KERN & Sohn GmbH

**Operating Instructions
Compact scales**

KERN FTC

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Table of contents

1   Introduction

1.1   Safety instructions

CAUTION!

Do not use the scale in hazardous areas!

Our product range includes special devices for hazardous areas.

DANGER!

Electric shock hazard!

▲ Always pull out the mains plug before any work on the device.

DANGER!

Electric shock hazard if the mains cable is damaged!

▲ Check the mains cable for damage regularly and replace it immediately if it is damaged.

▲ On the rear side of the device, maintain a clearance of at least 3 cm in order to prevent the mains cable bending too much.

CAUTION!

On no account open the device!

The warranty is void if this stipulation is ignored. The device may only be opened by authorized persons.

CAUTION!

Handle the compact scale with care.

The scale is a precision instrument.

▲ When the weighing pan has been removed, never clean the area under the load plate holder with a solid object!

▲ Do not put excessive loads on the scale.

▲ Avoid banging the weighing pan.

Disposal

➜ Observe the valid environmental regulations when disposing of the scale.

If the device has a rechargeable battery:

The battery contains heavy metals and therefore must not be disposed of with normal waste.

➜ Observe the local regulations for disposing of environmentally hazardous materials.

Note   **Use with foodstuffs**

Parts coming into contact with foodstuffs have smooth surfaces and are easy to clean. The materials used do not splinter and are free of harmful substances.

With foodstuffs, it is recommended to use the supplied protective cover.

➜ Clean the protective cover regularly and carefully.

➜ Replace damaged or very dirty protective cover immediately.

1.2   Description

The compact scales are available in a small and large size in various capacities and resolutions.

The power supply is carried out via a built-in power supply device, an internal rechargeable battery with an external mains adapter or an external battery.

One of the following options can also be ordered:

• Additional interface RS232

• Ethernet interface

• Analog second scale interface

1.2.1   **Overview**

1   Display

2   Scale specifications

3   Load plate

4   Adjustable foot

5   Keys

1   Power supply
        connection

2   Optional interface

3   RS232 interface
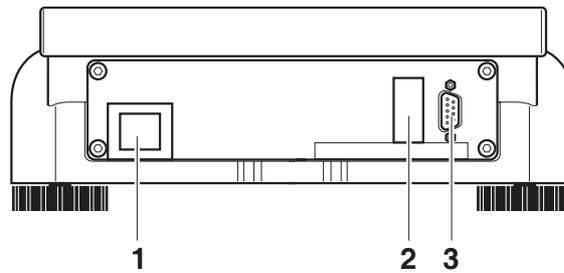
1.2.2   Display
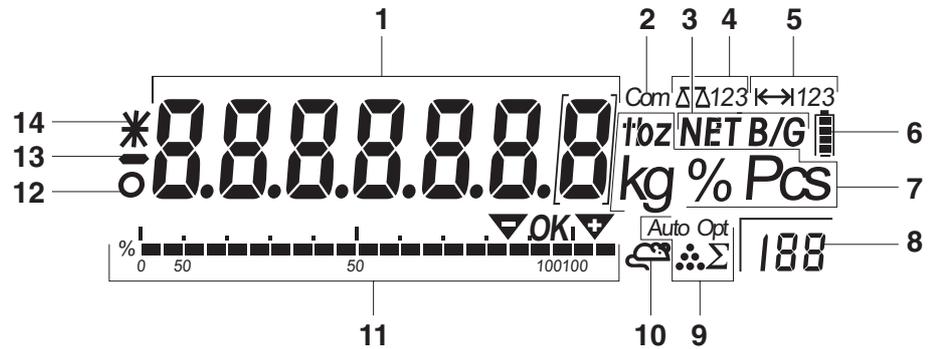
1   7-segment display, 7 digits, with decimal point

2   Active interface

3   Symbol for displaying gross and net values

4   Active scale

5   Weighing range display

6   Battery charge level; only present on scales with a battery

7   Weight units

8   Selected reference quantity

9   Symbols for optimizing the average piece weight

10 Symbol for dynamic weighing

11 Graphic display of the weighing range

12 Stability monitor (goes out when a stable weight value is reached)

13 Sign

14 Identification for changed or calculated weight values, e.g. higher resolution, minimum weight not reached

1.2.3   Keypad

Main functions

Key	Function in operating mode	Function in the menu
ON / OFF	Switching device on / off, abort	To the last menu item –End–
→0←	Setting scale to zero	Scrolling back
TARE	Taring scale	Scrolling forward
PRINT	Transfer key Long key press: Calling up menu	Activating menu item Accepting selected setting
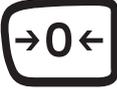
Additional functions

Key	Function
BG/NET	Switching between gross and net weight; displaying tare specification
🔍	Calling up additional information, e.g. gross weight, average piece weight, higher resolution …
⚖	Switching the scale
▮▲	Switching between weight value and number of pieces
REF 10	Determining average piece weight from 10 pieces
REF n	Determining average piece weight from any number of pieces

1.3 Putting into operation

1.3.1 Selecting or changing the location

The correct location is crucial to the accuracy of the weighing results!
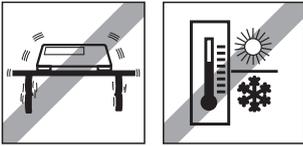
→ Select a stable, vibration-free and if possible a horizontal location.

The ground must be able to safely bear the weight of the fully loaded scale.

Observe the following environmental conditions:

- No direct sunlight
- No strong drafts
- No excessive temperature fluctuations
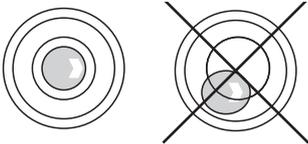
Aligning the scale

Only scales that have been aligned precisely horizontally provide accurate weighing results. The certified scales have a spirit level to simplify alignment.

→ Turn the adjustable feet of the scale until the spirit level's air bubble is inside the inner circle.

Major geographical location changes

The manufacturer adjusts each scale to the local gravity conditions (GEO value). In the event of major geographical location changes, this setting must be adjusted by a service technician. Certified scales must also be recertified observing the national certification regulations. These steps are not necessary for scales with an internal calibration weight.

1.3.2   Connecting the power supply

CAUTION!

Before connecting the scale to the mains, check whether the voltage value printed on the rating plate corresponds with the local mains voltage.

▲ Never connect the device if the voltage value printed on the rating plate is different to the local mains voltage.

➔ Plug the mains plug into the socket.

   After connection, the device performs a self-test. When the zero display appears, the device is ready to weigh.

➔ Calibrate the device in order to obtain the greatest possible precision, see Section 4.3.1.
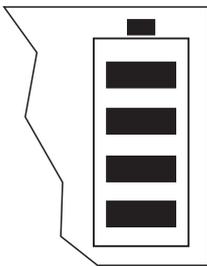
Scales with a built-in battery can work independently from the mains for approximately 30 hours in normal operation. A prerequisite for this is that the background lighting is switched off and that no peripheral devices are connected.

The device automatically switches to battery operation as soon as the mains supply is interrupted. When the mains supply is restored, the device automatically switches back to mains operation.

The battery symbol indicates the present charging level of the battery. 1 segment corresponds to approx. 25 % capacity. When the symbol flashes the battery must be charged (min. 4 hours). The charging period is extended if work is continued during charging. The battery is protected against overcharging.

Note   The battery's charging capacity can be reduced under continuous mains operation.

➔ To maintain the charging capacity, after a maximum of 4 weeks discharge the battery completely before recharging it.

1.3.3   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).

1.3.4   **Adjustment**

<u>General</u>:

According to the EU guideline 90/384/EEC balances must be verified officially if they are to be used as follows (legally regulated area):

- For commercial transactions if the price of goods is determined by weighing
- For the production of medines in pharmacies as well as for analyses in the medical and pharmaceutical laboratory
- For official purposes
- For the production of finished packages

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

<u>Verification Information:</u>

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.

2   Operation

2.1   Switching on and off

Switching on   ➔ Press $\boxed{\frac{ON}{OFF}}$.

The scale conducts a display test. When the weight display appears, the scale is ready to weigh.

Switching off   ➔ Press $\boxed{\frac{ON}{OFF}}$.

Before the display goes out, -OFF- appears briefly.

2.2   Zeroing / Zero point correction

Zeroing corrects the influence of slight changes on the load plate.

Manual   1. Unload scale.

2. Press $\boxed{\rightarrow 0 \leftarrow}$.

The zero display appears.

Automatic   In the case of scales that cannot be certified, the automatic zero point correction can be deactivated in the menu or the amount can be changed.

As standard, the zero point of the scale is automatically corrected when the scale is unloaded.

