KERN & Sohn GmbH

Operating Manual
Precision balance

KERN PFB

Version 2.2
02/2013
GB

KERN PFB

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Operating Manual
Precision balance

English

Table of Contents

English

1 Technical Data

KERN	PFB 120-3	PFB 200-3	PFB 300-3	PFB 1200-2
Readability (d)	0.001 g	0.001 g	0.001 g	0.01 g
Weighing range (max)	120 g	200 g	300 g	1200 g
Reproducibility	0.001 g	0.001 g	0.001g	0.01 g
Linearity	±0.003 g	±0.003 g	±0.003 g	±0.03 g
Smallest part weight for parts counting	2 mg	2 mg	2 mg	20 mg
Reference quantities at parts counting	10, 20, 50, 100, 200			
Weighing Units	g, ct, lb, oz, d, ozt, dwt, mo, tl h, tl c, tl t, t, bt, n			
Recommended adjustment weight, not added (class)	100 g (F1)	200 g (F1)	300 g (F1)	1000 g (F1)
Warm-up time	2 hours			
Stabilization time (typical)	3 sec.			
Operating temperature	+ 5° C .... + 35° C			
Humidity of air	max. 80 % (not condensing)			
Housing (B x D x H) mm	200 x 257 x 152 (with draft shield) 200 x 257 x 87(without draft shield)			
Draft shield (B x D x H) mm	158 x 143 x 64 (inside) 167 x 154 x 80 (outside)			
Weighing plate, stainless steel (mm)	Ø 80	Ø 80	Ø 80	Ø 120
Weight kg (net)	2 kg			
Voltage	12 V / 500 mA			

KERN	PFB 2000-2	PFB 3000-2	PFB 6000-1	PFB 6K0.05
Readability (d)	0.01 g	0.01 g	0.1 g	0.05 g
Weighing range (max)	2000 g	3000 g	6000 g	6000 g
Reproducibility	0.01 g	0.01 g	0.1 g	0.05 g
Linearity	±0.03 g	±0.03 g	± 0.3 g	± 0.15 g
Smallest part weight for parts counting	20 mg	20 mg	200 mg	200 mg
Reference quantities at parts counting	10, 20, 50, 100, 200			
Weighing Units	g, ct, lb, oz, d, ozt, dwt, mo, tl h, tl c, tl t, t, bt, n			
Recommended adjustment weight, not added (class)	2000 g (F1)	3000 g (F1)	5000 g (F1)	5000 g (F1)
Warm-up time	2 hours			
Stabilization time (typical)	3 sec.			
Operating temperature	+ 5° C .... + 35° C			
Humidity of air	max. 80 % (not condensing)			
Housing (B x D x H) mm	200 x 257 x 152 (with draft shield) 200 x 257 x 87 (without draft shield)		200x260x87	200x257x87
Draft shield (B x D x H) mm	158 x 143 x 64 (inside) 167 x 154 x 80 (outside)		-	-
Weighing plate, stainless steel (mm)	Ø 120	Ø 120	155 x 145	155 x 145
Weight kg (net)	2 kg			
Voltage	12 V / 500 mA			

English

PFB-BA-e-1322

KERN	PFB 600-1M	PFB 600-2M
Readability (d)	0.1 g	0.01 g
Weighing range (max)	600 g	600 g
Reproducibility	0.1 g	0.01 g
Linearity	± 0.1 g	± 0.02 g
Verification value (e)	100 mg	100 mg
Verification class	II	II
Minimum load (Min)	2 g	200 mg
Smallest part weight for parts counting	20 mg	20 mg
Reference quantities at parts counting	10, 20, 50, 100, 200	
Weighing Units	g	g, ct
Recommended adjustment weight, not added (class)	600 g (F1)	600 g (F1)
Warm-up time	30 minutes	2 hours
Stabilization time (typical)	3 sec.	
Operating temperature	+ 5° C .... + 35° C	
Humidity of air	max. 80 % (not condensing)	
Housing (B x D x H) mm	190 x 220 x 140 (with draft shield) 190 x 220 x 60 (without draft shield)	
Draft shield (B x D x H) mm	158 x 143 x 64 (inside) 167 x 154 x 80 (outside)	
Weighing plate, stainless steel (mm)	Ø 120	
Weight kg (net)	2 kg	
Voltage	12 V / 500 mA	

PFB-BA-e-1322

KERN	PFB 6000-0M	PFB 6000-1M
Readability (d)	1 g	0.1 g
Weighing range (max)	6000 g	6000 g
Reproducibility	1 g	0.1 g
Linearity	± 1 g	± 0.3 g
Verification value (e)	1 g	1 g
Verification class	II	II
Minimum load (Min)	2 g	2 g
Smallest part weight for parts counting	200 mg	200 mg
Reference quantities at parts counting	10, 20, 50, 100, 200	
Weighing Units	g	g, ct,
Recommended adjustment weight, not added (class)	6000 g (F1)	6000 g (F1)
Warm-up time	30 minutes	2 hours
Stabilization time (typical)	3 sec.	
Operating temperature	+ 5° C .... + 35° C	
Humidity of air	max. 80 % (not condensing)	
Housing (B x D x H) mm	190 x 220 x 80	
Weighing plate, stainless steel (mm)	155 x 145	
Weight kg (net)	2 kg	
Voltage	12 V / 500 mA	

2 Declaration of conformity

KERN & Sohn GmbH
D-72322 Balingen-Frommern *Phone: 0049-[0]7433- 9933-0*
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Declaration of conformity

EC-Konformitätserklärung	EC-Declaration of -Conformity
EC- Déclaration de conformité	EC-Declaración de Conformidad
EC-Dichiarazione di conformità	EC-Conformiteitverklaring
EC- Declaração de conformidade	EC- Prohlášení o shode
EC-Deklaracja zgodności	EC-Заявление о соответствии

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

Electronic Balance: KERN PFB

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

Date: 18.09.2008 **Signature:**

KERN & Sohn GmbH
Management

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3 Basic Information (General)

3.1 Proper use

The balance you purchased is intended to determine the weighing value of material to be weighed. It is intended to be used as a "non-automatic" balance, i.e. the material to be weighed is manually and carefully placed in the centre of the weighing plate. As soon as a stable weighing value is reached the weighing value can be read.

