Operating Manual
Precision balance

KERN PLJ_N

Version 3.0
12/2009
GB

PLJ_N-BA-e-0930

GB

KERN PLJ_N
Version 3.0 12/2009
Operating Manual
Electronic Precision balance

English

Table of Contents

PLJ_N-BA-e-0930

English

1   Technical Data

KERN	PLJ 360-3NM	PLJ 600-3NM
Weighing range (max)	360 g	600 g
Readability (d)	1 mg	1 mg
Minimum load (Min)	20 mg	20 mg
Verification value (e)	10 mg	10 mg
Verification class	II	II
Reproducibility	1 mg	15 mg
Linearity	± 2 mg	± 3 mg
Stabilization time (typical)	4 sec	4 sec
Minimum unit weight at piece counting	1 mg	5 mg
Warm-up time	2 hours	4 hours
Adjustment weight	internal	
Reference quantities at piece counting	10, 20, 50, freely selectable	
Weighing Units	g, ct, mg	
Electric Supply	230 V / 50 Hz, 11V AC	
Operating temperature	+ 15° C …. + 30° C	
Humidity of air	max. 80 % (not condensing)	
Dimensions housing B x D x H [mm]	with windscreen 206 x 335 x 157	
	without windscreen 206 x 335 x 85	
Dimensions glass draught shield [mm]	exterior 150 x 150 x 80	
	interior 140 x 140 x 65	
Weighing plate (stainless steel) [mm]	128 x 128	
Weight kg (net)	4 kg	
Underfloor weighing	Standard hooks	
Interface	RS 232C	

KERN	PLJ 3500-2NM	PLJ 4500-2NM
Weighing range (max)	3500 g	4500 g
Readability (d)	10 mg	10 mg
Minimum load (Min)	500 mg	500 mg
Verification value (e)	100 mg	100 mg
Verification class	II	II
Reproducibility	10 mg	10 mg
Linearity	± 20 mg	± 20 mg
Stabilization time (typical)	4 sec	4 sec
Minimum unit weight at piece counting	10 mg	50 mg
Warm-up time	2 hours	4 hours
Adjustment weight	internal	
Reference quantities at piece counting	10, 20, 50, freely selectable	
Weighing Units	g, ct, mg	
Electric Supply	230 V / 50 Hz, 11V AC	
Operating temperature	+ 15° C …. + 30° C	
Humidity of air	max. 80 % (not condensing)	
Dimensions housing B x D x H [mm]	206 x 335 x 85	
Weighing plate (stainless steel) [mm]	195 x 195	
Weight kg (net)	4.5 kg	
Underfloor weighing	standard hooks	
Interface	RS 232C	

KERN	PLJ 750-3N
Weighing range (max)	750 g
Readability (d)	1 mg
Reproducibility	15 mg
Linearity	± 3 mg
Stabilization time (typical)	4 sec
Minimum unit weight at piece counting	5 mg
Warm-up time	4 hours
Adjustment weight	internal
Reference quantities at piece counting	10, 20, 50, freely selectable
Weighing Units	g, ct, mg
Electric Supply	230 V / 50 Hz, 11V AC
Operating temperature	+ 15° C …. + 30° C
Humidity of air	max. 80 % (not condensing)
Dimensions housing B x D x H [mm]	with windscreen 206 x 335 x 157
	without windscreen 206 x 335 x 85
Dimensions glass draught shield [mm]	exterior 150 x 150 x 80
	interior 140 x 140 x 65
Weighing plate (stainless steel) [mm]	128 x 128
Weight kg (net)	4 kg
Underfloor weighing	Standard hooks
Interface	RS 232C

2 Declaration of -Conformity

KERN & Sohn GmbH

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Konformitätserklärung

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 with 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 PLJ_N

Mark applied	EU Directive	Standards
CE	2004/108/EC EMC	EN 61326 : 2006
	2006/95/EC Low Voltage	EN 61010-1 : 2004

Date: 27.01.2010   **Signature:**

Gottl. KERN & Sohn GmbH
Management

KERN & Sohn GmbH

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<div style="float:left">English</div>

D	Konformitäts-erklärung	Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt. **Diese Erklärung gilt nur in Verbindung mit der Konformitätsbescheinigung einer benannten Stelle.**
GB	Declaration of conformity	We hereby declare that the product to which this declaration refers conforms with the following standards. **This declaration is only valid with the certificate of conformity by a notified body.**
CZ	Prohlášení o shode	Tímto prohlašujeme, že výrobek, kterého se toto prohlášení týká, je v souladu s níže uvedenými normami. **Toto prohlášení platí pouze ve spojitosti s deklarací o souladu uvedeného pracoviště se směrnicemi EU.**
E	Declaración de conformidad	Manifestamos en la presente que el producto al que se refiere esta declaración está de acuerdo con las normas siguientes. **Esta declaración solo será válida acompañada del certificado de conformidad de una institución renombrada.**
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. **Cette déclaration est valide seulement avec un certificat de conformité d'un organisme notifié.**
I	Dichiarazione di conformitá	Dichiariamo con ciò che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate. **Questa dichiarazione sarà valida solo se accompagnata dal certificato di conformità della parte nominale.**
NL	Conformiteit-verklaring	Wij verklaren hiermede dat het product, waarop deze verklaring betrekking heeft, met de hierna vermelde normen overeenstemt. **Deze verklaring geldt uitsluitend in verbinding met het certificaat van overeenstemming vanwege een daarmee belaste instantie.**
P	Declaração de conformidade	Declaramos por meio da presente que o produto no qual se refere esta declaração, corresponde às normas seguintes. **Esta declaração vale só em combinação com um certificado de conformidade duma instituição nomeada.**
PL	Deklaracja zgodności	Niniejszym oświadczamy, że produkt, którego niniejsze oświadczenie dotyczy, jest zgodny z poniższymi normami. **Niniejsze oświadczenie obowiązuje wyłącznie w połączeniu z oświadczeniem o zgodności danego miejsca.**
RUS	Заявление о соответствии	Мы заявляем, что продукт, к которому относится данная декларация, соответствует перечисленным ниже нормам. **Эта декларация действует совместно с удостоверением соответствия названной лаборатории.**

Electronic Balance: KERN PLJ_NM

EU Directive	Standards	EC-type-approval certificate no.	Issued by
90/384/EEC	EN 45501	TCM 128/08-4606	CMI

Date: 27.01.2010　　　　　　　　　　**Signature:**

Gottl. 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 weighings. 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 or damage 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.

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 glass wind screen, 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, vapours and dust;

- Do not expose the device to extreme dampness for longer periods of time. Non-permitted condensation (condensation of air humidity on the appliance) may occur if a cold appliance is taken to a considerably warmer environment. In this case, acclimatize the disconnected appliance for ca. 2 hours at room temperature.

- Avoid static charge of goods to be weighed 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, remove plastic cover and setup balance at the intended workstation.
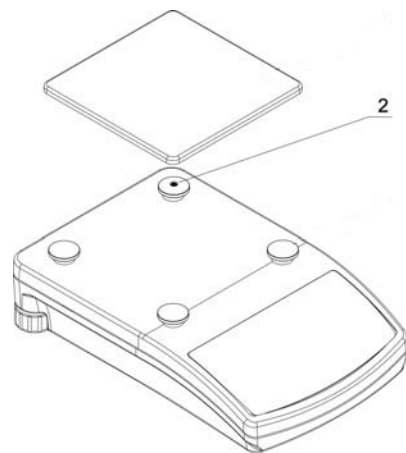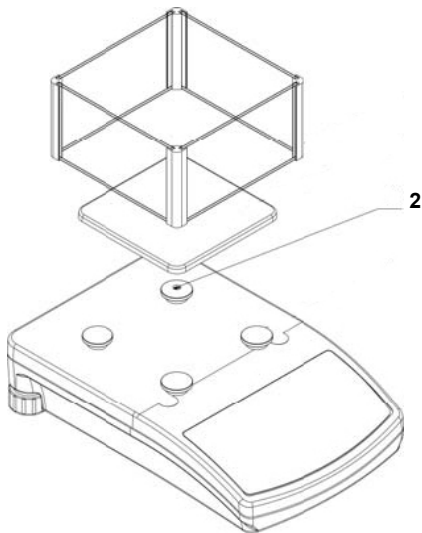
6.2.1 Placing
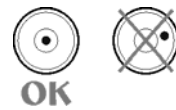
Design layout of weighing balance:

Assemble all parts as per illustration. To ensure earthing of weighing plate, Place carrier (2) right at rear.

Models readability d = 1 mg: Models readability d = 10 mg:

Level balance with foot screws until the air bubble of the water balance is in the prescribed circle

6.2.2 Scope of delivery

Serial accessories:

- Balance
- Mains power supply
- Operating Manual
- Draught shield (models providing readability of d = 1mg only)
- Hook for underfloor weighing

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.
After connection to the power supply the balance will carry out a self-test. The balance is ready for weighing when the weight display appears. If the display diverts from zero, press the **TARE**-key.

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.
The accuracy of the balance depends on the local acceleration of gravity.
Strictly observe hints in chapter Adjustment.

6.5.1 Stability display

The appearance of the stability symbol **[◣◢]** on the display indicates that the balance is in a stable state. If the status is instable the **[◣◢]** display disappears.

6.5.2 Balance zero display

If an exact zero reading is not displayed on the balance in spite of the weighing dish being empty, press the **TARE** key and the balance will start resetting to zero **[→0←]** .

7 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.
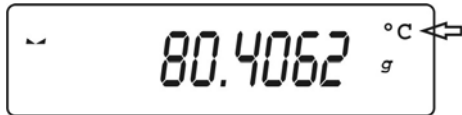
Adjustment with internal weight

```
            |
            ↓
┌───────────────────────────────┐
│   Automatic start (chpt. 7.1)  │
└───────────────────────────────┘
            |
            ↓
```

┌─────────────────────────────────────┐
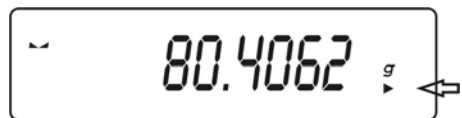│ 1. Temperature controlled (chpt.   │
│   7.1)   │
│ A change in temperature of 3 °C   │
│ triggers the weighing balance to send a │
│ message announcing internal   │
│ adjustment: │
│   │
│   ┌─────────────────────────┐   │
│   │ ⌣   80.4062   °C ⇐ │   │
│   │   g   │   │
│   └─────────────────────────┘   │
└─────────────────────────────────────┘

┌─────────────────────────────────────┐
│ 2. Time controlled   │
│   (chpt.7.1)   │
│ After a set time interval (1 – 12 h) in │
│ the menu (**P1.5 CALt**) has passed the │
│ weighing balance will send a message   │
│ about internal adjustment: │
│   │
│   ┌─────────────────────────┐   │
│   │ ⌣   80.4062   g   │   │
│   │   ► ⇐ │   │
│   └─────────────────────────┘   │
└─────────────────────────────────────┘

English

7.1 Automatic adjustment using internal weight

With the internal adjustment weight, the weighing accuracy can be checked and re-adjusted at any time.

The automatic adjustment function is always enabled. You can start adjustment at any time by pressing the **CAL**-key manually.

Automatic adjustment is started each time
- after the weighing balance was disconnected from the mains
- when temperature changes take place
- at the end of a time interval

Temperature / time controlled adjustment is taking place:
5 minutes before the start of automatic adjustment, this will be announced by a "° **C**", (change of temperature) or a "►" (after a certain time interval ends) symbol on the display.

<div style="text-align:center">

⌣   80.4062 °C_g ⇐   or   ⌣   80.4062 _g_► ⇐

</div>
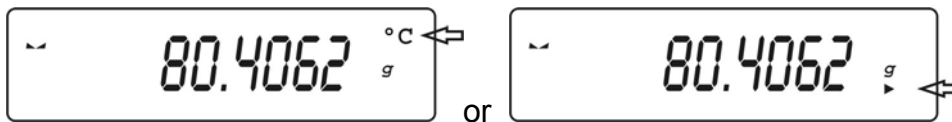
The user must complete his/her weighing process within this time.
After 5 minutes **[CAL 30]** appears on the display.

<div style="text-align:center">

CAL_30

</div>
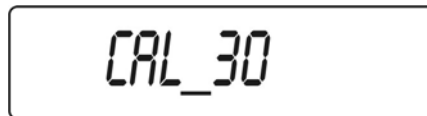
This starts a "count down" of 30 seconds **[CAL 30]** → **[CAL 0].** During these 30 seconds it is possible to cancel the adjustment by pressing the **TARE** key. This makes the balance return to weighing mode in order to e. g. complete an unfinished measurement.

After a further 5 minutes the automatic adjustment will restart and **[CAL 30]** appears.

7.2   Adjustment functions "P1 CAL"

Models PLJ:

P1.1	iCAL	|	[internal adjustment]
P1.2	ECAL	|	[external adjustment] - not documented
P1.3	tCAL	|	[adjustment test]
P1.4	ACAL	| both/nonE/tenno/tinnE	[criteria for starting automatic adjustment]
P1.5	CALt	| 1 h ÷ 12h	[time setting for starting automatic adjustment]
P1.6	CALr	| YES/no	[printout adjustment log]

7.2.1 Internal adjustment - „iCAL"

The automatic adjustment function with internal adjusting weight is permanently enabled. It is also possible to start adjusting at any time by pressing the **CAL**-key or by invoking the menu item "**P1.1 iCAL**".

Operation:	Display:
Start balance by pressing [ON/OFF]	**0.0000 g**
Press [MENU].	**P1 CAL**
Press [→]. Ensure that there are no objects on the weighing plate.	**P1.1 iCAL**
Confirm by pressing [→]; automatic adjustment will follow. After successful adjustment the balance automatically returns to weighing mode. Information: Adjustment errors are indicated by an acoustic signal and an error message will appear on the display. Press [TARE/→0←/ESC] and repeat adjustment process.	**CAL** ⇓ - - - - - - - - ⇓ **0.0000 g**
It is possible to cancel adjustment by pressing [TARE/→0←/ESC]	

7.2.2 Adjustment test – „tCAL"

Here, deviation from the last adjustment is determined. This is only a check, i.e. no values are changed.

