Operating Instructions

Jewelry Balances

JE

METTLER TOLEDO

Table of Contents

1 Introduction

Thank you for choosing a METTLER TOLEDO balance. The balances of the Jewelry line combine a large number of weighing possibilities with easy operation.

The operating instructions are based on the initially installed terminal firmware (software) version V 1.01.

▶ www.mt.com/jewelry

1.1 Conventions and symbols used in these Operating Instructions

Key and / or button designations are shown in graphic or bold text (e.g. ▤).

These symbols indicate an instruction:

- ▪ prerequisites
- 1 steps
- 2 …
- ⇨ results

This symbol indicates press key briefly (less than 1.5 s).

This symbol indicates press and hold key down (longer than 1.5 s).

This symbol indicates a flashing display.

2 Safety Information

- Read and understand the instructions in this manual before you use the balance.
- Keep this manual for future reference.
- Include this manual if you pass on the balance to other parties.

If the balance is not used according to the instructions in this manual or if it is modified, the safety of the user may be impaired and Mettler-Toledo GmbH assumes no liability.

2.1 Definition of signal warnings and symbols

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results.

WARNING	for a hazardous situation with medium risk, possibly resulting in death or severe injury if not avoided.
CAUTION	for a hazardous situation with low risk, resulting in minor or moderate injury if not avoided.
NOTICE	for a hazardous situation with low risk, resulting in damage to the balance, other material damage, malfunctions and erroneous results, or loss of data.
Note	(no symbol) for useful information about the product.

 General hazard   Electrical shock

 NOTICE

2.2 Product safety information

Your balance represents state-of-the-art technology and complies with all recognized safety rules, however, certain hazards may arise in extraneous circumstances. Do not open the housing of the balance; it does not contain any parts that can be maintained, repaired or replaced by the user. If you experience problems with your balance, contact your authorized METTLER TOLEDO dealer or service representative.

The balance has been tested for the experiments and intended purposes documented in the appropriate manual. However, this does not absolve you from the responsibility of performing your own tests of the products supplied by us regarding their suitability for the methods and purposes you intend to use them for.

Intended use

This balance is designed to be used in analytical laboratories by qualified staff. Your balance is used for weighing. Use the balance exclusively for this purpose.

Any other type of use and operation beyond the limits of technical specifications without written consent from Mettler-Toledo GmbH, is considered as not intended.

Site requirements

The balance has been developed for indoor operation. Avoid the following environmental influences:

- Conditions outside of the ambient conditions specified in the technical data
- Powerful vibrations
- Direct sunlight
- Corrosive gas atmosphere

- Explosive atmosphere of gases, steam, fog, dust and flammable dust
- Powerful electric or magnetic fields

Staff qualification

Incorrect use of the balance or the chemicals used in the analysis can lead to death or injury. The following experience is needed for operating the balance.

- Knowledge and experience in working with toxic and caustic substances.
- Knowledge and experience in working with standard laboratory equipment.
- Knowledge and experience in working in accordance with general lab safety rules.

Responsibilities of the balance owner

The balance owner is the person that uses the balance for commercial use or places the balance at the disposal of his staff. The balance owner is responsible for product safety and the safety of staff, user(s) and third party.

The operator has the following responsibilities:

- Know the rules for safety at the workplace that are in effect and enforce them.
- Ensure that only qualified staff uses the balance.
- Define the responsibilities for installation, operation, cleaning, troubleshooting and maintenance and ensure that the tasks are done.
- Train the staff in regular intervals and inform them about dangers.
- Provide the necessary protective gear for the staff.

Shut down of the balance in emergency situations

– Pull the plug from the electrical outlet.

Safety notes

> ⚠ **WARNING**
>
> **Danger of death or serious injury due to electric shock!**
>
> Contact with parts that contain a live current can lead to injury and death. If the balance cannot be shut down in an emergency situation, people can be injured or the balance can be damaged.
>
> 1 Only use the supplied three-core power cable with equipment grounding conductor to connect your balance.
> 2 Check that the voltage printed on the balance is the same as your local power supply voltage.
>
>   ⇨ If this is not the case, under no circumstances connect the AC/DC adapter to the power supply, but contact a METTLER TOLEDO representative.
> 3 Only connect the balance to a three-pin power socket with earthing contact.
> 4 Only standardized extension cable with equipment grounding conductor must be used for operation of the balance.
> 5 Do not disconnection the equipment grounding conductor.
> 6 Check the cables and the plug for damage and replace damaged cables and plugs.
> 7 Make sure that the cables are arranged so that they cannot be damaged or interfere with the operation.
> 8 Keep all electrical cables and connections away from liquids.
> 9 Make sure that the power plug is accessible at all times.

> ❗ **NOTICE**
>
> **Environment**
>
> Only use indoors in dry locations.

NOTICE

Danger of damaging the keyboard with pointed or sharp objects!

Do not use pointed or sharp objects to navigate on the keyboard. This may damage the surface of the keyboard.

– Operate the keyboard with your fingers.

NOTICE

Danger of damage to the balance!

Never open the balance. The balance contains no user-serviceable parts.

– In the event of problems, please contact a METTLER TOLEDO representative.

NOTICE

Danger of damage to the balance due to incorrect parts!

Using incorrect parts with the balance can damage the balance or cause the balance to malfunction.

– Only use parts supplied with the balance, listed accessories and spare parts from Mettler-Toledo GmbH.

NOTICE

Damage of the balance or software

In some countries, excessive mains voltage fluctuations and strong glitches may occur. This may affect the balance functions or damage the software.

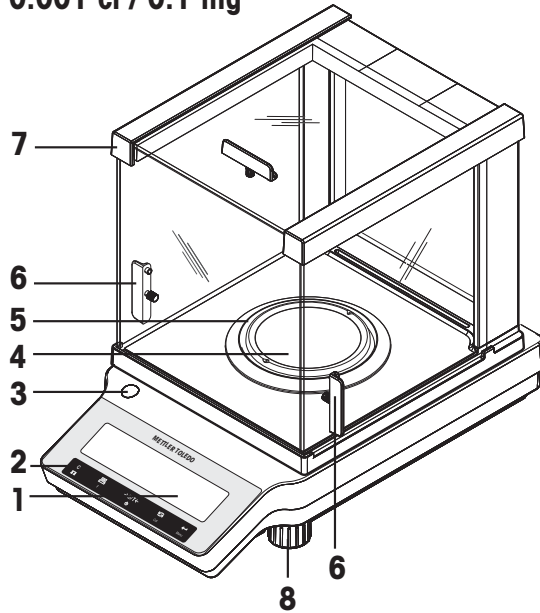– Use a voltage regulator for stabilizing.

Finding more information
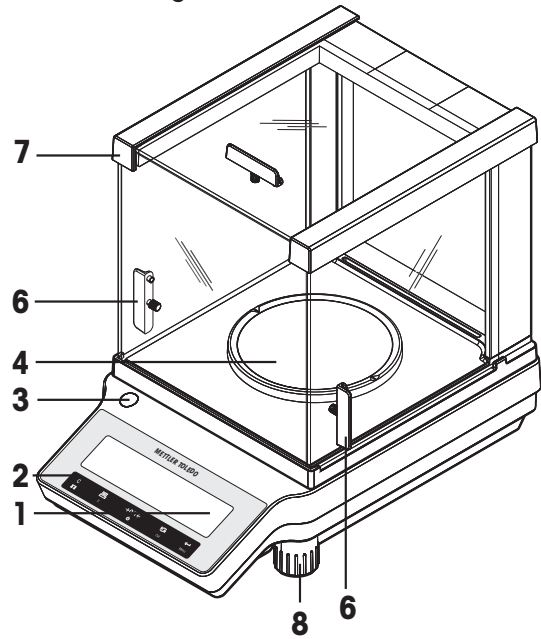
Refers to an external document.
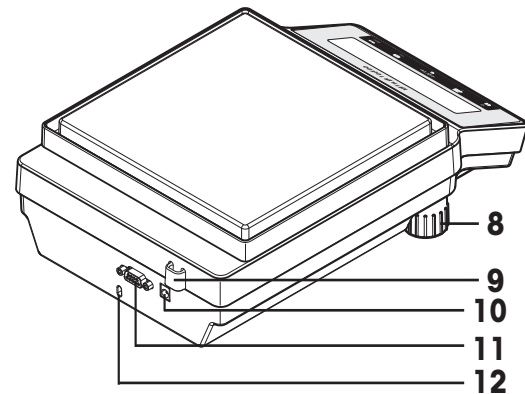
3 Design and Function

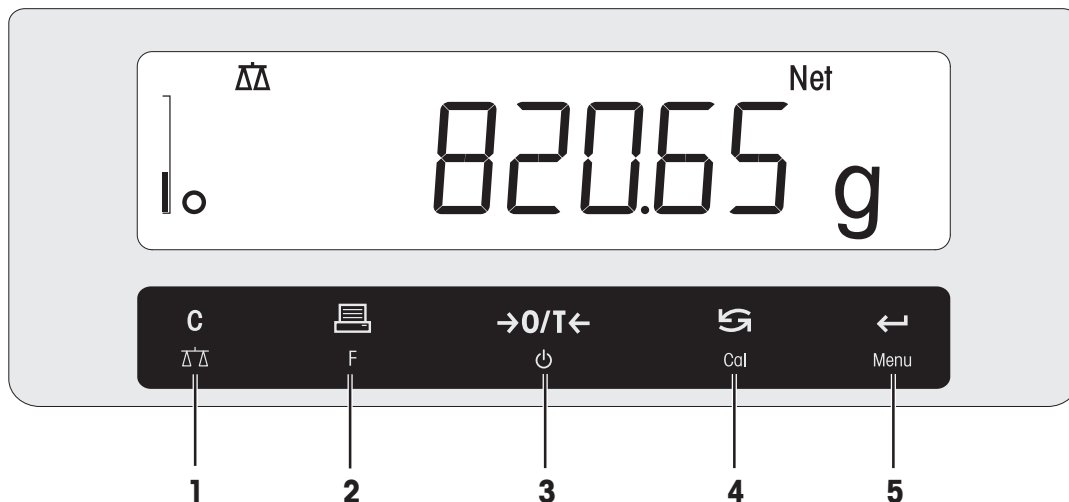## 3.1 Overview

3.1.1 Components

0.001 ct / 0.1 mg   **1 mg**

10 mg
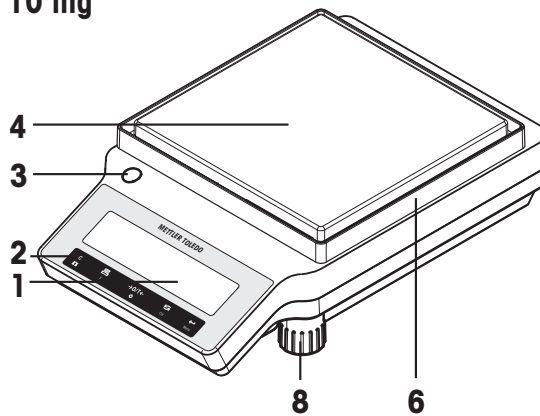
1	Display	2	Operation keys
3	Level indicator	4	Weighing pan
5	Draft shield element	6	Handle for operation of the draft shield door
7	Glass draft shield	8	Leveling foot
9	Legal for Trade (LFT) sealing	10	Socket for AC adapter
11	RS232C serial interface	12	Kensington slot for anti-theft purposes

3.1.2 Operation keys

Legend key functions

| No.	Key	Press briefly (less than 1.5 s) ☜	Press and hold (longer than 1.5 s) ☜
1	C ⚖⚖	• Cancel or leave menu without saving • One step back in the menu	• Select the simple weighing application • Exit application
2	🖶 F	• Print display value • Transmit data • To navigate backwards in the menu or menu selection • Decrease parameters in menu or applications	• Open the application list for selecting an application
3	→0/T← ⏻	• Zero/Tare • Switch on	• Switch off into standby mode
4	� Cal	• With entries, scroll down • To navigate forward menu topics or menu selections • To toggle between unit 1, recall value (if selected), unit 2 (if different from unit 1) and the application unit (if any) • Increase parameters in menu or applications.	• Select adjustment (calibration) – with internal weight * – with external weight – Customer fine adjustment * * On models with internal weight only
5	↵ Menu	• Enter or leave menu selection • To enter application parameter digit and switch to next parameter digit • To accept parameter in menu selection.	• Enter or leave menu (parameter settings) • To store parameter • To accept numeric inputs in applications.

3.1.3 Display
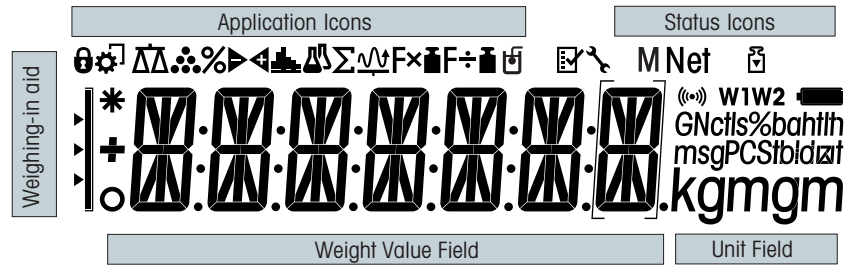
Application Icons			
△△	Application weighing	Σ	Application totaling
.⫶.	Application piece counting	F×▪	Application multiplication factor
%	Application percent weighing	F÷▪	Application division factor
▶◀	Application check weighing	🗊	Application density
ⓗⓛ	Application statistics	🔒	Menu locked

Note

While an application is running, the corresponding application icon appears at the top of the display.

| Status Icons			
M	Indicates stored value (Memory)	((•))	Acoustic feedback for pressed keys activated
🗓	Adjustments (calibration) started	W1	Weighing range 1 (Dual Range models only)
🔧	Service reminder	W2	Weighing range 2 (Dual Range models only)

Weight Value Field and Weighing-in aid			
—	Indicates negative values	[ ]	Brackets to indicate uncertified digits (approved models only)
O	Indicates unstable values	▶	Marking of nominal or target weight
✳	Indicates calculated values	⊕	Marking of tolerance limit T+
		▷	Marking of tolerance limit T-

Unit Field						
GNctls%bahtlh msgPCStbldzt **kgmgm**	g	gram	ozt	troy ounce	tls	Singapore taels
	kg	kilogram	GN	grain	tlt	Taiwan taels
	mg	milligram	dwt	pennyweight	tola	tola
	ct	carat	mom	momme	baht	baht
	lb	pound	msg	mesghal		
	oz	ounce	tlh	Hong Kong taels		

3.2 Basic principles for operation

Selecting simple weighing or terminate application

– Press and hold ⏃⏃ until **WEIGH** appears on the display.
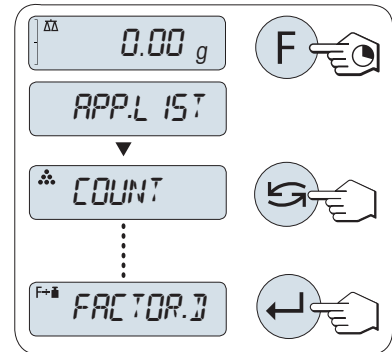 ⇨ The balance returns to the simple weighing mode.
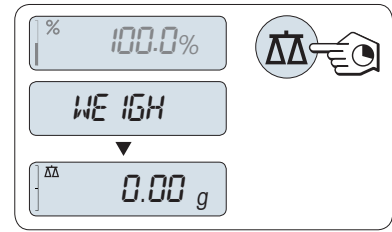
Note

How to perform simple weighing **see** [Performing a simple weighing ▶ Page 22].

Selecting an application

1 Press and hold **F** until **APP.LIST** (application list).
  ⇨ Last active application e.g. **COUNT** appears on the display.
2 Select an application by multiple pressing ⤾.
3 To execute selected application press ↵.

Available applications

Display	Remark	Description
COUNT	Piece counting	**see** [Application piece counting ▶ Page 34]
PERCENT	Percent weighing	**see** [Application percent weighing ▶ Page 37]
CHECK	Check weighing	**see** [Application check weighing ▶ Page 39]
STAT	Statistics	**see** [Application statistics ▶ Page 41]
TOTAL	Totaling	**see** [Application totaling ▶ Page 43]
FACTOR.M	Multiplication factor	**see** [Application multiplication factor weighing ▶ Page 44]
FACTOR.D	Division factor	**see** [Application division factor weighing ▶ Page 46]
DENSITY	Density	**see** [Application density ▶ Page 48]

Entering the menu

1 Press and hold **Menu** to enter main menu. The first menu **BASIC** is displayed (except menu protection is active).
2 Press ⤾ repeatedly to change menu.
3 Press ↵ to confirm the selection.
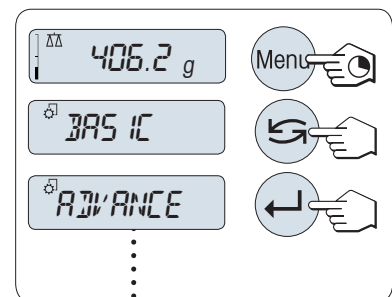
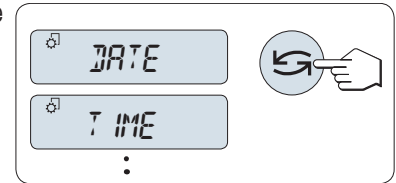**Note**

Detailed description of the menu **see** [The Menu ▶ Page 25].

Selecting menu topics

– Press ⇆. The next menu topic appears in the display. Each time ⇆ is pressed, the balance switches to the next menu topic.

Changing settings in selected menu topic

1 Press ↵. The display shows the current setting in the selected menu topic. Each time ⇆ is pressed, the balance switches to the next selection. After the last selection, the first is shown again.
2 Press ↵ to confirm the setting. For store the setting see section **Saving settings and closing the menu**.
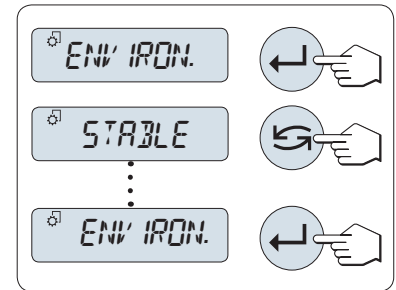
Changing settings in a submenu selection

The same procedure as for menu topics.