3.2 Improper Use

Do not use balance for dynamic weighing. In the event that small quantities are removed or added to the material to be weighed, incorrect weighing results can be displayed due to the "stability compensation" in the balance. (Example: Slowly draining fluids from a container on the balance.)
Do not leave permanent load on the weighing plate. This may damage the measuring system.
Impacts and overloading exceeding the stated maximum load (max) of the balance, minus a possibly existing tare load, must be strictly avoided. Balance may be damage by this.
Never operate balance in explosive environment. The serial version is not explosion protected.
The structure of the balance may not be modified. This may lead to incorrect weighing results, safety-related faults and destruction of the balance.
The balance may only be used according to the described conditions. Other areas of use must be released by KERN in writing.

3.3 Warranty

Warranty claims shall be voided in case

- Our conditions in the operation manual are ignored

- The appliance is used outside the described uses

- The appliance is modified or opened

- Mechanical damage and damage caused by media, liquids

  Natural wear and tear

- The appliance is improperly set up or incorrectly electrically connected

- The measuring system is overloaded

3.4 Monitoring of Test Resources

In the framework of quality assurance the measuring-related properties of the balance and, if applicable, the testing weight, must be checked regularly. The responsible user must define a suitable interval as well as type and scope of this test. Information is available on KERN's home page (www.kern-sohn.com with regard to the monitoring of balance test substances and the test weights required for this. In KERN's accredited DKD calibration laboratory test weights and balances may be calibrated (return to the national standard) fast and at moderate cost.

4 Basic Safety Precautions

4.1 Pay attention to the instructions in the Operation Manual

Carefully read this operation manual before setup and commissioning, even if you are already familiar with KERN balances.

Versions in other languages are non-binding translations.
The only binding version is the original document in German.

4.2 Personnel training

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

5 Transportation & Storage

5.1 Testing upon acceptance

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

5.2 Packaging / return transport

⇨ Keep all parts of the original packaging for a possibly required return.

⇨ Only use original packaging for returning.

⇨ Prior to dispatch disconnect all cables and remove loose/mobile parts.

⇨ Reattach possibly supplied transport securing devices.

⇨ Secure all parts such as the glass wind screen, the weighing platform, power unit etc. against shifting and damage.

6 Unpacking, Setup and Commissioning

6.1 Installation Site, Location of Use

The balances are designed in a way that reliable weighing results are achieved in common conditions of use.
You will work accurately and fast, if you select the right location for your balance.

Therefore, observe the following for the installation site:

- Place the balance on a firm, level surface;
- Avoid extreme heat as well as temperature fluctuation caused by installing next to a radiator or in the direct sunlight;
- Protect the balance against direct draughts due to open windows and doors;
- Avoid jarring during weighing;
- Protect the balance against high humidity, vapors and dust;
- Do not expose the device to extreme dampness for longer periods of time. Non-permitted condensation (condensation of air humidity on the appliance) may occur if a cold appliance is taken to a considerably warmer environment. In this case, acclimatize the disconnected appliance for ca. 2 hours at room temperature.
- Avoid static charge of goods to be weighed or weighing container.

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

6.2 Unpacking

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

6.2.1 Placing/ Remove the transportation lock

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

Remove the transportation lock [1] (PFB 120-3, PFB 200-3, PFB 300-3):

6.2.2 Scope of delivery

Serial accessories:

- Balance
- Weighing plate
- Mains power supply
- Operating Manual
- Draft shield (only models PFB 120-3, PFB 200-3, PFB 300-3, PFB 600-1M, PFB 600-2M, PFB 1200-2, PFB 2000-2, PFB 3000-2)

6.3 Mains connection

Power is supplied via the external mains adapter. The stated voltage value must be the same as the local voltage.
Only use original KERN mains adapters. Using other makes requires consent by KERN.

6.4 Connection of peripheral devices

Before connecting or disconnecting of additional devices (printer, PC) to the data interface, always disconnect the balance from the power supply.
With your balance, only use accessories and peripheral devices by KERN, as they are ideally tuned to your balance.

6.5 Initial Commissioning

In order to obtain exact results with the electronic balances, your balance must have reached the operating temperature (see warming up time chap. 1). During this warming up time the balance must be connected to the power supply (mains, accumulator or battery).
The accuracy of the balance depends on the local acceleration of gravity.
Strictly observe hints in chapter Adjustment.

6.6 Adjustment

As the acceleration value due to gravity is not the same at every location on earth, each balance must be coordinated - in compliance with the underlying physical weighing principle - to the existing acceleration due to gravity at its place of location (only if the balance has not already been adjusted to the location in the factory). This adjustment process must be carried out for the first commissioning, after each change of location as well as in case of fluctuating environment temperature. To receive accurate measuring values it is also recommended to adjust the balance periodically in weighing operation.

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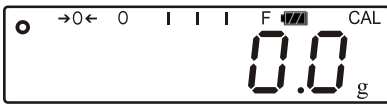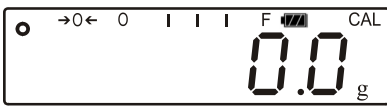
The adjustment should be made with the recommended adjustment weight (see chap. 1 "Technical data").

6.7.1 Procedure when adjusting (non-verifiable models):

Observe stable environmental conditions.

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

Ensure that there are no objects on the weighing plate.

Balance display	Operation
→0← 0 I I I F CAL 0.0 g / UnLoAd	⇨ In weighing mode press [MODE] approx. 3 sec. until „UnLoAd" appears.
LoAd	When display „LoAd" appears, put the necessary adjustment weight (see chap.1; Technical Data) on the center of the weighing plate. Adjustment will be carried out automatically after dead stop control.
	⇨ Wait for stability display
	„Pass" appears, the adjustment process has been finished successfully. ⇨ Take away adjustment weight
→0← 0 I I I F CAL 0.0 g	Wait until the balance is again in the weighing mode.

6.7.2 Adjustment procedure (models PFB-M):

Observe stable environmental conditions.

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

Ensure that there are no objects on the weighing plate.

