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Operating and Installation Instructions Display device

KERN KFS-T

Version 1.3
10/2012
GB

KFS-T-BA_IA-e-1213

GB

KERN KFS-T

Version 1.3 10/2012

Operating and installation instructions
Display unit

English

Contents

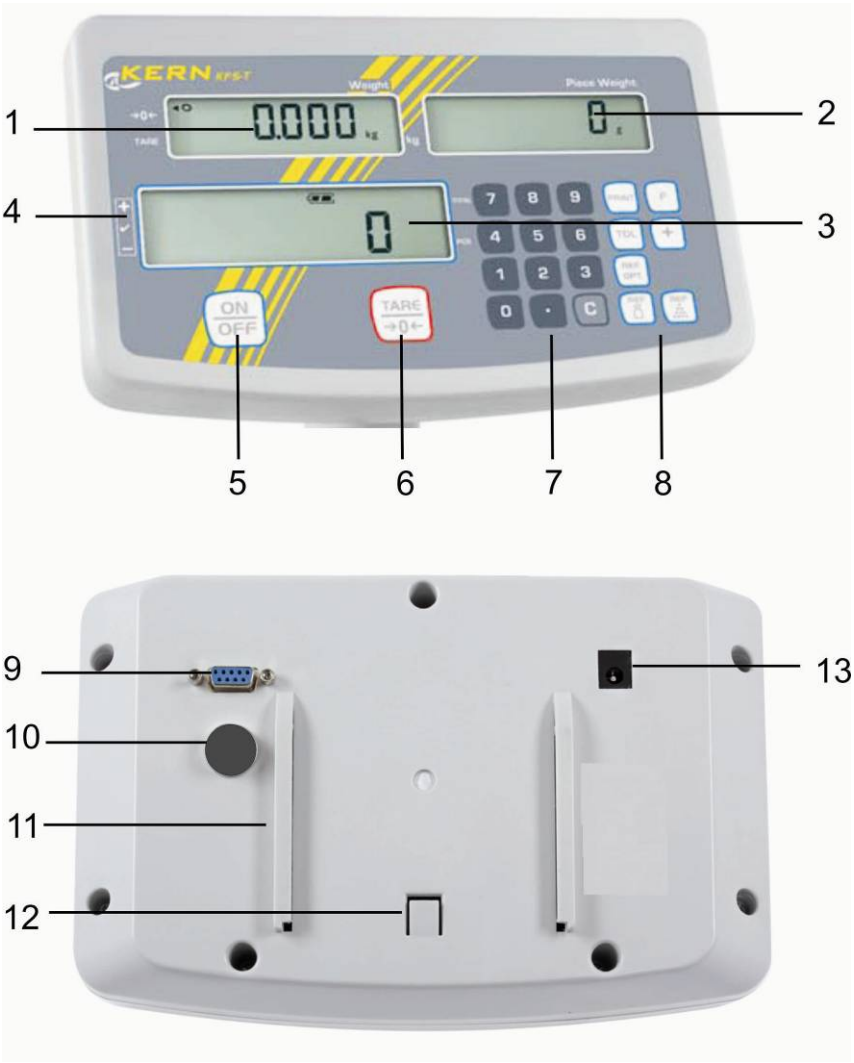
English

1 Technical data

KERN	KFS-T
Display	6-digit
Divisions	1,2,5,…10n
Weighing Units	kg
Display	LCD 16.5 mm digits with back lighting
DMS weighing cells	80-100 Ω. Max. 4 item per 350 Ω; Sensitivity 2-3 mV/V
Range calibration	We recommend ≥ 50 % max.
Electric Supply	Input voltage 220 V – 240 V, 50 Hz
	Power pack secondary voltage 12V, 500mA
Housing	260 x 150 x 65
Admissible ambient temperature	0°C – 40°C
Net weight	1.5 kg
Rechargeable battery (optional) Operating / charge time	40 h / 12 h
Support base incl. wall bracket	Standard
Data output	RS232

English

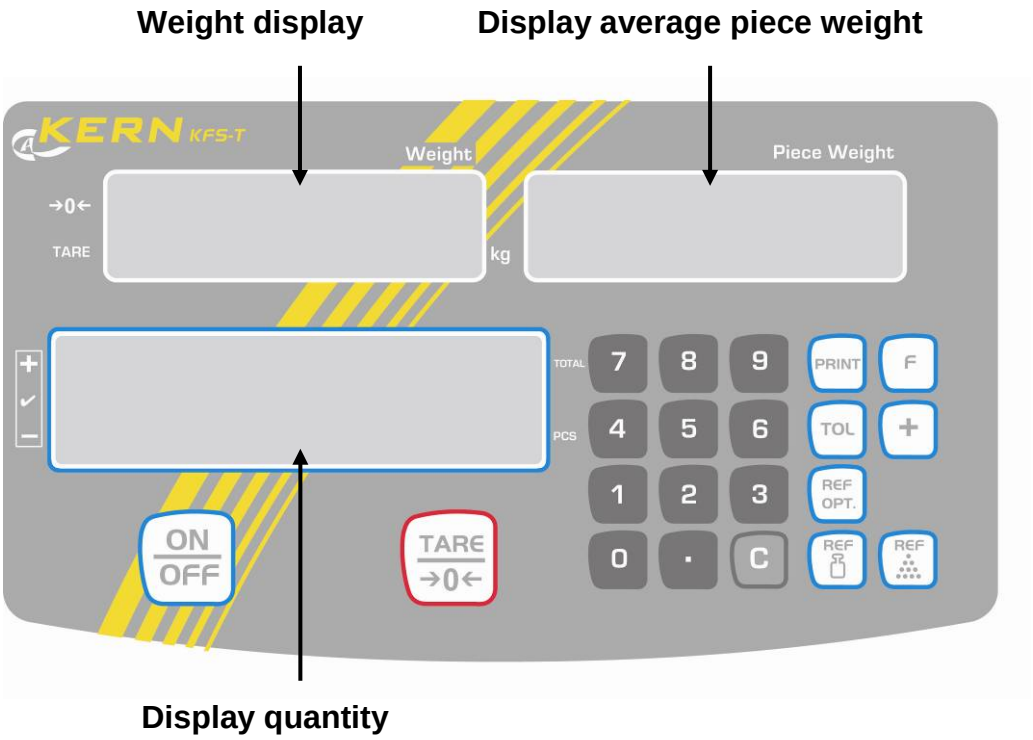
2 Appliance overview



1. Display “weight”
2. Display “average item weight“
3. Display “quantity”
4. Tolerance margin, see chpt. 7.6
5. ON/OFF key
6. Tare and zero set key
7. Numeric keys
8. Function keys
9. RS-232
10. Input connection load cell cable
11. Guide rail support base / stand
12. End stop support base / stand
13. Mains adapter connection

English

2.1 Overview of display



- **Weight display**

Here the weight of your goods is displayed in [kg].

Indicator [◀] next to symbol displays:

TARE	Net weight
o	Stability display
→0←	Zeroing display

- **Display average piece weight**

Here the average reference weight of a sample is displayed in [g]. This value is either numerically entered by user or calculated by weighing on balance.

English

- **Display quantity**

Here the current piece quantity (PCS = pieces) or in totalizing mode the sum Sum of the placed parts is displayed, see chapter 7.8.

Indicator [◀] next to symbol displays:

TOTAL	Total number of pieces
+	Target quantity of items above upper tolerance limit
✓	Target quantity of items within tolerance limits
-	Target quantity of items below lower tolerance limit

- **Other displays**

	• Power supply via line adapter • Status display battery (optional)
BUSY	• Saving / calculating weighing data
LIGHT	• Piece below minimum weight of piece

English

2.2 Keyboard overview

Key	Function
	⇨ Turn on/off
	⇨ Taring (>2 % Max) ⇨ Zero setting (< 2 % Max) ⇨ Change menu settings
	⇨ For entering of item weight by weighing see chpt. 7.6.1
	⇨ For numeric entry of item weight see chpt. 7.6.2
	⇨ Reference optimisation
	⇨ Set / call limits for tolerance check
	⇨ Addition in sum memory ⇨ Exit menu, return to weighing mode
	⇨ Calculate weighing data via interface
	⇨ Call function menu ⇨ How to select menu items
 ….	⇨ Numeric keys
	⇨ Decimal point
	⇨ Delete key

2.3 Audio signal

1 x briefly	Confirm by pressing key
1 x longer	Saving was successful
2 x briefly	Invalid entry
3 x briefly	Missing entry
continuous	Tolerance check depends on menu setting ”14.bu”, see chap. 8

3 Basic Information (General)

3.1 Proper use

The display unit acquired by you is used in combination with a weighing plate and serves to determine the weighing value of material to be weighed. It is intended to be used as a “non-automatic weighing system”, i.e. the material to be weighed is manually and carefully placed in the centre of the weighing plate. As soon as a stable weighing value is reached the weighing value can be read.

