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Operating instructions
Medical Stand assist scales

KERN MTA

MTA 400K-1NM
Version 3.3
2025-05
en

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no	Andre språkversjoner finnes det på www.kern-sohn.com/manuals

en

KERN MTA
Version 3.3 2025-05
Operation instructions Stand assist scales

Contents

1 Technical data

KERN (type)	MTA 400K-1NM
Trademark	MTA 400K-1M
Readability (d)	0.1 kg / 0.2 kg
Weighing range (max)	300 kg / 400 kg
Minimum weight (min)	2 kg / 4 kg
Verification value (e)	0.1 kg / 0.2 kg
Verification class	III
Reproducibility	0.1 kg / 0.2 kg
Linearity	± 0.1 kg / ± 0.2 kg
Accuracy for conformity assessment (first verification)	till to 50 kg = 0.5 e >50 kg-200 kg = 1 e >200 kg – 400 kg = 1,5 e
Recommended adjustment weight (Class)	400 kg (M1)
Weighing Units	kg
Warm-up time	10 min
Electric Supply	Input Voltage: 100 V – 240 V, 50/60 Hz
Operating temperature	10°C … + 40°C
Humidity of air	max. 80 % (not condensing)
Dimensions (B x D x H) mm	Display housing 200 x 128 x 55 Weighing platform 780 x 680 x 68 Weighing surface 600 x 600
Weight kg (net)	40
Verification in accordance with 2014/31/EU	Category III
Medical product as per (EU) 2017/745	Category I with measuring function
Rechargeable battery operation optional	Service life background illumination ON: 20 h Operating time background illumination off: 40 h Loading time 12 h 6 x 1.2 V 2000 mA
RS -232 interface	✓
Stand	Height: 94 cm

2 Declaration of conformity

The current EC/EU Conformity declaration can be found online in:

www.kern-sohn.com/ce

For verified weighing scales (= weighing scales assessed for conformity) the declaration of conformity is included in the scope of delivery.

Only these balances are medical products.

2.1 Explanation of the graphic symbols for medical products

CE M18 0122 0297

All medical balances with this mark fulfill the following guidelines:

1. 2014/31/EU: Guideline for non-automatic balances
2. (EU) 2017/745: Medical products regulation

UDI

Unique product identification

MD

Is a medical device

III

Balances which carry this mark, are conformity-evaluated as per accuracy class III of the EC-guideline 2014/31/EU.

WF 170012

Designation of the serial number of every device, applied at the device and on the packaging

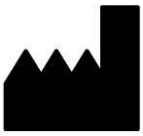
Number here as example

2022-06

Identification of the manufacturing date of the medical product.

Year and month here as example

“Attention, please note the accompanying document“,
or “Please note operating instructions”



Identification of manufacturer of medical product including address

Kern & Sohn GmbH
D–72336 Balingen,Germany
www.kern-sohn.com

“Electro-medical device“
with attachment for type B

Device protection class II

Dispose of old appliances separately from your household waste!

Instead, take them to communal collection points.

12 V DC / 500 mA

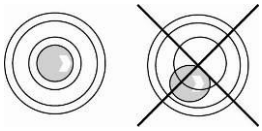
Display of supply voltage for scales with polarity display