Balance display	Operation
`F 1 Unt`	⇨ Start balance by pressing [ON/OFF] During the selftest press [MODE]. „**F1 Unt**" is displayed.
`tECH`	⇨ Press [MODE] repeatedly until „tECH" is displayed
⇨ **Press adjustment switch on the lower side of the balance!**	
`P in`	⇨ Press [→0←], „Pin" is displayed
	⇨ Enter password:
`P1 Lin`	Press [PCS], [PRINT ESC], [TARE] subsequently. „P1 Lin" is displayed
`P2 CAL`	⇨ Press [MODE], „**P2 CAL**" will be displayed
`UnLoAd` ⇩ `° LoAd`	⇨ Press [→0←], „UnLoAd" followed by „LoAd" is displayed.
	⇨ Put the necessary adjustment weight (see chap.1; Technical Data) on the centre of the weighing plate. Adjustment will be carried out automatically after dead stop control.
	⇨ Wait for stability display

PASS	„Pass" appears, the adjustment process has been finished successfully. ⇨ Remove adjusting weight during selftest
0.00 g	Wait until the balance is again in weighing mode.

6.8 Linearization

Linearity shows the greatest deviation of a weight display on the scale to the value of the respective test weight according to plus and minus over the entire weighing range.
If linearity deviation is discovered during a testing instrument control, you can improve this by means of linearization.

- In balances with a resolution of > 15 000 dividing steps carrying out a linearization is recommended.
- Carrying out linearization is restricted to specialist staff possessing well acquainted with the workings of weighing scales.
- The test weights to be used must be adapted to the weighing scale's specifications; see chapter "testing instruments control".
- Observe stable environmental conditions. Stabilisation requires a certain warm-up time.
- After successful linearization you will have to carry out calibration; see chapter "testing instruments control".

6.8.1 Linearization non-verifiable models (low resolution)

Balance display	Operation
F1 Unt	⇨ Start balance by pressing [ON/OFF] Whilst the balance carries out a self test, press [MODE] until „F1 Unt" appears
tECH	⇨ Press [MODE] repeatedly until "tECH" appears
P in	⇨ Press [→0←], „Pin" appears
P1 Lin	⇨ Press [PCS], [PRINT/ESC] and [TARE] successively, „P1 Lin" appears
P in	⇨ Press [→0←] anew, „Pin" appears again
LoAd 0 / LoAd 1	⇨ Press successively [PRINT/ESC], [PCS] and [%], „LoAd 0" appears; after the apparition of the stability display and the signal sound, „LoAd 1" will be displayed

$LoAd\ 2$	⇨ Put on weight 1 (see table chap. 6.8.1) ⇨ Wait for the stability display and the signal sound ⇨ „LoAd 2" appears ⇨ Remove weight 1 and put on the weight 2
$LoAd\ 3$	⇨ After the stability display and the signal sound „LoAd 3" appears; remove weight 2 and put on weight 3
$LoAd\ 4$	⇨ After the stability display and the signal sound „LoAd 4" appears; remove weight 3 and put on weight 4
$LoAd\ 0$ $LoAd\ 4$	⇨ After having placed weight 4, „LoAd 0" appears again ⇨ Remove weight 4, „LoAd 4" appears anew ⇨ Place weight 4 again
$LoAd\ 3$	⇨ Wait for the stability display and the signal sound, „LoAd 3" will be displayed ⇨ Remove weight 4 and place weight 3
$LoAd\ 2$	⇨ Wait for the stability display and the signal sound, „LoAd 2" will be displayed ⇨ Remove weight 3 and place weight 2
$LoAd\ 1$	⇨ Wait for the stability display and the signal sound, „LoAd 1" will be displayed ⇨ Remove weight 2 and place weight 1
$LoAd\ 0$	⇨ Wait for the stability display and the signal sound ⇨ „LoAd 0" will be displayed
	⇨ Remove weight 1
→0← 0 ▌▌▌ F CAL 0.0 g	⇨ After the stability display and the signal sound the balance carries out a selftest and changes into the weighing mode. Now the linearization is concluded successfully.

6.8.2 Linearization of non verifiable models (low resolution) and verifiable models

Balance display	Operation
F1 Unt	⇨ Start balance by pressing [ON/OFF]. While the balance carries out a self test, press [MODE] until „F1 Unt" appears
tECH	⇨ Press [MODE] repeatedly until "tECH" appears
In case of verifiable models press the adjustment switch on the lower side of the balance!	
P in	⇨ Press [→0←], „Pin" appears
P1 Lin	⇨ Press [PCS], [PRINT/ESC] and [TARE] successively, „P1 Lin" appears
P in	⇨ Press [→0←] anew, „Pin" appears again
LoAd 0 LoAd 1	⇨ Press successively [PRINT/ESC], [PCS] and [%], „LoAd 0" appears; after the apparition of the stability display and the signal sound, „LoAd 1" will be displayed ⇨ Put on weight 1 (see table chap.6.8.1)
LoAd 2	⇨ Wait for the stability display and the signal sound ⇨ „LoAd 2" appears ⇨ Remove weight 1 and put on the weight 2
LoAd 3	⇨ After the stability display and the signal sound „LoAd 3" appears; remove weight 2 and put on weight 3
0.00 g	⇨ After the stability display and the signal sound the balance carries out a selftest. Remove the weight during selftest. The balance changes into weighing mode. Now the linearization is concluded successfully.

6.8.3 Table Linearization points

Non-verifiable models:

Max	Weight 1	Weight 2	Weight 3	Weight 4
120 g	30 g	60 g	90 g	120 g
200 g	50 g	100 g	150 g	200 g
300 g	50 g	100 g	200 g	300 g
1200 g	300 g	600 g	900 g	1200 g
2000 g	500 g	1000 g	1500 g	2000 g
3000 g	0.5 kg	1 kg	2 kg	3 kg
6000 g	1 kg	2 kg	4 kg	6 kg

Models PFB-M:

Max	Load 0	Load 1 (weight 1)	Load 2 (weight 2)	Load 3 (weight 3)
600 g	0 g	200 g	400 g	600 g
6000 g	0 g	2000 g	4000 g	6000 g

6.9 Verification

General introduction:
According to EU directive 90/384/EEC or 2009/23EG balances must be officially verified if they are used as follows (legally controlled area):
   a) For commercial transactions if the price of goods is determined by weighing.
   b) For the production of medicines in pharmacies as well as for analyses in the medical and pharmaceutical laboratory.
   c) For official purposes
   d) For manufacturing final packages
In cases of doubt, please contact your local trade in standard.

