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Operating Instructions
Display units

KERN KXC-TM

Type TKXC-TM-A

Version 1.1

2024-11

GB

TKXC-TM-A-BA-e-2411

GB

KERN KXC-TM

Version 1.1 2024-11

Operating Instructions Display units

Content

1 Technical data

KERN	KXC-TM
Item no./ Type	TKXC-TM-A
Display	LCD 6 digits, height 48 mm with back lighting
Resolution (verifiable)	Single (Max.) 3000 e
	Multi Range/Multi Intervall (Max.) 2x3000 e
Resolution (non-verifiable)	100 – 999.999 d
Verification class	III
Weighing ranges	2
Divisions	1,2,5,10, n
DMS weighing cells	87-1100 Ω. (minimum/maximum resistance)
Applications	Weighing, Counting, Checkweighing
Weighing Units	g, kg, lb, pcs, %, FFA
Allowable ambient temperature	-10 °C ... + 40 °C
Operating temperature range with the rechargeable battery	0 °C … + 40 °C
Humidity of air	max. 80% rel. (non-condensing)
Electric Supply	Input voltage 100 ~ 240 V; 50 / 60 Hz; 0.4 A Overvoltage Category II Mains supply voltage fluctuations ±10 %
	Optional storage battery TYKR-01-A (RC193650); 3.7 V; 3700 mAh
Storage battery operation (optional)	Operating time 48 hrs (backlight off) Operating time 20 hrs (backlight on) Loading time approx. 8 hrs.
Dimensions display unit	232 x 80 x 150 (W x D x H) [mm]
Net weight (kg)	2,5
Interfaces	RS-232, USB-Device, WiFi, Analogue (0-10V, 4-20mA), Ethernet, Bluetooth via KUP (optional)
Altitude	Below 2000 m
IP protection	IP 68
Pollution degree	2

*** Smallest part weight for piece counting - under lab conditions:**

- There are ideal ambient conditions for high-resolution counting
- The parts to be counted are not scattered

**** Smallest part weight for piece counting - under normal conditions:**

- There are unsteady ambient conditions (draft, vibrations)
- The parts to be counted are being scattered

2 Declaration of conformity

The current EC/EU Conformity declaration can be found online in:

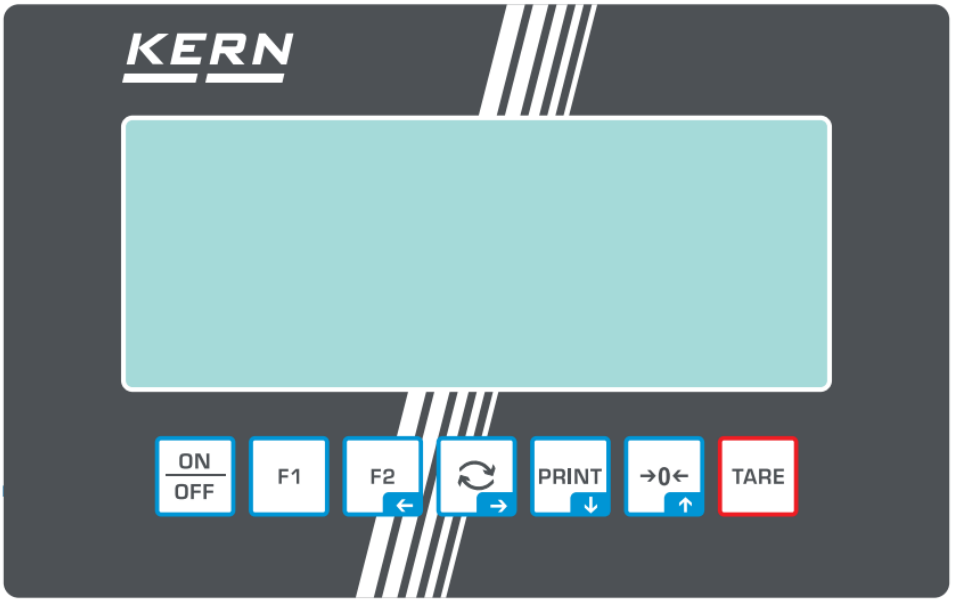
www.kern-sohn.com/ce

3 Appliance overview

3.1 Components

Pos.	Designation
1	Display
2	Keyboard

3.2 Operating elements



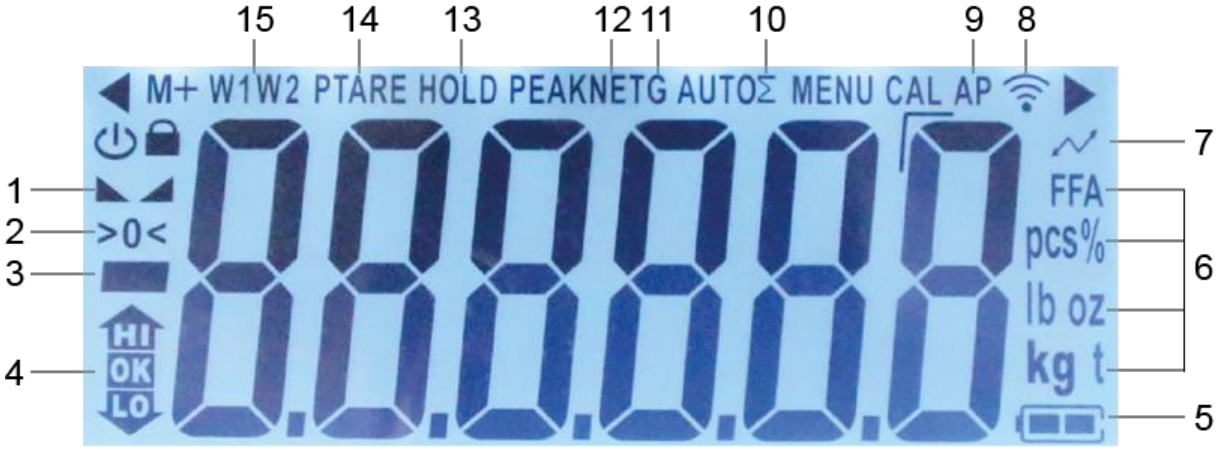
3.2.1 Keyboard overview

Button	Name	Function in Operating mode	Function in Menu
ON/OFF	ON/OFF-button	➢ Switch on/off (press button long time) ➢ Switch on/off the display back-ground illumination (press button short time)	
F1	F1-key	➢ Functions key, see chap. 9.5	
F2	F2-key	➢ Functions key, see chap. 9.5	➢ Navigation key ← ➢ Menu level back ➢ Exit menu / back to weighing mode.
	-key	➢ Change-over button, see chap. 9.5	➢ Navigation key → ➢ Activate menu item ➢ Confirm selection
PRINT	PRINT-button	➢ Calculate weighing data via in-terface ➢ Display increased resolution (long keystroke, only for verified scales)	➢ Navigation key ↓ ➢ Select menu item
→0←	ZERO-key	➢ Zeroing	➢ Navigation key ↑ ➢ Select menu item
TARE	TARE-button	➢ Taring	➢ Invoke application menu (press button long time)

3.2.2 Numerical input

Button	Designation	Function
	Navigation key ➔	Select cipher
		Confirm entry. Press button repeatedly for every digit. Wait until the numeric input window extinguishes.
	Navigation key ➔	Reduce flashing cipher (0 – 9)
	Navigation key ➔	Increase flashing cipher (0 – 9)

3.2.3 Overview of displays



Position	Display	Description
1	◣◢	Stability display
2	**>0<**	Zero display
3	▬	Minus display
4	HI OK LO	Tolerance marks for check weighing
5		Rechargeable battery charge indicator
6	**Units display / Pcs/ %**	options g, kg, lb, gn, oz or Application icon [**Pcs**] for piece counting or [%] for determination of percentage
7		Data transfer running
8		WIFI-symbol
9	**AP**	Autoprint enabled
10	Σ	Weighing data can be found in the sum memory
11	**G**	Display gross weight value
12	**NET**	Display net weight value
13	**HOLD**	Hold/ animal weighing function
14	**PTARE**	Pre-Tare function
15	**W1W2**	Display of selected weighing range

4 Basic Information (General)

4.1 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.

It can be used in indoor and outdoor. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be imparied.

4.2 Improper Use

- Our balances are non-automatic balances and not provided for use in dynamic weighing processes. However, the balances can also be used for dynamic weighing processes after verifying their individual operative range, and here especially the accuracy requirements of the application.
- 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 damage by this.
- Never operate the 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.

4.3 Warranty

Warranty claims shall be voided in case:

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

4.4 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 calibration laboratory test weights and balances may be calibrated (return to the national standard) fast and at moderate cost.

5 Basic Safety Precautions

5.1 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.

5.2 Personnel training

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

5.3 Electrostatic sensitive components

Electrostatic discharge (ESD) can cause damage to electronic components. Damaged components do not always lead to malfunctions immediately, but sometimes only after some time.

Therefore, take precautions for ESD protection before removing hazardous components from the packaging and carrying out work in the electronics area:

- Ground yourself before touching electronic components (ESD clothing, wristband, shoes, etc.).
- Only carry out work on electronic components at suitable ESD workstations (EPA) with suitable ESD tools (antistatic mat, conductive screwdrivers, etc.).
- Only transport electronic components outside the EPA in suitable ESD packaging.
- Never remove electronic components from their packaging if they are outside the EPA.

6 Transport and storage

6.1 Testing upon acceptance

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

6.1 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 wind screen, the weighing plate, power supply unit etc. against shifting and damage.

7 Unpacking, Installation and Commissioning

7.1 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.

On the installation site observe the following:

- 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.
- 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.
- Do not operate in areas with hazard of explosive material or in potentially explosive atmospheres due to materials such as gasses, steams, mists or dusts.
- Keep away chemicals (such as liquids or gasses), which could attack and damage the balance inside or from outside.
- In the event of the occurrence of electromagnetic fields, static charges (e.g., when weighing / counting plastic parts) and unstable power supply, large display deviations (incorrect weighing results, as well as damage to the scale) are possible. Change location or remove source of interference.

7.2 Unpacking and checking

Remove device and accessories from packaging, remove packaging material and install the device at the planned workplace. Check if that there has been no damage and that all items of delivery scope are present.

Scope of delivery / serial accessories:

- Display Unit
- Operating instructions

7.3 Mains connection

Do not connect the scales to the power mains unless the information on the scales (sticker) matches the local mains voltage.

Important:

- ➢ Before starting your weighing balance, check the mains cable for damage.
- ➢ Ensure that the power unit does not come into contact with liquids.
- ➢ Ensure access to mains plug at all times.

7.4 Rechargeable battery operation (optional)

ATTENTION

- ⇨ The rechargeable battery and the battery match with each other.
- ⇨ Operating temperature range with the rechargeable battery: 0 °C … + 40 °C
- ⇨ The rechargeable battery can only be replaced by the same or by a type recommended by the manufacturer.
- ⇨ The rechargeable battery is not protected against all environmental influences. If the rechargeable battery is exposed to certain environmental influences, it may set on fire or explode. Persons may be injured or material damage may occur.
- ⇨ Protect the rechargeable battery against fire and heat.
- ⇨ Do not bring the rechargeable battery in contact with fluids, chemical substances or salt.
- ⇨ Do not expose the rechargeable battery to high pressure or microwaves.
- ⇨ Under no circumstances the rechargeable batteries and the charging unit may be modified or manipulated.
- ⇨ Do not use a defective, damaged or deformed rechargeable battery.
- ⇨ Do not connect or short-circuit the electrical contacts of the rechargeable battery with metallic objects.
- ⇨ Liquid may squirt out from a damaged rechargeable battery. If the liquid gets into contact with the skin or the eyes, the skin and the eyes may be irritated.
- ⇨ Ensure the correct polarity when inserting or changing the rechargeable battery.
- ⇨ The rechargeable battery operation is overridden when the mains adapter is connected.
- ⇨ If the rechargeable battery starts to smell, being hot, changing the colour or being deformed, it must be immediately unplugged from mains supply and from the balance if possible.

7.4.1 Load rechargeable battery

Before the first use, the rechargeable battery package should be charged for at least 15 hours.

To save the rechargeable battery, in menu (see chap. 14.3.1) the automatic switch-off function <AUtOFF> can be activated.

If the capacity of the rechargeable batteries is exhausted, <Lo bAt> appears in the display. Connect the power cable as soon as possible to load the rechargeable battery. Charging time until complete recharging is approx. 8 hrs.

7.5 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.

7.6 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, rechargeable accumulator or battery).

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

Strictly observe hints in chapter Adjustment.

7.7 Adjustment of non-calibratable devices

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.