Operation:	Display:
Start balance by pressing [ON/OFF]	**0.0000 g**
Press [MENU] .	**P1 CAL**
Press [→] .	**P1.1 iCAL**
Press repeatedly [↑] button. Ensure that there are no objects on the weighing plate.	**P1.3 tCAL**
Press [→], adjustment test is carried out automatically. The result is displayed	**CAL** ⇓ **diff** ⇓ **d 0,0042 g**
Press [PRINT], balance returns to menu	**P1.3 tCAL**
Press [TARE →0← ESC] repeatedly until "**SAVE**"? appears Press [PRINT] to save the changes you made. Press [TARE →0← ESC], to cancel the changes you made. Afterwards the balance automatically jumps back to weighing mode.	**SAVE?** ⇓ **0.0000 g**

7.2.3 Criteria for starting automatic internal adjustment – „ACAL"

Note:

This adjustment function is locked [Er 9 lock] in verifiable devices.

Operation:	Display:
Start balance by pressing [ON/OFF]	**0.0000 g**
Press [MENU].	**P1 CAL**
Press [→].	**P1.1 iCAL**
Press repeatedly [↑] until function "ACAL" appears	**P1.4 ACAL**
Press [→], current setting will be flashing	**nonE**
Press the arrow keys (↓ ↑), to select among the settings below: **nonE** Automatic adjustment disabled **tEmp** Start automatic adjustment after change in temperature **timE** Start automatic Adjustment dependent on setting of function P1.5 CALt **both** and time Start automatic Adjustment dependent on temperature	**timE**
Confirm setting by pressing [PRINT]. Weighing balance returns to menu.	**P1.4 ACAL**
Press [TARE/ESC] repeatedly until "SAVE"? appears.	**SAVE ?**
The changes you made will be saved by pressing [PRINT]. To cancel changes [TARE/ESC]. Afterwards the balance automatically jumps back to weighing mode.	**0,0000 g**

7.2.4 Time setting to start automatic internal adjustment – „CAL t"

Note:

This adjustment function is locked [Er 9 lock] in verifiable devices.

Set the time interval after which automatic adjustment is to be started in this menu item as follows:

Operation:	Display:
Start balance by pressing [ON/OFF]	**0.0000 g**
Press [MENU].	**P1 CAL**
Press [→] .	**P1.1 iCAL**
Press [↑] repeatedly until function "**P1.5 CALt**" appears	**P1.5 CALt**
Press [→], current setting will be flashing	**1 h**
Use the arrow keys (↓ ↑) to select a time interval 1 – 12 h	**12 h**
Confirm setting by pressing [PRINT]. Weighing balance returns to menu.	**P1.5 CALt**
Press [TARE/ESC] repeatedly until "SAVE"? appears.	**SAVE ?**
The changes you made will be saved by pressing [PRINT]. To cancel changes, press the [TARE/ESC] key. Afterwards the balance automatically jumps back to weighing mode.	**0.0000 g**

English

7.2.5 Printout adjustment protocol – „CAL r"

Go to this menu item to enable the function used to produce printouts for adjustment data.

Enable/disable function:

Operation:	Display:
Start balance by pressing [ON/OFF]	**0.0000 g**
Press [MENU].	**P1 CAL**
Press [→].	**P1.1 ECAL**
Press [↑] repeatedly until function "**CALr**" appears	**P1.6 CALr** Models PLJ .... **P1.3 CALr** Models PLS
Press [→], current setting will be flashing	**no**
Press the arrow keys (↓ ↑), to select among the settings below: **no** Data output disabled **yes** Data output enabled	**YES**
Confirm setting by pressing [PRINT]. Weighing balance returns to menu.	**P1.6 CALr** Models PLJ **P1.3 CALr** Models PLS
Press [TARE/→0←/ESC] repeatedly until "SAVE"? appears.	**SAVE ?**
The changes you made will be saved by pressing [PRINT] Press [TARE/→0←/ESC] to cancel the changes you made. Afterwards the balance automatically jumps back to weighing mode.	**0.0000 g**

Data output adjustment log:

The content of the data output is determined in menu **P2 GLP**. All parameters set to "**YES**" will be issued.

Example:

P2 GLP

P2.1	uSr	|	
P2.2	PrJ	|	
P2.3	Ptin	|	YES
P2.4	PdAt	|	YES
P2.5	PuS	|	YES
P2.6	PPrJ	|	YES
P2.7	Pld	|	YES
P2.8	PFrn	|	YES

```
*** Automatic calibration report ***
Date      : 09/02/2007
Time      : 11:21:39
User Id   : 12345678
Project Id: 87654321
Balance Id: 114493

Calibr.   : Automatic
Difference: -  0.0002 g

Name ...........................
```

7.3 Verification

General introduction:

According to EU directive 90/384/EEC 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 instructions

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 officially verified and re-verified in 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!
After verification the balance is sealed at the indicated positions.
Verification of the balance is invalid without the "seal".

Position of the "official seals":
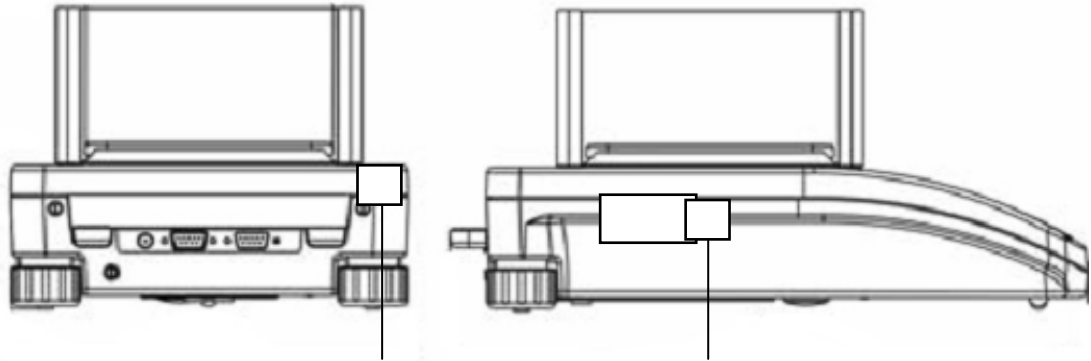
Position of the official seals

Balances with obligation to verify must be taken out of operation if:

- **The weighing result of the balance is outside the error limit.** Therefore, in regular intervals load balance with known test weight (ca. 1/3 of the max. load) and compare with displayed value.
- **The reverification deadline has been exceeded.**

8 Operating elements

8.1 Backlit display

Very contrastful display which can also be red in the darkness.
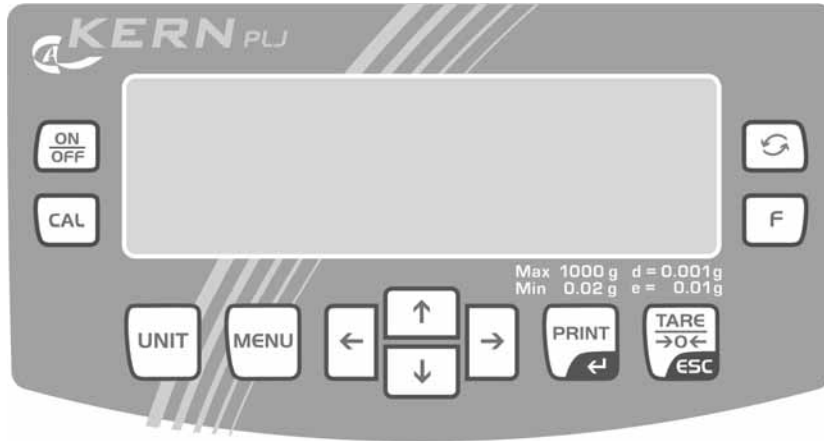
8.2 Keyboard overview in weighing mode

Key	Function
ON/OFF	• Turn on/off
CAL	• Invoke adjustment function
F	• Function key (changing parameters after selecting a function)
↻	• Switch-over key into operating modes
UNIT	• Weighing units switch-over
MENU	• Invoke menu
← ↑ → ↓	• Arrow keys for navigation in menu
PRINT	• Data export to external device (printer or PC) • Confirm/save settings
TARE →0← ESC	• Taring • Leave menu • Set weight display at zero

9 User menu

The user menu has seven main menus (P1 – P7), arranged in the following sub-menus:

P1 CAL   [adjustment]

P1.1	iCAL	|		[Internal adjustment] PLJ only
P1.2	ECAL	|		[external adjustment] – not documented
P1.3	tCAL	|		[adjustment test]
P1.4	ACAL	|	both/nonE/tenno/tinnE	[criteria for starting automatic adjustment]
P1.5	CALt	|	1 h ÷ 12h	[time setting for starting automatic adjustment]
P1.6	CALr	|	YES/no	[printout adjustment log]

P2 GLP   [good lab practice]

P2.1	USr	|	_	[user]
P2.2	PrJ	|	_	[project]
P2.3	Ptin	|	YES/no	[printout time]
P2.4	PdAt	|	YES/no	[printout date]
P2.5	PUSr	|	YES/no	[printout user]
P2.6	PPrJ	|	YES/no	[printout project]
P2.7	PId	|	YES/no	[printout serial number weighing balance]
P2.8	PFr	|	YES/no	[frame printout]

P3 rEAd   [basic settings]

P3.1	AuE	|	Stand/Slouu/FASt	[filter settings]
P3.2	ConF	|	FASt_rEL/Fast/rEL	[rest control display]
P3.3	Auto	|	On/OFF	[Auto zero]
P3.4	Ldi9	|	ALuuAYS/never/uu_StAb	[delete last decimal place]

P4 Print   [parameter for serial interface RS 232]

P4.1	bAud	|	2400/4800/9600/19200	[baud rate]
P4.2	CntA	|	YES/no	[continuous output standard weighing unit]
P4.3	Cntb	|	YES/no	[continuous output currently set weighing unit]
P4.4	rEPL	|	YES/no	[manual (press key) or automatic output]
P4.5	PStb	|	YES/no	[output stable/instable weighing values]
P4.6	Lo	|	000.0000	[input minimal weight for automatic output]

English
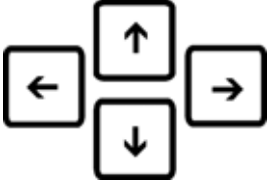
P5 unit   [weighing unit]

P5.1	StUn	| g/mg/ct/oz/ozt/dwt/t/mom/G	[standard weighing unit, e.g. "g"]
P5.2	mg	| YES/no	[mg - milligram]
P5.3	Ct	| YES/no	[ct – carat]
P5.4	oZ	| YES/no	[oz – ounce]
P5.5	oZt	| YES/no	[ozt – Troy ounce]
P5.6	dwt	| YES/no	[dwt – pennyweight]
P5.7	t	| YES/no	[t – Tael]
P5.8	nno	| YES/no	[mom - Momme]
P5.9	Gr	| YES/no	[gr – Grain]

P6 Func   [operating modes]

P6.1	FFun	| ALL/PcS/HiLo/PrcA/Prcb/d_Co/d_Li	[selection enabled operating modes]
P6.2	PcS	| YES/no	[piece counting]
P6.3	HiLo	| YES/no	[weighing with tolerance control]
P6.4	PrcA	| YES/no	[percentage weighing, ref. weight determination "weighing"]
P6.5	Prcb	| YES/no	[percentage weighing, ref. weight determination "numeric"]
P6.6	d_Co	| YES/no	[determination density "solids"]
P6.7	d_Li	| YES/no	[determination density "liquids"]

P7 othEr   [additional useful functions]

P7.1	bL	| On/Aut/OFF	[display background illumination]
P7.2	bLbA	| no/20/30/40/50/60/70/80/90/100	[Background illumination of display auto-off after x sec.]
P7.3	bEEP	|	[Key sound]
P7.4	PrnS	|	["Balance parameters" printout]

9.1 Navigation in the menu

Keyboard overview in menu:

Key	Function
MENU	• Call main menu
↓ ↑	• Menu selection
→	• Confirm menu selection • Invoke sub-menu
↑ ← → ↓	• To select parameters in a function or to increase/decrease the value of a digit or number press the ↓- and ↑-key. • To shift to the right or left by one menu item press the ←- and →-key.
PRINT	• Confirm/save settings
TARE →0← ESC	• Leave menu

Storing / jumping back to weighing mode

Any changes made in the balance memory will only be saved when the storing process is complete.

To achieve this, press the **TARE**-key several times until **"SAVE"?** appears.

Any changes carried out are stored by pressing the **PRINT** key.
To cancel changes, press the **TARE** key.
Afterwards the balance automatically jumps back to weighing mode.

10 Basic Operation

10.1 Simple weighing

⇨ Start balance by pressing the **ON/OFF**-key and wait for zero display **[→0←]**.
If an exact zero reading is not displayed on the balance in spite of the
weighing dish being empty, press the **TARE**-key and the balance will start
resetting to zero.

⇨ To change to different weighing units, press the **UNIT**-key [g], [mg], [ct].

⇨ Place goods to be weighed on balance

⇨ Wait until the stability display appears [◣◢]

⇨ Read weighing result.

⇨ Turn off balance by pressing the **ON/OFF key**.

10.2 Weighing with taring

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

10.2.1 Taring

⇨ Place the weighing box and press the **TARE**-key. The zero display appears.
The tare weight is saved until it is deleted.
Information:
The tare procedure can be repeated as many times as necessary, for example
with initial weighing of several components for a mix (add-on weighing). The
limit is reached when the total weighing range capacity is full. After removing
the taring container the total weight is displayed as negative display.

10.2.2 Delete tare

⇨ Unload the balance and press the **TARE** –key; the zero display appears.