Verification notes:
An EU type approval exists for balances described in their technical data as verifiable. If a balance is used where obligation to verify exists as described above, it must be verified and re-verified at regular intervals.
Re-verification of a balance is carried out according to the respective national regulations. The validity for verification of balances in Germany is e.g. 2 years.
The legal regulation of the country where the balance is used must be observed!

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

Position of seals and adjusting switch:
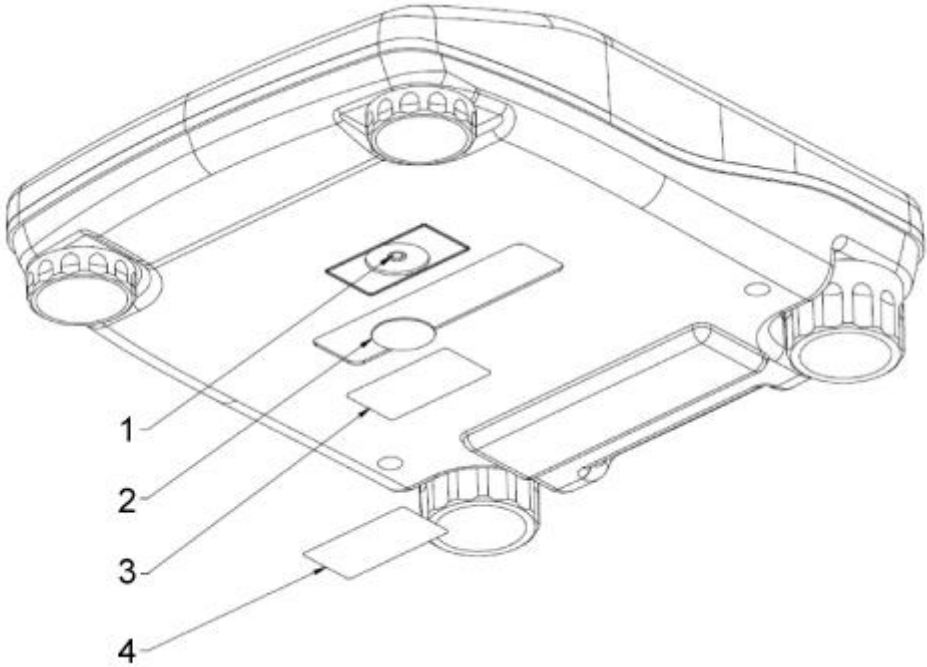
1. Adjustment switch
2. Plastic disk to cover the adjustment switch
3. Self-destroying seal mark
4. Self-destroying seal mark

6.10 Operation with second display unit PFB-A08 for open points of sale

For the use in open points of sale, operation with a second display unit is required. In the models PFB 600-1M and PFB 6000-0M this (PFB-A08) is already existing.
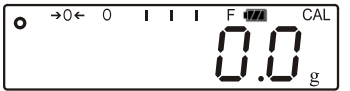
⚠ **The second display unit is exclusively suitable for the connection to KERN balances.**

For configuration proceed as follows:

First adjust on the balance the following:
- In the menu select menu item „F3 Con" and adjust the continuous printed output „P Cont"
- Moreover set the baud rate to „9600"

Adjust the Sale mode: Setting „SALE Y" = 6000 e	
- The totalizing function is not available - Only the weighing unit Gram is available	
F1 Unt	⇨ Start balance by pressing [ON/OFF]. While the balance carries out a self test, press [MODE] until „F1 Unt" appears
SALE n	⇨ Press [MODE] repeatedly until „**SALE n**" is displayed
Press adjustment switch on the lower side of the balance!	
SALE n	⇨ Press [→0←]
SALE Y	⇨ Press [MODE], „**SALE Y**" is displayed
	⇨ Confirm setting by [→0←]
→0← 0 ∣ ∣ ∣ F ▦ CAL **0.0** g	The balance changes automatically into weighing mode thus being limited to max. 6000e.

Switch off Sale mode: Setting „SALE n" = 6000 e or 60000 d	

- The totalizing function is available
- The weighing units gram and carat are available

$F \ I \ Un\bar{t}$	⇨ Start balance by pressing [ON/OFF]. While the balance carries out a self test, press [MODE] until „F1 Unt" appears
$SALE \ \bar{n}$	⇨ Press [MODE] repeatedly until „**SALE n**" is displayed
Press adjustment switch on the lower side of the balance!	
$SALE \ n$	⇨ (when „**SALE n**" is not displayed, press [MODE])
	⇨ Confirm setting by [→0←]
→0← 0 I I I F ▰ CAL $0.0 \ g$	The balance changes automatically into weighing mode and thus will be adjusted for 6000 e or 60000 d.

⇨ Connect the second display to the balance via the delivered connecting cable
⇨ Now the balance can be controlled via the second display:

Press [ON/OFF] to switch on or off only the second display

Reset balance and second display to zero by [→0←]

Tare balance and second display to zero by [TARE]

7 Controls

7.1 Keyboard overview

Buttons specification:
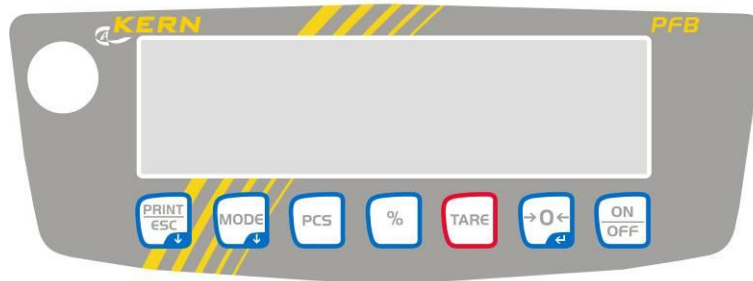
Key	Designation	Pressed once and released
[ON/OFF icon]	**[ON/OFF]**	⇨ Turn on/off
[ZERO icon]	**[ZERO]**	⇨ Set weight display at zero ⇨ Activate the current element in the menu ⇨ Select in Weighing units (menu F UNIT): change to the next unit
[TARE icon]	**[TARE]**	⇨ Taring
[% icon]	**[%]**	⇨ Call-up %-function ⇨ In the percent mode back to weighing mode ⇨ Only % function
[PCS icon]	**[PCS]**	⇨ Call-up parts counting mode ⇨ In the piece count mode back to weighing mode
[MODE icon]	**[MODE]**	⇨ Weighing units switch-over; ⇨ At weighing unit switch-over (menu „F UNIT"): Set weighing unit on/off ⇨ Counting up in parts counting mode ⇨ Select menu and pass through menu items from top to bottom ⇨ Changing readability
[PRINT ESC icon]	**[PRINT/ESC]**	⇨ Print out weighing result ⇨ Exit menu (jumping back to weighing mode)

