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User manual

Precision Scale

KERN PCB

Type TPCB-A

Version 1.0

2021-04

GB



TPCB_A-BA-e-2110



KERN PCB

Ver. 1.0 2021-04

User manual

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Contents

1	Technical specification	5
2	Declaration of Conformity.....	8
3	Device overview.....	9
3.1	Parts	9
3.2	Operating controls	10
3.2.1	Keyboard overview	10
3.2.2	Introducing the numerical value	11
3.2.3	Indication overview	11
4	Basic instructions (general information)	12
4.1	Intended use.....	12
4.2	Non-intended use	12
4.3	Guarantee	12
4.4	Testing equipment supervision.....	13
5	Basic safety instructions.....	13
5.1	Compliance with the instructions included in the user manual	13
5.2	Personnel training.....	13
6	Transport and storage.....	13
6.1	Checking during reception.....	13
6.2	Packaging / return transport	13
7	Unpacking, positioning and start-up.....	14
7.1	Installation place, operation place	14
7.2	Unpacking and check	14
7.3	Integration, setting and leveling.....	15
7.4	Power supply.....	15

7.5	Battery operation (option)	15
7.6	Rechargeable battery operation (option)	16
7.6.1	Battery charging	16
7.7	Connecting peripherals	17
7.8	First start	17
7.9	Adjustment	17
7.9.1	External adjustment <CALEHE>	18
7.9.2	External adjustment using the user-defined adjustment weight	19
7.9.3	Gravity constant in the adjustment point <GRAADJ>	21
7.9.4	Gravity constant in the setting point <GRAUSE>	22
8	Basic mode	23
8.1	Switching on/off	23
8.2	Ordinary weighing	23
8.3	Resetting	24
8.4	Taring	24
8.5	Weight unit switching	25
8.6	Weighing using the under-scales weighing hanger	26
9	Operation concept	27
10	Application <Weighing>	29
10.1	Settings specific for the application	29
10.2	Description of individual functions	30
10.2.1	Taking over the placed weight as the PRE-TARE value	30
10.2.2	Entering the known tare in the numerical form	31
10.2.3	Data-Hold function <hold>	31
10.2.4	Percentage weighing	32
10.2.5	Weighing with the multiplication factor	33
10.2.6	“Mol” weighing mode	34
10.3	Fast change button 	35
10.3.1	Weight units	35
10.3.2	Application units	36

11	Application <Counting the number of pieces>	37
11.1	Settings specific for the application	37
11.2	Application use	38
11.2.1	Counting the number of pieces	38
11.2.2	Check counting	40
12	Application <Weighing with the tolerance range>	43
12.1	Settings specific for the application	43
12.2	Application use	44
12.2.1	Target weighing	44
12.2.2	Test weighing	47
13	Menu	49
13.1	Menu navigation	49
13.2	Application menu	49
13.3	Setup menu	50
13.3.1	<Setup> menu overview	50
14	Communication with a peripheral device using KUP	54
14.1	RS-232 (TYKUPB-03-A)	55
14.1.1	Protocol templates (KERN YKB-01N)	56
14.2	USB (TYKUPB-03-A)	57
14.3	WLAN (TYKUPB-05-A)	58
14.4	KERN Communications Protocol	61
14.5	Data transfer functions	62
14.5.1	Summing mode <ΣΠ>	62
14.5.2	Data transfer after pressing the PRINT <ΠΑΡΟΛ> button	63
14.5.3	Automatic data transfer <ΑΥΤΟ>	64
14.5.4	Continuous data transfer <ΣΧΗΤ>	64
14.6	Data format	65
15	Maintenance, service and disposal	66
15.1	Cleaning	66
15.2	Maintenance and service	66
15.3	Disposal	66
16	Help for any minor failures	67
17	Error messages	68

1 Technical specification

KERN	PCB 200-3	PCB 300-2	PCB 300-3
Product number / type	TPCB 200-3-A	TPCB 300-2-A	TPCB 360-3-A
Interval (<i>d</i>)	0.001 g	0.01 g	0.001 g
Weighing range (<i>Max</i>)	200 g	300 g	360 g
Reproducibility	0.001 g	0.01 g	0.001 g
Linearity	±0.003 g	±0.02 g	±0.003 g
Minimum part weight when counting the number of pieces in laboratory conditions*	2 mg	20 mg	2 mg
Minimum part weight when counting the number of pieces in standard conditions**	20 mg	200 mg	20 mg
Adjustment points	50/100/150/200/250 g	50/100/150/300 g	100/150/200/300/350 g
Recommended adjustment weight (not delivered)	200 g (F1)	300 g (M1)	300 g (F1)
Settling time (standard)	3 s		
Heating time	120 min		
Weight units	kg, g, gn, dwt, tl (Taiwan), tl (Hong Kong), ozt, tl (Singapore, Malaysia), ct, mo, lb, oz		
Air humidity	max. 80%, relative (non-condensing)		
Permissible ambient temperature	5°C to +35°C		
Input voltage of the device	6 V, 1 A		
Input voltage of the power supply	100–240 VAC, 50 Hz		
Batteries (option)	4 batteries 1.5 V, type AA or 1 battery 9 V, type R22		
Rechargeable battery operation (option)	operating time 48 h (illumination off) operating time 24 h (illumination on) charging time ca. 8 h		
automatic switch-off (battery, rechargeable battery)	you can choose: off, 30 s, 1, 2, 5, 30, 60 min		
housing dimensions:	350 × 390 × 120 (width × depth × height) [mm]		
Scale plate	Ø 82 mm plastic, varnish-coated, coating ensuring static charge dissipation	Ø 105 mm stainless steel	Ø 82 mm plastic, varnish-coated, coating ensuring static charge dissipation
Net weight [kg]	1		
Interfaces	RS-232 (optional), USB (optional), WLAN (optional) using a KUP port		
Equipment for the under-scales weighing hanger	yes (hook included)		

KERN	PCB 1000-2	PCB 2000-1	PCB 3000-2
Product number / type	TPCB 1200-2-A	TPCB 2000-1-A	TPCB 3600-2-A
Interval (d)	0.01 g	0.1 g	0.01 g
Weighing range (Max)	1200 g	2000 g	3600 g
Reproducibility	0.01 g	0.1 g	0.01 g
Linearity	±0.03 g	±0.2 g	±0.03 g
Minimum part weight when counting the number of pieces in laboratory conditions*	20 mg	200 mg	20 mg
Minimum part weight when counting the number of pieces in standard conditions**	200 mg	2 g	200 mg
Adjustment points	200 g/500 g/700 g/1 kg	500 g/1 kg/1.5 kg/2 kg	1/1,5/2/3/3,5 kg
Recommended adjustment weight F1 (not delivered)	1 kg (F1)	2 kg (M1)	3 kg (F1)
Heating time	120 min	30 min	120 min
Settling time (standard)	3 s		
Weight units	kg, g, gn, dwt, tl (Taiwan), tl (Hong Kong), ozt, tl (Singapore, Malaysia), ct, mo, lb, oz		
Air humidity	max. 80%, relative (non-condensing)		
Permissible ambient temperature	5°C to +35°C		
Input voltage of the device	6 V, 1 A		
Input voltage of the power supply	100–240 VAC, 50 Hz		
Batteries (option)	4 batteries 1.5 V, type AA or 1 battery 9 V, type R22		
Rechargeable battery operation (option)	operating time 48 h (illumination off) operating time 24 h (illumination on) charging time ca. 8 h		
automatic switch-off (battery, rechargeable battery)	you can choose: off, 30 s, 1, 2, 5, 30, 60 min		
Housing dimensions (W × D × H) [mm]	350 × 390 × 120		
Scale plate [mm]	130 × 130 stainless steel		
Net weight [kg]	1.4		
Interfaces	RS-232 (optional), USB (optional), WLAN (optional)		
Equipment for the under-scales weighing hanger	yes (hook included)		

KERN	PCB 6000-0	PCB 6000-1	PCB 10000-1
Product number / type	TPCB 6000-0-A	TPCB 6K-4-A	TPCB 10K-4-A
Interval (d)	1 g	0.1 g	0.1 g
Weighing range (Max)	6000 kg	6000 kg	10,000 g
Reproducibility	1 g	0.1 g	0.1 g
Linearity	±2 g	±0.3 g	±0.3 g
Minimum part weight when counting the number of pieces in laboratory conditions*	2 g	200 mg	200 mg
Minimum part weight when counting the number of pieces in standard conditions**	20 g	2 g	2 g
Adjustment points	1 / 2 / 5 / 6 kg	1 / 2 / 5 / 6 kg	2 / 5 / 7 / 10 kg
Recommended adjustment weight F1 (not delivered)	5 kg (M2)	5 kg (F2)	10 kg (F1)
Heating time	30 min	120 min	120 min
Settling time (standard)	3 s		
Weight units	kg, g, gn, dwt, tl (Taiwan), tl (Hong Kong), ozt, tl (Singapore, Malaysia), ct, mo, lb, oz		
Air humidity	max. 80%, relative (non-condensing)		
Permissible ambient temperature	5°C to +35°C		
Input voltage of the device	6 V, 1 A		
Input voltage of the power supply	100–240 VAC, 50 Hz		
Batteries (option)	4 batteries 1,5 V, type AA or 1 battery 9 V, type R22		
Rechargeable battery operation (option)	operating time 48 h (illumination off) operating time 24 h (illumination on) charging time ca. 8 h		
automatic switch-off (battery, rechargeable battery)	you can choose: off, 30 s, 1, 2, 5, 30, 60 min		
Housing dimensions (W × D × H) [mm]	350 × 390 × 120		
Scale plate [mm]	150 × 170 stainless steel		
Net weight [kg]	1.8		
Interfaces	RS-232 (optional), USB (optional), WLAN (optional)		
Equipment for the under-scales weighing hanger	yes (hook included)		

*** Minimum part weight when counting the number of pieces in laboratory conditions:**

- There are optimum ambient conditions to count pieces with high resolution
- No diversification of the counted pieces' weight

****Minimum part weight when counting the number of pieces in standard conditions:**

- There are unsteady ambient conditions (wind gusts, vibrations)
- There is diversification of the counted pieces' weight

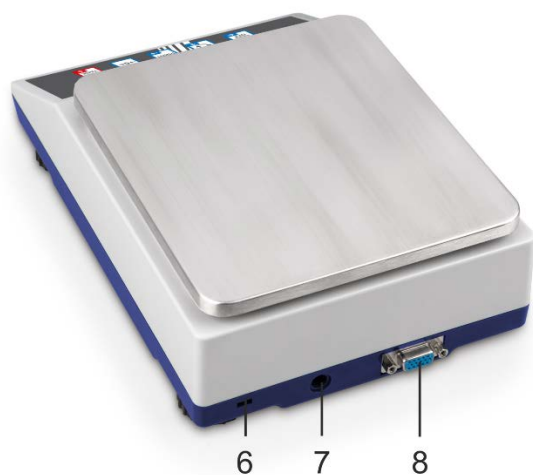
2 Declaration of Conformity

The valid Declaration of Conformity EC/UE is available at:

www.kern-sohn.com/ce

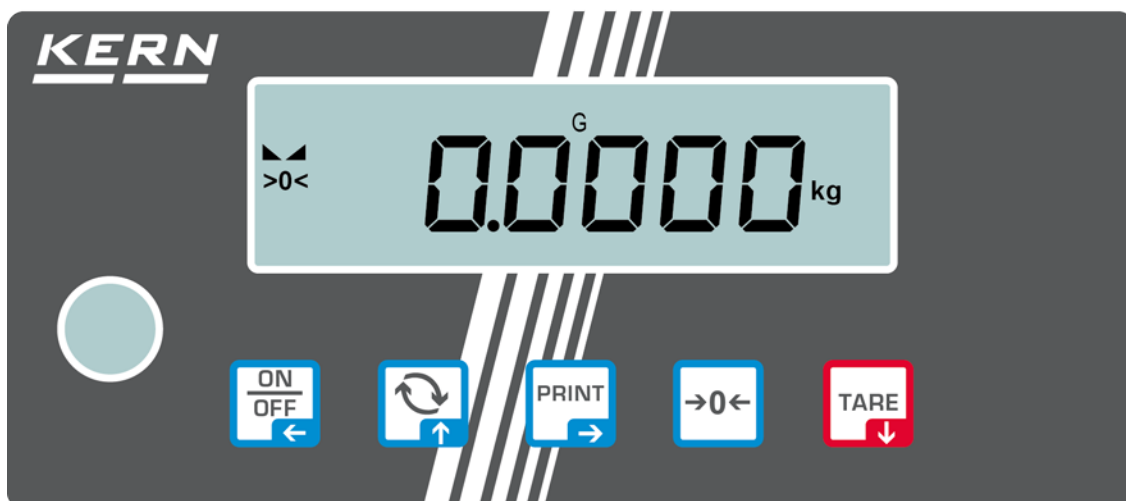
3 Device overview

3.1 Parts



Item	Name	Item	Name
1	Scale plate	7	Power supply socket
2	Wind breaker	8	KUP (KERN Universal Port)
3	Display	9	Leveling screw feet
4	Keyboard	10	Equipment for the under-scales weighing hanger
5	Leveler	11	Transport protection (located depending on the model)
6	Theft-protection port (Kensington lock)	12	Battery compartment

