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Operating instructions
Precision scales

KERN PBS / PBJ

TPBJ 8200-1M-B, 6200-2M-B, 4200-2M-B, 2200-2M-B, 1020-3-B, 620-3M-B

TPBS 620-3-B, 1020-3-B, 4200-2-B, 6200-2-B

Version 1.0
2025-07
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KERN PBS / PBJ

Version 1.0 2025-07

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1 Technical data

KERN	PBJ 600-3M	PBJ 1000-3	PBJ 2000-2M
Item number / type	TPBJ 620-3M-B	TPBJ 1020-3-B	TPBJ 2200-2M-B
Readability (d)	0,001 g	0,001 g	0,01 g
Weighing range (max)	620 g	1.02 kg	2.2 kg
Reproducibility	0,001 g	0,001 g	0,01 g
Linearity	± 0,002 g	± 0,003 g	± 0,02 g
Settling time (typical)	2,5 s	2,5 s	2,5 s
Calibration value (e)	0,01 g	-	0,1 g
Calibration class	I	-	II
Minimum weight (min)	0,1 g	0,1 g	0,5 g
Smallest part weight when counting parts under laboratory conditions*	1 mg	1 mg	10 mg
Smallest part weight when counting parts under normal conditions**	10 mg	10 mg	100 mg
Adjustment option	Internal		
Warm-up time	4 h	4 h	2 h
Weighing units	kg, g	kg, g	kg, g, ct
Air humidity	max. 80 % relative (non-condensing)		
Permissible ambient temperature	10-30 °C		
Input voltage device	DC 12 V, 1 A		
Input voltage power supply unit	AC 100-240 V, 50 / 60 Hz		
Housing dimensions [mm]	191 x 317 x 79		
Dimensions [mm] (fully assembled)	202 x 317 x 166	202 x 317 x 166	202 x 317 x 166
Weighing plate, stainless steel [mm]	113 x 110	113 x 110	176 x 189
Draft shield dimensions [mm]	Inside 180 x 193 x 87	Inside 180 x 193 x 87	-
	Exterior 202 x 228 x 103	Exterior 202 x 228 x 103	
Net weight (kg)	4.2 kg	5.0 kg	5.0 kg
Interfaces	RS232		
Underfloor weighing system	Hook	Hook	Hook
Degree of soiling	2		
Overvoltage category	Category I		
Altitude metres	Up to 2000 m		
Installation site	Only in closed rooms		

KERN	PBJ 4000-2M	PBJ 6000-2M	PBJ 8000-1M
Item number / type	TPBJ 4200-2M-B	TPBJ 6200-2M-B	TPBJ 8200-1M-B
Readability (d)	0,01 g	0,01 g	0,1 g
Weighing range (max)	4.2 kg	6.2 kg	8.2 kg
Reproducibility	0,01 g	0,01 g	0,1 g
Linearity	± 0,02 g	± 0,02	± 0,2
Settling time (typical)	2,5 s	2,5 s	1,2 s
Calibration value (e)	0,1 g	0,1 g	1 g
Calibration class	II	I	II
Minimum weight (min)	0,5 g	1 g	5 g
Smallest part weight when counting parts under laboratory conditions*	500 mg	10 mg	100 mg
Smallest part weight when counting parts under normal conditions**	5 g	100 mg	1 g
Adjustment option	internal		
Warm-up time	2 h	2 h	2 h
Weighing units	kg, g, ct	kg, g	kg, g
Air humidity	max. 80 % relative (non-condensing)		
Permissible ambient tempe-rature	10-30 °C		
Input voltage device	DC 12 V, 1 A	DC 12 V, 1 A	DC 12 V, 1 A
Input voltage power supply unit	AC 100-240 V, 50 / 60 Hz		
Housing dimensions [mm]	191 x 317 x 79		
Dimensions [mm] (fully assembled)	191 x 317 x 79		
Weighing plate, stainless steel [mm]	176 x 189		
Net weight (kg)	5,0 kg		
Interfaces	RS232		
Underfloor weighing system	Hook		
Degree of soiling	2		
Overvoltage category	Category I		
Altitude metres	Up to 2000 m		
Installation site	Only in closed rooms		

KERN	PBS 600-3
Item number / type	TPBS 620-3-B
Readability (d)	0,001 g
Weighing range (max)	620 g
Reproducibility	0,001 g
Linearity	± 0,002 g
Settling time (typical)	2,5 s
Smallest part weight when counting parts under laboratory conditions*	1 mg
Smallest part weight when counting parts under normal conditions**	10 mg
Recommended calibration weight, not included, (class)	100–600 g (E2)
Adjustment points	100-600 g
Warm-up time	4 h
Weighing units	kg, g, mg, t, gn, dwt, tl (Tw), tl (HK), ozt, tl (Singap, Malays), ct, lb, oz, tl (Cn), m, PCS, %, D, mom, B (m= meshgal, b= baats)
Air humidity	max. 80 % relative (non-condensing)
Permissible ambient tempe-rature	10-30 °C
Input voltage device	DC 12 V, 1 A
Input voltage power supply unit	AC 100-240 V, 50 / 60 Hz
Housing dimensions [mm]	191 x 317 x 79
Dimensions [mm] (fully assembled)	202 x 317 x 166
Weighing plate, stainless steel [mm]	113 x 110
Draft shield dimensions [mm]	Inside 180 x 193 x 87
	Exterior 202 x 228 x 103
Net weight (kg)	3.2 kg
Interfaces	RS232
Underfloor weighing system	Hook
Degree of soiling	2
Overvoltage category	Category I
Altitude metres	Up to 2000 m
Installation site	Only in closed rooms

KERN	PBS 1000-3	PBS 4000-2	PBS 6000-2
Item number / type	TPBS 1020-3-B	TPBS 4200-2-B	TPBS 6200-2-B
Readability (d)	0,001 g	0,01 g	0,01 g
Weighing range (max)	1.02 kg	4.2 kg	6.2 kg
Reproducibility	0,001 g	0,01 g	0,01 g
Linearity	± 0,002 g	± 0,02 g	± 0,02 g
Settling time (typical)	2,5 s	2,5 s	2,5 s
Smallest part weight when counting parts under laboratory conditions*	1 mg	10 mg	10 mg
Smallest part weight when counting parts under normal conditions**	10 mg	100 mg	100 mg
Recommended calibration weight, not included, (class)	600 g (E2)	4 kg (E2)	6 kg (E2)
Adjustment points	100-1000g	1-4 kg	1-6 kg
Warm-up time	4 h	4 h	4 h
Weighing units	kg, g, mg, t, gn, dwt, tl (Tw), tl (HK), ozt, tl (Singap, Malays), ct, lb, oz, tl (Cn), m, PCS, %, D, mom, B (m= meshgal, b= baats)		
Air humidity	max. 80 % relative (non-condensing)		
Permissible ambient tempe-rature	10-30 °C		
Input voltage Device	DC 12 V, 1 A		
Input voltage power supply unit	AC 100-240 V, 50 / 60 Hz		
Housing dimensions [mm]	191 x 317 x 79		
Dimensions [mm] (fully assembled)	202 x 317 x166	202 x 317 x166	202 x 317 x166
Weighing plate, stainless steel [mm]	113 x 110	113 x 110	113 x 110
Draft shield dimensions [mm]	Inside 180 x 193 x 87 Exterior 202 x 228 x 103	-	-
Net weight (kg)	3.2 kg	3.2 kg	3.4 kg
Interfaces	RS232	RS232	RS232
Underfloor weighing system	Hook	Hook	Hook
Degree of soiling	2		
Overvoltage category	Category I		
Altitude metres	Up to 2000 m		
Installation site	Only in closed rooms		

2 Declaration of Conformity

You can find the current EC/EU Declaration of Conformity online at

www.kern-sohn.com/ce

ℹ For verified scales (= conformity-assessed scales), the declaration of conformity is included in the scope of delivery.

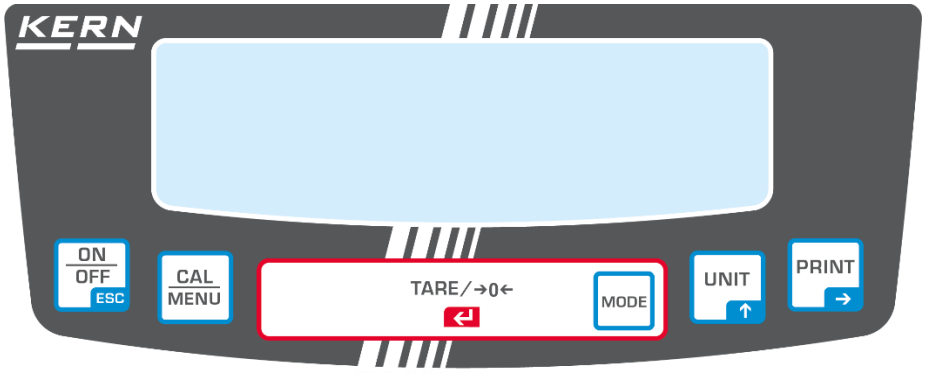
3 Device overview

Models with readability d = 0.001 g:

Models with readability d≥ 0.01 g:

1. Windbreak
2. Weighing plate
3. Display
4. Keyboard
5. Foot screw

3.1 Keyboard overview



In weighing mode:

Button	Designa-tion	Press once and again release	Press and hold for ap-prox. 3 seconds
ON/OFF ESC	**[ON/OFF]**	Switches between operating and standby mode.	Exit menu / return to mode
CAL MENU	**[CAL]**	Calls up the adjustment or the menu selection. (*1)	Displays the last menu item set.
TARE / →0←	**[TARE]**	Taring / zeroing	No operation
UNIT	**[UNIT]**	Switch weighing unit (*3)	No operation
PRINT	**[PRINT]**	Output of the weight value to exter-nal devices (printer, PC	Output of date and time to external devices.

*1 This button is used to set values if per cent (%), number of pieces (PCS), specific gravity of solids (▼d) or specific gravity of liquids (d) is displayed.

*3 Units other than "g" must first be set up in the scale before they can be used for measure-ments. Only grams (g), per cent (%) and piece counting (PCS) are set at the factory.

In the menu:

Button	Designation	Press once and again release	Press and hold for approx. 3 seconds
ON/OFF ESC	**[ON/OFF]**	Back to the submenu or weighing mode	Back to weighing mode
CAL MENU	**[CAL]**	Goes to the next menu item.	Displays the last set menu menu item.
TARE / →0← ↵	**[TARE]**	The last menu item displayed is selected and set.	No operation
UNIT ↑	**[UNIT]**	Enter numerical values. Increases the numerical value of the flashing digit by 1.	No operation
PRINT →	**[PRINT]**	Enter numerical values. Goes to the next digit.	No operation

3.1.1 Numerical input

Button	Designation	Function
UNIT ↑	button ↑	Increase flashing digit
PRINT →	button →	Digit dialling to the right
TARE / →0← ↵	Navigation button ↵	Confirm input
ON/OFF ESC	ESC	Cancel input

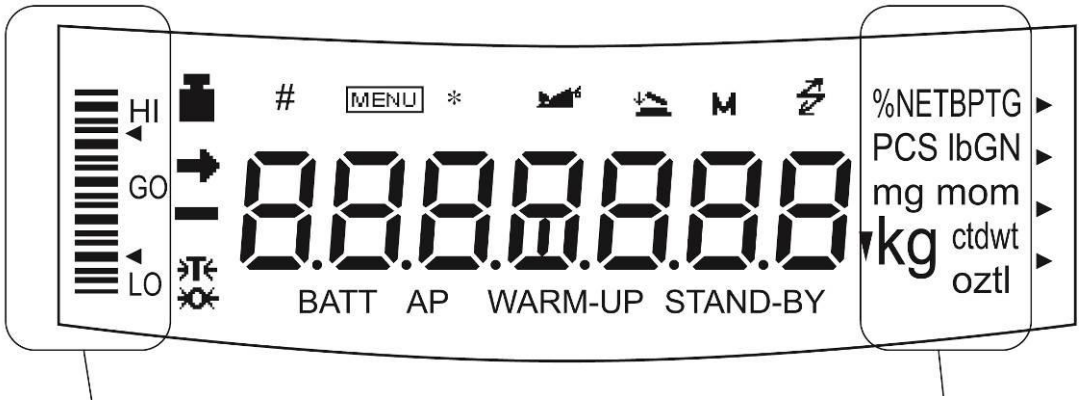
- The [#] indicator is displayed for numerical input.
- "SET" indicates that the value has been saved successfully.
- If "ERR" is displayed, the value could not be saved successfully, return to the menu at ON/OFF ESC and repeat the entry.