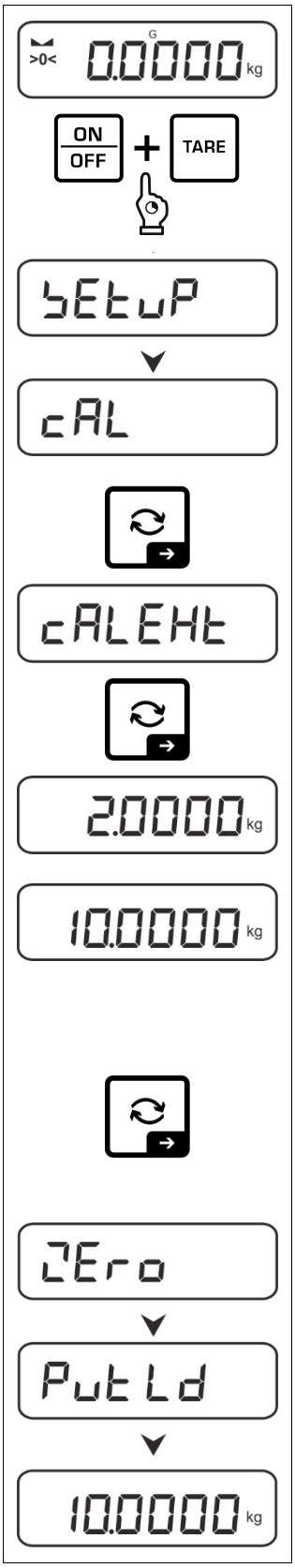
- Prepare the required adjustment weight, see chap. 1.
  The adjustment weight to be applied depends on the capacity of a weighing scale. Carry out adjustment as closely as possible to admissible maximum load of weighing scale. Info about test weights can be found on the Internet at: http://www.kern-sohn.com.
- Observe stable environmental conditions. A warm up time (see chapter 1) is required for stabilization.
- Ensure that there are no objects on the weighing plate.
- Avoid vibration and air flow.
- Always carry out adjustment with the standard weighing plate in place.

The adjustment is locked in weighing scales with type approval certificate.

To disable the access lock, destroy the seal mark and actuate the adjustment switch. Position of the adjustment switch, see chap. 8. Adjustment of calibratable devices see Chap. 7.8

- **Attention:**
  After destruction of the seal the balance must be re-verified by an authorised agency and a new verification wire/seal mark fitted before it can be reused for applications subject to verification.

7.7.1 External adjustment < cALEHt >



⇨ Press and hold the TARE and ON/OFF buttons simultaneously to enter the setup menu.

⇨ Wait until the first menu item < cAL > is displayed.

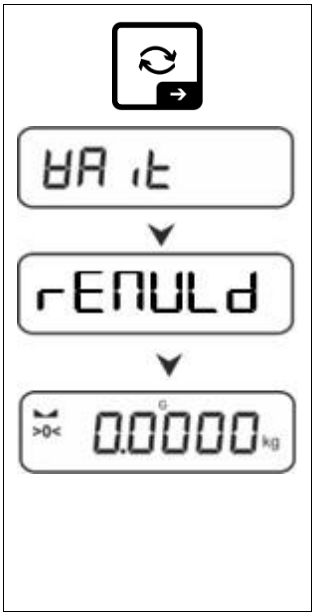
⇨ Confirm by ➔ button, < cALEHt > will be displayed.

⇨ Confirm by pressing the ➔ button, the first selectable adjustment weight is displayed.

⇨ Use the navigation keys ↓↑ to select the desired adjustment weight, see chap. 1 „Adjustment points“ or „Recommended adjustment weight“

⇨ Prepare the required adjustment weight.

⇨ Acknowledge selection by ➔ button.< ZEro >, < PtLd > followed by the weight value of the adjustment weight to be placed will be displayed.

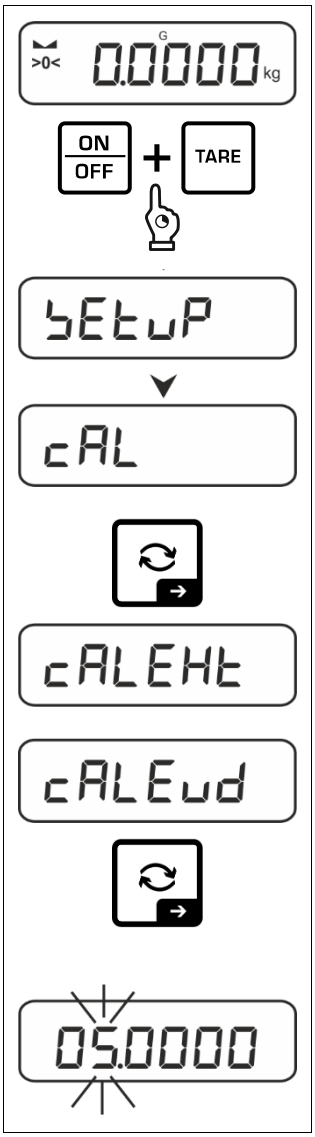


⇨ Place the adjustment weight and confirm with ➔ button, < WAit> followed by < rEnULd> will be displayed.

⇨ Once < rEnULd> is displayed, remove the adjustment weight.

⇨ After successful adjustment the balance automatically returns to weighing mode.
In case of an adjustment error (e.g. objects on the weighing plate) the display will show the error message < WronG >. Switch off balance and repeat the adjustment process.

7.7.2 External adjustment with user-defined adjustment weight < cALEud >



⇨ Press and hold the TARE and ON/OFF buttons simultaneously to enter the setup menu.

⇨ Wait until the first menu item < cAL > is displayed.

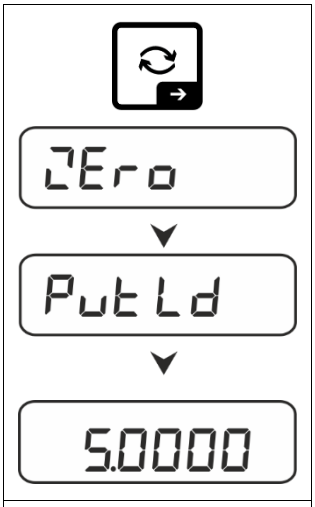
⇨ Confirm by ➔ button, < cALEHt> will be displayed.

⇨ Use the navigation keys to select 🡻 🡹 < cALEud>.

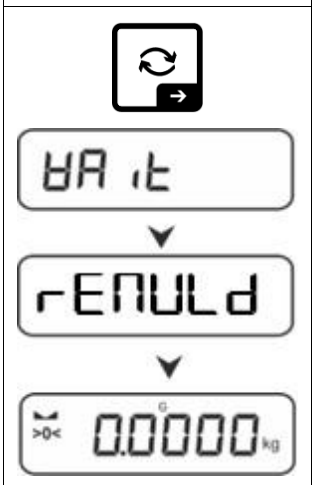
⇨ Acknowledge by ➔ button. The numeric input window for the weight value of the adjustment weight appears. The active digit is flashing.

⇨ Provide adjustment weight.

⇨ Enter weight value, numerical input see chap. 3.2.2



⇨ Acknowledge selection by ➔ button. < ZEro >,
< PutLd > followed by the weight value of the adjustment weight to be placed will be displayed.



⇨ Place the adjustment weight and confirm with ➔ button,
< WAit> followed by < rEnULd> will be displayed.

⇨ Once < rEnULd> is displayed, remove the adjustment weight.

⇨ After successful adjustment the balance automatically returns to weighing mode.
In case of an adjustment error (e.g. objects on the weighing plate) the display will show the error message < WronG>.
Switch off balance and repeat the adjustment process.

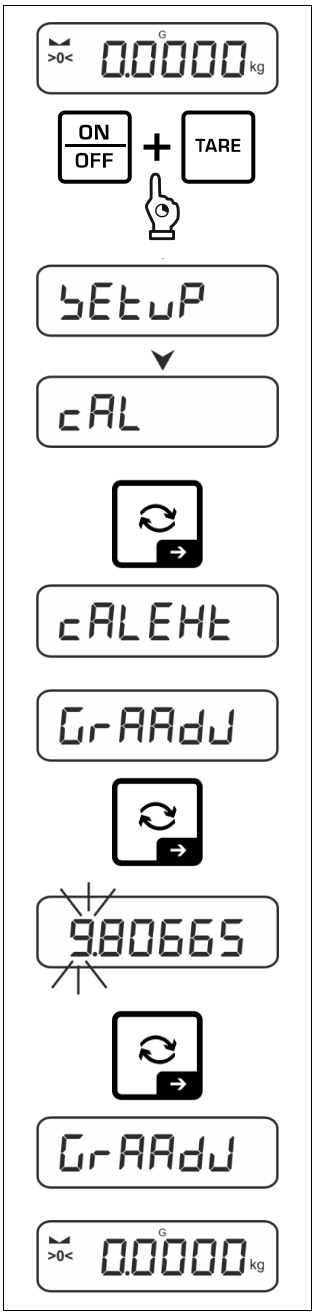
7.7.3 Gravitational constant adjustment location < GrAAdJ >

INFORMATION

- Only enter the gravitational constants after adjustment and linearisation. The two constants must be known for this.
- The two gravitational constants **<GrAAdJ>** and **<GrAuSE>** are reset to the default value after readjustment.

Set the gravitational constant at the adjustment point:

The calibration location is the location where the scale is calibrated and linearised during configuration. Before setting, find out which value of the constant is valid for you at the place of adjustment and linearisation.



⇨ Press and hold the TARE and ON/OFF buttons simultaneously to enter the setup menu.

⇨ Wait until the first menu item < CAL > is displayed.

⇨ Confirm by ➔ button, < CALEHt > will be displayed.

⇨ Use the navigation keys to select 🡻 🡹 < GrAAdJ >.

⇨ Acknowledge using ➔ button, the current setting is displayed. The active digit is flashing.

⇨ Enter weight value and confirm using the ➔ button, numerical input see chap. see chap. 3.2.2.
Weighing balance returns to menu.

⇨ Press repeatedly 🡸 button to exit menu.

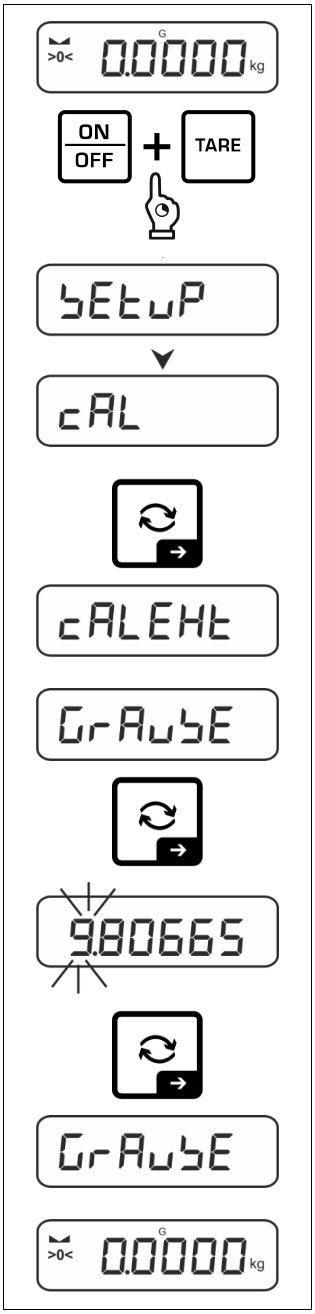
7.7.4 Gravitational constant place of location < GrAuSE >

INFORMATION

- Only enter the gravitational constants after adjustment and linearisation. The two constants must be known for this.
- The two gravitational constants **<GrAAdJ>** and **<GrAuSE>** are reset to the default value after readjustment.

Set the gravitational constant at the installation site:

The installation location is the place where the scales will be used. This enables accurate measurements. Find out which value of the constant is valid for the user before setting the scale.



⇨ Press and hold the TARE and ON/OFF buttons simultaneously to enter the setup menu.

⇨ Wait until the first menu item < cAL > is displayed.

⇨ Confirm by ➔ button, < cALEHt > will be displayed.

⇨ Use the navigation keys to select 🡻 🡹 < GrAuSE >.

⇨ Acknowledge using ➔ button, the current setting is displayed. The active digit is flashing.

⇨ Enter weight value and confirm using the ➔ button, numerical input see chap. 3.2.2.
Weighing balance returns to menu.

⇨ Press repeatedly ← button to exit menu.

7.8 Calibration of calibratable devices

INFORMATION

Please note that to configure a calibrated device, the calibration seal must be destroyed and the scales must be recalibrated and sealed by an authorised body (e.g. when converting to another platform).