2.3   Simple weighing

1. Place weighing sample on scale.

2. Wait until the stability monitor ○ goes out.

3. Read weighing result.

2.4   **Weighing with tare**

2.4.1   **Taring**

➜ Place the empty container on the scale and press [TARE].

The zero display and the symbol **NET** appear.

The tare weight remains saved until it is cleared.

2.4.2   **Clearing the tare**

➜ Unload scale and press [TARE].

The symbol **NET** goes out, the zero display appears.

If A.CL-tr is activated in the menu, the tare weight is automatically cleared as soon as the scale is unloaded.

2.4.3   **Automatic taring**

Prerequisite

A-tArE is activated in the menu, the symbol **T** flashes in the display.

➜ Place the container or packaging material on the scale.

The packaging weight is automatically saved as the tare weight, the zero display and the symbol **NET** appear.

2.4.4   **Chain tare**

Prerequisite

The tare function CHAIn.tr is activated in the menu.

With this function it is possible to tare several times if, for example, cardboard is placed between individual layers in a container.

1. Place the first container or packaging material on the scale and press [TARE].

   The packaging weight is automatically saved as the tare weight, the zero display and the symbol **NET** appear.

2. Weigh the weighing sample and read/print out the result.

3. Place the second container or packaging material on the scale and press [TARE] again.

   The total weight on the scale is saved as the new tare weight. The zero display appears.

4. Weigh the weighing sample in the second container and read/print the result.

5. Repeat the last two steps for other containers.

2.5   Calling up the gross weight and tare value

1. Press [BG/NET].

   The gross weight is displayed for 2 seconds.

2. Press [BG/NET] again while the gross weight is displayed.

   The tare value is displayed. After a few seconds, the scale changes back to the net weight display.

2.6   Displaying weight values with a higher resolution

→ Press [Q].

   The current weight value is displayed for 2 seconds in a higher resolution. The scale then changes back to the normal resolution.

2.7   Displaying the capacity available

The scale has a graphic display of the scale capacity available. The bar indicates how many per cent of the scale capacity is already occupied and what capacity is still available. In the example, approx. 65 % of the scale capacity is occupied.

2.8   Dynamic weighing

With the dynamic weighing function, it is possible to weigh restless weighing samples such as live animals. If this function is activated, the symbol ⏖ appears in the display.

With dynamic weighing, the scale calculates the mean value from 56 weighing operations within 4 seconds.

With manual start   **Prerequisite**

AVErAGE -> MAnuAL is selected in the menu.

The weighing sample must be heavier than 5 scale divisions.

1. Place the weighing sample on the scale and wait until it has stabilized.

2. Press [PRINT] to start dynamic weighing.

   During dynamic weighing, horizontal segments appear in the display, and the dynamic result is then displayed with the symbol *****.

3. Unload the scale to be able to start a new dynamic weighing operation.

With automatic start   **Prerequisite**

AVErAGE -> AUtO is selected in the menu.

The weighing sample must be heavier than 5 scale divisions.

1. Place the weighing sample on the scale.

    The scale starts the dynamic weighing automatically.

    During dynamic weighing, horizontal segments appear in the display, and the dynamic result is then displayed with the symbol *****.

2. Unload the scale to be able to perform a new dynamic weighing operation.

2.9   Printing results

If a printer or computer is connected to the scale, the weighing results can be printed out or sent to a computer.

➜ Press ⌈PRINT⌋ .

The display contents are printed out and transferred to the computer. See Section 8.2 for sample protocols.

2.10   Switching scales

If a second scale or a weighing platform is connected, e. g. via the optional analog second scale interface, the currently active scale is shown in the display.

The second scale can be operated in exactly the same way as the first scale.

➜ Press ⌈△△⌋ .

The display changes from one scale to the other.

2.11   Cleaning

CAUTION!

Electric shock hazard!

▲ Before cleaning with a damp cloth, pull out the mains plug to disconnect the unit from the power supply.

CAUTION!

When the weighing pan has been removed, never clean the area under the load plate holder with a solid object!

This could damage the weighing cell.

Other cleaning information:

- Use damp cloths.
- Do not use any acids, alkalis or strong solvents.
- Do not clean using a high-pressure cleaning unit or under running water.
- If very dirty, remove the weighing pan, protective cover (if present) and adjustable feet and clean these items separately.
- Follow all the relevant instructions regarding cleaning intervals and permissible cleaning agents.

3   Counting

The compact scales FTC have additional functions for piece counting. The relevant settings in the menu are described in Section 4.4.1.

3.1   Counting parts into a container

1. Place the empty container on the scale and press $\boxed{\text{TARE}}$.

   The container is tared and the zero display appears.

2. Place **10** reference parts on the scale and press $\boxed{\text{REF 10}}$.

   -or-

→ Place the number of pieces displayed above the key $\boxed{\text{REF n}}$ on the scale and press $\boxed{\text{REF n}}$.

   The scale determines the average piece weight and then shows the number of pieces.

3. Add more parts to the container until the required number of pieces is reached.

Note • The average piece weight remains saved in the factory setting until a new average piece weight is determined.

• With $\boxed{\text{🔢}}$ it is possible to switch between the number of pieces and the weighing units preset.

• When the number of pieces is displayed, it is possible to display with $\boxed{\text{Q}}$ the average piece weight, i. e. the weight of a single reference part, for 2 seconds.

• If A.CL-APW ON is set in the menu, the average piece weight is automatically cleared after each counting operation. The average piece weight must be determined again for the next counting operation.

• If ACCurCY ON is set in the menu, the accuracy achieved is briefly shown after the number of pieces is determined.

3.2   Counting parts out of a container

1. Place the full container on the scale and press `TARE`.

   The container is tared and the zero display appears.

2. Remove **10** reference parts and press `REF 10`.

   -or-

➜ Remove the number of pieces displayed above the key `REF n` and press `REF n`.

   The scale determines the average piece weight and then shows the number of pieces removed, together with a minus sign.

3. Remove more parts from the container until the required number of pieces is reached.

3.3   Counting with variable reference quantity

If `VAr-SPL ON` is set in the menu, it is possible to select from 5 preset reference quantities via `REF n`.

➜ Press `REF n` as often as necessary until the display above the key has changed to the desired reference quantity.

The rest of the counting process is as described earlier.

3.4   Counting with minimum accuracy

The item `Min.rEFW` in the menu allows to preset a minimum accuracy of 97.5 %, 99.0 % or 99.5 %. On the basis of this, the scale calculates the minimum reference weight necessary to reach the defined accuracy.

1. Place the reference parts on the scale and press `REF 10` or `REF n`.

2. If the average piece weight is not sufficient to ensure the desired accuracy, `Add x` **PCS** appears.

3. Add the displayed number of pieces.

   The scale then automatically determines the average piece weight with the larger reference quantity.

The rest of the counting process is as described earlier.

3.5   Reference optimization

The greater the reference quantity, the more accurately the scale determines the number of pieces.

3.5.1   Automatic reference optimization

rEF.OPt -> AUtO must be set in the menu for this. The symbol **Auto Opt** appears in the display.

1. Place the reference parts on the scale and press REF 10 or REF n.
2. Place additional reference parts, max. the same number as for the first reference determination, on the scale.

   The scale automatically optimises the average piece weight with the larger number of reference parts.

The rest of the counting process is as described earlier.

Note   The reference optimization can be performed several times.

3.6   Counting with automatic reference determination

Prerequisite

A-SMPL ON is set in the menu.

→ Place the number of pieces displayed above the key REF n into the container.

   The scale automatically determines the average piece weight and then shows the quantity.

The rest of the counting process is as described earlier.

3.7   Counting with two scales

For piece counting, it is possible to connect a second scale or weighing platform, e. g. a floor scale for counting a large number of pieces via the optional analog second scale interface.

The necessary settings for the application and interface parameters are described in the Sections 4.4.1, 4.6.1 and 4.6.4.

3.7.1   Counting with a reference scale

Prerequisite

The connected second scale is configured as reference scale.

1. Place the reference parts on the reference scale and press `REF 10` or `REF n`.

   The scale determines the average piece weight and changes to the display in pieces (PCS).

2. Place the parts to be counted on the first scale.

   The total quantity is displayed.

Note
- If `tOtAL-Ct -> bULK` is set in the menu, only the number of pieces on the bulk scale is displayed.
- If `tOtAL-Ct -> bOtH` is set in the menu, the reference quantity is added to the bulk quantity.

3.7.2   Counting with a bulk scale

Prerequisite

The connected second scale is configured as bulk scale.

1. Place the reference parts on the first scale and press `REF 10` or `REF n`.

   The scale determines the average piece weight and changes to the display in pieces (PCS).

