GB

KERN ALT

Version 1.0 12/2004

Operating Instructions

Electronic analytical balance

Table of contents

1 Technical data

KERN	*ALT 100-4M*	*ALT 160-5D*	*ALT 220-4M*	*ALT 310-4*
Readout (d)	*0.1 mg*	*0.1mg/0.01mg*	*0.1 mg*	*0.1 mg*
Weighing range (Max)	*100 g*	*160 g/60 g*	*220 g*	*310 g*
Taring range (subtractive)	*100 g*	*160 g/60 g*	*220 g*	*310 g*
Reproductability	*0.2 mg*	*0.2mg/0.1mg*	*0.2 mg*	*0.2 mg*
Linearity	*± 0.2 mg*	*± 0,2mg/0,1mg*	*± 0.2 mg*	*± 0.3 mg*
Minimal piece weight for counting function	*0,2 mg*	*0,2 mg*	*0,2 mg*	*0,2 mg*
Adjustment weight	*internal*	*internal*	*internal*	*internal*
Verifiable	*yes*	*no*	*yes*	*no*
Verification value (e)	*1 mg*	*-*	*1 mg*	*-*
Accuracy category	*I*	*-*	*I*	*-*
Reference piece numbers for parts counting	*10, 20, 50,100, freely selectable*			
Weighing Units	*mg, g, ct,*			*mg, g, ct, lb, oz, ozt, dwt, t {h}, t {S}, t {t}, mom, GN, N, t, freely pro-grammable*
Stabilization time (typically)	*4 sec.*			
Permissible ambient temperature	*+ 15° C .... +30° C*			
Humidity of air:	*max. 80 % (not condensing)*			
Under floor weighing device	*On-hook eyelets, serial*			
Weighing plate mm	*100*	*80*	*100*	
Housing (W x D x H) mm	*205 x 500 x 290*			
Weight kg (net)	*8,9*			

2 Declaration of conformity

KERN & Sohn GmbH
D-72322 Balingen-Frommern
Postfach 4052
E-Mail: info@kern-sohn.de
Tel: 0049-[0]7433- 9933-0
Fax: 0049-[0]7433-9933-149
Internet: www.kern-sohn.de

Konformitätserklärung

Declaration of conformity for apparatus with CE mark
Konformitätserklärung für Geräte mit CE-Zeichen
Déclaration de conformité pour appareils portant la marque CE
Declaración de conformidad para aparatos con marca CE
Dichiarazione di conformitá per apparecchi contrassegnati con la marcatura CE

English We hereby declare that the product to which this declaration refers conforms with the following standards.

Deutsch Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.

Français Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.

Español Manifestamos en la presente que el producto al que se refiere esta declaración est´´a de acuerdo con las normas siguientes

Italiano Dichiariamo con ciò che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.

Electronic Balance: KERN ALT

Mark applied	EU Directive	Standards
CE	89/336EEC EMC	EN 61000-4-2 :1999 EN 61000-4-3 :1996 EN 61000-4-4 : 1999 EN 61000-4-5 : 1998 EN 61000-4-6 : 1999 EN 61000-4-11 : 1997 EN 55022 :2000

Date: 18.01.2005

Signature:

Gottl. KERN & Sohn GmbH
Management

KERN & Sohn GmbH
D-72322 Balingen-Frommern
Postfach 4052
E-Mail: info@kern-sohn.de
Tel: 0049-[0]7433- 9933-0
Fax: 0049-[0]7433-9933-149
Internet: www.kern-sohn.de

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English 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.

Deutsch 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.

Français 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.

Español 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 conformidad de la parte nominal.

Italiano 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.

Model:	**KERN ALT 100-4M** **KERN ALT 220-4M**

EU Directive	**Standards**	**EC-type-approval certificate no.**	**Issued by**
90/384/EEC	EN 45501	T6655	NMI

Date: 18.01.2005 **Signature:**

Gottl. KERN & Sohn GmbH
Management

3 Fundamental information (general)

3.1 Designated use

The balance you have acquired serves to determine the weighing value of the 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. The weighing value can be read off after a stable weighing value has been obtained.

3.2 Inappropriate use

Do not use balance for dynamic add-on weighings, if small amounts of goods to be weighed are removed or added. The “stability compensation“ installed in the balance may result in displaying an incorrect measuring value! (Example: Slowly draining fluids from a container on the balance.)
Do not leave a permanent load on the weighing plate. This can damage the measuring system.

Be sure to avoid impact shock and overloading the balance in excess of the prescribed maximum load rating (max.), minus any possible tare weight that is already present. This could cause damage to the balance.
Never operate the balance in hazardous locations. The series design is not explosion-proof.
Structural alterations may not be made to the balance. This can lead to incorrect weighing results, faults concerning safety regulations as well as to destruction of the balance.
The balance may only be used in compliance with the described guidelines. Varying areas of application/planned use must be approved by KERN in writing.

3.3 Guarantee

The guarantee is not valid in the following cases:

- non-observation of our guidelines in the operating instructions
- use outside the described applications
- alteration to or opening of the device
- mechanical damage and damage caused by media, liquids, natural wear and tear
- inappropriate erection or electric installation
- overloading of the measuring equipment

3.4 Monitoring the test substances

The metrology features of the balance and any possible available adjusting weight must be checked at regular intervals within the scope of quality assurance. For this purpose, the answerable user must define a suitable interval as well as the nature and scope of this check. 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. Test weights and balances can be adjusted quickly and at a reasonable price in KERN's accredited DKD calibration laboratory (return to national normal).

4 Fundamental safety instructions

4.1 Observe notices in the operating manual

Please read the operating instructions carefully before erecting and commissioning, even if you already have experience with KERN balances.

4.2 Training of personnel

The device may only be operated and looked after by trained members of staff.

5 Transport and storage

5.1 Acceptance check

Please check the packaging immediately upon delivery and the device during unpacking for any visible signs of external damage.

5.2 Packing

Please retain all parts of the original packaging in case it should be necessary to return items at any time.
Only the original packaging should be used for return consignments.
Before despatch, disconnect all attached cables and loose/movable parts.
Apply any intended transport security devices. Secure all parts e.g. weighing plate, mains power supply etc. against slipping and damage.

6 Unpacking, installation and commissioning

6.1 Installation Site, Location of Use

The balance is constructed in such a way that reliable weighing results can be achieved under normal application conditions.
By selecting the correct location for your balance, you will be able to work quickly and precisely.

Therefore please observe the following at the place of installation:

- 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. Inadmissible bedewing (condensation of air moisture on the device) can occur if a cold device is taken into a significantly warmer environment. In this case, please acclimatise the device for approx. 2 hours at room temperature after it has been disconnected from the mains.
- Avoid static charging of items to be weighed, or weighing container.

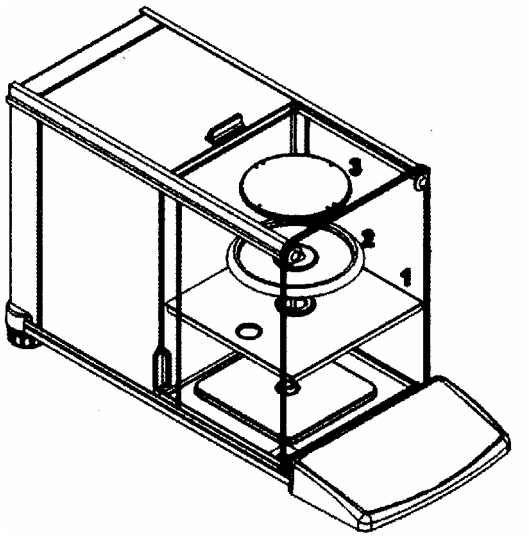
Major display deviations (incorrect weighing results) are possible if electromagnetic fields occur as well as due to static charging, currents and instable power supply. It is then necessary to change the location.

6.2 Unpack

Carefully remove the balance from its packaging, remove the plastic wrapping and position the balance in its intended working location.

6.2.1 Assembly

Structure of the balance:



(1) Base plate

(2) Screen ring

(3) Weighing plate

Use the foot screws to level the balance until the air bubble in the bubble level is in the prescribed circle.

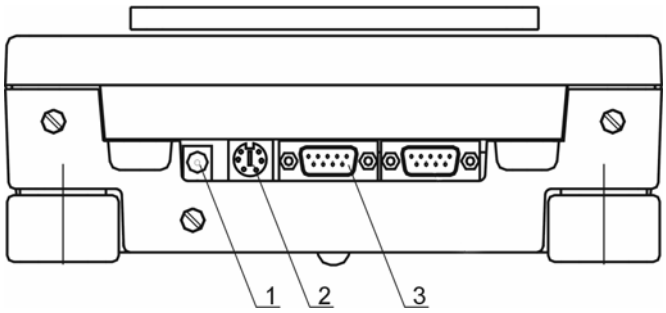
6.2.2 Scope of delivery

Standard accessories:

- Scales
- Weighing plate
- Network appliance
- Instruction manual
- Wind protection

6.3 Mains supply

Electric power supply is by means of the external mains supply circuit. The printed voltage level must comply with the local voltage.
Only use original KERN mains supply circuits. The use of other makes is subject to approval by Kern.



1. Mains supply
2. PS/2 keyboard
3. RS232 interface

6.4 Connection of peripheral equipment

The balance must be disconnected from the mains before connecting or disconnecting additional equipment (printer, PC) to or from the data interface.
Only use KERN accessories and peripheral equipment with your balance. These have been ideally coordinated to your balance.

6.5 Initial Commissioning

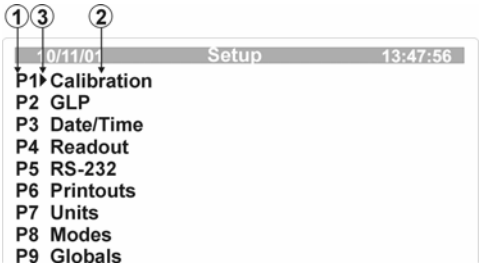
A warm-up time of 1 hour stabilises the measured values after switching on.
The accuracy of the balance depends on the local acceleration of the fall.
Instructions in chapter Adjustment must be observed.

7 User menu

The user menu has nine main menus with the following sub-menus:

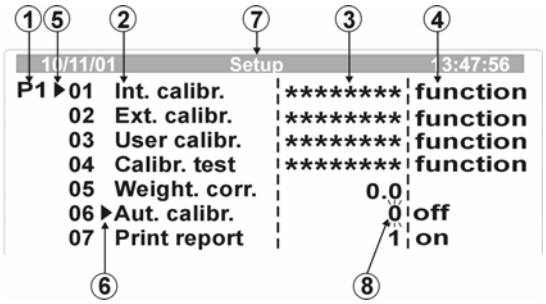
P1 Calibration	P2 GLP	P3 Date/Time	P4 Readout	P5 RS-232	P6 Printouts	P7 Units	P8 Modes	P9 Globals
Int. calibr. **Ext. calibr** **User calibr.** **Calibr. Test:** **Weight.corr.** **Aut. calibr.** **Print report**	**User No.** **Prj. No.** **Time print** **Date print** **UserNo. print** **Prj. No. print** **Id print** **Diff. print**	**Date format** **Time format** **Time** **Date** **Disp. time** **Disp. date**	**Filter** **Filter range** **Disp refresh** **Stable range** **Stable speed** **Autozero** **Last digit**	**Boud rate** **Parity** **Data bits** **Stop bits** **Handshake** **Auto print** **Interval** **Print on stab**	**Printout No.** **Pr. 1 start** **Pr. 1 stop** **Pr. 2 start** **Pr. 2 stop** **Pr. 3 start** **Pr. 3 stop** **Pr. 4 start** **Pr. 4 stop** **String 1** **String 2** **String 3** . . . **String 78** **String 79** **String 80**	**Grams** Miligrams Kilograms Pounds Ounces, Ounces troy Carats Dwt Taels. Hk Taels. S Taels. T Mommes Granis Newtons Tical Custom Custom Factor	**Parts Count** **Checkweigh ing** **Filling** **Percont** **Animal** **Formulation** **Statistics** **Density**	**Beep** **Language** **Backlight** **Contrast** **Screensaver** **Temperature** **Balance Id** **Software rev.** **Par. Printout** **Par. Receive.** **Factory deff.**

Main Menu



1. Menu number (P1 – P9)
2. Menu designation
3. Cursor (►) indicates the current menu item

Submenu:



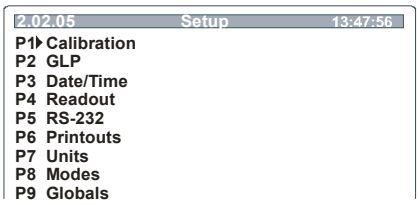
1. Menu number (P1 – P9)
2. Parameter number and designation
3. Parameter value or ****** i.e. this parameter is available as a function
4. Functional Description
5. Cursor (►) indicates the current menu item (e.g. P1).
6. Cursor (►) indicates the current parameter (e.g. 06).
7. ”Setup“i.e. the user is in Setup Mode.
8. Use the arrow key to modify the parameter value, the active parameter blinks.