Mains connection

Sealing mark KERN SEAL

Supply voltage direct current

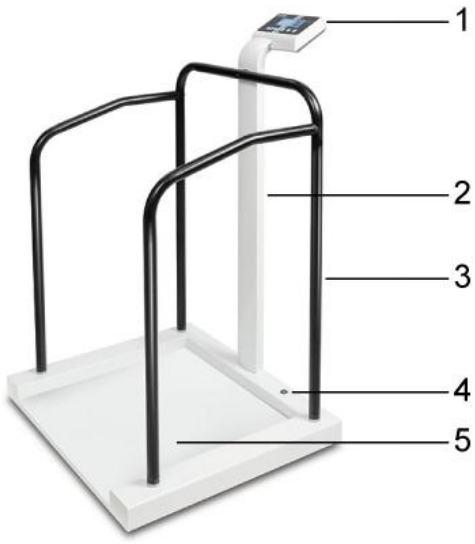
Information



Level balance before use

Electrostatically endangered structural components

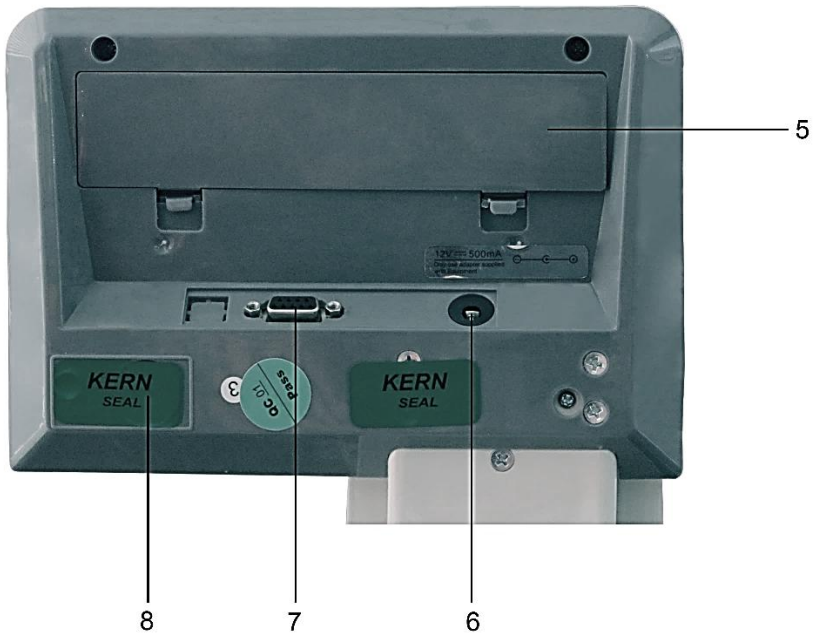
3 Appliance overview



1. Display Unit
2. Stand
3. Hand rail
4. Bubble level
5. Weighing pan

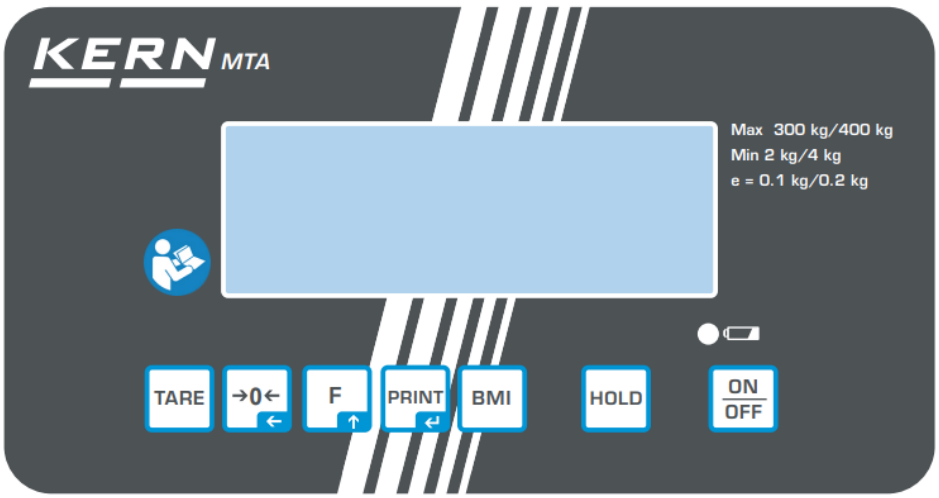
Secondary display at rear

Display unit at rear



5 Rechargeable battery/Battery compartment
6 Mains supply
7 RS 232 C
8 Adjustment switch (under the seal mark)

4 Keyboard overview



Type MTA 400K-1NM

Button	Designation	Function
	ON/OFF-button	Turn on/off
	HOLD button	Hold function/Calculation of a stable weight value
	BMI button	Calculation of the Body Mass Index
	Print button	Data transfer via interface **In menu:** • Confirm selection **For numeric entry:** • Confirm numerical value
	Function key	**In menu:** • Call up menu • Select menu items **For numeric entry:** • Increase numerical value
	Zeroing key	Weighing scale will be reset to „0.0“ **For numeric entry:** • Change decimal digit
	TARE key	Tare balance

5 Overview of displays

Display	Designation	Description
STABLE	Stability display	Scales are in a steady state
ZERO	Zeroing display	Should the balance not display exactly zero despite empty weighing plate, press the  button. Your balance will be set to zero after a short standby time.
NET	Net weight display	Illuminated when net weight is displayed Illuminated after weighing scale was tared
GROSS	Gross weight display	Illuminated when gross weight is displayed
HOLD	HOLD function	HOLD function active
BMI	BMI function	Illuminated while BMI function is enabled
	Battery-rechargeable battery display	Shows the capacity of the rechargeable batteries or of the batteries

6 Basic instructions

	Balances have to be verified for the purposes stated below in accordance with Directive 2014/31/EU. Article 1, paragraph 4. “Determination of mass in the practice of medicine that is, weighing patients for reasons of medical supervision during medical surveillance, examination and treatment.”

6.1 Specific function

6.1.1 Indication

Medical scales:
Indication:

- These scales are used to determine the weight of people in medical treatment facilities. The scales are suitable for the detection, prevention, and monitoring of diseases.

Use:

- When using bodyweight scales and handrail scales, the person to be weighed should stand carefully in the middle of the weighing plate and remain still.

After reaching a stable weighing value, the weighing value can be read.

The scale is designed for continuous operation.

6.1.2 Contraindication

No contraindication known.

6.2 Proper use

This weighing scale is designed for determining the weight of a person whilst standing, such as in doctor’s surgeries. The balance is suitable for recognizing, preventing and controlling illnesses.

	Scales fitted with a serial interface may only be connected to appliances in compliance with Directive EN60601-1.

- On personal weighing scales, the person should step onto the center of the weighing platform and remain standing without moving.

Once a steady display value is shown, you can read the weight result. The weighing scale is designed for continuous duty.

	The weighing platform may only be stepped on by persons capable of standing on both feet on the weighing platform.

- The balance should be checked for correct condition prior to each utilization by a person familiar with proper operation of the balance.

	If the balance doesn't have any contact with the transfer cable, do not touch the transfer port in order to avoid an ESD-failure. 

6.3 Non-intended product use / contraindications

	• Do not use these scales for dynamic weighing processes. • 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. This could cause damage to the balance. • Never operate the balance in explosive environment. The serial version is not explosion protected. It should be noted that a flammable mixture of anaesthetics and oxygen or laughing gas may occur. • The structure of the balance may not be modified. This may lead to incorrect weighing results, safety-related faults and destruction of the balance. • The balance may only be used according to the described conditions. Other areas of use must be released by KERN in writing. • If the balance is not used for a longer time, take out the batteries and store them separately. Leaking battery liquid could damage the balance.

6.4 Warranty

Warranty claims shall be voided in case:

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

6.5 Monitoring of Test Resources

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

6.6 Plausibility check

Please make sure that the measurement values computed by the appliance are plausible and are allocated to the respective patient, before storing and using the values for further purposes. This applies especially also for values transferred via interface.

6.7 Reporting serious incidents

All serious incidents appeared related to this product must be reported to the manufacturer and the responsible authority of the member state where the user and/or the patient are residents.

„Serious incident" that means an incident which directly or indirectly had, could have or could have had one of the following consequences:

- the death of a patient, a user or another person,
- the temporary or permanent fatal deterioration of the health status of a patient, a user or other persons,
- a serious danger for public health.

7 Basic Safety Precautions

7.1 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.	

7.2 Personnel training

The medical staff must apply and follow the operating instructions for proper use and care of the product.

The balance must be installed via the interfaces only by experienced administrators or hospital technicians.