Input principle of numerical values

1 Press ↵ to select a digit (cyclically from left to right) or a value (depending on the application). The selected digit or the selected value is blinking.
2 For changing blinking digits or values, press ⇆ to increase or **F** to decrease.
3 Press and hold ↵ to accept the value.
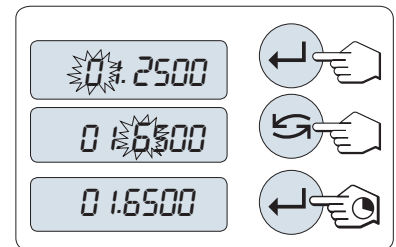
Saving settings and closing the menu

1 Press and hold **Menu** to leave menu topic.
   ⇨ **SAVE:YES** appears on the display.
2 Press ⇆ to toggle between **SAVE:YES** and **SAVE:NO**.
3 Press ↵ to execute **SAVE:YES**. Changes are saved.
4 Press ↵ to execute **SAVE:NO**. Changes are not saved.
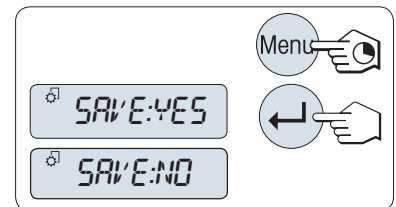
Cancel

▪ During menu operation
– To leave menu topic or menu selection without saving press **C** (one step back in the menu).
▪ During application operation
– To cancel settings press **C**.
   ⇨ The balance returns to the previous active application.
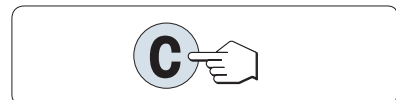
Important

If no entry is made within 30 seconds, the balance reverts to last active application mode. Changes are not saved. If changes are made, the balance asks "**SAVE:NO**".

4 Installation and Putting into Operation

⚠ WARNING

Danger of death or serious injury due to electric shock!
The balance must be disconnected from the power supply when carrying out all setup and mounting work.

4.1 Unpacking and delivery inspection

NOTICE

Danger of damage to the balance due to incorrect parts!
Using incorrect parts with the balance can damage the balance or cause the balance to malfunction.

– Only use parts supplied with the balance, listed accessories and spare parts from Mettler-Toledo GmbH.

1 Open the packaging and carefully remove all components.
2 Check the delivered items.

The standard scope of delivery contains the following items:

Components		Carat balances	Gold balances	
		0.001 ct / 0.1 mg	1 mg	10 mg
Draft shield	170 mm	✓	✓	–
Weighing pan	ø 90 mm	✓	–	–
	ø 120 mm	–	✓	–
	180 × 180 mm	–	–	✓
Draft shield element		✓	–	✓
Pan support		–	–	✓
Protective cover		✓	✓	✓
Universal AC adapter (with plug set)		✓	✓	✓
Carat pan	S 80 ø × 20 mm	✓	–	–
	M 90 ø × 30 mm	–	✓	–
EC declaration of conformity		✓	✓	✓
Operating instructions or User Manual; printed or on CD-ROM, depending on country of use		✓	✓	✓

4.2 Installing components

Carat balances with readability of 0.001 ct / 0.1 mg

Place the following components on the balance in
the specified order:

1   Push the side glass doors back as far as will go.
2   Place draft shield element (1).
3   Place weighing pan (2).

Note

Cleaning the draft shield **see** [Cleaning and
service ▸ Page 57].
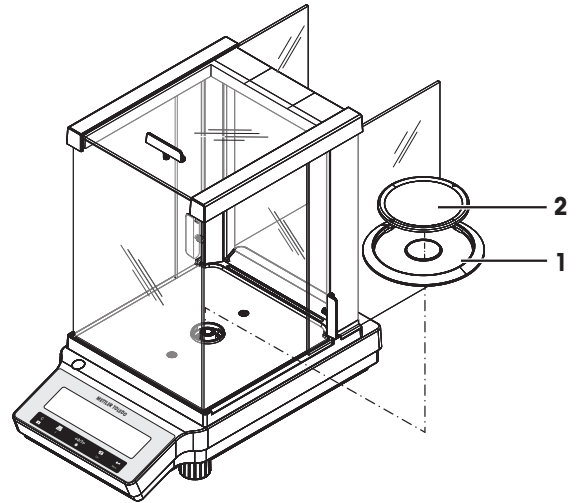
Gold balances with readability of 1 mg

Place the following components on the balance in
the specified order:

1   Push the side glass doors back as far as will go.
2   Place weighing pan (1).
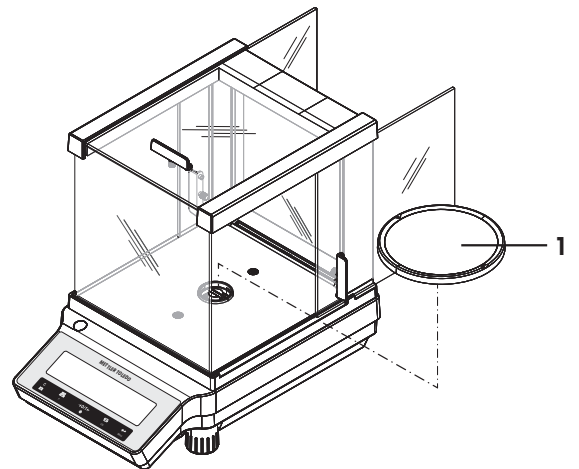
Note

Cleaning the draft shield **see** [Cleaning and
service ▸ Page 57].

Gold balances with readability of 10 mg

Place the following components on the balance in the specified order:

1 Place draft shield element (1): carefully pull apart the draft shield element to fix it under the retaining plate.

2 Insert pan support (2).

3 Place weighing pan (3).
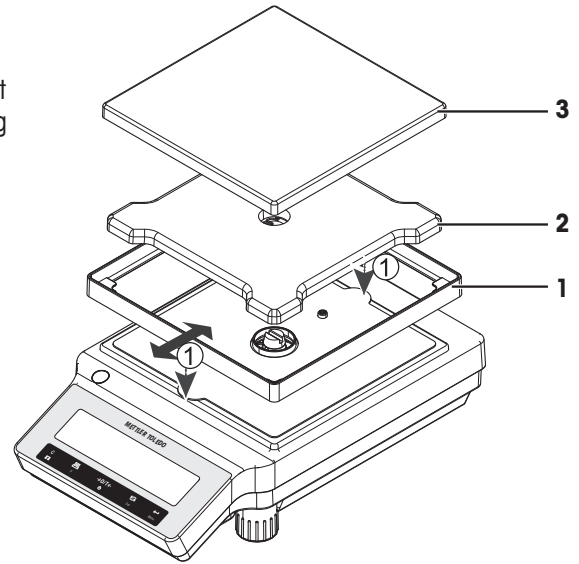
4.3 Installing protective cover

Important

Make sure using the correct protective cover, **see** [Accessories and Spare Parts ▶ Page 72].

Balances with readability of 0.1 mg / 1 mg	Balances with readability of 10 mg
Install the protective cover according to the illustrations below, using a screwdriver Philips No. 2.	Install the protective cover according to the illustrations below, using a screwdriver Torx TX20.

4.4 Selecting a location

An optimal location will ensure accurate and reliable operation of the balance. The surface must be able to safely take the weight of the balance when fully loaded. The following local conditions must be observed:
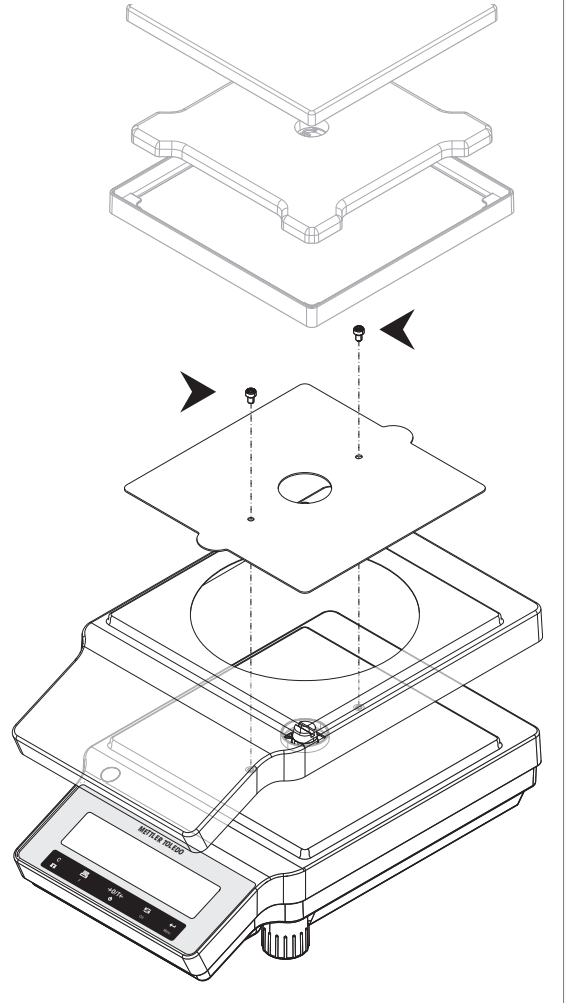
Important

If the balance is not horizontal at the outset, it must be leveled during commissioning.

- The balance must only be used indoors and up to a maximum altitude of 4,000 m above sea level.
- Before switching on the balance, wait until all parts are at room temperature (+5 to 40 °C).
  The humidity must be between 10% and 80% non-condensing.
- The power plug must be accessible at all times.
- Firm, horizontal and vibration-free location.
- Avoid direct sunlight.
- No excessive temperature fluctuations.
- No strong drafts.
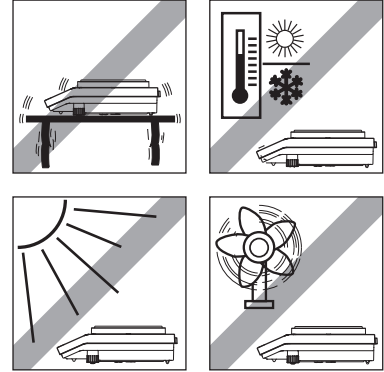
4.5 Connecting the balance

⚠ **WARNING**

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death. If the balance cannot be shut down in an emergency situation, people can be injured or the balance can be damaged.

1. Only use the supplied three-core power cable with equipment grounding conductor to connect your balance.
2. Check that the voltage printed on the balance is the same as your local power supply voltage.

   ⇨ If this is not the case, under no circumstances connect the AC/DC adapter to the power supply, but contact a METTLER TOLEDO representative.

3. Only connect the balance to a three-pin power socket with earthing contact.
4. Only standardized extension cable with equipment grounding conductor must be used for operation of the balance.
5. Do not disconnection the equipment grounding conductor.
6. Check the cables and the plug for damage and replace damaged cables and plugs.
7. Make sure that the cables are arranged so that they cannot be damaged or interfere with the operation.
8. Keep all electrical cables and connections away from liquids.
9. Make sure that the power plug is accessible at all times.

NOTICE

Danger of damage to the AC/DC adapter due to overheating!

If the AC/DC adapter is covered or in a container, it is not sufficiently cooled and overheats.

1. Do not cover the AC/DC adapter.
2. Do not put the AC/DC adapter in a container.

The balance is supplied with an universal AC adapter and a country-specific plug. The AC adapter is suitable for use with the following voltage range:

100 – 240 V AC, 50/60 Hz.

- – Connect the AC adapter to the connection socket on the back of your balance (see figure) and to the power line.
    - ⇨ The balance performs a display test (all segments in the display light up briefly), **WELCOME**, **Software version**, **Maximum load** and **Readability** appears briefly.

The balance is ready for use.
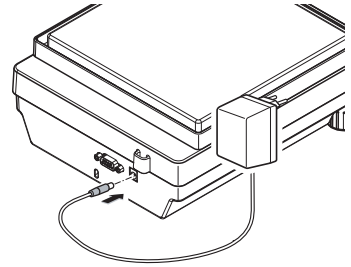
4.6 Setting up the balance

4.6.1 Switching on the balance

Before working with the balance, it must be warmed up in order to obtain accurate weighing results. To reach operating temperature, the balance must be connected to the power supply for at least 30 minutes (0.1 mg models 60 minutes).
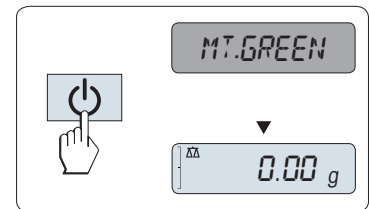
Switching on

- ▪ The balance is in **STANDBY** mode. **MT.GREEN** appears on the display.
- – Press ⏻ or remove any load from weighing pan or tap on the weighing pan.

The balance is ready for weighing or for operation with the last active application.

Important

Approved balances can only be switched on by pressing ⏻ in selected countries.

4.6.2 Leveling the balance

Important

If the balance is not horizontal at the outset, it must be leveled during commissioning.

Important

The balance must be leveled and adjusted each time it is moved to a new location.

1 Align the balance horizontally.
2 Turning the two front leveling screws of the housing until the air bubble is in the inner circle of the level indicator.
    - ⇨ The position of the air bubble illustrates which leveling screw you need to turn (L = left leveling screw, R = right leveling screw) and in which direction so that the air bubble moves to the center.
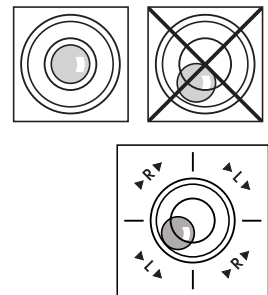
Example

In this example, turn the left leveling screw counterclockwise.

4.6.3 Setting date and time

When you put your new instrument into operation for the first time, you should enter the current date and time.

Note

- • These settings are retained even if you disconnect your instrument from the power supply.
- • A reset of the instrument will not change these settings.

- Set the current date according to the date format **DATE.FRM** in the menu **ADVANCE.**.
- Set the current time according to the time format **TIME.FRM** in the menu **ADVANCE.**.

1 Press and hold **Menu** until menu **BASIC** appears on the display.

2 Press ↵ to open menu **BASIC**.
  ⇨ **DATE** appears.

3 Press ↵ to confirm.

4 **Set current date**. Press ↵ to select day, month or year; press ↰ to set current day, month or year.

5 Press and hold ↵ to confirm the settings.
  ⇨ **DATE** appears..

6 **Set current time**. Press ↰ to select **TIME**.

7 Press ↵ to confirm.
  ⇨ **+1H** appears.

8 Select **SET.TIME** by pressing ↰.

9 Press ↵ to confirm.

10 Press ↵ to select hours or minutes; press ↰ to set current hours or minutes.

11 Press and hold ↵ to confirm the settings.
  ⇨ **TIME** appears.

12 Press and hold ↵ to store the settings.
  ⇨ **SAVE:YES** appears.

13 Press ↵ to confirm.
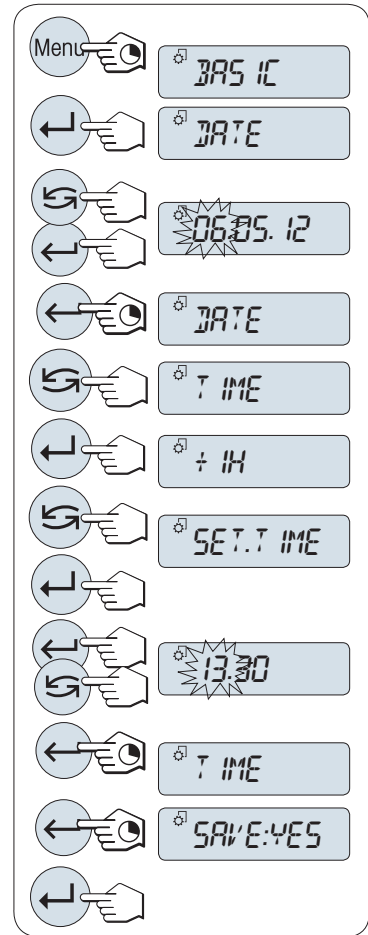
4.6.4 Adjusting the balance

To obtain accurate weighing results, the balance must be adjusted to match the gravitational acceleration at its location and depending on the ambient conditions. After reaching the operation temperature, adjusting is necessary

- before the balance is used for the first time.
- after a change of the location.
- at regular intervals during weighing service.

4.7 Adjustment (calibration)

> **NOTICE**
>
> Before adjusting the balance, it must be warmed up.
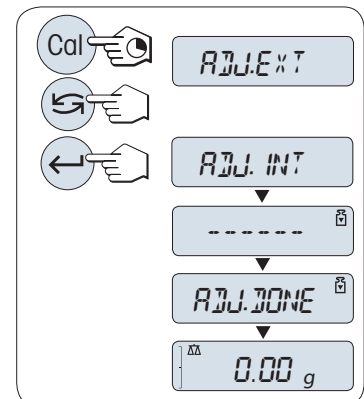
4.7.1 Adjustment with internal weight

Note

On models with internal weight only (see technical data).

- ▪ Weighing pan is unloaded.
1 To carry out this operation press and hold **CAL** until **ADJUST** appears.
2 Select **ADJ.INT** by pressing ⇆.
   - ⇨ **ADJ.INT** appears on the display.
3 Press ↵ to execute internal adjustment.

The balance adjusts itself automatically. The adjusting is finished when the message **ADJ.DONE** appears briefly on the display. The balance returns to the last active application and is ready for operation.

Sample adjustment printout using internal weight:

```
- Internal Adjustment --
21.Jan 2012          12:56

METTLER TOLEDO

Balance Type      JE703C
SNR          1234567890

Temperature      22.5 °C
Diff              3 ppm

Adjustment done
----------------------
```
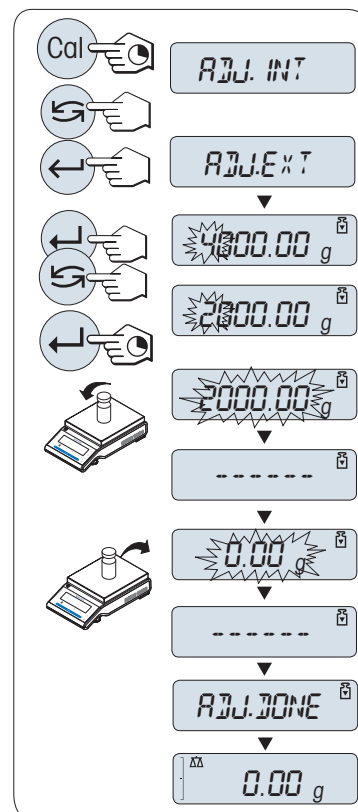
4.7.2 Adjustment with external weight

Important

Because of certification legislation, the approved models cannot be adjusted with an external weight *
(depend on selected countries' certification legislation).
* except OIML accuracy class I approved models.

1 Have required adjustment weight ready.
2 To carry out this operation press and hold **CAL** until **ADJUST** appears.
3 Select **ADJ.EXT** by pressing ⤺.
   ⇨ **ADJ.EXT** appears on the display.
4 Unload weighing pan.
5 Optional: If necessary, you can define a different weight value. Press ↵ to change a digit (cyclically from left to right); press ⤺ to change the blinking digit.
6 Press and hold ↵ to execute external adjustment.
   ⇨ The required adjustment weight value flashes in the display.
7 Place adjustment weight in center of pan.
   ⇨ The balance adjusts itself automatically.
8 When zero is flashing, remove adjustment weight.
⇨ The adjusting is finished when the message **ADJ.DONE** appears briefly on the display. The balance returns to the last active application and is ready for operation.