2. Place the parts to be counted on the bulk scale.

   The total quantity is displayed.

Note
- If `tOtAL-Ct -> bULK` is set in the menu, only the number of pieces on the bulk scale is displayed on the bulk scale.
- If `tOtAL-Ct -> bOtH` is set in the menu, the reference quantity is added to the bulk quantity.

3.7.3   Counting with an auxiliary scale

Note   This configuration allows counting of diverse parts, for example very small parts on one scale and large parts on the other scale.

Prerequisite

The connected second scale is configured as an auxiliary scale. The scale doesn't change automatically but only after pressing the ⎡⎤ key.

1. Activate the appropriate scale.

2. Place the reference parts on this scale and press ⎡REF 10⎤ or ⎡REF n⎤.

   The scale determines the average piece weight and changes to the display in pieces (PCS).

3. Place the parts to be counted on the same scale.

   The number of pieces is displayed.

4   Settings in the menu

Settings can be changed and functions can be activated in the menu. This enables adaptation to individual weighing requirements.

The menu consists of 6 main blocks containing various submenus on several levels.

4.1   Operating the menu

4.1.1   Calling up the menu and entering the password

The menu differentiates between 2 operating levels: Operator and Supervisor. The Supervisor level can be protected by a password. When the device is delivered, both levels are accessible without a password.

Operator menu
1. Press [PRINT] and keep it pressed until COdE appears.
2. Press [PRINT] again.

   The menu item tErMINL appears. Only the submenu dEVICE is accessible.

Supervisor menu
1. Press [PRINT] and keep it pressed until COdE appears.
2. Enter the password and confirm with [PRINT].

   The first menu item SCALE appears.

Note   No supervisor password has been defined when the device is first delivered. Therefore respond to the password inquiry with [PRINT] when you call up the menu for the first time.

If a password has still not been entered after a few seconds, the scale returns to weighing mode.

Emergency password for Supervisor access to the menu

If a password has been issued for Supervisor access to the menu and you have forgotten it, you can still enter the menu:

➔ Press [→0←] 3 times and confirm with [PRINT].

4.1.2   Selecting and setting parameters
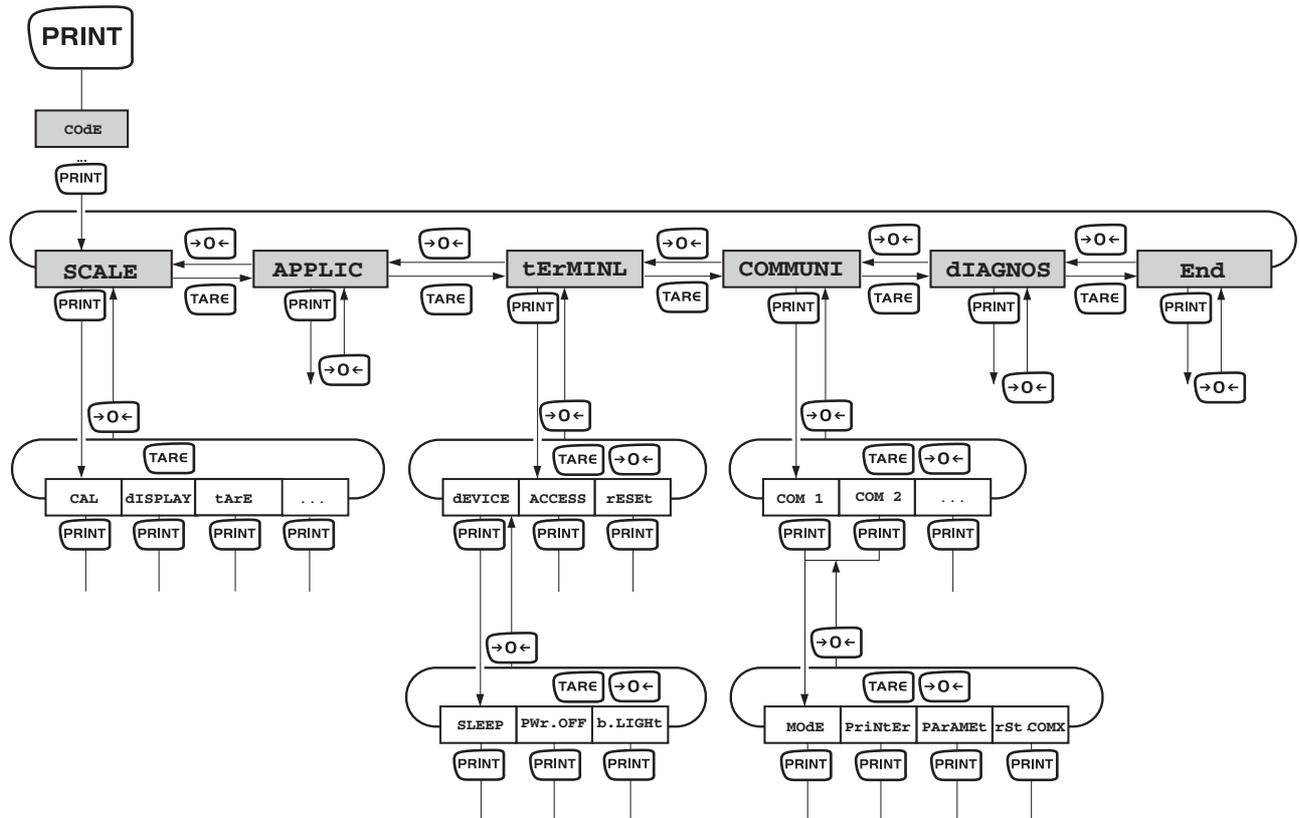
Scrolling on one level   ➜ Scroll forward: Press [TARE].

                             ➜ Scroll back: Press [→0←].

Activating menu items/   ➜ Press [PRINT].
accepting selection

Exiting menu   1. Press [ON/OFF].

                     The last menu item END appears.

                  2. Press [PRINT].

                     The inquiry SAVE appears.

                  3. Confirm inquiry with [PRINT] to save the settings and return to weighing mode.

                     -or-

                  ➜ Press [TARE] to discard changes and return to weighing mode.

4.2   Overview

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Page
		CAL				28
		dISPLAY	UNIt1	g, **kg**, oz, lb, t		30
			UNIt2	**g**, kg, oz, lb, t		
			rESOLU			
			UNt.rOLL	ON, **OFF**		
		tArE	A-tArE	ON, **OFF**		30
			ChAIn.tr	**ON**, OFF		
			A.CL-tr	ON, **OFF**		
		ZErO	AZM	OFF; 0.5 d; 1 d; 2 d; 5 d; 10 d		30
		rEStArt	ON/**OFF**			31
		FILtEr	VibrAt	LOW, **MEd**, HIGH,		31
			PrOCESS	**UNIVEr**, dOSING		
			StABILI	FASt, **StAndrd**, PrECISE		
		rESEt	SUrE?			31
APPLIC	COUNt	VAr-SPL	ON, **OFF**			32
		SPL-qtY	Sq1 ... Sq5			
		Min.reFW	**OFF**, 97.5%, 99.0%, 99.5%			
		rEF OPt	**OFF**, AUtO			
		A-SMPL	ON, **OFF**			
		A.CL-APW	ON, **OFF**			
		ACCurCY	ON, **OFF**			
		tOtAL.Ct	**bULK**, bOth			
	AVErAGE	**OFF**, AUtO, MAnuAL				33
	rESEt	SUrE?				33
tERMINL	dEVICE	SLEEP	**OFF**, 1 min, 3 min, 5 min			34
		PWr OFF	**YES**, NO			
		b.LIGHt	ON, **OFF**			
	ACCESS	SUPErVI				34
	rESEt	SUrE?				34

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Page
COMMUNI	COM 1/COM 2	MOdE	**Print**			35
			A.Print			
			CONtINU			
			dIALOG			
			CONt.OLd			
			dIAL.OLd			
			dt-b	GrOSS	ON, OFF	
				tArE	ON, OFF	
				nEt	ON, OFF	
			dt-G	GrOSS	ON, OFF	
				tArE	ON, OFF	
				nEt	ON, OFF	
			COnt-Wt			
			COnt-Ct			
			2nd.dISP			
			rEF			
			bULK			
			AuXILIA			
		PriNtEr	tEmPLat	**StdArd**, tEMPLt1, tEMPLt2		35
			ASCi.Fmt	LINE.FMt	**MULtI** SIN-GLE	
				LENGtH	1 … 100	
				SEPArAt	,;…	
				Add LF	0 … 9	
		PArAMEt	bAUd	300 … 38400		36
			PAritY	7 nonE, 8 nonE, 7 odd, 8 odd, **7 EVEN**, 8 EVEN		
			H.SHAKE	NO, **XONXOFF**, nEt 422, nEt 485		
			NEt.Addr	0 … 31		
			ChECSuM	ON, **OFF**		
			Vcc	ON, **OFF**		
		rSt.COMx	SUrE?			36

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Page
COMMUNI	OPtION	EtH.NEt	IP.AddrS, SUbNEt, GAtEWAY			36
		USb	USb tESt			36
		diGitAL	IN 1 … 4	**OFF**, ZErO, tArE, Print, rEF 10, rEF n, SCALE, Unit		36
			OUT 1 … 4	**OFF**, StAbLE, bEL.Min, AbV.Min, UndErLd, OVErLd, StAr		
		ANALOG	Mode	**rEF**, bULK, AuXILIA, bYPASS		36
	dEF.PrN	tEMPLt1/ tEMPLt2	LINE 1 ... LINE 20	**NOt.USEd**, HEAdEr, SCALE.NO, GrOSS, tArE, nEt, APW, rEF Ct, PCS, StArLN, CrLF, F FEEd		37
dIAGNOS	tESt SC	intErN/ExtErN				38
	KboArd					
	dISPLAY					
	SNr					
	SNr2					
	LiSt					
	LiSt2					
	rESEt.AL	SUrE?				