7.1 User principle of the menu control

In the menu the settings of the balance can be modified and functions can be activated.
This way, the balance can be adjusted to individual weighing requirements. To do so proceed as follows:

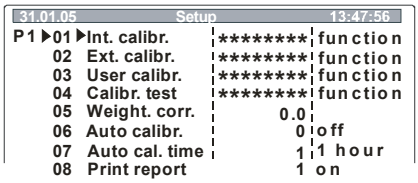
⇨ Use the ON/OFF-key to turn on the balance.

⇨ After actuating the F -key the display shows the main menus that can be set

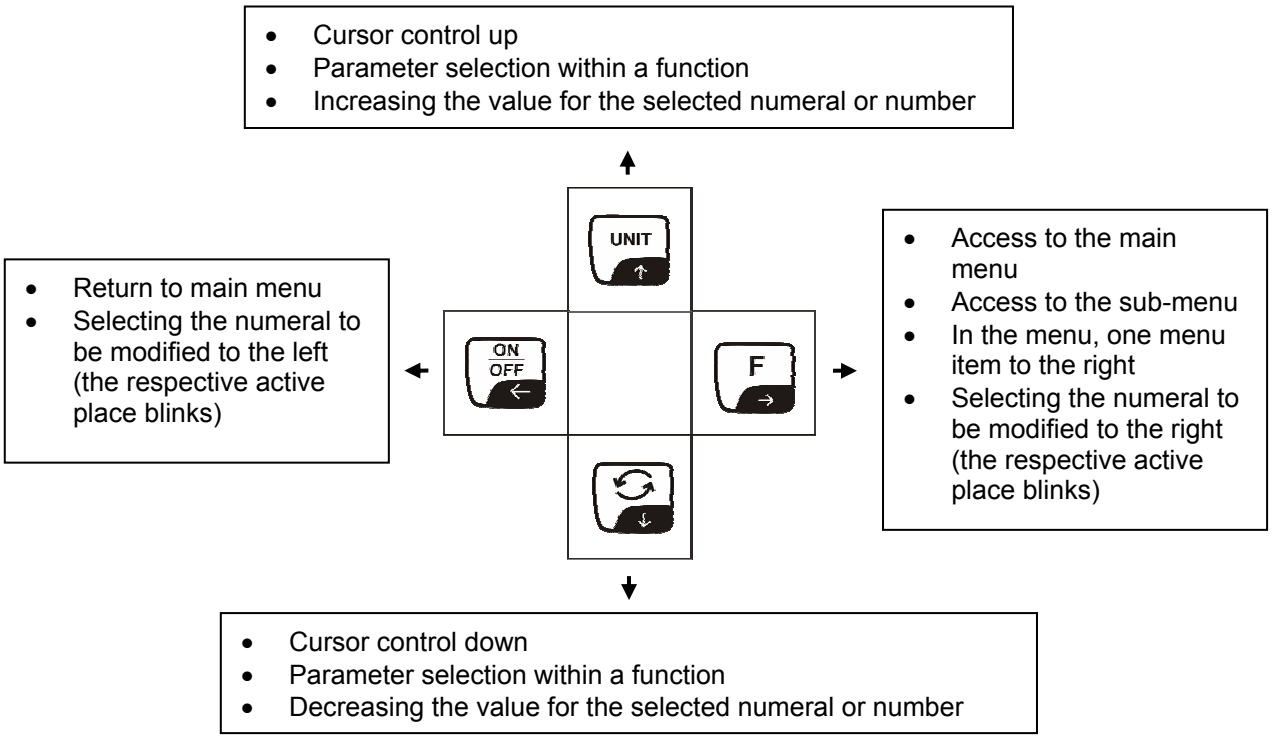


⇨ Select your setting using the cursor (►).
Use the -key to move the cursor (►) down, the UNIT -key to move it up

⇨ The F -key confirms your selected setting, the display shows the sub-menu or the active menu item blinks:



⇨ Use the arrow keys to move within and enter into the menu:



⇨ Use the PRINT SET -key to confirm or the TARE →0← ESC -key to cancel

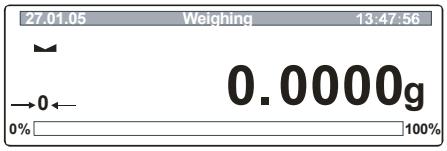
⇨ Use the TARE →0← ESC -key to return to the menu

⇨ Actuate TARE →0← ESC -key again, a message will inquire whether you want to save the changes you made.

⇨ Actuating the PRINT SET -key will save the selected setting.

⇨ If you do not want to save the selected setting press TARE →0← ESC

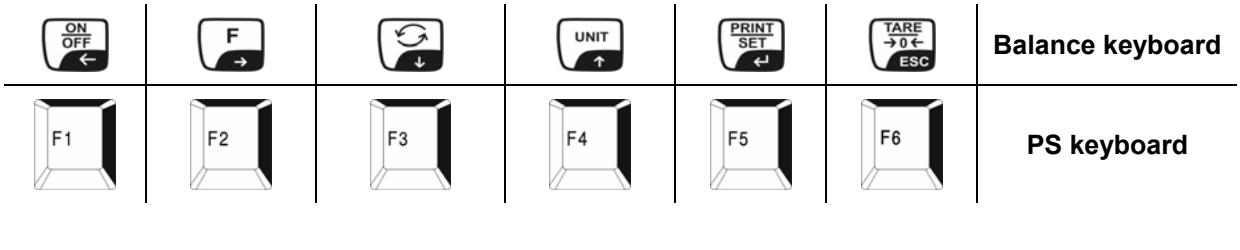
⇨ The balance will automatically return to weighing mode

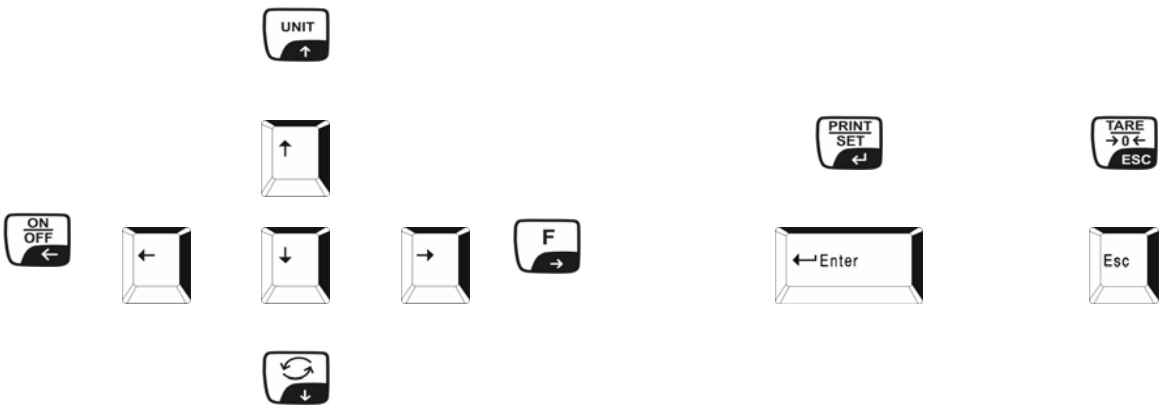


7.2 Operating the balance with PS/2 keyboard (see chapter 6.3)

Using a PS/2 keyboard will help you to enter numbers and texts faster and easier.

Key allocation:





7.3 Menu selection

7.3.1 P1 Calibration (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. It is also recommendable to adjust the balance periodically during weighing operation in order to obtain exact measured values.

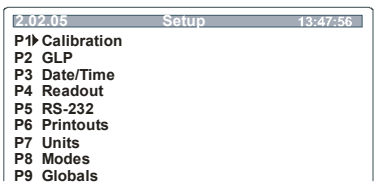
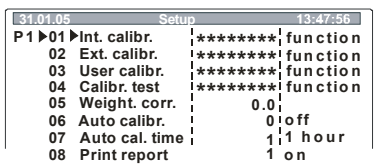
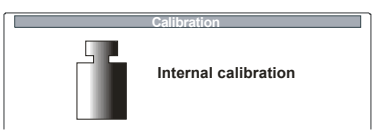
Using the inbuilt adjusting weight the balance automatically carries out an adjustment after any temperature change of 0.8 °C or any time it was disconnected from the power supply.
Of course it is also possible to check the accuracy of the balance manually any time. You can choose between two options:

1. Adjustment is started by pressing the F -key three times.
   After successful adjustment the balance automatically returns to weighing mode.
2. Under menu item "**P1 01 Calibration with internal weight**" (see table below)

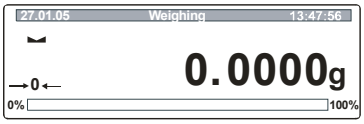
Procedure for adjustment:

Observe stable environment conditions. A warming-up time of ca. 1 hour for stabilisation is necessary.

Important!
During the adjustment process no objects should be on the weighing plate.

Operator	Indication
⇨ Call up menu item **"P1 Calibration "** (see chapter 7.1) ⇨ Press F -key	
01 Int. calibr. - Adjustment with internal weight	
⇨ Use the cursor (►) to select "**01 Int. calibr. "**	
⇨ Press the F -key; the adjustment with internal weight is carried out.	

⇨ After successful adjustment the balance automatically returns to weighing mode.
In case of an adjustment error (e.g. objects on the weighing plate) the display will show an error message, repeat adjustment.



02 Ext. Cal - Adjustment with an external weight
Locked for verifiable appliances

03 User cal. – locked for verifiable appliances

04 Cal. test – not documented

05 Weight corr. – locked for verifiable appliances

06 Autom. cal. – locked for verifiable appliances

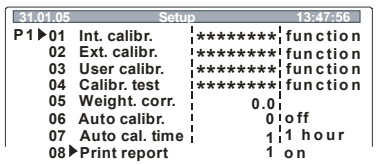
07 Auto. Cal.time – locked for verifiable appliances

08 Print report – printout of the adjustment data

⇨ Use the cursor (►) to select **"08 "print report"**

⇨ Press the F –key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to save your settings

0 **Print report** deactivated
1 **Print report** activated



⇨ Confirm with PRINT SET -key

⇨ When **print report** is activated you will receive a printout of your adjustment data after each adjustment (Ex.):

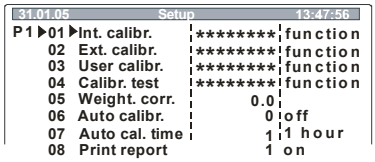
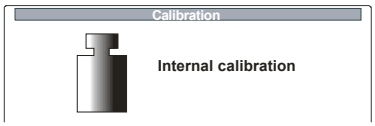
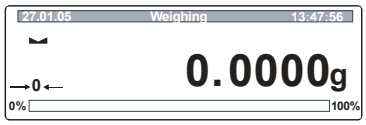
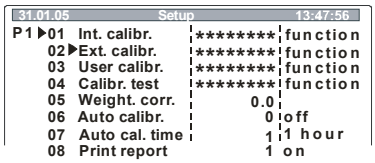
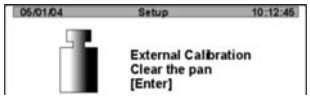
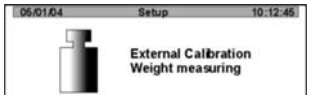
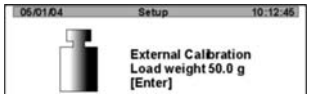
***** Internal calibration report *****

Calibr. : internal

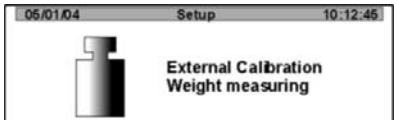
Diff.. : 0.0038 g

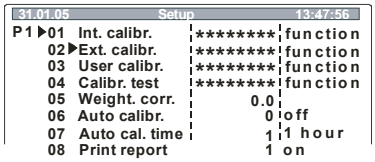
Signature…….

7.3.1.1 Calibration (adjustment) only for model KERN ALT 310

Operator	indication
⇨ Call up menu item **"P1 Calibration"** (see chapter 7.1) ⇨ Press F -key	
01 Int. cal. - Adjustment with internal weight	
⇨ Use the cursor (►) to select **"01 Int. cal."**	
⇨ Press the F key; the adjustment with internal weight is carried out.	
⇨ After successful adjustment the balance automatically returns to weighing mode. In case of an adjustment error (e.g. objects on the weighing plate) the display will show an error message, repeat adjustment.	
02 Ext. Cal - Adjustment with an external weight	
⇨ Use the cursor (►) to select "**02 Ext. cal."**	
⇨ Press F -key Ensure that there are no objects on the weighing plate.	
⇨ Press PRINT SET -key; the display shows the measuring value of the adjusting weight.	 