3.1.2 Set decimal point when entering numerical values

A decimal point only needs to be entered when determining density or if a multiplier is to be defined for the user-defined unit.

- Press the PRINT button repeatedly until the last digit flashes. Press the PRINT button again to enter decimal point setting mode. The inverted triangle symbol ▼ or the current decimal point flashes.
- Press the UNIT button to move the decimal point one place at a time to the desired position.
- Press the TARE / →0← button to set the position of the decimal point. The message "SEt" appears briefly to indicate that the setting is complete.

3.2 Display overview



Capacity display

Unit display

Display	Designation	Description of the
➜	Stability indicator	Indicates that the weight value is stable. (*1) Indicates the currently selected element in the menu element selection.
T	Tare symbol	Indicates that a pre-tarring value is set.
	Weight symbol	Lights up during measuring range adjustment. Displays the adjustment settings during menu selection. Flashes before the automatic measuring range adjustment starts. **Note:** If automatic adjustment is not activated, the operator must carry out the adjustment as soon as this symbol flashes. • with the built-in weight (**PBJ** models see section8.3 1.1) • with external weight (for **PBS** models, see section).8.1.2
([) (])	Brackets	On calibrated scales, the non-calibrated value is in brackets.
#	Number sign	Displays the input of numerical values.
MENU	Menu icon	Appears during menu selection. Always appears when the menu is locked.
*	Asterisk	Indicates that the displayed numerical value is not a weight value.
	Communication symbol	Lights up during communication with external devices via the RS-232C cable. Signals that the communication functions are set to ON.
▼	Inverted triangle symbol	Displays the setting of the specific weight measurement. Serves as a replacement for the decimal point.
→0←	Zero display	
	Animal symbol	Displays the setting of the animal weighing function.
	Symbol for automatic storage and zeroing	Displays the setting for automatic storage and zeroing.
M	Memory symbol	Scale is in recipe mode
AP	Symbol for automatic printing	Displays the setting of the automatic print function.
STAND-BY	Standby symbol	Lights up when the power supply to the scale is in standby mode. Also lights up when the application function has switched to standby mode.

*1 Stability symbol
The display value may fluctuate when the stability symbol is permanently illuminated if the load changes slowly or the stability detection band has been set to a large value.

4 Basic information (general)

4.1 Intended use

The scales you have purchased are used to determine the weight of goods to be weighed. It is intended for use as a "non-automatic scale", i.e. the sample is placed manually, carefully and centred on the weighing plate. Once a stable weight value has been reached, the weight value can be read off.

4.2 Improper use

- Our scales are non-automatic scales and are not intended for use in dynamic weighing processes. However, the scales can also be used for dynamic weighing processes after checking the individual area of application and, in particular, the accuracy requirements of the application.
- Do not leave a permanent load on the weighing plate. This can damage the measuring mechanism.
- Avoid shocks and overloading the scales above the specified maximum load (Max), minus any tare load already present. This could damage the scales.
- Never operate the scales in potentially explosive atmospheres. The standard version is not explosion-proof.
- The scale must not be modified in any way. This can lead to incorrect weighing results, safety-related defects and the destruction of the scale.
- The scale may only be used in accordance with the specifications described. Deviating areas of use/application must be approved in writing by KERN.

4.3 Guarantee

Warranty expires with

- Non-compliance with our specifications in the operating instructions
- Use outside the described applications
- Modifying or opening the device
- Mechanical damage and damage caused by media, liquids Natural wear and tear
- Improper set-up or electrical installation
- Overload of the measuring unit

4.4 Test equipment monitoring

As part of quality assurance, the metrological properties of the scales and any test weights must be checked at regular intervals. The responsible user must define a suitable interval as well as the type and scope of this check. Information regarding the test equipment monitoring of balances and the test weights required for this is available on the KERN homepage (www.kern-sohn.com). In its accredited DKD calibration laboratory, KERN can calibrate test weights and scales quickly and cost-effectively (traceability to the national standard).

5 Basic safety instructions

5.1 Observe the notes in the operating instructions

Please read these operating instructions carefully before installation and commissioning, even if you already have experience with KERN scales

5.2 Staff training

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

6 Transport and storage

6.1 Control on takeover

Please check the packaging immediately upon receipt and the appliance for any visible external damage when unpacking.

6.2 Packaging

- ⇨ Keep all parts in the original packaging for any necessary return transport.
- ⇨ Only the original packaging is to be used for return transport.
- ⇨ Disconnect all connected cables and loose/movable parts before despatch.
- ⇨ Refit any transport locks provided.
- ⇨ Secure all parts, e.g. glass draft shield, weighing plate, power supply unit, etc. against slipping and damage.

7 Unpacking, installation and commissioning

7.1 Installation site, place of use

The scales are designed to achieve reliable weighing results under normal operating conditions.
You can work accurately and quickly if you choose the right location for your scales.

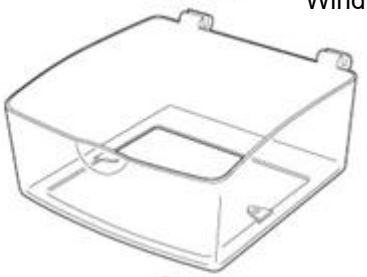
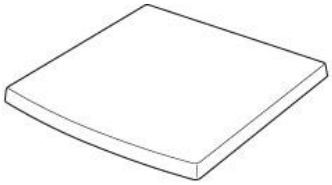
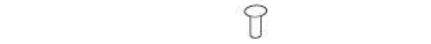
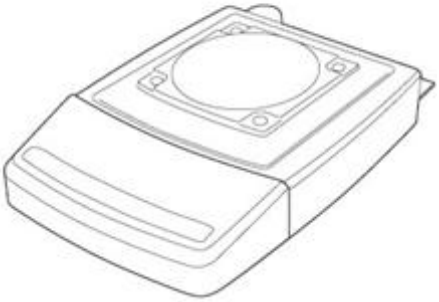
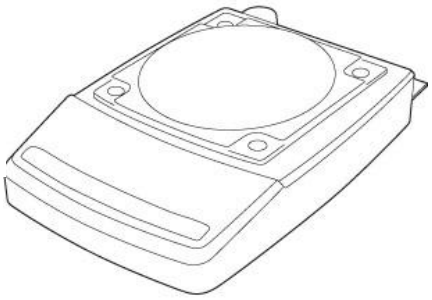
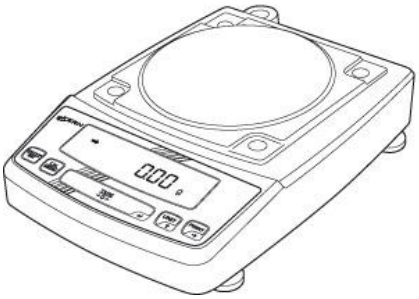
Observe the following at the installation site:

- Place the scales on a stable, level surface.
- Avoid extreme heat and temperature fluctuations, e.g. by placing the appliance next to a radiator or in direct sunlight.
- Protect the scales from direct draughts through open windows and doors.
- Avoid vibrations during weighing.
- Protect the scales from high humidity, vapours and dust.
- Do not expose the appliance to high humidity for long periods of time. Unauthorised condensation (condensation of humidity on the appliance) can occur if a cold appliance is brought into a much warmer environment. In this case, acclimatise the appliance disconnected from the mains for approx. 2 hours at room temperature.
- Avoid static charging of items to be weighed and weighing containers.
- Do not operate in potentially explosive atmospheres or in areas at risk of explosion due to gases, vapours, mists or dusts!
- Chemicals (e.g. liquids or gases) that could attack and damage the inside or outside of the scales must be kept away.
- If electromagnetic fields or static charges occur (e.g. when weighing / counting plastic parts) or if the power supply is unstable, large display deviations (incorrect weighing results and damage to the scales) are possible. The location must then be changed or the source of interference eliminated

7.2 Unpacking / Scope of delivery

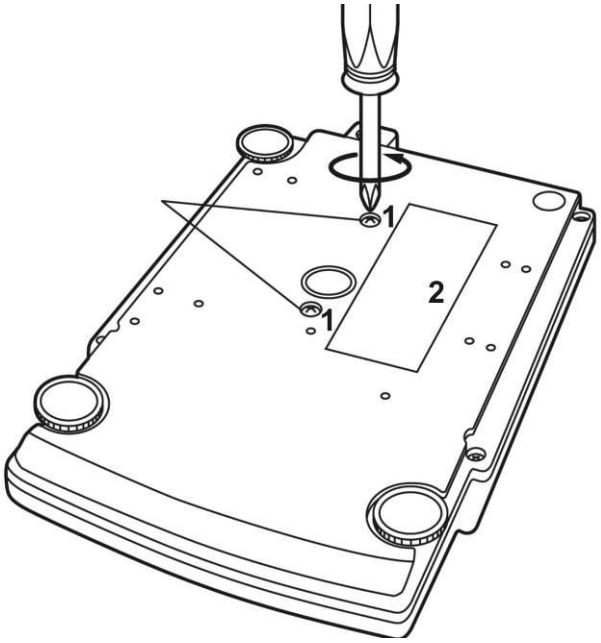
Remove the appliance and accessories from the packaging, remove the packaging material and set up at the designated workstation. Check that all parts included in the scope of delivery are present and undamaged.

Scope of delivery / standard accessories:

Models with readability d = 0.001 g:	Models with readability d≥ 0.01 g:
Windbreak	
 Weighing	
Carrier weighing	
 Safety bonnet	
Main weighing unit	
2 fixing screws Safety bonnet	
• Mains adapter • Screwdriver • Operating instructions • Menu overview	

7.3 Set up

⇨ **Remove transport lock (PBJ models)**

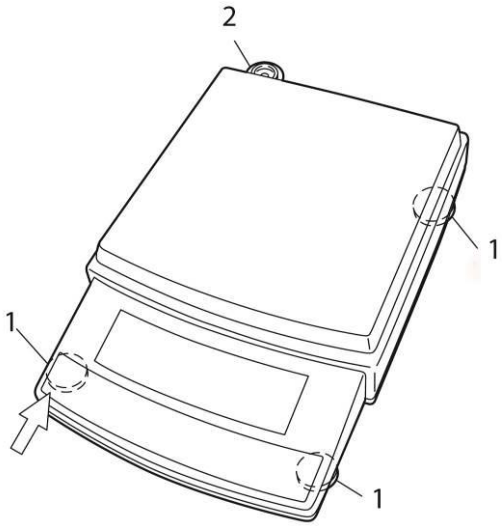


To release the transport lock, turn both transport screws [1] anti-clockwise until they lock (see information plate [2]).

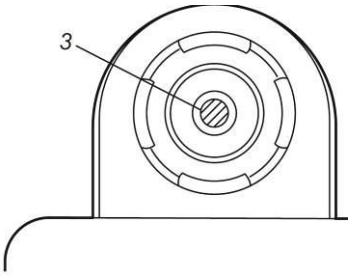
To transport, turn both transport screws clockwise until they lock.

⇨ **Attach protective bonnet**
Remove the protective film from the adhesive strips and fit the protective cover so that it does not touch the weighing plate.

⇨ **Levelling**



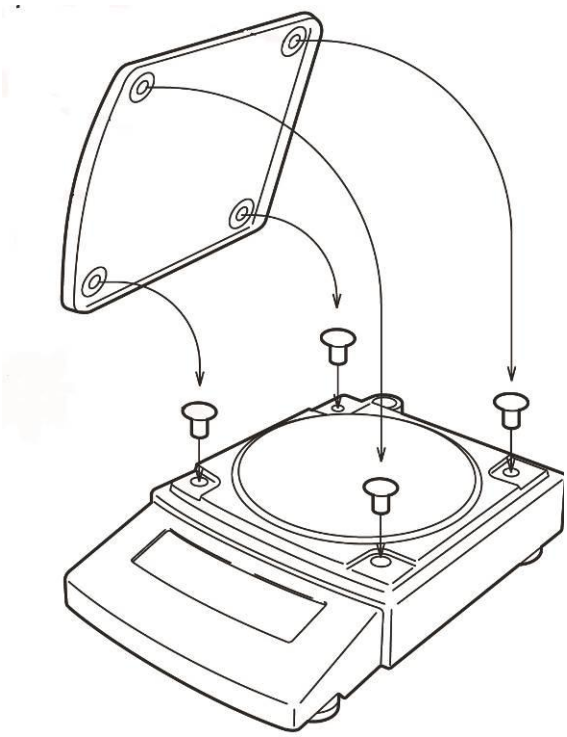
⇨ Screw in all three adjustable foot screws [1] as far as they will go.