4.3   Scale settings (SCALE)

4.3.1   CAL – 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 during the initial start-up, after change in location and variation of surrounding temperature. It is also recommendable to adjust the balance periodically during weighing operation in order to obtain exact measured values.

Adjusting of non verifiable balances

External	For scales **without** an internal calibration weight:
	1. Unload scale.
	2. Activate menu item CAL with [PRINT] . The scale determines the zero point. –0– appears in the display. The calibration weight to be placed on the scale then flashes in the display.
	3. If necessary, change the weight value displayed with [TARE] .
	4. Place the calibration weight on the scale and confirm with [PRINT] .
	The scale calibrates with the calibration weight loaded. After calibration is completed, –donE– appears briefly in the display, and the scale automatically returns to weighing mode.

Adjusting of verifiable balances

- Switch off the scale.

- Remove the scale bottom plate by undoing the Torx TX20 retaining screws .Important: In order to remove the bottom plate it is necessary to break the certification seal affixed to it! Once this seal has been destroyed, the scale must be recertified

by an accredited organization, and a new certification seal must be affixed before the instrument may be used as a certified scale again!

- Hold down the service switch (pushbutton) on the analogprint (indicated by an arrow in the drawings below, while at the same time switching on the scale. Keep the service switch pressed in until "Service" appears in the display.

Small platform model   **Large platform model**
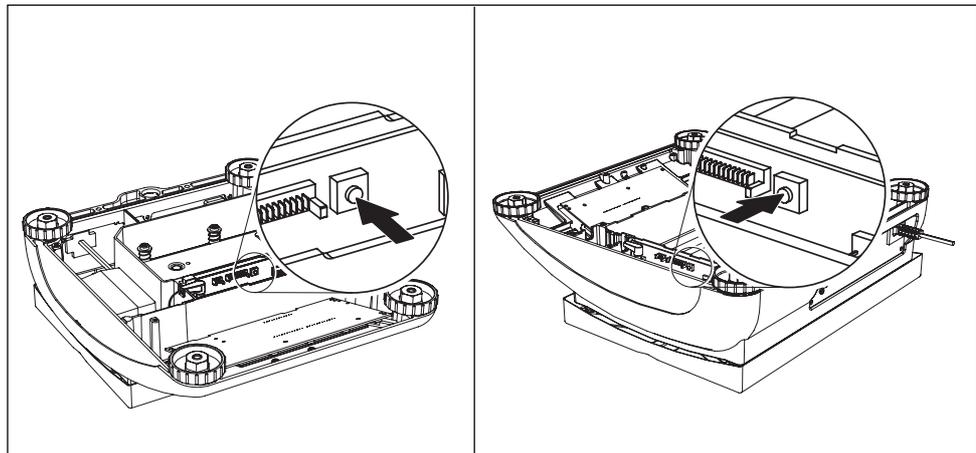
1.Display "Scale": Press the [PRINT]-key (within 20s)

2.Display "Metrolo": Press the [TARE]-key

3.Display "Scale 1": Press the [PRINT]-key

4.Display "ramp": Press the [TARE]-Tkey

5.Display "SNR": Press the [TARE]-key

6.Display "SCAL.bld": Press the [TARE]-key

7.Display "GEO" (adjustment by means of GEO value):

The GEO value can be set in this block and the balance also adapted to the local gravity ratios without adjusting weights.

Case a)You are familiar with the GEO values.

Once the [PRINT]-key has been pressed, the current GEO value will be displayed.

Press the [TARE] oder [→0←]-key, in order to alter the GEO value. The next value is displayed every time the key is pressed (adjustment range: 0 - 31). See the GEO value chart in chapter 7.1.1 for the appropriate value.

Confirm the selected GEO value using the [PRINT] -key.

Please note: The GEO value may not be readjusted following this "adjustment by means of GEO value", as this would cause the set adjusting values to become invalid.

Fall b) Sie sind mit den GEO-Werten NICHT vertraut. Die Justierung muss in diesem Fall mit Justiergewicht erfolgen (siehe Punkt 8).

You are NOT familiar with the GEO values. In this case adjustment must be made using adjusting weights (see item 9).

[TARE] - Taste drücken

7.Display "LIN-CAL": Press ⌷TARE⌷-key

8.Display "CAL": Press ⌷TARE⌷-key

Press the ⌷PRINT⌷ -key.The scale determines the zero point. -preload- appears in the display. The calibration weight to be placed on the scale then flashes in the display.

If necessary, change the weight value displayed with ⌷TARE⌷ .

Place the calibration weight on the scale and confirm with ⌷PRINT⌷ .

The scale calibrates with the calibration weight loaded. After calibration is completed, -done- appeats briefly in the display.

Return to weighing mode:

Press the ⌷ON/OFF⌷ -key, "END" will appear on the display :

Press the ⌷PRINT⌷ -key, order to save the alterations. "Save" will appear on the display.

Press the ⌷PRINT⌷ -key to confirm. Following this the balance will return to weighing mode.

4.3.2   DISPLAY – weighing unit and display accuracy

UNIt1	Select weighing unit 1: g, kg, oz, lb, t
UNIt2	Select weighing unit 2: g, kg, oz, lb, t
rESOLU	Select readability (resolution), model-dependent
UNt.rOLL	When UNT.rOLL is switched on, the weight value can be displayed in all available units and as pieces with ⌷▲⌷.
Notes	• On certified scales, the weighing units oz and lb are displayed with the symbol *. • On certified scales, resolutions that deviate from the scale definition are displayed without a weighing unit and with the symbol **. • On dual-range/dual interval scales, resolutions marked with **I<–> 1/2I** are divided up into 2 weighing ranges / intervals, e.g. 2 x 3000 d.

4.3.3   TARE – tare function

A-tArE	Switching on/off automatic taring
CHAIn.tr	Switching on/off chain tare
A.CL-tr	Switching on/off automatic taring with automatic clearing of the tare weight when the load is removed from scale

4.3.4   ZERO – automatic zero update

AZM	On certified scales, this menu item does not appear. Switching on/off automatic zero update and selecting zeroing range. Possible settings: OFF; 0.5 d; 1 d; 2 d; 5 d; 10 d

4.3.5   RESTART – automatic saving of zero point and tare value

ON/OFF	When the Restart function is activated, the last zero point and tare value are saved. After switching off / on or after a power interruption, the device continues to work with the saved zero point and tare value.

4.3.6   FILTER – adaptation to the ambient conditions and the weighing type

VIbrAt	Adaptation to the ambient conditions
LOW	• Very steady and stable environment. The scale works very quickly, but is very sensitive to external influences.
MEd	• Normal environment. The scale operates at medium speed.
HIGH	• Restless environment. The scale works more slowly, but is insensitive to external influences.
PrOCESS	Adaptation to the weighing process
UNIVEr	• Universal setting for all weighing samples and normal weighing goods
dOSING	• Dispensing liquid or powdery weighing samples
StAbILI	Adjusting the weighing speed
FASt	• The scale operates very fast.
StAndrd	• The scale operates at medium speed.
PrECISE	• The scale operates with the greatest possible reproducibility.
	The slower the scale works, the greater the reproducibility of the weighing results.