7.3 Preventing contamination

The prevention of cross-contamination (fungal skin infections,……) requires regular cleaning of the weighing platform. Recommendation: After any weighing procedure that could potentially result in contamination (e. g. after weighing that involves direct skin contact).

7.4 Preparation for use

- Check the personal balance for damage before any use
- Maintenance and reverification (in Germany MTK): The personal balance must be serviced and reverified at regular intervals.
- Do not use the appliance on slippery surfaces or in facilities with risk of vibration
- During installation the personal balance must be levelled
- If possible, the product must remain in its original packaging for transportation purpose. Should this not be possible, make sure that the product is protected against damage
- Step onto and leave the personal balance only when a qualified person is present

8 Electromagnetic compatibility (EMC)

8.1 General hints

	The installation and use of the electrical personal balances MTA requires special precautionary measures as outlined in the EMC information below.

This device complies with the limits set for medical electrical devices of group 1, class B (as per EN 60601-1-2).

Electromagnetic compatibility (EMC) describes a device's ability to perform reliably within an electromagnetic environment without causing inadmissible electromagnetic interference at the same time. Amongst other things, such disturbances may be transmitted by connecting cables or by the air.

Inadmissible disturbances from the environment may result in incorrect displays, inaccurate measured values or incorrect behavior of the personal balances MTA. Also in certain cases the personal balances MTA may cause such failures in other devices. To eliminate problems of that kind, we recommend you to take one or several of the measures listed below:

- Change the alignment or distance of the device to the source of EMI.
- Install or use the personal balances MTA at another location.
- Connect the personal balances MTA to another power source.
- For further questions please contact our customer services.

Disturbances may be caused by improper modification or add-ons to the device or not recommended accessories (such as power supply units or connecting cables). The manufacturer will not be responsible for these. Modifications may also result in a loss of authorization relating to the use of the device.

	Devices emitting high frequency signals (mobile telephones, radio transmitters, radio receivers) may cause interference in the personal balances MTA. For that reason do not use them near the personal balances MTA. Chapter 8.4 contains details about recommended minimum distances.

8.2 Electromagnetic interferences

Guidelines and manufacturer's declaration – electromagnetic interferences		
The personal balances MTA are designed for use in an electromagnetic environment that meets the requirements stated below. The customer or user of the personal balances MTA should ensure that operation takes place in such an environment.		
Emitted interference measurements	**Conformity**	**Electromagnetic environment - guideline**
HF emissions as per CISPR 11 / EN 55011	Assembly 1	The personal balances MTA use HF energy merely for their internal working. Their HF emission therefore is very low and it is highly unlike to interfere with adjacent electronic devices.
HF emissions as per CISPR 11 / EN 55011	Category B	The personal balances MTA are designed for use in all equipments including those in living areas and those connected directly to the public power grid that also supplies buildings used for living purposes.
Emission of harmonics as per IEC 61000-3-2	Category A	
Emission of voltage fluctuations / flicker as per IEC 61000-3-3	Conforms with	

Do not operate the personal balances MTA directly next to other appliances or stacked with other devices. If such type of operation is necessary, observe the personal balances MTA to ensure normal operation in such an arrangement.

8.3 Electromagnetic immunity to interferences

Guidelines and manufacturer's declaration - electromagnetic immunity to interferences			
The personal balances MTA are designed for use in an electromagnetic environment that meets the requirements stated below. The customer or user of the personal balances MTA should ensure that operation takes place in such an environment.			
Immunity to interferences tests	**IEC 60601 test level**	**Conformity**	**Electromagnetic environment - guideline**
Discharge static electricity (DSE) as per IEC 61000-4-2	± 6 kV contact discharge ± 8 kV air discharge	± 6 kV ± 8 kV	Floors should be made of wood or concrete or tiled with ceramic tiles. If floors are covered with synthetic material, relative air humidity must be at least 30%.
Fast transient electrical disturbances / bursts as per IEC 61000-4-4	± 2 kV for power lines ± 1 kV for input and output lines	± 2 kV ± 1 kV	The quality of the supply voltage should match that of the typical business or hospital environment.
Impulse voltages / surges as per IEC 61000-4-5	± 1 kV voltage Live wire - live wire ± 2 kV voltage Live wire - earth	± 1 kV Inapplicable	The quality of the supply voltage should match that of the typical business or hospital environment.
Voltage dips, short-term disruptions and fluctuations in supply voltage as per IEC 61000-4-11	< 5 % U_T (> 95 % dip of U_T) for 1/2 period 40 % U_T (> 60 % dip of U_T) for 5 periods 70 % U_T (> 30 % dip of U_T) for 25 periods < 5 % U_T (> 95 % dip of U_T) for 5 s	Compliance with requirements under all postulated conditions Controlled switch off Return to undisturbed situation after user intervention.	The quality of the supply voltage should match that of the typical business or hospital environment. Where the user of the personal balances MTA demands continuous operation even during disruptions to the power supply, we recommend powering the personal balances MTA by no-break power supply or a battery.
Magnetic field for supply frequency (50/60 Hz) as per IEC 61000-4-8	3 A/m	3 A/m 50/60 Hz	Magnetic fields for the supply frequency should match the typical values found in the particular business or hospital environment.
NOTE U_T equals AC line voltage prior to application of test level.			

Guidelines and manufacturer's declaration - electromagnetic immunity to interferences

The personal balances MTA are designed for use in an electromagnetic environment that meets the requirements stated below. The customer or user of the personal balances MTA should ensure that operation takes place in such an environment.

Immunity to interferences tests	IEC 60601 test level	Conformity	Electromagnetic environment - guideline
Conducted HF disturbance variables as per IEC 61000-4-6	3 V_{rms} 150 kHz to 80 MHz	3 V	Do not use portable or mobile radio sets nearer to the personal balances MTA or its wires than the distance recommended as safety distance which is calculated according to the equation relevant for its transmission frequency. Recommended safety distance: $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ for 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ for 800 MHz to 2.5 GHz Use P as rated capacity of radio transmitter in Watt (W) as per details given by the radio transmitter manufacturer and d as recommended safety distance in meters (m). The field intensity of stationary radio transmitters should for all frequencies be lower according to an in situ [a] examination than the conformity level.[b] Interference may occur near devices bearing the symbol below.
Emitted HF disturbance variables According to IEC 61000-4-3	3 V_{rms} 80 MHz to 2.5 GHz	3 V/m 	

NOTE 1 Higher frequency range applies to 80 MHz and 800 MHz.
NOTE 2 These guidelines may not be applicable in all cases.
The spreading of electromagnetic variables is influenced by absorption and reflections from buildings, objects and persons.