10.3 Standard weighing unit

Selected weighing unit will be retained even after disconnection from the mains.

Invoke menu **P5 Unit**:
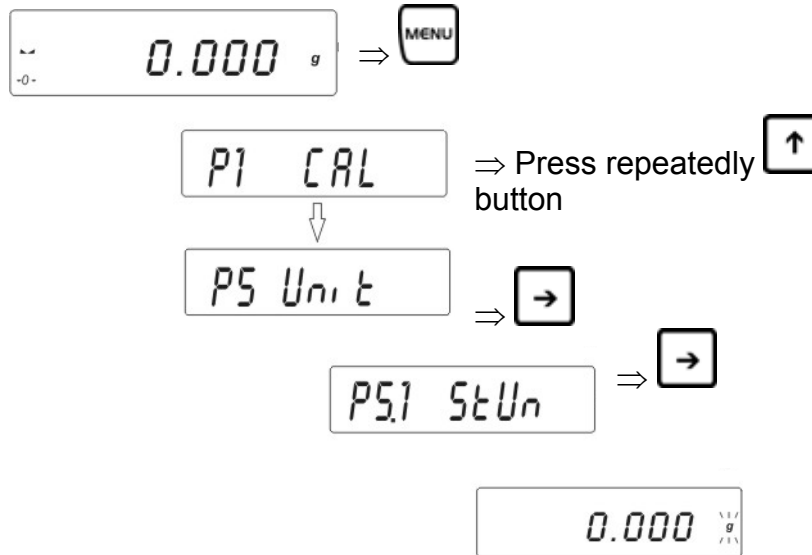
The currently set weighing unit is flashing

$[g] \leftrightarrow [mg] \leftrightarrow [ct]$

Press the [↑]-key repeatedly until the desired weighing unit (See chpt. 1 "Technical Specifications ") appears

The balance returns to menu.
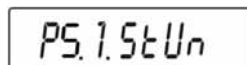
Return to weighing mode:

⇨ Press the **TARE** -button repeatedly until the "**SAVE**"? inquiry appears. Confirm query by pressing the **PRINT**-key or cancel by pressing the **TARE**-key. The balance returns to weighing mode; the display show the set weighing unit. The set weighing unit remains even after disconnection from the mains.
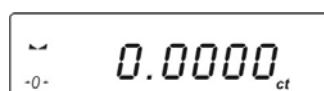
10.4 Weighing units switch-over

A weighing unit may be changed by pressing the **UNIT**-key several times:

$$[g] \rightarrow [mg] \rightarrow [ct]$$

Information:
In calibrated models selection is restricted to options **[g]** $\rightarrow$ and **[mg]** $\rightarrow$ **[ct]**.
The different weighing models have integrated different foreign weighing units. For details please refer to chpt. 1, "Technical specifications".

10.5 Underfloor weighing

Objects unsuitable for placing on the weighing scale due to size or shape may be weighed with the help of the flush-mounted platform.
Proceed as follows:

- Switch off balance.

- Open the closing lid on the bottom of your balance.

- Suspend hook for underfloor weighing carefully and completely.

- Place your balance over an opening.

- Suspend the goods to be weighed from the hook and carry out the weighing.
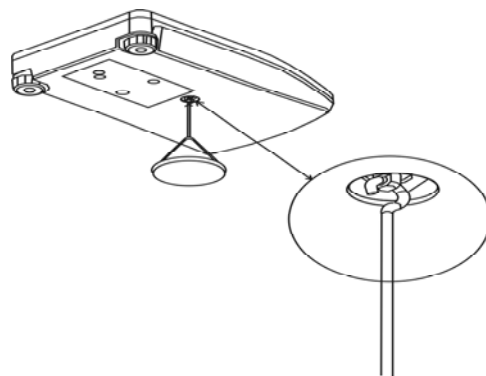
Fig. 1: Setup of balance for underfloor weighing

⚠   **CAUTION**
Always ensure that all suspended objects are stable enough to hold the desired goods to be weighed safely (danger of breaking).   **Never suspend loads that exceed the stated maximum load (max) (danger of breaking)**   **Always ensure that there are no persons, animals or objects that might be damaged underneath the load.**

❗   **NOTICE**
After completing the underfloor weighing the opening on the bottom of the balance must always be closed (dust protection).

11 Menu function "P6 Func" - Operating modes

Functions can be selected in Menu **"6.1.FFun"**, which are then made available to the operator without having to access the menu every time. All activated operating

modes can be called directly by pressing the ⟳ key.

Menu activation:

| ⌃ 0.000 g ⟹ MENU |

| P1   CAL | ⟹ Press repeatedly ⬆ button

| P6 Func | ⟹ →
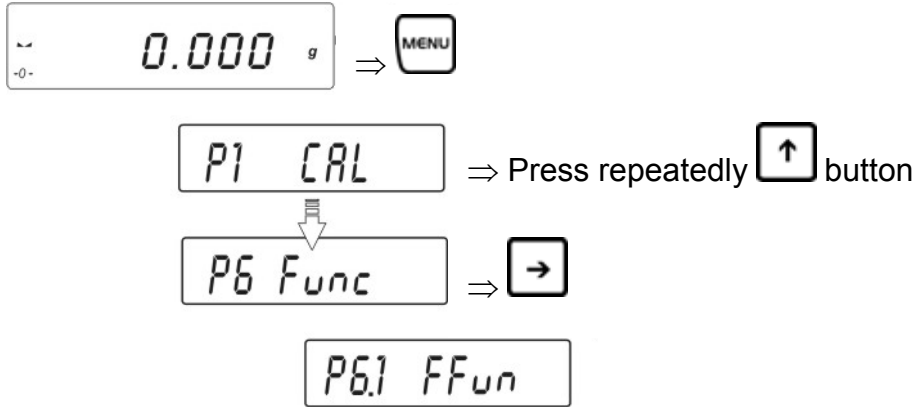
| P6.1 FFun |

A function can only be activated directly in Menu **"6.1.FFun"**.

- If only one operating mode is callable via the ⟳ key, simply select the desired function by pressing the arrow keys (⬇ ⬆) and confirm by pressing the **PRINT**-key.

- If several operating modes are callable via the ⟳ key, select function "**ALL**" by pressing the arrow keys (⬇ ⬆) and confirm by pressing the **PRINT**-key. The selection as to which Operating modes are deposited in **"ALL"** is made in the next chapter 11.1.

| P6.1 FFun | ⟹ →

| ALL | ⟹ ⬆
| PcS |
| Hi Lo |
| PrcA |
| Prcb |
| d_Co |
| d_Li |
| Add |
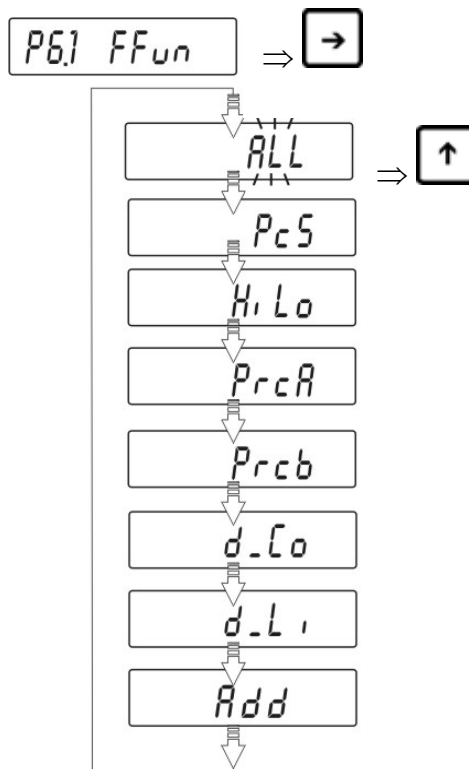
⇨ Confirm settings by pressing the **PRINT** key. Balance jumps back to sub-menu **6.1.FFun**.

Return to weighing mode:

⇨ Press the **TARE**-button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

Back to parameter selection using the F-key:

The **F**-key allows you to change set function parameters after having selected a function without having to return to the menu first.

Example:
You are in piece counting mode with set reference piece number 20 pcs. You wish to change these to 10 pcs.

- Press the **F**-key; the set reference piece number 20 pcs appears.

- Press arrow keys to change to 10 pcs and confirm by pressing the **PRINT**-key.

- "load" appears on the display. Place the reference weight on balance and confirm by pressing the **PRINT**-key.

- Remove the reference weight and continue with piece counting.

11.1 Settings for Function P6.1 FFun "ALL"

The selection of the menu items, which can then be called up by pressing the ⟳ button, is made at this point.
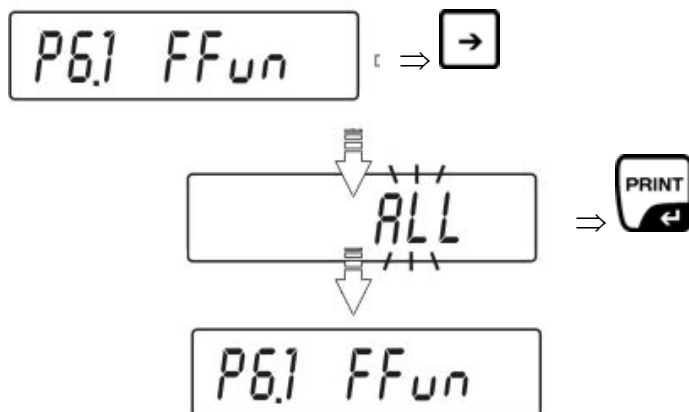
Return to weighing mode:

⇨ Press the **TARE**-button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

⇨ All activated operating modes can now be called up in Weighing mode by pressing the ⟳ button.

Press the ⟳ button in Weighing mode and the initial activated function will appear: Select desired function by pressing the arrow keys (↓ ↑).

11.2 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.
As a rule:
The higher the reference quantity the higher the counting exactness.

- **Call add-up function**

The current setting is displayed
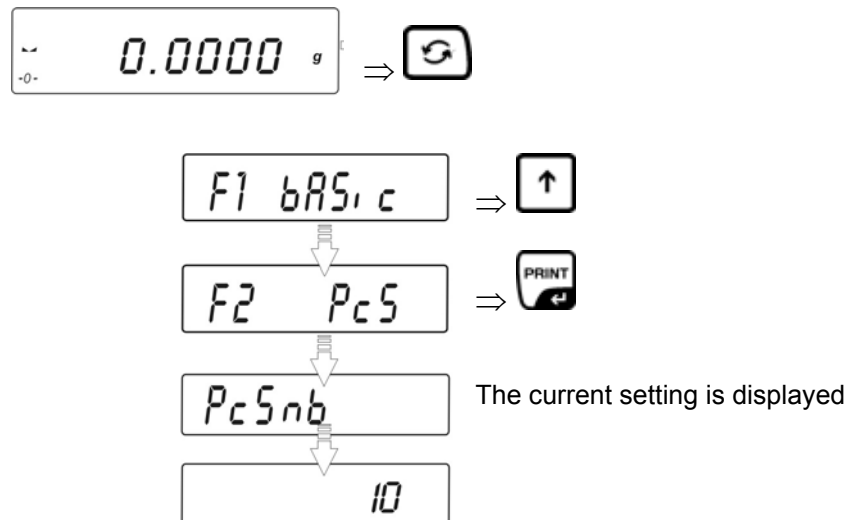
Press the arrow keys (↓ ↑), to select the desired reference piece number.

- **Reference piece number 10, 20 or 50**
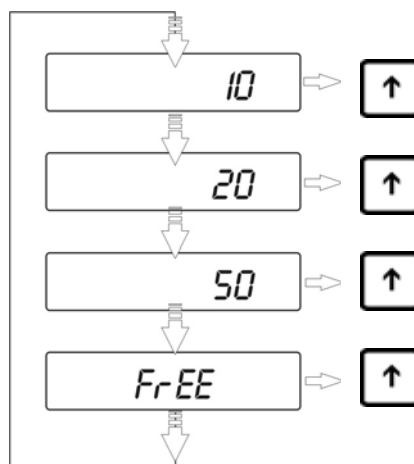
Confirm selected reference piece number by pressing the **PRINT**-key
(e.g. 20)

Make reference:

Place as many pieces to add-up as required by the set reference piece number.
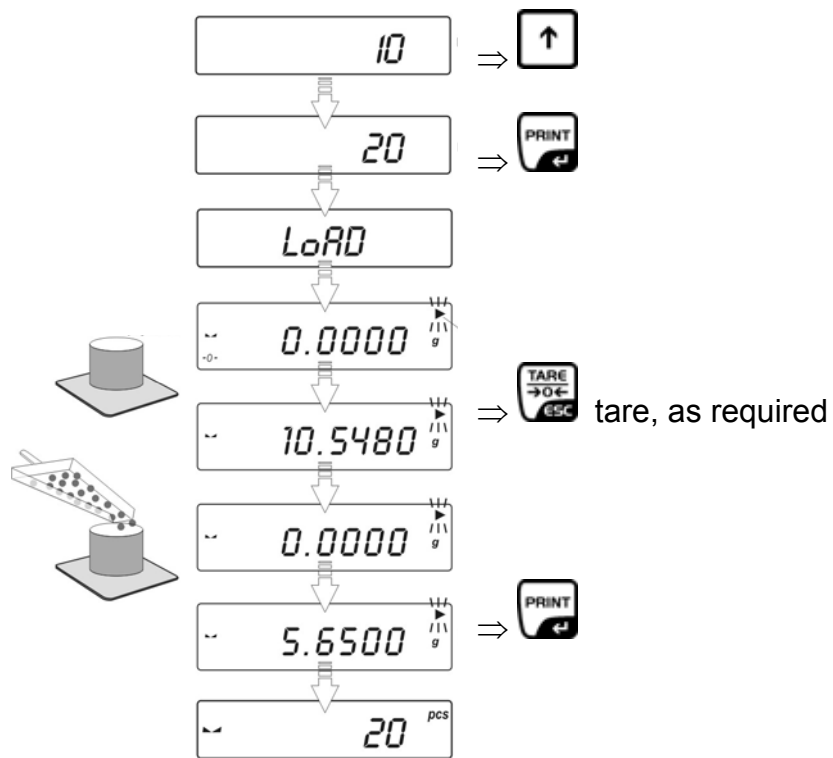
10	⇒ ↑
20	⇒ PRINT ↵
LoRD	
0.0000 g	
10.5480 g	⇒ TARE →0← ESC tare, as required
0.0000 g	
5.6500 g	⇒ PRINT ↵
20 pcs	