4.3.7   RESET – resetting scale settings to factory settings

SUrE?	Confirmation inquiry
	• Reset the scale settings to factory settings with [PRINT]
	• Do not reset scale settings with [TARE]

4.4   Application settings (APPLICATION)

4.4.1   COUNT – settings for counting

`VAr-SPL`	Adaptation of the reference quantity
ON	• The reference quantity can be changed in operating mode
OFF	• Counting only with defined reference quantities
`SPL-qtY`	Reference quantity
Sq1 ... Sq5	• Define 5 fixed reference quantities
`Min.reFW`	Monitoring the minimum reference weight
OFF	• No monitoring of the minimum reference weight
97.5, 99.0, 99.5	• Monitoring the minimum reference weight so that a counting accuracy of 97.5 %, 99.0 % or 99.5 % is achieved
`rEF.OPt`	Optimizing the average piece weight
OFF	• No reference optimization
AUtO	• Automatic reference optimization

`A-SMPL`	Automatic determination of the average piece weight
ON	• After taring, the average piece weight is determined with the next weight placed on the scale and the displayed reference quantity
OFF	• No automatic determination of the average piece weight
`A.CL-APW`	Automatic clearing of the average piece weight
ON	• When the load is taken off the scale after a counting operation, the average piece weight is automatically cleared. The next counting operation begins with determining the average piece weight again.
OFF	• The average piece weight is maintained until a new average piece weight is determined
`ACCurCY`	Displaying the counting accuracy
ON	• After the average piece weight is determined, the counting accuracy that can be achieved is shown briefly in the display.
OFF	• No counting accuracy display
`tOtAl.Ct`	Counting on two scales
bULK	• Display number of pieces for the parts on the bulk scale only
bOth	• Display number of pieces for all parts on the bulk and the reference scale

4.4.2 AVERAGE – determining the average weight for an unstable load

`OFF`	Calculating average weight switched off
`AUtO`	Calculating average weight with automatic start of the weighing cycle
`MAnuAL`	Calculating average weight with manual start of the weighing cycle via [PRINT]

4.4.3 RESET – resetting application settings to factory settings

`SUrE?`	Confirmation inquiry
	• Reset the application settings to factory settings with [PRINT]
	• Do not reset the application settings with [TARE]

4.5   Terminal settings (TERMINAL)

4.5.1   DEVICE – Sleep mode, energy-saving mode and display backlighting

SLEEP	This menu item only appears on devices in mains operation.
	When SLEEP is activated, the scale switches off display and backlighting after the time period set when not in use. The display and backlighting are switched on again at the press of a key or if the weight changes.
	Possible settings: OFF, 1 min, 3 min, 5 min
PWr OFF	This menu item only appears on devices in battery operation.
	When PWr OFF is activated, the device switches itself off automatically after approx. 3 minutes when not in use.
b.LIGHt	Switching the display backlighting on/off.
	On scales with a battery, the background lighting switches itself off automatically if there has been no activity on the scale for 5 seconds.
Note	This menu item is accessible without a Supervisor password.

4.5.2   ACCESS – password for Supervisor menu access

SUPErVI	Password entry for Supervisor menu access
ENtER.C	Request to enter password
	➜ Enter the password and confirm with [PRINT]
rEtYPE.C	Request to repeat the password entry
	➜ Enter the password again and confirm with [PRINT]
Notes	• The password can consist of up to 4 characters.
	• The key [PRINT] must not be part of the password. It is required for confirming the password.
	• The key [→0←] may only be used in combination with another key.
	• If you enter an impermissible code or make a typing error in the repetition, COdE.Err. appears in the display.

4.5.3   RESET – resetting terminal settings to the factory settings

SUrE?	Confirmation inquiry
	• Reset terminal settings to the factory settings with [PRINT]
	• Do not reset the terminal settings with [TARE]

4.6   Configuring interfaces (COMMUNICATION)

4.6.1   COM1/COM2 -> MODE – operating mode of the serial interface

`Print`	Manual data output to the printer with PRINT
`A.Print`	Automatic output of stable results to the printer (e. g. for series weighing operations)
`CONtINU`	Ongoing output of all weight values via the interface
`dIALOG`	Bi-directional communication via MT-SICS commands, control of the scale via PC
`CONt.OLd`	As per `CONtINU`, see above, but with 2 fixed blanks in front of the unit (compatible with Spider 1/2/3)
`dIAL.OLd`	As per `dIALOG`, see above, but with 2 fixed blanks in front of the unit (compatible with Spider 1/2/3)
`dt-b` `GROSS` `tArE` `nEt`	DigiTOL-compatible format. • Transfer of the gross weight, identified with "G" • Transfer of the tare weight • Transfer of the net weight
`dt-G`	As per `dt-b`, see above, gross weight identified with "G"
`COnt-Wt`	TOLEDO Continuous mode
`COnt-Ct`	TOLEDO Continuous mode, transfer of the number of pieces
`2nd.dISP`	For connecting a second display (automatically activates the 5-V voltage supply at Pin 9)
`rEF`	Data transfer from the reference scale (automatic switchover)
`bULK`	Data transfer from the quantity scale (automatic switchover)
`AuXILIA`	Data transfer from the reference or quantity scale (manual switchover)

4.6.2   COM1/COM2 -> PRINTER – settings for protocol printout

This menu item only appears if the mode "Print" or "A.Print" is selected.

`tEmPLat` `StdArd` `tEmPLt1` `tEmPLt2`	Selecting protocol printout • Standard printout • Printout in accordance with Template 1 • Printout in accordance with Template 2
`ASCi.FmtT` `LINE.Fmt` `LENGtH` `SEPArAt` `Add LF`	Selecting formats for the protocol printout • Line format: `MULtI` (multi-line) or `SINGLE` (single-line) • Line length: 0 … 100 characters, appears only with line format `MULtI` • Separator: `, ; . / \ _` and space; appears only with line format `SINGLE` • Line feed: 0 … 9

4.6.3   COM1/COM2 -> PARAMET – communication parameter

bAUd	Selecting baud rate: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400 baud
PAritY	Selecting parity: 7 none, 8 none, 7 odd, 8 odd, 7 even, 8 even
H.SHAKE	Selecting Handshake: NO, XONXOFF
NET.Addr	not documented
ChECSuM	Activating checksum byte (appears only in TOLEDO Continuous mode)
Vcc	not documented

4.6.4   COM1/COM2 -> RESET COM1/RESET COM2 – resetting serial interface to factory settings

SUrE?	Confirmation inquiry • Reset interface settings to factory settings with [PRINT] • Do not reset the interface settings with [TARE]

4.6.5   OPTION – configuring options

If no option is installed or is not yet configured, N.A. appears in the display.

EtH.NEt	Configuration of the Ethernet interface
IP.AddrS	• Enter IP address
SUBNEt	• Enter Subnet address
GAtEWAY	• Enter Gateway address
USb	not documented
USb TEST	
diGitAL	not documented
IN 1 ... 4	
OFF	
ZErO	
tArE	
PriNt	
rEF 10	
rEF n	
SCALE	
UNIt	

OUT 1 ... 4	
OFF	
StAbLE	
bEL.MIN	
AbV.MIN	
UNdErLd	
OVErLd	
StAr	
ANALOG	Configuration of the analog second scale interface
Mode	Operating mode of the second scale
rEF	• Second scale can only be used to determine the average piece weight
bULK	• Second scale can only be used as bulk scale
AuXILIA	• No difference between reference and bulk scale, all functions available on the scale selected
BYPASS	• Second scale interface not assigned

4.6.6   DEF.PRN – configuring templates

tEMPLt1/tEMPLt2	Selecting Template 1 or Template 2
LINE 1 ... 20	Select line
NOt.USEd	• Line not used
HEAdEr	• Line as header. The contents of the header must be defined via an interface command, see Section 5.1.
SCALE.NO	• Scale number
GROSS	• Gross weight
tArE	• Tare weight
nEt	• Net weight
APW	• Average piece weight
rEF Ct	• Reference quantity
PCS	• Pieces
StARLN	• Line with ***
CrLF	• Line feed (blank line)
F FEEd	• Page feed

4.7   Diagnosis and printing out of the menu settings (DIAGNOS)

tESt SC	
Internal	Testing scale with internal calibration weight
	• `-Int CAL-` appears in the display during the test.
	• After completion of the test, ideally `*d=0.0g` briefly appears in the display, after which the scale changes to the next menu item `KboArd`.
External	Testing scale with external calibration weight
	1. The scale checks the zero point. `-0-` appears in the display. The test weight flashes in the display.
	2. If necessary, change the weight value displayed with `TARE`.
	3. Put the calibration weight on the scale and confirm with `PRINT`.
	4. The scale checks the calibration weight put on them.
	5. After the test is completed, the deviation from the last calibration briefly appears in the display, ideally `*d=0.0g`, after which the scale changes to the next menu item `KboArd`.
KboArd	Keyboard test
PUSH 1 ... 10	• First press the large keys on the bottom row in order: `ON/OFF` `→0←` `TARE` `PRINT`
	• Then press the smaller keys in the top row: `BG/NET` `Q` `△△` `▪▲` `REF 10` `REF n`
	If the key works, the scale changes to the next key.
	Note
	You cannot abort the keyboard test!
	If you have selected the menu item `KboArd`, you must press all keys.
dISPLAY	Display test: The scale displays all functioning segments
SNr	Display of the serial number
SNr2	Display of the serial number of scale 2. This menu item only appears if an analog second scale is connected.
LiSt	Printout of a list of all menu settings
LiSt2	Printout of a list of all menu settings of scale 2. This menu item only appears if an analog second scale is connected.
rESEt.AL	Resetting all menu settings to the factory settings
SUrE?	Confirmation inquiry
	• Reset all menu settings to the factory settings with `PRINT`
	• Do not reset the menu settings with `TARE`

5 Interface description

5.1 SICS interface commands

The compact scales FTC support the command set MT-SICS (METTLER TOLEDO **S**tandard **I**nterface **C**ommand **S**et). With SICS commands, it is possible to configure, query and operate the scales from a PC. SICS commands are divided up into various levels.