[a] The field intensity of stationary radio transmitters such as base stations of wireless telephones and mobile radio sets, amateur radio stations, AM and FM radio and television stations cannot be reliably predicted in advance. To determine the electromagnetic environment in respect of stationary transmitters, you should consider a study of electromagnetic phenomena at the location. If the measured field intensity at the location where the personal balance is to be used exceeds the conformity level above, you should observe the personal balances MTA in order to ensure the intended operation. If you observe unusual features of performance you may have to take additional measures such as a change in alignment or a different location for the personal balances MTA.

[b] For a frequency range of 150 kHz to 80 MHz field intensity should be less than 3 V/m.

8.3.1 Crucial features of performance

	The personal balances MTA do not have any crucial features of performance as per IEC 60601-1. The system may be subject to interference by other devices even if these devices conform to current emission requirements as per CISPR.

8.4 Minimum distances

Recommended safety distances between portable and mobile HF telecommunication devices and the personal balances MTA

The personal balances MTA are designed for use in an electromagnetic environment in which HF disturbance variables are controlled. The customer or user of the personal balances MTA can help avoiding electromagnetic disturbances by keeping the minimum distance between portable and mobile HF telecommunication devices (transmitters) and the personal balances MTA - depending on the output performance of the communication device, as stated below.

Rated capacity of transmitter W	**The safety distance depends on the transmission frequency** m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.20	1.20	2.30
10	3.80	3.80	7.30
100	12.00	12.00	23.00

For transmitters with a maximum rated capacity not stated in the table above you can calculate the recommended safety distance d in meters (m) yourself by using the equation belonging to each column, whereby P equals the maximum rated capacity of the transmitter in Watt (W) as per details provided by the transmitter manufacturer.

NOTE 1 Higher frequency range applies to 80 MHz and 800 MHz.
NOTE 2 These guidelines may not be applicable in all cases.
The spreading of electromagnetic variables is influenced by absorption and reflections from buildings, objects and persons.

9 Transport and storage

9.1 Testing upon acceptance

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

9.2 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 weighing plate, power supply unit etc. against shifting and damage.

10 Unpacking, Installation and Commissioning

10.1 Installation Site, Location of Use

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

On the installation site observe the following:

- Place the balance 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 balance against direct draughts due to open windows and doors
- Avoid jarring during weighing
- Protect the balance against high humidity, vapors and dust
- Do not expose the device to extreme dampness for longer periods of time. Non-permitted condensation (condensation of air humidity on the appliance) may occur if a cold appliance is taken to a considerably warmer environment. In this case, acclimatize the disconnected appliance for ca. 2 hours at room temperature.
- Avoid static charge of the balance and of the person to be weighed
- Avoid contact with water.

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.

10.2 Unpacking

Remove the individual components of the balance or the complete balance from the packaging with care and install at the intended location. When using the power supply unit, ensure that the power cable does not produce a risk of stumbling.

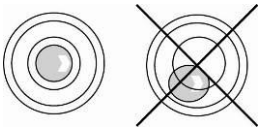
10.3 Scope of delivery

Serial accessories:

- Balance with display unit and stand
- Mains adapter (in conformity with EN 60601-1)
- Operating instructions
- 4 x adjustable feet
- Screws / Small parts

			
x 2	x 8	x 2	x 2

10.4 Balance assembly and installation

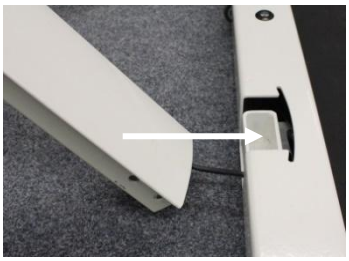


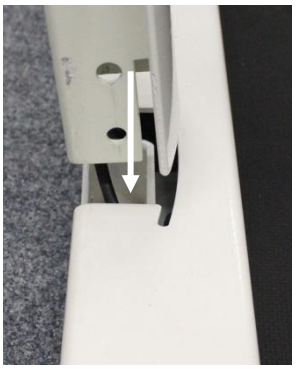
⇨ Level balance with foot screws until the air bubble of the water balance is in the prescribed circle.

⇨ Check levelling regularly.

Refitting Procedure:

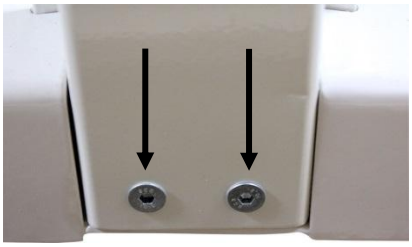
Plug the stand carefully into the provided opening of the frame as shown in the illustration.
Ensure that the cable is not squeezed.





Screw down the stand on the weighing plate:

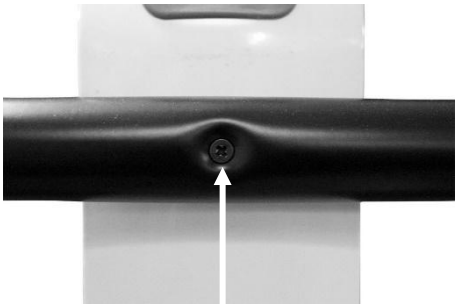
x 2



Place the handrail of the stand on the provided pins and fix it using the screws to the base plate.

x 4

Screw down the stand at the handrail



Place the side parts on the provided pins and fix them on the frame

x 4

Screw together the handrail of the stand with the side parts as shown in the illustration

10.5 Mains connection

Power is supplied by the external mains adapter which also serves to isolate the mains supply from the scale. The stated voltage value must be the same as the local voltage.
Always use genuine approved KERN power pack units as per EN 60601-1 directive.