⚠ DANGER

Electric shock due to contact with live components

Electric shock leads to serious injury or death

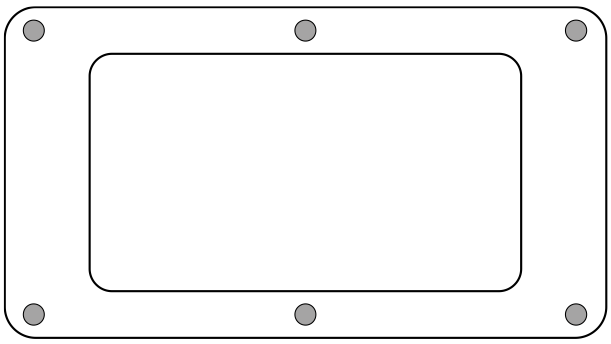
⇨ Do not touch any live components, only the adjustment switch

NOTE

⇨ Please be sure to observe the notes on electrostatically sensitive components in the chapter "Electrostatic sensitive components".

Open the display unit:

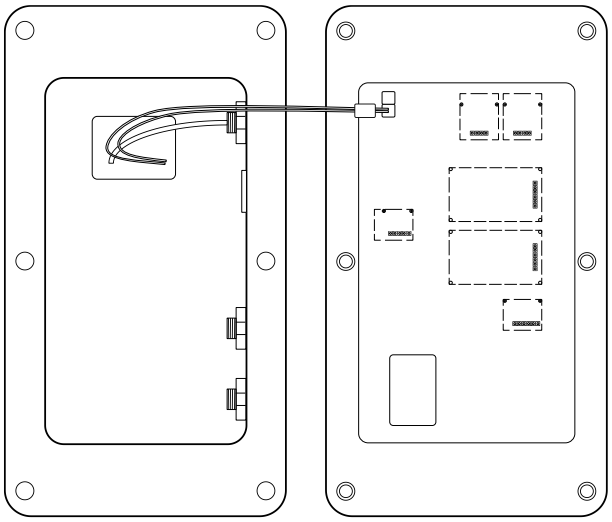
1. Loosen the screws on the back of the display unit.



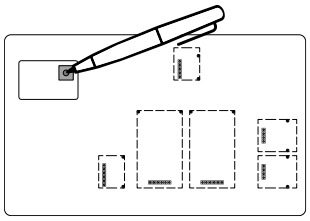
2. **NOTE**

⇨ Make sure that you do not damage any cables (e.g. by tearing them off or pinching them).

Carefully open both halves of the display unit.



Open service menu:



+

⇨ Remove the cover of the adjustment switch on the circuit board (for the position of the adjustment switch, see Chap.8)

⇨ Switch on the appliance and press the adjustment switch

⇨ Wait until **<H 10>** appears on the display

⇨ Release buttons

⇨ The device can now be configured in calibrated mode

Carry out adjustment

To carry out the adjustment or set the gravitational constants, the service menu must be opened and called up via <AdJuSt> → <cAL>. Operation is then the same as in chapter 7.7.1 described.

Close the display unit:

Note

- ⇨ Make sure that you do not damage any cables (e.g. by tearing or pinching them).
- ⇨ Make sure that any seals present are in their intended place.

1. Carefully fold together both halves of the display unit.
2. Screw the display unit together (tightening torque = 5 Nm ± 5%).

8 Verification

General:

According to EU directive 2014/31/EU balances must be officially verified if they are used as follows (legally controlled area):

- For commercial transactions if the price of goods is determined by weighing.
- For the production of medicines in pharmacies as well as for analyses in the medical and pharmaceutical laboratory.
- For official purposes
- For manufacturing final packages

In cases of doubt, please contact your local trade in standard.

Balances in the legally controlled area (-> verified balances) must keep the error limits in the verification validity period – normally they are the double of the verification error limits.
When this verification validity period expires, a re-verification must be carried out. Should be necessary an adjustment of the balance to keep the verification error limits to satisfy the reverification requirements, this is not deemed a warranty case.

Verification notes:

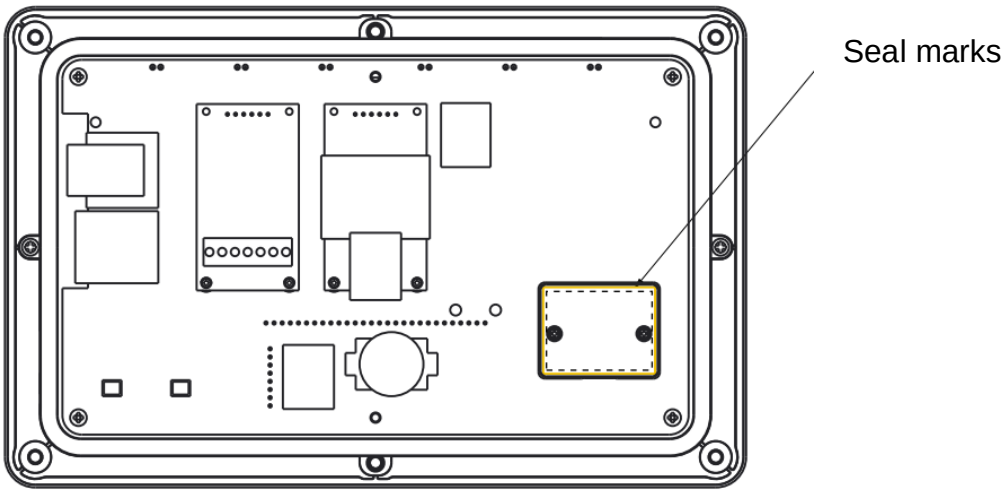
An EU type approval exists for balances described in their technical data as verifiable. If the balance is used where obligation to verify exists as described above, it must be verified and re-verified at regular intervals.

Re-verification of a balance is carried out according to the respective national regulations. The validity for verification of balances in Germany is e.g. 2 years.

The legal regulation of the country where the balance is used must be observed!

Verification of the balance is invalid without the seal.
The seal marks attached on balances with type approval point out that the balance may only be opened and serviced by trained and authorised specialist staff. If the seal mark is destroyed, verification looses its validity. Please observe all national laws and legal regulations. In Germany a re-verification will be necessary.

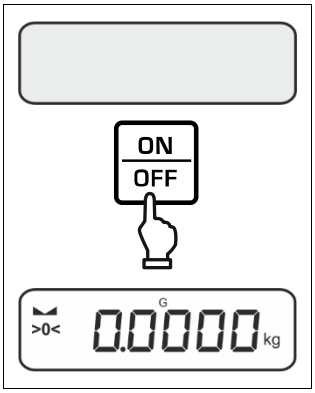
Position of the official seals:



9 Basic Operation

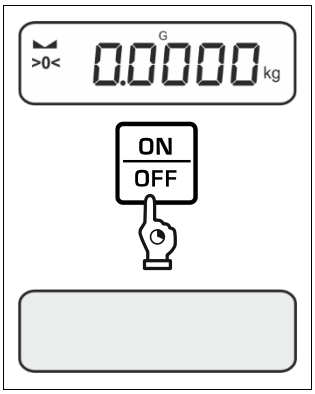
9.1 Turn on/off

Start-up:



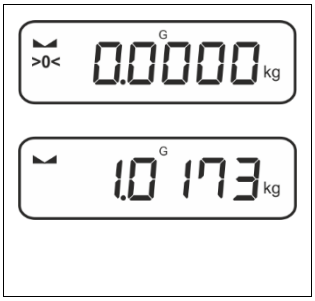
⇨ Press the **ON/OFF** button.
The display lights up and the balance carries out a selftest.
Wait until the weight display appears
The scales are now ready for operation using the last active application

Switching off:



⇨ Keep **ON/OFF** button pressed until the display disappears

9.2 Simple weighing



⇨ Check zero display [**>0<**] and set to zero with the help of the **ZERO** key, as required.

⇨ Place goods to be weighed on balance

⇨ Wait until the stability display appears (▬).

⇨ Read weighing result.

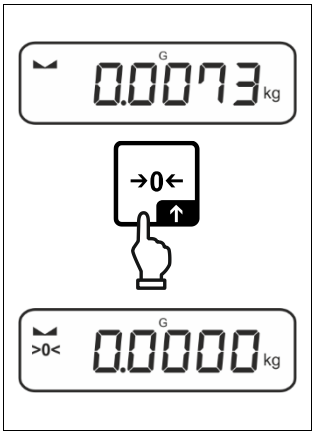
Overload warning
Overloading exceeding the stated maximum load (max) of the device, minus a possibly existing tare load, must be strictly avoided.
This could damage the instrument.
Exceeding the maximum load is indicated by the display "⌐ - - ¬". Unload balance or reduce preload.

9.3 Zeroing

In order to obtain optimal weighing results, reset to zero the balance before weighing.

Zeroing is only possible in the range ± 2% Max.

For values greater than ± 2% maximum the error message < OL in Lt > is displayed

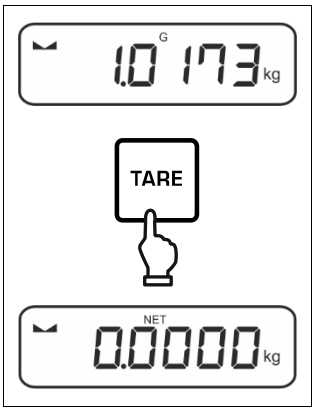


⇨ Unload the balance

⇨ Press the **ZERO** key to set the balance to zero.

9.4 Taring

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



⇨ Put weighing container on the weighing plate.

⇨ Wait until the stability display appears ◣◢), then press **TARE** key. The weight of the container is now internally saved. Zero display and indicator **<NET>** will appear. **<NET>** informs that all shown weight values are net values.

- When the balance is unloaded the saved taring value is displayed with negative sign.
- To delete the stored tare value, unload the weighing plate and press the **TARE** key or the **ZERO** key.
- 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 taring range capacity is full.
- Numerical input of tare (PRE-TARE)

9.5 Change-over button and F button (standard settings)

The change-over button ⇄ and the F button can be allocated with different functions.

The following functions are set as per standard (<dEFAuL>) in the different weighing applications:

	**Short key pressing**	**Long key pressing**
WE ih	➢ When pressed for first time: Setting weighing unit ➢ Switch-over between the weighing units	➢ Display gross weight value
count	➢ When pressed for first time: Setting the reference quantity ➢ Switch-over between the weighing units	➢ When the balance has been tared and the weighing unit is displayed, you can change the display between gross weight, net weight and tare weight by pressing the button long time.
chECh	➢ When pressed for first time: Setting weighing unit ➢ Switch-over between the weighing units	➢ When the balance has been tared and the weighing unit is displayed, you can change the display between gross weight, net weight and tare weight by pressing the button long time.

F1	**Short key pressing**	**Long key pressing**
WE ih	➢ Open PRE-TARE settings	➢ Carry out Data-Hold function
count	➢ Setting the reference quantity	**No function assigned**
chECh	➢ Open settings for check-weighing	➢ Open settings for target weighing

F2	**Short key pressing**	**Long key pressing**
WE ih	➢ Select application	**No function assigned**
count		
chECh		

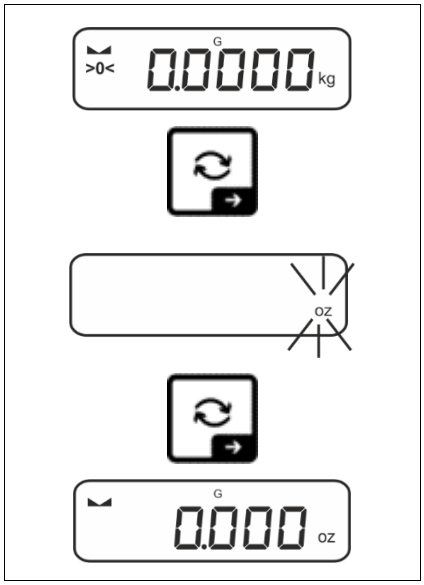
For more setting options please see the setup menu under < button >, see chap. 14.3.1.

The standard settings (<dEFAuL>) for the <Weighing> application are described below.

9.5.1 Switch-over weighing unit

As per standard the change-over button ⇄ is set so that is it possible to switch-over between the weighing units by **shortly** pressing.

Enable unit:

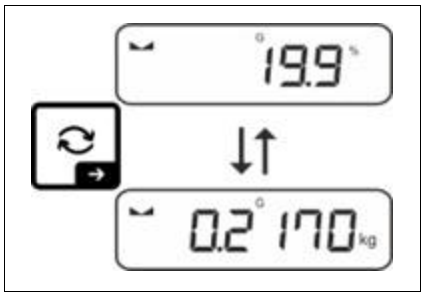


The unit for quick selection can be determined when the ⇄-button is shortly pressed for the first time.