3.2 Improper Use

Do not use display unit for dynamic weighing. In the event that small quantities are removed or added to the material to be weighed, incorrect weighing results can be displayed due to the “stability compensation“ in the display unit. (Example: Slowly draining fluids from a container on the balance.)
Do not leave permanent load on the weighing pan. This may damage the measuring system.
Impacts and overloading exceeding the stated maximum load (max) of the weighing plate, minus a possibly existing tare load, must be strictly avoided. Both, the weighing plate and the display unit may be damaged during this process.
Never operate display unit in explosive environment. The serial version is not explosion protected.
Changes to the display unit's design are not permitted. This may lead to incorrect weighing results, safety-related faults and destruction of the display unit.
The display unit may only be operated in accordance with the described default settings. Other areas of use must be released by KERN in writing.

3.3 Warranty

Warranty claims shall be voided in case

- Our conditions in the operation manual are ignored
- The appliance is used outside the described uses
- The appliance is modified or opened
- Mechanical damage or damage by media, liquids, natural wear and tear
- The appliance is improperly set up or incorrectly electrically connected
- The measuring system is overloaded

3.4 Monitoring of Test Resources

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

4 Basic Safety Precautions

4.1 Pay attention to the instructions in the Operation Manual

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

4.2 Personnel training

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

5 Transport and storage

5.1 Testing upon acceptance

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

5.2 Packaging / return transport

- ⇨ Keep all parts of the original packaging for a possibly required return.
- ⇨ Only use original packaging for returning.
- ⇨ Prior to dispatch disconnect all cables and remove loose/mobile parts.
- ⇨ Reattach possibly supplied transport securing devices.
- ⇨ Secure all parts such as the glass wind screen, the weighing platform, power unit etc. against shifting and damage.

6 Unpacking and placing

6.1 Installation Site, Location of Use

The display units are designed in a way that reliable weighing results are achieved in common conditions of use.
Precise and fast work is achieved by selecting the right place for your display unit and your weighing plate.

On the installation site observe the following:

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

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

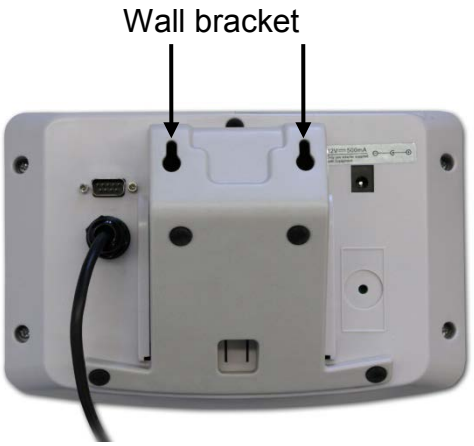
6.2 Scope of delivery / serial accessories:

- For display unit, see chapter 2
- Mains adapter
- Support base incl. wall bracket
- Protective cover
- Operating instructions

6.3 Unpacking/installation

Carefully remove the display unit from packaging, remove plastic cover and place it in the designated work area.
Mount the display unit in a way that facilitates operation and where it is easy to see.

To be used with support base and wall bracket



Push support base in guide rail [11] up to end stop [12], see chap. 2.

Using with tripod (optional)

To position the display higher up, the display unit may be mounted on an optionally available tripod. (KERN IFB-A01/A02).

6.4 Mains connection

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

6.5 Adjustment

As the acceleration value due to gravity is not the same at every location on earth, each display unit with connected weighing plate 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 weighing system has not already been adjusted to the location in the factory). This adjustment process must be carried out for the first commissioning, after each change of location as well as in case of fluctuating environment temperature. To receive accurate measuring values it is also recommended to adjust the display unit periodically in weighing operation.

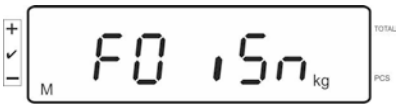
- Provide adjustment weight.
- The required adjustment weight depends on the capacity of the weighing system. Carry out adjustment as near as possible to the scale's maximum weight. Information about test weights you will find in the internet under: http://www.kern-sohn.com
- Observe stable environmental conditions. Stabilisation requires a certain warm-up time.

Call up menu:

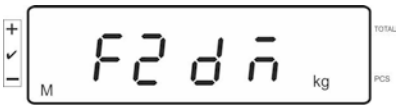
⇨ Switch-on balance and during the selftest press F.
Ensure that there are no objects on the weighing pan.

Reset to zero if necessary by pressing TARE →0←.

⇨ Go to weighing mode and press and hold F for approx. 5-6 seconds until **FUNC** followed by **F0 iSn** appears. Release button.



⇨ Press TARE →0← repeatedly until **F2 dm** is displayed.



⇨ Press F and select the set weighing scales type by TARE →0←.

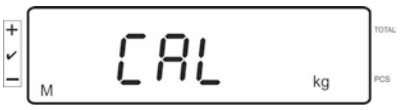
SiG rG = Single-range balance

dUAL r = Dual range balance

dUAL i = Multi-interval balance

⇨ Acknowledge with F.

⇨ Press TARE →0← repeatedly until „**CAL**“ will be displayed.



⇨ Acknowledge by F and select desired setting with TARE →0←.

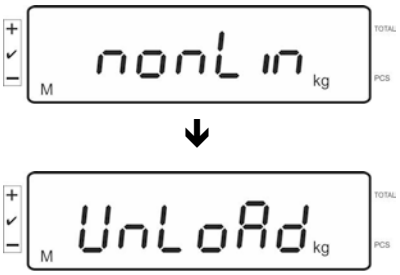
LinEAr = Linearization

nonLin = Adjustment

English

Carry out adjustment:

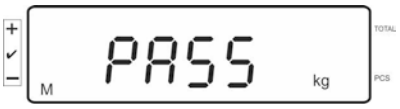
⇨ Confirm menu setting **nonLin** with [F].



Ensure that there are no objects on the weighing pan.

⇨ **LoAd** will be displayed after standstill control has been carried out.

⇨ Put the required adjustment weight carefully in the centre of the weighing pan.



⇨ After successful adjustment, the weighing scales will carry out a self test. **During** this self test remove the adjustment weight and the weighing scales will automatically return to weighing mode.
An adjusting error or incorrect adjusting weight will be indicated by the error message; repeat adjustment procedure.

English

6.6 Linearization

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

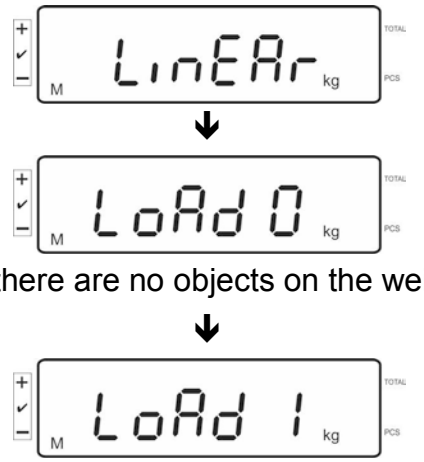
- Carrying out linearization is restricted to specialist staff possessing well acquainted with the workings of weighing scales.
- The test weights to be used must be adapted to the weighing scale's specifications; see chapter "testing instruments control".
- Observe stable environmental conditions. Stabilisation requires a certain warm-up time.
- Do not remove the adjustment weight during linearization in step **LAOD 1** to **LOAD 4,** merely increase it instead. Conversely do not remove the adjustment weight during step **LAOD 4** to **LOAD 1**, merely increase it instead.
- After successful linearisation you will have to carry out calibration; see chapter "testing instruments control".

Tab. 1: Adjustment weights"LOAD1 – LOAD4"

MAX	LOAD 1	LOAD 2	LOAD 3	LOAD 4
3kg	0.5kg	1kg	2kg	3kg
6kg	1kg	2kg	4kg	6kg
15kg	3kg	5kg	10kg	15kg
30kg	5kg	10kg	20kg	30kg
60 kg	10kg	20kg	40kg	60kg
120 kg	30kg	60kg	60kg	150kg
300 kg	50kg	100kg	200kg	300kg
600 kg	100kg	200kg	400kg	600kg
1.5 t	3000kg	5000kg	1000kg	1500kg
3 t	5000kg	1000kg	2000kg	3000kg

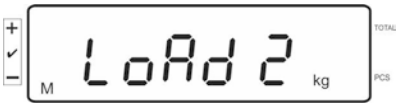
⇨ Call menu item linearization LinEAr, see chap. 6.5

⇨ Confirm menu setting LinEAr with [F].