Sample adjustment printout using external weight:

```
- External Adjustment --
21.Jan 2012        12:56

METTLER TOLEDO

Balance Type    JE3002GE
SNR             1234567890

Temperature       22.5 °C
Nominal         2000.00 g
Actual          1999.99 g
Diff                5 ppm

Adjustment done

Signature


........................
-----------------------
```

4.7.3 Customer fine adjustment

> **NOTICE**
>
> This function should be executed only by trained personnel.

The function customer fine adjustment **ADJ.CF** allows you to adjust the value of the internal adjustment weight with your own adjustment weight. The adjustable range of the adjustment weight is possible only in a very small range. Customer fine adjustment impacts the function of internal adjustment. The customer fine adjustment can be deactivated at any time.

Note

- This feature is available on models with internal weight only.
- Because of certification legislation, approved models cannot be adjusted with customer fine adjustment (depending on selected countries' certification legislation).
- Use certificated weights.
- Balance and test weight have to be on operating temperature.
- Observe the correct environmental conditions.

Execute customer fine adjustment

- ▪ The balance is under measuring condition.
1 Have required adjustment weight ready.
2 Unload weighing pan.
3 To carry out this operation press and hold **CAL** until **ADJUST** appears.
4 Select **ADJ.CF** by pressing ⮌.
   - ⇨ **ADJ.CF** appears on the display.
5 Select **EXECUTE**.
6 Start Adjustment with ⮐.
   - ⇨ **SET REF.** appears briefly.
   - ⇨ The last saved value flashes on the display.
7 Select the target adjustment weight. Press ⮐ to change a digit (cyclically from left to right); press ⮌ to change the blinking digit.
8 Press and hold ⮐ to confirm and execute **ADJ.CF**.
   - ⇨ The required adjustment weight value flashes in the display. This could take some time.
9 Place required adjustment weight in center of pan.
10 Remove adjustment weight when zero is flashing.
11 Wait until **ADJ.DONE** briefly appears.
   - ⇨ The adjusting is finished when the message **ADJ.DONE** appears briefly on the display. The balance returns to the last active application and is ready for operation.
   - ⇨ If the error message **WRONG ADJUSTMENT WEIGHT** appears, the weight is not within the allowed value range and could not be accepted. **ADJ.CF** could not be executed.

Note

Storing the adjustment is not required.
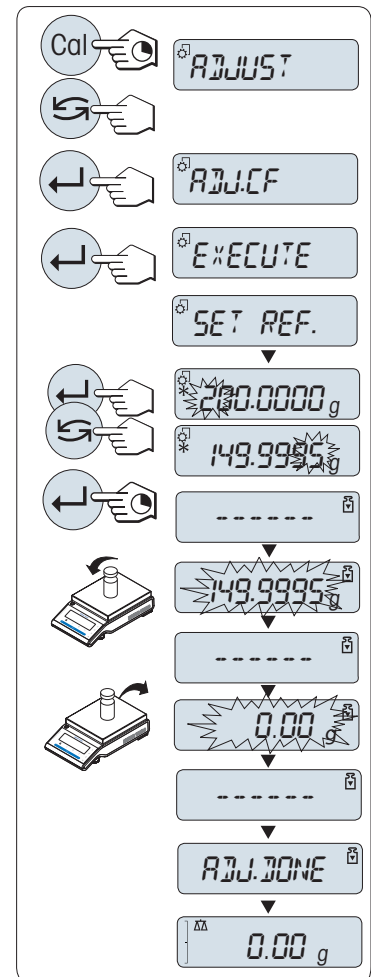
Deactivate customer fine adjustment

1 To carry out this operation press and hold **CAL** until **ADJUST** appears.

2 Select **ADJ.CF** by pressing ⤺.

⇨ **ADJ.CF** appears on the display.

3 Select **RESET**.

4 Start **RESET** by pressing ⏎.

⇨ **NO?** appears.

5 Select **YES?** and confirm with ⏎.

⇨ The adjusting is finished when the message **ADJ.DONE** appears briefly on the display. The balance returns to the last active application and is ready for operation with initial adjustment.

4.8 Performing a simple weighing

1 Press →0/T← to zero the balance.
Note: If your balance is not in the weighing mode, press and hold the ⚖ key down until **WEIGHING** appears in the display. Release the key. Your balance is in the weighing mode and set to zero.

2 Place weighing sample on the weighing pan.

3 Wait until the instability detector ○ disappears and the stability beep sounds.

4 Read the result.
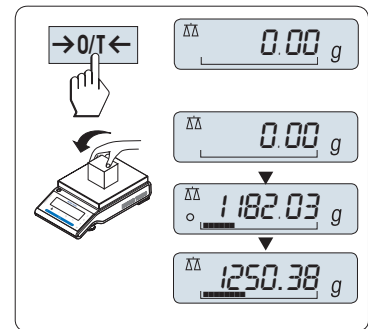
Zeroing

1 Unload the balance.

2 Press →0/T← to set the balance to zero. All weight values are measured in relation to this zero point.

Use the →0/T← zeroing key before you start with a weighing.
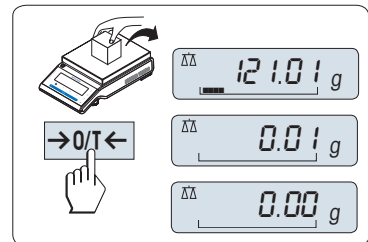
Taring

▪ If you are working with a weighing container, first set the balance to zero.

1 Place empty container on the weighing pan. The weight is displayed.

2 Press →0/T← to set the balance to zero.

⇨ **0.00 g** appears in the display.

3 Place weighing sample into the weighing container.

⇨ The result appears in the display.
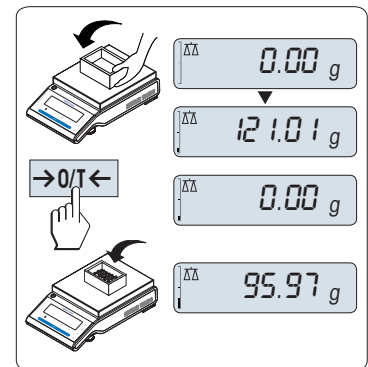
Switching weight units

The ⤺ key can be used at any time to toggle between weight unit **UNIT 1**, **RECALL** value (if selected) and weight unit **UNIT 2** (if different from weight unit 1) and the application unit (if any).
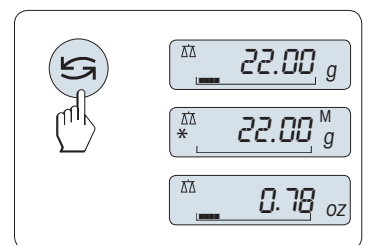
Recall / Recall weight value

Recall stores stable weights with an absolute display value bigger than 10d.
Requirement: The function **RECALL** must be activated in the menu.

1   Load weighing sample. The display shows weight value and
    stores stable value.
2   Remove weighing sample. When the weight is removed the
    display shows zero.
3   Press ⤺. The display shows last stored stable weight value for
    5 seconds together with asterisk (*) and memory (M) symbols.
    After 5 seconds the display goes back to zero. This can be
    repeated unlimited times.

Delete last weight value

As soon a new stable weight value is displayed, the old recall value
becomes replaced by the new weight value. When pressing
→0/T←, the recall value is set to 0.

Note: If the power is switched off, the recall value is lost. The recall
value can not be printed.

Weighing with the weighing-in aid

The weighing-in aid is a dynamic graphic indicator which shows the
used amount of the total weighing range. You can thus recognize at
a glance when the load on the balance approaches the maximum
load.

Print / Transmit data

Pressing the 🖩 key transmits the weighing results over the interface
e.g. to a printer or a PC.

Switching off into standby mode

–   Press and hold the ⏻ key until **STANDBY** appears on the display.
    Release the key.
⇨   **MT.GREEN** appears on the display.

Note

•   Once your balance has been switched off, it is in energy saver mode **STANDBY**. In this case your
    balance needs no warm-up time in the standby mode and is immediately ready for weighing.
    If you wish to perform a weighing, you only need to place the sample on the weighing pan and the
    balance immediately displays the result. There is no need to switch it on with the ⏻ key (with approved
    balances only possible in selected countries).
•   To completely switch off the balance, disconnect it from the power supply.
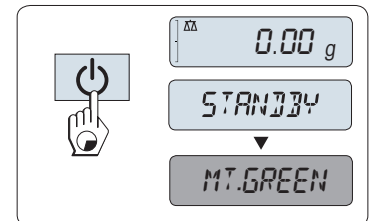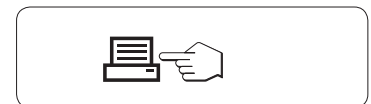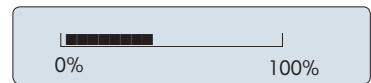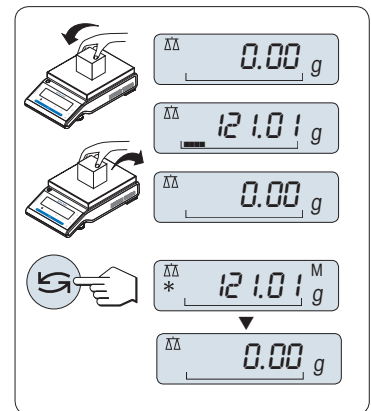
4.9 Weighing below the balance

Your balance is equipped with a hanger for carrying out weighings below the work surface (weighing below
the balance).

> ## NOTICE
>
> **Damage to balance**
> Do not place the balance on the pan support location bolt.

1   Press and hold the ⏻ key.

2   Disconnect the balance from the power supply.

3   Disconnect all interface cables.

1   Remove weighing pan, pan support and draft shield element if present.

2   Turn the balance carefully on its side.

3   Remove the cap. Keep it for later use.

4   Turn the balance to its normal position and simply reinstall all components in the reverse order.
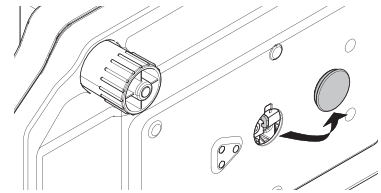
4.10 Transporting the balance

Switching off the balance

1   Press and hold the ⏻ key.

2   Disconnect the balance from the power supply.

3   Disconnect all interface cables.

Transport over short distances

To move the balance over a short distance to a new location, follow the instructions below.

NOTICE

Danger of damage to the glass draft shield!

Glass parts of the balance can be damaged.

–   Never lift the balance by the glass draft shield. The draft shield is not sufficiently fastened to the balance.

Transporting over long distances

The complete original packaging must be used for transportation or shipment of the balance over long distances or if it cannot be ensured that the balance will be transported upright.

5 The Menu

5.1 What is in the menu ?

The menu allows you to match your balance to your specific weighing needs. In the menu you can change the settings of your balance and activate functions. The main menu has 4 different menus and these contains different topics, each of which allows you various selection possibilities.

For menu **PROTECT see** [Main menu ▶ Page 26].

Menu BASIC

Topic	Explanation	Description
DATE	Setting the current date.	[see ▶ Page 26]
TIME	Setting the current time.	[see ▶ Page 26]
1/10 D	Setting display increment (1/10d function)	[see ▶ Page 26]
UNIT 1	Specification of the 1st weight unit in which the balance should show the result.	[see ▶ Page 26]
UNIT 2	Specification of the 2nd weight unit in which the balance should show the result.	[see ▶ Page 27]
SET ID	Setting an identification.	[see ▶ Page 27]
PRT.MENU	Printing the settings.	[see ▶ Page 27]
RESET	Call up of the factory settings.	[see ▶ Page 27]

Menu ADVANCE.

Topic	Explanation	Description
ENVIRON.	Matching the balance to the ambient conditions.	[see ▶ Page 27]
ADJ.LOCK	Switching the adjustment function on or off.	[see ▶ Page 28]
DATE.FRM	Setting the date format.	[see ▶ Page 28]
TIME.FRM	Preselection of the time format.	[see ▶ Page 28]
RECALL	Switching the application "Recall" for storing stable weights on or off.	[see ▶ Page 28]
STANDBY	Setting the time after which the balance should be switched off automatically.	[see ▶ Page 28]
B.LIGHT	Switching on or off the display backlight.	[see ▶ Page 28]
A.ZERO	Switching the automatic zero correction (Autozero) on or off.	[see ▶ Page 29]
SRV.ICON	Switching the service reminder (service icon) on or off.	[see ▶ Page 29]
SRV.D.RST	Reset service date and hours (service reminder)	[see ▶ Page 29]

Menu INT.FACE

Topic	Explanation	Description
RS232	Matching the serial interface RS232C to a peripheral unit.	[see ▶ Page 29]
HEADER	Setting the header for printout of individual values.	[see ▶ Page 30]
SIGN.L	Setting the footer for printout of individual values.	[see ▶ Page 30]
LN.FEED	Setting line feed for printout of individual values.	[see ▶ Page 30]
ZERO.PRT	Setting the auto print function for printing zero.	[see ▶ Page 30]
COM.SET	Setting the data communication format of the serial interface RS232C.	[see ▶ Page 30]
BAUD	Setting the transfer speed of the serial interface RS232C.	[see ▶ Page 31]
BIT.PAR.	Setting the character format (Bit/Parity) of the serial interface RS232C.	[see ▶ Page 31]

Topic	Explanation	Description
STOPBIT	Setting the character format (stop bit) of the serial interface RS232C.	[see ▶ Page 32]
HD.SHK	Setting the transfer protocol (Handshake) of the serial interface RS232C.	[see ▶ Page 32]
RS.TX.E.O.L.	Setting the end of line format of the serial interface RS232C.	[see ▶ Page 32]
RS.CHAR	Setting the char set of the serial interface RS232C.	[see ▶ Page 32]
INTERVL.	Selection of the time interval for the simulated print key press.	[see ▶ Page 32]

5.2 Description of menu topics

In this section you will find information regarding the individual menu topics and the available selections.

5.2.1 Main menu

Selecting the submenu.

BASIC	The small **BASIC** menu for simple weighing is displayed.
ADVANCE.	The extended **ADVANCE.** menu for further weighing settings is displayed.
INT.FACE	The menu **INT.FACE** for all interface parameter settings for peripheral devices e.g. printer is displayed.
PROTECT	Menu protection. Protection of balance configurations against unmeant manipulation.
OFF	Menu protection is off. (**Factory setting**)
ON	Menu protection is on. The menu **BASIC**, **ADVANCE.** and **INT.FACE** are not displayed. This is indicated with 🔒 in the display.

5.2.2 Basic menu

DATE – Date

Setting the current date according to date format.

Important: A reset of the balance will not change this setting.

TIME – Time

Setting the current time according to time format

+1H	Set the current time forwards by 1 hour. **(Factory setting)**
-1H	Set the current time backwards by 1 hour.
SET.TIME	Enter the current time.

Important: A reset of the balance will not change this setting.

1/10 D – Display increment 1/10 d

This menu topic allows you to reduce the readability of the display.

Important: This menu topic is not available with models which are approved and e=d.

OFF	**1/10 D** display increment is switched off (full resolution) **(Factory setting)**
ON	**1/10 D** switched on (low resolution)

Important: A reset of the balance will not change this setting.

UNIT 1 – Weight unit 1

Depending on requirements, the balance can operate with the following units (depending on the model)

- Only those weight units allowed by the appropriate national legislation are selectable.
- With approved balances, this menu topic has a fixed setting and cannot be changed.

Units:

g	Gram	**dwt**	Pennyweight
kg	Kilogram	**mom**	Momme
mg	Milligram	**msg**	Mesghal
ct	Carat	**tlh**	Tael Hong Kong
lb	Pound	**tls**	Tael Singapore
oz	Ounce (avdp)	**tlt**	Tael Taiwan
ozt	Ounce (troy)	**tola**	Tola
GN	Grain	**baht**	Baht

UNIT 2 – Weight unit 2

If it is required to show the weighing results in weighing mode in an additional unit, the desired second weight unit can be selected in this menu topic (depending on the model). Units see **UNIT 1**.

Important: Only those weight units allowed by the appropriate national legislation are selectable.

SET ID – Set identification

This menu topic allows you to set your own desired identification to the balance for the convenience of asset management or other purposes. The ID can be printed with other balance information. One ID can be set and max 7 alphanumeric characters are possible (blank, 0…9, A…Z).

SET ID	Set identification
	The setting starts from left to right and the display prompts the configurable position by flashing corresponding place.

- ▪ **SET ID** is selected.
1. Search through (blank, 0…9, A…Z) by pressing ↰.
2. After selecting the character, press ↵ to confirm and move to the next place. To store press and hold ↵.

Important: A reset of the balance will not change this setting.

PRT.MENU – Print menu

This menu topic allows you to execute a printout of the menu settings if a printer is connected. This topic is only visible if **PRINTER** mode is selected.

- ▪ **PRT.MENU** appears on the display and a printer is properly connected.
- – To execute a printout press ↵.

RESET – Reset balance settings

This menu topic allows you to call-up the factory settings.

To toggle between **YES**? and **NO**? press ↰.

Important: A reset of the balance will not change **DATE**, **TIME**, **1/10 D**, and **SET ID** settings.

5.2.3 Advanced menu

ENVIRON. – Environment settings

This setting can be used to match your balance to the ambient conditions.

STD.	Setting for an average working environment subject to moderate variations in the ambient conditions. (**Factory setting**)
UNSTAB.	Setting for a working environment where the conditions are continuously changing.
STABLE	Setting for a working environment which is practically free from drafts and vibrations.

ADJ.LOCK – Adjustment (calibration) lock

Under this menu topic you can lock function of the **Cal** key.

OFF	The adjustment lock is switched **off**. The adjustment function is on. The **Cal** key is activ. (**Factory setting**)
ON	The adjustment lock is switched **on**. The adjustment function is off. The **Cal** key has no function.

DATE.FRM – Date format

This menu topic allows you to preselect the date format.

The following date formats are available:

	Display examples	Printing examples
DD.MM.Y	01.02.09	01.02.2009
MM/DD/Y	02/01/09	02/01/2009
Y-MM-DD	09-02-01	2009-02-01
D.MMM Y	1.FEB.09	1.FEB 2009
MMM D Y	FEB.1.09	FEB 1 2009

Factory setting: **DD.MM.Y**

TIME.FRM – Time format

This menu topic allows you to preselect the time format.