The small sticker attached to the side of the display unit indicates the power port:

The LED remains illuminated as long as the weighing scale remains connected to the mains.

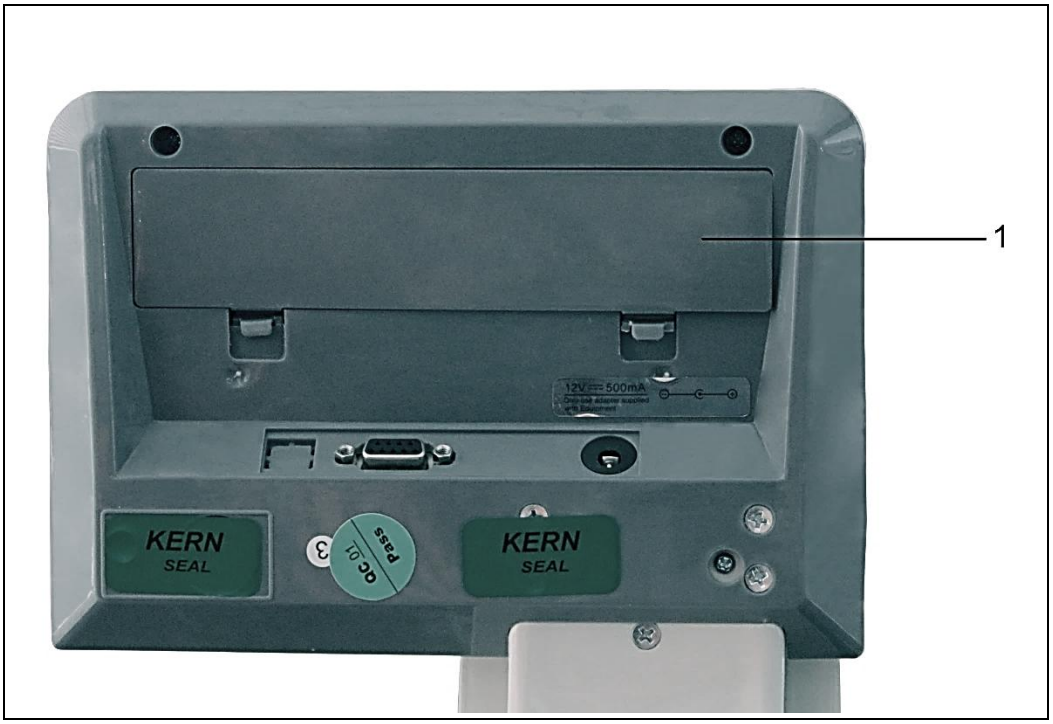
The LED display informs you during loading about the loading status of the rechargeable battery.

green: Rechargeable battery completely recharged

blue: Charging rechargeable battery

The standard version of the balance is without rechargeable battery.

10.6 Rechargeable battery operation using an optional battery power pack



Open the battery compartment cover (1) at the base of the display unit and insert the rechargeable battery. Charge the rechargeable battery for at least 12 hours before initial use.

The appearance of the symbol  in the weight display indicates that the rechargeable battery is almost exhausted. The weighing scale will remain ready for operation for a few more minutes before switching off in order to save battery. Charge rechargeable battery.

 Voltage has dropped below prescribed minimum.

 Rechargeable battery very low.

 Rechargeable battery completely recharged

Prior to commissioning the balance, charge the rechargeable battery completely.

Right underneath the display there is a LED with the symbol  . If the LED lights green, the rechargeable battery is fully charged. If it lights blue, the rechargeable battery is being charged.

If the balance is not used for a longer time, take out the rechargeable battery and store it separately. Leaking liquid could damage the balance.

10.7 Battery operation

As an alternative for the rechargeable battery operation, the balance offers also the possibility to be operated with 6x AA-batteries.
Open the battery cover (1) at the lower side of the display unit and insert the batteries according to the example shown below. Lock again the battery compartment cover. If

the batteries are empty, in the balance display appears the symbol  . Change batteries. To save the battery, the balance switches automatically off (see chap.11.6 Auto off).

 Capacity of batteries exhausted.

 Capacity of batteries will soon be exhausted.

 Batteries completely charged

Insert batteries:

Remove battery compartment cover	
Connect battery retainer as per illustration to the contact of the housing	
Insert battery retainer	

Insert batteries in the battery compartment and lock them with battery compartment cover.	

10.8 Initial Commissioning

In order to obtain exact results with the electronic balances, your balance must have reached the operating temperature (see warming up time chap.1). During this warming up time the balance must be connected to the power supply (mains, accumulator or battery) and be switched on.

The accuracy of the balance depends on the local acceleration of gravity.
The value of gravity acceleration is shown on the type plate.

11 Operation

11.1 Weighing

⇨ Start balance by pressing ON/OFF.
The balance will carry out a self-test
The balance is ready for operation as soon as the weight display for "**0.0 kg**" has appeared.

- However, you can reset the weighing scale to zero by pressing the →0← key.

⇨ Have person stand in the center of the scales. Wait until the standstill display „**STABLE**" appears, then read the weighing result.

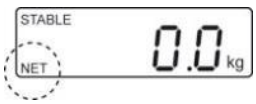
- If the person is heavier than the weighing range, **"OL"** (=overload) will appear in the display.

11.2 Taring

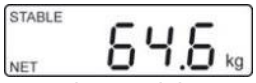
The tare weight of any preloads can be deducted by pressing a button so that the actual weight of the person is displayed in subsequent weighings.

(example)

⇨ Put object (such as towel or padding) on the weighing pan.



⇨ Press TARE, the zero display appears.
„**NET**" is shown at the bottom on the left.



(example)

⇨ Allow the person to step onto the center of the weighing platform. Wait until the standstill display „**STABLE**" appears, then read the weighing result.

- When the balance is unloaded the saved taring value is displayed with negative sign.
- To delete the stored tare value, unload the balance and press TARE.