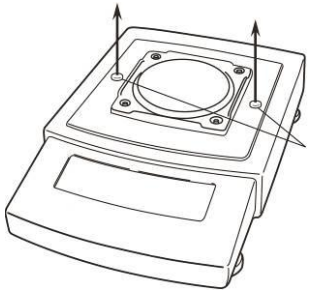
⇨ Press the left front side of the scale slightly downwards and unscrew the two front foot screws until the air bubble [3] in the level indicator [2] is in the prescribed circle.
⇨ While continuing to apply slight pressure to the front of the scale, finally unscrew the rear foot screw until the scale is stable.
⇨ Check levelling regularly.

⇨ **Installing the weighing plate**

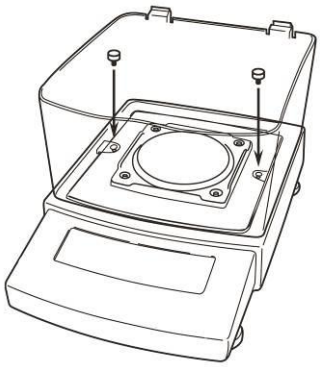
Models with readability d≥ 0.01 g:



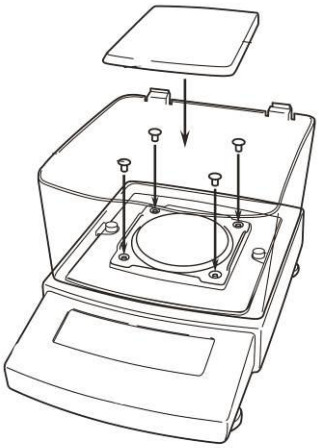
Models with readability = 0.001 g:



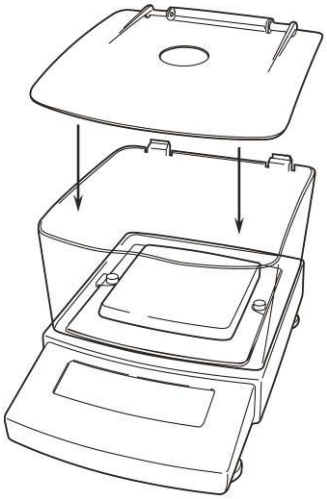
Remove the rubber plug as shown.



Fit the windscreen and secure it with the screws.



Install the weighing plate as shown. Ensure correct positioning.



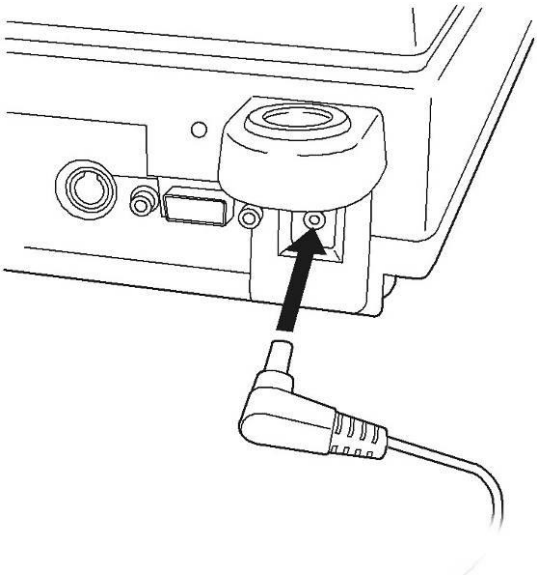
Fit the draft shield cover.

7.4 Mains connection

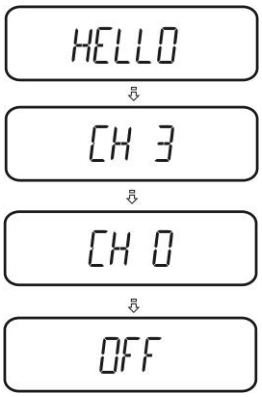
Power is supplied via the external power supply unit. The printed voltage value must match the local voltage.
Only use original KERN power supply units. The use of other makes requires the approval of KERN.

PBJ models:
Before connecting to the mains, always loosen the transport securing screws on the scales in accordance with the information plate, see section 7.3

7.5 Switch on the power supply



⇨ Supply the scales with power via the mains adapter. The display lights up and the scales carry out a self-test.



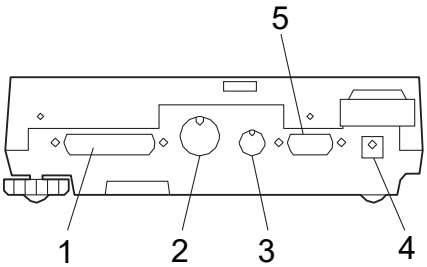
PBS models

⇨ OFF" is displayed after the self-test has been completed.
⇨ Press the ON/OFF button to switch on. The scale carries out a display test. As soon as the weight display appears, the scale is ready for weighing.

7.6 Connection of peripheral devices

Before connecting or disconnecting additional devices (printer, PC) to the data interface, the scale must be disconnected from the mains.
Only use accessories and peripherals from KERN with your balance, these are optimally matched to your balance.

Output of external devices:



Interfaces on the back

1 RS-232C interface
2 DATA IO interface
3 AUX interface
4 DC-IN connection
5 Keyboard interface

7.7 Initial commissioning

In order to obtain accurate weighing results with electronic scales, the scales must have reached their operating temperature (see warm-up time, chapter 1). The scales must be connected to the power supply (mains connection, rechargeable battery or battery) for this warm-up time.

The accuracy of the scale depends on the local gravitational acceleration.
Be sure to follow the instructions in the Adjustment chapter.

8 Adjustment

As the value of the acceleration due to gravity is not the same at every location on earth, each scale must be adjusted to the prevailing acceleration due to gravity at the installation site in accordance with the underlying physical weighing principle (only if the scale has not already been adjusted to the installation site at the factory). This adjustment process must be carried out when the scale is first put into operation, after each change of location and in the event of fluctuations in the ambient temperature. In order to obtain accurate measured values, it is also advisable to periodically adjust the scale during weighing operation.

Ensure stable ambient conditions. A warm-up time (see chapter 1) is required for stabilisation. Ensure that there are no objects on the weighing plate.

(PBS models only)

8.1 Manual adjustment with CAL button

The scales are set at the factory so that calibration can be started directly from weighing mode using the **CAL key.**

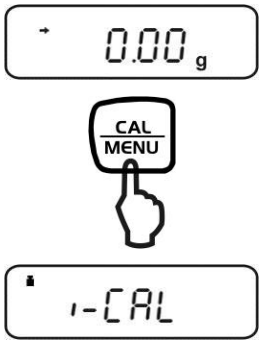
- PBJ models: Adjustment with internal weight
- PBS models: Adjustment with external weight (blocked for verified) locked)

Other adjustment methods can be activated in the menu.

8.1.1 Adjustment with internal weight (PBJ models only)

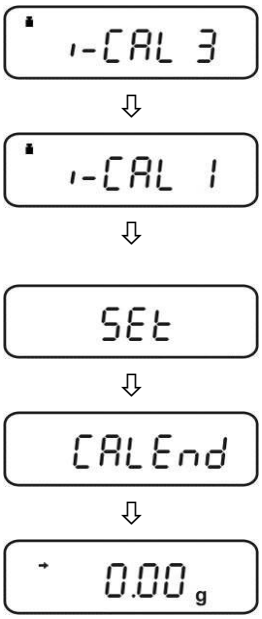
Prerequisite: **"I.CAL"** menu setting / menu item

1. In weighing mode, press CAL MENU. I-CAL is displayed.



If "I-CAL" is not displayed, use ON/OFF ESC to return to weighing mode and activate menu item 1, see Menu overview.

2. TARE / →0← -Press the button, the adjustment runs automatically.



3. After successful adjustment, the scale automatically automatically returns to weighing mode.
   If a calibration error occurs (e.g. objects are on the weighing pan), an error message appears on the display; repeat the calibration procedure.
   If an optional printer is connected and the GLP function is activated, the calibration report is output, see Chap. 8.5

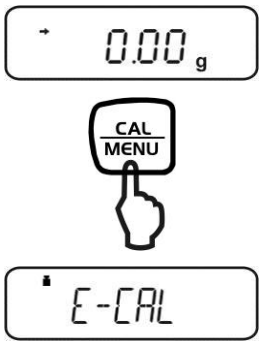
Printout example (KERN YKB-01N):

- - - - - - - - - - - - - - - - -	
CAL - INTERNAL	Adjustment mode
- - - - - - - - - - - - - - - - -	
CORE	Company
TYPE PBJ4200-2M	Model
SN WBxxxxxxxxx	Serial no.
ID 1234	Scale identification no. (see chapter 8.5.1)
DATE 27-01-2011	
TIME 11.54.53	
REF 4000.00g	Calibration weight used
BFR 4003.97g	Before adjustment
AFT 4000.00g	After adjustment
-COMPLETE	
-SIGNATURE-	Processor
- - - - - - - - - - - - - - - - -	

8.1.2 Adjustment with external weight (factory setting for PBS models)

- **Prerequisite**: "**E-CAL**" menu setting / menu item 3. .
- On calibrated PBJ models, external adjustment is locked (except for accuracy class I → see technical data, chapter 1).
- Carry out adjustment as close as possible to the maximum load of the scale (for recommended adjustment weight, see chapter 1). However, adjustment is also possible with weights of other nominal values or tolerance classes, but this is not optimal from a metrological point of view. The accuracy of the calibration weight must correspond approximately to the readability **d** of the scale, or better.
  You can find information on test weights on the Internet at:http://www.kern-sohn.com

⇨ In weighing mode, press CAL MENU . E-CAL is displayed.

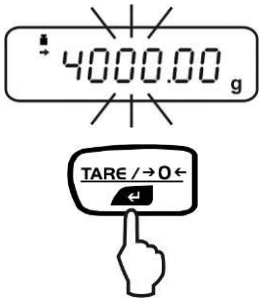


If "E-CAL" is not displayed, use ON/OFF ESC to return to weighing mode and activate menu item 3, see menu overview

⇨ TARE /→0← The weight value of the recommended calibration weight (see section 1) flashes on the display.

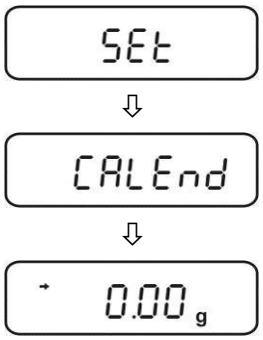
If the weight value is to be changed, press CAL MENU , the active digit flashes. Use the navigation buttons to make the desired setting (see section 3.1.1 "Numerical input").

⇨ Carefully place the calibration weight in the centre of the weighing plate, press TARE /→0← .



⇨ Wait until the zero display flashes.

Remove the calibration weight and press TARE / →0← . After successful calibration, the scale automatically returns to weighing mode.
If a calibration error occurs (e.g. objects are on the weighing pan), an error message appears on the display; repeat the calibration procedure.



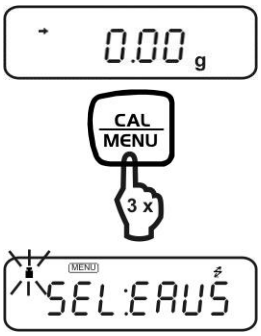
If an optional printer is connected and the GLP function is activated, the calibration report is output, see section . 8.5 Printout example (KERN YKB-01N):

- - - - - - - - - - - - - - - - -	
CAL -EXTERNAL	Adjustment mode
- - - - - - - - - - - - - - - - -	
CORE	Company
TYPE PBS4200-2M	Model
SN WBxxxxxxxxx	Serial no.
ID 1234	Scale identification no. (see chapter 8.5.1)
DATE 27-01-2011	
TIME 11.54.53	
REF 4000.00g	Calibration weight used
BFR 3999.97g	Before adjustment
AFT 4000.00g	After adjustment
-COMPLETE	
-SIGNATURE-	Processor
- - - - - - - - - - - - - - - - -	

8.2 Calibration test

Activate function:

⇨ In weighing mode, press CAL MENU 3 times.
Menu group 1 "Calibration" is displayed, the indicator flashes.



⇨ Confirm with TARE /→0← , the current setting flashes.

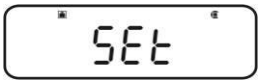
, Adjustment with internal weight "I-CAL
(PBJ models only, see chap. 8.1.1), menu item 1

,t Calibration test with internal weight "I-tESt
(PBJ models only, see chap. 8.2.2), menu item 2

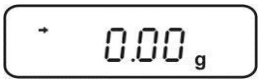
E Adjustment with external weight "E-CAL
(see chapter 8.1.2), menu item 3

Et Calibration test with external weight "E-tESt
(see chapter 8.2.1), menu item 4

⇨ Confirm with TARE /→0←



⇨ ON/OFF ESC Press repeatedly or for 3 seconds, the scale returns to weighing mode

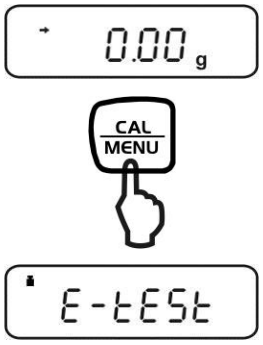


ℹ The saved setting can now be called up directly via CAL MENU .