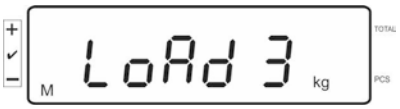


Ensure that there are no objects on the weighing plate.

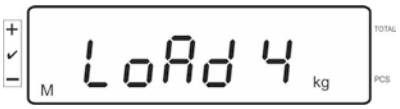
⇨ “LoAd 1” will be displayed after standstill control has been carried out. Put the first adjustment weight approx. 1/4 Max (see table 1) carefully in the centre of the weighing pan.
“LoAd 2” will be displayed after standstill control has been carried out.



⇨ Put the second adjustment weight approx. 2/4 max (see table 1) carefully in the centre of the weighing pan. “LoAd 3” will be displayed after standstill control has been carried out.



⇨ Put the third adjustment weight approx. 3/4 max (see table 1) carefully in the centre of the weighing pan. “LoAd 4” will be displayed after standstill control has been carried out.



⇨ Put the forth adjustment weight approx. 4/4 max (see table 1) carefully in the centre of the weighing pan.
After successful standstill control the balance carries out a selftest, then it automatically returns to weighing mode.

- An adjusting error or incorrect adjusting weight will be indicated by the error message; repeat adjustment procedure.
- You can cancel adjustment by pressing any key with the exception of [C] and [TARE →0←].

English

7 Operation

7.1 Start-up

⇨ Press ON/OFF and the instrument will carry out a self-test. As soon as the weight display appears, the instrument will be ready to weigh.

7.2 Switching Off

⇨ Press ON/OFF and the display will disappear.

7.3 Zeroing

Resetting to zero corrects the influence of light soiling on the weighing plate.
Resetting range ± 2 % max.

⇨ To unload the weighing system

⇨ Press TARE/→0←, the zero display as well as the indicator **[◀]** next to →0← will appear.

7.4 Simple weighing

⇨ Place goods to be weighed on balance.
⇨ Wait for stability display [O].
⇨ Read weighing result.

Overload warning

Overloading exceeding the stated maximum load (max) of the device, minus a possibly existing tare load, must be strictly avoided. This could damage the instrument.
Exceeding maximum loads is indicated by the display of “O-err“, and an audio sound. Unload weighing system or reduce preload.

7.5 Weighing with tare

⇨ Deposit weighing vessel. After successful standstill control press the TARE →0← button. Zero display and the indicator **[◀]** next to TARE appear. The weight of the container is now internally saved.

⇨ Weigh the material, the net weight will be indicated.

⇨ After removing the weighing container, the weight of the weighing container appears as negative display.

⇨ The tare procedure can be repeated as many times as necessary, for example with initial weighing of several components for a mix (add-on weighing). The limit is reached when the total weighing range capacity is full.

⇨ To delete the tare value, remove load from weighing plate and press TARE →0← .

7.6 Counting

During piece counting parts can either be counted into a container or out of a container. To count a greater number of parts the average weight per part has to be determined with a small quantity (reference quantity). The larger the reference quantity, the higher the counting exactness.
High reference must be selected for small parts or parts with considerably different sizes.

- The average piece weight can only be determined by stable weighing values.
- If weighing values are under zero, the piece counter display shows a negative number of items.
- The message light appearing on the display indicates that load falls below minimum weight value.
- Delete incorrect entries by pressing C.
- The accuracy of an average item weight can be improved at any time during additional counting processes. For this purpose add additional items and press REF OPT.. After the reference optimization sounds a signal tone. As the additional pieces increase the base for the calculation, the reference also becomes more exact.

English

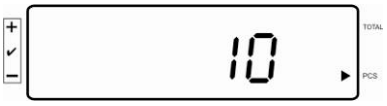
7.6.1 Determination of the average piece weight by weighing

Set reference

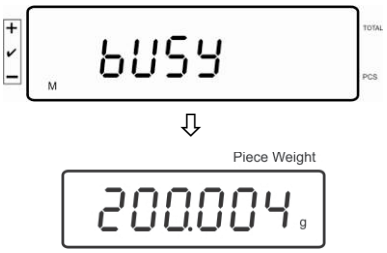
⇨ Reset balance to zero or tare the empty weighing container if necessary.

⇨ Place on the weighing plate a known number (e.g. 10 items) of individual pieces as a reference.

⇨ Wait for the stability display, than enter the number of individual items via the numeric keypad.



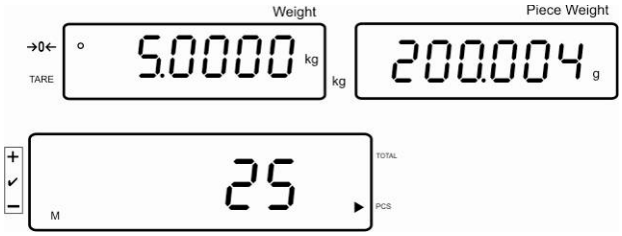
⇨ Acknowledge with REF.



The balance determines the average piece weight.

Count the items

⇨ Tare if necessary, place weighing good and read off the number of items.



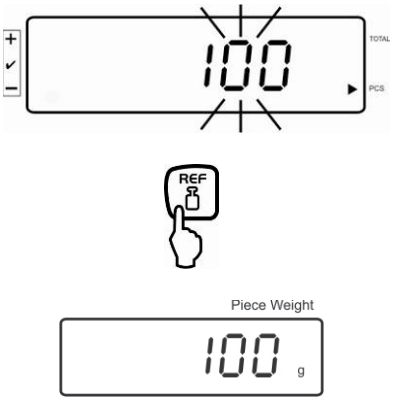
Delete reference

⇨ Press C and the average unit weight will be deleted.

7.6.2 Numeric input of the average piece weight

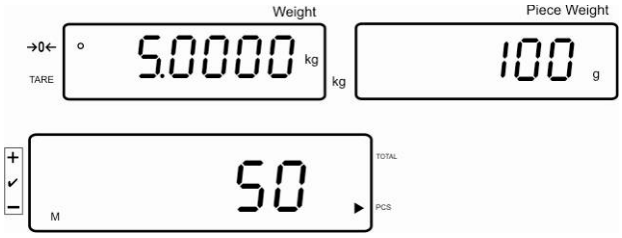
Set reference

⇨ Enter established item weight by pressing numeric keys and confirm by REF.



Count the items

⇨ Tare if necessary, place weighing good and read off the number of items.



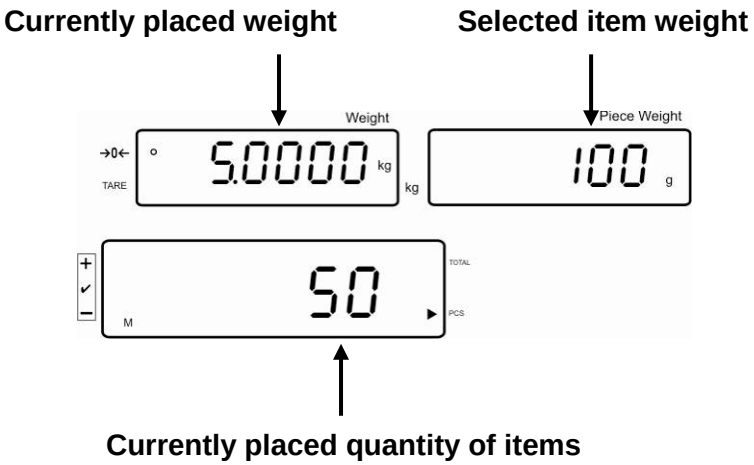
Delete reference

⇨ Press C and the average unit weight will be deleted.