3.2 Operating controls



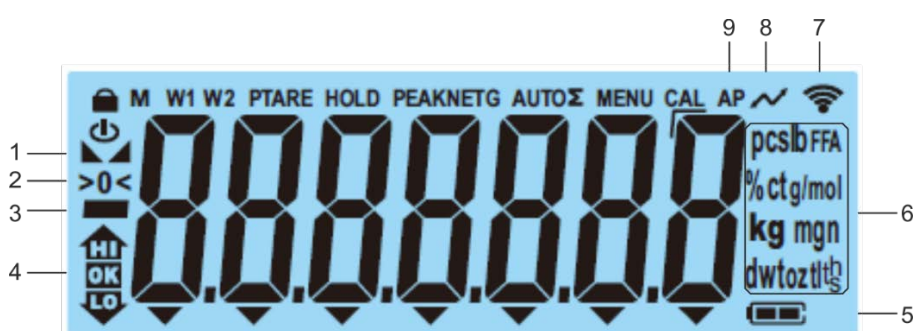
3.2.1 Keyboard overview

Button	Name	Function in the operating mode	Menu function
	ON/OFF button	➤ Switching on/off ➤ Display backlight switching on and off	➤ Navigation button ← ➤ Return to a higher menu level ➤ Leaving menu / return to the weighing mode
	Button ↺	➤ Rapid change button, see chapter 10.3	➤ Navigation button ↑ ➤ Selecting the menu item
	PRINT button	➤ Weight data transfer via the interface	➤ Navigation button → ➤ Activating menu item ➤ Selection confirmation
	ZERO button	➤ Zeroing (zeroing range 2% Max)	
	TARE button	➤ Taring	➤ Displaying the application menu (by pressing and holding the button) ➤ Navigation button ↓ ➤ Selecting the menu item

3.2.2 Introducing the numerical value

Button	Name	Function
	Navigation button →	Digit selection
		Confirmation of the entered data. Press the button several times for every item. Wait until the window for value entry in the numerical form is displayed.
	Navigation button ↓	Decreasing the value of the flashing digit (0–9)
	Navigation button ↑	Increasing the value of the flashing digit (0–9)

3.2.3 Indication overview



Item	Symbol	Description
1		Stabilization indicator
2	>0<	Zero indicator
3		Negative value indicator
4		Tolerance symbols for check weighing
5		Battery charge indicator
6	Unit indicator / Pcs / %	The choice of: g, kg, lb, gn, dwt, oz, ozt or application icon [Pcs] for counting the number of pieces or [%] when determining the percentage value
7		Wi-Fi symbol
8		Data transmission pending
9	AP	Active Autoprint function (automatic printing)
–	G	Gross weight value indicator
–	NET	Net weight value indicator
–	Σ	Weighing data are included in the total memory

4 Basic instructions (general information)

4.1 Intended use

The scale you bought is intended for weighing the weighed material. It should be considered a “non-automatic scale”, e.g. the weighed material should be carefully placed manually on the scale plate center. The weight can be read after it has stabilized.

4.2 Non-intended use

The scale is not intended for dynamic weighing, e.g. for removing or adding small amounts of the weighed material. The scale’s “stabilizing and compensating” mechanism can result in displaying erroneous weighing results! (Example: slow outflow of the liquid from the container placed on the scale.)

Do not subject the plate to long-term load. This may damage the weighing mechanism.

Avoid any scale impact and overload higher than the stipulated maximum load (*Max*), deducting the tare from the existing load. This could damage the scale.

Never operate the scale in explosive atmospheres. The standard version is not explosion-proof.

Never introduce any structural modifications to the scale. This may result in displaying erroneous weighing results, violating the technical safety conditions, and also in scale damage.

The scale should always be operated in line with the provided guidelines. Other operation ranges / areas require a written consent of KERN.

4.3 Guarantee

The warranty expires:

- if you fail to follow our guidelines included in the user manual;
- if you fail to use the device in line with the intended use;
- if you introduce any modifications or open the device;
- if the device gets damaged mechanically or damaged by the utilities, liquids and ordinary wear and tear;
- if the device is not set correctly or the electrical system is not as required;
- if the weighing mechanism gets overloaded.

4.4 Testing equipment supervision

Within the quality assurance system, you must check the technical measurement properties of the scale and possibly of the available reference weight regularly. To that aim, the responsible user should define a relevant cycle, as well as the type and scope of such an inspection. The information on the supervision of the testing equipment, i.e. scales, and the required reference weights, can be found on the home page of KERN (www.kern-sohn.com). The reference weights and scales can be calibrated fast and for a low cost in the KERN calibration laboratory (against the national reference) approved by DKD (Deutsche Kalibrierdienst).

5 Basic safety instructions

5.1 Compliance with the instructions included in the user manual



- ⇒ Before you set and start the device, read this user manual thoroughly even if you are familiar with KERN scales.
- ⇒ All language versions contain non-binding translation. Only the original document in German is binding.

5.2 Personnel training

The device can be operated and maintained solely by trained workers.

6 Transport and storage

6.1 Checking during reception

Immediately after you have received the shipment, please check if it is free from any visible outer damage. The same applies for the unpacked device.

6.2 Packaging / return transport



- ⇒ Please keep all the parts of the original packaging in case you had to send it back to us.
- ⇒ Always use the original packaging for the return transport.
- ⇒ Before you dispatch the device, disconnect any connected cables as well as loose/moving parts.
- ⇒ Reinstall any transport locks, if present.
- ⇒ Protect all the parts, e.g. wind breaker, scale plate, power supply etc. from slipping and damage.

7 Unpacking, positioning and start-up

7.1 Installation place, operation place

The scales are designed to ensure reliable weighing results in standard operating conditions.

The choice of a correct scale location ensures its accurate and fast operation.

This is why you should follow the following rules when selecting the installation place:

- Place the scale on stable, flat surface.
- Avoid extreme temperatures and temperature fluctuations, occurring e.g. when you place it at the radiator or in a place exposed to direct sun rays.
- Protect the scale from the direct draft present at open windows and doors.
- Avoid impact when weighing.
- Protect the scale from high humidity of air, vapors and dust.
- Do not expose it to long-term heavy moisture. Any forbidden condensation of the air moisture on the device may occur when a cold device is placed in a much hotter environment. In such circumstances, leave the device not connected to the mains for 2 hours to adapt to the ambient temperature.
- Avoid static discharge from the weighed material and scale container.

If there are any electromagnetic fields, static discharge and unstable power supply, high readout deviations (erroneous weighing results) may occur. In such circumstances, change the location.

7.2 Unpacking and check

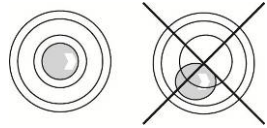
Remove the device and accessories from the packaging, remove the packaging material and place the device in the target location. Check if all components included in the delivery are present and not damaged.

Scope of delivery / standard accessories:

- Scale, see chapter 3.1
- Power supply
- User manual
- Dust cover
- Hook for the under-scales weighing hanger

7.3 Integration, setting and leveling

- ⇒ Remove any transport protection at the scale bottom.
- ⇒ Install the scale plate and, whenever required, also the wind breaker.
- ⇒ Place the scale on smooth surface.
- ⇒ Level the scale using the leveling feet. The air bubble in the leveler must be present in the marked area.



- ⇒ Check leveling at regular intervals.

7.4 Power supply



Choose the plug appropriate for the operation country and plug it into the power supply.



Check if the scale voltage is set correctly. The scale can be connected to the mains only when the voltage specified on the scale (sticker) and the local voltage are identical.

Always use the original power supply by KERN. Using any other products requires KERN consent.



Important information:

- Before you start the device, check the power cord for damage.
- The power cord must not have any contact with liquids.
- The plug must be always readily available.

7.5 Battery operation (option)

Once the batteries are discharged, the $\langle L \square b A E \rangle$ symbol is displayed.

- ⇒ Turn the scale upside down carefully to get access to its bottom.
- ⇒ Open the battery compartment and replace the batteries.

Always pay attention to the correct polarity.

- ⇒ Replace the cover.



- To save batteries, you may enable the $\langle A U E O F F \rangle$ function in the menu (see chapter 13.3.1).
- If the scale is not used for a prolonged period of time, remove the batteries and store them separately. Any leaking electrolyte could damage the scale.

7.6 Rechargeable battery operation (option)

PLEASE NOTE!   	⇒ The rechargeable battery and the charger are compatible. Always use the power supply delivered with the scale. ⇒ Do not use the scale when charging. ⇒ Always replace the battery with the one of the same type or of the type recommended by the manufacturer. ⇒ The battery is not protected against all the environmental impacts. Exposing the battery to specific environmental conditions may result in its fire or explosion. It may result in serious injuries or material losses. ⇒ Protect the battery from fire and heat. ⇒ Do not allow the battery to have any contact with liquids, chemicals or salts. ⇒ Do not expose the battery to high pressure or microwave radiation. ⇒ Do not modify any batteries, charger and do not tamper them. ⇒ Do not use any faulty, damaged or deformed battery. ⇒ Do not connect the electrical contacts of the battery and do not use any metal items to short circuit them. ⇒ The electrolyte may be released by the damaged battery. Any contact of the electrolyte with the skin or eyes may irritate them. ⇒ When you place or replace batteries, always pay attention to the correct polarity (see the information in the battery compartment). ⇒ When the power supply is connected, the battery operation mode is switched off. Always remove the battery for weighing in the power supply mode longer than 48 h! (Overheating danger). ⇒ If you detect any odor emitted by the battery, its heating, discoloration or deformation, disconnect it immediately from the power supply and, whenever possible, from the scale.
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7.6.1 Battery charging

The rechargeable battery (option) is charged using the supplied power cord.

Before first use, charge the battery for at least 15 hours using the power cord.

To save the rechargeable battery, you may enable the `<AutoFF>` function in the menu (see chapter 13.3.1).

Once the rechargeable battery is discharged, the `<LoBat>` symbol is displayed. To charge the battery, connect the power cord as soon as possible. The charging time until the full charging status is reached is ca. 10 hours.

7.7 Connecting peripherals

Before you connect or disconnect any extra devices (printer, computer) to/from the data interface, the scale should always be disconnected from the mains.

Use solely accessories and peripherals supplied by KERN with the scale, being perfectly compatible with it.

7.8 First start

To get accurate weighing results using electronic scales, ensure the scales achieves the appropriate operating temperature (see “Heating time”, chapter 1). During the heating time, the scale must be connected to the power source (the socket, rechargeable battery or batteries).

The scale accuracy depends on the local standard gravity.

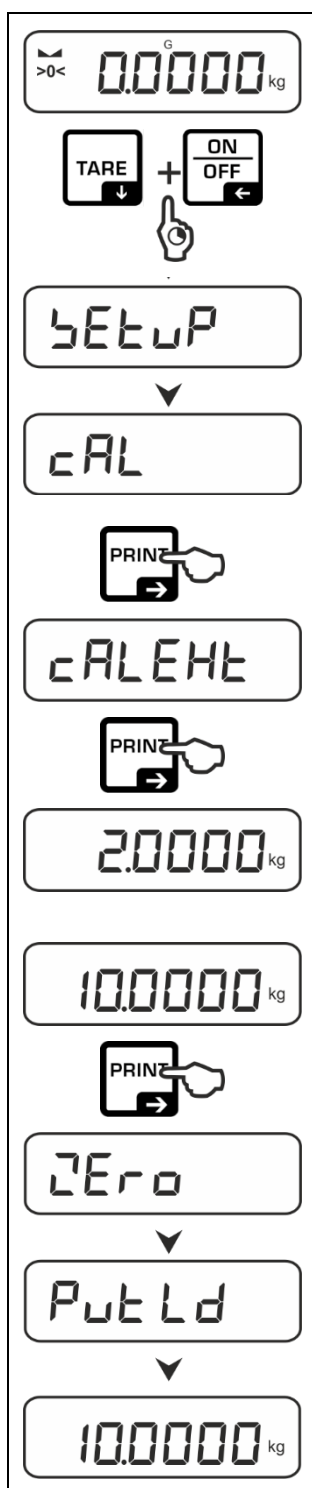
Always follow the guidelines in the “Adjustment” chapter.