8.2.1 Calibration test with external weight

- **Prerequisite**: "E-tESt" menu setting / menu item 4
- On verified scales, the calibration test is blocked by a switch (except for accuracy class I). To cancel the access lock, the sealing mark must be destroyed and the adjustment switch actuated. For the position of the adjustment switch, see chapter .9
  Caution:
  After the seal has been destroyed, the scale must be recalibrated by an authorised body and a new seal affixed before it can be used again in legal-for-trade applications.

⇨ In weighing mode, press CAL MENU. E-tESt is displayed.

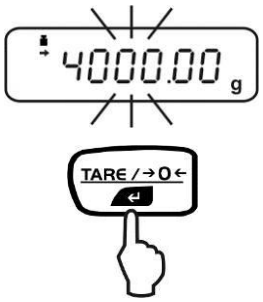


If "E-tESt" is not displayed, use ON/OFF ESC to return to weighing mode and activate menu item 4, see menu overview.

⇨ TARE / →0← The weight value of the recommended calibration weight (see section 1) is displayed flashing.

If the weight value is to be changed, press CAL MENU, the active digit flashes. Use the navigation buttons to make the desired setting (see section3.1.1 "Numerical input").

⇨ Carefully place the calibration weight in the centre of the weighing plate, press TARE / →0← .

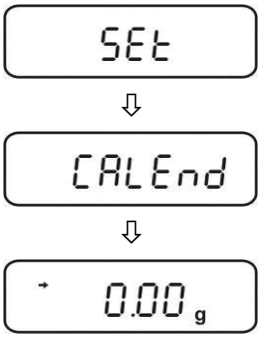


⇨ Wait until the zero display flashes.

⇨ Remove the calibration weight and press TARE /→0← .
Wait briefly, the difference to the previous adjustment is displayed.

Either

CAL MENU Press , the d value is reset to zero.
The scale is calibrated with this reset.



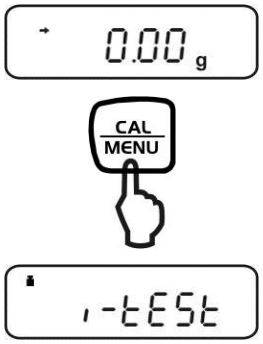
or

⇨ TARE /→0← The d value is not reset to zero. No adjustment takes place.

8.2.2 Calibration test with internal weight (only PBJ)

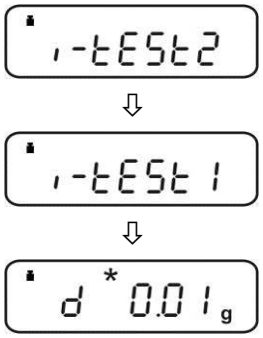
Prerequisite: "I-tESt" menu setting / menu item 2

⇨ Press CAL MENU in weighing mode. I-tESt is displayed.



If "i-tESt" is not displayed, use ON/OFF ESC to return to weighing mode and activate menu item 2, see menu overview.

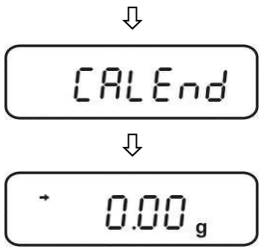
⇨ TARE /→0← Press , the check runs automatically.



Wait briefly, the difference to the previous adjustment is displayed.

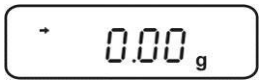
⇨ Either

CAL MENU press , the d value is reset to zero.
The scale is calibrated with this reset.



or

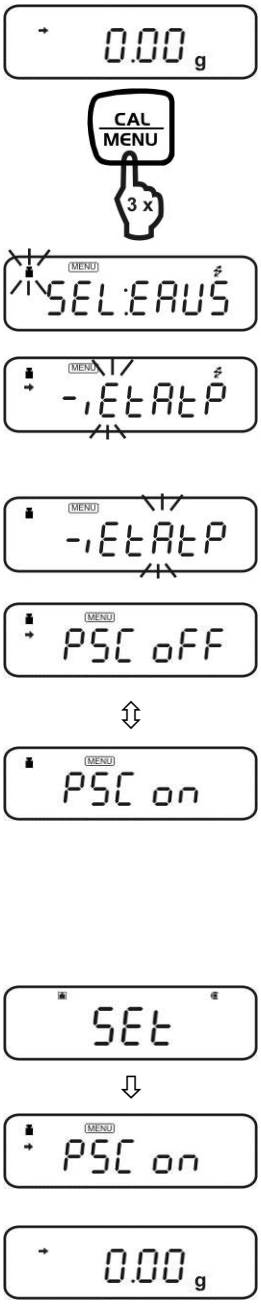
⇨ TARE /→0← The d value is not reset to zero. No adjustment takes place.



8.3 Automatic adjustment by PSC (Perfect Self Calibration), PBJ models only

The PSC function determines the ambient temperature of the scale at all times. If the upper or lower tolerance limits are exceeded, this is signalled and the necessary adjustment is made fully automatically. This ensures that the scale is optimally ready for use at all times.

Activate function:



⇨ In weighing mode, press CAL MENU 3 times.
Menu group 1 "Calibration" is displayed, the indicator flashes.

⇨ Confirm with TARE /→0← , the current setting flashes.

⇨ CAL MENU repeatedly until "A" flashes.

⇨ Confirm with . TARE /→0←

⇨ You can use CAL MENU to switch between the following settings.
"PSC on" (menu item 5) = function activated
"PSC off" (menu item 6) = function deactivated
The current setting is indicated by the stability indicator (➡).

⇨ Confirm selection with TARE /→0←

⇨ ON/OFF ESC repeatedly or for 3 seconds, the scale returns to weighing mode.

- The flashing weight symbol indicates that automatic adjustment is imminent.
- To prevent calibration from starting in the middle of a measurement series, press ON/OFF ESC as soon as the weight symbol flashes. The automatic adjustment is then cancelled.
- If the PSC function is not activated, the operator must carry out the calibration with the internal calibration weight (chap.8.1.1) as soon as the weight symbol flashes.

8.4 Automatic adjustment via Clock-CAL (PBJ models only)

The balance can be set up so that it performs an automatic adjustment at set times (up to three times a day, "TCALt1", "TCALt2" and "TCALt3") using its internal calibration weight and its built-in clock. Clock-CAL is particularly useful if adjustment protocols for regular adjustments are required or if adjustments are to be carried out during pauses in order to avoid interruptions to measuring activities.

For Clock-Cal to be executed, the following conditions must be met at the specified time. If the conditions are not met within one minute, the adjustment is skipped.

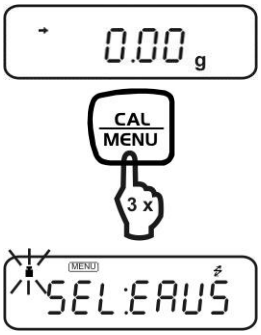
- The scale must be in weighing or standby mode.
- The stability indicator must be displayed.
- The load on the weighing plate must be close to zero.
- No other adjustment process may be started.

- The weight symbol flashes for about two minutes to indicate that the adjustment is imminent.
- To prevent calibration from starting in the middle of a measurement series, press ON/OFF ESC as soon as the weight symbol flashes. The automatic adjustment is then cancelled.
- If all three times are set to "00:00", the function is switched off.

Setting the times for Clock-CAL:

Example "ACALt1" at 12 noon.

⇨ In weighing mode, press CAL MENU 3 times.
Menu group 1 "Calibration" is displayed, the indicator flashes.



⇨ Confirm with TARE/→0← , the current setting flashes.

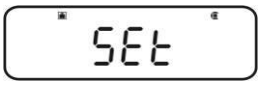
⇨ CAL MENU repeatedly until "t" flashes.

⇨ Confirm with TARE/→0← , the first time "tCAL t1" (menu item 7) is displayed.

⇨ Confirm with TARE/→0← , the current setting is displayed (the active digit flashes).

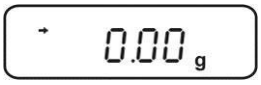
⇨ Use the navigation buttons to enter the desired time (see section3.1.1 "Numerical input").

⇨ Confirm with TARE/→0←



⇨ Use CAL MENU to call up additional times "tCAL t2" (menu item 8) or "tCAL t3" (menu item 9) and enter the desired time as described above.

⇨ To return to weighing mode, press ON/OFF ESC repeatedly or for 3 seconds.

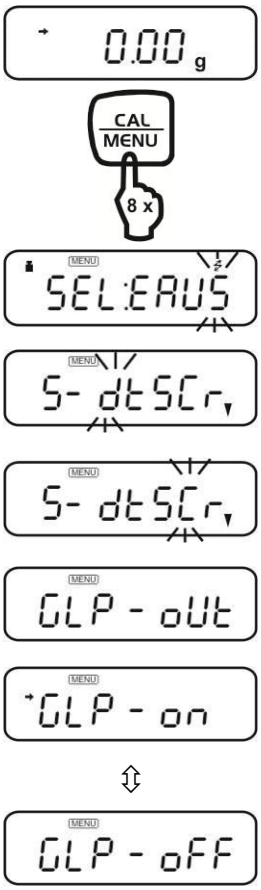


8.5 ISO/GLP logging

Quality assurance systems require printouts of weighing results and the correct scale adjustment, stating the date and time as well as the scale identification. The easiest way to do this is via a connected printer.

Ensure that the communication parameters of the scale and printer match. Communication parameters, see Chap. 17.4

8.5.1 Setting the calibration protocol and scale identification number



⇨ In weighing mode, press CAL MENU repeatedly until "S" flashes.

⇨ Confirm with TARE /→0← .

⇨ CAL MENU repeatedly until "C" flashes.

⇨ Confirm with . TARE /→0←

⇨ TARE /→0← press.

⇨ You can use CAL MENU to switch between the following settings.

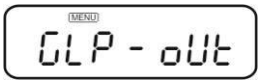
"GLP on" (menu item 68) = function activated

"GLP off" (menu item 69) = function deactivated

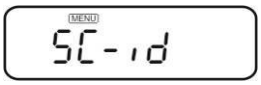
The current setting is indicated by the stability indicator (➡).

⇨ Confirm selection with TARE /→0←

⇨ Use ON/OFF ESC to return to the menu.



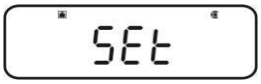
⇨ Call up menu item 70 with CAL MENU

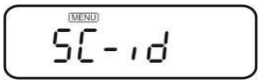


⇨ Confirm with TARE /→0←, the currently set scale identification number is displayed (the active digit flashes).

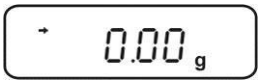
⇨ Use the navigation buttons to enter a 4-digit number between "0000" and "9999" (see section3.1.1 "Numerical input").

⇨ Confirm with . TARE /→0←





⇨ To return to weighing mode, press ON/OFF ESC repeatedly or for 3 seconds.