5.1.1 Available SICS commands

	Command	Meaning
LEVEL 0	@	Reset the scale
	I0	Inquiry of all available SICS commands
	I1	Inquiry of SICS level and SICS versions
	I2	Inquiry of scale data
	I3	Inquiry of scale software version
	I4	Inquiry of serial number
	S	Send stable weight value
	SI	Send weight value immediately
	SIR	Send weight value repeatedly
	Z	Zero the scale
	ZI	Zero immediately
LEVEL 1	D	Write text into display
	DW	Weight display
	K	Keyboard check
	SR	Send and repeat stable weight value
	T	Tare
	TA	Tare value
	TAC	Clear tare
	TI	Tare immediately
LEVEL 2	C2	Calibrate with the external calibration weight
	C3	Calibrate with the internal calibration weight
	I10	Inquire or set scale ID
	I11	Inquiry of scale type
	P100	Print out on the printer
	P101	Print out stable weight value
	P102	Print out current weight value immediately

	Command	Meaning
	PWR	Power On/Off
	SIRU	Send weight value in the current unit immediately and repeat
	SIU	Send weight value in the current unit immediately
	SNR	Send stable weight value and repeat after every weight change
	SNRU	Send stable weight value in the current unit and repeat after every weight change
	SRU	Send weight value in the current unit and repeat
	ST	After pressing the Transfer key, send the stable weight value
	SU	Send stable weight value in the current unit
	TST2	Start test function with external weight
	TST3	Start test function with internal weight
LEVEL 3	PW	Average piece weight
LEVEL SPECIAL	I31	Header for the printout
	ICP	Send configuration of the printout
	LST	Send menu settings
	M01	Weighing mode
	M02	Stability setting
	M03	Autozero function
	M19	Send calibration weight
	M21	Inquire/set weight unit
	P	Print text
	P130	Weight value, unit and price
	PCS	Number of pieces
	PRN	Print out at every printer interface
	REF	Average piece weight
	RST	Restart
	SFIR	Send weight value immediately and repeat quickly
	SIH	Send weight value immediately in high resolution
	SWU	Switch weight unit
	SX	Send stable data record
	SXI	Send data record immediately
	SXIR	Send data record immediately and repeat
	U	Switch weight unit

5.1.2 Requirements for communication between scale and PC

- The scale must be connected to the RS232 or Ethernet interface of a PC with a suitable cable.

- The interface of the scale must be set to "Dialog" mode, see Section 4.6.1.

- A terminal progam must be available on the PC, e.g. HyperTerminal.

- The communication parameters baud rate and parity must be set in the terminal program and on the scale to the same values, see Section 4.6.3.

5.2   TOLEDO Continuous mode

5.2.1   TOLEDO Continuous commands

The scale supports the following input commands in TOLEDO Continuous mode:

Command	Meaning
P <CR><LF>	Print out the current result
T <CR><LF>	Tare the scale
Z <CR><LF>	Zero the display
C <CR><LF>	Clear the current value
Tx.xxx <CR><LF>	Define tare

5.2.2   Output format in TOLEDO Continuous mode

Weight values are always sent in the following format in TOLEDO Continuous mode:

	Status			Field 1						Field 2							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
STX	SWA	SWB	SWC	MSD	–	–	–	–	LSD	MSD	–	–	–	–	LSD	CR	CHK

Field 1	6 digits for the weight value that is sent without a decimal point and unit
Field 2	6 digits for the tare weight that is sent without a decimal point and unit
STX	ASCII characters 02 hex, characters for "start of text"
SWA, SWB, SWC	Status words A, B, C, see below
MSD	Most significant digit
LSD	Least significant digit
CR	Carriage Return, ASCII characters 0D hex
CHK	Checksum (2-part complement of the binary sum of the 7 lower bits of all previously sent characters, incl. STX and CR)

Status word A								
		Status Bit						
Function	**Selection**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Decimal position	X00	0	1			0	0	0
	X0					0	0	1
	X					0	1	0
	0.X					0	1	1
	0.0X					1	0	0
	0.00X					1	0	1
	0.000X					1	1	0
	0.0000X					1	1	1
Numerical increment	X1			0	1			
	X2			1	0			
	X5			1	1			

Status word B	
Function / value	**Bit**
Gross / net: Net = 1	0
Sign: Negative = 1	1
Overload = 1	2
Movement = 1	3
lb/kg: kg = 1	4
1	5
Powerup = 1	6

Status word C	
Function / value	**Bit**
0	0
0	1
0	2
Print request = 1	3
Extended = 1	4
1	5
Manual taring, only kg = 1	6

6   Event and error messages

Error	Cause	Remedy
Display Dark	• Back lighting set too dark • No mains voltage • Unit switched off • Mains cable not plugged in • Brief fault	➜ Set back lighting (b.LIGHt) brighter ➜ Check mains ➜ Switch on unit ➜ Plug in mains plug ➜ Switch device off and back on again
Insufficient load L _ _ _ _ ⌐	• Load plate not on the scale • Weighing range not reached	➜ Place load plate on the scale ➜ Set to zero
Overload ⌐ ‾ ‾ ‾ ‾ ⌐	• Weighing range exceeded	➜ Unload scale ➜ Reduce preload
– – – – – –	• Result not yet stable	➜ If necessary adjust vibration adapter or weigh dynamically
– – no – –	• Function not permissible	➜ Unload scale and set to zero
⌐ ‾ no ‾ ⌐ L _ no _ ⌐	• Zeroing not possible with over-load or insufficient load	➜ Unload scale
Err 4	• Average piece weight too low	➜ Select and place larger number of reference parts on the scale
Err 5	• No valid value from the reference scale	➜ Check cable connection between the units ➜ Check interface settings
Err 6	• No calibration	➜ Unplug the mains plug then plug it back in; switch unit off and then back on in battery mode ➜ Calibrate scale ➜ Contact your dealer or local rep-resentative
Err 7	• Average piece weight too low	➜ Counting is not possible on this scale with this average piece weight

Error	Cause	Remedy
$Err\ 9$	• Unstable weight value when referencing	→ Ensure stable surroundings → Ensure that the weighing pan is freely movable → Adjust vibration adapter
$Err\ 17$	• Printout not yet ended	→ End printout → Repeat required action
$Err\ 18$	• Switching the weighing unit impermissible during dynamic weighing	→ End dynamic weighing → Switch weighing unit
$Err\ 53$	• EAROM checksum error	→ Unplug the mains plug then plug it back in; switch unit off and then back on in battery mode → Contact your dealer or local representative
Weight display unstable	• Restless installation location • Draft • Restless weighing sample • Contact between weighing pan and/or weighing sample and surroundings • Mains fault	→ Adjust vibration adapter → Avoid drafts → Dynamic weighing → Remedy contact → Check mains
Incorrect weight display	• Incorrect zeroing • Incorrect tare value • Contact between weighing pan and/or weighing sample and surroundings • Scale tilted	→ Unload scale, set to zero and repeat weighing operation → Clear tare → Remedy contact → Level scale

7   Technical data and accessories

7.1   Technical data

7.1.1   Type key

The compact scales FTC are available with various capacities and platforms that can be seen from the complete type designation.