The following date formats are available:

	Display examples
24:MM	15:04
12:MM	3:04 PM
24.MM	15.04
12.MM	3.04 PM

Factory setting: **24:MM**

RECALL – Recall

This menu topic allows you to switch the **RECALL** function on or off. When it is switched on recall stores the last stable weight if the absolute display value was bigger than 10d.

OFF	**RECALL** switched **off**. **(Factory setting)**
ON	**RECALL** switched **on**.

Important: The recall value is displayed with an asterisk and cannot be printed.

STANDBY – Automatic standby

If the automatic standby function is activated, the balance automatically switches itself after a pre selected time of inactivity into the energy saver mode **STANDBY** (e.g. with no key being pressed and no changes of weight occurring).

A.OFF	Automatic standby deactivated.
A.ON	Automatic standby activated (**Factory setting**).
60	Time in minutes of inactivity for activating standby function. Setting range: 2…720 minutes.

B.LIGHT – Backlight

Under this menu topic, the display backlight can be switched off or on.

B.L. ON	Backlight is always **on**. (**Factory setting**)
B.L. OFF	Backlight is always **off**.

A.ZERO – Automatic zero setting

This menu topic allows you to switch the automatic zero setting on or off.

ON	**A.ZERO switched on** (factory setting). The automatic zero setting continuously corrects possible variations in the zero point that might be caused through small amounts of contamination on the weighing pan.
OFF	**A.ZERO switched off**. The zero point is not automatically corrected. This setting is advantageous for special applications (e.g. evaporation measurements).

Important: With approved balances, this setting is not available (only available in selected countries).

SRV.ICON – Service reminder

This menu topic allows you to switch the service reminder 🔧 on or off.

ON	Service reminder 🔧 **switched on**. You will be informed to call service for recalibration. This will be indicated by the flashing service icon: 🔧. **(Factory setting)**
OFF	Service reminder 🔧 **switched off**.

SRV.D.RST – Service date reset

This menu topic allows you to reset service date.
Important: This menu topic is only available if **SRV.ICON** setting **ON** was selected.

To toggle between **YES**? and **NO**? press ⟳.

5.2.4 Interface menu

RS232 – RS232C interface

At this menu topic you can select the peripheral device connected to the RS232C interface and specify how the data is transmitted.

PRINTER	Connection to a printer. (**Factory setting**) **Note** Only one printer possible. 🌐 Refer to your printer documentation for recommended printer settings.
PRT.STAB	If the 🖶 key is pressed, the next stable weight value will be printed. (**Factory setting**)
PRT.AUTO	Every stable weight value will be printed, without pressing the 🖶 key.
PRT.ALL	If the 🖶 key is pressed, the weight value will be printed regardless of stability.
PC-DIR.	Connection to a PC: the balance can send data (as a Keyboard) to the PC used for PC applications e.g. Excel. **Note** • The balance sends the weight value without the unit to the PC. • Not available on Win7.
PRT.STAB	If the 🖶 key is pressed, the next stable weight value will be sent followed by an enter. (**Factory setting**)
PRT.AUTO	Every stable weight value will be sent followed by an enter, without pressing the 🖶 key.

PRT.ALL	If the ⊟ key is pressed, the weight value will be sent followed by an enter regardless of stability.	
HOST	Connection to a PC, Barcode Reader etc.: the balance can send data to the PC and receive commands or data from the PC. **Note** The balance sends the complete MT-SICS answer to the PC (see chapter "MT-SICS interface commands and functions".	
SND.OFF	Send mode switched off. (**Factory setting**)	
SND.STB	If the ⊟ key is pressed, the next stable weight value will be sent.	
SND.CONT	All weight value updates will be sent regardless of stability, without pressing the ⊟ key.	
SND.AUTO	Every stable weight value will be sent, without pressing the ⊟ key.	
SND.ALL	If the ⊟ key is pressed, the weight value will be sent regardless of stability.	
2.DISP	Connection of an optional auxiliary display unit. **Important:** The transmission parameters cannot be selected. Settings are automatically set.	

HEADER – Options for the printout header of individual values

This menu topic allows you to specify the information that is to be printed at the top of the printout for every individual weighing results (after pressing ⊟).
Important: This menu topic is only available if **PRINTER** setting was selected.

NO	The header is not be printed. (**Factory setting**)
DAT/TIM	Date and time are printed.
D/T/BAL	Date, time and balance information (Balance type, SNR, Balance ID) are printed.
	Note: Balance ID only if set.

SIGN.L – Options for the printout footer for signature line of individual values

This menu topic allows you to set a footer for signature at the bottom of the printout for every individual weighing result (after pressing ⊟).
Important: This menu topic is only available if **PRINTER** setting was selected.

OFF	The signature footer is not be printed. (**Factory setting**)
ON	The signature footer is printed.

LN.FEED – Options for complete the printout of individual values

This menu topic allows you to specify the number of blank lines to complete the printout (line feed) for every individual weighing result (after pressing ⊟).
Important: This menu topic is only available if **PRINTER** setting was selected.

0	Possible numbers of blank lines: 0 to 99. (**Factory setting = 0**)

ZERO.PRT – Options for PRT.AUTO

This menu topic allows you to specify the auto print function **PRT.AUTO** for printing zero **YES** or **NO**.

OFF	Zero is not be printed (Zero +/- 3d). (**Factory setting**)
ON	Zero is always printed.

Important: This menu topic is only available if **PRT.AUTO** function of the **PRINTER** or **PC-DIR.** was selected.

COM.SET – Options for the data communication format (RS232C) (HOST)

This menu topic allows you to set the data format depending on which peripheral device is connected.
Important: This menu topic is only available if **HOST** setting was selected.

MT-SICS	The MT-SICS data transfer formats is used. (**Factory setting**) For more information see section ″MT-SICS interface commands and functions″.	
SART	The following Sartorius commands are supported:	
	K	Ambient conditions: very stable
	L	Ambient conditions: stable
	M	Ambient conditions: unstable
	N	Ambient conditions: very unstable
	O	Block keys
	P	Print key (print, auto print; activate or block)
	R	Unblock keys
	S	Restart/self-test
	T	Tare key
	W	Calibration/adjustment [*)]
	Z	Internal calibration/adjustment [**)]
	f1_	Function key (CAL)
	s3_	C key
	x0_	Perform internal calibration [**)]
	x1_	Print balance/scale model
	x2_	Print weighing cell serial number
	x3_	Print software version

[*)] May be inaccessible on verified balances/scales

[**)] Only on models with built-in motorized calibration weight

Functionality mapping

HOST settings:	Sartorius printer settings:
SND.OFF	not applicable
SND.STB	manually print with stability
SND.ALL	manually print without stability
SND.CONT	automatically print without stability
SND.AUTO	similar applicable to automatically print when load is changed

BAUD – Baud rate RS232C

This menu topic allows you to match the data transmission to different serial RS232C receivers. The baud rate (data transfer rate) determines the speed of transmission via the serial interface. For problem-free data transmission the sending and receiving devices must be set at the same value.

The following settings are available:
600 bd, 1200 bd, 2400 bd, 4800 bd, **9600 bd (Factory setting)**, 19200 and 38400 bd.

Important
- Not visible for 2nd display.
- Each device has separate settings.

BIT.PAR. – Bit/Parity RS232C

At this menu topic you can set the character format for the attached RS232C serial peripheral device.

8/NO	8 data bits/no parity (**Factory setting**)	
7/NO	7 data bits/no parity	

7/MARK	7 data bits/mark parity
7/SPACE	7 data bits/space parity
7/EVEN	7 data bits/even parity
7/ODD	7 data bits/odd parity

Important

- Not visible for 2nd display.
- Each device has separate settings.

STOPBIT – Stop bits RS232C

At this menu topic you can set the stop bits of the transmitted data to different RS232C serial receivers.

1 BIT	1 Stop bit (**Factory setting**)
2 BITS	2 Stop bits

HD.SHK – Handshake RS232C

This menu topic allows you to match the data transmission to different RS232C serial receivers.

XON.XOFF	Software handshake (XON/XOFF) (**Factory setting**)
RTS.CTS	Hardware handshake (RTS/CTS)
OFF	No handshake

Important

- Not visible for 2nd display.
- Each device has separate settings.

RS.TX.E.O.L. – End of line RS232C

At this menu topic you can set the end of line character of the outgoing transmitted data to different RS232C serial receivers.

CR LF	<CR><LF> Carriage Return followed by Line feed (ASCII-Codes 013 + 010) (**Factory setting**)
CR	<CR> Carriage Return (ASCII-Code 013)
LF	<LF> Line feed (ASCII-Code 010)
TAB	<TAB> Horizontal tab (ASCII-Code 009) (only visible if **PC-DIR.** is selected)

Important

- Not visible for 2nd display.
- Each device has separate settings.

RS.CHAR – Char set RS232C

At this menu topic you can set the character set of the transmitted data to different RS232C serial receivers.

IBM.DOS	Char set IBM/DOS (**Factory setting**)
ANSI.WIN	Char set ANSI/WINDOWS

Important

- Not visible for 2nd display.
- Each device has separate settings.

INTERVL. – Print key simulation

At this menu topic you can activate a simulation of the 🖨 key. **INTERVL.** simulates a print key press every x seconds.

Range:	0 to 65535 seconds
0 sec:	Disables the print key simulation

Factory setting: 0 sec

Important: The executed action is according to the configuration of the print key, (see interface setting).

6 Applications

6.1 Application piece counting
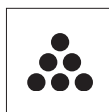
The **Piece counting** application allows you to determine the number of pieces put on the weighing pan. All pieces must be of approximately equal weight, since the number of pieces is determined on the basis of average weight.

1 Call-up **APP.LIST** by pressing and holding **F**.
2 Select application **COUNT** by scrolling with ⤺.
3 Activate function **COUNT** by pressing ↵.
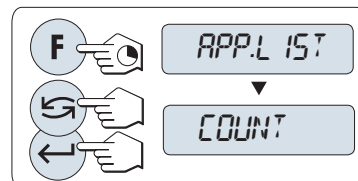
Piece counting first requires the setting of a reference weight, there are 4 possibilities:
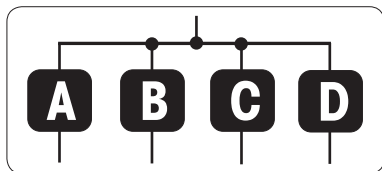
- **A** Setting the reference **by multiple pieces with fix reference values**.
- **B** Setting the reference **by multiple pieces with variable reference values**.
- **C** Setting the reference **for 1 piece in weighing mode**.
- **D** Setting the reference **for 1 piece in manual mode**.

Setting the reference by multiple pieces with fix reference values
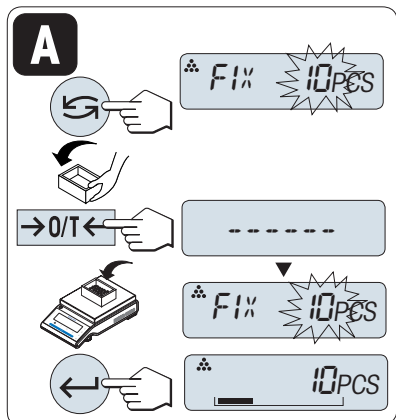
1 Select a number of reference pieces by scrolling with ⤺. Possible numbers* are 5, 10, 20 and 50.
  * with approved balances in selected countries: min 10.
2 Press →0/T← to tare. If using: place empty container on the weighing pan first or tare again.
3 Add the selected number of reference pieces to container.
4 Press ↵ to confirm.

Setting possibility

B Setting the reference by multiple pieces with variable reference values

1 Select **VAR.REF** by scrolling with ⤺. Press ↵ to confirm.
2 Select the number of reference pieces. Possible numbers are 1 to 999. With approved balances in selected countries: min 10
3 To select a digit, press ↵ (cyclically from left to right).
   ⇨ The selected digit is blinking.
4 To change the digit, press ⤺.
5 Press →0/T← to zero/tare. If using: place empty container on the weighing pan first or zero/tare again.
6 Add the selected number of reference pieces to container.
7 Press and hold ↵ to confirm.
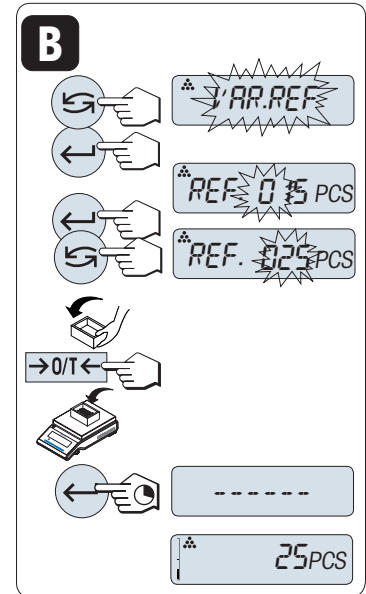
Setting the reference for one piece in weighing mode
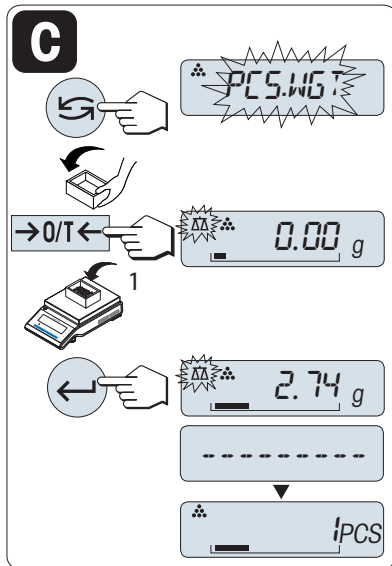
1 Select **PCS.WGT** by scrolling with ⤺.
2 Press →0/T← to tare. If using: place empty container on the weighing pan first or tare again.
3 Add one reference piece to container. The weight of one piece is displayed.
4 Press ↵ to confirm.

Important

With approved balances, this setting is not available in selected countries.

Setting possibility

D Setting the reference for one piece in manual mode

1 Select **PCS.WGT** by scrolling with ⤺.
2 Press ↵ to confirm.
3 Enter the final reference one piece weight.
4 To select a digit, press ↵ (cyclically from left to right).
   ⇨ The selected digit is blinking.
5 To change the digit, press ⤺.
6 Press and hold ↵ to confirm.

Important: With approved balances, this setting is not available in selected countries.

Important: If without any key press within 60 seconds, the balance return to the previous active application. Press **C** to cancel and returns to the previous active application.

On completion of the setting procedure, your balance is ready for piece counting.

Note

• The **RECALL** value is displayed with an asterisk (*) and icon **M** and can not be printed.
• Take into account minimum values: min. reference weight = 10d (10 digits), min. piece weight* = 1d (1 digit)!
  * with approved balances in selected countries: min 3e
• The current reference weight remains stored until the reference setting is changed.

Exit current application

To exit the current application and to return to simple weighing mode, press and hold ⛛ (longer than 1.5 s).
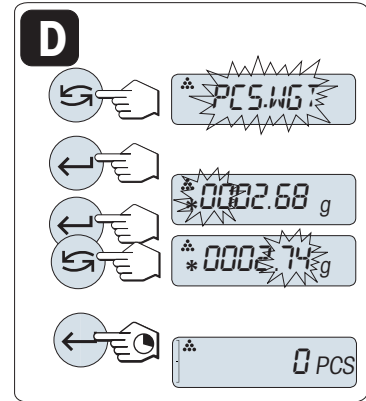
6.2 Application percent weighing

The **Percent weighing** application allows you to check a sample weight as percentage to a reference target weight.

1   Call-up **APP.LIST** by pressing and holding **F**.
2   Select application **PERCENT** by scrolling with ⟲.
3   Activate function **PERCENT** by pressing ↵.
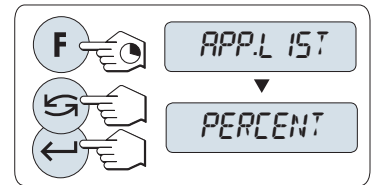
Percent weighing first requires the setting of a reference weight that should corresponds to 100%, there are 2 possibilities:
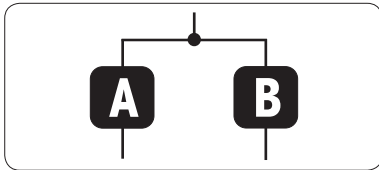
- **A** Setting the reference **in manual mode (enter 100%)**.
- **B** Setting the reference **in weighing mode (weigh 100%)**.

Setting possibility

A Setting the reference by manual mode (enter 100%)

1   Press ↵ to activate manual mode.
2   To select a digit, press ↵ (cyclically from left to right).
    ⇨ The selected digit is blinking.
3   To change the digit, press ⟲.
4   Press and hold ↵ to confirm the value.
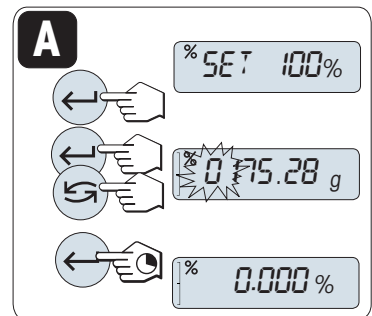
Setting the reference by weighing mode (weigh 100%)
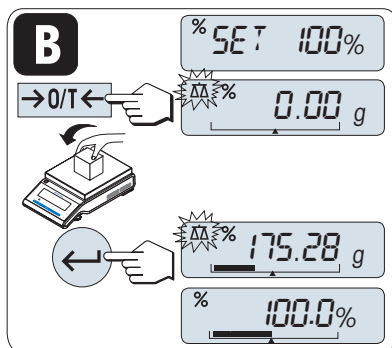
1   Press →0/T← to tare the balance and to activate the weighing mode. If needed: place empty container on the weighing pan and tare again.
2   Load the reference weight (100%).
    Note: Reference weight must be at least +/- 10d.
3   Press ↵ to confirm.

Important: if without any key press within 60 seconds or by pressing **C**, the balance returns to the previous active application.

On completion of the weighing-in procedure, your balance is ready for percent weighing.

Switching between percent and weight display
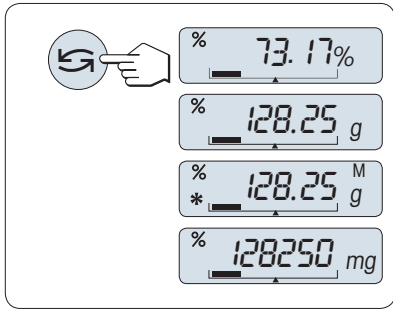
– Press 🔄 key at any time to switch the display between percent display, weighing unit **UNIT 1**, **RECALL** value (if activated) and weighing unit **UNIT 2** (if different from **UNIT 1**).
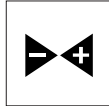
Note

• The recall value is displayed with an asterisk (*) as well as icon **M** and can not be printed.

• The current set weight remains stored until it is redetermined.