9 Calibration

General information:
According to EU Directive 2014/31EU, scales must be calibrated if they are used as follows (legally regulated area):

- In commercial transactions, when the price of goods is determined by weighing.
- In the manufacture of medicines in pharmacies and in analyses in medical and pharmaceutical laboratories.
- For official purposes
- in the production of pre-packaging

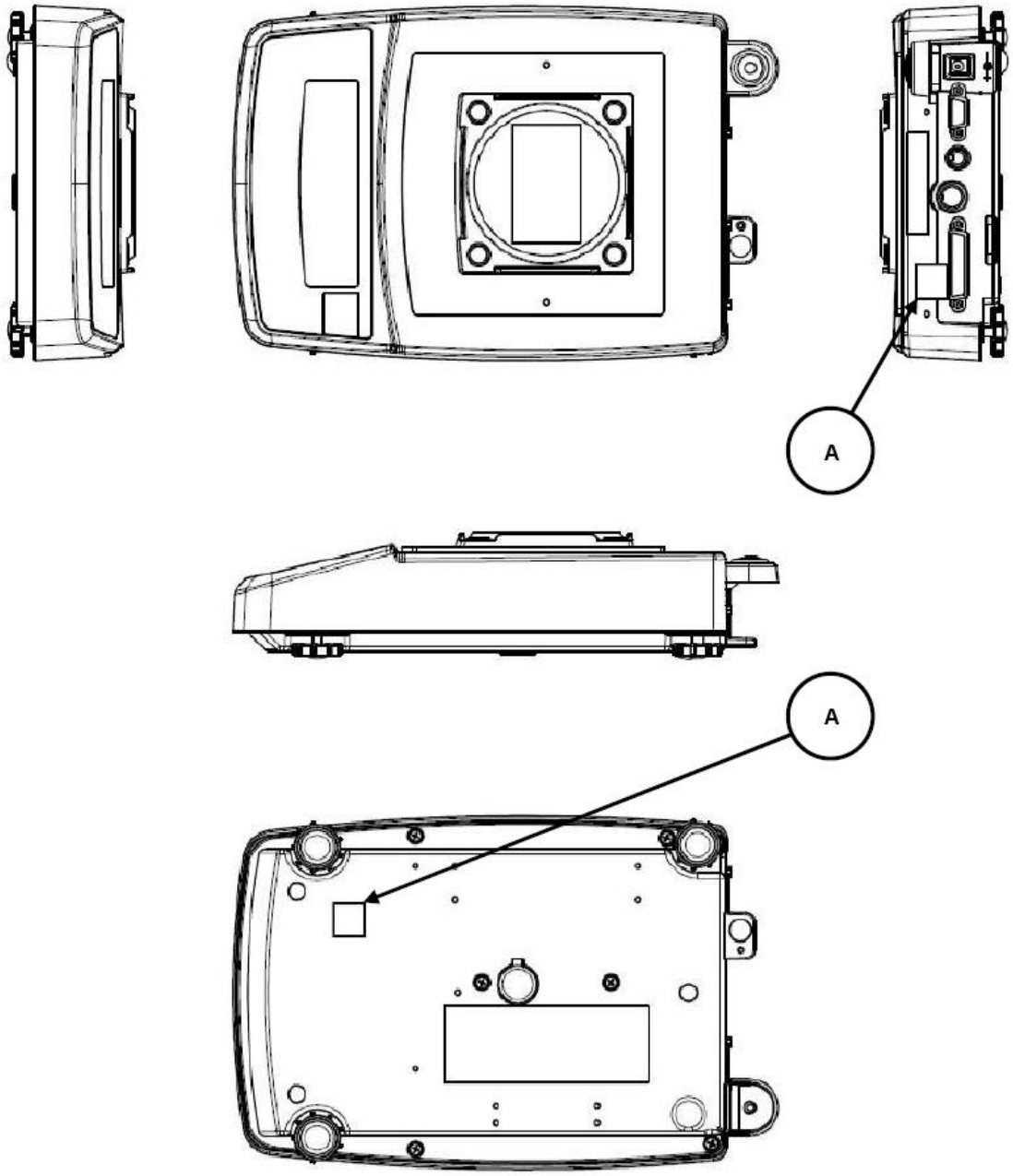
If in doubt, please contact your local weights and measures office.

Scales in the legally regulated area (-> verified scales) must comply with the market error limits during the verification validity period - these are generally twice the verification error limits.
If this calibration validity period expires, a recalibration must be carried out. If it is necessary to adjust the scales to comply with the calibration error limits in order to pass this re-verification, this does not constitute a warranty case.

Calibration instructions:
The scales labelled as legal for trade in the technical data have EU type approval. If the scales are used in the legal-for-trade area as described above, they must be calibrated and regularly recalibrated.
The recalibration of a scale is carried out according to the respective legal regulations of the countries. The verification validity period in Germany, for example, is usually 2 years for scales.
The legal regulations of the country of use must be observed!

The verification of the scales is invalid without the seal marks.
In the case of scales with type approval, the attached seal marks indicate that the scales may only be opened and serviced by trained and authorised specialists. Destroyed seal marks invalidate the verification validity. The national laws and regulations must be observed. Recalibration is required in Germany.

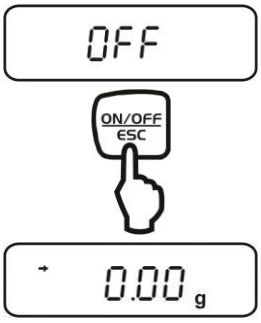
Position of sealing marks and adjustment switch:



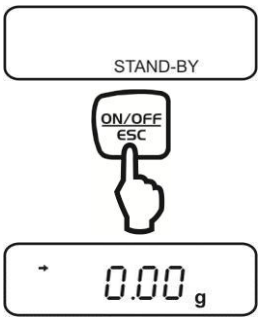
10 Basic operation

10.1 Switching the scales on and off

Switch on:



1. After connecting to the power supply, the scale displays OFF . To switch on, press ON/OFF ESC . The scale performs a segment test and starts automatically in weighing mode.



2. If the scales are in stand-by mode, press ON/OFF ESC . The scale is immediately ready for operation without warm-up time.

Switch off:

1. ON/OFF ESC Press . The scales switch to stand-by mode, i.e. the scales are ready for operation.
2. To switch off the scales completely, disconnect the scales from the power supply.

Do not disconnect the scales from the power supply when [**WAIT**] or [**SET**] is displayed.
from the power supply.

10.1 Zeros

⇨ Unload the scales

⇨ TARE /→0← Press , the zero display appears.

10.2 Simple weighing

In order to obtain accurate weighing results, the scale must have reached its operating temperature (see warm-up time, chapter 1).

- ⇨ Wait for zero display, zero with TARE / →0← if necessary.
- ⇨ Load the sample
- ⇨ Wait until the stability display (➡) appears.
- ⇨ Read off the weighing result.

Error display during weighing

oL	Overload, the capacity of the scale has been exceeded
-oL	Underload, the load on the scale is too light

If an optional printer is connected, the weight value can be output.

Printout examples (KERN YKB-01N):

1. Calibrated models

50.5[7] g

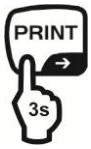
Weighing value, for verified scales the non-verified value is in brackets.

2. Non-calibrated models

1999.93 g

Weighing value

3. Output time/date



08:51 25/02/11	Output time/date
50.5[7] g	Weighing value output

10.3 Taring

The tare weight of any weighing container can be tared off at the touch of a button so that the net weight of the weighed goods is displayed for subsequent weighings.

- ⇨ Place the weighing container on the weighing plate.
- ⇨ Wait until the stability display (➡) appears, then press TARE /→0← . The weight of the container is now saved internally.
- ⇨ Weighing goods.
- ⇨ Wait until the stability display (➡) appears.
- ⇨ Read off the net weight.

Note:

- When the scales are unloaded, the stored tare value is displayed with a negative sign.
- To delete the stored tare value, release the load on the weighing plate and press TARE /→0← .
- The taring process can be repeated any number of times. The limit is reached when the entire weighing range is utilised.
- The PRE-TARE function for pre-drawing a known container weight can be activated in the menu, see section / menu item 36

10.4 Underfloor weighing

Underfloor weighing can be used to weigh items that cannot be placed on the weighing pan due to their size or shape.
Proceed as follows:

- ⇨ Switch off the scales
- ⇨ Open the cover on the base of the scales.
- ⇨ Place the scales over an opening.
- ⇨ Screw in the hook completely.
- ⇨ Attach items to be weighed and perform weighing

⚠ CAUTION

- **Make absolutely sure that all attached objects are stable enough to hold the desired weighing goods securely (risk of breakage).**
- **Never suspend loads in excess of the specified maximum load (Max) (risk of breakage)**

Always ensure that there are no living creatures or objects under the load that could be damaged.

NOTE

Once underfloor weighing is complete, the opening at the bottom of the scales must be closed again (dust protection).

11 Menu

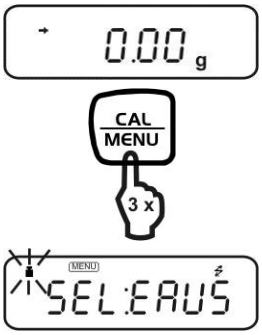
11.1 Navigation in the menu

The menu consists of 7 groups and 4 levels.
The menu assignment shows this structure, whereby access to the desired functions is facilitated by the numbering of the corresponding menu elements.
To navigate through the menu, please refer to the enclosed menu overview.

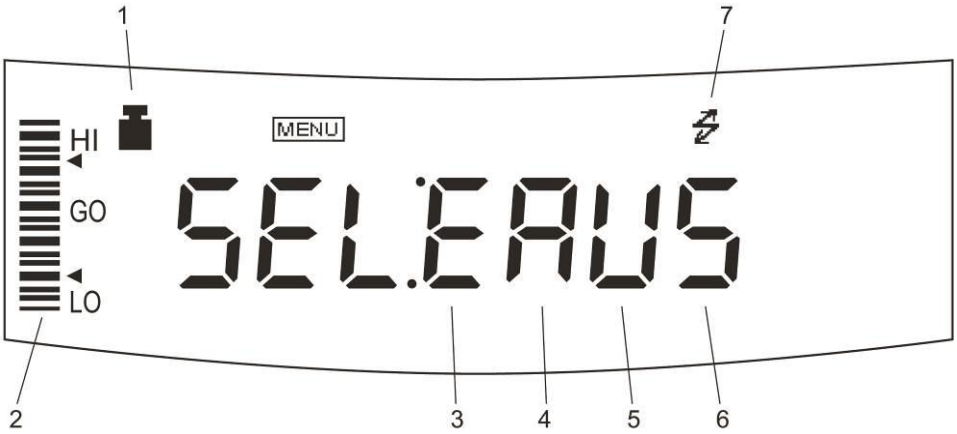
The MENU symbol is displayed when navigating the menu.

Call up the function:

⇨ In weighing mode, press CAL/MENU 3 times.
The first menu group "Calibration" is displayed, the indicator flashes.



⇨ Use CAL/MENU to select the desired menu group. Each time you press CAL/MENU, the corresponding symbol flashes, see explanation below.

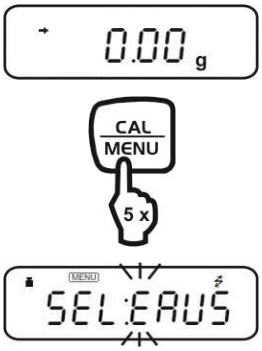


Menu group	Flashing symbol	Description of the
1		Adjustment
2	Analogue display	Capacity display, checkweighing and target weighing
3	E	Installation environment and taring
4	A	Application measurements and automatic output
5	U	Conversion of units and specific weight measurement
6	S	Clock setting and generation of an adjustment data set
7		Communication with external devices

Make settings:

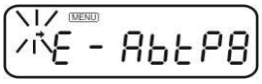
As an example, the condition for assessing stability should be set from 1 count (menu item 27) to 4 counts (menu item 29).
Use the number to search for the function in the menu overview and make the following settings on the scales.

⇨ Call up menu group 3, the "E" symbol flashes.



⇨

Press , the next menu level is displayed.

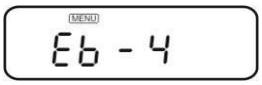


⇨

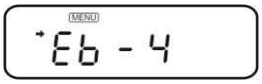
repeatedly until "b" flashes.

⇨ TARE /→0← press , "Eb-1" (menu item 27) is displayed.
The stability indicator (➡) lights up when "Eb-1" is the current setting.

⇨ CAL MENU repeatedly until "Eb-4" (menu item 29) is displayed.



⇨ Save with TARE /→0← . "SET" followed by the current setting "Eb-4" is displayed, characterised by the stability indicator (➡).



Return to the menu or to weighing mode:

⇨ ON OFF ESC Press briefly to return to the menu.

⇨ ON OFF ESC long press to return to weighing mode.

11.2 Useful accompanying functions

11.2.1 Recalling the last menu

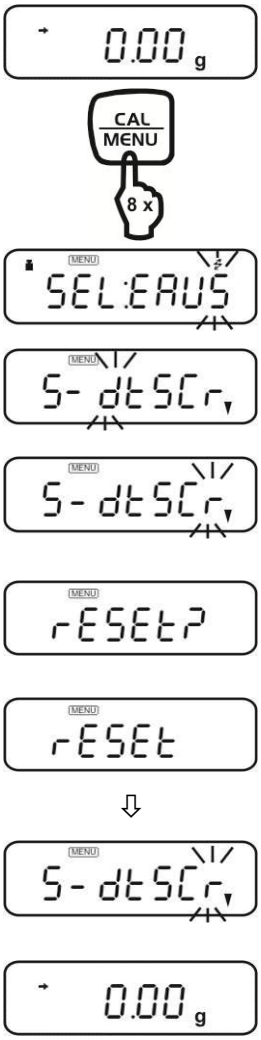
This function is useful if an application requires frequent changes to a specific menu item.