7.1.2   General data

FTC	
Applications	• Weighing • Dynamic weighing • Counting with fixed or variable reference quantity • Counting with reference and bulk scale
Settings	• Resolution selectable • Weighing unit selectable: g, kg, oz, lb, t • Taring function: manual, automatic, chain tare • Automatic zero point correction when the scale is switched on and during operation • Filter for adapting to the ambient conditions (vibration adapter) • Filter for adapting to the weighing type, e.g. dispensing (weighing process adapter) • Switch-off function, sleep mode for mains-operated devices, energy-saving mode for battery operation • Display lighting • Add mode for determining the piece weight when counting • Reference optimization • Graphic display of the weighing range
Accuracy class OIML/NTEP	III
Display	• LCD (liquid crystal display), digits 16 mm high, with back lighting
Keypad	• Pressure point membrane keypad • Scratch-proof labeling
Housing	• Diecast aluminum housing; chromium nickel steel weighing pan • Dimensions, see Page 48

FTC	
Protection Class (IEC 529, DIN 40050, EN60529)	• IP43 (not with Ethernet interface)
Resolution of the analog second scale interface	• 300000 points in noncertified configuration • 7000 points in certified configuration
Supply of the weighing cell	• 8.2 V

7.1.3   Weighing ranges and readability

The compact scales FTC with strain gauge weighing cells are supplied in the configuration 2 x 3000 d. Higher legibilities are available from the factory with the optional "Premium" weighing cells.

Capacity	**Configuration**			
	2 x 3000 d (standard)		**1 x 6000 d (with optional "Premium" weighing cells**	
	Weighing ranges	**Readability (certified)**	**Weighing range**	**Readability (certified)**
3 kg	1.5 kg / 3 kg	0.5 g / 1 g	3 kg	0.5 g
6 kg	3 kg / 6 kg	1 g / 2 g	6 kg	1 g
15 kg	6 kg / 15 kg	2 g / 5 g	15 kg	2 g
35 kg	15 kg / 35 kg	5 g / 10 g	35 kg	5 g
60 kg	30 kg / 60 kg	10 g / 20 g	60 kg	10 g

7.1.4 Dimensions
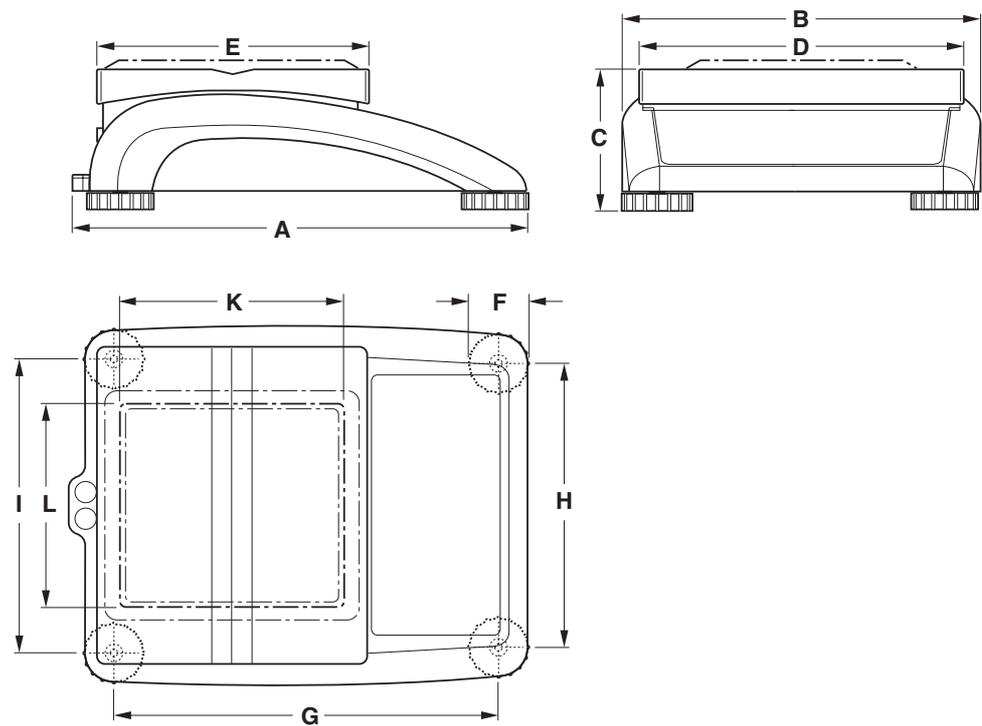
	A	B	C	D	E	F	G	H	I	K	L
SM[1]	335	265	100	240	200	46	276	208	216	–	–
LA[2]	370	360	115	350	240	52	310	304	310	–	–

[1]small platform model (mm)

[2]large platform model (mm)

7.1.5 Net weights

Model	without battery	with battery	with internal calibration weight (without battery)
small platform model	4.6 kg	5.3 kg	–
large platform model	8.2 kg	8.9 kg	–

7.1.6 Interface connections

The compact scale can be fitted with a maximum of 2 interfaces. The following combinations are possible:

COM1	COM2
RS232	–
RS232	Ethernet
RS232	Analog second scale interface

7.1.7 Assignment of the interface connections

Pin	RS232 (COM1/COM2)	Analog Interface
1	–	+ Excitation (+8.2 VDC)
2	TxD1/2	+ Sense
3	RxD1/2	Shield
4	–	– Sense
5	GND	– Excitation (GND)
6	–	–
7	–	+ Signal
8	–	– Signal
9	VCC	–

8   Appendix

8.1   Table of Geo Values

For weighing instruments verified at the manufacturer's, the geo value indicates the country or geographical zone for which the instrument is verified. The geo value set in the instrument (e.g."Geo 18") appears briefly after switch-on or is specified on a label.

Table **GEO VALUES 3000e** shows the geo values for European countries.

Table **GEO VALUES 6000e/7500e** shows the geo values for different gravitation zones.

8.1.1   GEO VALUES 3000e, OIML Class III (European Countries)

Geographical latitude	Geo value	Country
46°22' – 49°01'	18	Austria
49°30' – 51°30'	21	Belgium
41°41' – 44°13'	16	Bulgaria
42°24' – 46°32'	18	Croatia
48°34' – 51°03'	20	Czechia
54°34' – 57°45'	23	Denmark
57°30' – 59°40'	24	Estonia
59°48' – 64°00'	25*	Finland
64°00' – 70°05'	26	
41°20' – 45°00'	17	France
45°00' – 51°00'	19*	
47°00' – 55°00'	20	Germany
34°48' – 41°45'	15	Greece
45°45' – 48°35'	19	Hungary
63°17' – 67°09'	26	Iceland
51°05' – 55°05'	22	Ireland
35°47' – 47°05'	17	Italy
55°30' – 58°04'	23	Latvia
47°03' – 47°14'	18	Liechtenstein
53°54' – 56°24'	22	Lithuiania
49°27' – 50°11'	20	Luxemburg
50°46' – 53°32'	21	Netherlands
57°57' – 64°00'	24*	Norway
64°00' – 71°11'	26	

Geographical latitude	Geo value	Country
49°00' – 54°30'	21	Poland
36°58' – 42°10'	15	Portugal
43°37' – 48°15'	18	Romania
47°44' – 49°46'	19	Slovakia
45°26' – 46°35'	18	Slovenia
36°00' – 43°47'	15	Spain
55°20' – 62°00' 62°00' – 69°04'	24* 26	Sweden
45°49' – 47°49'	18	Switzerland
35°51' – 42°06'	16	Turkey
49°00' – 55°00' 55°00' – 62°00'	21* 23	United Kingdom

* factory setting

8.1.2   GEO VALUES 6000e/7500e OIML Class III (Height £)

Geografische Breite	Geo-Wert
00°00' – 12°44'	5
05°46' – 17°10'	6
12°44' – 20°45'	7
17°10' – 23°54'	8
20°45' – 26°45'	9
23°54' – 29°25'	10
26°45' – 31°56'	11
29°25' – 34°21'	12
31°56' – 36°41'	13
34°21' – 38°58'	14
36°41' – 41°12'	15
38°58' – 43°26'	16
41°12' – 45°38'	17
43°26' – 47°51'	18
45°38' – 50°06'	19
47°51' – 52°22'	20
50°06' – 54°41'	21
52°22' – 57°04'	22
54°41' – 59°32'	23
57°04' – 62°09'	24
59°32' – 64°55'	25
62°09' – 67°57'	26
64°55' – 71°21'	27
67°57' – 75°24'	28
71°21' – 80°56'	29
75°24' – 90°00'	30

8.2 Sample protocols

Weighing with tare

```
G          0.1085 kg
T          0.0145 kg
N          0.0940 kg
```

G = Gross weight

N = Net weight

T = Tare

Dyn WT = dynamically determined weight

Dynamic weighing

```
Dyn WT     43.52 kg
T           3.78 kg
```

Printout with header

```
G          0.1085 kg
T          0.0145 kg
N          0.0940 kg
```