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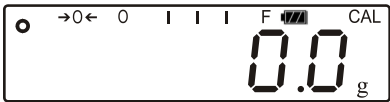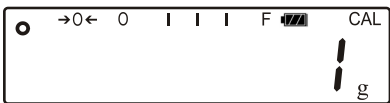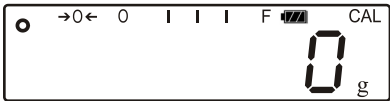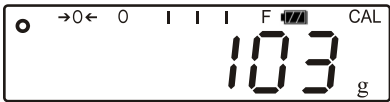
Display	Description	
g	Gram	
kg	Kilogram	
→0←	Zeroing display	
→T←	Taring	
o	Stability display	
Pcs	Display for parts counting	
%	Percent weighing display	
◄	Display for tolerance weighing	
(mom)	Momme	
CAL	Display for adjustment. Signals the adjustment function	
0 F	Bar graph	
Weight unit display	g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

8 Operation

8.1 Simple weighing

8.1.1 Non-verifiable models

Balance display	Operation
→0← 0 I I I F ▰▰ CAL **0.0** g	⇨ Start balance by pressing [ON OFF] The balance will carry out a self-test. Wait for „**0.0**" display
→0← 0 I I I F ▰▰ CAL **1** g	⇨ Should the balance not display exactly „**0.0**" despite empty scale pan, press the [→0←] button. The balance starts with resetting to „**0**"
→0← 0 I I I F ▰▰ CAL **0** g	
→0← 0 I I I F ▰▰ CAL **103** g	⇨ Place goods to be weighed on balance Wait until the stability display appears [●] . Read weighing result.
	⇨ To switch off the balance press shortly [ON OFF] .

8.1.2 Models PFB-M

Balance display	Operation
→0← 0 I I I F ▰▰ **0.00** g	⇨ Start balance by pressing [ON OFF] The balance will carry out a self-test. Wait for „**0.0**" display
0 I I I F ▰▰ **0.44** g (example)	⇨ Should the balance not display exactly „**0.0**" despite empty scale pan, press the [→0←] button. The balance starts with resetting to „**0**"
→0← 0 I I I F ▰▰ **0.00** g	
0 ▪▪▪▪ I I I F ▰▰ **20.00** g	⇨ Place goods to be weighed on balance. Wait until the stability display appears [●] . Read weighing result.
	⇨ To switch off the balance press shortly [ON OFF] .

English

8.2 Taring

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

8.2.1 Non-verifiable models

Balance display	Operation
→0← 0 I I I F ▰▰▰ CAL **25** g	⇨ Deposit weighing receptacles. The weight of the container is displayed.
→0← 0 I I I F ▰▰▰ CAL **0.0** g	⇨ Press [TARE], the zero display appears. The pictogram →T← is displayed. The pictogram →0← goes out. The weight of the container is now internally saved.
→0← 0 I I I F ▰▰▰ CAL **103** g	⇨ Place goods to be weighed in the weighing container. The net weight of the goods to be weighed is displayed.
→0← 0 I I I F ▰▰▰ CAL **− 103** g	⇨ The weight of the weighing container will be displayed as a minus number after removing the weighing container.
→0← 0 I I I F ▰▰▰ CAL **0.0** g	⇨ The tare weight is saved until it is deleted. Remove the load from the balance and press [TARE] . The zero display appears, the pictogram →T← goes out and →0← will be displayed again.

8.2.2 Models PFB-M
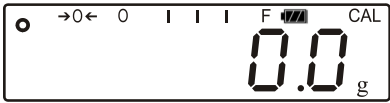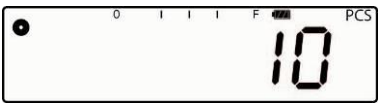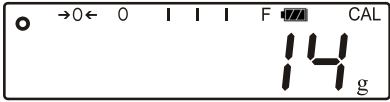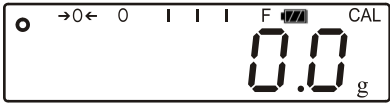
Balance display	Operation
20.00 g (example)	⇨ Put on weighing container. The weight of the container is displayed.
0.00 g NET	⇨ Press [TARE], the zero display appears. The pictogram **NET** is displayed. The pictogram →0← goes out. The weight of the container is now internally saved.
10.00 g NET	⇨ Place goods to be weighed in the weighing container. The net weight of the goods to be weighed is displayed.
− 10.00 g NET	⇨ The weight of the weighing container will be displayed as a minus number after removing the weighing container.
0.00 g →0←	⇨ The tare weight is saved until it is deleted. Remove the load from the balance and press [TARE]. The zero display appears, the pictogram **NET** goes out and →0← will be displayed again.

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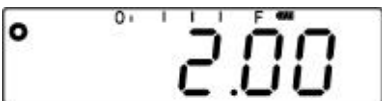
Before the balance can count parts, it must know the average part weight
(i.e. reference). Proceed by putting on a certain number of the parts to be counted.
The balance determines the total weight and divides it by the number of parts (the so-called reference quantity). Counting is then carried out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

i	**The higher the reference quantity the higher the counting exactness.**

8.3.1 Non-verifiable models

Balance display	Operation
→0← 0 I I I F CAL **0.0** g	⇨ Start balance by pressing [ON/OFF] The balance will carry out a self-test. Wait for „**0.0**" display.
→0← 0 I I I F CAL **SP 10** g	⇨ Press [PCS] Appears the reference quantity „**10**".
i	By pressing the [MODE] key several times, the reference quantities **10, 20**, **50**, **100**, **200** can be set
→0← 0 I I I F CAL **SP 10** g	⇨ Place as many parts to count on the weighing plate as the set reference quantity requires. ⇨ Confirm by pressing [→0←]
0 I I I F PCS **10** (Example)	The balance is now in parts counting mode and counts all units on the weighing plate.
→0← 0 I I I F CAL **14** g	⇨ Press [MODE] The balance is in weighing mode and displays the weight of the counted parts.
→0← 0 I I I F CAL **0.0** g	⇨ Remove the load ⇨ Back to weighing mode by pressing again the [PCS] button.