In weighing mode or during menu selection, press and hold the CAL MENU button for approx. 3 seconds. The menu item that was last changed or set is then displayed.

11.2.2 Restore factory settings

This function resets all settings in the menu to the factory settings. Factory settings are labelled with "**#**" in the menu overview.

Select menu item 72 in the menu overview



⇨ In weighing mode, press CAL MENU repeatedly until "S" flashes.

⇨ Confirm with TARE /→0← .

⇨ CAL MENU repeatedly until "r" flashes.

⇨ Confirm with TARE /→0← . The "rESEt?" menu reset query is displayed

⇨ TARE /→0← Press . "rESEt" indicates that the menu reset is complete.

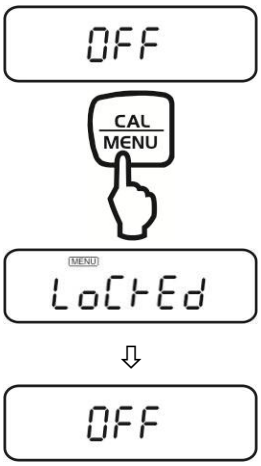
⇨ To return to weighing mode, press ON/OFF ESC repeatedly or for 3 seconds.

11.3 Menu lock

Lock menu access:

⇨ Connect the scales to the power supply.

⇨ During the off display, press and hold CAL MENU until "Locked" appears.

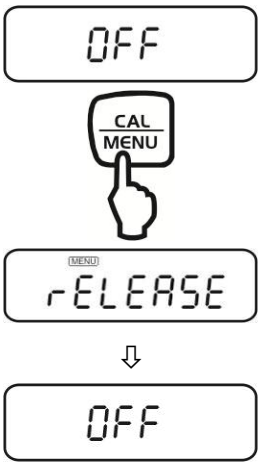


Menu access is now denied and the message "Locked" appears as soon as the operator attempts to select a menu.

Cancel access lock:

⇨ Disconnect the scales from the power supply. Wait 10 seconds, then reconnect.

⇨ During the off display, press and hold CAL MENU until "release" appears.

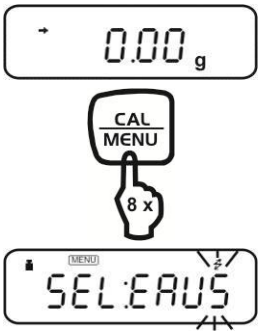


12 Set date and time

12.1 Date

Select menu item 63, see chap. 11.1

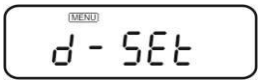
⇨ In weighing mode, press CAL MENU repeatedly until "S" flashes.



⇨ Confirm with TARE /→0← .

⇨ CAL MENU repeatedly until "d" flashes.

⇨ TARE /→0← press.



⇨ TARE /→0← Press again, the currently set date is displayed.

⇨ Change using the navigation buttons (see section 3.1.1 "Numerical input").

⇨ Confirm entry with . TARE /→0←

Either

⇨ Use ON/OFF ESC to return to weighing mode.

or

⇨ Continue with CAL MENU to set the date format

⇨ TARE /→0← The currently set format is displayed.

⇨ With CAL MENU you can choose between the following formats

Y.m.d. Menu item 63a

d.m.Y. Menu item 63b

m.d.Y. Menu item 63c

⇨ Confirm entry with . TARE /→0←

or

⇨ Use ON/OFF ESC to return to weighing mode, press repeatedly or for 3 seconds.

→ 0.00 g

- The built-in clock automatically makes corrections for a leap year.
- If the TARE /→0← button is pressed at the end of the date setting, the seconds are set to zero. If the date is set after the time, the seconds value will not be correct. It is therefore important to set the date first and then the time or to correct the seconds value using the seconds correction function (±), see Chap. 12.3.

12.2 Time of day

Select menu item 64, see chap. 11.1

Set the time in the same way as the date (see chap. 12.1).

12.3 Setting the display for standby mode

Specify what should be displayed in standby mode.

☞ Select menu item 65 if the time is to be displayed, see chap. 11.1

☞ Select menu item 66 if the date is to be displayed, see chap. 11.1

☞ Select menu item 67 if neither the time nor the date are to be displayed, see chap. 11.1

i	When the time is displayed in standby mode, the following functions are available to you • **Seconds display**: You can use UNIT to activate the display/non-display of seconds. • **Correction by ±30 seconds**: CAL MENU button while the seconds are displayed. If the value is between 00 - 29 seconds, the seconds are rounded down to zero. If the value is between 30 - 59 seconds, it is rounded up by one minute and 00 is displayed for seconds.

13 Functions for adapting to the ambient conditions

13.1 Stability and reaction (mean value)

It is possible to customise the stability of the display and the degree of response of the scale to the requirements of specific applications or the installation environment. You can choose between five operating modes for this purpose. Please note that data processing geared towards greater stability generally results in slower response times, while speeding up response times has a detrimental effect on stability. However, the scales in the PBS/PBJ series are designed to guarantee both properties, i.e. fast response times and high stability.

13.1.1 Automatic mode

Select menu item **22** :
The scales automatically and dynamically take an optimum average value.
while monitoring the load data. Unless there are special circumstances
you should always use this setting.

13.1.2 Pour mode

Select menu item **23** :
This mode is only suitable for weighing constant volumes of liquid. It is
very susceptible to wind and vibrations.

(When pour mode is activated, the MODE button is used to switch between 3 stability settings).

13.1.3 Standard mode

Select menu item **24** :
This mode is suitable for weighing in normal environments. The
Averaging is fixed and does not adapt as in automatic mode,
dynamically.

13.1.4 Anti-vibration mode

Select menu item **25** :
Use this mode if the scales are set up in a location where
strong vibrations prevail and their display fluctuates in automatic mode.
The reaction of the scale is triggered by small changes in the mass
deteriorated.

13.1.5 Anti-wind mode

Select menu item **26** :
Use this mode if the scales are set up in a location where they
air currents that cause its display to fluctuate in automatic mode.
The response deteriorates even more than in anti-vibration mode, but the
Weighing process is comparatively stabilised.

13.2 Stability detection band

(for legal-for-trade models only up to 8 counts, for non-legal-for-trade models up to 64 counts)
The conditions for when the scale is to be considered stable can be selected. If you have selected "1 count" and the display remains constant (within one display count), the scale is considered stable and the stability indicator➜ lights up. The stability detection band can be set to 2 to 64 counts.
Select menu item:

27	for	1 count
28	for	2 counts
29	for	4 counts
30	for	8 Counts

13.3 Pursuit

Tracking is a function that maintains the display of the current value for as long as possible.
To ACTIVATE this function, select menu item **34**
To DISABLE this function, select menu item **35**

14 Capacity display

This function displays the load on the weighing plate in the form of a bar graph. It is used to avoid suddenly occurring "oL" states (overload) during the measuring process.

Select menu item **11** in the menu overview to set up full scale mode:

(1)

A bar at the bottom of the scale indicates that the load on the weighing pan is low. (1)

(2)

A scale that extends to the upper range of the scale bar indicates that the weight on the weighing pan load close to the weighing capacity comes close.(2)

If you do not want a bar chart to be displayed, select menu item **21**.

15 Switching the weighing unit

You can switch the display between activated units by pressing the UNIT button several times.

You have the following options with the factory setting:

[g]→ [%]→ [PCS]→ [%]

Other settings must be activated in the menu as follows:

→U – Ct (example)	**Menu overview no. 54 to 62 :** CAL MENU - Press the button to switch between the units. Save selected unit with the TARE / →0← button
SEt	"SET" appears briefly. The unit was taken over.

15.1 Percentage conversion

→ 0.0 %	In weighing mode UNIT - Press the button repeatedly until "%" appears in the display
Setting the 100% reference value:	
	TARE / →0← - Press the button to tare the scales.
	Place the reference sample that corresponds to the 100% value. This value must correspond to 100 counts or more in the "g" unit.
	As soon as the stability indicator➜ lights up, press the CAL MENU button.
SEt	"SET" appears briefly.
→ 100.000 %	The weight of the reference sample is displayed as 100%.
	The weights of the subsequent samples are displayed as a percentage of the reference sample weight.

16 Application functions

16.1 Piece counting

When counting parts, you can either count parts into a container or count parts out of a container. To be able to count a larger quantity of parts, the average weight per part must be determined using a small quantity (reference quantity). The larger the reference quantity, the higher the counting accuracy. The reference must be set particularly high for small or very different parts.
The workflow is divided into four steps:

- Tare the weighing container
- Set reference quantity
- Weigh in reference quantity
- Count pieces

Prerequisite: Activate the PCS function via menu item **57** if it is not already set up. (The PCS unit is set at the factory.)
Make sure that the scale is in weighing mode. (unit "g" is displayed)

UNIT - Press the button repeatedly until "PCS" is displayed.

→ 0 PCS

Place the container on the weighing plate and tare the scales using the TARE / →0← button.

Count out exactly 5 (or 10, 20, 50, 100 or 200) parts of the sample to be weighed and place them in the container.

CAL MENU - Press the button.

(example)

→ Ld 50 PCS

Each time the CAL MENU button is pressed, the display switches between "Ld 5pcs"... "Ld 200pcs", "Ld 5pcs"...

The default setting is "Ld 10pcs".

SEt

→ 50 PCS

TARE / →0← - Press the button as soon as the display corresponds to the number of parts placed.

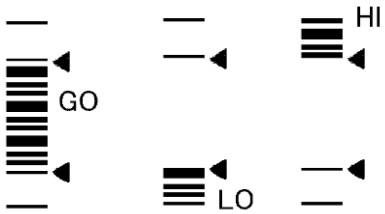
The reference quantity is saved.

16.2 Checkweighing and target weighing

16.2.1 Checkweighing (comparator) Display type 1

This is the most suitable method for assessing weighing cycles or errors on the basis of a sample weight.
In the menu overview, select menu item **15** .

Display elements used



The upper threshold value, which is indicated by the upper triangle symbol, is defined via menu item **16.**

The lower threshold value, which is indicated by the lower triangle symbol, is defined via menu item **17.**

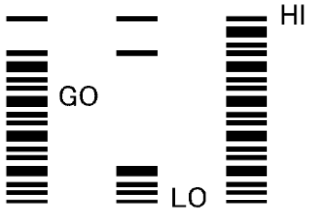
Note:
The determination is as follows:

Upper threshold value	< Sample weight		**HI**
Lower threshold value	≤ Sample weight	≤Upper threshold value	**GO**
Sample weight	< Lower threshold value		**LO**

16.2.2 Checkweighing (comparator) Display type 2

Use this mode for classifications based on sample weight. The display looks like a bar chart, but also includes a checkweighing function.
In the menu overview, select menu item **18** .

Display elements used



The upper threshold value, which is indicated by the upper triangle symbol, is defined via menu item **19.**

The lower threshold value, which is indicated by the lower triangle symbol, is defined via menu item **20.**

Note:
The determination is as follows:

Upper threshold value	< Sample weight		**HI**
Lower threshold value	≤ Sample weight	≤Upper threshold value	**GO**
Sample weight	< Lower threshold value		**LO**

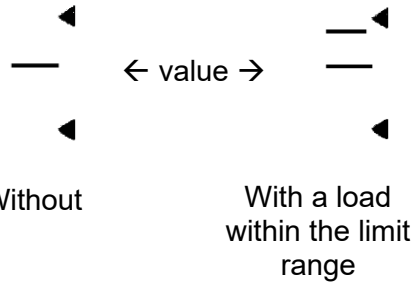
16.2.3 Target weighing mode

This mode is used to weigh constant quantities of liquid and to assess shortfalls and surpluses.

The target value is the numerical value that corresponds to the target quantity of the unit used for weighing. The limit value is a numerical value that is above or below the acceptable target value. The target value is shown as a centre line in the analogue display. The limit values are indicated by triangular symbols. A moving bar represents the current weight on the weighing pan.

Select the target weighing mode via menu item **12**.

Display elements used



Set the "target value", which corresponds to the centre line of the graphic, via the menu item **13**.

Set the "limit value", which corresponds to the distance between the centre line and the upper or lower triangle symbols, via menu item **14** .

16.3 Density determination

When measuring the liquid density, the weight of a reference solid with a known volume is measured in air and in the sample liquid. The density of the liquid is calculated from these two values.
The display unit for the liquid density is "d". The unit of data output is DL.

The optional density determination set must be used to determine the density. Information on this can be found on our website www.kern-sohn.com.

1. Set the menu items **61-1** and **61-2**:
   - **61-1**: Select either the "Hold" display mode or the continuous display mode (the specific weight value is updated according to the weight change in the water).