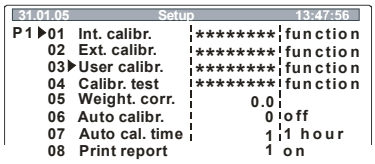
⇨ Now place the adjusting weight in the center of the weighing plate, press the PRINT SET -key. After successful adjustment the system will automatically return to the menu.
The TARE ESC-key can be used to cancel the adjustment.
In case of an adjustment error or incorrect adjusting weight an error message is displayed. Repeat adjustment.



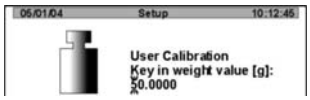


03 User calibr. – user-defined adjusting weight

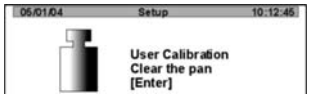
⇨ Use the cursor (►) to select "**03 User. cal.**"



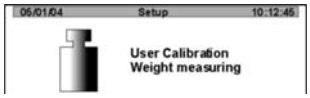
⇨ Press F -key; the display shows the measuring value of the adjusting weight. The first numeral of the displayed value blinks. You can modify it using the arrow keys.
After setting your new adjusting weight use the PRINT SET -key to confirm.

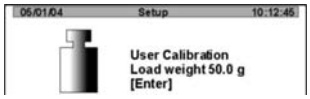


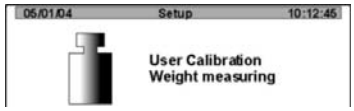
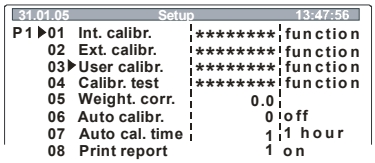
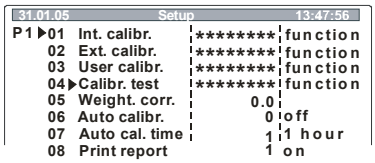
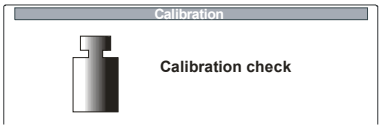
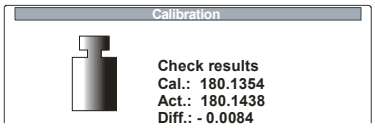
⇨ Ensure that there are no objects on the weighing plate. Press PRINT SET -key



⇨ Press the PRINT SET key; the display shows the measuring value you selected for the adjusting weight





⇨ Now place the adjusting weight in the center of the weighing plate, press the PRINT/SET -key. After successful adjustment the system will automatically return to the menu. The TARE/ESC -key can be used to cancel the adjustment. In case of an adjustment error or incorrect adjusting weight an error message is displayed. Repeat adjustment.	 
We recommend: Carry out adjustment as close to the maximum load of the balance as possible. Information concerning the test weights is available at: http://www.kern-sohn.com	
04 Calibration test Here, deviation from the last adjustment is determined. This is only a check, i.e. no values are changed.	
⇨ Use the cursor (▶) to select **"04 Cal. test"**	
⇨ Press the F -key, the calibration test is started	
⇨ The result is displayed	
05 Weight corr. – not documented	

06 Automatic calibration

⇨ Use the cursor (►) to select "**06 Autom. cal.**"

⇨ Press the F -key; the current menu item blinks.

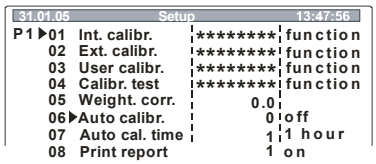
⇨ Use the - or UNIT - key to choose between the following settings:

0 no **Autom. calibration locked**

1 Temp. **Autom. Calibration for a Temperature change of 0.8 °C**

2 Time **Autom. Calibration after a user-defined interval**

3 both **Autom. Calibration for a Temperature change of 0.8 °C or after the defined interval**



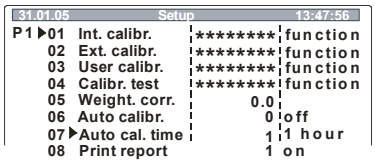
⇨ Confirm with PRINT SET -key

07 Auto cal. time - Automatic calibration after a user-defined interval

⇨ Use the cursor (►) to select "**07 Auto.cal.time**"

⇨ Press the F -key; the current menu item blinks.

⇨ Use the arrow keys to enter a value between 1 and 12 hours.



⇨ Confirm with PRINT SET -key

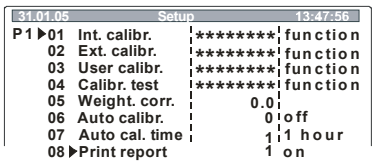
08 Print report

In this menu item you can activate the function for printing your calibrating data

⇨ Use the cursor (►) to select **"08 "print report"**

⇨ Press the F key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to save your settings

0 **Print report** deactivated
1 **Print report** activated



⇨ Confirm with PRINT SET -key

⇨ When **print report** is activated you will receive a printout of your adjustment data after each adjustment (Ex.):

***** Internal calibration report*****
Calibr. : internal

diff.. : 0,0038 g

Name…….

***** External calibration report *****

Calibr. : external

diff.. : -0,0624 g

Name …….

***** User calibration report*****

Calibr. : User calibration

diff.. : -0,0003 g

Name …….

7.3.1.2 Verification

General:

According to the EU guideline 90/384/EEC balances must be verified officially if they are to be used as follows (legally regulated 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 the production of finished packages

In case of doubt, please contact your local office of weights and measures.

Verification information

An EU qualification approval is available for those balances marked as appropriate for verification in the technical data. In the event that the balance is applied in an area subject to verification as described above, it must be officially verified and re-verified at regular intervals.

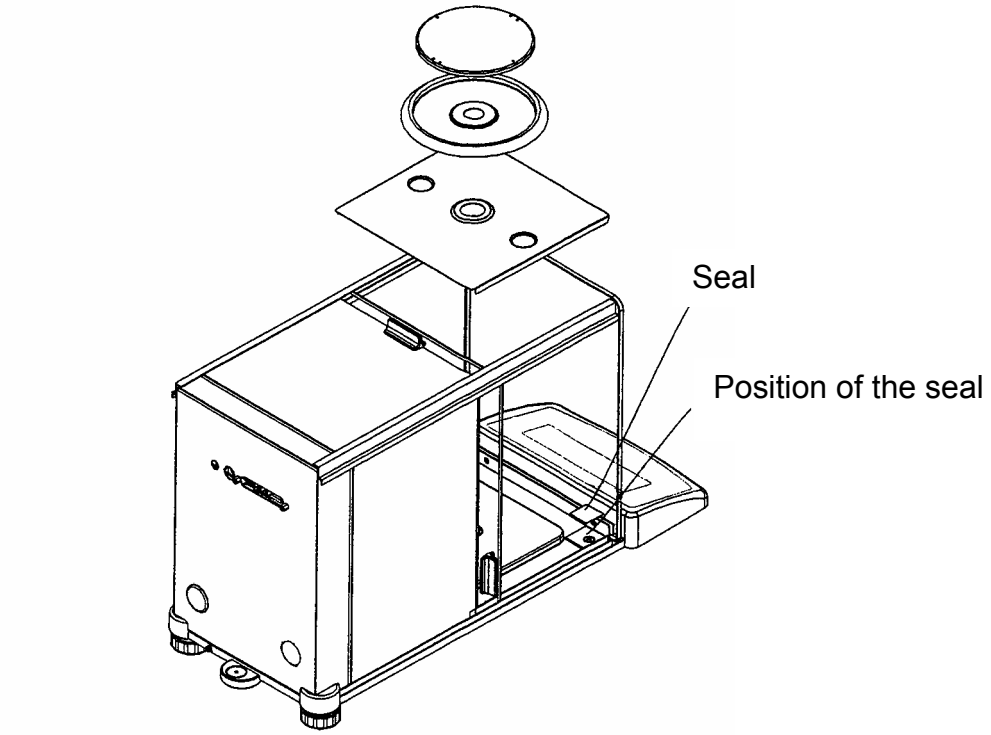
Re-verification of a balance is carried out in compliance with the respective legal provisions of the states. The term of verification validity for balances in Germany, for example, is normally 2 years.

The legal provisions of the country of use are to be observed.

After verification the balance is sealed at the marked positions.

Verification of the balance is invalid without the seal.

Position of the seal:

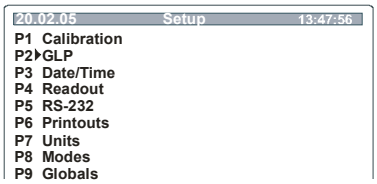
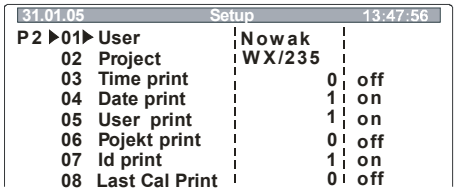
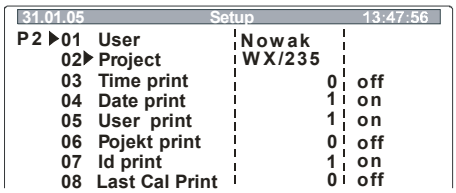


Balances with obligatory verification must be taken out of service if:

- **The weighing result of the balance is outside the maximum limits of operating errors.** Therefore load balance is regular intervals with known test weight (ca. 1/3 of the max. load) and compare with displayed value.
- **The date for subsequent or periodical verification has passed.**

7.3.2 P2 GLP (Good laboratory practice)

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.
Definition of a standard log:

Operator	Indication
⇨ Call up menu item **"P2 GLP"** (see chapter 7.1) ⇨ Press F -key	
01 User	
⇨ Use the cursor (►) to select **"01 User "** ⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7) to enter user name or number (max. 8 characters).	
⇨ Confirm with PRINT/SET -key	
02 Project	
⇨ Use the cursor (►) to select **"02 Project "** ⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7) to enter project name or number (max. 8 characters	
⇨ Confirm with PRINT/SET -key	
All other settings (03 – 08) are carried out in the same way.	

All settings that should be printed must be activated with “on“.

Example 1:

Settings					**Print**
P2	**03**	**Printout time**	1	yes	**Date : 18.01.05**
P2	**04**	**Printout date**	1	yes	**Time : 10:41:05**
P2	**05**	**User printout**	1	yes	**User : Miller**
P2	**06**	**Project printout**	1	yes	**Project: : AB/007**
P2	**07**	**ID printout**	1	yes	**Balance no. : WL 041078**
P2	**08**	**Last cal. print**	1	yes	**----------**
					18.01.05 07:48
					Automatic calibration
					Deviation.: 0.003[5] g

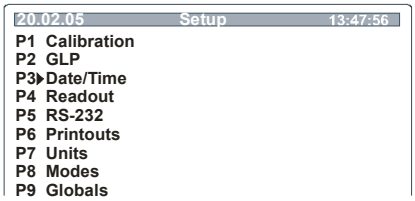
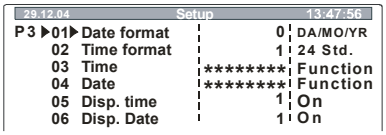
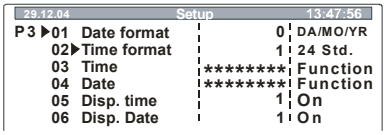
					10.429[0] g

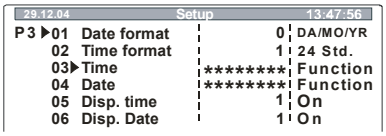
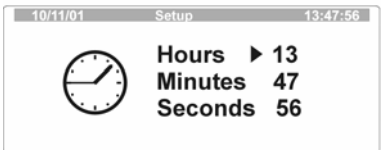
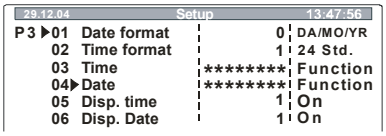
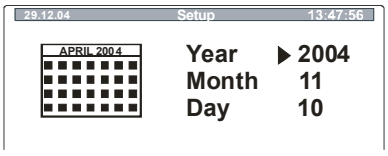
Example 2:

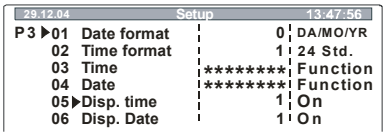
Settings					**Print**
P2	**03**	**Printout time**	0	no	**Date: 22/10/2004**
P2	**04**	**Printout date**	1	yes	**User: Miller**
P2	**05**	**User printout**	1	yes	**Balance no.: 10**
P2	**06**	**Project printout**	0	no	**----------**
P2	**07**	**ID printout**	1	yes	**13.0521 g**
P2	**08**	**Last cal. print**	0	no	

7.3.3 P3 Date/time

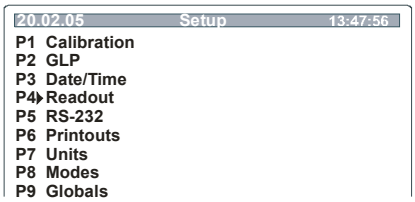
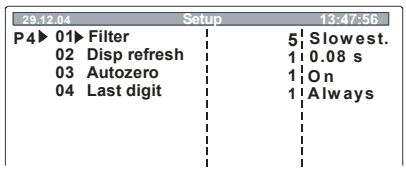
In this menu item you can call up output and formatting of set date and time.