8.3.2 Models PFB-M
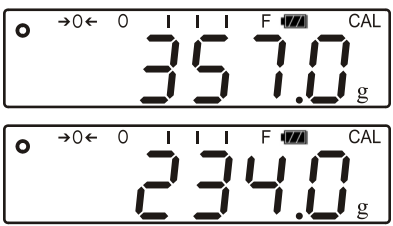
Balance display	Operation
	⇨ Start balance by pressing [ON/OFF] The balance will carry out a self-test. Wait for „**0.0**" display.
	⇨ Press [PCS]. Appears the reference quantity „**10**"
$\boldsymbol{i}$	By pressing the [MODE] key several times, the reference quantities **10, 20**, **50**, **100**, **200** can be set.
 (example)	⇨ Place as many parts to count on the weighing plate as the set reference quantity requires. ⇨ Confirm by pressing [→0←] The balance is now in parts counting mode and counts all units on the weighing plate.
	⇨ Press [MODE]. The balance is in weighing mode and displays the weight of the counted parts.
	⇨ Remove the counted parts ⇨ Press [PCS], the balance goes to weighing mode

English

8.4 Adding

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

8.4.1 Non-verifiable models

Balance display	Operation
$F1\ Unt$	⇨ Start balance by pressing [ON OFF] Whilst the balance is carrying out a selftest, press [MODE] . „**F1 Unt**" appears,
$F4\ ACC$	⇨ Press [MODE] repeatedly until „F4 ACC" appears
$ACC\ oFF$	⇨ Press [→0←] , „ACC oFF" appears
$ACC\ on$ →0← 0 I I I F ▨ CAL 0.0 g	⇨ Press [MODE] button to adjust „ACC on" ⇨ Acknowledge with [→0←] button and press Print to return into weighing mode
→0← 0 I I I F ▨ CAL 123.0 g (example)	Put on the first sample The weight of the first sample is displayed ⇨ Press [PRINT ESC]
→0← 0 I I I F ▨ CAL ACC 1 g	„**ACC 1**" is shortly displayed, then appears once more the weight of the first test item.
→0← 0 I I I F ▨ CAL 234.0 g (example)	⇨ Remove the first sample ⇨ Put on the second sample The weight of the second sample is displayed. ⇨ Press [PRINT ESC]
	„**ACC 2**" is shortly displayed
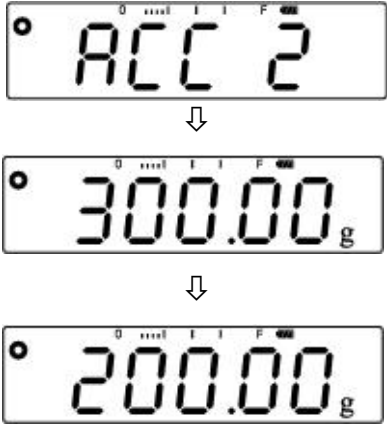
```→0← 0   I I I   F ▨   CAL```
```357.0 g```
```→0← 0   I I I   F ▨   CAL```
```234.0 g```
	Then appears for 2 seconds the weight of both test items, before the weight of the second test item will appear again.

With the further samples proceed as described above.

In order to display the total weight of the samples, remove weight from the weighing plate, wait for the zero display and press PRINT ESC. The number of weighing actions and the total weight of the samples will be displayed shortly.

8.4.2 Models PFB –M

⚠ **The totalizing function is not available in sale mode.**

Balance display	Operation
```→0← 0 I I I F ▨``` ```0.00 g```	⇨ Start balance by pressing ON OFF. The balance will carry out a self-test. Wait for „**0.0**" display.

```0 IIIII I I   F ▨```
```100.00 g```
(example)
	⇨ Put on the first sample
	
	⇨ The weight of the first sample is displayed.

```0 IIIII I I   F ▨```
```ACC 1```
⇩
```0 IIIII I I   F ▨```
```100.00 g```
	⇨ Press PRINT ESC, „**ACC 1**" is shortly displayed, then appears once more the weight of the sample which now is stored.

```0 IIIII I I F ▨``` ```200.00 g```	⇨ Remove the first sample and put on the second one. The weight of the second sample is displayed.

ACC 2 ⇩ **300.00 g** ⇩ **200.00 g**	⇨ Press [PRINT ESC], „**ACC 2**" is shortly displayed, then appears shortly the total weight and then the weight of the second sample which now is also stored.

With the further samples proceed as described above.

In order to display the total weight of the samples, remove weight from the weighing plate, wait for the zero display and press [PRINT ESC]. The number of weighing actions and the total weight of the samples will be displayed shortly.
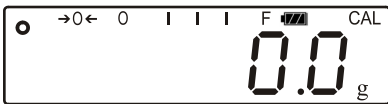
ⓘ	**In order to delete the stored values, press** [PRINT ESC] **and while the sum of the test items is displayed, press** [PCS] **, the balance will return to „0.0 g".**

ⓘ	**The two following items limit the totalizing process:** 1. Totalizing max. 99 times 2. Number of digits displayed

8.5 Percent weighings

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

8.5.1 Non-verifiable models

Balance display	Operation
→0← 0 I I I F CAL **0.0** g	⇨ Start balance by pressing [ON/OFF] The balance will carry out a self-test. Wait for the „**0.0 g**" display.
	⇨ Put a reference weight on the weighing plate, which corresponds to 100%
→0← 0 I I I F CAL **100.00** %	⇨ Press [%] In the display appears „**100.00%**"
→0← 0 I I I F CAL **0.00** %	⇨ Remove reference weight The display returns to „**0.0 %**"
	⇨ Put on specimen
→0← 0 I I I F CAL **50.00** %	In the display appears the percentage of the specimen with reference to the reference weight.
→0← 0 I I I F CAL **0.0** g	⇨ Back to weighing mode by pressing again the [%] button.