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

- **for selection "optional reference piece number" FrEE**
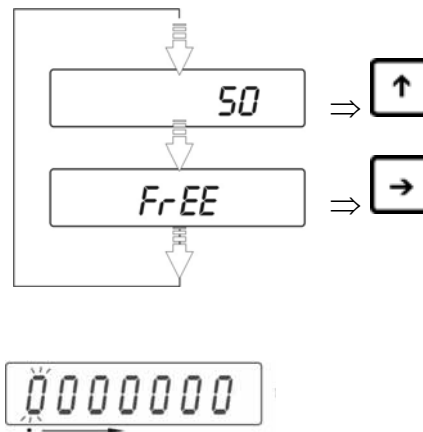
50	⇒ ↑
FrEE	⇒ →

0000000

− Use the arrow keys ← → to select the digit to be changed

0000200 ⇒ ↑
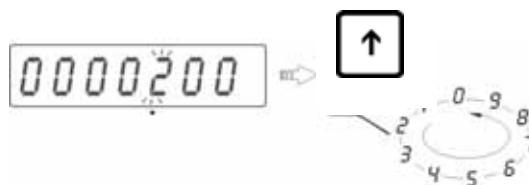
− Use the arrow keys ↓ ↑ to select the number

− Confirm the entered reference piece number by pressing the **PRINT**-key
− "LoAd" appears on the display.

$$L o \mathcal{R} d$$
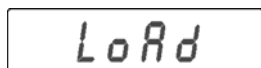
− Place as many counting parts on the balance as the set reference quantity requires, confirm by pressing the **PRINT** key.
Information:
If there is no load on the weighing plate when the **PRINT**-key is pressed, "**Er8 outr**" will appear briefly on the display before the display of the balance returns automatically to weighing mode.
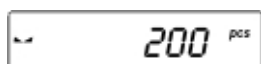
$$\text{200}\ ^{pcs}$$

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

- **Return to weighing mode**

$$0 \quad ^{pcs} \Rightarrow \boxed{\circlearrowleft}$$

$$\boxed{F2 \quad PcS} \Rightarrow \boxed{\downarrow}$$

$$\boxed{F1 \quad bRSi\,c} \Rightarrow \boxed{PRINT}$$

$$0.0000 \ _{g}$$
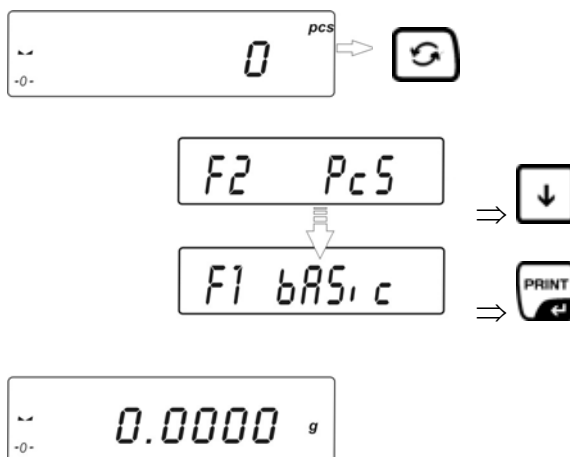
11.3 Weighing with tolerance range

For weighing with tolerance ranges you can enter individual upper and lower limits.
For tolerance controls such as dosaging, apportioning or sorting the scale will display violated upper or lower limits and show the tolerance tag.

The triangular tolerance marker (▲) in the upper part of the display shows whether the goods to be weighed are within the two tolerance limits.
The tolerance marker is only in operation during operating mode tolerance weighing; it is otherwise not visible.

The tolerance marker provides the following information:
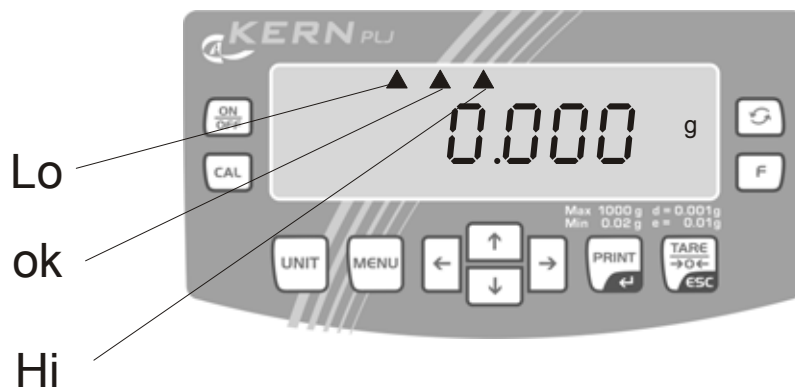
lo	Goods to be weighed below tolerance limit
ok	Goods to be weighed within tolerance range
Hi	Goods to be weighed above tolerance limit

- **Call function**
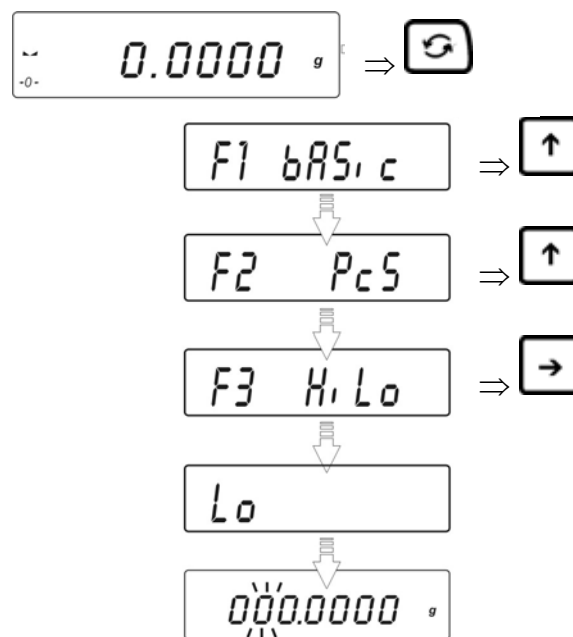
- **Setting the lower tolerance limit "Lo"**

- Use the arrow keys ← → to select the digit to be changed, enabled digit will be flashing
- Use the arrow keys ↓ ↑ to select the number
- Confirm the entered lower tolerance tag by pressing the **PRINT**-key.

- **Setting the upper tolerance limit "Hi".**
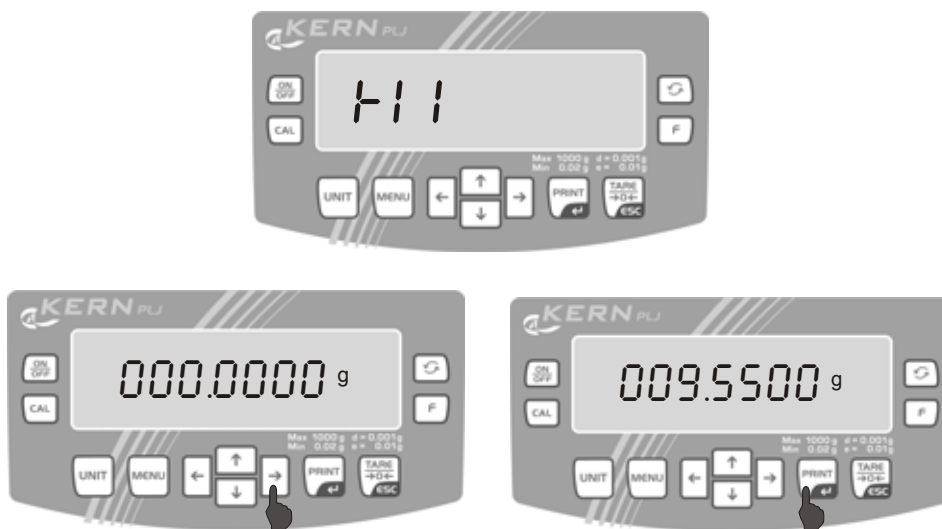
- Use the arrow keys ← → to select the digit to be changed, enabled digit will be flashing
- Use the arrow keys ↓ ↑ to select the number
- Confirm the entered lower tolerance tag by pressing the **PRINT**-key.

The balance is now in checkweighing mode Put on goods to be weighed, tolerance control is started

Information:
If invalid values are entered such as lower tolerance limit greater than upper tolerance limit, the balance will issue the error message and return automatically to weighing mode.

- **Return to weighing mode**
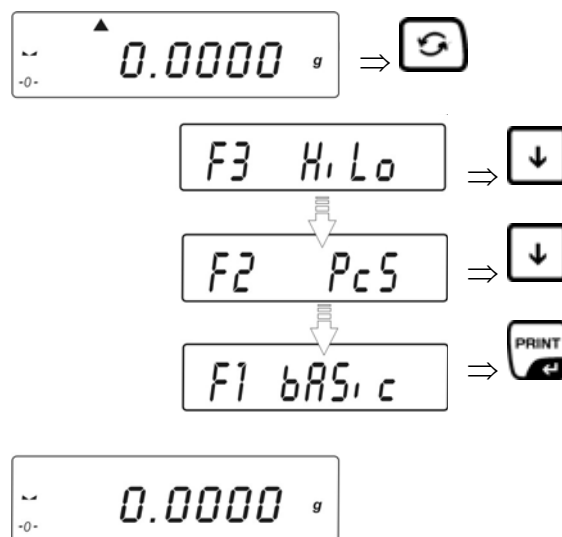
11.4 Percent determination

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

11.4.1 Determining the reference weight by weighing (function F4 PrcA)

- **Call function**
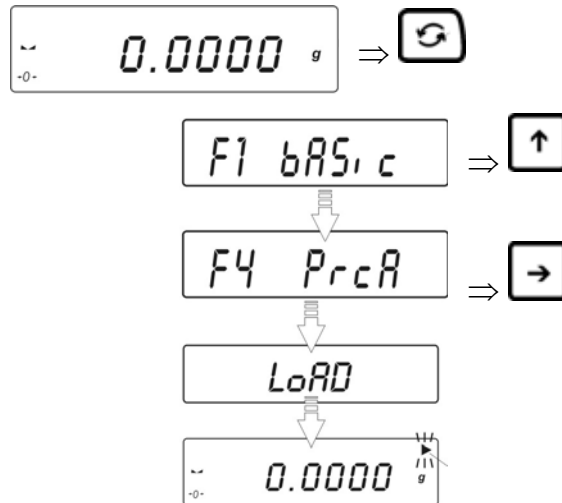
- **Make reference**

    – Place the reference weight
    – Confirm by pressing the **PRINT** key
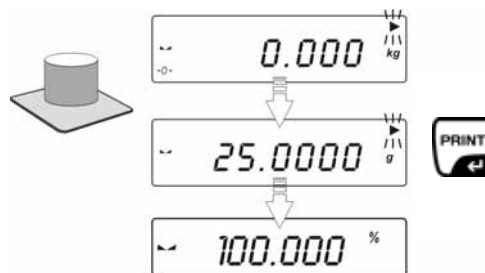
    – This weight is adopted as reference (100%).

Remove reference weight. The balance is now in percent determining mode Place the load on the balance; percentage value in relation to reference body is shown on display:

11.4.2 Determining the reference weight by entering numeric value (function F4 Prcb)

- **Call function**
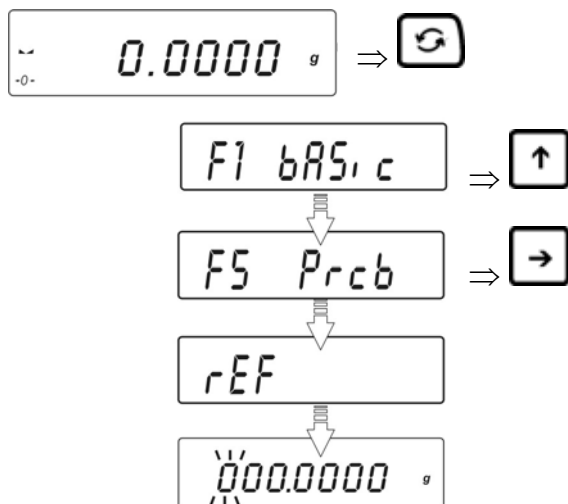
- **Make reference**

  − You will be asked to enter the reference weight by a flashing message.

  − Use the arrow keys ← → to select the digit to be changed, enabled digit will be flashing.

  − Use the arrow keys ↓ ↑ to select the number

  − Confirm the entered reference weight by pressing the **PRINT**-key.
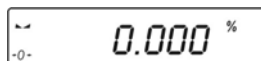
Now you can place the test objects onto the weighing plate; the percentage to the reference body is displayed
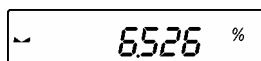
- **Return to weighing mode**
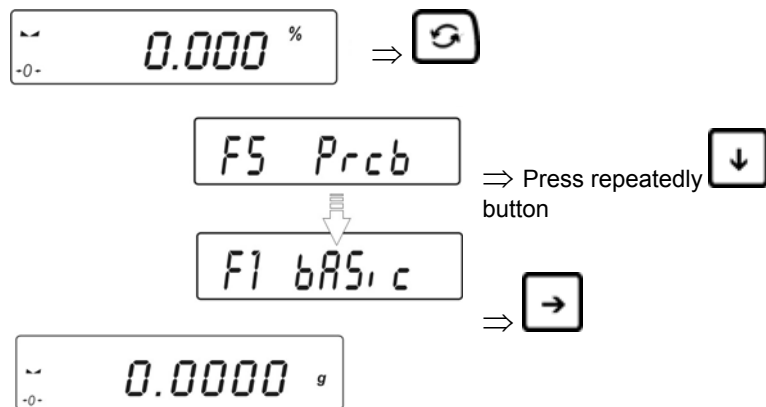
11.5 Density determination – functions "d_Co" and "d_Li"

For procedure of density determination please see the operating instructions "Set density"

12 Menu function "P2 GLP" - GLP/ISO protocol

Quality assurance systems require printouts of weighing results as well as of correct adjustment of the balance stating date and time and balance identification. The easiest way is to have a printer connected.