7.9 Adjustment

As the standard gravity value is not the same in every spot on Earth, every display with the scale plate connected should be adjusted, in line with the weighing rules resulting from the laws of physics, to the standard gravity in the scale location (provided the scale system has not already been subject to factory adjustment in its location). Such an adjustment process should be carried out during the first start, following every location change and also in the case of any ambient temperature fluctuations. To ensure achieving accurate measurement date, it is also recommended to carry out regular display adjustment also in the weighing mode.

- i** • Prepare the required adjustment weight, see chapter 1. Whenever possible, adjust using the adjustment weight with the weight similar to the maximum load of the scale (the adjustment weight is recommended, see chapter 1). The adjustment may also be carried out using weights with other nominal values or tolerance classes, but this is not optimal from the measurement technique perspective. The adjustment weight precision must correspond to the interval $[d]$ of the scale, though preferably it should be a bit higher. For information concerning reference weights, see online at: <http://www.kern-sohn.com>
- Ensure stable environmental conditions. The heating time is required for the stabilization (see chapter 1).
- Ensure there are no objects on the scale plate.

7.9.1 External adjustment <CALEHT>



⇒ To display the setup menu, press and hold TARE and ON/OFF buttons simultaneously.

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

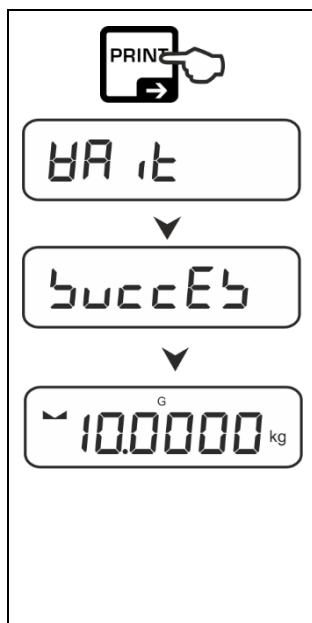
⇒ Confirm by pressing →, <CALEHT> symbol will be displayed.

⇒ Confirm by pressing →, the first selectable adjustment weight will be displayed.

⇒ Using the navigation buttons ↓↑, select the required adjustment weight, see chapter 1 “Adjustment points” or “Recommended adjustment weight”. Entering a value in the numerical form, see chapter 3.2.2.

⇒ Prepare the required adjustment weight.

⇒ Confirm the selection, pressing →. The <ZERO> and <Put Ld> symbols will be displayed consecutively. Next, the value of the adjustment weight which should be placed on the scale will be displayed.

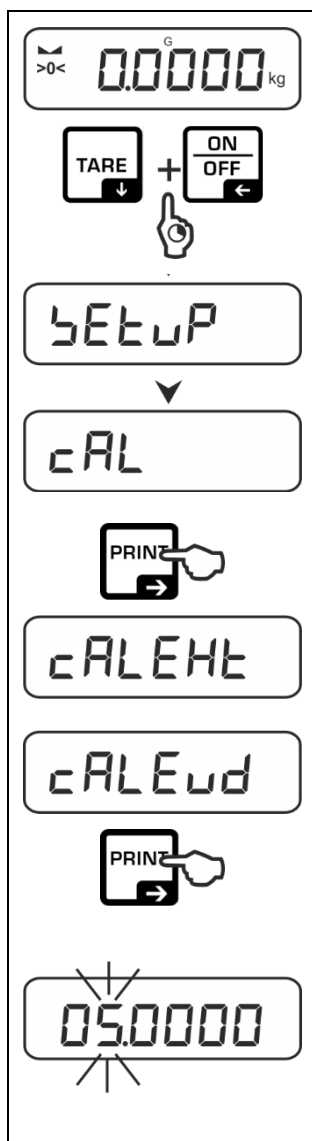


⇒ Place the adjustment weight and confirm, pressing →, <HA it> i <buccEb> symbols will be displayed consecutively.

⇒ After the successful adjustment, the scale will switch to the weighing mode again automatically. If an adjustment error occurs (e.g. there are any items on the scale plate), the display will show <Error>. Switch the scale off and repeat the adjustment process.

7.9.2 External adjustment using the user-defined adjustment weight

<cALEud>



⇒ To display the setup menu, press and hold TARE and ON/OFF buttons simultaneously.

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

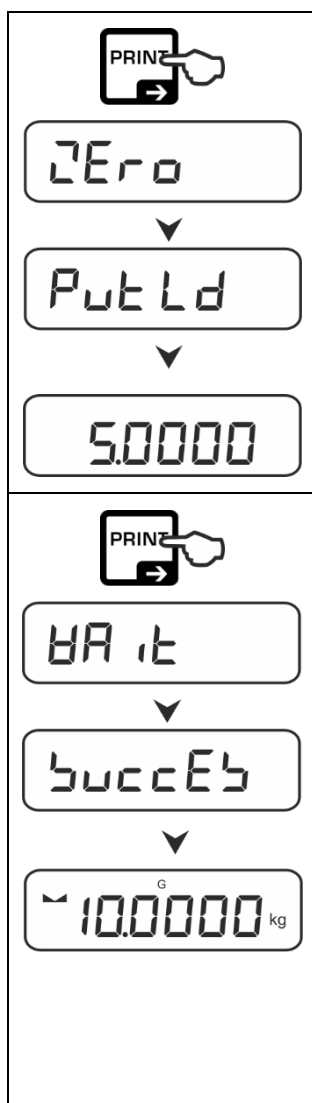
⇒ Confirm by pressing →, <cALEHt> symbol will be displayed.

⇒ Using the navigation buttons ↓↑, select the menu item <cALEud>.

⇒ Confirm pressing →. A box for entering the numerical value will be displayed, enabling to enter the adjustment weight value. The active item is blinking.

⇒ Prepare the adjustment weight.

⇒ Enter the weight value; for entering the numerical value see chapter 3.2.2.

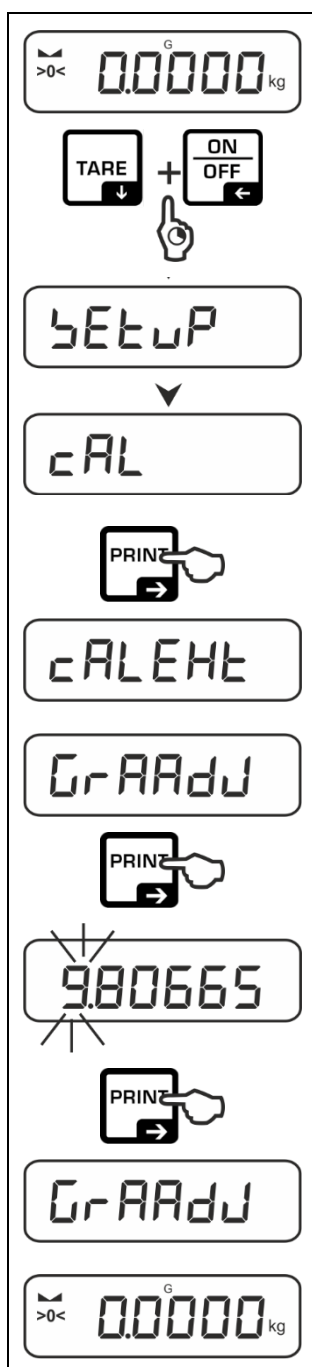


⇒ Confirm the selection, pressing →. The <Zero> and <Put Ld> symbols will be displayed consecutively. Next, the value of the adjustment weight which should be placed on the scale will be displayed.

⇒ Place the adjustment weight and confirm, pressing →, <HA it> i <Success> symbols will be displayed consecutively.

⇒ After the successful adjustment, the scale will switch to the weighing mode again automatically. If an adjustment error occurs (e.g. there are any items on the scale plate), the display will show <Error>. Switch the scale off and repeat the adjustment process.

7.9.3 Gravity constant in the adjustment point <GrAdj>



⇒ To display the setup menu, press and hold TARE and ON/OFF buttons simultaneously.

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

⇒ Confirm by pressing →, <CALEnt> symbol will be displayed.

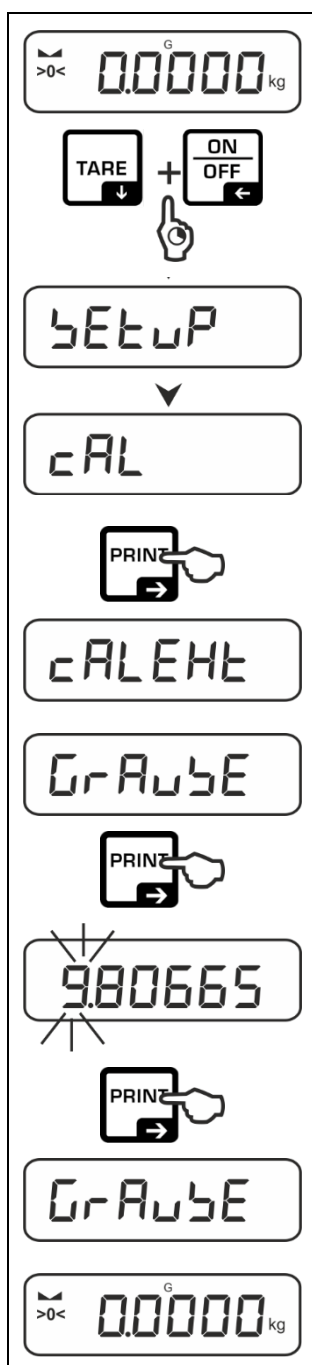
⇒ Using the navigation buttons ↓↑, select the menu item <GrAdj>.

⇒ Confirm by pressing the → button, the current setting will be displayed. The active item is blinking.

⇒ Enter the required value and confirm, pressing →; for entering numerical value see chapter 3.2.2. The scale will be switched to the menu again.

⇒ To leave the menu, press ← several times.

7.9.4 Gravity constant in the setting point <GrAuSE>



⇒ To display the setup menu, press and hold TARE and ON/OFF buttons simultaneously.

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

⇒ Confirm by pressing →, <cAL EHL> symbol will be displayed.

⇒ Using the navigation buttons ↓↑, select the menu item <GrAuSE>.

⇒ Confirm by pressing the → button, the current setting will be displayed. The active item is blinking.

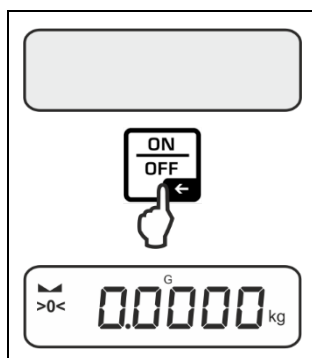
⇒ Enter the required value and confirm, pressing →; for entering numerical value see chapter 3.2.2. The scale will be switched to the menu again.

⇒ To leave the menu, press ← several times.

8 Basic mode

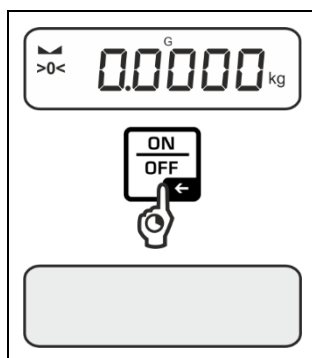
8.1 Switching on/off

Switching on:



- ⇒ Press the **ON/OFF** button.
Once the display is lit, the scale autotest will be carried out.
Wait until the weight indicator is displayed.
The scale is ready to use with the last active application.

Switching off:



- ⇒ Press and hold the **ON/OFF** button until the display goes off.

8.2 Ordinary weighing



- ⇒ Check the zero indication [**>0<**], and whenever required, zero by pressing the **ZERO** button.
- ⇒ Place the weighed material.
- ⇒ Wait until the stabilization indicator is displayed (■).
- ⇒ Read out the weighing result.



Overload warning

Always avoid any device overload higher than the stipulated maximum load (*Max*), deducting the tare from the existing load.

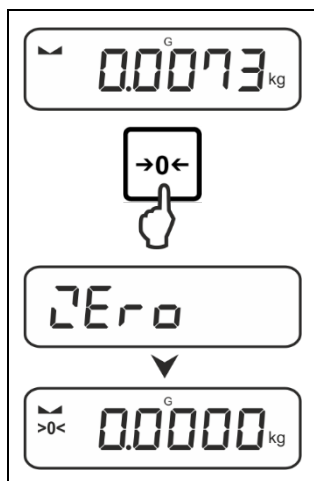
This could damage the device.

