using  one can select between the different units (See the following table).

- ⇒ Acknowledge selected unit using .

	Display	Conversion factor 1 g =
Gram	g	1.
Ounce	oz	0.035273962
Troy ounce	ozt	0.032150747
Pound	lb	0.0022046226
Tael Hongkong	tlh	0.02671725
Tael Taiwan	tlt	0.0266666
Grain (dependent on model)	gn	15.43235835
Pennyweight (dependent on model)	dwt	0.643014931
Momme	mom	0.2667
Tola	tol	0.0857333381
Carat (dependent on model)	ct	5
Freely selectable factor *)	FFA	xx.xx

*) Input conversion factor

⇒ As specified above, press  repeatedly until „FFA“ is displayed.

⇒ To enter the factor, press ; the enabled digit starts flashing.

Using , the displayed value is increased by 1, with  it is reduced by 1.

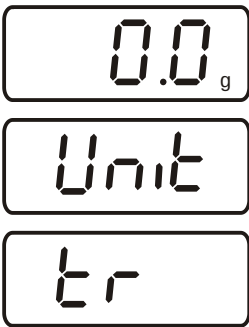
Use  to shift the number selection to the left.

⇒ Confirm input by .

⇒ Press repeatedly  to take over the „Freely selectable factor“ as current weighing unit.

Dosing and
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.



- ⇒ Keep pressed  in weighing mode until “Unit” is displayed.
- ⇒ Press  repeatedly until "tr" is displayed.
- ⇒ Acknowledge using , the current setting is displayed.
- ⇒ Select desired setting by .

tr	on	Function activated
tr	off	Function deactivated

- ⇒ Acknowledge selection by .

Selection adjustment weight

In the model series KERN FCF, the adjustment weight can be selected from three/four pre-set nominal values (approx. 1/3; 2/3; max) In order to achieve high-quality weighing results in the sense of the measuring technology, it is recommended to select the nominal value as high as possible. The non delivered adjustment weights can be purchased from KERN as option.



⇒ Keep pressed  in the weighing mode until “Unit” is displayed.



⇒ Press  repeatedly until „CAL“ will be displayed.



⇒ Acknowledge using , the current setting is displayed.

⇒ Select desired setting by .

⇒ Acknowledge selection by .

Display
background
illumination



⇒ Keep pressed  in the weighing mode until “Unit” is displayed.



⇒ Press  repeatedly until „bl“ will be displayed.



⇒ Acknowledge using , the current setting is displayed.

⇒ Select desired setting by .

bl	on	Background illumination switched on	Contrastful display which can also be red in the darkness.
bl	off	Background illumination switched off	Battery saving
bl	Ch	The background illumination will be switched off automatically 10 sec after having reached a stable weighing value.	Battery saving

⇒ Acknowledge selection by .

Animal weighing function

The animal weighing function can be applied for busy weighings. During a defined period the mean value of the weighing results is formed.

The more unquiet the weighed item, the longer the period should be selected.

0.0 g

Unit

ANL

⇒ Keep pressed **MENU** in the weighing mode until “Unit” is displayed.

⇒ Press **MODE CAL** repeatedly until „ANL“ will be displayed.

⇒ Acknowledge using **SET M**, the current setting is displayed.

⇒ Select desired setting by **MODE CAL**.

ANL	3	Period 3 seconds
ANL	5	Period 5 seconds
ANL	10	Period 10 seconds
ANL	15	Period 15 seconds
ANL	off	Animal weighing not active

⇒ Acknowledge selection by **SET M**.

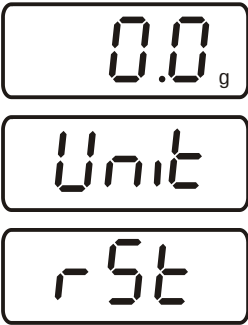
⇒ Put weighed load (animal) on weighing pan and press **SET M**. In the display runs a „Countdown“. The average value of the weighing results is displayed and remains displayed on the screen.

⇒ Use **SET M** to change between animal weighing and normal weighing.

⇒ Press **SET M** to restart the weighing cycle for animal weighing.

Reset to
factory setting

This function resets all balance settings to factory setting.



- ⇒ Keep pressed  in the weighing mode until “Unit” is displayed.
- ⇒ Press  repeatedly until "rSt" is displayed.
- ⇒ Acknowledge using , the current setting is displayed.
- ⇒ Select desired setting by .

rSt	yes	Balance will be reset to factory setting.
rSt	no	The balance keeps its individual setting

- ⇒ Acknowledge selection by  . The balance returns to weighing mode.

9 Servicing, maintenance, disposal

9.1 Cleaning

Before cleaning, 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. Take care that the device is not penetrated by fluids and polish it 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.

9.2 Servicing, maintenance

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

Before opening, disconnect from power supply.

9.3 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.

10 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.
- Batteries are inserted incorrectly or empty
- No batteries inserted.

The displayed weight is permanently changing

-

- 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 value is obviously wrong

- 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.

11 Declaration of Conformity

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

www.kern-sohn.com/ce