Exit current application

To exit the current application and to return to simple weighing mode, press and hold ⟠ (longer than 1.5 s).

6.3 Application check weighing

The **Check weighing** application allows you to check the deviation of a sample weight within a tolerance limit to a reference target weight.

1 Call-up **APP.LIST** by pressing and holding **F**.
2 Select application **CHECK** by scrolling with ⤺.
3 Activate function **CHECK** by pressing ↵.
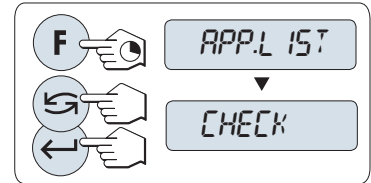
Step 1: Check weighing first requires the setting of a reference weight that should corresponds to the nominal weight, there are 2 possibilities:

1A Setting the reference **in manual mode** (enter nominal weight).

1B Setting the reference **in weighing mode** (weigh nominal weight).

Step 2: Check weighing needs the upper and lower limits:

2 Setting the **upper and lower limits in percentage**.
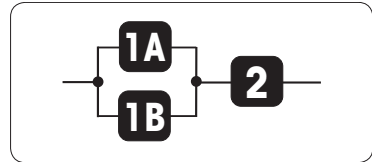
Step 1, setting possibility:

1A Setting the reference by manual mode (enter nominal weight)

1 Press ↵ to activate manual mode.
2 Select the reference target weight.
3 To select a digit, press ↵ (cyclically from left to right).
   ⇨ The selected digit is blinking.
4 To change the digit, press ⤺.
5 Press and hold ↵ to confirm the nominal weight.
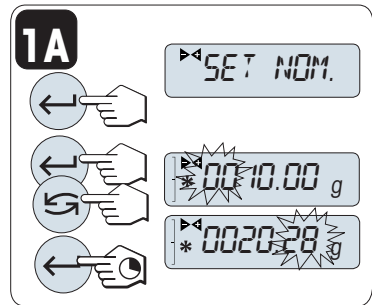
Step 1, setting possibility:

## 1B Setting the reference by weighing mode (weigh nominal weight)

1 Press →0/T← to tare the balance and to activate the weighing mode. If using: place empty container on the weighing pan first or tare again.
2 Load the nominal weight.
3 Press ↵ to confirm the nominal weight.
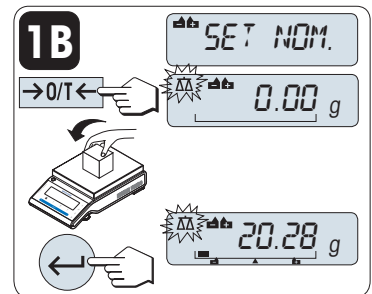
Step 2:

2 **Setting the upper and lower limits** (in percentage):

1 Press ↵ to start setting.
2 Press ↵ to confirm the default limit of +/- 2.5% or enter the limit value.
3 To select a digit, press ↵ (cyclically from left to right).
   ⇨ The selected digit is blinking.
4 To change the digit, press ⤸.
5 Press and hold ↵ to confirm the limits.
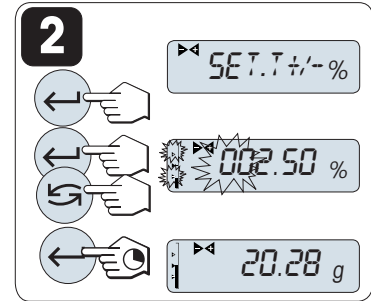
Important

- If without any key press within 60 seconds, the balance returns to the previous active application. Press **C** to cancel and returns to the previous active application.
- The nominal weight must be at least 10 digit.

On completion of the setting procedure, your balance is ready for checkweighing.

Weighing-in-Aid

The Weighing-in-Aid helps you quickly determine the position of the sample weight regarding the tolerance.

1 Lower limit
2 Target weight
3 Upper limit
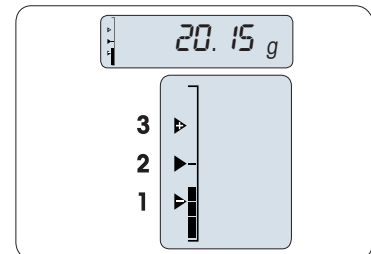
Exit current application

To exit the current application and to return to simple weighing mode, press and hold ⚖️ (longer than 1.5 s).

6.4 Application statistics

The **Statistics** application allows you to generate statistics of a series of weighing values. 1 to 999 values are possible.

1   Call-up **APP.LIST** by pressing and holding **F**.
2   Select application **STAT.** by scrolling with ↩.
3   Activate function **STAT.** by pressing ↵.
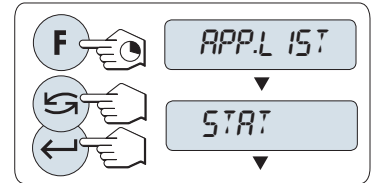
Memory clear question

If the memory is already cleared (sample counter is 0) the memory clear question will not be displayed.

1   To continue the last statistics press ↵ to confirm **CLR.M:NO**.
2   For a new statistical evaluation clear the memory. Press ↩ to select **CLR.M:YES** and press ↵ to confirm.

Weighing the first sample weight

1   Press →0/T← to zero/tare the balance if needed.
2   Load the first sample weight.
3   Press ↵. The display shows the sample count - 1 - and the current weight is stored as sample and the weight is printed out. **Note:** When the sample counter is displayed you may press **C** to undo (drop) this sample.
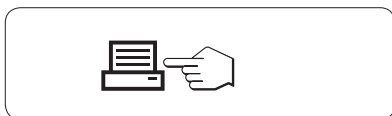4   Unload the first sample weight.
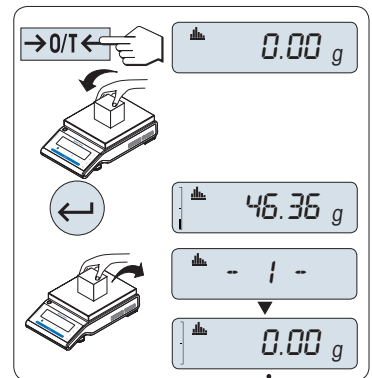
Weighing further sample weights

The same procedure as for the first sample weight.

•   1…999 samples are possible.
•   The next value will be accepted if the sample weight is in the range 70% – 130% of the current average value. **OUT OF RANGE** will be displayed if the sample is not accepted.
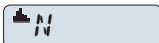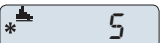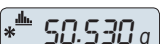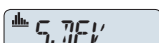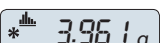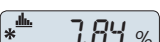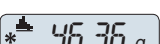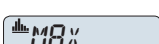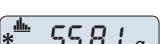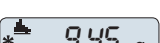
Results

–   Press 🖶 if the numbers of sample are greater than or equal to 2.
⇨   Results are displayed and printed.

Displayed results

1   Press ⏎ to show the next statistical value.
2   Press **C** to cancel displaying results and to continue weighing next sample.

0.5 seconds

number of samples	◣ N	▸ ✳◥ 5	⏎
average	◣ ẋ	▸ ✳◥ 50.530 g	⏎
standard deviation	◣ S.DEV	▸ ✳◤ 3.961 g	⏎
relative standard deviation	◣ S.REL	▸ ✳◥ 7.84 %	⏎
lowest value (minimum)	◥ MIN	▸ ✳◤ 46.36 g	⏎
highest value (maximum)	◣ MAX	▸ ✳◤ 55.81 g	⏎
different between the minimum and the maximum	◣ DIFF	▸ ✳◥ 9.45 g	⏎
sum of all values	◣ SUM	▸ ✳◥ 252.65 g	⏎

Exit current application

To exit the current application and to return to simple weighing mode, press and hold ⚖ (longer than 1.5 s).

6.5 Application totaling

Σ

The **TOTALING** application allows you to weigh in different samples to add their weight values and to totalize them. 1 to 999 samples are possible.

1 Call-up **APP.LIST** by pressing and holding **F**.
2 Select application **TOTAL** by scrolling with ⮌.
3 Activate function **TOTAL** by pressing ⏎.
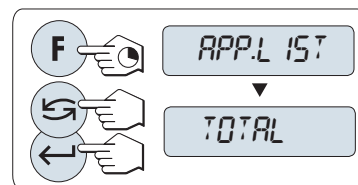
F	APP.LIST
	▼
	TOTAL

Memory clear question

If the memory is already cleared (sample counter is 0) the memory clear question will not be displayed.

1 To continue the totaling evaluation press ⏎ to confirm **CLR.M:NO**.
2 For a new totaling evaluation clear the memory. Press ⮌ to select **CLR.M:YES** and press ⏎ to confirm.

CLR.M:NO
CLEARED
▼
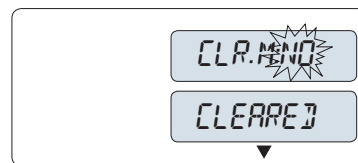
Weighing in the sample weight

1 If using a container: place empty container on the weighing pan and press →0/T← to zero or tare the balance.
2 Load the first sample weight.
3 Press ⏎. The display shows the sample count - 1 - and the current weight is stored.
   Note: When the sample counter is displayed you may press **C** to undo (drop) this sample.
4 Unload the first sample weight. The display shows zero.
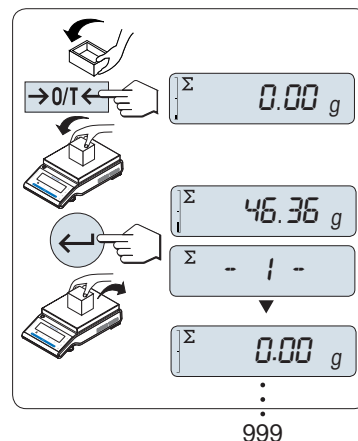
Weighing in further sample weights
The same procedure as for the first sample weight.

• 1…999 samples are possible.

Σ	0.00 g
Σ	46.36 g
Σ	- 1 -
▼	
Σ	0.00 g

999
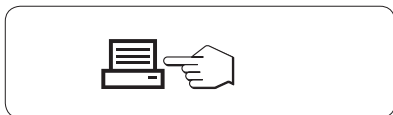
Results

– Press 🖶 if the numbers of sample are greater than or equal to 2.
⇨ Results are displayed and printed.

Displayed results

1 Press ⏎ briefly to show the totalized value.
2 Press **C** briefly to cancel.
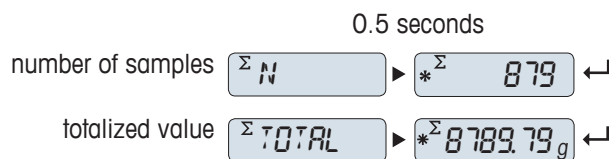
0.5 seconds

number of samples | Σ N ▶ | *Σ 879 | ⏎
totalized value | Σ TOTAL ▶ | *Σ 8789.79 g | ⏎

Exit current application

To exit the current application and to return to simple weighing mode, press and hold ⚖ (longer than 1.5 s).

6.6 Application multiplication factor weighing

F×🔋

The **Multiplication factor weighing** application allows you to multiply the weight value (in grams) by a predefined factor (result = factor * weight) and have it calculated to a predefined number of decimal places.

1 Call-up **APP.LIST** by pressing and holding **F**.
2 Select application **FACTOR.M** by scrolling with ↩.
3 Activate function **FACTOR.M** by pressing ↵.

1 **Setting the factor value**

1 Press ↵ to execute **SET.F.MUL**. Either the factor 1 appears as default value or the factor that was saved most recently.
2 To select a digit, press ↵ (cyclically from left to right).
   ⇨ The selected digit is blinking.
3 To change the digit, press ↩.
4 Press and hold ↵ to confirm the selected factor (no automatic acceptance).
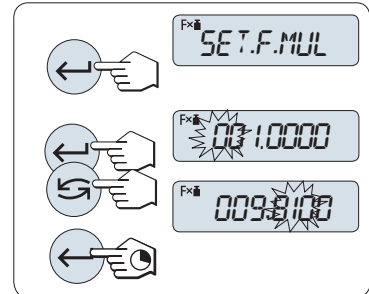
Important: Zero for multiplication factor value is outside the allowed range, the error message **FACTOR OUT OF RANGE** will be displayed.

2 **Setting the step value**

SET.STEP appears in the display, and the program changes automatically to allow the display increments to be entered. The smallest possible display increment appears as default value, or the last value that was saved.

1 Press ↵ to execute **SET.STEP**.
2 To select a digit, press ↵ (cyclically from left to right).
   ⇨ The selected digit is blinking.
3 To change the digit, press ↩.
4 Press and hold ↵ to confirm the selected step (no automatic acceptance).

Important: The allowed range for the step depends on the factor and the resolution of the balance. If it is outside the allowed range the error message **STEP OUT OF RANGE** will be displayed.

Important: If without any key press within 60 seconds, the balance return to the previous active application. Press **C** to cancel and returns to the previous active application.

On completion of the setting procedure, your balance is ready for multiplication factor weighing.

Weighing procedure

1 Press →0/T← to zero/tare.

2 Load sample weight on weighing pan.

3 Read the result. The appropriate calculation is then made using the weight of sample and the selected factor, the result being displayed with the selected display step.
Note: No units are displayed.

4 Unload sample weight.

Toggling between displaying the calculated value and the measured weight

You can use the ⇆ key to toggle between the calculated Value, weight value **UNIT 1**, **RECALL** value (if selected) and weight value **UNIT 2** (if different from **UNIT 1**).

Exit current application

To exit the current application and to return to simple weighing mode, press and hold ⚖ (longer than 1.5 s).
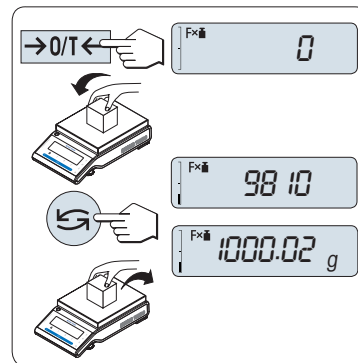
6.7 Application division factor weighing

The **Division factor weighing** divide a predefined factor by the weight value (in grams) (result = factor / weight) and have it rounded to a predefined number of decimal places.

1 Call-up **APP.LIST** by pressing and holding **F**.
2 Select application **FACTOR.D** by scrolling with ⟲.
3 Activate function **FACTOR.D** by pressing ⏎.
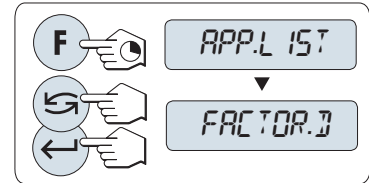
1 **Setting the factor value**

1 Press ⏎ to execute **SET.F.DIV**. Either the factor 1 appears as default value or the factor that was saved most recently.
2 To select a digit, press ⏎ (cyclically from left to right).
   ⇨ The selected digit is blinking.
3 To change the digit, press ⟲.
4 Press and hold ⏎ to confirm the selected factor (no automatic acceptance).
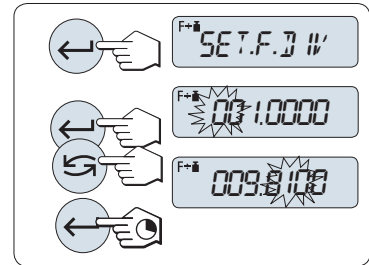
Important: Zero for division factor value is outside the allowed range, the error message **FACTOR OUT OF RANGE** will be displayed.

2 **Setting the step value**

SET.STEP appears in the display, and the program changes automatically to allow the display increments to be entered. The smallest possible display increment appears as default value, or the last value that was saved.
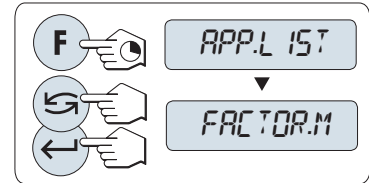
SET.STEP appears in the display, and the program changes automatically to allow the display increments to be entered. The smallest possible display increment appears as default value, or the last value that was saved.

1 Press ⏎ to execute **SET.STEP**.
2 To select a digit, press ⏎ (cyclically from left to right).
   ⇨ The selected digit is blinking.
3 To change the digit, press ⟲.
4 Press ⏎ to confirm the selected step (no automatic acceptance).

Important: The allowed range for the step depends on the factor and the resolution of the balance. If it is outside the allowed range the error message **STEP OUT OF RANGE** will be displayed.

Important: If without any key press within 60 seconds, the balance return to the previous active application. Press **C** to cancel and returns to the previous active application.

On completion of the setting procedure, your balance is ready for division factor weighing.
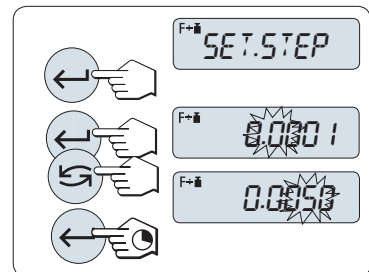
Weighing procedure

1 Press →0/T← to zero/tare.

2 Load sample weight on weighing pan.

3 Read the result. The appropriate calculation is then made using
   the weight of sample and the selected factor, the result being
   displayed with the selected display step.
   Note: No units are displayed. To avoid a division by zero, the
   factor division is not calculated at zero.

4 Unload sample weight.

**Toggling between displaying the calculated value and the
measured weight**

You can use the ⤺ key to toggle between the calculated Value,
weight value **UNIT 1**, **RECALL** value (if selected) and weight value
UNIT 2 (if different from **UNIT 1**).

Exit current application

To exit the current application and to return to simple weighing mode, press and hold ⚖ (longer than
1.5 s).
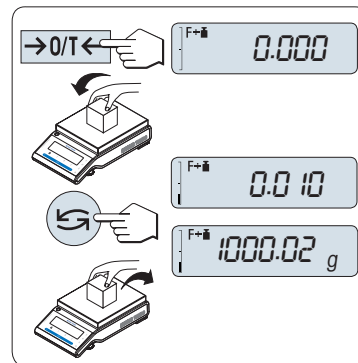
6.8 Application density

The **Density** application allows you to determine the density of solid bodies and liquids. Determination of the density uses **Archimedes' principle** according to which a body immersed in a fluid undergoes an apparent loss in weight which is equal to the weight of the fluid it displaces.

To determine the density of solid bodies, we recommend you to work with the optional density kit which contains all the attachments and aids needed for convenient and precise density determination. To determine the density of liquids, you additionally need a sinker which you can also obtain from your METTLER TOLEDO dealer.

Note for performing of density determinations

- You can also use the hanger for weighing below the balance which belongs to your balance.
- If a METTLER TOLEDO printer is attached to your balance, the settings will be automatically recorded.

We recommend you to consult the operating instructions enclosed with the density kit.