8.5.2 Models PFB-M

Balance display	Operation
0.00 g	⇨ Start balance by pressing [ON/OFF]. The balance will carry out a self-test. Wait for the „**0.0 g**" display.
	⇨ Put a reference weight on the weighing plate, which corresponds to 100%
100.00 % (example)	⇨ Press [%] In the display appears „**100.00%**"
0.00 %	⇨ Remove reference weight The display returns to „**0.0 %**"
	⇨ Put on specimen
20.00 %	In the display appears the percentage of the specimen with reference to the reference weight.
0.00 g	⇨ Back to weighing mode by pressing again the [%] button.

9 The menu

9.1 Menu map

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

9.2 Call up menu
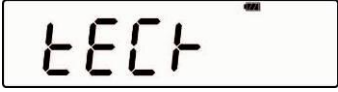
The menu is called-up by pressing the [MODE] key, while the balance is carrying out the self test. In the display appears the message „F1 UNT"

9.3 Navigation in the menu

Key	Direction in the menu	Description
MODE ↓	↓	Select menu and pass through menu items from top to bottom
→0← ↵	→	Select current element
PRINT ESC ←	↑	Exit the current element, return to weighing mode

9.4 Menu overview non-verifiable models

Balance display	Operation
F1 Unt	Selection of weighing units
F2 bL	Background lighting on/automatic/off • EL on: Background lighting on • EL Au: Background lighting switches on automatically EL off: Background lighting off

```F3 Con```	RS -232 interface
	S 232:
	    ● P Prt: connect with printer
	        ■ b XXXX: Baud rate can be selected between 9600, 600, 1200, 2400, 4800
	        ■ LP-50: not documented
	           ● EnG: Selection of Language English
	           ● Chi: Selection of Language Chinese
	        ■ tP: Standard printer setting
	    ● P Cont: Continuous printout
	    ● P AUto: autom. Printout
	    ● P ASk: Data output via remote control commands
	
	S USb: not documented