⇨ Press the ⇄ button and wait until the display flashes.

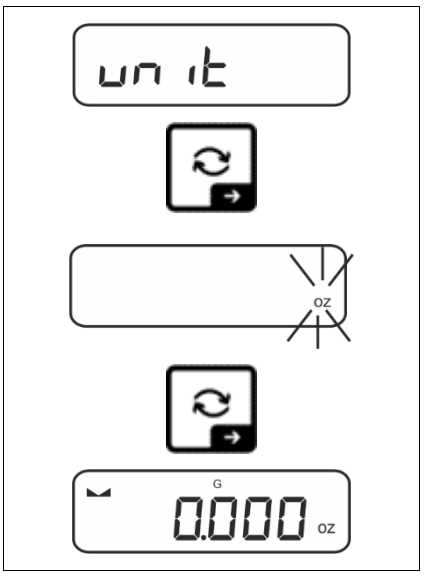
⇨ Use the navigation keys ↓↑ to select the weighing unit and confirm on ➔ button.

Switch over unit:



⇨ Using ⇄ button, it is possible to switch over between the enabled unit 1 and unit 2.

Enable another unit:



⇨ Select menu setting < unit > and confirm on ➔ button.

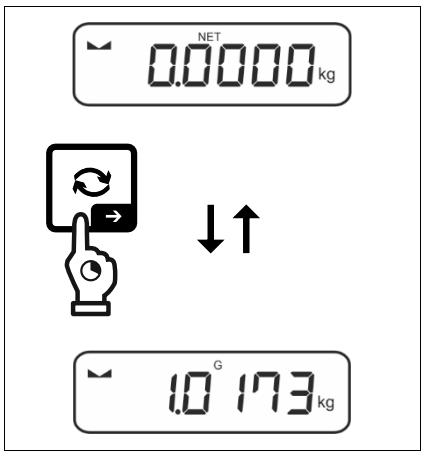
⇨ Wait until the display flashes.

⇨ Use the navigation keys ↓↑ to select the weighing unit and confirm on ➔ button.

For the required settings of an application unit (%, FFA) selection, please see chap. 11.4.2 and 11.4.3.

9.5.2 Display gross weight value

As per standard the change-over button ⇄ is set so that is it possible to display the gross weight value by long-time pressing.



⇨ Keep the ⇄ button pressed until the display shows the gross weight value.

After releasing the button, the gross weight value will be kept in the display for a short time.

9.5.3 Open PRE-Tare settings

As per standard the F-key is set so that the menu setting < PtArE > is invoked by pressing the key **shortly**. Further settings, see chap. 11.2.

9.5.4 Carry out Data-Hold function

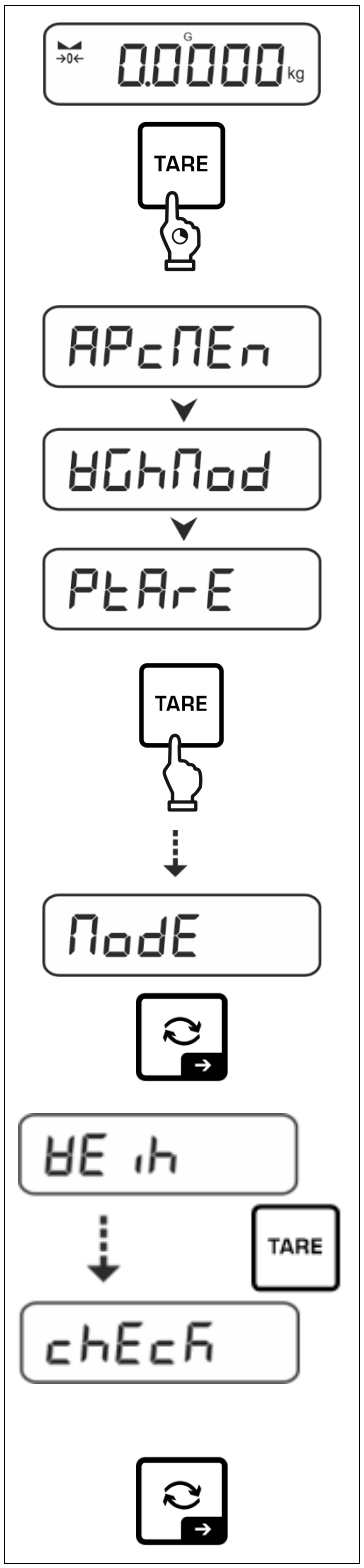
As per standard the F-key is set so that the Data-Hold function < hoLd > is executed by pressing the key for a long time, see chap. 11.3.

10 Operating concept

From factory the balance is delivered with various applications (weighing, check weighing, counting). After the first start-up the balance is in the <Weighing> application.

In the **application menu** (see chap. 14.2) however, you can define, selecting an application, in which mode the balance after switching-on has to continue working. Either as per standard in weighing mode or e.g. in check mode or counting mode.

Selecting an application:



⇨ Press the **TARE** key and hold it until < APcNEn > is displayed.

⇨ The display changes to < WGhNodE > followed by <PtArE>.

⇨ Use the **TARE**-button to select the menu setting <NodE> and acknowledge with ➔ button.

⇨ The last active application, e.g. < WE ih > is displayed.

⇨ Use the **TARE**-button to select the desired application, selectable

WE ih	Weighing
count	Counting
chEcK	Check weighing

⇨ Acknowledge selection by ➔ button.

According to the selected application in the application menu just appear the application-specific settings, so that you reach the target quickly without deviation.

- Information about the application-specific settings you will find in the description of the respective application.
- All basic settings and parameters, which influence the whole operation of the balance, are resumed in the **Setup Menu** (see chap. 14.3.1)
  These settings remain valid for all applications.
- The number of the available applications depends on the model.

Change application:

⇨ Press the **TARE** button and keep it pressed until the first menu item of the setup menu will be displayed

⇨ Use the 🡻 button to select the menu setting < nodE > and acknowledge with ➔ button. The current setting will be displayed.

⇨ Press the 🡻 button to select the required unit and confirm by pressing the ➔ button.

11 Application <Weighing>

How to carry out a simple weighing and taring, please refer to chap. 9.2 or 9.4. Further specific settings you will find in the following chapters.

Shouldn't the application <Weighing> already be enabled, select the menu setting < ModE > ➡ < WE ih >, see chap. 10

11.1 Application-specific settings

Call up menu:

⇨ Press the **TARE** key and hold it until < APcNEn> is displayed.

⇨ The display changes to < WChMod> followed by < PtArE >.

⇨ Navigation in menu see chap. 14.1

Overview (not verifiable models):

Level 1	Level 2	Level 3	Description / Chapter
PtArE PRE-TARE	ActuAL	Take over the placed weight as PRE-TARE value,, see chap. 11.2.1	
	MAnuAL	Numerical input of the tare weight, see chap. 11.2.2	
	cLEAr	Delete PRE-TARE value	
hoLd	-	Start-Hold function, see chap. 11.3	
un it Units	available weighing units, see chap. 1	This function defines in which weighing unit the result will be displayed, see chap. 11.4.1	
	pcs	Application unit counting	
	FFA	Multiplication factor see chap. 11.4.2	
	%	Application unit for determining percentages see chap. 11.4.3	
ModE Applications	WE ih	Weighing	see chap. 10
	count	Counting	
	chEcK	Check weighing	

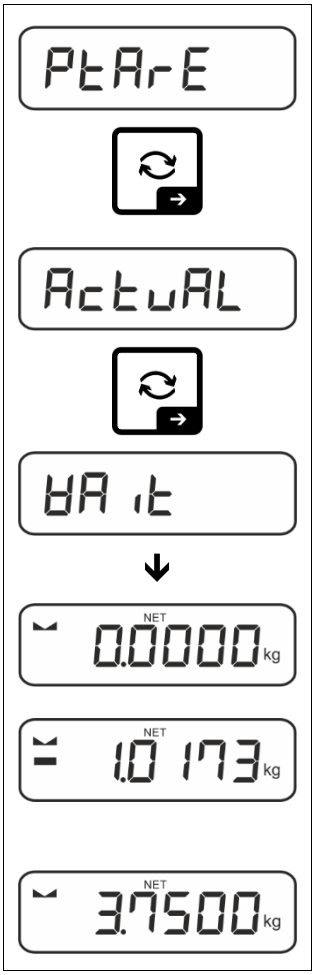
Overview (verifiable models):

Level 1	Level 2	Level 3	Description / Chapter
PtArE PRE-TARE	ActuAL	Take over the placed weight as PRE-TARE value, see chap. 11.2.1	
	nAnuAL	Numerical input of the tare weight, see chap. 11.2.2	
	cLEAr	Delete PRE-TARE value	
hoLd	-	Start-Hold function, see chap. 11.3	
un it units	**g**	This function defines in which weighing unit the result will be displayed, see chap. 11.4.1	
	kg		
nodE Applications	WE ih	Weighing	see chap. 10
	count	Counting	
	chEcK	Check weighing	

11.2 PRE-Tare

11.2.1 Take over the placed weight as PRE-TARE value

< PtArE > ➡ < ActuAL >



⇨ Deposit weighing container

⇨ Invoke menu setting < PtArE > and confirm by ➔ button.

⇨ To take over the placed weight as a PRE-TARE value, use the navigation keys ⇵ to select < ActuAL >

⇨ Acknowledge by ➔ button. < WAit > is displayed.

⇨ The weight of the weighing container is stored as tare weight. Zero display and indicators **<PTARE>** and **<NET>** will appear.

⇨ Remove the weighing container, the tare weight will appear with negative sign.

⇨ Place the filled weighing container.

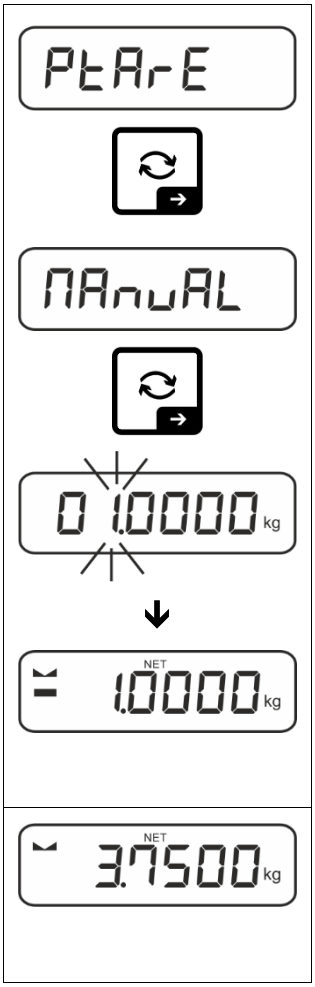
⇨ Wait until the stability display appears (▬).

⇨ Read net weight.

The entered tare weight remains valid until a new tare weight is input. To delete press the TARE key or confirm the menu setting < cLEAr > using the ➔ button.

11.2.2 Enter the known tare weight numerically

< PtArE > ➡ < MAnuAL >



⇨ Invoke menu setting < PtArE > and confirm by ➔ button.

⇨ Using the navigation keys ↓↑ select the setting
Select < MAnuAL > and confirm by pressing the ➔ button.

⇨ Enter known tare weight, numerical input
see chap. 3.2.2, the active digit flashes.

⇨ The input weight is saved as tare weight, the indicators **< PTARE >** and **< NET >** and the tare weight with minus sign will appear.

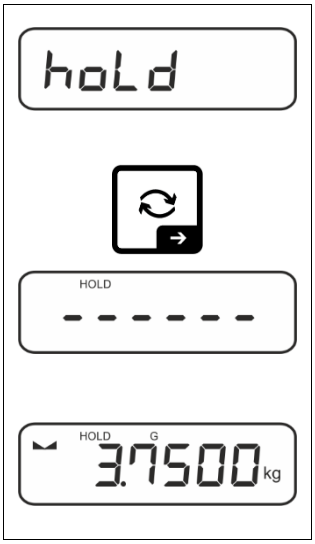
⇨ Place the filled weighing container.

⇨ Wait until the stability display appears (▬).

⇨ Read net weight.

The entered tare weight remains valid until a new tare weight is input. To delete enter the zero value or confirm the menu setting < CLEAr > using the ➔ button.