Operator	indication
⇨ Menu item **"P3 Date/time"** (see chapter 7.1) ⇨ Press F -key	
01 Date format	
⇨ Use the cursor (►) to select **"01 Date format"** ⇨ Press the F -key; the current menu item blinks. ⇨ Use the -key to choose between the following settings: **1** **M**onth/**D**ay/**Y**ear **0** **D**ay/**M**onth/**Y**ear	
⇨ Confirm with PRINT SET -key	
02 Time format	
⇨ Use the cursor (►) to select **"02 Time format"** ⇨ Press the F -key; the current menu item blinks. ⇨ Use the -key to choose between the following settings: **0** 24 hours **1** 12 hours (PM/AM)	
⇨ Confirm with PRINT SET -key	

03 Time	
⇨ Use the cursor (►) to select **"03 Time"**	
⇨ Press F -key ⇨ Get to your selection with ↻ - or UNIT - key	
⇨ Use the F -key to confirm your selection (e.g. hours), the current menu item blinks.	
⇨ Use the UNIT -key to increase the value, the ↻ -key to decrease. ⇨ Use the ON/OFF - and F -keys to select the place to be changed (the respective active place blinks).	
⇨ Use the PRINT/SET -key to confirm your selection (e.g. hours). ⇨ To change minutes and seconds proceed in the same way.	
⇨ Confirm with PRINT/SET -key	
04 Date	
⇨ Use the cursor (►) to select **"04 Date"**	
⇨ Press F -key	
⇨ All other settings are the same as for entering time (03 Time).	

05/06 Disp. time/date	
⇨ Use the cursor (►) to select e.g. **"05 Disp. time"** ⇨ Press the F -key; the current menu item blinks. ⇨ Use the -key to choose between the following settings: **0** Display of time/date deactivated **1** Display of time/date activated	
⇨ Confirm with PRINT SET -key	

7.3.4 P4 Readout

Operator	**indication**
⇨ Call up menu item **"P4 Readout"** (see chapter 7.1) ⇨ Press F -key	
01 Filter	
⇨ Use the curser (►) to select **"01 Filter"** ⇨ Press the F -key; the current menu item blinks. ⇨ With the - and UNIT - key you can select between the following adjustments: 1 Very quiet and stable environment: Balance works very fast but is more sensitive to external influences ↓ ↓ 5 Busy environment: Balance works more slowly but is less sensitive to outside influences	
⇨ Confirm with PRINT SET -key	

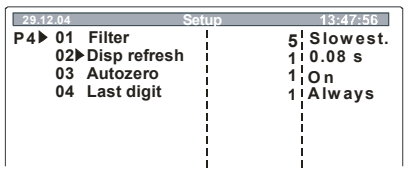
02 Disp. refresh

⇨ Use the cursor (►) to select **"02 Disp. refresh"**

⇨ Press the F -key; the current menu item blinks.

⇨ With the - and UNIT - key you can select between the following adjustments:

1 0.1 s
↓ ↓
5 0.5 s



⇨ Confirm with PRINT SET -key

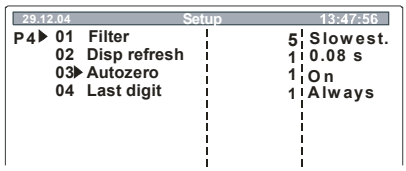
03 Autozero

⇨ Use the cursor (►) to select **"03 Autozero"**

⇨ Press the F -key; the current menu item blinks.

⇨ With the - and UNIT -key you can select between the following adjustments:

0 Deviations from the Zero display are **not** automatically tared.
1 Deviations from the Zero display are automatically tared.



⇨ Confirm with PRINT SET -key

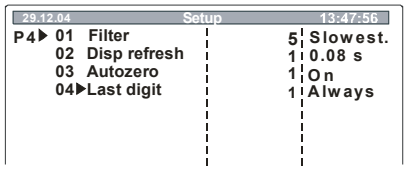
04 Last digit

⇨ Use the cursor (►) to select **"04 Last digit"**

⇨ Press the F -key; the current menu item blinks.

⇨ With the - and UNIT - key you can select between the following adjustments:

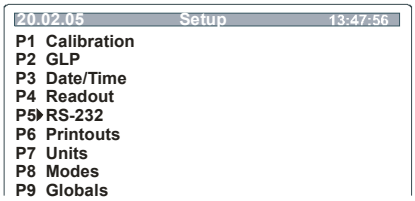
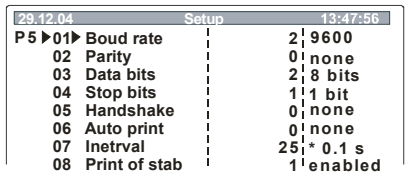
0 4 fractional digits.
1 All fractional digits



⇨ Save with PRINT SET -key

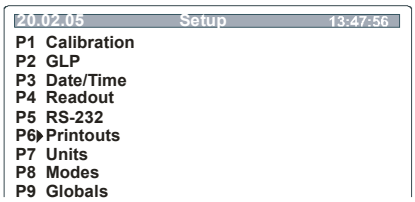
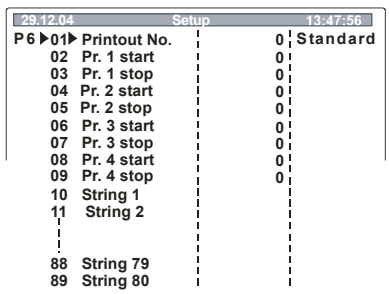
7.3.5 P5 RS-232

In this menu item you can save your settings for the interface.

Operator	indication
⇨ Call up menu item **"P5 RS-232"** (see chapter 7.1) ⇨ Press F -key	
01 – 10 Parameter selection	
⇨ Use the cursor (►) to select your setting **(01 – 10)** ⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to save your settings	
⇨ Confirm with PRINT SET -key	

7.3.6 P6 Printouts

In this menu item you can select between 5 different types of data output:

Operator	indication
⇨ Call up menu item **"P6 Printouts"** (see chapter 7.1) ⇨ Press F -key	
01 Printout No.	
⇨ Use the cursor (►) to select your setting **"01 Printout No."** ⇨ Press the F -key; the current menu item blinks. ⇨ With the ↻ - and UNIT - key you can select between the following adjustments: **0 standard** **1 printout 1** ↓ ↓ **4 printout 4**	
⇨ Use the PRINT SET -key to confirm your selection	

7.3.6.1 Standard-data output (0 standard)

Data output is carried out by actuating the PRINT -key.
Definition of the log header is executed in menu item "**P2 GLP**".
Example

Date:	22/10/2004
Time	13.04.23
User:	Mustermann
Project:	XW/456
	0.008 g

Date:	22/10/2004
Time	13.16.49
User:	Mustermann
Project:	XW/456
Balance:	10
?	62.685 g *

*: ? = instable measuring value

7.3.6.2 User-defined data output (1 printout 1 ↔ 4 printout 4)

Here you can define 4 different kinds of data output (printout 1 – 4).

⇨ The content of the data output is defined as follows.

First line **printout 1 start -.1**, i.e. text begins at line 1 (string 1)

Last line **printout 1 stop - 20**, i.e. text ends at line 20 (string 20)

⇨ Text input per line is carried out via the arrow keys (see chapter 7.1) in the respective strings.

string 1 Start of text input
string 20 End of text input

During text input lines may overlap, e.g.:

printout 1 start – 1
printout 1 stop – 40
printout 2 start – 20
printout 2 stop – 40

Text input:
- Max. 640 characters
- 80 lines
- 8 characters per line

⇨ After each line confirm your text input using the PRINT -key.

⇨ After complete text input press the TARE ESC -key; this is followed by an inquiry whether you want to save your setting.
⇨ Use the PRINT -key to confirm (see chapter 7.1).

Apart from flow text (characters, numbers and numerals) the following variables are stored in the menu:

General variables	
%%	Printout of 1 character “%”(i.e. in order to print out 1 character % two %% have to be entered)
%N	Net weight
%d	Current date
%t	Current time
%i	Balance ID-no.
%R	Program no.
%P	Project no.
%U	User no.
%F	Current function (operating mode)
%C	Date and time of last adjustment
%K	Type of last adjustment
%I	Deviation from last adjustment

Print related variables	
****	Printout of 1 character “ / ”(i.e. in order to print out 1 character / two // have to be entered)
c	CRLF (carriage return line feed) Beginning of line next line
r	CR (carriage return) beginning of line
n	LF (line feed) next line
t	Tabulator
s	Next “string”
0	End of data input

Variables in the various operating modes		
Variable	Description	Mode of operation
%W	Reference quantity	Parts counting
%V	Measuring value in number parts or in % (percent determination)	
%H	Lower limit	Weighing with tolerance range
%L	Upper limit	
%Z	Rated value	Dosing
%B	Reference mass	Percent determination
%A	Sensibility	Dynamic weighing (Animal weighing)
%b	Median Value	
%I	Method	Density determination
%p	Liquid	
%c	Temperature	
%a	Density liquid	
%v	Sinker	

Variable for statistics	
%n	Number weighings
%x	Median Value
%S	Sum of all measuring values
%m	Min value
%M	Max value
%D	Difference min and max value
%s	Standard Deviation
%r	Variance

Variables are entered either directly via arrow keys or more comfortably in menu item **P6 “10 Pr. Edit“**.

Examples for text input:

Example 1: *Max mass can not exceed 11.250 g!*

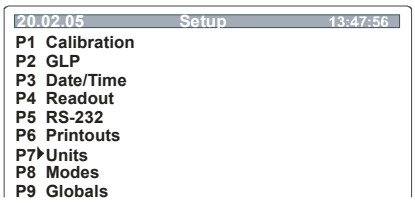
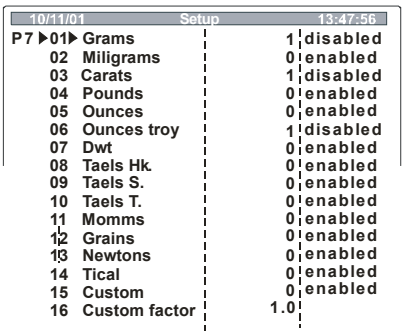
Parameter No.	*Text*							
	1	2	3	4	5	6	7	8
20 string 10	***M***	***a***	***x***		***m***	***a***	***s***	***s***
21 string 11		***c***	***a***	***n***		***n***	***o***	***t***
22 string 12		***e***	***x***	***c***	***e***	***e***	***d***	
23 string 13	***1***	***1***	***.***	***2***	***5***	***0***		***g***
24 string 14		***!***						
25 string 15								

Example 2: *Kern & Sohn GmbH*
Datum:
Zeit:
Gewicht:
******Unterschrift:…….*
**** Wägen mit Toleranzbereich****

Parameter Nr.	*Text*							
	1	2	3	4	5	6	7	8
26 string 16	***K***	***e***	***r***	***n***		***&***		***S***
27 string 17	***o***	***h***	***n***		***G***	***m***	***b***	***H***
28 string 18	\	***c***	***D***	***a***	***t***	***u***	***m***	***:***
29 string 19	***%***	***d***	\	***c***	***Z***	***e***	***i***	***t***
30 string 20	***:***	***%***	***t***	\	***r***	\	***n***	***G***
31 string 21	***e***	***w***	***i***	***c***	***h***	***t***	***:***	***%***
32 string 22	***N***	\	***c***	\	***c***	*	*	*
33 string 23	*	*	***U***	***n***	***t***	***e***	***r***	***s***
34 string 24	***c***	***h***	***r***	***i***	***f***	***t***	***:***	***.***
35 string 25	***.***	***.***	***.***	***.***	***.***		***.***	***.***
36 string 26	***.***	***.***	\	***c***	*	*	***%***	***F***
37 string 27	*	*	*	*				

7.3.7 P7 Weighing units

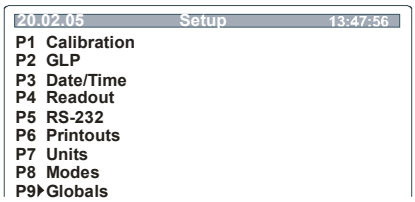
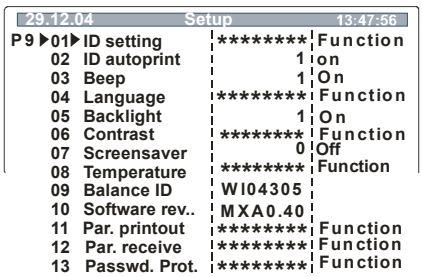
In this menu item you can activate various different weighing units (see chapter 1 “Technical data“).
Switch into activated units by pressing the UNIT - key several times.