7.7 Totalization

Adding-up during weight display:

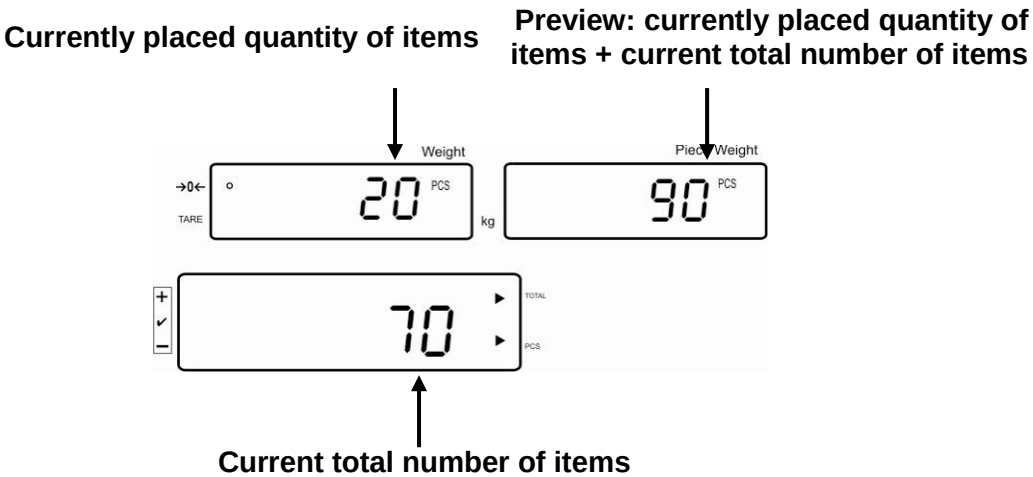
Weight display:	Currently placed weight
Item weight display:	Selected item weight
Item quantity display:	Currently placed quantity of items



Adding-up during item display:

Press F and the display changes to item display.

Weight display:	Currently placed item quantity
Item weight display:	Currently placed item quantity + total of added display values
Item quantity display:	Total of added-up display values



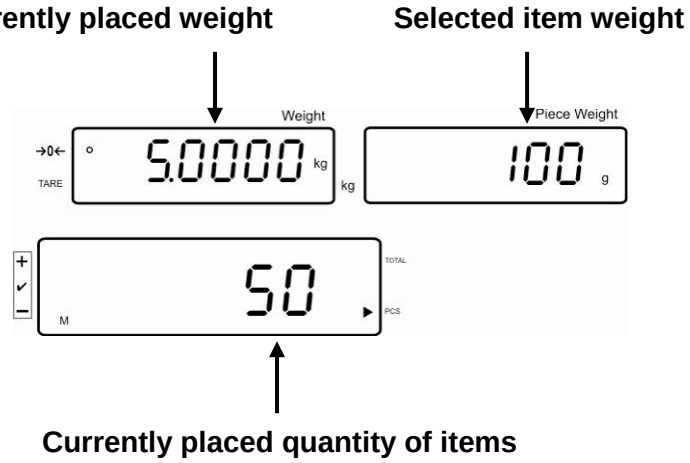
7.7.1 Manual totalizing

With this function the individual weighing values are added into the summation memory by pressing [+] and edited, when an optional printer is connected.

Menu setting:
„**F11 AC**“ ⇨ „**5 AC 1**“, see chap. 8
„**F7 UA**“ ⇨ „**4 UA 5**“ see chap. 8

⇨ Calculate the average item weight (see chap. 7.6.1) or enter it manually (see chap. 7.6.2).

⇨ Place weighing goods A.



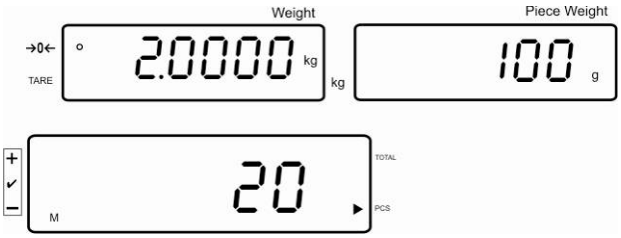
⇨ Wait for stability display, then press [+]. The displayed value (e.g. 50 pieces) will be added to the summation memory and printed if an optional printer is connected.

```
**********
NO:      1
GS:  5.0000kg
UW:    100g
PCS:    50pcs
**********
```

⇨ Remove the weighed good. More weighed goods can only be added when the display ≤ zero.

English

⇨ Place goods to be weighed B.

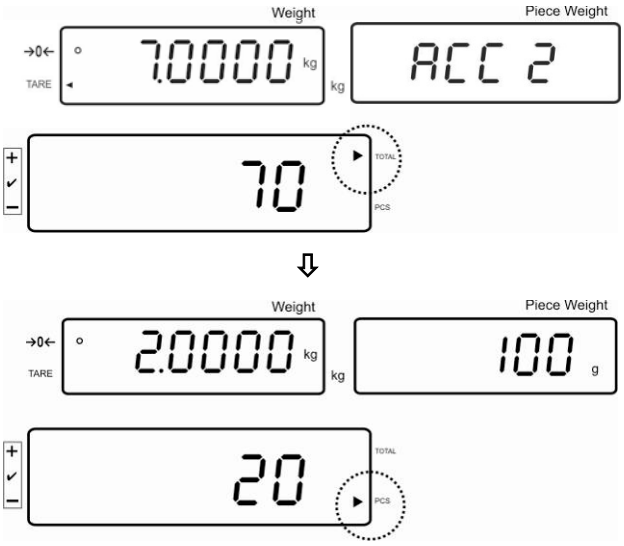


⇨ Wait for stability display, then press [+]. The displayed value (e.g. 20 pieces) will be added to the summation memory and printed if an optional printer is connected.

```
****************
NO:        2
GS:    2.0000kg
UW:       100g
PCS:      20pcs
****************
```

⇨ The total weight, the number of weighings as well as the total number of pieces will shortly appear (Indicator **[◀]** next to TOTAL).

Afterwards the display will change to the currently placed unit quantity (indicator **[◀]** next to PCS)



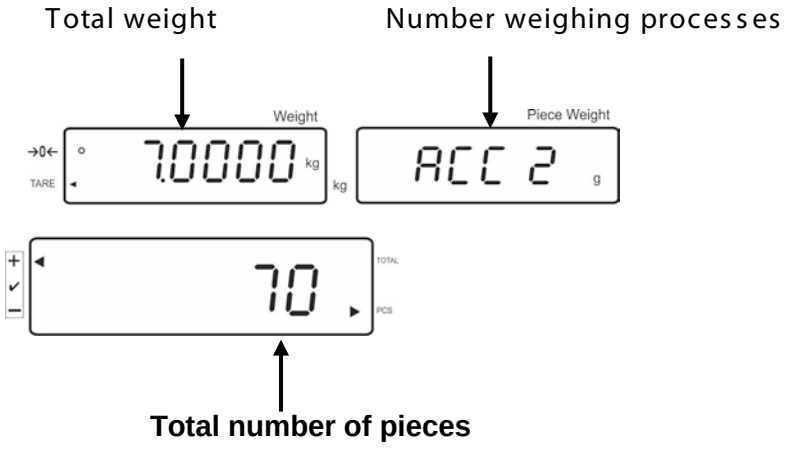
⇨ Add more weighed goods as described before.
Please note that the weighing system must be unloaded between the individual weighing procedures.

⇨ This process may be repeated 99 times or till such time as the capacity of the weighing system has been exhausted.

Display and output sum „Total“:

⇨ Unload the weighing pan and press [+], the total weight, the number of weighings, followed by the total number of pieces will be shown for 2 sec and printed if an optional printer is connected.

Indicator:



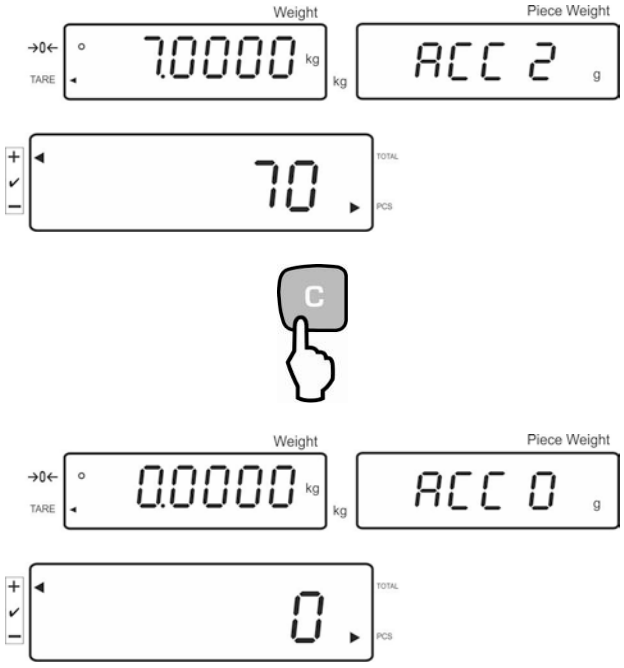
Printout example:

```
**********
   Total
NO:     2
WT: 7.0000kg
PCS:   70pcs
**********
```

English

Delete weighing data:

⇨ Press [+] to display the total weight, the number of weighing procedures and the total quantity for 2 sec. During this display press [C].