     Use CAL MENU to select "SG Hold". Use TARE / →0← to activate or deactivate "Hold" (➡ lights up = activated,➡ does not light up = deactivated / continuous display).

     Press ON/OFF ESC repeatedly to return to measuring mode. Press CAL MENU to set the sink volume.
   - **61-2**: Enter the volume (cm^3) of the reference weight (for numerical input, see Chap.3.1.1). Confirm the entry with . TARE / →0←

     Return to measuring mode by repeatedly pressing ON/OFF ESC .

2. Remove the cover from the underfloor hook on the underside of the scales.
3. Hang the weighing vessel on the hook and immerse it completely in the sample liquid.
4. In weighing mode, press UNIT several times until "Air gd" appears. The display automatically changes to "gd▶ " after approx. 2 s (this is measurement in air mode).
5. Press TARE / →0←.
6. Place the weight on the weighing plate.
7. When the stability indicator (➡) appears, press CAL MENU. The weight in the air is then measured. During the measurement, "▶ " is displayed.
8. Then "wAtEer gd" appears and after approx. 2 s the display changes to "gd▶ ".
9. Place the weight in the weighing vessel on the underfloor hook. The display shows the weight value of the weight in liquid.

   Press CAL MENU to display the liquid density in the display mode for the set density value.

   Press ON/OFF ESC to return to step 8.

   Note: If air bubbles appear and the density result is not plausible, you can restart the measurement.
10. Press CAL MENU to start the next measurement and continue with step 5.

Note: If "dSP oL" is displayed, remove the sample and continue with step 4.

16.4 Extreme value detection

(only in non-calibratable setting)
The "extreme value" is the highest or lowest value displayed after the display has changed beyond five times the zero range.
To set the extreme value, select menu item **49**.

16.5 Automatic print function (Auto Print)

(only in non-calibratable setting)
The automatic print function allows data to be printed out automatically without having to press the PRINT button for each individual measurement. When this function is activated, the auto-print symbol AP lights up.
You can choose between six types of automatic printing. Information on setting the zero range can be found in chapter 11.7

Printing during loading:
In the menu overview, select menu item **42.**
Load the sample if the displayed value is within the zero range. If the stability indicator➜ is illuminated and the displayed positive value exceeds 5 times the zero range, data is output automatically. The next data output only takes place after the display has returned to a value within the zero range by unloading the sample or pressing the TARE / →0← button.

Printing during loading and unloading:
In the menu overview, select menu item **43** .
Load or unload the sample if the displayed value is within the zero range. If the stability indicator➜ is illuminated and the displayed positive or negative value exceeds 5 times the zero range, data is output automatically. The next data output only takes place after the display has returned to a value within the zero range by unloading the sample or pressing the TARE / →0← button.

Printing when loading and at zero:
In the menu overview, select menu item **44** .
Load the sample if the displayed value is within the zero range. If the stability indicator➜ is illuminated and the displayed positive value exceeds 5 times the zero range, data is automatically output. Unload the sample or press the TARE / →0← button. If the displayed value is within the zero range and the stability indicator➜ is illuminated, the data is output again.

Printing when loading, loading and at zero:
In the menu overview, select menu item **45** .
Load the sample if the displayed value is within the zero range. If the stability indicator➜ is illuminated and the displayed positive or negative value exceeds 5 times the zero range, data is automatically output. Unload the sample or press the TARE / →0← button. If the displayed value is within the zero range and the stability indicator➜ is illuminated, the data is output again.

16.6 Automatic zero setting

(only in non-calibratable setting)
If the display value is within the zero range and the stability indicator lights up, the zero setting is carried out automatically. The zero symbol appears.
To switch on the zeroing function, select menu symbol **41**

16.7 Zero range

The "zero range" serves as a reference value for determining whether a sample has been applied or not.
To set the zero range, select menu item **48** .

16.8 Taring/printing for stability (PBJ models)

(only possible with calibratable devices)

Specify whether the scale must first achieve stability before printing via the PRINT button or displaying the zero point via the TARE / →0← button.

If you want to print or tare without waiting for stability:
(immediate operation)

- Select the menu item **39** .

If printing or taring is only to take place after stability has been achieved: (Wait for stability)

- Select the menu item **40** .

Notes:
While the scales are waiting for stability, "----" is displayed.

- After the TARE / →0← button has been pressed, the following appears "---". Take this opportunity to press the ON/OFF ESC button, provided that you want to deactivate this function and cancel taring.
- If the communication and standby STAND-BY symbols are illuminated and you press the PRINT button, you must wait for the stability indicator ➜ to light up.

  The data is output after the stability indicator ➜ lights up. If you press the ON/OFF ESC during the waiting time, the scale switches to standby mode. The data is printed out as soon as stability is achieved in the next weighing process.

16.9 Printing with interval output (interval timer)

(only in non-calibratable setting)
Automatically outputs the displayed value at preset intervals. The "T" symbol ("T" of the tare symbol) lights up when the interval timer is activated.

Adjustment

Select menu item **50** in the menu overview.

- Set output interval (between 00:01 (1 second) and 99:59 (99 minutes 59 seconds)→ Numerical input, see chapter 3.1.1
- When the interval timer is in standby mode and the "T" and "Standby" symbols are both illuminated, press the PRINT button.

  The first data is output. The data is then output automatically at the set time intervals.
- To stop the output, press the [POWER] button.
  The scale returns to the standby state of the interval timer in step 1).

- The interval timer is cancelled when the scales are switched off. However, the set interval value is not deleted.
- Connected devices may not function correctly if the set interval is too short. In this case, set a longer interval.
- No more than one of the 7 functions can be set at the same time. If you set the interval timer, the following functions are automatically deactivated (auto-print, automatic zeroing, extreme value detection, add-on mode, animal weighing, recipe mode).

16.10 Recipe mode

This mode is for convenient weighing of individual components for a recipe. The mass of each component is displayed and saved each time the PRINT button is pressed. The mass of this component is output via the
RS-232C or DATA I/O interface and the display is automatically set to 0 for the next weighing of the component.
Once all components have been weighed in, the mass is totalled and displayed as the total weight. This value is output using the ON/OFF ESC button.

In the menu overview, select menu item **51.**

- 1. if the recipe mode is activated, the display is in recipe stand-by until the recipe is started. The add-on symbol, memory symbol and stand-by symbol are shown in the display. Place the container (if used) and press the TARE / →0← button to tare. Note , taring with the TARE / →0← button is not accepted after the PRINT button has already been pressed (as in step 2). Taring is only possible again after ON/OFF ESC has been pressed (as in step 5**).**

- 2. press the PRINT button. If an external device is connected, "--------- FORMULATION MODE ---------" is displayed.
- 3. load the first component and then press the PRINT button. The mass value is then displayed as "CMP001". The display is then automatically set to 0.
- 4 Repeat step 3 until all components have been weighed in.
- 5. then press the ON/OFF ESC button. The total weight is displayed and output on externally connected devices with the unit "TOTAL="
- 6. remove everything from the weighing plate, start the next recipe with step 1.

16.11 Automatic storage and zeroing (add-on mode)

This function is used to weigh a large number of individual samples. When the function is activated, the symbol for automatic storage and zeroing lights up.

In the menu overview, select menu item **52**.

- Place the weighing container on the scale and press the TARE / →0← button while the automatic storage and zeroing function is in standby mode. (The symbol for automatic storage and zeroing and the standby symbol STAND-BY are illuminated).
  The scale is set to zero.
- PRINT - Press the button. The standby symbol disappears and measurements in the
  The automatic storage and zeroing function can be started within the framework of the automatic storage and zeroing function.
- Place the first sample on the weighing pan. Each time the stability symbol ➜ lights up and a value equal to or greater than five times the zero range is displayed or the PRINT button is pressed, the displayed value is output and the balance is reset to zero.
- The weighing process is carried out for the next sample without having to press the ON/OFF ESC button.
- ON/OFF ESC - Press the key. The scale returns to the standby status of the automatic storage and zeroing function and displays the total mass on the weighing pan without the packaging weight. PRINT - Press the button to print out this value.

Notes:

- If the stability symbol is illuminated and the display value is within the zero range, zeroing is performed automatically.
- If the PRINT button is pressed when the displayed value is less than five times the zero range, the zero setting is performed after the data output. (Manual loading)
- If the ON/OFF ESC button is pressed while the automatic memory and reset function is in standby status, the mains supply is also set to standby.

16.12 Animal carts

(only in non-calibratable setting)
This function is used to weigh animals. The animal symbol is illuminated when the animal weighing mode is active.

In the menu overview, select menu item **53.**

- Place the weighing container on the weighing pan and press the TARE button.

Note:
If the weighing container has been placed on the weighing pan, data may be output. This is not a fault.

- animal, which must have a mass of more than 50 times the zero range.
- As soon as the weight value is relatively stable, the value is automatically output.
- TARE - Press the button or remove the animal from the weighing pan
- If the displayed value is stable but below 10 times the zero range, the scales are automatically reset to zero. All residues in the weighing pan (faeces or fur) are automatically cancelled and set to zero. If the scale is not set to zero, the value of the zero range must be increased (see chapter 10.7)

Notes:

- No standby status is provided for the animal weighing function.
- Press the ON/OFF ESC button to switch the mains supply to standby.
- If live animals are to be weighed, the stability detection band is automatically extended in animal weighing mode. The reproducibility of the measurement data is slightly lower here than in other operating modes.
- If the animal to be weighed cannot be checked and the automatic print function does not respond, you can press the PRINT button to output the display value. Then remove the animal from the scales. Even if the stability symbol lights up before the animal has been removed from the scales, the data will not be printed again.
- By setting a wider stability detection band in the menu, the stability symbol lights up sooner.
- If the scale is slow to return to zero, you must set the zero range to a higher value.
- The pre-taring function (section 11.2.1) cannot be used in conjunction with the animal weighing function.

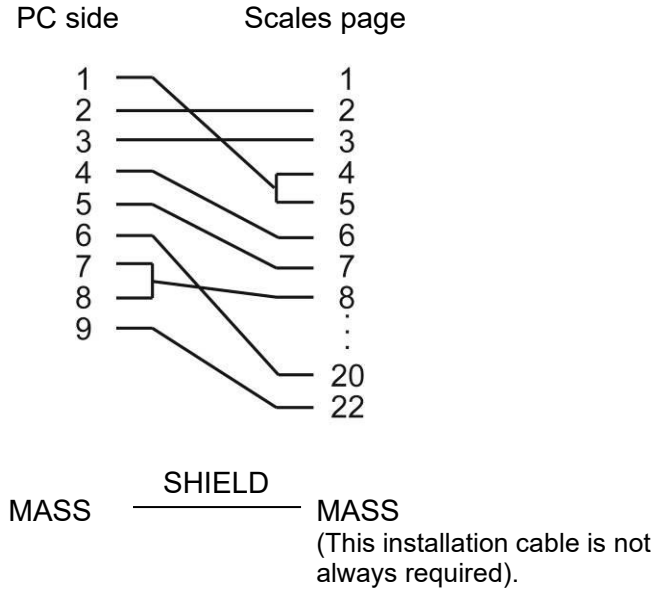
17 Data output

17.1 Personal computer - RS-232C

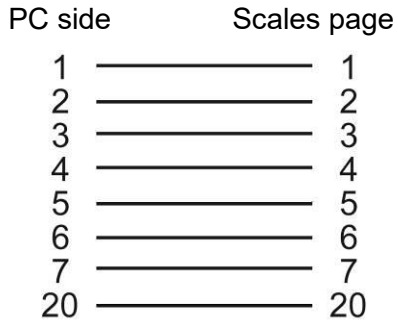
17.1.1 Connecting the cable

ATTENTION:
Signals other than RS-232C can also be output via the RS-232C/AUX interface of the PBS/PBJ series scales. If these signal lines are connected incorrectly, damage may occur to the personal computer or the scales. Therefore, use a suitable, correctly connected cable to ensure communication between the scale and personal computer.
Some types of PC may not operate normally when connected with an optional RS-232C cable in the manner shown in the diagram.

(1) IBM PC/AT and compatible personal computer (D-sub 9-pin)



(2) IEEE standard (D-sub 25-pin)



17.2 Data formats

The following explanation applies if menu item **77** (Format EB type) has been selected. Explanations of other formats can be found in the information on the corresponding data formats of the compatible computer.

Note:
□ stands for space code and <delimiter> stands for delimiter code.