The content of the data output is determined in menu "P2 GLP". All parameters set to "YES" will be issued.
Examples:

P2 GLP

P2.1	uSr	|	max. 8 digits
P2.2	PrJ	|	max. 8 digits
P2.3	Ptin	|	YES
P2.4	PdAt	|	YES
P2.5	PuS	|	YES
P2.6	PPrJ	|	YES
P2.7	Pid	|	YES
P2.8	PFrn	|	YES

```
----------------------
Date     : 09/02/2007
Time     : 11:21:39
User Id  : 12345678
Project Id: 87654321
Balance Id: 114493

  100.0216 g
----------------------
```

P2.8 PFrn: YES

Date
:20.03.07
Time
:11.31.07
UserID
:Mustermann
Balance ID   :180151
19.3406 g

P2.8 PFrn: no
Date   :
Time   :
UserID   :
Balance ID   :180151
19.3406 g

Definition of a standard log:

Operation:	Display:
Call menu point „**P2 GLP**" : Press MENU .	**0.0000 g** ⇓ **P1 CAL**
Press ↑ .	**P2 GLP**
Press → . The first menu item „**P2.1 Usr**" for entering the user name appears.	**P2.1 Usr**

English

`P2.1 USr` $\Rightarrow$ [→] The first digit is flashing	
$\Rightarrow$ [↑] To change the number value, press the ↓ ↑ keys.	
$\Rightarrow$ [→] Press the ← → keys, to select the digit on the left/right (the relevant current digit flashes).	
$\Rightarrow$ [↑] + [→].	
`OP1_IIILr` Confirm input with [PRINT] button.	
`P2.1 USr`	
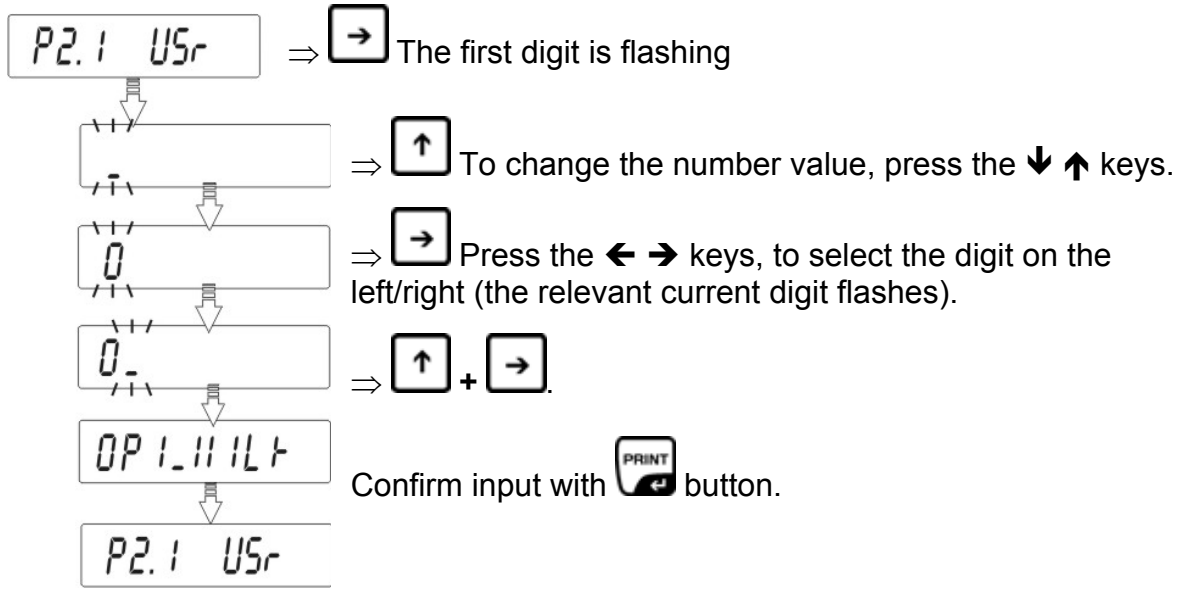
Enter user name or number (max. 8 digits) with the help of the arrow keys	Example: Data input: `HErn` ------------------ Data output: **KERN**

Overview data input / data output:

- _	0	1	2	3	4	5	6	7	8	9

A	B	C	D	E	F	G	H	I	J	K	L	M

N	O	P	Q	R	S	T	U	V	W	X	Y	Z

a	b	c	d	e	f	g	h	i	j	k	l	m

n	o	p	q	r	s	t	u	v	w	x	y	z

After confirming by pressing [PRINT] the balance will return to the menu.	**P2.1 Usr**
[↑], the next menu item "**P2.2 PrJ**" used to enter the project name appears.	**P2.2 PrJ**

Press [→] , first digit is flashing	**–**
Press the arrow keys to enter project name or number (max. 8 digits).	
Confirm setting by pressing [PRINT ↵] . Weighing balance returns to menu.	**P2.2 PrJ**
Press [↑] until the next menu item "**P2.3 Ptin**" used to enter the time appears.	**P2.3 Ptin**
Press [→], current setting will be flashing	**no**

Press the arrow keys ↓ ↑ to select among the settings below:
 	
   no   = time not displayed
   YES = time displayed
	YES

Confirm setting by pressing [PRINT ↵]. Weighing balance returns to menu.	**P2.3 Ptin**
Press [↑] until the next menu item "**P2.4 PdAt**" used to enter the date appears.	**P2.4 PdAt**

Use the same steps to enter further GLP-Parameter.

Menu overview

P2.1	Usr	|	_	[user]
P2.2	PrJ	|	_	[project]
P2.3	Ptin	|	YES/no	[printout time]
P2.4	PdAt	|	YES/no	[printout date]
P2.5	PUSr	|	YES/no	[printout user]
P2.6	PPrJ	|	YES/no	[printout project]
P2.7	Pid	|	YES/no	[printout serial number weighing balance]
P2.8	PFr	|	YES/no	[frame printout]

Return to weighing mode:

Press the **TARE**-button repeatedly until the "**SAVE**"? inquiry appears.
Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

English

13 Menu function "P3 rEAd" basic settings

Basic settings can be changed and functions activated in Menu "P3 rEAd". It is now possible to change individual weighing requirements.

13.1 Filter settings

This menu item allows the balance to be set according to specific ambient conditions and measuring purposes.

Call up menu:

| | 0.000 g | ⇒ MENU |

| P1 CAL | ⇒ Press repeatedly ↑ button |

| P3 rEAd | ⇒ → |

| P3.1 AuE | ⇒ → |

| StAnd | ⇒ Press the ↑ button as often as necessary until the required setting* appears: |

| SLouu |

| FASt | ⇒ PRINT confirm |

| P3.1 AuE |

* Press the arrow keys (↓ ↑), to select among the settings below:
    FASt   Sensitive and fast (very quiet set-up location).
    StAnd   Default
    Slouu   Robust but slow (very busy set-up location)

Return to weighing mode:

⇨ Press the **TARE**-button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

13.2 Rest position display

Call up menu:

$\Rightarrow$ Press repeatedly ⬆ button

$\Rightarrow$ ➡

$\Rightarrow$ ⬆

$\Rightarrow$ ⬆

$\Rightarrow$ Press the ⬆ button as often as necessary until the required setting appears:

$\Rightarrow$ confirm
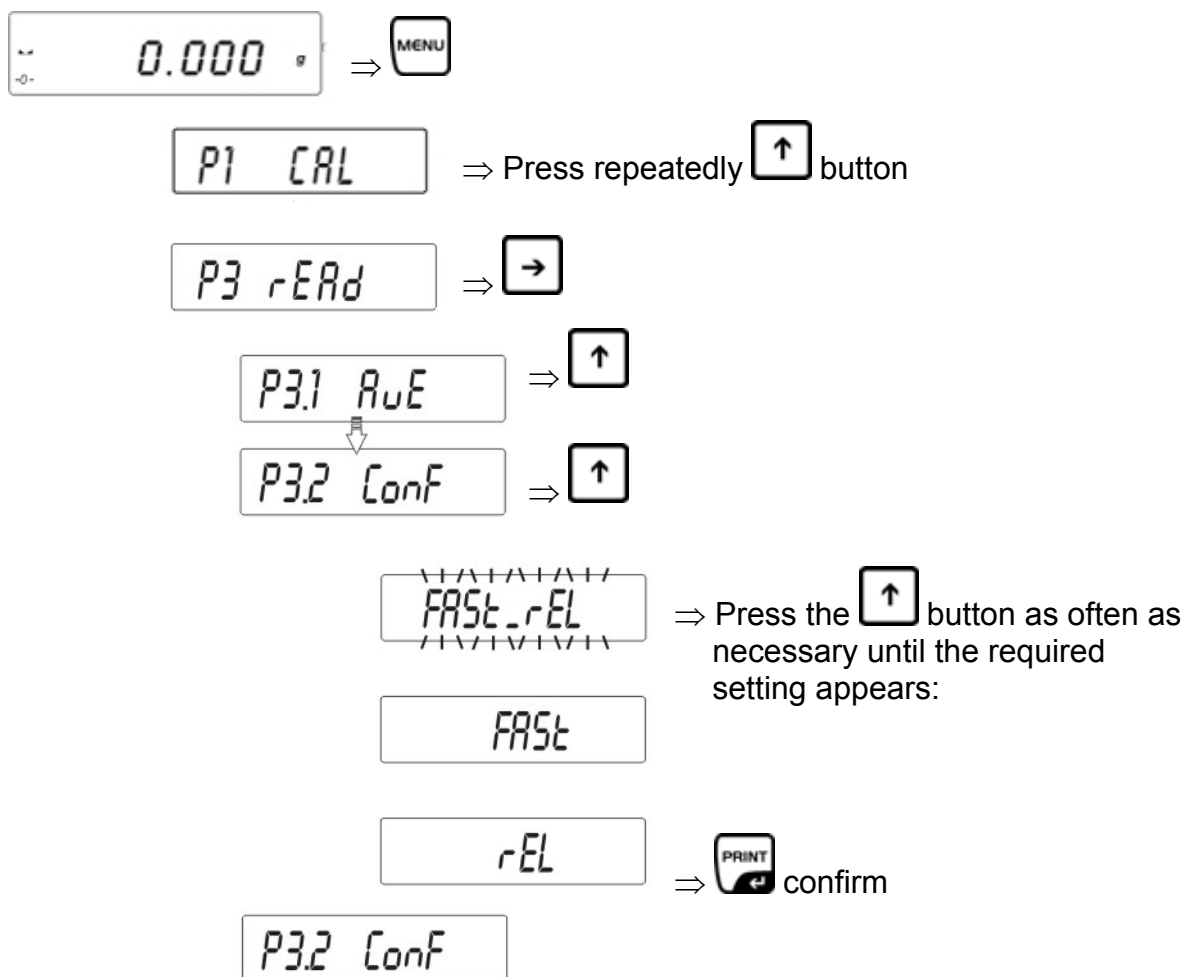
* Press the arrow keys (⬇ ⬆), to select among the settings below:

FASt_rEL = rest position control fast

FASt = rest position control fast and accurate

rEL = rest position control accurate

Return to weighing mode:

$\Rightarrow$ Press the **TARE**-button repeatedly until the **"SAVE"**? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
   -or-
   press the **TARE**-button to return to Weighing mode without saving.

13.3 Auto Zero

This function helps to tare automatically deviations from the zero display

Call up menu:

$$\boxed{\text{0.000 g}} \Rightarrow \boxed{\text{MENU}}$$

$$\boxed{\text{P1 CAL}} \Rightarrow \text{Press repeatedly} \boxed{\uparrow} \text{button}$$

$$\boxed{\text{P3 rEAd}} \Rightarrow \boxed{\rightarrow}$$

$$\boxed{\text{P3.1 AuE}} \Rightarrow \text{Press repeatedly} \boxed{\uparrow} \text{button}$$

$$\boxed{\text{P3.2 ConF}}$$

$$\boxed{\text{P33 Auto}} \Rightarrow \boxed{\rightarrow}$$

$$\boxed{\text{On}} \Rightarrow \text{Press the} \boxed{\uparrow} \text{button as often as necessary until the required setting appears (no = off, yes = on)}$$

$$\boxed{\text{OFF}}$$

$$\boxed{\text{P33 Auto}} \Rightarrow \boxed{\text{PRINT}} \text{confirm}$$

Return to weighing mode:

⇨ Press the **TARE**-button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

13.4 Changing readability – decimal place

Readability may be reduced by 1 digit on the weighing balances, as required. The last decimal place will be rounded and removed from the display.
Call up menu:

`0.000 g`	⇒ MENU

| `P1 CAL` | ⇒ Press repeatedly ↑ button |

| `P3 rEAd` | ⇒ → |

`P3.1 AuE`	⇒ Press repeatedly ↑ button
`P3.2 ConF`	
`P3.3 Auto`	
`P3.4 Ld.9`	⇒ →

`ALuuAYS`	⇒ Press the ↑ button as often as necessary until the required setting appears:
`nEuEr`	
`uu_StAb`	⇒ PRINT confirm
`P3.4 Ld.9`	

* Press the arrow keys (↓ ↑), to select among the settings below:
AlwAYS =shows last decimal place
nEuEr =does not show last decimal place
uu_StAb = last decimal place will only be shown for stable weighing values

Return to weighing mode:
⇨ Press the **TARE**-button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode. -or-
press the **TARE**-button to return to Weighing mode without saving.