The exceeded maximum load is indicated with **1** **- -** **7**. Reduce the scale load or reduce the initial load.

8.3 Resetting

To ensure the optimal results of the weighing process, zero the scale before weighing. Zeroing is possible solely in the range of $\pm 2\%$ Max.

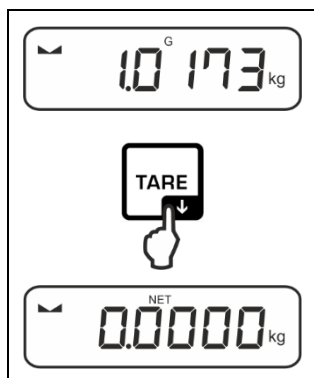
For any values higher than $\pm 2\%$ Max, the >0< error message is displayed.



- ⇒ Remove the load from the scale.
- ⇒ Press **ZERO**, to zero the scale.

8.4 Taring

The empty weight of any container used for weighing can be tared, pressing the button which results in displaying the net weight of the weighed material during consecutive weighing processes.

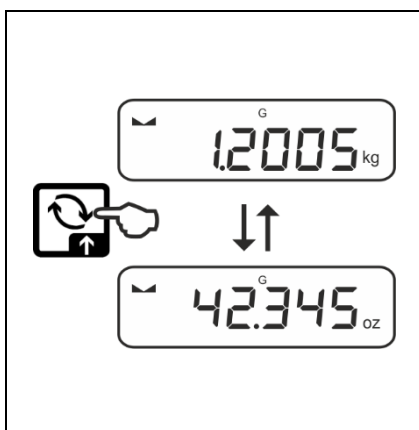


- ⇒ Place the scale container on the scales plate.
- ⇒ Wait until the stabilization indicator is displayed (▴ ▾), and press **TARE**. The container weight is saved in the scale memory. The following will be displayed: zero indicator and **<NET>**. **<NET>** indicates that all displayed weight values are net.



- After the load is removed from the scale, the tare weight is displayed as a negative value.
- To delete the saved tare value, remove the load from the scale plate and press **TARE** or **ZERO** button.
- The taring process can be repeated any number of times, e.g. when weighing several mixture ingredients (making up the weight). The limit is reached when the complete taring scope is used.
- Entering tare in the numerical form (PRE-TARE function), see chapter 0.

8.5 Weight unit switching



Using , you can switch between the active unit 1 and unit 2.
(For unit activation see chapter 10.3.1.)

i When switching on the scale, the unit used when the scale was switched off is displayed.

8.6 Weighing using the under-scales weighing hanger

Weighing using the under-scales weighing hanger enables to weigh any objects which cannot be placed on the scale plate because of their size or shape.

Carry out the following steps:

- ⇒ Switch the scale off.
- ⇒ Remove the plug at the scale bottom.
- ⇒ Place the scale over an opening.
- ⇒ Screw the hook in completely.
- ⇒ Hang the weighed material and carry out weighing.



CAUTION

- All hung objects must be stable enough and the weighed material must be fixed securely (the risk of separating).
- Never hang any loads exceeding the specified maximum load (*Max*) (risk of separating).

No people or animals or items who/which could be injured or damaged can stay under the load.



TIP

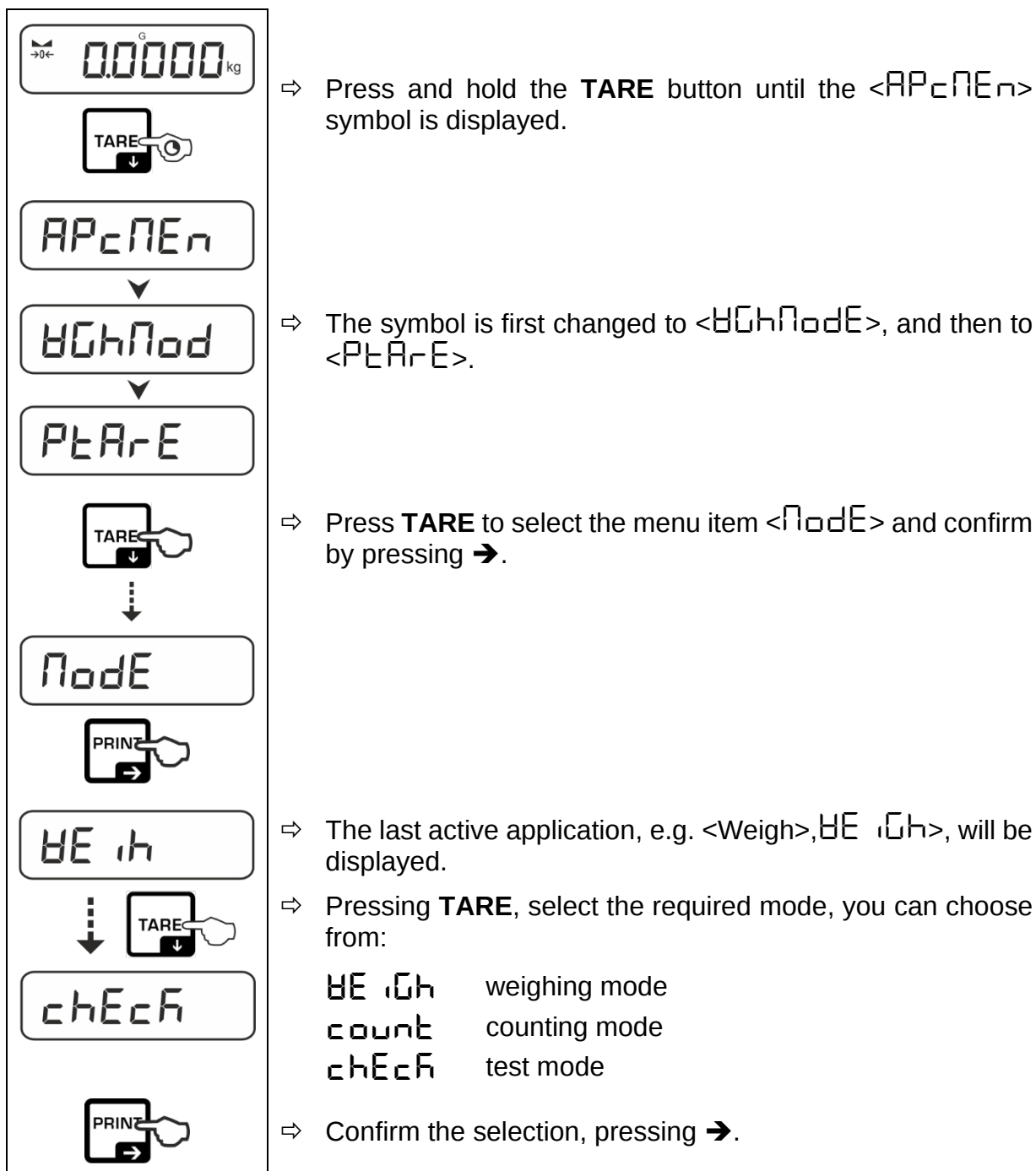
After you have finished weighing, always close the opening on the scale bottom (dust protection).

9 Operation concept

The scale is delivered with various applications (ordinary weighing, test weighing, counting the number of pieces). During the first switch-on, the scale is started with the <Weighing> application.

However, once you switch the scale on, you may select its further operation mode by selecting the relevant application in the **application menu** (see chapter 13.2). You may also select the standard weighing mode or e.g. use it as a reference scale or scale for counting the number of pieces.

How to choose the application:



After the application is selected, the application menu displays solely settings specific for that application thanks to which you may get fast and directly to where you want.



- The information on specific application settings is provided in every application description.
- All the basic settings and parameters affecting the scale operation are provided in the **setup menu** (see chapter 13.3). The settings apply to all applications.
- The number of available applications is conditional on the model.

Application change:

- ⇒ Press and hold **TARE** i **ON/OFF** buttons simultaneously until the first setup menu item is displayed.
- ⇒ Press **TARE** to select the menu item **<MODE>** and confirm by pressing **→**. The current setting will be displayed.
- ⇒ Press **TARE** to select the required mode and confirm by pressing **→**.

10 Application <Weighing>

The ordinary weighing and taring is described in chapter 8.2 or 8.4 The other specific possibilities are described below.

i If the application <Weighing> is not active yet, choose the menu item <Node
→ **WEIGH**>, see chapter 9.

10.1 Settings specific for the application

Displaying the menu:

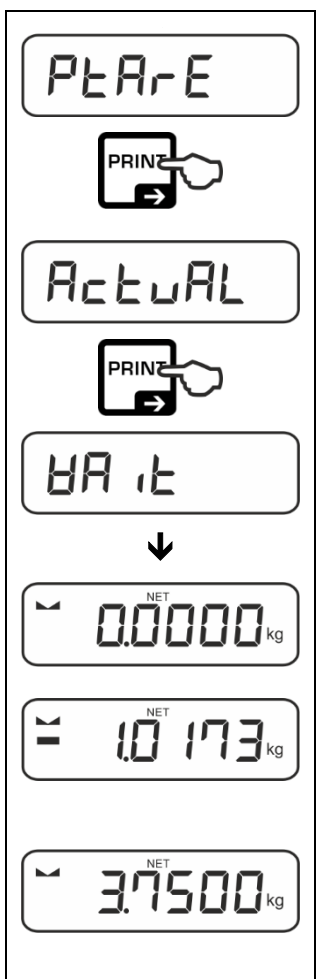
- ⇒ Press and hold the **TARE** button until the <**APCNE**> symbol is displayed.
- ⇒ The symbol is first changed to <**WEIGHNODE**>, and then to <**PRE-TARE**>.
- ⇒ Menu navigation, see chapter 13.1.

Overview:

Level 1	Level 2	Level 3	Description/chapter
PRE-TARE PRE-TARE function	ACTUEL	Taking over the placed weight as the PRE-TARE value, see chapter 10.2.1	
	NUMUEL	Entering tare in the numerical form, see chapter 10.2.2	
	CLEAR	Deleting the PRE-TARE value	
hold	–	Starting the “HOLD” function, see chapter 10.2.3	
unit Units	available weight units, chapter. 1	This function enables to specify the weight unit which is to be used to display the result.	
	FFA	Multiplication factor, see chapter 10.2.5	
	Pcs	Unit of the application <Counting the number of pieces>	
	%	Unit of the application <Determining the percentage value>, see chapter 10.2.4	
	mol	“Mol” weighing mode, see chapter 10.2.6	
Node Application mode	WEIGH	weighing mode	see chapter 9
	count	counting mode	
	check	test mode	

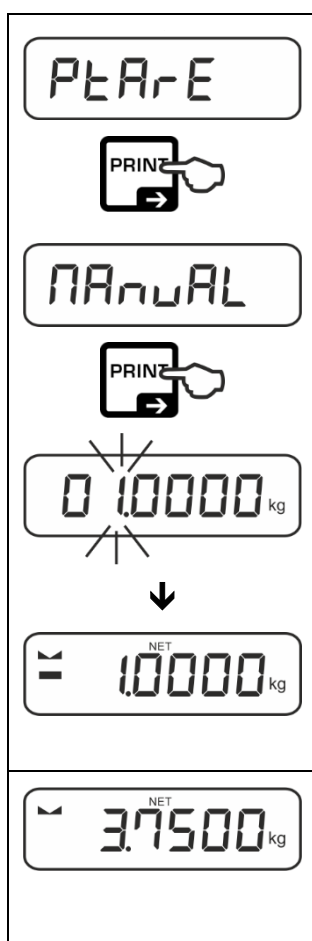
10.2 Description of individual functions

10.2.1 Taking over the placed weight as the PRE-TARE value <P_{TE} → A_{CEL}>

	⇒ Place the scale container. ⇒ Display the <P_{TE}> menu setting and confirm, pressing →. ⇒ To take over the weight of the placed weight as PRE-TARE, use the navigation buttons ↓↑ to select <A_{CEL}>. ⇒ Confirm pressing →. The <HAIT> symbol will be displayed. ⇒ The scale container weight will be saved as tare. The following will be displayed: zero indicator and <NET>. ⇒ Remove the scale container, the following will be displayed: (NET) symbol and tare weight with a negative symbol. ⇒ Place a filled scale container. ⇒ Wait until the stabilization indicator is displayed (▢). ⇒ Read out the net weight.
--	--

i The entered tare value will be used until you enter a new one. To delete it, press TARE or confirm the menu item <CLEAR>, pressing TARE.