11.3 Data-Hold function



⇨ Menu setting < hoLd >

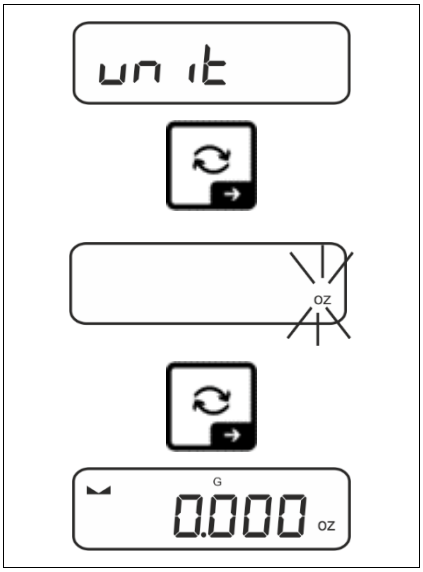
⇨ Place goods to be weighed.

⇨ Acknowledge by ➔ button.

⇨ The first stable weight value is symbolised by [HOLD] in the upper edge of the display. After the load is removed, the value is left in the display for another 10 seconds.

11.4 Weighing Units

11.4.1 Setting weighing unit



⇨ Select menu setting < unit > and confirm on ➔ button.

⇨ Wait until the display flashes.

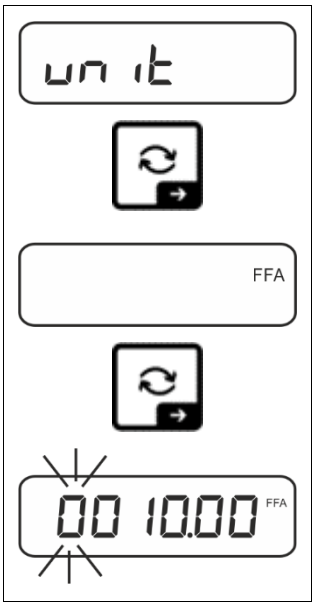
⇨ Use the navigation keys ⇵ to select the weighing unit and confirm on ➔ button.

- For the required settings of an application unit (FFA, %) selection, please see chap. 11.4.2 and 11.4.3.
- Using the ⇄ button (standard setting) you can switch between the active unit 1 and unit 2 (standard setting of buttons, see chap. 9.5. Other setting options, see chap. 14.3.1.

11.4.2 Weighing with multiplication factor via the application unit <FFA>

Here you determine with which factor the weighing result (in gram) will be multiplied.

By that way, e.g. a known error factor in the weight determination can be immediately taken into account.



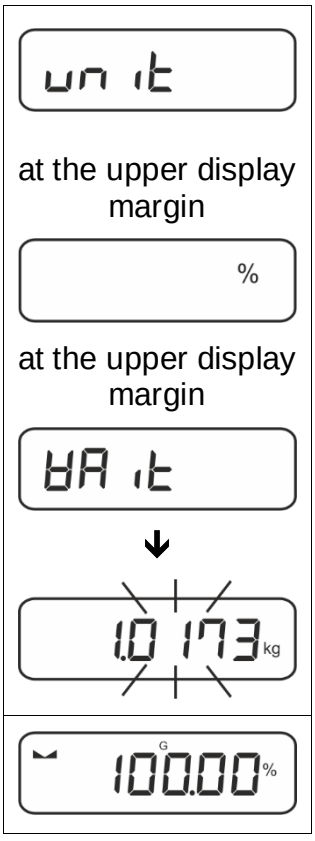
⇨ Select menu setting < unit> and confirm on ➔ button.

⇨ Use the navigation keys ↓↑ to select the setting < FFA > and confirm on ➔ button.

⇨ Enter multiplication factor, numerical input see chap. 3.2.2, the active digit flashes.

11.4.3 Percent weighing by application unit <%>

The application unit <%> allows to check the weight of a sample in percent, based on a reference weight.



⇨ Select menu setting < unit>.

⇨ Place a reference weight which corresponds to 100 %

⇨ Acknowledge by ➔ button.

⇨ Use the navigation keys ↓↑ to select the setting < % > and confirm on ➔ button.

⇨ Confirm the flashing weight value of the reference weight using ➔ button.

⇨ From now on the weight of the sample will be shown in percent based on the reference weight

12 Application <Counting>

Shouldn't the application <Counting> already be enabled, select the menu setting < ModE > ➡ < count >, see chap. 10

12.1 Application-specific settings

Call up menu:

⇨ Press the **TARE** key and hold it until < APcMEn> is displayed.

⇨ The display changes to < couMod > followed by < rEF >.

⇨ Navigation in menu see chap. 14.1

Overview:

Level 1	Level 2	Level 3	Description / Chapter
rEF Reference quantity	5	Reference quantity 5	
	10	Reference quantity 10	
	20	Reference quantity 20	
	50	Reference quantity 50	
	FrEE	Optional, numerical input, see chap. 3.2.2	
	inPut	Input of piece weight, numerical input, see chap. 3.2.2	
PtArE PRE-TARE	ActuAL	Take over the placed weight as PRE-TARE value, see chap. 11.2.1	
	MAnuAL	Numerical input of the tare weight, see chap. 11.2.2	
	cLEAr	Delete PRE-TARE value	
tArGEt Target counting	VALuE	Counting mode	see chap. 12.2.2
	ErruPP	Upper tolerance	
	ErrLoW	Lower tolerance	
	cLEAr	Delete settings	
ModE Applications	count	Counting	see chap. 10
	chEcK	Check weighing	
	WE ih	Weighing	

12.2 Using the application

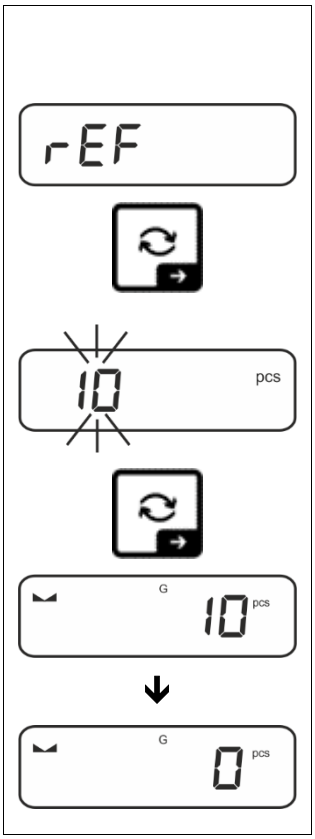
12.2.1 Piece counting

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.

- The higher the reference quantity the higher the counting exactness.
- Especially high reference must be selected for small parts or parts with considerably different sizes.
- Smallest counting weight see table „Technical data“.

1. Set reference

Reference quantity 5, 10, 20 or 50:



⇨ If necessary, put on and tare the weighing container.

⇨ Put on the desired quantity of reference pieces.

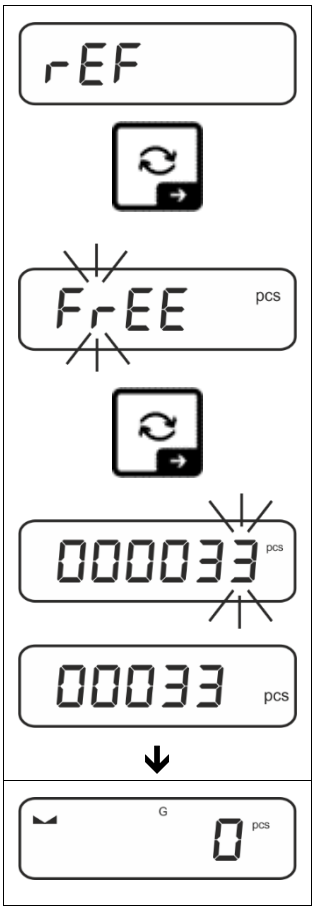
⇨ Invoke menu setting < rEF > and confirm by ➔ button.

⇨ Use the navigation keys ⇃↾ to select the reference piece quantity (5, 10, 20, 50) according to the placed reference and confirm with the ➔ button.

⇨ The balance will calculate the average item weight and then displays the quantity of pieces.

⇨ Remove reference weight. The balance is now in piece counting mode counting all units on the weighing plate.

Reference quantity user-defined:



⇨ If necessary, put on and tare the weighing container.

⇨ Put on the desired quantity of reference pieces.

⇨ Invoke menu setting < ref > and confirm by ➔ button.

⇨ Use the navigation keys ↓↑ to select the setting < FrEE> and confirm on ➔ button.

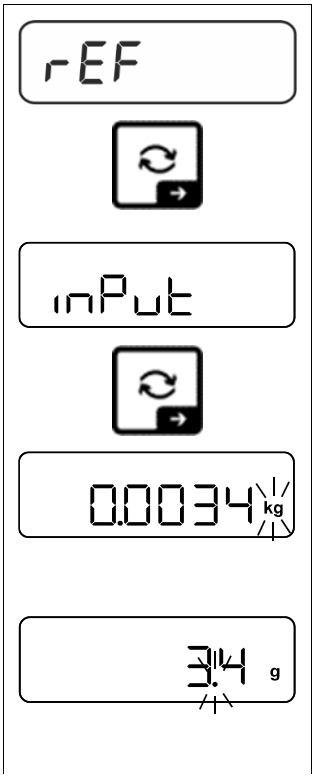
⇨ The numeric input window appears.

⇨ Enter and confirm the quantity of the placed reference parts, numerical input see chap. 3.2.2

⇨ The balance will calculate the average item weight and then displays the quantity of parts.

⇨ Remove reference weight. The balance is now in piece counting mode counting all units on the weighing plate.

Counting with optional piece weight:

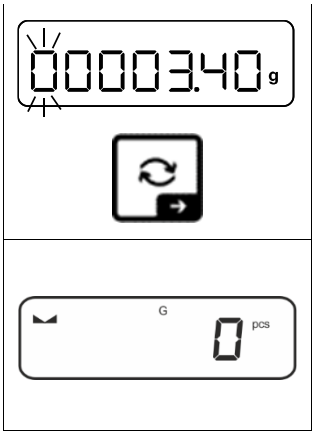


⇨ Invoke menu setting < rEF > and confirm on ➔ button.

⇨ Use the navigation keys ↓↑ to select the setting < inPut > and confirm on ➔ button.

⇨ Use the navigation keys ↓↑ to select the weighing unit and confirm on ➔ button.

⇨ Use the navigation keys ↓↑ to select the comma position and confirm on ➔ button.

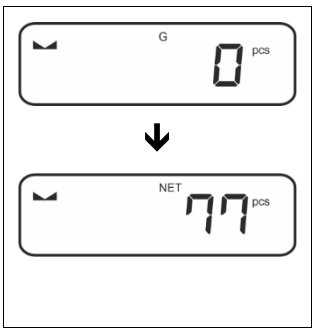


⇨ Enter piece weight, numerical input
see chap. 3.2.2, the active digit flashes.

⇨ Acknowledge by ➔ button.

The balance is now in piece counting mode counting all units on the weighing plate.

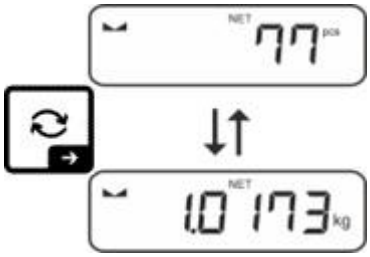
2. Parts counting



⇨ If necessary, put on and tare the weighing container.

⇨ Fill the counting quantity. The piece quantity is shown directly in the display.

Use the ⇄ to switch between piece quantity and weight display (standard setting see chap. 9.5).



12.2.2 Target counting

The <Target counting> application variant allows weighing of goods within set tolerance limits in keeping with a determined target quantity.

Reaching the target quantity is indicated by an acoustic (if activated in menu) and an optic signal (tolerance marks).

Optical signal:

The tolerance marks provide the following information:

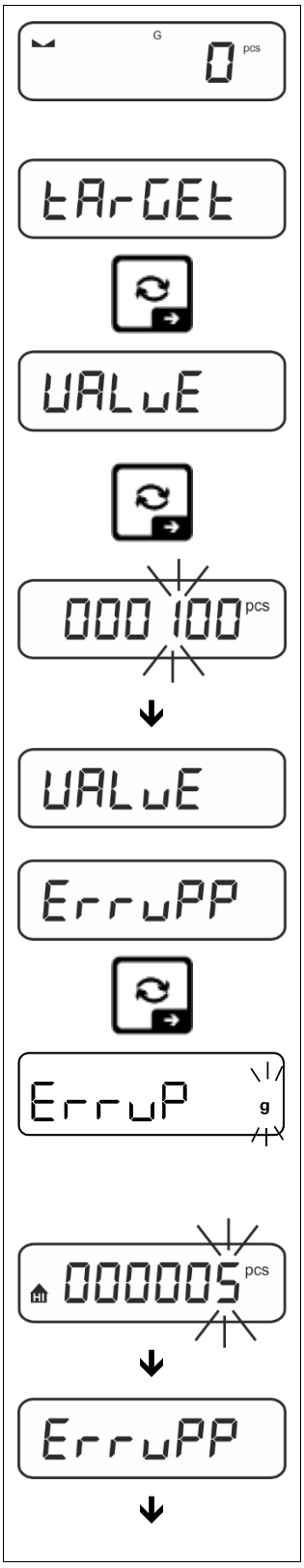
	Target quantity exceeds defined tolerance
	Target quantity within defined tolerance
	Target quantity below defined tolerance

Acoustic signal:

The acoustic signal depends on the menu setting
< SEtuP ➡ bEEPEr >, see chap. 14.3.1.