Operator	indication
⇨ Call up menu item **“P7 Units“** (see chapter 7.1) ⇨ Press F -key	
01 – 16 Parameter selection	
⇨ Use the cursor (►) to select your setting **(01 – 16)** ⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to save your settings **0** Weighing unit deactivated **1** Weighing unit activated	
⇨ Use the PRINT SET -key to confirm your selection ⇨ Save (see chapter 7.1)	

7.3.8 P8 operating modes

See chapter 8.1

7.3.9 P9 General functions

Operator	indication
⇨ Call up menu item **"P9 Globals"** (see chapter 7.1) ⇨ Press F -key	
01 – 13 Parameter selection	
⇨ Use the - and UNIT -key to select parameter **"01 - 13"**	

01 ID setting	Entering a user code
02 ID Autoprint	User code can also be printed
03 Beep	Tone on/off
04 Language	User guidance selectable in German, English and Spanish
05 Backlight	Back lighting of the display on/off
06 Contrast	Contrast of the display
07 Screensaver	Back lighting automatically switches off as soon as a stable measuring value is reached (Condition: Backlight on)
08 Temperature	Temperature display
09 Balance ID	Balance identification no.
10 Software rev	Software issue
11 Par. Printout	Balance parameters are printed out
12 Par receive	not proved by documents
13 Password protection	Password protection

⇨ Press the F -key; the current menu item blinks.

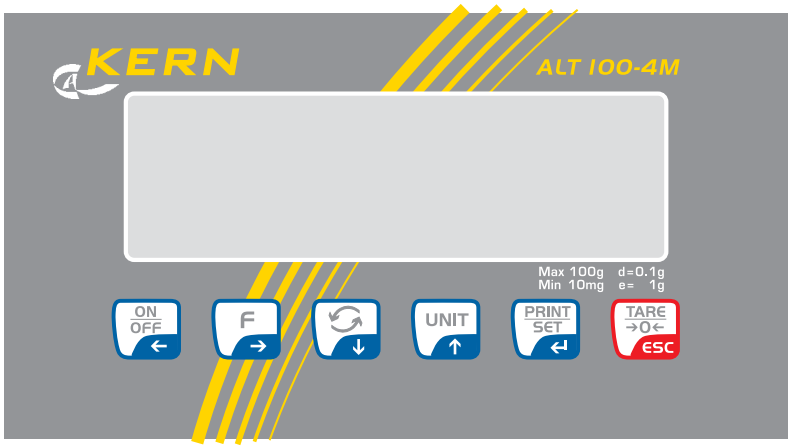
⇨ Activate / deactivate parameter with - and UNIT -key

⇨ Confirm your selection with PRINT SET -key

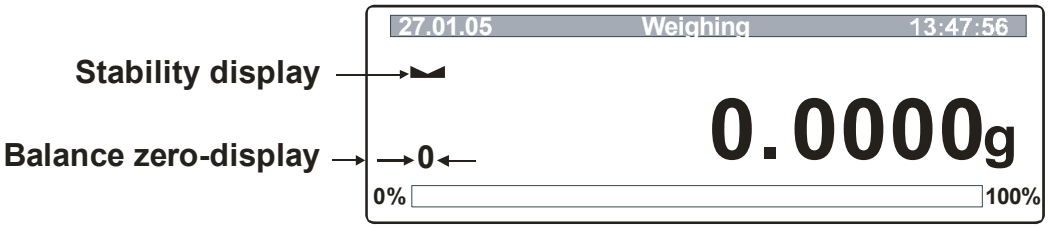
8 Operation

Operating elements

- **Display:**



- **Overview of display:**



Balance zero-display:
If the balance does not show exactly zero although the pan scale is unloaded, press the TARE/ESC-key and the balance will be reset to zero.
(Display [→0←]).

Stability display:
If the display shows the stability display **[** ◺◿ **]** the balance is in a stable status.
When status is instable the **[** ◺◿ **]** –display disappears.

Graphic display:

1. Weight display
2. Balance zero-display
3. Stability display
4. Capacity display
5. Mode of operation
6. Current date
7. Current time

- **Overview of the keypad:**

Key	Function
	• Turn on/off • Menu point to the left
	• Access to user menu • Menu point to the right
	• Option key into operating modes • Decreasing the value for the selected numeral or number • Parameter selection (cursor control downwards)
	• Switching between weighing units • Parameter selection (cursor control upwards) • Increasing the value for the selected numeral or number
	• Printout of the weighed value on an external appliance (printer or PC) • Confirm/save settings
	• Tare • Quit menu • Set weight display at zero

8.1 Operating modes (P8 modes)

In this menu item you can activate/deactivate the following operating modes:

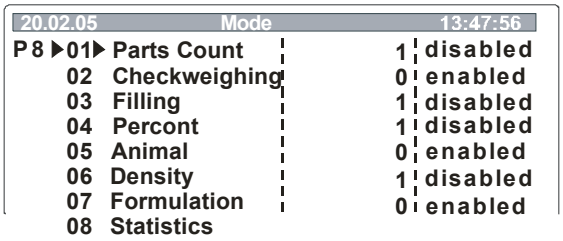
P8 01: Parts Counting
P8 02: Check weighing
P8 03: Filling
P8 04: Percent weighing
P8 05: Animal weighing
P8 06: Density
P8 07: Formulation
P8 08: Statistics

Notice: Some operating modes can be combined (e.g. statistics/parts counting, statistics/percent determination). Further details are described in the respective chapters.

Activate/deactivate operating modes:

⇨ In the main menu, call up menu item P8 "Operating mode“ (see chapter 7.1)

⇨ Press F -key, the overview of the operating modes appears:

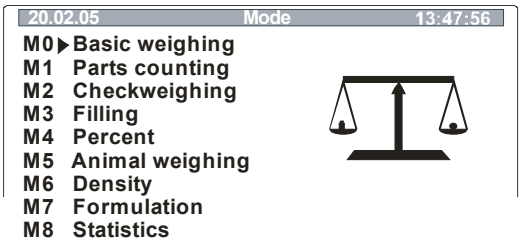


⇨ Use the arrow keys (see chapter 7.1) to activate (1) or deactivate (0) the desired operating modes.

⇨ Confirm your setting with the PRINT SET -key.

⇨ Save (see chapter 7.1)

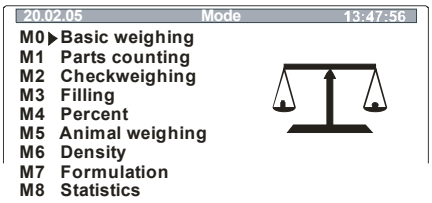
All activated operating modes are now stored in a submenu (M0 – M8) and can be called up directly via the -key:



Moving in the operating mode:

⇨ Press the -key

⇨ Use the cursor (►) to select your operating mode



⇨ Press the -key; the parameter selection appears

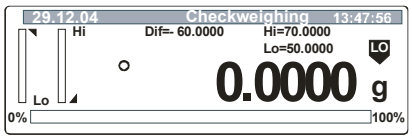
⇨ Use the cursor (►) to select parameter

⇨ Press the -key; the current menu item blinks

⇨ Use the arrow keys (see chapter 7.1) to save your settings. All settings possible are described in the chapters of the respective operating mode

⇨ Confirm your setting with the -key

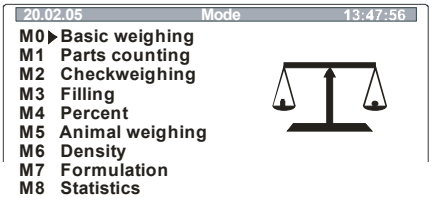
⇨ Press -key again, the graphic display of the respective operating mode appears. You are now in the operating mode.



Return to weighing mode:

⇨ Press -key

⇨ Cursor (►) to **M0 Basic weighing**



⇨ Press the or the -key

8.1.1 Simple weighing

Operation:	Display:
⇨ Use the ON/OFF-key to turn on the balance. **or** ⇨ Use the →0←-key to call up menu item "**M0 Basic weighing**" (chapter 8.1)	
⇨ As soon as the weight display shows „**0.000"** your balance is ready for weighing	**0,0000**
⇨ Put on items to be weighed; after stability time the measuring value is displayed.	**19.6879 g**
⇨ Pressing the UNIT -key you can switch to another weighing unit, e.g. ct (see Chapter 7.4.6 "P7 Weighing units")	**98.4380 ct**
⇨ To turn off the balance press the ON/OFF-key	

8.1.1.1 Tare

The dead weight of any type of weighing container can be tared out by pressing a button, so that subsequent weighing procedures show the net weight of the items to be weighed.

Operation:	Display:
⇨ Use the ON/OFF-key to turn on the balance.	
⇨ As soon as the weight display shows „**0.0000"** your balance is ready for weighing	**0.0000 g**
⇨ Place items to be weighed on balance, the weighed value is displayed.	**19.6879 g**
⇨ Press the TARE-key to start the taring process. The weight of the container is now saved internally.	**0.0000 g**
⇨ Place the item to be weighed into the tare container. Now read the weight of the items to be weighed on the display.	**53.2587 g**

The taring process can be repeated any number of times, e.g. for several components for a mixture (add-on weighing).
The limit is reached when the whole weighing range is exhausted.
After removing the tare container the overall weight is displayed in the negative.

8.1.1.2 Under floor weighing

Using under floor weighing allows weighing of objects that because of their size of shape cannot be placed on the pan scale.
Proceed as follows:

- Turn off balance.
- Open the closing lid at the bottom of the balance.
- **Carefully and completely** hook in the hook for under floor weighing.
- Place balance over an opening.
- Suspend the item to be weighed from the hook and carry out weighing.

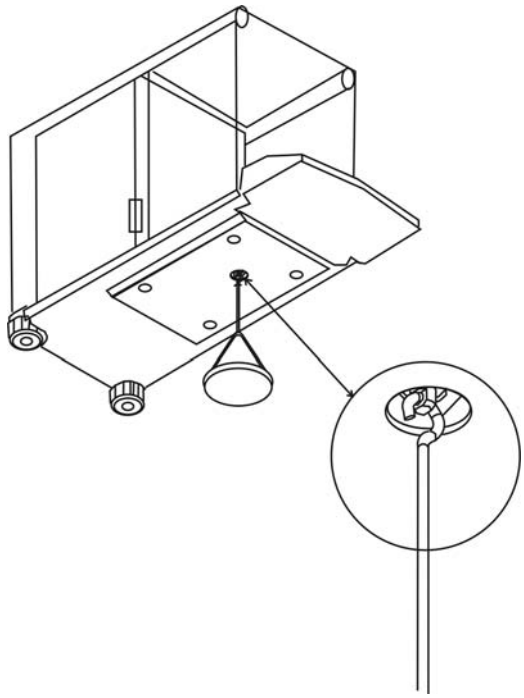


Fig. 1: Setting up balance for under floor weighing

CAUTION

- **Ensure that all suspended objects are stable enough to hold the desired items to be weighed securely (danger of breaking).**
- **Never suspend loads that exceed the stated maximum load (Max) (danger of breaking)**

Always ensure that underneath the load there are no living beings or objects that might be damaged.

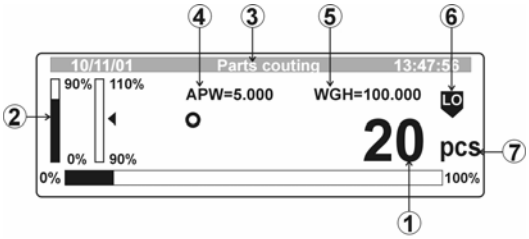
NOTE

When the under floor weighing the opening in the bottom of the balance must be closed (protection against dust).

8.1.2 Parts counting

Before the balance can count parts, it must know the average part weight (i.e. reference). This is either entered manually or determined by weighing. 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 accuracy.