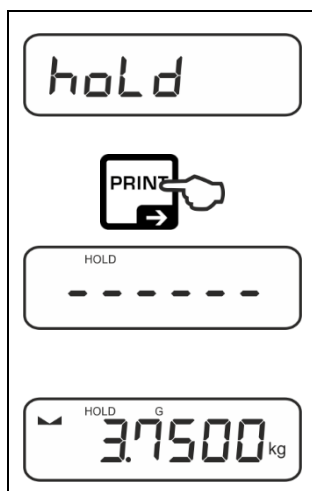
10.2.2 Entering the known tare in the numerical form, <PTARE → NANUAL>



- ⇒ Display the <PTARE> menu setting and confirm, pressing **→**.
- ⇒ Use the navigation buttons **↓↑** to choose the setting <NANUAL> and confirm by pressing **→**.
- ⇒ Enter the known tare value; for introducing the numerical value see chapter 3.2.2, the active item is blinking.
- ⇒ The entered weight will be saved as tare; the following will be displayed: (NET) symbol and tare weight with a negative symbol.
- ⇒ Place a filled scale container.
- ⇒ Wait until the stabilization indicator is displayed (▬).
- ⇒ Read out the net weight.

i The entered tare value will be used until you enter a new one. To delete it, enter a zero value or confirm the menu item <CLEAR>, pressing TARE.

10.2.3 Data-Hold function <hOLd>



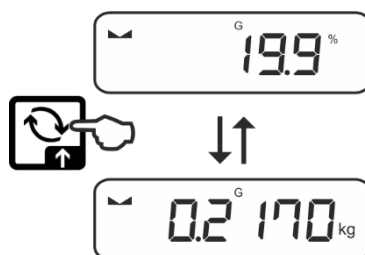
- ⇒ Choose the menu item <hOLd>.
- ⇒ Place the weighed material.
- ⇒ Confirm pressing **→**.
- ⇒ The display will show the first stable weighing value for 15 s as the [HOLD] symbol at the upper boundary of the display.

10.2.4 Percentage weighing

<Percentage weighing> application enables to check the percentage sample weight in reference to the reference weight.

	⇒ Choose the menu item <unit>. ⇒ Place the reference weight corresponding to 100%. ⇒ Confirm pressing →. ⇒ Use the navigation buttons ↓↑ to choose the setting <%> and confirm by pressing →. ⇒ Confirm the blinking weight value by pressing →. ⇒ From now on, the sample weight is displayed as percentage referring to the reference weight.
--	---

- i** • Using ↻, you can switch between the active unit 1 and unit 2 (for unit activation see chapter 0).

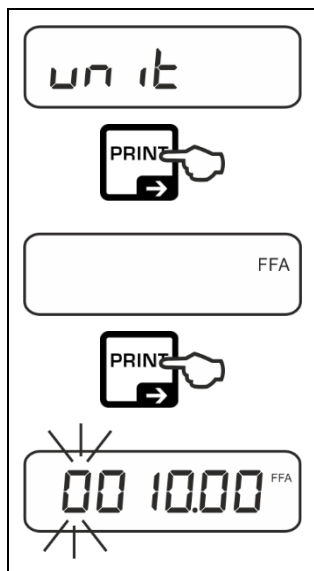


The required settings may be determined fast and easily using ↻ (without displaying the <unit> button), see chapter 10.3.2.

10.2.5 Weighing with the multiplication factor

Here, you can specify the factor to be used for multiplying the weighing result (in grams).

All the same, determining weight you can consider e.g. the known error factor.



⇒ Select <unit> menu setting and confirm, pressing →.

⇒ Use the navigation buttons ↑↓ to choose the setting <FFA> and confirm by pressing →.

⇒ Enter the multiplication factor; for introducing the numerical value see chapter 3.2.2, the active item is blinking.

i The required settings may be determined fast and easily using ↶ (without displaying the <unit> button), see chapter 10.3.2.

10.2.6 “Mol” weighing mode

This function calculates the amount of substance (in moles) based on the molar mass and the substance mass.

	⇒ Select <unit> menu setting and confirm, pressing →. ⇒ Use the navigation buttons ↓↑ to choose the setting <mol> and confirm by pressing →. ⇒ Enter the molar mass of the substance; for introducing the numerical value see chapter 3.2.2, the active item is blinking. ⇒ Weigh the substance. The mass is displayed in moles.
--	--

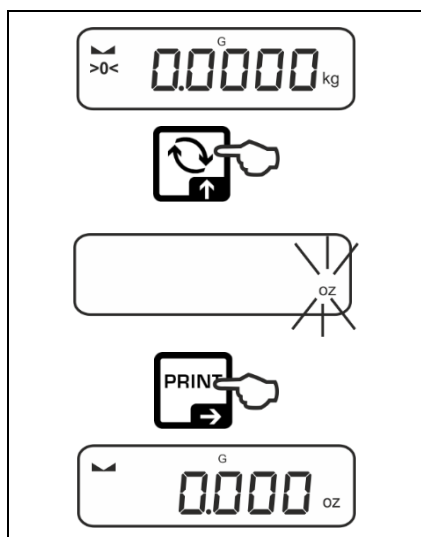
i The required settings may be determined fast and easily using  (without displaying the <unit> button), see chapter 10.3.2.

10.3 Fast change button

The fast change button  can be ascribed a unit which you can use to switch to from any other active unit fast and conveniently.

10.3.1 Weight units

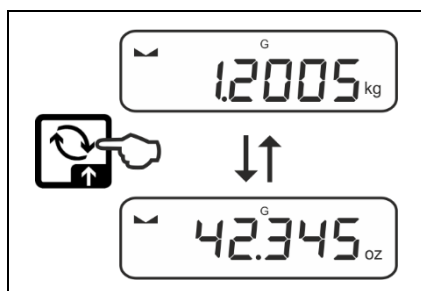
Unit activation:



⇒ Press  and wait for the symbol to stop blinking.

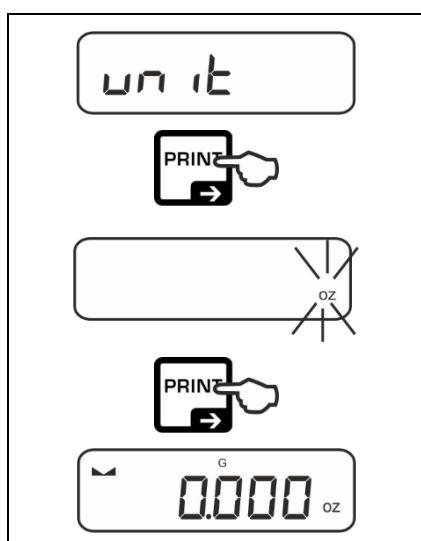
⇒ Press  to select the required unit and confirm by pressing .

Unit switching:



⇒ Using , you can switch between the active unit 1 and unit 2.

Unit deactivation:



⇒ Select    menu setting and confirm, pressing .

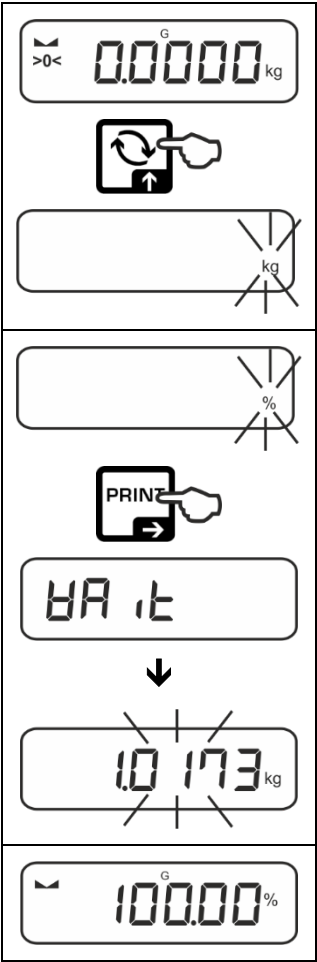
⇒ Wait until the symbol stops blinking and confirm by pressing .

From now on, pressing the  button again will enable to select all available units again.

10.3.2 Application units

When selecting the application unit (% , Pcs, mol, FFA), the required settings may be selected directly after calling with .

Example of the “Percentage weighing” setting



⇒ Press  and wait for the symbol to stop blinking.

⇒ Select <%> unit by pressing .

⇒ Place the reference weight corresponding to 100%.

⇒ Confirm pressing .

⇒ Confirm the blinking weight value by pressing .

⇒ From now on, the sample weight is displayed as percentage referring to the reference weight.

11 Application <Counting the number of pieces>



If the application <Counting the number of pieces> is not active yet, choose the menu item <MODE → count>, see chapter 9.

11.1 Settings specific for the application

Displaying the menu:

- ⇒ Press and hold the **TARE** button until the <APCERN> symbol is displayed.
- ⇒ The symbol is first changed to <countod>, and then to <REF>.
- ⇒ Menu navigation, see chapter 13.1.

Overview:

Level 1	Level 2	Level 3	Description/chapter
REF Number of reference items	5	Number of reference items 5	
	10	Number of reference items 10	
	20	Number of reference items 20	
	50	Number of reference items 50	
	FREE	Selected arbitrarily; for introducing the numerical value see chapter 3.2.2	
PRE PRE-TARE function	ACTUEL	Taking over the placed weight as the PRE-TARE value, see chapter 10.2.1	
	PARUEL	Entering tare in the numerical form, see chapter 10.2.2	
	CLEAR	Deleting the PRE-TARE value	
TARGE Check counting, see chapter 0	VALUE	ERRUPP	Upper tolerance limit
		ERRLOH	Lower tolerance limit
MODE Application mode	WEIGH	weighing mode	
	count	counting mode	
	check	test mode	
			see chapter 9

11.2 Application use

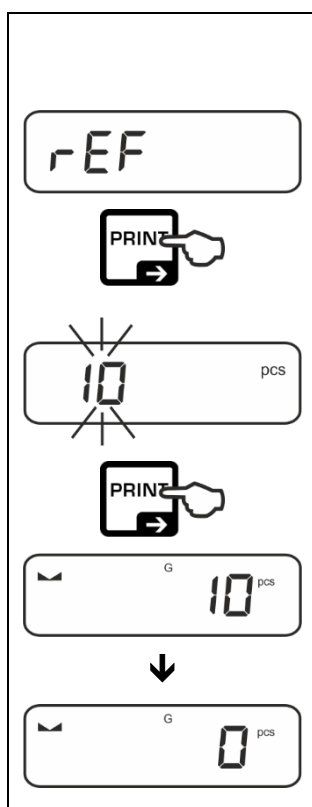
11.2.1 Counting the number of pieces

Before it is possible to count pieces using the scale, you should determine the average weight of an individual part (unit weight), the so-called reference value. To do it, place the specific number of pieces which the counting the number of pieces will be carried out for. The scale will determine the total weight which will be divided by the number of pieces, the so-called reference piece number. Next, based on the calculated mean weight of an individual part, the number of pieces will be counted.

- i** • The higher number of the reference pieces, the higher the accuracy of counting the number of pieces.
- For small or highly diverse parts, the reference value must be sufficiently high.
- For the minimum weight of the counted pieces, see the “Technical specification” table.

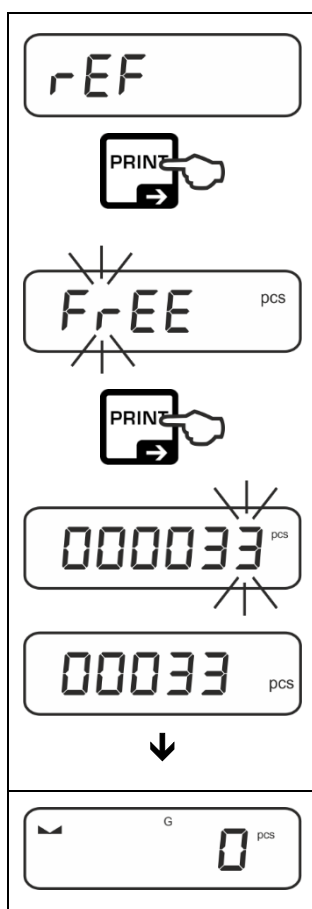
1. Setting the reference value

Number of reference items 5, 10 or 20:



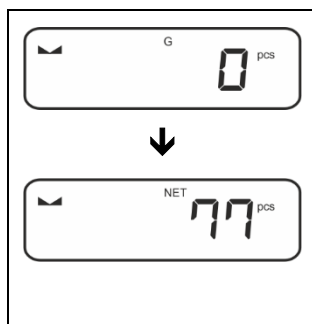
- ⇒ Whenever required, place an empty container on the scale and tare it.
- ⇒ Place the required number of reference items.
- ⇒ Display the <rEF> menu setting and confirm, pressing →.
- ⇒ Using the navigation buttons ↓↑, select the number of reference items (5, 10, 20, 50) corresponding to the placed reference load and confirm by pressing →.
- ⇒ The mean weight of an individual part will be determined by the scale and then the part number will be displayed.
- ⇒ Remove the reference load. The scale is in the counting mode and counts all parts present on the scale plate.