1 Call-up **APP.LIST** by pressing and holding **F**.
2 Select application **DENSITY** by scrolling with ⤸.
3 Activate function **DENSITY** by pressing ⏎.
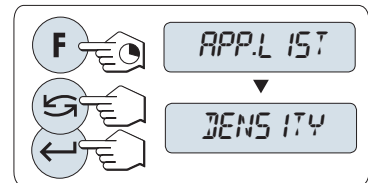
Setting the method for density determination

1 Select:
   SOLID, the function for the density determination of solids, or
   LIQUID, the function for the density determination of liquids with a sinker.
2 Press ⏎ to confirm the selection
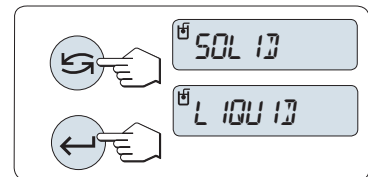
Exit current application

To exit the current application and to return to simple weighing mode, press and hold ⚖ (longer than 1.5 s).

6.8.1 Density determination of solids

Requirement: the method **SOLID** is set.

Setting the parameter of the auxiliary liquid

1 Select the auxiliary liquid by scrolling with ⤸: **H-2-O** for distilled water, **ETHANOL** or **FREE** for a freely definable auxiliary liquid.
2 Press ⏎ to confirm the selection.
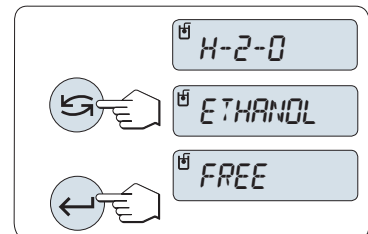
If you have selected water or ethanol as the auxiliary liquid

1. Enter the current temperature of the auxiliary liquid (read off on thermometer).
2. Set the value in °C. The temperature ranges from 10 °C to 30.9 °C.
3. To select a digit, press ⏎ (cyclically from left to right).
   ⇨ The selected digit is blinking.
4. To change the digit, press ⟲.
5. Press and hold ⏎ to confirm the value.

Note: the densities of distilled water and ethanol in the range 10 °C to 30.9 °C are stored in the balance.

If you have selected a freely definable auxiliary liquid

1. Enter the density of the auxiliary liquid in g/cm^3 at the current temperature (read off on thermometer).
2. To select a digit, press ⏎ (cyclically from left to right).
   ⇨ The selected digit is blinking.
3. To change the digit, press ⟲.
4. Press and hold ⏎ to confirm the value.

Important: if without any key press within 60 seconds or by pressing **C**, the balance returns to the previous active application.

On completion of the settings, your balance is ready for performing the density determination of liquids.

Note: taring the balance is possible at any time.
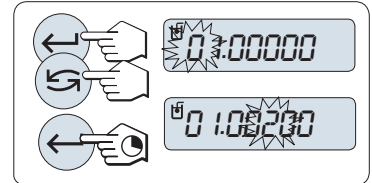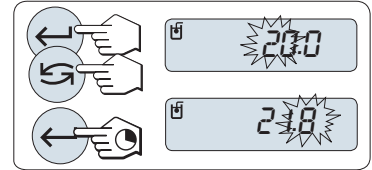
The balance prompts you: **PRESS ENTER TO START**.

– Press ⏎ to start. Tare/Zero is executed.
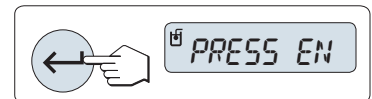
The balance prompts you to weigh the solid in air **WEIGH IN AIR**.

1. Load the solid.
2. Press ⏎ to initiate the measurement.

The balance prompts you to weigh the solid in the auxiliary liquid **WEIGH IN LIQUID**.

1. Load the solid.
2. Press ⏎ to initiate the measurement.

The balance now shows the determined density of the solid in g/cm^3.

Note

- This result has already been corrected for the air buoyancy. The buoyancy caused by the two immersed wires (ø 0.6 mm) can be neglected.
- By pressing **C**, the balance returns to **PRESS ENTER TO START**.
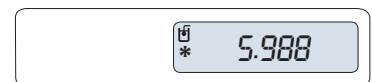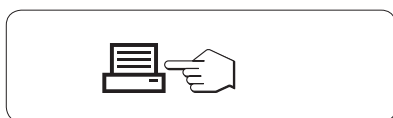
Result

– Press 🖫.
   ⇨ The result will be printed.

6.8.2 Density determination of liquids

Requirement: the method **LIQUID** is set.

Setting the displacement volume of your sinker

Press and hold ↵ to confirm the default value of 10.0 cm³ or change it if needed:

1 To select a digit, press ↵ (cyclically from left to right).
   ⇨ The selected digit is blinking.
2 To change the digit, press ⟲.
3 Press and hold ↵ to confirm the value.
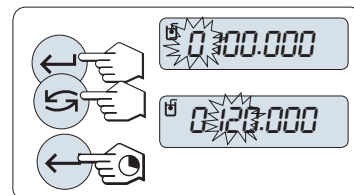
Important: if without any key press within 60 seconds or by pressing **C**, the balance returns to the previous active application.

On completion of the settings, your balance is ready for performing the density determination of liquids.

Note: taring the balance is possible at any time.

The balance prompts you: **PRESS ENTER TO START**.

– Press ↵ to start.
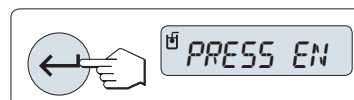
The balance prompts you to weigh the sinker in air **WEIGH IN AIR**.

1 Position the sinker.
2 Press ↵ to initiate the measurement.

The balance prompts you to weigh the sinker in the liquid **WEIGH IN LIQUID**.

1 Pour the liquid into the beaker. Make sure that the sinker is immersed by al least 1 cm in the liquid, and that there are no air bubbles in the container.
2 Press ↵ to initiate the measurement.

The balance now shows the determined density of the liquid at the current temperature (read off on the thermometer).
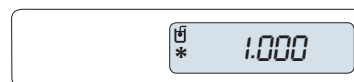
Note

• This result has already been corrected for the air buoyancy. The buoyancy caused by the immersed wire (ø 0.2 mm) of the sinker can be neglected.
• By pressing **C**, the balance returns to **PRESS ENTER TO START**.
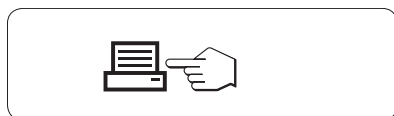
Result

– Press 🖶.
   ⇨ The result will be printed.

6.8.3 Formulae used to calculate density

The **DENSITY**"application is based on the formulae listed below.

Formulae for determining the density of solids with compensation for air density

$$\rho = \frac{A}{A-B}(\rho_0 - \rho_L) + \rho_L$$

$$V = \alpha \frac{A-B}{\rho_0 - \rho_L}$$

ρ = Density of the sample

A = Weight of the sample in air

B = Weight of the sample in the auxiliary liquid

V = Volume of the sample

ρ_0 = Density of the auxiliary liquid

ρ_L = Density of air (0.0012 g/cm^3)

α = Weight correction factor (0.99985), to take the atmospheric buoyancy of the adjustment weight into account

Formula for determining the density of liquids with compensation for air density

$$\rho = \alpha \frac{P}{V} + \rho_L$$

ρ = Density of the liquid

P = Weight of the displaced liquid

V = Volume of the sinker

ρ_L = Density of air (0.0012 g/cm^3)

α = Weight correction factor (0.99985), to take the atmospheric buoyancy of the adjustment weight into account

T/°C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
10.	0.99973	0.99972	0.99971	0.99970	0.99969	0.99968	0.99967	0.99966	0.99965	0.99964
11.	0.99963	0.99962	0.99961	0.99960	0.99959	0.99958	0.99957	0.99956	0.99955	0.99954
12.	0.99953	0.99951	0.99950	0.99949	0.99948	0.99947	0.99946	0.99944	0.99943	0.99942
13.	0.99941	0.99939	0.99938	0.99937	0.99935	0.99934	0.99933	0.99931	0.99930	0.99929
14.	0.99927	0.99926	0.99924	0.99923	0.99922	0.99920	0.99919	0.99917	0.99916	0.99914
15.	0.99913	0.99911	0.99910	0.99908	0.99907	0.99905	0.99904	0.99902	0.99900	0.99899
16.	0.99897	0.99896	0.99894	0.99892	0.99891	0.99889	0.99887	0.99885	0.99884	0.99882
17.	0.99880	0.99879	0.99877	0.99875	0.99873	0.99871	0.99870	0.99868	0.99866	0.99864
18.	0.99862	0.99860	0.99859	0.99857	0.99855	0.99853	0.99851	0.99849	0.99847	0.99845
19.	0.99843	0.99841	0.99839	0.99837	0.99835	0.99833	0.99831	0.99829	0.99827	0.99825
20.	0.99823	0.99821	0.99819	0.99817	0.99815	0.99813	0.99811	0.99808	0.99806	0.99804
21.	0.99802	0.99800	0.99798	0.99795	0.99793	0.99791	0.99789	0.99786	0.99784	0.99782
22.	0.99780	0.99777	0.99775	0.99773	0.99771	0.99768	0.99766	0.99764	0.99761	0.99759
23.	0.99756	0.99754	0.99752	0.99749	0.99747	0.99744	0.99742	0.99740	0.99737	0.99735
24.	0.99732	0.99730	0.99727	0.99725	0.99722	0.99720	0.99717	0.99715	0.99712	0.99710
25.	0.99707	0.99704	0.99702	0.99699	0.99697	0.99694	0.99691	0.99689	0.99686	0.99684
26.	0.99681	0.99678	0.99676	0.99673	0.99670	0.99668	0.99665	0.99662	0.99659	0.99657
27.	0.99654	0.99651	0.99648	0.99646	0.99643	0.99640	0.99637	0.99634	0.99632	0.99629
28.	0.99626	0.99623	0.99620	0.99617	0.99614	0.99612	0.99609	0.99606	0.99603	0.99600
29.	0.99597	0.99594	0.99591	0.99588	0.99585	0.99582	0.99579	0.99576	0.99573	0.99570
30.	0.99567	0.99564	0.99561	0.99558	0.99555	0.99552	0.99549	0.99546	0.99543	0.99540

T/°C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
10.	0.79784	0.79775	0.79767	0.79758	0.79750	0.79741	0.79733	0.79725	0.79716	0.79708
11.	0.79699	0.79691	0.79682	0.79674	0.79665	0.79657	0.79648	0.79640	0.79631	0.79623
12.	0.79614	0.79606	0.79598	0.79589	0.79581	0.79572	0.79564	0.79555	0.79547	0.79538
13.	0.79530	0.79521	0.79513	0.79504	0.79496	0.79487	0.79479	0.79470	0.79462	0.79453
14.	0.79445	0.79436	0.79428	0.79419	0.79411	0.79402	0.79394	0.79385	0.79377	0.79368
15.	0.79360	0.79352	0.79343	0.79335	0.79326	0.79318	0.79309	0.79301	0.79292	0.79284
16.	0.79275	0.79267	0.79258	0.79250	0.79241	0.79232	0.79224	0.79215	0.79207	0.79198
17.	0.79190	0.79181	0.79173	0.79164	0.79156	0.79147	0.79139	0.79130	0.79122	0.79113
18.	0.79105	0.79096	0.79088	0.79079	0.79071	0.79062	0.79054	0.79045	0.79037	0.79028
19.	0.79020	0.79011	0.79002	0.78994	0.78985	0.78977	0.78968	0.78960	0.78951	0.78943
20.	0.78934	0.78926	0.78917	0.78909	0.78900	0.78892	0.78883	0.78874	0.78866	0.78857
21.	0.78849	0.78840	0.78832	0.78823	0.78815	0.78806	0.78797	0.78789	0.78780	0.78772
22.	0.78763	0.78755	0.78746	0.78738	0.78729	0.78720	0.78712	0.78703	0.78695	0.78686
23.	0.78678	0.78669	0.78660	0.78652	0.78643	0.78635	0.78626	0.78618	0.78609	0.78600
24.	0.78592	0.78583	0.78575	0.78566	0.78558	0.78549	0.78540	0.78532	0.78523	0.78515
25.	0.78506	0.78497	0.78489	0.78480	0.78472	0.78463	0.78454	0.78446	0.78437	0.78429
26.	0.78420	0.78411	0.78403	0.78394	0.78386	0.78377	0.78368	0.78360	0.78351	0.78343
27.	0.78334	0.78325	0.78317	0.78308	0.78299	0.78291	0.78282	0.78274	0.78265	0.78256
28.	0.78248	0.78239	0.78230	0.78222	0.78213	0.78205	0.78196	0.78187	0.78179	0.78170
29.	0.78161	0.78153	0.78144	0.78136	0.78127	0.78118	0.78110	0.78101	0.78092	0.78084
30.	0.78075	0.78066	0.78058	0.78049	0.78040	0.78032	0.78023	0.78014	0.78006	0.77997

Density of C_2H_5OH according to the "American Institute of Physics Handbook".

7 Communication with Peripheral Devices

7.1 Function PC-Direct

The numerical value displayed at the balance can be transferred to the cursor position in Windows Applications (e.g. Excel, Word) as by typing with the keyboard.

Note: The units will not be transferred.

Requirements

- PC with one of the Microsoft Windows® operating system 32bit/64bit: XP (SP3), Vista (SP2), Win 7 (SP1) or Win 8.
- Serial interface RS232 or USB.
- Administrator rights for installing software (for USB not required).
- Windows application (e.g. Excel).
- Balance to PC connection with cable RS232 or USB.

Settings at the balance

> **!** **NOTICE**
>
> Disconnect the USB connection from the balance prior to changing settings.

Balance interface settings, **see** Interface menu:

- Topic **RS232** or **USB**: set **PC-DIR.** and select the most appropriate option for the desired weighing result.
- Topic **RS.TX.E.O.L./RS E.O.L.** or **USB E.O.L./USB E.O.L**:
  – set **<TAB>** to write into the same row (e.g. in Excel).
  – set **<CR><LF>** to write into the same column (e.g. in Excel).
- Save changes.

Installing SerialPortToKeyboard

Operation of PC-Direct via serial port RS232 requires the installation of **SerialPortToKeyboard** on your host computer. The file **SerialPortToKeyboard.exe** can be found on the CD-ROM in the folder Software. If you have any questions please contact a METTLER TOLEDO representative.

Download SerialPortToKeyboard

1. Insert the product CD in the CD/DVD drive of the host computer.
2. Tap **Software**.
3. Download and unpack the .exe file from the CD on your computer.
4. Click **Save** to download to your specified location.
5. Right-click on the downloaded install program **SerialPort-ToKeyboard.exe** and select **Run as Administrator** from the menu.
6. If a safety warning appears, allow Windows to install.
7. Click **Next** and follow the installer's instructions.
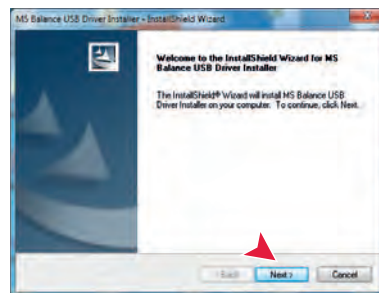
Settings at the PC

Settings for SerialPortToKeyboard

1 Select the serial port **COM** to be used for connection with the balance.

2 Set the **Baud Rate** to **9600**.

3 Activate **Connect**

Note

• The window can be minimized.

• Closing of the window terminates the session.
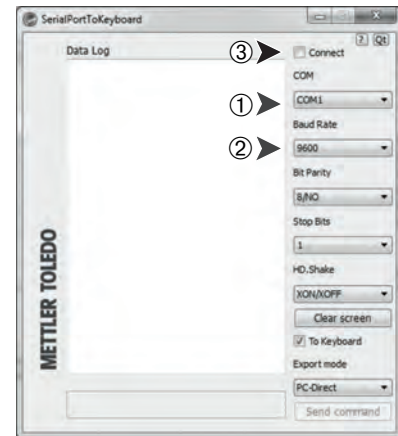
Checking operation

1 Start **SerialPortToKeyboard** (RS232)

2 Start Excel (or another application) at the PC.

3 Activate a cell in Excel.

According to your selected **PC-DIR.** option, the displayed values will appear e.g. in the column one after the other one in the different rows.

8 Error and Status Messages

8.1 Error messages

Error messages in the display draw your attention to incorrect operation or that the balance could not execute a procedure properly.

Error message	Cause	Rectification
NO STABILITY	No stability.	Ensure more stable ambient conditions. If not possible, check settings for environment.
WRONG ADJUSTMENT WEIGHT	Wrong adjustment weight on pan or none at all.	Place required adjustment weight in center of pan.
REFERENCE TOO SMALL	Reference for piece counting too small.	Increase reference weight.
EEPROM ERROR - PLEASE CONTACT CUSTOMER SERVICE	• EEPROM (memory) error. • Excessive mains voltage fluctuation or strong glitches occurred.	Please contact METTLER TOLEDO customer service.
WRONG CELL DATA - PLEASE CONTACT CUSTOMER SERVICE	Wrong cell data.	Please contact METTLER TOLEDO customer service.
NO STANDARD ADJUSTMENT - PLEASE CONTACT CUSTOMER SERVICE	No standard calibration.	Please contact METTLER TOLEDO customer service.
PROGRAM MEMORY DEFECT - PLEASE CONTACT CUSTOMER SERVICE	Program memory defect.	Please contact METTLER TOLEDO customer service.
TEMP SENSOR DEFECT - PLEASE CONTACT CUSTOMER SERVICE	Temperature sensor defect.	Please contact METTLER TOLEDO customer service.
WRONG LOAD CELL BRAND - PLEASE CONTACT CUSTOMER SERVICE	Wrong load cell brand.	Please contact METTLER TOLEDO customer service.
WRONG TYPE DATA SET - PLEASE CONTACT CUSTOMER SERVICE	Wrong type data set.	Please contact METTLER TOLEDO customer service.
BATTERY BACKUP LOST - CHECK DATE TIME SETTINGS	Backup battery is empty. This battery ensures that the date and time are not lost when the balance is disconnected from power.	Connect the balance to the power supply for charging the battery (e.g. during the night) or contact METTLER TOLEDO customer service.
⌐ ‑ ‑ ‑ ‑ ‑ ‑ ¬	Overload - The weight on the pan exceeds the weighing capacity of the balance.	Reduce the weight on the weighing pan.
∟ ‑ ‑ ‑ ‑ ‑ ‑ ⌟	Underload	Check that the weighing pan is positioned correctly.
ABOVE INITIAL ZERO RANGE	Wrong weighing pan or pan is not empty.	Mount correct weighing pan or unload weighing pan.
BELOW INITIAL ZERO RANGE	Wrong weighing pan or pan is missing.	Mount correct weighing pan.
MEM.FULL	Memory full.	Clear the memory and start a new evaluation.