14 Menu function "P7 othEr"- additional useful functions

Here, you can set the parameters that influence the operation of the balance, such as background lighting and key sounds.

14.1 Display background illumination

Call up menu:

$$\boxed{\begin{array}{l} {\scriptstyle \sim} \\ {\scriptstyle -0-} \quad 0.000 \quad {\scriptstyle g} \end{array}} \Rightarrow \boxed{\text{MENU}}$$

$$\boxed{P1 \quad CAL} \Rightarrow \text{Press repeatedly} \boxed{\uparrow} \text{button}$$

$$\boxed{P7 \quad othEr} \Rightarrow \boxed{\rightarrow}$$

$$\boxed{P7.1 \quad bL} \Rightarrow \boxed{\rightarrow}$$

$$\boxed{On}$$
$$\boxed{Aut} \quad \Rightarrow \text{Press the} \boxed{\uparrow} \text{button as often as necessary until the required setting appears:}$$
$$\boxed{OFF}$$

$$\boxed{P7.1 \quad bL} \Rightarrow \boxed{\text{PRINT}} \text{confirm}$$

* Press the arrow keys (↓ ↑), to select among the settings below:

ON   = Background illumination on
OFF   = Background illumination off
Aut   The background illumination will be switched off automatically 10 sec after having reached a stable weighing value.

Return to weighing mode:

⇨ Press the **TARE**-button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
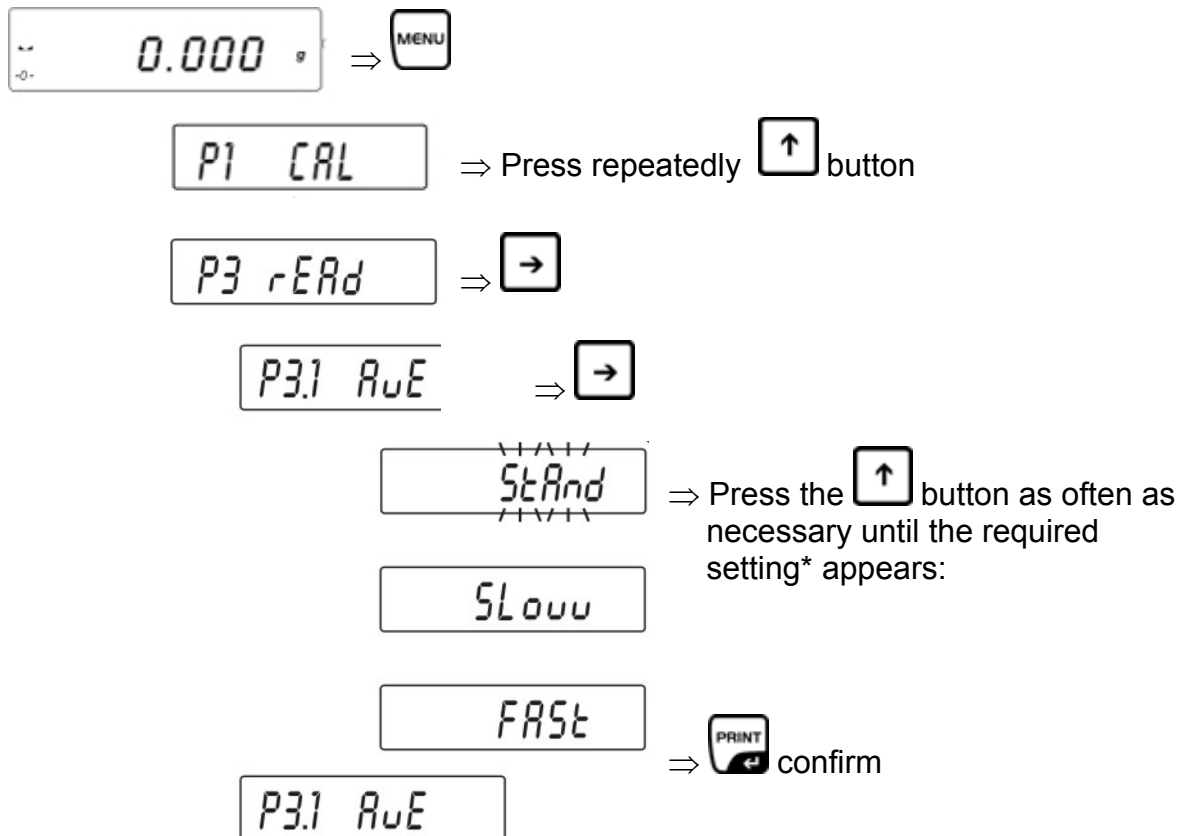press the **TARE**-button to return to Weighing mode without saving.

Information:
Backlighting automatically switched off 10 seconds after achieving a stable weighing value The background light will switch on automatically after the weighing value has changed.

14.2 Acoustic signal for key operation

Call up menu:

| ⁻ 0.000 g | ⇒ | **MENU** |

| P1 CAL | ⇒ Press repeatedly | ↑ | button |

| P7 othEr | ⇒ | → |

| P7.1 bL | ⇒ | ↑ |

| P7.2 bEEP | ⇒ | → |

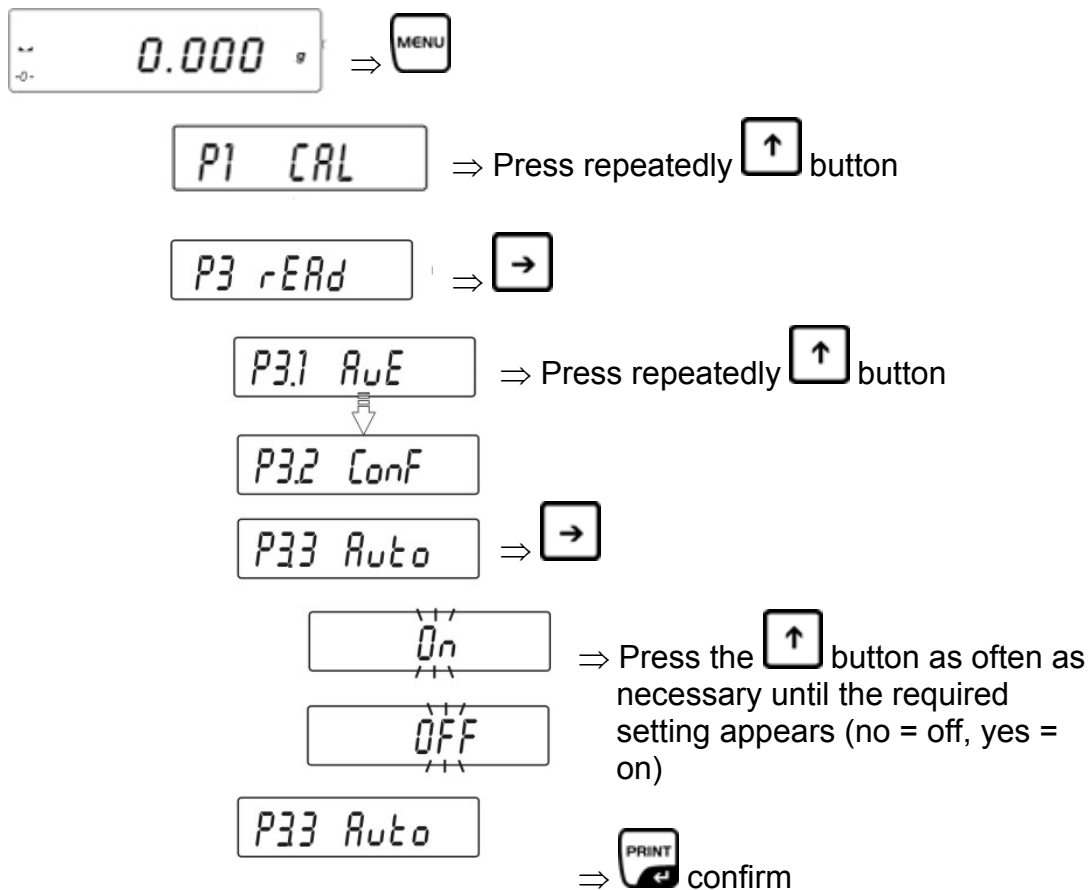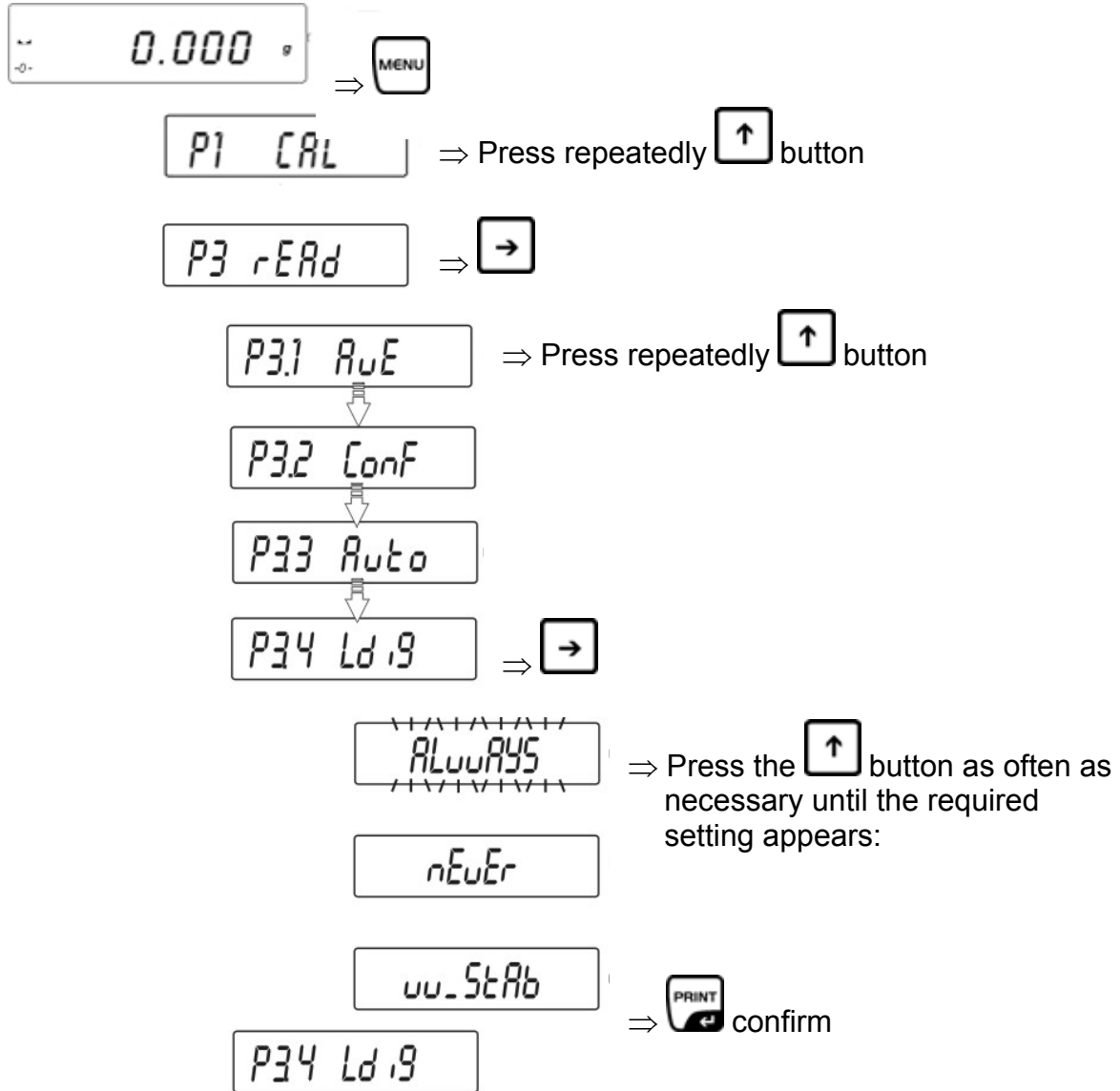| On | ⇒ Press the | ↑ | button as often as necessary until the required setting appears (no = off, yes = on) |

| OFF |

| P7.2 bEEP | ⇒ | PRINT | confirm |

Return to weighing mode:
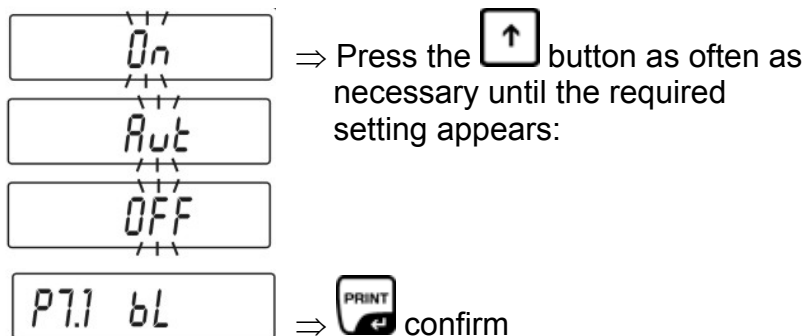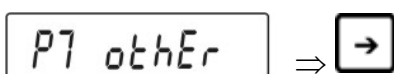
⇨ Press the **TARE**-button repeatedly until the "**SAVE**"? inquiry appears.
Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

14.3 Printing balance parameters

Call up menu:

Press the **F**-key; output of balance parameter is achieved via RS 232 interface.