Number of reference items defined by the user:



- ⇒ Whenever required, place an empty container on the scale and tare it.
- ⇒ Place the required number of reference items.
- ⇒ Display the <rEF> menu setting and confirm, pressing ➔.
- ⇒ Use the navigation buttons ⬆⬆ to choose the setting <FrEE> and confirm by pressing ➔.
- ⇒ The window for value entry in the numerical form is displayed.
- ⇒ Enter and confirm the number of reference parts placed; for introducing the numerical value see chapter 3.2.2.
- ⇒ The mean weight of an individual part will be determined by the scale and then the part quantity will be displayed.
- ⇒ Remove the reference load. The scale is in the counting mode and counts all parts present on the scale plate.

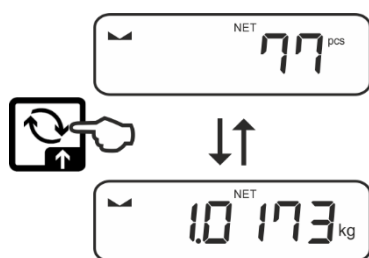
2. Part counting



- ⇒ Whenever required, place an empty container on the scale and tare it.
- ⇒ Fill the container with parts to be counted. The number of pieces will be displayed directly on the display.



↻ button enables to switch between the indication of the number of pieces and of the weight.



11.2.2 Check counting

The scale enables to weigh materials to the specific target number of pieces in the preset tolerance range. This function enables also to check if the weighed material belongs to the preset tolerance range.

Achieving the target value is indicated by an audible signal (if enabled in the menu) and a visual signal (tolerance symbol , , ).

Visual signal:

Tolerance symbols provide the following information:

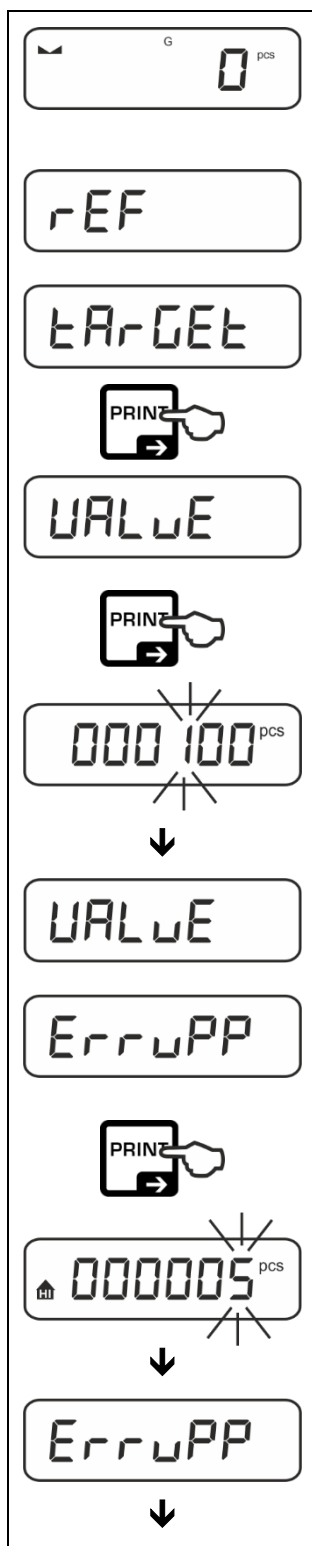
	The target number of pieces above the preset tolerance
	The target number of pieces in the preset tolerance range
	The target number of pieces below the preset tolerance

Audible signal:

The audible signal depends on the `<SETUP → BEEPER>` menu setting, see chapter 13.3.1.

What to do:

1. Defining the target number of pieces and tolerance



⇒ Ensure the scale is in the piece count mode and the mean weight of a single item is defined (see chapter 11.2). Whenever required, switch using .

⇒ Display the menu item <rEF>.

⇒ Use the navigation buttons $\uparrow$ to choose the setting <ArGEt> and confirm by pressing $\rightarrow$.

The <VALUE> symbol will be displayed.

⇒ Confirm by pressing $\rightarrow$ button, the numerical value entry box is displayed. The active item is blinking.

⇒ Enter the target number of pieces; for entering the numerical value see chapter 3.2.2) and confirm.

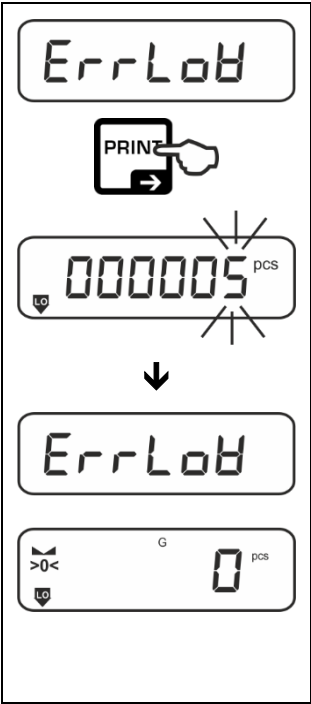
The scale will be switched to the menu <VALUE> again.

⇒ Using the navigation buttons $\uparrow$, select the <ErruPP> setting.

⇒ Confirm by pressing $\rightarrow$ button, the numerical value entry box is displayed. The active item is blinking.

⇒ Enter the upper tolerance limit; for entering the numerical value see chapter 3.2.2) and confirm.

The scale will be switched to the menu <ErruPP> again.



- ⇒ Using the navigation buttons $\uparrow\downarrow$, select the $\langle \text{ErrLoB} \rangle$ setting.
- ⇒ Confirm by pressing $\rightarrow$ button, the numerical value entry box is displayed. The active item is blinking.
- ⇒ Enter the lower tolerance limit; for entering the numerical value see chapter 3.2.2) and confirm.
- ⇒ The scale will be switched to the menu $\langle \text{ErrLoB} \rangle$ again.
- ⇒ To leave the menu, press $\leftarrow$ several times.

Once the setting works are completed, the scale is ready to start test counting.

2. Tolerance check start:

- ⇒ Determine the mean weight of an individual part, see chapter 11.2.1.
- ⇒ Place the weighed material and, based on the tolerance symbols / audible signal, check if the weighed material belongs to the preset tolerance range.

Weighed material below the preset tolerance	Weighed material in the preset tolerance range	Weighed material above the preset tolerance

12 Application <Weighing with the tolerance range>

12.1 Settings specific for the application



If the application <Weighing with the tolerance range> is not active yet, choose the menu item <MODE → CHECK>, see chapter 9.

Displaying the menu:

- ⇒ Press and hold the **TARE** button until the <APCERN> symbol is displayed.
- ⇒ The symbol is first changed to <CHNOD>, and then to <TAREE>.
- ⇒ Menu navigation, see chapter 13.1.

Overview:

Level 1	Level 2	Level 3	Description/chapter
TAREE Target weighing, see chapter 0	VALUE Target weight	ERRUPP	Upper tolerance limit
		ERRLOD	Lower tolerance limit
L .N .ES Test weighing, see chapter 0	L .NLOD	Lower limit value, for entering the numerical value see chapter 3.2.2	
	L .NUPP	Upper limit value, for entering the numerical value see chapter 3.2.2	
PREARE PRE-TARE function	ACTUEL	Taking over the placed weight as the PRE-TARE value, see chapter 10.2.1	
	NANUEL	Entering tare in the numerical form, see chapter 10.2.2	
	CLEAR	Deleting the PRE-TARE value	
MODE Application mode	WE .GH	weighing mode	see chapter 9
	COUNT	counting mode	
	CHECK	test mode	

12.2 Application use

12.2.1 Target weighing

The application <**Target weighing**> enables to weigh materials to the specific target number of pieces in the preset tolerance limits.

Achieving the target weight is indicated by an audible signal (if enabled in the menu) and a visual signal (tolerance symbols).

Visual signal:

Tolerance symbols provide the following information:

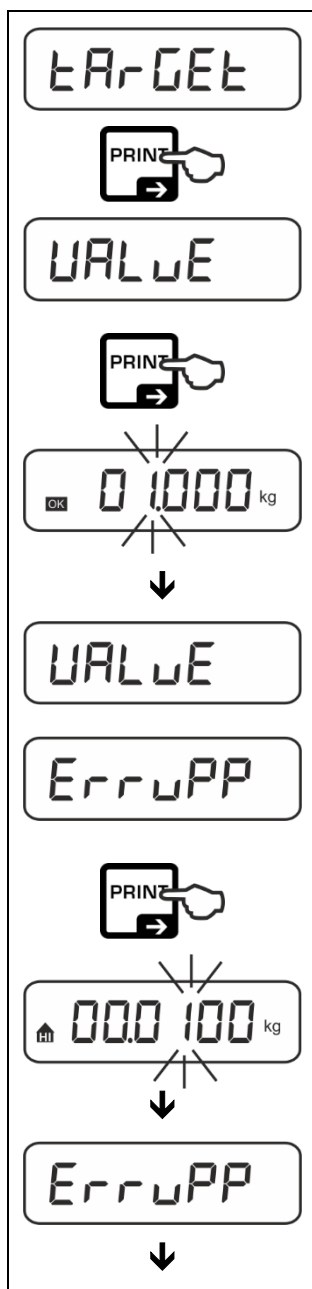
	Upper limit
	Target weight
	Lower limit

Audible signal:

The audible signal depends on the <SEtUP → bEEPER> menu setting, see chapter 13.3.1.

What to do:

1. Defining the target weight and tolerance



⇒ Use the navigation buttons $\uparrow/\downarrow$ to choose the setting <TARGET> and confirm by pressing $\rightarrow$.

The <VALUE> symbol will be displayed.

⇒ Confirm by pressing $\rightarrow$ button, the numerical value entry box is displayed. The active item is blinking.

⇒ Enter the target value (for entering the numerical value see chapter 3.2.2) and confirm.

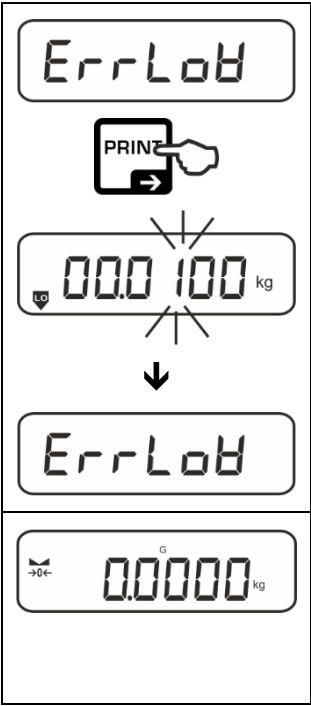
The scale will be switched to the menu <VALUE> again.

⇒ Using the navigation buttons $\uparrow/\downarrow$, select the <ErrUPP> setting.

⇒ Confirm by pressing $\rightarrow$ button, the numerical value entry box is displayed. The active item is blinking.

⇒ Enter the upper limit of weight deviation (for entering the numerical value see chapter 3.2.2) and confirm.

The scale will be switched to the menu <ErrUPP> again.



- ⇒ Using the navigation buttons $\uparrow\downarrow$, select the $\langle \text{ErrLoB} \rangle$ setting.
- ⇒ Confirm by pressing $\rightarrow$ button, the numerical value entry box is displayed. The active item is blinking.
- ⇒ Enter the lower limit of weight deviation (for entering the numerical value see chapter 3.2.2) and confirm.
- ⇒ The scale will be switched to the menu $\langle \text{ErrLoB} \rangle$ again.
- ⇒ To leave the menu, press $\leftarrow$ several times.

Once the setting works are completed, the scale is ready to start test weighing.

3. Tolerance check start:

- ⇒ Place the weighed material and, based on the tolerance symbols / audible signal, check if the weighed material belongs to the preset tolerance range.

Weighed material below the preset tolerance	Weighed material in the preset tolerance range	Weighed material above the preset tolerance

12.2.2 Test weighing

The application <Test weighing> enables to check if the weighed material belongs to the preset tolerance range.