Error message	Cause	Rectification
FACTOR OUT OF RANGE	Factor is outside the allow range.	Select a new factor.
STEP OUT OF RANGE	Step is outside the allowed range.	Select a new step.
OUT OF RANGE	Sample weight is outside the allowed range.	Unload the pan and load a new sample weight.

NOTICE

Damage of the balance or software

In some countries, excessive mains voltage fluctuations and strong glitches may occur. This may affect the balance functions or damage the software.

– Use a voltage regulator for stabilizing.

8.2 Status messages

Status messages are displayed by means of small icons. The status icons indicate the following:

Status Icon	Signification
	Service Reminder Your balance is due for servicing. Contact your dealer's customer service department as soon as possible to have a technician service your balance. See menu topic **SRV.ICON**.

9 Maintenance

9.1 Cleaning and service

Every now and then, clean the weighing pan, draft shield element, bottom plate, draft shield (depending on the model) and housing of your balance. Your balance is made from high-quality, durable materials and can therefore be cleaned using a damp cloth or with a standard cleaning agent.

To thoroughly clean the draft shield glass panels, remove the draft shield from the balance. When reinstalling the draft shield, ensure that it is in the correct position.

Please observe the following notes:

⚠ WARNING

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death. If the balance cannot be shut down in an emergency situation, people can be injured or the balance can be damaged.

1. Disconnect the balance from the power supply prior to cleaning and maintenance.
2. Only use METTLER TOLEDO power cable, if these need to be replaced.
3. Make sure that no liquid enters into the balance, terminal or AC/DC adapter.
4. Do not open the balance, terminal or AC/DC adapter.
   These contain no user-serviceable parts.

NOTICE

Danger of damage to the balance due to inappropriate cleaning methods!

The balance is made from high quality, resistant materials and can be damaged by certain cleaning agents, solvents or abrasives. If liquids enter the housing they can damage the balance.

1. Use only water and a mild detergent to clean the balance or terminal.
2. Wipe off any spills immediately.
3. Make sure that no liquid enters the interior of the balance.

Important

Contact a METTLER TOLEDO representative to find about the service options available – regular maintenance by an authorized service engineer will ensure consistent weighing accuracy over the long term and extend the service life of the balance.

9.2 Cleaning the draft shield

It is possible to remove the sliding glass doors for cleaning or for replacing.

Removing or inserting sliding glass doors

1 Remove the handle first.
2 Remove the sliding glass doors.
3 Install the handle after insertion of the glass door.

Important
Front and rear glass panels cannot be removed.
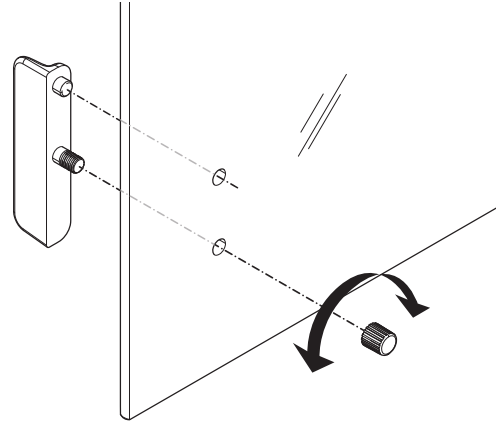
9.3 Disposal

In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.
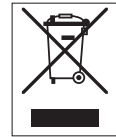
9.4 Firmware (Software) Updates

In the interest of its customers, METTLER TOLEDO continuously updates its internal software (firmware) for the balances. Inquire at your local METTLER TOLEDO office about upgrade and update options.

10 Technical Data

10.1 General data

⚠ **WARNING**

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death.

1. Only use an approved AC/DC adapter with a current-limited SELV output.
2. Ensure correct polarity ⊖—(●—⊕

Standard power supply

AC adapter:	Primary: 100 – 240 V, ±10%, 50/60Hz, 0.3 A
	Secondary: 12 V DC, 0.84 A (with electronic overload protection)
Balance power supply:	12 V DC, 0.84 A
	Can be used up to 2000 m height above mean sea level.

NOTICE

If the balance is used above 2000 m mean sea level, the optional power supply must be used.

Optional power supply

AC adapter:	Primary: 100 – 240 V, ±10%, 50/60Hz
	Secondary: 12 V DC ±3%, 2.5 A (with electronic overload protection)
Cable for AC adapter:	3-core, with country-specific plug
Balance power supply:	12 V DC ±3%, 2.25 A, maximum ripple: 80 mVpp
	Can be used up to 4000 m height above mean sea level.

Protection and standards

Overvoltage category:	II
Degree of pollution:	2
Protection:	Protected against dust and water
Standards for safety and EMC:	See Declaration of Conformity
Range of application:	For use only in closed interior rooms

Environmental conditions

Height above mean sea level:	Depending on the power adapter (2000 - 4000 m)
	Except for China: max. 2000 m
Ambient temperature:	Operating condition for ordinary lab application: +10 to 30 °C (operability guaranteed between +5 to 40 °C)
	Storage condition: -25 to 70 °C
Relative air humidity:	10% up to 80% at 31 °C, linearly decreasing to 50% at 40 °C, non-condensing
Warm-up time:	At least **30** minutes (0.1 mg models **60** minutes) after connecting the balance to the power supply

Materials

Housing:	Top housing: Plastic (ABS)
	Bottom housing: Die-cast aluminum, lacquered
Weighing pan:	Pan ø 90 mm: Stainless steel X2CrNiMo 17-12-2 (1.4404)
	All others: Stainless steel X5CrNi 18-10 (1.4301)
Draft shield element:	0.1 mg models: Stainless steel X5CrNi 18-10 (1.4301)
Draft shield:	Plastic (ABS), glass
In-use-cover:	Plastic (PET)

10.2 Model-specific data

10.2.1 Carat balances with readability of 0.001 ct / 0.1 mg

Technical data

	JE503C	JE503CE
Limit values		
Maximum capacity	505 ct / 101 g	505 ct / 101 g
Readability	0.001 ct / 0.1 mg	0.001 ct / 0.1 mg
Repeatability (at nominal load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Sensitivity temperature drift	2 ppm/°C	2 ppm/°C
Typical values		
Repeatability (at nominal load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Minimum sample weight (U=1%, k=2)	16 mg	16 mg
Minimum sample weight OIML	10 mg	10 mg
Settling time	2 s	2 s
Adjustment	Int. Cal	Ext. Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	210×344×279 mm	210×344×279 mm
Weighing pan dimensions	ø 90 mm	ø 90 mm
Usable height of draft shield	170 mm	170 mm
Weight of balance	4.6 kg	4.4 kg
Weights for routine testing		
OIML CarePac	#11123002	#11123002
Weights	100 g F2, 5 g E2	100 g F2, 5 g E2
ASTM CarePac	#11123102	#11123102
Weights	100 g 1, 5 g 1	100 g 1, 5 g 1

	JE703C	JE703CE
Limit values		
Maximum capacity	700 ct / 140 g	700 ct / 140 g
Readability	0.001 ct / 0.1 mg	0.001 ct / 0.1 mg
Repeatability (at nominal load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Sensitivity temperature drift	2 ppm/°C	2 ppm/°C
Typical values		
Repeatability (at nominal load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Minimum sample weight (U=1%, k=2)	16 mg	16 mg
Minimum sample weight OIML	10 mg	10 mg
Settling time	2 s	2 s
Adjustment	Int. Cal	Ext. Cal
Interfaces	1 RS232	1 RS232

	JE703C	JE703CE
Balance dimensions (W × D × H)	210×344×279 mm	210×344×279 mm
Weighing pan dimensions	ø 90 mm	ø 90 mm
Usable height of draft shield	170 mm	170 mm
Weight of balance	4.6 kg	4.4 kg
Weights for routine testing		
OIML CarePac	#11123002	#11123002
Weights	100 g F2, 5 g E2	100 g F2, 5 g E2
ASTM CarePac	#11123102	#11123102
Weights	100 g 1, 5 g 1	100 g 1, 5 g 1

	JE1103C	JE1103CE
Limit values		
Maximum capacity	1100 ct / 220 g	1100 ct / 220 g
Readability	0.001 ct / 0.1 mg	0.001 ct / 0.1 mg
Repeatability (at nominal load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Sensitivity temperature drift	2 ppm/°C	2 ppm/°C
Typical values		
Repeatability (at nominal load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Minimum sample weight (U=1%, k=2)	16 mg	16 mg
Minimum sample weight OIML	10 mg	10 mg
Settling time	2 s	2 s
Adjustment	Int. Cal	Ext. Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	210×344×279 mm	210×344×279 mm
Weighing pan dimensions	ø 90 mm	ø 90 mm
Usable height of draft shield	170 mm	170 mm
Weight of balance	4.6 kg	4.4 kg
Weights for routine testing		
OIML CarePac	#11123001	#11123001
Weights	200 g F2, 10 g F1	200 g F2, 10 g F1
ASTM CarePac	#11123001	#11123101
Weights	200 g F2, 10 g F1	200 g 1, 10 g 1

10.2.2 Gold balances with readability of 1 mg

Technical data

	JE203G	JE203GE
Limit values		
Maximum capacity	220 g	220 g
Readability	1 mg	1 mg
Repeatability (at nominal load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Sensitivity temperature drift	2 ppm/°C	2 ppm/°C
Typical values		
Repeatability (at nominal load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Minimum sample weight (U=1%, k=2)	140 mg	140 mg
Minimum sample weight OIML	20 mg	20 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal	Ext. Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	210×319×289 mm	210×319×289 mm
Weighing pan dimensions	ø 120 mm	ø 120 mm
Usable height of draft shield	170 mm	170 mm
Weight of balance	4.6 kg	4.4 kg
Weights for routine testing		
OIML CarePac	#11123001	#11123001
Weights	200 g F2, 10 g F1	200 g F2, 10 g F1
ASTM CarePac	#11123101	#11123101
Weights	200 g 1, 10 g 1	200 g 1, 10 g 1

	JE303G	JE303GE
Limit values		
Maximum capacity	320 g	320 g
Readability	1 mg	1 mg
Repeatability (at nominal load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Sensitivity temperature drift	2 ppm/°C	2 ppm/°C
Typical values		
Repeatability (at nominal load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Minimum sample weight (U=1%, k=2)	140 mg	140 mg
Minimum sample weight OIML	20 mg	20 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal	Ext. Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	210×319×289 mm	210×319×289 mm
Weighing pan dimensions	ø 120 mm	ø 120 mm

	JE303G	JE303GE
Usable height of draft shield	170 mm	170 mm
Weight of balance	4.6 kg	4.4 kg
Weights for routine testing		
OIML CarePac	#11123001	#11123001
Weights	200 g F2, 10 g F1	200 g F2, 10 g F1
ASTM CarePac	#11123101	#11123101
Weights	200 g 1, 10 g 1	200 g 1, 10 g 1

	JE503G	JE503GE
Limit values		
Maximum capacity	520 g	520 g
Readability	1 mg	1 mg
Repeatability (at nominal load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Minimum sample weight (U=1%, k=2)	140 mg	140 mg
Minimum sample weight OIML	20 mg	20 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal	Ext. Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	210×319×289 mm	210×319×289 mm
Weighing pan dimensions	ø 120 mm	ø 120 mm
Usable height of draft shield	170 mm	170 mm
Weight of balance	4.6 kg	4.4 kg
Weights for routine testing		
OIML CarePac	#11123007	#11123007
Weights	500 g F2, 20 g F1	500 g F2, 20 g F1
ASTM CarePac	#11123107	#11123107
Weights	500 g 1, 20 g 1	500 g 1, 20 g 1

10.2.3 Gold balances with readability of 10 mg

Technical data

	JE1002G	JE1002GE
Limit values		
Maximum capacity	1200 g	1200 g
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg
Settling time	1 s	1 s
Adjustment	Int.Cal	Ext.Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	200×319×100 mm	200×319×100 mm
Weighing pan dimensions	180×180 mm	180×180 mm
Weight of balance	3.8 kg	3.2 kg
Weights for routine testing		
OIML CarePac	#11123008	#11123008
Weights	1000 g F2, 50 g F2	1000 g F2, 50 g F2
ASTM CarePac	#11123108	#11123108
Weights	1000 g 1, 50 g 1	1000 g 1, 50 g 1

	JE2002G	JE2002GE
Limit values		
Maximum capacity	2200 g	2200 g
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg
Settling time	1 s	1 s
Adjustment	Int.Cal	Ext.Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	200×319×100 mm	200×319×100 mm
Weighing pan dimensions	180×180 mm	180×180 mm
Weight of balance	3.8 kg	3.2 kg

	JE2002G	JE2002GE
Weights for routine testing		
OIML CarePac	#11123009	#11123009
Weights	2000 g F2, 100 g F2	2000 g F2, 100 g F2
ASTM CarePac	#11123109	#11123109
Weights	2000 g 1, 100 g 1	2000 g 1, 100 g 1

	JE3002G	JE3002GE
Limit values		
Maximum capacity	3200 g	3200 g
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg
Settling time	1 s	1 s
Adjustment	Int.Cal	Ext.Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	200×319×100 mm	200×319×100 mm
Weighing pan dimensions	180×180 mm	180×180 mm
Weight of balance	3.8 kg	3.2 kg
Weights for routine testing		
OIML CarePac	#11123009	#11123009
Weights	2000 g F2, 100 g F2	2000 g F2, 100 g F2
ASTM CarePac	#11123109	#11123109
Weights	2000 g 1, 100 g 1	2000 g 1, 100 g 1

	JE4002G	JE4002GE
Limit values		
Maximum capacity	4200 g	4200 g
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg

	JE4002G	JE4002GE
Settling time	1 s	1 s
Adjustment	Int.Cal	Ext.Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	200×319×100 mm	200×319×100 mm
Weighing pan dimensions	180×180 mm	180×180 mm
Weight of balance	3.8 kg	3.2 kg
Weights for routine testing		
OIML CarePac	#11123010	#11123010
Weights	2000 g F2, 200 g F2	2000 g F2, 200 g F2
ASTM CarePac	#11123110	#11123110
Weights	2000 g 4, 200 g 4	2000 g 4, 200 g 4

	JE5002G	JE5002GE
Limit values		
Maximum capacity	5200 g	5200 g
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg
Settling time	1 s	1 s
Adjustment	Int.Cal	Ext.Cal
Interfaces	1 RS232	1 RS232
Balance dimensions (W × D × H)	200×319×100 mm	200×319×100 mm
Weighing pan dimensions	180×180 mm	180×180 mm
Weight of balance	3.8 kg	3.2 kg
Weights for routine testing		
OIML CarePac	#11123011	#11123011
Weights	5000 g F2, 200 g F2	5000 g F2, 200 g F2
ASTM CarePac	#11123111	#11123111
Weights	5000 g 4, 200 g 4	5000 g 4, 200 g 4

10.3 Dimensions

10.3.1 Carat balances with readability of 0.001 ct / 0.1 mg

Models:

JE503C
JE503CE
JE703C
JE703CE
JE1103C
JE1103CE
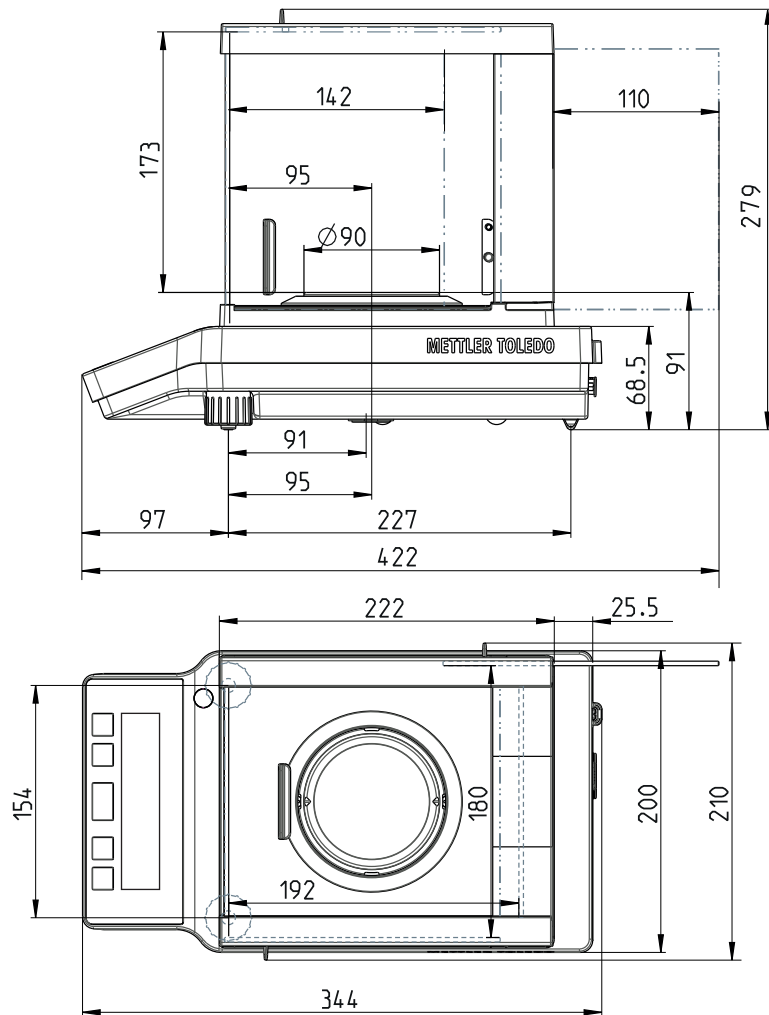
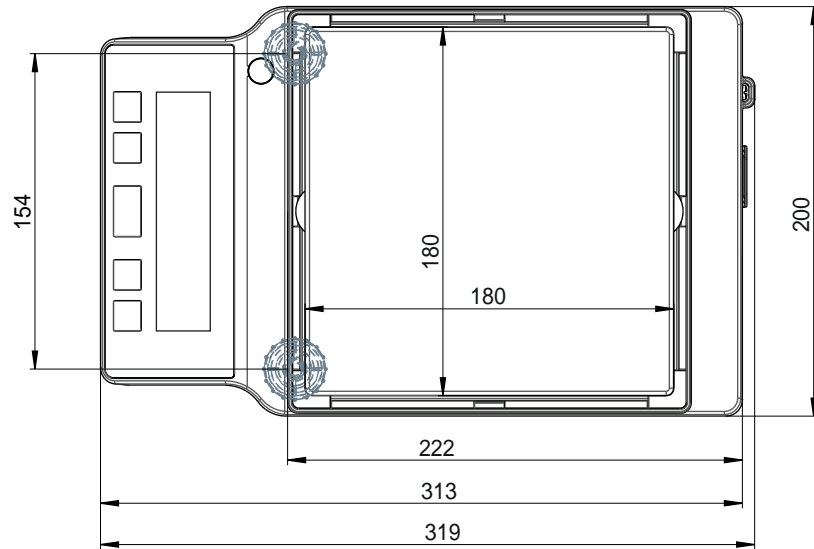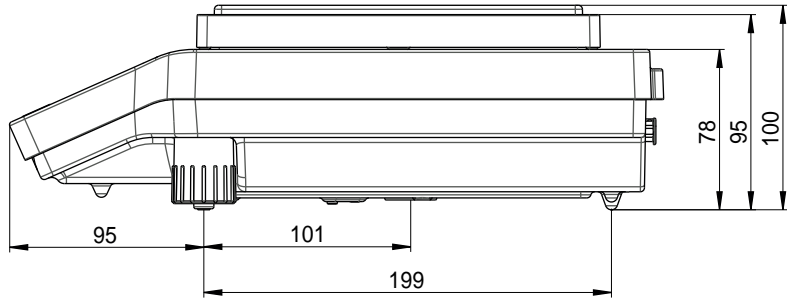### 10.3.2 Gold balances with readability of 1 mg