English

7.7.2 Automatic adding-up

With this function the individual weighing values are automatically added into the summation memory when the balance is unloaded and edited, when an optional printer is connected.

Menu setting:
„**F11 AC**“ ⇨ „**5 AC 0**“, see chap. 8
„**F7 UA**“ ⇨ „**4 UA 5“** see chap. 8

Adding-up:

⇨ Calculate the average item weight (see chap.. 7.6.1) or enter it manually (see chap.. 7.6.2).

⇨ Place weighing goods A.
After the standstill control sounds a signal tone, the weighing value will be added into the summation memory.

⇨ Remove the weighed good. When an optional printer is connected, data will be edited.

```
**********
 NO:    1
GS:  5.0000kg
 UW:   100g
PCS:   50pcs
**********
```

More weighed goods can only be added when the display ≤ zero.

⇨ Place goods to be weighed B.
After the standstill control sounds a signal tone, the weighing value will be added into the summation memory.

⇨ Remove the weighed good.
The total weight, the number of weighings as well as the total number of pieces will shortly appear (Indicator **[◀]** next to TOTAL).
When an optional printer is connected, data will be edited.

```
**********
 NO:    2
GS:  2.0000kg
 UW:   100g
PCS:   20pcs
**********
```

English

⇨ Add more weighed goods as described before.
Please note that the weighing system must be unloaded between the individual weighing procedures.

This process may be repeated 99 times or till such time as the capacity of the weighing system has been exhausted.

Display and output sum „Total“:

⇨ Unload the weighing pan and press [+], the total weight, the number of weighings, followed by the total number of pieces will be shown for 2 sec and printed if an optional printer is connected.

```
**********
   Total
NO:    2
WT: 7.0000kg
PCS:  70pcs
**********
```

Delete weighing data:

⇨ Press [+] to display the total weight, the number of weighing procedures and the total quantity for 2 sec. During this display press [C].

7.8 Tolerance check

The weighing scales allow weighing goods according to a target quantity or target weight within specified tolerances. With this function one can also check if the weighing good is within a defined tolerance range. Reaching target quantity is indicated by an audio sound (if enabled in menu) and a visual signal (Tolerance margin ◀) displayed.

For menu settings, see chapter 8:

Target quantity / target weight with tolerances	2 limits	Menu setting “F3 Pn / 13.Pn 2”, see chap.. 8
Accurate target quantity / accurate target weight without tolerance	1 limit	Menu setting “F3 Pn / 13.Pn 1”, see chap.. 8

Audio signal:
The audio sound depends on the settings made in menu block “F4 bU“, see chpt 8.
Options:

14 bu0 Acoustic signal turned off

14 bu 1 Audio signal will ring out when load is within tolerance range.

14 bu 2 Audio signal will ring out when load is beyond tolerance range.

Optical signal:
The triangular tolerance marker [◀] in the display of the display shows whether the goods to be weighed are within the two tolerance limits.

◀ Target quantity / target weight exceeds maximum tolerance limit

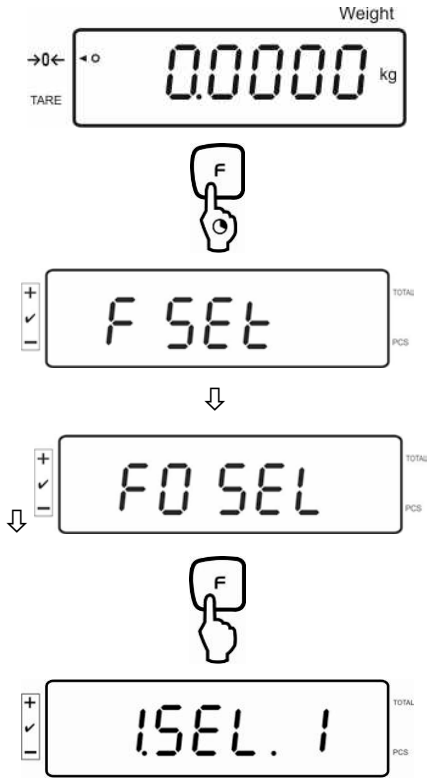
◀ Target quantity / target weight within tolerance range

◀ Target quantity / target weight below minimum tolerance limit

English

Activate function

⇨ For menu setting “F0 SEL 2“ see chpt. 8



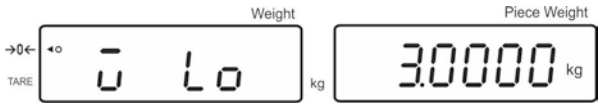
Tolerance check „Weighing“

Tolerance check „Counting“

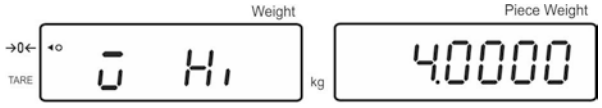
Display limits

1. Tolerance check for target weight

⇨ Press TOL to display the lower limit for target weight including current setting.

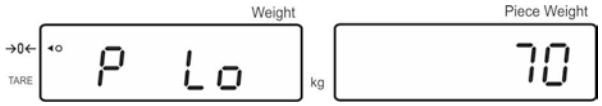


⇨ Press F to display the upper limit for target weight including current setting.

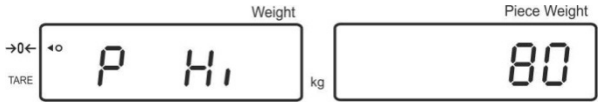


2. Tolerance check for target quantity

⇨ Press TOL to display the lower limit for target quantity including current setting.



⇨ Press F to display the upper limit for target quantity including current setting.



⇨ Return to weighing mode using F

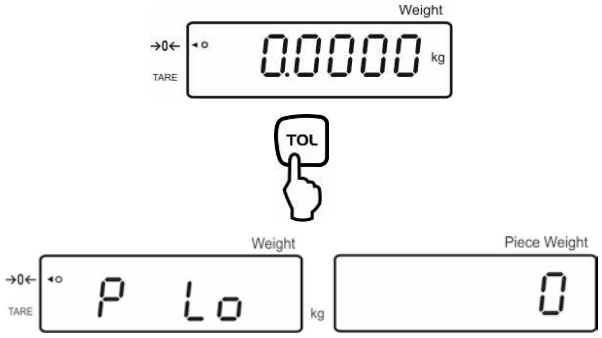
English

7.8.1 Tolerance check for target quantity

⇨ Activate menu setting „F0 sel / SEL 2“, see chap.7.8 „Activate function“.

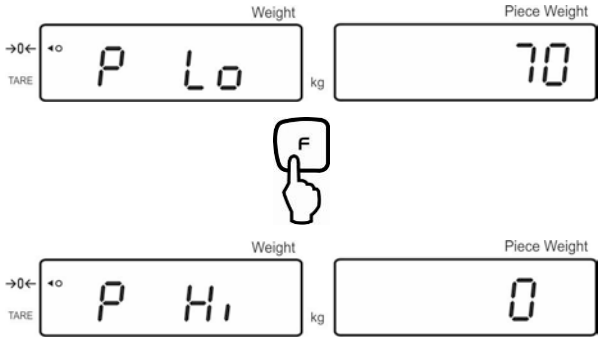
Set limit values

⇨ Press TOL to display the lower limit including current setting.



If required, delete the current setting by pressing C.

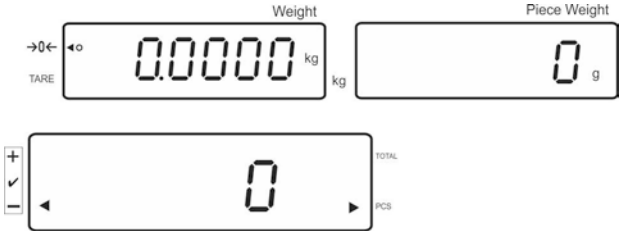
⇨ Use the numeric keys to enter the quantity for the lower limit (such as 70 units) and confirm by pressing F.



The upper limit will be displayed with the current setting.

Delete with C if necessary.

⇨ Use the numeric keys to enter the quantity for the upper limit (such as 80 units) and confirm by pressing F.