Procedure:

1. Define target quantity and tolerances



⇨ Make sure that the scale is in counting mode and that an average piece weight has been defined (see chap. 12.2.1). If necessary, switch over with the ⟲ button.

⇨ Use the navigation keys ↓↑ to select the setting < tAr-GEt > and confirm with ➔ button.

< VALuE > is displayed.

⇨ Confirm on ➔ button, the numeric input window appears. The active digit is flashing.

⇨ Enter the target quantity (numerical input see chap. 0) and confirm the entry.

The balance returns to the < VALuE > menu.

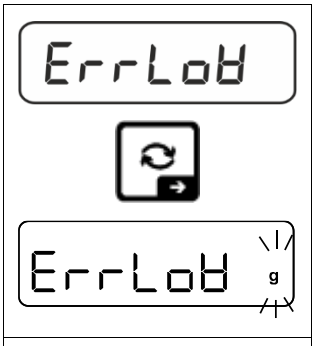
⇨ Use the navigation keys ↓↑ to select the setting < Er-ruPP> and confirm on ➔ button.

⇨ Use the navigation keys ↓↑ to select the weighing unit and confirm on ➔ button.

⇨ The numeric input window appears. The active digit is flashing.

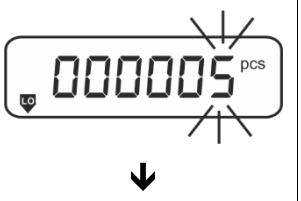
⇨ Enter the upper tolerance (for numerical input see chap. 0) and confirm the entry.

The balance returns to the < ErruPP > menu.



⇨ Use the navigation keys ↓↑ to select the setting < Err-LoH> and confirm on ➔ button.

⇨ Use the navigation keys ↓↑ to select the weighing unit and confirm on ➔ button.



⇨ The numeric input window appears. The active digit is flashing.

⇨ Enter the lower tolerance (for numerical input, see chap. 0) and confirm the entry.

⇨ The balance returns to the < ErrLoH > menu.

⇨ Press repeatedly ➔ button to exit menu.

Finished the setting works, the weighing balance will be ready for target counting.

2. Start tolerance check:

⇨ Determine the average piece weight, see chap. 12.2.1

⇨ Place the weighed material and check by means of the tolerance marks / acoustic signal if the weighed material is within the defined tolerance.

Load below specified tolerance	Load within specified tolerance	Load exceeds specified tolerance
		

The entered values will remain valid until new values are entered.

To delete the values, select menu setting < tArGEt > ➡ < cLEAr > and confirm on ➔ button.

13 Application < Checkweighing >

Shouldn't the application <Checkweighing> already be enabled, select the menu setting < ModE > ➡ < chEcK >, see chap. 10

13.1 Application-specific settings

Call up menu:

⇨ Press the **TARE** key and hold it until < APcMEn > is displayed.

⇨ The display changes to < chKMod> followed by < L iM itS>.

⇨ Navigation in menu see chap. 14.1

Overview:

Level 1	Level 2	Level 3	Description / Chapter
tArGEt Target weighing, see chap. 13.2.1	UALuE	Target weight, numerical input, see chap. 3.2.2	
	ErruPP	Upper tolerance, numerical input see chap. 3.2.2	
	ErrLoW	Lower tolerance, numerical input see chap. 3.2.2	
	cLEAr	Delete settings	
L iM itS check weighing, see chap. 13.2.2	L iMuPP	Upper limit value, numerical input see chap. 3.2.2	
	L iMLoW	Lower limit value, numerical input see chap. 3.2.2	
	cLEAr	Delete settings	
PtArE PRE-TARE	ActuAL	Take over the placed weight as PRE-TARE value, see chap.11.2.1	
	MAnuAL	Numerical input of the tare weight, see chap. 11.2.2	
	cLEAr	Delete PRE-TARE value	
ModE Applications	WE ih	Weighing	see chap. 10
	count	Counting	
	chEcK	Check weighing	

13.2 Using the application

13.2.1 Target weighing

The <target weighing> application variant allows weighing of goods within set tolerance limits in keeping with a determined target weight.

Reaching the target weight is indicated by an acoustic (if activated in menu) and an optic signal (tolerance marks).

Optic signal:

The tolerance marks provide the following information:

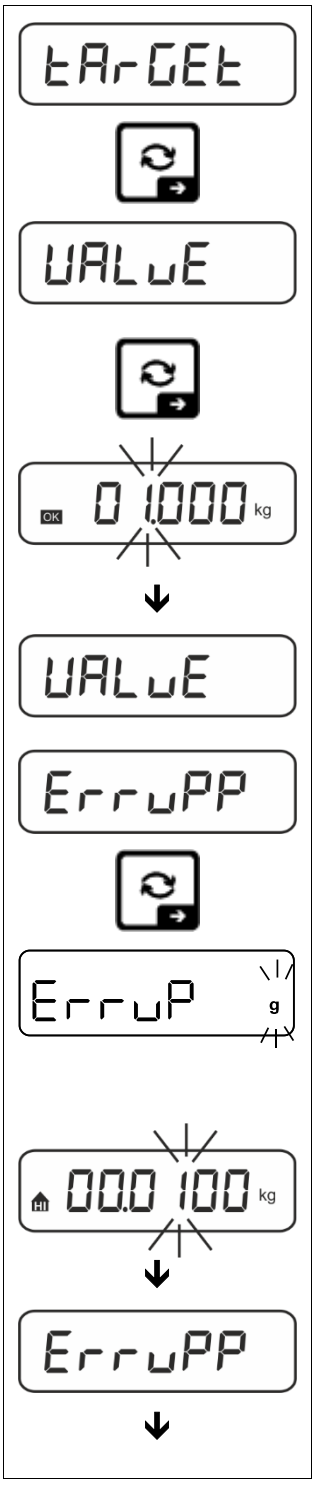
HI	Upper limit
OK	Target weight
LO	Lower limit

Acoustic signal:

The acoustic signal depends on the menu setting
< SEtuP ➡ bEEPEr >, see chap. 0.

Procedure:

1. Define target weight and tolerances



⇨ Use the navigation keys ↓↑ to select the setting

< tArGEt > and confirm with ➔ button.

< VALuE > is displayed.

⇨ Confirm on ➔ button, the numeric input window appears. The active digit is flashing.

⇨ Enter target weight (numerical input see chap. 3.2.2) and confirm the entry.

The balance returns to the < VALuE > menu.

⇨ Use the navigation keys ↓↑ to select the setting

< ErruPP> and confirm on ➔ button.

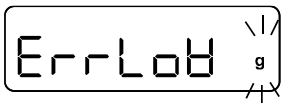
⇨ Use the navigation keys ↓↑ to select the weighing unit and confirm on ➔ button.

⇨ The numeric input window appears. The active digit is flashing.

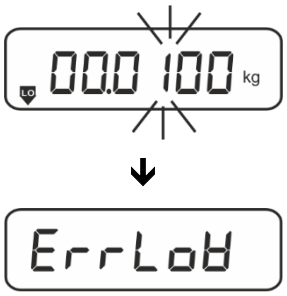
⇨ Enter the upper limit for the weight deviation (numerical input see chap. 3.2.2) and confirm the entry.

The balance returns to the <ErruPP> menu.

⇨ Use the navigation keys ↓↑ to select the setting < Err-LoH> and confirm on ➔ button.



⇨ Use the navigation keys ↓↑ to select the weighing unit and confirm on ➔ button.



⇨ The numeric input window appears. The active digit is flashing.

⇨ Enter lower limit for weight deviation (numerical input see chap. 3.2.2) and confirm the entry.

⇨ The balance returns to the < ErrLoH> menu.

⇨ Press repeatedly ← button to exit menu.

Finished the setting works, the weighing balance will be ready for checkweighing.

3. Start tolerance check:

⇨ Place the weighed material and check by means of the tolerance marks / acoustic signal if the weighed material is within the defined tolerance.

Load below specified tolerance	Load within specified tolerance	Load exceeds specified tolerance
		

The entered values will remain valid until new values are entered.

To delete the values, select menu setting < tArGEt > ➡ < cLEAr > and confirm on ➔ button.

13.2.2 Checkweighing

With the <Checkweighing> application variant you can check if the weighing good is within a predefined tolerance range.

When limit values are exceeded below or above, an acoustic signal (if enabled in menu) will sound and an optic signal (tolerance marks) will be displayed

Optic signal:

The tolerance marks provide the following information:

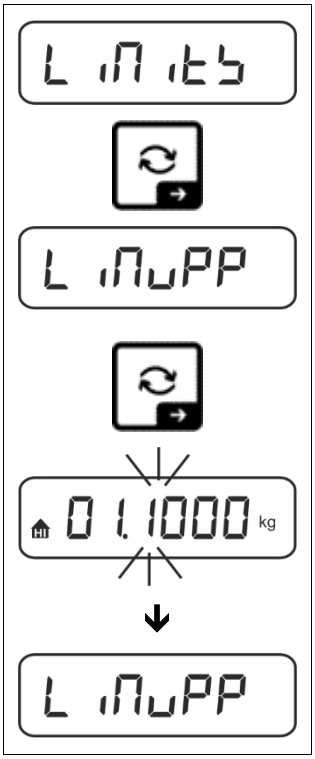
HI	Weighed-in goods exceed predefined tolerance
OK	Weighed-in goods within predefined tolerance
LO	Weighed-in goods below predefined tolerance

Acoustic signal:

The acoustic signal depends on the menu setting
< SEtuP > ➡ < bEEPEr >, see chap. 14.3.1.

Procedure:

1. Define limit values



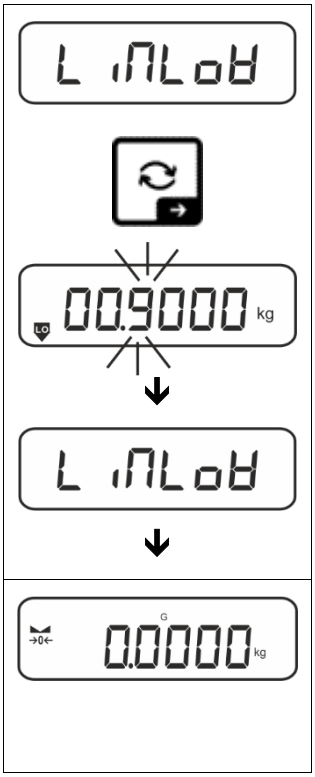
⇨ Using the navigation keys ⇵ select the setting
Select < LiMits> and confirm on ➔ button.

< LiMuPP > will appear.

⇨ Press ➔ button to confirm, the numeric input window for entering the upper limit value will appear.
The active digit is flashing.

⇨ Enter upper limit value (numerical input see chap. 3.2.2) and confirm the entry.

The balance returns to the < LiMuPP > menu.



⇨ Use the navigation keys ⇵ to select setting < L inLoH >.

⇨ Press ➔ button to confirm, the numeric input window for entering the lower limit value will appear. The active digit is flashing.

⇨ Enter lower limit value (numerical input see chap. 3.2.2) and confirm the entry.

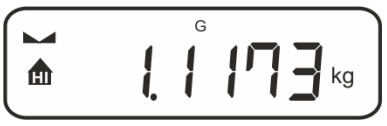
The balance returns to the < L inLoH> menu.

⇨ Press repeatedly ← button to exit menu.

Finished the setting works, the weighing balance will be ready for checkweighing.

2. Start tolerance check:

⇨ Place the weighed material and check by means of the tolerance marks / acoustic signal if the weighed material is within the defined tolerance.

Load below specified tolerance	Load within specified tolerance	Load exceeds specified tolerance
		

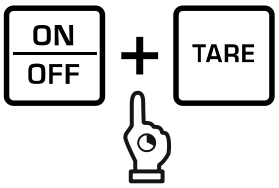
The entered values will remain valid until new values are entered.

To delete the values, select menu setting < L in tb > ➡ < cLEAr > and confirm on ➔ button.