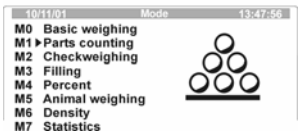
Display overview for parts counting operation:

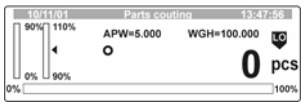
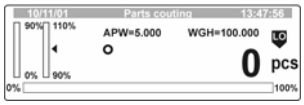
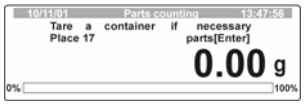
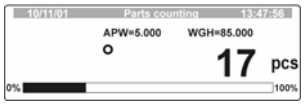
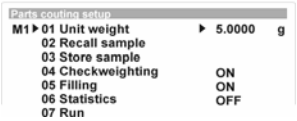
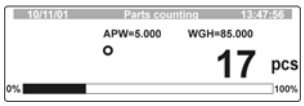


1. Number of all parts on the weighing plate
2. Weighing-in aid coarse/fine (only displayed for active dispensing)
3. Operating mode (status bar)
4. Reference weight
5. Weight of all parts on the weighing plate
6. Tolerance marker (only displayed for active tolerance weighing)

LO	too light
OK	rated value
HI	too heavy

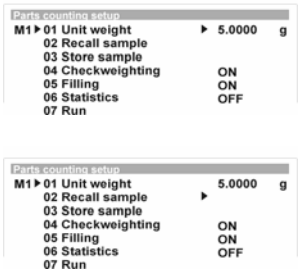
7. Display for parts counting operation

Operator	Indication
⇨ Call up operating mode **"M1 Parts counting"** (see chapter 8.1) ⇨ Press F -key	
⇨ Use the cursor (►) to select your setting **(01 – 07)**	
01 Unit weight – manual input of reference weight	
⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to enter the reference weight for a unit. Confirm with PRINT SET -key	

⇨ Press PRINT/SET -key; the display changes into parts counting operation	
⇨ The balance is now in parts counting mode counting all units on the weighing plate	
01 Unit weight – determination of reference weight by weighing	
⇨ Press the PRINT/SET -key; display changes to parts counting operation	 
⇨ Press the UNIT -key; select reference quantity (factory-defined are quantities of 10, 20, 50,100, or freely selectable), use the PRINT/SET key to confirm	
⇨ Place as many parts on the weighing plate as required by the set reference quantity, confirm by pressing the PRINT/SET -key If you are using a weighing container first tare your balance pressing the TARE/ESC-key.	
⇨ Press PRINT/SET -key The (⚠) symbol in the display indicates that the automatic reference optimization is turned on. Every time more pieces are added the balance carries out optimization automatically. It is not necessary to press another key to start the optimization process. For each reference optimization the average piece weight (reference) is newly calculated. Since additional parts increase the basis for the calculation the reference becomes more exact.	
⇨ Actuate the F -key. The reference quantity is saved under **"01 Unit weight"**.	
⇨ Press the PRINT/SET -key; the balance is now in parts counting mode counting all units on the weighing plate.	

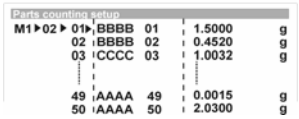
02 Recall sample – call up a reference weight from the database

⇨ Use the cursor (►) to select "**02 Recall sample**"

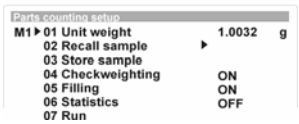


⇨ Press the F -key; the sub-menu "**02 Recall sample**" will be displayed.

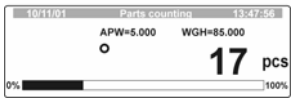
⇨ Use the arrow keys to select the desired reference weight



⇨ Use the PRINT SET -key to confirm; the selected reference weight appears under **"01 Unit weight"**.



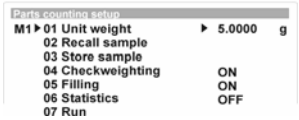
⇨ Press the PRINT SET -key; the balance is now in parts counting mode counting all units on the weighing plate.

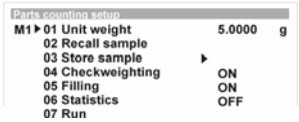


03 Store sample – Saving a reference weight in the database

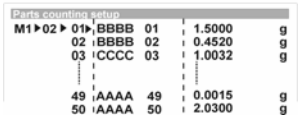
The reference weight stored in menu item **"01 Unit weight"** can be saved in the database as follows (max. 200 Parameter):

⇨ Use the cursor (►) to select "**03 Store sample**"

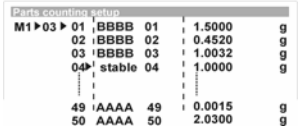


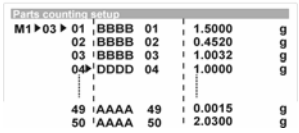
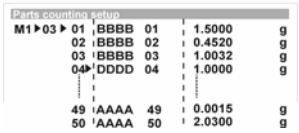
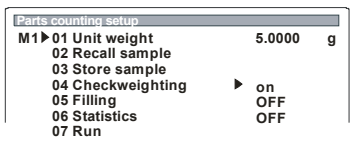
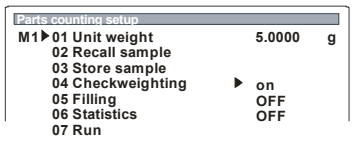


⇨ Press the F -key; the sub-menu "**03 Store sample**" will be displayed.



⇨ Use the arrow keys (↻ or UNIT) to select parameter no.



⇨ Press the F -key; use the arrow keys to enter parameter name (max. 10 characters)	
⇨ Use the PRINT SET -key to confirm, the blinking stops	
⇨ Press the PRINT SET -key; return to menu	
04 Checkweighing The combination parts counting / checkweighing allows you to check whether your reference weight is within your set tolerance	
⇨ Use the cursor (►) to select the "**04 Checkweighing** " ⇨ Press F -key	
⇨ Press the F -key; the current menu item blinks. ⇨ Activate operating mode "**Checkweighing**" via the arrow keys ⇨ Set tolerance limits	
⇨ Confirm with PRINT SET -key	
⇨ Press the PRINT SET -key; return to menu	

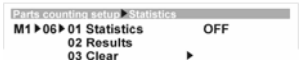
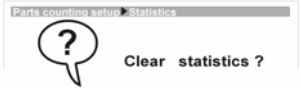
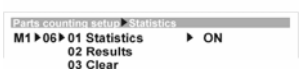
05 Filling

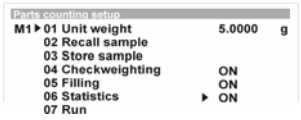
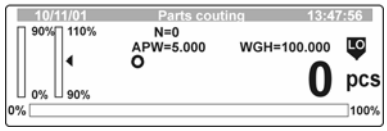
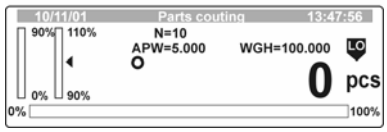
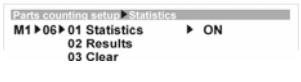
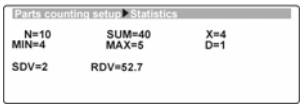
The combination of parts counting /filling allows your to set a target quantity.

⇨ Use the cursor (►) to select the "**05 Filling**" ⇨ Press F -key	
⇨ Press the F -key; the current menu item blinks. ⇨ Activate operating mode "Filling" via arrow keys ⇨ Enter value for the target quantity	
⇨ Confirm with PRINT SET -key	
⇨ Press the PRINT SET -key; return to menu	

06 Statistics

When combining parts counting /statistics the displayed value is accepted by pressing the UNIT -key.

⇨ Use the cursor (►) to select "**06 Statistics**" ⇨ Press F -key	
⇨ Press the F -key; the current menu item blinks	
⇨ Use the cursor (►) to select "**03 Clear**"	
⇨ Press the F -key; data will be deleted	
⇨ Confirm with PRINT SET -key	
⇨ Use the cursor (►) to select **01 Statistics** ⇨ Press F -key	
⇨ Activate operating mode "Statistics" with the arrow keys; press the PRINT SET -key to confirm	

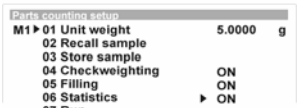
⇨ Press the PRINT SET -key; return to menu	
⇨ Press the PRINT SET -key; the balance is now in parts counting mode	
⇨ After each measuring (stable measuring value) press the PRINT SET -key; the displayed value will be saved and added to the saved number of values (N).	
⇨ Calling up the statistic results after e.g. 10 measurements (N=10) Use the F -key to call up the sub- menus	
⇨ Use the cursor (►) to select **“06 Statistics”**	
⇨ Confirm with F -key	
⇨ Use the cursor (►) to select **“02 Results”**	
⇨ Use the F -key to confirm; the display will show your statistical results.	

⇨ By actuating the PRINT/SET -key you can print your statistical results on a connected printer (see example).

N	: 10		→ Number of weighing proc.
SUM	: 40	pcs	→ Total of all weight values
X	: 4	pcs	→ Average Value
MIN	: 4	pcs	→ Smallest value
MAX	: 5	pcs	→ Largest value
D	: 1	pcs	→ MAX – MIN
SDV	: 2	pcs	→ Standard Deviation
RDV	: 52,7	%	→ Variance

⇨ Press TARE/ESC-key

⇨ Use the PRINT/SET -key to return to the sub-menu

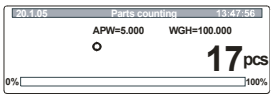
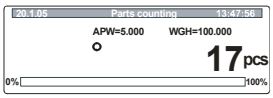


06 Run

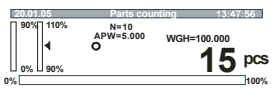
Parameter selection **"M1 07 RUN"** (confirm with PRINT/SET -key) will take you directly into parts counting mode.

8.1.2.1 Printout data output

Standard data output:

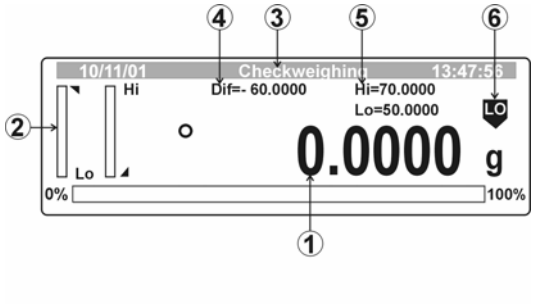
Key	*Indication*	*GLP Parameters*	*Data output*
PRINT SET		*P2 03 time printout 0: no* *P2 04 date printout 0: no* *P2 05 user printout. 0: no* *P2 06 project printout 0: no* *P2 07 printout Id 0: no* *P2 08 cal printout. 0: no*	**17 pcs**
PRINT SET		*P2 03 time printout 1: yes* *P2 04 date printout 1: yes* *P2 05 user printout. 1: yes* *P2 06 project printout 1: yes* *P2 07 printout Id 1: yes* *P2 08 cal printout. 1: yes*	**Date: 16/01/2004** **Time 13:12:30** **User: Mustermann** **Project: Checking.** **Weight: 11111111** **Last adjustment:** **----------** **16/01/2004 13:02** **External adjustment:** **0.0001 g** **----------** **17 pcs**

User-defined data output

Key	*Indication*	*Variable selection*	*Data output*
PRINT SET		*%d;* *%t;* *%i;* *%R;* *%P;* *%U;* *%F;* *%V;* *%N;* *%W;* *%n;* *%x;* *%S;* *%m;* *%M;* *%D;* *%s;* *%r;* *%C;* *%K;* *%I;*	**17/01/2004** **08:16:09** **11111111** **MBA 0.01** **Checking.** **Mustermann.** **quantity** **15 pcs** **15.048 g** **5.30000 g** **13** **15 pcs** **195 pcs** **15 pcs** **17 pcs** **2 pcs** **0 pcs** **0.00 %** **16/01/2004 13:02** **External adjustment:** **0.01 g**

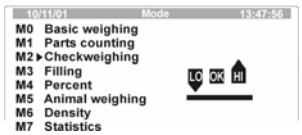
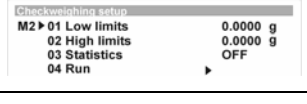
8.1.3 Checkweighing (Weighing with tolerance range)

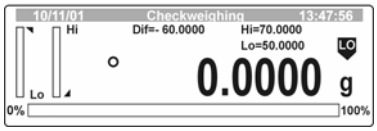
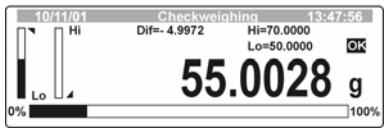
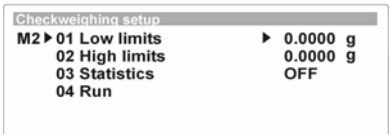
Overview of display:



1. Current weight display
2. Weighing-in aid coarse/fine
3. Mode of operation
4. Rated value
5. Upper limit (Hi), lower limit (Lo)
6. Tolerance marker

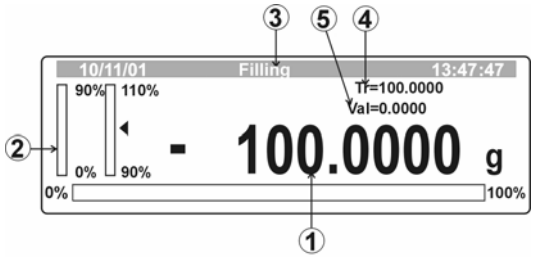
LO	too light
OK	rated value
HI	too heavy

Operator	indication
⇨ Call up operating mode **"M2 Checkweighing "** (see chapter 8.1) ⇨ Press F -key	
01 - 02 low/high limit – Enter limiting values	
⇨ Use the cursor (►) to select "**01 Lower limit or 02 upper limit"**	
⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to enter limiting values and confirm with the PRINT SET -key. Remark: At first set parameter 02 high limit.	
⇨ Use the cursor (►) to select **04 Run** and confirm with the PRINT SET -key	

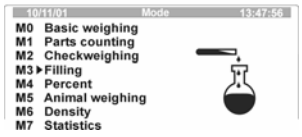
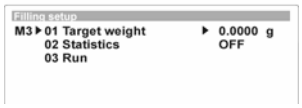
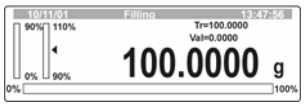
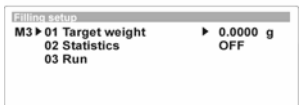
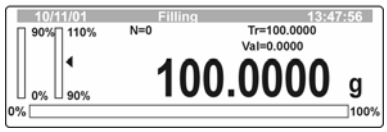
⇨ The balance is now in “Weighing with tolerance range“ mode	
⇨ Put on goods to be weighed, tolerance control is started	
03 Statistics- Combination checkweighing/statistics	
⇨ Use the cursor (►) to select “**03 Statistics“**,	
⇨ All further steps are the same as for the combination parts count/statistics (chapter 8.1.2)	

8.1.4 Filling

Display overview for filling operation:



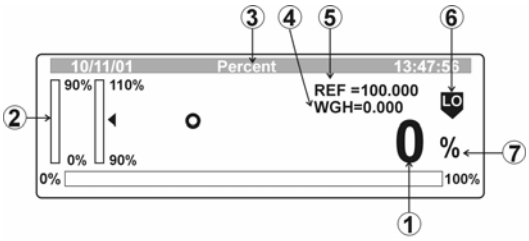
1. Residual filling quantity
2. Weighing-in aid coarse/fine
3. Mode of operation
4. Target weight
5. Present weight of sample

Operator	indication
⇨ Call up operating mode **"M3 Filling"** (see chapter 8.1) ⇨ Press F -key	
⇨ Use the cursor (►) to select **01 Target weight**	
⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to enter the target value.	
⇨ Confirm with PRINT SET -key	
⇨ Use the cursor (►) to select **03 Run** and confirm with the PRINT SET -key**;** the balance is now in Filling mode	
02 Statistics combination Filling/statistics	
⇨ Use the cursor (►) to select "**02 Statistics**"	
⇨ All further steps are the same as for the combination parts count/statistics (chapter 8.1.2)	

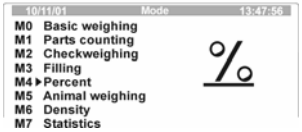
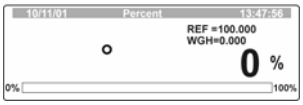
8.1.5 Percent determination

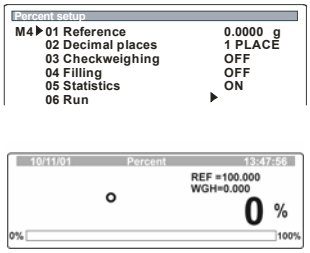
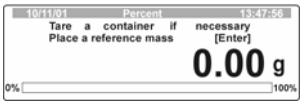
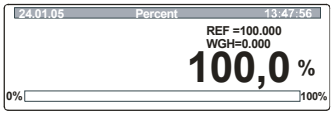
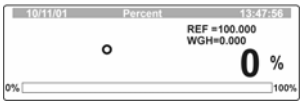
Percent determination allows weight display in percent, in relation to a reference weight

Display overview for percent determination operation:



1. % - deviation to reference weight
2. Weighing-in aid coarse/fine (only displayed for active dispensing)
3. Mode of operation
4. Present weight of sample
5. Reference weight
6. Tolerance marker (only displayed for active tolerance weighing)
7. Percent determination mode

Operator	indication
⇨ Call up operating mode **"M4 Percent"** (see chapter 8.1) ⇨ Press F -key	
01 Reference – Numeric entry of the reference weight	
⇨ Use the cursor (►) to select "**01 Reference**"	
⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to enter reference weight and confirm with the PRINT SET -key.	
⇨ Press the PRINT SET -key; the balance is now in percent determination mode.	
⇨ Now place items to test onto the weighing plate, the percentage in relation to the reference part is displayed.	

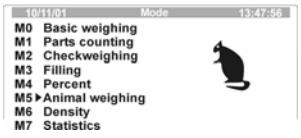
01 Reference – determination of reference weight by weighing	
⇨ Percent determination mode	
⇨ Press UNIT-key. Put on reference weight; if necessary, tare first	
⇨ Press PRINT SET -key, the weight is stored as reference (100%).	
⇨ Now place items to test onto the weighing plate, the percentage in relation to the reference part is displayed.	
02 Decimal places	
⇨ Use the cursor (►) to select "**02 Decimal places"**,	
⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to enter decimal digits; confirm with the PRINT SET -key	
⇨ Press the PRINT SET -key; the balance is now in percent determination mode.	
03 Checkweighing **04 Filling** **05 Statistics** **06 Run**	
⇨ Use the cursor (►) to select parameter "03 - 06"	
⇨ All further steps are the same as for the combination parts count/statistics (chapter 8.1.2)	

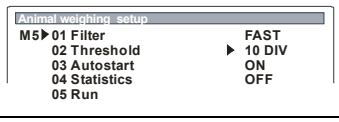
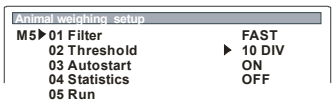
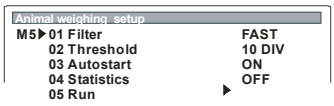
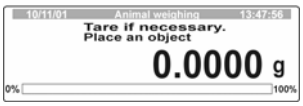
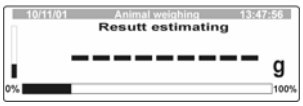
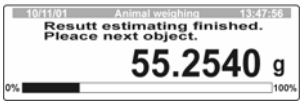
8.1.6 Animal weighing (Dynamic weighing)

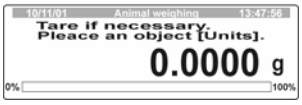
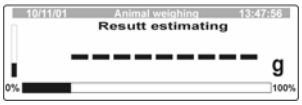
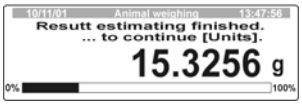
For unsteady items to be weighed (e.g. animals) or strong vibrations you can activate the dynamic weighing function with automatic or manual start. During a certain period of time the balance determines weight values and calculates an average.

In **automatic start** measuring starts automatically as soon as the weight changes.

In **manual start** you trigger measuring by actuating the -key.

Operator	**indication**
⇨ Call up operating mode **"M5 Animal weighing"** (see chapter 8.1) ⇨ Press F -key	
01 Filter – filter for adjustment to the environmental conditions Vibrations are filtered out by increasing the number of measuring cycles.	
⇨ Use the cursor (►) to select "**01 Filter"**	
⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to enter the sensitivity of the filter and confirm with the PRINT SET -key. (insensitive, **slowest** very busy setup location) **slow** **normal** ↓ **fast** **fastest** (sensitive very quiet setup location)	

02 Threshold (Condition: 03 – Auto start activated)	
⇨ Use the cursor (►) to select **"02 Threshold"**	
⇨ Press the F -key; the current menu item blinks. Use the arrow keys (see chapter 7.1) to set the number of measurements used for averaging. Confirm by pressing the PRINT SET -key 10 DIV ↓ 1000 DIV	
03 Weighing with automatic start After selecting your parameters and with **03 Auto start** activated, carry out weighing as follows:	
⇨ Use the cursor (►) to select "**05 Run**".Confirm by pressing the PRINT SET -key	
⇨ If you are using a weighing container use the TARE →0← ESC -key for taring	
⇨ Put goods to be weighed on weighing plate	
⇨ Dynamic weighing is started automatically.	
⇨ When weighing is complete the weight is shown in the display	
⇨ To start a new weighing cycle relieve the balance	
⇨ Press the F -key; return to menu	

03 Weighing with manual start After selecting your parameters and with **03 Auto start** deactivated, carry out weighing as follows:	
⇨ Use the cursor (►) to select "**05 Run**".Confirm by pressing the PRINT/SET -key	
⇨ If you are using a weighing container use the TARE/ESC-key for taring	
⇨ Put goods to be weighed on weighing plate	
⇨ Dynamic weighing is started by actuating the UNIT-key	
⇨ When weighing is complete the weight is shown in the display	
⇨ To start a new weighing cycle relieve the balance and press the UNIT -key	
⇨ Press the F -key; return to menu	

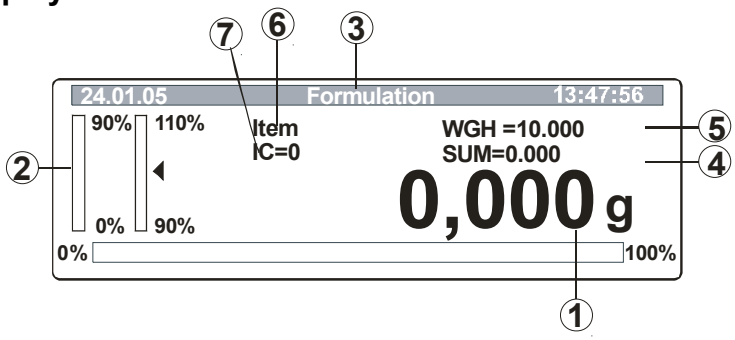
8.1.7 Density determination

Density determination of solids and liquids see user manual "Density set".

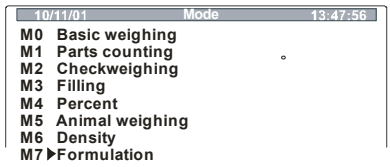
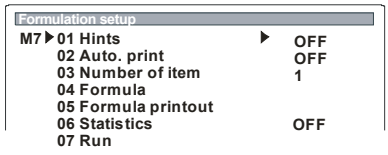
8.1.8 Formulation

The formulation function allows to add on various components of a mixture. To check, the overall weight of all components can be called up.

Overview of display:

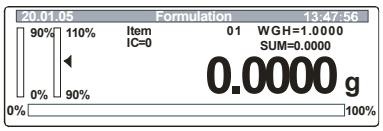


1. Present weight of sample
2. Weighing-in aid coarse/fine
3. Mode of operation
4. Sum memory
5. Target value of a component (defined in parameter 04 Formula)
6. Data of a component (defined in parameter 04 Formula)
7. Number of added components

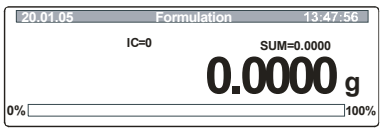
Operator	indication
⇨ Call up operating mode **"M7 Formulation"** (see chapter 8.1) ⇨ Press F -key	
01 – 07 Parameter selection	
⇨ Use the cursor (►) to select parameter "01 - 07"	

⇨ Press the F -key; the current menu item blinks.

01 Hints **on** Data of the individual components of a formula are shown in the display



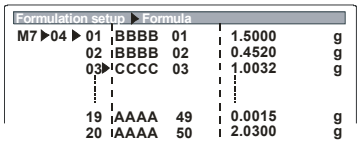
off Setting for generating a mixture by means of weighing



02 Autoprint **on** Autom. data output
off No automatic data output

03 Number of items Number of components (1 to 20)

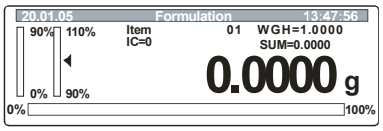
04 Formula The formula is entered in the sub-menu (designation max 10 characters and quantity)



05 Printout Printout of formula
06 Statistics Combination with statistics
07 Run Call up of formulation mode

⇨ Use the arrow keys to activate/deactivate parameters, confirm your selection pressing the PRINT SET -key

⇨ Use the cursor (►) to select "**05 Run**".Confirm by pressing the PRINT SET -key. The balance is now in formulation mode.