15 Data output RS 232C "P4 Print"

15.1 Technical Data

- 8-bit ASCII Code
- 8 data bits, 1 stop bit, no parity bit
- Baudrate selectable from 2400 - 19200 Baud (factory setting 4800 Baud.)
- For operation with interface faultless operation is only ensured with the correct KERN – interface cable (max. 2m)

Transfer modes:
- Manually after pressing the **PRINT** key
- Continuously, according to setting
- Automatically according to stability display
- On request by external device (For remote control commands, see chpt. 16.5))

Output conditions:
- stable   – Output for stable weighing value
- unstable – sequential output by pressing the **PRINT** button (Marks in the printout: <?>)

15.2 Pin allocation of the balance output plug (front view)

5   1

○ ○ ○ ○ ○

○ ○ ○ ○

9   6
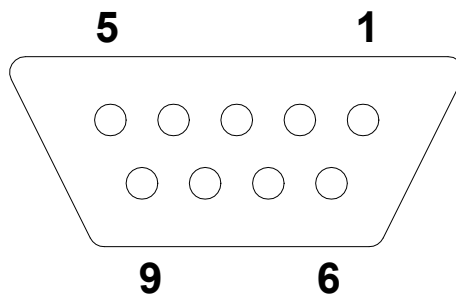
Pin 2: Receive data
Pin 3: Transmit data
Pin 5: Signal ground

15.3 Interface cable

PC 25-channel

Balance
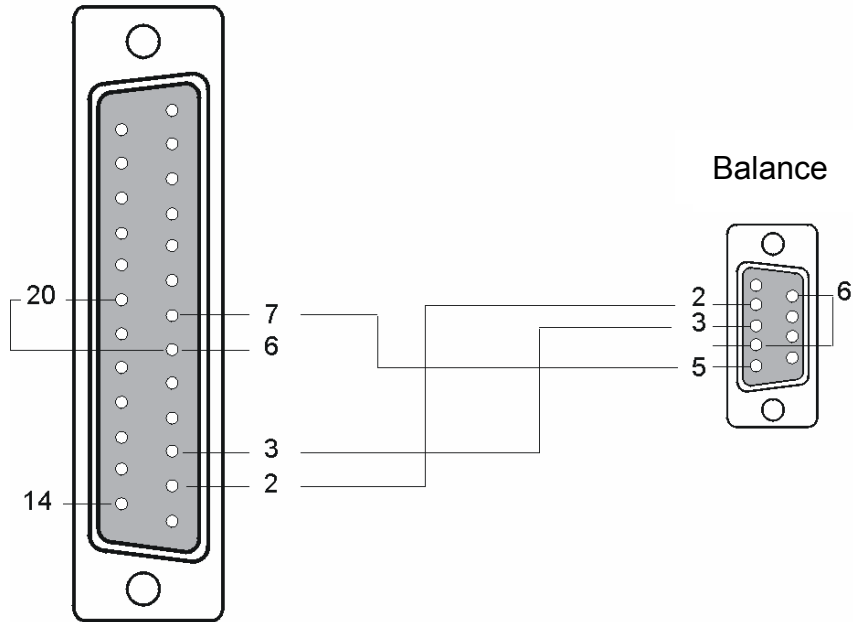
PC 9-channel   Balance
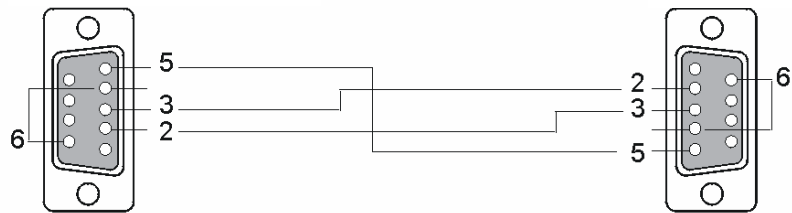
Printer   Balance
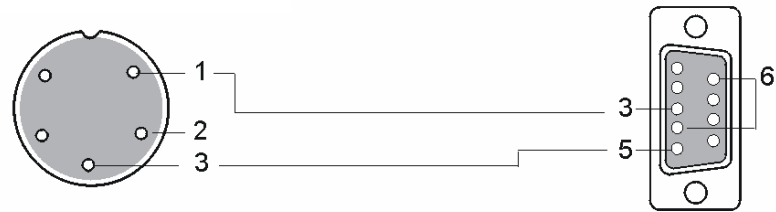
Balance
2 (RxD)
3 (TxD)
4 (DTR)
5 (GND)
6 (DSR)

15.4 Menu function " P4 Print " - RS 232C parameter

15.4.1 Setting Baudrate „P4.1   bAud"

Call up menu:

| | 0.000 | g | $\Rightarrow$ MENU |

P1   CAL $\Rightarrow$ Press repeatedly [↑] button

P4 Print $\Rightarrow$ [→]

P4.1 bAud $\Rightarrow$ [→]

2400 $\Rightarrow$ Press the [↑] button as often as
          necessary until the required
4800   setting appears:

P4.1 bAud $\Rightarrow$ [PRINT] confirm
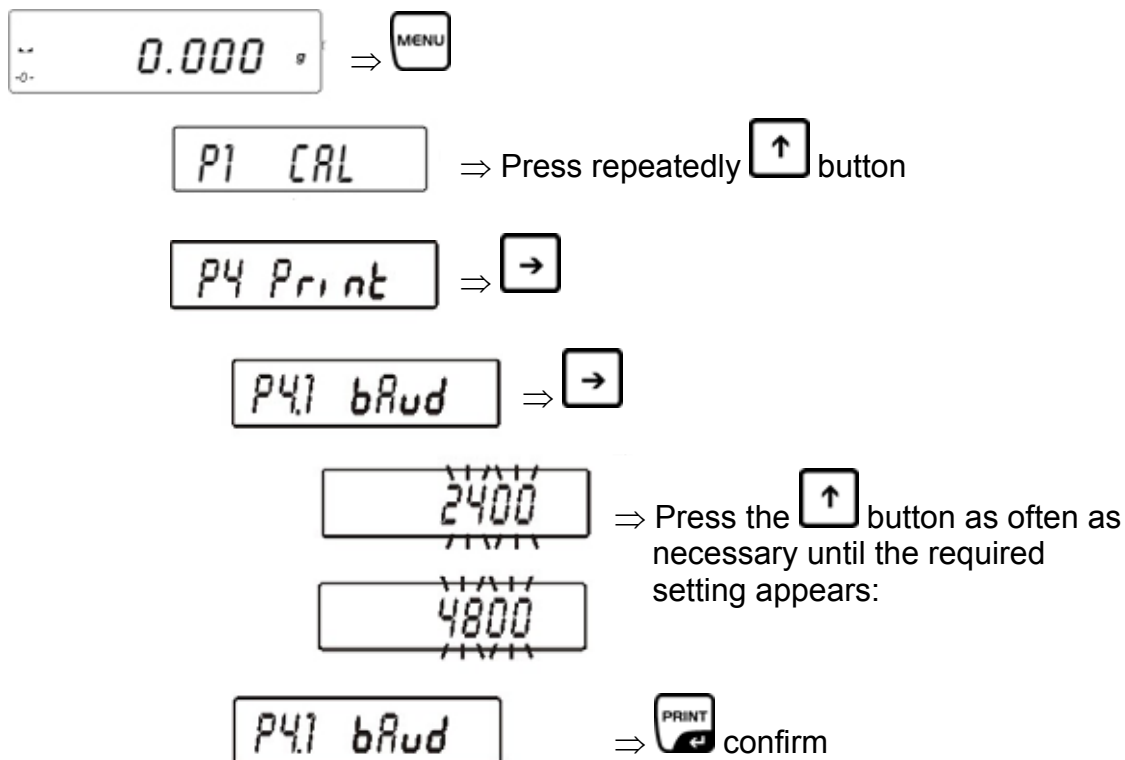
* Press the arrow keys (↓ ↑), to select among the settings below:
  - 2400 bit/s
  - 4800 bit/s
  - 9600 bit/s
  - 19200 bit/s

Return to weighing mode:

⇨ Press the **TARE** -button repeatedly until the "**SAVE**"? inquiry appears.
   Confirm inquiry by pressing the **PRINT**-button to save changes and to
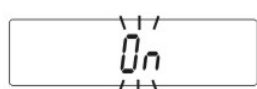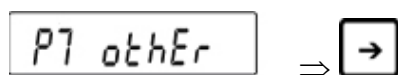   return to Weighing mode.
   -or-
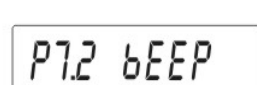   press the **TARE**-button to return to Weighing mode without saving.

15.4.2 Continuous output in standard weighing unit "P4.2   CntA"

Call up menu:
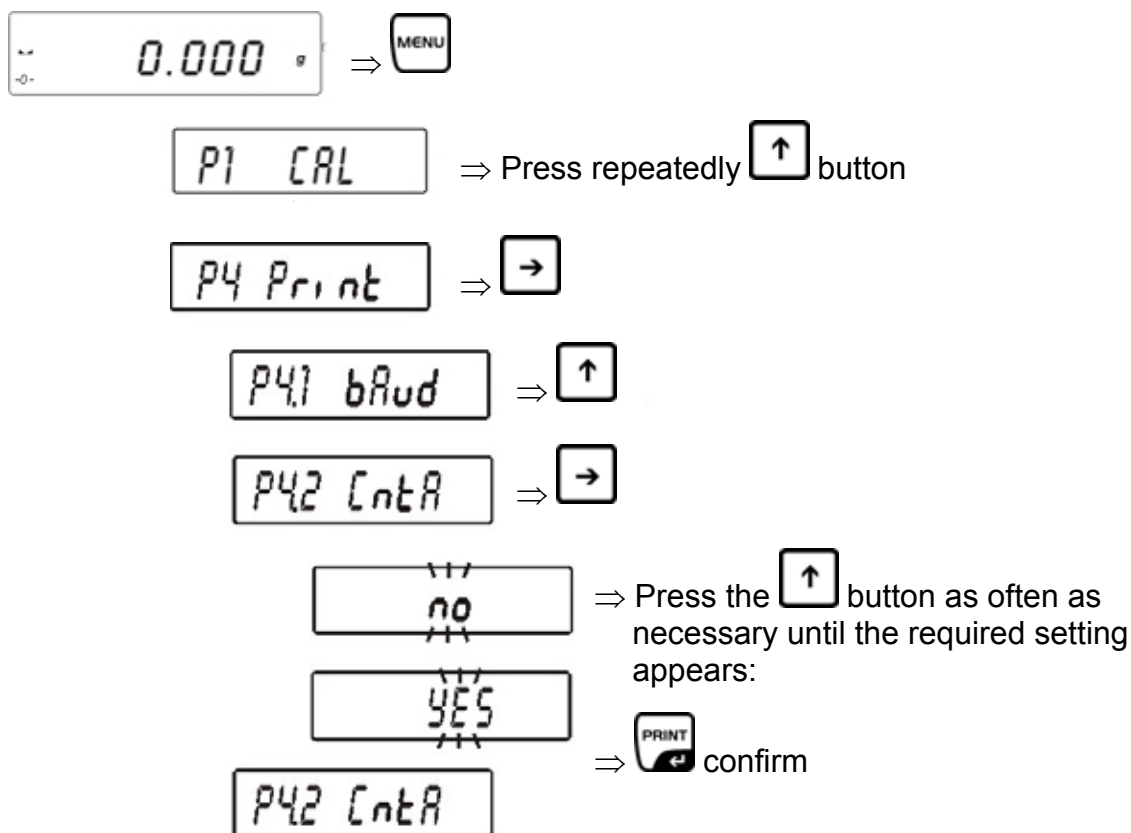
* Press the arrow keys (↓ ↑), to select among the settings below:

         CntA no   Function deactivated
         CntA yes   Function activated

Return to weighing mode:

     ⇨ Press the **TARE** -button repeatedly until the "**SAVE**"? inquiry appears.
        Confirm inquiry by pressing the **PRINT**-button to save changes and to
        return to Weighing mode.
        -or-
        press the **TARE**-button to return to Weighing mode without saving.

15.4.3 Continuous output in current weighing unit „P4.3 Cntb"

```
 ~
-0-   0.000  g    ⇒  [MENU]
```

```
 P1   CAL      ⇒ Press repeatedly [↑] button
```

```
 P4  Print     ⇒ [→]
```

```
 P4.1  bAud    ⇒ Press repeatedly [↑] button
```

```
 P43  Cntb     ⇒ [→]
```

```
    no         ⇒ Press the [↑] button as often as
                 necessary until the required setting
                 appears:

    YES

 P43  Cntb     ⇒ [PRINT] confirm
```
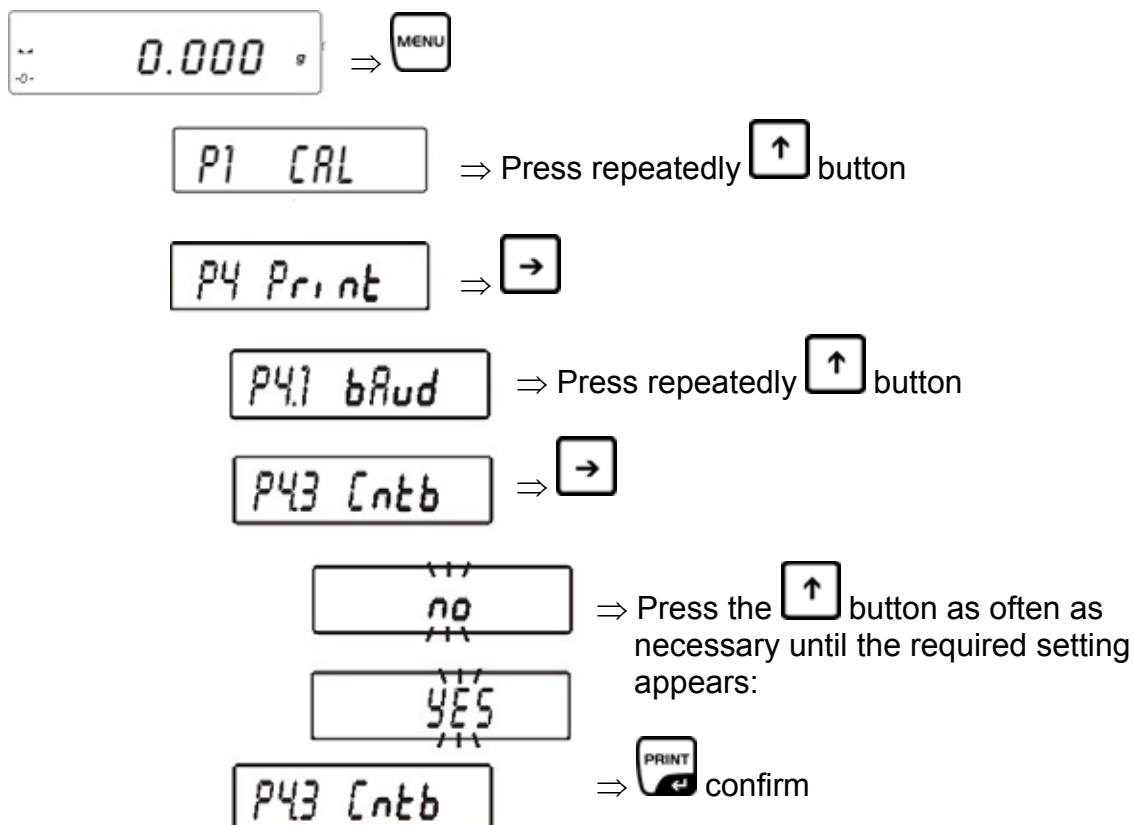
* Press the arrow keys (↓ ↑), to select among the settings below:

Cntb no Function deactivated
Cntb yes Function activated

Return to weighing mode:

⇨ Press the **TARE** -button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

15.4.4 Setting data output type: manual/automatic „P4.4 rEPL"

| | 0.000 g | ⇒ | MENU |

| P1 CAL | ⇒ Press repeatedly [↑] button

| P4 Print | ⇒ [→]

| P4.1 bAud | ⇒ Press repeatedly [↑] button

| P44 rEPL | ⇒ [→]

| no | ⇒ Press the [↑] button as often as necessary until the required setting appears:

| YES |

| P44 rEPL | ⇒ [PRINT] confirm
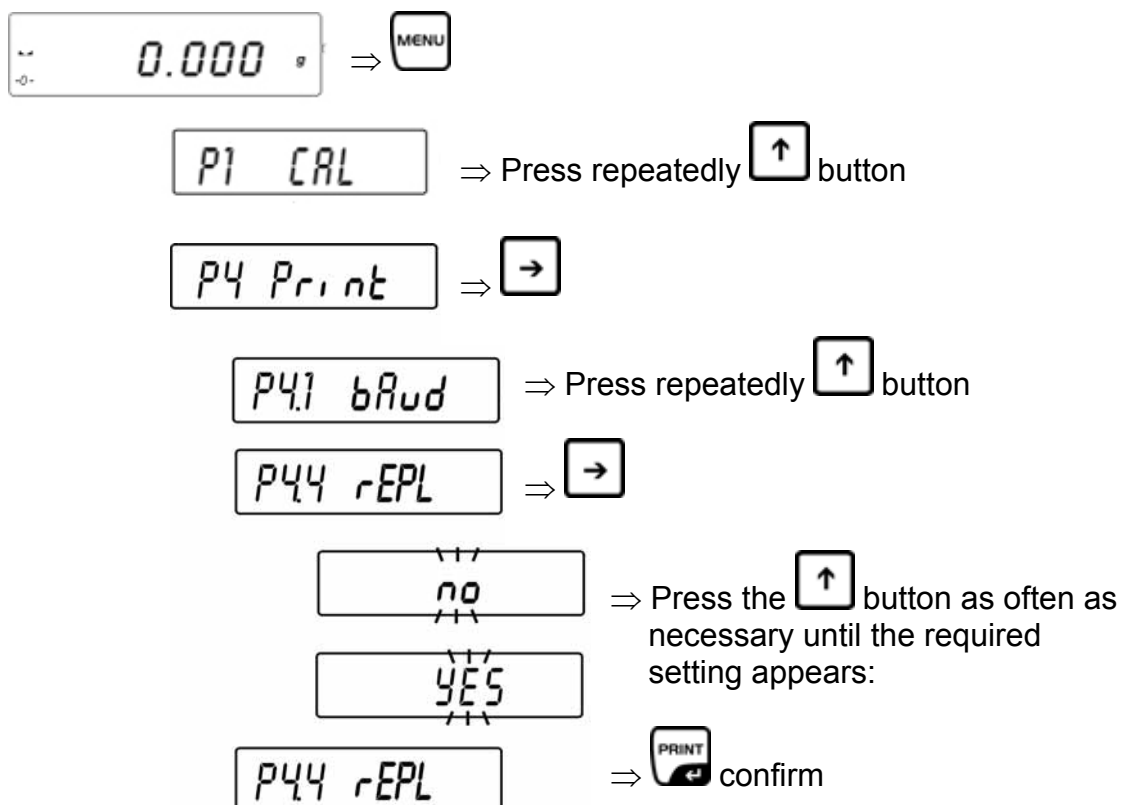
* Press the arrow keys (↓ ↑), to select among the settings below:

| **rEPl** | **no** | Manual issue after pressing the **PRINT** key. |
| **rEPl** | **yes** | Automatic issue of first stable weighing value |

> **Sequence of operations:**
>
> 1. Taring
> 2. Place weight, issue of first stable weighing value
> 3. Renewed output only possible after weight was removed. Condition: Display +/- 50 display steps from zero
> 4. Place next weight.

Return to weighing mode:

⇨ Press the **TARE** -button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

15.4.5 Setting data output for stable/instable weighing value
"P4.5 PStb" (models with non-verifiable setting only)

`0.000 g`	⇒ MENU

| `P1   CAL` | ⇒ Press repeatedly ↑ button |

| `P4 Print` | ⇒ → |

| `P4.1 bAud` | ⇒ Press repeatedly ↑ button |

| `P4.5 PStb` | ⇒ → |

`no`	⇒ Press the ↑ button as often as necessary until the required setting appears:
`YES`	⇒ PRINT confirm
`P4.5 PStb`	
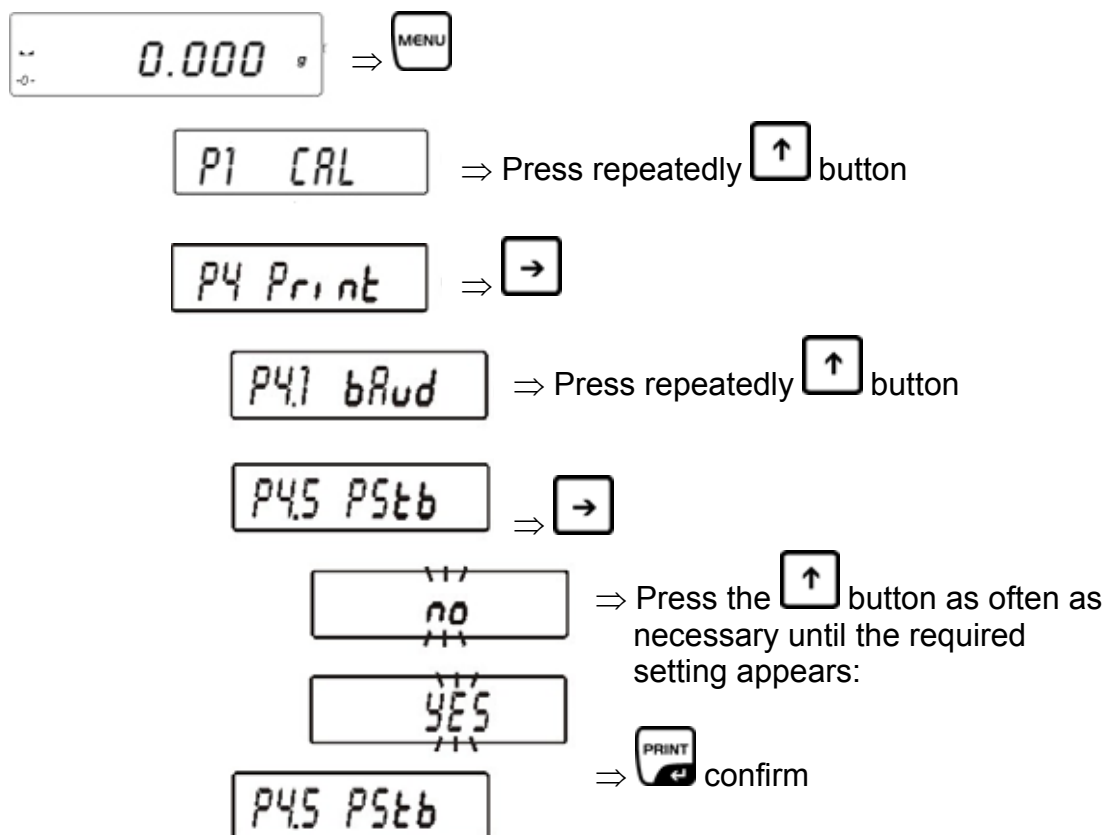
* Press the arrow keys (↓ ↑), to select among the settings below:

PStb no   Output even for unstable weighing value
PStb yes Output for stable weighing value only

Return to weighing mode:

⇨ Press the **TARE** -button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

15.4.6 Entering minimum weight for automatic output "P4.6 Lo"

Weighing value issued automatically if current weighing value exceeds entered minimum value. The next weighing value will not be issued unless the weighing value has meanwhile dropped below the entered weighing value.
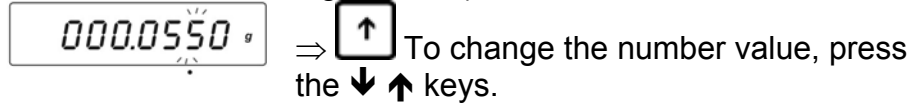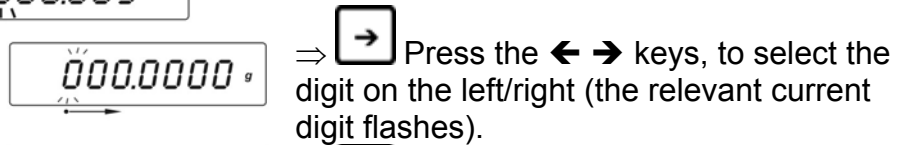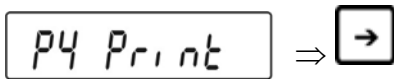
`0.000 g` ⇒ **MENU**	
`P1 CAL`	⇒ Press repeatedly ↑ button
`P4 Print`	⇒ →
`P4.1 bAud`	⇒ Press repeatedly ↑ button
`P4.6 Lo`	⇒ →
`000.005 g`	
`000.0000 g`	⇒ → Press the ← → keys, to select the digit on the left/right (the relevant current digit flashes).
`000.0550 g`	⇒ ↑ To change the number value, press the ↓ ↑ keys.
`000.0550 g`	⇒ **PRINT** confirm
`P4.6 Lo`	

Return to weighing mode:

⇨ Press the **TARE** -button repeatedly until the "**SAVE**"? inquiry appears. Confirm inquiry by pressing the **PRINT**-button to save changes and to return to Weighing mode.
-or-
press the **TARE**-button to return to Weighing mode without saving.

15.5 Communication protocol / remote control commands

Instruction:	Meaning of Instruction:
Z	Set weight display at zero
T	Taring
S	Send weight value immediately
SI	Send stable weight value
SU	Send stable weighing value in current weighing value
SUI	Send weighing value immediately in current weighing unit
C1	Turn on continuous transmission in standard weighing unit
C0	Turn off continuous transmission in standard weighing unit
CU1	Turn on continuous transmission in current weighing unit
CU0	Turn off continuous transmission in current weighing unit

Complete each instruction with **CR LF**.

15.5.1 Manual output

The user may start output manually by pressing the **PRINT**-key (For settings see chapter 16.4.5, function "**P4.5 PStb**", locked for verifiable devices).

Data record format:

1	2	3	4 - 12	13	14 - 16	17	18
Stability indicator	Blank	Signs	Weight	Blank	Unit	CR	LF

Stability indicator   Space if stable,
                                          ? if not stable
                                          ^ if overload
                                          v if underload

Presign: Space, if positive
                                          negative sign, if negative

Weight: 9 signs, right justified

Unit: 3 signs, left justified

15.5.2 PC controlled output

Response message of balance after remote instruction was sent:

XX_   Instruction:
XX_A CR LF   Instruction accepted; will be executed
XX_I   CR LF   Instruction received; impossible to carry out
XX_^   CR LF   Instruction received but *time overflow error* occurred
XX_v   CR LF   Instruction received, but insufficient load
XX_E CR LF   Error during execution, timeout for stable weighing value
                                           exceeded

Data record format:

1 - 3	4	5	6	7	8 - 16	17	18 - 20	21	22
Remote control command	Blank	Stability indicator	Blank	mark	Weight	Blank	Unit	CR	LF

Instruction: 1. up to 3 signs

Stability indicator: Space if stable,
                                          ? if not stable
                                          ^ if overload
                                          v if underload

Presign: Space, if positive
                                          negative sign, if negative

Weight: 9 signs, right justified

Unit: 3 signs, left justified

15.5.3 Output of date/time

Output of date and time is enabled in menu item "**P2 GLP**":

- **PdAt – yes**

- **Ptin - yes**

16 Error messages

Er1 Hi	Initial weight error
Er2 nuLL	Value below allowed range
Er3 FuL1	Value above allowed range
Er4 FuL2	Weighing range exceeded
Er5 rout	Value outside allowed range e.g. tare value <= 0, Reference weight = 0
Er7 tout	Zero/Tare not possible as stable weighing value is still pending
Er8 outr	Input outside range e.g. for tolerance control: Input upper limit<lower limit
Er9 Lock	Function blocked
Er10 cal	Adjustment error e.g. incorrect adjustment weight}

17 Service, maintenance, disposal

17.1 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.

17.2 Service, maintenance

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

17.3 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.

18 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.