```F4 ACC```	Adding (see chap. 8.4): ⇨ ACC of: Adding disabled ⇨ ACC on: Adding enabled
```tECt```	Press [→0←]: Pin: Press [PCS], [PRINT ESC] and [TARE] successively, „P1 Lin" appears

	P1 Lin	Linearization (see chapter 6.8)
	P2 CAL	
	P3 Cont	
	P4 AZn	Not documented
	P5 GrA	
	P6 CAP	

9.5 Menu overview models PFB-M

Balance display	Operation
F 1 Unt	Not available
F2 bL	Background lighting on/automatic/off • EL on: background lighting on • EL Au: background lighting switches on automatically • EL off: background lighting off

F3 Con	RS -232 interface
	S 232:
	 • P Prt: connect with printer
	  ▪ b XXXX: Baud rate can be selected between 9600, 600, 1200, 2400, 4800
	  ▪ LP-50: not documented
	   • EnG: selection of language English
	   • Chi: selection of language Chinese
	  ▪ tP: standard printer setting
	 • P Cont: continuous printout
	 • P AUto: autom. printout
	 • Wireless
	 • P ASk: data output via control remote commands
	
	S USb: not documented

SALE n	SALE n: Second display **Press adjusting switch!** • SALE Y: Sale mode enabled (6000 e) • SALE n: Sale mode not enabled (6000e or 60000d)
tECH	**Press adjusting switch!** Press ⟨→0←⟩: Pin: press ⟨PCS⟩, ⟨PRINT ESC⟩ and ⟨TARE⟩ successively, „P1 Lin" appears
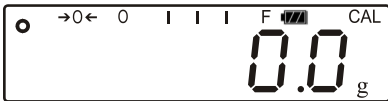
		P1 Lin	Linearization (see chap. 6.8)
		P2 CAL	Not documented
		P3 Cont	
		P4 AZn	
		P5 GrA	
		P6 CAP	
		P7 SPd	
		P8 5-t	Multi-Tare function: • St on: Multi-Tare ON • St oFF: Multi-Tare OFF

English

9.6 Menu settings

9.6.1 Switch over weighing units (Unit) (only non-verifiable appliances)

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

Activate function:

Balance display	Operation
→0← 0 I I I F ▰ CAL **0.0** g	⇨ Start balance by pressing [ON/OFF] As long as the balance carries out a self test, press [MODE].
▰ **F1 Unt**	„**F1 Unt**" is displayed.
▰ **on** (Example)	⇨ Press [→0←] Weighing unit is switched on or off. ⇨ Use [MODE] to switch weighing unit on or off ⇨ Using [→0←] change to the next unit.
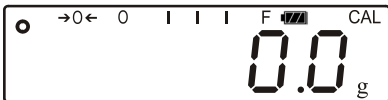
Switch-over weighing unit:

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

9.6.2 Display background illumination

In the menu the display background illumination can be switched on or off.
To achieve this, follow the sequence of operations below:
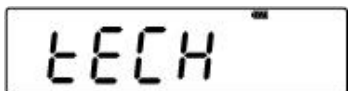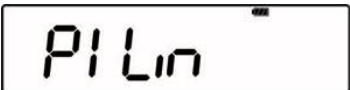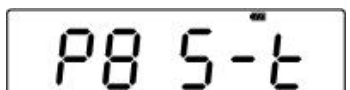
Balance display	Operation
$\overset{\circ}{\underset{\text{or}}{\square}} \; \overset{\rightarrow 0 \leftarrow \; 0 \; | \; | \; | \; \text{F} \; \blacksquare \; \text{CAL}}{0.0}_{g}$ $\overset{\circ}{\square} \; \overset{\rightarrow 0 \leftarrow \; 0 \; | \; | \; | \; \text{F} \; \blacksquare}{0.00}_{g}$ (models PFB-M)	⇨ Start balance by pressing [ON OFF] As long as the balance carries out a self test, press [MODE].
F1 Unt	„**F1 Unt**" is displayed.
F2 bL	⇨ Press [MODE] „**F2 bL**" is displayed.
EL on (Example)	⇨ Press [→0←] „**EL on**" or „**EL off**" resp. „**EL AU**" is displayed ⇨ Press [MODE] to switch over between the three settings ⇨ Press [→0←] to activate the displayed setting.

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

9.6.3 Multi-Tare function (only models PFB-M)

The balance can be tared several times successively. For that make in the menu the following setting:

Balance display	Operation
0.00_g	⇨ Start balance by pressing $\boxed{\substack{\text{ON}\\\text{OFF}}}$. While the balance carries out a self test, press $\boxed{\text{MODE}}$.
F1 Unt	„**F1 Unt**" is displayed.
tECH	⇨ Press $\boxed{\text{MODE}}$ repeatedly until „tECH" is displayed
Press adjusting switch!	
P in	⇨ Press $\boxed{\rightarrow 0 \leftarrow}$, „Pin" is displayed
P1 Lin	⇨ Enter password using the buttons $\boxed{\text{PCS}}$, $\boxed{\substack{\text{PRINT}\\\text{ESC}}}$ and $\boxed{\text{TARE}}$ successively, „P1 Lin" is displayed
P8 5-t	⇨ Press $\boxed{\text{MODE}}$ repeatedly until „P8 5-t" is displayed
St on	⇨ Press $\boxed{\rightarrow 0 \leftarrow}$, „St on" is displayed (if „St on" is not displayed, press $\boxed{\text{MODE}}$) ⇨ Press $\boxed{\rightarrow 0 \leftarrow}$ again, the Multi-Tare function is now enabled.
0.00_g	⇨ Return to weighing mode using $\boxed{\substack{\text{PRINT}\\\text{ESC}}}$

10 Data output RS232

You can print out weighing data via the RS 232C interface.

The following conditions must be met to provide successful communication between the weighing balance and the printer.

- Use a suitable cable to connect the weighing balance to the interface of the printer. Faultless operation requires an adequate KERN interface cable.

- Communication parameters (baud rate, bits and parity) of balance and printer must match.

10.1 Technical data

Connection   9 pin d-subminiature bushing
Baud rate   9600
Parity   8 bits, no parity

10.2 Pin allocation of balance output bushing:

Pin 2 input
Pin 3 output
Pin 5 signal earth
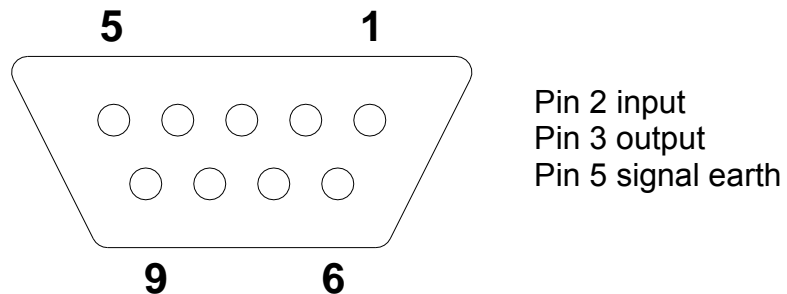
10.3 Printer operation - printout examples

Standard printout "weighing data"

G:	8.65 g	Gross weight

Printout parts counting

PCS:	10 pcs	Reference quantity
UW:	0.861 g	Individual weight
G:	8.61 g	Gross weight

Printout adding

1:	35.07 g N	First weighing
2:	8.62 g N	Second weighing
3:	8.00 g N	Third weighing
1-3:	51.69 g N	Total of all individual weighings

Printout percent

PERC:	30,19 %	Weight value in percent

ℹ	**Please note that negative values cannot been edited via the interface!**

10.4 Continuous data output

		,			-/U							k	g	CR	LF
-Header 1-			-Header 2-				-- Weighing data --					Weighing unit		Final character	

Head line 1: ST=stable,   US=instable
Head line 2: NT=net,   GS=gross

10.5 Remote control instructions

The remote control commands are sent from the remote control unit to the balance as ASCII code. After the balance having received the s/w/t commands, it will send the following data.

T	Function:	Tare balance
Z	Function:	Set balance to zero
W	Function:	Weighing value for the weight (stable or unstable) is sent via the RS232 interface
S	Function:	Stable weighing value for the weight is sent via the RS232 interface
P	Function:	In counting mode the number of the pieces to be counted is displayed in „Pcs"

11 Error messages

Err 3	Incorrect adjusting weight	Put on correct adjustment weight (see chap. 1; Technical Data
Err 4	Zero range exceeded	Remove load and press ⌐0↵ to reset balance to zero.
Err 5	Keyboard error	Inadmissible input
Err 6	Electronic error	Switch balance off and on again. If the error message remains displayed, please contact your dealer.
	Transportation lock	Remove the transportation lock

12 Service, maintenance, disposal

12.1 Cleaning

Before cleaning, please disconnect the appliance from the operating voltage.

Please do not use aggressive cleaning agents (solvents or similar agents), but a cloth dampened with mild soap suds. Ensure that no liquid penetrates into the device and wipe with a dry soft cloth.
Loose residue sample/powder can be removed carefully with a brush or manual vacuum cleaner.

Spilled weighing goods must be removed immediately.

12.2 Service, maintenance

The appliance may only be opened by trained service technicians who are authorized by KERN.
Before opening, disconnect from power supply.

12.3 Disposal

Disposal of packaging and appliance must be carried out by operator according to valid national or regional law of the location where the appliance is used.

13 Instant help

In case of an error in the program process, briefly turn off the balance and disconnect from power supply. The weighing process must then be restarted from the beginning.

Help:

Fault	**Possible cause**
The displayed weight does not glow.	• The balance is not switched on.
	• The mains supply connection has been interrupted (mains cable not plugged in/faulty).
	• Power supply interrupted.
	• (Rechargeable) batteries are inserted incorrectly or empty
	• No (rechargeable) batteries inserted.
The displayed weight is permanently changing	• Draught/air movement
	• Table/floor vibrations
	• Weighing plate has contact with other objects.
	• Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)
The weighing result is obviously incorrect	• The display of the balance is not at zero
	• Adjustment is no longer correct.
	• Great fluctuations in temperature.
	• Warm-up time was ignored.
	• Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)

Should other error messages occur, switch balance off and then on again. If the error message remains inform manufacturer.