1. For measured values:

First sign	Minus: '-' Non-minus: Space
2nd to 11th characters:	Numerical values or " [", "]" are right-aligned. The position of the decimal point varies depending on the device type.
12. to 13. sign:	Units such as g□ or kg
14. to 15. sign:	Limiter

Note:

- If the limiter is a CR or LF (menu item **94** or **95** selected), the 13th character is not available.
- When printing stability information, the first character mentioned above is preceded by the following characters:
  Stable time: S
  Unstable time: D

2. For "oL" or "-oL"

"oL"□□□□□ OL□□□□□ <limiter>
"-oL" -□□□□ OL□□□□□ <limiter>

17.3 Use of command codes

Note:
If the communication parameters are set incorrectly, the message "ComErr" a communication error is displayed.

1. commands that end with a number, a letter or a symbol other than [=]:
must be transmitted to the scale with a limiter for each command code.

Example 1:
PRINT<CR> ... The same process as pressing the PRINT button.

2. commands ending with [=]: Digits must transmitted to the scale with a delimiter.

Example 2: TIME=1234 <CR> ... 12:34 is set as the current time.

Example 3: P.TARE=1.23 <CR> (example for the second decimal place).
...1.23g is set as the pre-tarring value.

Example 4: P.TARE=0.00 <CR> (example for the second decimal place)
...Deletes (cancels) the pre-tare value.

Note:
The number of digits, the decimal point and the position of the decimal point in the number character transmitted after the '=' are the same as if the numerical value were entered via the keyboard.
Use the same number of decimal places as in weighing mode.
This restriction does not apply to USER=, SOLID= and LIQUID=.

Notes:

- If the four-digit number contains a 0, the setting is complete at this point and the menu selection is finished.
- The result of this command varies depending on the type of scale.

Example 6:	#=2.56 <CR>
Example 7:	#=12.345.67 <CR> A personal computer can define a specific digit display for weighing and display processes on the scales. For the commands in examples 6 & 7, [#2.56] and [#12.345.67] are displayed on the scale. If you press the PRINT button, the strings '2-56<CR>' and '12-345-67<CR>' are output by the scale.

3. feedback command

The scale returns the string of N characters enclosed between a response command '{' or '}' and the delimiter.
No unprocessed feedback commands remain in the scales' receive buffer from N ≤30.

Example 8:	ABCDEFG12345<CR> ... After receiving this command, the scale outputs ABCDEFG12345<CR>. The printer can print this string.

Note:

Only capital letters and some of the symbols (decimal point, decimal symbol, etc.) can be used for output via electronic printers. The maximum line length is 15 characters.

4. command codes for formats of the EB type (menu item 77) and the Old EB type (menu item 78)

(i) Output commands

D01	Ongoing issue
D03	Continuous output with stability information
D05	Single issue
D06	Setting automatic printing (type of automatic printing is defined separately)
D07	Single output with stability information
D09	Cancellation of continuous output and automatic printing

(ii) Commands relating to operating buttons	
POWER	Corresponds to the ON/OFF ESC button.
Q	Corresponds to the ON/OFF ESC button.
MENU	Corresponds to the CAL MENU button.
TARE	Corresponds to the ON/OFF ESC button.
T	Corresponds to the CAL MENU button.
UNIT	Corresponds to the UNIT button.
PRINT	Corresponds to the PRINT button.
POWER+	Corresponds to holding the ON/OFF ESC button for approx. 3 seconds.
MENU+	Corresponds to holding the CAL MENU button for approx. 3 seconds.
UNIT+	Corresponds to holding the UNIT button for approx. 3 seconds.
PRINT+	Corresponds to holding the PRINT button for approx. 3 seconds.

(iii) Commands related to application measurements	
ADDON	Sets the automatic saving and zeroing mode.
+	Takes effect immediately after the automatic storage and zeroing mode has been set.
A	Sets the animal weighing mode.
ANIMAL	Sets the animal weighing mode.
R	Cancels the application weighing mode.

(iv) Commands relating to unit conversion	
g	Switches to the "g" unit.
kg	Registration of the "kg" unit and changeover.
PERCENT	Registration of the "%" unit and changeover.
%	Sets 100% if the display is in the "%" unit.
G	Switching g - %
PCS	Registration of the "PCS" unit and switchover.
SDENSE	Registration of the "solid density" unit and switching.
LDENSE	Registration of the "liquid body density" unit and switching.
RSTUNIT	Returns to the default settings.

(v) Readout commands for setting values	
TARGET	Read out the set target value.
LIMIT	Read out the set limit value.
G.LO	Read out the set lower limit value in the checkweighing display 1.
G.UP	Read out the set upper limit value in the checkweighing display 1.
L.LO	Read out the set lower limit value in the checkweighing display 2.
L.UP	Read out the set upper limit value in the checkweighing display 2.
UW	Read out the set value for the weight unit.
G/PCS	Corresponds to the g/PCS button.
CALWIT	Read out the set value of external weights for measuring range calibration.
ACALT1	Read out time 1 in Clock-CAL.
ACALT2	Read out time 2 in Clock-CAL.
ACALT3	Read out time 2 in Clock-CAL.
P.TARE	Read out the set pre-tarring value.
ZRNG	Read out the zero range setting value.
USER	Read out the conversion coefficient for the user unit.
VOL	Read out the set value for the reference weight.
DENSE	Read out the set value for the density of the ambient liquid.
ITIME	Read out the set value for the interval timer.

(vi) Commands for setting numerical values	
CALWIT=	Sets the value of external weights for the measuring range calibration.
ACALT1=	Sets the time 1 in Clock-CAL.
ACALT2=	Sets the time 2 in Clock-CAL.
ACALT3=	Sets the time 3 in Clock-CAL.
UW=	Sets the weight unit.
VOL=	Sets the volume of the reference weight.
SDENSE=	Sets the density of the ambient liquid
DATE=	Sets the date.
TIME=	Sets the time.
TARGET=	Sets the target value.
LIMIT	Sets the limit value.
G.LO=	Sets the lower limit value of the checkweighing display 1.
G.UP=	Sets the upper limit value of the checkweighing display 1.
L.LO=	Sets the lower limit value of the checkweighing display 2.
L.UP=	Sets the upper limit value of the checkweighing display 2.
PCS=	Set any number of pieces.
#=	Corresponds to the numeric keys on the keyboard
ID=	Defines the ID.

(vii) Commands with special functions	
CAL	Calls up the measuring range calibration mode.
C18	Calls up the measuring range calibration mode.
LOCK	Sets the menu lock.
RELEASE	Cancels the menu lock.
TIME	Reads out the date and time.
ADJCLK	Causes correction by +/- 30 seconds.
RSTMN	Menu reset
MENU=	Allows you to call up any menu.
{	Feedback.
}	Feedback.
[@]	Switches to multipoint connection mode. (@ stands for a lower case letter)

5. compatible commands for electronic scales of the Mettler Toledo series	
S	Single issue in stable condition
SI	Immediate one-off issue
SIR	Ongoing issue
SR	Continuous output in stable condition
T	Taring after stabilisation
TI	Immediate taring
Z	Zero setting (same as immediate taring)

5. compatible commands for electronic scales from the Sartorius series	
<ESC>P	One-off taring
<ESC>T	Taring

Note:
<ESC> stands for the escape code (1BH)

17.4 Operator settings

17.4.1 Overview

This menu is used to define the technical data for communication between the scale and a personal computer or electronic printer.

Note:
This menu affects both the RS-232C and the DATA I/O interface.
For the device that is connected to the DATA I/O interface, such as an electronic printer, you must set the communication parameters of the scale to the default settings, i.e. select the following menu items: **76**, **77**, **83**, **89**, **92**, **94**.

17.4.2 Handshaking

The handshaking function determines whether peripheral devices can receive communication data from the scale or not. It does not transmit the status of the scale to the peripheral devices. The scale can receive data for as long as the free space in its receive buffer allows. This function is ready for operation as soon as "oFF" is displayed. Its faultless operation in other states cannot be guaranteed.
If the scale output is prevented by handshaking, the scale display is blocked.
Make the appropriate settings for handshaking.

If no software handshaking is to be performed, select the menu item	**73**
If software handshaking is to be carried out in the manner described below, select the menu item • After the scale has received X-OFF (13H), the data output of the scale is stopped. • After the scale has received X-ON (11H), the data output of the scale is started.	**74**
If hardware handshaking is to be carried out in the manner described below, select the menu item • If DTR is set to OFF, data output from the scale is disabled. • If DTR is set to ON, the data output of the scale is started.	**75**
To initiate time-controlled hardware handshaking, select the menu item	**76**

17.4.3 Format

Set the data output format of the scale.
For the standard format of electronic scales

- Select menu item **77** .

For the old output format of electronic KERN scales:

- Select menu item **78** .

17.4.4 Communication speed

Set the communication speed (300, 600, 1200, 2400, 4800, 9600, 19200 or 38400bps).
The value shown in "b-xxx" indicates the bps (bits/second). Baud rate and bps are the same value.
Select one of the menu items **81** to **88**.

17.4.5 Parity / bit length

Select parity and bit length.

No parity, 8-bit length:	Select the menu item **89**
Odd parity, 7-bit length:	Select the menu item **90**
Even parity, 7-bit length:	Select the menu item **91**

17.4.6 Stop bits

Select the number of stop bits.

Stop bit 1:	Select the menu item **92**
Stop bit 2:	Select the menu item **93**

17.4.7 Limiter

The "Delimiter" is used to separate individual data or commands from each other. Set the delimiter as follows:

Set to CR(0DH):	Select the menu item **94**
Set to LF(0AH):	Select the menu item **95**
Set to CR+LF(0D0AH):	Select the menu item **96**

18 Maintenance, servicing, disposal

18.1 Cleaning

Please disconnect the appliance from the operating voltage before cleaning.

Please do not use any aggressive cleaning agents (solvents or similar), but only a cloth moistened with mild soapy water. Make sure that no liquid penetrates the appliance and wipe with a dry, soft cloth.
Loose sample residues/powder can be carefully removed with a brush or hand hoover.

Immediately remove any spilt weighing material.

18.2 Maintenance, servicing

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

18.3 Waste disposal

The operator must dispose of the packaging and appliance in accordance with the applicable national or regional legislation at the place of use.

19 Small breakdown service

In the event of a fault in the programme sequence, the scale should be switched off briefly and disconnected from the mains. The weighing process must then be re-started from the beginning.

General display:

Display	Explanation
---	Wait for the next advert.
-t imE-	The date and time are displayed.
Abort	Process was cancelled.
APL End	Application measurement was released.
d ouEr	Calibration check detects an error that is too large. (Please contact your dealer.)
d UndEr	Calibration check detects an error that is too large. (Please contact your dealer.)
LoCKEd	Menu lock active.
rELEASE	Mens lock cancelled.
rESEt	Menu has been reset.
SEt	The content of the new setting and coefficient have been saved.
oFF	Reset due to power failure.
wA it	Built-in weight moves. Wait.
All numeric characters flash.	Apply the displayed calibration weight.

Error display:

Displayed error code	Explanation	Remedy
CAL E0	Fault in the weight loading mechanism.	Check the transport screws.
CAL E1	The load on the weighing pan is unstable during calibration.	
CAL E2	High drift of the zero point during calibration.	Empty the scales.
CAL E3	High drift during PCAL.	Use the correct weight.
CAL E4	High drift during measuring range calibration.	Use the correct weight.
CAL E5	Calibration weight is incorrect.	Use the correct weight.
CHE x	Fault in the scale (scale stops at this display)	*
ComErr	Command code received is not correct.	Check limiter etc.
dSP oL	Integer of the displayed unit is over 7 digits long.	Reduce load.
Err 0x	Disturbance in the balance.	*
Err 24	Mains voltage is faulty.	Check the mains voltage.

* Get in touch with your dealer.

Troubleshooting:

Symptom	Probable cause	Remedy
Display is blank.	• AC adapter not connected. • The room's circuit breaker is off. • Voltage is wrong.	Check the mains voltage and connect the AC adapter correctly
Display "OL" or "-OL"	Transport screws not loosened. Weighing pan supports not fitted. Load on the weighing pan too high.	Turn the screws anti-clockwise until they lock Fitting the pan supports use the scales within their capacity.
Display does not respond when load is placed on weighing pan.	Weighing pan has slipped.	Position the weighing pan correctly.
Display fluctuates.	Influenced by vibrations or air flow. Protective cover touches the weighing pan.	Set up the scales in a suitable location and try to change the environmental settings Attach the cover to the main weighing unit
Weighing result is inaccurate.	Measuring range calibration not performed. Taring not performed.	Calibrate the scales correctly Tare the scales before weighing
Scale does not display the desired unit.	The unit has not been set up.	Set up unit beforehand
Menu item selection is rejected.	Menu lock is switched ON.	Unlocking the menu