14 Menu

14.1 Navigation in the menu

Call up menu:

Application menu	Setup menu
	
Press the **TARE** button and keep it pressed until the first menu item will be displayed	Press the **TARE** and **ON/OFF** button at the same time and keep them pressed until the first menu item will be displayed

Select and adjust parameters:

Scrolling on one level	Use the navigation buttons to select the individual menu blocks one by one. Use the navigation key 🡻 to scroll down. Use the navigation key 🡹 to scroll up.
Activate menu item / **Confirm selection**	Press navigation key 🡺
Menu level back / back to weighing mode	Press navigation key 🡸

14.2 Application menu

The application menu allows you a fast and targeted access to the respectively selected application (see chap. 10).

An overview of the application-specific settings you will find in the description of the respective application.

14.3 Setup menu

In the setup menu you have the possibility to adapt the behaviour of the balance to your requirements (e.g. environmental conditions, especial weighing processes).

These settings are global and do not depend on the selected application (with exception of: <button>).

14.3.1 Overview < SEtuP >

Not verifiable models:

Level 1	Level 2	other levels / description	
		Description	
CAL Adjustment	CALEHt	➔ External adjustment, see chap. 7.7.1	
	CALEud	➔ External adjustment, user-defined, see chap. 7.7.2	
	GrAAdJ	➔ Gravity constant adjustment site, see chap.7.7.3	
	GrAuSE	➔ Gravity constant installation site, see chap. 7.7.4	
coM Communication	rS232 ↕ uSb-d	bAud	600
			1200
			2400
			4800
			9600
			14400
			19200
			38400
			57600
			115200
			128000
			256000
		dAtA	7db itS
			8db itS
		PAr itY	nonE
			odd
			EUEn
		StoP	1Sb it
			2Sb itS
		hAndSh	nonE
		Protoc	AcP
	AnA-oP	0- 10U	0 – 10 V
		4-20nA	4 – 20 mA
	WLAn	on	WLAN ein
		oFF	WLAN aus

Print Data output	intFcE		rs232		RS 232 interface*
			usb-d		USB interface*
			WLAn		WLAN interface* *only in connection with KUP interface
	SuM		on		Switch on / off add-up mode, see chap. 15.3.1
			oFF		
	PrModE	trIG	MAnuAL		on, oFF Data output by pressing the **PRINT** button, see chap. 15.3.2
			AutoPr		on, oFF Automatic data output with stable and positive weighing value see chap.15.3.3. Another output only after zero display and stabilisation, depending on the settings **<** CrAnGE **>**, selectable **(off, 1, 2, 3,4,5)**. **<** CrAnGE **>** defines the factor for d. This factor multiplied with d results in the threshold; when it is exceeded, a value cannot more be considered as stable.
			cont	oFF	Continuous data output
				on	SPEEd Setting output interval see chap. 15.3.4
					ZEro on, oFF 0 (unloaded) also transmit continuously
					StAbLE on, oFF Transmit stable values only
		WEIGHt	SGLPrt		on, oFF Displayed weight value is transmitted
			GntPrt		Gross on, oFF
					nEt on, oFF
					tArE on, oFF
					FormAt LonG (detailed measurement protocol)
					short (standard measurement protocol)

		LAYout	nonE	on, oFF Standard layout	
			uSEr	ModEL	on, oFF Output model designation of the scale
				SEr iAL	on, oFF Output serial number of the scale
				AL id	Alibi-ID output
				dAtE	Date output
				t iME	Time output
			GLP	on, oFF GLP compliant weighing protocol output	
		rESEt	no	Do not delete settings	
			YES	Delete settings	

bEEPEr Acoustic signal	KEYS	oFF	Switch on / off acoustic signal by pressing button	
		on		
	chEcK	ch-oK	oFF	Acoustic signal off
			SLoW	Slow
			Std	Standard
			FASt	Fast
			cont.	Continuous
		ch-Lo	oFF	Acoustic signal off
			SLoW	Slow
			Std	Standard
			FASt	Fast
			cont.	Continuous
		ch-H	oFF	Acoustic signal off
			SLoW	Slow
			Std	Standard
			FASt	Fast
			cont.	Continuous
AutoFF Automatic switch-off function in rechargeable battery operation	ModE	oFF	Automatic switch-off function switched off	
		Auto	The balance is automatically switched-off according to the time without load change or without operation defined in menu item < tiME >	
		onLY0	Automatic switch-off only with zero display	
	tiME	30S	After the set time without load change or operation the balance will switch off automatically	
		1Min		
		2Min		
		5Min		
		30Min		
		60Min		

button Key allocation	F1-KEY ⇕ F2-KEY ⇕ CHANGE	SPUSH ⇕ LPUSH	DEFAUL	Standard settings, see chap. 9.5
			OFF	Button disabled
			UNIT	Set weighing unit, see chap. 11.4.1
			MODE	Select weighing application, see chap. 10
			HOLD	Execute HOLD function, s.Kap. 11.3 *only for the application <Weighing>
			PTARE	Open PRE-Tare settings, see chap. 11.2 *only for the applications <Weighing>, <Check-weighing>
			REF	Set reference quantity, see chap. 12.2.1 *only for the application <Counting>
			LIMITS	Open settings for checkweighing, see chap. 13.2.2 *only for the application <Checkweighing>
			TARGET	Open settings for target weighing, see chap. 13.2.1 *only for the application <Checkweighing>
BLIGHT Display background illumination	MODE	ALWAYS	Background lighting of display is switched on permanently	
		TIMER	The background illumination is automatically switched-off according to the time without load change or without operation defined in menu item < TIME >	
		NOBL	Display background illumination always switched off	
	TIME	5 S 10 S 30 S 1 MIN 2 MIN 5 MIN 30 MIN	Definition, after which time the background illumination is automatically switched-off without load change or without operation.	

tArErG Taring range	100% ⇕ 10%	Definition max. taring range, selectable 10% - 100%. Numerical input see chap. 3.2.2	
ZtrAcK Zerotracking	on	Automatic zero tracking [≤3d]	
	oFF	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“. (e.g. slow flow of liquids from a container placed on the balance, evaporating processes). When apportioning involves small variations of weight, it is advisable to switch off this function.	
dAt iME Date and time	SEt	-2022-	Enter the year
	dAForM	12-31	Enter the month and the day
	t iForM	23.59.59	Enter the time (hours, minutes, seconds)
un itS Units	available weighing units / appication units, see chap. 1	on, oFF Using this function you can define which weighing units are available in the application-specific menu < un it>. The units selected by < on > are available in the application-specific menu.	
ModES Weighing applications	WE ih	Weighing	
	count	Counting	
	chEcK	Check weighing	
LocK	SEtLcK	on, oFF This function can be used to block access to the setup menu. When set to <on>, the entry of a 6-digit number is required as a password.	
rESEt	Reset balance settings to factory settings		

Verifiable models:

Level 1	Level 2	other levels / description	
		Description	
coM Communication	rs232 ⇕ usb-d	bAud	600
			1200
			2400
			4800
			9600
			14400
			19200
			38400
			57600
			115200
			128000
			256000
		dAtA	7db its
			8db its
		PAr ity	nonE
			odd
			EUEn
		StoP	1sb it
			2sb its
		hAndsh	nonE
		Protoc	AcP
	AnA-oP	0- 10U	0 – 10 V
		4-20mA	4 – 20 mA
	WLAn	on	WLAN ein
		oFF	WLAN aus

Print Data output	intFcE		rs232		RS 232 interface*
			usb-d		USB interface*
			WLAn		WLAN interface* *only in connection with KUP interface
	SuM		on		Switch on / off add-up mode, see chap. 15.3.1
			oFF		
	PrModE	trIG	MAnuAL		on, oFF Data output by pressing the **PRINT** button, see chap. 15.3.2
			AutoPr		on, oFF Automatic data output with stable and positive weighing value see chap.15.3.3. Another output only after zero display and stabilisation, depending on the settings **<** CrAnGE **>**, selectable **(off, 1, 2, 3,4,5)**. **<** CrAnGE **>** defines the factor for d. This factor multiplied with d results in the threshold; when it is exceeded, a value cannot more be considered as stable.
			cont	oFF	Continuous data output
				on	SPEEd	Setting output interval see chap. 15.3.4
					ZEro	on, oFF 0 (unloaded) also transmit continuously
		WEIGHt	SGLPrt		on, oFF	Displayed weight value is transmitted
			GntPrt		Grossb	on, oFF
					nEt	on, oFF
					tArE	on, oFF
					FormAt	LonG (detailed measurement protocol)
					short (standard measurement protocol)

		LAYout	nonE	on, oFF Standard layout	
			uSEr	ModEL	on, oFF Output model designation of the scale
				SEr iAL	on, oFF Output serial number of the scale
				AL id	Alibi-ID output
				dAtE	Date output
				t iME	Time output
			GLP	on, oFF GLP compliant weighing protocol output	
		rESEt	no	Do not delete settings	
			YES	Delete settings	

bEEPEr Acoustic signal	KEYS	oFF	Switch on / off acoustic signal by pressing button	
		on		
	chEcK	ch-oK	oFF	Acoustic signal off
			SLoW	Slow
			Std	Standard
			FASt	Fast
			cont.	Continuous
		ch-Lo	oFF	Acoustic signal off
			SLoW	Slow
			Std	Standard
			FASt	Fast
			cont.	Continuous
		ch-hi	oFF	Acoustic signal off
			SLoW	Slow
			Std	Standard
			FASt	Fast
			cont.	Continuous
AutoFF Automatic switch-off function in rechargeable battery operation	ModE	oFF	Automatic switch-off function switched off	
		Auto	The balance is automatically switched-off according to the time without load change or without operation defined in menu item < t iME >	
		onLY0	Automatic switch-off only with zero display	
	t iME	30S	After the set time without load change or operation the balance will switch off automatically	
		1M in		
		2M in		
		5M in		
		30M in		
		60M in		

button Key allocation	F1-KEY ⇕ F2-KEY ⇕ CHANGE	SPUSH ⇕ LPUSH	DEFAUL	Standard settings, see chap. 9.5
			OFF	Button disabled
			UNIT	Set weighing unit, see chap. 11.4.1
			MODE	Select weighing application, see chap. 10
			HOLD	Execute HOLD function, s.Kap. 11.3 *only for the application <Weighing>
			PTARE	Open PRE-Tare settings, see chap. 11.2 *only for the applications <Weighing>, <Check-weighing>
			REF	Set reference quantity, see chap. 12.2.1 *only for the application <Counting>
			LIMITS	Open settings for checkweighing, see chap. 13.2.2 *only for the application <Checkweighing>
			TARGET	Open settings for target weighing, see chap. 13.2.1 *only for the application <Checkweighing>
BLIGHT Display background illumination	MODE	ALWAYS	Background lighting of display is switched on permanently	
		TIMER	The background illumination is automatically switched-off according to the time without load change or without operation defined in menu item < TIME >	
		NOBL	Display background illumination always switched off	
	TIME	5S 10S 30S 1MIN 2MIN 5MIN 30MIN	Definition, after which time the background illumination is automatically switched-off without load change or without operation.	

dAt iME Date and time	SEt	-2022-	Enter the year
	dAForM	12-31	Enter the month and the day
	t iForM	23.59.59	Enter the time (hours, minutes, seconds)
un itS Units	available weighing units / appication units, see chap. 1	on, oFF Using this function you can define which weighing units are available in the application-specific menu < un it>. The units selected by < on > are available in the application-specific menu.	
ModES Weighing applications	WE ih	Weighing	
	count	Counting	
	chEcK	Check weighing	
LocK	SEtLcK	on, oFF This function can be used to block access to the setup menu. When set to <on>, the entry of a 6-digit number is required as a password.	
rESEt	Reset balance settings to factory settings		

15 Communication with peripheral devices

15.1 KERN Communications Protocol (KERN Interface Protocol)

KCP is a standardized set of interface orders for KERN balances, which allows many parameters and device functions to be called up and controlled. KERN devices that have KCP can use it to connect easily to computers, industrial control systems and other digital systems. A detailed description you will find in the „KERN Communications Protocol“ manual, available in the download area on our KERN homepage (www.kern-sohn.com).

To activate KCP please observe the menu overview of your balance’s operating instructions.

KCP is based on simple ASCII orders and replies. Every interaction consists of an order, possibly with arguments separated by spaces and finished by <CR>< LF>.

The KCP orders supported by your balance may be queried emitting the order „I0“ followed by CR LF.