11.2.1 Subsequent tare weight

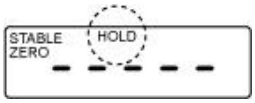
The balance can be tared several times successively. It is possible to enable or disable this function. For that make in the menu the following setting:

- Menu setting:
  [F5 Str] ⇨ **[Str on]** (see chap. 12)

11.3 HOLD function

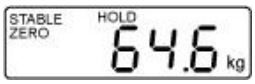
The balance has an integrated standstill function (mean value calculation). With this function it is possible to weigh people accurately even if they do not stand still on the weighing plate.

⇨ Start balance by pressing ON/OFF.
Wait for stability display **„STABLE"** to appear.



⇨ Press HOLD, in the display „**---------**" will appear and the **„HOLD"** symbol appears.

⇨ Allow the person to step onto the center of the weighing platform.



(example)

⇨ After a short time the stability display **„STABLE"** appears and the weighing value of the person is displayed and „frozen".

After unloading the balance, the weighing value remains displayed for approx. 10 seconds, than the balance changes automatically into the weighing mode.
The **„HOLD"** symbol disappears.

There is no average value calculation in the event of too much movement.

11.4 Show another decimal place (not verified value)

(short-time additional decimal place)

Press TARE and hold for about 2 s whilst weighed result is being shown. The second decimal place will be shown for approx. 5 s. This value is considered as not verified and must not be used for the defined purpose of a verified balance.

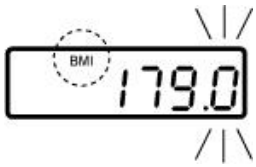
11.5 Calculation of the Body Mass Index

You need to know a person's body height before you can calculate the BMI for that person. This should be known.

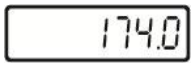
11.5.1 Calculating Body Mass Index

⇨ Start balance by ON/OFF

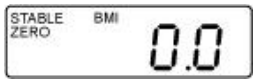
⇨ Wait for stability display **„STABLE"** to appear.



⇨ Press BMI.
The most recently entered body height will be shown with the enable digit flashing. The **"BMI"** symbol lights up.



⇨ To enter body height, press the →0← and F key.



⇨ Confirm the value entered with PRINT. BMI **„0.0"** is displayed

⇨ Allow the person to step onto the center of the weighing platform.
„---------„ appears shortly, followed by the person's BMI value.

⇨ Unload weighing plate

⇨ Return to weighing mode using BMI
The **"BMI"** symbol will disappear and the kg display reappears.

- Reliable calculation of BMI is restricted to a body height of 100 cm to 200 cm and a weight of >10 kg.
- If weighing has to take place under unsteady conditions, the display can be stabilised via the Hold function.

11.5.2 Classification of BMI values

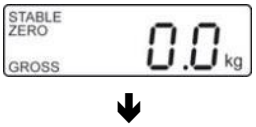
Weight classification for adults over 18 years of age using the BMI in accordance with WHO, 2000 EK IV and WHO 2004.

Category	BMI (kg/m²)	Risk of diseases associated with overweight
Underweight	< 18.5	Low
Normal weight	18.5 – 24.9	Average
Overweight	≥ 25.0	
Pre-adipose	25.0 – 29.9	A bit increased
Adipose degree I	30.0 – 34.9	Increased
Adipose degree II	35.0 – 39.9	High
Adipose degree III	≥ 40	Very high

11.6 Automatic switch-off function „AUTO OFF“

The weighing scale will switch off automatically after the adjusted time as long as neither the display unit nor the weighing plate is operated.

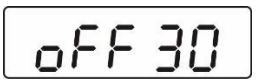
- Menu settings:
  [F1 oFF] ⇨ **[oFF 0/3/5/15/30]** (see chap. 12)



⇨ In weighing mode, press F and the first function **[F1 oFF]** will be displayed.

(example)

⇨ Press PRINT, the last saved time is displayed, for example, **[oFF 15]**



(example)

⇨ Press F repeatedly until the desired time is displayed, e.g. **[oFF 30]**

[oFF 0]	**AUTO OFF -** function disabled
[oFF 3]	Weighing system will be turned off after 3 min.
[oFF 5]	Weighing system will be turned off after 5 min.
[oFF 15]	Weighing system will be turned off after 15 min.
[oFF 30]	Weighing system will be turned off after 30 min.

⇨ Save selected time with PRINT, **[F1 oFF]** is displayed

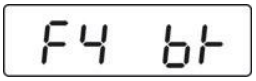
⇨ Return to weighing mode using TARE

11.7 Display background illumination

- Menu settings:
  [F4 bk] ⇨ **[bL on / bL oFF / bL AU]** (see chap. 12)

⇨ In weighing mode, press F and the first function **[F1 oFF]** will be displayed.

⇨ Press F repeatedly until **[F4 bk]** is shown.



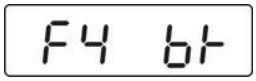
⇨ Press PRINT, the last saved setting is displayed, for example [**bL on**]

(example)

⇨ To select the desired setting, press F

⇩

bL on	Continuous background lighting
bL off	Background illumination off
bL Auto	Automatic background illumination on when weighing plate is loaded or key pressed.



⇨ With PRINT save select setting , [**F4 bk]** is displayed.

⇨ Return to weighing mode using TARE

12 Menu

	Access to service menu „tCH“ is locked in verified balances. To disable the access lock, destroy the seal mark and actuate the adjustment switch. Position of the adjustment switch see chap. 18.1 **Attention**: After destruction of the seal mark the weighing system must be re-verified by an authorized agency and a new seal mark fitted before it can be reused for applications subject to verification.

12.1 Navigation in the menu

Call up menu	⇨ In weighing mode, press  and the first function **[F1 oFF]** will be displayed.
Select function	⇨ With help of  , the individual functions can be selected one after the other.
Change settings	⇨ Confirm selected function by  . The current setting will be displayed. ⇨ Select desired setting by  and confirm with  , the balance returns to the menu.
Exit menu/ **Return to weighing mode**	⇨ Press  , the balance will return to weighing mode.