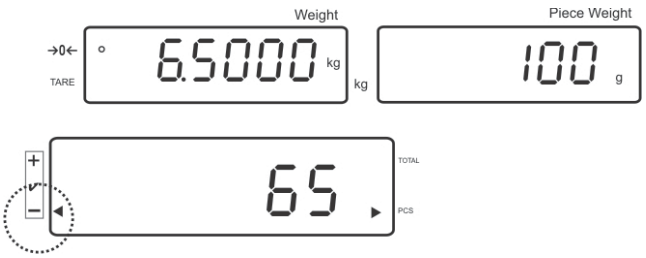


Start tolerance check

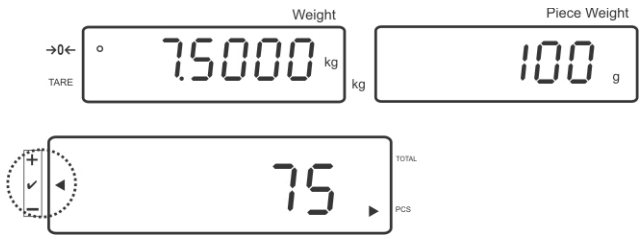
⇨ Specify unit weight, see chap. 7.6.1 or 7.6.2

⇨ Place load and wait until tolerance margin **[◀]** appears. With the help of the indicator check if the weighed goods are under, inside or over the default tolerance.
Depending on the setting in the menu an additional audio signal may be sounded.

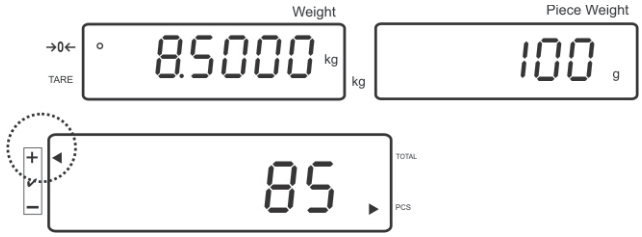
Target quantity below tolerance:



Target quantity within tolerance:



Target quantity exceeds tolerance:



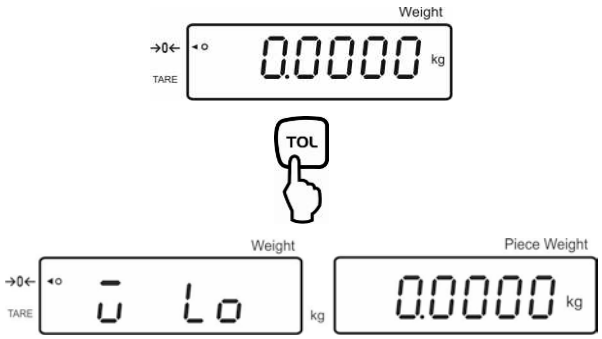
English

7.8.2 Tolerance check for target weight

⇨ Activate menu setting „F0 sel / SEL 1“, see chap.7.8 „Activate function“.

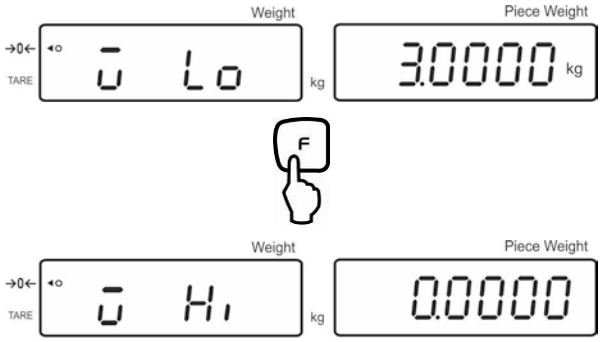
Set limit values

⇨ Press TOL to display the lower limit including current setting.



Delete with C if necessary.

⇨ Use the numeric keys to enter the weight for the lower limit value (such as 3 kg) and confirm by pressing F.

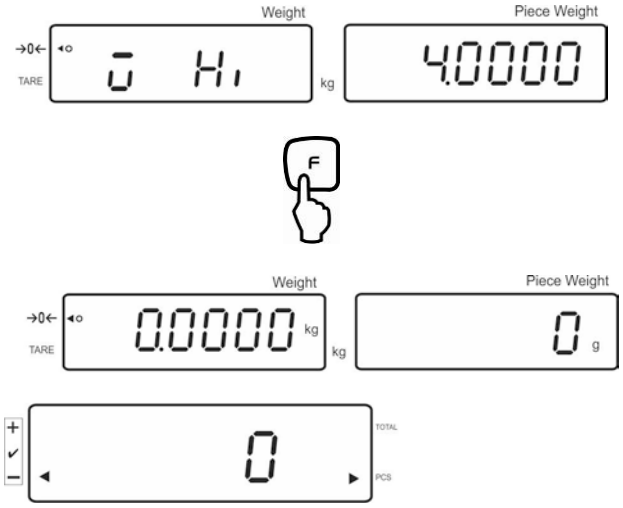


The upper limit for the target weight including current setting will be displayed.

Delete with C if necessary.

English

⇨ Use the numeric keys to enter the upper limit (such as 4 kg) and confirm by F.



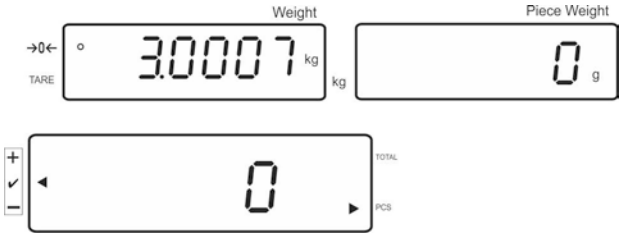
English

Start tolerance check

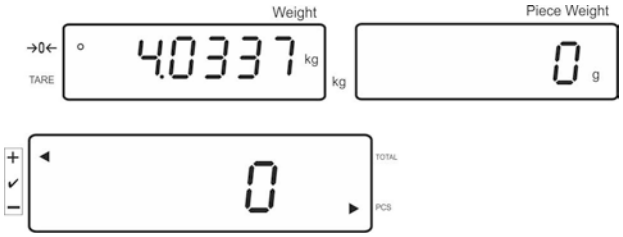
⇨ Place load and wait until tolerance indicator **[◀]** appears. With the help of the tolerance indicator check if the weighed goods are under, inside or over the default tolerance.
Depending on the setting in the menu an additional audio signal may be sounded.

Target weight below tolerance:

Target weight within tolerance:



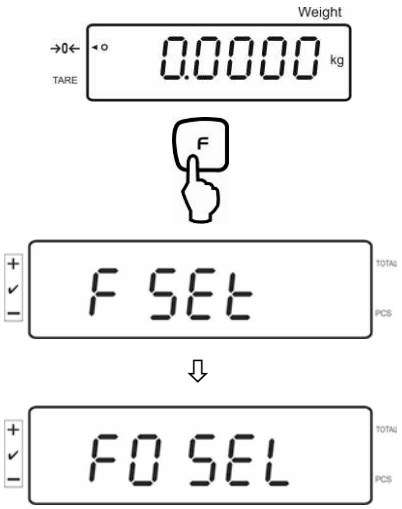
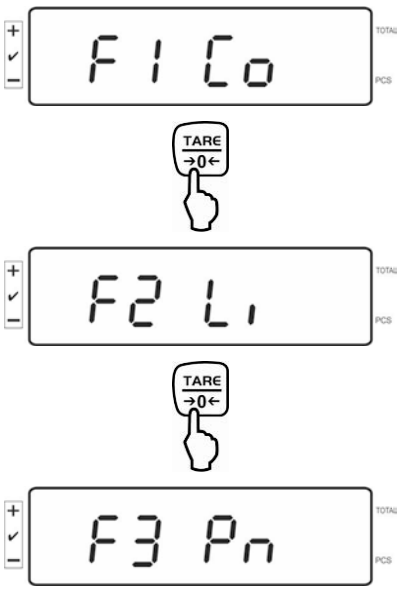
Target weight exceeds tolerance:



English

8 Function menu

Navigation in the menu:

Call up menu	In weighing mode keep F pressed until F S E t appears. Release button. The first menu item **F0. SEL** is displayed. 
Select menu items	With help of TARE, the individual menu items can be selected one after the other.  etc.

English

Change settings	Confirm selected menu item with F and the current setting will be shown. Change setting in selected menu item by pressing TARE →0←. 
Confirm setting	Confirm required setting with F and the appliance returns to the menu.
Return to weighing mode	Press to return to weighing mode +. 