Protocol of the scale settings (menu point `List`, see page 38)

```
SOFTWARE VER 16-1-1.04

SCALE
-------------
METROLO       :NO APPr
SNR           :0000000
Scale Build
 SCAL.TYP     :SINGLE.R
 BAS.UNIT     :g
 SCL.CAP      :6100.00
 RESOL.       :0.01 g
GEO           :19
DISPLAY
 UNIt1        :g
 UNIt2        :kg
 RESOLU       :0.01 g
 UNt.rOLL     :OFF
tArE
 A-TArE       :OFF
 CHAIn.tr     :ON
 A.CL-tr      :OFF
 PB.TArE      :ON
ZERO
 Z-CAPT       :-2 18
 AZM          :0.5 d
RESTART       :OFF
FILTER
 VIBRAT       :MED
 PROCESS      :UNIVEr
 StABILI      :StAnDrD
Min.WEiG
 SEt.VAL      :0.000 g
 ONOFF        :OFF
```

```
APPLICATION
-------------
COUNT
 VAr-SPL
 Spl-Qty
  SQ1         :5
  SQ2         :10
  SQ3         :25
  SQ4         :50
  SQ5         :100
 Min.RefW     :99
 REF OPT      :OFF
 A-SMPL       :ON
 A.CL-APW     :OFF
 ACCurCy      :ON
 tOtAL.Ct     :BULK
DYNAMIC        :OFF

TERMINAL
-------------
DEVICE
 SLEEP        :OFF
 B.LIGHt      :ON
```

```
COMMUNICATION
-------------
COM 1
 MODE     1:Print
 PriNtEr
  tEmPLat 1:StdArd
  ASCi.Fmt
   LINE.FMT1:MULTI
   LENGtH 1:24
   ADD LF 1:0
 PARAMET
  BAUD    1:2400
  PAriTY  1:8 odd
  H.SHAKE 1:XONXOFF
  ChECSUM 1:OFF
  Vcc     1:OFF
COM 2
 MODE     2:DIALOG
 PARAMET
  BAUD    2:9600
  PAriTY  2:8 nonE
  H.SHAKE 2:XONXOFF
  ChECSUM 2:OFF
  Vcc     2:OFF
OPTION
 EtH.NEt   :N.A.
 USB       :N.A.
 ANALOG    :N.A.
 DiGitAL   :N.A.
DEF.PrN
 tEmPLt1
 tEmPLt2
```

Konformitätserklärungen

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 Scale: KERN FTC

Mark applied	EU Directive	Standards	Approval/Test-certificate N°
$\mathsf{C}\mathsf{E}$	73/23EEC Low Voltage	EN61010-1	
$\mathsf{C}\mathsf{E}$	89/336EEC EMC	EN55022 Emission Kl. B: EN61000-3-2 EN61000-3-3 EN50082-1	
$\mathsf{C}\mathsf{E}$ [year] [code] M 1)	90/384EEC Non automatic weighing Instruments 1)	EN45501 1)	T6179 1)

1)   applies only to certified balances
        gilt nur für geeichte Waagen
        valable uniquement pour les balances vérifiées
        sólo aplicable a balanzas verficadas
        la dichiarazione vale solo per le bilance omologate

Date: 24.01.2007   **Signature:**

Gottl. KERN & Sohn GmbH
Management

Notice

Certified balances and balances used for legal applications have the EU type approval. The year of the initial verification is shown next to the CE mark. Such balances are verified in the factory and carry the „M" mark on the actual balance and the packaging. The year of initial verification is shown next to the CE mark. The GEO value of verified balances explains for which location of use the balance has been verified. This GEO value is shown on the balance itself and on the packing. Further details see GEO value table.

Hinweise

Für geeichte/eichpflichtige Waagen liegt eine EU Bauartzulassung vor. Das Jahr der ersten Eichung ist neben dem CE Zeichen aufgeführt. Solche Waagen sind ab Werk geeicht und tragen die Kennzeichnung „M" auf dem Gerät selbst und auf der Verpackung. Der GEO-Wert gibt bei vom Hersteller geeichten Waagen an, für welchen Aufstellungsort die Waage geeicht ist. Dieser GEO-Wert befindet sich auf der Waage sowie der Verpackung. Genaueres ist der GEO-Wert-Tabelle zu entnehmen.

Remarques

Les balances vérifiées/admissibles à la vérification font l'objet d'une approbation de modèle UE. L'année de la vérification primitive est indiqués à côté de la marque CE. Ces balances sont vérifiées d'origine et portent la marque „M" sur l'appareil lui-même et sur l'emballage. Le valeur GEO indique le lieu d'utilisation pour lequel la balance été vérifiée. Ce valeur GEO se trouve sur la balance ainsi que sur l'emballage. Veuillez trouver plus de détails dans le tableau GEO.

Notas

Las balanzas verificadas/verificables cuentan con una aprobación de modelo UE. El año de la primera verificación está indicado al lado del distintivo CE. Estas balanzas están verificadas en fábrica y llevan la designación „M" sobre el propio aparato y sobre el embalaje. El valor GEO indica el lugar de ubicación por lo cual la balanza está verificado. El valor se encuentra sobre la balanza así como sobre el embalaje. Por favor toman demßas detalles de la tabla GEO.

Avvertenza

Per le bilance approvate esiste un'approvazione CE del tipo. L´anno della prima verifica è indicato a fianco della marcatura CE. I tipi marcati con un contrassegno „M" su sfondo verde peino possono essere impiegati da subito. Il coefficiente GEO di bilance omolgate indca per quale luogo la bilancia è stata omologata. Questo coefficiente GEO si trova sulla bilancia e sull'imballo. Ulteriroi informazioni vedi tabella coefficente GEO.

GEO-WERT-Tabelle / GEO-value table

geographische Breite /geo-graphical latitude				Höhe über Meer in Metern / altitude				
				0-650	650-1300	1300-1950	1950-2600	2600-3250
0°	0'	-	9° 52'	4 / 5	3 / 4	2 / 3	1 / 2	0 / 1
9°	52'	-	15° 6'	5 / 6	4 / 5	3 / 4	2 / 3	1 / 2
15°	6'	-	19° 2'	6 / 7	5 / 6	4/ 5	3 / 4	2 / 3
19°	2'	-	22° 22'	7 / 8	6 / 7	5 / 6	4 / 5	3 / 4
22°	22'	-	25° 21'	8 / 9	7 / 8	6 / 7	5 / 6	4 / 5
25°	21'	-	28° 6'	9 / 10	8 / 9	7 / 8	6 / 7	5 / 6
28°	6'	-	30° 41'	10 / 11	9 / 10	8 / 9	7 / 8	6 / 7
30°	41'	-	33° 9'	11 / 12	10 / 11	9 / 10	8 / 9	7 / 8
33°	9'	-	35° 31'	12 / 13	11 / 12	10 / 11	9 / 10	8 / 9
35°	31'	-	37° 50'	13 / 14	12 / 13	11 / 12	10 / 11	9 / 10
37°	50'	-	40° 5'	14 / 15	13 / 14	12 / 13	11 / 12	10 / 11
40°	5'	-	42° 19'	15 / 16	14 / 15	13 / 14	12 / 13	11 / 12
42°	19'	-	44° 32'	16 / 17	15 / 16	14 / 15	13 / 14	12 / 13
44°	32'	-	46° 45'	17 / 18	16 / 17	15 / 16	14 / 15	13 / 14
46°	45'	-	48° 58'	18 / 19	17 / 18	16 / 17	15 / 16	14 / 15
48°	58'	-	51° 13'	19 / 20	18 / 19	17 / 18	16 / 17	15 / 16
51°	13'	-	53° 31'	20 / 21	19 / 20	18 / 19	17 / 18	16 / 17
53°	31'	-	55° 52'	21 / 22	20 / 21	19 / 20	18 / 19	17 / 18
55°	52'	-	58° 17'	22 / 23	21 / 22	20 / 21	19 / 20	18 / 19
58°	17'	-	60° 49'	23 / 24	22 / 23	21 / 22	20 / 21	19 / 20
60°	49'	-	63° 30'	24 / 25	23 / 24	22 / 23	21 / 22	20 / 21
63°	30'	-	66° 24'	25 / 26	24 / 25	23 / 24	22 / 23	21 / 22
66°	24'	-	69° 35'	26 / 27	25 / 26	24 / 25	23 / 24	22 / 23
69°	35'	-	73° 16'	27 / 28	26 / 27	25 / 26	24 / 25	23 / 24
73°	16'	-	77° 52'	28 / 29	27 / 28	26 / 27	25 / 26	24 / 25
77°	52'	-	85° 45'	29 / 30	28 / 29	27 / 28	26 / 27	25 / 26