12.2 Menu overview

<table>
<tr><th>Menu block
Main menu</th><th>Menu item
Submenu</th><th>Available settings / explanation</th></tr>
<tr><td colspan="3"></td></tr>
<tr><td rowspan="5">F1 oFF
Automatic shutdown
Auto Off</td><td>oFF 0*</td><td>Automatic shutdown off</td></tr>
<tr><td>oFF 3</td><td>Automatic shutdown after 3 min</td></tr>
<tr><td>oFF 5</td><td>Automatic shutdown after 5 min</td></tr>
<tr><td>oFF 15</td><td>Automatic shutdown after 15 min</td></tr>
<tr><td>oFF 30</td><td>Automatic shutdown after 30 min</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td rowspan="3">F2 SUt</td><td>oFF*</td><td rowspan="3">Not documented</td></tr>
<tr><td>Prt</td></tr>
<tr><td>Pr ACC</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>F3 Prt
Interface parameter</td><td colspan="2">1. RS-232 mode
Select desired mode by F, then confirm with PRINT.
<table>
<tr><td>P Prt</td><td>Weight will be added to summation memory and printed after pressing PRINT</td></tr>
<tr><td>P Cont</td><td>Continuous data output</td></tr>
<tr><td>Series</td><td>Not documented</td></tr>
<tr><td>ASK</td><td>Remote control instructions:
W: Send all weighing details
S: Send stable weight value
T: Taring
Z: Zeroing</td></tr>
<tr><td>P cnt 2</td><td>Not documented</td></tr>
<tr><td>P Stab</td><td>Automatic data output of stable weighing values</td></tr>
<tr><td>P Auto</td><td>Weighed result will be added automatically to summation memory and issued</td></tr>
</table>
2. Baud rate
The currently set baud rate (b xxxx) will be shown after the RS-232 mode was confirmed. Select desired Baudrate by pressing F and confirm by pressing PRINT.
Available Baud rate: 600, 1200, 2400, 4800, 9600</td></tr>
</table>

	3. Data output format (P Prt, P Auto, P Cont settings only) the currently set data output format will be shown after the baud rate was confirmed. Select desired format by F and confirm with PRINT.		
	Only when set P Prt, P	Prt 0-3	Data output format, see chap. 13.3
	Only when set P Cont	Cont 1	Default **Sd0 – on/off** Continuous data output, selectable „transmitting 0“, yes / no
		Cont 2	Not documented
		Cont 3	Not documented
	4. Printer type After the data output format has been confirmed, the currently set printer type will be displayed. Select desired mode by F, then confirm with PRINT. LP -50 Not documented tPUP Use this setting		
F4 bt Background illumination of display	bl on	Display background illumination on	
	bl oFF	Display background illumination off	
	bl AU*	Backlighting for display will come on automatically as soon as the weighing scale is operated.	
tCH Service menu	Pin	Password Input: Press F, TARE, BMI subsequently.	
	Operate adjustment switch; position see chap.18.1		
P1 SPd Display speed	15*	Not documented	
	30		
	60		
	7.5		

P2 CAL	Adjustment, see chap. 18	
P3 Pro	tri*	Not documented
	CoUnt	Not documented
	rESEt	Reset weighing scale to factory setting
	SEtGrA	Not documented

* default setting

13 Data output RS 232

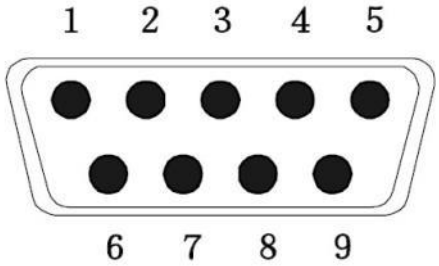
You can print weighing data automatically via the RS 232 interface or manually by pressing PRINT via the interface according to the setting in the menu.

This data exchange is asynchronous using ASCII - Code.

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

- Use a suitable cable to connect the weighing balance to the interface of the printer. Faultless operation requires an adequate KERN interface cable.
- Communication parameters (baud rate, bits and parity) of balance and printer must match. For detailed description of interface parameters see chap. 13.2)

13.1 Pin allocation of balance output bushing:

	Pin 2: TXD - output Pin 3: RXD - input Pin 5: GND - signal ground

13.2 Technical data

Connection	9 pin d-subminiature bushing
	Pin 2 output
	Pin 3 input
	Pin 5 signal earth
Baud rate	Optional 600/1200/2400/4800/9600
Parity	8 bits

13.3 Printer operation

Printout examples:

Prt	
0 / 2	60.0kg
1 / 3	60.0kg 170.0cm 20.7BMI

Remote control instructions:

S:

29.03.2017	09:31:21:	ST		20.0kg	Stable value positive
29.03.2017	09:31:51:	ST	-	20.0kg	Stable value negative

W:

29.03.2017	09:32:25:	US		44.3kg	Instable value positive
29.03.2017	09:35:33:	US	-	18.4kg	Instable value negative

14 Error messages

Display	Description
Err4	**Zero setting range exceeded** (on start-up or when pressing the  key) • Load on weighing pan • Excess load, during zero setting of weighing scale • Incorrect adjustment process • Fault on load cell
Err6	**Value outside the A/D converter range** • Damaged weighing cell • Damaged electronics

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

15 Servicing, maintenance, disposal

15.1 Cleaning

	Before any maintenance, cleaning and repair work disconnect the appliance from the operating voltage.

15.2 Cleaning / disinfecting

Clean the weighing platform and the housing with household detergent or commercially available disinfectant, e.g. 70% isopropanol. We recommend a disinfectant suitable for wiping disinfection. Please follow manufacturer's instructions.

Do not use abrasive or aggressive cleaners such as spirits or alcohol or similar as they might damage the high-quality surface.