English

Overview:

Menu item	Available settings	
F0 SEL Enable tolerance check	1 SEL0	Tolerance check disabled
	1 SEL1*	Tolerance check for weighing
	1 SEL2*	Tolerance check for counting
F1 Co Display conditions of the tolerance marker	11 Co0	Tolerance marker is always displayed, even if standstill control is not yet displayed.
	11 Co 1*	Tolerance marker is only displayed in connection with standstill control.
F2 Li Tolerance range	12 Li 0	Tolerance marker is only displayed above zero range.
	12 Li 1*	Tolerance marker is displayed for the whole range.
F3 Pn Number of limiting points	13 Pn 0	1- Limiting point (OK/ -)
	13 Pn 1*	2- Limiting points (+/OK/-)
F4 bU Audio signal	14 bu0*	Audio sound during tolerance check disabled
	14 bu1	Audio sound when load is within tolerance limits
	14 bu2	Audio sound when load is beyond tolerance limits
F5 Ao Automatic zero point correction (zero tracking)	2 Ao0	Automatic zero tracking off
	2 Ao1	Automatic limiting point correction on, 0.5 d
	2 Ao2*	Automatic limiting point correction on, 1 d
	2 Ao3	Automatic limiting point correction on, 2 d
	2 Ao4	Automatic limiting point correction on, 4 d
F6 AP Automatic shutdown for battery operation	3 Ap0*	AUTO OFF function disabled
	3 Ap1	Instrument will be switched off after 3 minutes of inactivity of display unit or weighing bridge.
F7 UA RS-232 mode	4 UA0	Output via RS232C interface disabled
	4 UA1*	Continuous data output
	4 UA2	Continuous data output of stable weighing values
	4 UA3	One output for stable weighing value. No output for stable weighing values. Renewed output after stabilization.
	4 UA4	Remote control commands, see chap. 9.2.8 / output after pressng the PRINT button
	4 UA5	Standard printer setting, output after pressing the PRINT button
	4 UA6	Not documented
F8 bl. Baud rate	41 bl 0	1200 bps
	41 bl1	2400 bps
	41 bl 2	4800 bps
	41 bl 3*	9600 bps

English

F9 PA Parity	42 Pr0*	No parity bit
	44 Pr1	Odd parity
	44 Pr2	Even parity
F10 S0	Sd0 on*	Autom. printout enabled on zero display
	Sd0 of	Autom. printout disabled on zero display
F11 AC	5 AC 0	For automatic totalizing see chap. 7.7.2 With this function the individual weighing values are automatically added into the summation memory when the balance is unloaded and edited, when an optional printer is connected.
	5 AC 1*	Manual totalizing, see chap. 7.7.1 With this function the individual weighing values are added into the summation memory by pressing  and edited, when an optional printer is connected.
F12 bk Display background illumination	5 bkL0	Background illumination off
	5 bkL1*	Automatic background illumination on when weighing pate is loaded or key pressed.
	5 bkL2	Continuous background lighting

English

Factory settings are marked by *.

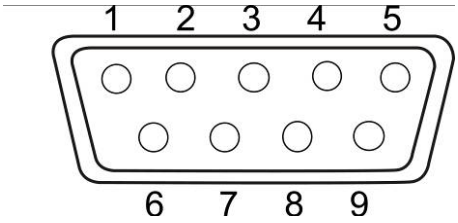
9 RS 232C interface

The RS 232C interface allows a bi-directional data exchange from the balance to external devices. This data exchange is asynchronous using ASCII - Code.
The following conditions must be met to provide successful communication between the weighing system and the printer.

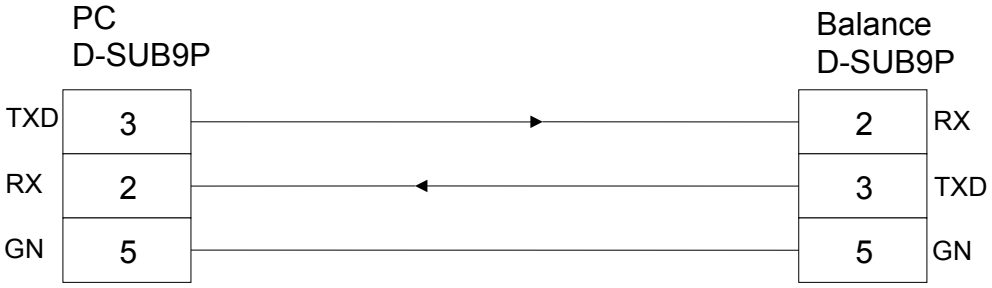
- Use a suitable cable to connect the display unit to the interface of the printer. Faultless operation requires an adequate KERN interface cable.
- Communication parameters (Baud rate, parity, see chap. 8) of display device and printer must match.

Pin allocation of balance output plug:

Pin nr.	Signal	Input/Output	Function
2	RXD	Input	Receive data
3	TXD	Output	Transmit data
4	DTR	Output	HIGH
5	GND	-	Signal ground
6	-	-	
7	-	-	
8	-	-	
9	GND	-	Signal ground



Interface cable:



9.1 Printer mode

Printout example (KERN YKB-01N):

ST, GS 1.000kg

Symbols:

ST	Stable value
US	Instable value
NT	Net weight
GS	Gross weight
NO	Number of weighing when totalizing
UW	Average piece weight
PCS	Quantity
WT	Total weight „Total“

9.2 Remote control instructions

Command	Function	Printout example
S	Stable weighing value for the weight is sent via the RS232 interface	ST,NT 0.0000kg
W	Weighing value for the weight (stable or unstable) is sent via the RS232 interface	ST,GS 1.9990kg
T	No data are sent, the balance carries out the tare function.	-
Z	No data are sent, the zero-display appears.	-
P	Quantity will be sent via the RS232-interface	ST,GS 10pcs

10 Service, maintenance, disposal

10.1 Clean

Before cleaning, disconnect the appliance from the operating voltage.

Please do not use aggressive cleaning agents (solvents or similar agents), but a cloth dampened with mild soap suds. Take care that the device is not penetrated by fluids and polish it with a dry soft cloth.
Loose residue sample/powder can be removed carefully with a brush or manual vacuum cleaner.

Spilled weighing goods must be removed immediately.

10.2 Service, maintenance

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

10.3 Disposal

Disposal of packaging and appliance must be carried out by operator according to valid national or regional law of the location where the appliance is used.
Should other error messages occur, switch balance off and then on again. If the error message remains inform manufacturer.

11 Error messages, troubleshooting guide

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

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

Error message	**Possible cause**
o-Err	• Weighing range exceeded
u-Err	• Insufficient preload, e. g. missing weighing pan
b-Err	• Missing internal memory
1-Err	• Incorrect adjusting weight
2-Err	• Inappropriate adjustment
I-Err	• Item weight too low
Err 3	• Adjustment error • Transport safety device has not been removed

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

12 Installing display unit / weighing bridge

Installation / configuration of the weighing system must be carried out by a well acquainted specialist with the workings of weighing balances.

12.1 Technical data

Supply voltage:	5 V/150mA
Sensitivity	2-3 mV/V
Resistance parameter	80 - 100 Ω, max 4 items per 350 Ω load cell

12.2 Weighing system design

The display unit is suitable for connection to any analogue platform in compliance with the required specifications.
The following data must be established before selecting a weighing cell:

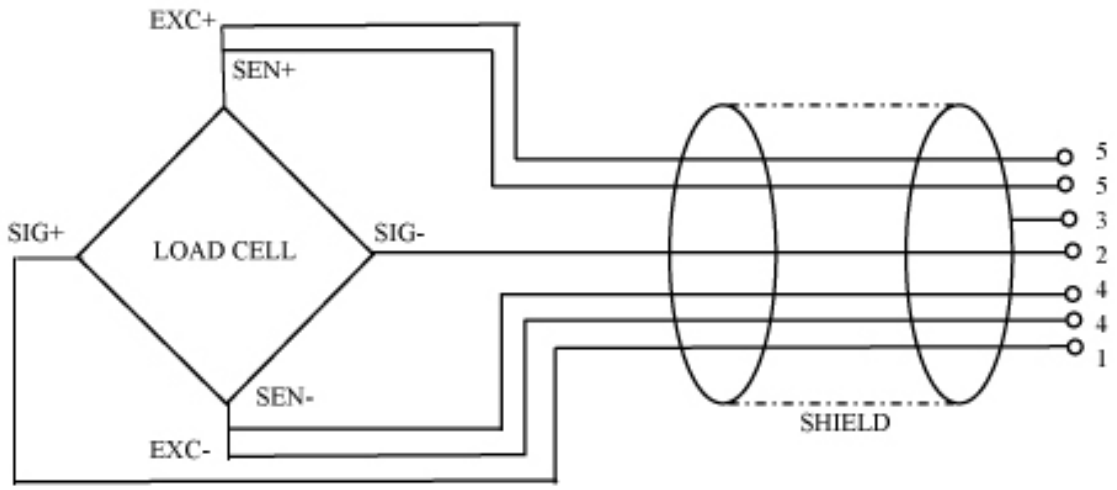
- **Weighing balance capacity**
  This usually corresponds to the heaviest load to be weighed.
- **Preload**
  This corresponds to the total weight of all parts that are to be placed on the weighing cell such as upper part of platform, weighing pan etc.
- **Total zero setting range**
  This is composed of the start-up zero setting range (± 2%) and the zero setting range available to the user via the ZERO-key (2%). The total zero setting range equals therefore 4 % of the scale's capacity.