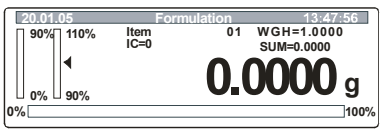


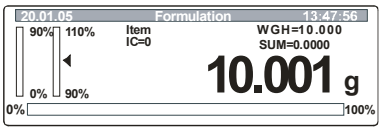
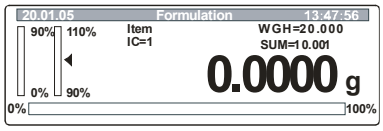
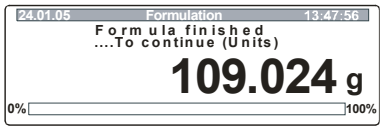
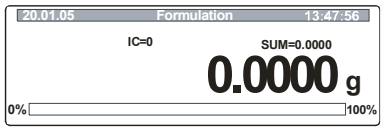
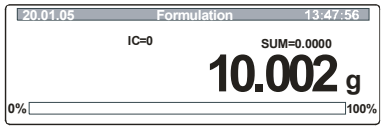
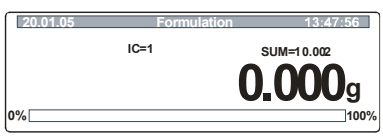
⇨ Now you can begin adding on the various components of a mixture:

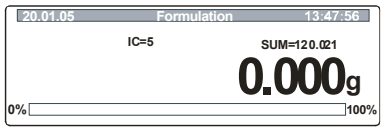
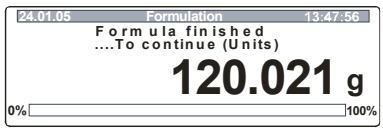
⇨ Press the F -key; return to menu

Generating a mixture according to a defined formula

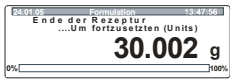
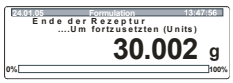
⇨ If you are using a weighing container use the TARE ESC -key for taring



⇨ Add on component 1, see target value (WGH) on the display	
⇨ As soon as the measuring value is stable press the UNIT -key; component 1 is saved; the display shows the target value component 2 (WGH), the sum of the saved components (SUM), as well as the number if the components already added (IC)	
⇨ Add on component 2, see target value (WGH) on the display ⇨ Repeat these two steps until you have added on all components.	
⇨ Press TARE/ESC-key	
⇨ Confirm completion of the mixture with the UNIT-key	
⇨ Press the F -key; return to menu	
Generating a mixture by adding on	
⇨ Parameter selection: 01 Hints off 02 Printout on – Formula printout 04 Formula Press PRINT/SET -key	
⇨ If you are using a weighing container use the TARE/ESC-key for taring	
⇨ Add on component 1	
⇨ As soon as the measuring value is stable actuate the UNIT -key; component 1 is saved, the display shows the sum of the saved components (SUM), as well as the number if the components already added (IC) The weight display returns to zero.	

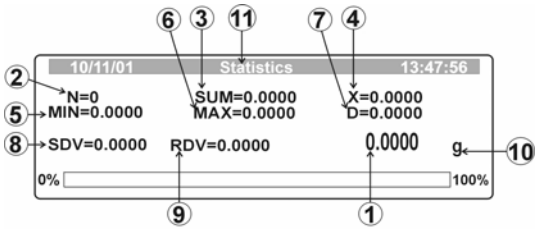
⇨ Add on component 2; as soon as the measuring value is stable actuate the UNIT -key ⇨ Repeat this step until you have added all components.	
⇨ Confirm adding of the last component with the TARE/ESC -key ⇨ Confirm completion of the mixture with the PRINT/SET -key	
⇨ Press the F -key; return to menu	

Example for a data output (standard printout)

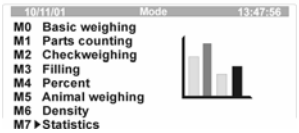
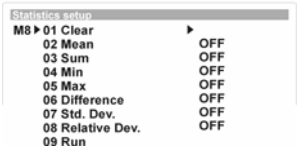
Key	*Indication*	*GLP Parameters*		*Data output*
PRINT/SET		*P2 03printout of time* *P2 04printout of date* *P2 05user's printout* *P2 06printout of design* *P2 07printout Id* *P2 08printout of calibration*	*0:no* *0:no* *0:no* *0:no* *0:no* *0:no*	**1 10.000 g** **2 10.000 g** **3 10.002 g** **----------** **SUM 30.002 g**
PRINT/SET		*P2 03printout of time* *P2 04printout of date* *P2 05 user's printout* *P2 06printout of design* *P2 07printout Id* *P2 08printout of calibration*	*1:yes* *1:yes* *1:yes* *1:yes* *1:yes* *1:yes*	**Date: 16/01/2004** **Time 13:12:30** **User: Mustermann** **Project: xxxxx** **Balance: :11111111** **Last adjustment:** **----------** **16/01/2004 13:02** **External adjustment** **Deviation: 0.0001 g** **----------** **1 10.000 g** **2 10.000 g** **3 10.002 g** **----------** **SUM 30.002 g**

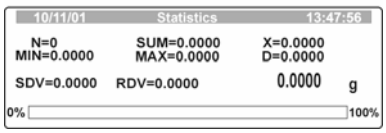
8.1.9 Statistics

The Statistical function is possible for display values in g, pieces or %.
By actuating the PRINT SET -key the currently displayed value is saved for the statistics.
Overview of display:

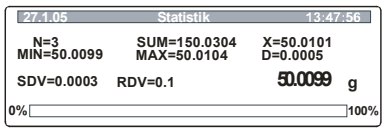
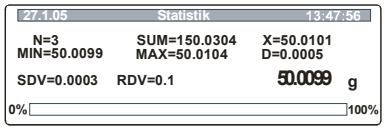
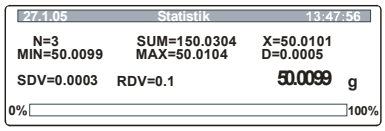


1. Present weight of sample
2. Number of all weight proc.
3. Total of all weight values
4. Average value
5. Smallest value
6. Largest value
7. Difference Max-Min
8. Standard deviation SDV: $\sqrt{\frac{n\sum x^2-\left(\sum x\right)^2}{n(n-1)}}$
9. Variance RDV: (SDV / average) * 100%)
10. Weighing unit
11. Mode of operation

Operator	**indication**
⇨ Call up operating mode **"M8 Statistics"** (see chapter 8.1) ⇨ Press F -key	
01 – 08 Parameter selection	
⇨ Use the cursor (►) to select parameter "01 - 08"	
⇨ Press the F -key; the current menu item blinks. **01 Clear** Delete data **02 Sum** Sum of all Weighings **03 Mean** Rated value **04 Min** Minimum **05 Max** Maximum **06 Difference** Difference min/max **07 Stand. Devi**. Standard Deviation **08 Factor variance** Variance **09 Run** Enter statistics mode	

⇨ Use the arrow keys to activate/deactivate parameters, confirm your selection pressing the PRINT SET key	
⇨ Press the PRINT SET -key; the balance is now in statistics mode.	
⇨ Use the UNIT -key to print your statistic values on a connected printer	Prinout: N : 5 SUM : 169,6880 g X : 33,9376 g Min : 0,0000 g MAX : 100,0012 g D : 100,0012 g SDV : 42,2166 g RDV : 124,4%
Press the F -key; return to menu	

Example for a data output during a measuring sequence:

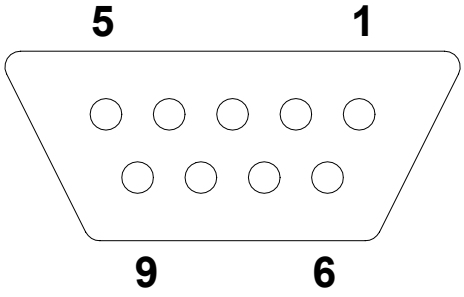
Key	*Indication*	*GLP Parameters*	*Data output*
PRINT SET		***P2 03 time printout 0: no*** ***P2 04 date printout 0: no*** ***P2 05 user printout. 0: no*** ***P2 06 project printout. 0: no*** ***P2 07 printout Id 0: no*** ***P2 08 Cal printout. 0: no***	**3 50.0099 g**
PRINT SET		***P2 03 time printout 1: yes*** ***P2 04 date printout 1: yes*** ***P2 05 user printout. 1: yes*** ***P2 06 project printout 1: yes*** ***P2 07 printout Id 1: yes*** ***P2 08 Cal printout. 1: yes***	**Date: 16/01/2004** **Time 13:12:30** **User: Mustermann** **Project: xxxxx** **Weight: : 11111111** **Last adjustment:** **----------** **16/01/2004 13:02** **External adjustment:** **0.0001g** **----------** **3 50.0099 g**
UNIT			**N : 3** **SUM : 150.0304 g** **X : 50.0101 g** **Min : 50.0099 g** **MAX : 50.0104 g** **D : 0.0005 g** **SDV : 0.0003 g** **RDV : 0.01 %**

9 Data output

9.1 Tecnical data

- 8 Data bits
- Baud rate selectable at 2400, 4800, 9600 and 19200 Baud
- Miniature plug necessary (9 pol D-Sub)
- For operation with interface faultless operation is ensured only with the respective KERN- interface cable (max. 2m)

9.2 Pin allocation of the balance exit plug (front view)



Pin 2: Rxd
Pin 3: Txd
Pin 4: DTR
Pin 5: GND
Pin 6: Tara
Pin 7: RTS
Pin 8: CTS
Pin 9: Print

9.3 Remote commands

Commands	function
R CR LF	Reset to factory setting – reset
PC CR LF	Command to call up the values of the balance
S CR LF	Measuring value stable
SI CR LF	Measuring value instable
SU CR LF	Last stable measuring value
SUI CR LF	Current measuring value
Z CR LF	Zeroing stable value
ZI CR LF	Zeroing instable value
T CR LF	Taring stable value
TI CR LF	Taring instable value
C0 CR LF	Cancel continuous data output
C1 CR LF	Start continuous data output
CU0 CR LF	Cancel continuous data output (operating mode)
CU1 CR LF	Start continuous data output (operating mode)
NB CR LF	Serial no. of balance
FS CR LF	Weighing range max.
RV CR LF	Software issue
PD CR LF	Date display
PD CR LF	Time display
PMCR LF	Mode of operation
PS CR LF	Balance parameters are printed out
B CR LF	Keytone
ER CR LF	Call up error message
DS CR LF	Display check
CS CR LF	Delete display check
DH CR LF	Display check header
CH CR LF	Delete display check header
DF CR LF	Display check bar graph (footer)
CF CR LF	Delete display check bar graph (footer)
CL CR LF	Start internal adjustment from outside
KL CR LF	Lock keyboard
KU CR LF	Unlock keyboard
E0 CR LF	Keytone off
E1 CR LF	Keytone on
O0 CR LF	Balance off
O1 CR LF	Balance on
A0 CR LF	Auto zero off
A1 CR LF	Auto zero on
TC0 CR LF	Automatic adjustment off
TC1 CR LF	Automatic adjustment on

10 Maintenance, upkeep, disposal

10.1 Cleaning

Please disconnect the device from the operating voltage before cleaning.

Only use a cloth dampened with mild suds and not aggressive cleaning agents (solvents or similar). Please ensure that fluids are not able to get into the device and rub off using a clean, soft cloth.
Loose sample residue/powder can be removed carefully using a brush or hand vacuum cleaner.

Remove any spilt material to be weighed immediately.

10.2 Maintenance, upkeep

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

10.3 Disposal

The operating company shall dispose of the packaging and the device in compliance with the valid national or regional law of the operating location.

11 Troubleshooting

The balance should be switched off for a short time following an interruption in the programme sequence and disconnected from the mains supply. It is then necessary to repeat the weighing process from the beginning.

Help:

Malfunction	***Possible cause***
Weight display is not illuminated.	• *The balance is not switched on.* • *The mains supply connection has been interrupted (mains cable not plugged in/faulty).* • *Power supply interrupted.* • *Batteries are inserted incorrectly or empty* • *There are no batteries inserted.*
The weight display changes continually	• *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 wrong	• *The display of the balance is not at zero* • *Adjustment is no longer correct.* • *Great fluctuations in temperature.* • *Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)*

Switch the balance off if other error messages should appear and then switch on again. If error message persists, inform manufacturer.