To prevent cross-contamination (fungal skin infection) please observe the following time intervals for disinfection:

- Weighing plate before and after any measurement with direct skin contact
- When required:
  - Display
  - Touch-sensitive keyboard

- ⇨ Do not spray the device with disinfectant, just wipe it.
- ⇨ Make sure that disinfectant does not penetrate the interior of the balance.
- ⇨ Remove dirt immediately.

15.3 Sterilisation

Sterilisation of the appliance not allowed.

15.4 Servicing, maintenance

The appliance may only be opened by trained service technicians who are authorized by KERN.
We recommend a regular safety-related technical check (STK).
Disconnect scales from mains before opening.

15.5 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.

16 Instant help for troubleshooting

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

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

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

17 Verification

General:
According to EU directive 2014/31/EU balances must be officially verified if they are used as follows (legally controlled area):

a) For commercial transactions if the price of goods is determined by weighing.

b) For the production of medicines in pharmacies as well as for analyses in the medical and pharmaceutical laboratory.

c) For official purposes

d) For manufacturing final packages

e) Determination of mass in the practice of medicine that is, weighing patients for reasons of medical supervision during medical surveillance, examination and treatment,

In cases of doubt, please contact your local trade in standard.

Verification notes:
An EU type approval exists for balances described in their technical data as verifiable. If the balance is used where obligation to verify exists as described above, it must be verified and re-verified at regular intervals.
Re-verification of a balance is carried out according to the respective national regulations. For verification validity period, see chap. 17.1.
The legal regulation of the country where the balance is used must be observed!

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

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

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

17.1 Verification validity period (current status in D)

Personal scales (including chair and wheelchair scales) in hospitals	4 years
Personal balances, when not located in hospitals (for example, doctor's offices and nursing homes)	unlimited
Baby weighing scales and mechanical birth weight scales	4 years
Bed scales	2 years
Scales in dialysis stations	unlimited

Notes:

- Also rehab clinics and health authorities are treated as hospitals
- Not treated as hospitals (verification validity not limited) are dialysis stations, nursing homes and doctor’s surgeries.

  (Data source: ”Bureau of Standards News, Weighing Instruments in Medicine“)

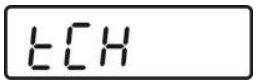
18 Adjustment

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.

	• Prepare the required adjustment weight. The adjustment weight to be applied depends on the capacity of a weighing scale, see chap. 1. Carry out adjustment as closely as possible to admissible maximum load of weighing scale. Info about test weights can be found on the Internet at: http://www.kern-sohn.com. • Observe stable environmental conditions. For warm-up time required for stabilisation see chap.1.

	Access to service menu „tCH“ is locked in verified balances. To disable the access lock, destroy the seal mark and actuate the adjustment switch. Position of the adjustment switch see chap. 18.1. **Attention**: After destruction of the seal the weighing system must be re-verified by an authorized agency and a new verification wire/seal mark fitted before it can be reused for applications subject to verification.

Procedure:

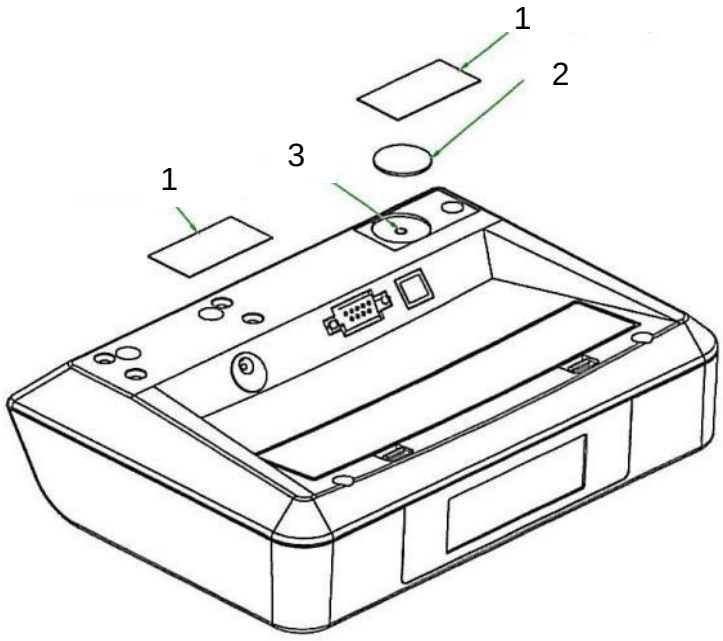
	In weighing mode, press F repeatedly until **[tCH]** appears.
	Press PRINT, **[Pin]** is displayed
	⇨ Press F, TARE and BMI one after the other, **[P1 SPd]** will appear
 	⇨ Press F, **[P2 CAL]** will be displayed ⇨ **Operate adjustment switch; position see chap.18.1** ⇨ Press PRINT, **[duA rA]** or **[SnG rA]** is displayed ⇨ Select **[duA rA]** and confirm with PRINT, **[dESC]** appears.
	⇨ Press PRINT, **[dESC]** is displayed
	⇨ Press F repeatedly until **[CAL]** will be displayed. ⇨ Confirm with PRINT, **[UnloAd]** appears
	⇨ Ensure that there are no objects on the weighing plate. ⇨ Wait for stability display "**STABLE**", then confirm with PRINT

 (example)	⇨ The size of the currently set adjustment weight will be displayed. To change, select the digit to be altered by →0←, and the numerical value by F.

	⇨ Confirm with PRINT, **[LoAd]** appears.
LoAd ↓ PASS STABLE ZERO GROSS 0.0 kg	⇨ Place adjustment weight in the center of the weighing pan ⇨ Wait until stability display „**STABLE**“ appears ⇨ Confirm with PRINT **[PASS]** is displayed. ⇨ The balance carries out a selftest, after that **[Err19]** is displayed and a signal tone sounds. ⇨ Switch off the balance ⇨ Take away adjustment weight ⇨ Switch the balance on again, after the selftest the balance changes into weighing mode. Adjustment has now been completed successfully.

18.1 Adjustment switch and seals

Position adjustment switch and seal marks



1. Self-destroying seal mark
2. Cover
3. Adjustment switch