  The addition of weighing scales capacity, preload and the total zero setting range give the required capacity for the weighing cell.
  To avoid overloading of the weighing cell, include an additional safety margin.
- **Smallest desired display division**

English

12.3 How to connect the platform

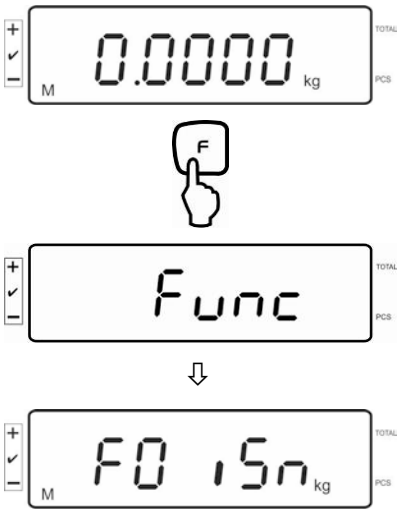
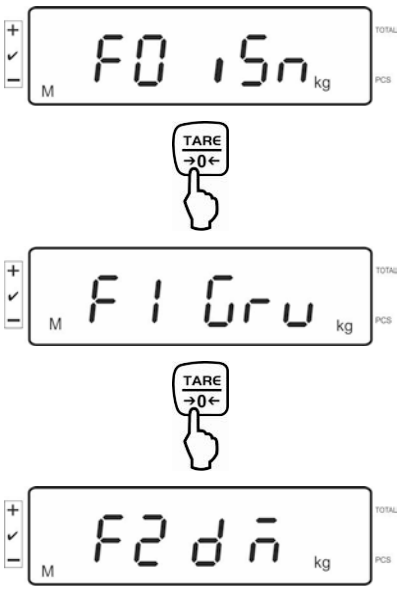
- ⇨ Disconnect the display unit from the power supply.
- ⇨ Weld the individual wires of the load cell cable to the printed circuit board.
- ⇨ Please see diagram below for plug allocation.



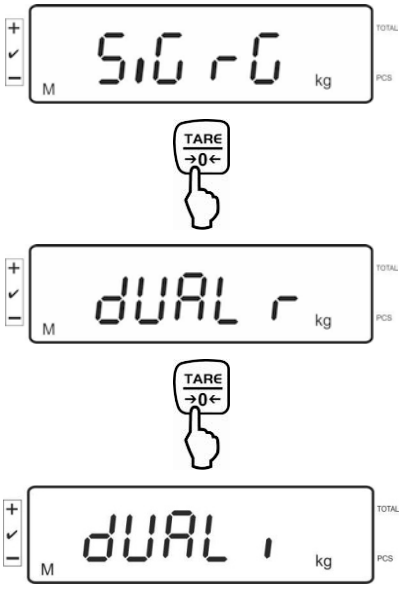
English

12.4 Configuring display devices

Navigation in the menu:

Call up menu	Switch-on balance and during the selftest press F.  To call the firm menu item F, press and hold for approx. 5-6 seconds until **Func** followed by **F0 iSn** appears. Release button. 
How to select menu items	With help of TARE →0←, the individual menu items can be selected one after the other.  and so on

English

Change settings	Confirm selected menu item such as **F2 dm** by pressing F and the current setting will be displayed. Change setting in selected menu item by pressing TARE →0←. 
Confirm setting	Confirm required setting with F and the appliance returns to the menu.
Reject setting	+ Press , the unit will return to the menu
Return to weighing mode	Press back to weighing mode + several times. 

English

Configuration menu overview:

Menu block Main menu	Menu item sub menu	Available settings / explanation		
F0 iSn	-	Display internal resolution		
F 1 Grv	-	Not documented		
F2 dm	SiG rG	Single-range balance Confirm with [F], then the following menu items can be selected by [TARE →0←].		
		dESC		Position decimal point available selection 0, 0.0, 0.00, 0.000, 0.0000, 0.00000
		inC	inC 1	Readability selectable 1, 2, 5, 10, 20, 50
			inC 2	
			inC 5	
			inC 10	
			inC 20	
			inC 50	
		CAP		Balance capacity (max)
		Adjust weighing system according to configuration.		
		CAL	nonLin	Adjustment, see chap. 6.5
			LinEAr	For linearisation see chapter 6.6

English

<table>
<tr><td rowspan="15"></td><td rowspan="15">dUAL r</td><td colspan="4">Dual range balance
Confirm with F, then the following menu items can be selected by TARE →0←.</td></tr>
<tr><td colspan="2">dESC</td><td colspan="2">Position decimal point available selection 0, 0.0, 0.00, 0.000, 0.0000, 0.00000</td></tr>
<tr><td rowspan="6">inC</td><td rowspan="6">div 1</td><td>inC 1</td><td rowspan="6">Readability for
1. Weighing range
Selectable 1, 2, 5, 10, 20, 50</td></tr>
<tr><td>inC 2</td></tr>
<tr><td>inC 5</td></tr>
<tr><td>inC 10</td></tr>
<tr><td>inC 20</td></tr>
<tr><td>inC 50</td></tr>
<tr><td rowspan="6">div 2</td><td>inC 1</td><td rowspan="6">Readability for
2. Weighing range
Selectable 1, 2, 5, 10, 20, 50</td></tr>
<tr><td>inC 2</td></tr>
<tr><td>inC 5</td></tr>
<tr><td>inC 10</td></tr>
<tr><td>inC 20</td></tr>
<tr><td>inC 50</td></tr>
<tr><td rowspan="4"></td><td rowspan="2"></td><td rowspan="2">CAP</td><td>CAP 1</td><td colspan="2">Balance capacity (Max) 1st weighing range</td></tr>
<tr><td>CAP 2</td><td colspan="2">Balance capacity (Max) 2nd weighing range</td></tr>
<tr><td colspan="5">Adjust weighing system after configuration.</td></tr>
<tr><td rowspan="2"></td><td rowspan="2">CAL</td><td>nonLin</td><td colspan="2">Adjustment, see chap. 6.5</td></tr>
<tr><td>LinEAr</td><td colspan="2">For linearisation see chapter 6.6</td></tr>
</table>

English

	dUAL i	Multi-interval balance Confirm by →0←, after that the following menu items are available.			
		dEC i		Position decimal point available selection 0, 0.0, 0.00, 0.000, 0.0000	
		inC	div 1	inC 5	Readability for 1. Weighing range Selectable 1, 2, 5, 10, 20, 50
				inC 5	
				inC 5	
				inC 10	
				inC 20	
				inC 50	
			div 2	inC 1	Readability for 2. Weighing range Selectable 1, 2, 5, 10, 20, 50
				inC 2	
				inC 5	
				inC 10	
				inC 20	
				inC 50	
		CAP	CAP 1	Balance capacity (Max) 1st weighing range	
			CAP 2	Balance capacity (Max) 2nd weighing range	
		Adjust weighing system according to configuration.			
		CAL	nonLin	Adjustment, see chap. 6.5	
			LinEAr	Linearisation see chap. 6.6	

English

13 Declaration of conformity

KERN & Sohn GmbH
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Declaration of conformity

EG-Konformitätserklärung
EC- Déclaration de conformité
EC-Dichiarazione di conformità
EC- Declaração de conformidade
EC-Deklaracja zgodności

EC-Declaration of -Conformity
EC-Declaración de Conformidad
EC-Conformiteitverklaring
EC- Prohlášení o shode
EC-Заявление о соответствии

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

Electronic Balance: KERN KFS-T;BFS;IFS

EU Directive	**Standards**
2004/108/EC	EN55022: 2006 A1:2007 EN61000-3-3:1955+A1:2001+A2:2005 EN55024: 1998+A1:2001+A2:2003
2006/95/EC	EN 60950-1:2006 EN 60065:2002+A1:2006
2005/32/EC	

Date: 18.07.2011 **Signature:**

KERN & Sohn GmbH
Management

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