Exceeding the limit values (fall below and rise above) is signaled with a visual indication (tolerance symbols) and an audible indication (if enabled in the menu).

Visual signal:

Tolerance symbols provide the following information:

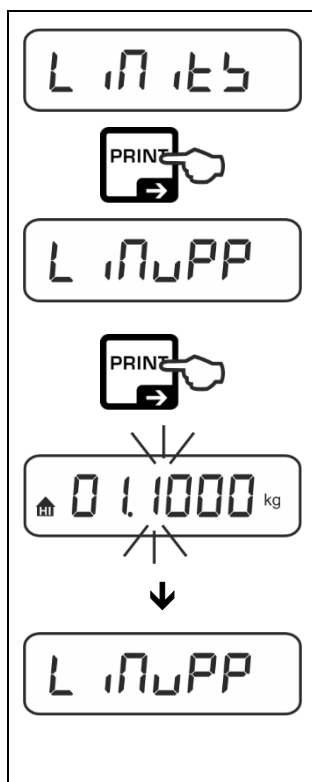
	Weighed material above the preset tolerance,
	Weighed material in the preset tolerance range
	Weighed portion below the preset tolerance,

Audible signal:

The audible signal depends on the <SETUP → BEEPER> menu setting, see chapter 13.3.1.

What to do:

1. Limit determination:



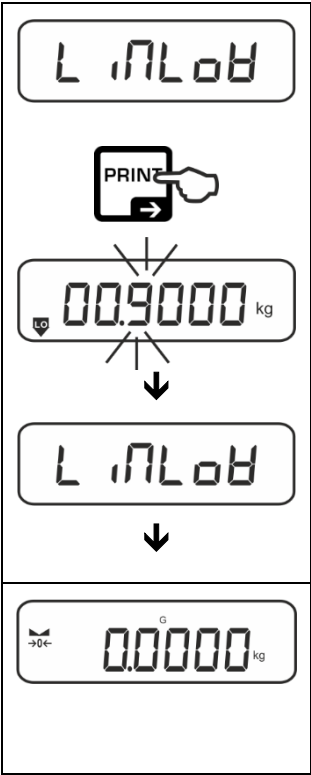
⇒ Use the navigation buttons ↓↑ to choose the setting <L 11.15> and confirm by pressing →.

The <L 11.15> symbol will be displayed.

⇒ Confirm by pressing →. The window for value entry in the numerical form will be displayed where you can enter the upper limit value. The active item is blinking.

⇒ Enter the upper limit value (for entering the numerical value see chapter 3.2.2) and confirm.

The scale will be switched to the menu <L 11.15> again.



- ⇒ Using the navigation buttons $\uparrow$, select the $\langle L \ 1nLoB \rangle$ setting.
- ⇒ Confirm by pressing $\rightarrow$. The window for value entry in the numerical form will be displayed where you can enter the lower limit value. The active item is blinking.
- ⇒ Enter the lower limit value (for entering the numerical value see chapter 3.2.2) and confirm.

The scale will be switched to the menu $\langle ErruPP \rangle$ again.

- ⇒ To leave the menu, press $\leftarrow$ several times.

Once the setting works are completed, the scale is ready to start test weighing.

4. Tolerance check start:

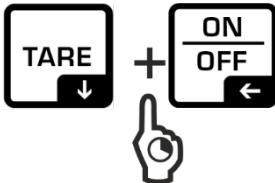
- ⇒ Place the weighed material and, based on the tolerance symbols / audible signal, check if the weighed material belongs to the preset tolerance range.

Weighed material below the preset tolerance	Weighed material in the preset tolerance range	Weighed material above the preset tolerance

13 Menu

13.1 Menu navigation

Displaying the menu:

Application menu	Setup menu
 In the weighing mode press and hold TARE button until the first menu item is displayed.	 Press and hold TARE i ON/OFF buttons simultaneously until the first menu item is displayed.

Parameter choice and setting:

Scrolling on the sale level	Using the navigation buttons, you may select consecutive menu blocks. Scroll forward using the navigation button ↓. Scroll backward using the navigation button ↑.
Activating menu item / selection confirmation	Press the navigation button →.
Return to a higher menu level / return to the weighing mode	Press the navigation button ←.

13.2 Application menu

The application menu enables fast and targeted access to the selected application (see chapter 9).



The overview of specific application settings is provided in every application description.

13.3 Setup menu

The setup menu enables to adapt the scale settings / scales behavior to your requirements (e.g. ambient conditions, special weighing processes).

Such settings are general and independent of the selected application.

13.3.1 <Setup> menu overview

Level 1	Level 2	Level 3	Level 4 / description
		Description	
cAL Adjustment	cALEHt	➔	External adjustment, see chapter 7.9.1
	cALEud	➔	User-defined external adjustment, see chapter 7.9.2
	GrARdJ	➔	Gravity constant in the adjustment point, see chapter 7.9.3
	GrAubE	➔	Gravity constant in the setting point, see chapter 7.9.4
coM Communication	rs232 ↕ usb-d ↕	bAud	300
			600
			1200
			2400
			4800
			9600
			14400
			19200
			38400
			57600
			115200
			128000
			256000
		dAtA	7db it5
			8db it5
		PAR ity	nonE
			odd
			EUEr
		StoP	1b it
			2b it5
		hAndsh	nonE
		Protoc	FcP (selectable solely for USB)
	BLAn	on	
		oFF	

Print Data transmission	Interface	RS232	RS-232 interface	
		USB-d	USB interface of the device	
	Sum	on	Summing mode on/off, see chapter 14.5.1	
		off		
	Print mode	MANUAL	on, off Data transfer after pressing the PRINT button, see chapter 14.5.2	
		Auto	on, off Automatic data sending with the stable and positive weighing value, see chapter 14.5.3. Displaying again only when the zero indication is displayed and stabilized, depending on <Z-RANGE> settings, you can choose: (off, 1, 2, 3, 4, 5)	
		cont	on, off Continuous data transfer depending on the preset cycle <SPEED>, see chapter 14.5.4	
		Format	Short	Standard measurement protocol
			Long	Extended measurement protocol
		LAYOUT	Not documented	
BEEPER Audible signal	KEYS	off	Audible signal switch on/off by pressing the button	
		on		
	CHECK	ch-off	off	The audible signal is off
			Slow	Slow
			Standard	Standard
			Fast	Fast
			Continuous	Continuous
		ch-Slow	off	The audible signal is off
			Slow	Slow
			Standard	Standard
			Fast	Fast
			Continuous	Continuous
		ch-High	off	The audible signal is off
			Slow	Slow
			Standard	Standard
			Fast	Fast
			Continuous	Continuous

AutoFF The automatic switch-off function for the battery-operated device	Node	oFF	Automatic switch-off function enabled	
		Auto	Automatic scale switch-off after the time defined in <time> menu item elapsed with no change of the load or when not operated	
		only0	Automatic switch-off only for the zero indication	
	time	30s	Automatic scale switch-off after the preset time elapsed with no change of the load or when not operated	
		10 min		
		20 min		
		50 min		
		300 min		
600 min				
button5 Function button allocation	Not documented			
BLight Display backlight	Node	ALWAYS	Display illumination always on	
		time	Automatic illumination switch-off after the time defined in <time> menu item elapsed with no change of the load or when not operated	
		noBL	Display illumination always off	
	time	5s	Defining the time when the backlighting is switched off automatically without changing the load or operating	
		10s		
		30s		
		10 min		
		20 min		
		50 min		
		300 min		
tAREG Taring range	100% ↕ 10%	Defining the maximum taring range, you can choose 10–100%. To enter the numerical value, see chapter 3.2.2.		
ZeroAck Maintaining zero	on	Automatic maintaining zero [≤3 d]		
	oFF	i If the amount of the weighed material is reduced or increased significantly, the scale's “stabilizing and compensating” mechanism can result in displaying erroneous weighing results! (e.g.: slow outflow of the liquid from the container placed on the scale, evaporating processes). When dosing with small weight fluctuations, it is recommended to switch this function off.		

ህክህ Units	(for available units see chapter 1	Here, you can set the units to be available in the <unit> menu. To switch between the units for which <□□> setting is selected, use the button  .
	FFA	For weighing with the multiplication factor, see chapter 10.2.5
	%	Unit of the application <Determining the percentage value>, see chapter 10.2.4
	Pcs	Unit of the application <Counting the number of pieces>
	mol	“Mol” weighing mode, see chapter 10.2.6
ጠወደኔ Applications see chapter 9	ዘደ ሲክ	Application <Weighing>
	count	Application <Counting the number of pieces>
	ከደርክ	Application <Test weighing>
ፖይንት	Scale resetting to factory settings	

14 Communication with a peripheral device using KUP

The interfaces enable to exchange weighing data with the connected peripherals.

The data can be transferred to the printer, computer or control indicators. And vice versa, it enables to give control commands and enter data using the connected devices.

PCD series scales have KUP (KERN Universal Port) as a standard.

You can use the following three interface options:

	Interface adapter with a cable	
	Product number / type	Model
RS-232	TYKUPB-03-A	YKUP-03
USB	TYKUPB-04-A	YKUP-04
WLAN	TYKUPB-05-A	YKUP-05



The available interfaces can be used in parallel.

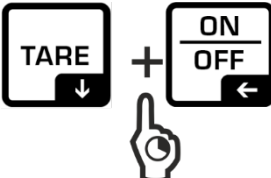
Scale port load



KUP = VGA Connector = DSub Connector with 15 pins in 3 rows

Pin	Details
1	KUP1_TX
2	KUP2_TX
3	KUP3_TX
4	NC
5	GND
6	KUP1_RX
7	KUP2_RX
8	KUP3_RX
9	VDD3V3
10	NC
11	NC
12	NC
13	V6.5
14	NC
15	KUP_RES

14.1 RS-232 (TYKUPB-03-A)

Printer connection	⇒ Switch the scale and the printer off. ⇒ Connect the scale using the appropriate interface adapter (TYKUPB-03-A) to the printer interface. ⇒ Switch the scale and the printer on.
Interface configuration	⇒ Display the setup menu, see chapter 13.1.  Setting communication parameters: ⇒ Select <C0F> menu setting and confirm, pressing ➔, see chapter 13.3.1. ⇒ Use the navigation buttons ↑↓ to choose the setting <F232> and confirm by pressing ➔. The first communication parameter, i.e. <Baud>, will be displayed. ⇒ Confirm by pressing the ➔ button, the current setting will be displayed. ⇒ Use the navigation buttons ↑↓ to choose the required setting and confirm by pressing ➔. The scale will be switched back to the menu <Baud> again. ⇒ Use the navigation buttons to display the following consecutive communication parameters: data bit, parity, stop, handshake, protocol and set them in the same way. For selection options see chapter 13.3.1. How to select data transmission method: ⇒ Select <Pr 00> menu setting and confirm, pressing ➔, see chapter 13.3.1. Wait until the first menu item <00FE> is displayed. ⇒ Confirm by pressing the ➔ button, the current setting will be displayed. ⇒ Use the navigation buttons ↑↓ to choose the setting <F232> and confirm by pressing ➔.

	⇒ Confirm by pressing ➔. The scale will be switched back to the menu < 0.0000 FCE >.
	⇒ Use the navigation buttons to display consecutive menu items (PrMODE, count, ForPAE, see chapter 14.5) and set the parameters in the same way. For selection options see chapter 13.3.1.
	⇒ To leave the menu, press ⬅ several times.



Communication parameters (e.g. transmission speed, bits and parity) of the scale and printer must be compliant.

Standard KERN settings (factory setting):

- 9,600 bauds
- 8 data bits
- 1 stop bit
- no parity

14.1.1 Protocol templates (KERN YKB-01N)

Weighing mode, target weighing and test weighing

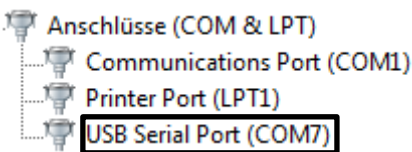
N:	S S	2,998 kg	Net weight (stable weighing value)
T:		0.3000 kg	Tare
G:		3.2999 kg	Gross weight

N:	S D	2,998 kg	Net weight (unstable weighing value)
T:		0.3000 kg	Tare
G:		3.2999 kg	Gross weight

Counting the number of pieces, check counting

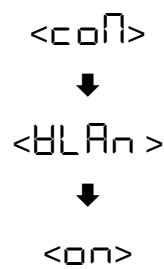
N:	S D	3.2998 kg	Net weight (unstable weighing value)
T:		0.0000 kg	Tare
G:		3.2998 kg	Gross weight
PCS:		33 pcs	Placed number of pieces
UW:		0.1000 kg	Average weight of a single part
REF:		10 pcs	Number of reference items

14.2 USB (TYKUPB-03-A)

Settings in the setup menu	<Pr int> ↓ < intFcE> ↓ <u5b-d> ⇒ For setting communication parameters, see chapter 14.1
Device connection	⇒ Switch the scale off. ⇒ Connect the device with the main computer by means of the delivered USB cable (TYKUPB-03-A). ⇒ Switch the scale on. The virtual COM port will be detected and it will get the suitable number. Example (Microsoft Windows device manager)  The required USB controller of the scale is pre-installed on the devices with the latest operating system. Unless it is detected by the system automatically, the suitable controller may be found in the Downloads tab at http://www.kern-sohn.com.