Extract of the mostly used KCP orders:

I0	Shows all implemented KCP orders
S	Sending stable value
SI	Sending current value (also instable)
SIR	Sending current value (also instable) and repeating
T	Taring
Z	Zeroing

Example:

Order	S	
Possible replies	S␣S␣␣␣␣100.00␣g S␣I S␣+ or S␣-	Order accepted, execution of the order started, currently another order is executed, timeout reached, over- or underload

15.2 KERN alibi memory

For weighings where verification is mandatory and which are to be analysed and processed by a PC (e.g. printing out a packing list using a PC instead of a printer connected directly to the balance) electronic archiving is required by the metrological authorities by a verifiable data memory which cannot be manipulated. These stored data strings can be retrieved & displayed at any time via a connected PC

- The Alibi memory offers the possibility to store up to 250.000 weighing results, when the memory is exhausted, already used IDs are overwritten (starting with the first ID).
- By pressing the Print key or by KCP remote control command "S" or "MEMPRT" the storage process can be performed.
- The weight value (N, G, T), date and time and a unique alibi ID are stored.
- When using a print option, the unique alibi ID is also printed for identification purposes as well.
- The stored data can be retrieved via the KCP command "MEMQID". This can be used to query a specific single ID or a series of IDs.
- Example:
    - MEMQID 15 → The data record which is stored under ID 15 is returned.
    - MEMQID 15 20 → All data sets, which are stored from ID 15 to ID 20, are returned.

The detailed description can be found in the *KERN Communication Protocol* manual, available in the Downloads tab on the home page of KERN (www.kern-sohn.com).

i	- Protection of stored legally relevant data: o After a record is stored, it will be read back immediately and be verified byte by byte. If error is found that record will be marked as an invalid record. If no error, then the record can be printed if needed. o There is checksum protection stored in every record. o All information on a printout is read from the memory with checksum verification, instead of direct from buffer. - Data loss prevention measures: o The memory is write-disabled upon power-up. o A write enable procedure is performed before writing a record to the memory. o After a record is stored, a write disable procedure will be performed immediately (before verification). o The memory has a data retention period longer than 20 years.

15.3 Issue functions

15.3.1 Add-up mode < SUM >

With this function the individual weighing values are added into the summation memory by pressing a button and edited when an optional printer is connected.

Activate function:

⇨ In Setup menu invoke the menu setting < PrInt > ➡ < SUM > and confirm with button ➔.

⇨ Use the navigation keys ⇵ to select the setting < on> and confirm on ➔ button.

⇨ To exit the menu, press the navigation key ⬅ repeatedly

ℹ Condition: Menu setting
< PrModE > ➡ < tr iG> ➡ < MAnuAL > ➡ <on>

Add-up weighed goods:

⇨ If required, place empty container on scale and tare.

⇨ Place first good to be weighed on balance. Wait until stability display (◣◢) appears and then press the PRINT-button. The display changes to < SUM 1>, followed by the current weighing value. The weighing value is stored and edited by the printer. The symbol ∑ pops up. Remove the weighed good.

⇨ Place second good to be weighed on balance. Wait until stability display (◣◢) appears and then press the PRINT-button. The display changes to < SUM2 >, followed by the current weighing value. The weighing value is stored and edited by the printer. Remove the weighed good.

⇨ Add-up more weighed goods as described above.

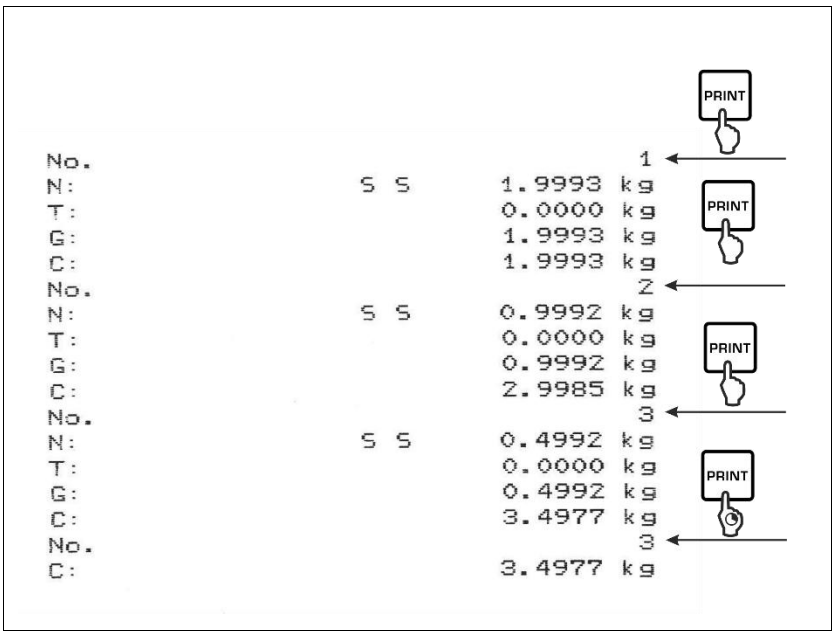
⇨ You can repeat this process until the capacity of the scales is exhausted.

Display and edit sum „Total“:

⇨ Press the PRINT key long time. The number of weighings and the total weight are edited.
The sum memory is deleted; the symbol [.∑.] extinguishes.

Sample log (KERN YKB-01N):

Menu setting < PrModE > ➡ < FormAt > ➡ < short >



First weighing

Second weighing

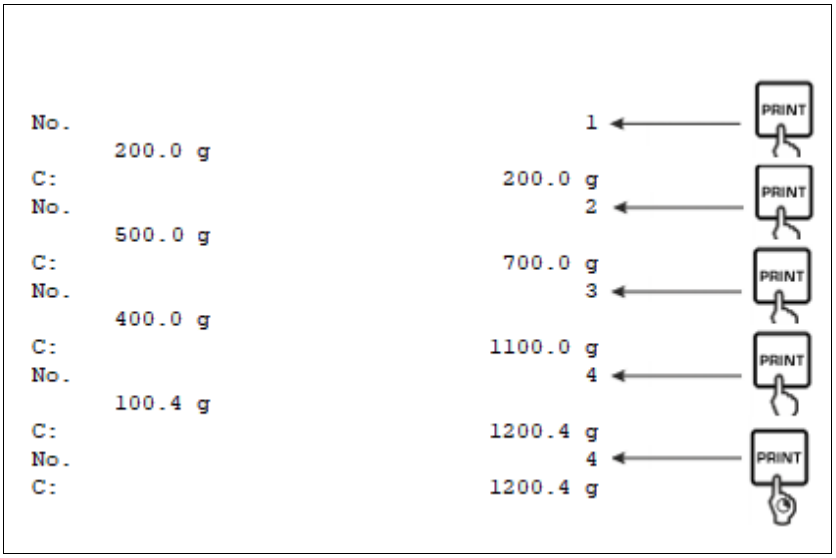
Third weighing

Number of weighings/ Total

Sample log (KERN YKB-01N):

Menu setting

< PrModE > ➡ < UE iGht > ➡ < SGLPrt > ➡ <on>



First weighing

Second weighing

Third weighing

Fourth weighing

Number of weighings/ Total

15.3.2 Data output after pressing the PRINT button < MANUAL >

Activate function:

⇨ In Setup menu invoke the menu setting < PRint > ➡ < PRMODE > ➡ < tRiG > and confirm with ➔ button.

⇨ For a manual data output select the menu setting < MANUAL > with the navigation keys ⇵ and confirm on the ➔ button.

⇨ Use the navigation keys ⇵ to select the setting < on> and confirm on ➔ button.

⇨ To exit the menu, press the navigation key ⬅ repeatedly.

Place goods to be weighed on balance:

⇨ If required, place empty container on scale and tare.

⇨ Place goods to be weighed. The weighing value is edited by pressing the PRINT-button.

15.3.3 Automatic data output < AUtO >

Data output happens automatically without having to press the **PRINT** button as soon as the corresponding output condition has been met, dependent on the setting in the menu.

Enable function and set the output condition:

⇨ In Setup menu invoke the menu setting < Pr int > ➡ < PrModE > ➡ < tr iG > and confirm with ➔ button.

⇨ For an automatic data output select the menu setting < AUtO > using the navigation keys ↓↑ and confirm by the ➔ button.

⇨ Use the navigation keys ↓↑ to select the setting < on > and confirm on ➔ button. < ZrAnGE > is displayed.

⇨ Acknowledge by ➔ button and set the required output condition with the navigation keys ↓↑.

⇨ Acknowledge by ➔ button.

⇨ To exit the menu press the navigation key ➔ repeatedly.

Place goods to be weighed on balance:

⇨ If required, place empty container on scale and tare.

⇨ Place weighed goods and wait until the stability display (◣◢) appears.
The weighing value is issued automatically.

15.3.4 Continuous data output < cont >

Enable function and set the output interval:

⇨ In Setup menu invoke the menu setting < Pr int > ➡ < PrModE > ➡ < tr iG > and confirm with ➔ button.

⇨ For a continuous data output select the menu setting < cont > using the navigation keys ↓↑ and confirm on ➔ button.

⇨ Use the navigation keys ↓↑ to select the setting < on> and confirm on ➔ button.

⇨ < SPEEd> is displayed.

⇨ Acknowledge with the ➔ button and set the required time interval with the navigation keys ↓↑ (numerical input see chap. 3.2.2)

⇨ Set the required output condition <ZEro> & <StAbLE>.

⇨ To exit the menu press the navigation key ➔ repeatedly.

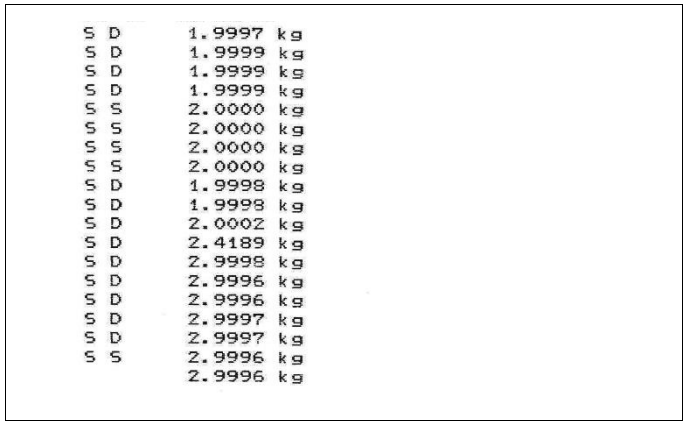
Place goods to be weighed on balance

⇨ If required, place empty container on scale and tare.

⇨ Place goods to be weighed.

⇨ The weighing values are issued according to the defined interval.

Sample log (KERN YKB-01N):



```
S D     1.9997 kg
S D     1.9999 kg
S D     1.9999 kg
S D     1.9999 kg
S S     2.0000 kg
S S     2.0000 kg
S S     2.0000 kg
S S     2.0000 kg
S D     1.9998 kg
S D     1.9998 kg
S D     2.0002 kg
S D     2.4189 kg
S D     2.9998 kg
S D     2.9996 kg
S D     2.9996 kg
S D     2.9997 kg
S D     2.9997 kg
S S     2.9996 kg
        2.9996 kg
```

15.4 Data format

⇨ In the setup menu call up the menu setting <PrInt> ➡ <PrModE> ➡ <WEIGHt> ➡ <CntPrt> and confirm on ➔ button.

⇨ Use the navigation keys ⇵ to select the menu setting <FormAt> and confirm on ➔ button.

⇨ Use the navigation buttons ⇵ to select the desired setting.
Options:

<short> Standard measuring protocol

<LonG> Detailed measuring protocol

⇨ Confirm setting with ➔ button.

⇨ To exit the menu press the navigation key ➔ repeatedly.

Sample log (KERN YKB-01N):

FormAt ➡ short	FormAt ➡ LonG
N: S S 2.0000 kg T: 0.5000 kg G: 2.5000 kg	N: S D 2.0000 kg Tara weight after x: 0.5000 kg Gross weight: 2.5000 kg

16 Servicing, maintenance, disposal

Before any maintenance, cleaning and repair work disconnect the appliance from the operating voltage.

16.1 Cleaning

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. Polish 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.

16.2 Servicing, maintenance

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

⇨ Before opening, disconnect from power supply.

16.3 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.

17 Instant help for troubleshooting

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.

Fault	Possible cause
The weight display 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.
The displayed weight is permanently changing	• Draught/air movement • Table/floor vibrations • Weighing plate has contact with foreign 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. • The balance is on an uneven surface. • Great fluctuations in temperature. • Warm-up time was ignored. • Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)

18 Error messages

Error message	Explication
CL in it	Zero setting range exceeded
undEr2	Zero setting range not achieved
instAb	Load instable
Wrong	Adjustment error
L_ _ _ J	Underload
⌜ - - - ⌝	Overload
LobAt	Capacity of batteries / rechargeable batteries exhausted