Models:
JE203G
JE203GE
JE303G
JE303GE
JE503G
JE503GE
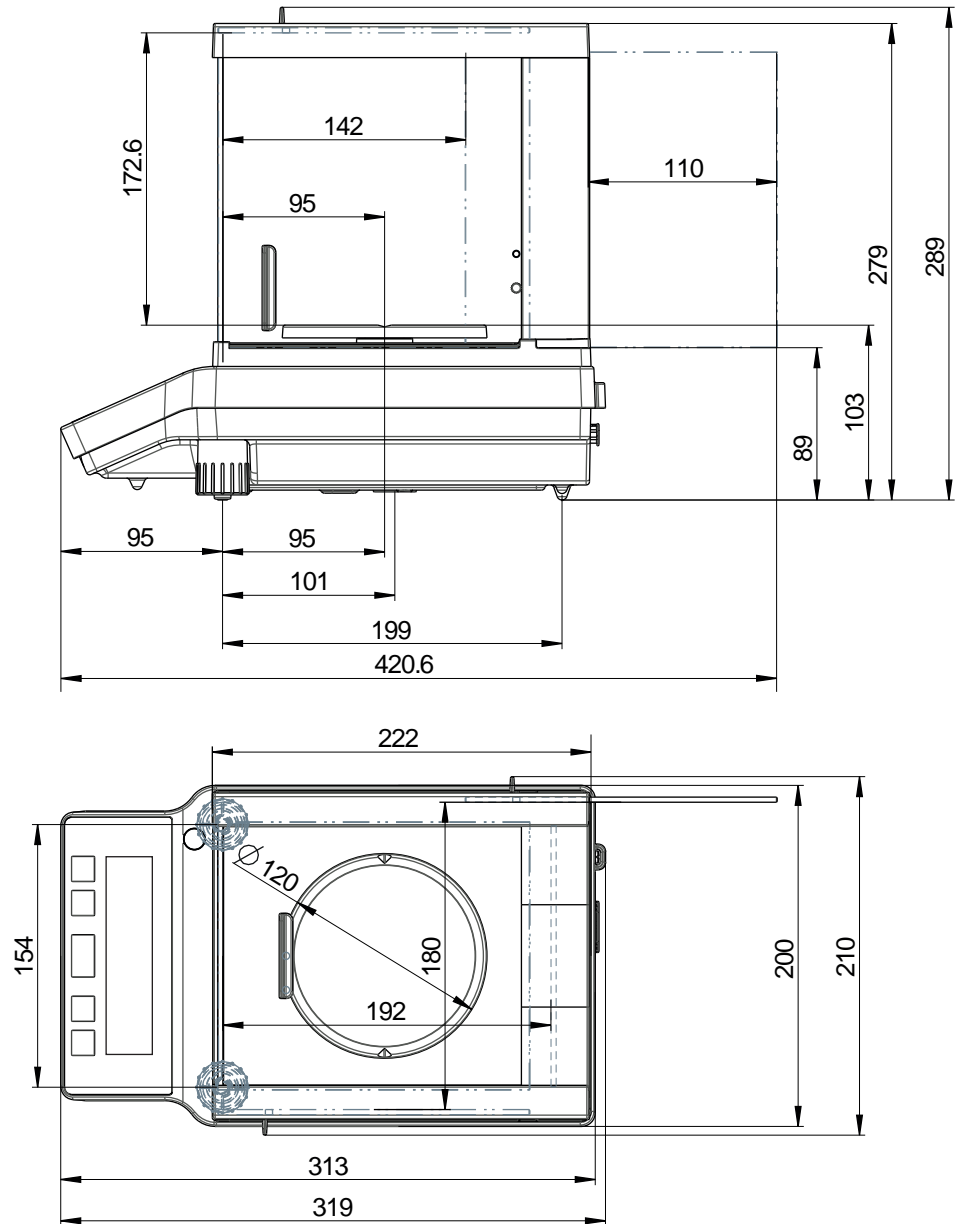
10.3.3 Gold balances with readability of 10 mg

Models:
JE1002G
JE1002GE
JE2002G
JE2002GE
JE3002G
JE3002GE
JE4002G
JE4002GE
JE5002G
JE5002GE

10.4 Interface specification

10.4.1 RS232C interface

Each balance is equipped with an RS232C Interface as standard for the attachment of a peripheral device (e.g. printer or computer).

Schematic	Item	Specification
	Interface type	Voltage interface according to EIA RS-232C/ DIN66020 CCITT V24/V.28)
	Max. cable length	15 m
	Signal level	Outputs: +5 V … +15 V (RL = 3–7 kΩ) −5 V … −15 V (RL = 3–7 kΩ) Inputs: +3 V … +25 V −3 V … -25 V
	Connector	Sub-D, 9-pole, female
	Operating mode	Full duplex
	Transmission mode	Bit-serial, asynchronous
	Transmission code	ASCII
	Baud rates	600, 1200, 2400, 4800, 9600, 19200, 38400 (software selectable)
	Bits/parity	7-bit/none, 7-bit/even, 7-bit/odd, 8-bit/none (software selectable)
	Stop bits	1 stop bit
	Handshake	None, XON/XOFF, RTS/CTS (software selectable)
	End-of-line	<CR><LF>, <CR>, <LF> (software selectable)
	Power supply for 2nd display	+ 12 V, max 40 mA (software selectable, 2nd display mode only)

Schematic labels: DATA — RxD IN, TxD OUT; GND; pins 5...1, 9...6; HAND SHAKE — CTS IN, RTS OUT; POWER SUPPLY — +12V OUT; 2nd display mode only

10.4.2 MT-SICS interface commands and functions

Many of the instruments and balances used have to be capable of integration in a complex computer or data acquisition system.

To enable you to integrate balances in your system in a simple manner and utilize their capabilities to the full, most balance functions are also available as appropriate commands via the data interface.

All new METTLER TOLEDO balances launched on the market support the standardized command set "METTLER TOLEDO Standard Interface Command Set" (MT-SICS). The commands available depend on the functionality of the balance.

For further information please contact your METTLER TOLEDO representative.

For further information please refer to the Reference Manual MT-SICS downloadable from the Internet under

▶ www.mt.com/jewelry

11 Accessories and Spare Parts

11.1 Accessories

Accessories

Printers
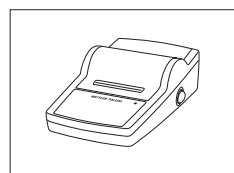
	RS-P25 printer with RS232 connection to instrument	11124300
	Paper roll (length: 20 m), set of 5 pcs	00072456
	Paper roll (length: 13 m), self-adhesive, set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975
	RS-P26 printer with RS232 connection to instrument (with date and time)	11124303
	Paper roll (length: 20 m), set of 5 pcs	00072456
	Paper roll, self-adhesive (length: 13 m), set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975
	RS-P28 printer with RS232 connection to instrument (with date, time and applications)	11124304
	Paper roll (length: 20 m), set of 5 pcs	00072456
	Paper roll, self-adhesive (length: 13 m), set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975
	P-52RUE dot matrix printer with USB, RS232, and ethernet connections	30237920
	Paper roll, set of 5 pcs	00072456
	Paper roll, self-adhesive, set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975
	P-56RUE thermal printer with RS232, USB and ethernet connections, simple printouts, date and time, label printing (limited).	30094673
	Paper roll, white (length: 27 m), set of 10 pcs	30094723
	Paper roll, white, self-adhesive (length: 13 m), set of 10 pcs	30094724
	Paper roll, white, self-adhesive labels (550 labels), set of 6 pcs	30094725
	P-58RUE thermal printer with RS232, USB and ethernet connections, simple printouts, date and time, label printing, balance applications: statistics, formulation, totaling,	30094674
	Paper roll, white (length: 27 m), set of 10 pcs	30094723
	Paper roll, white, self-adhesive (length: 13 m), set of 10 pcs	30094724
	Paper roll, white, self-adhesive labels (550 labels), set of 6 pcs	30094725
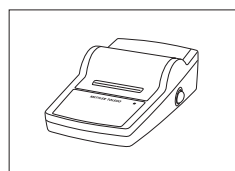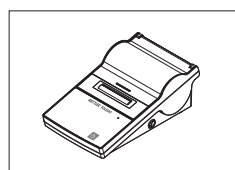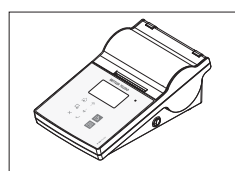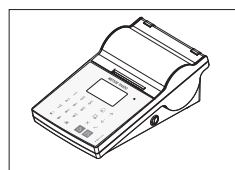
Cables for RS232 interface
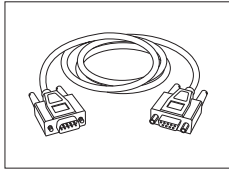
	RS9 – RS9 (m/f): connection cable for PC, length = 1 m	11101051
	RS9 – RS25 (m/f): connection cable for PC, length = 2 m	11101052
	RS232 - USB converter cable – Cable with converter to connect a balance (RS232) to a USB port	64088427
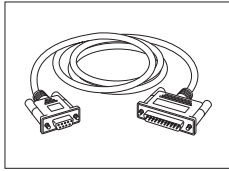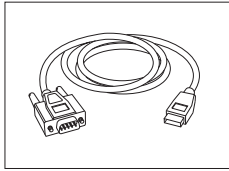
Density determination
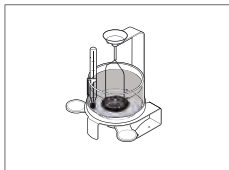
	Density kit ME-DNY-4 for balances with readability of 0.01 mg / 0.1 mg	30029886
	Glass beaker, height 100 mm, ø 60 mm	00238167
	Sinker for density of liquids in conjunction with density kit	00210260
	Calibrated (sinker + certificate)	00210672
	Recalibrated (new certificate)	00210674
	Calibrated thermometer with certificate	11132685
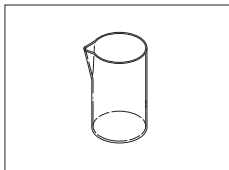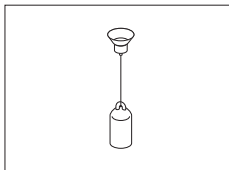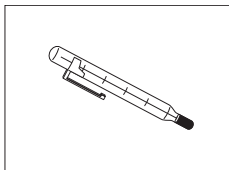
Carat pans
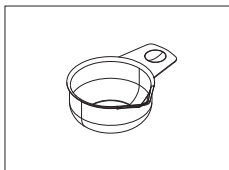
	Carat pan XS, ø 50 mm / heigh 20 mm (set of 10 units)	12102565
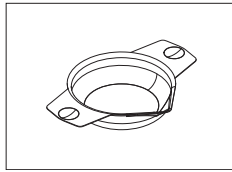
	Carat pan S, ø 80 mm / heigh 20 mm (set of 10 units)	12102645
	Carat pan M, ø 90 mm / heigh 30 mm (set of 10 units)	12102646
	Carat pan L, ø 90 mm / heigh 45 mm (set of 10 units)	12102647
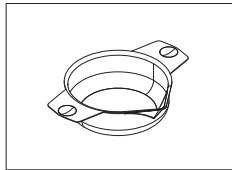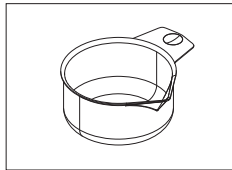
Weighing pans
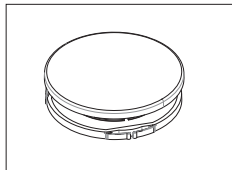
	Set of weighing pan ø 160 mm with pan support for balances with readability of 10 mg and 100 mg using draft shield	30042896

Draft shields
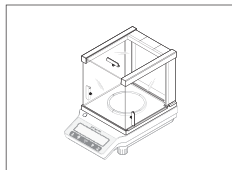
	Draft shield low with sliding doors, usable heigh 170 mm. • for balances 0.1 mg or 1 mg • for balances 10 mg or 100 mg, weighing pan ø 160 mm is needed (#30046407)	30042884

Auxiliary displays
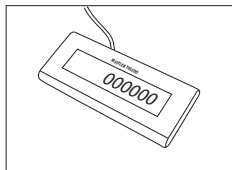
	RS232 auxiliary display AD-RS-J7	12122380

Protective covers
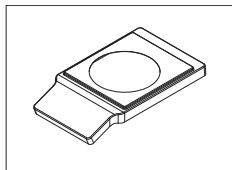
	Protective cover for models with readability of 0.01 mg / 0.1 mg	30037742
	Protective cover for models with readability of 1 mg … 100 mg	30042890
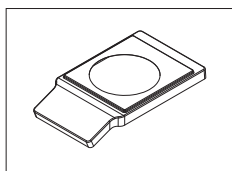
Dust covers
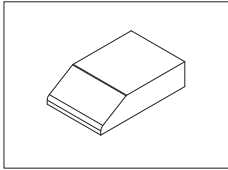
	Dust cover for models without draft shield	30029051
	Dust cover for models with draft shield low (170 mm)	30029050
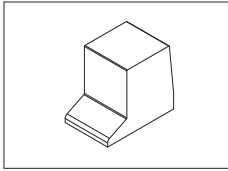
Anti-theft devices
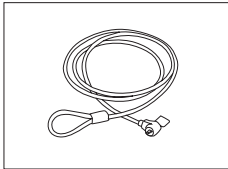
	Anti-theft steel cable	11600361

Software
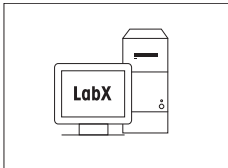
	LabX direct balance (simple data transfer)	11120340

Transport cases
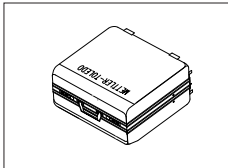
	Transport case for models with draft shield (170 mm)	30046405
	Transport case for models without draft shield	30046406

Miscellaneous
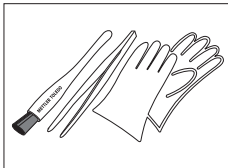
	Tool kit, contains brush, tweezer and glove	30046403
	AC/DC universal adapter (EU, USA, AU, UK) 100–240 VAC, 50/60 Hz, 0.5 A, 12 VDC 1 A	11120270
	AC/DC adapter (without power cable) 100–240 V AC, 0.8 A, 50/60 Hz, 12 V DC 2.5 A	11107909
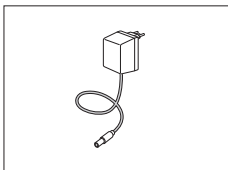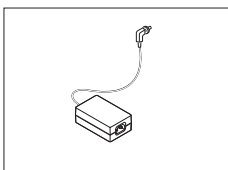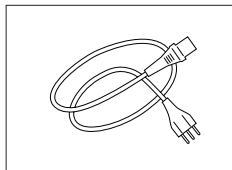
Country-specific 3-Pin power cable with grounding conductor.

Power cable AU	00088751
Power cable BR	30015268
Power cable CH	00087920
Power cable CN	30047293
Power cable DK	00087452
Power cable EU	00087925
Power cable GB	00089405
Power cable IL	00225297
Power cable IN	11600569
Power cable IT	00087457
Power cable JP	11107881
Power cable TH, PE	11107880
Power cable US	00088668
Power cable ZA	00089728

Adjustment weights
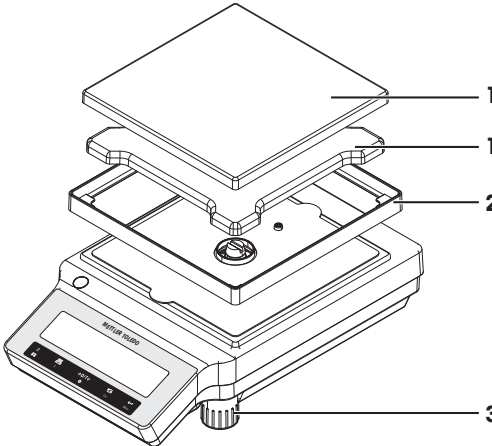
OIML / ASTM Weights (with calibration certificate)
see http://www.mt.com/weights

11.2 Spare parts
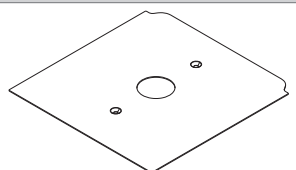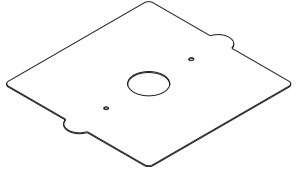
JE balances with readability of 0.1 mg / 1 mg

Drawing	Pos	Description	Part No.
	1	Sliding top door for draft shield high or low with mounted handle (170 mm)	30037733
	2	Pair of handles for sliding doors of draft shield	30037736
	3	Pair of sliding side doors for draft shield low with mounted handles (left and right), 170 mm	30042885
	4	Weighing pan ø 120 mm incl. pan support, 1 mg	30042889
	5	Weighing pan ø 90 mm incl. pan support, 0.1 mg	30037737
	6	Draft shield element, 0.1 mg	12122043
	7	Pair of leveling foot	30037744

JE balances with readability of 10 mg

Drawing	Pos	Description	Part No.
	1	Weighing pan 180 × 180 mm with pan support, 10 mg	30042895
	2	Draft shield element 180 × 180 mm, 10 mg	30042897
	3	Pair of leveling foot	30037744

Miscellaneous

Drawing	Pos	Description	Part No.
		Bottom plate for draft shield	30037739
		Bottom plate for models without draft shield	30042901

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Numerics

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It helps to:
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- Calibrate and operate your weighing equipment with security
- Comply with quality and compliance standards in laboratory and
  manufacturing

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30066320