14.3 WLAN (TYKUPB-05-A)

Settings in the setup menu



- ⇒ Switch the scale off.
- ⇒ Connect the relevant port adapter (TYKUPB-05-A).
- ⇒ Switch the scale on.
- ⇒ When switched on with no configuration, the scale will first create the access point to WLAN called “AI-Thinker_xxxxxx.neu”.
- ⇒ Connect the scale to the computer using the said access point.
- ⇒ Enter the IP address of the scale 192.168.4.1 in the Internet browser. The configuration page is displayed. The static IP address is preset using KCP commands.

The image shows the ESP8266 WebConfig interface with three main sections: Serial Setting, SoftAP, and Station. The Station section is active, showing fields for Mode (apsta), AP Name (PDWLAN), AP Password (12345678), IP address (0.0.0.0), Subnet mask (0.0.0.0), Gateway (0.0.0.0), and Mac (bc:dd:c2:87:2b:77). Labels A, B, and C are placed next to the Mode, AP Name/Password, and Save buttons respectively.

A	Select “apsta” operating mode.
B	Enter the WLAN name and the relevant password.
C	Save the settings and restart the target software (Restart button).

- ⇒ Disconnect from the computer (access point) and disconnect the power supply of YKV module.



After the settings are entered in the device, ensure the scale power supply has been disconnected.

Only then the settings will be applied.

Updating (Restart button) and saving (Save button) are not sufficient.

E

- Connect the power supply to YKV module again.
- Establish connection with the computer (access point).
- Display the configuration page and check the IP address.

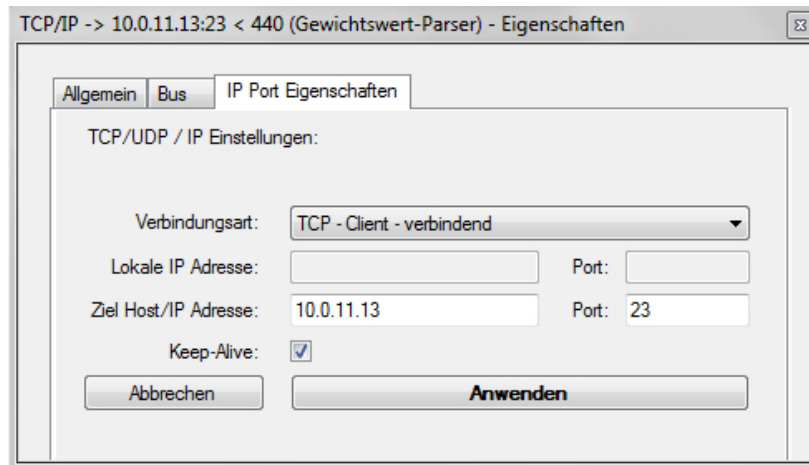
(See figure:)

ESP8266 WebConfig Restore Reboot

Serial Setting	SoftAP	Station
Baud: 115200	SSID: AI-THINKER_872B77	Mode: apsta
Databits: 8	Passwd:	AP Name: PDWLAN
Parity: NONE	Auth Mode: OPEN	AP Password: 12345678
Stopbits: 1	IP addr: 192.168.4.1	IP address: 10.0.11.13 E
	Subnet mask: 255.255.255.0	Subnet mask: 255.255.0.0
	Gateway: 192.168.4.1	Gateway: 10.0.0.1
	Mac: be:dd:c2:87:2b:77	Mac: bc:dd:c2:87:2b:77
Save	Save	Save

- ⇒ Close the configuration page and connect the computer to the selected network.

- ⇒ Open the target software (e.g. KERN Balance Connection) and enter the IP address and the port number 23, see the figure below.



To check the configuration allocated by DHCP and to ensure customized/permanent configuration of the IP address, subnet mask or gate, you may use **JNWx** commands of KCP.

14.4 KERN Communications Protocol

KCP is a standardized set of interface commands for KERN scales enabling to display many parameters and functions of the device and to control them. Thanks to it, KERN devices with KCP may be easily connected to a computer, industrial control systems and other digital systems. 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).

To activate KCP, follow the description in the menu overview in the manual for a given scale.

KCP is based on ordinary commands and responses in ASCII format. Every interaction is composed of a command or arguments separated by spaces and is finished with <CR><LF> commands.

KCP commands supported by the scale may be displayed by sending an inquiry composed of "I0" command and CR LF commands.

The list of most often use KCP commands:

I0	Display all the implemented KCP commands
S	Submit a stable value
SI	Submit the current value (including an unstable one)
SIR	Submit the current value (including an unstable one) and repeat
T	Taring
Z	Zeroing

Example:

Befehl	S	
Possible re-sponses	S_ S_ 100.00_g S_l S_+ or S_-	Command acceptance, command implementation start Another command is implemented now, time limit exceeded Overloading or insufficient loading

14.5 Data transfer functions

14.5.1 Summing mode <Σ>

This function enables to add individual weighing values to the total memory once the button is pressed and to print them once connected to an optional printer.

Function enabling:

- ⇒ In the setup menu, display the <Pr Mode → Σ> menu item and confirm, pressing →.
- ⇒ Use the navigation buttons ↓↑ to choose the setting <On> and confirm by pressing →.
- ⇒ To leave the menu, press the navigation button ← several times.



Preliminary condition: Menu setting <Pr Mode → NORMAL → On>

Summing the weighed material:

- ⇒ Whenever required, place an empty container on the scale and tare it.
- ⇒ Place the first weighed material. Wait until the stabilization indicator is displayed (▴▴), and press PRINT. First <Σ 1> symbol and then the current weight value will be displayed. The weight value will be saved and sent to the printer. The Σ symbol will be displayed. Remove the weighed material.
- ⇒ Place the second weighed material. Wait until the stabilization indicator is displayed (▴▴), and press PRINT. First <Σ 2> symbol and then the current weight value will be displayed. The weight value will be saved and sent to the printer. Remove the weighed material.
- ⇒ Add the weight of another weighed material to the total, as specified above.
- ⇒ This process may be repeated at any frequency until you reach the scale weighing range.

Displaying and printing the “Total”

- ⇒ Press and hold the PRINT button. The number of weighing actions and the total weight will be displayed.
The total memory will be deleted; the [Σ] symbol will go off.

Protocol template (KERN YKB-01N)

Menu setting <PrNode → Format → Short>

No.				1	PRINT	First weighing
N:	S S	1.9993	kg			
T:		0.0000	kg		PRINT	
G:		1.9993	kg			
C:		1.9993	kg			
No.				2		Second weighing
N:	S S	0.9992	kg			
T:		0.0000	kg			
G:		0.9992	kg		PRINT	
C:		2.9985	kg			
No.				3		Third weighing
N:	S S	0.4992	kg			
T:		0.0000	kg			
G:		0.4992	kg		PRINT	
C:		3.4977	kg			
No.				3		
C:		3.4977	kg			Number of weighing actions /total

14.5.2 Data transfer after pressing the PRINT <PRINT> button

Function enabling:

- ⇒ In the setup menu, display the <Print → PrNode> menu item and confirm, pressing →.
- ⇒ To transfer data manually, using navigation buttons ↑↓, choose the <PRINT> menu item and confirm by pressing →.
- ⇒ Use the navigation buttons ↑↓ to choose the setting <OK> and confirm by pressing →.
- ⇒ To leave the menu, press the navigation button ← several times.

Placing the weighed material:

- ⇒ Whenever required, place an empty container on the scale and tare it.
- ⇒ Place the weighed material. The weighing value will be transferred after PRINT button is pressed.

14.5.3 Automatic data transfer <Auto>

Data transfer takes place automatically without pressing the **PRINT** button provided the appropriate transfer conditions are met depending on the menu setting.

Function enabling and transfer condition setting:

- ⇒ In the setup menu, display the <Print → PrintMode> menu item and confirm, pressing →.
- ⇒ To transfer data automatically, using navigation buttons ↓↑, choose the <Auto> menu item and confirm by pressing →.
- ⇒ Use the navigation buttons ↓↑ to choose the setting <On> and confirm by pressing →. The <Auto> symbol will be displayed.
- ⇒
- ⇒ Confirm by pressing → and use the navigation settings ↓↑ to set the required transfer condition.
- ⇒ Confirm pressing →.
- ⇒ To leave the menu, press the navigation button ← several times.

Placing the weighed material:

- ⇒ Whenever required, place an empty container on the scale and tare it.
- ⇒ Place the weighed material and wait until the stabilization indicator is displayed ().
The weighing value will be transferred automatically.

14.5.4 Continuous data transfer <Cont>

Function enabling and transfer cycle setting:

- ⇒ In the setup menu, display the <Print → PrintMode> menu item and confirm, pressing →.
- ⇒ To transfer data continuously, using navigation buttons ↓↑, choose the <Cont> menu item and confirm by pressing →.
- ⇒ Use the navigation buttons ↓↑ to choose the setting <On> and confirm by pressing →.
- ⇒ The <Cont> symbol will be displayed.
- ⇒ Confirm by pressing → and using the navigation buttons, ↓↑, set the required cycle (for introducing the numerical value, see chapter 3.2.2).
- ⇒ To leave the menu, press the navigation button ← several times.

Place the weighed material.

- ⇒ Whenever required, place an empty container on the scale and tare it.
- ⇒ Place the weighed material.
- ⇒ The weighing values will be transferred in line with the predefined cycle.

Protocol template (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
S S	2.9996	kg

14.6 Data format

- ⇒ In the setup menu, display the <Pr int → Pr Mode> menu item and confirm, pressing →.
- ⇒ Use the navigation buttons ↓↑ to choose the menu setting <ForMat> and confirm by pressing →.
- ⇒ Using the navigation buttons ↓↑, select the required setting. You can choose:
 - <Short> Standard measurement protocol
 - <Long> Extended measurement protocol
- ⇒ Confirm the setting, pressing →.
- ⇒ To leave the menu, press the navigation button ← several times.

Protocol template (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

15 Maintenance, service and disposal



Before you start any works related to the maintenance, cleaning and repair, disconnect the device from the operating voltage.

15.1 Cleaning

Do not use any aggressive cleaning agents (solvents etc.), but clean the device with a cloth and mild soap solution. The liquid must not get inside the device. Wipe with a dry, soft cloth.

Any loose specimen/powder remains can be removed carefully with a brush or a handheld vacuum cleaner.

Remove any scattered weighed material immediately.

15.2 Maintenance and service

- ⇒ The device can be operated and maintained solely by the technicians trained and authorized by KERN.
- ⇒ Disconnect from the mains before opening.

15.3 Disposal

The packaging and the device should be disposed in accordance with the national or regional law in the location where the device is operated.

16 Help for any minor failures

If there are any program execution problems, the scale should be switched off and disconnected from the mains for a while. Next, the weighing process should be started anew.

Problem	Possible cause
The weight indicator is not lit	• The scale is not on. • Interrupted mains connection (mains cable not connected/damaged). • Mains voltage failure.
The weight indication keeps fluctuating.	• Draft / air movements. • Table/air vibrations. • The scale plate is in contact with foreign bodies. • Electromagnetic fields / static discharge (select another location / if possible, switch off the interfering device).
The weighing result is clearly wrong.	• The scale indication was not reset. • Incorrect adjustment. • Scale not placed on a level surface. • There are heavy temperature fluctuations. • The heating time not observed. • Electromagnetic fields / static discharge (select another location / if possible, switch off the interfering device).

17 Error messages

Error message	Explanation
2L n t	Zeroing range exceeded (upward)
undEr2	Zeroing range exceeded (downward)
instAb	Unstable load
Brong	Adjustment error
L---	Insufficient loading
----	Overloading
Lo bAt	Discharged batteries/rechargeable batteries